日中脳神経外科連盟第4回学術集会

（第12回日中友好脳神経外科学会）

The 4thMeeting of Japan-China Neurosurgery Alliance

(The 12th Japan-China Friendship Neurosurgical Symposium)

Date：June 27-28, 2025

Venue：International University of Health & Welfare Atami Hospital
KKR Hotel Atami
Shizuoka, Japan

President

Kenichi OYAMA 大山　健一

Department of Neurosurgery
International University of Health & Welfare Mita Hospital

Yuqi ZANG 張　玉琪

Department of Neurosurgery
Tsinghua University

URL:https://jcna2025.umin.jp/index.html


Eisai
hhc
human health care
患者様の想いを見つめて、
薬は生まれる。
顕微鏡を覗く日も、薬をお届けする日も、見つめています。
病気とたたかう人の、言葉にできない痛みや不安。生きることへの希望。
私たちは、医師のように普段からお会いすることはできませんが、
そのぶん、患者様の想いにまっすぐ向き合っていたいと思います。
治療を続けるその人を、勇気づける存在であるために。
病気を見つめるだけではなく、想いを見つめて、薬は生まれる。
「ヒューマン・ヘルスケア」。それが、私たちの原点です。
ヒューマン・ヘルスケア企業 エーザイ
AFUTUREFREEOFLF
GlobalAlliance
エーザイはWHOのリンパ系フィラリア病制圧活動を支援しています。

Good Memories of Zhengzhou 鄭州

1st Meeting of China-Japan Neurosurgery Alliance

(9th China-Japan Friendship Neurosurgical Symposium) in November, 2017

Shaolin Temple

2nd JCNSA in Odawara, Japan 2018.11.18-11.19

3rd CJNSA in Urumqi, China 2019.8.1-8.4

We are delighted to announce that the 4th Meeting of Japan-China Neurosurgery Alliance will be held in Atami, Japan from June 27 to 28, 2025. This meeting has been held for the purpose of deepening the international friendship among Neurosurgical institutes in Japan and China since 1990, moreover, of making effort for advancement of our treatment by exchanging information about treatment strategies and surgical procedures in both countries. Special program is composed with lectures by invited speakers from each institute, and we are expecting to meet together old and new friends. Not making a main theme for this meeting, we hope you would make a splendid lecture about your own or main neurosurgical research and treatment that lead to our bright tomorrow. The congress venue will be at International University of Health & Welfare Atami Hospital and KKR Atami Hotel located at the water front of Atami city of Japan. Atami city is a hot spring resort located in the easternmost tip of Shizuoka Prefecture, in the northeast of Izu Peninsula and attractive with nature resources in its vicinity. We sincerely hope that all attendees to this meeting will have a rewarding experience and return home with valuable information to inform your work. We also hope that you have an opportunity to explore this beautiful Atami city, which offers a wonderful variety of cultural, scenery and culinary delights for you to enjoy, all of which are enhanced by Japan's superb hospitality.

We will be honored to be your hosts during the meeting and we look forward to welcome you to Japan.

Sincerely yours,

Akira Teramoto, M.D., PhD.

Executive Chairman

Japan-China Neurosurgery Alliance

Emeritus President, Tokyo Rosai Hospital

Emeritus Professro, Nippon Medical School

Executive Director, Japan Brain Foundation

Kenichi Oyama, M.D., PhD.

President

The 4th Meeting of Japan-China Neurosurgery Alliance

Director & Professor

Department of Neurological Surgery

International University of Health & Welfare

Mita Hospital

Address from the Chinese Chairmen of China-Japan Neurosurgical Union

Dear respectful colleagues,

China and Japan are neighbors separated by a strip of water, with a history of friendly exchanges of more than 2,000 years. With the unremitting efforts of generations of neurosurgeons from both countries, the personnel of the two sides have jointly discussed new technologies and developments, deepened academic exchanges, and deepened cooperation and friendship. From 1990 to 2019, the Chinese and Japanese neurosurgery communities held eleven academic exchange conferences, which promoted the progress of neurosurgery in Asia. Time flies, and many predecessors have passed away one after another, but it is difficult to forget the great historical achievements they made, and we would like to pay deep respect here. Working together to promote the development of neurosurgery in Asia for the benefit of patients is the common goal of our representatives from China and Japan. It is the common dream of Chinese and Japanese experts to let the world hear more voices of Asian neurosurgery and occupy an important position in the world.

According to the constitution of the China-Japan Neurosurgery Alliance, on **June 27-28, 2025**, the 12th China-Japan Neurosurgery Alliance Academic Conference will be hosted by the Japanese side in the beautiful city of **Atami, Japan** (Chairman of the Japanese Alliance: Akira Teramoto; Executive Chairman of the Japanese Alliance: Kenichi Oyama). Located in the northern part of the Izu Peninsula and bordered by Sagami Bay, Atami City is a beautiful city that combines history, culture, natural landscapes, and hot springs, as well as a place where culture, art, and food come together, and where you can experience traditional culture and art. Cultural properties such as art museums and the latest shops offer a great way to enjoy the beauty of the past and the present.

Although the dream is far away, the chase can be reached! We warmly welcome domestic neurosurgeons to actively participate in this event, promote the exchange of talents in the field of neurosurgery between the two countries, explore the research and development of new materials and devices, further strengthen cooperation in the fields of deepening scientific and technological innovation and brain health and medical treatment, and strive to achieve the goal of steady and far-reaching development, and look forward to the fruitful results of this conference!

Prof. Liwei Zhang, the Former Chinese Chairman of China-Japan Neurosurgical Union
Prof. Yuqi Zhang, the Chinese Executive Chairman of China-Japan Neurosurgical Union
January 24, 2025

日中脳神経外科連盟　日本側　役員一覧（2025 年 6 月現在）

顧問	嘉山　孝正	東北大学参与、国際医療福祉大学特任教授・学事顧問
代表世話人	寺本　明	湘南医療大学副学長
世話人	新井　一	順天堂大学理事
世話人	有田　和徳	出水郡広域医療センター脳神経外科
世話人	飯原　弘二	国立循環器病研究センター病院病院長
世話人	泉 孝嗣	名古屋大学医学部脳神経外科
世話人	伊関　洋	介護老人施設遊施設長
世話人	植木　敬介	労働保険審査会委員
世話人	大熊　洋揮	弘前総合医療センター院長
世話人	大畑　建治	大阪府済生会中津病院脳神経外科
世話人	加藤　庸子	藤田保健衛生大学坂文種報徳會病院脳神経外科
世話人	河瀬　斌	慶應義塾大学名誉教授
世話人	川俣　貴一	東京女子医科大学脳神経外科
世話人	菊田　健一郎	福井大学医学系部門脳脊髄神経外科領域
世話人	貴島　晴彦	大阪大学医学部脳神経外科
世話人	木内　博之	山梨大学医学部脳神経外科
世話人	金 彪	宇都宮脳脊髄センターシンフォニー病院院長
世話人	栗栖　薫	中国労災病院院長
世話人	栗田　浩樹	埼玉医大国際医療センター脳神経外科
世話人	黒岩　敏彦	畷生会脳神経外科病院理事
世話人	黒崎　雅道	鳥取大学医学部脳神経外科
世話人	黒田　敏	富山大学医学部脳神経外科
世話人	河野　道宏	東京医科大学脳神経外科
世話人	甲村　英二	近畿中央病院病院長
世話人	齊藤　延人	東京大学医学部脳神経外科
世話人	佐伯　直勝	神経内科津田沼
世話人	塩川　芳昭	富士脳障害研究所附属病院院長
世話人	清水　惠司	耳原総合病院脳神経外科
世話人	鈴木　倫保	ANT5 株式会社
世話人	平　孝臣	三愛病院脳神経外科
世話人	高橋　弘	春日居サイバーナイフ・リハビリ病院

世話人	立花　修	やわたメディカルセンターリハビリテーション科
世話人	伊達　勲	岡山ろうさい病院院長
世話人	冨永　悌二	東北大学総長
世話人	中瀬　裕之	平成記念病院院長補佐
世話人	西川　亮	練馬駅リハビリテーション病院院長
世話人	野崎　和彦	東近江総合医療センター院長
世話人	藤井　幸彦	済生会三条病院臨床検査科
世話人	寶金　清博	北海道大学総長
世話人	堀内　哲吉	信州大学医学部脳神経外科
世話人	本郷　一博	伊那中央病院院長
世話人	松居　徹	埼玉医科大学総合医療ｾﾝﾀｰ名誉教授
世話人	松野　彰	国際医療福祉大学医学部脳神経外科
世話人	松前　光紀	横浜新緑総合病院院長
世話人	松丸　祐司	筑波大学脳神経外科
世話人	三國　信啓	札幌医科大学脳神経外科
世話人	村垣　善浩	神戸大学未来医工学研究開発センター
世話人	森田　明夫	東京労災病院院長
世話人	山口 文雄	五井病院脳神経外科
世話人	吉田　一成	慶應義塾大学名誉教授
世話人	若林　俊彦	ナゴヤガーデンクリニック院長

五十音順

中国側名誉会長
周良輔、張亜卓

中国側会長
張力偉 首都医科大学北京天壇病院

中国側執行会長
張玉琪 清華大学玉泉病院

氏名の画数順に並べる

中国側副会長
1. 于炎氷 北京中日友好病院
2. 王勁 北京清華長庚病院
3. 王茂徳 西安交通大学第一附属病院
4. 毛穎 復旦大学上海華山病院
5. 趙衛国 上海交通大学上海瑞金病院
6. 趙国光 首都医科大学北京宣武病院
7. 朱巍 復旦大学上海華山病院

氏名の画数順に並べる

中国側常務委員
1. 于宏偉 中国医科大学盛京病院
2. 王中 蘇州大学附属第一病院
3. 王寧 哈爾浜医科大学附属第一病院
4. 王貴懐 北京清華長庚病院
5. 石祥恩 北京三博脳科病院
6. 馮華 陸軍軍医大学重慶西南病院
7. 蘭青 蘇州大学第二附属病院
8. 任明軍 浙江省麗水市人民病院
9. 江榮才 首都医科大学宣武病院
10. 劉衛平 空軍軍医大学西京病院
11. 劉阿力 北京天壇病院
12. 劉赫 北京朝陽病院
13. 劉献志 鄭州大学第一附属病院
14. 許百男 解放軍総病院
15. 孫暁川 重慶医科大学第一附属病院
16. 李良 北京大学第一病院
17. 李昊 復旦大学上海児童病院
18. 李世亭 上海新華病院
19. 李維平 深セン市第二人民病院
20. 楊軍 北京大学第三病院

21. 楊学軍 北京清華長庚病院
22. 更・党木仁加甫 新疆医科大学附属第一病院
23. 呉安華 中国医科大学盛京病院
24. 呉浩 首都医科大学宣武病院
25. 張文川 上海交通大学第九人民病院
26. 陳書達 浙江省人民病院
27. 陳謙学 武漢大学人民病院
28. 岳樹源 天津医科大学総病院
29. 周文静 清華大学玉泉病院
30. 趙叢海 吉林中日連宜病院
31. 趙剛 吉林大学附属第一病院
32. 胡錦 復旦大学上海華山病院
33. 鐘平 上海華山病院
34. 侯立軍 上海長征病院
35. 洪濤 南昌大学第一附属病院
36. 袁越 北京中日友好病院
37. 欒新平 新疆医科大学第二病院
38. 諸葛啓訓 温州医科大学第一附属病院
39. 魯暁傑 南京医科大学附属無錫市第二人民病院
40. 游潮 四川華西病院

The 4th Meeting of Japan-China Neurosurgery Alliance
(The 12th Japan-China Friendship Neurosurgical Symposium)

1.Conference date & Venue

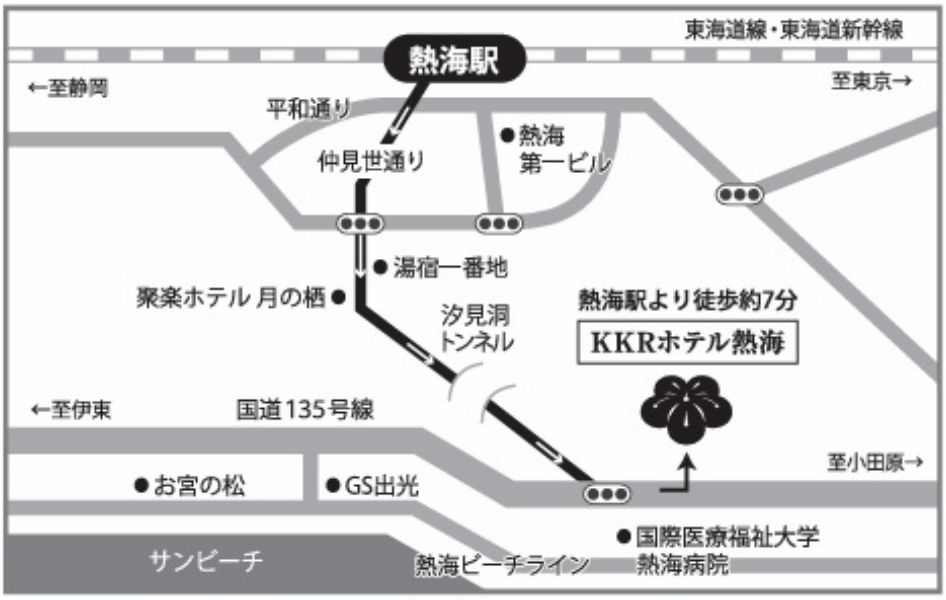
June 27(Fri), 2025
International University of Health & Welfare Atami Hospital
B1F Conference room
June 28 (Sat), 2025
KKR Hotel Atami 3F banquet hall “La Vie”

2. President

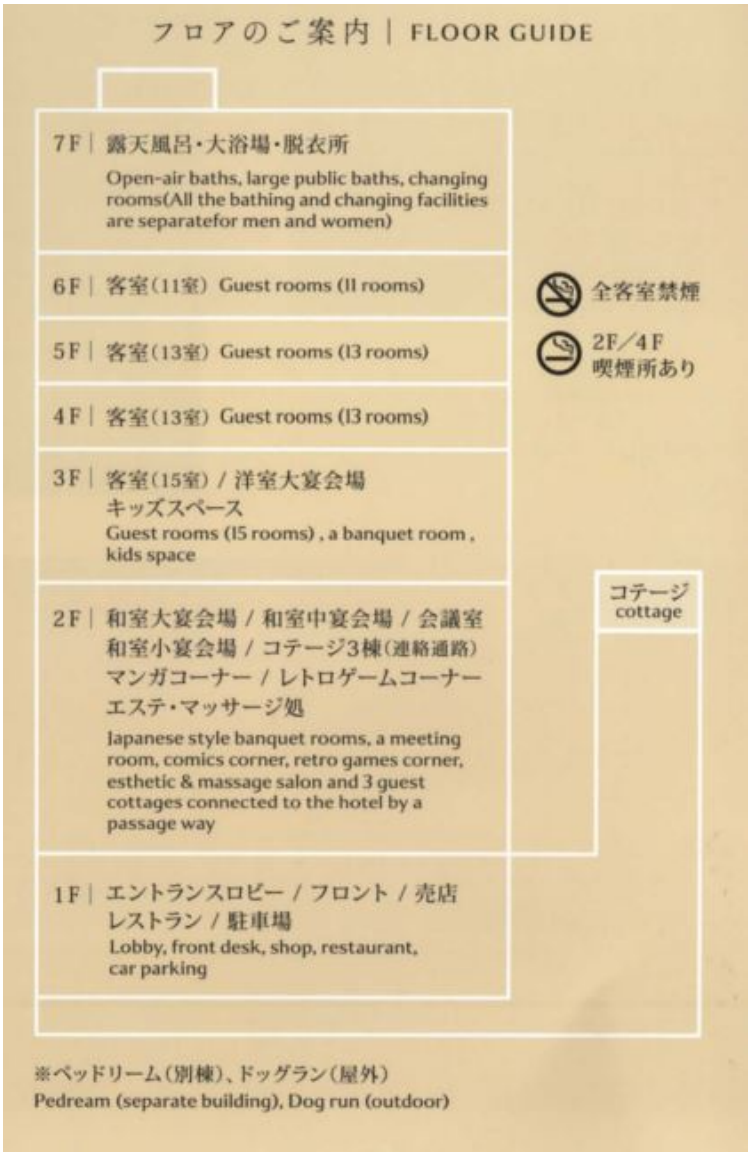
Kenichi Oyama M.D., PhD.
Professor & Director, Department of Neurosurgery,
International University of Health & Welfare Mita Hospital

Yuqi Zhang M.D., PhD
Professor & Chairman, Department of Neurosurgery,
Yuquan Hospital of Tsinghua University

3. Access



4. KKR Hotel Atami Floor Guide



5. Registration

Registration fee: 15,000 JPY

On line registration only: https://jcna2025.umin.jp/registrationl.html

Over view of schedule

[June 26 (Thu), 2025]

19:00-21:00　Welcome reception

The place of Tokyo

3-5-4 Shibakoen, Minato, Tokyo

Tel: 03-5733-6865

5 min walk from Tokyo Prince Hotel

[June 27(Fri), 2025]

15:30-17:45 Lectures
International University of Health & Welfare Atami Hospital
B1F conference room

18:00-18:30 Japan-China Joint Executive Meeting
International University of Health & Welfare Atami Hospital
B1F conference room

19:00-21:00 Social gathering
KKR Hotel Atami 3F banquet hall “La Vie”

[June 28 (Sat), 2025]

8:00-8:30 Opening ceremony
KKR Hotel Atami 3F banquet hall “La Vie”

8:30-18:50 Lectures
Room A, B: 3F banquet hall “La Vie”
Poster viewing room: 2F conference room “Avenir”

18:50 End of the Meeting
Closing remarks

19:30-21:30 Farewell party

Hotel Heartpia Atami
717-18 Izuyama, Atami, Shizuoka
Tel: 0120-405-056

[June 29 (Sun), 2025]

8:00　Adjournment

Bus Service to Narita Airport and Haneda Airport will be operated.
Departure time will be noticed during the meeting.

See you next time!!

Guidelines for Oral Presentations

For moderators

- ¨ Moderators are asked to remain within the time allotted for the session and each presentation.
- ¨ The time allotted for each presentation is scheduled as follows:

  Key note lecture.....Presentation 15 min incl. Q&A
  Lecture Presentation 10 min incl. Q&A

  A sound of a bell will indicate the end of a presentation time.

For presenters

- ¨ Please bring your own PC for your presentation and make sure to bring an AC adaptor.
- ¨ PC preview desk will not be available.
- ¨ For projector output purposes, a HDMI will be provided.
- ¨ Please come to your session room 15 min before your session starts.
- ¨ The time allotted for each presentation is scheduled as follows:

  Key note lecture.....Presentation 15 min incl. Q&A
  Lecture Presentation 10 min incl. Q&A¨

  A sound of a bell will indicate the end of your presentation time.

The 4thMeeting of Japan-China Neurosurgery Alliance

(The 12th Japan-China Friendship Neurosurgical Symposium)

June 27-28, 2025

Atami City, Japan

June 27, 2025　国際医療福祉大学熱海病院　会議室（地下 1 F）
（地址：〒413-0012 静岡県熱海市東海岸町 13 番地 1 号）

Time	Speaker　Topic
Moderator 主持：胡韶山 Hu Shaoshan,　近藤 聡英 Kondo Akihide	
15: 30 -15：40	近藤 聡英 Kondo Akihide　順天堂大学 Juntendo University
Application of a collagen matrix for dura closure in cases of posterior canal of the internal auditory canal	
15：40-15：50	穆林森 Mu Linsen 广东三九脑科医院 Guangdong 999 Brain Hospital
Neuroendoscopic surgery for brainstem cavernous hemangiomas	
15：50-16：00	何超 He Chao 温州医科大学附属诸暨医院 Zhuji Hospital Affiliated to Wenzhou Medical University
Ruptured giant basilar artery aneurysm associated with Moyamoya disease can be diagnosed by examination and cured by comprehensive therapy	
16：00-16：10	寺本　紳一郎 Teramoto Shinichiro　順天堂大学 Juntendo University
Investigation of predictors of latent visual impairment in patients with sellar lesions	
16：10-16：20	胡韶山 Hu Shaoshan 浙江省人民医院 Zhejiang Provincial People’s Hospital
Comprehensive treatment of malignant cerebral glioma based on peritumoral heterogeneity using photodynamic targeting technology	
16：20-16：30	雷霆 Lei Ting 首都医科大学附属三博脑科医院 Department of Neurosurgery, Sanbo Brain Hospital, Capital Medical University
Impact of oral bacteria on intracranial aneurysms: A morphological and molecular study	
16: 30-16:35	休憩

Moderator 主持：王向宇 Wang Xiangyu, 菊田 健一郎 Kikuta Kenichiro, 朱春然 Zhu Chunran 中冨浩文 Nakatomi Hirofumi	
16：35-16：45	马心龙 Ma Xinlong 清华大学玉泉医院（清华大学中西医结合医院） Tsinghua University Yuquan Hospital
Case analysis of flow diverter treatment for posterior circulation aneurysms	
16：45-16：55	菊田 健一郎 Kikuta Kenichiro 福井大学 Fukui University
Surgery of vestibular schwannoma in supine-lateral position with exoscope “ORBEYE”	
16：55-17：05	王向宇 Wang Xiangyu 暨南大学附属第一院 The First Affliated Hospital of Jinan University
Anatomical study and clinical application exploration of the posterior interhemispheric approachfor resecting space-occupying lesions along the free edge of the tentorium (Any segment)	
17：05-17:15	朱春然 Zhu Chunran 南京中医药大学附属中西结合医院 Affiliated Hospital of Integrated Traditional Chinese and Western Medicine, Nanjing University of Chinese Medicine
Protection strategies for venous sinuses during microvascular decompression surgery	
17：15-17：25	苗树船 Miao Shuchuan 成都中医药大学附属医院 Hospital of Chengdu University of Traditional Chinese Medicine
Association of atherogenic index of plasma and its modified indices with stroke risk in individuals with cardiovascular-kidney-metabolic syndrome stages 0-3: a longitudinal analysis based on CHARLS	
17：25-17：35	中冨浩文 Nakatomi Hirofumi, 国際医療福祉大学病院 International University of Health & Welfare Hospital
Functional Preservation Surgery for Acoustic Neuroma - Visualizing Diseased Nerve and Neural Function	
17：35-17：45	李彦东 Li Yandong 新疆医科大学第一附属医院 The First Affiliated Hospital of Xinjiang Medical University
Resection of ventrolateral foramen magnum meningioma via the far lateral approach with a straight incision	
17:45-17:55	退场
18：00-18:30	**日中合同世話人会** **大山健一 Oyama Kenichi 张玉琪 Zhang Yuqi**
19:00	晚餐会 KKR ホテル熱海 3F 宴会厅 ラヴィ （地址：〒413-00 日本国静岡県熱海市春日町７－３９）

The 4thMeeting of Japan-China Neurosurgery Alliance

(The 12th Japan-China Friendship Neurosurgical Symposium)

June 27-28, 2025

Atami City, Japan

开幕式　KKR ホテル熱海　３F　ラヴィ

（地址：〒413-00 日本国静岡県熱海市春日町７−３９）

Room A (La Vie A)

8：00-8：30	Opening ceremony 开幕式

Moderator 主持：菅原貴志 Sugawara Takashi, 展　広智 Ten Hirotomo

日方执行主席：大山健一 Oyama Kenichi 教授致辞

日方主席：寺本明　Teramoto Akira 教授致辞

中方执行主席：张玉琪 Zhang Yuqi 教授致辞

中方主席：张力伟 Zhang Liwei 教授致辞

日本脳神経外科学会理事長：斉藤延人 Saito Nobuhito 教授致辞

会场(I)：Room A (La Vie A)

8:30-18:00 大会专题发言

Time	Speaker　Topic
Moderator 主持：张力伟 Zhang Liwei, 寺本明 Teramoto Akira, 赵卫国 Zhao Weiguo　斉藤延人 Saito Nobuhito	
8：30-8：45	斉藤延人 Saito Nobuhito 東京大学医学部附属病院 The University of Tokyo Hospital
Surgical Strategies and Techniques for the Resection of Hemangioblastomas	
8：45-9：00	张力伟 Zhang Liwei 首都医科大学附属北京天坛医院 Beijing Tiantan Hospital, Capital Medical University
Brainstem glioma: experience of a single center from Beijing Tiantan Hospital	

9：00-9：15	大山健一 Oyama Kenichi 国際医療福祉大学三田病院 International University of Health & Welfare Mita Hospital
Anatomic consideration for surgical boundaries of the endoscopic endonasal cranial base surgery	
9：15-9：30	杨学军 Yang Xuejun 北京清华长庚医院 Beijing Tsinghua Changgung Hospital Tsinghua University
Digital and intelligent technologies promote a new paradigim in neurosurgery	
9：30-9：45	孙宇 Sun Yu 清华大学出版社 Tsinghua University Press
How to Write Statements in a Neuroscience Research Paper	
9：45-9：55	集合写真　Group Photo
9: 55-10：00	休憩
会场(I)：KKR ホテル熱海３F	
Room A (La Vie A): Cerebrovascular Diseases	
Time	**Speaker　Topic**
Moderator 主持：朱巍 Zhu Wei,斉藤 敦志 Saito Atsushi, 郭毅 Guo Yi, 長内 俊也 Osanai Toshiya	
10: 00-10：10	斉藤 敦志 Saito Atsushi　弘前大学 Hirosaki University
Surgical strategy of flow diversion with bypass for difficult unclippable aneurysms	
10：10-10：20	郭毅 Guo Yi 北京清华长庚医院 Beijing Tsinghua Changgung Hospital
Microsurgical clipping of basilar apex aneurysms	
10：20-10：30	朱巍 Zhu Wei 复旦大学附属上海华山医院
Hybrid surgical strategies for High-grade BAVMs: the Huashan experiences	
10：30-10：40	長内 俊也 Osanai Toshiya　北海道大学 Hokkaido University
Use of a Smartphone-based Telemedicine System for Moyamoya Disease: Validation in Preoperative Diagnosis and Postoperative Management	
10：40-10：50	吕宪利 Lv Xianli 北京清华长庚医院 Department of Neurosurgery, Beijing Tsinghua Changgung Hospital, School of Clinical Medicine, Tsinghua University
Increased Intra-aneurysm pressure after flow diverter implantation: a potential mechanism for delayed rupture	

10：50-11：00	村岡 真輔 Muraoka Shinsuke 名古屋大学 Nagoya University
Prognostic Factors in Aneurysmal Subarachnoid Hemorrhage During the Clazosentan Era: A Multicenter Study Using Multivariate Analyses and Machine Learning Model	
11：00-11：10	刘鹏 Liu Peng 北京大学第三医院 Peking University Third Hospital
Multimodal assessment predicts cognitive impairment after aneurysmal subarachnoid hemorrhage: a prospective cohort study	
11：10-11：20	江頭 裕介 Egashira Yusuke 岐阜大学 Gifu University
Adiitional bypass procedures for moyamoya disease that combinable with classical superficial temporal-middle cerebral artery anastomosis	
11：20-11：30	休憩
会场(I)：Room A (La Vie A): Skull Base Tumor	
Time	**Speaker Topic**
Moderator 主持：楼美清 Lou Meiqing, 河瀬 斌 Kawase Takeshi, 麦凯钧 Calvin Mak,黒崎 雅道 Kurosaki Masamichi 後藤 剛夫 Goto Takeo	
11：30-11：40	麦凯钧 Calvin Mak 中国香港伊利沙伯医院 Queen Elizabeth Hospital, Hong Kong, China
A paradigm shift of endoscopic transorbital surgery to the skull base: clinical experience of 60 cases from Hong Kong	
11：40-11：50	後藤 剛夫 Goto Takeo 大阪公立大学 Osaka Metropolitan University
Endoscopic keyhole anterior petrosal approach to the lesions around petrous apex	
11：50-12：00	刘卫平 Liu Weiping 西安市人民医院（西安市第四医院）Xi’an People’s Hospital (Xi’an Fourth Hospital)
The significance of diving techniques in pituitary tumor surgery	
12：00-12：10	黒崎 雅道 Kurosaki Masamichi 鳥取大学 Tottori University
Our surgical procedure and strategy for sellar lesions focusing on transsphenoidal surgery	
12：10-12：20	韩一芃 复旦大学附属儿科医院医院 National Children’s Medical Center, Children’s Hospital of Fudan University
Pediatric Craniopharangioma：a Tumour Requires Different Approaches	

12：20-12：30	林 康彦 Hayashi Yasuhiko　金沢医科大学 Kanazawa Medical University
Intrasellar pressure measurement for patients with pituitary tumors presenting with headache	
12：30-12：40	楼美清 Lou Meiqing 上海交通大学医学院附属上海市第一人民医院 Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine
The risk factors, intraoperative monitoring indicators, and clinical outcomes influencing facial nerve preservation during acoustic neuroma surgery	
12：40-12：50	菅原 貴志 Sugawara Takashi　国際医療福祉大学成田病院 International University of Health & Welfare Narita Hospital
Treatment Strategy and Surgical Technique for Lesions in and around the Cavernous Sinus	
13：00-13：45	Luncheon Seminar **(Room A 取午餐)**
Moderator 主持：松野 彰 Matsuno Akira	
Presenter	小野田 恵介 Onoda Keisuke 国際医療福祉大学成田病院 International University of Health & Welfare Narita Hospital
New Techniques in Surgery for Trigeminal Neuralgia-Efficacy of internal neurolysis	
会场(I)：Room A (La Vie A)：Brain tumors	
Time	**Speaker　Topic**
Moderator 主持：周大彪 Zhou Dabiao, 嘉山 孝正 Kayama Takamasa, 战琦 Zhan Qi, 樋口 佳則 Higuchi Yoshinori	
13：45 -13：55	下田 由輝 Shimoda Yoshiteru　東北大学 Tohoku University
Enhancing Glioma Resectability with Selective Intra-Arterial CT Angiography	
13：55-14：05	周大彪 Zhou Dabiao 首都医科大学附属天坛医院 Beijing Tiantan Hospital, Capital Medical University
MR-guided laser interstitial thermal therapy for the treatment of high-grade gliomas	

14：05-14：15	董军 Dong Jun 苏州医科大学附属第二医院 The Second Affiliated Hospital of Soochow University
Amlodipine suppresses tumorgenicity of glioma stem cells through degrading EGFR and downregulating the downstream pro-survival pathways	
14：15-14：25	樋口 佳則 Higuchi Yoshinori 千葉大学 Chiba University
Active Surveillance Strategy for Residual Tumors after Subtotal Resection of Large Vestibular Schwannomas: Long-Term Outcomes and Indications for Stereotactic Radiosurgery	
14：25-14：35	战琦 Zhan Qi 天津医科大学总医院 Tianjin Neurological Institute, Tianjin Medical University General Hospital
Hurdling over the blood-brain barrier with LPC-liposome technology for enhanced delivery and therapeutic efficacy of paclitaxel in glioblastoma	
14：35-14：45	闫秀伟 Yan Xiuwei 浙江省人民医院 Zhejiang Provincial People's Hospital
Mechanistic study of HIF-1α/PGK1/p-PDHK1-mediated metabolic reprogramming in hypoxic macrophages underlying photodynamic therapy resistance in glioblastoma	
14：45-14：50	休憩
会场(I)：Room A (La Vie A)：Intensive Neurosurgery and Traumatic Brain Injury (TBI)	
Time	**Speaker Topic**
Moderator 主持：江荣才 Jiang Rongcai, 末廣 栄一 Suehiro Eiichi, 莫俊 Mo Jun, 黒岩 敏彦 Kuroiwa Toshihiko	
14；50-15：00	袁宇 Yuan Yu 河北大学附属医院 Hebei University Affiliated Hospital
Application of NIRS Cerebral oxygen monitoring technology in critically ill patients with craniocerebral injury in neurosurgery	
15：00-15：10	江荣才 Jiang Rongcai 首都医科大学宣武医院 Xuanwu Hospital Capital Medical University
The current status of statin based treatment for chronic subdural hematomas in China	
15：10-15：20	末廣 栄一 Suehiro Eiichi 国際医療福祉大学成田病院 International University of Health & Welfare Narita Hospital
Challenges in head injury treatment in a super-aging society	

15：20-15：30	孙锋磊 Sun Fenglei 潍坊市人民医院 Weifang People's Hospital
Clinical study on multimodal monitoring using non-invasive brain edema monitoring in patients with acute moderate and severe craniocerebral injury	
15：30-15：40	莫俊 Mo Jun 浙江大学医学院附属第四医院 The Fourth Affiliated Hospital of School of Medicine, and International School of Medicine, International Institutes of Medicine, Zhejiang University
Two-stage Endoport-assisted endoscopic technique for cast intraventricular hematoma evacuation	
15：40-15：45	休憩
会场(I)：Room A (La Vie A)：Cerebrovascular Diseases	
Time	**Speaker Topic**
Moderator 主持：张世明 Zhang Shiming, 橋本 直哉 Hashimoto Naoya, 段永红 Duan Yonghong, 堀内 哲吉 Horiuchi Tetsuyoshi, 藍原 正憲 Aihara Masanori	
15：45-15：55	藍原 正憲 Aihara Masanori 群馬大学 Gumma University
Surgical approaches for brainstem cavernous malformations: A case series from our institution	
15：55-16：05	石祥恩 Shi Xiangen 首都医科大学附属三博脑科医院 Department of Neurosurgery, Sanbo Brain Hospital
Capital Medical University Giant dissecting aneurysm of the middle cerebral artery (MCA): report of four cases-successfully treated by microsuture technique	
16：05-16：15	张世明 Zhang Shiming 苏州大学附属第一医院 The First Affiliated Hospital of Soochow University
Cotton-assisted surgical clipping of very small aneurysms: A two-center study	
16：15-16：25	堀内 哲吉 Horiuchi Tetsuyoshi 信州大学 Shinshu University
Revisit of Sugita head fixation system	
16：25-16：35	段永红 Duan Yonghong 南华大学衡阳医学院第二附属医院 The Second Affiliated Hospital,Hengyang Medical School University of South China
Early microsurgical treatment of cerebral arteriovenous malformations with low GCS score by multimodal technique	

16：35-16：40	休憩
会场(I)：Room A (La Vie A)：Pediatric Neurosurgery, Functional Neurosurgery	
Time	**Speaker　Topic**
Moderator 主持：岳树源 Yue Shuyuan, 前原 健寿 Maehara Taketoshi, 杨辰龙 Yang Chenlong, 太組 一朗 Takumi Ichiro	
16：40-16：50	赵雷 Zhao Lei 河北医科大学第二医院 The department of Neurosurgery, the Second Hospital of Hebei Medical University
Conquering the Epileptic Glioma: Precision Resection in Medial Temporal Lobe Surgery	
16：50-17：00	前原 健寿 Maehara Taketoshi　東京科学大学 Institute of Science Tokyo
Multiple hippocampal transection for dominant-side mesial temporal lobe epilepsy without hippocampal sclerosis. -comparison with antero-medial temporal lobectomy for patients with hippocampal sclerosis	
17：00-17：10	杨辰龙 Yang Chenlong 北京大学第三医院 Peking University Third Hospital, Peking University
Idiopathic spinal cord herniation: an overlooked and frequently misdiagnosed entity	
17：10-17：20	王世勇 Wang Shiyong 暨南大学附属第一医院 The First Affliated Hospital of Jinan University
Retrospective analysis of subdural ultra-selective rhizotomy for the treatment of rotational spasmodic torticollis	
17：20-17：30	太組 一朗 Takumi Ichiro　聖マリアンナ医科大学 St. Marianna University
Balancing Visual Field Preservation and Sufficient Resection in Trans-Sylvian Trans-Uncal Amygdalo-Hippocampectomy: A Piecemeal, Retraction-Free Approach	
17：30-17：40	田卫东 Tian Weidong 石河子大学第一附属医院 The First Affiliated Hospital of Shihezi University
Clinical characteristics of rupture bleeding in children with cerebral arteriovenous malformation: Analysis of microsurgical treatment strategy	

17：40-17：45	休憩
会场(I)：Room A (La Vie A)：Nerve Disorders、Neurodegenerative disease	
Time	**Speaker　Topic**
Moderator 主持：李世亭 Li Shiting, 金 景成 Kim Kyongsong, 李昊 Li Hao, 前嶋 竜八 Maejima Ryuya	
17：45-17：55	赵华 Zhao Hua 上海交通大学医学院附属新华医院 Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine
Peripheral facial paralysis: indications, surgical timing and technical innovation of combined transplantation	
17：55-18：05	金 景成 Kim Kyongsong　日本医科大学 Nippon Medical School
MRI findindings of the tarsal tunnel syndrome	
18：05-18：15	崔滨 Cui Bin 航空总医院 Aviation General Hospital, Beijing
Etiological analysis of delayed cerebellar edema following microvascular decompression for hemifacial spasm	
18：15-18：25	谢国强 Xie Guoqiang 中国陕西省核工业 215 医院 Nuclear Industry 215 Hospital of Shaanxi Province
Anatomical assessment of trigeminal nerve tractography using diffusion MRI: A comparison of acquisition b-values and single- and multi-fiber tracking strategies	
18：25-18：35	前嶋 竜八 Maejima Ryuya　愛知医科大学 Aichi Medical University
Clinical characteristics and surgical treatment results of double crush syndrome by spinal degenerative disease and peripheral nerve entrapment disease	
18：35-18：45	章钟鼎 Zhang Zhongding 上海交通大学医学院附属新华医院神经外科 Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine
Refining Microvascular Decompression for Trigeminal Neuralgia: The Gelatin Sponge-Assisted Approach	
18：45-18:55	Close ceremony
19:15	**Farewell party**

会场（Ⅱ）：KKR ホテル熱海３F	
Room B (La Vie B): Spinal and Spine Neurosurgery	
Time	Speaker　Topic
Moderator 主持：吴浩 Wu Hao, 小野田 恵介 Onoda Keisuke, 韩宏彦 Han Hongyan, 井上 智夫 Inoue Tomoo	
10：00-10：10	井上 智夫 Inoue Tomoo　さいたま赤十字病院 Saitama Red Cross Hospital
Clinical Characteristics and Optimal Management of Craniocervical Junction Arteriovenous Fistulas with Subarachnoid Hemorrhage: a multicenter study	
10：10-10：20	张佳星 Zhang Jiaxing 北京友谊医院 Beijing Friendship Hospital, Capital Medical University
Exploration of treatment options for sacral/perineal pain with neurogenic bowel and bladder dysfunction following reoperation for sacral meningeal cysts	
10：20-10：30	吴浩 Wu Hao 首都医科大学宣武医院 Xuanwu Hospital, Capital Medical University
Analysis of long-term efficacy of spine-shortening surgery in the treatment of tethered cord syndrome	
10：30-10：40	山田 真介 Yamada Shinsuke　福井大学 Fukui University
Prediction of post-operative outcome of motor function by intraoperative neuromonitoring after resection for spinal tumors	
10：40-10：50	司雨 Si Yu 北京大学第三医院 Department of Neurosurgery, Peking University Third Hospital, Peking University
An accurate and convenient positioning technique for sacral cysts surgery and its applicable scope	
10：50-11：00	李志涛 Li Zhitao 天津环湖医院 Tianjin Huanhu Hospital
Progress in clinical application of spinal cord electrical stimulation	
11：00-11：05	休憩

会场（Ⅱ）：Room B (La Vie B)：Neurorestoration /Radiosurgery/Others	
Time	Speaker　Topic
Moderator 主持：陈琳 Chen Lin,　森 久恵 Mori Hisae, 柴毅 Chai Yi, 荻野 暁義 Ogino Akiyoshi	
11：05-11：15	陈琳 Chen Lin 国家电网公司北京电力医院 State Grid Corporation of China Beijing Electric Power Hospital
New medicine for nerve repair in facial paralysis: radiofrequency therapy for the facial nerve	
11：15-11：25	森 久恵 Mori Hisae　国立循環器病研究センター病院 National Cerebral and CardioVascular Center Hospital
Management of Post-Gamma Knife Radiosurgery Complications: Insights from Histopathological and Radiological Analysis	
11：25-11：35	王子德 Wang Zide 北京清华长庚医院 Department of Neurosurgery, Beijing Tsinghua Changgung Hospital, School of Clinical Medicine, Tsinghua University
Eupatilin ameliorates spinal cord injury by inhibiting damage-associated microglia and optimizing the regenerative microenvironment	
11：35-11：45	柴毅 Chai Yi 上海交通大学医学院附属仁济医院 Renji Hospital, School of Medicine, Shanghai Jiao Tong University
Dual-Functional Hydrogels for Neurovascular Regeneration: Modulating Cell Crosstalk and Microenvironment in Neural Repair	
11：45-11：55	荻野 暁義 Ogino Akiyoshi　国際医療福祉大学病院 International University of Health & Welfare Hospital
Gamma Knife Surgery as the primary management for patients with Koos grade IV Vestibular Schwannoma	
11：55-12：05	柳云鹏 Liu YunPeng 首都医科大学附属北京朝阳医院 Beijing Chao-Yang Hospital, Capital Medical University
High-fat diet disrupts the gut-brain axis and exacerbates ischemic stroke: can microbiota restoration reverse the damage?	
12：05-12：15	飯森 崇 Iimori Takashi　名戸ヶ谷病院 Nadogaya Hospital
Metal-Free Bone Flap Fixation for Cosmetic Open Neurosurgery	
13：00-13：40	Luncheon Seminar　**(Room A 取午餐)**

会场(Ⅱ)：Room B (La Vie B)：Brain tumors and others	
Time	Speaker Topic
Moderator 主持：杨军 Yang Jun, 林 康彦 Hayashi Yasuhiko, 崔晓腾 Cui Xiaoteng, 菅原 貴志 Sugawara Takashi	
13：40-13：50	築山 敦 Tsukiyama Atsushi 日本医科大学武蔵小杉病院 Nippon Medical School Musashikosugi Hospital
Clinical and Surgical Perspectives on Endoscopic Endonasal Biopsy for Autoimmune Hypophysitis	
13：50-14：00	崔晓腾 Cui Xiaoteng 天津医科大学总医院 Tianjin Medical University General Hospital
Dual novel compounds destroy mitochondrial morphology and function to treat glioblastoma by promoting the p62-mediated protein degradation of mitochondrial respiratory chain complex I	
14：00-14：10	杨军 Yang Jun 北京大学第三医院 Peking University Third Hospital, Peking University
Application of multimodal image three-dimensional reconstruction combined with neuronavigation in the operation of gliomas in eloquent regions	
14：10-14：20	魏建伟 Wei Jianwei 郑州大学第一附属医院 he First Affiliated Hospital of Zhengzhou University, Zhengzhou
TRIM25 promotes temozolomide resistance in glioma by regulating oxidative stress and ferroptotic cell death via the ubiquitination of keap1	
14：20-14：30	詹天翔 Zhan Tianxiang 浙江大学医学院附属第一医院 The first affiliated hospital, school of medicine, zhejiang university
Intracranial solitary fibrous tumor: Clinical and prognostic study of 36 cases	
14：30-14：35	休憩
会场(Ⅱ)：Room B (La Vie B)：Pediatric Neurosurgery/Interventional Neurosurgery	
Time	Speaker Topic
Moderator 主持：王靖生 Wang Jingsheng, 山根 文孝 Yamane Fumitaka, 陈程 Chen Cheng, 緒方 敦之 Ogata Atsushi	

14：35-14：45	王熙奥 Wang Xiao 哈尔滨医科大学第一附属医院 The First Affiliated Hospital of Harbin Medical University
Flow diverters in the treatment of pediatric giant dissecting intracranial aneurysms	
14：45-14：55	山根 文孝 Yamane Fumitaka 国際医療福祉大学熱海病院 International University of Health & Welfare Atami Hospital
Hemorrhagic complications of mechanical thrombectomy for acute ischemic stroke: general managements & perspectives	
14：55-15：05	王靖生 Wang Jingsheng 深圳市儿童医院 Shenzhen Children's hospital
Does filum terminale resection work in symptomatic occult tethered cord syndrome in children？104 cases follow-up	
15：05-15：15	辻 優一郎 Tsuji Yuichiro 大阪医科薬科大学 Osaka Medical and Pharmaceutical University
Mechanical thrombectomy for acute stroke with large ischemic lesion	
15：15-15：25	刘一鸥 Liu Yiou 清华大学玉泉医院（清华大学中西医结合医院）Tsinghua University Yuquan Hospital
Surgical strategies for children with epileptic spasms	
15：25-15：35	緒方 敦之 Ogata Atsushi 佐賀大学 Saga University
Three-dimensional microcatheter shaping using touch screen devices for cerebral aneurysm coil embolization	
15：35-15：45	陈程 Chen Cheng 国家儿童区域医疗中心广州市妇女儿童医学中心 Guangzhou Women and Children's Medical Center, National Children's Regional Medical Center (South Central China)
Efficacy evaluation of unilateral interlaminar approach for filum terminale section in the treatment of tethered cord syndrome in children: A single-center study	
15：45-15：55	太田 剛史 Ohta Tsuyoshi 神戸市立医療センター中央市民病院 Kobe City Medical Center General Hospital
Issues surrounding mechanical thrombectomy	
15：55-16：00	休憩
会场（Ⅱ）：Room B (La Vie B)：Functional Neurosurgery, Neurodegenerative disease, and Other	

Time	Speaker　Topic
Moderator 主持：包义君 Bao Yijun, 有島 英孝 Arishima Hidetaka, 仲骏 Zhong Jun, 岡 史朗 Oka Fumiaki	
16：00-16：10	有島 英孝 Arishima Hidetaka　福井大学 Fukui University
Retrospective study of superficial siderosis and intracranial hypotension	
16：10-16：20	仲骏 Zhong Jun 上海交通大学医学院附属新华医院 Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine
The key to PBC success: Pear or banana?	
16：20-16：30	何馨 He Xin 中国人民解放军总医院 PLA General Hospital, Beijing
Staged bilateral MR-guided focused ultrasound pallidothalamic tractotomy for Parkinson’s disease	
16：30-16：40	岡 史朗 Oka Fumiaki　山口大学 Yamaguchi University
Glymphatic System Dysfunction Assessed by ALPS Index in Subarachnoid Hemorrhage: Implications for Hydrocephalus and Clinical Outcomes	
16：40-16：50	包义君 Bao Yijun 中国医科大学附属第四医院 The Fourth Affiliated Hospital of China Medical University
Ginsenosides inhibit cellular apoptosis in perihematomal zones of intracerebral hemorrhage in rats: network pharmacology and experimental validation	
16：50-17：00	陈红伟 Chen Hongwei 航空总医院 Aviation General Hospital of China Medical University
Analysis of therapeutic effect of short-term high cervical spinal cord electrical stimulation on patients with consciousness disturbance after long drainage of hydrocephalus	
17：00-17：05	休憩
会场（Ⅱ）：Room B (La Vie B)：Functional Neurosurgery, Intracranial Infection, and Anatomy	
Time	**Speaker　Topic**
Moderator 主持：陈心 Chen Xin, 香川 幸太 Kagawa Kota, 常博文 Chang Bowen, 梶本 宜永 Kajimoto Yoshinaga	
17：05-17：15	香川 幸太 Kagawa Kota　広島大学 Hiroshima University
Wound dehiscence after epilepsy surgery	

17：15-17：25	袁伟珵 Yuan Weicheng 首都医科大学附属北京天坛医院 Beijing Tiantan Hospital, Capital Medical University
Anatomical relationship between cervical sympathetic trunk and common carotid artery at thyroid cartilage level	
17：25-17：35	丛文凯 Cong Wenkai 航空总医院 Aviation General Hospital
Risk factors for isolated temporal horn formation during the treatment of central nervous system infections	
17：35-17：45	常博文 Chang Bowen 中国科学技术大学第一附属医院 The First Affiliated Hospital of USTC,
Neuromodulation for postherpetic neuralgia: Preliminary experience in a single center	
17：45-17：55	梶本 宜永 Kajimoto Yoshinaga 城山病院 Shiroyama Hospital
Advances in the Pathophysiology of Normal Pressure Hydrocephalus, Secure LP Shunting Techniques, and Scientific Valve Pressure Setting	
17：55-18：05	陈心 Chen Xin 天津医科大学总医院 Tianjin Medical University General Hospital
Alzheimer’s surgery, toward standards - The Tianjin experience	
18：05-18：10	休憩
会场(Ⅱ)：Room B (La Vie B): Cerebrovascular Diseases and Pituitary Adenoma	
Time	**Speaker Topic**
Moderator 主持：洪涛 Hong Tao, 箱崎 浩一 Hakozaki Koichi, 韩芸峰 Han Yunfeng, 藤原 廉 Fujiwara Ren	
18：10-18：20	洪涛 Hong Tao 南昌大学第一附属医院
Subclassification And Surgical Techniques of Knosp Grade 4 Invasive Pituitary Adenoma(IPA)	
18：20-18：30	箱崎 浩一 Hakozaki Koichi 三重大学 Mie University
Spinal drainage and combined pharmacotherapy as potential outcome improvers for patients with poor-grade subarachnoid hemorrhage	

18：30-18：40	郭一丁 Guo Yiding 北京清华长庚医院 Beijing Tsinghua Changgung Hospital, School of Clinical Medicine Tsinghua University
Augmented reality-assisted preoperative planning for basilar artery aneurysm surgery: Comparative analysis of subtemporal and orbito-zygomatic approaches	
18：40-18：50	藤原 廉 Fujiwara Ren　成田富里徳洲会病院 Narita Tomisato Tokushukai Hospital
Usefulness of Awake Craniotomy Clipping - A Case of Multiple Cerebral Aneurysms 18：50-18：55　Close ceremony	
本プログラムでは中国の先生方の慣習に合わせ、英語表記のお名前を「姓→名」の順に統一しております。ご了承いただけますようお願い申し上げます。 **未录用投稿将在 KKR ホテル熱海会场(Ⅲ)以墙报形式播放 PPT 。**	

Abstracts

Day 1

Session 1

Application of a collagen matrix for dura closure in cases of posterior canal of the internal auditory canal

Akihide KONDO, Osamu Akiyama, Yuzaburo Shimizu, Mario Suzuki

The Department of Neurosurgery, Juntendo University Faculty of Medicine

Background

In cases of vestibular schwannoma or cerebellopontine angle meningioma, it is considered appropriate to open the posterior wall of the internal auditory canal to improve tumor resection rates. However, the petrous bone forming the posterior wall of the internal auditory canal is rarely completely ossified and contains a pneumatized mastoid process connected to the middle ear. In such cases, resection of the posterior wall may result in communication with the cerebrospinal fluid space, leading to cerebrospinal fluid leakage. Previous efforts have involved repair using muscle or fat grafts, but these methods were associated with damage to the autologous tissue. Recently, the tissue sealing function of collagen matrix has been elucidated, and such products have been developed and used in clinical practice.We therefore report on our experience with the use of collagen matrix for repair of the internal auditory canal dura mater.

Methods

We analyzed the incidence of cerebrospinal fluid leakage after tumor resection with removal of the posterior wall of internal auditory canal in patients who underwent surgery for cerebellopontine angle tumors at our institution.

Results

Eighty-seven cases were included in the study, and cerebrospinal fluid leakage occurred in two cases.

Discussion

The incidence of cerebrospinal fluid leakage in our study was comparable to previous reports, and repair of the dura mater using collagen matrix was considered an appropriate surgical technique.

Key words

Cerebrospinal fluid leakage, posterior wall of internal auditory canal, Cerebrospinal angle tumors

Neuroendoscopic surgery for brainstem cavernous hemangiomas

Mu Linsen

Department of Neurosurgery, Guangdong 999 Brain Hospital

Objective: To explore the application and value of total neuroendoscopic surgery for brainstem cavernous hemangiomas.

Methods: Thirteen cases of brainstem cavernous hemangiomas were treated with total neuroendoscopic surgery. The surgeries were performed entirely under neuroendoscopy, with a male-to-female ratio of 12:1, ages ranging from 32 to 71 years, tumor sizes between 0.9 and 2.5 cm, and GCS scores of 5 in one case and 15 in twelve cases. Two patients underwent surgery within one week of onset, five between one and two weeks, two between three and four weeks, and four more than one month after onset. Twelve patients had comprehensive imaging examinations before surgery, while one patient had only a head CT scan on the second day after onset. The lesions were located in the midbrain in three cases (one near the inferior colliculus, one in the cerebral peduncle, and one near the thalamus) and in the pons in ten cases (three at the lateral aspect, three at the floor of the fourth ventricle, one centrally, one ventrally, and one in the pontine arm-cerebellar region). Six surgical approaches were used: suboccipital transtentorial approach in two cases, posterior midline falx approach in five cases, infratemporal approach in three cases, CPA approach in one case, extreme lateral suboccipital transtentorial approach in one case, and endport surgery in one case. All surgeries were conducted under neurophysiological monitoring, with twelve assisted by neuronavigation for intraoperative localization. Postoperative pathology confirmed all as cavernous hemangiomas.

Results: All endoscopic surgeries for brainstem cavernous hemangiomas were successfully performed. The lesions were accurately located during surgery, with adequate exposure and clear surgical fields, free from blind spots and dead zones. Twelve cases achieved complete resection of the hemangiomas, while one case had minimal residual tissue. Postoperative pathology confirmed the diagnosis of cavernous hemangioma, with one case also showing venous malformation. The

operation duration ranged from 3.0 to 4.5 hours, and intraoperative blood loss was between 100 and 200 milliliters. Postoperatively, all twelve patients recovered well, with no new neurological deficits observed recently and improvements noted in long-term neurological deficits. One comatose patient regained consciousness five days post-surgery, and another patient with thalamus-associated cavernous hemangioma experienced early speech and limb dysfunction, which largely normalized within one to two months.

Conclusion: Neuroendoscopy offers advantages such as close observation, flexible maneuverability, and panoramic vision, effectively eliminating the blind spots of microscopic surgery and overcoming obstacles caused by head positioning and craniotomy. The high-definition panoramic view minimizes the need for large openings on the brainstem surface, facilitating minimally invasive and successful resection of brainstem cavernous hemangiomas. Neuroendoscopic surgery for brainstem cavernous hemangiomas, with its minimally invasive benefits, can be widely applied.

Key words: neuroendoscopy, brainstem, cavernous hemangioma, surgery, approach

Ruptured giant basilar artery aneurysm associated with Moyamoya disease can be diagnosed by examination and cured by comprehensive therapy.

破裂的巨大基底动脉瘤合并烟雾病综合治疗实现良好预后。

作者：何超 chao he zj.hechao@163.com 13735212898
单位：温州医科大学附属诸暨医院神经外科
Department of Neurosurgery, Zhuji Hospital Affiliated to Wenzhou Medical University

Objective: To investigate the treatment options for moyamoya disease (MMD) complicated by giant basilar artery aneurysm.

Methods: A retrospective analysis was performed on the clinical data of one surgically treated case of MMD complicated by a giant basilar artery aneurysm rupture and hemorrhage at our institution. Following interventions including Atlas stent-assisted coil embolization for giant basilar artery aneurysm, lumboperitoneal shunt for hydrocephalus, superficial temporal artery to middle cerebral artery (STA-MCA) bypass combined with encephalo-duro-myo-synangiosis (EDMS), and clinical observation, complications and prognosis were monitored.

Results：The patient was admitted to our emergency department in a comatose state

and underwent endotracheal intubation with mechanical ventilation and comprehensive supportive care. GCS 5, mRS 5. Emergency intervention with Atlas stent-assisted coil embolization was performed to treat the ruptured basilar artery aneurysm. Postoperatively, the patient experienced mild headache, with left limb muscle strength graded 4/5 and right limb strength 5/5. Three months later, a lumboperitoneal shunt was placed to address hydrocephalus. Eleven months postoperatively, follow-up digital subtraction angiography (DSA) confirmed complete occlusion of the aneurysm without recurrence or residual lesion. Subsequently, left-sided bypass surgery (STA-MCA+EDMS) was performed for moyamoya disease. Currently, the patient is functional independence, with full muscle strength (grade 5/5 in all limbs) and independent in daily living activities.GCS 15, mRS 0.

Conclusion: For patients with MMD complicated by giant basilar artery aneurysm rupture and hemorrhage, priority should be given to managing the ruptured culprit aneurysm, particularly through endovascular embolization, followed by addressing hydrocephalus complications, with delayed cerebrovascular bypass surgery (e.g., STA-MCA) potentially optimizing long-term prognosis.

Key words: giant basilar artery aneurysm; moyamoya disease; stent-assisted coil;lumboperitoneal shunt;.

Investigation of predictors of latent visual impairment in patients with sellar lesions

Shinichiro Teramoto[1], Shigeyuki Tahara[2], Hiromasa Goto[3], Takuma Kodama[1], Hirotaka Watada[3], Akihide Kondo[1]

[1]Department of Neurosurgery, Juntendo University Graduate School of Medicine, Tokyo, Japan
[2]Department of Neurosurgery, Nippon Medical School, Tokyo, Japan
[3]Department of Metabolism and Endocrinology, Juntendo University Graduate School of Medicine, Tokyo, Japan

Objective Patients with sellar lesions compressing the optic nerve sometimes perceive visual improvement after lesion resection, despite the absence of visual impairment on preoperative ophthalmological examination. This study investigated the indicators of latent visual impairment in patients with sellar lesions.

Methods Forty-five patients who underwent endoscopic transsphenoidal surgery for sellar lesions compressing the optic nerve with no visual impairment on preoperative ophthalmological examinations were divided into two groups: patients who perceived recovery of visual function after lesion resection as the “improved group” and patients who did not as the “unaffected group.” Patient backgrounds, characteristics of the sellar lesion, and the distance and angle of bending of the optic nerve itself due to lesion compression on the coronal and sagittal images were compared between the two groups.

Results Of the 45 patients, 21 were assigned to the “improved group” and 24 to the “unaffected group.” There were no significant differences in patient backgrounds and characteristics of sellar lesions, and the assessment of bending of the optic nerve itself showed significant differences between the groups ($p < 0.001$, respectively). Multivariate logistic regression analysis revealed that only sagittal optic nerve bending angle was a significant independent predictor of perceived visual recovery after resection of sellar lesions (odds ratio 2.29; 95% confidence interval 1.03–5.10; $p = 0.042$). The optimal cut-off point of sagittal optic nerve bending angle for perceiving visual recovery was identified as 30° (specificity 1.000, sensitivity 0.952).

Discussion In previous reports, measurement of optic nerve bending due to compression of the sellar lesion associated with visual impairment was difficult to verify reproducibly because the skull base and internal carotid artery, which vary among individuals, were used as indicators. Since we assessed the bending of the optic nerve itself, our results can be expected to provide more accurate demonstration. Sagittal bending of the optic nerve at the optic canal entrance caused by sellar and suprasellar tumors was reported to be associated with tumor-induced visual deterioration (J Neurosurg. 2019;134(1):180-188), suggesting that the sagittal image demonstrating the optic nerve

course from the optic canal to the intracranial space may be effective in assessing optic nerve bending due to compression from sellar lesions. In Japan, the treatment strategy for sellar lesions compressing the optic nerve without visual impairment often depends on the subjective experience of the attending physician. However, the findings of this study may make it possible to objectively predict the appropriate timing of surgery for sellar lesions without ophthalmological visual impairment.

Conclusion For sellar lesions with latent visual impairment, angle assessment of optic nerve bending due to compression caused by sellar lesions on the sagittal image may be useful in determining the indication for surgery.

Key words Sellar lesion; Visual impairment; Endoscopic transsphenoidal surgery

Comprehensive Treatment of Malignant Cerebral Glioma Based on Peritumoral Heterogeneity Using Photodynamic Targeting Technology

Shaoshan Hu

Department of Neurosurgery, Zhejiang Provincial People’s Hospital, shaoshanhu@126.com

Objective: To analyze the histopathological heterogeneity of peritumoral tissue through vascular microenvironment, immune microenvironment, and stem cell characteristics, thereby identifying the peritumoral "germinal interface." Utilizing metaverse artificial intelligence localization and yellow fluorescent visualization technologies, this study explores clinical techniques for preoperative/intraoperative precision localization, safe resection, and photodynamic targeting of the tumor and its peritumoral germinal interface in glioblastoma. The aim is to maximally reduce tumor burden, suppress residual tumor tissue, promote local immune remodeling, enhance survival rates, and improve patient prognosis.

