SUPPLEMENT 5

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Brain Tumours—What's Next for Neurosurgeons

22 – 23 November 2024

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31st Annual Scientific Meeting of The Hong Kong Neurosurgical Society

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Associate Professor, Department of Electrical Engineering, City University of Hong Kong, Hong Kong SAR, China

SCIENTIFIC PROGRAMME

Venue: The Ballroom, 7/F, Cordis Hong Kong, Mongkok, Hong Kong SAR, China

22 November 2024, Friday

08:00 – 08:25	Registration	Poster Room **EXHIBITION AND POSTERS**
08:25 – 08:30	**OPENING SPEECH** ***Dr ST Wong***	
08:30 – 09:30	**FREE PAPER I—Tumour I** Chairpersons: *Dr WM Hung, Dr Christopher Poon*	
09:30 – 10:00	**KEYNOTE LECTURE I** **Skull Base Chordomas: Towards Supramarginal Resection** ***Prof Juan Carlos Fernandez-Miranda*** Chairpersons: *Dr ST Chan, Dr ST Wong*	
10:00 – 10:30	**KEYNOTE LECTURE II (Zoom Lecture)** **Recent Advances in Therapy for Gliomas and Meningiomas** ***Prof Patrick Wen*** Chairpersons: *Dr Daniel Ng, Dr SC So*	
10:30 – 10:50	Tea Break	
10:50 – 11:20	**FREE PAPER II—Skullbase I** Chairpersons: *Dr YT Kan, Dr TS Tse*	
11:20 – 11:50	**KEYNOTE LECTURE III—Prof WS Poon Lecture** **Novel Clinical Trial Paradigm to Accelerate Progress in Glioma** ***Prof Kate Drummond*** Chairpersons: *Prof WS Poon, Dr HM Chiu*	
11:50 – 12:30	**FREE PAPER III—Skullbase II** Chairpersons: *Dr FC Cheung, Dr WK Wong*	
12:30 – 13:50	Lunch	
13:50 – 14:50	**FREE PAPER IV—Functional/basic science/AI (including video session)** Chairpersons: *Dr CF Fung, Prof Gilberto Leung*	
14:50 – 15:20	**KEYNOTE LECTURE IV** **Technology-Enhanced Brain Tumour Survivorship** ***Prof Kate Drummond*** Chairpersons: *Dr YW Fan, Dr Peter Woo*	
15:20 – 15:40	Tea Break	
15:40 – 16:10	**FREE PAPER V—Vascular I** Chairpersons: *Dr Tony Chan, Dr KY Chan*	
16:10 – 16:50	**FREE PAPER VI—Vascular II** Chairpersons: *Dr YC Po, Dr KT Chan*	
19:00 – 22:30	**ASM Dinner** **Managing Safety in Flight Operations** **Venue: Celestial Court, Sheraton Hotel, Tsim Sha Tsui** Guest Speaker: *Capt Lok Lee, Deputy Chief Pilot*	

23 November 2024, Saturday

08:30 – 08:45	Registration		Poster Room **EXHIBITION AND POSTERS**
08:45 – 09:15	**FREE PAPER VII—Tumour II** Chairpersons: *Dr Michael Lee, Dr Derek Wong*		
09:15 – 09:45	**FREE PAPER VIII—Paediatrics/Spine** Chairpersons: *Dr Wilson Ho, Dr YH Tse*		
09:45 – 10:15	**KEYNOTE LECTURE V** **Craniopharyngiomas and the Hypothalamus: Is Surgery Safe and Effective?** ***Prof Juan Carlos Fernandez-Miranda*** Chairpersons: *Dr Jason Chow, Dr Dawson Fong*		
10:15 – 10:35	Tea Break		
10:35 – 11:05	**KEYNOTE LECTURE VI** **Innovations in the Surgical Treatment of Pituitary Adenomas with Cavernous Sinus Invasion** ***Prof Juan Carlos Fernandez-Miranda*** Chairpersons: *Dr CP Tsang, Dr HT Wong*		
11:05 – 11:30	**SPINE CHAPTER LECTURE I (Zoom)** **1. Complications Management of Endoscopic Spine Surgery** **2. Advanced Techniques of Lateral Lumbar Interbody Fusion** ***Prof JW Hur*** Chairpersons: *Dr Alberto Chu, Dr David Sun*	**NURSING SESSION** **Contemporary Informatics in Neurosurgical Nurse and Patient Education** Chairpersons: *Ms Daisy MT Cheng, Ms HC Yeung*	
11:35 – 12:00	**SPINE CHAPTER LECTURE II** **PFDF Technique for Atlantoaxial Dislocation** ***Prof Zan Chen*** Chairpersons: *Dr HY Law, Dr Clarence Leung*		
12:05 – 12:25	**SPINE CHAPTER LECTURE III** **1. Surgical Treatment and A Novel Classification of Syringomyelia** **2. Preliminary Exploration of Combinative Rehabilitation Strategy Combining Spatiotemporal Spinal Cord Stimulation and Real-time Triggering Exoskeleton** ***Prof Jian Guan*** Chairpersons: *Dr Alberto Chu, Dr Joseph Lam*		
12:25 – 12:35	Group photo and Announcement		
12:35 – 14:00	Lunch		

23 November 2024, Saturday

14:00 – 14:30	**KEYNOTE LECTURE VII** **Building A Multidisciplinary Brain Tumour Service** ***Prof Kate Drummond*** Chairpersons: *Dr Danny Chan, Dr LF Li*	Poster Room **EXHIBITION AND POSTERS**
14:30 – 15:20	**FREE PAPER IX—Tumour—Endovascular** Chairpersons: *Dr KM Leung, Dr TL Poon*	
15:20 – 15:40	Tea Break	
15:40 – 16:00	**SRS LECTURE (Zoom)** **Vestibular Schwannoma in Radiosurgery** ***Prof Douglas Kondziolka*** Chairpersons: *Dr KY Yam, Dr CP Yu*	
16:00 – 16:40	**FREE PAPER X—Functional/Geriatrics** Chairpersons: *Dr CK Wong, Dr Alain Wong*	
16:40 – 16:50	Closing Remarks	

FP 1.1

The impact of next-generation sequencing on treatment decision making in DNA damage repair deficient and homologous repair deficiency in recurrent *IDH*-wildtype glioblastoma

Peter YM Woo[1], Elaine YL Ko[2], Joyce SW Chow[1], Samson HH Yum[2], CL Chiang[2], Dennis Leung[2], Jason MK Ho[1], Arthur CK Lau[1,2], LF Li[1], Gilberto KK Leung[2], TC Lam[2], Aya El Helali[1,2]

[1] Hong Kong Neuro-Oncology Society, Hong Kong SAR, China

[2] Department of Clinical Oncology, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China

Introduction: The accumulation of components of the DNA damage repair (DDR) pathway may play a vital role in driving glioblastoma progression and predicting response to poly (ADP-ribose) polymerase inhibitors (PARPi). Using next-generation sequencing (NGS), we aim to examine if DDR deficiency (dDDR) as a biomarker may impact the efficacy of PARPi in glioblastoma.

Methods: This study included patients with *IDH*-wildtype recurrent glioblastoma (rGB) who underwent comprehensive next-generation sequencing (c-NGS) between 2021 and 2023. The primary objectives were to determine the clinical impact of c-NGS–directed therapy and to investigate the prognostic significance of dDDR and homologous recombinant deficiency (HRD) among patients treated with PARPi.

Results: A total of 80 rGB patients were recruited, with 63% received genomically guided therapy. Patients who received PARPi had statistically significantly longer overall survival compared with those who received non-PARPi target therapy (23 vs 14.6 months; P=0.0019). Furthermore, we identified that when treated with PARPi, HRD status may be of potential therapeutic significance in rGB (P=0.043).

Conclusion: The application of NGS profiling in managing rGB is rapidly developing. Importantly, identifying patients with pathogenic mutations in the DDR pathway and HRD may represent a novel subgroup that may respond favourably to PARPi.

FP 1.2

Combination talazoparib: carboplatin for recurrent high-grade glioma with DNA damage repair deficiency TAC-GReD trial

Joyce SW Chow[1], Aya El Helali[2], Marc Lecoultre[2], Dexter Lee[2], Elaine YL Ko[2], LF Li[3], Sarah SN Lau[3], Gilberto KK Leung[4,5], Peter YM Woo[6], Jason MK Ho[7], CL Chiang[2], Matthew Chui[2], TH So[2], TC Lam[2]

[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Department of Clinical Oncology, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[3] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
[4] Department of Surgery, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[5] State Key Laboratory of Brain and Cognitive Sciences, The University of Hong Kong, Hong Kong SAR, China
[6] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[7] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China

Background: Recurrent high-grade gliomas (HGG) present a significant challenge in neuro-oncology due to their poor prognosis and lack of effective standard treatment. Emerging evidence indicates deficiencies in the DNA damage repair (DDR) pathway in a significant proportion of gliomas, leading to innate or acquired resistance mechanisms and worse survival outcomes. Somatic alterations in the DDR pathway, including *PTEN* mutations and '*BRCA*-ness', have paved the way for targeted therapy utilising poly (ADP-ribose) polymerase (PARP) inhibitors. The distinct mechanisms of action of PARP-trapping inhibitors, particularly in forming cytotoxic PARP-DNA complexes, have shown promise in personalised cancer treatment strategies.

Methods: The TAC-GReD trial is a prospective phase II, single-arm, open-label study designed to evaluate the efficacy and safety of the combination of talazoparib and carboplatin in patients with recurrent HGG harbouring pathogenic mutations in the DDR pathway. The trial aimed to assess the 6-month progression-free survival (PFS-6) as the primary endpoint, with secondary endpoints including objective response rate, overall survival (OS), safety and tolerability, and health-related quality of life measures.

Results: Thirty-three patients, with a median age of 55 years and 70% male, were enrolled in the TAC-GReD trial. The trial met the prespecified response criteria, with a PFS-6 rate of 25% (95% confidence interval [95% CI]=13%-48%), median progression-free survival of 3.4 months (95% CI=2.2%-5.7%), and OS of 6.5 months (95% CI=4.5%-9.8%). The treatment combination was deemed safe, with the most common treatment-related adverse events being haematologic, and no treatment-related deaths were reported. The quality-of-life scores remained stable throughout the trial.

Conclusion: The unique biomarker-stratified approach capitalises on the strong biological rationale for utilising PARP inhibitors in HGG, offering a potential avenue for innovative therapeutic strategies in the management of recurrent HGG.

Glioblastoma outcomes: a three-year single-centre retrospective review

FP 1.3

Alexander Woo[1], Sarah SN Lau[2], LF Li[2], Benedict BT Taw[2], Wilson WS Ho[2], Gilberto KK Leung[2], WM Lui[2], Kevin KF Cheng[2]
[1] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China
[2] Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China

Objective: To assess the outcome of glioblastoma patients who underwent treatment at Queen Mary Hospital.
Methods: This is a retrospective study of the glioblastoma population who underwent operation from 2020 to 2022, with demographic, molecular profiles, treatment, and survival data collected. Further statistical analysis via multivariate analysis was conducted.
Results: In all, 48 patients were assessed, and median overall survival was 10 months. Longer survival was associated with debulking surgery rather than biopsy, adjuvant treatment, *MGMT* (O-6-methylguanine-DNA methyltransferase) promoter methylation, and younger age.
Conclusion: Younger age, adjuvant treatment, molecular profile, and debulking were associated with longer survival in glioblastoma patients.

An individualised postoperative radiological surveillance schedule for patients with World Health Organization grade 4 astrocytoma: a multi-centre retrospective study

FP 1.4

Jason CY Li[1], Arthur CK Lau[2], Travis YH Chan[3], Joyce SW Chow[2], LF Li[3], Natalie MW Ko[4], Tony KT Chan[5], ST Wong[6], Michael WY Lee[7], Danny TM Chan[1], Peter YM Woo[1]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[3] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
[4] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China
[5] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China
[6] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[7] Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: World Health Organization (WHO) grade 4 diffuse astrocytomas are malignant primary brain tumours with a high rate of recurrence following standard-of-care treatment, requiring postoperative radiological surveillance for timely management. However, there is a lack of evidence-based and risk-stratified guidelines on the optimum imaging schedule.
Methods: This was a territory-wide, multi-centre retrospective analysis of consecutive adult patients with WHO grade 4 astrocytoma treated with surgery and temozolomide chemoradiotherapy across seven neurosurgical units in Hong Kong between 2006 to 2020. Data was extracted from the Hong Kong Glioblastoma Registry. Interval-censored Kaplan–Meier curves of event-free survival of included patients were described by a piecewise exponential model. We then generated the radiological surveillance schedules with a 30% event yield per scan, tailored based on important prognostic factors, ie, extent of resection, adjuvant treatments, and *MGMT* (O-6-methylguanine-DNA methyltransferase) promoter methylation status of the tumour.
Results: In total, 699 adult patients were identified. For a 30% event yield per scan, those treated with gross total resection should be monitored with magnetic resonance imaging every 15.9 weeks until the end of the standard 6-month adjuvant temozolomide chemotherapy phase protocol, and every 25.1 weeks after that. Patients with residual tumour should be monitored every 15.3 weeks until the end of standard treatment, and every 16.6 weeks after that. The recommended intervals are shorter for those who did not complete standard first-line treatment, and can be adjusted according to the *MGMT* promoter methylation status of the tumour.
Conclusion: Radiological surveillance frequency can be guided by an evidence-based method and individualised dependent on conventional prognostic factors.

FP 1.5

Clinical profile of World Health Organization grade II meningioma in a local hospital

MS Tong, WN Ho, ST Wong
Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China

Background: The World Health Organization (WHO) has updated its classification of WHO grade II meningioma in 2016 to provide better prognostic and therapeutic implications. There are controversies in follow-up and management of residual tumour and recurrence, especially the use of radiotherapy.
Methods: We reviewed our experience with 377 patients with meningioma resected in Tuen Mun Hospital between 2006 and 2024. Six patients were excluded due to WHO grade III meningioma and 299 were excluded due to WHO grade I meningioma. Spinal meningioma was also excluded. Patients with WHO grade II meningioma were followed until death or a median of 4 years. The loss to follow-up rate was 12.5%. Recurrence and survival rate were used for assessment of the outcome.
Results: A total of 72 patients with WHO grade II meningioma were included (median age=61 years). There were three chordoid and 69 atypical meningioma. Histological features including brain invasion, Ki-67 value and mitotic figure have been reviewed. Eighteen brain invasion cases were classified in WHO grade II group. Twenty-eight cases had recurrence or progression. Thirty-eight cases needed radiotherapy. In the radiotherapy group, 31 patients received adjuvant radiotherapy after first operation. The reoperation rate was 18.1% while the 5-year survival rate was 91.7%. The 5-year survival rate for patients with adjuvant radiotherapy and those without radiotherapy were 90.3% and 92.7%, respectively (P=1). Recurrence rate was 41.9% for the radiotherapy group and 31.7% for other patients (P=0.4594).
Conclusion: From our local data, we suggest that there is no significant benefit in recurrence rate and overall survival for WHO grade II meningioma patients to receive early postoperative adjuvant radiotherapy.

FP 1.6

Cost-effectiveness analysis of tumour-treating fields in patients with newly diagnosed World Health Organization grade 4 astrocytoma from a public healthcare provider perspective: a multi-centre prospective study in Hong Kong

Travis YH Chan[1], Peter YM Woo[1], Siyu Liu[2], Yike Ding[2], Benjamin HK Yip[2], Jayden HM Ho[1], KM Cheung[3], Winnie WY Sung[3], Joyce SW Chow[4], LF Li[5], Natalie MW Ko[6], Tony KT Chan[7], Jason MK Ho[8], ST Wong[8], Michael WY Lee[9], Danny TM Chan[1]

[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China
[3] Department of Clinical Oncology, Queen Elizabeth Hospital, Hong Kong SAR, China
[4] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[5] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
[6] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China
[7] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China
[8] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[9] Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: World Health Organizations (WHO) grade 4 diffuse gliomas are malignant primary brain tumours with a high rate of recurrence and the prognosis for overall survival is poor. Standard-of-care first-line treatment involves surgical resection, temozolomide chemotherapy, and radiotherapy. Tumour-treating fields has also been introduced as a novel fourth treatment modality. However, the cost of this therapy has been prohibitive for the majority of patients. This study was performed to evaluate the cost-effectiveness of such tumour-treating fields (TTF) from a public healthcare provider perspective.

Methods: This was a territory-wide, multi-centre prospective cost-effectiveness analysis of consecutive adult patients with WHO grade 4 astrocytoma treated with surgery and temozolomide chemoradiotherapy across seven public healthcare neurosurgical units in Hong Kong between 2019 to 2023. Data were extracted from the Hong Kong Glioblastoma Registry. A partitioned survival model with a cycle length of 1 month and a time horizon of 5 years was adopted at a discount rate of 3%. In addition, a Markov model to describe three mutually exclusive health states, ie, stable disease, progressive disease or death, was employed. The willingness-to-pay (WTP) threshold was set at three times the 2023 gross domestic product per capita of Hong Kong. The unit cost for TTF was set at HK$900 000 for 6 months of therapy.

Results: In all, 51 adult patients were identified. Overall survival of TTF patients was 23.6 months compared to 17.8 months for those that only received standard care. The WTP was HK$1 480 000 and the incremental cost-effectiveness ratio was HK$1 807 786 per life year gained (or HK$2 139 337 per quality-adjusted life year). A total treatment cost of HK$860 000 to HK$920 000 was shown to be cost-effective when assuming TTF duration was at least 4 months.

Conclusion: Tumour-treating fields is considered cost-effective from a Hong Kong public healthcare provider perspective.

FP 2.1

Internal acoustic canal drilling in retrosigmoid approach for vestibular schwannomas excision: two-decade experience in Queen Mary Hospital

Ray YM O, Ryan Leung, Kevin KF Cheng, Gilberto KK Leung
Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China

Objective: To review the outcome of retrosigmoid vestibular schwannomas (VS) excision with and without internal acoustic canal (IAC) drilled and to identify predictors of recurrence and functional outcomes.
Methods: Patients with VS excision via retrosigmoid approach in Queen Mary Hospital from 2004 to 2024 were reviewed retrospectively. Uni- and multivariate analyses were performed to determine predictors of outcomes.
Results: A total of 127 patients were identified after excluding patients with neurofibromatosis, other cranial nerve schwannomas, excision by other approaches, and prior radiation/operations. Postoperative stereotactic radiotherapy/radiosurgery for residual tumour was given to 6.3% of patients. Internal acoustic canal drilling was performed in 77.2% (n=98) of patients, while 22.8% (n=29) did not have IAC drilled. There were comparable patient demographics, tumour maximum diameter and Koos grade. Gross or near total excision was achieved in 87.8% in the IAC drilling group and 55.2% in the no IAC drilling group. There was significantly higher degree of excision and longer operation time in the IAC drilling group (both P<0.001). There was no significant difference in cerebrospinal fluid leakage, early/late reoperations, recurrence, and hearing deterioration. However, there was significantly higher rate of persistent deterioration in facial nerve function (P=0.049). Upon uni- and multivariate analyses, smaller extent of excision predicts higher likelihood of recurrence (odds ratio [OR]=4.058; P=0.011). Longer operation time predicts facial nerve function deterioration (OR=1.007; P=0.004). No significant predictor of hearing deterioration was identified.
Conclusion: Internal acoustic canal drilling in retrosigmoid approach for vestibular schwannoma excision allows higher degree of excision which may predict lower tumour recurrence rate. Nonetheless, this might come at the cost of longer operation time and higher rate of facial nerve function deterioration.