Methods: From May 2021 to February 2024, 49 cases of malignant gliomas confirmed by imaging and histopathology were enrolled. These included 21 males and 28 females, with 10 multifocal and 39 unifocal lesions (involving various functional areas). Seventeen cases were primary, and 32 were recurrent. Pathological subtypes included 3 anaplastic astrocytomas and 46 glioblastoma multiforme. Peritumoral tissue samples from tumor and adjacent regions were analyzed via immunohistochemistry and single-cell sequencing to assess vascular/immune microenvironments and stem cell features, distinguishing "germinal" and "non-germinal" interfaces for photodynamic targeting. Metaverse visualization models were constructed using radiological data (physical, metabolic, and immune interfaces). All patients received intravenous photosensitizer (Hematoporphyrin, 4–5 mg/kg) 40 hours preoperatively, followed by light avoidance. During microsurgical resection, the metaverse system guided tumor localization and germinal interface identification. Near-total resection was performed, with residual "germinal interface" confirmed via yellow fluorescence. Post-resection, laser irradiation was applied to the residual cavity and suspected residual areas. Postoperative histopathology, molecular profiling, and imaging were reviewed, with follow-up data on clinical outcomes, imaging, and survival recorded. A control group of 20 non-photodynamic-treated high-grade gliomas was included.

Results: Postoperative patients demonstrated improved short-term clinical symptoms and Karnofsky Performance Status (KPS) scores. Survival rates, duration, and quality of life significantly surpassed both the control group and published data, with long-term survival observed in some cases.

Conclusion: Metaverse and yellow fluorescent visualization technologies enable precise tumor localization, safe resection, and targeted therapy. Combined with photodynamic targeting, this "root eradication and microenvironment modification" strategy improves prognosis and achieves clinically significant outcomes.

Keywords: Glioma; Photodynamic therapy; Targeted therapy; Metaverse

Impact of Oral Bacteria on Intracranial Aneurysms: A Morphological and Molecular Study

Ting Lei, MD, PhD[1]; Xiang'en Shi, MD, PhD[1,2]

[1]Department of Neurosurgery, Sanbo Brain Hospital, Capital Medical University, Beijing, People's Republic of China.

[2]Department of Neurosurgery, Fuxing Hospital, Capital Medical University, Beijing, People's Republic of China.

Corresponding Author:

Xiang'en Shi, MD, PhD

1Department of Neurosurgery, Sanbo Brain Hospital, Capital Medical University, Beijing, People's Republic of China.

No. 50, Yikesong Rd., Haidian District, Beijing 100093, People's Republic of China.

2Department of Neurosurgery, Fuxing Hospital, Capital Medical University, Beijing, People's Republic of China.

No. 20, Fuxingmen wai street, Xicheng district, Beijing 100045, People's Republic of China.

Email: shixen@ccmu.edu.cn

Abstract

Objective: Intracranial aneurysms (IAs) are life-threatening cerebrovascular disorders with high mortality rates upon rupture. Emerging evidence suggests oral bacteria may contribute to IA pathogenesis through immune evasion, autophagosome-mediated arterial colonization, and vascular inflammation. However, direct morphological evidence from human IA samples remains lacking.

Methods: Multimodal analyses including transmission electron microscopy (TEM), immunoelectron microscopy (IEM), qPCR, and ELISA were performed on 58 paraffin-embedded and 6 frozen IA specimens. TEM/IEM localized autophagosomes and bacterial antigens (LPS for Gram-negative bacilli, LTA for Gram-positive cocci). Porphyromonas gingivalis (Pg) and Streptococcus mutans (Sm) were quantified via species-specific qPCR. Serum antibody profiles were compared between IA patients and healthy controls.

Results: TEM confirmed autophagosomes in all 4 fresh IA specimens. IEM demonstrated colocalization of LPS (Gram-negative) and LTA (Gram-positive) antigens

within autophagosomes. qPCR detected Pg DNA in 84.5% (49/58) paraffin and 83.3% (5/6) frozen samples. Meanwhile, no Sm DNA was detected. IA patients showed significantly lower serum anti-Pg IgG ($p<0.05$) but higher LPS-specific antibodies ($p<0.01$) versus controls. This inverse relationship aligns with prior reports of oral Pg abundance suppressing systemic antibody responses.

Conclusion: This study provides direct morphological and molecular evidence of oral bacterial colonization (Pg in particular) within human IA walls. Our findings implicate bacterial autophagosomes as potential mediators of IA pathogenesis through sustained vascular inflammation.

Keyword: Intracranial aneurysm; Oral bacteria; Autophagosome; Electron microscopy; qPCR

Session 2

后循环动脉瘤的血流导向装置治疗病例分析
Case Analysis of Flow Diverter Treatment for Posterior Circulation Aneurysms

马心龙 | Ma Xinlong

清华大学玉泉医院神经外科
Department of Neurosurgery, Tsinghua University Yuquan Hospital

Objective
To evaluate the clinical efficacy, safety, and perioperative management strategies of flow diverters (FDs) in treating posterior circulation aneurysms, including vertebral artery dissecting aneurysms and basilar artery aneurysms.
Methods
1. Case Selection: Two patients with posterior circulation aneurysms (1 left vertebral artery dissecting aneurysm; 1 left vertebral artery dissection with aneurysmal dilation) were enrolled.
2. Surgical Procedure: Pipeline embolization device (PED) implantation.
3. Perioperative Management: Postoperative intensified antiplatelet therapy (ticagrelor + aspirin) and heparinization, alongside aggressive lipid-lowering therapy.
4. Materials: Neuronmax 6F long sheath, Phenom series microcatheters, and PED/PED Shield stents.
Results
1. Technical Success: FD implantation was successfully completed in both cases, with immediate angiography confirming optimal stent positioning and reduced intra-aneurysmal blood flow.
2. Clinical Outcomes:
- Case 1: No postoperative complications; discharged uneventfully.
- Case 2: Mild postoperative dizziness with preserved limb function; no thromboembolic or hemorrhagic events.
3. Safety: No perioperative complications, including in-stent thrombosis, branch vessel occlusion, or cerebral ischemia.
Conclusion
1. FD treatment for posterior circulation aneurysms (particularly vertebral artery dissecting aneurysms) demonstrates feasibility, high technical success, and promising short-term outcomes.
2. Basilar artery aneurysms carry higher risks with FD therapy, necessitating cautious patient selection, while vertebral artery aneurysms are technically simpler with manageable complications.
3. Aggressive postoperative antiplatelet therapy (ticagrelor + aspirin) and heparinization are critical to minimizing thrombotic events.

Keywords
Posterior circulation aneurysm; Pipeline embolization device (PED); Flow diverter; Vertebral artery dissecting aneurysm; Antiplatelet therapy

Surgery of vestibular schwannoma in supine-lateral position with exoscope "ORBEYE"

Department of Neurosurgery, Division of Medicine, Faculty of Medical Sciences, University of Fukui

Kenichiro Kikuta, M.D., PhD., Yoshifumi, Higashino, M.D., PhD., Shinsuke Yamada, M.D., Satoshi Kawajiri, M.D., PhD. Hidetaka Arishima, M.D., PhD., Makoto Isozaki, M.D., Ph.D., Takahiro Yamauchi, M.D., Ayumi Akazawa, M.D., Ph.D., Oiwa Mizuki, M.D., Shintaro Yamada, M.D., Tomoki Kimura, M.D., Yoshinori Shibaike, M.D., Tomotaka Kureyama, M.D.

<Background> We have introduced an exoscope "ORBEYE" altenative to microscope to all neurosurgical operations since 2021. We have tried supine-lateral position combined with ORBEYE in C-P angle surgery since Nov. 2024. Problems and revised points in surgical set-up are to be discussed.
<Case 1> This 58-year-old man got deffness because of the rapid enlargement of right vestibular schwannoma in one year. The tumor was resected with ORBEYE through retrosigmoid approach. The patient was laid in supine-lateral position with a soft pad inserted beneath his right shoulder. His upper extremities were extended and placed beside the body. His head was fixed with 3-point fixation device with the neck flexed maximally and roteted about 60 degrees to the left side. As the patient's head was situated relatively far from the surgeon in this position, the surgeon got tired easilly during the longtime operation. In addition, the head rotation was not enough to observe the deep floor of the right internal auditory cannal (IAC). The tumur was subtotally resected and facial nerve function was completely preserved.
<Case 2> This 74-year-old woman got deffness because of the large left vestibular schwannoma. The patient was laid in supine-lateral position with his left arm was placed on the arm rest. This revison of patient positionng enabled enough neck rotation and realized adequate observation of the deep floor of IAC. In addition, achivement of enough drilling of the roof of IAC could be confirmed by intraoperative computed tomography (iCT) before starting of tumor resection. The tumur was totally resected including the part within IAC and facial nerve function was completely preserved.
<Conclusion> C-P angle surgery in supine-lateral positon was easy to set-up. Combination of ORBEVE and iCT might be an effective altenative option in surgery for vestibular schwannoma.

后纵裂入路切除天幕游离缘（任何区段）占位性病变的解剖研究及临床应用探索

王向宇 18620079811、wang_xy123@126.com; 李光旭 17712394967
暨南大学附属第一医院

Anatomical Study and Clinical Application Exploration of the Posterior Interhemispheric Approach for Resecting Space-Occupying Lesions Along the Free Edge of the Tentorium (Any Segment)

Xiangyu Wang(18620079811、wang_xy123@126.com)，Guangxu Li (17712394967)
The first affiliated hospital of Jinan University

Objective: To investigate the anatomical feasibility and clinical utility of the posterior interhemispheric approach for resecting space-occupying lesions distributed along the entire upper and lower regions of the free edge of the tentorium.

Methods: The posterior interhemispheric approach was simulated on 5 cadaveric heads under a microscope. The specific strategy involved creating a bone window starting from the confluence of sinuses, extending 6 cm along the superior sagittal sinus and 4 cm along the transverse sinus. The medial surface of the occipital lobe was retracted to expose the falx cerebri and tentorium. The tentorium was incised parallel to the straight sinus, and the free edge of the tentorium was explored along the inferior surfaces of the occipital and temporal lobes, extending to the petrous apex and posterior clinoid process. This demonstrated the exposure range of this surgical approach for managing lesions along the entire free edge of the tentorium and its vicinity. Two surgical cases were explored: one involving a meningioma located at the mid-segment of the free edge of the tentorium, and another involving a meningioma spanning the middle and posterior cranial fossae, extending from the tentorial apex to the petrous apex-posterior clinoid region along the entire free edge of the tentorium. Successful microsurgical resection of these lesions further confirmed the clinical utility of the posterior interhemispheric approach in managing lesions along the upper and lower regions of the tentorial free edge.

Results: The posterior interhemispheric approach provided exposure of the entire free edge of the tentorium and nearby lesions, including but not limited to: lesions near the apex of the cerebellar vermis, lesions above and below the free edge of the tentorium, lesions at the petrous apex, lesions near the posterior clinoid process, and lesions in the posterior part of the cavernous sinus. The use of an endoscope further expanded the exposure in these areas.

Conclusion: The posterior interhemispheric approach is effective for managing space-occupying lesions along the entire upper and lower regions of the free edge of the tentorium and its vicinity.

The Protection Strategies for Venous Sinuses During Microvascular Decompression Surgery

Chunran ZHU

Department of Neurosurgery, Affiliated Hospital of Integrated Traditional Chinese and Western Medicine, Nanjing University of Chinese Medicine, Nanjing 210028, Jiangsu, China

Objective: To explore the protection strategies for venous sinus during microvascular decompression (MVD) surgery by studying the dominant side of sigmoid sinus and the positional features of petrosal vein.

Methods: A total of 278 patients who underwent MVD surgery and had preoperative MRI scans at our institution from December 2020 to December 2021 were selected. We measured the cross-sectional area of the sigmoid sinus on the magnetic resonance imaging (MRI) and analyzed the spatial relationship between the petrosal vein, trigeminal nerve, and auditory nerve. The relation between affected side and the venous dominant side was also considered in protection strategies.

Results: The percentage of right-sided sigmoid sinus dominance was higher than that of the left-sided sinus, indicating that right-sided dominance is more prevalent. Based on this finding, the location and length of the surgical opening were carefully planned during preoperative preparation to protect the sigmoid sinus. Different surgical incision strategies were applied according to the special features and locations of petrosal sinuses. The improved strategy allowed for the complete protection of the main trunk of the petrosal vein in all patients, who showed good recovery postoperatively. There were no severe complications such as death, cerebral hemorrhage, or cerebral infarction after surgery.

Conclusion: Our result showed a dominance of the right-sided sigmoid sinus. Preoperative planning of the incision for MVD is important in assisting surgeons in protecting the sigmoid sinus structure. By evaluating the dominant side of the sigmoid sinus before incision and selecting appropriate surgical strategies, effective protection of the petrosal vein can be achieved. The protection of venous vessels during MVD is significant for enhancing its safety, which can effectively reduce surgical risks and minimize postoperative complications to improve surgical outcomes.

Association of atherogenic index of plasma and its modified indices with stroke risk in individuals with cardiovascular-kidney-metabolic syndrome stages 0-3: a longitudinal analysis based on CHARLS

Xiaoyan Wang[2#], Pengfei Wen[3#], Yun Liao[1], Tao Wu[1], Lin Zeng[1], Yuxing Huang[1], Xiaomei Song[1], Zhen Xiong[1], Lisha Deng[1], Dingjun Li[1], Shuchuan Miao[1]

[1]Department of Neurosurgery, Hospital of Chengdu University of Traditional Chinese Medicine, Chengdu, China, [2]Department of Clinical Nutrition, The First Affiliated Hospital of Chengdu Medical College, Chengdu, China, [3]Department of Dermatology, West China Hospital, Sichuan University, Chengdu, China

Objective: Cardiovascular-kidney-metabolic (CKM) syndrome is increasingly prevalent, yet the association between the atherogenic index of plasma (AIP), its modified indices (such as waist circumference [WC], waist-to-height ratio[WHtR], body mass index[BMI]), and stroke risk in individuals with CKM stages 0-3 remains understudied.

Methods: This study conducted a secondary analysis of data from the China Health and Retirement Longitudinal Study (CHARLS), including 3,697 participants aged ≥45 years at Baseline(2012, Wave 1) and 2015 (Wave 3) with CKM stages 0-3. Baseline, cumulative, and changes in AIP and its modified indices (AIP-WC, AIP-WHtR, AIP-BMI) were calculated. Logistic regression, Delong's test, integrated discrimination improvement (IDI), weighted quantile sum (WQS) regression, and mediation analysis were used to assess associations, predictive performance, component contributions, and mediation effects.

Results: A total of 3,697 participants were included, with 176 (4.8%) experiencing stroke during follow-up. Baseline, cumulative, and changes in AIP and its modified indices were significantly associated with stroke risk. The odds ratios (ORs) were: Baseline (AIP 1.64, AIP-WHtR 2.06, AIP-WC 2.06, AIP-BMI 1.99; all $P<0.05$); Cumulative (AIP 1.86, AIP-WHtR 2.14, AIP-WC 2.08, AIP-BMI 1.98; all $P<0.003$); Changes over time showed the strongest association (AIP 2.37, AIP-WHtR 2.49, AIP-WC 2.67, AIP-BMI 2.32; all $P<0.001$). Modified AIP indices (especially AIP-WHtR) demonstrated stronger associations and superior predictive ability compared to AIP alone. The association between AIP and its modified indices and stroke risk was amplified in CKM stages 2 and 3 but not significant in CKM stages 0 and 1. The AIP-WHtR-stroke risk association was primarily driven by Triglycerides (TG) and partially mediated by estimated pulse wave velocity (ePWV) (6.48%).

Conclusions: In CKM stages 0-3, AIP and its modified indices (especially AIP-WHtR) predict stroke risk, outperforming AIP alone. Dynamically monitoring changes in these indices is crucial for risk assessment, as the association strengthens in CKM stages 2 and 3). TG primarily drives this risk, while ePWV partially mediates the AIP-WHtR-stroke link. Utilizing these dynamic indices aids stroke risk stratification and personalized prevention in CKM patients.

Keywords cardiovascular-kidney-metabolic, stroke, atherogenic index of plasma and its modified indices, atherogenic index of plasma-waist-to-height ratio, estimated pulse wave velocity

Functional Preservation Surgery for Acoustic Neuroma – Visualizing Diseased Nerve and Neural Function

Hirofumi Nakatomi
Department of Neurosurgery, International University of Health and Welfare

Objective: This study evaluates the effectiveness of preoperative three-dimensional (3D) fusion imaging and intraoperative continuous neurophysiological monitoring in visualizing both the anatomy and function of the cochlear and facial nerves during acoustic neuroma surgery.

Methods: A total of 282 consecutive patients who underwent acoustic neuroma surgery between 2006 and 2023 were included in this study. In all cases, intraoperative continuous monitoring of auditory evoked dorsal nucleus action potentials (AEDNAP) and facial nerve root evoked electromyography (FREMAP) was performed. We developed and implemented a system that provides real-time visualization of the measured waveforms and maximum amplitude values, continuously displaying and recording nerve preservation rates relative to the baseline at the start of surgery. The system also tracks and visualizes nerve preservation trends throughout the procedure, enabling instant recognition of: 1. When and where intraoperative responses decline, 2. Which surgical maneuvers caused the decline. 3. How interventions affected functional recovery. This system comprehensively records all neurophysiological data throughout the procedure. Additionally, we established a comprehensive database that integrates patient characteristics, tumor-related factors, and intraoperative neurophysiological data. Multivariate analysis was conducted to evaluate correlations between intraoperative parameters and postoperative neurological function. Preoperative 3D fusion imaging was performed in 199 cases to visualize nerve trajectories.

Results: 1. Predictors of functional preservation: Logistic regression analysis identified final AEDNAP and FREMAP preservation rates as significant predictors of postoperative hearing and facial nerve function, respectively. **2.** Optimal preservation thresholds: Receiver operating characteristic (ROC) analysis indicated that a final AEDNAP preservation rate ≥35.5% and a FREMAP preservation rate ≥58.5% were significantly associated with better postoperative hearing and facial nerve function, respectively. **3.** Preoperative 3D fusion imaging: Nerve visualization was feasible in approximately 65% of cases.

Conclusion: Real-time intraoperative monitoring of brainstem auditory nuclei and facial nerve roots, with continuous feedback, significantly contributes to improved functional preservation outcomes. The surgical technique and monitoring system will be demonstrated via video presentation.

Resection of Ventrolateral Foramen Magnum Meningioma via the Far Lateral Approach with a Straight Incision

Li Yandong,Geng·Dangmurenjiafu,Zhu Guohua,Maimaitili·Mijiti

Department of Neurosurgery， The First Affiliated Hospital of Xinjiang Medical University

Objective: To explore the clinical effect of resecting ventrolateral foramen magnum meningioma via the far lateral approach with a straight incision.
Methods: The clinical data of 12 patients with ventrolateral foramen magnum meningioma admitted to the First Affiliated Hospital of Xinjiang Medical University from January 2020 to December 2024 were retrospectively analyzed, and relevant literatures were reviewed.
Results: The initial symptoms of the 12 patients included occipital and neck pain, choking during drinking water, unsteady gait, and limb numbness. All patients underwent tumor resection via the far lateral retromastoid or partial transcondylar approach with a straight incision. Eleven patients achieved gross total resection (Simpson Grade II), and 1 patient had subtotal resection. The median follow-up time was 32 (range: 3-60) months, and no patients had tumor recurrence. There were no operative deaths. After the operation, 3 patients presented with hoarseness and/or choking during drinking water, 1 patient had intracranial infection, 1 patient had pulmonary infection, and 1 patient had cerebellar infarction.
Conclusions: The far lateral retromastoid or partial transcondylar approach with a straight incision can fully expose the ventrolateral foramen magnum meningioma and achieve gross total resection of the tumor. During the operation, important structures such as the vertebral artery, posterior inferior cerebellar artery, and lower cranial nerves should be protected to reduce the incidence of complications.

Abstracts

Day 2

Room A

Room A (La Vie A): Key note lecture

Surgical Strategies and Techniques for the Resection of Hemangioblastomas

Nobuhito Saito, MD, PhD
Department of Neurosurgery
The University of Tokyo Hospital

Hemangioblastomas are highly vascular tumors, and meticulous control of intraoperative bleeding is essential during resection. These tumors are often associated with cysts; thus, resection of mural nodule-type hemangioblastomas tends to be relatively straightforward. In contrast, resecting large, solid tumors located deep within the medulla oblongata or cerebellum significantly increases the surgical difficulty.

In many cases, hemangioblastomas exhibit a rich network of feeding arteries and draining veins, resembling the vascular architecture of arteriovenous malformations (AVMs). Therefore, it is crucial to perform detailed preoperative planning, including the creation of three-dimensional fusion images based on MRI and cerebral angiography, to simulate the surgical procedure. Accurate identification of feeding and draining vessels and careful formulation of the surgical strategy are key to successful tumor resection.

In superficially located hemangioblastomas from the medulla oblongata to the upper cervical spinal cord, the tumor is often attached to the pia mater, with feeding and draining vessels present on the surface. The standard approach involves first occluding the feeding arteries, then dissecting the tumor from the pia mater, utilizing the cyst to facilitate separation from the spinal cord parenchyma, and finally dividing the draining vein for complete resection.

In hemangioblastomas attached to the floor of the fourth ventricle, there is no pia mater on the surface, and the tumor typically receives blood supply from the bilateral posterior inferior cerebellar arteries (PICAs). In such cases, it is important to promptly occlude the blood flow from both PICAs. Furthermore, when the tumor is located deep in the anterior medulla, feeding arteries may arise from perforating branches of the anterior spinal artery. In these cases, careful resection is necessary to control bleeding while avoiding damage to the medulla, which is extremely challenging.

For large hemangioblastomas located deep within the cerebellum, opening cerebellar fissures such as the horizontal fissure allows access to feeding arteries extending from the cerebellar surface into the deep regions.

In this presentation, we will discuss recent cases of large cerebellar and large medullary hemangioblastomas, highlighting specific surgical techniques and the challenges encountered during their resection.

Key Words: hemangioblastoma, VHL, medulla oblongata

Brainstem Glioma: Experience of A Single Center from Beijing Tiantan Hospital

Prof. Liwei Zhang M.D.

Beijing Tiantan Hospital, Capital Medical University, Beijing, China.

Purpose: To report the history and progress of the Neurosurgery Center of Beijing Temple of Heaven Hospital in the diagnosis and treatment of brainstem gliomas

Methods: A retrospective analysis was conducted on the historical evolution, conceptual innovation, technological progress, and latest achievements of the neurosurgery department of Beijing Temple of Heaven Hospital in the diagnosis and treatment of brainstem gliomas over the past 45 years.

Results: Based on a systematic review of our team's historical evolution and inheritance, we focused on introducing our team's new progress and achievements in the classification, diagnosis, treatment, and prognosis of brainstem gliomas. We also provided a brief summary of our basic research achievements in this difficult to treat disease.

Conclusion: The team has been deeply involved in the clinical diagnosis, treatment, and basic research of brainstem gliomas for nearly half a century, accumulating rich clinical experience and basic research results. In terms of new achievements, DIPG and non DIPG are two completely different subtypes of tumors. For non DIPG tumors, precision surgical treatment of brainstem gliomas under multimodal guidance can benefit patients greatly; For DIPG tumors, a comprehensive treatment plan based on cyto-reductive surgery can benefit patients. We believe that new treatment options and global cooperation will promote research progress and treatment effectiveness for this type of disease.

Key Words: Brianstem Glioma, Beiijng Tiantan Hospital, Single Center

Anatomic consideration for surgical boundaries of the endoscopic endonasal cranial base surgery

Kenichi OYAMA MD, PhD, Tomoaki NAITO MD, Ichiro NAKAZATO MD, PhD, Yoshinori TAKAYA MD, PhD, Hisashi ISHIKAWA MD, Yusuke TABEI MD, PhD, Ken SUMA MD, PhD, Akira Matsuno MD, PhD

International University of Health & Welfare Mita Hospital, Tokyo, Japan
International University of Health & Welfare Narita Hospital, Tokyo, Japan

Objective: To show the surgical boundaries of the endoscopic endonasal cranial base surgery.

Method: Cadaveric heads were dissected using the endoscope. Surgical techniques were applied to clinical cases.

Results: For endoscopic endonasal approach, we can choose two approaches depending on the lesions. Paraseptal approach is a more simple and less invasive approach than an extended approach, preserving normal anatomy in the nose. On the contrary, for the extended approach, we need to open up paranasal sinuses to create a wide corridor for treating complex skull base lesions. Using the sagittal plane modules, we can get to the midline cranial base, including frontal sinus, suprasellar area, clivus, and etc. The lateral limit of the sagittal plane modules is the internal carotid artery. To get access to the upper lateral skull base (cavernous sinus, orbit), simple opening of ethmoid sinus via uninostril approach provide sufficient exposure of this area. To reach the inferior lateral skull base (petrous apex, parapharyngeal space, condyle), transpterygoid approach is the key procedure providing wide exposure of this area. To get to the infratemporal fossa, endoscopic Denker's approach, followed by dissection around the lateral pterygoid plate is a feasible technique for accurate opening of this area.

Conclusion: Understanding of surgical anatomy is mandatory for treating the skull base lesions via endoscopic endonasal surgery. Less invasive and appropriate approach should be applied depending on the size, location and type of the lesion.

Digital and intelligent technologies promote a new paradigm in neurosurgery

Department of Neurosurgery, Beijing Tsinghua Changgung Hospital, School of Clinical Medicine, Tsinghua Medicine, Tsinghua University, Beijing, China.

Xuejun Yang, Peihai Zhang, Jiahe Guo, Kai Zhang, Yi Guo, Zhenxing Sun

Objective: In this study, we aim to establish a new paradigm of preoperative planning, virtual surgery, and intraoperative guidance for brain tumor surgery, based on a new preoperative planning and intraoperative guidance system for brain tumors.

Methods: From January 2024 to May 2025， we adopted and participated in the expansion of application for a new preoperative planning and intraoperative guidance system in our department. The applying procedures include: (1) Complete multimodal cranial imaging, functional mapping, and fiber tracing before surgery. Reconstruct the overall structure of the brain, including the cortical sulcus and gyrus, cortical vein, functional area adjacent to the brain tumors, and their connectivity fiber; (2) Analyze the topological pathways surrounding brain lesions and complete preoperative planning; (3) Applying virtual reality and augmented reality technology to surgical decision-making, preoperative training, and virtual surgery to enhance the realism of preoperative planning and the effectiveness of surgical training; (4) Introducing augmented reality technology in surgical positioning and scalp flap planning; (5) Based on the automatic partitioning and topological structure of the cortex, determine cortical approach to the lesion; (6) Real time fusion of surgical navigation and ultrasound imaging to guide the operations.

Results: The applicable scenarios included brain tumor resection, aneurysm clipping, vascular bypass, spine surgery, radiofrequency ablation and pain blocks, and biopsy. (1) Through virtual reality and augmented reality technology, preoperative topological structure analysis of lesions can be achieved, which can predict neural function remodeling and facilitate the maximum removal of brain parenchymal tumors; (2) Virtual reality technology and augmented reality technology, through visualization and three-dimensional presentation, promote young doctors to understand the relationship between the neural structure at the lesion site and the overall neural structure, as well as the relationship between the lesion and neural function and surrounding blood vessels. They are a new way of surgical training; (3) The guidance of digital technology can achieve optimal positioning and skin flap design, avoiding the mismatch between the skin flap designed solely based on the surgeon's experience and the surgical approach in a visual way, which can cause difficulties in surgical resection; (4) The automated partitioning technology and topological structure display of the cerebral

cortex help to enhance understanding of cortical partitioning and indication of cortical pathways during surgery, which can replace electrophysiological techniques in judging the central sulcus; (5) The fusion technology of neuronavigation and intraoperative ultrasound can compensate for the non real-time nature of navigation and the limitation of ultrasound only indicating lesion sound and shadow, achieving real-time and good structural guidance during surgery.

Conclusion: We believe that the development of digital and intelligent technologies will continue to help us establish a developing strategy for precision neurosurgery in the new era.

Keywords: neurosurgical operation, digital and intelligence, preoperative planning, intraoperative guidance

Room A (La Vie A): Cerebrovascular Diseases

Surgical strategy of flow diversion with bypass for difficult unclippable aneurysms

Atsushi Saito M.D., Ph.D., Hazuki Hirakawa M.D., Daiki Takenami M.D., Yu Nomura M.D., Kohta Ueno M.D., Takashi Sasaki M.D., Tomohiro Kaji M.D., Ph.D., Kiyohide Kakuta M.D., Ph.D., Kosuke Katayama M.D., Ph.D., Takahiro Morita M.D., Ph.D.,
Affiliation: Department of Neurosurgery, Hirosaki University Graduate School of Medicine

(Background)
Surgical or endovascular treatment for giant or complex aneurysms is challenging. Flow diversion with bypass has been recently reported as a successful treatment method and will be a choice for unclippable aneurysms aiming at intra-aneurysmal thrombosis. However, the indication, selection of bypass, mechanisms of intra-aneurysmal thrombosis remain unknown. We present two cases of unclippable aneurysms and to clarify the discussion points for flow diversion and the thrombosis.
(Case presentation)
The first case was a 66-year-old woman suspected impending rupture. She presented with sudden onset of severe headache, and magnetic resonance images showed no subarachnoid hemorrhage and left giant thrombosed aneurysm. The left internal carotid artery (ICA) angiography showed a partial intra-aneurysmal flow at the terminal portion of the left ICA with good collateral blood flows via Acom A and Pcom A. Flow reversal with bypass and proximal occlusion from end wall type to side wall type aneurysm was performed and intra-aneurysmal thrombosis successfully progressed.
The second case was a 55-year-old man presenting with transient hemiparesis. The left ICA angiography showed a partially thrombosed giant aneurysm at the left M1 portion. Flow reversal and flow reduction of intra-aneurysmal flow was planned with STA-MCA double bypass and M1 portion is occluded at the distal to the origin of the first temporal branch. Post-operative angiography showed no flow in the aneurysm.
(Conclusions)
We introduced two surgical cases of giant thrombosed aneurysm treated by flow reversal using bypass and occlusion. There are some questions to challenge, but flow reversal is one of therapeutic choices of unclippable giant partially thrombosed aneurysms.
Key words: aneurysm　bypass　clipping

Microsurgical clipping of basilar apex aneurysms

Yi GUO M.D.

Department of Neurosurgery, Beijing Tsinghua Changgung Hospital, Tsinghua University
Beijing, 102218, China
Email: gya01246@btch.edu.cn

Abstract

Microsurgical Clipping of Basilar Apex Aneurysms: A Single-Center Experience with Long-Term Outcomes and Technical Nuances

Key Words： Basilar artery apex, Microsurgical management, Surgical approach, Augmented reality

Objective: Basilar apex aneurysms, located at the bifurcation of the basilar artery, remain one of the most challenging lesions in cerebrovascular surgery due to their deep-seated anatomy, proximity to critical perforating arteries, and complex neurovascular relationships. Despite advancements in endovascular techniques, microsurgical clipping continues to play a pivotal role, particularly in cases of wide-necked, thrombotic, or recurrent aneurysms. This study aims to evaluate the safety, efficacy, and long-term outcomes of microsurgical clipping for basilar apex aneurysms, with a focus on technical nuances, complication avoidance, and postoperative functional recovery.

Methods: A retrospective analysis was conducted on 16 consecutive patients who underwent microsurgical clipping for basilar apex aneurysms at a single tertiary neurosurgical center between 2018 and 2024. Surgical indications included ruptured aneurysms or failed endovascular treatment. Pre-oprerative Augmented Reality (AR) technique assisted simulation surgery was used in 5 cases. Intraoperative adjuncts such as indocyanine green angiography (ICG), neurophysiological monitoring, and temporary clipping were utilized. Outcomes were assessed via postoperative angiography, Glasgow Outcome Score (GOS) at discharge and 12-month follow-up, and complication rates.

Results: Complete aneurysm occlusion was achieved in 90% of cases (15/16), with no intraoperative mortality. Postoperative complications occurred in 12% (2/16). Transient oculomotor nerve palsy occurred in 1 patients (6%), resolving within 3 months. Major complications included thalamoperforator infarction (n=1, 6%). At mean follow-up (42 months), 87% of patients (14/16) achieved favorable outcomes (mRS $\leqslant$2). No recurrences. Pre-oprerative Augmented Reality (AR) technique assisted simulation surgery can apply great help for neurosurgeon on surgical approach selection and individualizing surgical plan.

Conclusions: Microsurgical clipping remains a definitive treatment for basilar apex aneurysms, particularly in complex or recurrent cases, offering high occlusion rates and durable outcomes in experienced hands. While associated with risks related to the intricate anatomy, advances in microsurgical techniques and intraoperative adjuncts mitigate complications. Also with the help of cutting-edge digital/intelligence neurosurgical technique such as AR assisted simulation before operation, neurosurgical procedures can be effectively improved on surgical planning, surgical simulation, aiding young neurosurgeons in quickly understanding the normal and pathological neuroanatomy. This significantly shortens the learning curve. It provides strong support for the training of neurosurgeons, with significant clinical value and broad prospects for application. Though there has been a major shift in the paradigm of aneurysm treatment from microsurgery to endovascular procedures. Microneurosurgery still plays an important role in many basilar apex aneurysm cases and may be the only option for people in the developing world..

Treatment of high-grade brain arteriovenous malformations using a hybrid operating room: A prospective single-arm study

Wei Zhu 朱巍

1 Department of Neurosurgery, Huashan Hospital, Fudan University, 12 Wulumuqi Road Middle, Shanghai, China

2. National Center for Neurological Disorders, Shanghai 200040, China

3. Shanghai Key Laboratory of Brain Function and Preservation and Neural Regeneration, Shanghai 200040, China

4.Neurosurgical Institute of Fudan University, Shanghai 200090, China

5. Shanghai Clinical Medical Center of Neurosurgery, Shanghai 200040, China

(Objective) To evaluate the feasibility, safety, and effectiveness of one-stop hybrid treatment for high-grade brain arteriovenous malformations (BAVMs) using a hybrid operating room (hOR), and to compare outcomes with historical controls.

(Methods) A prospective single-arm study enrolled 44 patients with high-grade BAVMs (Spetzler-Martin grade ≥3) treated via one-stop hOR procedures (embolization followed by microsurgical resection) between 2016 and 2021. Propensity score-matched historical controls (n=66) treated between 2010 and 2016 were analyzed. Intraoperative angiography, functional MRI, electrophysiological monitoring, and awake craniotomy were utilized to optimize resection and preserve neurological function.

(Results) The hOR group achieved a 100% complete obliteration rate at 12-month follow-up versus 86.4% in controls (p=0.0106). Intraoperative angiography detected residual nidus in 4 hOR patients, enabling immediate further resection. The hOR group had lower rates of poor outcomes (mRS >2: 15.9% vs. 30.3%, p=0.0857) and mortality (0% vs. 3.3%). For combined Spetzler-Martin grade 4–6 AVMs, favorable outcomes were significantly higher in the hOR group (87.9% vs. 71.4%, p=0.033).

(Conclusion) One-stop hybrid treatment in a hOR is safe and effective for high-grade BAVMs, particularly those with complex angioarchitecture. Preoperative embolization, multimodal imaging, and intraoperative monitoring reduce hemorrhage risk and preserve neurological function while achieving high obliteration rates.

Keywords

High-grade BAVM; One-stop hybrid BAVM treatment; Single-arm study; Preoperative embolization; Neurological deficit

Use of a Smartphone-based Telemedicine System for Moyamoya Disease: Validation in Preoperative Diagnosis and Postoperative Management

Toshiya Osanai, Haruto Uchino, Kikutaro Tokairin, Kota Kurisu

Masaki Ito, Miki Fujimura

Department of Neurosurgery, Hokkaido University, Sapporo, Japan

Email：osanait@med.hokudai .ac.jp

【Background】

Recent advances in information and communication technologies have facilitated the adoption of smartphone-based telemedicine systems in clinical practice. The effectiveness of telemedicine using computed tomography (CT) and magnetic resonance imaging (MRI) has been well-demonstrated in the field of stroke medicine. However, for Moyamoya disease (MMD), there is limited evidence regarding the use of telemedicine for cerebral angiography, which remains the diagnostic gold standard, and managing multimodal imaging postoperatively.

【Objective】

This study aimed to evaluate the feasibility and diagnostic accuracy of a mobile telemedicine platform, particularly for preoperative angiographic assessment and postoperative image-based clinical decision-making in patients with MMD.

【Methods】

During the diagnostic phase, 15 adult patients (30 hemispheres) who underwent diagnostic cerebral angiography before surgical revascularization were retrospectively analyzed. The angiographic images were uploaded to the JOIN mobile application and evaluated by two independent readers on smartphones. Their interpretations were compared with those obtained using the hospital's picture archiving and communication system (PACS). The endpoints included Suzuki staging, collateral circulation assessment, posterior cerebral artery stenosis, and transdural anastomosis. The diagnostic agreement and accuracy metrics were calculated.

During the management phase, 20 patients who underwent combined revascularization procedures were prospectively enrolled. In 10 patients, the JOIN system was used for

postoperative image sharing and decision-making via an encrypted chat. The remaining 10 patients served as historical controls and were managed using conventional methods. Postoperative CT, MRI, and cerebral blood flow scintigraphy findings were evaluated. Neurological symptoms, radiological abnormalities, and functional outcomes were compared between the groups.

【Results】

Regarding preoperative diagnosis, intermodality agreement between smartphone- and PACS-based assessments was high, with Kappa coefficients of 0.79 and 0.77, respectively, for the two readers in Suzuki stage classification. The diagnostic performance for vascular stenosis and collateral pathways was comparable, suggesting sufficient image quality and interpretability using mobile devices.

In the postoperative management arm, all radiological images were successfully reviewed remotely using smartphones, and treatment plans were shared via group chats among the attending physicians. The abnormalities detected included cerebral hyperperfusion, watershed shift phenomenon, cortical edema, and crossed cerebellar diaschisis. Timely interventions, such as strict blood pressure control and pharmacotherapy, were implemented based on remote instructions. No significant differences were observed in the postoperative symptom incidence or modified Rankin scale scores between the smartphone and control groups.

【Conclusion】

The smartphone-based telemedicine system demonstrated adequate accuracy in interpreting preoperative cerebral angiography findings and facilitated effective postoperative management of patients with MMD. This approach allows specialists to provide timely input regardless of the location and may be a valuable tool to support decision-making, promote regional medical collaboration, and improve the efficiency of neurosurgical care delivery.

Increased Intra-aneurysm pressure after flow diverter implantation: a potential mechanism for delayed rupture

吕宪利 **Lv Xianli**

北京清华长庚医院 **Department of Neurosurgery, Beijing Tsinghua Changgung Hospital, School of Clinical Medicine, Tsinghua University**

【**Objective**】Delayed rupture of large or giant unruptured intracranial aneurysm may potentially occur subsequent to treatment with flow diverts. The underlying mechanism of its occurrence remains elusive. The aim of our study was to explore a novel approach for identifying the underlying factors contributing to delayed rupture after the surgery.

【**Methods**】We presented a case of a 60-year-old man with a large left posterior communicating artery aneurysm (1.85cm×1.68cm) who underwent flow diverter (FD) placement with coil embolization (Pipeline Flex, Medtronic, Irvine, CA, USA). The aneurysm cavity was accessed using a microcatheter, connected with an invasive arterial pressure monitoring sensor to observe the changes in mean arterial pressure (MAP). The MAP within the aneurysm cavity and parent artery was measured both before and after the stent deployment.

【**Results**】Before and after the FD deployment, we conducted continuous monitoring of MAP in arterial vessels and within the aneurysm cavity. The mean scores of MAP of the pre-FD deployment and post-FD deployment with parent artery were 70.5±2.07 vs 76.5±0.53 ($P<0.001$) , while those related to aneurysm cavity were 56.0±1.25 vs 68.4±1.26 ($P<0.001$) respectively. The both results showed that the difference between the mean scores of MAP were statistically significant ($P<0.001$). After the placement of the FD, the aneurysm was effectively occluded. The mean scores of MAP of the post-FD deployment and the aneurysm occluded with parent artery were 76.5±0.53 vs 70.6±2.07 ($P<0.001$) , while those related to aneurysm cavity were 68.4±1.26 vs 59.8±1.55 ($P<0.001$) respectively.

【**Conclusion**】According to our test, the MAP exhibited a significant increase in both the aneurysm cavity and the parent artery following surgery. But after the aneurysm was occluded, the MAP in both the parent artery and the aneurysm cavity was observed to decrease relative to the measurements taken post-FD placement. It was likely to the elevation of blood pressure post-operation will constitute a pred

Abstract

【**Key words**】Intra-aneurysm pressure, flow diverter, endovascular therapy, delayed rupture

Prognostic Factors in Aneurysmal Subarachnoid Hemorrhage During the Clazosentan Era: A Multicenter Study Using Multivariate Analyses and Machine Learning Model

Shinsuke Muraoka[1], Takashi Izumi[1], Kazuki Ishii[1,2], Issei Takeuchi[1], Masahiro Nishihori[1], Shunsaku Goto[1], Fumiaki Kanamori[1], Kenji Uda[2], Yusuke Sakamoto[3], Kinya Yokoyama[4], Kazuki Nishida[5,6], Basile Chretien[5,7], Ryuta Saito[1]

[1] Department of Neurosurgery, Nagoya University Graduate School of Medicine, Nagoya, Aichi, Japan.

Background: Subarachnoid hemorrhage (SAH) caused by a ruptured cerebral aneurysm is among the most life-threatening neurological emergencies. Cerebral vasospasm, a common complication following SAH, is known to significantly worsen patient outcomes. Nimodipine is widely used worldwide to prevent cerebral vasospasm; however, it is not approved for use in Japan. Instead, fasudil, a Rho kinase inhibitor, has been the standard pharmacological option in Japan. In 2022, clazosentan—an endothelin A receptor antagonist that acts upstream in the vasospasm pathway—was approved for clinical use. **Aims:** This study aimed to identify prognostic factors in patients with aSAH in Japan. **Methods:** A multicenter, retrospective, observational cohort study was conducted from April 2021 to March 2024. Patients underwent surgical repair of ruptured aneurysms within 48 hours of onset, followed by postoperative treatment with multiple drugs, including clazosentan and fasudil, to prevent cerebral vasospasm. The primary outcome was the proportion of patients with a good outcome, defined as a modified Rankin Scale score of 0 to 2 at discharge. Multivariate logistic regression and stepwise model selection were applied to identify prognostic factors. SHapley Additive exPlanations (SHAP) analysis was used to visualize the relative importance of predictors and their impact on outcomes. **Results:** Among 506 patients (mean age 63.5 years, 66.6% female), 53.0% achieved a favorable outcome. In multivariate analysis, treatment with clazosentan was associated with 1.84 times higher odds of a favorable outcome ($p=0.021$), increasing to 1.97 when clazosentan was administered without fluid retention complications ($p=0.010$). SHAP analysis further highlighted the impact of each factor on prognosis, identifying a lower WFNS grade, lower Fisher grade, younger age, clazosentan, cilostazol, and statin use as significant predictors of favorable outcomes. **Conclusion:** Clinical status at aSAH onset and age are uncontrollable factors; therefore, improving prognosis requires targeted prevention of DCI and effective management of brain edema. The administration of therapies such as clazosentan, cilostazol, and statins may contribute to favorable outcomes.

Alterations of Oscillatory Activity and Cognitive Function After Aneurysmal Subarachnoid Hemorrhage

Peng Liu
Department of Neurosurgery, Peking University Third Hospital, Peking University

Background: Aneurysmal subarachnoid hemorrhage (aSAH) can lead to cognitive impairment, but underlying neural mechanisms remain to be elucidated.
Materials and Methods: To predict long-term cognitive impairment after aSAH, resting electroencephalography (EEG) was measured in 112 patients hospitalized with a diagnosis of aSAH (n=66) or unruptured intracranial aneurysms (UIA; controls) (n=46). A neuropsychological battery was administered 8 to 24 months after discharge.
Results: Power spectrum analysis in the parietal-occipital lobe showed significantly higher power theta vs. alpha oscillations in patients with cognitive impairment after aSAH. The power of theta and alpha oscillations were significantly correlated with multiple cognitive scale scores on the neuropsychological battery. A neural model was established, which showed that connectivity between inhibitory and excitatory neurons in neural circuits contributed to changes in theta and alpha oscillations and cognitive impairment in aSAH.
Conclusion: The data collection, analysis, and computational model established in this study can serve as a new paradigm for other clinical studies investigating cognitive impairment.
Keywords: EEG, alpha oscillation, resting state, aneurysmal subarachnoid hemorrhage, cognitive function

Additional bypass procedures for moyamoya disease that combinable with classical superficial temporal-middle cerebral artery anastomosis

Yusuke Egashira, Yukiko Enomoto, Hirofumi Matsubara, and Tsuyoshi Izumo
Department of Neurosurgery, Gifu University Graduate School of Medicine

Superficial temporal artery-middle cerebral artery (STA-MCA) anastomosis is well-established surgical procedure for the prevention of ischemic or hemorrhagic stroke in patients with moyamoya disease (MMD). The main aim of this classical bypass is to improve the cerebral circulation in the MCA region. Because of the nature of MMD, the territories of anterior cerebral artery (ACA) and posterior cerebral artery (PCA), where the collateral flow from STA-MCA anastomosis is difficult to reach, also might develop cerebral blood flow insufficiency. We herein presented the following three additional bypass procedures that combinable with classical STA-MCA anastomosis. 1: Direct revascularization for the ACA territory. 2: Direct revascularization for PCA territory that play a complementary role to the ischemia in the ACA region. 3: Novel indirect procedure using subgaleal temporoparietal fascia. These procedures could provide better collateralization from bypass without the increased risk of wound ischemia or cosmetic issues.

Key Words: direct anastomosis; moyamoya disease

Room A (La Vie A): Skull base tumor

A paradigm shift of Endoscopic transorbital surgery to the skull base: clinical experience of 60cases from Hong Kong

Dr. Calvin Mak

Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong, China

(Background) Endoscopic transorbital surgery is an emerging minimally invasive surgical technique to treatorbital and skull base lesions. It offers a direct, anterior and paramedian approach to the lateracompartment of the cavernous sinus, orbital apex, middle cranial fossa, anterior cranial fossafloor as well as infratemporal fossa. There are different options of surgical approaches fortransorbital surgery, with the superolateral corridor being the most versatile and commonlyused. Lid crease incision offers excellent cosmetic outcome, and when combined with eitherlacrimal keyhole or lateral orbitotomy, the surgical freedom and instrument maneuverability canfurther be increased. Other incisions include medial transcaruncular approach, lateralcanthotomy incision, transconjunctival approach and swinging eyelid incision.

(Methods) We retrospectively analyze the operative experience and clinical outcome of the patients in ourcentre who underwent endoscopic transorbital surgery. Cases were grouped according todifferent locations: orbit, cavernous sinus, intradural and extradural, and analyze the outcomeaccordingly.

(Results) Since 2020, we have operated 60 cases using endoscopic transorbital surgery at QueenElizabeth Hospital, Hong Kong. The multidisciplinary surgical team includes neurosurgeon.oculoplastic surgeons, and ENT surgeons. Apart from classical indications of sphenoid ridgemeningioma, trigeminal schwannomas, frontal mucoceles and orbital apex tumors where theaxis of tumor is in line with the transorbital trajectory, our team has expanded the indications tomultiportal applications. For example, when combined with endonasal approach using anadditional endoscope, infratemporal fossa malignant tumors can be resected en bloc withnegative tumor margins, even when the posterior margin is close to the petrous carotid arterySuraical steps and operative videos and will be presented and discussed. Patients enjoyedexcellent cosmetic outcome, with a significantly shorter operation time and fewer blood loss.Most of the patients were ambulatory on the next day of operation, and can be discharged earlywithin 2-3 days. There were no case of CSF leak. When postoperative ocular palsies happenedmost of them recovered within 3 months, Permanent complication rate remains low.

(Conclusion)Endoscopic transorbital surgery is an endoscopic-assisted surgical technique to the skull basethat is minimal access and minimal invasive with low complication rate. Its primary indication istargeted at lesions lateral to the cavernous sinus, and we have been expandina the indicationswith the use of angled endoscopic instruments, and combined with multiportal applications.

Keyword: endoscopic transorbital, orbit, skull base, endoscope, cavernous sinus, infratemporal fossa

Endoscopic keyhole anterior petrosal approach to the lesions around petrous apex

Takeo Goto MD, PhD

Department of Neurosurgery, Osaka Metropolitan University Graduate School of Medicine, Osaka, Japan

Recently endoscope becomes a very effective surgical tool for less invasive tumor removal. In addition to endoscopic endonasal approach, endoscopic keyhole surgery is applied to several skull base or deeply seated tumors. In this article, we present a new surgical approach "endoscopic keyhole anterior petrosal approach" which is very useful procedure to the tumors around the petrous apex.

The patients were placed in spine position with their heads rotated 15 degrees to the opposite site. Key hole craniotomy with the size of 3.5 cm was placed at the temporal base. Temporal lobe was retracted under the 0 degree endoscope and superior surface of the petrosal bone and the dura matter over the trigeminal nerve was exposed. Then the greater superior petrosal nerve (GSPN)was identified over the dura matter with the facial nerve stimulator. The dura matter medial side of the GSPN was cut along the nerve and the Kawase's triangle was carefully exposed. Kawase's triangle was gently drilled out with the curved diamond drills. 3 and 2mm burrs were applied for safe drilling of the anterior petrosal apex. Superior petrosal sinus was cut and coagulated just the lateral side of the meckel's cave and the cave was opened along the V3. Finally the cerebellar tentorium was transected after confirmation of the trochlear nerve. The surgical field offered by this approach is almost as much as the field presented by the microscopic anterior petrosal approach. Even craniotomy is quite small but endoscopic panoramic view was effective to obtain wide surgical field.

Small and medium size tumors such as trigeminal schwannomas and petrous apex meningiomas successfully removed out. Our surgical video and endoscopic anatomy of this approach will be presented in this article.

Key word. Endoscope
Petrosal approach
Keyhole

The Significance of Diving Techniques in Pituitary Tumor Surgery

Weiping Liu[1], Gangfeng Sun[1], Xicai Yi[2], Yuqi Liu[3], Yafei Wang[1], Shuo Zhang[1], Zhibin Ding[3], Junfeng Zhang[3], Hai Zhong[3]

[1] Department of Brain Hospital, Xi' an People' s Hospital (Xi' an Fourth Hospital), No. 155 Hangtian East Road, Xi' an, 710004, Shaanxi Province, China;

[2]Department of Neurosurgery, Xijing Hospital, Air Force Medical University, 710032;

[3]The First Affiliated Hospital of Xi'an Medical College, 710077.

Objective: To investigate the clinical significance of diving technique in neuroendoscopy in transnasal pituitary adenoma resection.

Methods: The clinical data of 679 patients with pathologically confirmed pituitary adenoma admitted from January 2018 to November 2024 were retrospectively analyzed. This paper summarizes how to identify the characteristics of normal pituitary gland, pituitary tumor tissue morphology, bleeding point, and saddle diaphragm, and the location and treatment methods of residual pituitary tumor tissue.

Results: Among the 679 patients, 647 (95.3%) achieved total neuroendoscopic resection. The pituitary gland and tumor tissues were observed by preoperative imaging and intraoperative endoscopic direct vision or intraoperative diving techniques. If the pituitary tissue could not be identified, rapid frozen pathological examination of the possible pituitary boundary tissue was performed during the operation, and the results showed that there were 14 cases of pituitary tissue alone, 3 cases of pituitary tissue invaded by tumors, and 5 cases of pure tumor tissue.

Conclusion: Intraoperative diving techniques can identify the morphological characteristics of different pituitary tumor tissues and normal pituitary tissues and can distinguish the boundary between pituitary tissues and tumors. Residual tumor tissue can be found by diving techniques, and hemorrhage spots can also be found. The use of this method can improve the total resection rate of tumors, improve the identification rate of normal pituitary tissue, and facilitate the protection of the pituitary gland, and protect intrasellar structures such as saddle diaphragm and cavernous sinus. Blind manipulation can avoid damage to the pituitary gland, saddle diaphragm and blood vessels.

Our surgical procedure and strategy for sellar lesions focusing on transsphenoidal surgery

Masamichi Kurosaki
Division of Neurosurgery, Department of Brain and Neurosciences, Faculty of Medicine, Tottori University, 36-1 Nishi-cho, Yonago, 683-8504, Japan

Transsphenoidal surgery (TSS) is the first-choice treatment for functioning pituitary neuroendocrine tumor (PitNET) except for lactotroph tumors or non-functioning PitNETs with visual disturbances. TSS combined with microscope and intraoperative fluoroscopy, was established by Hardy in the 1960's. Moreover, endoscopic TSS has been introduced into many institutes. The main advantage of the endoscopic TSS is excellent panoramic visualization. In the last decade, the classic transsphenoidal surgery has undergone further transformation, so-called, extended TSS. Among them presellar trans-planum (tuberculum) or transclival approach is popular. We reported our surgical procedure and strategy for sellar lesions. Collaboration of neurosurgeons and otolaryngologists (2 surgeons, 4 hands surgery) has been performed in patients with sellar lesions in our hospital. Recently a high-definition type rigid endoscope and navigation system has been used. The otolaryngologist holds the endoscope allowing the neurosurgeon to use two surgical instruments during tumor removal. The nasoseptal flap has an important role in the development of endoscopic extended TSS. The flap is an effective barrier for the prevention of CSF leaks from cranial base. Our 4 hands surgery was a safe procedure, with minimal morbidity and excellent surgical results. Preoperative radiological evaluation was performed using 3D-multidetector-row CT and 3T MRI. We suggest that these images provide significant assistance as a diagnostic and therapeutic tool for the treatment of sellar lesions.

Key words : sellar lesion, PitNET, endoscopic transsphenoidal surgery (TSS), extended TSS

Intrasellar pressure measurement for patients with pituitary tumors presenting with headache

Yasuhiko Hayashi[1] Sho Takata[1], Ryouken Kimura[1], Issei Fukui[2], Masahiro Oishi[2], Yasuo Sasagawa[2], Mitsutoshi Nakada[2], Osamu Tachibana[1]

1: Department of Neurosurgery, Kanazawa Medical University

2: Department of Neurosurgery, Kanazawa University

[Introduction] Developmental mechanisms of headache associated with pituitary tumors have been speculated as the extension of the sellar dural components, such as diaphragm sellae and medical wall of the cavernous sinus, and the compression of the trigeminal nerves in the cavernous sinus. However, there were few reports describing the measurement of the intrasellar pressure (ISP) and headache manifestation.

[Methods] This retrospective study included 108 patients (mean age 53.2 yrs, male : female = 41:67) with pituitary tumors treated in our institutes from 2013 to 2018, including 34 patients manifested with headache (mean age 44.6 yrs, male : female = 11:23). The radiological evaluation was performed in the following aspects; 1) dural defects of the diaphragm sellae, 2) invasion of pituitary tumor into the cavernous sinus or the sphenoid sinus, 3) presence of the intratumoral hemorrhage or the cyst. Measurement of the intraoperative ISP was performed using with ICP Express and Sensor (Codman, Johnson & Johnson) both after opening of the small window and full removal of the sellar floor. 4) Severity of headache was assessed by Headache Impact Test version 6; HIT-6).

[Results] 1) Tumor sizes with headache are significantly smaller than those without headache. 2) ISP with headache was significantly higher than those without headache（37.2 ± 9.0 vs. 15.8 ± 5.2 mmHg）. 3) ISP measured after full removal of the sellar floor significantly decreased before removal. 4) Dural defects with headache were smaller than those without headache on MRI. 5) No invasion of the pituitary tumors into the cavernous sinus and the sphenoid sinus were found. 6) 20 out of 34 patients with headache harbored intratumoral hemorrhages or cysts. Ossification rates of the sphenoid sinus, such as pre-sellar and choncal types, are significantly higher in the patients with headache. 7) All these cases were relieved from headache after surgery (HIT-6 score: preoperative 57.7 ± 6.1, postoperative 38.3 ± 3).

[Conclusion] A small foramen of the diaphragm sellae superiorly, an intact medial wall of the cavernous sinus laterally can work as a structural barrier. All these factors, recognized on preoperative MRI, are summarized as confining the pituitary tumors to the sellar region and leading to consideration of increasing ISP, and may have contributed to preoperative decision making to relieve headache.

The risk factors, intraoperative monitoring indicators, and clinical outcomes influencing facial nerve preservation during acoustic neuroma surgery.

Department of Neurosurgery, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, 85 Wujin Road, Shanghai, 200080, China.
Meiqing Lou, Qiangyi Zhou,Jiati Ni, Yunke Bi,Qiao Shan,Chaoyou Fang

Objective: To identify independent risk factors affecting facial nerve preservation in acoustic neuroma surgery and evaluate the clinical value of intraoperative monitoring strategies.
Methods: A retrospective analysis of 600 consecutive cases (Jan 2017-Jun 2024) was conducted. Patients were stratified into favorable (House-Brackmann Grades I-II) and unfavorable (Grades III-IV) groups. Univariate/multivariate analyses of tumor volume, nerve adhesion degree, facial nerve course, and membranization index were performed, integrated with electrophysiological data from six-stage programmed resection (intracapsular decompression, internal auditory canal, inferior pole, superior pole, brainstem segment, facial nerve segment).
Results:
1. The membranization index ≥ 3 group showed significantly lower preservation rates (45.0% vs 87.9%, _p_=0.002), identified as an independent risk factor (_OR_=9.23, 95%_CI_ 2.14-39.85)
2. Patients with >3 high-amplitude alarms (>500μV) during facial nerve segment dissection had reduced preservation rates (28.6% vs 72.4%, _p_<0.001)
3. Combined model (membranization index ≥3 + >2 alarms) predicted functional failure with 82.3% accuracy (PPV 91.2%, _AUC_=0.887)
Conclusion: The novel programmed monitoring system (membranization index + staged electrophysiological warning) significantly improves facial nerve preservation, providing quantifiable intraoperative decision support.

Treatment Strategy and Surgical Technique for Lesions in and around the Cavernous Sinus

Takashi Sugawara, Akira Saitoh, Shuhei Yamasaki, Tomihiro Wakamiya, Kimihiro Nakahara, Tatsuya Tanaka, Indou Masahiro, Takashi Agari, Hiroshi Itokawa, Kazuaki Shimoji, Eiichi Suehiro, Keisuke Onoda, Akira Matsuno
Department of Neurosurgery, International University of Health and Welfare

Objective: Radical treatment of lesions in and around the cavernous sins is still challenging due to the risk of injury to critical structures such as the cranial nerves and internal carotid artery. In this presentation, we show surgical strategies and techniques for the lesions in and around the cavernous sinus with intraoperative video.

Surgical strategies for the tumors: Surgical resection is indicated for patients with neurological symptoms. The lesion in cavernous sinus is removed as much as possible while preserving cranial nerves. If the tumor in the cavernous sinus is too firm to be removed without damaging the cranial nerves, it is left. If the IC is narrowing, maneuvers near the IC are avoided to prevent rupture. When the patient has neurological symptoms of diplopia, ptosis, and visual field disturbance, the optic sheath and oculomotor cave are opened wide, and the lesions there are removed aggressively to restore its function.

In surgical resection of tumors in and around the cavernous sinus to restore cranial nerve function with this strategy, functional recovery was achieved at a higher rate, particularly for the oculomotor and optic nerves. Most of these tumors can be effectively controlled with only minimal transient damage through careful and delicate procedures.

Room A (La Vie A): Brain tumors

Enhancing Glioma Resectability with Selective Intra-Arterial CT Angiography

Yoshiteru Shimoda[1], Masayuki Kanamori[1], Shinichiro Osawa[1], Syunji Mugikura[2,3], Shingo Kayano[4], Yoshinari Osada[1], Hidenori Endo[1]

1. Department of Neurosurgery, Tohoku University Graduate School of Medicine, Sendai, Japan
2. Department of Diagnostic Radiology, Tohoku University Graduate School of Medicine, Sendai, Japan
3. Department of Image Statistics, Tohoku Medical Megabank Organization, Tohoku University, Sendai, Japan
4. Department of Radiological Technology, Tohoku University, Hospital, Tohoku University, Sendai, Miyagi, Japan

Objective:
Perforating arteries supplying the corticospinal tract often limit the extent of glioma resection. While conventional imaging techniques allow visualization of the origin of these arteries, they are insufficient for tracking their course toward the corona radiata. At our institution, we have employed ultra-high-resolution CT combined with selective intra-arterial contrast injection (UHR-IA-CTA) to evaluate the course of submillimeter vessels. This study aimed to assess the utility of preoperative UHR-IA-CTA in expanding the resectable range of gliomas.
Methods:
Tractography was fused with UHR-IA-CTA to identify perforating arteries supplying the corticospinal tract. Patients were classified into two groups: those in whom critical arteries ran outside the tumor (Group G1), and those in whom they ran through the tumor (Group G2). Resection rates and neurological outcomes were compared between groups.
Results:
Twenty-two patients (14 males, 8 females) were included: 14 with glioblastoma, 5 with IDH-mutant astrocytoma, 2 with oligodendroglioma, and 1 with DNT. Tumor locations included the frontal lobe (7 cases), posterior temporal lobe (8), parietal lobe (4), and insula (4). Target vessels included LSA (2), LIA (14), MA (6), anterior choroidal artery (1), and Heubner's artery (1), with some patients having multiple involved arteries.
In Group G1 (n=14, 64%), critical arteries were located outside the tumor. GTR was achieved in 9 cases (64%), STR in 4 (29%), and partial removal in 1 (7%). No patients experienced new neurological deficits due to vessel injury.
In Group G2 (n=8, 36%), critical arteries ran through the tumor. Resection results were GTR in 0 cases, STR in 2 (25%), partial removal in 4 (50%), biopsy in 1 (13%), and no surgery in 1 (13%). Again, no patients had vessel injury-related deficits.
The GTR/STR rate was significantly higher in G1 (93%) than in G2 (25%) (P=0.0023).
Conclusion:
Preoperative UHR-IA-CTA is valuable for identifying critical perforating arteries and contributes to safe and maximized glioma resection by guiding surgical planning and determining resectability.

Keywords: Glioma, Surgery, Perforating artery

MR-guided laser interstitial thermal therapy for the treatment of high-grade gliomas

磁共振引导下激光间质热疗治疗高级别脑胶质瘤

Author: Dabiao Zhou

作者：周大彪

Affiliation: Department of Neurosurgery, Beijing Tiantan Hospital, Capital Medical University, Beijing.

单位：首都医科大学附属北京天坛医院神经外科

Abstract

Objective: This study aims to evaluate the safety, tolerability, and preliminary efficacy of combining laser interstitial thermal therapy (LITT) with early administration of temozolomide (TMZ) in patients with recurrent glioblastoma (rGBM).

Methods: Ten patients with rGBM were enrolled. Following the LITT procedure, TMZ was administered at a dose of 75 mg/m^2/day during the early-TMZ phase for three weeks. After a 7-day interval, TMZ was given according to the standard dosage scheme for 6 cycles. Adverse events and complications were documented. Regular follow-up assessments were conducted to evaluate both patient performance status and tumor progression.

Results: All patients demonstrated good tolerance to LITT, with six out of ten achieving an ablation rate above 90%, and only one patient had an ablation rate below 70%. Oral administration of TMZ was well-tolerated by all patients during the early-TMZ phase. Mild headache was the most common adverse event (3/10), and only one severe adverse event occurred. At a 6-month follow-up post-LITT, tumor progression was observed in five patients; none of the patients reached survival endpoints.

Conclusions: Our study substantiates the favorable tolerability of early application of TMZ in combination with LITT. The safety profile was found to be acceptable, and the initial efficacy results were promising. Future studies should explore the potential of LITT combination therapy in greater detail and with larger patient samples.

Keywords: Glioblastoma, Glioma, LITT, Laser ablation

Amlodipine suppresses tumorgenicity of glioma stem cells through degrading EGFR and downregulating the downstream pro-survival pathways

Jun Dong, Xiaopei Zhang, Zengyang Li, Ping Wen
Department of Neurosurgery, the Second Affiliated Hospital of Soochow University

Background: Glioblastoma （GBM） is the most aggressive and lethal primary brain tumor in adults with poor prognosis. High therapeutic resistance and short-term recurrence of GBM are associated closely with the existence of glioma stem cells (GSCs), a valuable therapeutic target for this refractory malignancy. As a classical calcium channel blocker (CCB), amlodipine exhibits exact anti-tumor effect independent of CCB activity, however, its effect on GSCs has not been elucidated, and hinders evaluation of its potentials of repurposing against GSCs to disrupt GBM progression.

Methods: Glioma stem cell lines and the intracranial orthotopic GSCs-derived tumor model were applied to evaluate the effects of amlodipine against GSCs in vitro and in vivo. Molecular docking and Bioinformatics analysis was performed to predict the binding of amlodipine with membrane receptor of GSCs. Quantitative real-time PCR, Western blot, co-immunoprecipitation and immunofluorescence were utilized to clarify the regulating signaling pathway and elucidate underlying mechanisms.

Results: Definite inhibitory effects of amlodipine were observed against GSCs, including decreasing cell viability, self-renewal and stemness of GSCs, promoting GSCs apoptosis, as well as retarding GSCs-derived intracranial tumor growth, prolonging survival of tumor-bearing mice. While other dihydropyridine CCBs, such as nicardipine and nifedipine, as well as Ca2+ chelator BAPTA-AM, did not exhibit obvious effect on GSCs at the same dosage. L-type Ca2 + channel agonists also did not attenuate the inhibitory effect of amlodipine on GSCs. These findings suggest that the exact impact of amlodipine against GSCs was independent of calcium blocking activity. Mechanism studies disclosed high affinity binding of amlodipine with EGFR on cell membrane of GSCs, leading to EGFR endocytosis via clathrin-independent lipid raft, and decreasing protein level of EGFR by lysosomal degradation, ultimately downregulating EGFR downstream pro-survival signaling pathways.

Conclusion: Amlodipine suppressed GSCs-initiated tumor development via degrading EGFR and down-regulating its downstream pathways, implying that amlodipine had novel potentials in target therapy of GSCs against glioblastoma.

Key Words: glioma stem cells, glioblastoma, amlodipine, EGFR, repurpose

Active Surveillance Strategy for Residual Tumors after Subtotal Resection of Large Vestibular Schwannomas: Long-Term Outcomes and Indications for Stereotactic Radiosurgery

Yoshinori Higuchi[1], Shigeki Nakano[1], Shinichiro Origuchi[1], Kentaro Horiguchi[1], Kyoko Aoyagi[2], Toru Serizawa[3]

1. Department of Neurological Surgery, Chiba University Graduate School of Medicine, Chiba, Japan
2. Department of Neurosurgery, Chiba Cerebral and Cardiovascular Center, Ichihara, Japan
3. Tokyo Gamma Unit Center, Tsukiji Neurological Clinic, Tokyo, Japan

Objective: Surgical treatment of large vestibular schwannomas presenting with neurological symptoms is determined by the patient's overall health, regardless of age. While complete resection is ideal, subtotal resection is considered acceptable to preserve neurological function, particularly facial nerve integrity. However, residual tumors pose a potential risk of long-term regrowth, and the incidence of this phenomenon varies widely. Despite the increasing application of stereotactic radiosurgery (SRS), clear guidelines regarding the optimal timing for additional treatment remain undefined. This study aimed to evaluate the outcomes of active surveillance for postoperative residual tumors, focusing on tumor regrowth and subsequent management strategies.
Methods: We retrospectively analyzed 90 patients with Koos grade 3–4 vestibular schwannomas who underwent surgical resection at our institution. The mean preoperative maximum tumor diameter was 3.1 cm, and the mean tumor volume was 11.8 cm^3. Resection was performed with the primary goal of preserving facial nerve function, utilizing intraoperative facial nerve monitoring. Complete resection was attempted whenever feasible; however, when residual tumors of ≤1 cm^3 were identified, we adopted a strategy of active surveillance with periodic MRI follow-up. SRS was reserved for cases where tumor progression was subsequently documented. We evaluated the extent of resection, facial nerve preservation rates (House-Brackmann [HB] grade II or better), incidence of tumor regrowth, and the need for additional SRS.
Results The gross total resection rate achieved was 94.1%, while the facial nerve function was preserved in 94.0% of patients. Among the cohort, 13 patients (14.4%) underwent planned SRS due to postoperative residual tumors exceeding 1 cm^3. During the surveillance period, the 5-year cumulative incidence of tumor progression among cases with residual tumor ≤1 cm^3 was 25%. Interestingly, a subset of these residual tumors demonstrated spontaneous shrinkage without additional intervention, mirroring the phenomenon observed in the natural history of untreated vestibular schwannomas.
Conclusion: Residual tumors smaller than or equal to 1 cm^3 following subtotal resection exhibit significantly lower proliferative potential compared to untreated tumors, with some cases showing spontaneous regression. These findings suggest that subtotal resection, with the aim of optimizing postoperative functional outcomes, is a rational approach in selected cases. Nevertheless, when the residual tumor volume is substantial, the risk of regrowth increases, highlighting the continued importance of minimizing the extent of residual tumor during initial surgery. Active surveillance followed by SRS upon documented progression represents a safe and effective management strategy for small postoperative residual tumors.

LPC 脂质体技术驱动紫杉醇跨血脑屏障递送：一种新型紫杉醇制剂用于增效胶质母细胞瘤治疗

Hurdling over the blood-brain barrier with LPC-liposome technology for enhanced delivery and therapeutic efficacy of paclitaxel in glioblastoma

战琦，康春生

Qi Zhan, Chunsheng Kang

天津市神经病学研究所，天津医科大学总医院

Tianjin Neurological Institute, Tianjin Medical University General Hospital

Objective. Glioblastoma (GBM) chemotherapy faces significant clinical challenges, primarily due to the blood-brain barrier (BBB), which restricts drug penetration into brain parenchyma. A major contributing factor is the low transcytosis rate in brain endothelial cells (bECs). This study aimed to explore a novel technology designed to trigger endothelial transcytosis, thereby enhancing BBB crossing for effective GBM drug delivery.

Methods. Lysophosphatidylcholine (LPC)-stimulated transcytosis was investigated in bECs. LPC-modified liposome (LPC-Lipo) was developed, and its transcytosis mechanisms, focusing on endocytosis and intracellular transport, were analyzed. In vivo delivery efficiency and GBM therapeutic efficacy of LPC-Lipo-mediated paclitaxel (PTX) delivery were tested in a patient-derived xenograft (PDX) model.

Results. LPC modification significantly enhanced the BBB crossing capabilities of liposomal delivery system, facilitating PTX delivery into GBM regions. Treatment with LPC improved cargo endocytosis and transcytosis in bECs. LPC incorporation promoted liposomal transcytosis across the BBB via enhanced endocytosis and directional transport towards the Rab11+ recycling pathway, mediated by p62 upregulation. LPC-Lipo achieved approximately 2.3-fold higher PTX concentrations in the GBM region compared to conventional Lipos, effectively realizing the therapeutic potential of PTX in GBM chemotherapy and immunotherapy. Additionally, modifying clinical PTX liposome formulation Lipusu® with LPC yielded GBM treatment efficacy comparable to that of TMZ.

Conclusions. Our findings demonstrate that LPC-Lipo serves as a feasible and effective platform to penetrate the BBB, providing a promising avenue for administering more efficient yet poorly BBB-permeable therapeutic agents, thereby broadening GBM treatment options.

Keywords: Blood-brain barrier, Drug delivery, Glioblastoma, LPC, Paclitaxel

HIF-1α/PGK1/pPDHK1 介导的缺氧巨噬细胞代谢重编程在胶质母细胞瘤光动力治疗抵抗中的机制研究

Mechanistic Study of HIF-1α/PGK1/p-PDHK1-Mediated Metabolic Reprogramming in Hypoxic Macrophages Underlying Photodynamic Therapy Resistance in Glioblastoma

作者（中英文）闫秀伟　Yan Xiuwei

单位（中英文）浙江省人民医院　Zhejiang Provincial People's Hospital

Objective: This study aims to elucidate the mechanism by which HIF-1α/PGK1/pPDHK1-mediated metabolic reprogramming of hypoxic macrophages contributes to photodynamic therapy (PDT) resistance in glioblastoma (GBM).

Methods: Integrated clinical sample analyses (single-cell RNA sequencing, multiplex immunofluorescence), orthotopic GBM mouse models (constructed using GL261-luc cells), and in vitro experiments (gene knockdown in THP-1/Raw 264.7 cells) were employed to investigate the polarization mechanisms of tumor-associated macrophages (TAMs) within PDT-induced hypoxic microenvironments. Single-cell transcriptomics, metabolomics, and in vivo imaging were utilized to assess the regulatory role of the HIF-1α/PGK1/pPDHK1 axis in glycolytic reprogramming of TAMs.

Results: Following PDT, the proportion of hypoxic TAMs (Hypoxia-TAMs) in GBM recurrent lesions was significantly increased, with specific activation of the HIF-1α/PGK1/pPDHK1 metabolic axis driving a glycolysis-dependent pro-tumor phenotype. Genetic knockdown or pharmacological inhibition of PGK1 reversed TAM polarization and delayed tumor recurrence.

Conclusion: The HIF-1α/PGK1/pPDHK1 axis promotes pro-tumor polarization of TAMs through metabolic reprogramming. This study identifies novel therapeutic targets to overcome GBM treatment resistance and provides a theoretical foundation for clinical translation of "PDT combined with metabolic-immune intervention" strategies.

Keywords: Glioblastoma; Photodynamic therapy; Tumor-associated macrophages; Metabolic reprogramming;

Room A (La Vie A):
Intensive Neurosurgery and Traumatic Brain Injury (TBI)

The Application of NIRS Cerebral Oxygen Monitoring Technology in Critically Ill Patients with Craniocerebral Injury in Neurosurgery

Yu Yuan, Yumin Du

Department of Neurosurgery, Hebei University Affiliated Hospital, Baoding , China
Email:autofan100@sina.com Tel:13833216568

This study investigates the correlation between tissue oxygenation index (TOI) measured by near-infrared spectroscopy (NIRS) and optic nerve sheath diameter (ONSD) in patients with severe traumatic brain injury (TBI), aiming to evaluate the clinical significance of NIRS-based cerebral oxygen monitoring in predicting intracranial pressure and outcomes.

Objective: To explore the relationships between TOI, Glasgow Coma Scale (GCS) score, ONSD, and Glasgow Outcome Scale (GOS) score in TBI patients, and to assess the utility of NIRS technology for continuous, non-invasive monitoring of cerebral oxygenation and intracranial pressure dynamics.

Methods: A retrospective analysis was conducted on 40 consecutive TBI patients admitted to the neurosurgical intensive care unit of Hebei University Affiliated Hospital. Baseline demographics, GCS scores at admission, TOI values (measured via NIRS), and ONSD measurements (via ultrasonography) were collected. Follow-up GOS scores were obtained 6 months post-discharge. Spearman's rank correlation was used to analyze the associations between TOI and clinical parameters. Receiver operating characteristic (ROC) curve analysis evaluated the prognostic accuracy of TOI for favorable outcomes (GOS 4–5).

Results: TOI values varied across TBI subtypes: 61.51% (57.0–74.7) for contusions, 63.90% (59.9–71.9) for lobar hematomas, 63.93% (59.9–74.2) for epidural hematomas, 64.33% (59.0–70.8) for subdural hematomas, and 74.30% (64.4–77.4) for subarachnoid hemorrhages. TOI exhibited a significant positive correlation with GCS score ($\rho = 0.626$, $P < 0.001$) and GOS score ($\rho = 0.651$, $P < 0.01$), while showing a significant negative correlation with ONSD ($\rho = -0.562$, $P < 0.01$). Patients with favorable outcomes had higher TOI values (68.30% ± 8.26%) compared to those with unfavorable outcomes (59.74% ± 5.99%, $P = 0.002$). The area under the ROC curve for TOI predicting favorable outcomes was 0.809 (95% CI: 0.673–0.945), with an optimal cutoff of 64.33% (sensitivity 66.7%, specificity 92.3%).

Conclusions: 1. TOI correlates positively with GCS and GOS scores but inversely with ONSD in TBI patients. 2. NIRS-based TOI monitoring provides real-time, non-invasive insights into cerebral oxygenation, intracranial pressure trends, and long-term prognosis. 3. This technology offers a practical tool for dynamic assessment of TBI severity and guides early intervention strategies.

Keywords: Near-infrared spectroscopy (NIRS), tissue oxygenation index (TOI), optic nerve sheath diameter (ONSD), traumatic brain injury (TBI), intracranial pressure monitoring

The current status of statin based treatment for chronic subdural hematomas in China

Rongcai Jiang MD PhD

In 2008, the neurosurgical team in Tianjin Medical University General Hospital first discovered that atorvastatin calcium can promote the absorption of chronic subdural hematoma. In 2009, they began to try using atorvastatin calcium to treat chronic subdural hematomas who resisted surgical therapy. In 2014, they published the first case report on how atorvastatin can promote the absorption of chronic subdural hematoma and began to design a randomized placebo-controlled clinical study on the treatment of chronic subdural hematoma with atorvastatin calcium; In 2018, they first published a paper confirming the safety and effectiveness of atorvastatin calcium on chronic subdural hematoma. It is the first evidence based paper to show that the drug can effectively and safely treat chronic subdural hematomas. During this period, the team also established subdural heamatoma models in rats and validated statins inhibited inflammatory reactions in subdural hematomas, promoting endothelial proliferation to repair the leaked vessels, and regulating immune cells in the hematomas. In addition, through a proof of concept study, they further confirmed that statins combined with low-dose dexamethasone can enhance the therapeutic efficacy of drug therapy for chronic subdural hematomas. Since 2018, atorvastatin calcium has been widely used by Chinese neurosurgeons(almost 90%) to treat chronic subdural hematoma, either directly for non-surgical treatment or for perioperative prevention of postoperative recurrence. Atorvastatin calcium therapy for chronic subdural hematoma is changing the treatment strategy for this disease at least in China.

Challenges in head injury treatment in a super-aging society

Suehiro E, Tanaka T, Onoda K, Itokawa H, Shimoji K, Sugawara T, Matsuno A

Department of Neurosurgery, International University of Health and Welfare, Narita Hospital, Narita, Japan

The aging of the world is progressing rapidly. This situation is not only seen in developed countries, but is also expected to occur in developing countries in the future. The aging rate in Japan in 2024 was 29.3%, the highest in the world. In Japan, responding to elderly medical care is an urgent social issue. We are taking on the challenge of providing medical care for the elderly.

In elderly patients, the buffering effect of the expansion of the subdural space due to brain atrophy masks the neurological symptoms caused by the hematoma, making them difficult to detect. Therefore, we recommend that patients undergo head CT scans even if they are asymptomatic. However, an increase in the number of patients undergoing head CT scans leads to exhaustion for medical staff in the outpatient departments of higher-level hospitals. As a solution, blood D-dimer levels are measured as a triage. The cutoff value for D-dimer levels was set at 1.5 μg/ml, and it was shown that traumatic changes can be detected on head CT scans with a sensitivity of 77.4% and a specificity of 89.5%.

Approximately 30% of elderly patients with head trauma are taking antithrombotic drugs. The effects of drugs on head trauma have been reported to include an increase in intracranial hematomas, an increased risk of deterioration. Reversal therapy is available as a countermeasure against this. Although there are reports of improved hemostatic effects with reversal drugs, there are no reports of improved outcomes. We conducted an observational study on the current status of reversal therapy in Japan. According to this study, reversal therapy is currently being performed for severe cases. The purpose of reversal therapy is to prevent hematoma expansion. To achieve this, it is effective to administer a reversal agent early after injury before hematoma expansion. From the data of our observational study, we showed that the time from injury to administration of a reversal agent was significantly shorter in the favorable outcome group.

A mini-craniotomy assisted by a neuroendoscopic technique under local anesthesia is performed in decompression surgery in order to reduce invasiveness. With this method, intraoperative bleeding and operation time are significantly reduced compared to a major craniotomy. The impact on outcomes remains to be evaluated, but it is expected that the effectiveness of this surgical method will be demonstrated by determining appropriate surgical indications.

In Japan, these efforts have led to improvements in mortality rates for head trauma in elderly patients. Our future goal is to improve functional outcomes.

Key words: head trauma, elderly patients, antithrombotic drugs

Clinical Study on Multimodal Monitoring using non-invasive Brain Edema monitoring in patients with acute moderate and severe craniocerebral injury

Sun Fenglei[1], Wang Zengwu[1], Du Xiaolong[1], Sun Xiaoxiao[2], Wu Chunxia[1], Zhao Weiyi[1], Song Lei[1], Xie Kunming[1], Li Dachuan[3], Zhang Jinwen[3]

1：Weifang People's Hospital，

2：Department of Emergency Internal Medicine Beichen Campus,Weifang People's Hospital，

3：School of Clinical Medicine, Shandong Second Medical University,

Objective: : To explore the application value of multimodal monitoring with non-invasive cerebral edema dynamic monitor (NICOM) in patients with acute moderate and severe craniocerebral injury (TBI), evaluate the monitoring efficacy of cerebral edema, intracranial pressure (ICP) and prognosis, and provide more accurate and convenient monitoring means for clinical practice.

Methods: A prospective cohort study included 260 patients with acute moderate and severe TBI admitted between January 2024 and November 2024. All patients received conventional treatment and monitoring and monitored for continuous cerebral edema using NICOM. At the same time, according to the needs of the condition, some patients receive invasive ICP monitoring, transcranial Doppler ultrasound (TCD) monitoring and other multi-modal monitoring means. Glasgow Coma Scale (GCS), injury type, NICOM monitoring indicators (including cerebral edema index CE, disturbance factor DC, etc.), ICP, TCD and other parameters were recorded. At 3 months, the Glasgow Prognostic Score (GOS) was used to evaluate the prognosis.We analyze the correlation between NICOM monitoring index and ICP and TCD parameters, compare the difference of NICOM monitoring index between different prognosis groups, and evaluate the predictive value of NICOM for cerebral edema, ICP and prognosis.

Results: The NICOM monitoring index CE showed a significant positive correlation with ICP ($P < 0.05$). Patients with abnormal cerebral hemodynamics on TCD monitoring had significantly higher CE values than normal cerebral hemodynamics ($P < 0.05$). The CE value of patients at admission in the poor prognosis group (GOS 1-3) was significantly higher than that in the good prognosis group (GOS 4-5) ($P < 0.05$). The ROC curve analysis showed that CE has a high predictive value for poor prognosis, with the area under the curve (AUC) being 0.85 and 0.82, respectively.

Conclusion: The results of this study show that NICOM, as a non-invasive and continuous monitoring method of cerebral edema, can effectively reflect the degree of cerebral edema, intracranial pressure changes and brain function status of patients with acute moderate and severe TBI, and has a good predictive value for patient prognosis. NICOM monitoring index CE has a good correlation with ICP, BIS and TCD parameters, which can provide clinicians with more comprehensive and accurate condition information, help guide the formulation and adjustment of treatment plans, and improve patient outcomes.Multi-modal monitoring based on NICOM has important application value in the clinical management of acute moderate and severe TBI patients. It can realize real-time and dynamic monitoring of cerebral edema, intracranial pressure and brain function, provide scientific basis for clinical decision-making, help improve the success rate of treatment and improve the prognosis of patients.

Keyword： acute moderate and severe craniocerebral injury; non-invasive cerebral edema monitoring; multimodal monitoring; intracranial pressure; prognosis

Two-Stage Endoport-Assisted Endoscopic Technique for Cast Intraventricular Hematoma Evacuation

Jun Mo, M.D. [1]*; Huimin Shen, M.D. [1]; Tian Yang, M.D. [2]; Dan Xu, M.D. [1]; Ruxin Xing, M.D. [1]; Bo Wang M.D. [1]; Yili Chen, M.D. Ph.D. [1]

1. Department of Neurosurgery, The Fourth Affiliated Hospital of School of Medicine, and International School of Medicine, International Institutes of Medicine, Zhejiang University, Yiwu, Zhejiang, China

2. Department of Endocrinology, The Fourth Affiliated Hospital of School of Medicine, and International School of Medicine, International Institutes of Medicine, Zhejiang University, Yiwu, Zhejiang, China

Background: Intraventricular hemorrhage (IVH) with cast formation in the third ventricle presents a significant neurosurgical challenge, often resulting in poor outcomes due to acute obstructive hydrocephalus and the technical difficulties in achieving complete hematoma evacuation. Various methods have been reported to evacuate the IVH. Traditional external ventricular drainage (EVD) can rapidly control ICP, but it is easily blocked and always need a long-time drainage, which increase the risk of catheter related infection. EVD combined with intraventricular fibrinolysis (IVF) can reduce mortality but not the long-term functional outcome, the use of IVF agents also increases the risk of rebleeding and infection. Endoscopic surgery is a promising and minimally invasive surgical approach for IVH that has evolved significantly over recent years. The advancements range from early fiber endoscopy and rigid endoscopy to endoport-assisted endoscopy surgery. These techniques aim to maximize early hematoma evacuation, thereby improving patient prognosis. However, fiber and rigid endoscopy can be challenging when dealing with cast IVH, due to the limited field of view and adhesion of the hematoma to the choroid plexus. While endoport-assisted endoscopy can rapidly remove cast hematomas in the lateral ventricle under a dry field view, it is difficult to enter the third ventricle from the foramen of Monro after hematoma evacuation, because of lateral ventricle collapse. **Objective:** We present a novel two-stage strategy utilizing endoport-assisted endoscopic technique for the evacuation of severe IVH with cast third ventricle. This study aims to evaluate the technical feasibility, safety, and clinical outcomes of this innovative approach while identifying potential challenges and solutions in its clinical implementation. **Methods:** We conducted a retrospective analysis of patients with severe IVH (Graeb score > 6) and cast third ventricle treated at our institution between 2021 and 2023. The surgical technique involves a two-stage approach: initial endoport-assisted evacuation of lateral ventricle hematomas followed by third ventricle clot removal using a combined dry-field and underwater-field endoscopic technique. Primary outcomes included extent of hematoma evacuation (assessed by pre- and post-operative Graeb scores), duration of external ventricular drainage (EVD), and clinical outcomes measured by 90-day modified Rankin Scale (mRS). Secondary outcomes included procedural complications. **Results:** A total of 9 patients with mean age of 55 years were included in the study. The preoperative mean Graeb score was 9, and postoperative mean Graeb score was 3, with a 72% evacuation rate for the entire ventricles. The median duration for EVD drainage was observed to be 6 days. In terms of 90-day modified Rankin Scale (mRS) scores, a favorable outcome (mRS 1–3) was demonstrated in 78% of the patients, while the remaining 22% presented with a poor outcome (mRS 4–6). There were no complications related to the surgery itself in any of the reported cases. **Conclusion:** The endoport-assisted two-stage endoscopic technique represents a significant advancement in the management of severe IVH with cast third ventricle. Our results demonstrate that this approach achieves substantial hematoma evacuation while maintaining a favorable safety profile. The combination of dry-field and underwater techniques provides optimal visualization and maneuverability, facilitating more complete clot removal from both lateral and third ventricles. Early restoration of CSF circulation, as evidenced by shortened EVD duration, may contribute to improved clinical outcomes. This technique addresses a critical gap in the current treatment arsenal for complex IVH cases, though larger studies are warranted to further validate these promising initial results.

Room A (La Vie A): Cerebrovascular disease

Surgical approaches for brainstem cavernous malformations: A case series from our institution

Masanori Aihara, Soichi Oya

Department of Neurosurgery Gunma University Graduate School of Medicine

Background: Brainstem cavernous malformations (CMs) can cause severe neurological deficits when hemorrhage occurs, and symptoms may worsen progressively with recurrent bleeding. Due to the high surgical complexity and associated risks, surgical removal is often avoided. Here, we report our experience with surgically treated brainstem CMs at our institution.

Methods: We retrospectively reviewed eight patients who underwent surgery for brainstem CMs at our institution since 2017. Lesion location, surgical approach via safe entry zones (SEZs), and postoperative outcomes were evaluated.

Results: The cohort included one male and seven female patients, with a mean age of 48 years (range: 22–82). All lesions were located in the pons: four dorsal and four lateral. SEZs were selected based on lesion location. For dorsal lesions, the supra- and infra-facial SEZs were used in all four cases. For lateral lesions, one case used the supratrigeminal SEZ and three used the lateral pontine SEZ. Gross total resection was achieved in five cases, and subtotal resection in three. Patients approached via the supra- and infra-facial SEZ frequently experienced persistent diplopia and facial palsy, often requiring long-term rehabilitation. In contrast, patients treated through the lateral pontine SEZ showed favorable improvement in these symptoms, although some sensory deficits remained. All patients had a preoperative modified Rankin Scale (mRS) score of 4. Postoperative mRS scores were: 0 in 1, 1 in 3, 2 in 1, 3 in 2, and 4 in 1 patient.

Conclusion: Various SEZs have been proposed for accessing brainstem lesions, and it is critical to select an SEZ close to the lesion surface to minimize parenchymal damage. Based on our experience, the lateral pontine SEZ may offer advantages in avoiding postoperative cranial nerve deficits, particularly diplopia and facial palsy. Furthermore, we emphasize the importance of aligning the surgical approach with the lesion's longitudinal axis to further minimize parenchymal disruption. Optimal selection of SEZ and refinement of microsurgical techniques are essential for improving resection rates and preserving or restoring neurological function in brainstem CM surgery.

Key words: cavernous malformation, brainstem

Giant dissecting aneurysm of the middle cerebral artery (MCA): report of four cases–successfully treated by microsuture technique

Xiang'en Shi, Liu Fangjun,Sun Yunming, Lei ting, Hu Mengqing and Xiang Xin

Sanbo Brain Hospital, Capital Medical University, Beijing, China, Abstract:

Purpose: The microsuture technique is preferred for treating large dissecting aneurysms of the MCA trunk, especially when perforators are involved, which presents a challenge.

Methods: This reported the reconstruction of the MCA trunk using a microsuture technique to treat four patients with giant dissecting aneurysms of the MCA trunk after the wall of the dissecting aneurysm was removed with the preservation of its perforating arteries from the aneurysm body followed by a maxillary artery bypass to the distal artery of the dissecting aneurysm with a radial artery graft. The bypass aimed to prevent ischemia of the arteries distal the aneurysm while temporarily trapping the aneurysms.

Results: Two of four patients had recurrent aneurysms after reconstruction of the MCA trunk with clipping surgery and the other two presented with ruptured aneurysm. All patients' postoperative course was uneventful without any neurological deficits. Postoperative angiography confirmed the successful reconstruction of the MCA trunk and the disappearance of the dissecting aneurysm in three patients. In one patient, the MCA reconstruction was not visible, but the IMA bypass to the M2 segment was observed. In a six-year follow-up CT angiography, one patient showed that the bypass from the IMA to the M2 segment remained patent, and the reconstruction of the M1 trunk was also successful. After three months, two patients showed restoration of the M1 trunk without any visible aneurysms. One patient had a patent IMA bypass to the M2 segment, while the MCA trunk was not visible. Fortunately, no ischemia was observed in the perforating arteries from the MCA trunk in four patients.

Conclusion: The microsuture technique effectively treats giant dissecting aneurysms of the MCA trunk while reconstructing the MCA trunk and preserving its perforators.

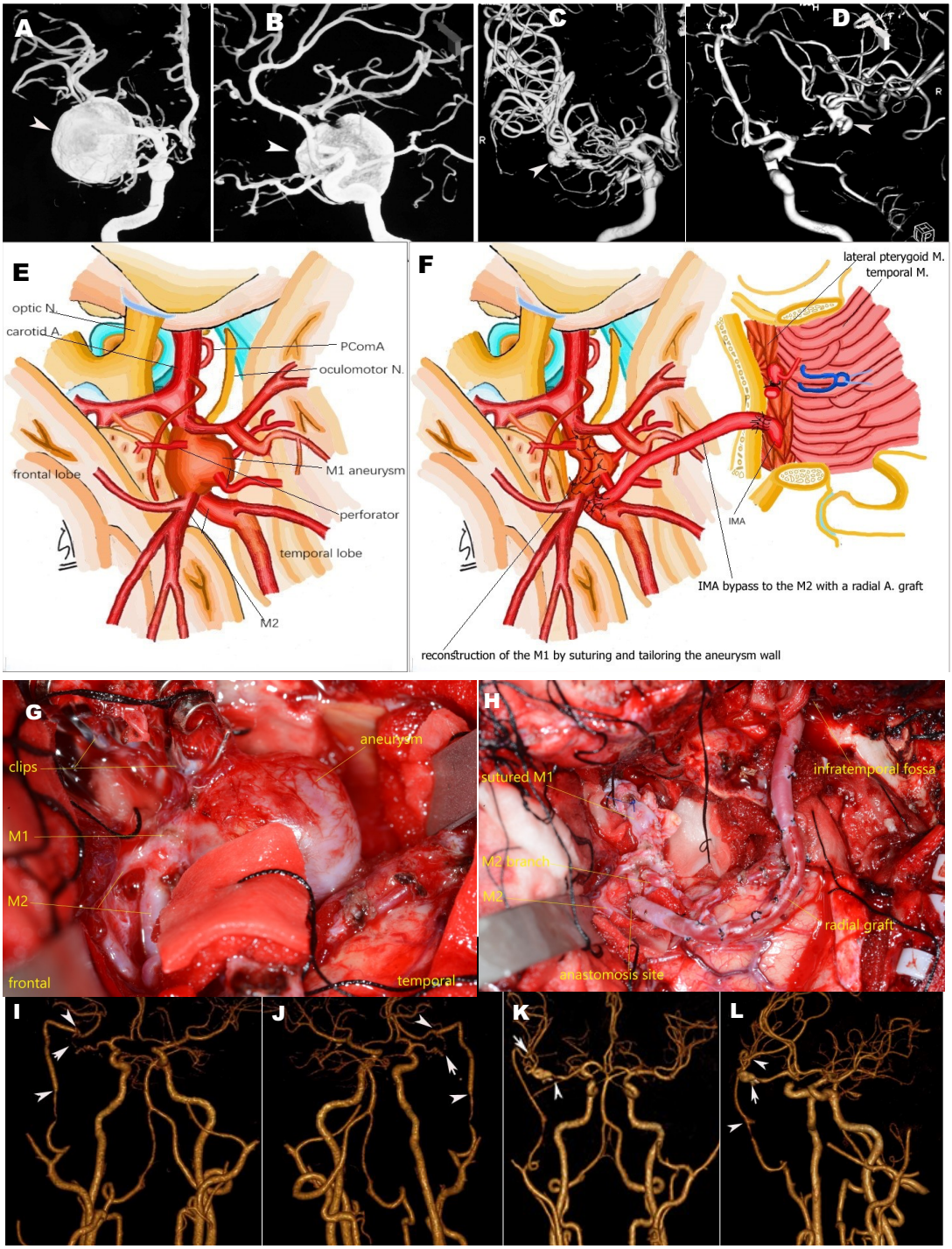


Figure 1. A 23-year-old man presented with persistent headaches for a year. He underwent clipping surgery to treat his giant aneurysm of right MCA trunk, but his headache persisted post-surgery. One year after clipping surgery, a recurrent aneurysm of the trunk was definitively revealed on the angiography. A three-dimensional reconstruction anteroposterior and lateral right carotid angiogram (A and B) revealed a giant dissecting aneurysm of the MCA trunk, arrowhead pointing. The recurrent aneurysm on three-dimensional reconstruction anteroposterior and lateral right carotid

angiogram (C and D) was confirmed one year after clipping surgery, arrowhead pointing. Intraoperative picture(E) showed an exposed recurrent dissecting aneurysm with multiple clips through an open sylvian fissure in frontotemporal craniotomy with the cut of the zygomatic arch. The schematic drawing (E) illustrates a large dissecting aneurysm of the MCA trunk, which has extended to several large perforators. In (F), a reconstruction of the MCA trunk is achieved through suturing, followed by an IMA bypass to a distal M2 segment of the aneurysm using a radial artery graft.

Intraoperative picture(G) of the recurrent dissection aneurysm removal and (H) sutured MCA trunk followed by IMA bypass of M2 segment distal the dissecting aneurysm with radial artery graft in the open Sylvian fissure. Postoperative computed tomography (CT) anteroposterior (I) and oblique (J) angiography showed the patency of the IMA bypass to the M2 segment distal to the dissecting aneurysm disappearing, arrowhead pointing anastomosis site of the IMA bypass to M2 segment with a radial artery graft, and an arrow indicating the sutured MCA trunk but fine vessel patency. At a 6-year follow-up, CT angiography, anteroposterior(K), and oblique views (L) showed the patency of the IMA bypass to the M2 segment and the dissecting aneurysm disappearance with arrow-pointing reconstruction of the MCA trunk and arrowhead-pointing the anastomosis site of the IMA bypass to the M2 segment with a radial artery graft. A., artery; N., nerve; M., muscle.

Key words: Dissecting aneurysm, Middle cerebral artery, Reconstruction, Bypass

To whom correspondence should be addressed: Xiang'en Shi, M.D., Ph.D. [E-mail: shixen@sina.com]

Cotton-Assisted Surgical Clipping of Very Small Aneurysms: A Two-Center Study

Shiming Zhang,Guangzhong Gao

Department of Neurosurgery, The First Affiliated Hospital of Soochow University, Suzhou, Jiangsu Province, China
Department of Neurosurgery, Taizhou People's Hospital, Taizhou, Jiangsu Province, China

Abstract

Objective

Very small intracranial aneurysms (VSIAs) are challenging to treat because aneurysm tearing and clip slippage can occur during neurosurgical clipping. In this study, we introduce and share our experience with cotton-assisted clipping of VSIAs.

Methods

We retrospectively analyzed the data of 23 patients with 26 VSIAs treated with cotton-assisted clipping between February 2008 and December 2020 in the Neurosurgery Departments of the First Affiliated Hospital, Soochow University and Taizhou People's Hospital. During surgery, 2 aneurysm necks were torn. To treat the tears, we wrapped rectangular cotton pads around the parental arteries at the site of rupture. The remaining 24 aneurysms were clipped after being wrapped in cotton pads.

Results

The 2 aneurysm ruptures were successfully repaired with cotton-assisted clipping. In the remaining 24 aneurysms, no cases of aneurysm clip slippage or aneurysm rupture occurred. Patients were followed up on average for 90 months (range, 78–161 months). Of the 23 patients, the 19 patients with preoperative Hunt–Hess grades of 1–3 recovered well after the surgery (Glasgow Outcome Scale [GOS] score, 5). Of the 4 patients with Hunt–Hess grades of 4–5, 3 had a good recovery (GOS scores, 4–5), and 1 patient died of heart disease 6 months after being discharged from the hospital; this patient had a GOS score of 4 at the time of discharge.

Conclusions

Cotton-assisted clipping could prevent aneurysm clip slipping and aneurysm rupture and facilitate the repair of aneurysm neck tears. This technique is a useful alternative therapy method for VSIAs.

Revisit of Sugita head fixation system

Tetsuyoshi HORIUCHI

Department of Neurosurgery
Shinshu University School of Medicine, Matsumoto, Japan

E-mail: tetuyosi@shinshu-u.ac.jp

Abstract:

The original Sugita head fixation system was born in 1978. This system was published in Journal of Neurosurgery. This head fixation system consisted of three parts (basal frame, subframe, head holder). The advantages of Sugita system include comfortable retractor system, appropriate and stable hand rest, skin hook, and head rotation. By contrast, difficulty in set-up and no indicator of head pin fixation are disadvantages compared with Mayfield skull clamp.

Although the Sugita fixation system was renewed in 2018, the renewed system cannot be used in China right now. In this presentation, the new fixation system is introduced in detail.

Key words: head, fixation, Sugita system

Early microsurgical treatment of cerebral arteriovenous malformations with low GCS score by multimodal technique.

Yong-Hong Duan,MD,Yuan-ding Jiang, Zhen-kun Xiao, Xin-yuan Gon, Ri-chu Liang,

Hengyang Key Laboratory of Hemorrhagic Cerebrovascular Disease,Department of Neurosurgery, The Second Affiliated Hospital,Hengyang Medical School University of South China

Objective: As previously reported in other literatures, 42% of patients with cerebral arteriovenous malformation died from neurological deficits and cerebral hemorrhage events. Rupture hemorrhage of BAVM leads to disturbance of consciousness and even cerebral hernia in patients with poor prognosis. This report aims to explore the clinical efficacy of early surgical treatment of ruptured cerebral arteriovenous malformation with low Glasgow score, and microsurgical treatment of this series of AVMs in a single center using multimodal techniques with channel communication. **Methods:** A retrospective analysis was performed on 26 cases of ruptured cerebral AVM with continuous Glasgow score (GCS) less than or equal to 13 in our stroke center. The inclusion criteria were the first author's solo operation (chief cerebrovascular doctor, more than 10 years of experience in cerebrovascular specialty), and the diagnosis of AVM was confirmed by CTA/DSA; Cerebral hemorrhage caused by rupture, GCS score ≤13, exclusion criteria: surgery performed by non-first author; Follow-up lost; Intracerebral hemorrhage was diagnosed before operation, but it was found to be arteriovenous malformation in basal ganglia. Microsurgical strategies: Preoperative localization of AVM was performed using CTA to determine AVM classification, size, functional area, and proximity to hematoma. DSA examination was improved for patients without cerebral hernia. For patients with permitted conditions, emergency embolization of blood supply arteries was performed, followed by microsurgery and craniotomy, combined with intraoperative color ultrasound, intraoperative fluorescence angiography, FLOW800 and other multi-modal techniques. Localization was performed, blood supply and drainage veins were determined, hematoma channels were established, and AVM was resected face-by-side. The total resection rate of AVM was evaluated by postoperative DSA, and prognosis was evaluated by mRS Score 6 months after surgery. **Results:** This group included 16 functional areas, 10 with GCS3-5 score, 9 with GCS6-9 score and 7 with GCS11-13 score. Pupils were dilated in 9 cases and midline displaced in 18 cases. There were 22 cases of SM grade 1-3 and 4 cases of SM4. The total removal rate of AVM was 25/26(96.2%), with a small residual vascular malformation in 1 case. There were 17 cases with good prognosis (mRS Score 0-3) and 10 cases with poor prognosis (mRS Score 4-6), among which 2 cases died. The causes of death were as follows: preoperative cerebral hernia, whole brain cast in 1 case, EVD only in 1 case, decompressive craniotomy, further microsurgery without conditions, and postoperative death. There was no intraoperative death due to blood loss.

Conclusion: This single-center case report shows that perfect preoperative preparation, intraoperative multimodal technical conditions, and mature and standardized microsurgical techniques are extremely important for the safety of surgery and can improve the prognosis of patients. Due to the small number of cases, its efficacy needs to be further confirmed by multi-center clinical control.

Key words: cerebral arteriovenous malformation, microsurgery, multimodal technique, Glasgow score

Room A (La Vie A):
Pediatric Neurosurgery, Functional Neurosurgery

Multiple hippocampal transection for dominant-side mesial temporal lobe epilepsy without hippocampal sclerosis. -comparison with antero-medial temporal lobectomy for patients with hippocampal sclerosis-

Taketoshi Maehara, Motoki Inaji, Daisu Abe, Asumi Orihara
Department of Neurosurgery, Institute of Science Tokyo

Introduction

Multiple hippocampal transection (MHT) is reported as effective procedure to treat patients with MRI negative dominant-side mesial temporal lobe epilepsy (MTLE) for preserving memory function and ceasing seizures. However, comparison to a well-established procedure such as antero-medial temporal lobectomy (ATL) should be guided by further evidence.

Patients & Methods

We retrospectively analyzed the records of 30 patients who underwent surgery for dominant-side MTLE. ATL was completed for 23 patients with hippocampal sclerosis (HS), and MHT was completed for 7 patients without HS. The seizure control status, number of anti-seizure medicines, neurocognitive function, and psychiatric disorders of each patient were reviewed.

Results

1)Seizure control of Engel class I was achieved in 16 patients (70%) in the ALT group versus 5 patients (71%) in the MHT group. 2)The mean number of anti- seizure medicines administered in the ATL group changed significantly from 2.4 to 1.9 ($p = 0.01$), while that in the MHT group was unchanged (from 2.1 to 2.0, $p = 0.77$). 3)Eleven patients (48%) in the ATL group developed psychiatric disorders during the postoperative follow-up period, whereas no psychological complications were observed in the MHT group. 4)Neither group showed neurocognitive decline after the surgery in any of the WAIS- III or WMS-R subtests.

Conclusion

MHT controls seizure attacks, preserves memory function, and induces no psychiatric worsening as a treatment for left TLE patients with normal memory function and normal hippocampus on MRI.

key words: temporal lobe epilepsy, multiple hippocampal transection, memory function
Email: maehara.nsrg@tmd.ac.jp
Postal address: 1-5-45, Yushima,Bunkyo-ku, Tokyo, 113-8519, Japan
phone number: 81-3-5803-5266

Idiopathic spinal cord herniation: an overlooked and frequently misdiagnosed entity

Chenlong Yang

ABSTRACT

Background: Idiopathic spinal cord herniation is an extremely rare entity that is characterized by protrusion of the spinal cord through a defect in the ventral dura. Due to the paucity of enough clinical evidence, the treatment and prognosis of idiopathic spinal cord herniation are still elusive. Herein, we reported a case of idiopathic spinal cord herniation occurring at the C7–T1 levels that was treated by surgical reduction.

Case description: A 44-year-old woman presented with a 5-year history of numbness and weakness in the bilateral lower limbs. Spinal magnetic resonance imaging demonstrated ventral displacement of the spinal cord at the C7–T1 levels, and there seemed to be a cuneiform space-occupying lesion dorsal to the spinal cord. A diagnosis of the spinal intradural extramedullary tumor was suspected. An exploratory operation was performed via a posterior midline approach. Intraoperatively, we found a defect in the ventral dura through which the spinal cord herniated to the epidural space. After the herniated parenchyma was returned, an artificial dura matter was used to repair the defect. The postoperative course was uneventful. After a 3-month follow-up, the lower-extremity weakness was significantly improved, and there was no recurrence of the spinal cord herniation.

Conclusion: Preoperative diagnosis of idiopathic spinal cord herniation is exceedingly challenging. Surgical reduction of the herniated spinal cord with the repair of the dural defect is an effective approach for the treatment of this rare disorder, and the surgical outcome is favorable.

Retrospective Analysis of Subdural Ultra-Selective Rhizotomy for the Treatment of Rotational Spasmodic Torticollis

Wang Shiyong
The First Affiliated Hospital of Jinan University
wang_xy123@126.com | +8618620079811

Objective: To analyze the clinical efficacy of subdural ultra-selective rhizotomy in the treatment of rotational spasmodic torticollis (ST).

Methods: A retrospective analysis was conducted on the clinical data of 26 patients with rotational ST treated in our department from June 2022 to December 2024. All patients were classified into various subtypes based on the range of affected spastic muscles, the posture of torticollis, the pattern of muscle spasm, and the severity of the condition. Preoperative imaging, 18F-FDG-FAPI PET/CT, and electromyography (EMG) were used to thoroughly assess the muscles involved in the spasm. During the surgery, the nerve roots innervating the spastic muscles were identified using neurophysiological monitoring. Ultra-selective cutting of the unilateral accessory nerve and limited anterior cervical nerve roots was performed to treat ST. The Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS) was used to compare preoperative and postoperative outcomes to evaluate the surgical efficacy.

Results: All patients were followed up for 3 to 30 months. Surgical outcomes were as follows: excellent (TWSTRS score improvement ≥75%) in 25 cases; good (TWSTRS score improvement ≥60%-75%) in 1 case, with an overall surgical effectiveness rate of 100%. Postoperative complications included intracranial infection in 3 cases and posterior fossa effusion in 2 cases, all of which improved after treatment. No patients experienced complications such as weakness in neck rotation, shoulder shrugging, restricted arm abduction, or dysphagia. Postoperative EMG showed the disappearance of abnormal muscle activity in the spastic muscles.

Conclusion: Subdural ultra-selective rhizotomy is an effective treatment for ST, significantly improving symptoms in patients. The surgery requires an individualized treatment plan based on the patient's clinical subtype, underlying conditions, preoperative imaging, and preoperative and intraoperative electrophysiological assessments to identify the spastic muscles. Intraoperatively, only ultra-selective cutting of limited nerve roots is performed, preserving normal neck function postoperatively. Although the current case series is still accumulating, with the longest follow-up being 30 months, no symptom recurrence has been observed. However, longer follow-up periods are still needed.

Balancing Visual Field Preservation and Sufficient Resection in Trans-Sylvian Trans-Uncal Amygdalo-Hippocampectomy: A Piecemeal, Retraction-Free Approach

Ichiro Takumi[1,2], Takashi Matsumori[1,2], Hidetoshi Murata[1] and Masahiro Noha[3]

[1] Department of Neurosurgery, [2] Epilepsy Center, St. Marianna University School of Medicine, [3] Department of Neurosurgery, Okinawa Red Cross Hospital

Objectives: Visual field deficits (VFD) remain a major concern in epilepsy surgery, especially in trans-sylvian selective amygdalo-hippocampectomy (SAHE). This study aimed to develop and assess a microsurgical technique that maximizes resection of mesial temporal structures while minimizing the risk of visual complications. The goal was to refine a trans-uncal variant of SAHE with piecemeal resection, no brain retractor, and anterior uncus subpial aspiration. **Methods:** Twelve patients with medically refractory temporal lobe epilepsy underwent trans-sylvian trans-uncal SAHE between 2019 and 2023. Either an exoscope or a microscope, in combination with a neuroendoscope, was used to facilitate visualization and deep resection. The mesial temporal structures were removed in 3–4 pieces without the use of metal retractors. Subpial aspiration of the anterior uncus was selectively performed to enhance posterior visualization and avoid injury to critical vessels or the optic radiation. Postoperative hippocampal resection volumes were quantified using BrainLab software, and visual field outcomes were assessed with Humphrey or Goldmann perimetry. **Results:** The average preoperative hippocampal volume was 2.182 cm^3 and postoperative volume was reduced to 0.707 cm^3, resulting in a mean resection rate of 71.9% and mean length of resection of 23.4 mm. Only one patient (8.3%) exhibited a transient 30-degree visual field deficit. No permanent VFDs were observed. Transient cranial nerve palsies occurred in 3 patients: one oculomotor and two trochlear, all resolving within weeks. No cases required en bloc resection, and no permanent hemiparesis or major vascular injury was observed. Compared to previously published techniques with retractor use and en bloc resection—which report high atrophy and quadrantanopia rates—our piecemeal method demonstrated favorable preservation of adjacent structures and visual function . **Conclusion:** Piecemeal resection of the mesial temporal structures via a trans-uncal, trans-sylvian approach offers a safe and effective alternative to conventional SAHE. The deliberate avoidance of metal brain retractors and incorporation of endoscopic visualization enables wider yet safer resection. Subpial aspiration of the anterior uncus further improves surgical maneuverability and protects visual pathways. This technique may reduce the incidence of visual and cranial nerve complications and should be considered a standard approach in epilepsy surgery aiming for seizure control with functional preservation.

Clinical characteristics of rupture bleeding in children with cerebral arteriovenous malformation Analysis of microsurgical treatment strategy

Weidong Tian[1*],Fulei Ceng, Guodong Qian,Shuaishuai Yao , Hui Wang ,Xue Dang ,Huanhuan Dong,Dong Zhao[2]

[1]*Department of Neurosurgery, the First Affiliated Hospital of Shihezi University.*

*Correspondence:**Weidongtian82@126.com**

ABSTRACT

Objective:To investigate the clinical characteristics and the effect of microsurgical resection of rupture hemorrhage in children with cerebral arteriovenous malformation.Methods:In this study, 12 children with cerebral arteriovenous malformed rupture and hemorrhage who received microsurgical treatment in the Department of Neurosurgery of the First Affiliated Hospital of Shihezi University from January 2019 to July 2024 were selected as the study objects, and neuroelectrophysiological monitoring and B-ultrasonic-assisted resection were applied during the operation. The general data, clinical manifestations and imaging characteristics of the children were analyzed. Meanwhile, gender, age, GCS score and Spetzler-Martin rating were analyzed. The GCS score, MRS Score and resection degree of vascular malformations were compared before and after surgery.Results:Twelve children with rupture and hemorrhage of cerebrovascular malformation, aged 8-15 years old, 6 males and 6 females, underwent emergency surgery after admission, all of which were completely resected. The clinical symptoms of 12 cases improved after surgery, and the prognosis was good, MRS Score was 0-2, and 1 case had postoperative epilepsy symptoms, which were relieved after oral drug treatment, with low frequency of seizures and no serious complications such as cerebral hemorrhage. There was no cerebrospinal fluid leakage and no death. The average follow-up time was (4.1±1.1) years, from 5 months to 6 years. There was no recurrence or death.Conclusion: In children with cerebral arteriovenous malformation rupture and hemorrhage, emergency

microsurgical resection can improve the clinical symptoms of children with good prognosis and fewer complications. But further confirmation of more cases is needed.

Key words: Children ; Cerebral arteriovenous malformation ; hemorrhage ; Operative effect

Fig1

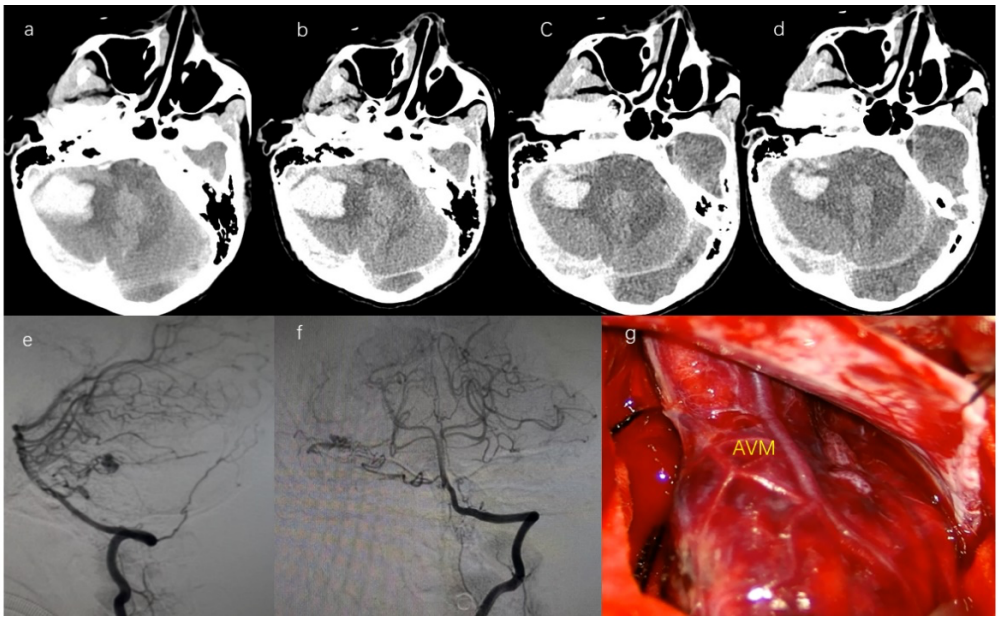
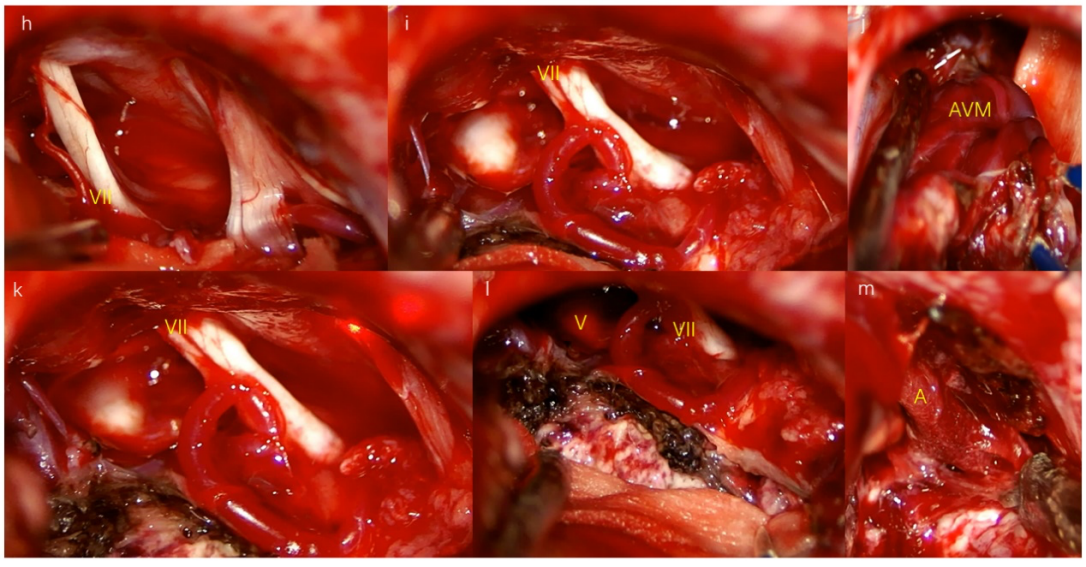


Fig2



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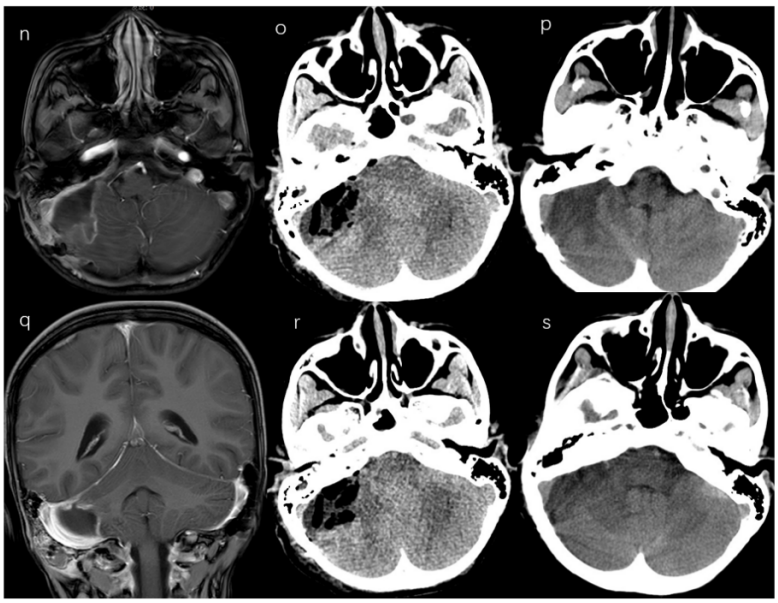


Fig4

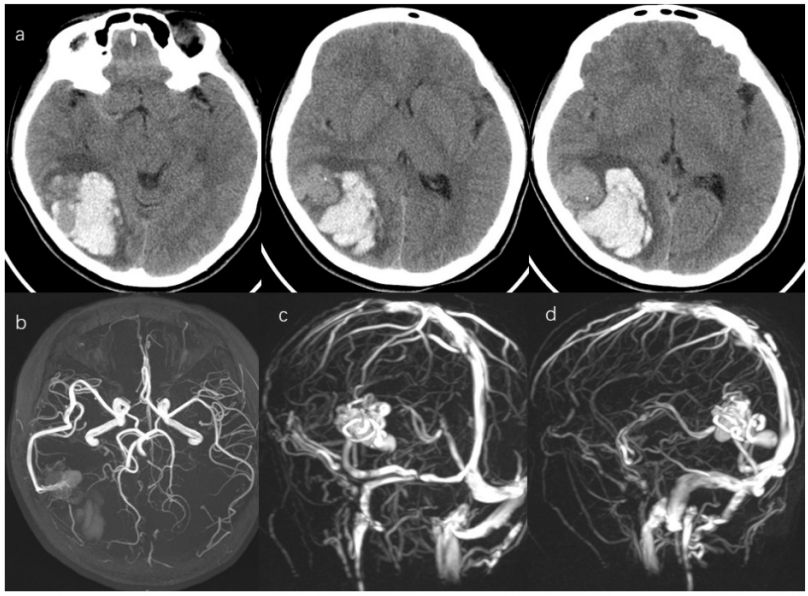
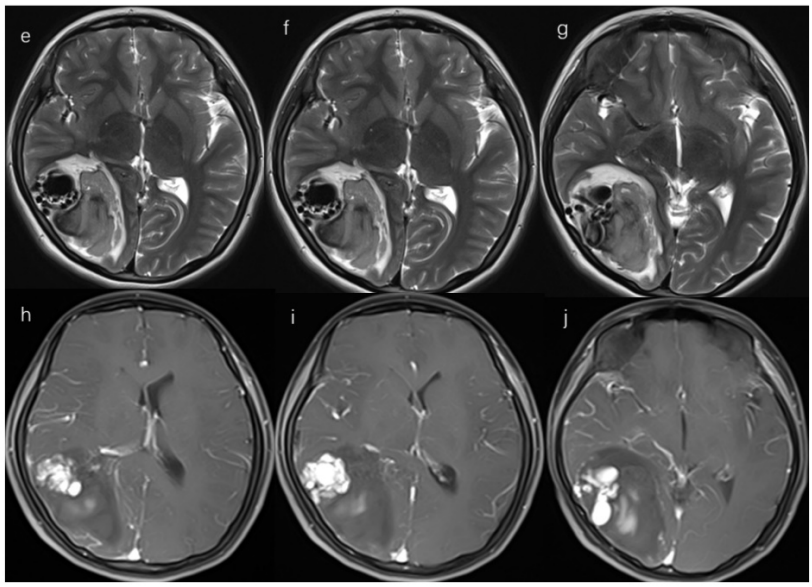


Fig5



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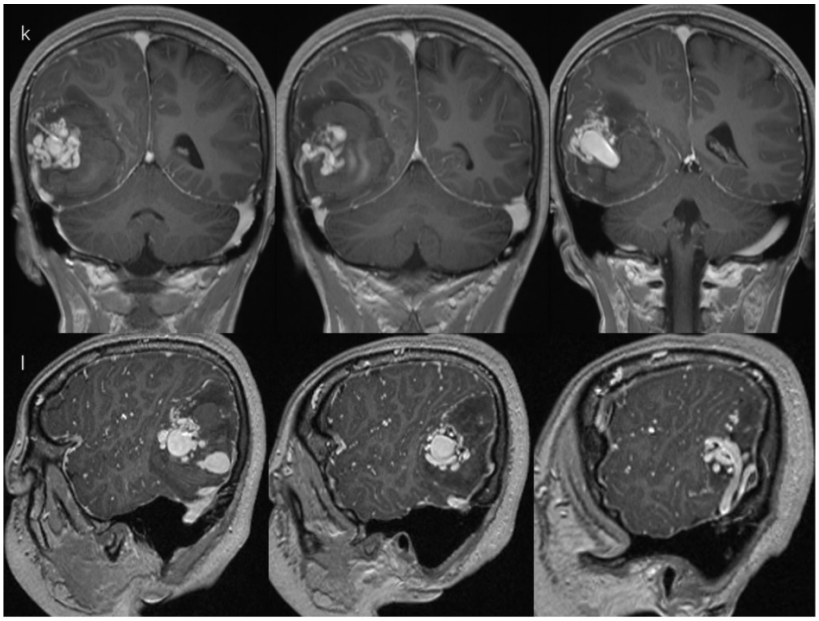

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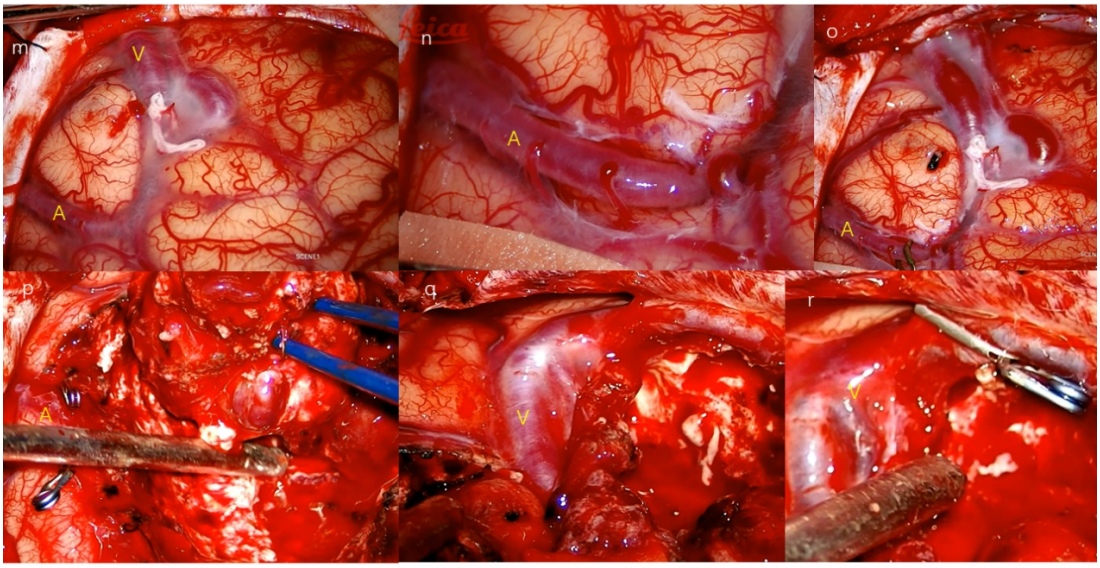

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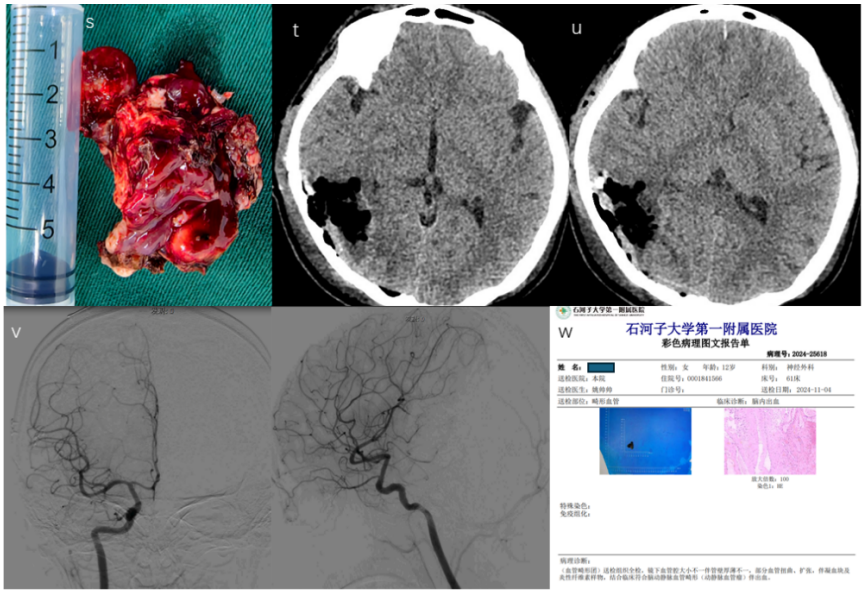

Room A (La Vie A):
Nerve Disorders、Neurodegenerative disease

Peripheral facial paralysis: indications, surgical timing and technical innovation of combined transplantation

周围性面瘫：联合移植的适应症、手术时机与技术革新

Li Shiting

李世亭

Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

上海交通大学医学院附属新华医院神经外科

Objective:

To introduce the results of combined hypoglossal and cervical nerve transplantation in 20 cases of severe peripheral facial paralysis, focusing on the selection of indications, surgical timing and surgical technology innovation.