FP 2.3

Cystic versus solid vestibular schwannoma in terms of implications of tumour characteristics on facial nerve outcome and tumour resection extent: a two-centre study

YW Ho[1], Ronald Li[1], Allan NL Chan[2], Alberto CH Chu[1]
[1] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China

Objective: Cystic vestibular schwannoma is a subtype of vestibular schwannoma, which is known to be difficult to manage when compared to its solid subtype. In this study, we aimed to evaluate the surgical outcome of cystic vestibular schwannoma, compared to solid vestibular schwannoma with the same surgical approach.
Methods: Patients with vestibular schwannoma who were operated at Kwong Wah Hospital and Princess Margaret Hospital from 2014 to 2023 were retrospectively analysed. Tumour is defined to be cystic when cystic component is present in both preoperative magnetic resonance imaging and intraoperative finding. Surgical outcome was compared between cystic and solid vestibular schwannoma, including Koos grading, residual tumour volume, symptomatic recurrence, facial nerve outcome, and postoperative complications.
Results: There were around 150 vestibular schwannoma patients operated in the two hospitals with retrosigmoid approach during the study period. Results to be analysed.
Conclusion: To be reported.

FP 3.1

An outcome analysis in Rathke's cleft cyst: a ten-year single-centre retrospective observational study

HM Leung, MH Yuen, Calvin HK Mak, TL Poon
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: Rathke's cleft cysts (RCC) are non-neoplastic epithelium-lined lesions arising from the remnants of Rathke's pouch. Majority of cases are asymptomatic and can be followed up with serial imaging. Large RCC can cause a variety of symptoms including visual disturbances, headache, endocrine disturbance, etc. Operations are then indicated. This study aimed at reviewing outcomes of RCC patients post-interventions.
Methods: This is a retrospective observational review of patients with RCC undergoing interventions in Queen Elizabeth Hospital from 2014 to 2023. Information regarding patients' demographics, radiological features such as size, extent and location of RCC, clinical presentation, details of interventions received, and clinical outcomes were collected. Clinical outcomes in terms of symptom improvement, complications rate, recurrence rate, and reoperation rate were included.
Results: Twenty-nine cases were included in this study. All underwent endoscopic transsphenoidal surgery. Preoperative imaging of all cases shows optic chiasm compression. 59% cases complained of visual deterioration preoperation. Visual improvement achieved in 72% of these cases. Recurrence rate, reoperation rate and further analysis of recurrence risk factors, eg, lesion size, extent of resection, etc. would be presented in the final presentation.
Conclusion: Endoscopic transsphenoidal surgery is an effective intervention for treating symptomatic RCC.

FP 3.2

Surgical management of intraorbital schwannoma in a minimally invasive era

Filbert CH Lam[1], Ben CF Ng[1], Hunter KL Yuen[2], Calvin HK Mak[1]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Hong Kong Eye Hospital, Hong Kong SAR, China

Objective: Intraorbital schwannoma is a rare disease entity to both neurosurgeons and ophthalmologists with few case reports. A retrospective study was conducted to review the outcomes of endoscopic transorbital surgery and open orbitotomy on intraorbital schwannomas.
Methods: Twelve cases of intraorbital schwannoma were treated between 2000 and 2024 by endoscopic transorbital approach (ETOA) and open orbitotomy. Operative parameters including length of hospital stay, surgery time, visual outcomes, extent of resection, and cranial nerve deficits were investigated.
Results: Six cases underwent ETOA between 2020 and 2024 while another six cases underwent open orbitotomy between 2000 and 2020. For ETOA, gross total excision was achieved in one patient while the remaining patients had subtotal excision. For open orbitotomy, three cases were able to achieve gross total excision, while others had subtotal excision. Operation duration for both ETOA and open orbitotomy were similar, averaging 270 minutes and 299 minutes, respectively. Average hospital stay for ETOA was 5 days, while average hospital stay for open orbitotomy was 11.6 days. Both ETOA and orbitotomy were able to demonstrate improvement in visual outcome (visual acuity, extraocular movement, ptosis or proptosis). Five out of six patients undergoing open orbitotomy experienced long-term postoperative complications (including optic neuropathy; cranial nerve III, cranial nerve IV or cranial nerve VI palsy; and neuropathic pain or numbness), while one patient undergoing ETOA was complicated by decreased visual acuity postoperation.
Conclusion: Endoscopic transorbital approach is an effective, minimally invasive and safe approach to intraorbital schwannoma with preservation of cranial nerve functions.

The surgical timing of pituitary apoplexy: a single-centre ten-year review

FP 3.3

Jasmine WZ Ye, LY Ho, Michael WY Lee, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: To review the pituitary apoplexy cases at Pamela Youde Nethersole Eastern Hospital (PYNEH) in the past 10 years and to investigate the significance of timing of surgery on functional outcome, especially vision.
Methods: All cases of pituitary apoplexy which had surgical decompression done in PYNEH in the past 10 years were extracted. Their demographics, presentation, timing of operation, and outcome were reviewed. They were divided into early and late surgery group, and their visual outcome were compared.
Results: There were 25 cases retrieved in total. Almost all of them presented with headache and nausea. 50% of cases had acute visual disturbances; 30% of cases had known diagnosis of pituitary adenoma and they may have visual deterioration ahead of apoplexy. There was an increasing trend of the number of cases done each year and a decreasing trend of the onset to surgery time. 16% of cases underwent surgery within 24 hours. The patients who had early versus late decompression surgery were compared in terms of rate of and time required for visual improvement. The early group had a faster recovery in visual function and a better outcome in long-term follow-up.
Conclusion: There is an increasing trend of pituitary apoplexy decompression cases and also a shortening of operation time. An earlier decompression for pituitary apoplexy facilitates earlier recovery of visual function and a better long-term functional outcome.

Intraoperative mapping of sphenopalatine artery for nasoseptal flap with indocyanine green and Doppler ultrasound during transsphenoidal surgery

FP 3.4

Laura LW Leung, Maxwell CY Choi, Victor KH Hui, Danny TM Chan, Leo KT Yeung
Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: During endonasal endoscopic transsphenoidal surgery, the sphenopalatine artery (SPA) is a major landmark that needs to be identified. Preservation of such an artery allows for the viability of the nasoseptal flap, a key flap used for reconstruction of skull base defects for prevention of cerebrospinal fluid leak post–endonasal surgery. The use of intraoperative indocyanine green (ICG) and Doppler ultrasound (USG) allows for the accurate localisation of such a structure.
Methods: A retrospective review was completed for all patients who performed transsphenoidal surgery for excision of pituitary tumour at Prince of Wales Hospital between 2019 and 2024. All patients whom had SPA localisation performed using ICG and Doppler USG were included. Postoperative complications and outcomes were also assessed.
Results: A total of 55 cases were included in our study. We found that the posterior septal branch of the SPA was localised via Doppler USG and/or ICG in 95% (n=52) of cases. There is also high concordance of the distance of SPA from the roof of the choana and sphenoid ostium as measured by Doppler USG and ICG. We also found 100% viability of the nasoseptal flap in our cases, and no major postoperative epistaxis was developed.
Conclusion: Sphenopalatine artery can be consistently located using intraoperative ICG and Doppler USG. The localisation of such artery is crucial to the preservation of nasoseptal flap viability and is recommended in all endoscopic transsphenoidal surgeries.

FP 3.5

Mono-nostril endoscopic transsphenoidal skull base surgery: a prospective single-centre cohort study

Leo KT Yeung, Maxwell CY Choi, Victor KH Hui, Danny TM Chan
Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: To describe a multidisciplinary local institution experience with trimodal mapping of the internal carotid artery (ICA) during mono-nostril endoscopic transsphenoidal skull base surgery for various skull base pathologies as part of an ongoing prospective registry established since January 2020.
Methods: In all, 163 consecutive cases were analysed, of which 74% (n=121) cases with at least one postoperative magnetic resonance imaging pituitary scan to assess extent of resection (EOR) were included. Intraoperative trimodal ICA mapping, indocyanine green endoscopy, Doppler ultrasound, and neuronavigation were performed for all cases starting from November 2020.
Results: Our cohort consisted primarily of pituitary adenomas (around 80%), followed by Rathke's cleft cysts (around 7%), non-tumour pituitary apoplexy (around 5%), craniopharyngiomas (around 3%), meningiomas (around 2.5%), and chordomas (around 2.5%). Notably, volumetric analysis revealed 69% (9/13) of Knosp grade 4 pituitary adenomas achieved gross total resection (defined as EOR >95%), while maintaining a zero ICA injury rate. This was a clinically significant improvement from our centre's anecdotal average of ICA injury in 3% of cases. Postoperative CSF leak occurred in 3% of cases.
Conclusion: Our prospective cohort demonstrated effectiveness of avoiding ICA injury using trimodal mapping of the ICA without compromising EOR.

FP 4.1

Prior-driven prompting for automated three-dimensional radiology report generation: a feasibility study for cerebral glioma magnetic resonance imaging

Maymay Cerys Harwood[1] *, Q Yang[2] *, W Li[3], X Guo[4], Peter YM Woo[1], Danny TM Chan[1], Y Yuan[3]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Electrical Engineering, City University of Hong Kong, Hong Kong SAR, China
[3] Department of Electronic Engineering, The Chinese University of Hong Kong, Hong Kong SAR, China
[4] Department of Engineering Science, University of Oxford, United Kingdom
* Equal contribution

Objective: Fully automated radiology report generation is rapidly attracting research attention for its potential in alleviating radiologists' workload. Existing report generation methods focus on two-dimensional modalities such as X-rays and struggle with three-dimensional (3D) volumes such as magnetic resonance imaging (MRI). In this work, we explored the potential of automated 3D radiology report generation using prior-driven prompting (PIP) to learn diagnostic information. By designing patient- and disease-driven prompts to exploit prior fundamental patient clinical data, we tackled the unique challenge of excess redundant background information faced in 3D scan reporting.
Methods: We developed patient-driven prompting using clinical information, eg, age and symptoms, to mine clinically relevant data via a patient-driven Mamba structure. Cerebral gliomas were used as the targeted disease prompts in a disease-driven Mamba. To evaluate report generation results, we employed common metrics such as BLEU-1 (Bilingual Evaluation Understudy–1), BLEU-2 (Bilingual Evaluation Understudy–2), ROUGE-L (Recall-Oriented Understudy for Gisting Evaluation), and METEOR (Metric for Evaluation of Translation with Explicit Ordering) scores, which measure the similarity between generated text and a radiologist-written report, and compare to existing automated report generation algorithms.
Results: We validated the framework using our collected 3D medical dataset of 293 cerebral glioma patients with MRI brain scans and their corresponding reports. The findings exhibited the following scores: 0.339, 0.284, 0.314, and 0.217 for BLEU-1, BLEU-2, ROUGE-L, and METEOR, respectively. There was a significant difference in the performance of our PIP score compared to existing automated reporting models (independent samples *t* test, $P<0.01$), indicating superior performance of this model.
Conclusion: Prior-driven prompting is a useful framework to automatically generate radiology reports in cerebral glioma patients and achieves better generation results than existing approaches.

FP 4.2

Four-year retrospective review on the effectiveness of microvascular decompression for management of trigeminal neuralgia

HP Law, WL Cheung, Victor KH Hui, Gabriel YY Lu, David YC Chan, Emily KY Chan, Danny TM Chan
Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: To evaluate the overall clinical outcome of microvascular decompression for treatment of trigeminal neuralgia.
Methods: This is a 4-year retrospective review of patients undergoing microvascular decompression for treatment of trigeminal neuralgia from July 2020 to June 2024 in Prince of Wales Hospital and North District Hospital. Primary outcome of this study was the complete pain-free rate after operation. Secondary outcomes included postoperative complications, overall pain control, and need for subsequent management for residual or recurrent patients.
Results: A total of 37 patients (16 males and 21 females), with a mean age of 66 years, were recruited to our study. In all, 30 patients (81%) were associated with arterial compression, while the remaining was due to venous compression or both, and one was due to epidermoid compression. Ten patients underwent surgical decompression because they had refractory symptoms despite previous pain interventions, of which four of them were re-do cases of microvascular decompression. In total, 32 patients (86%) were completely pain-free after operation. For those with residual pain, most had better pain control overall compared to preoperation and had a lower requirement for analgesics, not requiring further intervention. Only one patient had refractory symptom despite multiple interventions. Overall postoperative complication rate was 10%. One patient had postoperative facial palsy, two patients with hearing deficit, and one patient had hydrocephalus requiring shunting. There was no associated mortality.
Conclusion: Overall microvascular decompression is safe and effective. It should remain as a gold-standard pain intervention for treatment of trigeminal neuralgia.

FP 4.3

Outcomes of focal cortical dysplasia: a 20-year review

William Xue, Michael KW See, TL Poon
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: To review surgical outcomes and analyse its predictors in patients with focal cortical dysplasia (FCD).
Methods: This is a 20-year retrospective single-centre review of 19 patients with refractory epilepsy and FCD pathology from 2004 to 2024. Data from 1 to 18 years of postoperative follow-up were analysed. Inter-group comparison of categorical variables was done with Fisher's exact test and independent Student's *t* test was used for continuous variables. Data analysis was done using SPSS for Windows. A P value of ≤0.05 was considered statistically significant.
Results: A total of 21 resective surgeries were performed on 19 patients. Eighteen (86%) of the preoperative magnetic resonance imaging had corresponding features. Two specimens (10%) were FCD type 1, 15 (71%) were type 2, and 4 (19%) were type 3. Overall, 61% of patients achieved seizure freedom upon last follow-up. Three patients required repeated resection of residual FCD or placement of vagal nerve stimulator due to suboptimal seizure control. Two patients had new neurological deficits postoperatively, neither posed significant disability. Complete resection was associated with seizure freedom (P=0.036). There was no statistically significant difference in FCD type, sex, laterality, presence of mental retardation, staging of operation, use of mapping, and concordance with imaging or electrophysiological investigations with seizure-free rate.
Conclusion: A seizure-free rate compatible with literature was achieved in this local cohort, with complete resection being a favourable factor.

Role of enolase 1 in glioblastoma progression

FP 4.4

YY Hung, Karrie MY Kiang, Gilberto KK Leung
Division of Neurosurgery, Department of Surgery, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China

Objective: To investigate whether and how *ENO1* (enolase 1) contributes to glioblastoma (GBM) progression.
Methods: In vitro studies were conducted using human GBM cell lines, U87 and U251. Knockdown of ENO1 and inhibition of *ENO1* using an *ENO1* inhibitor, ENOblock, were done on the cell lines to examine the role of *ENO1* in GBM. The effects of *ENO1* knockdown and inhibition were evaluated by western blot, immunofluorescence staining, cell viability and proliferation assay, cell cycle analysis by flow cytometry, and colony formation.
Results: Treatment with ENOblock or knockdown of *ENO1* decreases the cell viability and cell proliferation of GBM but increases its cell death and sensitivity to temozolomide (TMZ). Treatment with ENOblock also decreases mitochondrial membrane stability in GBM. Knockdown of *ENO1* reduces colony formation of GBM and decreases the expression of mitochondrial proteins.
Conclusion: *ENO1* contributes to the progression of GBM and can potentially be a therapeutic target. Co-administration of TMZ and agents inhibiting the *ENO1* signalling pathway can potentially produce synergistic therapeutic effects.

Middle meningeal artery embolisation in treating chronic subdural haematoma: a case series

FP 5.1

WH Chan[1], Sarah SN Lau[2], WM Lui[2], James TF Zhuang[2], Edward YL Chu[3], YH Mak[3], Kevin KF Cheng[2]
[1] School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[2] Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China
[3] Department of Radiology, Queen Mary Hospital, Hong Kong SAR, China

Background: In recent years, middle meningeal artery embolisation (MMAE) has emerged as a favourable minimally invasive alternative to burr hole drainage for treating high-risk or recurrent chronic subdural haematoma (CSDH) by reducing the vascular supply to the surrounding neomembrane. This case series aimed to explore the utilisation and outcomes of MMAE in treating CSDH.
Methods: We conducted a retrospective review of MMAE performed at Queen Mary Hospital from July 2022 to June 2024.
Results: Fifteen MMAE were performed during the study period for CSDH. The mean age of patients was 66.3 years. Indications for MMAE included bleeding tendency, recurrent CSDH, and persistent CSDH. Four patients had previous admissions due to CSDH, and nine patients had a history of cardiac conditions and/or surgery. Eleven patients were on antiplatelets, anticoagulants, or thrombolytics before the procedure. Four MMAE were performed as an adjunctive treatment to burr hole drainage. All MMAE involved using polyvinyl alcohol particles, with N-butyl cyanoacrylate glue additionally used on three occasions. The average operative duration was 98.3 minutes. Average reduction of haematoma volume within 1 month postoperation was 43%. Six patients (40.0%) had a complete resolution within 6 months. Five patients (33.3%) developed new intracranial bleeding episodes in follow-up, with only one patient (6.7%) requiring another MMAE.
Conclusion: Middle meningeal artery embolisation is effective in reducing haematoma volume and could become an indispensable tool to tackle rising CSDH rates. The minimally invasive nature of MMAE also reduces complication rates and is a viable option for frail patients.

FP 5.2

A multi-centre comparative study of anti-epileptic drugs for seizure prophylaxis in patients with spontaneous subarachnoid haemorrhage

Masgov SC Lam[1], Victor KH Hui[1], Juan Kevan Sham[2], Peter YM Woo[1], YC Po[3], TL Poon[2], Danny TM Chan[1]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[3] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China

Objective: The use of anti-epileptic drugs (AEDs) for seizure prophylaxis is not standardised. Currently, Dilantin is administered at Princess Margaret Hospital (PMH), Epilim at Queen Elizabeth Hospital (QEH), and Keppra at Prince of Wales Hospital (PWH). We aimed to review the cost-effectiveness, efficacy and safety profile of various prophylactic AEDs in spontaneous subarachnoid haemorrhage (SAH) to standardise the choice of agent used in future.
Methods: This is a multi-centre retrospective cohort study conducted in PWH, PMH and QEH. Records of patient with acute subarachnoid haemorrhage with subsequent coiling and clipping were retrieved from the operation database of the neurosurgical department with operation date between October 2021 and September 2023. Patient demographics, disease presentation, the duration, and tolerability of AEDs were investigated. Outcome parameters included the efficacy and safety profiles, as well as the cost-effectiveness of different AEDs.
Results: A total of 343 patients were included, with 105 patients from PWH, 82 patients from PMH, and 156 patients from QEH. No significance difference was noted for the seizure prevention. There were fewer side-effects noted in Keppra. Also, the drug cost was lower in Keppra.
Conclusion: Keppra has better cost-effectiveness and tolerability than Dilantin and Epilim with similar efficacy profile on seizure prophylaxis of spontaneous SAH. We recommend the standardised use of Keppra in spontaneous SAH.

FP 5.3

Middle meningeal artery embolisation for chronic subdural haematoma: a single-centre experience

MT Wong, Robert SK Chan, LY Ho, SK Lam, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: Middle meningeal artery (MMA) embolisation is an emerging treatment option for patients with chronic subdural haematoma. This study aimed to evaluate its safety and effectiveness.
Methods: This was a retrospective study of patients who underwent MMA embolisation with particle or liquid embolic agents and/or coils in Pamela Youde Nethersole Eastern Hospital between 1 January 2021 to 31 August 2024. Comparisons were made with a historical cohort from 2017 to 2020. The primary outcome was symptomatic recurrence requiring re-operation within 180 days. Secondary outcomes include residual haematoma thickness, thromboembolic event, time to resolution of haematoma, surgery-to-antiplatelet/anticoagulant resumption time, procedure-related complications, and hospital stay.
Results: Forty-eight patients (with 52 chronic subdural haematomas [CSDHs]) were included. Two patients underwent standalone MMA embolisation, whereas 46 patients (with 50 CSDHs) underwent burr hole drainage and MMA embolisation in the same session. The symptomatic recurrence rate in the MMA embolisation group was significantly lower than the burr hole group (6.25% vs 21.4%). The mean surgery-to-antiplatelet or anticoagulant resumption time was 2.4 days. The mean time to resolution of haematoma was 63 days. The overall procedure-related complication rate was 3.8%. The incidence of thromboembolic event was 1.9%.
Conclusion: Middle meningeal artery embolisation is a feasible treatment option to prevent recurrence of CSDH and allow early resumption of antiplatelet or anti-coagulant, thus reduce incidence of thromboembolic event.