Methods:

A total of 20 patients with severe peripheral facial paralysis who underwent combined hypoglossal and cervical nerve transplantation in Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine were retrospectively reviewed. The degree of facial paralysis, course of disease, treatment process, facial nerve function, electrophysiological examination results, imaging findings, surgical techniques, surgical efficacy and complications were comprehensively summarized.

Results:

Twenty patients with severe peripheral facial paralysis were treated with HB grade V-VI before operation. After 6-24 months of follow-up, the facial nerve function recovered to varying degrees, including 9 cases of grade II, 7 cases of grade III, and 4 cases of grade IV. The tongue muscle atrophy occurred in different degrees after operation, but the speech function and eating function of the patients were not significantly affected. The curative effect was better than that of patients who only received hypoglossal nerve transplantation reported in the literature. No complications such as corneal ulcer, blindness, incision infection, cerebrospinal fluid leakage, and hoarseness occurred.

Conclusion:

Combined hypoglossal and cervical nerve transplantation is one of the effective methods for the treatment of severe peripheral facial paralysis, and the effectiveness and safety of the operation are its greatest advantages.

Keywords:

peripheral facial paralysis, combined transplantation, hypoglossal nerve transplantation, cervical nerve transplantation

MRI findings of the tarsal tunnel syndrome

Kyongsong Kim[1], Toyohikos Isu[2], Hiroyuki Dan[1], Riku Mihara[1], Kenta Koketsu[1], Yasuo Murai[3]

[1]Department of Neurological Surgery, Chiba Hokuso Hospital, Nippon Medical School
[2]Department of Neurosurgery, Kushiro Rosai Hospital
[3]Department of Neurological Surgery, Nippon Medical School

Purpose Tarsal tunnel syndrome (TTS) is an entrapment neuropathy of the tibial nerve at the tarsal tunnel. The diagnosis is difficult from electrophysiological finding, and clinical symptoms are important. In the diagnosis and surgical strategy, we are interested in MRI findings of the tarsal tunnel. Here we will report MRI findings of the patients with TTS.

Methods In this study, we used a 3D T2* fat suppression sequence of 1.5T MRI. At first, we compared preoperative MRI and operative findings in 28 sides of consecutive TTS. Next, we compared preoperative MRI findings with the postoperative results in 47 feet of consecutive TTS.

Results From MRI- and surgical findings, the causes of the TTS were one with ganglion (3.6%), and the others were diagnosed with idiopathic. Among 27 sides of the idiopathic TTS, MRI visualized the nerve compression in all cases, and 22 sides (82.1%) were arterial compression. However, 5 sides (17.9%) failed to reveal detailed compression causes in the MRI, and revealed during surgery, such as 3 with varices, 1 with connective tissue entrapment, and 1 with small vascular branch strangulation. In the next study, we evaluated the nerve width on the slice at the most compressed nerve, and the signal change of that nerve on T2* fat-suppressed axial MR images. The width of the most compressed nerve was mean 0.99±0.37 mm. There was no significant correlation between postoperative symptom improvement and the preoperative symptom severity. The signal change of the compressed nerve was observed in 29 feet (61.7%), and nerve width was significantly thinner than the other group. There was no significant difference in the preoperative symptom severity in patients with- (n=29) or without signal change (n=18), but, in the signal change group, symptom improvement was significantly greater than the others.

Conclusions Tarsal tunnel MRI was useful for detection of the nerve compression due to a mass lesion or idiopathic cases in the patients with TTS. In some cases, it was difficult to identify the compression causes from only MR imaging. Also, in the signal change group of the compressed nerve, the nerve width at the most compression point was significantly thinner, and postoperative symptom improvement was significantly greater. So nerve signal change on MR imaging may help with the diagnosis of TTS patients. However, false positives and false negatives have not been evaluated, and caution should be required.

Etiological Analysis of Delayed Cerebellar Edema following Microvascular Decompression for Hemifacial Spasm

Bin Cui[1] Ji-Dong Sun[1] Ni Wang[1] Da-Wei Meng[1] Yu-Peng Guo[1] Lin Wang[1] Guo-Qiang Chen[1]

[1]Department of Neurosurgery, Aviation General Hospital, Beijing 100012, China

Abstract

Objective: Microvascular Decompression (MVD) is the most effective method for the treatment of Hemifacial Spasm (HFS). Nevertheless, postoperative complications can impact the prognosis and, in certain instances, even pose a threat to life. Although delayed cerebellar edema following posterior cranial fossa surgery has been documented in some cases in previous literature, it has been scarcely mentioned in the context of MVD post-operation. The purpose of this study was to explore the symptoms, therapeutic regimens, and possible etiologies of delayed cerebellar edema after MVD for HFS, with the aim of providing a reference for the clinical research and avoiding the occurrence of this complication.

Methods: A retrospective study was carried out on patients with Hemifacial Spasm (HFS) who underwent Microvascular Decompression (MVD) at our center between June 2022 and November 2023. Data of patients who developed delayed cerebellar edema were meticulously collected, including age, gender, surgical details, neuroimaging findings, lumbar puncture results, symptoms, therapeutic regimens, and prognoses. Moreover, potential causes were comprehensively analyzed.

Results: A total of 855 patients with HFS underwent MVD treatment. Among them, 14 patients (male:female=2:12, left:right=10:4) developed delayed cerebellar edema, with an incidence rate of approximately 1.64%. MRI and CT scan showed cerebellar edema in the ipsilateral hemisphere. 1 patient was complicated with acute hydrocephalus. Diffusion-weighted images (DWI) showed no restriction and high

apparent diffusion coefficient (ADC) values, indicating the presence of vasogenic edema. Six patients with hypertension (including 1 case of myocardial infarction and cerebral infarction) and 1 case with hyperglycemia. MRA and MRTA were performed in all the patients before surgery. The responsible blood vessels were as follows: 7 cases of AICA, 2 cases of PICA, 3 cases of AICA + VA, 1 case of AICA + PICA, and 1 case of PICA+VA, and all the arteries were mobilized using a polytetrafluoroethylene (Teflon) implant. Collagen sponge was used in 8 patients to prevent hemorrhage or fix the Teflon. In 9 patients, varying degrees of spasm of the arteries supplying the cerebellar cortex were observed during the operation. The mean operating time in this group was 96.2 minutes. The spasm disappeared immediately in 11 cases and significantly improved in 3 cases after the operation (2 cases disappeared completely until the last follow-up). Seven patients underwent lumbar puncture due to headache or fever in the early postoperative period (< 7 days).The white blood cell count in the cerebrospinal fluid increased in 4 patients, and cerebellar edema occurred in 1 patient. Symptoms appeared on average 25.2 days after surgery, including headache, dizziness, unsteady walking and fever. Epstein-barr(EB) virus was detected by gene sequencing of the cerebrospinal fluid in 1 patient, and the EB virus antibody was positive in the blood of 1 patient. All patients were treated with dexamethasone and mannitol, among which dexamethasone was crucial for the improvement of symptoms and imaging. Symptoms disappeared after an average of 17.3 days of treatment, and no obvious sequelae were observed.

Conclusion: Headache, dizziness, and walking instability are common symptoms of delayed cerebellar edema after MVD. Although the morbidity is relatively low, the treatment period is long, which deserves attention. Imaging suggests vasogenic edema and the application of glucocorticoid attach great importance to treatment. We hypothesized that vasospasm of cerebellar cortex feeding artery, viral infection, and immune-mediated response may be the etiology of delayed cerebellar edema.

Anatomical assessment of trigeminal nerve tractography using diffusion MRI: A comparison of acquisition b-values and single- and multi-fiber tracking strategies

Author: Guoqiang Xie **Affiliation:** Nuclear Industry 215 Hospital of Shaanxi Province, China

Objective: We compare TGN tracking performance using dMRI data with different b-values, in combination with both single- and multi-tensor tractography methods. Our goal is to assess the advantages and limitations of these different strategies for identifying the anatomical regions of the TGN. **Methods:** We proposed seven anatomical rating criteria including true and false positive structures, and we performed an expert rating study of over 1000 TGN visualizations, as follows. We tracked the TGN using high-quality dMRI data from 100 healthy adult subjects from the Human Connectome Project (HCP). TGN tracking performance was compared across dMRI acquisitions with b= 1000 s/mm2 , b= 2000 s/mm2 and b= 3000 s/mm2, using single-tensor (1T) and two-tensor (2T) unscented Kalman filter (UKF) tractography. This resulted in a total of six tracking strategies. The TGN was identified using an anatomical region-of-interest (ROI) selection approach. First, in a subset of the dataset we identified ROIs that provided good TGN tracking performance across all tracking strategies. Using these ROIs, the TGN was then tracked in all subjects using the six tracking strategies. An expert rater (GX) visually assessed and scored each TGN based on seven anatomical judgment criteria. These criteria included the presence of multiple expected anatomical segments of the TGN (true positive structures), specifically branch-like structures, cisternal portion, mesencephalic trigeminal tract, and spinal cord tract of the TGN. False positive criteria included the presence of any fibers entering the temporal lobe, the inferior cerebellar peduncle, or the middle cerebellar peduncle. Expert rating scores were analyzed to compare TGN tracking performance across the six tracking strategies. Intra- and inter-rater validation was performed to assess the reliability of the expert TGN rating result. **Results:** The TGN was selected using two anatomical ROIs (Meckel's Cave and cisternal portion of the TGN). The two-tensor tractography method had significantly better performance on identifying true positive structures, while generating more false positive streamlines in comparison to the single-tensor tractography method. TGN tracking performance was significantly different across the three b-values for almost all structures studied. Tracking performance was reported in terms of the percentage of subjects achieving each anatomical rating criterion. Tracking of the cisternal portion and branching structure of the TGN was generally successful, with the highest performance of over 98% using two-tensor tractography and b= 1000 or b= 2000. However, tracking the smaller mesencephalic and spinal cord tracts of the TGN was quite challenging (highest performance of 37.5% and 57.07%, using two-tensor tractography with b = 1000 and b = 2000, respectively). False positive connections to the temporal lobe (over 38% of subjects for all strategies) and cerebellar peduncles (100% of subjects for all strategies) were prevalent. High joint probability of agreement was obtained in the inter-rater (on average 83%) and intra-rater validation (on average 90%), showing a highly reliable expert rating result. **Conclusions:** Overall, the results of the study suggest that researchers and clinicians may benefit from tailoring their acquisition and tracking methodology to the specific anatomical portion of the TGN that is of the greatest interest. For example, tracking of branching structures and TGN-T2 overlap can be best achieved with a two-tensor model and an acquisition using b= 1000 or b= 2000. In general, b= 1000 and b= 2000 acquisitions provided the best-rated tracking results. Further research is needed to improve both sensitivity and specificity of the depiction of the TGN anatomy using dMRI.

Keywords: Trigeminal nerve, Trigeminal neuralgia, Diffusion MRI, Diffusion tensor imaging, Single-tensor tractography, Multi-tensor tractography

Clinical characteristics and surgical treatment results of double crush syndrome by spinal degenerative disease and peripheral nerve entrapment disease.

Ryuya Maejima[1,2)], Masahito Hara[1,2)], Toshiki Fukuoka[1,2)], Tadashi Watanabe[1)]
Department of Neurosurgery[1], Department of Spine Surgery[2,] Aichi Medical University

【Introduction】Double crush syndrome (DCS) is a clinical condition involving spinal degenerative disease (SDD) and peripheral nerve entrapment disease (PNED). The clinical features of DCS remain unclear. In this study, we report our DCS cases with a literature review.

【Materials and Methods】We retrospectively reviewed the medical records of 711 surgical cases of SDD in our hospital between April 2019 and March 2023 (312 cervical spine cases, 399 thoracolumbar cases). Among these, surgical cases of PNED were subjected to this study. Clinical characteristics and surgical treatment results by NRS and McNab scale were evaluated at the first visit and 3-months postoperative and the end of follow-up.

【Results】The subjects included 11 patients (1.5% of the total, 6 men, 5 women, mean age 67.2 years); 2 cases of cervical myelopathy with carpal tunnel syndrome, 2 cases of cervical myelopathy with cubital tunnel syndrome, 1 case of cervical myelopathy with tarsal tunnel syndrome, 3 cases of cervical radiculopathy with cubital tunnel syndrome, 1 case of lumbar radiculopathy with piriformis syndrome and peroneal nerve disorder and 3 cases of lumbar radiculopathy with peroneal nerve disorder. The diagnosis was based on clinical symptoms and physical examination with clinical imaging for SDD and nerve conduction study for PNED. One-stage surgery was performed in 3 patients (27.2%) and staged surgery was performed in 8 patients (72.7%). In staged surgery cases, the average interval between surgeries was 16.6 months. 7 case (87.5%) of staged surgery cases underwent surgery for SDD at first. 7 patients of all (63.6%) have a negative Tinel-like sign particular to the PNED upon physical examination at first visit. In three of staged surgery cases, a Tinel-like sign changed from negative to positive at after spinal surgery. 3 patients (27.2%) showed satisfactory outcome (good or excellent by McNab scale) at 3-months postoperative, but 9 patients (81.8%) at the end of follow-up.

【Conclusion】Surgical DCS is a relatively rare condition. Although the diagnosis of DCS are challenging, the surgical treatment are effective. In DCS patients, Tinel-like sign characteristic of the PNED tend to be a negative and there is a possibility of the positive conversion after spine surgery. It is important carefully follow up the patient to detect changes in his or her condition. The surgical results for DCS diagnosed by doing this are good at the end without immediate effect. There was no difference between upper and lower limbs unless no detailed reports about DCS of lower limbs have been published.

Key word; Double Crush Syndrome, peripheral nerve entrapment disease

Application of gelatin sponge assisted technique in microvascular decompression for trigeminal neuralgia

Zhongding Zhang, Hua Zhao, Yinda Tang, Shiting Li
章钟鼎 赵华 唐寅达 李世亭
Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

Objective: Trigeminal neuralgia (TN) is a neurological disorder characterized by paroxysmal severe facial pain, and microvascular decompression (MVD) is the preferred surgical treatment. Traditional MVD widely employs Teflon, which may lead to postoperative adhesions and granuloma formation, closely associated with TN recurrence. This study aimed to evaluate the efficacy of a novel gelatin sponge (GS)-assisted technique, which isolates Teflon from direct nerve contact to reduce postoperative recurrence, and compared to conventional Teflon-only MVD.

Methods: This retrospective cohort study included 734 unilateral primary TN patients undergoing MVD between January 2014 and December 2019. After excluding patients with prior MVD, atypical TN, or incomplete data, 313 cases in the GS+Teflon group and 347 in the Teflon-only group were analyzed. Baseline characteristics (age, sex, disease duration, pain distribution, and offending vessel types) were comparable. In the GS group, moistened GS was placed between Teflon and blood vessels to avoid direct contact with demyelinated nerve regions, while the Teflon group used only Teflon pledgets to separate vessels from the trigeminal nerve. Postoperative outcomes were assessed using the Barrow Neurological Institute (BNI) pain score, recurrence rates, and complications. Kaplan-Meier survival analysis compared long-term efficacy, with statistical significance set at $P<0.05$.

Results: Operative time was slightly longer in the GS group (109.38 ± 14.77 minutes in GS group vs. 103.53 ± 16.02 minutes in Teflon group, $P<0.001$), but immediate postoperative pain relief (complete remission: 92.0% in GS group vs. 91.1% in Teflon group, $P=0.659$) and complication rates (3.5% in GS group vs. 4.9% in Teflon group, $P=0.378$) showed no significant differences. At 1, 2, and 3 years postoperatively, TN recurrence rates in the GS group were 1.0%, 1.2%, and 1.2%, respectively, versus 3.7%, 2.9%, and 1.7% in the Teflon group. The GS

group demonstrated a reduced 1-year recurrence risk (OR=3.7, P=0.031) and a significantly lower 3-year cumulative recurrence rate (OR=2.4, P=0.013). Kaplan-Meier analysis favored the GS group (P=0.020). Among 21 reoperated cases, 81.3% (13/16) in the Teflon group exhibited Teflon adhesions, whereas only 40% (3/5) in the GS group showed mild adhesions, with shorter adhesion-separation times.

Conclusion： In MVD, the GS-assisted technique reduces early postoperative inflammatory reactions and adhesions by isolating Teflon from nerve contact, significantly lowering 1-year TN recurrence rates without increasing complications. Although operative time is marginally prolonged, this approach improves long-term outcomes and reduces recurrence risks.

Keywords: Trigeminal neuralgia; Microvascular decompression; Gelatin sponge

Abstracts

Day 2

Room B

Room B (La Vie B): Spinal Neurosurgery

Title: Clinical Characteristics and Optimal Management of Craniocervical Junction Arteriovenous Fistulas with Subarachnoid Hemorrhage: a multicenter study

Authors: Tomoo Inoue, MD, PhD,[1] Toshiki Endo, MD, PhD,[1,2] Keisuke Takai, MD, PhD,[3] Toshitaka Seki, MD, PhD.[4] on behalf of the Neurospinal Society of Japan CCJ AVF study investigators

1. Department of Neurosurgery, Saitama Red Cross Hospital, Saitama, Japan
2. Department of Neurosurgery, Tohoku Medical and Pharmaceutical University, Sendai, Japan
3. Department of Neurosurgery, Tokyo Metropolitan Neurological Hospital, Tokyo, Japan
4. Department of Neurosurgery, Hokkaido University, Graduate School of Medicine, Sapporo, Japan

ABSTRACT

Background and Objectives: Craniocervical junction arteriovenous fistulas (CCJAVFs) presenting with subarachnoid hemorrhage (SAH) are rare conditions, with the optimal timing and approach to treatment still debated among neurosurgeons. This study aims to characterize CCJAVF-related SAH and determine appropriate surgical timing in a multicenter study.

Methods: Data from 111 consecutive patients with CCJAVF, including 51 with SAH, were collected from 29 centers across [Country]. The vascular anatomy, diagnosis, treatment, surgical timing, and clinical outcomes were analyzed. Binary logistic regression was used to identify risk factors for complications.

Results: The mean age of the patients was 67 years (range, 33–85 years), with 36 males and 15 females. Notably, a high percentage of patients (84%) presented with mild SAH (World Federation of Neurosurgical Societies [WFNS] grade I or II). Rebleeding and symptomatic vasospasm each occurred in 2% of cases. Initial treatments included direct surgery (n = 38), endovascular treatment (n = 10), and combined therapy (n = 3). Of the 51 patients, 17.6% (9/51) underwent acute (within 3 days of onset), 17.6% (9/51) subacute (within 4–14 days), and 64.7% (33/51) delayed procedures (after 15 days). Our study revealed a higher rate of complications, especially ischemic complications (P = .028), in patients who underwent acute surgery than in those who underwent delayed procedures. Endovascular treatment required retreatment in 60% (6/10) of cases, whereas direct surgery did not necessitate retreatment. The final modified Rankin Scale scores did not differ based on surgical timing.

Conclusion: CCJAVF-related SAH is often mild, as evidenced by a high proportion of patients with low-grade WFNS scores and a low rate of rebleeding/vasospasm. In contrast to intracranial aneurysmal SAH, our results do not support acute surgical intervention as the preferred management for patients with CCJAVF-related SAH. Through delayed surgery, clinicians can avoid ischemic complications and improve patient outcomes.

Keywords: arteriovenous fistula; craniocervical junction; endovascular treatment; subarachnoid hemorrhage; surgery

Exploration of Treatment Options for Sacral/perineal pain with Neurogenic Bowel and Bladder Dysfunction Following Reoperation for Sacral Meningeal Cysts.

Jiaxing Zhang[1], Jianjun Sun[1*]

[1] Department of Neurosurgery, Beijing Friendship Hospital, Capital Medical University, Beijing, China Email：jiaxing-bfh@hotmail.com

Objective: To summarize the surgical treatment outcomes of sacral canal lesions, particularly the recurrence of symptoms following sacral cyst surgery accompanied by pain and bowel/bladder dysfunction, and to explore the surgical treatment methods used.

Methods: A retrospective analysis was conducted on 129 patients diagnosed with sacral cysts and other sacral canal lesions treated from July 2023 to July 2024. Among these, 14 patients presented with recurrence or worsening of symptoms after previous sacral surgery, all accompanied by perineal (sacral) pain and varying degrees of bowel/bladder dysfunction. Pre-existing MRI scans indicated nerve root fibers within the cyst. After more than three months of conservative treatment without improvement, surgical options were evaluated. Seven patients underwent surgery to address recurrent sacral cysts and nerve root adhesions, while seven others opted for nerve root adhesion lysis and sacral nerve stimulation. Among the latter group, three received permanent stimulators, one had a successful trial during the first stage of surgery and awaited the second stage, while two patients declined the second stage after completing the first stage testing. One patient had an ineffective test and had the electrode removed.

Results: In the seven cases treated for recurrent sacral cysts and nerve root adhesions, all patients showed significant pain improvement. Two patients experienced improvement in bowel/bladder function, one with only bowel function improvement, and four had minimal improvement in bowel/bladder function after six months. In the other seven patients who chose nerve root adhesion lysis and sacral nerve stimulation, six showed significant pain improvement, with three experiencing simultaneous improvement in both pain and bowel/bladder function. One patient improved in bowel function during the trial phase, while urinary symptoms improved within a week post-surgery but recurred after a week; the second stage surgery is pending. Two patients had partial symptom improvement that did not meet expectations and did not undergo the second stage surgery. Another patient had ineffective treatment and had the electrode removed.

Conclusions： For patients undergoing reoperation for sacral lesions, nerve root decompression combined with sacral nerve stimulation can effectively improve perineal pain and dysfunction of bowel and bladder control. However, the therapeutic effects of neuromodulation require long-term observation to be clarified. Further investigation into the relevant mechanisms is necessary for cases that do not show relief.

Keywords: Recurrent Sacral Canal Cysts, Sacral Nerve Stimulation, Nerve Root Adhesion Lysis, Perineal Pain, Bowel/Bladder Dysfunction, Neuromodulation

Analysis of Long-Term Efficacy of Spine-Shortening Surgery in the Treatment of Tethered Cord Syndrome

Kai Wang, Zhenlei Liu, Lei Zhang, Hao Wu

Department of Neurosurgery, Xuanwu Hospital, Capital Medical University; Neurospine Center, China International Institute of Neuroscience

Objective: This study evaluates the long-term efficacy of spine-shortening surgery in patients with tethered cord syndrome (TCS). TCS is a condition caused by abnormal connections or adhesions between the spinal cord and spinal column, leading to various neurological dysfunctions, including lower limb weakness, sensory loss, and bladder/bowel dysfunction. The traditional surgical treatment is detethering surgery, which, however, is associated with a high incidence of postoperative complications and recurrence. In recent years, spine-shortening surgery has emerged as a more effective alternative. This study aims to evaluate the safety and long-term outcomes of spinal shortening surgery by analyzing its effects in patients with TCS.

Methods: A retrospective review of the patient database at the Neurospine Center, Xuanwu Hospital, Capital Medical University, identified 30 patients (mean age: 38.60 ± 14.06 years; range: 18–60 years) who underwent spine-shortening surgery between January 2023 and January 2025. Inclusion criteria included a confirmed diagnosis of TCS and suitability for spine-shortening, with radiological evidence of a low-lying conus medullaris below the L2 level, elevated terminal filum tension, or secondary lesions restricting caudal spinal cord mobility. Exclusion criteria comprised severe systemic diseases or prior spinal surgery. Preoperative assessments included imaging, neurological examinations, and functional scoring (e.g., pain, bowel/bladder function). All surgeries were performed by a single team, followed by 12-month postoperative follow-up to evaluate safety and long-term outcomes. Data were analyzed using SPSS software, comparing pre- and postoperative metrics to assess surgical efficacy.

Results: Among 30 patients, the procedure demonstrated good overall safety, with no intraoperative or major postoperative complications (e.g., infection, spinal cord injury, or neurological deterioration). At 12-month follow-up, visual analog scale (VAS) and Oswestry Disability Index (ODI) scores significantly decreased postoperatively ($p < 0.05$). Sensory abnormalities improved in half of patients, particularly in lower limbs and perineal regions. Neurogenic bowel dysfunction (NBD) and neurogenic bladder symptom score (NBSS-SF) scores also significantly improved ($p < 0.05$). Motor function recovery was observed in most patients, with 60% exhibiting a 1–2-grade increase in lower limb strength.

Conclusion: Spine-shortening surgery is an effective treatment for TCS, yielding significant long-term benefits, including pain relief, functional recovery, sensory improvement, and enhanced bowel/bladder function. The procedure is safe, with low complication rates, and markedly improves patients' quality of life. It offers a viable option for TCS patients, especially those with significant neurological deficits. However, larger cohorts and extended follow-up are needed to comprehensively evaluate long-term outcomes and risks.

Keywords: Spine-shortening surgery; Tethered cord syndrome; Long-term efficacy; Pain score; Functional recovery

Prediction of post-operative outcome of motor function by intraoperative neuromonitoring after resection for spinal tumors

Shinsuke YAMADA
S. Kawajiri, H. Arishima, K. Kikuta
Department of neurosurgery, University of Fukui

Object: Investigation into whether intraoperative neuromonitoring contributes to predicting motor function outcomes in spinal cord tumor resection
Material and Methods: A retrospective study was conducted on 14 consecutive patients with spinal cord tumors. Clinical factors (age, hypertension, diabetes, dyslipidemia, antithrombotic medication, steroid medication, smoking, alcohol), tumor factors (tumor location by MRI, lesion length, surrounding edema length), and intraoperative neuromonitoring factors (reduction ratio of transcranial motor evoked potentials; TcMEP) were analyzed. Outcome measures included McCormick score and Manual muscle test (MMT), and statistical analysis was performed to determine whether each factor correlated with postoperative deterioration of outcome measures.
Result: The reduction ratio of TcMEP in spinal cord tumor resection surgery was a predictive factor for MMT deterioration, with a threshold value of 0.23. Additionally, the length of edema surrounding the tumor correlated with postoperative decline in McCormick score.

Keyword: spinal tumor, intraoperative neuromonitoring

An accurate and convenient positioning technique for sacral cysts surgery and its applicable scope

Yu Si

Department of Neurosurgery, Peking University Third Hospital, Peking University

Abstract：

Objective: Explore a new accurate and convenient positioning technique for sacral cysts surgery and study it's application scope.

Methods: Prospectively collect the records of patients who were diagnosed with Sacral cysts, and define the thickness that distinguish between "superficial" and "deep" as the thickness of soft tissue when 90% of doctors can locate the bone clearly. Patients are then classified according to the fact whether the sacrococcygeal bone are superficial or deep. Study which types can adopt new positioning methods and the influencing factors of different types.

Results: A total of 218 patients were included in the study. We define the thickness that distinguish between "superficial" and "deep" as 2cm. T2 images are more appropriate sequences for precise localization of sacral cysts. According to the fact whether the sacrococcygeal bone are superficial or deep, patients can be divided into three types. Types I and IIA(account for 77%) are types that can use our new positioning technique. There is a moderate positive correlation between high BMI values and the thickness of superficial soft tissues.

Conclusions: We presents a new accurate and convenient positioning technique which is suitable for most patients with sacrococcygeal diseases.

Progress in clinical application of spinal cord electrical stimulation

Li Zhitao

Tianjin Huanhu Hospital，China

Objective:To analyze the clinical effect of disposable spinal cord electrical stimulation under general anesthesia under neuroelectrophysiological monitoring in the treatment of high risk foot patients with diabetes and spastic hemiplegia patients after stroke.

Methods:The clinical data of 7 patients with high risk foot of diabetes and 3 patients with spastic hemiplegia after stroke who underwent spinal cord electrical stimulation in the ninth ward of neurosurgery department of Tianjin Huanhu Hospital from May 2022 to May 2023 were collected. The surgery is performed under the guidance of a C-arm X-ray and neurophysiological monitoring, with a one-time implantation of a spinal cord electrical stimulation under general anesthesia. The diameter and peak flow rate of lower limb arteries, lower limb skin temperature (lower leg skin temperature, foot skin temperature), visual analogue scale (VAS) score, continuous action distance, blood glucose level and toe wound were compared between preoperative and postoperative patients with diabetes foot; Comparison of preoperative and postoperative muscle tone (Ashworth classification), joint range of motion, gait analysis, and static plantar center of gravity distribution in patients with spastic hemiplegia after stroke.

Results:A total of 7 patients with high-risk foot of diabetes were included. The diameters and peak flow velocities of the femoral artery, popliteal artery, anterior tibial artery, posterior tibial artery, and dorsalis pedis artery in both lower limbs of the patient improved significantly after surgery compared to before surgery. All 7 patients had varying degrees of lower limb pain before surgery, and their VAS scores significantly decreased after surgery (score: 1.1 ± 0.9 compared to 6.8 ± 3.4). The pain was significantly relieved, and the skin temperature of the calf and foot increased significantly compared to before surgery [calf skin temperature (℃): 33.3 ± 0.9 compared to 30.9 ± 0.7, foot skin temperature (℃): 31.4 ± 0.8 compared to 29.1 ± 0.6]. Fasting blood glucose and postprandial blood glucose both decreased significantly compared to before surgery [fasting blood glucose (mmol/L): 7.6 ±

1.4 compared to 10.5 ± 1.2, postprandial blood glucose (mmol/L): 9.3 ± 2.3 compared to 13.5 ± 1.1], and the differences were statistically significant (both $P<0.01$). All 7 patients showed significant improvement in lower limb activity after surgery compared to preoperative levels, with 1 patient requiring wheelchair mobility and 1 patient experiencing intermittent claudication before surgery. Two weeks after surgery, all patients resumed normal walking. Among the 7 patients, 2 patients suffered from diabetes foot wound ulceration before operation and could not heal for a long time. One month after operation, the blood circulation around the foot wound of the patient recovered, and the healing was accelerated. The wound was dry and scabbed, and the healing was good. Three patients with spastic hemiplegia after stroke had increased muscle tone before surgery, significantly decreased muscle tone after surgery, and normal knee joint muscle tone restored; Preoperative joint mobility was poor, but postoperative improvement was significant; Preoperative foot inversion and postoperative improvement of foot inversion and sagging; Preoperative orientation dysfunction, postoperative orientation accuracy; The postoperative electromyography of the affected limb showed significant improvement.

Conclusions:The one-time implantation of spinal cord electrical stimulation under general anesthesia under electrophysiological monitoring in high-risk foot patients with diabetes who do not tolerate diabetes peripheral neuralgia and local anesthesia spinal cord electric stimulation test can effectively alleviate peripheral neuralgia and other diabetes foot related symptoms, improve lower limb blood flow supply, and reduce the risk of toe amputation. Clinical practice has proved the effectiveness of this technique, especially for the early treatment of high-risk foot patients with diabetes. Spinal cord electrical stimulation implantation surgery was performed on patients with spastic hemiplegia after stroke. After surgery, professional and systematic rehabilitation treatment was carried out, and the patient's muscle tension was significantly relieved, joint mobility was significantly improved, foot inversion was improved, limb electromyography was significantly improved, and behavioral improvement was significant. Clinical practice has proven that this technique is effective in reducing muscle tension, improving walking gait, and thus improving the quality of life of patients with spastic hemiplegia after stroke.

Room B (La Vie B): Neurorestoration /Radiosurgery/Others

New Medicine for Facial Paralysis: A Comprehensive Management Strategy for Minimally Invasive Treatment of Facial Paralysis Based on the Concept of Neurorestoralogical Medicine

Chen Lin
Department of Neurosurgery, State Grid Corporation of China Beijing Electric Power Hospital 100073

Facial palsy is common, affecting 1 in 60 people during the course of their lifetime. Approximately 3 million new patients are diagnosed in China each year. The facial arteries and veins are intricately intertwined and their distribution is complex. Facial nerve function is paramount since diminished or vanished facial autonomous movement and expression significantly affect an individual's appearance. Non-restoration or incomplete restoration of facial nerve function will impose substantial social and psychological stress on patients, severely impeding social interactions and quality of life, while the occurrence of sequels and complications following facial palsy can result in long-term implications. Enhancing the cure rate for facial palsy is a significant challenge. However, there are significant misunderstandings regarding diagnosis, treatment, and prognosis of facial palsy, with many assuming that 70-80% can be easily cured, but the actual situation is startlingly different, precisely the opposite. Two-thirds of the patients do not fully recover, living with chronic sequels and/or complications typically due to aberrant facial nerve regeneration.

The novel concept of neurorestorative medicine suggests that the potential for neural repair is greater than currently perceived, or much greater. In the past five years, we have treated more than 3000 patients in the acute phase, sub-acute phase, and chronic stage (sequels and complications) using a combination of drug acupoint injection, precise needle puncture multi-target balance radiofrequency therapy, screening effective traditional Chinese medicine treatments, integrating scientific rehabilitation therapy and training. This has improved the cure rate in the acute phase, while providing new solutions to clinical challenges in sequels and complications, and formulated the "Integrated Traditional Chinese and Western Medicine Minimally Invasive Treatment Full-Course Management Strategy". On the basis of innovative patent technology, high-efficiency drugs and consumables, and rehabilitation plans, we aim to comprehensively enhance the level of facial palsy treatment.

Simultaneously, we have proposed some novel concepts to further refine theory and guide clinical practice, such as: Micro-entrapment syndrome of nerves innervating the face, Trilogy of facial paralysis. We differentiate the natural disease course changes of facial palsy sequels and facial palsy complications, proposing that facial palsy sequels refer to incomplete recovery of facial muscles after facial palsy, weak activity, and facial atrophy; while, facial palsy complications refer to facial nerve muscle dysfunction after facial palsy, including associated movements, facial nerve micro-compression syndrome, if not effectively intervened, the condition tends to progress. We first proposed a three-level prevention strategy for facial palsy complications (synkinesia, micro-entrapment syndrome of nerves innervating the face): primary prevention (also known as etiological prevention), which refers to fundamental preventive measures taken against pathogenic factors (such as non-standard treatment in the acute phase, insufficient intensity of facial palsy repair intervention, slow recovery process, excessive adverse stimulation, non-scientific training, etc.) before the onset of facial palsy complications, is the ultimate goal of preventive medicine. Secondary prevention (also known as preclinical prevention or "three early prevention"), which

Management of Post-Gamma Knife Radiosurgery Complications: Insights from Histopathological and Radiological Analysis

Department of Neurosurgery, National Cerebral and CardioVascular Center Hospital
Hisae Mori, Takenori Ogura, Hirotoshi Imamura, Koji Iihara, Hiroharu Kataoka

Background:
Gamma Knife Radiosurgery (GKRS) is widely used to treat cerebral arteriovenous malformations (AVMs), resulting in nidus occlusion via targeted radiation-induced histopathological changes. Despite its effectiveness, post-GKRS complications, including hemorrhage, cyst formation, and chronic encapsulated hematoma, represent significant clinical management challenges.

Objectives:
This study aims to elucidate effective management strategies for post-GKRS complications by integrating findings from detailed histopathological and radiological analyses of surgically resected AVM nidus specimens.

Methods:
We retrospectively reviewed 130 cases of cerebral AVMs treated surgically at our institution from April 2002 to September 2023. Among these, 13 patients who previously underwent GKRS required surgical intervention for GKRS-associated complications, resulting in the collection of 14 nidus specimens. We evaluated these specimens to identify correlations between the timing of surgical intervention, histopathological characteristics, and preoperative MRI findings.

Results:
Histopathological analysis demonstrated distinct thrombotic and neovascular alterations within AVM associated with post-GKRS complications such as hemorrhage, cyst formation, and encapsulated hematoma. Early post-radiosurgery cases (within 1–2 years post-GKRS) exhibited minimal pathological changes and subtle MRI features. Over prolonged periods, progressive histopathological findings emerged, corresponding to distinct phases of radiation-induced responses, notably significant neovascular growth and hemangiomatous transformations. MRI analyses aligned closely with histological findings, where increased neovascularization and structural nidus abnormalities identified radiologically signaled a heightened complication risk. Radiation-induced changes (RICs), initially subtle, typically resolved spontaneously within 1–2 years; however, persistent or progressive radiological findings indicating increased neovascular activity were strongly predictive of subsequent clinical complications requiring surgical intervention.

Conclusions:
Integrating detailed histopathological and MRI-based radiological evaluations significantly enhances the management of post-GKRS complications in cerebral AVM cases. Early detection of specific MRI indicators, such as increased neovascularization and persistent nidus structures, allows timely surgical intervention, minimizing the risk of severe clinical sequelae. These insights facilitate more precise timing and decision-making in surgical management, thus optimizing clinical outcomes and effectively mitigating delayed radiation injuries following GKRS treatment.

Key Words: AVM, Gamma Knife , Stereotactic Radiosurgery

Eupatilin Ameliorates Spinal Cord Injury by Inhibiting Damage-associated Microglia and Optimizing the Regenerative Microenvironment

Zide Wang[1], Beibei Yu[2], Guihuai, Wang[1], Weitao Man[1*]

[1]Department of Neurosurgery, Beijing Tsinghua Changgung Hospital, School of Clinical Medicine, Tsinghua University, Beijing, 102218, China

[2] Department of Neurosurgery, The Second Affiliated Hospital of Xi'an Jiao Tong University, Xi'an, 710032, China.

Objective: Spinal cord injury (SCI) triggers a cascade of inflammatory responses dominated by microglial activation, which critically shapes the post-injury microenvironment. While damage-associated microglia (DAM) are implicated in neurodegenerative diseases, their role in SCI remains poorly understood. This study aimed to investigate the dynamic plasticity of DAM in SCI and evaluate the therapeutic potential of Eupatilin, a natural flavonoid, in modulating DAM-driven inflammation and promoting functional recovery.

Methods: Single-cell RNA sequencing (scRNA-seq) reanalysis of spinal cord tissues from SCI mice (GSE162610) identified DAM subpopulations and their transcriptional dynamics. A thoracic spinal cord contusion model in C57BL/6 mice was established to validate DAM-associated hub genes via qPCR and immunofluorescence. Molecular docking predicted Eupatilin's interactions with key DAM regulatory proteins. In vivo, Eupatilin was administered intrathecally to assess its effects on DAM activity, inflammatory cytokine profiles, and motor recovery (Basso Mouse Scale, CatWalk gait analysis). Bulk RNA sequencing and CIBERSORTx deconvolution elucidated transcriptomic and cellular changes post-treatment.

Results: scRNA-seq revealed a distinct DAM subpopulation (expressing *Lyz2*, *Spp1*, *Fabp5*, *Lpl*) that expanded post-SCI (131 cells in Sham vs. 3,271 cells at 7dpi) and exhibited pro-inflammatory traits. Pseudotime trajectory analysis demonstrated DAM's plasticity, transitioning toward homeostatic microglia (MG2). Integration of scRNA-seq and microarray data identified five DAM-associated hub genes (*Ctsz*, *Folr2*, *Gusb*, *Grn*, *Fcer1g*), with qPCR confirming significant upregulation of *Fcer1g*, *Grn*, and *Gusb* post-SCI. Molecular docking revealed Eupatilin's strong binding affinity to these proteins via hydrogen bonding and hydrophobic interactions. In vivo, Eupatilin suppressed DAM activity by downregulating *Fcer1g*, *Grn*, and *Gusb* expression ($p < 0.05$) and reduced TNFα levels while enhancing anti-inflammatory ARG1 ($p < 0.05$). Bulk RNA-seq demonstrated Eupatilin's promotion of neurotrophic signaling and inhibition of apoptosis-related pathways. Functionally, Eupatilin-treated mice exhibited improved BMS scores ($p = 0.017$)

and enhanced axonal regeneration (TUJ1+ intensity, $p < 0.01$), alongside reduced glial scar expansion. CIBERSORTx analysis confirmed Eupatilin-driven DAM-to-MG2 transition, restoring homeostatic microglial proportions.

Conclusions: This study identifies DAM as a pivotal regulator of post-SCI inflammation and highlights Eupatilin's dual role in inhibiting DAM activity and fostering a regenerative microenvironment. By targeting hub genes (*Fcer1g*, *Grn*, *Gusb*), Eupatilin promotes microglial plasticity, reduces neuroinflammation, and enhances functional recovery. These findings position Eupatilin as a promising therapeutic candidate for SCI, offering novel insights into microglial subpopulation-targeted interventions. Further research is warranted to optimize delivery methods and validate mechanisms underlying DAM-MG2 transition.

Dual-functional Hydrogels: Boosting Neurovascular Regeneration and Brain Injury Repair via Regulating Cell Crosstalk and Microenvironment

Author: Chai Yi
Affiliations: Department of Neurosurgery, Renji Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai 200127, China **E-mail**: Chaiyi@renji.com

Objective
The objective was to study the impact of a dual-functionalized self - assembling peptide (SAP) nanofiber hydrogel and an aligned fibrin hydrogel (AFG) on neural and vascular cells. Specifically, it aimed to clarify how these hydrogels regulate cell behaviors, promote neurovascular crosstalk, and contribute to nerve regeneration, with the ultimate goal of finding effective strategies for nerve tissue repair.
Methods
For the dual - functionalized SAP nanofiber hydrogel, peptides RGI and KLT mimicking BDNF and VEGF were used to functionalize RADA peptide. PC12 cells and human umbilical vein endothelial cells (HUVECs) were co - cultured on the hydrogel in direct and indirect models. Gene expression was analyzed by RT - qPCR, and cell behaviors were evaluated by multiple assays. A rat brain injury model was established to assess the in vivo effects. For the AFG, it was fabricated by electrospinning. Human umbilical cord mesenchymal stem cells (hUMSCs) were cultured on AFG, and a rat brain injury model was used. Immunohistochemistry, behavior tests, MRI, and RNA transcriptome analysis were performed to evaluate its effects on neurogenesis and neurological functional recovery.
Results
The dual - functionalized SAP hydrogel RADA/RGI/KLT enhanced the neurite outgrowth of PC12 cells and tube - like structure formation of HUVECs in vitro. It promoted the rapid infiltration of neural and vascular cells into the lesion in a rat brain injury model. In co - culture models, it mediated neurovascular crosstalk through paracrine signaling and direct cell - cell contact. The AFG directed hUMSCs to differentiate into neural cells in vitro. In vivo, it promoted the recruitment of neural stem cells (NSCs) and neurogenesis at an early stage after brain injury. At 4 weeks after transplantation, more mature neurons were observed in the AFG group, and at 8 weeks, the regenerated tissue was more similar to normal cortex, and neurological functional recovery was evident. Transcriptome analysis showed that AFG upregulated neurogenesis - related genes and activated multiple signaling pathways.
Conclusions
Both the dual - functionalized SAP hydrogel and AFG showed positive effects on nerve regeneration. The dual - functionalized SAP hydrogel regulated the behaviors of neural and vascular cells and promoted their crosstalk. AFG provided a favorable microenvironment for neurogenesis and neurological functional recovery. These findings offer new perspectives for nerve tissue engineering. However, further research is needed to optimize the performance of these hydrogels and fully understand the underlying mechanisms for better translation into clinical applications.

Gamma Knife Surgery as the primary management for patients with Koos grade IV Vestibular Schwannoma

Akiyoshi Ogino[1, 2], Toshikazu Kano[2, 3]
[1]Department of Neurological Surgery, International University of Health and Welfare
[2]Department of Neurological Surgery and Center for Imaged-Neurosurgery, University of Pittsburgh
[3]Department of Neurological Surgery, Dokkyo Medical University

Objective: Although numerous long-term outcome studies have established the efficacy of stereotactic radiosurgery (SRS) for small-volume vestibular schwannomas (VSs), its role in the treatment of larger tumors remains debated. **Methods:** From 1987 to 2017, the authors performed single-session SRS on 170 patients with previously untreated Koos grade IV VSs, with tumor volumes ranging from 5 to 20 cm^3 (median volume: 7.4 cm^3). The median maximum extracanalicular tumor diameter was 27.5 mm. All tumors caused compression of the middle cerebellar peduncle and deformation of the fourth ventricle. Ninety-three patients were male, 77 were female, and the median age was 61 years. Sixty-two patients had serviceable hearing (Gardner-Robertson [GR] grades I and II). The median prescribed margin dose was 12.5 Gy. **Results:** At a median follow-up of 5.1 years, the progression-free survival rates for patients receiving a margin dose of ≥12.0 Gy were 98.4% at 3 years, 95.3% at 5 years, and 90.7% at 10 years. In contrast, those who received a margin dose of <12.0 Gy had a tumor control rate of 76.9% at 3, 5, and 10 years. Among patients with serviceable hearing at the time of SRS, hearing preservation rates were 58.1% at 3 years, 50.3% at 5 years, and 35.9% at 7 years. Younger age (<60 years, $p = 0.036$) and initial GR grade I hearing ($p = 0.006$) were significantly associated with better hearing preservation. Facial neuropathy developed in 7 patients (4%) during the follow-up period. A smaller tumor volume (<10 cm^3, $p = 0.002$) and a lower margin dose (≤13.0 Gy, $p < 0.001$) were correlated with a greater likelihood of preserving facial nerve function. The 10-year probability of delayed facial neuropathy for patients treated with a margin dose ≤13.0 Gy was 1.1%. Nine patients (5%) required ventriculoperitoneal shunting due to delayed symptomatic hydrocephalus. Trigeminal neuropathy was observed in 15 patients (9%), and delayed surgical resection was necessary in 4% of cases.
Conclusions: Single-session SRS effectively avoided the need for delayed resection in nearly 90% of patients with large-volume VSs over a 10-year period. For patients with minimal symptoms of tumor mass effect, SRS should be considered an effective alternative to surgery in most patients, especially those with advanced age or medical comorbidities.

High-Fat Diet Disrupts the Gut-Brain Axis and Exacerbates Ischemic Stroke: Can Microbiota Restoration Reverse the Damage?

Hanlin Zhong[1], Zeping Jin[1], Yang Wang[1], Yunpeng Liu[1,*]

[1]Department of Neurosurgery, Beijing Chao-Yang Hospital, Capital Medical University, Beijing, China

Email: liuyunpeng6644@126.com

Objective: Dietary habits have a profound influence on systemic metabolism, immune regulation, and neurological function, all of which contribute to stroke pathophysiology. The hypothalamic-pituitary-adrenal (HPA) axis plays a pivotal role in stress response and neuroprotection following ischemic stroke. However, the impact of a high-fat diet (HFD) on HPA axis function and subsequent stroke outcomes remains poorly understood. Additionally, the gut-brain axis has emerged as a key modulator of neuroinflammatory processes and stroke recovery. This study aims to elucidate how HFD alters HPA axis function and gut microbiota composition, leading to aggravated ischemic stroke outcomes, and to investigate whether fecal microbiota transplantation (FMT) and *Akkermansia muciniphila* (AKK) supplementation can mitigate these adverse effects.

Methods: Male C57BL/6 mice were randomly assigned to either a normal diet (ND) or HFD group and fed for 12 weeks prior to ischemic stroke induction via middle cerebral artery occlusion (MCAO). Neurological function was assessed using the modified neurological severity score (mNSS) and rotarod test on post-MCAO days 1, 3, and 7. Infarct volume was quantified using 2,3,5-triphenyltetrazolium chloride (TTC) staining. Serum levels of corticosterone (CORT), adrenocorticotropic hormone (ACTH), and corticotropin-releasing hormone (CRH) were measured at baseline and multiple time points after MCAO to evaluate HPA axis function. Immunofluorescence staining was performed to assess hypothalamic CRH expression and neuroinflammatory markers, including IBA1 and TUNEL staining in the peri-infarct region. To explore the role of gut microbiota in these effects, 16S rRNA sequencing was conducted to characterize microbial composition changes in the HFD and ND groups. FMT from ND-fed mice and direct AKK supplementation were administered to HFD-fed mice for four weeks prior to MCAO. The effects of these interventions on HPA axis function, gut microbiota restoration, and

stroke recovery were assessed through the aforementioned behavioral, histological, and molecular analyses.

Results: HFD significantly increased body weight and serum cholesterol levels compared to the ND group ($p < 0.05$). HPA axis function was markedly suppressed in HFD-fed mice, as evidenced by significantly reduced serum CORT, ACTH, and CRH levels at baseline and across all post-MCAO time points ($p < 0.05$). Neurological deficits were more severe in HFD-fed mice, with significantly worse mNSS scores and impaired rotarod performance at days 1, 3, and 7 post-MCAO ($p < 0.05$). Infarct volume showed a trend toward enlargement in the HFD group, correlating with suppressed CRH expression in the hypothalamus, increased microglial activation (IBA1+ cells), and enhanced neuronal apoptosis (TUNEL+ cells) in the peri-infarct area ($p < 0.05$). Gut microbiota analysis revealed that HFD significantly altered microbial composition, with a marked reduction in *Akkermansia muciniphila* abundance ($p < 0.01$). FMT and AKK supplementation both partially restored serum CRH and CORT levels and improved neurological function post-MCAO. Notably, while AKK supplementation significantly reduced infarct volume and neuroinflammatory markers, FMT alone did not lead to significant improvements in IBA1 or TUNEL staining, suggesting that specific microbial species, rather than global microbiota restoration, may be key mediators of neuroprotection.

Conclusions: Our findings demonstrate that HFD-induced suppression of the HPA axis contributes to worse ischemic stroke outcomes, characterized by exacerbated neurological deficits, larger infarct volumes, and heightened neuroinflammation. Gut microbiota dysbiosis, particularly the depletion of *Akkermansia muciniphila*, may play a crucial role in mediating these effects. Importantly, targeted microbiota-based interventions such as FMT and AKK supplementation show promise in restoring HPA axis function and improving post-stroke recovery. These results highlight the potential of gut microbiota modulation as a novel therapeutic approach for mitigating diet-induced stroke vulnerability and enhancing neuroprotection. Future research should further elucidate the mechanistic pathways linking gut microbial metabolites to HPA axis regulation and stroke pathology, paving the way for microbiota-based precision medicine strategies in stroke prevention and treatment.

Key Words: Gut-Brain Axis, High-Fat Diet, Ischemic Stroke, Microbiota Restoration

Metal-Free Bone Flap Fixation for Cosmetic Open Neurosurgery

Takashi IIMORI

Department of Neurosurgery, Nadogaya Hospital, Chiba, Japan

(Background)

With the advancement of endovascular treatment, indications for open neurosurgery have become increasingly limited. As a result, cosmetic considerations in open neurosurgery have gained greater importance. Conventional bone flap reconstruction with titanium plates can cause postoperative cosmetic issues such as skin thinning or ulceration. Furthermore, bone defects of the burr holes or the bone flap margin may lead to postoperative scalp depression and negatively impact postoperative quality of life. To address these issues, a bone flap fixation technique that avoids the use of metal implants while maintaining both stability and cosmetic results is desirable.

(Objectives)

We report the technical details and clinical outcomes of a metal-free bone flap fixation method using bioabsorbable devices and calcium phosphate bone paste at our institution.

(Methods)

We retrospectively reviewed the patients who underwent frontotemporal craniotomy with bone flap fixation using bioabsorbable materials and calcium phosphate bone paste between April 2022 and May 2024 at our institution. To reduce bony defect, the number of burr holes was minimized. During the craniotomy, the frontal edge of the bone flap was cut obliquely to ensure a stable fit at fixation. For fixation, the frontal edge of the bone flap was secured with 2-0 silk sutures or 2-0 absorbable sutures, and bioabsorbable cranioplastic devices were used at the temporal edge. Calcium phosphate bone paste was used to fill bone defects of the burr holes or the bone flap margin. Postoperative computed tomography scans (CT) were used to evaluate bone flap reconstruction, and cosmetic concerns were assessed retrospectively through medical record review.

(Results)

In all cases (n=167), postoperative CT demonstrated proper reconstruction of the bone flap. No flap displacement or instability were observed during follow-up. Patients reported no complaints regarding the cosmetic results of bone fixation.

(Conclusions)

Our method achieved both reliable bone flap fixation and satisfactory cosmetic outcomes.

Room B (La Vie B):
Brain tumors & Others

Clinical and Surgical Perspectives on Endoscopic Endonasal Biopsy for Autoimmune Hypophysitis

Atsushi Tsukiyama[1]、Shigeyuki Tahara[1]、Kosuke Miwa[1]、Eitaro Ishisaka[1]、Yasuo Murai[2]

1Nippon Medical School MusashiKosugi Hospital, Department of Neurological Surgery
2 Nippon Medical School Hospital, Department of Neurological Surgery

[Introduction] Advances in imaging techniques and the emergence of new biomarkers have made the diagnosis of autoimmune hypophysitis increasingly feasible. However, given the wide range of sellar lesions, including malignancies, there remain cases in which histopathological diagnosis is indispensable. In this presentation, we describe the indications, surgical techniques, and precautions for endonasal biopsy in cases of autoimmune hypophysitis. **[Methods and Results]** Biopsy is rarely required in lymphocytic adenohypophysitis (LAH), which typically occurs during late pregnancy or the postpartum period. However, in cases with significant visual impairment, endonasal surgery to open the sellar floor and incise the pituitary dura often leads to dramatic symptom improvement, even with partial biopsy of the anterior pituitary. On the other hand, biopsy for lymphocytic infundibulo-neurohypophysitis (LINH) requires a more tailored approach. As lesions usually involve the posterior pituitary and pituitary stalk, direct access to the stalk via the planum sphenoidale is generally avoided due to the risk of cerebrospinal fluid leakage. In our approach, the posterior sellar floor is extensively drilled, and the dura widely opened. Partial resection of the posterior portion of the anterior pituitary exposes the whitish posterior lobe tissue, from which biopsy samples are then obtained. In cases of IgG4-related hypophysitis, associated inflammation of surrounding dura and concurrent sinusitis may be present. Thus, both the pituitary dura and sphenoid sinus mucosa should also be submitted for pathological examination.A detailed understanding of sellar anatomy and precise communication with the pathologist regarding the anatomical origin of each specimen is crucial. Furthermore, wide exposure of the sella and pituitary dura may occasionally lead to incidental discovery of coexisting lesions. In our experience, we encountered cases of IgG4-related hypophysitis coexisting with pituitary neuroendocrine tumor, and LINH with concurrent Rathke's cleft cyst. **[Conclusion]** We report on endonasal biopsy for autoimmune hypophysitis. As this is not surgery for neoplastic lesions, the procedure must be minimally invasive and carefully tailored. Multiple intraoperative considerations are essential to achieve safe and diagnostic outcomes.

Dual novel compounds destroy mitochondrial morphology and function to treat glioblastoma by promoting the p62-mediated protein degradation of mitochondrial respiratory chain complex I

Xiaoteng Cui[1], Hanxi Xu[1], Chunsheng Kang[1]
[1] Lab of Neuro-oncology, Tianjin Neurological Institute, Tianjin Medical University General Hospital, Tianjin 300052, China

Objective: Glioblastoma (GBM) is the most notorious malignancy in the central nervous system, characterized by invasive growth, resistance to conventional radio-and chemo-therapy, and frequent recurrence. GBM patients exhibit rapid progression and poor prognosis, with a median survival time of 14.4 months, despite surgical resection combined with radiotherapy and temozolomide (TMZ) - based chemotherapy since the first diagnosis. Previously, we have developed two novel compounds: EPIC-1027 against the complex of HOTAIR/PRC2, and EPIC-1042 against the binding of PTRF and CAV1. In this study, we aim to develop a novel combinational therapeutic strategy by targeting mitochondria for GBM management.

Methods: Transcriptome data of clinical glioma sample were analyzed to establish a novel prognostic predictive signature. Quantitative proteomics was employed to assess the whole-cell changes of EPIC-1027 and EPIC-1042 treatment at the protein level. Cyclohexane, chloroquine, and MG132 were used to figure out the protein degradation pathway. Super-resolution microscope and transmission electron microscope were utilized for clarify the change of mitochondrial morphology after stimulation of EPIC-1027 and EPIC-1042. Seahorse analysis and JC-1 staining were performed to evaluate the energy production and membrane potential. CCK-8, EdU assay, and Annexin V kit were performed for evaluation the levels of cell proliferation and apoptosis in the treatment of EPIC-1027 and EPIC-1042. Intracranial GBM mouse model was constructed to verify the anti-GBM effect of EPIC-1027 and EPIC-1042 treatment in vivo.

Results: The PH signature integrated by the expression patterns of HOTAIR and PTRF in glioma samples was an independent hazardous factor on the malignant degree of GBM and prognostic prediction of GBM patients. Combined treatment of EPIC-1027 and EPIC-1042 could display a synergetic effect on significantly inhibiting GBM proliferation and promote apoptosis in vitro. Mice with othotopic GBM had a slowing tumor growth, a prolonged survival time after the treatment of EPIC-1027 and EPIC-1042. Mechanically, EPIC-1027 and EPIC-1042 combined treatment could significantly reduce the protein level of NDUFB8, a crucial member of mitochondrial respiratory chain complex I, by facilitating its degradation in the p62-dependent manner, leading to the inhibition of respiratory chain complex I and decrease of high mitochondrial membrane potential. GBM cells with stimulation of EPIC-1027 and EPIC-1042 had injured mitochondria, exhibiting vanished mitochondrial cristae and swelling morphology. The functions of glycolysis and oxidative phosphorylation were largely diminished after GBM cells were treated with EPIC-1027 and EPIC-1042.

Conclusions: Our study demonstrate that combinational treatment of EPIC-1027 and EPIC-1042 could give rise to mitochondrial deformity and dysfunction, resulting in decreased proliferation and increased apoptosis in GBM treatment, providing a novel drug combination for targeted mitochondrial therapy of GBM.

Application of multimodal image three-dimensional reconstruction combined with neuronavigation in the operation of gliomas in eloquent regions

Jun Yang

Department of Neurosurgery, Peking University Third Hospital, Peking University

Objective: To investigate the role of three-dimensional reconstruction of multi-modal images combined with neuronavigation in the operation of gliomas in eloquent regions.

Methods: A retrospective analysis was conducted on the clinical data of 30 patients with gliomas in eloquent regions who underwent surgical treatment at the Department of Neurosurgery of Peking University Third Hospital from April 2018 to March 2021. Before surgery, the patient's skull MRI with enhancement, diffusion tensor imaging (DTI), and CT angiography (or magnetic resonance angiography) data were fused to reconstruct nerve tracts, tumors, blood vessels, skulls and other structures, so as to design the optimal surgical path, and used in neuronavigation to guide tumor resection. Degree of tumor resection was evaluated by using MRI results 72 hour post operation. One week, one month, and three months after surgery, the Boston Diagnostic Aphasia Examination (BDAE) was used to assess language function, and the simplified Fugl-Meyer Assessment (FMS) was used to assess motor function.

Results: Through the three-dimensional image reconstruction, the anatomical relationship in all patients between the tumor and surrounding important structures such as nerve tracts, arteries and veins were clearly shown, the displacement and destruction of the nerve tracts were clarified, and the blood supply arteries and drainage veins were shown. Among the 30 patients, the tumor involved the motor area in 21 cases and language area in 25 cases. Totally resection was achieved in 28 cases (93.3%) and subtotal resection in 2 cases (6.7%). Among the 21 patients with preoperative neurological deficits, at the last follow-up, 20 patients had improved neurological function after surgery, and 1 patient had unchanged neurological function compared with presurgical conditions. Nine patients who had no neurological deficits before surgery developed transient symptoms related to neurological deficits after surgery, which resolved after 1 week.

Conclusion: The use of multimodal images to three-dimensionally reconstruct tumors and surrounding nerve fiber bundles, blood vessels and other important structures, so as to design surgical approaches and apply them to intraoperative navigation to guide the operation, could help protect the eloquent brain area and improve the efficacy of surgery.

TRIM25 promotes temozolomide resistance in glioma by regulating oxidative stress and ferroptotic cell death via the ubiquitination of keap1

Jianwei Wei[1] 魏建伟, Liwei Ma[2] 马丽伟 and Xianzhi Liu[1] 刘献志
1. Department of Neurosurgery, The First Affiliated Hospital of Zhengzhou University, Zhengzhou 450052, China. 中国，河南省郑州市，郑州大学第一附属医院神经外科
2. Department of Clinical Laboratory, The First Affiliated Hospital of Zhengzhou University, Zhengzhou 450052, China. 中国，河南省郑州市，郑州大学第一附属医院检验科

Objective： This study aimed to investigate the role of TRIM25 in temozolomide (TMZ) resistance in glioma, focusing on its regulatory mechanism involving oxidative stress and ferroptosis via ubiquitination of Keap1 and activation of the Nrf2 pathway.

Methods

(1) Bioinformatics analysis: TRIM25 expression in glioma tissues was analyzed using GEPIA and CGGA databases.

(2) In vitro experiments: TRIM25 was knocked down or overexpressed in glioma cell lines (U87, U251, T98G, LN18) to assess TMZ sensitivity, apoptosis, ROS levels, and ferroptosis markers (MDA, GSH, SLC7A11, GPX4).

(3) Mechanistic studies: Co-IP, ubiquitination assays, and CHX chase experiments determined TRIM25's role in Keap1 degradation and Nrf2 nuclear translocation.

(4) In vivo validation: An orthotopic glioma mouse model was used to evaluate tumor growth and TMZ resistance following TRIM25 knockdown.

Results

(1) TRIM25 was upregulated in high-grade gliomas and correlated with poor prognosis.

(2) TRIM25 knockdown enhanced TMZ-induced ferroptosis, increasing ROS accumulation and lipid peroxidation while reducing GSH levels.

(3) TRIM25 promoted Nrf2 activation by ubiquitinating and degrading Keap1, thereby suppressing oxidative stress.

(4) Nrf2 knockdown reversed TRIM25-mediated TMZ resistance, confirming the dependence on the Keap1-Nrf2 pathway.

(5) In vivo, TRIM25 silencing sensitized gliomas to TMZ, reducing tumor growth and improving survival.

Conclusion

TRIM25 drives TMZ resistance in glioma by ubiquitinating Keap1, leading to Nrf2 activation, which suppresses oxidative stress and ferroptosis. Targeting TRIM25-Keap1-Nrf2 signaling may provide a novel therapeutic strategy to overcome chemoresistance in glioblastoma.

Keywords

Glioma, TRIM25, Temozolomide resistance, Ferroptosis, Keap1/Nrf2 pathway

Intracranial Solitary Fibrous Tumor: Clinical and Prognostic Study of 36 Cases

Zhan Tianxiang
The first affiliated hospital, school of medicine, zhejiang university

KeyWords： Solitary fibrous tumor, Tumor interventional embolization therapy, stereotactic radiation therapy

Background
Solitary fibrous tumors (SFTs) are rare mesenchymal tumors that occasionally occur in the central nervous system (CNS).
Methods
We reviewed 36 patients admitted to our institution between 2007 and 2024 with CNS solitary fibrous tumors. We reviewed and analyzed patient profiles, such as demographics, presentations, imaging studies, extent of resection, and adjuvant treatment. Differences between malignant and benign SFTs were assessed using the $\chi 2$ test or Student's t-test. Kaplan-Meier analysis was used to estimate the overall survival(OS) and progression-free survival (PFS) rate. The multivariate Cox regression analysis was performed to evaluate the possible predictive value of the DFS rate of the previously mentioned covariates.
Results
A total of 20 men and 16 women were enrolled in the study (the average age was 49.85). The median follow-up time was 62 months. 24 patients underwent gross total resection (GTR), and 10 patients received a subtotal resection (STR). The tumors in 16 patients (44.4%) were malignant. 7 patient (19.4%) suffered SFT-related death (multiple organ failure by tumor metastasis), and 14 patients (38.8%) experienced tumor recurrence. We found that location of tumor at skull base / parasagittal area ($P < 0.001$) and STR ($P < 0.001$) were negatively associated with the PFS rate, interventional embolization therapy ($P < 0.001$) and Gamma Knife surgery (GKS) ($P < 0.001$) were positively associated with the PFS rate. Tumor interventional embolization therapy ($P < 0.001$) was positively associated with surgical resection rate and intraoperative blood loss.
Conclusion
CNS SFTs are rare, slow-growing, less aggressive, and recrudescent tumors. Complete resection is the most effective therapy. Interventional embolization therapy and stereotactic radiation therapy may be effective adjuvant therapy for prolonging progression-free survival.

Room B (La Vie B):
Pediatric Neurosurgery/Interventional Neurosurgery

Flow Diverters in the Treatment of Pediatric Giant Dissecting Intracranial Aneurysms

Authors：Xi'ao Wang , Shancai Xu

Department of Neurosurgery, The First Affiliated Hospital of Harbin Medical University

Purpose: Recent advancements in flow diverters (FDs) have significantly improved the management of complex intracranial aneurysms, especially challenging types such as large, giant, and dissecting aneurysms that are difficult to treat with conventional stents. Although there has been extensive research on FDs in adults, their efficacy in pediatric patients, particularly those with giant dissecting aneurysms, remains less explored. These aneurysms are exceedingly rare in children but can critically affect their growth and development. This article aims to share insights from our center's experience with FDs in pediatric cases, highlighting their potential to reduce rupture risks and aid in natural healing.

Method: This retrospective study details the treatment and outcomes of two pediatric cases involving male children diagnosed with giant dissecting aneurysms. The first case involved a child with persistent head and neck pain who was diagnosed via computed tomography (CT) and digital subtraction angiography (DSA) with a dissecting aneurysm in the V4 segment of the right vertebral artery. A 4.25 mm x 35 mm Pipeline FD was deployed using a Synchro-14 micro-wire and a Marksman catheter. The second case involved a child who had experienced intermittent headaches for over a year and was diagnosed with a dissecting aneurysm in a branch of the right middle cerebral artery. A 3.5 mm x 35 mm Tubridge FD was placed in the M3 segment using similar equipment. Both cases were closely monitored for deployment and immediate postoperative outcomes, with particular attention to contrast retention which indicates the stent's positional stability and vessel coverage.

Results: Post-surgery, both patients were treated with steroids, fluid management, and oral antiplatelet therapy to reduce the risk of thrombosis and facilitate recovery. Initial magnetic resonance imaging (MRI) and diffusion-weighted imaging (DWI) scans showed no procedural complications, and both patients were discharged with a modified Rankin Scale (mRS) score of 0, indicating no symptoms or significant disability. However, complications arose in the first child, who returned with symptoms including dizziness and vomiting, linked to an occlusion in the Pipeline FD and a new ischemic cerebellar lesion. After further treatment, he was discharged with an mRS of 1. The second child, at a six-month follow-up, showed no symptoms despite an artery occlusion and was discharged with an mRS of 0.

Conclusion: The experiences with these two pediatric cases demonstrate the utility of FDs in managing complex intracranial aneurysms in children. However, they also emphasize the need for meticulous patient selection and the importance of further studies to validate the safety and efficacy of FDs in larger pediatric cohorts. Our findings suggest that while FDs hold promise, careful monitoring and management of potential complications are crucial to achieving successful outcomes.

Hemorrhagic complications of mechanical thrombectomy for acute ischemic stroke: general managements & perspectives

Fumitaka Yamane[1)], Hiroshi Itokawa[2)], Tatsuya Tanaka[2)], Kimihiro Nakahara[2)], Hiroshi Nakaguchi[1)], Shynsuke Doi[1)], Eiichi Suehiro[2)], Kenichi Oyama[3)], Shinya Kohyama[4)], Akira Matsuno[2)]

1) International University of Health and Welfare Atami Hospital
2) International University of Health and Welfare Narita Hospital
3) International University of Health and Welfare Mita Hospital
4) Department of Endovascular Neurosurgery, Saitama Medical University International Medical Center

[Background] Mechanical thrombectomy (MT) is an effective treatment for acute ischemic stroke with large vessel occlusions (LVO). On the other hand, MT carries the risk of hemorrhagic complications (HC). In this study, we analyzed the associated factors of HC, with particular attention to intraoperative factors.

[Methods] Three hundred and sixteen patients underwent mechanical thrombectomy, 195 males and 121 females, average age was 75.2 years. Clinical and technical complications were retrospectively collected. Related factors were extracted from surgical records and examined factors in relation to bleeding complications.

[Results] The HC group consisted of 38 cases. The mean age was 77.9 years, older than that of the uncomplicated (non-HC) group (74.8 years), but not significant (p=0.158). No significant association was found among site of occlusion, infarct breakdown, National Institutes of Health Stroke Scale (NIHSS), Alberta Stroke Program Early CT Score (ASPECT), methods of MT and time to recanalization factors. Only modified Thrombolysis In Cerebral Infarction (mTICI) score showed a significant large number of TICI 2B in the HC group and TICI 3 in the non-HC group. Among the 38 patients in the HC group, 24 (63.1%) were related to intraoperative procedures. There were 17 cases of extravascular leakage due to device manipulation, 11 of which did not affect the prognosis. There were 9 cases of postoperative hemorrhagic complications unrelated to the procedure. Five patients had postoperative reperfusion deficits, five required external decompression, and three died. One patient had a fatal brainstem hemorrhage and one had a fatal subarachnoid hemorrhage 2 hours after procedure.

[Conclusions] The factor that was associated with HC was the degree of recanalization, mTICI 2B or less. The patients who had a longer recanalization time, especially if the procedure was terminated at mTICI 2B, were considered to require more rigorous postoperative management. Particular attention should be paid to the presence of cases of major bleeding after reopening.

Does filum terminale resection work in symptomatic occult tethered cord syndrome in children？104 cases follow-up

Wang Jingsheng; Zhang wei; Liu Minggang
Department of Neurosurgery, Shenzhen Children's hospital, Shenzhen, China
Email: jingsheng-wang@foxmail.com

OBJECTIVE Occult tethered cord syndrome (OTCS) in children comprises three main symptoms: enuresis, urine leakage during daytime, and fecal incontinence, which differs from the back pain and lower limb symptoms in adults. Because natural history of the disease is unclear, the indications for preventive surgery are especially controversial, even limited studies in surgery effectiveness on symptomatic OTCS.
METHODS The authors reviewed 104 pediatric patients with symptomatic OTCS (69 male, 35 female) treated with a novel improved filum terminale resection. All patients diagnosed with clinical and MRI criterias. A questionnaire was designed to collect pre-OP and follow-up information.
RESULTS Mean follow-up time is 2.6 yrs, with 72 patients have clinical improvement(69%), 30 stay stable(29%), 2 patients worse(2%). No CSF leakage or infection after surgery. Mean average time to improvement is 3.6 months, which shows negative correlation with age of surgery. Pre-OP prone-position MRI showed advancement of filum terminale correlates with surgical outcomes.
CONCLUSIONS The short-term curative effect and safety of the improved minimally invasive surgery is confirmed. The clinical manifestation aided by the prone and supine position MRIis the most effective method for diagnosing OTCS but still has some limitations in predicting surgical outcomes of OTCS patients.
KEYWORDS Occult tethered cord syndrome; untethering surgery; filum terminale resection; prone-position MRI; surgical outcomes.

Mechanical thrombectomy for acute stroke with large ischemic lesion

Authors: Yuichiro Tsuji, Ryo Hiramatsu, Masahiko Wanibuchi
Affiliation: Department of Neurosurgery, Osaka Medical and Pharmaceutical University, Takatsuki, Osaka, Japan
E mail: yuuichirou.tsuji@ompu.ac.jp

[Background]
Randomized clinical trials have demonstrated the efficacy and safety of Mechanical thrombectomy (MT) for acute ischemic stroke with large ischemic lesions.
[Objective]
In this study, we investigated the outcome of MT in patients with large infarct at presentation.
[Methods]
We enrolled patients with acute ischemic stroke with diffusion weighted imaging (DWI) -ASPECTS ≦5 who underwent MT from January 2015 to December 2024 in our hospital. We retrospectively compared patients with a good outcome [modified Rankin Scale (mRS): 0-3] and those with a poor outcome (mRS 4-6) at 3 months.
[Results]
A total of 90 patients were included in the analysis, and 26 (28.8%) had a good outcome at 3 months. There were 22 cases with DWI-ASPECTS 3 scores, of which 3 (13.6%) had a good outcome. Multivariate regression analysis revealed that older age (odds ratio [OR] 1.09; 95 CI 1.01-1.17; P=0.010), lower DWI-ASPECTS score (OR 0.32 [95% CI 0.13-0.77; P=0.005), and occlusion in the dominant side hemisphere (OR 3.8 [95% CI 0.97-15.6; P=0.045) were independent factor associated with clinical outcome after MT.
[Conclusion]
The study showed that about 30% of patients had a favorable outcome, which is comparable to the RESUCE Japan LIMIT study. This result suggested that patients with DWI-ASPECTS scores of 3 or less were less likely to have a favorable outcome.

Surgical strategies for children with epileptic spasms

Yiou Liu 1 , Wenjing Zhou 1 , Bo Hong 2 , Haixiang Wang 1 , Jiuluan Lin, Zhaohui Sun 1 , Siyu Wang

Objective. To investigate surgical prognostic factors in order to establish a surgical plan for children with drug-resistant epileptic spasms.

Methods. We retrospectively analysed 64 children with drug-resistant spasms who were operated on in Beijing; the electroclinical features, surgical procedures, and surgical outcomes of these children were discussed in detail. We divided the seizure-free patients into several groups according to imaging, aetiology, and application of stereo-electroencephalography in order to investigate the extent of the various influencing factors.

Results. Fifty-three (82.8%) patients had favourable outcome, and 11 (17.2%) had unfavourable outcome. Based on the univariate analysis, the factors associated with favourable seizure outcome were interictal high γ frequency (χ 2 = 4.161; p = 0.041), concordance between MRI and interictal epileptic discharges (IEDs) (χ 2 = 6.148; p = 0.013), and concordance between PET and IEDs (χ 2 = 4.281; p = 0.039). Concordance between MRI and IEDs (OR = 0.083, 95% CI = 0.014–0.483; p = 0.006) and continuous discharges on electrocorticography (OR = 0.109, 95% CI = 0.019–0.639; p = 0.014) were important factors associated with a favourable surgical outcome.

Conclusion. Resective surgery is an effective treatment for drug-resistant ES in children. A deeper understanding of the predictors of seizure outcome is beneficial for establishing a standard, one-stage resection procedure for spasms in order to benefit more patients who have not previously considered surgery. We propose a workflow for presurgical evaluation in children with epileptic spasms.

Three-dimensional microcatheter shaping using touch screen devices for cerebral aneurysm coil embolization

Atsushi Ogata[1], Hajime Maeyama[1], Akihiko Momozaki[1], Hiroki Namikawa[1], Shoma Ohmaru[1], Hiroshi Ito[1], Fumitaka Yoshioka[1], Jun Masuoka[1], and Tatsuya Abe[1]

[1]Department of Neurosurgery, Faculty of Medicine, Saga University, Saga, Japan

Abstract

Introduction: In cerebral aneurysm coil embolization, proper microcatheter shaping is crucial to reduce complications and achieve sufficient embolization. Shaping a microcatheter in three dimensions (3D) is often required but can be challenging. We assessed the usefulness of a novel shaping on screen (SOS) method that displays real-size 3D rotational angiography (RA) images on a touch screen device during cerebral aneurysm embolization to facilitate 3D microcatheter shaping.

Methods: In this study, 18 patients with cerebral aneurysm treated with this technique were included. Real-size 3D-RA images obtained during the embolization procedure were displayed on the touch screen device, which allowed for real-time manipulation. The shape of the microcatheter was adjusted to conform to the curvature of the vessel by swiping the touch screen device and bending the mandrel accordingly. We assessed the clinical and angiographic results, along with the accuracy and stability of the microcatheter.

Results: No procedure-related complications were observed. The mean packing density was 41% ± 12%. In all but one case, microcatheters were inserted into the aneurysms without guidewire assistance. After coiling, all microcatheter forms were stable.

Conclusions: 3D microcatheter shaping using touch screen devices during cerebral aneurysm coil embolization may be simple and safe and can achieve high packing density of aneurysms.

Keywords: cerebral aneurysm, microcatheter, shaping

Efficacy Evaluation of Unilateral Interlaminar Approach for Filum Terminale Section in the Treatment of Tethered Cord Syndrome in Children: A Single-Center Study

Chen cheng
Department of Neurosurgery, Guangzhou Women and Children's Medical Center, National Children's Regional Medical Center (South Central China)

Key Words Unilateral interlaminar approach, Filum terminale section, Tethered Cord Syndrome (TCS), Minimally invasive surgery

Abstract

Tethered Cord Syndrome (TCS), a congenital disorder caused by fibrofatty infiltration of the filum terminale leading to longitudinal spinal cord traction, accounts for 60%-70% of pediatric spinal developmental anomalies. Traditional surgery involves laminectomy (L5/S1 level) to expose the filum terminale, which effectively releases traction but risks postoperative biomechanical imbalance (e.g., progressive lordosis) and recurrent pain due to epidural adhesions at the laminectomy site. Recently, minimally invasive interlaminar approaches have been attempted for TCS, yet their safety and impact on spinal growth in children require further evidence.

Objective

To prospectively validate the advantages of the unilateral interlaminar filum terminale section over traditional laminectomy in perioperative trauma, spinal stability, and neurological outcomes, thereby clarifying its clinical value in pediatric TCS.

Methods

. **Study Design**: Single-center retrospective cohort study (November 2017 to January 2025).

. **Inclusion Criteria**:

• Age: 6 months–18 years, MRI-confirmed filum terminale-type TCS (filum diameter ≥2 mm or fatty infiltration).

• Exclusion: Patients with myelomeningocele, spina bifida, or prior lumbar surgery.

. **Grouping and Procedures**:

• **Traditional Group** (n=30): Under general anesthesia, a posterior midline incision exposed the L5/S1 level. Spinous processes and laminae were removed; the filum terminale was dissected and sectioned microscopically with bipolar coagulation.

• **Minimally Invasive Group** (n=99): A 2.0 cm posterior midline incision centered on the left L2-L3/L3-L4 interlaminar space was made. Paraspinal muscles were dissected while preserving supraspinous/interspinous ligaments. After laminotomy, the dura was incised longitudinally. Multimodal intraoperative neurophysiological monitoring (somatosensory/motor evoked potentials + sphincter electromyography) confirmed the absence of neural fibers (stimulation threshold >2.0 mA) before filum sectioning. Dura was sutured with 7-0 Prolene.

Results

. **Baseline Characteristics**: No significant differences in age (minimally invasive: 1.8±0.7 vs. traditional: 2.1±0.9 years, p=0.12), sex ratio (male: 62.6% vs. 60.0%, p=0.79), or preoperative neurological scores.

. **Perioperative Outcomes**:

• **Minimally Invasive Advantages**: Incision length reduced by 50% (2.0 cm vs. 4.0 cm), shorter operative time (58.1±14.6 vs. 94.3±38.2 min), and hospital stay (6.5±1.1 vs. 11.8±3.2 days).

• **Complications**: No cerebrospinal fluid (CSF) leakage or infections in the minimally invasive group. Traditional group: 1 CSF leak, 2 cases of incisional fat liquefaction.

• **Postoperative Recovery**: Minimally invasive group resumed spontaneous urination within 6 hours without catheters; traditional group required catheters for 5.2±1.3 days (3 cases extended to 7 days due to retention).

Conclusion

The unilateral interlaminar approach achieves comparable neural decompression to traditional laminectomy with minimal trauma and avoids spinal instability risks, making it a preferred option for pediatric filum terminale-type TCS. Further randomized trials are warranted to evaluate its long-term effects on adolescent spinal growth.

Issues surrounding mechanical thrombectomy

Tsuyoshi Ohta
Department of Neurosurgery
Kobe City Medical Center General Hospital

In 2015, five randomized trials, MR CLEAN, ESCAPE, REVASCAT, SWIFT PRIME, and EXTEND IA, showed the efficacy of mechanical thrombectomy over standard medical care in patients with acute large vessel occlusion of the proximal anterior circulation arteries. In the meta-analysis of those trials by the HERMES collaborators, mechanical thrombectomy led to significantly reduced disability at 90 days compared with control, and the number needed to treat to reduce disability by at least one level on mRS was 2.6. Furthermore, its efficacy is also shown for patients who are last known to be well 6 to 24 hours earlier with a clinical or tissue mismatch, who can be treated within 24 hours of moderate to severe stroke caused by a basilar artery occlusion with pc-ASPECTS score of ≥6, or with large core infarcts, leading to an expansion of its indications. The number of treatment cases in Japan was about 7,000 annually in 2016, but it exceeded 10,000 in 2017 and 15,000 in 2020 and keeps growing.

However, various issues have become apparent with the significant increase in the number of cases. The 2025-reported trials (ESCAPE-MeVO and DISTAL) did not show the benefits of mechanical thrombectomy for patients with stroke due to medium-vessel occlusion. Others include the type of anesthesia, combined use of intravenous tissue plasminogen activator, better reperfusion efficacy with first-pass effect than multiple-pass effect, futile recanalization of as high as 50% defined as having a poor 90-day prognosis despite achieving successful reperfusion, failed reperfusion of approximately 8 to 30 % of cases, the treatment strategies for non-embolic or atypical occlusion such as intracranial artery intracranial atherosclerotic disease, dissection, or tandem occlusion, the optimal selection and combination of various conventional thrombectomy devices such as stent retriever or aspiration catheters, and the cost-effectiveness considering patient backgrounds such as older age, pre-stroke morbidity, and cancer-related stroke. These issues remain undetermined and should be decided based on individual patient risk factors, preferences, and institutional experience. This presentation will summarize these issues and discuss prospects.

Room B (La Vie B):
Functional Neurosurgery, Neurodegenerative disease & others

Retrospective study of superficial siderosis and intracranial hypotension

Hidetaka ARISHIMA
S. Kawajiri, S Yamada, K. Kikuta
Department of neurosurgery, University of Fukui

Background: It is known that many cases of superficial siderosis (SS), which presents with neurological deficits such as hearing loss, cerebellar ataxia, and pyramidal symptoms, have small dural defects on the ventral side of the spinal cord, resulting in the accumulation of cerebrospinal fluid (CSF) outside the spinal dura mater. On the other hand, some cases of intracranial hypotension (IH) also present with CSF leakage to the epidural space of the spinal cord. These diseases are thought to be related to abnormalities in the dura mater, and were proposed by Kumar as "Duropathy." We investigated the similarities and differences between cases of SS and IH in our hospital.
Subjects and Methods: The subjects were 14 cases of SS and 5 cases of IH treated at our hospital, and the clinical and neuroradiological findings of these cases were retrospectively examined.
Results: Headache was observed in 5/14 cases of SS and all cases of IH, but the headache in SS was mild. Low cerebrospinal pressure was found in 5/14 cases of SS and all cases of IH. Hearing impairment was severe in 11/14 cases of SS and 1/5 cases of IH. Subdural hematoma was observed in 3/5 cases of IH, and 4/14 cases of SS had a history of surgery for chronic subdural hematoma of unknown cause. Spinal epidural CSF collection was observed in 13/14 cases of SS and 5/5 cases of IH, but epidural CSF collection in 3 cases of IH was also present on the dorsal side. Dural defects which could be confirmed by MRI or myelo-CT were found in 12/14 SS cases and 1/5 IH cases, and dural closure was performed in 6/14 SS cases and 1/5 IH cases.
Discussion: While some SS cases have the similar characteristic findings seen in IH, the clinic-radiological findings of SS are diverse, suggesting a complex pathology.
Conclusion: Some cases of IH may progress to SS over the course of many years, so long-term follow-up is necessary. In cases where large dural defects are confirmed by IH, dural closure may be considered early.

Keyword: superficial siderosis, intracranial hypotension, dural defect

The key to PBC success: Pear or Banana?

PBC 手术中“梨”真那么重要吗？

Zhong Jun

仲骏

Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

上海交通大学医学院附属新华医院神经外科

Objective:

The percutaneous balloon compression (PBC) procedure treats trigeminal neuralgia by compressing the Gasserian ganglion in Meckel's cave. On lateral fluoroscopy, a pear-shaped contrast-filled structure mainly consists of regenerative trigeminal rootlets, with a smaller, crescent-shaped, non-renewable ganglion (‘banana’) at its base. To minimize recurrence, it is essential to apply targeted pressure specifically to the ganglion. This paper aims to demonstrate that the bottom-boosted PBC process may help reduce recurrence.

Methods:

From Jan 2019 to Oct 2023, a total of 371 consecutive cases of PBC were performed by the senior author (JZ) at XinHua Hospital. The cases were divided into two groups based on the operative strategy, excluding those with missing follow-up or unsuccessful pear shape achievement intraoperatively. Group Pear comprised those who achieved a typical pear shape using the traditional technique; Group Banana, included those who underwent adjustments of the balloon position after visualizing a pear shape, followed by retraction until a headless pear emerged.

Results:

A total of 328 participants were ultimately enrolled in this study, comprising 92 individuals in group Pear and 236 in group Banana. The early efficacy of PBC was 95.7% in group Pear versus 99.2% in group Banana ($P>0.05$), declining to 75.0% and 92.4%, respectively, one year later ($P<0.01$). Immediate ipsilateral numbness rates were 60.9% in group Pear and 43.2% in group Banana ($P<0.01$), decreasing to 10.9% and 9.7%, respectively, after one year ($P>0.05$).

Conclusion:

A pear-shaped configuration indicates successful balloon entry into Meckel's cave. To prevent recurrence and reduce complications, compression should focus on the base rather than the apex of the pear.

Keywords:

Percutaneous balloon compression, Trigeminal neuralgia, Operation, Ganglion, Pear

Staged Bilateral MR-Guided Focused Ultrasound Pallidothalamic Tractotomy for Parkinson's Disease

Author Details

Xin. He[1], Longsheng. Pan[1];

[1]*Departments of Neurosurgery, PLA General Hospital, Beijing, China*

Objective

Since 2011, pallidothalamic tractotomy (PTT) has been employed as a therapeutic intervention for Parkinson's disease (PD) using magnetic resonance-guided focused ultrasound (MRgFUS). We aimed to investigate the Safety and Effectiveness of Staged Bilateral PTT-MRgFUS for PD.

Methods

Thirteen consecutive patients suffering from chronic (mean disease duration 9.0 years) and therapy-resistant PD were treated unilaterally with PTT MRgFUS. Eleven received operation of the second side. The primary endpoints comprised Unified Parkinson's Disease Rating Scale (UPDRS) scores assessed during both on- and off-medication states, along with adverse events recorded at baseline, 1 week, 1 month, 3 months, 6 months, and 12 months post-treatment.

Results

The mean duration between baseline UPDRS score and 1 year after the second side was 13.5 months. The UPDRS Part III score off-medication at 1 year after the first PTT was reduced by 37%($p=0.0002$) compared to that at baseline on-medication and 16% after the second PTT($p=0.02$). Percentage reductions of the mean scores comparing 1 year off- with baseline on-medication examinations were 83% for tremor, 63% for rigidity, and 57% for hypobradykinesia. Adverse events such as hypophonia（29%）and fatigue（29%）were mild and improved in post-treatment 3 months.

Conclusion

Our results suggest MRgFUS PTT was a safe and effective intervention for PD patients, in varying symptoms. Additional large-scale studies and long-term outcomes evaluation are needed.

Key words: Parkinson's Disease, Focused Ultrasound, Pallidothalamic Tract

Glymphatic System Dysfunction Assessed by ALPS Index in Subarachnoid Hemorrhage: Implications for Hydrocephalus and Clinical Outcomes

Fumiaki Oka[1], Masatoshi Yamane[2], Takuma Nishimoto[1], Naomasa Mori[1], Reo Kawano[3], Hideyuki Ishihara[1]

1. Department of Neurosurgery, Yamaguchi University Graduate School of Medicine, Ube, Yamaguchi, Japan
2. Department of Radiology, Yamaguchi University Hospital, Ube, Yamaguchi, Japan
3. Data Management and Biostatistics Unit, Innovation Center for Translational Research, National Center for Geriatrics and Gerontology, Obu, Aichi, Japan

Background: The glymphatic system (GS) is essential for clearing metabolic waste from the brain and is implicated in neurodegenerative diseases. Experimental studies have shown that GS dysfunction occurs in subarachnoid hemorrhage (SAH) and contributes to neurological impairment, but clinical evidence is lacking. The analysis along the perivascular space (ALPS) index, derived from MRI diffusion tensor imaging, evaluates water diffusivity in deep white matter and is a marker of GS function. A reduced ALPS index indicates GS dysfunction.

Aim: This study aimed to investigate the presence of GS dysfunction in SAH patients using the ALPS index and to evaluate its impact on clinical outcomes, including the development of hydrocephalus and poor prognosis.

Methods: Patients with SAH due to ruptured cerebral aneurysms underwent MRI at least two weeks after onset. The ALPS index and its association with clinical outcomes were analyzed.

Results: Sixty patients (48 females, median age 69 years [55–78]) were included. MRI was performed on day 21 [18-27] after onset. Poor outcomes at 3 months, defined as a modified Rankin Scale (mRS) score of 3–5, occurred in 16 patients (27%). The ALPS index was significantly lower in the poor outcome group (1.29 [1.16–1.44] vs. 1.09 [0.91–1.17], $p < 0.0001$). Fifteen patients (25%) developed shunt-dependent hydrocephalus, and their ALPS index was also significantly lower (1.28 [1.16–1.43] vs. 0.99 [0.84–1.14], $p < 0.0001$). Causal mediation analysis showed that hydrocephalus significantly mediated the relationship between a low ALPS index and poor prognosis. The total effect (OR: 8.92, $p = 0.038$) and the indirect effect (OR: 3.25, $p = 0.019$) were significant, while the direct effect was not (OR: 2.74, $p = 0.364$). Hydrocephalus mediated 78% of the total effect ($p < 0.001$).

Conclusion: A reduced ALPS index suggests GS dysfunction in SAH patients, which may contribute to hydrocephalus development and negatively impact clinical outcomes.

Key words: subarachnoid hemorrhage, glymphatic system

人参皂苷抑制大鼠脑出血血肿周围区细胞凋亡的作用机制：基于网络药理学与实验验证

Ginsenosides inhibit cellular apoptosis in perihematomal zones of intracerebral hemorrhage in rats: network pharmacology and experimental validation

包义君

Yijun Bao

中国医科大学附属第四医院

The Fourth Affiliated Hospital of China Medical University

Abstract

Objectives: Intracerebral hemorrhage (ICH) is a pathological process featured by abnormal accumulation of blood within brain tissue due to the rupture of intracranial blood vessels. ICH is a cerebrovascular disease with high morbidity, mortality and disability, which seriously jeopardizes human health. Ginsenosides Rb1 and Rg1 are the primary components of ginseng rhizome extract, which have demonstrated various pharmacological functions. This study aims to explore the preliminary molecular mechanism of ginsenosides Rb1 and Rg1 in perihematomal zones of rat intracerebral hemorrhage using network pharmacology-based experiments and to screen the targets of ginsenosides Rb1 and Rg1 in ICH and to reveal their pharmacological and molecular mechanisms of action.

Methods: The drug targets of ginsenosides Rb1 and Rg1 were retrieved from HERB databases. Disease targets of ICH were obtained from Genecard, OMIM, TTD, CTD and Drugbank databases. The intersected targets were evaluated by Kyoto Encyclopedia of Genes and Genomes (KEGG) and Gene Ontology (GO) enrichment analyses. A protein-protein interaction (PPI) network was constructed by intersected targets and visualized by Cytoscape software, enabling the key targets. Molecular docking was utilized to predict binding patterns and affinities. To confirm these targets, an ICH rat model was established through collagenase injection and the effects of ginsenosides Rb1 and Rg1 on the behavior and hematoma were evaluated. Further analysis of key targets and the potential pathways was verified in perihematomal zones using reverse transcription polymerase

chain reaction (RT-PCR) and Western Blot techniques.

Results: A total of 16 and 12 drug targets were obtained for ginsenosides Rb1 and Rg1 in the HERB database, respectively. Meanwhile, 1212 ICH related targets were acquired in the Genecard, OMIM, TTD, CTD, HERB and Drugbank databases. After intersecting ICH and drug targets, 14 potential therapeutic targets were identified. Enrichment analysis showed that ginsenoside Rb1 was mainly associated with apoptosis, angiogenesis, phosphatase binding and MAPK pathways, while ginsenoside Rg1 was mainly associated with apoptosis, cell-mediated immunity, growth factor activity and JAK-STAT pathways. From the PPI network, five key targets directly binding to the two ginsenosides were identified, including FN1, IL1B, TGFB1, SERPINE1 and BCL2. Molecular docking analysis and molecular dynamics simulation revealed that both ginsenosides Rb1 and Rg1 exhibited high affinity for their respective target proteins. Animal experiments demonstrated their inhibitory effects on cellular apoptosis in perihematomal zones of ICH rats. Specifically, Rb1 inhibited the abnormal elevation of IL-1β, p-P38 MAPK and p-ERK1/2, while Rg1 reversed the upregulations of TGF-β1, p-JAK2 and p-STAT3.

Conclusions: Ginsenosides Rb1 and Rg1 play a key role in mitigating ICH by modulating key molecular targets involved in apoptosis and inflammatory pathways. Ginsenosides Rb1 and Rg1 inhibited cellular apoptosis in the perihematomal zones. These anti-apoptotic effects might be differentially attributed to the regulation of IL-1β/P38 MAPK/ERK1/2 pathway by Rb1 and TGF-β1/JAK2/STAT3 pathway by Rg1. These results suggest that both ginsenosides have therapeutic potential in improving motor function and reducing neuronal apoptosis in the context of ICH.

Keyword: Ginsenosides; Intracerebral hemorrhage (ICH); Cellular apoptosis; Network pharmacology; Molecular mechanisms.

Analysis of therapeutic effect of short-term high cervical spinal cord electrical stimulation on patients with consciousness disturbance after long drainage of hydrocephalus

Hongwei Chen*

Department of Neurosurgery for cerebrospinal fluid diseases, Aviation General Hospital, No.3 Anwai Beiyuan Street, Chaoyang District, Beijing 100012, China

*Correspondence: hongwei12@163.com

【 **Abstract** 】**Objective** To investigate the curative effect of short-term high cervical spinal cord electrical stimulation on patients with consciousness disturbance after long-term drainage of hydrocephalus. **Methods** From November 2022 to June 2023, the clinical data of 14 patients with consciousness disorder after long-term cerebrospinal fluid drainage were retrospectively analyzed by short-duration high cervical spinal cord nerve stimulation in the Department of Neurosurgery of our hospital. The cervical spine CT scan was used to determine the location of electrode implantation. Clinical observation was performed 2-3 weeks after surgery, including neurological physical examination and modified Coma Recovery Scale (CRS-R) score. According to the outcome of patients' clinical symptoms and score results, the surgical efficacy was evaluated, which was divided into effective and ineffective. **Results** There were 4 males and 10 females. Mean age 47.5 years; After review, the electrodes of CT14 patients were implanted into the cervical spinal canal epidural of C2 ~ 4. The stimulation parameters of the 14 patients were frequency 5 Hz or 70 Hz, pulse width 210 μs, voltage 1 ~ 5 V, startup time 8 ~ 12 h/d, stimulation mode 15 min and intermittent for 15 min. After 2 to 3 weeks, the curative effect of 14 patients was 10 effective (5 excellent,5 improved),5 ineffective; The overall effective rate was 71.4% (10/14). Hospitalization costs an average of $25,000. **Conclusion** Short-duration high cervical spinal cord stimulation has the advantages of less trauma, early intervention and low cost, and is effective in treating patients who remain unconscious after long-term drainage of hydrocephalus, and can be used as one of the feasible options for early treatment of DOC.

【 **Key words** 】 short-time range; high cervical spinal cord stimulation; Hydrocephalus; disturbance of consciousness; long drainage

* Hongwei Chen，Department of Neurosurgery for cerebrospinal fluid diseases, Aviation General Hospital of China Medical University, No.3 Anwai Beiyuan Street, Chaoyang District, Beijing 100012, China

Tel: 86-010 59520123

Tel: 86-13581529241

Email: hongwei12@163.com

Room B (La Vie B):
Functional Neurosurgery, Intracranial Infection, & Anatomy

Wound dehiscence after epilepsy surgery

Kota Kagawa[1], Go Seyama[1], Akitake Okamura[1], Rofat Askoro[2], Nobutaka Horie[2]

[1]Department of Neurosurgery, Hiroshima University Hospital
[2]Department of Neurosurgery, Graduate School of Biomedical and Health Sciences, Hiroshima University

Objective. Wound dehiscence is a complication of craniotomy in which patients are subjected to additional procedures to achieve wound closure. During surgery for epilepsy, a craniotomy is performed at various sites to cure or palliate seizures in patients with intractable epilepsy. Collaborations between medicine and engineering have provided many surgical devices and materials for various stages of craniotomy, from skin incision to wound closure. The risk factors for wound dehiscence remain undetermined. Here, we attempt to identify risk factors associated with wound dehiscence after surgery for epilepsy.
Methods. We retrospectively reviewed the clinical records and operative notes of consecutive patients with intractable epilepsy who underwent a craniotomy to perform resective or disconnective surgery for epilepsy between 2015 and 2023 in the Department of Neurosurgery, Hiroshima University Hospital, with a minimum follow-up of one year. We conducted a multivariate logistic regression analysis to determine the risk factors for wound dehiscence.
Results. The study population included 174 patients who underwent corpus callosotomy (CC; 70 patients), cortical resection (CR; 65 patients), or cortical resection via intracranial video EEG monitoring (CR via IVEEG; 39 patients). Wound dehiscence occurred in 14 (8.0%) patients. Univariate analysis found that wound dehiscence was associated with CR via IVEEG ($p = 0.0330$), electrocautery scalpels ($p = 0.0037$), T-shaped skin incisions ($p = 0.0216$), dural closure ($p = 0.0002$), and longer operative duration ($p = 0.0088$). Multivariate logistic regression analysis revealed that skin incision using an electrocautery scalpel ($p = 0.0462$, OR: 9.38, 95% CI 1.04–84.74) and dural closure using nonabsorbable dura ($p = 0.0078$, OR: 6.29, 95% CI 1.63–24.31) were independent risk factors for wound dehiscence.
Conclusions. Surgical devices and materials contribute to wound dehiscence after epilepsy surgery. To avoid wound dehiscence, the use of an electrocautery scalpel is not recommended when performing skin incisions, nor is dural closure using a nonabsorbable artificial dura. When dural closure by primary suture or autologous graft is difficult, the use of absorbable artificial dura is recommended.

Key words

- Wound dehiscence
- Epilepsy surgery

Anatomical relationship between cervical sympathetic trunk and common carotid artery at thyroid cartilage level

Weicheng Yuan[1,2], Liang Wang[1],Han Shuo[2]

1.Department of Neurosurgery, Beijing Tiantan Hospital, Capital Medical University, Beijing China

2.Department of Anatomy Teaching, School of Basic Medicine, Hebei Medical University, Hebei China

Email:15633233890m@sina.cn **Tel**：15633233890

Abstract:

During the course of teaching anatomy, we discovered the cervical sympathetic trunk in the carotid sheath. The superior cervical ganglion of the cervical sympathetic trunk crosses the bifurcation of the internal and external carotid arteries and runs posteriorly of the common carotid artery and the internal jugular vein. The relationship between the cervical sympathetic trunk and the common carotid artery of the carotid sheath was studied in 112 healthy volunteers by high-frequency cervical ultrasound. Our results showed that at the thyroid cartilage level, 38.4 % of the cervical sympathetic trunk was proximal to the medial side of the common carotid artery, 29.0 % was posterior to the common carotid artery, and 32.6 % was lateral to the common carotid artery.

Objective：

Based on previous cases of cervical sympathetic trunk variation, we hope to understand and define the anatomical relationship between cervical sympathetic trunk (CST) and carotid sheath common carotid artery in order to reduce the confusion of neck surgery. The objectives of this study were to (1) observe the anatomical variation of CST relative to common carotid artery at thyroid cartilage level using high resolution ultrasound (HRUS), (2) quantify these anatomical relationships, and (3) assess its risk assessment for head and neck surgery.

Methods:

A prospective cohort study of 112 healthy volunteers (224 necks) aged between 20 and 65 years was conducted. The cervical sympathetic trunk (CST) and common carotid artery were observed by high resolution ultrasound (HRUS). The anatomical relationships can be divided into three categories: (1) CST is located medial to the common carotid artery of the carotid sheath;(2) CST is located posterior to the common carotid artery; and (3) CST is located lateral to the common carotid artery. Cohen's κ value was used to assess inter-observer consistency. Statistical analyses included descriptive statistics, chi-square tests for categorical variables, and multivariate logistic regression analysis to identify predictors (age, sex, side).

Conclusion：

Based on the rare variation of cervical sympathetic trunk, the anatomical relationship between cervical sympathetic trunk and carotid sheath of internal carotid artery was analyzed by large-scale imaging evidence, indicating that the position of cervical sympathetic trunk relative to carotid sheath has great variation. These data analysis results bring great reference to Cranial base junction area surgery, carotid endarterectomy, neck lymph node dissection, radiofrequency ablation and other operations and new surgical methods in the future.

Key words: cervical sympathetic trunk, common carotid artery, anatomical variation, ultrasonography, surgical anatomy

中枢神经系统感染治疗过程中孤立颞角形成的危险因素

Risk factors for isolated temporal horn formation during the treatment of central nervous system infections

作者：丛文凯 Wenkai Cong
单位：航空总医院 Aviation General Hospital

Objective: To explore the risk factors for isolated temporal horn formation during the treatment of central nervous system infections.
Method: A total of 150 confirmed patients with central nervous system infections treated in the Cerebrospinal Disease Neurosurgery Department of the Aviation General Hospital from January 2020 to January 2024 were selected. They were divided into an isolated temporal angle group of 36 cases and a non isolated temporal angle group of 114 cases based on whether they had formed an isolated temporal angle. According to the appearance of cerebrospinal fluid, there were 35 cases in the purulent cerebrospinal fluid group and 115 cases in the non purulent cerebrospinal fluid group. Collect general clinical data, laboratory tests, imaging data, etc. of patients, and use univariate and multivariate logistic regression methods to determine the risk factors for isolated temporal angle formation.
Result: The incidence of isolated temporal horn was 24.0% (36/150). The univariate results showed that there was a correlation between cerebrospinal fluid white blood cell count, cerebrospinal fluid red blood cell count, cerebrospinal fluid multinucleated cell proportion, cerebrospinal fluid protein content, cerebrospinal fluid sugar content, pathogenic bacteria being gram-negative bacilli, purulent cerebrospinal fluid, and isolated temporal horn occurrence ($P<0.05$). Multivariate logistic regression analysis showed that red blood cell count in cerebrospinal fluid, purulent cerebrospinal fluid, and the presence of gram-negative bacteria were associated with isolated temporal horn development ($P<0.05$). Gram negative bacilli are more likely to produce purulent cerebrospinal fluid in central nervous system infections ($P<0.05$).
Conclusion: Central nervous system infections caused by gram-negative bacilli are more likely to produce purulent cerebrospinal fluid. The significantly increased cerebrospinal fluid red blood cell count, purulent cerebrospinal fluid, and pathogen of gram-negative bacteria are significantly positively correlated with isolated temporal horn after central nervous system infection.
Keywords: Central nervous system infection, isolated temporal horn, risk factors, purulent cerebrospinal fluid, gram-negative bacteria

Neuromodulation for Postherpetic Neuralgia: Preliminary Experience in a Single Center

Bowen Chang[1]

1. Department of Neurosurgery, The First Affiliated Hospital of USTC, Division of Life Sciences and Medicine, University of Science and Technology of China, Hefei, People's Republic of China

E-mail: changbowen21@163.com

Objective: This retrospective study aimed to evaluate the efficacy and safety of spinal cord stimulation (SCS) and trigeminal semilunar ganglion stimulation (TSGS) in treating postherpetic neuralgia (PHN) and compare the optimal stimulation parameters for both techniques. The study sought to provide insights into the effectiveness of neuromodulation in managing PHN and contribute to personalized treatment approaches.

Methods: A retrospective analysis was conducted on the medical records of 30 PHN patients (18 male, 12 female; mean age 67.06 ± 10.68) who underwent SCS (n=18) or TSGS (n=12) between January 2022 and January 2024 at a single neurosurgical center. Patients had previously received conventional treatments (oral analgesics, physical therapy, nerve blocks) without sufficient pain relief. Efficacy was evaluated using the Visual Analog Scale (VAS) and the Modified Global Impression of Change (MGIC) scale at the last follow-up (minimum 1 month). Optimal stimulation parameters (frequency, pulse width, voltage) were also analyzed.

Results:

- **Pain Reduction:** Postoperative pain significantly decreased in both the SCS and TSGS groups, as measured by VAS scores. The average postoperative VAS score was significantly lower than the preoperative score ($p<0.01$ for both groups). Specifically, average post-op VAS score for patients with body pain who underwent SCS was 2.38 ± 0.98; while average post-op VAS score for patients with facial pain who underwent TSGS was 4.41 ± 0.56.
- **Satisfaction:** The satisfaction rate, based on MGIC, was significantly higher in the SCS group (89%) compared to the TSGS group (77%) ($p<0.05$). This indicates that patients who received SCS for thoracoabdominal pain were more satisfied with their treatment outcomes.
- **Optimal Stimulation Parameters:** Optimal stimulation parameters varied between SCS and TSGS. TSGS required a significantly higher frequency but lower pulse width and voltage compared to SCS. This suggests a need for

personalized parameter adjustments depending on the treatment type and location of the pain.

- **Adverse Events:** No serious adverse events (surgical site infections, hematoma, electrode fracture, migration, bowel or bladder dysfunction) were reported during the follow-up period of 1 to 24 months (mean: 10.13 ± 5.58 months). Four patients experienced pain recurrence, all in the TSGS group.

Conclusions:

- **Efficacy of Neuromodulation:** The study strongly supports the use of neuromodulation (both SCS and TSGS) as an effective treatment option for chronic PHN. Neuromodulation resulted in statistically significant pain relief in both groups.
- **Treatment Personalization:** However, the study highlights the importance of personalized treatment based on pain location. SCS demonstrated superior satisfaction rates and better pain relief for thoracoabdominal PHN compared to TSGS for facial PHN. This suggests that the choice of neuromodulation technique should consider the anatomical location and specific characteristics of the patient's pain. Optimal stimulation parameters also differ significantly between SCS and TSGS, underscoring the need for precise adjustments to maximize therapeutic benefits and minimize adverse effects.
- **Limitations:** The study's retrospective nature, relatively small sample size, and the lack of a control group are limitations. The follow-up period (1-24 months) might not be sufficient to assess long-term effects. Future prospective studies with larger sample sizes and longer follow-up periods are needed to confirm these findings and further investigate the optimal parameters for each treatment method. Additionally, exploring the underlying pathophysiological differences contributing to the variations in treatment response between facial and body PHN is warranted.

Advances in the Pathophysiology of Normal Pressure Hydrocephalus, Secure LP Shunting Techniques, and Scientific Valve Pressure Setting

Yoshinaga Kajimoto, MD, PhD[1), 2)], Toshihiko Kuroiwa, MD, PhD[1)]

1) Department of Neurosurgery, Shiroyama Hospital
2) Professor Emeritus, Department of Neurosurgery, Osaka Medical and Pharmaceutical University

Background: Normal Pressure Hydrocephalus (NPH) is a treatable neurological disorder, but its pathophysiology and optimal management remain subjects of ongoing research. Our recent studies elucidate the underlying mechanisms and support refined surgical strategies for LP shunt placement and valve pressure adjustment.

Objectives: 1) To elucidate the pathophysiological mechanisms of NPH, with a focus on cerebral blood flow (CBF) disturbance and venous compression.

2) To present secure and minimally invasive LP shunting techniques.

3) To demonstrate a scientific and individualized approach to valve pressure setting based on anthropometric parameters.

Methods: 1) Clinical data from 21 NPH patients who underwent CSF infusion testing and NIRS analysis were analyzed, 2) We reviewed shunt malfunction cases and identified 12 common pitfalls in LP shunt surgery. We also proposed three countermeasures, including ultrasound and fluoroscopic-guided techniques, 3) A scientific theory and mathematical model for valve pressure estimation based on patient height and weight were established and converted into a Quick Reference Table (QRT) for clinical use.

Results: 1) NPH pathophysiology is associated with venous compression and impaired cerebral autoregulation, leading to chronic ischemia.

2) LP shunting demonstrated high efficacy (adaptation rate 99.7%) and safety, particularly in elderly patients, when pitfalls were anticipated and managed.

3) The QRT-based method for valve pressure setting significantly reduced the need for postoperative adjustments (resetting rate: 30-41%) and minimized the risk of CSDH (<0.5%). The QRT-based method has become standard practice in Japan.

Conclusion: Enhanced understanding of NPH pathophysiology, combined with secure LP shunting techniques and scientifically grounded valve pressure settings, improves surgical safety and patient outcomes.

Keywords:

Normal Pressure Hydrocephalus, LP Shunt, Cerebral Autoregulation, Venous Compression, Valve Pressure Setting, Quick Reference Table

Alzheimer's Surgery: Toward Standards - The Tianjin Experience

Jiheng, Zhang, M.D., Shenhao Zhou, M.D., Bingyou Yuan, M.D., Wei Wei, M.D., Zengguang Wang, M.D., Ph.D., Jianning Zhang, M.D., Ph.D., **Xin Chen, M.D., Ph.D**.*

Department of Neurosurgery, Tianjin Medical University General Hospital

* Corresponding Author

Background: Alzheimer's disease (AD) is a progressive neurodegenerative disorder marked by cognitive decline and currently lacks disease-modifying treatments. Emerging evidence suggests that the brain lymphatic system plays a critical role in clearing pathogenic proteins, including amyloid-β (Aβ) and tau. Recent studies have indicated that enhancing cervical lymphatic drainage may offer cognitive benefits in patients with AD.

Objective: To evaluate the clinical efficacy and safety of bilateral decompression of the deep cervical lymphatic trunk (DCLT) combined with anastomosis of middle deep cervical lymph nodes (Level III, mdcLNs) to the external jugular vein (EJV) in patients with moderate to severe AD.

Methods: This single-center, prospective, single-arm cohort study included 28 patients with moderate to severe AD (mean age: 69.1 ± 7.0 years), diagnosed according to the National Institute on Aging–Alzheimer's Association (NIA-AA) criteria and confirmed by FDG/Aβ/Tau PET-CT within the A/T/N framework. All surgeries were performed by the senior author (X.C.). Cognitive function was assessed using ADAS-Cog14, MMSE, MoCA, CDR-SB, and CDR-GS on postoperative days 5 and 30. Multimodal biomarker analysis included FDG/Aβ/Tau PET-CT, plasma Aβ42/Aβ40 ratio, and plasma levels of phosphorylated tau (p-tau217 and p-tau181) in the plasma were conducted on postoperative day 30.

Results: Over 90% of caregivers reported subjective symptom improvement postoperatively. By postoperative day 5, 86% of patients showed clinically meaningful cognitive improvement (defined as ΔADAS-Cog14 ≥ 2), with a mean score reduction of 5.8 ($P < 0.05$). MMSE and MoCA scores increased by 1.96 and 2.04 points, respectively (both $P < 0.05$). By day 30, all patients (100%) achieved clinically meaningful improvement (mean ADAS-Cog14 change = 8.8), with further gains in MMSE (+3.94), MoCA (+3.31), and a reduction in CDR-SB (–1.25) (all $P < 0.05$). No significant changes were observed in amyloid or tau burden or FDG uptake on PET-CT at day 30. Reported adverse events included insomnia (12.5%), localized skin sensory disturbance (6.25%), and mild agitation (6.25%). No cases of EJV thrombosis, wound infection, new neurological deficits, or cognitive deterioration occurred.

Conclusions: Bilateral DCLT decompression combined with mdcLN–EJV anastomosis appears to be a safe and effective short-term intervention for improving cognitive function in patients with moderate to severe AD. These findings support further large-scale studies with extended follow-up to validate long-term efficacy and explore underlying mechanisms.

Keywords: Alzheimer's disease; lymphatic-venous anastomosis; glymphatic system; cognitive improvement; neurodegenerative disease

Room B (La Vie B):
Cerebrovascular Diseases and Pituitary Adenoma

Subclassification of Knosp Grade 4 Pituitary Adenoma: Bringing Insights Into the Significance of Tumor Growth Pathways

Limin Xiao, Taohui Ouyang, Bowen Wu, Shenhao Xie, Bin Tang, Yulin He, Han Ding, Xiao Wu, Tao Hong,
The FirstAffiliated Hospital of Nanchang University,Nanchang, China

BACKGROUND: Understanding the growth pathway of Knosp grade 4 pituitary adenoma (KG4PA) has a direct impact on surgical planning and safety for tumor eviction.
OBJECTIVE: To analyze the different characteristics between KG4PAs with a focus on the tumor growth pathway and its relationship to the cavernous segment of internal carotid artery.
METHODS: Clinical data from 129 patients with KG4PAs who underwent endoscopic endonasal surgery were retrospectively reviewed. A subclassification scheme was proposed based on the tumor growth pathway and its relevant features. The clinical connotation of the subclassification on surgical outcomes was also analyzed.
RESULTS: The KG4PAs were classified into 3 types based on the tumor growth pathway and itsrelevant features: groups A, B, and AB. The grosstotal resection rate in group A (51.2%) was much lower than that in group B (87.5%) and AB (87%) with a significant difference between the 3 groups(P = .0004). The overall rate of visual function improvement, preoperative cranial nerve (CN) palsy improvement, and postoperative hormonal remission was 85.1%, 83.3%, and 85.7%, respectively. The rate of transient CN palsy, permanent CN palsy, permanent diabetes insipidus, panhypopituitarism, CSF leakage, and internal carotid artery injury was 7.8%, 3.9%, 4.7%, 2.3%, 1.5%, and 0.7%, respectively.
CONCLUSION: The subclassification strengthens our understanding of KG4PAs on tumor growth corridors and topographic relations of tumor and cavernous segment of internal carotid artery. Furthermore, the distinction into groups 4A, 4B, and 4AB is of benefits for selecting approaches, predicting risk and avoiding complications, and generating more tailored individualized surgical strategies for KG4PAs with better outcomes.
KEY WORDS: Cavernous segment of ICA, Cavernous sinus, Endonasal endoscopic surgery, Horizontal segment of ICA, Knosp grade 4 pituitary adenoma, Tumor growth corridor

Spinal drainage and combined pharmacotherapy as potential outcome improvers for patients with poor-grade subarachnoid hemorrhage

Koichi Hakozaki, Fumihiro Kawakita, Kazuaki Aoki, Hidenori Suzuki
Department of Neurosurgery, Mie University Graduate School of Medicine, 2-174 Edobashi, Tsu, Mie 514-8507, Japan

Background/Objectives: The outcome for aneurysmal subarachnoid hemorrhage (SAH) remains poor particularly for patients presenting with World Federation of Neurological Surgeons (WFNS) grades IV−V. Delayed cerebral ischemia (DCI) is a key determinant of outcome, and in poor-grade SAH, its mechanisms extend beyond angiographic vasospasm (aVSP) to include microcirculatory and neuroelectric dysfunctions. While nimodipine is the standard prophylactic agent recommended internationally, it is not approved in Japan, where alternative medications such as cilostazol, fasudil, and eicosapentaenoic acid (EPA) are used. Given the limited data on poor-grade SAH, this study aimed to evaluate outcome determinants including these treatments prior to the introduction of clazosentan. **Methods**: We analyzed 357 SAH patients with admission WFNS grades IV–V prospectively enrolled in 9 primary stroke centers in Mie prefecture in Japan from 2013 to 2022. This study compared clinical variables between patients with favorable (modified Rankin Scale [mRS] score 0−2) and unfavorable (mRS score 3−6) outcomes at 90 days post-onset. The baseline variables consisted of age, sex, past history of SAH and cerebral infarction, pre-onset comorbidities, current smoking, location of ruptured aneurysms, WFNS and modified Fisher grades at admission, and presence of acute hydrocephalus. Treatment-related variables included treatment modalities of aneurysmal obliteration, procedural complications, cerebrospinal fluid drainage, perioperative medications to prevent DCI, development of aVSP, endovascular treatment for symptomatic aVSP, DCI, delayed cerebral infarction, and shunt-dependent hydrocephalus. Multivariate analyses were then performed to identify independent determinants of favorable 90-day outcomes, followed by propensity score matching analyses. **Results**: The median age was 68 years, 73.9% of patients were female and 53.5% had admission WFNS grade V. DCI occurred in 12.9% of patients, aVSP in 26.1%, and delayed cerebral infarction in 22.4%, and 66.9% had unfavorable outcomes. Independent variables related to unfavorable outcomes were older age (adjusted odds ratio [aOR] 0.943, 95% confidence interval [CI] 0.924–0.964, $p < 0.001$), admission WFNS grade V (aOR 0.545, 95% CI 0.317–0.937, $p = 0.028$), ventricular drainage (aOR 0.527, 95% CI 0.284–0.977, $p = 0.042$), edaravone administration (aOR 0.453, 95% CI 0.235–0.874, $p = 0.018$), and delayed cerebral infarction (aOR 0.204, 95% CI 0.090–0.466, $p < 0.001$), while those for favorable outcomes were spinal drainage (aOR 6.118, 95% CI 2.687–13.927, $p < 0.001$), modified Fisher grade 3 (aOR 2.929, 95% CI 1.668–5.143, $p < 0.001$) and triple prophylactic anti-DCI medication consisting of cilostazol, fasudil hydrochloride and eicosapentaenoic acid (aOR 1.869, 95% CI 1.065–3.279, $p = 0.029$). Statin and cerebral vasospasm did not influence outcomes. As spinal drainage and the triple prophylactic anti-DCI medication were intervenable variables, propensity score matchings were performed and confirmed that both spinal drainage and the triple prophylactic anti-DCI medication were useful to achieve favorable outcomes. **Conclusions**: In poor-grade SAH, spinal drainage and the triple prophylactic anti-DCI medication may be effective in improving outcomes, possibly by suppressing DCI pathology other than cerebral vasospasm.