FP 6.1

A comparison of outcomes for spontaneous intracranial haemorrhage patients on antiplatelet agents requiring surgical evacuation and perioperative platelet transfusion against antiplatelet-naive patients requiring surgical evacuation of intracranial haemorrhage

Berkley CH Cheung[1], Carmen Yim[2]
[1] Division of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[2] Division of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: To compare outcomes for patients on antiplatelet agent(s) with concomitant spontaneous intracranial haemorrhage requiring surgical intervention and given platelet transfusion against outcomes of patients not on antiplatelet agent(s) with spontaneous intracranial haemorrhage requiring surgical intervention.
Methods: This is a 10-year retrospective case controlled observational reviewing patients from Tuen Mun Hospital and Kwong Wah Hospital with intracranial haemorrhages requiring surgical intervention to assess whether antiplatelet therapy requiring platelet transfusion affected patient outcomes.
Results: Currently the practice of reversal of antiplatelet therapy before neurosurgical intervention varies between different centres. Antiplatelet therapy before neurosurgical intervention potentially results in worse surgical outcomes despite platelet transfusion. There is potential to standardise the practice of antiplatelet reversal and for point-of-care devices to help guide platelet transfusion in the future.
Conclusion: There may be room to improve outcome for patients on antiplatelet agents prior to emergency neurosurgical intervention. The future may be point-of-care devices that may help guide platelet transfusion.

FP 6.2

Clinical outcomes of superficial temporal artery–middle cerebral artery bypass in adult patients with Moyamoya disease: a ten-year single-centre experience

Joshua XM Hui, WM Lui, Wilson WS Ho, James TF Zhuang, Kevin KF Cheng
Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China

Objective: To report the outcomes of superficial temporal artery (STA)–middle cerebral artery (MCA) bypass for patients with Moyamoya disease (MMD).
Methods: This is a retrospective cohort study of adult patients with MMD who underwent STA-MCA bypass operation between 2014 and 2024.
Results: Superficial temporal artery–middle cerebral artery bypass was performed in 58 cerebral hemispheres in 38 adult patients between 2014 and 2024. In all, 77% of patients presented with ischaemic type MMD and 18% patients presented with haemorrhagic type; two patients (5.3%) were diagnosed incidentally. The mean age at operation was 40.5 years. Early postoperative ischaemia, haemorrhage, and seizure (<30 days of operation) occurred in five (8.6%), two (3.4%), and five (8.6%) cases, respectively. Early postoperative ischaemia was observed more frequently in patients with hypertension. Ischaemia, haemorrhage, and seizure after 30 days occurred in three (7.9%), four (10.5%), and three (5.3%) patients, respectively, at an average length of follow-up of 60 months.
Conclusion: The outcomes of STA-MCA bypass for MMD in a single centre over a 10-year period is presented.

FP 6.3

Evaluation of coated versus uncoated flow diverter in treatment of cerebral aneurysm: a single-centre review

KC Tong, Tony KT Chan, YC Po
Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China

Objective: To evaluate and compare coated versus uncoated flow diverters in the treatment of cerebral aneurysm. Emphasis, obliteration rate, clinical outcome, and complications were investigated.
Methods: Cases treated with flow diverters were screened between 2014 to 2024 and retrospectively reviewed. Records were made of clinical presentation, obliteration rate, clinical outcome, and complications.
Results: To be analysed.
Conclusion: Flow diverters have been shown to achieve high rate of aneurysm occlusion. Increasing application of flow diverters is also observed in acute phase of ruptured aneurysm. The use of coated versus uncoated flow diverter in cerebral aneurysm from our centre was evaluated.

FP 6.4

Experience of stent placement for stenosis of the vertebral artery ostium at Kwong Wah Hospital

X Xiao, Ronald Li, Joanna WK Ho, Alberto CH Chu, Alain KS Wong, KY Chan
Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: To investigate the outcome of angioplasty and stent placement for symptomatic vertebral artery ostium stenosis at Kwong Wah Hospital.
Methods: This is a retrospective study of a cohort from January 2015 to February 2024. Data from patients treated with angioplasty and stenting for symptomatic vertebral artery ostium stenosis at Kwong Wah Hospital were analysed. Primary outcome was to assess for any vertebrobasilar insufficient symptoms at last follow-up. Secondary outcomes were technical outcome, perioperative complications, and in-stent stenosis.
Results: Fourteen consecutive patients with symptomatic vertebral artery ostium stenosis were treated with angioplasty and stent placement. Thirteen patients (92.9%) have no related symptoms at last follow-up. The rate of successful revascularisation after the procedure was 100%. No major perioperative complications were observed. In-stent stenosis was observed in 64.3% of patients (n=9).
Conclusion: Angioplasty and stent placement is a safe and effective treatment option for symptomatic vertebral artery ostium stenosis. Further randomised study is required to compare the effect of stenting and best medical treatment, as well as how to reduce in-stent stenosis.

FP 7.1

A comparative analysis of performance between multi-platform artificial intelligence large language models and human neurosurgical trainees on neurosurgery board-style examination

Candice HW Lam[1], Elton HL Yeung[1], Maxwell CY Choi[1], Chaplin CL Chan[1], Jason CH Yiu[1], Justin HY Yu[1], Queenie HN Lam[1], David YC Chan[1], JX Lim[2], Danny TM Chan[1], Peter YM Woo[1]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, National University of Singapore, Singapore

Objective: The emergence of artificial intelligence (AI) has led to a paradigm shift in medical specialist education. This study compared the performance of large language models (LLMs) and human neurosurgical trainees in conducting the written component of the Fellow of the Royal College of Surgeons of Edinburgh (FRCS) neurosurgery examinations.

Methods: This comparative study involved the analysis of 150 single-best-answer questions aligned with the FRCS neurosurgery examinations. Seven LLMs were evaluated, namely, ChatGPT4o mini, ChatGPT 3.5, Google Gemini, Microsoft Copilot, Perplexity, Neurosurgical Atlas, and Claude. Results of 12 higher surgical trainees (HSTs) in neurosurgery from Hong Kong and Singapore who performed the test under strict examination conditions were also reviewed.

Results: Overall, LLMs (mean 68.9%; standard deviation [SD]=0.46) outperformed HSTs (mean=57.7%; SD=0.49) [t_{17}=2.32; P=0.03]. Neurosurgical Atlas scored the highest (82.7%), followed by ChatGPT4o mini (80.7%), Perplexity (77.3%), Claude (65.3%), Google Gemini (64.7%), ChatGPT 3.5 (64%), and Microsoft Copilot (47.3%). Large language models were noticeably better in the Principle of Neurosurgery– (t_{17}=2.34; P=0.03) and Medical Management of Neurosurgical Conditions–themed questions (t_{17}=3.74; P=0.002). Higher surgical trainees performed similarly to LLMs in the Operative Neurosurgery–theme questions (t_{17}=-0.41; P=0.69). Large language models performed better than HSTs regardless of question complexity, in both first-order (t_{17}=2.13; P=0.04) and higher-order questions (t_{17}=2.15; P=0.04). Generally, LLMs excelled in three of the seven neurosurgical sub-specialties covered, namely, neuro-oncology (t_{17}=3.59; P=0.002), spine (t_{17}=3.14; P=0.006), and paediatric neurosurgery (t_{17}=2.48; P=0.02*). Higher surgical trainees performed similarly to LLMs in cerebrovascular neurosurgery, functional neurosurgery, trauma, and pain-themed topics.

Conclusion: This study illustrates the performance between various LLMs and human neurosurgical trainees. Although not perfectly accurate, LLMs generally demonstrated superior performance and reflects how neurosurgical trainees can rely on selected models for knowledge transfer.

A comprehensive analysis of neurosurgical resident procedural volume and case-mix in Hong Kong

FP 7.2

Kelly YT Lau[1], TC Lo[1], Kaushiki Chaturvedi[1], Colin Chan[1], Sarah SN Lau[2], Jason MK Ho[3], Alberto CH Chu[4], Kevin KF Cheng[2], ST Wong[3], YC Po[5], TL Poon[6], Michael WY Lee[7], Danny TM Chan[1], Daniel WK Ng[8], KY Yam[3], KY Pang[7], WS Poon[1], Peter YM Woo[1]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
[3] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[4] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China
[5] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China
[6] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[7] Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China
[8] Private practice

Objective: The first neurosurgery residency programme in the United States was established in the 1940s. Over the past 80 years, neurosurgical education has evolved from an informal apprenticeship to a structured system with standardised training requirements, including aspects such as the duration of training, research mandates, and minimum case requirements. This analysis aimed to highlight the extent of neurosurgical procedures conducted during residency training in Hong Kong.
Methods: This is a retrospective study of all neurosurgical training centres in Hong Kong. The procedure consolidation sheets of the training logbooks of 48 neurosurgical residents from 2012 to 2023 were reviewed. Procedures were broadly categorised into their various sub-specialties. The role of the resident when performing neurosurgical procedures and their level of training were also documented.
Results: Of the 48 residents, 85% (n=41) completed training. The number of procedures performed by a resident that completed training (mean±standard deviation) was 831±295. The most common three procedures performed were burr hole for drainage for chronic subdural haematoma, external ventricular drainage for hydrocephalus, and craniotomy for evacuation of supratentorial intracerebral haemorrhage. The most common neurosurgical sub-specialty procedures performed were with regard to cerebrovascular and neuro-oncology. Overall, an uneven distribution of types of training was observed across trainees. Changes in training, and effects on levels of responsibility on trainees over the years will also be discussed.
Conclusions: Neurosurgical training in Hong Kong is comprehensive, offering exposure to a diverse range of procedures.

Intracranial solitary fibrous tumour: a single-centre retrospective analysis of characteristics, recurrence, and metastasis

FP 7.3

Desiree KK Wong, Michael KW See, TL Poon
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: Intracranial solitary fibrous tumour (SFT), previously known as haemangiopericytoma, is a rare aggressive mesenchymal tumour in the brain, occurring in less than 1% of all intracranial tumours and 2% to 5% of meningeal tumours. This study aimed to describe the characteristics and analyse risk factors for recurrence and extracranial metastases in intracranial SFT.
Methods: This is a 25-year retrospective single-centre study of patients newly diagnosed with intracranial SFT or haemangiopericytoma from 1999 to 2024. Patients with extracranial SFT or were diagnosed outside of the study period were excluded. Patient demographics, tumour factors, treatment factors, recurrence, and metastatic outcomes were analysed.
Results: Eighteen patients were diagnosed with intracranial SFT from 1999 to 2024. Age (mean±standard deviation) was 57±16.4 years. Eleven patients (61%) were male. The average follow-up time was 8.0±7.9 years. Eleven patients died, with an average survival of 12.4±9.8 years (range, 0.3-22.6). Seven (39%) were right-sided tumours, with five (28%) in frontal area. Seventeen (94%) were solitary. Twelve (67%) had STAT6-positive staining. Nine (50%) had five or more mitoses per high-power field. Six (33%) were classified as World Health Organization grade 3 tumour. Twelve patients (67%) had gross total resection and eight (44%) had postoperative radiotherapy. Seven patients (39%) had local recurrence, with an average progression-free survival of 6.0±5.9 years. Four patients (22%) had extracranial metastases, with an average metastatic-free survival of 10.6±6.6 years. Patients who eventually developed extracranial metastases had larger preoperative tumour volumes (115±88.6 cm^3) compared to non-metastatic tumours (47.7±39.9 cm^3; P value of analysis of variance <0.05).
Conclusion: Intracranial SFT is a rare entity in our centre. Larger preoperative tumour volume may increase risk for dissemination, therefore requiring closer clinical follow-up and higher vigilance for these patients.

Functional outcomes after untethering of spinal cord in spinal dysraphism

FP 8.1

Candice HW Lam[1] *, Robert TL Ho[1] *, X Jian[1], YH Hung[1], Queenie HN Lam[1], Chelsie Chan[2], Chaplin CL Chan[1], Jason CH Yiu[1], Dawson TS Fong[3]
[1] School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[2] Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China
[3] Hong Kong Neurosurgery Centre, Hong Kong SAR, China
* Equal contribution

Objective: Spinal dysraphism represents one of the most prevalent benign tumours within the paediatric population. This study seeks to investigate the functional outcomes following untethering of spinal cord.
Methods: This retrospective review spans a 5-year period from 2016 to 2021. A total of 49 patients diagnosed with spinal lipoma were selected, excluding filum types and those who had undergone previous operations. All operations were conducted by a single surgeon. Postoperative functional outcomes, including neurology, sphincter function and wound conditions, were evaluated up to 2024.
Results: A retrospective analysis of 49 patients with spinal cord dysraphism revealed a diverse age range of 5 months to 14 years and a median age of 11 months. Gender distribution was balanced with 26 boys (53.1%) and 23 girls (46.9%). Complex lipomas were most common (n=19), followed by transitional lipoma (n=5). Among the 26 patients (53.1%) with preexisting neurological symptoms, 20 (76.9%) reported postoperative improvement. Only three (6.1%) experienced postoperative complications, including limb atrophy (n=1), impaired urodynamics (n=1), permanent urinary catheterisation (n=1), chronic constipation (n=1), and bowel incontinence (n=2). A Cox proportional hazards model assessing factors influencing progression-free survival showed a non-significant overall fit (score test P=0.6) but good discriminative ability (concordance=0.876). Incomplete excision due to chaotic element showed a trend towards increased risk of progression (hazard ratio=11.22; P=0.0564) and led to poorer prognosis.
Conclusion: Spinal lipomas can have profound effects on patients' neurological outcome and long-term quality of life. With complete untethering of the spinal cord, it provides a safe and promising functional outcome.

Comparison of the clinical outcomes between surgical and endovascular treatments of spinal dural arteriovenous fistulas: a single-centre retrospective review

FP 8.3

Winky WT Wong, Juan Kevan Sham, Calvin HK Mak, TL Poon
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: To compare the clinical outcomes of surgical and endovascular treatments in patients with spinal dural arteriovenous fistulas (sDAVFs).
Methods: A retrospective cohort of 23 patients with cervical, thoracic, lumbar, and sacral sDAVFs from a single centre treated between 2008 to 2023 were included in this study. Clinical findings, rate of initial treatment failure or recurrence, neurological outcomes, and risk factors associated with initial endovascular treatment failure were analysed.
Results: Patient age (mean±standard deviation) was 60.8±7.6 years and most patients were male (n=21, 91.3%). The duration of symptoms before treatment was given ranged from 1 to 55 months (mean=14.4). Location of sDAVFs was as follows: 13.0% at cervical level, 52.2% at thoracic level, 21.7% at lumbar level, 8.7% at sacral level, and 4.3% at lumbo-sacral junction. Ten patients (43.5%) underwent surgical treatment and 13 patients (56.5%) underwent endovascular treatment. Seven patients (30.4%) in the endovascular group further underwent surgical treatment due to unsuccessful embolisation or recurrence. Complete occlusion was higher in the surgical group (100% vs 53.8%; P=0.012). Recurrence was higher in the endovascular group (38.5% vs 0; P=0.027). A greater proportion of patients in the endovascular group required retreatment (61.5% vs 0%; P=0.002). Improvement of 1 point or above on the modified Rankin Scale was more significant in the surgical group; however, the results were comparable between the two groups for improvements of 1 point or above on the modified Aminoff–Logue scale.
Conclusion: This study suggests that neurosurgery is superior to endovascular treatment as a primary treatment for complete occlusion of sDAVFs. Further studies are required to investigate on ways to overcome unsuccessful embolisation.

FP 9.1

Clinical decision tool to predict functional outcomes after successful endovascular recanalisation in anterior-circulation large vessel occlusion stroke

Christopher HF Sum[1], James TF Zhuang[1], Kevin KF Cheng[1], WM Lui[1], CT Kay[2], Grace Ho[3], HT Lau[3]
[1] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
[2] Department of Medicine, Queen Mary Hospital, Hong Kong SAR, China
[3] Department of Radiology, Queen Mary Hospital, Hong Kong SAR, China

Background: The treatment effect of intra-arterial thrombectomy (IAT) for intracranial large-vessel occlusion (LVO) can vary substantially between individuals with different background characteristics. A predictive tool that provides an evidence-based framework to forecast a patient's functional outcomes is valuable.
Objective: To develop and validate a clinical decision tool based on an Asian cohort of LVO-stroke patients.
Methods: A consecutive series of patients treated with IAT at our institution were investigated. The inclusion criteria were: (1) Patients with anterior-circulation LVO; (2) IAT performed between April 2017 to April 2023; (3) Successful recanalisation defined by a modified treatment in cerebral infarction score of 2b to 3; and (4) clinical follow-up performed at 3 months after operation. A total of 247 patients fulfilled the criteria. Clinical and radiological characteristics that are expected to interact with or predict functional outcome were included in a forward stepwise logistic regression model. Included patients were randomly divided into two groups, with 70% assigned as the derivation cohort and the rest as the validation cohort.
Results: On univariate analysis based on the training set, the following predictors were associated with good 3-month modified Rankin Scale score of 2 or below: age, occlusion segment, NIHSS (National Institutes of Health Stroke Scale) score on admission, ASPECTS (Alberta Stroke Program Early Computed Tomography), rCS, and onset-to-perfusion time. On multivariate analysis, all the six predictors emerged as significant. The resultant binary predictive regression equation was validated using receiving operator characteristic curve with an area under the curve of 0.807 (95% confidence interval=0.735-0.879; P<0.001).
Conclusion: We have presented a precise predictive model for 3-month functional outcome in an Asian cohort of patients with anterior-circulation LVO stroke post-IAT. This five-variable simple clinical tool showed good discrimination and calibration in the validation set.

FP 9.2

Efficacy of preoperative embolisation for hypervascular brain tumour: a two-centre retrospective cohort study

Florence Chan[1], Juan Kevan Sham[1], Tony KT Chan[2], TL Poon[1]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China

Objective: It was known that preoperative embolisation of hypervascular brain tumours could help reduce intraoperative bleeding. We evaluated preoperative embolisation for hypervascular brain tumours and its effect on intraoperative and postoperative outcome.
Methods: A two-centre retrospective cohort study was performed. We retrospectively reviewed electronic patient records of 17 patients who underwent preoperative embolisation for brain tumour at Queen Elizabeth Hospital and Princess Margaret Hospital between 2009 and 2024. Intraoperative and postoperative outcomes were evaluated.
Results: Thirteen females and four males, with a mean age of 52.1 years, were included in this study. Seventeen tumours including three solitary fibrous tumours, two paraglangliomas, nine meningiomas, two hemangioblastomas, and one neuroblastoma were studied. Branches from the external carotid artery were targeted for embolisation in the majority of the tumours (n=12, 70.6%) with contour particles being most commonly used (n=14, 82.4%). Average operation time and blood loss for tumour resection were 479.3 minutes and 1330 mL. An average of 2.1 g/dL drop of haemoglobin was observed post-tumour resection. Blood transfusion was not commonly required intraoperatively for tumour resections (n=6, 35.3%). Only two cases had embolisation procedure–related complications. Majority of the patients had similar pre- and postoperative functional status (modified Rankin Scale score).
Conclusion: Preoperative embolisation is a relatively safe option of adjuvant treatment for hypervascular brain tumours.

Mechanical thrombectomy in posterior circulation: a ten-year review

FP 9.3

Gabriel TC Wu, Ronald Li, Alberto CH Chu, KY Chan, Alain KS Wong
Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: To review the patient characteristics and outcome of ischaemic stroke cases in the posterior circulation with intra-arterial mechanical thrombectomy done in the past 10 years in a local neurosurgical centre.
Methods: This is a 10-year retrospective review of the cases of posterior circulation ischaemic stroke with intra-arterial mechanical thrombectomy done from January 2014 to June 2024. Patient characteristics, complications, and functional outcome were evaluated.
Results: There were 22 patients with posterior circulation large vessel occlusion identified in the reviewed period, accounting for 7% of the total number of cases of intra-arterial mechanical thrombectomy. Reperfusion of grade 0 to 2a on the thrombolysis in cerebral infarction scale was noted in three patients (13.6%) and grade 3 reperfusion was achieved in nine patients (40.9%). Nonetheless, 10 patients (45.5%) succumbed during their index admission. The cohort will be further analysed to identify major risk factors with impact on outcome.
Conclusion: Despite being relatively infrequent, posterior circulation ischaemic stroke has a more atypical presentation and carries a heavy burden of morbidity and mortality even with prompt intervention.

Spontaneous vertebral artery dissection: a ten-year review of surgical treatment in Queen Elizabeth Hospital

FP 9.4

Jasmine WZ Ye, NL Chan, TL Poon
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: To review the disease nature of spontaneous vertebral artery (VA) dissection with subarachnoid haemorrhage (SAH) and the treatment strategies in Queen Elizabeth Hospital in the past ten years.
Methods: This is a 10-year retrospective review. Cases of SAH due to VA dissection with operation done were extracted. The demographics, risk factors, characteristics of aneurysm, means of treatment, and their outcome were collected.
Results: Thirty-eight cases were found. The case number per year showed no significant change in the past 10 years. In total, 70% of these cases were female, most commonly in their 60s. 60% of them presented with good-grade SAH with a Glasgow Coma Scale (GCS) score of 14 to 15. Regarding the characteristics of aneurysm, they were evenly distributed in terms of laterality, more commonly on dominant side of VA and distal to posterior inferior cerebellar artery. In all, 42% of cases had aneurysm size of 2 mm or below. Means of treatment were all endovascular except one case underwent clipping. Most common strategy used was flow diverter insertion with or without embolisation, composing 57% of them. 20% of them had trapping done. The intervention time from symptoms onset is 22 hours. Recurrence and residual aneurysm were not uncommon, which happened in 25% of cases. The outcome of these cases was good in general, with 60% of them able to gain a GCS score of 14 to 15 upon discharge. Mortality was 23%.
Conclusion: Spontaneous vertebral artery dissection is a common cause of posterior circulation SAH. It is common to recur and an early treatment with appropriate strategy chosen is vital to maximise the survival and functional outcome.

Investigation of outcomes of mechanical thrombectomy in older adult patients compared with younger patients: a retrospective cohort study

FP 9.5

Bill KB Wong, LY Ho, SK Lam, Robert SK Chan, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: Older adults who had ischaemic stroke are typically excluded from clinical trials for neuroendovscular intervention. This retrospective cohort study aims to examine the outcomes and the utility of mechanical thrombectomy on older adult patients.
Methods: All activated stroke calls treated with mechanical thrombectomy by our neurosurgical units from January 2023 to June 2024 were examined, with a subgroup of patients aged 80 years or above identified. Patient's demographics including baseline and postoperative National Institute of Health Stroke Scale (NIHSS) score, computed tomography imaging findings, thrombolysis in cerebral infarction (TICI) scores, complications, and their outcome upon discharge were analysed.
Results: There were 31 cases of mechanical thrombectomy of age 80 years or above identified during the study period. Twenty-nine cases were anterior circulation stroke and two cases were posterior circulation stroke. The mean age was 86.7 years. The mean NIHSS score on presentation and post thrombectomy were 23.7 and 27.5, respectively. Eight patients died during postoperative hospital stay. Twenty out of the remaining 24 surviving patients had an improvement in NIHSS score upon discharge (62.5% of all older adult patients). Eight of the 24 patients had recanalisation with TICI score of 3.
Conclusion: Our study showed that although mechanical thrombectomy in older adult patients is associated with higher morbidity and mortality, it can be a reasonable treatment option providing a chance of significant improvement in post-stroke patients' quality of life.

Clinical and biomarker profiles of Parkinson's disease patients undergoing deep brain stimulation

FP 10.1

Danise M Au[1,2], HY Wong[1,2], Lily KW Cheng[1,2], YL Cheng[1,2], Serene HF Or[3], KY Mok[1,2,4], Fanny CF Ip[1,2], Michael KW See[5], Germaine HF Chan[3], Nelson YF Cheung[3], TL Poon[5], Amy KY Fu[1,2], Nancy YY Ip[1,2]
[1] Division of Life Science, State Key Laboratory of Nervous System Disorders, Daniel and Mayce Yu Molecular Neuroscience Center, The Hong Kong University of Science and Technology, Hong Kong SAR, China
[2] Hong Kong Center for Neurodegenerative Diseases, InnoHK, Hong Kong SAR, China
[3] Department of Medicine, Queen Elizabeth Hospital, Hong Kong SAR, China
[4] Department of Neurodegenerative Disease, UCL Queen Square Institute of Neurology, London, United Kingdom
[5] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: Deep brain stimulation (DBS) has been used for patients with refractory Parkinson's disease (PD) in Hong Kong for over 25 years. This study aimed to characterise the clinical and biomarker profiles of PD patients receiving DBS.
Methods: This is a cross-sectional study of PD patients at Queen Elizabeth Hospital between October 2020 and August 2024. Motor symptoms, non-motor symptoms, quality of life (QoL), and biomarker levels were studied.
Results: Of the 122 patients recruited, 15 received DBS; five had DBS performed before recruitment (post-DBS, all targeting the bilateral subthalamic nuclei), and 10 had DBS performed after recruitment (pre-DBS). Pre-DBS patients had significantly more severe disease (Hoehn and Yahr staging and MDS-UPDRS [Movement Disorder Society–unified Parkinson's disease rating scale] scores), lower level of functioning (on the Schwab and England Activities of Daily Living scale), reduced QoL (the Parkinson's Disease Questionnaire [PDQ-39]), higher levodopa equivalent dosage (LED), and longer disease duration than non-DBS candidates. Post-DBS, MDS-UPDRS scores and QoL improved significantly; LED reduced significantly to a level comparable to that of non-DBS candidates. Cognitive function (Montreal Cognitive Assessment), distress (the Depression, Anxiety and Stress Scale–21 Items), and sleep quality (the Parkinson's Disease Sleep Scale–2) of pre-DBS patients were similar to that of non-DBS candidates, but improved post-DBS. Neurofilament light levels did not differ between pre-DBS and non-DBS patients, but decreased slightly post-DBS.
Conclusion: This study suggests that current selection criteria are able to identify DBS candidates with more severe disease, who show quantifiable improvement postoperatively. Longitudinal follow-up with a larger sample size of DBS patients is needed to ascertain the significance and progression of these trends.

FP 10.2

Multi-centre retrospective review on outcomes in geriatric traumatic brain injury on different anticoagulants: is it the newer the better?

Hannaly CH Lui[1], Danny TM Chan[1], Calvin HK Mak[2], Alberto CH Chu[3], Juan Kevan Sham[2], WL Cheung[1], YP Hsieh[2], Vivian HY Pak[3]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[3] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: To compare outcomes of geriatric traumatic brain injury (TBI) patients on novel oral anticoagulants (NOACs) versus Warfarin.
Methods: This was a retrospective review of geriatric TBI patients admitted to the Neurosurgery Unit of Prince of Wales Hospital, Queen Elizabeth Hospital and Kwong Wah Hospital from 1 January to 31 December 2023. The Glasgow Outcome Scale Extended (GOS-E) assessment at 1 month and 6 months were measured as primary outcomes. Radiological progression, need of neurosurgical intervention, and same-admission mortality are measured as secondary outcomes. Outcomes between patients enrolled in geriatric co-care programme, extended care programme and standard rehabilitation were also measured.
Results: There were 190 geriatric TBI patients on anticoagulants admitted to the named three hospitals in 2023, in which 32 were on Warfarin and 158 on NOACs (Dabigatran: 25; Apixaban: 91; Rivaroxaban: 19; Edoxaban: 23). The NOAC group had comparable rates of poor clinical outcomes at 1 month (51.3% vs 50%; P=0.32) and 6 months (55.7% vs 50%; P=0.14) with the Warfarin group. However, the NOAC group had significantly lower rates of radiological progression (7% vs 9.4%; P=0.04), neurosurgical intervention (8.9% vs 25%; P<0.01), and mortality (8.9% vs 21.9%; P<0.01) than the Warfarin group. Additionally, patients in the geriatric co-care programme showed no unplanned readmissions within 6 months (P<0.01).
Conclusion: Anticoagulant use was associated with higher mortality and poorer clinical outcomes in geriatric TBI patients. However, NOACs demonstrated lower rates of radiological progression, neurosurgical intervention, and mortality compared to Warfarin in the same patient population.

FP 10.3

Subthalamic nucleus deep brain stimulation for patients with Parkinson's disease: comparison of active contact selection by clinical test versus beta-band brain sensing

Matt SC Chan, Clair KY Lau, XL Zhu, WL Cheung, Danny TM Chan
Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: Subthalamic nucleus (STN) deep brain stimulation (DBS) is a well-established therapy for Parkinson's disease (PD). Traditionally, active contact of the DBS lead is selected by clinical testing which is a highly specialised and lengthy process. In PD, STN beta-band oscillations are decreased by DBS and this has been proposed as important to the mechanism of therapy. The study was performed to evaluate an alternative method for selecting the active contact by beta-band sensing by utilising this modality as a biomarker for STN detection. The recent adopted implantable pulse generator with brain sensing function can detect the magnitude of beta band in each contact.
Methods: Twenty PD patients with STN-DBS were evaluated. The active contacts selected by conventional clinical testing and the contact with the beta-band peak magnitude obtained by brain sensing were compared.
Results: There was no statistically significant difference between active contact selection by clinical testing and beta band information.
Conclusion: Beta band information through brain sensing is a useful method for active contact selection and is comparable to conventional clinical testing.

FP 10.4

A prospective cohort study of mild traumatic brain injury in adult patients: differential prognostic modelling insights for short and intermediate term outcomes

Robert TL Ho[1] *, Jimmy SC Chu[2] *, KL Man[2], Janice NF Lui[3], Calvin HK Mak[2]
[1] Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[3] Department of Occupational Therapy, Queen Elizabeth Hospital, Hong Kong SAR, China
* Equal contribution

Objective: To investigate traumatic brain injury (TBI) prognostication using a machine learning approach and identify key prognostic factors which may advise optimised distribution of resources in the clinic and on follow-up.
Methods: Random forest models were developed using 68 clinical variables from 34 TBI patients aged over 18 years to predict Glasgow Outcome Scale (GOS) scores at both 6 weeks and 26 weeks post-injury. Variable importance was analysed to identify and compare key prognostic factors for these two time points.
Results: The random forest model achieved 91.67% accuracy in predicting 6-week GOS scores, with an out-of-bag prediction error of 20.59%. Vital signs emerged as crucial predictors, with systolic blood pressure (SBP) at discharge and admission showing high importance scores (2.81 and 2.10, respectively). Similarly, heart rate at discharge and admission were strong predictors (2.46 and 1.82, respectively). These findings align with Rau et al's 2018 study, who reported SBP as a top predictor in their random forest model for TBI mortality prediction and further strengthens the importance of SBP control even in mild TBI for improved GOS scores. Computed tomography (CT)–related factors were also significant. The thickness of subdural hematoma on repeated CT scans was a more important predictor (2.19), compared other initial CT findings (2.12), suggesting that the evolution of subdural haematomas in follow-up imaging plays a crucial role. Age at admission (2.8) was another important predictor, potentially more influential than in previous studies. In contrast, the model for 26-week GOS score achieved 82.5% accuracy. The comparison of 6-week and 26-week models reveals significant differences in predictor importance over time (P=0.004, Cohen's d=0.969). While a moderate positive correlation exists between the models (r=0.693, P=0.009), key shifts occur. Acute physiological parameters (SBP and heart rate) dominate the 6-week model as the stronger predictors, whereas CT imaging factors at admission gain prominence at predicting 26-week outcomes. Notably, maximum thickness of subdural haematoma rises from 11th to 1st in importance. Age shows the largest absolute decrease in importance (diff=1.55). These findings suggest a shift in the recovery process from initial physiological instability to the long-term effects of specific brain injuries. In the acute phase, vital signs are crucial predictors, indicating the importance of physiological stabilisation. As recovery progresses, the recovery of traumatic brain changes becomes more significant in determining outcomes. This provides insight for tailoring prognostic models and clinical focus throughout the recovery trajectory, potentially influencing decisions on care and rehabilitation strategies.
Conclusion: The study identified key prognostic factors for mild TBI and the importance of neuroimaging, vital sign monitoring, and patient demographics in different stages mild TBI care. These findings provide valuable insights for TBI management and suggest potential for profile-specific distribution of resources in TBI care.

Enhancing diagnostic outcomes: the impact of artificial intelligence–driven computed tomography brain analysis in the emergency department at Queen Mary Hospital

P1-1.1

Kylie KY Cheung[1], Sarah SN Lau[2], SH Tsui[3], TC Tsang[3], Stephen CW Cheung[1], Kevin KF Cheng[2]
[1] Department of Radiology, Queen Mary Hospital, Hong Kong SAR, China
[2] Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China
[3] Department of Accident and Emergency, Queen Mary Hospital, Hong Kong SAR, China

Background: The implementation of artificial intelligence (AI) [Annalise.ai] in the analysis of computed tomography (CT) brain scans at the Accident and Emergency (A&E) Department of Queen Mary Hospital since 2024 has demonstrated significant improvements in diagnostic outcomes. This study evaluated the use of AI software since its implementation from March 2024 up to June 2024. The AI system was designed to assist A&E physicians by automating the detection of critical abnormalities, such as intracranial haemorrhage (ICH), thereby enhancing the efficiency and accuracy of diagnoses.
Methods: Retrospective data extraction from Annalise.ai software counted 3350 CT brain scans during the study period, among which 277 were abnormal. Each identified abnormal scan underwent further evaluation by physicians to confirm findings and determine subsequent clinical actions.
Results: Our study found Annalise.ai integrated seamlessly with existing imaging systems, providing real-time analysis and prioritisation of scans based on urgency. The introduction of AI analysis resulted in a marked reduction in the time taken for initial scan interpretation and improved detection rates of significant pathologies. The sensitivity of AI in identifying ICH was notably high, with many cases flagged for immediate attention, leading to faster treatment decisions.
Conclusion: Artificial intelligence–driven CT brain analysis software has proven to be a valuable asset in the emergency setting at Queen Mary Hospital. The technology not only supports physicians but also enhanced patient outcomes through timely interventions. Future studies will focus on long-term impacts on patient care and integration into routine clinical practice.

The therapeutic promise of calcitriol in the re-education of tumour-associated macrophages in glioblastoma

P1-1.2

Yogesh KH Wong, Karrie MY Kiang, Henry H Chan, Gilberto KK Leung
Division of Neurosurgery, Department of Surgery, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China

Objective: With the intrinsic T-cell scarcity and myeloid-dominance nature of glioblastoma (GBM) tumour microenvironment (TME), myeloid-targeting treatments appear as promising alternatives to T-cell therapy. Tumour-associated macrophages (TAMs) is the predominant population within GBM TME and is known to exhibit immunosuppressive characteristics. We hereby showcased calcitriol serves to re-educate TAMs through transcriptional control over *LRP1* signalling.
Methods: CX3CR1$^{+/GFP}$ transgenic xenografts were generated and treated with calcitriol or vehicle. Tumour growth and survival were monitored, and brains were collected for downstream analysis. Human monocytes were subjected to knockdown of *LRP1* (low-density lipoprotein receptor–related protein 1) [short hairpin *LRP1* plasmid] and were treated with calcitriol. Bone marrow–derived macrophages were obtained from mouse stromal cells. Monocytes were induced to differentiate into macrophages before co-culturing with tumour cells. Cells were then subjected to phagocytosis assay and downstream analyses. Chromatin immunoprecipitation–polymerase chain reaction assays were used to confirm transcriptional control of *LRP1* under calcitriol.
Results: Calcitriol treatment leads to reduced tumour size and prolonged survival in xenografts, alongside increased TAM infiltration, M2-to-M1 polarisation and increase in phagocytosis. In vitro phagocytic assay in co-culture experiments confirms increased phagocytic rate with calcitriol. Chromatin immunoprecipitation–polymerase chain reaction demonstrates that vitamin D receptor (calcitriol nuclear receptor) binds to *LRP1* promoter, with *LRP1* showing dose-dependent upregulation through calcitriol treatment on levels of both messenger ribonucleic acid and protein. Short hairpin LRP1 plasmid–macrophages demonstrated reduced phagocytic rate, with calcitriol treatment successfully rescuing the reduced phagocytosis.
Conclusion: We demonstrated calcitriol as a promising immunomodulating agent which serves to re-educate and rescue the anti-tumoural abilities of the immunosuppressive TAM in GBM. Through transcriptional regulation of *LRP1*-mediated phagocytosis, calcitriol promotes clearance of tumour cells in GBM.

P1-1.3

Clinical evidence of tele-rehabilitation: a prospective cohort study of mild traumatic brain injury in adult patients

Jimmy SC Chu[1] *, Robert TL Ho[2] *, KL Man[1], Janice NF Lui[3], Calvin HK Mak[1]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[3] Department of Occupational Therapy, Queen Elizabeth Hospital, Hong Kong SAR, China
* Equal contribution

Objective: In addition to prognostic prediction with a machine learning approach in traumatic brain injury (TBI) patients, we compare outcomes between face-to-face and hybrid rehabilitation with telehealth modalities.

Methods: We performed a prospective cohort study with 38 subjects included in the first phase, with clinical data from the same pool of prognostic modelling. Subjects were randomised to perform either face-to-face or hybrid occupational therapy with an intention-to-treat approach adopted. Hybrid rehabilitation encompasses a reduced frequency (less than weekly) of face-to-face rehabilitation and high frequency (daily at maximum) of recognised digital rehabilitation resources. A comparative analysis of post-concussion symptoms and Glasgow Outcome Scale Extended (GOS-E) and Modified Barthel Index (mBI) results at 6 weeks was conducted.

Results: In the rehabilitation comparison, 54.5% (12/24) of face-to-face and 64.3% (9/14) of telehealth/hybrid patients showed static or improving symptoms at 6 weeks. Logistic regression showed insignificant odds ratio (OR) of 0.5556 (P=0.395). There is also insignificant OR of 0.5455 (P=0.568) for GOS-E and OR of 2.80 (P=0.248) for mBI. These demonstrated the similar clinical efficacy of entirely face-to-face and hybrid rehabilitation in mild TBI patients. There is no significant difference in age, blood pressures, education status, mechanism of injury, head injury history, use of antiplatelet or anticoagulants, initial findings from the computed tomography of the brain, and initial Glasgow Coma Scale scores between the two study groups. Yet, the Hong Kong Montreal Cognitive Assessment score by initial assessment has statistically significant difference, with a mean score of 17.6 (95% confidence interval [95% CI]=15.0-20.2) in the face-to-face group and 24.1 (95% CI=21.3-26.9) in the hybrid group, highlighting a possible criterion for selecting patient to perform hybrid rehabilitation without hindering clinical effect.

Conclusion: Our study demonstrated clinical non-inferiority of hybrid rehabilitation over pure face-to-face rehabilitation and discovered possible criteria for patient selection. These findings suggest potential for telehealth interventions in TBI rehabilitation, which may promote better use of inpatient and digital resources to achieve good clinical effect. Continuation of the study with future cost-utility modelling is warranted.