Keywords: cerebral vasospasm, delayed cerebral ischemia, subarachnoid hemorrhage

Augmented Reality-Assisted Preoperative Planning for Basilar Artery Aneurysm Surgery: Comparative Analysis of Subtemporal and Orbito-Zygomatic Approaches

Guo, Yiding[1]; Zhao, Benqi[2]; Zhang, Peihai[1]; Liu, Yong[3]; Yang, Xuejun[1]; Guo, Yi[1]

[1]Department of Neurosurgery, Beijing Tsinghua Changgung Hospital, Medical Center of Tsinghua University, Beijing, China, 102218. [2]Department of Radiology, Beijing Tsinghua Changgung Hospital, Medical Center of Tsinghua University, Beijing, China, 102218. [3]Department of Neurosurgery, Erdos Center Hospital, Erdos, Inner Mongolia Autonomous Region, China, 017000

Abstract:

Background: Augmented Reality (AR) has gathered significant attention in the field of neurosurgery for its potential in improving preoperative planning. With offering 3D visualizations of complex skull base anatomy, AR can enhance the neurosurgeons' capability to plan for procedures with greater precision. In neurosurgical procedures involving the basilar artery (BA), AR can aid in visualizing the relationship between the aneurysm and surrounding critical structure including vessels and neural fibers. This study investigates the application of AR in preoperative planning for BA aneurysm surgery and compares two common BA aneurysms surgical approaches—subtemporal and orbito-zygomatic.

Objective: The objective of this study is to assess the use of AR-assisted planning in real neurosurgical practice in BA aneurysm clipping. The study aims to evaluate whether AR technology can improve the visualization of vascular structures, particularly the BA and posterior cerebral artery (PCA). The study also compares two surgical approaches—subtemporal and orbito-zygomatic—in terms of vessel exposure, with a focus on the role of AR in enhancing surgical precision and decision-making.

Method: Preoperative CTA data from 9 patients with BA aneurysms were used to create 3D models of the skull and vasculature using SurgicalAR® software. These models were visualized on a head-mounted AR device (Microsoft HoloLens) for surgical planning, focusing on key anatomical structures like the BA and posterior cerebral artery (PCA). The two approaches were compared in terms of vessel exposure and measurement accuracy.

Results: The subtemporal approach provided superior visualization of the ipsilateral PCA (22.4 ± 0.4 mm) and BA (18.5 ± 0.6 mm) compared to the orbito-zygomatic approach, which measured the PCA at 8.4 ± 0.5 mm and BA at 7.5 ± 0.4 mm. The subtemporal approach allowed more precise identification of vascular structures, although soft tissue and real-time surgical deviations were limitations in the AR models.

Conclusion: AR-assisted preoperative planning improved anatomical understanding, particularly for the subtemporal approach in BA aneurysm surgery. While the orbito-zygomatic approach showed limited vascular exposure, AR technology demonstrated potential in enhancing surgical precision. Further research with larger cohorts and refined AR tools is needed to optimize clinical use and address challenges in soft tissue visualization and image quality.

Keywords: Augmented Reality; Basilar Artery; Aneurysm; Subtemporal Approach; Orbito-Zygomatic Approach

Usefulness of Awake Craniotomy Clipping - A Case of Multiple Cerebral Aneurysms

Ren Fujiwara, MD PhD

Narita Tomisato Tokushukai Hospital, Japan

Objective

Treatment decision-making for aneurysms adjacent to functionally critical perforating arteries presents significant challenges. We report a case of awake craniotomy clipping performed in collaboration with anesthesiology and speech therapy departments. During the procedure, contralateral hemiparesis developed after clip application, prompting immediate adjustment that successfully prevented permanent deficit. This case highlights the essential technical aspects, anesthetic considerations, indications, and significance of awake craniotomy for cerebral aneurysm surgery.

Case Presentation

A 78-year-old female with comorbid diabetes mellitus, hypertension, and previous cerebral infarction presented with enlargement of a left middle cerebral artery (MCA) aneurysm detected during follow-up imaging. An anterior communicating artery aneurysm was also identified, and simultaneous treatment of both lesions was planned. The left MCA aneurysm was located at mid-M1 with superior projection, adjacent to crucial perforators and the anterior temporal artery origin. The anterior communicating artery aneurysm similarly carried high ischemic risk. Given these considerations, awake craniotomy was selected as the optimal approach.

Operative Findings and Postoperative Course

After laryngeal mask airway placement, scalp nerve blocks were administered. Left frontotemporal craniotomy was performed, and the sylvian fissure was dissected via distal transsylvian approach. A straight clip was applied to the left A1-A2 junction aneurysm. For the anterior temporal artery origin aneurysm, sedation was reversed and the airway device removed before clip application. Although indocyanine green angiography confirmed perforator patency, right facial and upper limb paresis developed immediately following clip placement. Prompt clip repositioning led to neurological improvement. The patient experienced transient anterior thalamic infarction on postoperative day 2, which resolved with treatment. She was discharged on postoperative day 13 with a mRS score of 0.

Discussion

Anesthetic management for awake craniotomy relies on nerve blocks to minimize analgesic requirements, with laryngeal mask airways facilitating safe extubation and speech therapist evaluation providing critical functional assessment. In this case, remimazolam was utilized, allowing precise awakening control through antagonist administration. Technical considerations included horseshoe head fixation to reduce patient discomfort and extensive sylvian fissure dissection. Preparation of temporary clip space and hemorrhage prevention strategies enabled safe manipulation. This technique

is indicated for cognitively intact, cooperative patients, particularly for aneurysms at high-risk locations such as mid-M1, short M1-M2 segments, and internal carotid-anterior choroidal artery regions where ischemic complications would significantly worsen outcomes. Literature review indicates successful ischemia prevention in 3 of 30 similar cases.

Conclusion

Awake craniotomy clipping enables real-time neurological assessment during treatment of aneurysms adjacent to critical vasculature. In this case, intraoperative recognition of neurological changes prompted clip adjustment, preventing permanent functional deficit. Careful patient selection and appropriate intraoperative management can yield favorable outcomes, though vigilance for delayed ischemic events remains essential. Further accumulation of cases is necessary to validate the safety and efficacy of this approach.

Keywords: awake craniotomy, cerebral aneurysm clipping, perforator preservation

Abstracts

Day 2
Poster session

Room C
2F conference room
“Avenir”

The Long-Term Outcome in a Cohort of 36 Patients with Sacral dural arteriovenous fistulae After Endovascular embolization or Microsurgery

Gong Chen[1]#, Xuanfeng Qin[1],Qinzhu An[1],Yu Duan[2], Renling Mao[2] , Jian li[2]

[1] Neurosurgery, Huashan Hospital, Huadong Hospital, Fudan University, Shanghai,China
[2] Neurosurgery , Huadong Hospital, Fudan University,Shanghai, China
#Professor; Doctor
Neurosurgery, Huashan Hospital,Fudan University,
No.12,Wulumuqi Mid Road, 200040,Shanghai,China.
Tel: 13120622336.
onlycg123@163.com

Objective: Sacral dural arteriovenous fistulae (SDAVF) is a rare spinal vascular malformation, and often misdiagnose or even mistreated. This study delved into the clinical characteristics, vascular architecture, treatment results of SDAVF, with the goal of enhancing upcoming diagnostic and therapeutic methodologies.

Methods: From March 2014 to March 2022, consecutive patients with SDAVF were retrospectively analyzed. The data on demographics, symptom resolution, angioarchitectural features and postoperative course were studied. Spinal cord function was evaluated by modified Aminoff-Logue scale (mAL).

Results: A total of 36 patients with 36 SDAVFs were enrolled, 12 of whom were misdiagnosed on their initial visit. The SDAVFs were located at S1 in 24 (66.7%), S2 in 10 (27.8%), and S3 in 2 (5.6%) cases, respectively. The primary feeding arteries included lateral sacral artery of internal iliac artery (31/36, 86.1%), the branches of externaliliac artery (2/36, 5.6%) and median artery (3/36, 8.3%), most of which are straight. Venae terminalisis is the sole drainage vein, flowing back into perimedullary venous network. Endovascular embolization is the main therapy method for 30 cases, while the other 6 cases were treated with microsurgical fistulectomy. MRI tests showed that the abnormal vascular signals around the medulla disappeared, and the spinal cord edema was alleviated in the majority of cases (32/36, 88.9%). Six patients, who all were treated by endovascular embolization at first time, had residual or recurrent and two of them were performed by microsurgical fistulectomy again. All patients by microsurgical fistulectomy had no residual or recurrent during follow-up. According to spinal cord functional assessment, the Aminoff-Logue score was significantly decreased (Z=-3.449, P=0.001) postoperatively

Conclusion: The misdiagnosis rate of SDAVF is very high. The most feeding artery of SDAVF came from the lateral sacral artery (LSA) , which was thicker and more straight, making it easier for microcatheters to reach the fistula site. So,endovascular embolism has become first choice and mainstream of treatment with minimal invasion , safe and effective results.

[Keyword] Sacral dural arteriovenous fistulae, Misdiagnosis, Angioarchitecture,Endovascular embolization,

The application value of mixed reality navigation in neurosurgical practice: a single-center experience

Gang Chen

jhy_501@163.com

Department of Neurosurgery, Zhuhai People's Hospital (Zhuhai Hospital Affiliated with Jinan University,China), Zhuhai, China

Abstract

Neurosurgery has stepped into the era of precise neurosurgery. Continuously enhancing the accuracy, minimally invasive feature, and rapidity of surgery while guaranteeing its safety has become the main focus and challenge in the current development of precise neurosurgical techniques. The application of neuro-navigation technology has offered assistance for achieving precise neurosurgical operations. However, most traditional navigation systems are costly and cannot be widely adopted in grassroots hospitals. Moreover, most traditional navigation systems can only provide two-dimensional image navigation displays, and surgeons can only locate lesions based on experience and imagination. Additionally, during the operation, surgeons need to alternate between the surgical field and the navigation display screen, which may cause potential errors and prolong the operation time. Therefore, the development of a new, more affordable, intuitive, and convenient navigation system has emerged as an urgent demand. The advancement of medical imaging technology and visualization technology has made this navigation technology feasible.

Mixed reality navigation is an innovative three-dimensional image navigation technology integrating the virtual digital world with the real one. In contrast to traditional navigation technologies, mixed reality technology holds distinct advantages in terms of usability and cost. The mixed reality navigation technology is capable of providing a reconstructed virtual three-dimensional brain model in the actual space, which can be combined precisely with the patient's head to form a combination of the virtual three-dimensional head model and the real patient's head. By donning Hololens2, surgeons can observe the real-time displayed three-dimensional lesion structure and distinct adjacent important tissue structures. This technology offers an intuitive three-dimensional structure and eliminates the necessity of switching back and forth between the surgical field and the navigation screen, enhancing the surgeon's comprehension of the anatomy of the surgical area while guaranteeing the safety and convenience of the operation.

Currently, there are extremely limited studies on the application of mixed reality navigation technology in neurosurgery, and there is a dearth of research support regarding the reliability, stability, and clinical application value of the navigation system. Hence, through this study, including the practicality of mixed reality navigation technology and the evaluation of its clinical application value, we aim to offer a reference basis for the further enhancement and promotion of mixed reality navigation technology in the future.

Objective

To evaluate the application value of a mixed reality neuro-navigation system based on HoloLens2 in neurosurgical operations.

Methods

We developed a mixed reality neuro-navigation system based on HoloLens2 glasses and conducted a feasibility test for clinical application. A total of 41 patients with intracranial lesions

were included in this study. For each patient, a holographic image based on multimodal imaging was created and then imported into HoloLens2. After registration based on landmark points, the hologram was projected onto the patient's head, allowing neurosurgeons to directly observe the holographic projection of the lesion. Based on this projection, preoperative marking and intraoperative navigation could be further conducted. The rapidity and stability of the system were evaluated by preoperative modeling time, navigation registration time, and the times of registrations. The accuracy, practicality, and safety of the system in clinical application were evaluated by average operation time, whether the bone window was appropriate, tumor resection rate, KPS score, and the incidence of surgical complications.

Results

A total of 41 cases were included in this study and retrospectively analyzed, including 15 males and 26 females. There were 32 cases of brain tumors, including 25 supratentorial and 7 infratentorial cases. There were 5 cases of cerebral hemorrhage, 3 cases of hemifacial spasm, and 1 case of trigeminal neuralgia. Preoperative modeling was successfully performed in all 41 cases, with an average modeling time of 21.57±6.11 minutes. All cases were successfully registered in one attempt, with an average registration time of 0.82±0.07 minutes. All cases were successfully registered in one attempt, with an average registration time of 1.06±0.35 minutes. The average operation time for 32 tumor patients was 4.42±1.54 hours, and the average operation time for 5 cases of cerebral hemorrhage was 1.74±1.29 hours. The average operation time for 4 cases of microvascular decompression was 3.8±0.5 hours. The center of all lesions was within the bone window range, with no underexposure or overexposure. Among the 32 tumor patients, 29 cases (90.6%) achieved total resection, and 3 cases (9.4%) achieved subtotal resection. There were no perioperative deaths, and the KPS score of all patients did not decrease after surgery compared to before surgery.

Conclusion

This study provides a complete and clinically applicable workflow for head-mounted mixed reality navigation. The clinical application of cases verified its rapidity, practicality, accuracy, and safety, proving that this technology can provide assistance in the precise treatment of neurosurgical diseases.

Characterization and clinical implications of different malignant transformation patterns in diffuse low-grade gliomas

Xiaodong Chen

Department of Neurosurgery, Peking University Third Hospital, Peking University

Malignant transformation (MT) of low-grade gliomas (LGGs) to a higher-grade variant seems inevitable, yet it remains unclear which LGG patients will progress to grade 3 or even directly to grade 4 after receiving a long course of treatment. To elucidate this, we conducted a retrospective cohort study based on 229 adults with recurrent LGG. Our study aimed to disclose the characteristics of different MT patterns and to build predictive models for patients with LGG. Patients were allocated into group 2-2 (n = 81, 35.4%), group 2-3 (n = 91, 39.7%), and group 2-4 (n = 57, 24.9%), based on their MT patterns. Patients who underwent MT showed lower Karnofsky performance scale (KPS) scores, larger tumor sizes, smaller extents of resection (EOR), higher Ki-67 indices, lower rates of 1p/19q codeletion, but higher rates of subventricular involvement, radiotherapy, chemotherapy, astrocytoma, and post-progression enhancement (PPE) compared with those in group 2-2 ($p < 0.01$). On multivariate logistic regression, 1p/19q codeletion, Ki-67 index, radiotherapy, EOR, and KPS score were independently associated with MT ($p < 0.05$). Survival analyses demonstrated that patients in group 2-2 had the longest survival, followed by group 2-3 and then group 2-4 ($p < 0.0001$). Based on these independent parameters, we constructed a nomogram model that exhibited superior potential (sensitivity: 0.864, specificity: 0.814, and accuracy: 0.843) compared with PPE in early prediction of MT. Combining the factors of 1p/19q codeletion, Ki-67 index, radiotherapy, EOR, and KPS score that were presented at initial diagnosis could precisely forecast the subsequent MT patterns of patients with LGG.

The Innovative Concept of Craniotomy in suboccipital retrosigmoid keyhole approach: anatomical study, technique nuances, and clinical application

Chang-chun Liao1†,De-Zhu An1†, Bai-cha Tang1, Ling Zhou2, Zhi-jian Weng1, Kai-hua Wu1, Jia-yan Li1, Xin-feng-Yi1, Zhi-heng Jian1, Min-Feng Sheng3, Chen Gang1*

1. Department of Neurosurgery, Zhuhai People's Hospital(The Affiliated Hospital of Beijing Institute of Technology, Zhuhai Clinical Medical College of Jinan University), Zhuhai, China.
2. Zhuhai Stomatological Hospital, Zhuhai, China.
3. Second affiliated hospital of Soochow University, Suzhou, Jiangsu Province, China

Background: The suboccipital retrosigmoid approach is a classic approach for surgical access to cerebellopontine angle diseases. Previously, we identified a novel method for precise localization of keypoint, known as the "one point, two lines, two distances" theory. However, a comprehensive, safe method for craniotomy remains lacking.

Objective: Based on the new landmark method of localization , this study aims to further investigate the anatomical relationship between key bony landmarks behind the sigmoid sinus, and to describe the anatomical basis, surgical technique, and outcomes of suboccipital retrosigmoid keyhole approach for craniotomy.

Methods: Twelve adult specimens of skull were used for the study. The anatomical relationships between the keypoint were analyzed to establish a precise, rapid, and safe method for performing suboccipital retrosigmoid keyhole craniotomy. This method was then validated through cadaveric dissection. Furthermore, a retrospective analysis of surgical outcomes was performed on 122 clinical patients, assessing accuracy, safety, and exposure results.

Results: Measurements from six adult specimens of skull revealed that the up point of digastatic groove roughly corresponds to the margin of the sigmoid sinus. In the craniotomy simulations performed on 12 cadaveric specimens, after drilling at the key point, a milling cutter was used to free the bone flap in a "rear-down-front" direction. This process passed through the up point of digastatic groove, with bone around the mastoid emissary vein being removed using a grinding drill, followed by resection of the residual bone along the margin of the sigmoid sinus. A bone window of approximately 2.5 cm in diameter was achieved in all specimens. In all cadaver specimens, the formation of bone flap resulted in a well-exposed window without any injury to the venous sinus structures. In the clinical cohort of 122 patients, keypoints were accurately located, and suitable bone windows were created with a good exposure range, all without any venous sinus damage during surgery.

Conclusion: the up point of digastatic groove serves as a crucial reference point for keypoint localization. Craniotomy techniques based on this reference point provide a precise and safe approach for suboccipital retrosigmoid craniotomy.

Keywords: suboccipital retrosigmoid approach; transverse sinus; sigmoid sinus; keypoint; digastric groove

The Effect of Nursing Care Based on Solution-Focused Approach on the Quality of Life of Patients with Cerebral Vascular Malformations Treated by Endovascular Embolization

Xiao-Hong Chen[1],Ling-Yun Shi[2],Yuan-Zhang[3],Wei-Qin Gu[4]

1The First Affiliated Hospital of Xinjiang Medical University;2School of Nursing, Xinjiang Medical University

【**Abstract**】 **Objective** To explore the effect of nursing care based on the solution-focused approach on the quality of life of patients with cerebral vascular malformations treated by endovascular embolization, in order to optimize nursing strategies and improve the post-treatment quality of patients' life. **Methods** A total of 62 patients with cerebral vascular malformations who underwent endovascular embolization in our hospital from June 2023 to June 2024 were selected as the observation objects. They were divided into a control group and an observation group by the random number table method, with 31 cases in each group. The control group received routine nursing care. Before surgery, patients were given health education and nursing guidance. After surgery, close monitoring of various vital signs such as blood pressure, heart rate, and respiration was strengthened to promptly identify and address any abnormalities. Special attention was paid to monitoring for complications such as bleeding, and dietary and daily living care management was provided. The observation group received solution-focused nursing care on top of the routine care provided to the control group. The specific methods were as follows: (1) Describing the problem: Through effective communication, understand the patient's inner feelings and needs, provide easily comprehensible surgical information to reduce anxiety and enhance confidence. (2) Constructing specific goals: Set rehabilitation goals together with the patients, formulate personalized intervention plans, and encourage the patient to gradually achieve the goals. (3) Exploring exceptions: Pay attention to the discomfort of the patient during the treatment period, provide timely guidance, and help the patients solve problems. (4) Giving feedback: Give positive feedback on the patient's positive behaviors to mobilize their subjective initiative and enthusiasm. (5) Assessing progress: Comprehensively assess the patients' emotional and physiological states, objectively evaluate their progress, and enhance their confidence in recovery. Both groups of patients were followed up for 2 months. Telephone and WeChat were used to understand the related adverse events during the prognostic process of the patients, and the prognostic conditions of the two groups of patients were evaluated. **Results** (1) Rehabilitation effect: After nursing intervention, the SF-36 quality of life score and Fugl-Meyer (FMA) score of limb motor function in the observation group were better than those in the control group, with statistical significance (P<0.05). Before nursing, there was no statistical significance in the comparison of SF-36 quality of life scores and FMA scores between the two groups (P>0.05). (2) Complication comparison: The complication rate in the observation group (19.35%) was lower than that in the control group (25.81%), but there was no statistical significance between the groups (P>0.05). (3) Psychological state: After

nursing intervention, the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) scores of patients in the observation group were significantly lower than those in the control group, with statistical significance (P<0.05). Before nursing intervention, there was no statistical significance in the comparison of SAS and SDS scores between the two groups (P>0.05). **Conclusion** Nursing intervention based on the solution-focused approach can effectively improve the quality of life of patients with cerebral vascular malformations treated by endovascular embolization, enhance their confidence in disease management, improve negative emotions, promote comprehensive physical and psychological recovery, and has important clinical application value.

【**Keywords**】 Cerebral vascular malformations; Nursing strategies; Interventional embolization; Solution-focused approach.

Temporal Trends and Practice Variation in Early Repair of the Ruptured Aneurysm Among Patients with Aneurysmal Subarachnoid Hemorrhage

Wei Chen, MD., PhD[1,2,3]

1. Department of Neurosurgery, West China Hospital of Sichuan University, Chengdu, China
2. West China Biomedical Big Data Center, West China Hospital, Sichuan University
3. Med-X Center for Informatics, Sichuan University, Chengdu, China

Abstract

Early repair of the ruptured aneurysm, preferably within 24 hours of onset, is endorsed by clinical guideline as the preferred management strategy for patients with aneurysmal subarachnoid hemorrhage (aSAH). We included 82,615 aSAH patients who underwent surgical or endovascular treatment for their ruptured cerebral aneurysms. We measured trends in the proportion of early repair of the ruptured cerebral aneurysm (RRCA), defined as within day 1 of admission, overall and by subgroups. Overall, 84.0% receiving early RRCA. The proportion of early RRCA increased steadily from 82.5% in 2012 to 85.8% in 2019 (*P* for trend <0.001). The delivery of early RRCA varied widely among hospitals. Most patients with aSAH received early RRCA treatment and exhibited an upward trend over the recent 8-year period. However, substantial variation in access to early RRCA was observed across population subgroups, particularly at the hospital level, in contemporary clinical practice.

Objective

Early repair of the ruptured aneurysm, preferably within 24 hours of onset, is endorsed by clinical guideline as the preferred management strategy for patients with aSAH. However, a comprehensive picture of this guideline-recommended usage in contemporary clinical practice is not available. This study aimed to characterize temporary trends over time and practice variation in the implementation of an early RRCA strategy among patients with aSAH in a large, national representative data.

Methods

We conducted a retrospective cohort study using the National Inpatient Sample database from 2012 through 2019. We identified adult (aged >18 years) aSAH patients using the International Classification of Diseases, 9th/10th Revision, Clinical Modification diagnostic and procedural codes, which have been previously validated. Patients with head trauma, arteriovenous malformations, and cerebral arteritis were excluded. After further exclusion of patients with missing data for timing of procedures, the remaining patients constituted our study population.

The exposures were patient socio-demographics (i.e., age, race and ethnicity, and insurance status), clinical characteristics, geographic regions, and hospital characteristics. Our primary

outcome of interest was the proportion of early RRCA. We measured trends in the proportion of early RRCA, defined as within day 1 of admission, overall, and by demographic and geographical subgroups. Additionally, we created multilevel regression models to quantify hospital-level variation in the early RRCA rates. We measured the intraclass correlation (ICC) and median OR to quantify variation across hospitals using the multilevel multivariable regression models, as suggested by previous study.

Results

A total of 16,523 hospitalizations for aSAH and received RRCA treatments were analyzed between 2012 and 2019 in the sample, which projected to an estimated population of 82,615 admissions nationally across the study duration. The mean age of the population was 56.1 (0.1) years, 68.9% were women, 57.5% were White adults, and 17.9% were Black adults. During the study period, 84.0% (95% CI, 83.4-84.7%) of RRCA were performed early RRCA. The proportion of early RRCA increased steadily from 82.5% in 2012 to 85.8% in 2019 (*P* for trend <0.001). In adjusted analyses, male sex, higher comorbidity burden, microsurgical clipping treatment, and private investor hospital ownership emerged as predictors negatively associated early RRCA.

The proportion in each geographic region receiving early RRCA ranged from 78.7% to 87.9% with a median (interquartile range [IQR]) of 84.2% (83.0-86.1%). In contrast, there was substantial variation in implementing early RRCA across hospitals, with a median (IQR) rate of 86.1% (75.0-100.0%) and a range from 0 to 100.0%. The magnitude of hospital-level variation was increased over time. In multilevel models adjusted for patient and hospital characteristics, 5.0% of variation in performing early RRCA was explained at the hospital level (ICC, 0.05; 95% CI, 0.02-0.14) in 2019. The median OR for the early use of RRCA strategy was 1.24 (95% CI, 1.21-1.27) in 2019, indicating 24.0% increased odds of implementing early RRCA if moving from a lower-use to a higher-use hospital.

Conclusions

In conclusion, contemporary data from a large national database show that most patients with aSAH received RRCA treatment in early and exhibited an upward trend over the recent 8-year period. Our findings revealed that improvements in the proportion of early RRCA are associated with reductions in magnitude of disparity of the rate over the study period. However, substantial variation in access to early RRCA were observed across population subgroups, particularly at the hospital level, in contemporary U.S. practice. Future research and policy attention should be devoted to identify additional sources and causes of this variation and to develop initiatives. In doing so, there may be an opportunity to optimize the guideline-based practical quality-of-care among patients with aSAH that improve patient care and outcomes.

Key words: aneurysmal subarachnoid hemorrhage; ruptured cerebral aneurysm; timing; trends; variation

A Prediction Model for Pulmonary Embolism in Spontaneous Intracerebral Hemorrhage Patients

Department of Neurosurgery, the First Affiliated Hospital of Chongqing Medical University, Chongqing 400016, PR China
Yuanyun Chen[1], Jiang Li[*]

Objective: This study aims to investigate the risk factors associated with pulmonary embolism (PE) in patients with spontaneous intracerebral hemorrhage (sICH) and to develop a reliable and efficient predictive model for early detection of PE in clinical practice. Early identification of PE in sICH patients is crucial due to its high morbidity and mortality rates, yet current predictive tools are limited.

Methods: A retrospective study was conducted involving 1,129 sICH patients admitted between January 2017 and May 2024. Patients were divided into a training set (n=525), an internal validation set (n=357), and an external validation set (n=247). Univariate and multivariate stepwise logistic regression analyses were performed to identify independent risk factors for PE. A nomogram model (Model P-P) was constructed using R language based on the identified risk factors and validated internally and externally. The performance of Model P-P was compared with a previously established model (Model A) using additional patient data.

Results: The overall incidence of PE in sICH patients was 11.34%. Multivariate analysis identified deep vein thrombosis (DVT), age ≥65 years, Glasgow Coma Scale (GCS) score ≤6, fibrinogen degradation product (FDP) ≥7.5 mg/L, D-dimer (DD) ≥4.56 mg/L, hemoglobin levels <90 g/L, hemorrhage volume >60 ml, plasma osmolality ≥306.5 mmol/L, and surgical method as significant independent risk factors for PE ($p<0.05$). Model P-P demonstrated a sensitivity of 84.2%, specificity of 94%, and an area under the curve (AUC) of 0.910(95% CI: 0.857-0.962). The calibration curves showed high consistency between predicted and actual outcomes. Decision curve analysis (DCA) indicated clinical utility within a threshold risk range of 2% to 96%. In validation sets, Model P-P maintained high performance with an AUC of 0.843(95% CI: 0.773–0.913) in the internal validation set and 0.945(95% CI: 0.912--0.978) in the external validation set. Compared to Model A, Model P-P exhibited superior accuracy with a significantly higher AUC (0.894: 95% CI: 0.8023-0.9854 vs. 0.785: 95% CI: 0.6142-0.9552, $p<0.05$).

Conclusions: The developed Model P-P provides a reliable and efficient tool for predicting PE in sICH patients. Its high accuracy and clinical utility make it a valuable instrument for early evaluation and personalized treatment decision-making in neurosurgical intensive care units. Future research should focus on multi-center validation to further confirm the model's applicability and generalizability.

Analysis of the Incidence and Risk Factors Affecting Venous Thromboembolism after Meningioma Surgery

Jinrong Chen[1],Ling-Yun Shi[1],Abiding Abulaiti[2],Siyue Han[2],Zakeer Kudelati[3]
[1].The First Affiliated Hospital of Xinjiang Medical University,Urumqi, Xinjiang 830054, China
[2].School of Nursing, Xinjiang Medical University, Urumqi, Xinjiang 830054, China
[3].College of Health Management, Xinjiang Medical University, Urumqi, China

Objective: The aim was to investigate the risk factors for venous thromboembolism (VTE) in patients after meningioma surgery.
Method: This retrospective study analyzed the clinical data of 554 patients who underwent meningioma surgery at the First Affiliated Hospital of Xinjiang Medical University between April 2017 and May 2023. The patients were divided into two groups: the VTE group (164 cases) and the no-VTE group (390 cases), based on the occurrence of venous thromboembolism (VTE) after surgery. Univariate analysis and multifactorial logistic regression analysis were conducted to investigate the risk factors associated with VTE following meningioma surgery.
Results: The univariate analysis revealed significant associations ($P<0.05$) between the occurrence of VTE in postoperative patients with meningioma and various factors, including gender, age, hospital stay duration, HDL levels, fibronectin levels, D-dimer levels, platelet count, hemoglobin levels, CRP levels, white blood cell count, calcitonin levels, routine urine pH, use of anticoagulant drugs, use of hormonal drugs, pre- and postoperative muscle tension, postoperative bed rest duration, pressure ulcer score, and length of surgery; Further multifactorial logistic regression analysis identified several independent risk factors for the development of postoperative VTE in meningioma patients,older age (OR 1.03, 95% CI 1.01-1.06, $p=0.02$) , longer hospital stay, higher D-dimer(OR 1.00, 95% CI 1.00-1.01, $p<0.01$), (OR 3.52, 95% CI 1.78-6.97, $p<0.01$) , longer postoperative bed rest time(OR 1.05, 95% CI 1.05, $p=0.01$) , lower pressure ulcer score(OR 0.85, 95% CI 0.85, $p<0.01$), and higher VTE score(OR 1.14, 95% CI 1.02-1.28, $p=0.02$).
Conclusion: In conclusion, patients with meningiomas are at an increased risk of developing postoperative VTE. Through a comprehensive analysis of risk factors in postoperative patients with meningiomas, we identified six independent risk factors associated with VTE in these patients. These risk factors include older age, elevated D-dimer levels, hormone therapy, longer postoperative bed rest, lower pressure ulcer scores, and higher VTE scores.
Keywords: meningioma; venous thromboembolism; risk factors

Amlodipine suppresses tumorgenicity of glioma stem cells through degrading EGFR and downregulating the downstream pro-survival pathways

Jun Dong, Xiaopei Zhang, Zengyang Li, Ping Wen
Department of Neurosurgery, the Second Affiliated Hospital of Soochow University

Background: Glioblastoma （GBM） is the most aggressive and lethal primary brain tumor in adults with poor prognosis. High therapeutic resistance and short-term recurrence of GBM are associated closely with the existence of glioma stem cells (GSCs), a valuable therapeutic target for this refractory malignancy. As a classical calcium channel blocker (CCB), amlodipine exhibits exact anti-tumor effect independent of CCB activity, however, its effect on GSCs has not been elucidated, and hinders evaluation of its potentials of repurposing against GSCs to disrupt GBM progression.

Methods: Glioma stem cell lines and the intracranial orthotopic GSCs-derived tumor model were applied to evaluate the effects of amlodipine against GSCs in vitro and in vivo. Molecular docking and Bioinformatics analysis was performed to predict the binding of amlodipine with membrane receptor of GSCs. Quantitative real-time PCR, Western blot, co-immunoprecipitation and immunofluorescence were utilized to clarify the regulating signaling pathway and elucidate underlying mechanisms.

Results: Definite inhibitory effects of amlodipine were observed against GSCs, including decreasing cell viability, self-renewal and stemness of GSCs, promoting GSCs apoptosis, as well as retarding GSCs-derived intracranial tumor growth, prolonging survival of tumor-bearing mice. While other dihydropyridine CCBs, such as nicardipine and nifedipine, as well as Ca2+ chelator BAPTA-AM, did not exhibit obvious effect on GSCs at the same dosage. L-type Ca2 + channel agonists also did not attenuate the inhibitory effect of amlodipine on GSCs. These findings suggest that the exact impact of amlodipine against GSCs was independent of calcium blocking activity. Mechanism studies disclosed high affinity binding of amlodipine with EGFR on cell membrane of GSCs, leading to EGFR endocytosis via clathrin-independent lipid raft, and decreasing protein level of EGFR by lysosomal degradation, ultimately downregulating EGFR downstream pro-survival signaling pathways.

Conclusion: Amlodipine suppressed GSCs-initiated tumor development via degrading EGFR and down-regulating its downstream pathways, implying that amlodipine had novel potentials in target therapy of GSCs against glioblastoma.

Key Words: glioma stem cells, glioblastoma, amlodipine, EGFR, repurpose

Lumbar Endoscopic Surgery in Severe Lumbar Stenosis-technique and approach

腰椎内镜手术在重度腰椎管狭窄中的应用-技巧和手术入路

Dou NingNing
窦宁宁
Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine
上海交通大学医学院附属新华医院神经外科

Objective:

Although endoscopic drill has the advantages in manipulation and hemostasis, whose low efficiency and blurred vision reduce the efficacy of lumbar endoscopic unilateral laminotomy with bilateral decompression (LE-ULBD). The present study was designed to evaluate the safety and efficacy of full-visualized trephine/osteotome in the LE-ULBD surgery for severe lumbar stenosis.

Methods:

Fifty-seven severe lumbar stenosis patients who underwent LE-ULBD between January 2020 to January 2023 were enrolled, who were divided into drill and visualized tre phine groups. The medical records including demographics, operative duration, intraoperative electrophysiological findings, postoperative hospital stay or hospital stay, postoperative outcomes and complications were retrospectively reviewed and analyzed.

Results:

A total of 57 patients included 15 in drill and 42 in trephine group were enrolled in the study. There was significant difference in the pre- and postoperative visual analogue scale and Oswestry Disability Index scores in both groups ($p < 0.05$). The mean operative duration in the trephine group (101.05 ± 12.18 minutes) was shorter than that in the drill group (134.67 ± 9.68 minutes) ($p < 0.05$). There was no statistical difference between the 2 groups in electrophysiological monitoring, posthospital stays, postoperative outcomes and complications.

Conclusion:

Full-visualized trephine/osteotome has been approved to be convenient, safe and efficient in our study, which combined with translaminar inside-out technique and EMG monitoring especially free-EMG may offer a new choice in LE-ULBD surgery for lumbar stenosis patients. Keywords: LE-ULBD, Full visualized trephine/osteotome, Endoscopic drill, Translaminar inside-out technique, Intraoperative electrophysiological monitoring

Keywords:

endoscopic surgery; lumbar stenosis; technique; EMG

Comparative Analysis of Clinical, Imaging, Pathological, and Prognostic Features in Adult and Pediatric Diffuse Midline Glioma

Authors: Qiang Fu, Tuhetiaji Tuerhongjiang , Bo Liu, Qingjiu Zhou
Affiliation: The First Affiliated Hospital of Xinjiang Medical University

Objective: Given that diffuse midline glioma (DMG) is an aggressive central nervous system tumor with unclear differences in clinical manifestations and prognosis between pediatric and adult patients, this study aimed to compare the heterogeneity between the two groups in clinical features, imaging characteristics, molecular pathology, and prognosis based on single-center data. Additionally, it analyzed the association between chief complaints, treatment complications, and prognosis to provide evidence for precision medicine.

Methods: A retrospective analysis was conducted on 28 pathologically confirmed DMG patients, including 20 adults (age ≥18 years) and 8 children (age <18 years). Comprehensive data on clinical complaints, imaging features (tumor location, enhancement patterns, necrosis/cystic changes), molecular pathology (H3 K27M mutation, Ki-67 index), treatment complications, and survival outcomes were collected. Kaplan-Meier survival analysis and Cox proportional hazards models were employed for statistical analysis.

Results: (1) **Clinical features and treatment complications:** The pediatric group predominantly presented with cranial nerve palsy (5/8, 62.5%) and vomiting (5/8, 62.5%), with a median symptom progression time of 1.5 months and 75% of tumors located in the brainstem. The adult group frequently reported chronic headache (15/20, 75%) and limb weakness (8/20, 40%), with a median symptom progression time of 6 months and 50% of tumors located in the thalamus. Additionally, 35% of adults (7/20) experienced delayed radiotherapy initiation due to hydrocephalus or postoperative infections, with a median delay of 2 weeks compared to the pediatric group ($p = 0.04$). (2) **Molecular pathology and imaging characteristics:** The H3 K27M mutation rate was 100% (8/8) in the pediatric group, with a median Ki-67 index of 35% (range: 15-60%). In adults, 85% (17/20) were mutation-positive, with a median Ki-67 index of 20% (range: 5-40%), showing significant intergroup differences ($p = 0.02$). The pediatric group exhibited a higher proportion of DWI hyperintensity (5/8 vs. 7/20, $p = 0.03$), which positively correlated with the Ki-67 index ($r = 0.04$). The adult group had significantly higher rates of cystic/necrotic changes (12/20 vs. 2/8, $p = 0.007$) and hydrocephalus (9/20 vs. 1/8, $p = 0.02$). (3) **Prognosis and risk factors:** The median overall survival (OS) was 8.5 months for children, significantly shorter than the 12.1 months observed in adults ($p = 0.028$). Multivariate analysis identified age <18 years (HR = 2.4, 95% CI: 1.1-5.3), Ki-67 ≥35% (HR = 3.1, 95% CI: 1.3-7.2), vomiting (HR = 1.9, 95% CI: 1.1-3.4), and delayed radiotherapy in adults (HR = 2.1, 95% CI: 1.2-3.8) as independent poor prognostic factors.

Conclusion: Pediatric DMG exhibits unique clinical phenotypes (cranial nerve symptoms, rapid progression) and molecular characteristics (high H3 K27M mutation expression, high proliferative activity), with significantly worse prognosis compared to adults. Adult patients often experience delayed radiotherapy due to hydrocephalus and infections, impacting treatment efficacy. Future strategies should focus on optimizing targeted epigenetic therapies for children and enhancing complication management in adults to improve outcomes.

Successful Application of Pedicled Cap-Shaped Aponeurosis-Periosteum Bone Flap in Repairing Skull Defects in Children: Case Report

Dongchao Pan[1],Long Yao[1],Liyi Shen[1],Cheng Gan[2*],Jidi Fu[1*]

[1]Department of Neruosurgery,Plastic Surgery Hospital,Chinese Academy of Medical Sciences,Beijing,China

[2]Scar and Wound Treatment Center,Plastic Surgery Hospital,Chinese Academy of Medical Sciences,Beijing,China

Correspondence: Cheng Gan,Email:ganchengdoc@163.com;Jidi Fu,Email:fujidi2006@126.com

Background and Importance: Skull reconstruction surgery aims not only to restore the integrity of the skull but also emphasizes the biocompatibility, mechanical properties, and integration with surrounding tissues of the repair materials. Currently, skull reconstruction surgery faces several challenges, including the selection of repair materials, prevention of surgical complications, and restoration of skull morphology post-repair. This study successfully performed a repair of a skull defect in a child using a pedicled cap-shaped aponeurosis-periosteum bone flap.

Clinical Presentation: The patient, an 11-year-old male, underwent a mirror image skull reconstruction with a pedicled cap-like aponeurosis-periosteum bone flap under general anesthesia, due to a skull defect following craniocerebral trauma surgery. Postoperatively, the child recovered well. We conducted continuous postoperative follow-up and recorded imaging data at 3 months, 6 months, and 1 year after surgery to compare the changes.

Conclusion: The pedicled cap-shaped aponeurosis-periosteum bone flap demonstrates significant advantages in skull reconstruction, particularly in the repair of pediatric skulls.

Key words: pedicled cap-shaped aponeurosis-periosteum bone flap; skull defect; skull repair

Development and validation of a predictive model for poor initial outcomes after Gamma Knife radiosurgery for trigeminal neuralgia: A prognostic correlative analysis

Yongkun Guo, MD*[1234], Sen Wang, MM,[1] Guanqi Chen, MM,[1] Jingwei, Xie, MD,[1] Ruyi Yang, MD,[4] Xinjun Wang, MD,[123] Fei Wang, MM,[1] Chunyu, Liu, MM,[1]

Department of [1]Neurosurgery and [2]Gamma Knife Radiation Center, The Fifth Affiliated Hospital of Zhengzhou University, Zhengzhou,China,[3]Henan Engineering Research Center for Prevention and Treatment of Brain Injuries, Zhengzhou, China, [4]Henan Key Laboratory of Brain Science and Brain Computer Interface Technology, Zhengzhou, China.

KEYWORDS: gamma knife radiosurgery; primary trigeminal neuralgia; predictive model; initial outcomes; pain recurrence

OBJECTIVE: The present study aims to develop a reliable predictive model for identifying preoperative predictors about poor initial outcomes in patients with primary trigeminal neuralgia (PTN) treated with gamma knife radiosurgery (GKRS) and further elucidate the clinical significance of these predictors in initial outcomes and long-term pain recurrence. **METHODS:** A total of 217 PTN patients were divided into a training set (n=167) and a validation set (n=50). The initial outcomes of GKRS treatment were assessed based on the Barrow Neurological Institute (BNI) pain intensity scale. A predictive model was developed through multivariate regression and validated with repeated sampling. The differences in predictors of long-term pain recurrence were analyzed using Kaplan-Meier. The association between predictors was tested with chi-square and subgroup analyses were conducted to compare initial outcomes and long-term pain recurrence betweent wo clinically significant correlates. **RESULTS:** The training and validation sets showed areas under the curve of 0.85 and 0.88, respectively. Calibration curves and decision curve analysis (DCA) indicated significant clinical benefits in both sets. Independent risk factors for poor initial outcomes included hyperglycemia, absence of neuro-vascular contact (NVC), carbamazepine insensitivity, and atypical pain (TN2). Carbamazepine insensitivity was moderately associated with TN2 and predicted long-term pain recurrence as well. In parallel, patients with both phenotypes performed significantly worse initial outcomes compared with other subgroups (Adjusted $p = 0.0125$). **CONCLUSION:** Patients with both TN2 and carbamazepine insensitivity have the poorest initial treatment outcomes and face an increased risk of recurrence. Furthermore, our predictive model is highly accurate and useful, offering a comprehensive identification of PTN patients for poor initial outcomes based on clinical characteristics and imaging perspectives. We believe that the nomogram presented in this model enables clinicians to calculate multiple variables and predict the probability of adverse events.

Development and validation a prognostic model based on natural killer T cells marker genes for predicting prognosis and characterizing immune status in glioblastoma through integrated analysis of single-cell and bulk RNA sequencing

Jiahe Hu[1], Shaoshan Hu[1,*]

[1] Cancer Center, Department of Neurosurgery, Zhejiang Provincial People's Hospital (Affiliated People's Hospital), Hangzhou Medical College, Zhejiang, Hangzhou, China.

Objective: Glioblastoma (GBM) is an aggressive and unstoppable malignancy. Natural killer T (NKT) cells, characterized by specific markers, play pivotal roles in many tumor-associated pathophysiological processes. Therefore, investigating the functions and complex interactions of NKT cells is great interest for exploring GBM. **Methods:** We acquired a single-cell RNA-sequencing (scRNA-seq) dataset of GBM from Gene Expression Omnibus (GEO) database. The weighted correlation network analysis (WGCNA) was employed to further screen genes subpopulations. Subsequently, we integrated the GBM cohorts from The Cancer Genome Atlas (TCGA) and Chinese Glioma Genome Atlas (CGGA) databases to describe different subtypes by consensus clustering and developed a prognostic model by least absolute selection and shrinkage operator (LASSO) and multivariate Cox regression analysis. We further investigated differences in survival rates and clinical characteristics among different risk groups. Furthermore, a nomogram was developed by combining riskscore with the clinical characteristics. We investigated the abundance of immune cells in the tumor microenvironment (TME) by CIBERSORT and single sample gene set enrichment analysis (ssGSEA) algorithms. Immunotherapy efficacy assessment was done with the assistance of Tumor Immune Dysfunction and Exclusion (TIDE) and The Cancer Immunome Atlas (TCIA) databases. Real-time quantitative polymerase chain reaction (RT-qPCR) experiments and immunohistochemical profiles of tissues were utilized to validate model genes. **Results:** We identified 945 NKT cells marker genes from scRNA-seq data. Through further screening, 107 genes were accurately identified, of which 15 were significantly correlated with prognosis. We distinguished GBM samples into two distinct subtypes and successfully developed a robust prognostic prediction model. Survival analysis indicated that high expression of NKT cell marker genes was significantly associated with poor prognosis in GBM patients. Riskscore can be used as an independent prognostic factor. The nomogram was demonstrated remarkable utility in aiding clinical decision making. Tumor immune microenvironment analysis revealed significant differences of immune infiltration characteristics between different risk groups. In addition, the expression levels of immune checkpoint-associated genes were consistently elevated in the high-risk group, suggesting more prominent immune escape but also a stronger response to immune checkpoint inhibitors. **Conclusions:** By integrating scRNA-seq and bulk RNA-seq data analysis, we successfully developed a prognostic prediction model that incorporates two pivotal NKT cells marker genes, namely, CD44 and TNFSF14. This model has exhibited outstanding performance in assessing the prognosis of GBM patients. Furthermore, we conducted a preliminary investigation into the immune microenvironment across various risk groups that contributes to uncover promising immunotherapeutic targets specific to GBM.

Illness perception and psychosocial adjustment in brain tumor patients and their family caregivers: An actor-partner interdependence model analysis

Abstract

Objective: With the improvement in long-term survival rates of brain tumor patients, increasing attention has been paid to disease treatment and the accompanying complex physiological and psychological changes. This study aims to describe the levels of illness perception and psychosocial adjustment in brain tumor patients and their primary caregivers, analyze the actor-partner relationships of primary caregivers using the Actor-Partner Interdependence Model (APIM), and explore the impact of illness perception on psychosocial adjustment under the joint influence of both parties.

Methods: A total of 216 brain tumor patients and their primary caregivers were included in this study. Convenience sampling was used to select participants from a tertiary hospital in Jiangxi Province, China, between January 2024 and September 2024. The Brief Illness Perception Questionnaire and the Psychosocial Adjustment to Illness Scale were used to assess participants' illness perception and psychosocial adjustment levels. The Actor-Partner Interdependence Model was tested and analyzed using AMOS 24.0 software.

Results: The illness perception score of brain tumor patients (53.53±6.18) was lower than that of their primary caregivers (56.32±5.46), while the psychosocial adjustment score of patients (67.89±7.29) was higher than that of their primary caregivers (66.26±5.96). Analysis using the Actor-Partner Interdependence Model revealed significant mutual influences between brain tumor patients and their primary caregivers: the illness perception of primary caregivers significantly affected the psychosocial adjustment of patients (β=0.093, p=0.014); the illness perception of patients also significantly influenced the psychosocial adjustment of primary caregivers (β=0.104, p=0.037). Additionally, the psychosocial adjustment of patients was significantly associated with their understanding or coherence of the illness (β=0.435, p=0.008), while the emotional representation of illness by primary caregivers also had a significant impact on their psychosocial adjustment.

Conclusion: The findings suggest that targeted interventions for patients and their family caregivers can help alleviate psychological stress, enhance disease coping and adaptation abilities, and ultimately improve the quality of life for patients.

Keywords: Brain tumor, Illness perception, Psychosocial adjustment, Family caregivers, Actor-Partner Interdependence Model

Huang Ting, Xu Ping

Department of Neurosurgery, the First Affiliated Hospital of Nanchang University, Nanchang 330006, China

The Effect of Occipital Artery-posterior Cerebral Artery Bypass on Visual Disturbance After Occipital Lobe Infarction

Hongyan Han*, Zengwei Feng, Yunlong Zuo, Jiayi Chang

The First Department of Neurosurgery, Aviation General Hospital of China Medical University, Beijing, China

Objective: The purpose of this study is to retrospectively analyze the clinical data of the patients with MMD involves posterior circulation developed occipital lobe infarction, and underwent combined vascular bypass surgery(occipital artery-posterior cerebral artery bypass+ encephalon-dura-periosteal-synangiosis, OA-PCA +EDPS) ,and evaluate the extent of visual function improvement after surgery. **Methods:** From May 2013 to Feberary 2024, 109 patients with moyamoya disease involving the posterior circulation were treated with OA-PCA+EDPS in our department, and 62 patients met the conditions of this study. All of the 62 patients underwent professional neurological examinations, visual field examinations, and preoperative imaging examinations. Postoperative CTA and CTP were performed in 1-2 weeks after surgery. **Results :** Among the 62 cases in this group, 34 were males and 28 were females; they range from 4 to 71 years old, with an average of 39.5±16.9 years old. Clinical manifestations: 58 cases started with acute cerebral infarction. Clinical symptoms: 57 cases of visual impairment. A total of 65 OA-PCA+EDPS operations were performed, and all cases were successfully bypassed. Intraoperative fluoroscopic angiography showed that the anastomotic stoma was unobstructed. Fifty-seven cases reported significant improvement in visual function on the first day after surgery, but 12 cases deteriorated again a week later. There were no surgical complications such as brain strokes. 56 patients were followed up for 2-70 months, with an average follow-up time of (35.48±15.32) months. Forty six patients had clinical symptoms, especially visual impairment and cognitive function, improved to varying degrees. None of the 56 patients had a new stroke after the operation during the follow-up period. **Conclusions:** When Moyamoya disease involves the posterior cerebral artery, and developed occipital lobe infarction , revascularization should be performed to improve blood supply. OA-PCA+EDPS can significantly improve patients' symptoms, and can significantly improve visual impairment for some patients.

Keywords: Moyamoya disease; occipital artery-posterior cerebral artery bypass; skull periosteum; combined direct and indirect bypass

The Therapeutic Effect of Transcranial Direct Current Stimulation on Trigeminal Neuralgia：A behavioral and neurobiological characterization

Ziming Ji

The Second Affiliated Hospital of Hebei Medical University

Abstract

Trigeminal neuralgia (TN) is a common and extremely painful form of facial neuropathic pain, typically characterized by sudden and severe pain in the face. Traditional treatment methods for TN include pharmacological therapies (such as carbamazepine), microvascular decompression, and radiofrequency ablation of the gasserian ganglion. While these treatments can alleviate pain to some extent, they are limited by side effects, surgical risks, and treatment costs. In recent years, non-invasive methods like transcutaneous direct current stimulation (TDCS) have gained attention in the field of neurology. TDCS is an electrical stimulation technique applied through the skin that can modulate nerve excitability and alleviate discomfort caused by neuropathic pain. This study aims to assess the therapeutic effect of TDCS on trigeminal neuralgia, explore its potential as an alternative therapy, and provide a basis for future clinical applications.

Key words: Behavioral test, LFP, Trigeminal Neuralgia, Transcranial Direct Current Stimulation, Open Field test

Cognitive and Cerebral Hemodynamic Effects of Endovascular Recanalization of Chronic Symptomatic Unilateral Middle Cerebral Artery Occlusion: A Retrospective Single-Center Study

一侧症状性大脑中动脉慢性闭塞患者血管内再通对认知功能和脑血流动力学的影响：一项单中心回顾性研究

Chaohui Jing, Wanchun Zhu , Xuming Hua, Xin Zhang, Liang Wan, Shiting Li

荆朝晖，朱婉春，华续明，张新，万亮，李世亭

Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

上海交通大学医学院附属新华医院神经外科

Objective:

Percutaneous transluminal angioplasty and/or stenting (PTAS) has surfaced as a potential alternative therapeutic modality to extracranial-intracranial bypass for patients with chronic symptomatic unilateral middle cerebral artery (MCA) occlusion. The aim of this study was to assess such patients after surgical revascularization, emphasizing the incidence rates of complications and long-term neurocognitive outcomes.

Methods:

Patients with chronic symptomatic unilateral MCA occlusion who have undergone endovascular recanalization were retrospectively collected in the institutional prospective database. Subjects who had undergone Montreal Cognitive Assessment (MoCA) testing, Mini-mental State Examination (MMSE) testing and computerized tomography perfusion (CTP) imaging scans, both pre- and postprocedure, were included. The primary characteristics before surgery were clinically summarized, and complication rates during peri-procedure were evaluated.

Results:

21 patients have undergone effective PTAS were involved. Complications have developed in 2 patients. Significant improvements in MoCA scores ($p < 0.001$, $p < 0.001$) and MMSE scores ($p < 0.001$, $p < 0.001$) were observed in patients after 3 months and 1-year follow-up comparing to the preoperative simultaneously. There were statistical differences in rCBV, TTP, MTT and Delay of CTP parameters ($p = 0.004$, $p = 0.002$, $p = 0.016$ and $p < 0.001$, respectively) between pre- and post-operative.

Conclusion:

PTAS is an effective way to reperfusion of infarct related artery and improve the neurocognitive function in patients with chronic symptomatic MCA occlusion. Careful operation plus BMT management is essential and critical.

Keywords:

chronic MCA occlusion; PTAS; neurocognitive function; CTP

STA-MCA bypass combined with EDMPS for preschool children with moyamoya disease

Yonghui Jiao, Dong Wang, Junfeng Shen, Yongjian, Jin

Affiliation:

Department of Neurosurgery, Aviation General Hospital, Beijing, China.

E-mail:jinyj@vip.sina.com

【**Abstract**】**Objective:** To explore the safety and feasibility of superficial temporal artery-middle cerebral artery bypass combined encepho-dural-myo-pericranio-synangiosis (STA-MCA+EDMPS) in the treatment of moyamoya disease(MMD)in preschool children (≤6 years old).

Methods: The clinical data of 18 preschool children with MMD treated with STA-MCA+EDMPS surgery at the Department of Neurosurgery, Aviation General Hospital from January 2017 to December 2019 were retrospectively analyzed. Three-dimensional reconstruction of cranial CT angiography (CTA) was performed 1 week after surgery to evaluate the scope of craniotomy and the patency of bypass vessels. A head CT or MRI examination was performed 1 week and 6 months after the operation, and a DSA or CTA examination was performed 12 months after the operation to evaluate the growth of bypass vessels. Outpatient or telephone follow-up was conducted every 12 months after the operation until the end of the follow-up, and the mRS score was used to evaluate the patient's neurological recovery.

Results: The surgeries on 31 hemispheres of 18 patients were successfully completed. The CTA examination 1 week after the operation showed that the bypass vessel was unobstructed. All 4 patients who had TIA symptoms before surgery had their symptoms disappear after surgery. Postoperative MRI examination of 1 patient showed asymptomatic small-area cerebral infarction. One patient developed contralateral new cerebral infarction while waiting for contralateral surgery after the first postoperative operation. All patients did not experience symptoms of hyperperfusion or poor wound healing after surgery. The follow-up time of 18 patients was (57.3±13.3) months (33-79 months). At the end of the follow-up, among the 18 patients, 17 patients had an mRS score of (0-2) points, 1 patient had an mRS score of 3 points, which was unchanged from that before surgery. Twelve months after surgery, 18 patients were reviewed for DSA or CTA. The results showed that the STA-MCA bypass unobstructed in 26 sides of 13 patients and not visualized in 5 sides of 5 patients. Collateral vessels due to indirect revascularization were visible in all 18 patients.

Conclusion: Using STA-MCA+EDMPS to treat preschool children with MMD can not only quickly improve the blood supply of ischemic brain tissue, but also achieve a larger range of indirect revascularization. It is safe and feasible, and has good long-term follow-up results.

【**Key words**】Superficial temporal artery-middle cerebral artery bypass; Encepho-dural-myo-pericranio-synangiosis; Preschool children;
Moyamoya disease

Exploration of a Perioperative Precision Nursing Model for Pediatric Moyamoya Disease: A Prospective Practice of Multidisciplinary Team Collaboration

Authors: Jin Huan, Jin Yongjian, Cui Sujuan, Zhang Yan
Affiliation: Aviation General Hospital

Objective To investigate the efficacy of a multidisciplinary team (MDT)-based prospective practice in implementing a precision nursing model for pediatric Moyamoya disease (MMD) during the perioperative period. **Methods** A total of 62 pediatric MMD patients who underwent surgical treatment at the Department of Neurosurgery, Aviation General Hospital, from January 2022 to December 2023 were enrolled. All patients were diagnosed with MMD via digital subtraction angiography (DSA) and met surgical intervention criteria. Surgical procedures included superficial temporal artery-middle cerebral artery (STA-MCA) bypass combined with encephaloduroarteriosynangiosis (EDAS). Patients were randomized into a study group (n=31) and a control group (n=31) using a random number table. The study group received MDT-based nursing, involving neurosurgeons, anesthesiologists, pediatricians, rehabilitation therapists, nutritionists, and nurses. Prospective interventions included:Preoperative joint assessment of physical status, psychological state, and nutritional status to formulate individualized surgical and nursing plans.Neurosurgeons designed and performed surgery to ensure precision and safety.Anesthesiologists selected optimal anesthesia protocols based on patient condition and surgical requirements.Pediatricians assisted in patient evaluation, rehabilitation therapists initiated early postoperative training, and nutritionists developed tailored nutritional support.Nurses provided preoperative psychological counseling, health education, and postoperative care, including vital sign monitoring, drainage tube management, positioning guidance, dietary advice, and complication detection.The control group received routine nursing. Outcomes were compared between groups, including hospitalization duration, postoperative complication rates, neurological recovery (NIHSS score), and quality of life (SF-36 scale). **Results** The study group had a significantly shorter mean hospitalization duration (10.5 days vs. 14.2 days, P=0.002) and lower complication rate (10% vs. 23.3%, P=0.045). At 3-month follow-up, the study group showed superior NIHSS scores (P=0.001) and higher SF-36 scores in physical function, social function, and mental health (P<0.05). MDT care also alleviated preoperative anxiety and improved postoperative compliance. **Conclusion** The MDT-based perioperative nursing model demonstrates significant advantages for pediatric MMD, effectively reducing hospitalization time, lowering complication rates, enhancing neurological recovery, and improving quality of life. This approach provides novel scientific evidence and practical guidance for perioperative care in pediatric MMD.

Keywords: Moyamoya disease; pediatric; perioperative care; multidisciplinary team; precision nursing

Pediatric Intramedullary Schwannoma of the Medulla: A Rare Case Report and Literature Review

Li Bin
李宾
Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

Objective: Intramedullary schwannomas of the medulla oblongata are exceedingly rare and can be easily misdiagnosed as more common entities such as brainstem gliomas. We report a case of pediatric intramedullary schwannoma in the medulla, describe our surgical strategy, and review the latest literature on intracerebral (brain parenchymal) schwannomas, including emerging molecular insights and diagnostic advances.

Methods: A 9-year-old boy presented with progressive brainstem-related symptoms. Preoperative magnetic resonance imaging (MRI) showed a well-demarcated lesion within the medulla, demonstrating solid enhancement. The patient underwent microsurgical resection via a midline suboccipital approach under intraoperative neurophysiological monitoring (IONM). Postoperative imaging and pathological examinations were performed to confirm the diagnosis and evaluate the extent of resection. A literature review was conducted to summarize current knowledge on intramedullary schwannomas, with particular focus on pediatric cases and newly reported molecular findings.

Results: Gross total resection was successfully achieved. Histopathological examination revealed spindle cells in Antoni A and Antoni B areas, with strong immunoreactivity for S100 and SOX10, confirming the diagnosis of schwannoma. Postoperatively, the patient experienced transient left lower-limb numbness, which completely resolved within one month; no permanent neurological deficits remained. Literature data indicate that pediatric intramedullary schwannomas, although exceptionally rare, may be driven by ectopic neural crest cells or metaplastic Schwann cells. Recent studies have also identified SH3PXD2A::HTRA1 gene fusions in approximately 10% of intracranial or spinal schwannomas, pointing to potential novel molecular pathways. Surgical resection remains the mainstay of treatment, with IONM contributing significantly to safe tumor removal and favorable functional outcomes.