Theory of mind testing for neurocognition in awake craniotomy: a two-case illustration

P1-1.4

Sabrina HY Wong[1], Joyce SW Chow[1], Michael KW See[1], TL Poon[1], Michelle YY Tse[2], CH Wong[2]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Department of Clinical Psychology, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: To illustrate two cases in which theory of mind (ToM) testing was used during awake craniotomy for tumour excision for preservation of neurocognitive function.
Methods: This is a case illustration study.
Results: Tumour resections, especially gliomas, were previously limited by their infiltrative nature and their location which may be near eloquent areas. The advancement of intraoperative mapping allows localisation and preservation of critical structures, classically motor and speech areas. We demonstrate two cases of tumour resections, in which the incorporation of ToM testing done by clinical psychologists with the Reading the Mind in the Eyes test in intraoperative mapping was used to allow preservation of relative areas of cognitive function, such as emotional recognition, which is an inherent attribute in maintaining a patient's postoperative quality of life. Postoperative evaluation shows no deficits in semantic mentalising in both patients.
Conclusion: Intraoperative mapping with ToM testing shows promising results and demonstrates the potential in further broadening the spectrum of functions that can be utilised with intraoperative mapping.

Role of ferroptosis suppressor protein 1 on glioblastoma

P1-1.5

Henry KS Kwok, TY Ng, Karrie MY Kiang, Gilberto KK Leung
Department of Surgery, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Queen Mary Hospital, Hong Kong SAR, China

Objective: To investigate the role of *FSP1* (ferroptosis suppressor protein 1) on glioblastoma (GBM).
Methods: Database search was first performed to look for any difference in the expression of FSP1 in GBM, as well as the correlation between the expression and prognosis. The expression difference was then confirmed by western blot and reverse transcription–quantitative polymerase chain reaction (RT-qPCR) on human GBM cell lines. Inhibition of *FSP1* was done on the GBM cell lines by using *FSP1* inhibitor (iFSP1). Drug-induced cytotoxicity and cell proliferation were then checked via different assays (MTT and sulforhodamine B) after treatment with iFSP1. Lipid peroxidation was used as a ferroptosis marker and was checked using lipid peroxidation assay.
Results: The database search revealed an overexpression of *FSP1* in GBM. Overexpression of *FSP1*, which was also associated with poorer survival and worse outcomes in GBM, was then confirmed by western blot and RT-qPCR in different human GBM cell lines. Cell proliferation was suppressed in human GBM cell lines upon the addition of iFSP1. Cell viability was also decreased when compared to control.
Conclusion: Overexpression of *FSP1* is related to poorer survival and worse outcomes in GBM. Inhibition of FSP1 increases suppression of cell proliferation and decreases cell viability in GBM cell lines. Data suggest that the decrease in cell proliferation and viability may be due to ferroptosis.

Interrelationship between ferroptosis and cuproptosis in the pathogenesis of intracranial haemorrhage

P1-2.1

Ashley FC Chan, Karrie MY Kiang, Gilberto KK Leung
Department of Surgery, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Queen Mary Hospital, Hong Kong SAR, China

Objective: Previous studies have shown the presence of cuproptosis in intracranial haemorrhage (ICH) models and also the interplay between ferroptosis and cuproptosis. However, the relationship between the two in ICH remains unknown. This study aimed to investigate the mechanistic link between ferroptosis and cuproptosis in ICH and explored their potential as therapeutic targets.
Methods: The study utilised ICH mouse models and heme-induced injury cell culture models. Cells were treated with hemin to simulate heme-induced injury, and the activation of ferroptosis and cuproptosis was studied. In vivo studies were also carried out. In mouse models, ICH was induced, and ferroptosis and cuproptosis markers were evaluated at different time points. Iron chelators were then used to inhibit ferroptosis, aiming to establish the interrelationship between ferroptosis and cuproptosis both in vitro and in vivo.
Results: The results demonstrated an upregulation of ferroptosis and cuproptosis markers. Moreover, the use of ferroptosis inhibitors decreases both the ferroptosis and cuproptosis markers in vitro. Similarly, the same results were obtained in vivo, showing the relationship between ferroptosis and cuproptosis.
Conclusion: This study provides novel insights into the interplay between ferroptosis and cuproptosis in the pathogenesis of ICH. The findings suggest that targeting the interplay between ferroptosis and cuproptosis may offer a promising therapeutic strategy for ICH.

Sirtuin 5 suppresses tumour growth by regulating mitochondrial metabolism and synaptic remodelling in gliomas

P1-2.2

W Tang[1] *, Bo Chen[1] *, Gilberto KK Leung[1,2], Karrie MY Kiang[1] *
[1] Department of Surgery, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[2] State Key Laboratory of Brain and Cognitive Sciences, The University of Hong Kong, Hong Kong SAR, China
* Equal contribution

Sirtuin 5 (SIRT5) is increasingly recognised as a key regulator of cellular metabolism, which is commonly dysregulated in cancer cells, resulting in enhanced proliferation and tumour progression. To investigate the clinicopathologic implications of SIRT5 dysregulation in glioblastoma, we performed comprehensive analyses of transcriptomic data and functional verifications using in vitro and in vivo glioblastoma models. We found that higher SIRT5 expression levels were associated with a favourable prognosis in glioma patients. Knockdown of SIRT5 significantly enhanced glioblastoma cell growth. Our data suggest its potential role in regulating mitochondrial metabolism in gliomas. Furthermore, SIRT5 is also significantly correlated with synaptic remodelling pathways. Our findings indicate a tumour-suppressive role for SIRT5 that extends beyond regulating cancer metabolism by which it may function through modulating neuroplasticity. Understanding these cellular interactions provides nuanced insights into the multi-faceted role of SIRT5 and the broader therapeutic implications for the development of novel treatment strategies.

P1-2.4

Modulating yes-associated protein in overcoming temozolomide chemoresistance in glioblastoma

CL Wong, Karrie MY Kiang, Gilberto KK Leung
Division of Neurosurgery, Department of Surgery, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China

Objective: The Hippo signalling pathway is often dysregulated in cancer. The study aimed to investigate whether the Hippo signalling pathway contributes to temozolomide chemoresistance in glioblastoma (GBM), and to validate whether the combinational treatment of temozolomide and yes-associated protein (YAP) inhibitor is effective against GBM.
Methods: Temozolomide-sensitive and temozolomide-resistant U87 and U251 GBM human cell lines were previously established. Temozolomide-resistant cells were maintained in low-dose temozolomide. Here, we investigated whether Hippo signalling contributed to temozolomide chemoresistance. By modulating the Hippo signalling pathway through short-hairpin YAP gene knockdown, the outcome on GBM cancer phenotypes was studied by cell assays (in vitro) and mouse orthotopic xenograft (in vivo). Finally, the therapeutic effect of YAP inhibitor is studied in vitro and in vivo, respectively.
Results: Our data showed that YAP was overexpressed in temozolomide-resistant GBM cells. Nuclear translocation of YAP (which became its active state) was increased in temozolomide-resistant cells. In fact, YAP inhibition demonstrated reduced cell viability and higher susceptibility to temozolomide. Mice with tumour injection of the YAP knockdown cells had significantly reduced tumour size. Similarly, YAP inhibitor resensitised temozolomide-resistant cells to temozolomide. Mechanistically, YAP knockdown reduced cell stemness, which in turn attenuated temozolomide chemoresistance.
Conclusion: Our data suggest dysregulated Hippo signalling pathway contributed to temozolomide chemoresistance, thus targeting the Hippo signalling pathway resensitised GBM cells to temozolomide. This research provides pre-clinical evidence on using YAP inhibitor for combinational therapy with temozolomide for the treatment of GBM.

P1-2.5

Impaired degradation of isocitrate dehydrogenase 1 through chaperone-mediated autophagy promotes glioblastoma cell cycle progression

W Tang, Karrie MY Kiang, Gilberto KK Leung
Department of Surgery, School of Clinical Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China

Introduction: Chaperone-mediated autophagy (CMA) selectively targets proteins containing KFERQ-like motifs for lysosomal degradation, primarily facilitated by the chaperone HSC70 (heat shock cognate 70) and the receptor LAMP2A (lysosomal-associated membrane protein 2A). While several CMA substrates have been identified across various cancers, the specific roles and substrates of CMA in glioblastoma (GBM) remain poorly understood. Notably, IDH1 (isocitrate dehydrogenase 1), a key metabolic enzyme and prominent GBM marker, was previously identified as a CMA substrate in mouse embryonic stem cells.
Objective: To investigate the role of CMA in GBM and its effect on IDH1 turnover in GBM cells.
Methods: The impact of CMA on GBM cell growth was examined using cultured GBM cells and orthotopic mouse models. CMA-mediated degradation of IDH1 was verified through western blotting and co-immunoprecipitation. Cell cycle regulation by CMA or IDH1 was assessed using cell cycle analysis. The correlation between IDH1 and cell cycle regulators was analysed using The Cancer Genome Atlas dataset via the Gene Expression Profiling Interactive Analysis platform.
Results: Inhibiting CMA through LAMP2A knockdown promoted GBM cell growth in vitro and in vivo. Chaperone-mediated autophagy inhibition disrupted the retinoblastoma protein (RB) pathway, promoting cell cycle progression, as indicated by increased levels of cyclin D1, cyclin-dependent kinases 4, phosphorylated RB, and transcription factor *E2F1*. IDH1 accumulated following LAMP2A knockdown or lysosomal inhibition and co-immunoprecipitated with HSC70. IDH1 suppression reversed the tumour-promoting effects of CMA inhibition, reducing cyclin D1, phosphorylated RB, and E2F1 expression, while IDH1 overexpression promoted cell cycle progression. The IDH1 metabolites alpha-ketoglutarate partially stimulated cyclin D1 expression.
Conclusion: Chaperone-mediated autophagy is essential for suppressing GBM progression by facilitating IDH1 degradation, thereby inhibiting cell cycle progression.

Delayed acute subdural haemorrhage with cerebral venous thrombosis caused by an elongated styloid process (Eagle's syndrome) in a post-traumatic patient: a case report and literature review

P1-3.1

Noxx TL Lam[1], Peter YM Woo[1], Rebecca YT Ng[1], Victor KH Hui[1], Eddy WY Wong[2], Danny TM Chan[1]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Ear, Nose and Throat, Prince of Wales Hospital, Hong Kong SAR, China

Objective: Eagle's syndrome, where the styloid process is abnormally elongated, can be a rare but life-threatening mechanical cause of cerebral venous thrombosis (CVT). In some cases, it might lead to delayed acute subdural haemorrhage. Diagnosis of such condition can be difficult due to its heterogeneous clinical presentation and sequelae. We aim to describe the presentation, underlying pathophysiology, workup, and management for such condition.
Methods: We retrospectively reviewed a case where a patient diagnosed with styloid process–induced CVT that was complicated with delayed-onset bilateral acute subdural haemorrhage, describing their diagnostic workup and subsequent management at our neurosurgical centre.
Results: We identified one case of delayed acute subdural haemorrhage secondary to styloid process–induced CVT. Patients' clinical presentation, injury mechanism, presenting complications, and postulated pathophysiological mechanisms were identified and analysed. Multidisciplinary management was provided, including neurosurgical management of its related acute complication, anticoagulation, and surgical resection of the styloid process to prevent future recurrence. In further follow-up, no recurrent CVT was noted. Literatures were reviewed and compared against the index patient in the described case.
Conclusion: Styloid process–induced CVT is a rare yet possible cause of delayed acute subdural haemorrhage. Early identification, appropriate radiological workup, and multidisciplinary management may reduce the risk of recurrent CVT and its sequelae.

A rare sphenoidal sinus arachnoid cyst mimicking mucocele: a case report

P1-3.2

Bill KB Wong, LY Ho, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: Arachnoid cysts are fluid resembling cerebrospinal fluid (CSF) collected in between layers of arachnoid membrane. It is commonly found at the anterior or middle cranial fossa, or at the retrocerebellar location. We described a case of arachnoid cyst located at the infratemporal fossa extending into the left sphenoid sinus mimicking a mucocele initially.
Methods: A 30-year-old female was admitted to the hospital for headache and vomiting. Her initial CSF analysis was suggestive of *Haemophilus influenzae* meningitis. Her computed tomography showed a low-density expansile lesion at the left sphenoid bone with surrounding bony remodelling, thinning and bone dehiscence. Magnetic resonance imaging suggested a large mucocele arising from the left sphenoid sinus with extension into the left temporal fossa and infratemporal space. The patient was seen by otolaryngologists and was operated via endoscopic sinus surgery based on the provisional diagnosis of a mucocele. The cyst wall was opened and marsupialised, with clear fluid discharge instead of the anticipated mucoid. The patient was later suspected of CSF leakage with secondary operation performed.
Discussion: There were five reported cases in the English literature of arachnoid cyst in the paranasal sinuses, with a majority being diagnosed of mucocele initially.
Conclusion: Radiological images are sometimes difficult in determining the exact nature of a cyst-like lesion when it happens to be in an uncommon location with signal changes of the lesion. Surgeons are to be vigilant keeping the differential diagnoses in mind to prevent CSF leakage and other complications.

P1-3.3

Skull base repair strategy for cerebrospinal fluid leaks in endoscopic endonasal skull nase surgery: a single-centre prospective cohort study

Maxwell CY Choi[1], Leo KT Yeung[1], Laura LW Leung[1], Victor KH Hui[1], Samuel MW Chow[2], Danny TM Chan[1]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Otorhinolaryngology, Head and Neck Surgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: To describe patterns of intraoperative and postoperative cerebrospinal fluid (CSF) leaks at a high-volume multidisciplinary skull base centre and outline our skull base repair strategy.
Methods: In all, 187 consecutive cases performed in our institution using an endoscopic endonasal approach since January 2020 were included. Cases with intraoperative and postoperative CSF leaks were analysed based on endoscopic approach and repair strategy.
Results: Endoscopic transsphenoidal approach (ETSS) was used in 95.2% (178/187) of the cases, with an intraoperative CSF leak rate of 7.9% (14/178) and postoperative CSF leak rate of 2.2% (4/178). Extended endoscopic endonasal approaches (EEEA) including transplanum-transtubercular (n=5) and transclival (n=4) approaches were performed in 4.8% (9/187) of the cases, with an overall CSF leak rate of 22.2% (2/9) both intraoperatively and postoperatively. Notably, these two cases both employed the transplanum-transtubercular approach. For low-flow intraoperative CSF leaks, inlay TachoSil and TISSEEL were used. Inlay dural substitute (eg, DuraGen) and onlay TachoSil reinforced with nasoseptal flap and TISSEEL were adopted for high-flow intraoperative CSF leaks. For postoperative CSF leaks, lumbar drain was inserted followed by either conservative management or endoscopic repair. For endoscopic repair, inlay abdominal graft with onlay fascia lata graft, Medpor, repositioning of the nasoseptal flap with assistance from otorhinolaryngology experts, and TISSEEL glue were used.
Conclusion: We reported postoperative CSF leak rates of 2.2% and 22.2% in ETSS and EEEA, respectively, which were comparable to international standards. In anticipation of postoperative CSF leak in certain EEEA approaches such as the transplanum-tubercular route, additional pre-emptive rigid buttressing repair methods (eg, Medpor and injectable hydroxyapatite cement paste) may be warranted. A larger territory-wide cohort is needed to statistically identify predisposing factors and best repair strategy for CSF leaks.

P1-3.4

Concomitant endoscopic third ventriculostomy and endoscopic tumour biopsy: trajectories, surgical techniques, and outcomes

Laura LW Leung[1], XL Zhu[1], WL Cheung[1], Victor KH Hui[1], Gabriel YY Lu[1], Leo KT Yeung[1], Emily KY Chan[1], David YC Chan[1], Rebecca YT Ng[1], Peter YM Woo[1], Danny TM Chan[1], WS Poon[1], Keith KS Iao[2], KC Ng[2], Joe IC Ho[2], KM Chan[2]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Centro Hospitalar Conde de São Januário, Macau SAR, China

Objective: Concomitant endoscopic third ventriculostomy (ETV) and endoscopy tumour biopsy (ETB) allows for simultaneous cerebrospinal fluid (CSF) sampling, relief of obstructive hydrocephalus, and acquisition of tumour tissue for histological diagnosis. We reviewed a combined series from two hospitals in Hong Kong and Macau focusing on the key outcomes of procedure safety, the need of subsequent CSF shunting, and the pathological yield.
Methods: This is a retrospective review of all cases of concomitant ETV and ETB performed in both hospitals between January 2001 to April 2024. A total of 34 cases were identified. Clinical, radiological and histological data were collected from electronic patient records. Descriptive statistical analyses were performed.
Results: The only identified procedure-associated complication was intraventricular haemorrhage (0.3%, 1/34). Positive biopsy findings were 94.1% (32/34). 11.8% (4/34) of patients required subsequent ventriculoperitoneal shunting with two (6%) due to disease progression.
Conclusion: Concomitant ETV and ETB is a safe and effective surgical procedure. High familiarity with the relevant neurosurgical anatomy and precise preoperative planning is key to optimising surgical outcomes and minimising complications.

Direct epidural electrical stimulation of the optic nerve for intraoperative monitoring of function

P1-3.5

Sarah SN Lau, WK Li, Ivy KW Lam, KT Ho, WM Lui, Kevin KF Cheng
Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China

Background: This feasibility study evaluates the use of direct epidural electrical stimulation of the optic nerve as an intraoperative monitoring technique during neurosurgical procedures involving lesions closely associated with the optic apparatus. Traditional methods, such as visual evoked potentials, have proven difficult and unreliable for monitoring visual function in these contexts.
Methods: We performed optic nerve stimulation in a patient with right clinoidal ridge meningioma extending into the optic nerve sheath and with suprasellar extension compressing the optic chiasma. A pair of stimulation micro-electrodes were placed across the de-roofed optic nerve sheath to perform direct visual action potential prior to tumour resection.
Results: Electrically induced visual evoked potentials (eVEPs) exhibited characteristic N20, N30 and N40 waves. More significantly, we were able to demonstrate that eVEPs could effectively capture the decompressive effects of surgical intervention with increase in signal amplitude post tumour removal.
Conclusion: These results indicated that epidural electrical stimulation of the optic nerve is a safe and effective method for providing real-time feedback on optic nerve conduction intraoperatively. This technique can enhance surgical outcome by minimising the risk of postoperative visual deficits. Further clinical studies are warranted to establish the reliability and efficacy of this practice in broader patient populations.

Dual-target deep brain stimulation for cervical dystonia: a case report

P1-4.1

Jonathan Victor CH Mui[1], Michael KW See[1], Germaine HF Chan[2], Nelson YF Cheung[2], TL Poon[1]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Department of Medicine, Queen Elizabeth Hospital, Hong Kong SAR, China

Introduction: Deep brain stimulation (DBS) is widely used to treat cases of severe cervical dystonia where medical therapy has failed. While common targets include the globus pallidus interna (GPi) and subthalamic nucleus (STN), recent research suggests dual-target DBS may be effective in treatment of motor disorders such as Parkinson's disease and cervical dystonia, especially in cases of suboptimal control with single-target DBS.
Case description: We present the case of a 56-year-old female with severe cervical dystonia who had previously undergone single-target DBS to bilateral GPi. The patient reported some clinical improvement initially but subsequently reported increased stiffness and left torticollis despite optimising medical therapy, Botox injection and implantable pulse generator (IPG) programming. She therefore underwent a second operation where the bilateral GPi electrodes were revised with additional implantation of bilateral STN electrodes for dual targeting. Effective electrode placement and targeting were confirmed postoperatively with independent activation of the STN and GPi electrodes, respectively. Three months after surgery, the patient reported significant improvement in cervical range of movement with reduced spasm and phasic movements.
Conclusion: While STN and GPi remain common DBS targets for cases of refractory dystonia, this case suggests that dual-target DBS of both STN and GPi simultaneously can be a safe and effective option for further symptom control in cases of single-target DBS with suboptimal response. A patient-tailored operative approach including careful target selection, trajectory planning and postoperative IPG programming is recommended to improve clinical outcome.