Conclusion: This case underscores the importance of accurate differentiation between intramedullary schwannomas and other brainstem lesions such as gliomas and solid hemangioblastoma. A comprehensive diagnostic workup that includes advanced MRI techniques, thorough histopathological evaluation, and attention to emerging molecular markers is essential. Early surgical intervention, guided by IONM, can achieve complete tumor resection with minimal neurological morbidity. Further research into genetic and developmental mechanisms will help refine individualized treatment approaches for this rare entity.

Keywords:

Intramedullary； schwannoma; microneurosurgery; Intraoperative neurophysiological monitoring;

Basic research on the timing selection of facial paralysis transplantation surgery

面瘫移植手术时机选择的基础研究

Liyuhan

李宇晗

Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

上海交通大学医学院附属新华医院神经外科

Objective:

To determine the optimal timing for facial-hypoglossal nerve anastomosis after facial nerve injury following vestibular schwannoma surgery by characterizing the dynamic pathological and molecular changes over time.

Methods:

Clinical patients with facial nerve injury were stratified into three cohorts based on duration post-injury: 3 months, 5 months, and 12 months. Histopathological analysis and single-cell RNA sequencing were performed on nerve specimens to identify temporal cellular and molecular alterations.

Results:

Early-stage injuries (≤3 months) were characterized predominantly by inflammatory responses, while later stages (≥12 months) showed extensive fibrosis and reduced regenerative potential. Single-cell profiling revealed distinct shifts in immune cell populations, Schwann cell phenotypes, and extracellular matrix components across time points. Key signaling pathways associated with neuroinflammation, fibrosis, and nerve regeneration were temporally regulated.

Conclusion:

This study provides a comprehensive pathological and molecular timeline of facial nerve injury, highlighting the critical window for surgical intervention. The findings offer a scientific foundation for optimizing the timing of facial-hypoglossal anastomosis to enhance functional recovery and guide clinical decision-making.

Keywords:

Facial nerve injury, Vestibular schwannoma, Nerve regeneration, Single-cell RNA sequencing, Hypoglossal-facial anastomosis, Timing of surgery, Fibrosis, Inflammation

Predicting long-term outcomes in patients with classical trigeminal neuralgia following microvascular decompression with an MRI-based radiomics nomogram: a multicentre study

Shuo Li, Chenlong Liao, Wenchuan Zhang

Department of Neurosurgery, Shanghai Ninth People's Hospital, Affiliated to Shanghai Jiao Tong University School of Medicine

Objectives： This study aimed to develop a clinical-radiomics nomogram to predict the long-term outcomes of patients with classical trigeminal neuralgia (CTN) following microvascular decompression (MVD).

Materials and methods： This retrospective study included 455 patients with CTN who underwent MVD from three independent institutions A total of 2030 radiomics features from the cistern segment of the trigeminal nerve were extracted computationally from the three-dimensional steady-state free precession and three-dimensional time-off light magnetic resonance angiography sequences. Using the least absolute shrinkage and selection operator regression, 16 features were chosen to develop radiomics signatures. A clinical-radiomics nomogram was subsequently developed in the development cohort of 279 patients via multivariate Cox regression. The predictive performance and clinical application of the nomogram were assessed in an external cohort consisting of 176 patients.

Results： Sixteen highly outcome-related radiomics features extracted from multisequence images were used to construct the radiomics model, with concordance indices (C-index) of 0.804 and 0.796 in the development and test cohorts, respectively. Additionally, a clinical-radiomics nomogram was developed by incorporating both radiomics features and clinical characteristics (i.e., pain type and degree of neurovascular compression) and yielded higher C-indices of 0.865 and 0.834 in the development and test cohorts, respectively. K–M survival analysis indicated that the nomogram successfully stratified patients with CTN into high-risk and low-risk groups for poor outcomes (hazard ratio: 37.18, $p < 0.001$).

Conclusion： Our study findings indicated that the clinical-radiomics nomogram exhibited promising performance in accurately predicting long-term pain outcomes following MVD.

Keywords： Radiomics, Trigeminal neuralgia, Microvascular decompression, Prediction model

Analysis of the therapeutic effect and experience sharing of short-term spinal cord stimulation in the treatment of prolonged disorders of consciousness

Wenchao Li[1*], Lei Hui[1], Xiangsheng Li[1], Fuguang Li[1], Jianhua Zhao[1*], Xinzhong Zhang[1*]

[1] *Department of Neurosurgery, The First Affiliated Hospital of Xinxiang Medical University, Xinxiang 453000*

Objective: To investigate the clinical efficacy and technical points of short-term spinal cord stimulation in the treatment of prolonged disorders of consciousness (pDOC).

Method: A retrospective analysis was conducted on the clinical data of 26 patients with pDOC treated with short-term spinal cord stimulation at the Neurosurgery Awakening Center of the First Affiliated Hospital of Xinxiang Medical College from March 2024 to July 2024. Intraoperative and postoperative CT scan of cervical spine was performed to determine the position of electrode implantation, and the technical points of the surgical process were analyzed. Clinical follow-up was conducted on all patients on the 15th day, 1st month, and 2nd month after surgery, including neurological physical examination, COMA RECOVERY SCALE-REVISED(CRS-R) record form, and event-related potential (ERP). Evaluate the surgical efficacy based on the patient's clinical symptom outcome and scoring results.

Result: With the patient under general anesthesia, the surgeon performed a percutaneous epidural puncture at the 11-12 intervertebral space of the patient's thoracic vertebra. The spinal cord stimulation electrode was dynamically adjusted under X-ray fluoroscopy in the hybrid operating room, and the stimulator was successfully placed into the high cervical spinal cord level. Intraoperative and postoperative CT scans were performed, and electrodes were implanted into the cervical spinal canal and epidural space of C2-6 in all 26 patients. The stimulation parameters for 26 patients were: frequency of 5 Hz and 70 Hz, pulse width of 220 μs, voltage of 1-6 V, daily start-up time from 8am to 8pm, stimulation mode of 5Hz group program stimulation for 300 seconds, interval for 900 seconds; The 70Hz group program is stimulated for 900 seconds with an interval of 900 seconds. Two months after surgery, 15 patients showed significant therapeutic effects, while 11 patients had no significant effects (including 1 death and 1 secondary hydrocephalus); The overall effective rate was 57.6% (15/26). Among the 7 comatose patients, 3 reached the vegetative state, 1 reached the minimally conscious state (MCS)+state, and 3 reached the MCS - state; Among the 8 patients with preoperative vegetative state (VS), 2 achieved wakefulness, 3 improved to MCS+, and 3 improved to MCS -;One patient had difficulty in removing the stimulator, and the rest had no obvious surgery-related complications.

Conclusion: Short-term spinal cord stimulation is minimally invasive, safe and effective, which has early treatment value and diagnostic value. It has a wide application prospect in the diagnosis and treatment of consciousness disorders, and can be used as one of the feasible options for the treatment of pDOC; Surgeons should pay attention to the unique difficulties and technical essentials of electrode insertion during the operation; Event related potentials and CRS-R scores are independent factors influencing the efficacy of pDOC patients.

Clinical Characteristics and Management of Postoperative Dysphagia in 78 Patients with Moyamoya Disease

Li Qizhuang

Aviation General Hospital

Objective To evaluate the incidence, risk factors, and management of postoperative dysphagia in patients with moyamoya disease after revascularization surgery.

Methods Retrospective cohort study of 873 patients (4–66 years) undergoing revascularization surgery (2021.1–2024.12). Dysphagia was diagnosed based on:

1.Clinical Screening: Standardized Swallowing Function Questionnaire (SFQ-30) score ≥60 (moderate/severe dysfunction).

2.Imaging Confirmation:Fiberoptic Endoscopic Evaluation of Swallowing (FEES): Pharyngeal retention or incomplete epiglottic closure.

Data on incidence, risk factors, severity, complications and outcomes were analyzed.

Results

Incidence and Progression

Postoperative dysphagia occurred in 8.9% (78/873), with median onset at postoperative day 5.3 and resolution within 1–4 weeks. Pharyngeal phase dysfunction (46.7%) was most common, including delayed swallow initiation and residual bolus. Median dysphagia duration was 7.3 days (interquartile range: 2–36).

Pathophysiology

Oropharyngeal dysfunction (78.9%) dominated, while esophageal phase abnormalities were rare (11.1%).

Risk Factors

preoperative hemispheric infarction (p=0.03, OR=1.9) and postoperative hyperperfusion syndrome (p = 0.03) were independent predictors.

Interventions

Early rehabilitation (≤48 hours post-surgery) reduced hospital stay by 5.2 days (95% CI: 2.1–8.3).

Modified texture diet combined with head-neck positioning decreased aspiration episodes by 58% (p=0.008).

Conclusion

A multimodal approach combining SFQ-30 and FEES improves dysphagia detection in moyamoya patients. Surgical planning should prioritize minimizing brain exposure, and early targeted rehabilitation is essential to mitigate aspiration risks.

Study on the Application of Neurointervention in the Treatment of Severe Aneurysmal Subarachnoid Hemorrhage Patients

Liu Lei , Ma Chenjian, Chen Shuchao, Guo Dejiang, Du Yutao, Yang Kai

Aviation General Hospital

Objective: To evaluate the value and significance of neurointervention in the treatment of severe aneurysmal subarachnoid hemorrhage (aSAH) patients.

Methods: A total of 60 patients with high-grade aneurysmal subarachnoid hemorrhage (Hunt-Hess grades III-V) treated in our department from January 2010 to November 2024 were included. All patients underwent endovascular embolization of the ruptured aneurysm, followed by intensive care in the NICU. The distribution of Hunt-Hess grades was as follows: 58.3% grade III, 31.7% grade IV, and 10% grade V. A total of 72 aneurysms were treated, with the following distribution: 20.3% anterior communicating artery aneurysms, 20.3% posterior communicating artery aneurysms, 5.6% middle cerebral artery aneurysms, 7.0% internal carotid artery terminus aneurysms, 11.1% vertebral artery aneurysms, 2.8% posterior cerebral artery aneurysms, 2.8% posterior inferior cerebellar artery aneurysms, and 5.6% multiple aneurysms. The interventional techniques included single-catheter embolization under general anesthesia, double-catheter double-embolization technique, balloon-assisted embolization, stent-assisted embolization, and flow-diverting device techniques. All patients received intensive care in the NICU postoperatively.

Results: The degree of aneurysm embolization was classified according to the Raymond scale: 46.9% grade 1, 46.9% grade 2, and 6.2% grade 3. Intraoperative rupture occurred in 2 cases (3.3%), and postoperative rebleeding occurred in 1 case (1.7%). The average surgical time was 90 minutes, with a survival rate of 93.3%. At 90 days, the modified Rankin Scale (mRS) scores were as follows: 81.7% scored 0-3, 13.3% scored 4-5, and 6.7% died. Long-term hydrocephalus occurred in 31.7% of the patients.

Conclusion: Neurointerventional techniques for the treatment of severe aneurysmal subarachnoid hemorrhage are minimally invasive, provide complete hemostasis, are rapid, and demonstrate significant clinical efficacy. It is recommended as the preferred treatment for this condition.

Keywords: Neurointervention, Severe, Aneurysm, Subarachnoid Hemorrhage

Optic Nerve Decompression through Pterional and Supraorbital Approaches in the Treatment of Severe Traumatic Optic Neuropathy

Chenlong Liao, Wenchuan Zhang*

Department of Neurosurgery, Shanghai Ninth People's Hospital, Shanghai JiaoTong University School of Medicine, NO.639 Shanghai Zhizaoju Road, Huangpu District, Shanghai, China,200092

*Correspondence: liaochenlong@shsmu.edu.cn

Abstract

Objective

To investigate the effectiveness of optic nerve decompression (OND) in the treatment of severe traumatic optic neuropathy (TON) through pterional and supraorbital approaches, and to identify the prognostic factor for postoperative visual acuity (VA) following OND.

Method

Patients with severe TON treated with OND through either pterional or supraorbital approach in our institute from September 2019 to June 2022 were retrospectively reviewed in this study. Demographic information, trauma factors, the interval between trauma and complete blindness, the interval between trauma and surgery, and the associated craniofacial traumas were recorded. Hospitalization days and the postoperative VA of patients in two groups were compared.

Results

There were 54 severe TON patients with NLP included in this study; 21 patients underwent OND through the pterional approach, and the other 33 underwent the supraorbital approach. Respectively, in groups of pterional and supraorbital approaches, the average hospitalization days were 9.8 ± 3.2 and 10.7 ± 2.9 days (p=0.58), the mean durations of follow-up were 18.9 ± 4.3 and 20.8 ± 3.7 months (p=0.09), and the average circumference of OND were 53.14 ± 15.89 ◦ (range 220 ◦ -278◦) and 181.70 ± 6.56◦ (range 173 ◦ -193◦) ($p < 0.001$). The overall improvement rates of pterional and supraorbital approaches are 57.1% and 45.5% (p=0.40), respectively. Optic canal fracture (OCF) was revealed to be significantly associated with postoperative VA in the supraorbital approach (Binary: p=0.014, CI: 1.573-57.087; Ordinal: p=0.003, CI: 1.517-5.503), but not in the pterional approach. In the group of supraorbital approach, patients with OFC had a higher rate of a better outcome (78.6%) than those without (21.4%).

Conclusion

Patients with severe traumatic TON may benefit from OND through either the pterional or supraorbital approach. OCF is a potential prognostic factor for postoperative VA following OND through the supraorbital approach.

Study on the Value of Visualized Nasoenteric Tube Placement Technology in Nutritional Support for Neurocritical Patients

Liu Mei, Liu Lei

Aviation General Hospital

Objective: To explore the value and significance of visualized nasoenteric tube placement technology in providing nutritional support for neurocritical patients.

Methods: A total of 70 neurocritical patients who required enteral nutritional support using visualized nasoenteric tube placement technology from January 2024 to December 2024 were selected as the study subjects. The success rate of tube placement, time required for placement, incidence of complications during the procedure, patient tolerance, and the effectiveness of the tube placement were analyzed.

Results: The visualized nasoenteric tube placement technology effectively addressed the enteral nutritional needs of patients with gastroparesis, insufficient gastric motility, coma, advanced age, mechanical ventilation (high risk of aspiration), severe pancreatitis, intolerance to gastric feeding, or those who could not achieve the target feeding volume through gastric feeding. All patients achieved the target feeding volume.The average time for visualized nasoenteric tube placement was 20 minutes, significantly improving the success rate of tube placement and reducing patient discomfort during the procedure.Post-placement X-ray localization confirmed that the catheter tip accurately passed through the duodenum and reached the descending part in 100% of cases.

Conclusion: The visualized nasoenteric tube placement technology has a precision rate of 100%, with high success rates, broad applicability, fewer complications, shorter operation times, and minimal patient discomfort. It effectively and promptly addresses the enteral nutritional support needs of neurocritical patients, with an aspiration incidence of 0%, making it the preferred method for nutritional support in neurocritical patients.

Keywords: Visualized technology, nasoenteric tube, neurocritical care, enteral nutritional support

Name: Liu Ying 刘颖
Unit: Aviation General Hospital 航空总医院
Title: Supervisor Nurse
Homogenization nursing intervention in enteral nutrition of patients with persistent vegetative state
The application effect
Objective: To explore the application of homogeneous nursing intervention in patients central nervous system infection and coma through nasointestinal tubeThe effect in internal nutrition.
Method: 88 patients with persistent vegetative state who received enteral nutrition in our neurosurgery department from July 2023 to July 2024 were enrolled. 45 patients with persistent vegetative state who were admitted were selected as the control group and received routine nursing care; 43 patients were selected as the observation group, and homogeneous nursing interventions were implemented on the basis of routine nursing: a multidisciplinary collaborative enteral nutrition support group composed of doctors, nurses, nutritionists, and pharmacists was established, enteral nutrition nursing systems and processes were established, enteral nutrition screening and evaluation were improved, specialized training on enteral nutrition was carried out, nutrient solution preparation and storage environments were standardized, and homogeneous health education was provided. Compare the enteral nutrition status of two groups of patients.
Results: Enteral nutrition was carried out for 3 to 5 days. The patients in the observation group had tube blockage, abdominal pain, diarrhea, and stomach pond
The incidence of complications such as retention, vomiting, glucose metabolism disorder, and nasal skin pressure injury was 10.00%, and the incidence of aspiration pneumonia infection was 3.75%, which was lower than the control group's 29.49% and 15.83%, respectively ($P<0.05$); There was no statistically significant difference in the levels of prealbumin before enteral nutrition between the two groups ($P>0.05$), The albumin level in the observation group receiving enteral nutrition for 20 days (37.87 ± 2.26) g/L was higher than that in the control group (34.22+2.04) g/L ($P<0.05$).
Conclusion: Implementing homogeneous nursing interventions for patients with persistent vegetative state can effectively reduce the incidence of enteral nutrition complications and infections, improve patients' nutritional status and body mass, and is worthy of application.
Keywords: homogeneous nursing intervention; Persistent plant state; Enteral nutrition; complication

Far Lateral Approach for Treating Hemorrhagic Craniocervical Junction Dural Arteriovenous Fistulas and Case Illustrations

Liang Xiaolong[1], Liu Jie[2,3], Chen Xu[4],Gao Kaiming[5],Zhu Guangsheng[6]

[1]People's Hospital of Deyang City, Sichuan Clinical Research Center for Neurological Diseases, Deyang, China

[2]Department of Neurosurgery, The Second Affiliated Hospital of Guilin Medical College, Guangxi,China.

[3]Laboratory of Microneurosurgery, Guilin Neurosurgical Institute,Guangxi, China.

[4]Department of Neurosurgery, The First Affiliated Hospital of Yunnan University, Kunming, China.

[5]Department of Neurosurgery, Tianjin Huanhu Hospital, Tianjin, China.

[6] Department of Neurosurgery, Hezhou People's Hospital,Guangxi,China.

Abstract Objective To investigate the surgical efficacy and clinical experience of microsurgical treatment via the far lateral approach for craniocervical junction dural arteriovenous fistulas (CCJDAVFs).**Methods** Clinical data were collected from 12 patients with hemorrhagic craniocervical junction dural arteriovenous fistulas, who underwent surgical intervention via the far lateral approach from September 2021 to May 2024. All fistulas were located between the lower edge of the foramen magnum and the C1 vertebral body. Microsurgical techniques were employed to clip or coagulate the fistulas, with intraoperative angiography performed to confirm the disappearance of the arteriovenous fistulas. Clinical and radiological follow-up was conducted at 3 months postoperatively to evaluate the surgical outcomes by comparing preoperative clinical symptoms. **Results** Of the 12 cases, 9 were supplied by radiculo-meningeal artery, and 3 were supplied by both radiculo-meningeal artery and the lateral spinal artery. Venous drainage was cephalad in 8 cases and caudad in 4 cases. Immediate radiological cure was achieved in all 12 patients, with good incision healing and no cerebrospinal fluid leakage. Postoperative symptoms were alleviated in 10 cases, aggravated in 1 case, and unchanged in 1 case. One patient developed intracranial infection postoperatively, which resolved after appropriate treatment. Three-month digital subtraction angiography showed no recurrence of arteriovenous fistulas, and no rebleeding occurred during the follow-up period. Symptoms significantly improved in 1 case and disappeared in 10 cases. One patient, whose symptoms of hydrocephalus did not improve, underwent permanent ventriculoperitoneal shunt surgery. **Conclusions** The far lateral approach provides a safe, adequate, and effective exposure of the feeding arteries and draining veins for cranio-cervical junction dural arteriovenous fistulas. Identifying the fistulas and all feeding arteries is key to successful surgery.

Keywords Far Lateral Approach; Craniocervical Junction; Dural Arteriovenous Fistulas; Hemorrhagic

L-11 林静辉

Abstract

Objective: Intravenous indocyanine green video angiography (ICG-VA) is commonly used to evaluate vascular bypass surgeries. Our previous work applied microcatheter-based intra-arterial ICG-VA in bypass surgeries. This technique enabled the visualization of the perfusion range of the superficial temporal artery (STA) and cortical draining veins. However, the technique was relatively limited and had certain drawbacks, such as the additional surgical procedures and its invasiveness. Hence, this article describes additional arterial injection methods developed during our clinical practice.
Methods: This retrospective study included 46 hemispheres of 41 patients who underwent superficial temporal artery-middle cerebral artery（STA-MCA）bypass surgery between February 2023 and June 2024, including 32 hemispheres with moyamoya disease, 6 with internal carotid artery occlusion, and 8 with middle cerebral artery occlusion. During the surgery, one of four arterial injection methods was performed on each hemisphere, including the microcatheter-based arterial injection method, donor artery branch injection method-A, donor artery branch injection method-B, or donor artery main trunk injection method. Concurrently, peripheral venous injection was administered to sequentially perform ICG-VA and assess the hemodynamic status following the bypass. Finally, the four methods were compared and analyzed using intraoperative imaging data.
Results: Compared with intravenous ICG-VA, intra-arterial injection not only reflects the vascular patency of the anastomosis but also enables rapid visualization and assessment of blood flow speed. Moreover, it uses a smaller dose of ICG, allowing observation of the perfusion range of the donor vessels and the cortical draining veins. The first method was applied to 17 hemispheres, the second to 21 hemispheres, and the third and fourth methods to 3 and 5 hemispheres, respectively.
Conclusions: All four intra-arterial injection methods facilitate a superior assessment of the hemodynamic status after bypass surgery compared to intravenous injection. The choice of method can be tailored based on intraoperative conditions.

Metabolomic machine learning predictor for diagnosis traumatic chronic subdural hematoma

Xiang Mao[1]

1.Department of Neurosurgery, the First Affiliated Hospital of Anhui Medical University,Hefei, Anhui, 230022, China;

Abstract: Chronic subdural hematoma (cSDH) represents a prevalent neurological condition among the elderly population, with trauma identified as its primary etiological factor. Despite extensive research, the precise mechanisms underlying cSDH formation remain incompletely understood. Current evidence suggests that the pathogenesis of cSDH involves multiple interrelated processes, including chronic inflammation, microvascular injury, aberrant angiogenesis, and coagulation dysfunction. Nevertheless, no single hypothesis has been able to comprehensively elucidate the complex pathophysiology of subdural fluid accumulation, and the specific biochemical characteristics of this fluid remain poorly defined.The diagnostic approach to cSDH primarily relies on clinical symptomatology and neuroimaging techniques. However, the insidious nature of the condition often results in an absence of overt clinical manifestations during the early stages. This diagnostic delay often results in intervention at advanced disease stages, contributing to unfavorable clinical outcomes. To date, the management of cSDH remains suboptimal, underscoring the critical need for further research into the molecular mechanisms of hematoma formation and the development of targeted therapeutic strategies.

Objective: The primary objective of this study is to perform a comprehensive metabolomic analysis of patients with traumatic chronic subdural hematoma (cSDH). Through a comparative investigation of metabolic profiles between cSDH patients and individuals with mild traumatic brain injury (mTBI), we aim to identify unique metabolic signatures specifically associated with subdural hematoma pathogenesis. Furthermore, this study seeks to characterize the metabolic differentials between subdural hematoma fluid and corresponding peripheral blood samples. By integrating these analytical findings, we endeavor to elucidate the pathophysiological mechanisms underlying cSDH development and progression. Ultimately, this research aims to establish novel diagnostic biomarkers for early detection and to identify potential therapeutic targets for improved clinical management of cSDH.

Methods: In this study, liquid chromatography-mass spectrometry (LC-MS)-based metabolomics was uesd to characterize the metabolic profiles of patients with traumatic chronic subdural hematoma and to develop a predictive diagnostic model. The investigation encompassed a comparative analysis of metabolic alterations between peripheral blood and subdural hematoma fluid, with subsequent exploration of potential mechanisms underlying hematoma formation. The study cohort comprised 185 plasma samples, including 60 healthy controls, 60 patients with mild traumatic brain injury (mTBI), and 65 patients with traumatic cSDH. Additionally, subdural hematoma fluid samples were obtained from 35 cSDH patients. Multivariate statistical analyses, including principal component analysis (PCA) and orthogonal partial least squares-discriminant analysis

(OPLS-DA), were performed to identify intergroup metabolic differences. Pathway enrichment analysis was conducted to elucidate the predominant metabolic pathways associated with differential metabolites. Machine learning algorithms were implemented to screen potential biomarker metabolites and construct a predictive model, which was subsequently validated in an independent cohort to assess its diagnostic efficacy.

Results: The study population comprised two distinct cohorts: a training cohort consisting of 30 healthy controls, 30 patients with mild traumatic brain injury (mTBI), and 35 patients with traumatic chronic subdural hematoma (cSDH); and a validation cohort including 30 healthy controls, 30 mTBI patients, and 30 cSDH patients. Demographic analysis revealed no significant intergroup differences in age distribution or gender composition within each cohort, ensuring baseline comparability among study participants. Regarding clinical parameters, platelet count (PLT), anticoagulant use history, and hypertension history showed no statistically significant differences between groups in either cohort ($P > 0.05$). However, coagulation profile analysis demonstrated that both activated partial thromboplastin time (APTT) and prothrombin time (PT) were significantly prolonged in the mTBI and cSDH groups compared to healthy controls across both cohorts ($P < 0.05$). Notably, no significant differences in APTT or PT values were observed between the mTBI and cSDH groups ($P > 0.05$). Comprehensive metabolomics analysis identified 21 differentially expressed metabolites and 10 significantly altered metabolic pathways associated with the pathogenesis of traumatic cSDH. Comparative analysis between hematoma fluid and peripheral blood samples further substantiated the potential involvement of these metabolites in subdural hematoma formation. To facilitate the interpretation and clinical application of complex metabolomic data, we employed machine learning algorithms to analyze significantly differentiated metabolites. This approach enabled the development of a robust predictive model incorporating 10 candidate biomarkers, which demonstrated consistent performance upon validation in an independent external cohort.

Conclusions: This comprehensive metabolomics study provides novel insights into the distinctive metabolic profile associated with traumatic chronic subdural hematoma, representing the first systematic characterization of metabolic alterations in this pathological condition. The identification of significant metabolic differences between subdural hematoma fluid and peripheral blood has enhanced our understanding of the pathophysiological mechanisms underlying cSDH development, potentially revealing new therapeutic targets for clinical intervention. Furthermore, the development and validation of a machine learning-based predictive model represents a significant advancement in the field, offering a promising approach for early prediction of traumatic cSDH occurrence. These findings not only contribute to the fundamental understanding of cSDH pathogenesis but also provide a foundation for the development of targeted diagnostic and therapeutic strategies.

Key words： Metabolomic, Machine Learning, Chronic Subdural Hematoma

Application of "Four-step" Method in Robot-guided Percutaneous Balloon Compression of the Gasserian Ganglion for Trigeminal Neuralgia

Changcheng Ma

Department of Neurosurgery, Peking University Third Hospital, Peking University

Objective: To summarize the effect of "four-step" method in robot-guided percutaneous balloon compression of the gasserian ganglion for trigeminal neuralgia.

Methods: Clinical data of 20 patients with trigeminal neuralgia who underwent robot-guided percutaneous balloon compression of the gasserian ganglion from June 2020 to November 2021 were retrospectively analyzed. The median Visual Analogue Scale (VAS)score of the 20 patients before surgery was 8(range,7-10). Preoperative planning and surgery were performed with a "four-step" process: ① preliminary positioning on three-dimensional images; ② determination of puncture direction on sagittal and coronal CT images; ③ fine-tuning of the relationship between puncture path and Meckel's sac on MRI images; and ④ low-resistance puncture.

Results: All the patients successfully received the operation and the intraoperative lateral X-ray balloon showed a typical "pear shape". The pain symptoms were relieved immediately after operation with the VAS scores being 0 in 17 cases and 1 in 3 cases. Postoperative operation-sided numbness with unilateral sensory dysfunction of half of the tongue was observed in all the patients, masticatory muscle strength decreased in 15 patients, corneal reflex decreased in 1 patient, and oral herpes occurred in 3 patients. The patients were followed up for 3-23 months (mean,10.7±5.1 months). The VAS score was 0 in all the patients, and no trigeminal neuralgia recurred. Residual mild facial numbness was found in 2 cases, while facial numbness, lingual dysesthesia, masticatory muscle weakness, hypocorneal reflexes and oral herpes disappeared in the other 18 cases.

Conclusion: Using the "four-step" method to implement the robot-guided percutaneous balloon compression of the gasserian ganglion has satisfactory results.

Neuroendoscopic surgery for brainstem cavernous hemangiomas

穆林森/Mu Linsen

Department of Neurosurgery, Guangdong 999 Brain Hospital

Objective: To explore the application and value of total neuroendoscopic surgery for brainstem cavernous hemangiomas.

Methods: Thirteen cases of brainstem cavernous hemangiomas were treated with total neuroendoscopic surgery. The surgeries were performed entirely under neuroendoscopy, with a male-to-female ratio of 12:1, ages ranging from 32 to 71 years, tumor sizes between 0.9 and 2.5 cm, and GCS scores of 5 in one case and 15 in twelve cases. Two patients underwent surgery within one week of onset, five between one and two weeks, two between three and four weeks, and four more than one month after onset. Twelve patients had comprehensive imaging examinations before surgery, while one patient had only a head CT scan on the second day after onset. The lesions were located in the midbrain in three cases (one near the inferior colliculus, one in the cerebral peduncle, and one near the thalamus) and in the pons in ten cases (three at the lateral aspect, three at the floor of the fourth ventricle, one centrally, one ventrally, and one in the pontine arm-cerebellar region). Six surgical approaches were used: suboccipital transtentorial approach in two cases, posterior midline falx approach in five cases, infratemporal approach in three cases, CPA approach in one case, extreme lateral suboccipital transtentorial approach in one case, and endport surgery in one case. All surgeries were conducted under neurophysiological monitoring, with twelve assisted by neuronavigation for intraoperative localization. Postoperative pathology confirmed all as cavernous hemangiomas.

Results: All endoscopic surgeries for brainstem cavernous hemangiomas were successfully performed. The lesions were accurately located during surgery, with adequate exposure and clear surgical fields, free from blind spots and dead zones. Twelve cases achieved complete resection of the hemangiomas, while one case had minimal residual tissue. Postoperative pathology confirmed the diagnosis of cavernous hemangioma, with one case also showing venous malformation. The operation duration ranged from 3.0 to 4.5 hours, and intraoperative blood loss was between 100 and 200 milliliters. Postoperatively, all twelve patients recovered well, with no new neurological deficits observed recently and improvements noted in long-term neurological deficits. One comatose patient regained consciousness five days post-surgery, and another patient with thalamus-associated cavernous hemangioma experienced early speech and limb dysfunction, which largely normalized within one to two months.

Conclusion: Neuroendoscopy offers advantages such as close observation, flexible maneuverability, and panoramic vision, effectively eliminating the blind spots of microscopic surgery and overcoming obstacles caused by head positioning and craniotomy. The high-definition panoramic view minimizes the need for large openings on the brainstem surface, facilitating minimally invasive and successful resection of brainstem cavernous hemangiomas. Neuroendoscopic surgery for brainstem cavernous hemangiomas, with its minimally invasive benefits, can be widely applied.

Clinical analysis of extended far lateral approach for resection of jugular foramen tumors

Maimaitili·Mijiti[1], Li Yandong[1], Feierkaiti Abudukeyimu[1], Zhang Gaocai[1], Lian Minghao[1], ZhangYongtao[1], Zhu Guohua[1],Geng • Dangmurenjiafu[1]✉

([1] Neurosurgery Center of the First Affiliated Hospital of Xinjiang Medical University, Urumqi, Xinjiang Uyghur Autonomous Region, 830054)

Objective: To explore the clinical efficacy of the extended far lateral approach in the resection of jugular foramen tumors.

Methods: The clinical data of 22 patients with jugular foramen tumors admitted to the Department of Neurosurgery of the First Affiliated Hospital of Xinjiang Medical University from January 2020 to December 2024 were retrospectively analyzed, including 11 schwannomas, 5 paragangliomas, 4 meningiomas, and 2 hypoglossal schwannomas in the posterior group. All patients underwent surgical treatment, including 9 cases of basal far lateral approach, 4 cases of paracondylar approach, 5 cases of partial transcondylar approach, and 4 cases of supracondylar approach. Postoperative MRI examination confirmed the degree of tumor resection, and Karnofsky functional status score (KPS) was used to assess the neurological status of patients after surgery and during follow-up.

Results: Among 22 patients, total resection was performed in 16 patients (72.7%) and subtotal resection in 6 patients (27.3%). There were no postoperative deaths and no recurrences. Cranial nerve function was improved in 7 cases, unchanged in 8 cases, and aggravated in 7 cases, including aggravated facial paralysis in 3 cases and aggravated cranial nerve paralysis in 4 cases in the posterior group. There were 4 cases of central nervous system infection, 4 cases of pulmonary infection and 1 case of cerebrospinal fluid leakage after operation. Postoperative KPS was 80-100 points in 16 cases and < 80 points in 6 cases. Median follow-up was 17 months (range, 2-60 months). At last follow-up, KPS was 80 ~ 100 points in 20 patients (90.9%) and < 80 points in 2 patients (9.1%).

Conclusion: The far lateral approach and its extended approach are used to remove the tumor in the jugular foramen area with sufficient exposure, and the total resection rate and near total resection rate of the tumor are relatively high, and the postoperative complications are controllable, which can achieve a better prognosis for patients.

Microvascular Decompression for Hemifacial Spasm Caused by Posterior Inferior Cerebellar Artery Compression at the Pontomedullary Sulcus

Author: Dawei Meng, Lin Wang, Guoqiang Chen
Affiliation: Department of Neurosurgery, Aviation General Hospital, Beijing, China.

Abstract

Background: Microvascular decompression surgery is the most effective treatment for hemifacial spasm. However, vascular compression of the facial nerve at the pontomedullary sulcus presents surgical challenges due to its deep location and difficult exposure, which may also lead to oversight of the offending vessels. Studies indicate that the posterior inferior cerebellar artery (PICA) is the most common offending vessel compressing the facial nerve at the pontomedullary sulcus. Sometimes the PICA exhibits a pronounced anatomical loop that creates marked indentation on the brainstem at the facial nerve root exit zone adjacent to the pontomedullary sulcus.

Objective: This study investigates the clinical characteristics and surgical outcomes of patients with hemifacial spasms caused by PICA compression at the pontomedullary sulcus.

Methods: Thirty-nine patients with hemifacial spasm caused by PICA-induced compression of the facial nerve at the pontomedullary sulcus were collected through systematic review of preoperative MRI scans and intraoperative surgical videos. Clinical characteristics, surgical outcomes, and postoperative complications were subsequently analyzed.

Results: Among the 39 patients (male: 10; female: 29; mean age: 51.4 years), the mean disease duration was 5.04 years (range 0.5-23). Five patients underwent revision surgery due to missed offending vessels during initial operations. The PICA loop was entirely located at the ventral to the glossopharyngeal (CN IX) and vagus (CN X) nerves and was obscured by these nerves. Postoperatively, delayed resolution occurred in 10 cases, with spasms ceasing after a mean latency of 3.6 months. During a mean follow-up of 24.9 months, all patients achieved complete symptom cessation. Complications included transient aseptic meningitis (n=2), delayed facial paralysis (n=2), vertigo (n=1), and medullary ischemia-induced ataxia and vertigo (n=1), all resolving with targeted therapies. One patient with revision surgery experienced persistent severe ipsilateral hearing loss.

Conclusions: Microvascular decompression achieves favorable outcomes in hemifacial spasm patients with PICA-induced facial nerve compression at the pontomedullary sulcus. However, the deep location of the offending vessel, frequently obscured by the overlying glossopharyngeal (CN IX) and vagus (CN X) nerve complex, poses significant intraoperative challenges. Meticulous exploration of the pontomedullary sulcal region is critical for identifying the neurovascular conflict and ensuring complete decompression in such cases.

key word：Microvascular Decompression，Hemifacial Spasm，Pontomedullary Sulcus，PICA，Outcome

Clinical efficacy analysis of modified long-range abdominal abdominal drainage for intracranial infection caused by postoperative gram-positive cocci

Qi Guanghong * Aviation General Hospital

purpose:
To explore the clinical efficacy of modified long-range abdominal drainage for intracranial infection caused by postoperative Gram-positive cocci.

method:
A total of 40 gram-positive coccal patients admitted to our department in January 2023 and December 2024 were analyzed for the clinical efficacy of the modified abdominal drainage combined with intrathecal injection of sensitive antibiotics.

results:
In 40 patients, the duration of the modified long-range abdominal abdominal drainage was approximately 21 – 30 days. Among them, all Gram-positive coccal infection were cured and changed to secondary hydrocephalus. In the later stage, they were given lumbar pool-abdominal shunt, and were discharged after surgery; 4 patients were discharged after recovery. A mean follow-up of 3-6 months after discharge showed no recurrence of intracranial infection.

conclusion:
After the implantation of the drainage tube, there are complications such as easy prolapse, exudation, cerebrospinal fluid leakage, retrograde infection, and short indwelling time. In clinical work, how to avoid the above complications has always been a difficulty for clinicians. By treating gram-positive coccal infection with modified long-range abdominal drainage catheter, it can effectively reduce the complications, increase the carrying time, reduce the number of puncture, and avoid the recurrence of intracranial infection. This improved method is feasible in clinical work.

keyword:
Modified long-range abdominal drainage of intracranial hydrocephalus with Gram-positive cocci

Intervention Effect Study of Traditional Chinese Medicine Acupuncture Point Application on Sleep Disorders In Patients With Alzheimer ’s Disease Based On "Brain-Gut Axis" Theory

Ling-Yun Shi[1], Geng·Dangmurenjiafu[1],Jia-Ju Zhao[2]

1The First Affiliated Hospital of Xinjiang Medical University;2School of Nursing, Xinjiang Medical University

Abstract: Sleep disturbances in Alzheimer's disease (AD) patients exacerbate cognitive decline and reduce quality of life. Emerging evidence suggests that the gut-brain axis mediates bidirectional communication between gut microbiota and the central nervous system, offering novel therapeutic targets. Traditional Chinese medicine (TCM) acupoint application, a non-invasive external therapy, may modulate gut microbiota and improve sleep.

Objective: To evaluate the efficacy of TCM acupoint application targeting the gut-brain axis in improving sleep quality among AD patients and explore its potential mechanisms.

Methods: In this single center randomized controlled trial, 96 AD patients with sleep disorders from a tertiary hospital in Xinjiang were allocated via random number table to either the intervention group (n=48) or control group (n=48). The experimental group received TCM acupoint application (selecting acupoints such as Shenmen, Sanyinjiao, Taixi, and Zusanli, with a TCM formula including Semen Ziziphi Spinosae and Polygala tenuifolia) combined with routine care, while the control group only received routine care. The patients were treated once a day after admission, and after 4 weeks of intervention, the changes in the Pittsburgh Sleep Quality Index (PSQI) score, serum neurotransmitter levels (5-HT, GABA, etc.), and the diversity and composition ratio of the intestinal flora were compared between the two groups.

Results: (1) The effective rate of the experimental group (46 cases, accounting for 95.83%) was higher than that of the control group (38 cases, accounting for 79.16%), and the difference was statistically significant ($P < 0.05$). (2) There was no difference in sleep quality between the two groups before treatment ($P > 0.05$), but after treatment, the PSQI score of the experimental group was significantly lower than that of the control group, and the difference was statistically significant ($P < 0.05$). (3) After treatment, the PSQI score of the experimental group was significantly lower than that of the control group ($P < 0.05$), the levels of serum 5-HT and GABA were significantly higher than those of the control group ($P < 0.05$), the diversity index of the intestinal flora was significantly increased ($P < 0.05$), and the relative abundance of probiotics (such as Bifidobacterium and Lactobacillus) increased, while the relative abundance of pathogenic bacteria (such as Escherichia coli) decreased.

Conclusion: TCM acupoint application improves sleep quality in AD patients, potentially through gut microbiota modulation and neurotransmitter regulation. These findings support the gut-brain axis as a therapeutic target for AD-related sleep disorder.

Application Effect of Predictive Nursing in Patients with Guillain-Barré Syndrome (GBS) After Microvascular Decompression Surger

Aviation General Hospital
Shen Hongyan, Wang Liang, Liu Na, Wang Yaru, Liu Min

Abstract

Objective: To explore the application effect of predictive nursing in patients with Guillain-Barré Syndrome (GBS) after microvascular decompression surgery.

Methods: A total of 10 patients with GBS after microvascular decompression surgery admitted to Aviation General Hospital from January 2022 to December 2024 were selected and randomly divided into an observation group and a control group, with 5 cases in each group. The control group received routine nursing care, while the observation group received predictive nursing in addition to routine care, including early symptom monitoring, complication prevention, psychological support, rehabilitation training, nutritional support, and pain management. The incidence of complications, neurological recovery, length of hospital stay, and quality of life scores were compared between the two groups.

Results: The incidence of complications in the observation group was significantly lower than that in the control group ($P<0.05$), neurological recovery was better ($P<0.05$), the length of hospital stay was shorter ($P<0.05$), and the quality of life scores were significantly higher ($P<0.05$).

Conclusion: Predictive nursing can effectively reduce the incidence of complications, promote neurological recovery, shorten hospital stays, and improve the quality of life in patients with GBS after microvascular decompression surgery, demonstrating significant clinical application value.

Keywords: Predictive nursing; Microvascular decompression; Guillain-Barré Syndrome; Complications; Quality of life

An accurate and convenient positioning technique for sacral cysts surgery and its applicable scope

Yu Si

Department of Neurosurgery, Peking University Third Hospital, Peking University

Abstract：

Objective: Explore a new accurate and convenient positioning technique for sacral cysts surgery and study it's application scope.

Methods: Prospectively collect the records of patients who were diagnosed with Sacral cysts, and define the thickness that distinguish between "superficial" and "deep" as the thickness of soft tissue when 90% of doctors can locate the bone clearly. Patients are then classified according to the fact whether the sacrococcygeal bone are superficial or deep. Study which types can adopt new positioning methods and the influencing factors of different types.

Results: A total of 218 patients were included in the study. We define the thickness that distinguish between "superficial" and "deep" as 2cm. T2 images are more appropriate sequences for precise localization of sacral cysts. According to the fact whether the sacrococcygeal bone are superficial or deep, patients can be divided into three types. Types I and IIA(account for 77%) are types that can use our new positioning technique. There is a moderate positive correlation between high BMI values and the thickness of superficial soft tissues.

Conclusions: We presents a new accurate and convenient positioning technique which is suitable for most patients with sacrococcygeal diseases.

Surgical Nuances in the Management of Pineal Region Tumors Using the Occipital Transtentorial Approach

Lingmin Shao, Mohammad Rohul Amin, Jia Liu, Renzhong Liu, Zhihong Jian
Department of Neurosurgery, Renmin Hospital of Wuhan University, Wuhan, 430060, China.

Abstract

Objective: This study aims to explore the surgical techniques and outcomes associated with the excision of pineal region tumors using the occipital transtentorial approach.

Methods: A retrospective analysis was conducted on 12 patients with pineal region tumors treated between January 2018 and January 2022. The clinical data, surgical methods, and outcomes were examined.

Results: Pathological findings revealed 3 germ cell tumors (including 2 pure germ cell tumors), 2 astrocytoma, 1 glioblastoma, 2 pineocytoma, 3 epidermoid cysts, and 1 small cell neuroendocrine carcinoma of pulmonary origin. Total resection was achieved in 10 cases (83.3%), while subtotal resection was achieved in 2 cases (16.7%). There were no mortalities. Pre-resection external ventricular drainage was performed in 5 patients, followed by third ventriculostomy or terminal ventriculostomy to address hydrocephalus, including 2 cases treated with endoscopicventriculostomy. One patient required a ventriculoperitoneal shunt postoperatively to resolve persistent hydrocephalus.

Conclusion: The occipital transtentorial approach is effective for the removal of tumors in the pineal region and the posterior third ventricle. Performing a third ventriculostomy or terminal ventriculostomy post-tumor removal can help alleviate hydrocephalus.

Keywords: Pineal region tumors, Occipital transtentorial approach, Hydrocephalus, Ventriculostomy

Nursing Experience of Valproate Sodium-Associated Hyperammonemic Encephalopathy After Craniocerebral Tumor Surgery

Qiu-xia Shi1,Ling-yun Shi2,guo-liang Hou3,Xue-li Yue4
1The First Affiliated Hospital of Xinjiang Medical University;2School of Nursing, Xinjiang Medical University

Objective : To explore and summarize prevention and nursing strategies for valproate sodium-associated hyperammonemic encephalopathy in patients after craniocerebral tumor surgery, aiming to reduce complication rates, mortality, and improve treatment efficacy and quality of life.

Methods : A retrospective analysis was conducted on clinical data from 35 patients who treated with valproate sodium postoperatively in the neurosurgery department of our hospital between January 2021 and July 2024. The Targeted nursing interventions were as follows: 1. Close monitoring of vital signs, especially consciousness, within 48–72 hours postoperatively. During this period, symptoms such as decreased consciousness, nausea, and vomiting caused by cerebral edema may mimic hyperammonemic encephalopathy, necessitating careful differentiation. 2. Continuous 24-hour administration of valproate sodium (Depakine 1200 mg in 0.9% sodium chloride solution at 2.2 mL/h) via a micro-infusion pump. After 24 hours, oral administration (500 mg twice daily) was initiated if no complications occurred. Blood drug concentration was regularly monitored to maintain an effective range of 50–100 mg/L. Strict adherence to infusion protocols was emphasized to prevent ammonia accumulation. 3. For long-term valproate sodium users, routine liver function, blood drug concentration, and blood ammonia levels monitoring were implemented. Although valproate sodium may elevate blood ammonia, only a minority develop encephalopathy. Immediate discontinuation was recommended if hyperammonemia or abnormal EEG occurred, followed by the resolution of symptoms

Results: Among 8 patients diagnosed with valproate sodium-associated hyperammonemic encephalopathy: The Blood ammonia levels were effectively controlled in 6 cases, with symptom improvement and no severe neurological deficits. 2 patients achieved normalized ammonia levels after dose adjustment.

No permanent neurological dysfunction or mortality related to hyperammonemic encephalopathy was observed. Nursing satisfaction reached 94.29% (33/35).

Conclusion Proactive monitoring of consciousness, standardized valproate sodium administration, and laboratory testing can effectively control blood ammonia levels, enabling early detection and management of hyperammonemic encephalopathy. This approach reduces complications, ensures patient safety, and enhances recovery outcomes. The active involvement of the nursing teams is critical to patient rehabilitation. Future efforts should focus on evidence-based practices to develop systematic nursing protocols for preventing this condition postoperatively.

Keywords

Craniocerebral Tumor Surgery;Valproate Sodium;Hyperammonemic Encephalopathy

Investigating the mechanism of sacral meningeal cysts through multidimensional proteomics.

Jiaxing Zhang[1†], Jingfang Liu[2†], Jianjun Sun[1*]
[†] Equal contribution

[1] Department of Neurosurgery, Beijing Friendship Hospital, Capital Medical University, Beijing, China; [2] Institute of Microbiology, Chinese Academy of Sciences, China

Abstract

Investigating abnormal expression in the tissue microenvironment at the molecular level is crucial for understanding the occurrence and formation mechanism of sacral meningeal cysts. By comparing the proteomics of adjacent cerebrospinal and sacral cyst fluids obtained in situ, we found that sacral meningeal cysts are more than spinal cord extensions. The contents isolated from the cyst walls differed significantly. By comparing multidimensional data on cyst tissues regarding spatial distribution, time, presence or absence of nerve roots, quantity, and size, a deeper understanding of the possible mechanisms of water molecule transport and gradual cyst formation is achievable.

Objectives：Sacral meningeal cysts (SMCs) are common neurological disorders with a prevalence of 1.5%–13.2%, predominantly affecting females. Despite their clinical significance, the molecular pathogenesis of SMCs remains unclear, and current treatments often result in suboptimal outcomes and high recurrence rates. This study aims to investigate the molecular mechanisms underlying the occurrence and formation of SMCs by analyzing abnormal expression in the tissue microenvironment.

Methods：We conducted a comprehensive proteomic analysis on cerebrospinal fluid and cyst fluid samples from 33 well-characterized SMC patients. Using advanced imaging-guided preoperative planning and state-of-the-art proteomic technologies, we compared the proteomics of adjacent cerebrospinal and sacral cyst fluids obtained in situ. Additionally, we analyzed multidimensional data on cyst tissues, including spatial distribution, temporal changes, presence or absence of nerve roots, quantity, and size.

Results：Our findings revealed distinct proteomic profiles between SMCs and normal cerebrospinal fluid, indicating that SMCs are more than mere spinal cord extensions. The contents isolated from the cyst walls showed significant differences. By comparing multidimensional data, we gained deeper insights into the mechanisms of water molecule transport and gradual cyst formation.

Conclusions：These results challenge the conventional understanding of SMC formation, suggesting that the cyst wall composition and molecular events are more complex than previously thought. The identified molecular signatures provide a robust framework for understanding SMC pathogenesis, with potential implications for diagnostic refinement and therapeutic development. Future work should focus on clinical validation and further elucidation of the underlying mechanisms to improve treatment outcomes and reduce recurrence rates.

Keywords: sacral extradural meningeal cyst; mechanism of formation and development; multidimensional proteomics; cell adhesion molecule binding; transport water molecules

一、 Author Introduction

Name: Sun Youzhen 孙友珍

Unit: Aviation General Hospital 航空总医院

Title: Supervisor Nurse

E-mail zhenzhen.160@163.com

Mobile number: 13301263907

二、 Abstract of the paper

Homogenization nursing in VTE nursing of comatose patients with central nervous system infection

同质化护理干预在中枢神经系统感染昏迷患者 VTE 护理中的应用效果

Application effect

Objective: To explore the application effect of nursing intervention in VTE nursing of comatose patients with central nervous system infection.

Method: 80 patients with nervous system infection and coma in our hospital from June 2023 to June 2024 were randomly divided into two groups using a double-blind randomization method. The control group received routine care, while the experimental group received homogeneous nursing intervention. Compare the hemorheology, VTE incidence, and patient satisfaction between two groups before and after nursing care.

Result: The hemorheology of the experimental group was lower than that of the control group, and the incidence of VTE was lower than that of the control group, $P<0.05$。

Conclusion: The implementation of homogeneous nursing intervention has a definite effect on comatose patients with central nervous system infection.

【 **Keywords** 】 Homogenized nursing intervention; Coma patients with central nervous system infections; VTE application effect

Experience in Endovascular Recanalization for Symptomatic Chronic Internal Carotid Artery Occlusion

Tang Xihe, Liu Yiran, Zhao Yu, Shen Junfeng, Jin Yongjian, Chen Guoqiang
Neurosurgery Center, Beijing Aeronautical General Hospital, Beijing 100012, China
Corresponding author: Jin Yongjian, Email: jinyj@vip.sina.com

Chen Guoqiang: Email: guoq_chen@163.com

唐熙和 北京航空总医院 颈动脉闭塞再通治疗

Abstract

Objective: To summarize the experience and outcomes of endovascular recanalization for symptomatic chronic internal carotid artery occlusion (CICAO).

Methods: A retrospective analysis was conducted on 21 patients with symptomatic unilateral CICAO who underwent endovascular therapy between February 2022 and August 2024. Preoperative evaluations included magnetic resonance perfusion imaging (MRP) and high-resolution vessel wall MRI (HR-VWI) to assess cerebral perfusion and occluded lumen characteristics. Postoperative assessments comprised carotid Doppler ultrasound for stent morphology and blood flow velocity, as well as follow-up MRI. All procedures were performed via femoral artery access using balloon angioplasty and stenting techniques, with a 3-month postoperative follow-up.

Results: Based on preoperative imaging, CICAO was classified into Types A, B, and C. Types A and B demonstrated higher success rates (A: 8/8, 100%; B: 8/9, 88.9%) compared to Type C (1/4, 25%). The overall recanalization rate was 80.95% (17/21), with a perioperative complication rate of 4.76% (1/21). Clinical improvement was observed in 17 patients, with no cases of hyperperfusion or new cerebral infarction. One patient died from acute myocardial infarction on postoperative day 5. Unsuccessful recanalization did not exacerbate symptoms in failed cases.

Conclusion: Multimodal imaging-based classification effectively guides endovascular recanalization for symptomatic CICAO. Short-term outcomes are favorable, though long-term efficacy requires further investigation.

Keywords: Multimodal imaging; Chronic internal carotid artery occlusion; Endovascular recanalization

Interventional embolization for the treatment of aneurysmal malformation of the vein of Galen in infants and children in 2 cases and review of the literature

Zhang jinwei（张津维）Wu shuihua(吴水华)

The Affiliated Children's Hospital Of Xiangya School of Medicine ,Central South University（Hunan children’s hospital)

Objective To explore the clinical features, diagnosis and effect of interventional embolization of Galen vein aneurysmal malformation in infants and children. **Methods** We retrospectively analyzed the clinical data of two cases of Galen vein aneurysmal malformation admitted to the Department of Neurosurgery of Hunan Children's Hospital from January 2020 to December 2022, and searched the literature related to the treatment of infantile Galen vein aneurysmal malformation with interventional embolization in Pubmed, Wanfang Medical Network, and China Knowledge Network from January 2014 to October 2024 to summarize and analyze the clinical characteristics, typing, diagnosis, treatment modality, and treatment results of the infants and children. We summarized and analyzed the children's clinical characteristics, staging, diagnosis, interventional embolization treatment and treatment results. **Results** Among the two cases admitted to our hospital, Case 1 had a head circumference of 52 cm at 12 months after surgery, and the development of speech and gross motor skills improved significantly compared with the preoperative period. In case 2, the head circumference was 53.5 cm at 6-month postoperative follow-up, and the development of speech and language improved compared with the preoperative period. The review of cranial MRI suggested that there was no change in the aneurysmal malformation of the vein of Galen compared with the preoperative period, and the dilatation of the cerebral ventricles improved compared with the preoperative period, and the family refused to undergo cerebral angiography and interventional embolization again, and the patient has been lost to the follow-up at the present time. A total of 10 articles were retrieved that met the inclusion and exclusion criteria, and a total of 15 cases of Galen vein aneurysmal malformation in infants and children were reported by interventional embolization, plus 2 cases in our hospital, for a total of 17 cases, of which 12 cases were choroidal and 5 cases were intramural; 3 cases were detected by ultrasonography during pregnancy; 1 case of interventional embolization was performed through a vein, 1 case of interventional embolization was performed through a combination of arterial and venous arteries and 15 cases of interventional embolization were performed through arterial arteries. 1 case was fatal, 3 cases had residual aneurysmal malformation, and 13 cases were cured (76%). residual, 13 cases were cured (76.47%). Among the 11 children with preoperative combined hydrocephalus, there were 7 cases of complete remission, 2 cases of significant remission, 1 case of no remission, and 1 case of death after surgery. **Conclusion** Galen's vein aneurysmal malformation is a rare intracranial vascular malformation, the main clinical manifestations of which are increased head circumference, developmental backwardness, and cardiac failure, prenatal ultrasound and fetal magnetic resonance examination are the main means of prenatal diagnosis, and cerebral angiography is the gold standard for confirming the diagnosis, and interventional embolization has good results.

Experience sharing of electrical nerve stimulation in the treatment of atypical facial pain

Wang Ning Meng Dawei Cui bin Zhang Chanjuan Ma Haowei Sun Jidong Wang Lin Chen Guoqiang

The Department of Neurosurgery, Aviation General Hospital，Beijing，China

Objective: To investigate the efficacy, safety and application prospect of electrical nerve stimulation in the treatment of atypical facial pain

Methods: Atypical facial pain (AFN) is a functional disease that is relatively rare in clinical practice, and the pain symptoms are easily confused with trigeminal neuralgia, and the pain location is usually in the face, such as the cheeks, nasolabial folds, upper and lower jaws, etc., but the pain area does not follow the typical nerve distribution, and the nature of the pain is diverse, which may be persistent dull pain, burning pain or tingling. The pain can vary from mild to severe, severely affecting the patient's daily life. As of now, the exact cause of AFP remains unknown. May be associated with neurological disturbances, including sympathetic dysfunction. In addition, the patient's psychological factors also play a role, such as long-term anxiety and depression, which may induce or worsen pain. The current diagnosis of AFP is mainly based on the exclusion of other conditions that may cause facial pain. The doctor will take a detailed medical history, including the time, frequency, and triggering factors of pain, and will also perform an examination of the oral cavity, nasal cavity, and other parts, and may also use imaging tests (such as MRI) to rule out sinusitis, temporomandibular joint disease, trigeminal neuralgia and other diseases. Such patients are more demanding on the outcome of treatment. Therefore, how to provide the best treatment plan for young patients or patients with higher needs puts forward higher requirements for the treatment ability of our clinicians.

According to the clinical characteristics of AFP, accurate diagnosis is the key to treatment, for patients with a clear diagnosis, drug therapy such as carbamazepine, oxcarbazepi, etc., may also use antidepressants (such as amitriptyline) and antiepileptic drugs (such as gabapentin) to relieve pain. Psychotherapy (e.g., cognitive behavioral therapy) is also important if psychological factors are significant. Physical therapy, such as transcutaneous electrical nerve stimulation, may also be used to reduce pain.

However, for such patients, the effect of conservative treatment is often not ideal, especially for some patients with severe pain symptoms, unsatisfactory effect of conservative treatment, high mental and psychological pressure, low treatment compliance, and there is still a lack of relevant guidelines and suggestions on what treatment method can better solve the patient's symptoms.

For the treatment of idiopathic TN and atypical facial pain, our center has recently used Spinal Cord Stimulation（SCS）, Peripheral nerve electrical stimulation（PNS） and Motor cortex stimulation（MCS） surgical methods to treat atypical facial pain, with definite curative effect, and the pain symptoms of postoperative patients have been significantly improved, and no clear complications have appeared, which is worthy of everyone's attention and clinical promotion, so that more patients can benefit.

Results:

For patients with facial pain, a definitive diagnosis is first required to rule out classic trigeminal neuralgia, and trigeminal nerve microvascular decompression is the first choice for such patients. If there is no clear responsibility for vascular compression, microvascular decompression is not suitable for treatment, such as percutaneous trigeminal semilunar ganglion radiofrequency temperature-controlled thermocoagulation, Meckel's balloon compression, gamma knife treatment, but bilateral facial numbness and hypoesthesia may be left, which will seriously affect the patient's quality of life and have a high recurrence probability. According to the characteristics of the patient's case, the PNS, SCS and MCS surgery can significantly improve the clinical symptoms of patients by using nerve electrical impulses, and will not produce severe facial numbness and hypoesthesia, which is an alternative treatment option for clinicians to consider.

Conclusions:

For the treatment of atypical facial pain, neurostimulation therapy is a safe and effective method, with little trauma and low risk, and can be individualized according to the patient's symptoms, especially some pain symptoms are severe, the conservative treatment effect is not satisfactory or multiple recurrences, the mental and psychological pressure is high, and the treatment compliance is low, and the application prospect is very broad.

Key Words：Atypical facial pain；trigeminal neuralgia；electrical nerve stimulation

Case Report: Fatal Outcome Following Anterior Cervical Discectomy and Fusion for Cervical Spondylotic Myelopathy

Pan Wang, HanJian Du, Nan Wu*

Department of Neurosurgery, Chongqing Research Center for Glioma Precision Medicine, Chongqing General Hospital, Chongqing University, Chongqing 401147, China

Presenting author： Pan Wang

Either oral or E-poster

Objective: To report a case of severe cervical spondylotic myelopathy (CSM) in which a sudden neurological decline occurred on postoperative day 3, despite initial postoperative improvement in muscle strength. This decline ultimately culminated in death from pulmonary infection, infectious shock and gastrointestinal bleeding. We analyze the potential contributing factors to this adverse outcome.

Methods: The patient, 58 years old, presented with progressive numbness and weakness in four limbs, accompanied by difficulty walking and multiple falls over the preceding year. The patient's past medical history included diabetes mellitus (over 15 years) and hypertension (over 5 years), with poor glycemic and blood pressure control. Six months prior, the patient underwent coronary artery stenting and taken aspirin and clopidogrel everyday. Physical examination revealed graded 4/5 of the upper extremity muscle strength, and graded 2/5 of proximal lower extremity muscle strength, and distal lower extremity muscle strength was graded 1/5. Pathological reflexes were absent. Cervical MRI demonstrated severe cervical vertebral osteophyte formation and disc herniation, resulting in spinal cord compression and myelomalacia. After excluding absolute contraindications, the patient underwent microscopic anterior cervical discectomy and fusion (ACDF) with spinal canal decompression and interbody bone grafting.