An update of survival for histological and molecular glioblastoma and comparison of pattern of recurrence in Queen Elizabeth Hospital

P1-4.2

YP Hsieh, KC Chan, Michael KW See, Joyce SW Chow
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: According to the cIMPACT-NOW (the Consortium to Inform Molecular and Practical Approaches to CNS Tumor Taxonomy), presence of *TERT* (telomerase reverse transcriptase) promoter mutation, or concurrent gain of entire chromosome 7 and loss of chromosome 10, or amplification of epidermal growth factor receptor are the molecular clues for upgrading histologically lower-grade isocitrate dehydrogenase (IDH)-wild–type diffuse astrocytic gliomas to World Health Organization grade 4 glioblastoma (GBM). We retrospectively compared the differences in survivals and recurrence patterns between patients with histological GBM (histoGBM) and molecular GBM (molGBM) during the period of 2021 to 2023.
Methods: Patients with diagnosis of GBM during January 2021 to December 2023 in Queen Elizabeth Hospital were recruited. They have been regularly followed up clinically by the Department of Neurosurgery with quarterly magnetic resonance imaging surveillance before and after surgery to monitor presence of recurrence. Recurrence is defined as radiological evidence of disease recurrence or clinically deterioration. Pattern of recurrence was defined by radiological location of the recurrence as either local or leptomeningeal spread of disease. Progression-free survival (PFS) is the period between first surgical excision of GBM and date of recurrence.
Results: In all, 47 patients were recruited, with nine molGBM patients and 38 histoGBM patients. In total, five out of nine molGBM patients (55.6%) and 28 of the 38 histoGBM patients (73.7%) were confirmed with recurrence. Median PFS of molGBM patients and histoGBM patients (±standard deviation) were 44±19.0 and 31±8.4 weeks, respectively (P=0.614), while overall survivals were 99±43.4 vs 33±5.5 weeks, respectively (P=0.06). Majority of them were still local recurrence in both groups (60.0% vs 67.9%, molGBM patients vs histoGBM patients; P=0.538).
Conclusion: Despite non–statistically significant longer survival was observed in patients with molGBM, pattern of recurrence remains local, which is similar to histoGBM.

Pulmonary metastasis from glioblastoma: a case report and literature review

P1-4.3

Agnes WK Wong[1], Jason MK Ho[2], Stephanie YW Chau[1], Caspar SL Chu[2], WN Yuen[3], Peter YM Woo[1], Danny TM Chan[1], ST Wong[2]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[3] Department of Clinical Pathology, Tuen Mun Hospital, Hong Kong SAR, China

Objective: Glioblastoma is widely known not to metastasise beyond the central nervous system. However, this phenomenon is reported to occur in 0.2% to 0.5% of patients. Its rarity and lack of clinical practice guidelines pose a challenge to treatment decision-making. A rare case of pulmonary metastasis from glioblastoma is reported to illustrate the practical management challenges.
Methods: We reported a case of a patient with right frontal lobe glioblastoma with histologically proven pulmonary metastasis. The literature was reviewed on this rare phenomenon.
Results: A 53-year-old female was admitted with a 1-month history of headache, confusion and impaired cognition. Magnetic resonance imaging revealed a right frontal lobe contrast-enhancing haemorrhagic intra-axial mass tumour. 5-aminolevulinic acid–guided gross total resection of the tumour was performed and the histopathological diagnosis was isocitrate dehydrogenase 1–wildtype, *MGMT* promoter–unmethylated glioblastoma. Adjuvant concurrent temozolomide chemoradiotherapy followed by 10 cycles of chemotherapy was administered. Thirteen months after diagnosis focal recurrence was detected, but the patient refused repeated resection. Lomustine and bevacizumab was administered as second-line systemic treatment. Nineteen months since the initial resection, an incidental left 3-cm infrahilar lung mass was discovered on a chest X-ray. Computed tomography and positron emission tomography–computed tomography of the thorax suggested it was metastatic in nature. Ultrasound-guided core biopsy confirmed the diagnosis of pulmonary metastasis from glioblastoma. In the same month, the patient experienced rapid neurological deterioration and succumbed due to aspiration pneumonia before oncologic treatment could be started.
Conclusion: Despite its clinical rarity, clinicians should be cognisant of the possibility of extra-neural metastasis of glioblastoma. The treatment quandary warrants investigations into the risk factors, prognostic factors and survival benefits of treatments for patients with this rare disease phenomenon.

Vermis epidermoid cyst: a case report

P1-4.4

Emerson TY Lui, Eric YH Cheung, LY Ho, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Introduction: Intracranial epidermoid cyst is considered a rare disease entity and represents only less than 2% of brain tumours. Epidermoid cyst in the cerebellar vermis is atypical with only a few cases reported. We report a case of vermis epidermoid cyst in a patient complicated by obstructive hydrocephalus.
Objective: To present a rare case of vermis epidermoid cyst and to illustrate that diagnostic confusion could arise by computed tomography alone.
Case summary: A 56-year-old female presented with persistent unsteady gait and headache for 1 week. Computed tomography of the brain on admission showed a hyperdense vermis lesion with differential diagnoses of intracerebral haematoma. Suboccipital craniotomy was then performed; intraoperatively a thin-walled cyst with keratin deposit and machine-oil–like content was found, which were characteristic of an epidermoid cyst. Pathology later confirmed the diagnosis. Other cases were reviewed in literature and some authors also reported similar diagnostic challenge by computed tomography. Our patient received a short course of rehabilitation and returned to normal function with no neurological sequelae.
Conclusion: Epidermoid cyst in the cerebellar vermis is an uncommon intracranial tumour entity and the correct diagnosis could be challenging by computed tomography alone.

Advancements in targeted therapy for von Hippel–Lindau disease: minimising multiorgan surgical needs through pathophysiological insights

P1-4.5

Jason MK Ho[1,2], Peter YM Woo[2,3]
[1] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[2] Hong Kong Neuro-Oncology Society, Hong Kong SAR, China
[3] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: To discuss the latest updates in the management of von Hippel–Lindau (VHL) disease that aim to obviate the need for multiple surgeries or interventions across various organs.
Methods: The traditional management approach for VHL disease relies on recurrent palliative surgical interventions for tumours in multiple organs. However, the average life expectancy of VHL patients is only 40 to 50 years, with many patients succumbing to central nervous system haemangioblastomas. This treatment strategy subjects patients to repeated high surgical risks and significantly impacts their daily activities, social life, and psychological well-being. This presentation will cover the latest updates in VHL disease management that target the underlying pathophysiology, aiming to reduce the necessity for palliative surgeries. Case studies will also be shared, highlighting local experiences in adopting these updated management strategies.
Results: The new targeted therapy has demonstrated efficacy in reducing tumour size in multiple organs among local patients, resulting in a decrease in the number of required palliative surgeries. Common side-effects, such as anaemia, were observed.
Conclusion: The introduction of this new targeted therapy revolutionises the management of VHL disease. It presents an opportunity to transform care from a fragmented approach to a coordinated, multidisciplinary strategy.

The role of intraventricular antibiotics as an adjunct to intravenous antibiotics in the management of ventriculitis: a single-centre experience

P1-5.2

Jason MT Ho, Eric YH Cheung, Bill KB Wong, Robert SK Chan, CY Hung, LY Ho, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Background: Ventriculitis is a potentially lethal clinical condition reported to have a mortality rate and neurological sequelae in up to 30% and 60% of patients, respectively. Intraventricular antibiotics, as an adjunct to intravenous antibiotics, have been shown to be effective in achieving high cerebrospinal fluid (CSF) sterilisation rate and low recurrence rate.
Objective: This study aimed to review the role of intraventricular antibiotics in terms of microbial eradication, improvement in biochemical parameters, morbidity, and mortality.
Methods: Patients who were diagnosed as ventriculitis and admitted to the Department of Neurosurgery of Pamela Youde Nethershole Eastern Hospital from 1 July 2019 to 31 July 2024 were retrospectively reviewed and analysed. Patients who were treated with both intraventricular and intravenous antibiotics were included. Clinical records, radiological images, and microbiological and laboratory parameters were evaluated.
Results: Five patients with ventriculitis were managed with both intraventricular and intravenous antibiotics. All patients received at least one intraventricular antibiotic as an adjunct to intravenous antibiotics. Intraventricular amikacin was used in 80% of our patients with an average dose of 250 mg per day for a median duration of 7.25 days. Intraventricular polymyxin B was used in 20% of the patients with an average dose of 50 000 units per day for a median duration of 9 days. All patients had significant resolution in inflammatory markers, including C-reactive protein and white cell count in CSF. Sterilisation of CSF culture was achieved in only 20% of patients. The overall 30-day morality was 80%. Neurological sequelae were significant among the survivors.
Conclusion: The use of intraventricular antibiotics as an adjunct to intravenous antibiotics has provided promising result in terms of resolution of inflammatory parameters. However, its superiority over intravenous antibiotics alone in terms of CSF sterilisation as well as overall morbidity and mortality remains controversial.

Paediatric epidural haemorrhage: a ten-year case series review

P1-5.3

Kennis Wu
Division of Neurosurgery, Department of Surgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: To review the mechanism of injury, surgical management and outcome of traumatic epidural haemorrhage (EDH) in a paediatric population in Prince of Wales Hospital. Glasgow Coma Scale (GCS) score on admission and time to incision will be evaluated for any correlation to outcome.
Methods: Records of all patients aged 18 years or below with traumatic EDH admitted to the Division of Neurosurgery of Prince of Wales Hospital from August 2014 to August 2024 were reviewed. Details regarding their admission date, timing of operation, GCS score on admission and neurological recovery upon discharge were all retrieved from the Clinical Management System of Hospital Authority.
Results: In all, 30 patients with traumatic EDH, ranging from 2 months to 18 years old, were included in this review. Aetiology ranges from bicycle accident (23.3%), fall from chair/bed (23.3%), fall on same level (20%), road traffic accidents (16.6%) to others including recreational injury (16.6%). On arrival, 19 patients had a GCS score of 14 to 15, six patients had a score of 9 to 13, and five patients scored 3 to 8. All surgeries were carried out within 24 hours of admission. One case had a second emergency operation for persistently raised intracranial pressure; one case had cerebrospinal fluid leak re-operated by re-insertion of external ventricular drain. Ultimately, all cases showed good recovery, regaining full GCS upon discharge or later during follow-up in clinic. Speed of recovery is most related to GCS score on admission.
Conclusion: Paediatric EDH commonly results from bicycle accident without helmet protection. Even with delayed presentation, with timely intervention, patients can have good neurological recovery.

Depth electrode localisation and electrocorticography confirmation for lesionectomy in a paediatric patient with tuberous sclerosis and refractory seizures

P1-5.4

Ryan Leung[1], CH Ho[1], Sarah SN Lau[1], WL Yeung[2], Kevin KF Cheng[1], Wilson WS Ho[1]
[1] Department of Neurosurgery, Hong Kong Children's Hospital, Hong Kong SAR, China
[2] Department of Paediatrics and Adolescent Medicine, Hong Kong Children's Hospital, Hong Kong SAR, China

Objective: To present the case of a patient with tuberous sclerosis and intractable seizures who underwent successful surgical treatment with lesionectomy guided by depth electrode localisation and electrocorticography (ECoG) confirmation.
Methods: A 5-year-old boy with known tuberous sclerosis complex presented with medically refractory epilepsy. Presurgical evaluation included video-electroencephalography monitoring, magnetic resonance imaging (MRI) and neuropsychological testing. Depth electrodes were implanted to localise the seizure onset zone. Intraoperative ECoG was performed to confirm the epileptogenic tuber prior to resection.
Results: Depth electrode recordings showed frequent sharp/spike waves originating from tuber in the right inferior temporal lobe. A lesionectomy was performed with complete resection of the epileptogenic tuber. Intraoperative ECoG post-resection demonstrated no abnormal discharges from this region. The patient had an uneventful postoperative course without new neurological deficits. At follow-up, the patient remains seizure-free.
Conclusion: In paediatric patients with tuberous sclerosis and medically intractable epilepsy, surgical treatment with lesionectomy can be an effective option. Depth electrode recordings can help localise the seizure onset zone when surface electroencephalograph and MRI findings are discordant. Intraoperative ECoG provides real-time electrophysiological confirmation of the epileptogenic tuber to guide the extent of resection. With careful patient selection and multimodal localisation, favourable seizure outcomes can be achieved with minimal morbidity.

Primary leptomeningeal diffuse large B-cell lymphoma presenting as cauda equina syndrome: a case report

P1-5.5

Adrian TC Lam, Eric YH Cheung, CY Hung, SK Lam, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Introduction: Non-Hodgkin lymphoma (NHL) can involve the central nervous system either primarily as the sole area of the disease or as secondary spread of systemic disease. Primary central nervous system lymphoma is uncommon and constitutes for 1% of all NHL. Although the majority of leptomeningeal involvement stem from a primary lymphoma elsewhere, isolated primary leptomeningeal lymphoma (PLML) without parenchymal lesions is rare and accounts for only 7% of all PCNSL. This case report details a patient with PLML who presented with symptoms of cauda equina syndrome.
Case summary: A 63-year-old Chinese man presented with insidious onset of progressive gait disturbance. Neurological examination revealed weakness and diminished deep tendon reflexes in bilateral lower limbs. Magnetic resonance imaging reported diffuse thickening and increased enhancement of the cauda equina. Analysis of the cerebrospinal fluid showed lymphocytic pleocytosis and atypical lymphoid cells. Laminectomy and biopsy revealed diffuse large B-cell lymphoma. Systemic screening disclosed no other suspicious lesions in the body, hence the diagnosis of PLML was established. He was commenced on immunochemotherapy followed by autologous stem cell transplant with substantial improvement in symptomatology.
Conclusion: In individuals with symptoms of cauda equina syndrome, primary leptomeningeal lymphoma should be considered among the differential diagnoses. It is imperative to have a high index of suspicion and treat the condition early in order to prevent irreversible neurological damage and metastasis.

P2-1.1

Adjunctive value provided by ^{18}F-fluoroethyl-L-tyrosine positron emission tomography to fluorodeoxyglucose positron emission tomography in distinction of spinal cord tumours

P Liu[1], J Huang[2], W Duan[1], T Song[2], J Wang[2], C Zhang[1], Y Du[1], Y Chen[1], R Fu[1], J Lu[2] *, Z Chen[1] *
[1] Department of Neurosurgery, Xuanwu Hospital, Capital Medical University, Beijing, China
[2] Department of Radiology and Nuclear Medicine, Xuanwu Hospital, Capital Medical University, Beijing, China
* Equal contribution

Objective: This study aimed to compare the diagnostic efficacy of *O*-(2-^{18}F-fluoroethyl)-L-tyrosine (^{18}F-FET) positron emission tomography (PET) and 2-deoxy-2-[^{18}F]fluoro-D-deoxyglucose (^{18}F-FDG) PET for spinal cord lesions.
Methods: Paired preoperative ^{18}F-FDG PET/magnetic resonance imaging (PET/MRI) and ^{18}F-FET PET/MRI scans were conducted on patients with suspected spinal cord tumours. Clinical manifestations and PET performance, including mean standardised uptake value (SUV_{mean}), maximum standardised uptake value (SUV_{max}), mean tumour-to-background ratio (TBR_{mean}), maximum tumour-to-background ratio (TBR_{max}), metabolic tumour volume (MTV), total lesion metabolism (TLM), and tumour volume, were compared using group analysis and receiver operating characteristic (ROC) curves (Fig).
Results: Thirty-five patients were categorised into three groups based on their pathological diagnosis, namely, high-grade tumours (HGTs, n=6), low-grade tumours (LGTs, n=19), and non-tumour diseases (NTDs, n=10). The background SUV_{mean} of ^{18}F-FET PET was significantly lower than that of ^{18}F-FDG PET (P<0.0001), while the delineated tumour volumes showed no significant difference (P>0.05). The mass SUV_{mean}, SUV_{max}, MTV, and TLM values of both ^{18}F-FDG PET and ^{18}F-FET PET were statistically different between HGTs and LGTs (P<0.05). Similarly, the mass SUV_{max}, TBR_{max}, MTV, and TLM values of both ^{18}F-FDG PET and ^{18}F-FET PET, as well as the mass SUV_{mean} of ^{18}F-FET PET, exhibited statistical differences between HGTs and NTDs (P<0.05). Yet, none were able to distinguish LGTs and NTDs (P>0.05). Notably, ^{18}F-FET PET provided valuable supporting diagnostic evidence in one case of mixed neuronal-glial tumour (MNGT) and two cases of intramedullary inflammatory lesions. Optimal cut-off values of all measured parameters for distinguishing tumours and NTDs were determined through ROC analysis.
Conclusion: *O*-(2-^{18}F-fluoroethyl)-L-tyrosine PET presented comparable diagnostic performance to ^{18}F-FDG PET in differentiating HGTs, LGTs, and NTDs, but exhibited particular utility in MNGT and inflammatory lesions.

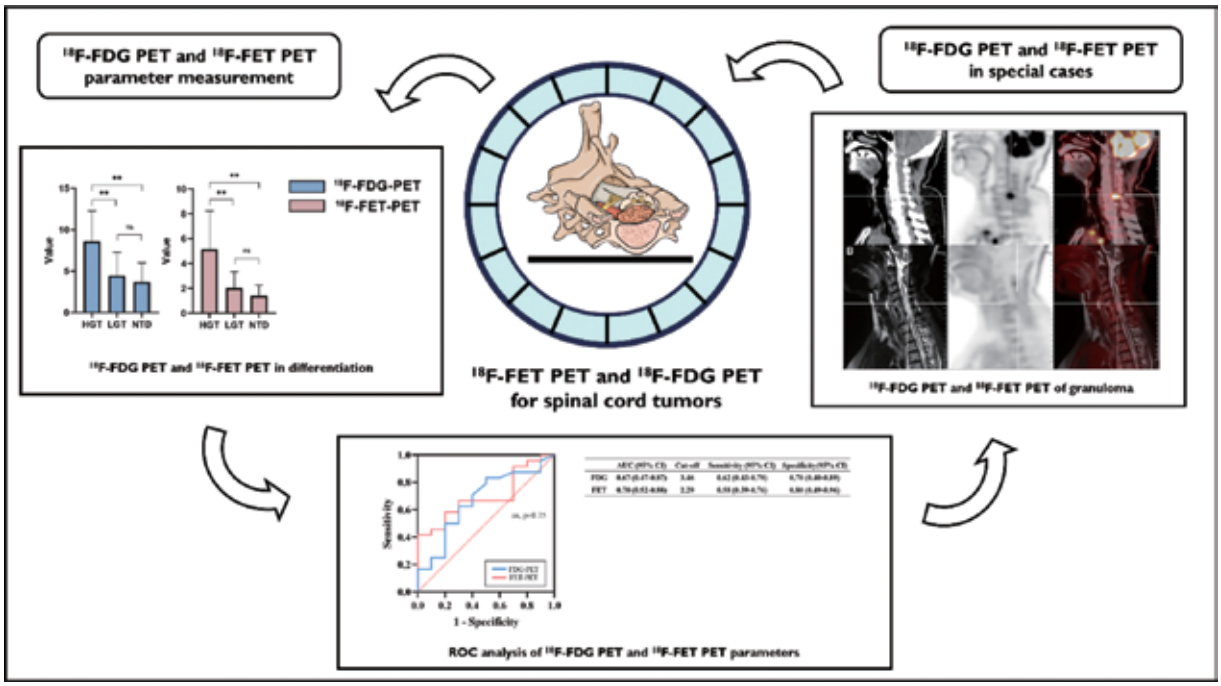

FIG. Methods of the study

Laminectomy with facet joint removal and posterior spinal fixation for surgical resection of cervical spinal dumbbell schwannoma: a case report

P2-1.2

WS Lam, Ronald Li, Alberto CH Chu, Alain KS Wong, KY Chan
Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: The surgical treatment of cervical spinal dumbbell schwannomas necessitates a tricky balance between sufficient exposure and resection of the tumour as well as preservation of structural spinal instability. We illustrate here the potential approach to be used to achieve such.
Methods: This is the reporting of a case of cervical spinal dumbbell schwannoma in a 68-year-old woman who underwent surgical excision. A review of the literature on similar cases was also done.
Results: The patient presented with progressive left upper limb weakness and numbness in addition to frequent falls for a few months. Magnetic resonance imaging (MRI) of the cervical spine found a dumbbell-shaped, contrast-enhancing lesion measuring around 4.4 × 0.8 × 1.8 cm^3 spanning left C5/6 neuroforamina suggestive of a C6 nerve root neurogenic tumour. Full laminectomy from lower C4 to upper C6 was performed and subtotal excision of the tumour was achieved alongside cord decompression, with posterior spinal fixation done subsequently using lateral mass screws. Formal pathology of the surgical specimen confirmed the lesion was a schwannoma. Postoperatively the patient's ambulatory status returned to near baseline with notable improvement in left lower limb weakness on motor charting. At 3 months postoperation, progress MRI showed a residual small lesion of 1.4 × 0.7 × 1.4 cm^3, and clinically the patient had no new radiculopathy, myelopathy, or symptoms of spinal stenosis.
Conclusion: Challenges persist in the treatment of cervical spinal dumbbell schwannomas. It is important to reduce tumour recurrence but not at the expense of spinal stability as both can give rise to debilitating neurological deficits. Aggressive bone removal with subsequent instrumental fixation is a possible solution.

Spinal dural ectasia: a case report

P2-1.3

Ziggy TT Chung, Eric YH Cheung, CY Hung, Robert SK Chan, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: To report a rare case of spinal dural ectasia presenting with radiculopathy after lamina fenestration for L2/3 spinal stenosis at our centre and to explore other non-syndromal causes and atypical presentations of spinal dural ectasia.
Case summary: This is a 58-year-old man with a history of L2/3 spinal stenosis with fenestration to L2/3 done in 2012. He complained of recurrence of back pain with radiation to the right lower limb and new onset of left lower limb numbness of below knee. Magnetic resonance imaging scans in 2018 and 2023 showed a focal dural ectasia at L2/3 level with interval increase in size. Laminectomy for decompression of nerve root and repair of spinal meningocele were performed and the patient reported improvement of symptoms. Dural ectasia is typically seen in patient with ankylosing spondylitis and connective tissue disorders. The exact ethology of dural ectasia remains unknown but there have been previous studies showing that spinal surgeries could lead to peridural fibrosis, causing reduction in pliability of the dura with increased transmission of cerebrospinal fluid pulsations through the dural sacculations and consequent scalloping of the vertebrae.
Conclusion: We presented an unusual case of spinal dural ectasia occurring as a complication of post-lamina fenestration. Familiarity with this disease process in the atypical setting is invaluable in making the diagnosis and in the management of these patients.

Benign spinal tumour: a single-centre review

P2-1.4

Fiona Chan, Eric YH Cheung, CY Hung, LY Ho, SK Lam, Michael WY Lee, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: To review the characteristics and patients' outcome of benign spinal tumours being operated in Pamela Youde Nethersole Eastern Hospital during the period of 2018 and 2024.
Methods: This study reviewed a total of 56 patients, with a mean age of 58.4 years (range, 19-86) and male-to-female ratio of 1:1.07, that were operated by the Department of Neurosurgery of Pamela Youde Nethersole Eastern Hospital from 1 January 2018 to 31 August 2024. Their characteristics including symptoms, time of onset, and tumour nature were compared with their functional outcome postoperatively.
Results: Out of the 56 cases, 55.4% of benign spinal tumours were at thoracic level. 87.5% of patients were diagnosed to have intradural extramedullary spinal tumour, including schwannoma and meningioma. 80.4% of patients had a total or near total excision. All patients had similar or improved functional status after operation. The odds of improvement of modified Rankin Scale score for 1 point or above among patients with symptoms duration of less than 12 months was 1.34 times higher than that of symptoms duration of 12 months or above.
Conclusion: The shorter the duration from symptom onset to diagnosis, the better the functional recovery after operation. High clinical suspicion and early diagnosis are important to improve functional outcome after surgical excision of spinal tumour.

P2-1.5

Single-position robot-assisted oblique lateral interbody fusion: a PRISMA review and meta-analysis of clinical studies

Christopher CH Mak, David YC Chan, Peter YM Woo, WS Poon, Danny TM Chan
Division of Neurosurgery, Department of Surgery, Prince of Wales Hospital, Hong Kong SAR, China

Background: The advent of single-position surgery has revolutionised spinal fusion surgery by eliminating the need for patient repositioning. Its implementation has been facilitated by robotic navigation, reducing operating time and improving operator ergonomics. This review examines the merits and pitfalls of implementing robotic surgical navigation in single-position oblique lateral interbody fusion (OLIF) for both the operator and the patient.

Methods: A PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) systematic review was conducted using four databases (MEDLINE, Embase, Cochrane Library, and PubMed) to identify case series, cohort studies, or clinical trials which studied robotic single-position OLIFs. Meta-analysis and meta-regression of intraoperative and postoperative parameters on patient outcome and surgical performance were performed using RStudio. Risk of bias was assessed using the Cochrane Risk of Bias 2 (RoB 2) tool.

Results: A total of six studies met our inclusion criteria, totalling 112 individuals (35 males and 77 females) with a mean age of 62 years. Overall, single-position robot-assisted OLIFs had a mean duration (±standard deviation) of surgery of 173±23 minutes (Fig), mean fluoroscopic time of 14.9±2.9 minutes, mean intraoperative blood loss of 52.5±18.3 mL, and mean postoperative hospital stay of 7.69 days. There is a reported consensus of reduced duration of surgery, fluoroscopic time, intraoperative blood loss, in addition to accounts of improved pedicle screw placement accuracy, improved operator ergonomics, and reduced patient complications. However, there were significant inter-study heterogeneity and risk-of-bias stem from the lack of blinding, incomplete outcome measures, and absence of controls from certain study designs.

Conclusion: Single-position robot-assisted OLIF represents a new paradigm of spinal fusion surgery with promising patient outcomes and improved operator usability.

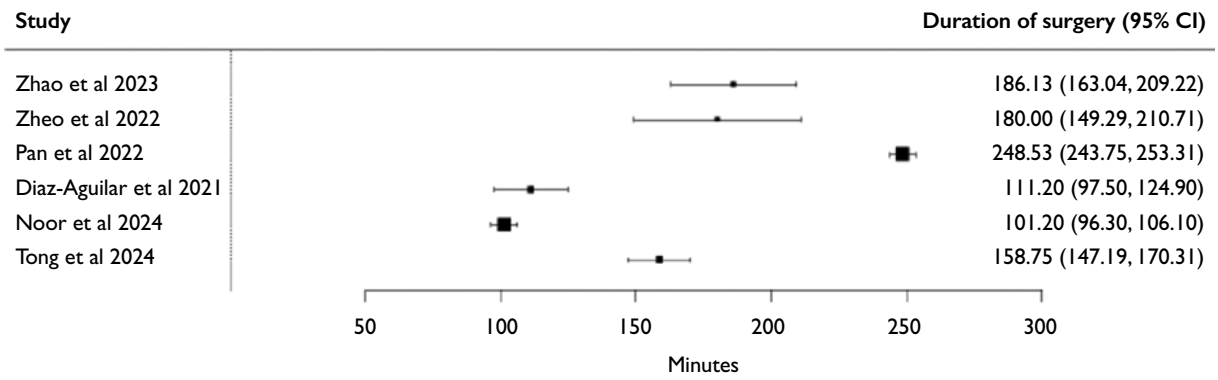

FIG. Forest plot of duration of surgery of single-position robotic-assisted oblique lateral interbody fusion
Abbreviation: 95% CI = 95% confidence interval

Treatment of giant aneurysm: a single-centre case series

P2-2.1

Arthur CH Chang, Sarah SN Lau, James TF Zhuang, Raymand Lee, Edward YL Chu, Wilson WS Ho, WM Lui, Kevin KF Cheng
Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China

Background: Intracranial giant aneurysms are defined as any aneurysms with a diameter of 2.5 cm or above. They pose significant therapeutic challenges due to their size and complexity. Current treatment options include open surgery for clipping, trapping with bypass, or endovascular treatments by embolisation, with or without stent assistance. In recent years, endovascular treatment has become a popular treatment modality for aneurysms overall, but there has been ongoing debate over whether endovascular or open surgery offer superior clinical outcome in this group of patients.
Methods: A retrospective review of patients with giant aneurysm and their outcomes was conducted.
Results: There were seven patients with giant aneurysms between 2006 and 2019. Among them, one was male and six were female, ranging from 31 to 79 years old. The mean age of presentation was 52 years. Aneurysm size ranged from 2.8 cm to 5 cm. All aneurysms were located in the anterior circulation, with two in M1, one in M1/2 junction, one in M2, one in clinoidal internal carotid artery (ICA), and two in terminal ICA. Two patients had aneurysmal rupture on presentation, and both were World Federation of Neurological Societies grade 1 subarachnoid haemorrhage. All seven patients underwent treatment. Trapping with extracranial-intracranial bypass was performed in four patients. One patient underwent craniotomy with clipping. Two patients underwent endovascular treatment, one with simple coil embolisation, and the other with flow diverter and embolisation. One patient died postoperatively from hyperperfusion haemorrhage. Among the five patients with long-term follow-up, only one had persistent left ear tinnitus. The other four patients are well and asymptomatic, all with a modified Rankin Scale score of 0.
Conclusion: Giant aneurysms can be treated by endovascular or open surgery. Risks and benefits of each treatment modality should be well balanced, and management decision should be made on a case-by-case basis.

A horizontal segment (M1) middle cerebral artery saccular aneurysm immediately distal to a right-angle M1 angulation caused by an arachnoid band

P2-2.2

DH Kwan, ST Wong
Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China

Objective: To report a rare case of a ruptured saccular aneurysm in the horizontal segment of the middle cerebral artery (M1) which was not associated with an arterial side branch or a bifurcation.
Methods: This was a retrospective case study. The patient's clinical notes and radiological findings were collected and analysed.
Results: The patient, a 68-year-old female, presented with a ruptured saccular aneurysm in the horizontal segment of the middle cerebral artery (M1), which was not associated with an arterial side branch or a bifurcation. The formation of the saccular aneurysm was attributed to an acute angulation at the M1 due to tight arachnoid bands. The patient underwent a craniotomy with clipping of the aneurysm. Her postoperative course was uneventful.
Conclusion: Arachnoid bands may contribute to the formation of an aneurysm by causing acute angulation of the vessel route.

Minimally invasive surgery for spontaneous intracerebral haemorrhage: evolution in surgical techniques

P2-2.3

CC Wong, Eric YH Cheung, Robert SK Chan, CY Hung, LY Ho, Michael WY Lee, SK Lam, KY Pang
Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: To review the effectiveness and surgical outcome of the three different surgical techniques used in clot evacuation of spontaneous intracerebral haemorrhage (sICH), including open craniotomy, insertion of haematoma drain and endoscopic clot evacuation in our unit.
Methods: We retrospectively reviewed all patients admitted to the Department of Neurosurgery of Pamela Youde Nethersole Eastern Hospital for sICH with aforementioned procedures performed from July 2021 to July 2024. Modified Rankin Scale score was used to assess their degree of functional status. A score of 0 to 2 in 6 months after sICH was defined as favourable. Other clinical factors including length of hospital/intensive care unit stay, central nervous system (CNS) infection, rebleeding requiring re-operation and mortality rate in 30 days were also evaluated.
Results: A total of 58 patients had undergone surgical management for sICH (including 45 cases of open craniotomy, eight cases of haematoma drain, and five cases of endoscopic clot evacuation), with a mean age of 55 years, which was comparable among the three groups. Average length of hospital stay was lower in the endoscopic clot evacuation and haematoma drain groups compared with the open craniotomy group (15 days vs 21 days). In all, 20% mortality was noted in the endoscopic clot evacuation group, compared to 25% in the other two groups. Patients with endoscopic clot evacuation had more favourable functional outcome (40% compared with 13.3% for the open craniotomy group and 0 for the haematoma drain group). No CNS infection and no rebleeding requiring re-operation were noted in all groups.
Conclusion: Endoscopic clot evacuation is a safe and effective minimally invasive surgical technique for sICH, as evidenced by the lower 30-day mortality rate, shorter length of hospital stay, and better functional outcome compared with open craniotomy.

Intracranial aneurysms in patients with polycystic kidney disease: a local review

P2-2.4

Katrina CW Chau[1], Sarah SN Lau[2], Kevin KF Cheng[2], Becky Ma[3]
[1] Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China
[2] Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China
[3] Division of Nephrology, Department of Medicine, Queen Mary Hospital, Hong Kong SAR, China

Objective: To review local polycystic kidney disease (PKD) patients with intracranial aneurysms (ICAs) and their outcomes.
Methods: Local data from 58 patients with known PKD were analysed using statistics software.
Results: Regarding the 58 patients with baseline imaging performed (22 males and 46 females), 17 were found to have intracranial aneurysms (4 males and 13 females), among which seven had multiple ICAs. Baseline hypertension and smoking incidence were similar between those with and without ICAs, with mean age of first presentation being 55.8 years. The incidence of concomitant polycystic liver disease (52.9% vs 26.8%) and need for renal replacement therapy (29.4% vs 9.7%) were higher among the group with ICA than that without. Among a total of 25 ICAs, 19 were situated in large calibre arteries (76%), while six (24%) were located in small calibre communicating arteries; the number of ICAs located in the anterior and posterior circulations were 20 (80%) and 5 (20%), respectively. Of 12 aneurysms (48%) were treated neurosurgically by either coil embolisation (n=7), clipping (n=4) or flow diverter insertion (n=1). Five patients had aneurysmal rupture, all of which belong to the group with multiple aneurysms. One patient passed away from aneurysmal subarachnoid haemorrhage despite treatment, while another passed away from non–aneurysmal intracranial haemorrhage. As this study is still ongoing, the association between renal function and neurosurgical outcomes has yet to be delineated. The role of other confounders and disease modifiers, as well as genetic markers, will also be further explored.
Conclusion: A local review gives insight into outcomes of PKD patients with ICAs, particularly regarding how outcomes differ from non-PKD patients. Greater understanding of the condition would facilitate decisions regarding surveillance and treatment of ICAs in such a population for improving patient outcomes.

Functional outcomes of intracranial haemorrhage post–clot evacuation

P2-2.5

CC Lam, Elvin He, ST Wong
Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China

Objective: To investigate the outcomes of patients with primary and secondary intracranial haemorrhage post–clot evacuation.
Methods: This is a retrospective study of cases of intracranial haemorrhage with clot evacuation done in Tuen Mun Hospital dated 1 January 2022 to 31 December 2022.
Results: In all, 27 patients underwent clot evacuation from 1 January 2022 to 31 December 2022. Immediately post-discharge, 14.8% (n=4) patient scored 3 or below on the modified Rankin Scale (mRS), while 85.1% (n=22) scored higher than 3. On 1 year post-discharge (or after final course of rehabilitation), 18.5% (n=4) patients scored 3 or below, while 81.4% (n=23) scored higher than 4. There was a statistically significant inverse relationship between preoperative Glasgow Coma Scale (GCS) score and mRS score on discharge (t=-2.35, P=0.028, 95% confidence interval=-0.33 to -0.21). Patients with a preoperative GCS score of lower than 4 were likely to have a mRS score of 5 or above on discharge (Youden's index=-1.43, P value for area under the curve=0.03). Patients with clot volume higher than 39.6 mL (Youden's index 0.524, P value for area under the curve=0.001) are more likely to have a mRS score of 5 or above on discharge.
Conclusion: A lower preoperative GCS score and higher clot volume are detrimental towards functional outcomes of patients.

A series of anterior communicating artery fenestrations with underlying aneurysms

P2-3.1

HY Ma[1], Ronald Li[2], Alain KS Wong[2], KY Chan[2], Alberto CH Chu[2]
[1] Department of Diagnostic and Interventional Radiology, Kwong Wah Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: Fenestration of intracranial arteries is an uncommon vascular variation more often seen in the anterior communicating artery and the basilar artery. It has been proposed that arterial fenestrations may be associated with an increased risk of aneurysm formation.
Methods: We reviewed 4500 cases who underwent cerebral angiography at our centre over the past 5 years. We reported 16 patients with anterior communicating artery fenestrations.
Results: In our 16 patients with anterior communicating artery fenestrations, we observed four cases (25%) of concomitant anterior communicating artery aneurysms.
Conclusion: It is essential to evaluate for concurrent aneurysms upon identification of intracranial fenestrations.

Direct carotid-cavernous fistula: manifestation of vascular Ehlers-Danlos syndrome

P2-3.2

Sophia Christy Lam, NL Chan, TL Poon
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: Ehlers-Danlos syndrome (EDS) is a group of genetic connective tissue disorders. Vascular EDS, in particular, causes vascular fragility and can present as direct spontaneous carotid-cavernous fistula (CCF). We present two cases of direct spontaneous CCF in EDS patients to discuss the pathophysiology, disease presentation, and management.
Methods: We reported on two cases of EDS patients presenting with direct spontaneous CCF.
Results: A 44-year-old female presented to us with right direct spontaneous CCF. During operation, transarterial flow diverter and transvenous cavernous sinus coil embolisation were attempted to preserve the internal carotid artery (ICA). However, the fistula worsened during coil packing attempts. Therefore, we decided to proceed with endovascular right ICA trapping, obliterating the CCF successfully. The patient also had common iliac artery dissection intraoperatively, and underlying vascular fragility was suspected. The patient was unfortunately found arrested on day 1 postoperation and succumbed after resuscitation. Her autopsy showed type A aortic dissection, and genetic testing later confirmed vascular EDS. Subsequently, another 28-year-old male with known genetically diagnosed vascular EDS presented to us with left direct spontaneous CCF. With the experience from the previous case, we decided to perform endovascular left ICA trapping directly and successfully obliterated the CCF.
Conclusion: Vascular EDS is prone to arterial dissection and, therefore, is at higher risk of direct CCF. The presentation of spontaneous CCF in young individuals warrants suspicion of connective tissue disease, such as EDS. Given the vascular fragility in EDS, it should be taken into consideration when planning for the management.

Superior sagittal sinus dural arteriovenous fistula: tackle the arteriovenous fistula, preserve the sinus

P2-3.3

TF Chak, NL Chan, TL Poon
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: To demonstrate the hand-compression pressure cooker technique and balloon sinus protection.
Methods: This is a case report of superior sagittal sinus (SSS) dural arteriovenous fistula (dAVF) with successful embolisation.
Results: This case is a 69-year-old man presented with a gradually worsening headache and prominent scalp vessels at the forehead. Digital subtraction angiography confirmed SSS dAVF with no cortical venous reflux. First-stage transarterial embolisation via the left superficial temporal artery (STA) was limited by the tortuosity of the artery and the risk of liquid embolic agent reflux into the SSS. With the experience from the first embolisation, the second embolisation was performed with direct scalp puncture to the right STA, in combination with balloon sinus protection and hand-compression pressure cooker techniques. The branches of the right STA were directly punctured with 21-gauge butterfly needles under ultrasound guidance. Intermittent inflation of the venous-remodelling balloon in the SSS was performed to protect the sinus. Direct finger-compression was applied just proximal to the butterfly needle to avoid reflux of liquid embolic agent. The fistula was embolised with 25% Onyx with good forward flow of liquid embolic agent observed. Post-embolisation angiograms of the right external carotid artery demonstrated successful devascularisation of the dAVF supplied by the right STA and also the right occipital artery. The SSS was maintained patent.
Conclusion: The hand-compression pressure cooker technique and sinus balloon protection are effective for SSS dAVF.