Results: Immediately postoperatively, the patient's limb movement and muscle strength were unchanged. Postoperative management included glycemic control, corticosteroids to mitigate spinal cord edema, acupuncture, nutritional support, and gastroprotective agents. On postoperative day 3, following acupuncture and massage therapy, the patient acutely developed an inability to raise their left upper limb, with muscle strength decreasing to 0/5. Immediate head and neck CTA and cerebral angiography revealed no evidence of cerebral vascular occlusion or acute cerebral infarction. Brain MRI and DWI were similarly negative for acute cerebral infarction. Cervical spine radiographs (anteroposterior and lateral views) demonstrated appropriate positioning of the fusion cage and screws, without evidence of spinal cord compression. Cervical MRI confirmed the appropriate position of the fusion cage and screws, with no significant change in the edema at the C6 level compared to preoperative imaging. Shoulder MRI revealed a possible partial tear of the supraspinatus tendon; grade I injury of the subscapularis tendon and the long head of the biceps tendon (intra-articular portion), with some areas of compromised continuity, suggestive of a partial tear. Following high-dose corticosteroid therapy and initiation of broad-spectrum antibiotics, three days later, the surgical incision site became erythematous, swollen, and painful, with a persistent fever exceeding 38.5°C. Cervical

MRI revealed a cervical abscess. Emergency abscess drainage was performed, and the local wound gradually improved. However, the patient subsequently developed recurrent abdominal distension, severe pneumonia, septic shock, severe anemia, hypoalbuminemia, and acute gastrointestinal bleeding. Emergency gastroscopy revealed a gastric perforation. Emergency surgical repair of the perforation was performed, followed by one week of continued supportive care. Repeat gastroscopy demonstrated non-healing of the perforation. The patient's condition continued to deteriorate, and the family declined further intervention. The patient expired one day later.

Conclusion: The sudden decline in muscle strength on postoperative day 3 was a critical event contributing to the patient's demise. The etiology of this sudden decline is likely multifactorial and warrants further consideration. Potential contributing factors include: 1) Spinal cord injury, potentially exacerbated by decompression during surgery; 2) Nerve injury, potentially exacerbated by acupuncture and massage therapy. While the surgical indication for this patient was clear, and postoperative rehabilitation, including corticosteroid therapy, was warranted, adverse events occurred in association with these interventions. The optimal management of such complex patients requires further investigation.

Endoscopic transsphenoidal surgery for pituitary adenomas

Wang Ning, Yang Guang, Shao Qi, Meng Xiangxi, Ge Haitao, Zhao Boxian, Lu Enzhou

Neurosurgery Department of The First Affiliated Hospital of Harbin Medical University,

Objective: To exchange the experience of transnasal endoscopic treatment of pituitary adenoma

Methods: From April 1, 2021 to February 27, 2025, 655 cases of different types of pituitary adenomas were treated by the same operator through nasal neuroendoscopy

Results: Among the 655 pituitary adenomas, 479 cases (73%) were non-functional pituitary adenomas (145 of which were apoplexy; 69 of Invasive type, 42 of spongy sinus invasion; 82 of which were Intraoperative cerebrospinal fluid leakage). 76 cases (12%) were Growth hormone (GH) pituitary adenomas (7 of apoplexy; 5 of Invasive type; 18 of Intraoperative cerebrospinal fluid leakage). 75 cases (11%) of prolactin (PRL) pituitary adenomas (23 of apoplexy; 3 of Invasive type; 10 of Intraoperative cerebrospinal leakage). 14(2%) cases were mixed pituitary adenomas (10 of non-functional +PRL pituitary adenomas, 2 of GH+PRL pituitary adenomas, 1 of GH+TSH pituitary adenomas, and 1 of TSH+PRL pituitary adenomas). 9 cases(1%) were adrenocorticotropin pituitary adenoma(ACTH) (1 of invasive type). 1 case(0.2%) was thyroid stimulating hormone pituitary adenoma (TSH). Recurrent pituitary adenoma were 81 cases.
Of the 655 pituitary adenomas, 616 were complete resection, with rate of 94% of total resection. Cerebrospinal fluid leakage occurred in 2 cases after operation.

Conclusion: The surgical treatment of pituitary adenoma by nasal neuroendoscopy should be based on the principle of individuation.

Key words: endoscopic transsphenoidal surgery, pituitary adenomas

题目 Individualized bypass strategy with tentative clamping method

作者 Long Wang

单位 Department of Neurosurgery, Beijing Hospital, National Center of Gerontology, Institute of Geriatric Medicine, Chinese Academy of Medical Sciences, Beijing, PR China

Objective：Cerebral Revascularization (CR) remained an indispensable arm in the neurosurgical arsenal, especially managing symptomatic hemisphere with misery perfusion (SHMP).

Methods：We described an a mid-aged gentleman diagnosed with progressive middle cerebral steno-occlusion following carotid endarterectomy by employing individualized arterial reconstruction with tentative clamping method (TCM) under supervision of intraoperative monitoring. An operative video was also accompanied to demonstrate further details.

Conclusion：The optimal treatment strategy for SHMP should be tailored by individuals. The risk of postoperative adverse sequel can be minimized and improved neuro-cognitive status was accomplished with an aid of TCM for such prophylactic procedure.

Keyword：Superficial temporal artery · Cerebral revascularization · Middle cerebral artery occlusion · Cerebral ischemic · Hemispheric hypo-perfusion

A Study of Knowledge Enhancement-Based Big Language Modeling in Craniocerebral Trauma Clinical Tasks

Jiaying Wen[1], Li Jiang[*]

Chongqing Medical University

Objective Traumatic Brain Injury (TBI) represents one of the most critical and prevalent conditions in neurosurgery, characterized by high morbidity and mortality rates. The integration of Artificial Intelligence (AI) into clinical practice holds significant potential to assist physicians in rapidly and accurately assessing TBI patients, thereby facilitating informed diagnostic and therapeutic decisions. However, the application of AI in clinical settings faces several challenges, including the scarcity of specialized medical databases, the inherent complexity and variability of clinical tasks, and the "black box" nature of AI models, which limits their interpretability. A Knowledge Base (KB) serves as a structured repository capable of storing domain-specific knowledge, encompassing both structured and unstructured data. By digitizing and organizing such data, machine learning algorithms can leverage similarity metrics to contextualize information, thereby mitigating the risk of AI "hallucinations." Retrieval-augmented Generation (RAG) represents an advanced approach that integrates language models with information retrieval techniques, enabling the extraction of relevant information from embedded unstructured KBs. This retrieved information is then used to refine prompts for Large Language Models (LLMs), enhancing their interpretability and reliability. To address these challenges, we developed TLLM-SYSTEM, an intelligent assistant system tailored for TBI clinical diagnostic and therapeutic tasks, leveraging LLMs. The primary objective of this system is to provide clinicians with robust decision-making support in managing TBI-related cases. **Methods** We constructed a medical LLM by fine-tuning the open-source LLaMA framework through a multi-stage training process, including pre-training, fine-tuning, and situational learning. Concurrently, we developed a TBI-specific Knowledge Base (TKB) that integrates medical knowledge across three dimensions: (1) general medical knowledge derived from textbooks, (2) cerebrovascular-related sub-domain knowledge extracted from clinical guidelines and expert consensus documents, and (3) TBI-specific sub-domain knowledge. We then integrated the LLM with the TKB and RAG to construct three distinct models: LLM, LLM+RAG, and LLM+RAG+KB. The performance of these models was evaluated based on their accuracy in handling TBI-related clinical diagnostic and therapeutic tasks, with the optimal model selected as the core module for TLLM-SYSTEM. To assess the system's efficacy, we compared its performance against that of experienced neurosurgeons and other state-of-the-art LLMs, including Chat GPT (4.0) and Chat Doctor. Furthermore, we conducted a multicenter pilot trial involving 30 medical centers to evaluate the generalizability and robustness of TLLM-SYSTEM across diverse clinical settings. **Results** Our comparative analysis demonstrated that the LLM+RAG+KB model outperformed both the LLM and LLM+RAG models in terms of accuracy, leading to its adoption as the core module of TLLM-SYSTEM. When applied to clinical tasks, TLLM-SYSTEM achieved a high degree of consistency with the diagnostic and therapeutic decisions made by neurosurgeons. In comparison to Chat GPT (4.0) and Chat Doctor, TLLM-SYSTEM exhibited superior reliability, efficiency, and professionalism in its outputs. Notably, the system provided detailed rationales for its diagnostic and therapeutic recommendations, thereby enhancing its interpretability. During the multicenter pilot trial, TLLM-SYSTEM demonstrated excellent generalizability, maintaining high accuracy across diverse case sources and clinical environments. **Conclusion** TLLM-SYSTEM, which integrates LLMs with RAG and a specialized KB, represents a significant advancement in the application of AI to TBI clinical tasks. The system not only demonstrated high efficiency and generalizability but also provided transparent and interpretable rationales for its recommendations. By offering reliable decision-making support, TLLM-SYSTEM has the potential to assist clinicians in managing TBI cases with greater speed, accuracy, and confidence. Future research should focus on expanding the KB and further refining the system's capabilities to address a broader range of clinical scenarios.

Global Burden of Ischemic Stroke Attributable to Particulate Matter Pollution: Socioeconomic Disparities, Household-to-Ambient Transitions, and 2050 Projections

Erman Wu[1,2], Dangmurenjiafu Geng[1*]

1. Neurosurgery Center of the First Affiliated Hospital of Xinjiang Medical University, Urumqi, Xinjiang 830054, China
2. Department of Computer Science and Information Technologies, Elviña Campus, University of A Coruñaf, A Coruña, Spain

Correspondence*:

Dangmurenjiafu Geng, Neurosurgery Center of the First Affiliated Hospital of Xinjiang Medical University, Urumqi, Xinjiang 830054, China. No. 137, Liyushan South Road, Urumqi, Xinjiang, China. **Email:** damrjab@163.com.

BACKGROUND: Ischemic stroke attributable to particulate matter pollution (PMP) poses a growing global health challenge, particularly in low-resource settings where epidemiological surveillance remains limited. While high-income regions have reported declining trends, the evolving patterns across socioeconomic strata and the long-term trajectory of PMP-related stroke burden remain poorly quantified. This study evaluates the global disease burden, epidemiological transitions, and 2050 projections of PMP-attributable ischemic stroke using comprehensive data from 1990 to 2021.

METHODS: Leveraging the Global Burden of Disease Study 2021, we analyzed age-standardized mortality rates (ASMR), disability-adjusted life years (DALYs), and their components (YLLs/YLDs) stratified by Socio-demographic Index (SDI) quintiles, 21 GBD regions, and 204 countries/territories. Average annual percent change (AAPC) quantified temporal trends (1990-2021), while Bayesian age-period-cohort models projected disease burden through 2050.

RESULTS: Between 1990 and 2021, global ischemic stroke deaths attributable to PMP rose by 32.94% (681,180 to 905,600), yet age-standardized death rates declined by 46.65% (AAPC: −2.09%), reflecting divergent impacts of population aging and pollution mitigation. Middle SDI regions accounted for 40.2% of PMP-related DALYs in 2021, with low SDI regions disproportionately burdened by household air pollution (80–82.5% of DALYs) and high SDI nations dominated by ambient PMP (92–99.5%). Geographic hotspots emerged in East, South, and Southeast Asia (58.3% of global DALYs), while Sub-Saharan Africa retained persistent household pollution-driven disability (89% of regional DALYs). Sex-specific disparities revealed higher mortality in males aged <80 years but elevated lifetime disability in females (23.7% higher YLDs), peaking earlier at 65–69 years. Projections through 2050 signal rising PMP-attributable burdens.

CONCLUSIONS: Our analysis reveals a paradoxical global landscape: While environmental policy successes in high-SDI regions have reduced PMP-attributable stroke burden, demographic shifts and persistent household air pollution threaten to exacerbate disparities in low/middle-SDI regions. Targeted interventions addressing region-specific PMP sources—clean energy transitions in South Asia and improved ventilation technologies in Sub-Saharan Africa—must be prioritized to mitigate projected increases.

Keywords Global burden, Ischemic stroke, Particulate Matter Pollution, spatiotemporal trends

Application of Ancient Dao Yin Technique in Patients with Limb Weakness after Cerebral Hemorrhage

Department of Neurosurgery, Affiliated Hospital of Integrated Traditional Chinese and Western Medicine, Nanjing University of Chinese Medicine
Xing Xuemei, Zhao Lan, Zhu Longfeng, Liu Hong, Wang Sijie

Abstract

Objective: To investigate the rehabilitation efficacy of the ancient Dao Yin technique (a traditional Chinese exercise integrating body movement, breath control, and mental focus) based on meridian theory in patients with limb weakness following cerebral hemorrhage. cerebral hemorrhage patients often experience sequelae such as limb weakness due to qi stagnation, meridian obstruction, and yin-yang imbalance, significantly impairing quality of life. This study explores the impact of Dao Yin on limb functional recovery and quality of life.

Methods: Sixty-five patients with Glasgow Coma Scale (GCS) scores of 9–12 after cerebral hemorrhage were randomly divided into an experimental group (30 cases) and a control group (35 cases) using a random number table. The experimental group received conventional therapy combined with daily Dao Yin rehabilitation training (once daily for 14 days), while the control group received conventional treatment alone. Assessments included GCS scores, muscle strength (Lovett muscle strength grading), Barthel Index, and Hamilton Anxiety Scale (HAMA) scores before and after the intervention, followed by statistical analysis.

Results: During the intervention, 1 patient in the experimental group and 3 in the control group dropped out due to disease progression, leaving 61 cases for analysis. After 14 days, the experimental group showed significantly improved muscle strength scores , Barthel Index , and HAMA scores compared to the control group ($P < 0.05$). The Dao Yin technique effectively alleviated limb weakness and enhanced functional recovery and quality of life.

Conclusion: The ancient Dao Yin technique promotes limb rehabilitation in cerebral hemorrhage patients by harmonizing qi-blood flow and unblocking meridians, demonstrating superior efficacy to conventional therapy alone. This study provides evidence-based support for integrating traditional Chinese rehabilitation techniques into clinical practice. Future research should focus on protocol optimization and mechanistic exploration.

Keywords: Ancient Dao Yin technique; cerebral hemorrhage; limb weakness; rehabilitation training; traditional Chinese therapy

Clinical report on trigeminal neuralgia families associated with the MPZ gene.

Chengwei Xu

Affiliation: The Affiliated Hospital of Inner Mongolia Medical University

Objective: To identify the genetic cause of familial trigeminal neuralgia within a specific family through whole-genome sequencing and to evaluate potential therapeutic interventions.

Methods: A trigeminal pain-affected family was studied using whole-genome sequencing. Three family members exhibiting facial discharge-like pain along with histories of scoliosis and cavus feet, were evaluated. Sequencing revealed a heterozygous mutation in the myelin protein 0 (MPZ) gene at the locus c.308G>A (p.Gly103Glu), which was traced back to the mother. The study also explored the effectiveness of trigeminal nerve microvascular decompression and trigeminal nerve meniscus balloon compression as treatment options for the affected family members.

Results: The identified mutation, c.308G>A (p.Gly103Glu) in the MPZ gene, is a novel finding in the context of familial trigeminal neuralgia in this country. Following surgical interventions, including microvascular decompression and meniscus balloon compression, postoperative follow-up showed favorable outcomes, with family members reporting a pain-free status.

Conclusions: This study provides novel insights into the genetic factors underlying familial trigeminal neuralgia and demonstrates the potential effectiveness of specific surgical treatments. The discovery of the heterozygous MPZ mutation expands our understanding of the genetic contributors to this condition and highlights potential therapeutic strategies for management.

Mechanistic study of the synergistic effects of photodynamic therapy and ferroptosis in glioma

Lei Xu, Shaoshan Hu* Department of Neurosurgery, Zhejiang Provincial People's Hospital, Affiliated People's Hospital, Hangzhou Medical College, Hangzhou, Zhejiang, China.

Objective： This study addresses glioblastoma multiforme (GBM), the most aggressive primary brain tumor, which faces two critical therapeutic challenges: the blood-brain barrier (BBB) impeding drug delivery and treatment resistance caused by abnormally elevated glutathione (GSH) levels (10–20-fold higher than in normal tissues) in the tumor microenvironment (TME). To overcome the efficacy limitations of current photodynamic therapy (PDT), we propose constructing a novel nanoscale drug delivery system employing a multimodal synergistic therapeutic strategy.

Methods： A biodegradable bovine serum albumin (BSA)-modified tetrasulfide-bonded dendritic mesoporous organosilica nanocomposite (DMONs-HE@BSA NCs) was synthesized. Dynamic light scattering (DLS) confirmed its monodisperse size distribution (182.3 ± 3.2 nm), while transmission electron microscopy (TEM) revealed its well-ordered mesoporous architecture. Drug release efficiency under simulated TME conditions (pH 5.0, 10 mM GSH) was significantly enhanced. Using an orthotopic U87MG glioma model, in vivo imaging demonstrated superior brain accumulation compared to free photosensitizers. The SPARC (secreted protein acidic and rich in cysteine)-mediated targeting mechanism was validated via Transwell assays, leveraging SPARC overexpression in both the BBB and GBM to ensure selective delivery. Upon GSH-responsive degradation in the TME, DMONs-HE@BSA NCs released encapsulated hypericin (HYP, a photosensitizer) and erastin (a ferroptosis inducer), while depleting intracellular GSH. This dual-action system synergized PDT with ferroptosis and further regulated the KEAP1/PGAM5/AIFM1 pathway to induce oxeiptosis.

Results: Experimental data indicated that the modified DMONs-HE@BSA NCs effectively penetrated the BBB and successfully targeted GBM tissue, significantly enhancing the accumulation of HYP in tumor tissue. Upon exposure to light, the HYP and erastin contained within DMONs-HE@BSA NCs significantly increased the production of reactive oxygen species (ROS) and collaboratively induced ferroptosis in GBM cells. Moreover, DMONs-HE@BSA NCs further promoted oxidative cell death by regulating related signaling pathways, thereby effectively inhibiting tumor cell proliferation.

Conclusions： This study confirms that the synthesized DMONs-HE@BSA NCs exhibit significant potential in enhancing the efficacy of PDT. By generating a substantial amount of ROS to induce ferroptosis and oxidative cell death, DMONs-HE@BSA NCs significantly inhibited the growth of GBM. These findings present a new and promising therapeutic strategy for patients with GBM, illustrating the substantial potential of PDT in clinical applications.

An Automatical 3D Visualization Model Reconstruction and Analysis System for Brain Tumor

Department of Neurosurgery, the First Affiliated Hospital of Chongqing Medical University, Chongqing 400016, PR China
Weijun Xu[1], Li Jiang[*], Quanhong Shi

Objective: This study aims to develop and evaluate the performance of the TU-SYSTEM, an automatic system designed for the 3D visualization, segmentation, and reconstruction of brain tumors and their surrounding critical structures, based on multimodal MRI scans. The system's potential for surgical planning and rehabilitation is also explored through quantitative analysis of critical parameters, such as corticospinal tract (CST) metrics, aiding in the understanding of motor dysfunction in brain tumor patients.

Methods: Multimodal MRI imaging data, including T1, T1c, T2, T2-FLAIR, MR angiography, MR venography, and DTI sequences, were collected to train and test the TU-SYSTEM. The system integrates 3D-Unet and 2D-Unet models to automatically segment brain tumors, peritumoral edema, functional brain areas, vessels, and fiber tracts. The performance of the TU-SYSTEM was compared with manual methods in terms of segmentation accuracy and 3D reconstruction quality. Quantitative analysis of fiber tracts was also conducted, focusing on the corticospinal tract (CST), with comparison between patients exhibiting motor dysfunction and normal individuals. A clinical test set was used to assess the system's efficiency and reliability.

Results: The TU-SYSTEM significantly reduced the time for 3D reconstruction, with processing time dropping from 4440±721 seconds to 657±78 seconds ($p<0.05$), marking a tenfold improvement. Image quality assessments showed no significant differences between TU-SYSTEM-generated models and manually reconstructed models ($p>0.05$), with both achieving high pass rates (92.18% for TU-SYSTEM vs. 94.58% for manual reconstruction). Quantitative analysis of CST revealed significant reductions in FA values, fiber tract volume (FV), and streamline count (FS) in patients with limb motor dysfunction compared to normal individuals ($p<0.05$). Notably, a decrease in FA of 5.85% or more on the affected side was associated with a high probability of motor dysfunction (sensitivity 84.6%, specificity 78.6%).

Conclusion: The TU-SYSTEM demonstrated high efficiency, accuracy, and reliability in the automatic segmentation and 3D reconstruction of brain tumors and their surrounding structures. The system not only provides a high-quality 3D model but also allows for quantitative analysis of important brain structures such as CST, facilitating preoperative surgical planning and offering valuable insights for rehabilitation strategies. The TU-SYSTEM represents a significant advancement in the integration of machine learning and medical imaging for brain tumor management.

The Role of Satellite Glial Cells in the Progression of Diabetic Peripheral Neuropathy and Their Clinical Implications

Xin Xu[1], Wenchuan Zhang[1*]

[1]*Department of Neurosurgery, Shanghai Ninth People's Hospital, Shanghai Jiao Tong Univeristy School of Medicine, Shanghai, 200011.*

*Correspondence: zhangwench88@hotmail.com

Diabetic peripheral neuropathy (DPN) is a major complication of diabetes, affecting over 60% of diabetic patients worldwide and often leading to neuropathic pain, lower limb ulcers, and amputations. Despite advances in treatment, the progressive and irreversible nature of DPN remains a significant challenge. Increasing evidence suggests that glial cell activation plays a crucial role in the pathogenesis of DPN by modulating neuroinflammatory responses and neuronal dysfunction.

In this study, we employed single-cell RNA sequencing to investigate the role of satellite glial cells (SGCs) in DPN. Dorsal root ganglion (DRG) samples were collected from Sprague-Dawley rats in three groups: control, diabetic model (DM), and diabetic peripheral neuropathy (PDPN). Our results revealed a significant expansion and persistent activation of SGCs in the PDPN group, accompanied by marked transcriptomic alterations. Notably, we found that sustained SGC activation disrupted SGC-neuron communication and contributed to an amplified inflammatory response, further exacerbating neuropathic progression.

Clinically, surgical nerve decompression has been shown to relieve neuropathic pain and restore sensory function in DPN patients, particularly when performed early. Our findings suggest that the dysregulation of SGCs may influence the efficacy of decompression surgery by modulating local neuroinflammatory responses.

This study provides the first single-cell evidence of SGC dysregulation in DPN and underscores their role in driving neuroinflammation. Targeting SGC-mediated inflammatory pathways may represent a novel therapeutic strategy for mitigating DPN progression. Future in vivo and in vitro studies are warranted to elucidate the mechanistic interactions between SGCs and neurons and to evaluate their impact on clinical interventions such as nerve decompression surgery.

Key words: DPN; satellite glial cells; Nerve Decompression Surgery; Neuroinflammation; SGC-Neuron interaction.

An External Knowledge Brain Enhanced Clinical Multi-Task Support System for Acute Ischemic Stroke

Department of Neurosurgery, the First Affiliated Hospital of Chongqing Medical University, Chongqing 400016, PR China
Zhijie Xie[1], Li Jiang[*]

Objective

As the second leading cause of death worldwide, ischemic stroke causes about 5.9 million deaths and 102 million disabilities every year. With the rapid development of artificial intelligence (AI) technology, the use of AI to automatically analyze and interpret medical data of acute ischemic stroke (AIS) patients has become a hot research topic. Computed tomography angiography (CTA), as a fast and noninvasive vascular imaging technique, is valuable in the diagnosis and treatment of AIS. Although studies have been devoted to the automatic recognition of CTA images, the use of AI to achieve multitasking in AIS, including cerebrovascular image analysis, condition assessment, and prognosis prediction, is still an area that needs to be explored.In this study, we propose to construct an automatic assessment system for acute cerebral infarction patients based on the original head and neck CTA images (A-SYSTEM), which can automatically reconstruct, recognize and analyze the patient's CTA image data, and through the guidance and enhancement of the knowledge base, ultimately outputs the assessment results of the patient's condition, and realizes the interpretability of the output results in the form of “graphic and textual co-explanation”. The system automatically reconstructs, recognizes and analyzes the patient's CTA image data, and through the guidance and enhancement of the knowledge base, finally outputs the evaluation results of the patient's condition, and realizes the “interpretability” of the output results in the form of “graphic and textual explanation”.

Methods

In order to construct A-SYSTEM, we have included a large number of original head and neck CTA images of patients with cerebral infarction in the electronic medical record systems of several large hospitals. This system is mainly composed of three parts: image reconstruction and recognition, text recognition to and decision-making system. First, the image recognition and reconstruction module automatically segments and 3D reconstructs the patient's head and neck CTA images and generates preliminary diagnostic results. Next, the text recognition module automatically extracts and recognizes the CTA results output by the image recognition module. Finally, the automatic decision-making module synthesizes the results of image and text recognition to analyze the patient's current condition and predict the prognosis. These three modules work in tandem to enable A-SYSTEM to efficiently

accomplish the diagnostic and prognostic assessment tasks of AIS. Meanwhile, we constructed and validated a scoring system based on patients' head and neck CTA images, Cerebral Arterial Stenosis Score (CASS), as a source of medical subdomain-specific knowledge.The system is capable of comprehensively assessing the patency of the major cerebral arteries and their branches in the anterior and posterior circulation of the brain, covering the internal carotid artery, middle cerebral artery, anterior cerebral artery, posterior cerebral artery, vertebral artery, and basilar artery, among other important vessels. By accurately analyzing these vessels, the system can accurately determine whether stenosis, occlusion, or other blood flow abnormalities exist, thus providing clinicians with critical hemodynamic information and it facilitates a comprehensive assessment of the cerebral anterior and posterior circulatory status..On this basis, we constructed a knowledge base for acute cerebral infarction covering three dimensions of medical domain knowledge, including general medical knowledge from medical textbooks, cerebrovascular-related subdomain knowledge from clinical guidelines and expert consensus on common neurosurgical emergencies, and medical subdomain-specific knowledge from the Cerebral Arterial Scoring System (CASS). We compare A-SYSTEM with clinicians to study its accuracy and efficiency in handling real cases, and utilize the knowledge base to enhance the “interpretability” of the system.

Results

After several iterations, the tables of both the A-SYSTEM image reconstruction and recognition module and the text recognition module were optimized.The CASS scoring system also outperformed the traditional CBS and BATMAN scores in terms of accuracy in assessing the severity of the patient's condition at admission and in predicting prognosis. In the validation of the overall system performance, A-SYSTEM outputs 84.26% and 86.67% correct overall rates for predicting the severity and prognosis of a patient at admission, respectively, which are not significantly different from that of a senior neurosurgeon, while the efficiency of the system is much higher than that of a physician. At the same time, A-SYSTEM not only outputs the evaluation results of patient's condition and prognosis, but also outputs the basis for the corresponding conclusions in the form of “graphic explanation”, which enables doctors to effectively “trace back” the working logic of the system.

Conclusions

The A-SYSTEM constructed in this research has the ability to quickly and automatically recognize and analyze patient images and text data, and accurately assess and predict the patient's condition, which can provide substantial help to clinicians. At the same time, A-SYSTEM can output “interpretable” results to help doctors understand the internal logic of the system and enhance user trust, which will help to promote the research and application of this kind of intelligent diagnosis and treatment system in the clinic.

Research and Construction of an Explainable Spontaneous Intracerebral Hemorrhage Clinical Multimodal Task Support System Guided by an "External Knowledge Brain"

Department of Neurosurgery, the First Affiliated Hospital of Chongqing Medical University, Chongqing 400016, PR China
Yulong Xia[1], Li Jiang[*]

Objective: This study aims to construct a clinical multimodal task support system for spontaneous intracerebral hemorrhage (ICH), guided by an "external knowledge brain" (referred to as the H-SYSTEM). The system is capable of automatically identifying and analyzing patients' imaging and textual information, generating diagnostic and therapeutic decisions based on the analysis results, and presenting the decision-making rationale in a format that integrates both text and images. **Methods:** To construct the H-SYSTEM, we have established a multicenter, large-sample integrated database of images and text for intracerebral hemorrhage (ICH), with comprehensive annotations of both imaging and textual information. The system is primarily composed of three components: image recognition, text recognition, and the decision-making system. The image recognition component is based on a deep learning model using the U-Net architecture, while the text recognition component utilizes the BERT-IDCNN-BiLSTM-CRF model.In addition, this study has collected domestic and international literature and resources related to spontaneous intracerebral hemorrhage to construct an "external knowledge brain" for spontaneous ICH. This external knowledge base guides the training process of the entire system, enhancing its accuracy and "explainability." Building on this foundation, we have employed attention maps and expert knowledge to illustrate the internal workings and logic of the system. This approach has mitigated, to a certain extent, the "black-box effect" that is a common concern in deep learning, making the internal logic of the system interpretable.Furthermore, we have compared the H-SYSTEM with clinical physicians to evaluate its accuracy and efficiency in handling real-world cases. **Results:** After more than 200 iterations, the image recognition model achieved a Dice coefficient of 87.58%, precision of 99.82%, and recall of 87.15%. When compared with radiologists, there was no statistically significant difference between the model's output and that of the radiologists. The text recognition model, BERT-IDCNN-BiLSTM-CRF, achieved an F1 score of 91.11%, precision (P value) of 92.03%, and recall of 90.22%, outperforming other models.In the test set, the overall accuracy of the diagnostic results generated by the H-SYSTEM was 94.53% and 95.21%, respectively, with no significant difference compared to senior neurosurgeons. However, the system's efficiency in processing cases was significantly higher than that of neurosurgeons. Specifically, the system took approximately 271.07 seconds to process 60 cases, while neurosurgeons required 10,757.38 seconds. Within the same 60-minute timeframe, the system could handle around 460 cases, compared to the 13 cases handled by neurosurgeons.Additionally, the H-SYSTEM supports "decision traceability" by outputting attention maps and domain knowledge. This feature helps users understand the system's internal logic from both computational and medical perspectives, thereby reducing the "black-box effect" often associated with deep learning models and enhancing their interpretability. **Conclusions:** The H-SYSTEM constructed in this study is capable of automatically recognizing and analyzing images and text data from ICH patients and making diagnostic and therapeutic decisions. It has demonstrated the ability to rapidly and accurately complete clinical multimodal tasks. Moreover, with its "integrated text-and-image explanation" and "logical traceability" functions, the system is able to provide clinical physicians with highly efficient and strongly "interpretable" decision support.

终丝牵拉致脊髓空洞的诊断及治疗

Diagnosis and Surgical Treatment of Syringiomyelia of spinal cord due to tethering of termal filum

谢京城 王振宇 刘彬 马长城 陈晓东
北京大学第三医院神经外科
XIE Jing-cheng, WANG Zhen-yu, LIU Bin, et al. Department of Neurosurgery, Peking University Third Hospital, Beijing 100191, China.

【摘要】目的 总结终丝牵张致脊髓空洞的临床特点、影像学特征和治疗经验。**方法** 回顾性分析 10 例由于终丝牵拉致脊髓空洞患者的临床资料。本组男 4 例，女 6 例，年龄 7～54 岁，平均年龄 26.5 岁。双下肢麻木无力、大小便功能障碍为主要症状。MRI 检查显示终丝内积水、脊髓低位、脊髓内长 T1、长 T2 信号，囊壁无强化。显微镜下行终丝松解术，术后患者俯卧位 7 天。**结果** 手术将终丝切断，病理检查均符合终丝组织，术后患者双下肢无力及大小便功能障碍逐渐恢复，无手术并发症。随访 3 个月 ～10 年，平均 4.1 年，所有患者神经功能完好，腰椎生理曲度完好，随访期间未见空洞复发。**结论** 终丝牵张致脊髓空洞罕见，临床上以慢性脊髓及神经功能障碍为表现。在 MRI 上脊髓低位、终丝及脊髓内表现为脑脊液信号，空洞壁无无强化。手术应在显微镜下松解脊髓牵拉因素，手术疗效满意。

【关键词】脊柱；显微外科手术；脊髓空洞症

【Abstract】Objective To summarize the clinical manifestation, imaging characteristic and experience of surgical treatment of spinal cord syringiomyelia due to tethering of filum. **Method** The authors retrospectively analyzed a series of 10 patients with spinal cord syringiomyelia combined with tethering of filum surgically treated under microscope from 2001 to 2011. There were 4 males and 6 fameles with average age of 26.5 yaers (rang from 7 to 54 years old). The weakness of lower extremities, bowl and bladder dysfunction were the main clinical manifestation. MRI inmaging showed the lower of spinal cord with fluid in the spianl cord with lower signal in T1 and higher signal in T2 seriers without enhancement. 10 operations had been performed with the de-tethering procedure under microscope. The patients remained prone position until 7 days post-operition. **Results** The tethering filum had been gross total resected and histological examination showed typical filum tissue in all cases. There was no operative complication happened. The lower limbs weakness or bowel and bladder dysfunction were gradually relieved post-operation. The period of follow-up was ranged from 3 months to 10 years (average 4.1 years). All the patients with neurological intact, there were no recurrence of the syringiomyelia, and the alignment and lordosis of spine were kept evaluated with MRI investigation during follow-up period. **Conclusion** The syringiomyelia in the sipnal cord due to filum tethering at thoraco-lumbar spine were rare found and characterized by chronic dysfunction of spinal cord and nerve, the manifestation in MRI imaging is cystolic CSF signal both in T1 and T2 series without enhancement. The surgical treatment including de-tethering of the spinal cord under microscope, the outcome of surgical treatment is satisfactory.

【Key words】Spine; Microsurgery; Syringiomyrlia

题目(中英文):

颅内动脉瘤血管内治疗围术期应用抗血小板药物的疗效性和安全性

（Perioperative Application of Antiplatelet Agents in Endovascular Therapy for Intracranial Aneurysms: Efficacy and Safety Outcomes）

作者(中英文):

肖振坤（ZhenKun Xiao）

单位(中英文):

南华大学附属第二医院（The Second Hospital, University of South China）

Objective:

Recent guidelines recommend individualized antiplatelet therapy during the perioperative period of intracranial aneurysm (IA) treatment to prevent thromboembolic complications and reduce postoperative morbidity. However, controversies persist regarding the efficacy and safety of antiplatelet agents in this context. This study aims to evaluate the safety and efficacy of perioperative antiplatelet therapy initiation in patients undergoing intracranial aneurysm treatment

Methods:

This systematic review and meta-analysis adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Randomized controlled trials (RCTs) assessing perioperative antiplatelet therapy in IA patients were included. Meta-analyses were conducted using random-effects or fixed-effects models. The Cochrane Collaboration’s Risk of Bias Tool was employed to assess study quality. Primary efficacy outcomes included thromboembolic events (ischemic stroke, transient ischemic attack [TIA], and thrombosis), while primary safety outcomes encompassed any bleeding events (intracranial hemorrhage, gastrointestinal bleeding), functional outcomes, and mortality.

Results:

Ten high-quality RCTs involving 1862 patients were included. Meta-analysis demonstrated that perioperative antiplatelet therapy significantly reduced the incidence of ischemic stroke (RR, 0.05, 95%CI, 0.02-0.08; $p < 0.001$) and thrombosis (RR, 0.02, 95%CI, 0.01-0.03; $p < 0.001$). However, no significant increase in bleeding events was observed (OR, 0.04, 95%CI, 0.02-0.08; $p < 0.001$) and ICH was . No differences in mortality or functional outcomes were detected between treatment and control groups.

Conclusion:

Perioperative initiation of antiplatelet therapy in IA patients may mitigate thromboembolic complications without significantly elevating bleeding risks. These findings support the therapeutic efficacy and safety of this approach. However, further large-scale randomized trials are warranted to validate these results and optimize clinical protocols.

Keyword: Intracranial Aneurysms, Antiplatelet Therapy, Meta-Analysis, Safety and Efficacy, Randomized Clinical Trials.

Intraoperative Monitoring of Trigeminal Sensory Integrity via Blink Reflex: A Novel Approach

基于瞬目反射的术中神经电生理监测——三叉神经感觉通路完整性评估新策略

Tingting Ying, Yan Yuan, Wenxiang Zhong, Hua Zhao, Yinda Tang and Shiting Li

应婷婷 袁艳 钟文翔 赵华 唐寅达 李世亭

Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

上海交通大学医学院附属新华医院神经外科

Objective:

Objective: To determine the value of the blink reflex in evaluating trigeminal sensory function during microvascular decompression for trigeminal neuralgia.

Methods:

The blink reflex (BR) in 103 patients with primary typical trigeminal neuralgia treated by microvascular decompression (MVD) was tested pre- and intraoperatively. The changes in BR were recorded. All patients underwent general anesthesia with intravenous propofol and fentanyl. Surgical efficacy and complications were evaluated after surgery. The relationship between intraoperative changes in the BR and postoperative trigeminal sensory function was analyzed.

Results:

The BR was elicited in all patients before surgery, and no significant difference was found between the affected side and the contralateral side. in 93 of the 103 cases, the BR was successfully elicited during MVD surgery. Therefore, the recordability of the BR was 90.29%6. R1latency on the affected side and the contralateral side were 11.62 + 4.96 ms and 11.66 + 4.37ms, respectively. During MVD surgery, Ri of the BR disappeared on the affected side in 7 cases and remained in 86 cases. After the operation, 98 of the 103 patients had immediate and complete remission of trigeminal neuralgia symptoms, and 5 cases had partial remission. The 7patients whose Ri disappeared during the surgery all experienced facial numbness postoperatively. Of the 86 patients whose R1 remained, only 2 patients had postoperative facial numb-ness. Of the 10 patients whose R1 was not recordable during the operation, one complained of postoperative facial numbness. No patients had complications such as facial paralysis, cerebrospinal fluid leakage, and death.

Conclusion:

Conclusion: The blink reflex may allow monitoring of trigeminal sensory function during microvascular decompression under general anesthesia.

Keywords:

Blink reflex; BR; trigeminal neuralgia; intraoperative monitoring; sensory function; facial numbness

Use of high-resolution ultrasonography in subcutaneous anterior transposition of the ulnar nerve for cubital tunnel syndrome

高频超声在神经松解术治疗尺神经卡压综合征中的应用

Min Yang

杨敏

Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

上海交通大学医学院附属新华医院神经外科

Objectives*:*

Cubital tunnel syndrome (CTS) is the most common syndrome deriving from ulnar nerve entrapment. Ultrasonography (US) can be used to establish the diagnosis, to show the pathological anatomy of the cubital tunnel region and to guide anterior subcutaneous transposition of ulnar nerve.

Methods:

62 patients with clinical and electrophysiologic evidence of ulnar nerve entrapment were included. All patients underwent US examination and anterior subcutaneous transposition of the ulnar nerve. The maximal diameter of the ulnar nerve (MDU) was measured at longitudinal views and the range of the hypo echoic area around the nerve was analyzed. The actual MDU was measured also during surgery as well as the cross-sectional area (CSA) at the transversal scans.

Results:

The actual MDU was 6.4±0.4mm. The preoperative MDU was 3.1±0.2mm. The MDU recorded on CTS were greater than those in normal subjects. The range of the hypo echoic area observed on longitudinal ultrasonographical scans was 4.1±0.4mm.

Conclusions:

High-resolution US can be used not only for diagnostic reasons, but also as an effective preoperative and intraoperative planning tool for anterior subcutaneous transposition of the ulnar nerve for CTS.

Keyword：

High-resolution Ultrasonography, Cubital tunnel syndrome, ulnar nerve , anterior subcutaneous transposition

Clinical Application of 3D Designed, Customized PEEK Implant in Revision Cranioplasty

First author:Yang Kai
Corresponding author:Liu Lei

Department of Neurosurgery, Aviation General Hospital of China Medical University（Beijing, China）

Address: No. 3, Bei Yuan Road, Chaoyang District, Beijing, P. R. China.

Zip-code: 100012.

Mail Address: Yang Kai: yangkai1204@hotmail.com

Liu Lei:liulei301@126.com

Abstract

Objective: This study aims to explore the effectiveness and safety of using three-dimensional (3D) designed, customized poly ether ether ketone (PEEK) implant in revision cranioplasty. **Methods**: A retrospective analysis was conducted on sixty patients admitted between September 2018 and January 2023 in the General Aviation Hospital of Beijing, who underwent the revision cranioplasty using 3D designed, customized PEEK implant to replace titanium mesh. For each patient, the pre- and postoperative image data, intraoperative surgical techniques, as well as the postoperative recovery were compared and analyzed. **Results**: Comparing the pre- and postoperative 3D computer-tomography reconstructed image data of each patient, it was found that all patients who had undergone the revision cranioplasty had satisfactory skull contour. The follow-up time was between five and 18 months. Two patients had Grade II healing, two patients had transient flap hydrops which disappeared after puncture-aspiration and bandage, and two patients had collapse of the frontotemporal junction and temporalis muscle hypertrophy of the surgical side, who were not satisfied with the appearance,The remaining 54 patients were stable after operation without special discomfort, None of these patients had implant displacement or rejection reaction, without the need for reoperation or removal of the implant. **Conclusion**: For patients with intracranial infection, without titanium mesh exposure or with only local exposure but no infection, the revision cranioplasty can be performed using 3D designed, customized PEEK implant, which is a safe and reliable material. Furthermore, the operation has few complications, effective with high degree of satisfaction, and it is recommended for a more widespread application.

Keywords: 3D; PEEK; Revision cranioplasty; Implant exposure; PEEK replacement

Title: Innovative Treatment of Trigeminal Neuralgia Secondary to Craniofibrous Dysplasia: A Case Report Featuring Robotic-Assisted Stereotactic Percutaneous Balloon Compression via a Lateral Approach

Authors: Yu Zeng, Xiaosheng Yang, Wenchuan Zhang

Affiliation: Department of Neurosurgery, Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

Key words: Secondary trigeminal neuralgia; Fibrous dysplasia; Structured-light guided robotic surgery; Percutaneous balloon compression

Objective: This case report aims to share the experience of treating a patient with trigeminal neuralgia secondary to craniofibrous dysplasia, where conventional access was obstructed by dysplastic bone, using a novel lateral approach for percutaneous balloon compression at the Gasserian ganglion, different from the traditional Hartel approach.

Methods: Preoperative planning involved the use of three-dimensional computed tomography reconstruction to initially determine the direction of needle insertion. During the surgery, a robot-assisted system with structured light guidance was employed to accurately locate the entry point for the needle. The procedure was further guided by C-arm to confirm that cannula tip at the margin of foramen ovale.

Results: Preoperative assessments revealed that the usual Hartel route was blocked by hyperplastic bone, preventing access to the foramen ovale. However, the foramen ovale was still accessible via a lateral route due to sufficient space. Utilizing structured light for guidance, the lateral entry path was confirmed. Successful insertion of the needle was achieved under C-arm guidance, with the balloon expansion showing satisfactory morphology. Electrophysiological signals indicated effective compression of the trigeminal nerve, and the patient experienced immediate relief from pain post-surgery. At a 6-month follow-up, the patient reported well-controlled pain with only mild numbness.

Conclusion: This case demonstrates that robotic-assisted surgery can significantly aid in the treatment of trigeminal neuralgia caused by complex skull base pathologies where traditional surgical approaches are not feasible. The use of a lateral approach facilitated by advanced imaging and robotic technology not only achieved pain relief but also improved patient outcomes in terms of comfort and recovery. This report redefines minimally invasive neurosurgical paradigms for complex craniofacial disorders, emphasizing technology-driven solutions to anatomical challenges.

Predictive nursing based on diffusion tensor imaging technology can enhance the physical rehabilitation of patients with cerebral haemorrhages

Xingming Zhong
The First Affiliated People's Hospital of Huzhou University, Huzhou, Zhejiang, 313000, China.

Correspondence:
Xingming Zhong
Address: *The First Affiliated People's Hospital of Huzhou University, Huzhou, Zhejiang, China.*;
Email: zhzhongxingming@126.com

Abstract

Objective： To explore the effect of predictive nursing on limb rehabilitation in patients with spontaneous hypertensive cerebral haemorrhage in the basal ganglia region based on diffusion tensor imaging technology(DTI).

Methods: From January 2020 to January 2021, 55 patients with spontaneous hypertensive cerebral haemorrhage in the basal ganglia were selected from the Department of Neurosurgery, Huzhou First People's Hospital. They were randomly divided into a control group and an experimental group. The control group was given routine nursing measures, and the experimental group was assigned predictive nursing based on DTI. After three weeks of intervention, compare the two groups' nursing effects. The fugl-Meyer motor function rating scale(FMA)and Modified Barthel Index Scoring Scale(MBI) was used to evaluate patients' motor function and daily living activities.

Results： After three weeks of intervention, motor function scores improved in both groups compared with before treatment ($P < 0.05$). There was a statistically significant difference in FMA scores between the experimental and control groups before and after intervention ($P < 0.001$). There was a statistically significant difference in FMA scores between the two groups before and after intervention ($P < 0.001$). The MBI scores of the two groups before and after the intervention were statistically significant ($P < 0.001$). From the mean point of view, the MBI score of the experimental group after the intervention was significantly higher than before the intervention.

Conclusion： Predictive nursing based on DTI can improve the limb motor function of patients with basal ganglia haemorrhage and enhance the patient's ability to live daily.

Keywords: Diffusion Tensor Imaging; Basal Ganglia Haemorrhage; Foreseeable care; Limb function; Rehabilitation

- Application of gelatin sponge assisted technique in microvascular decompression for trigeminal neuralgia
- 明胶海绵辅助技术在三叉神经微血管减压术中的应用

- Zhongding Zhang, Hua Zhao, Yinda Tang, Shiting Li
- 章钟鼎 赵华 唐寅达 李世亭
- Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine
- 上海交通大学医学院附属新华医院神经外科

- **Objective**

Trigeminal neuralgia (TN) is a neurological disorder characterized by paroxysmal severe facial pain, and microvascular decompression (MVD) is the preferred surgical treatment. Traditional MVD widely employs Teflon, which may lead to postoperative adhesions and granuloma formation, closely associated with TN recurrence. This study aimed to evaluate the efficacy of a novel gelatin sponge (GS)-assisted technique, which isolates Teflon from direct nerve contact to reduce postoperative recurrence, and compared to conventional Teflon-only MVD.

- **Methods**

This retrospective cohort study included 734 unilateral primary TN patients undergoing MVD between January 2014 and December 2019. After excluding patients with prior MVD, atypical TN, or incomplete data, 313 cases in the GS+Teflon group and 347 in the Teflon-only group were analyzed. Baseline characteristics (age, sex, disease duration, pain distribution, and offending vessel types) were comparable. In the GS group, moistened GS was placed between Teflon and blood vessels to avoid direct contact with demyelinated nerve regions, while the Teflon group used only Teflon pledgets to separate vessels from the trigeminal nerve. Postoperative outcomes were assessed using the Barrow Neurological Institute (BNI) pain score, recurrence rates, and complications. Kaplan-Meier survival analysis compared long-term efficacy, with statistical significance set at $P<0.05$.

- **Results**

Operative time was slightly longer in the GS group (109.38 ± 14.77 minutes in GS group vs. 103.53 ± 16.02 minutes in Teflon group, $P<0.001$), but immediate postoperative pain relief (complete remission: 92.0% in GS group vs. 91.1% in Teflon group, $P=0.659$) and complication rates (3.5% in GS group vs. 4.9% in Teflon group, $P=0.378$) showed no significant differences. At 1, 2, and 3 years postoperatively, TN recurrence rates in the GS group were 1.0%, 1.2%, and 1.2%, respectively, versus 3.7%, 2.9%, and 1.7% in the Teflon group. The GS group demonstrated a reduced 1-year recurrence risk (OR=3.7, $P=0.031$) and a significantly lower 3-year cumulative recurrence rate (OR=2.4, $P=0.013$). Kaplan-Meier analysis favored the GS group ($P=0.020$). Among 21 reoperated cases, 81.3% (13/16) in the Teflon group exhibited Teflon adhesions, whereas only 40% (3/5) in the GS group showed mild adhesions, with shorter adhesion-separation times.

- **Conclusion :**

In MVD, the GS-assisted technique reduces early postoperative inflammatory reactions and adhesions by isolating Teflon from nerve contact, significantly lowering 1-year TN recurrence rates without increasing complications. Although operative time is marginally prolonged, this approach improves long-term outcomes and reduces recurrence risks.

- **Keywords:**
- Trigeminal neuralgia; Microvascular decompression; Gelatin sponge

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Multidisciplinary treatment of Diabetic Lower Extremity Lesions: a comprehensive approach to improving patient outcomes

Yue Zhang[1], Wenchuan Zhang[1*]

[1]*Department of Neurosurgery, Shanghai Ninth People's Hospital, Affiliated to Shanghai Jiao Tong University School of Medicine, Shanghai, 200011.*

*Correspondence: zhangwench88@hotmail.com

Background: Diabetic lower extremity lesions (DLEL) are severe complications of diabetes mellitus, characterized by neuropathy, vasculopathy, pain, sensory and motor disturbances, ulcers, deep tissue destruction, and infections. In China, DLEL affects over half of the 155 million diabetic patients, resulting in high disability rates, prolonged hospital stays, and significant healthcare costs. Current fragmented care across specialties often leads to suboptimal outcomes, including high amputation rates.
Objective: This study aims to explore the benefits of a multidisciplinary treatment (MDT) approach centered on nerve decompression surgery for managing DLEL. The goal is to demonstrate how integrating nerve decompression into a comprehensive MDT framework can enhance patient outcomes, reduce complications, and provide a more effective management strategy.
Methods: A review of current literature was conducted to assess the role of nerve decompression surgery within MDT for DLEL. The analysis focused on integrating surgical and non-surgical treatments, including nerve decompression, vascular management, wound care, and metabolic control, to create a coordinated care plan. Evidence was evaluated to determine the impact of MDT with nerve decompression on diagnostic accuracy, wound healing, amputation rates, and healthcare costs.
Results: Nerve decompression surgery, as part of an MDT approach, significantly improves outcomes in patients with DLEL. This surgical intervention alleviates nerve compression, restores sensory and motor function, and helps prevent the progression of foot ulcers. When combined with MDT involving vascular interventions, wound care, and pain management, the approach has shown to enhance ulcer healing rates by 37.1% and reduce major amputation rates. MDT provides a structured and personalized treatment strategy that addresses the complex interplay of neuropathy and vasculopathy, contributing to better overall patient outcomes.
Conclusions: A multidisciplinary approach centered on nerve decompression surgery is a highly effective strategy for managing diabetic lower extremity lesions. By uniting the expertise of various medical fields, MDT offers comprehensive care that addresses the multifaceted nature of DLEL, ultimately improving clinical outcomes, reducing healthcare costs, and enhancing patient quality of life. Establishing MDT frameworks with nerve decompression as a key component is crucial for advancing the management of DLEL and improving patient care.

Key words: diabetic lower extremity lesions; multidisciplinary treatment; nerve decompression surgery; diabetic peripheral neuropathy; amputation prevention.

To analyze the relationship between serum caspase-3 content and hypertensive intracerebral hemorrhage and its evaluation value for short-term prognosis

1、Zhang cheng* 2、 Wen li-wei 3 、Xu yuan-yuan 4、 Li jian-ming
Department of neurosurgery；The third people's hospital of zigong；Sichuan Zigong 643020

Abstract: **objective**: To investigate the relationship between serum caspase-3 content and hypertensive intracerebral hemorrhage, and to analyze its value in evaluating short-term prognosis.**Methods**:The case data of 118 patients with hypertensive intracerebral hemorrhage who underwent neuroendoscopic surgery in our hospital from September 2020 to September 2022 were collected and sorted, and the cases that met the inclusion criteria of this study were selected to be enrolled, so as to reduce or eliminate the selection bias as much as possible. 118 patients with hypertensive intracerebral hemorrhage who underwent neuroendoscopic surgery were included in the intracerebral hemorrhage group. According to the GCS score of the patients after admission, they were divided into a coma group (46 cases) with ≤8 points, a moderate consciousness disturbance group (45 cases) with 9-11 points, and a mild consciousness disturbance group (27 cases) with 12-14 points. 100 healthy volunteers who underwent physical examination in our hospital during the same period were included in the normal control group, and the differences of early serum caspase-3 content in each group were compared. With all-cause death 1 month after surgery as the short-term prognosis assessment criteria, patients were divided into a death group of 20 cases and a survival group of 98 cases. The differences in clinical data were analyzed and logistics regression was used to analyze the risk factors affecting all-cause death 1 month after surgery. Receiver Operating Characteristic curve (ROC) was used to analyze the predictive value of early serum caspase-3 content after admission to hypertensive intracerebral hemorrhage. **Results**: Serum content of caspase-3 in cerebral hemorrhage group was higher than that in normal control group, content of caspase-3 in cerebral hemorrhage group increased continuously with the aggravation of consciousness disorder(P<0.05). There were statistically significant differences in age, cerebral hemorrhage, GCS score, D dimer and caspase-3 distribution between death group and survival group(P<0.05). There was no significant difference in the distribution of gender, diabetes mellitus, pulmonary infection, systolic blood pressure at admission, diastolic blood pressure at admission, bleeding site, white blood cell and platelet(P>0.05). The results of logistics regression analysis showed that: elderly age, large amount of cerebral hemorrhage, low GCS score at admission, high level of d-dimer, high caspase-3 level was independent risk factors for death of hypertensive cerebral hemorrhage patients 1 month after surgery. Optimal cut-off value of all-cause death in hypertensive intracerebral hemorrhage patients at early stage of admission was 17.46 μg/L, AUC 0.730[95%CI 0.622~0.839], corresponding sensitivity and specificity were 70.41% and 65.0%, respectively. **Conclusion**: Serum content of caspase-3 of hypertensive intracerebral hemorrhage patients increases abnormally, and the content further increases as disease gets worse. High level of caspase-3 is an independent risk factor for poor short-term prognosis in patients with hypertensive intracerebral hemorrhage and has certain early prediction value.

Keywords: Hypertensive cerebral hemorrhage; caspase-3; ROC; Short-term prognosis; Predictive value

Title：Clinical treatment of congenital craniosynostosis with 210 case analysis（张津维-颅缝早闭的临床治疗及 210 例分析)；

Name：Zhang jinwei（张津维)；

Hospital Name：The Affiliated Children's Hospital Of Xiangya School of Medicine ,Central South University（Hunan children's hospital)（中南大学湘雅医学院附属儿童医院（湖南省儿童医院))；

Objective： An examination of the clinical presentation, surgical approach, and prognosis of various types of premature closure of the cranial suture.

Methods: The clinical data of 210 children with premature closure of cranial suture from January 2016 to December 2023 in Hunan Children's Hospital were retrospectively analyzed. The children's clinical manifestations, surgical methods, and clinical follow-up were collected and analyzed.

Results: All 210 children with craniosynostosis were treated with good surgical results and no serious surgical complications. Among them, 3 children with total craniosynostosis underwent staged surgery, and all the other children underwent first-stage surgery. At the time of surgery in 21 children, < 6 months, all children with craniosynostosis achieved satisfactory results in early surgery, and the early surgery of sagittal synostosis was more satisfactory,After 1 month ~ 4 years of postoperative follow-up, the craniofacial shape was reconstructed and the brain tissue was fully developed. The statistical results of 210 patients with postoperative CT non-contrast scan + three-dimensional reconstruction and numerical measurement of cranial cavity volume showed that the cranial volume of postoperative patients increased significantly ($P<0.05$).

Conclusion: Craniofacial CT noncontrast + three-dimensional reconstruction examination is of great significance for the clinical diagnosis, disease classification and postoperative follow-up of craniosynostosal premature aucus. According to the different characteristics of each child, the individualized surgical plan and early surgery are selected for better treatment results.

Keywords: craniosynostosis premature closure; Surgical modality; children

Efficacy Analysis Of Drainage Tube Compression As An Adjunct To Puncture Drainage In Hypertensive Intracerebral Hemorrhage

Li-Na Zhang[1], Ling-Yun Shi[1] „Jian-Xue Li[2],

[1]The First Affiliated Hospital of Xinjiang Medical University,2School of Nursing, Xinjiang Medical University

Objective: To evaluate the impact of drainage tube compression on hematoma drainage efficacy following puncture drainage in hypertensive intracerebral hemorrhage (HICH). **Methods:** Sixty HICH patients who underwent neuronavigation-guided puncture drainage at the First Affiliated Hospital of Xinjiang Medical University from June 2024 to January 2025 were randomly divided into control (n=30) and observation (n=30) groups. The control group clamping of the distal tube by bidirectional manual compression three times a day for the first three postoperative days to induce fluid oscillation within the drainage tube. The observation group received no such intervention. The Daily drainage volume and complications (infection and rebleeding rates) were compared between the two groups.

Results: The control group demonstrated significantly higher daily drainage volumes than the observation group during the first three postoperative days (25.77 ± 5.53 mL vs. 17.77 ± 3.21 mL, $t = 6.85$, $P < 0.01$). No statistically significant difference was observed in postoperative complication rates between groups ($\chi^2 = 0.537$, $P = 0.765$). **Conclusion:** Drainage tube compression can effectively enhance hematoma drainage and accelerate clot evacuation in HICH puncture drainage without compromising safety.

Keywords : Hypertensive Intracerebral Hemorrhage; Neuronavigation-guided Puncture Drainage; Drainage Efficacy

Microvascular decompression for abducens nerve palsy associate with neurovascular conflict

微血管减压术治疗外展神经麻痹

Zhao Hua

赵华

Department of Neurosurgery, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

上海交通大学医学院附属新华医院神经外科

Objective:

Abducens nerve palsy caused by neurovascular conflicts is rare and requires further exploration. This study aimed to investigate the clinical features and surgical outcomes of abducens palsy caused by neurovascular conflict.

Methods:

Twenty-six patients with abducens palsy caused by neurovascular conflict were included in present study. The clinical data and treatment outcomes were retrospectively analyzed. Symptom improvement score was used to evaluate the changes in diplopia, which include five grades: complete remission, significant relief, partial relief, no improvement, and worsening of symptoms.

Results:

Neurovascular conflict was determined in 26 patients (12 male and 14 female) with a mean age of 60.54±13.55 years (range, 35 to 84 years). The mean duration of symptoms was 10.19±11.30 months (range, 1 to 60 months). Ten patients underwent microvascular decompression (MVD) while 16 patients received observation and drug therapy. No fatal complications occurred in any patient. In the MVD group, 9 patients achieved remission of diplopia, while 1 patient showed no change in symptoms. In observation group, only 4 patients achieved symptom relief and 12 patients showed no improvement or worsened. The symptom improvement score of MVD group was significantly higher than that of observation group at last follow-up (3.50±0.97 vs. 1.38±0.95, $P<0.001$). Neurovascular compression, although rare, should be considered as a possible underlying cause of isolated abducens nerve palsy.

Conclusion:

Microvascular decompression can be considered a treatment option based on the comprehensive preoperative evaluation. Patients with significant atrophy of the extraocular muscles are unsuitable for MVD surgery.

Keywords:

Abducens nerve palsy · The sixth cranial nerve · Microvascular decompression · Neurovascular conflict

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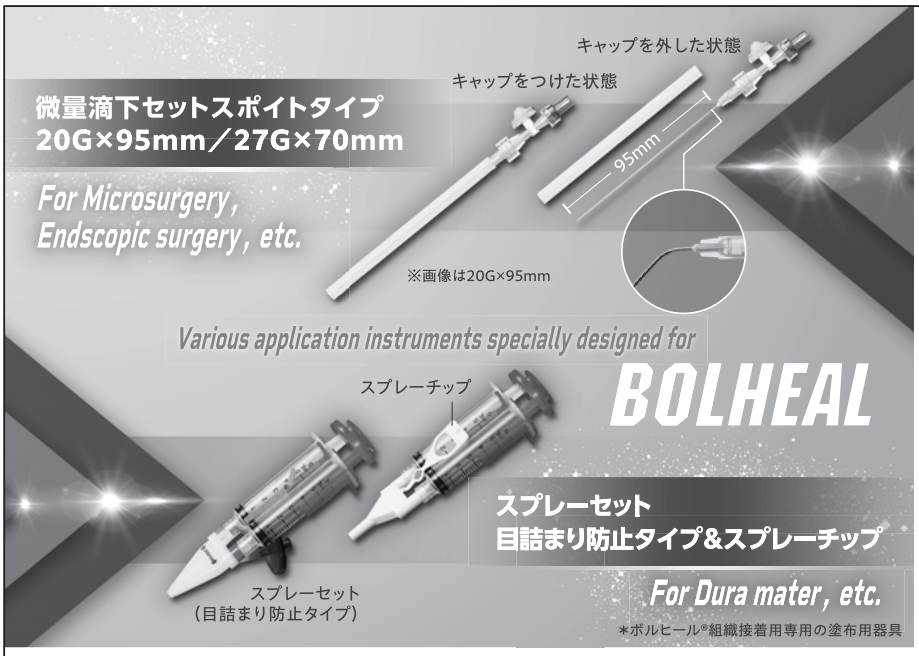

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エス・アンド・ブレイン株式会社
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