P2-3.4

Association between intracerebral haemorrhage computed tomography radiological biomarkers and outcomes of operated patients

Tammy TH Law[1], David YC Chan[1], Danny TM Chan[1], Larry YW Wong[2], HT Wong[3], Anderson CO Tsang[4], WK Wong[5], ST Wong[6], Michael WY Lee[7], Peter YM Woo[1], Jenny KS Pu[4]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[3] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China
[4] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
[5] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China
[6] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[7] Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

Objective: Spontaneous intracerebral haemorrhage (ICH) is a type of stroke that is associated with high mortality and morbidity. This study aimed to investigate the association of various radiological biomarkers exhibited by the presenting computed tomography (CT) scan on the outcome of operated ICH patients to aid in preoperative prognostication.

Methods: Data were retrieved from all neurosurgical centres in Hong Kong from 2016 to 2017. Adult patients (≥18 years old) diagnosed with spontaneous ICH who were subsequently operated were recruited. The presenting non-contrast enhanced CT scans of these patients were reviewed. The radiological biomarkers investigated included the blend sign, black hole sign, island sign and swirl sign, ICH volume, location whether there was the presence of intraventricular haemorrhage or hydrocephalus. Modified Rankin Scale score at 6 months was used as the primary outcome, with 0 to 2 being favourable and 3 to 6 being unfavourable. Secondary outcomes were 30-day mortality, presence of postoperative complications, length of hospital stay, and whether the patient required long-term institutional care.

Results: A total of 513 patients were included. The blend sign (odds ratio [OR]=1.76; 95% confidence interval [95% CI]=1.033-2.998), black hole sign (OR=2.973; 95% CI=1.322-6.683), island sign (OR=2.951; 95% CI=1.688-5.161), and swirl sign (OR=3.093; 95% CI=1.782-5.369) were associated with unfavourable outcomes. Factors including sex, co-morbidities and use of antiplatelet/anticoagulant were analysed, and no other confounders were identified. All of these biomarkers were associated with higher 30-day mortality. For postoperative complications, only the swirl sign demonstrated statistically significant association with higher symptomatic haemorrhage (OR=2.504; 95% CI=1.216-5.159) and new territory ischaemic stroke (OR=2.783; 95% CI=1.216-6.367). There were no significant differences in length of stay for patients having these biomarkers or not. The black hole sign and swirl signs were associated with higher proportion of patients being discharged to long-term care institution (P=0.015 and P<0.001, respectively).

Conclusion: Spontaneous ICH patients with the blend sign, black hole sign, island sign and swirl sign are more likely to have unfavourable outcome after surgery.

Subdural effusion following extracranial-intracranial bypass: a single-centre review

P2-3.5

WT Chun[1], Travis YH Chan[1], Sarah SN Lau[2], James TF Zhuang[2], Wilson WS Ho[2], WM Lui[2], Kevin KF Cheng[2], LF Li[2]
[1] Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[2] Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China

Background: Extracranial-intracranial (EC-IC) bypass involves the creation of an anastomosis between an extracranial artery and the middle cerebral artery to improve brain perfusion. It is typically performed for invasive skull base tumours involving major vessels, severe intracranial vessels stenosis or occlusion, moyamoya disease, and complex intracerebral aneurysms. We have reviewed 55 EC-IC bypass procedures in a single centre and report an unusual case of recurrent subdural effusion in an old male patient following EC-IC bypass.
Results: The patient developed bilateral subdural effusion with increasing mass effect resulting in deteriorating consciousness. Burr hole drainage was initially performed, but there was recurrence of subdural effusion which necessitated ventriculoperitoneal shunt placement in the end. Effusion remained static afterwards.
Conclusion: This case highlights the complexities associated with managing recurrent subdural effusion in patients undergoing EC-IC bypass. It underscores the need for timely recognition and intervention to mitigate neurological decline in this vulnerable population. The report calls for further research to better understand the incidence of this complication and to establish optimal management protocols. Given the increasing number of EC-IC bypass procedures performed, identifying and addressing such complications is crucial for improving patient outcomes and reducing morbidity in this high-risk cohort.

Unveiling the hidden culprit: how the gut-brain axis fuels neuroinflammation in ischaemic stroke

P2-4.1

Brian DY Ma[1] *, Travis YH Chan[1] *, Benjamin WY Lo[2]
[1] Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
* Equal contribution

Objective: To investigate the role of the gut-brain axis in modulating post-stroke neuroinflammation and its implications for potential therapeutic applications.
Methods: A comprehensive literature search was conducted using PubMed, Web of Science, and Google Scholar for articles published between January 2000 and January 2023. Keywords included 'gut microbiota', 'intestinal microbiota', 'ischemic stroke', 'cerebrovascular incident', 'brain-gut axis', and 'microbiota-gut-brain axis'. The search was limited to original research, systematic reviews, or meta-analyses on gut microbiota composition in models/subjects or the impact of gut microbiota on stroke outcomes. Comments and case reports were excluded. A total of 81 articles met the inclusion criteria, providing data on gut microbiota composition, post-stroke changes, and their influence on neuro-inflammatory changes.
Results: Extensive preclinical studies in animal models demonstrate that the gut microbiome was crucial for glial development and normal functioning. The absence of such interactions impaired normal microglial functioning and cellular debris clearance, exacerbating stroke-induced inflammatory cascades. A bi-directional interaction existed between gut microbiota and stroke outcomes. Interventions targeting these pathways, such as pre- and probiotics, fecal matter transplants, or antibiotics, had shown to modulate glial phenotypes in preclinical stroke models. Additionally, microbiota manipulation modulated systemic inflammatory responses by reducing leukocyte chemotactic activity and promoting the expression of neuroprotective T cells and cytokines.
Conclusion: Metabolites such as lipopolysaccharides, short-chain fatty acids, and trimethylamine N-oxide, through the gut-brain axis, play a direct role in reducing infarct size, oedema, and overall recovery post-stroke. Existing preclinical stroke models have showcased promising results, highlighting the potential of gut microbiota manipulation as a therapeutic strategy.

P2-4.2

Management of ruptured intracranial aneurysms with duplicated/azygous vessels: case series and literature review

MC Lee[1], Ronald Li[1], Joanna WK Ho[1], Alain KS Wong[1], Danny HY Cho[2], KY Chan[1], Alberto CH Chu[1]
[1] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China
[2] Department of Diagnostic and Interventional Radiology, Kwong Wah Hospital, Hong Kong SAR, China

Objective: Intracranial vessels may show a diverse range of anatomical variations. They have been reported to have increased risk of aneurysm formation and severe intracranial haemorrhage. The goal of this study was to discuss management of ruptured intracranial aneurysms in the setting of duplicated/azygous vessels.
Methods: We retrospectively reviewed patients presenting with ruptured intracranial aneurysms who underwent neurosurgical intervention between 2014 and 2024 in our centre.
Results: Among 272 cases of ruptured aneurysms in the anterior cerebral circulation with neurosurgical intervention done, three cases (1.1%) were associated with anatomical variations, in which they included duplicated middle cerebral artery, duplicated anterior cerebral artery, and azygous anterior cerebral artery.
Conclusion: Variants of the anterior cerebral circulation accounted for a small but non-negligible number of ruptured intracranial aneurysms. These aneurysms can be treated with either clipping or embolisation with preservation of the duplicated/azygous vessels depending on the configuration.

P2-4.3

Augmented reality–guided ventricular catheter placement: a proof-of-concept study

Desiree KK Wong[1], Camroo Ahmed[2], Z Ding[2], Leanne Chan[3], Peter YM Woo[2], Danny TM Chan[2]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[3] Department of Electrical Engineering, City University of Hong Kong, Hong Kong SAR, China

Objective: External ventricular drainage (EVD) is a neurosurgical procedure used to monitor intracranial pressure. Complications can occur in up to 30% of patients, including catheter obstruction, infection, and need for multiple attempts. This study introduces augmented reality (AR)–guided neurosurgical navigation (ArNav) to enhance accuracy of EVD placement.
Methods: The ArNav system utilises an AR headset's depth camera to capture a facial feature map of the patient, which is then matched with a corresponding feature map generated from a patient's computed tomography (CT) scan data using a deep learning algorithm. The system registers the three-dimensional (3D) CT image onto the patient's face by aligning facial landmarks, visualising the superimposed 3D CT image through the AR headset. This accurate 3D registration aids in selecting the optimal burr hole location and provides real-time tracking of the catheter tip, trajectory, and depth measurements. An evaluation study of the ArNav system was performed on 3D-printed patient head models, each incorporating the foramen of Monro as a reference target. For each patient, two models were prepared, and the EVD catheter was inserted with and without the assistance of ArNav to target the 3D-printed foramen of Monro.
Results: Initial findings demonstrated that the ArNav significantly enhanced the accuracy of catheter placement, achieving a mean deviation of less than 3 mm from the foramen of Monro, compared to a deviation of more than 8 mm using the freehand approach.
Conclusion: Augmented reality–guided EVD catheter placement represents a novel and clinically significant advancement in neurosurgery. The system improves the accuracy of catheter positioning, thereby reducing the risks associated with EVD procedures.

Comparison between intensive running exercise and stretching in patients with Parkinson's disease

P2-4.4

Kevin KF Suen, Danny TM Chan
Department of Neurosurgery, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong SAR, China

Objective: There is a growing volume of evidence that supports the positive effect of exercise and physical therapy to patients with Parkinson's disease. However, limited evidence is found about the benefits of regular intensive running exercise to this population. This study aimed to compare intensive running exercise and stretching in patients with Parkinson's disease.
Methods: This is an unblinded, single-centre, prospective, two-arm randomised controlled trial. A maximum of 30 patients were recruited from the Parkinson's disease clinic at Prince of Wales Hospital during 2018 and 2019. Patients were randomised with a 2:1 ratio into either the intervention group, which involved progressive aerobic track running, or the active control group, which involved stretching exercise. Outcomes included Movement Disorder Society–Unified Parkinson's Disease Rating Scale score, Parkinson's Disease Questionnaire score, walking duration for 10 metres, 6-minute walk test, Mini-Balance Evaluation Systems Test, Modified Hoehn and Yahr Scale score, Schwab and England Activities of Daily Living Scale score, Non-Motor Symptoms Scale score, Hospital Anxiety and Depression Scale score, Beck Anxiety Inventory score, and Geriatric Depression Scale (GDS) score. The assessment took place at baseline, at completion of the training, and 6 months after completion of the training.
Results: In total, 25 patients were recruited. For the between-group comparison of the changes of various measurements over different time points, from pre-training to post-training, there was an improvement in GDS score in the active control group (P=0.049), while the change in all other outcomes had no significant between-group differences.
Conclusion: Stretching exercises in the active control group were more beneficial than intensive running exercises in the intervention group in terms of the GDS scores. This suggests that the benefits to patients may not be proportional to the intensity of the exercise.

Management of recurrent convexity Rosai–Dorfman disease: a case report

P2-4.5

KL Lam, Ronald Li, Alberto CH Chu, Alain KS Wong, KY Chan
Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: Rosai–Dorfman disease (RDD) is a rare benign condition of unknown cause characterised by abundant histiocytes in the lymph nodes or other locations throughout the body. Classically, it manifests as chronic painless cervical lymphadenopathy with pyrexia. Extra-nodal manifestation can also occur in the eye, upper respiratory tract, salivary gland, skin, bone, testis, meninges, and the central nervous system. This study reports the clinico-histopathologic features, management and outcome of a rare case of RDD, with unusual presentation as an epidural mass.
Methods: A 52-year-old woman presented with a painful right parietal scalp swelling for 4 weeks, associated with fever. Subsequent imaging revealed a right parietal scalp swelling with underlying scalp and extra axial hypotenuse collections, with erosive changes over the right parietal bone. The patient underwent craniectomy for resection and cranioplasty.
Results: Pathological examination revealed diffuse sheets of large histiocytes positive for S100 protein and cluster of differentiation 68 protein. Overall features suggest extra-nodal RDD. A recurrence developed 6 years later, with craniectomy for resection and cranioplasty performed again. Closure was done with rotational flap. The patient was then started on prednisone.
Conclusion: Rosai–Dorfman disease with dural involvement is rare and it is often a challenge to arrive at the correct diagnosis. The disease, although rare, should be considered in febrile individuals with epidural mass lesion. Recurrent RDD is not uncommon and can be a challenge to manage. Excision and corticosteroid therapy provide a favourable outcome. Our case presentation serves as a reference when diagnosing and managing RDD.

P2-5.1

Intraoperative three-dimensional photogrammetry: a novel method using artificial intelligence for neurosurgical brain mapping

Elson PH Mo[1,2], Samuel SN Chan[2], Matt SC Chan[1], Peter YM Woo[1], Danny TM Chan[1]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] OAO Limited, Hong Kong SAR, China

Objective: Three-dimensional (3D) photogrammetry plays a crucial role in surgical specialties, such as craniofacial surgery and orthopaedics, by providing a non-invasive precise method for capturing and analysing anatomical structures. It facilitates the creation of interactive 3D models that are invaluable for surgical planning and patient education. With the integration of artificial intelligence (AI), we aimed to extend its use to neurosurgery, potentially in preoperative planning, neurosurgical brain mapping, and neuronavigation, which could enhance outcomes, especially in brain tumour resection.

Methods: We developed an AI model for 3D photogrammetry reconstruction, capable of generating coloured 3D models from intraoperative images captured through a mobile device. Additionally, a web application, GIMII, was created to facilitate the navigation and manipulation of these 3D models. Further measurements on the dimensions of the AI-generated 3D model were performed to evaluate the dimensional accuracy of the model generation from the AI model, by comparing with the measurements on the computed tomography (CT) imaging–derived 3D model using the 3D Slicer and Blender software.

Results: A total of four cases were scanned and documented with our method. The AI-generated 3D photogrammetry models in GIMII exhibited high imaging resolution, but inconsistencies in scanning coverage due to operational factors. One intraoperative example has CT and magnetic resonance imaging images available for further evaluation of the dimensional accuracy. It shows that the AI-generated 3D model can achieve a dimensional accuracy of ±3 mm when taking the CT imaging–derived 3D model as the standard for dimensions.

Conclusion: Our AI model was able to generate high-quality intraoperative 3D models. This technology holds potential for further applications in assisting surgical planning, neuronavigation, and education in neuroanatomy and neurosurgery.

P2-5.2

Advanced Stroke Life Support course significantly improves knowledge of stroke diagnosis and management for prehospital and hospital-based providers in Hong Kong

Michael WY Lee[1], Joies KY Luk[2]; ASLS® course instructors
[1] Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China
[2] Accident and Emergency Department, Ruttonjee and Tang Shiu Kin Hospitals, Hong Kong SAR, China

Objective: The Advanced Stroke Life Support (ASLS) programme was developed at the University of Miami Gordon Center for Simulation and Innovation in Medical Education in the late 1990s, on the heels of a ground-breaking National Institute of Neurological Disorders and Stroke (NINDS) trial, which showed that alteplase as a thrombolytic was effective for ischaemic stroke. This legacy ASLS course was first solely provided by the Hong Kong Neurosurgical Society in Hong Kong on 20 October 2018 (Fig), and till 2023 it has trained more than 400 healthcare providers (HCPs). The purpose of this study is to evaluate the impact of the ASLS course on knowledge of stroke diagnosis and management among HCPs.
Methods: From 2019 to 2023, 361 HCPs, comprising 343 nurses and 18 doctors and pharmacists, who completed the prehospital and hospital ASLS course were recruited in this study.
Results: There were 25 questions in total in the pre-course and post-course assessment, and those participants who scored 68% or below would need to have retest before they could receive their completion certificate. The retest rate was 2.2% (n=8) and all passed eventually during the retest. There were statistically significant differences in improvement between nurses and doctors with regard to pre-course mean, post-course mean, and delta value (Mann-Whitney *U* test P<0.001; P<0.001, and P=0.026, respectively) [Tables 1 and 2]. The pre-course mean on the examination was 72% (32%-100%; range=68%, median=72%) and the post-course mean was 87.2% (72%-100%; range=28%, median=88%). That was a delta value of 15.2% (-12 to +56; range=68; median=12), which was an impressive statistically significant improvement (P<0.001) over the baseline knowledge they had prior to the course. When comparing the ASLS course worldwide data of about 10 000 learners that were presented at the International Stroke Conference in 2018, the pre-course mean on the examination was 64%, which was less than our data in Hong Kong. Their post-course mean was 89%, which were similar. Their delta value was 25%, which was more than our data in Hong Kong.
Conclusion: With the launching of the new ASLS Blended Learning Course of the American Heart Association in Asia-Pacific and China region on 23 August 2024, first and solely hosted by the Hong Kong Neurosurgical Society, we hope that the quality of the didactic learning could be further enhanced. It did make an impact to the knowledge of stroke diagnosis and management to HCPs, especially to nurses in Hong Kong.

Reference:

Anzardo EV, Motola I, Brotons AA, Carter SP, Rodriguez RD, Issenberg SB. Abstract TP356: Advanced Stroke Life Support® Course significantly improves knowledge of stroke diagnosis and management for prehospital and hospital-based providers [abstract]. Stroke 2018;49 (Suppl 1).

FIG. The first class of the legacy ASLS course provided by the Hong Kong Neurosurgical Society in Hong Kong on 20 October 2018 at the Accident and Emergency Training Centre of Hospital Authority

TABLE 1. Mann-Whitney *U* test results

	Nurse?	No.	Mean rank	Sum of ranks
Pretest score	No	18	284.44	5120.00
	Yes	343	175.57	60221.00
	Total	361		
Posttest score	No	18	288.92	5200.50
	Yes	343	175.34	60140.50
	Total	361		
Delta	No	18	128.00	2304.00
	Yes	343	183.78	63037.00
	Total	36		

TABLE 2. Test statistics*

	Pretest score	Posttest score	Delta
Mann-Whitney *U*	1225.000	1144.500	2133.000
Wilcoxon *W*	60221.000	60140.500	2304.000
Z score	-4.329	-4.556	-2.220
Asymptotic significance†	<0.001	<0.001	0.026

* Grouping variable: Nurse?
† Two-tailed

Cardiopulmonary resuscitation in neurosurgery: a single-centre experience

P2-5.3

Sarah SN Lau[1], YW Ho[2], Gloria WT Mak[1], Evangelyn YK Mak[1], WY Lok[3], WS Chan[3], Katherine Liu[4], Clara CM Poon[4], Eric CK Chung[4], LF Li[1], Kevin KF Cheng[1]
[1] Division of Neurosurgery, Department of Surgery, Queen Mary Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China
[3] Department of Anaesthesiology, Queen Mary Hospital, Hong Kong SAR, China
[4] Operation Theatre Services, Queen Mary Hospital, Hong Kong SAR, China

Background: The implementation of a neurosurgery resuscitation drill at Queen Mary Hospital was intended to enhance emergency preparedness within the neurosurgical team. This initiative aimed to improve the response to intraoperative emergencies, particularly cardiac arrests, which, while rare, can have critical consequences in neurosurgical settings.
Methods: The drill was designed to simulate real-life scenarios, allowing team members to practice their roles in a controlled environment. A questionnaire was distributed to participants post-drill to evaluate their perceptions of the exercise, focusing on aspects such as clarity of roles, communication, and overall preparedness.
Results: Feedback from the questionnaire indicated a high level of satisfaction among participants. Respondents felt that the drill clarified their specific responsibilities during an emergency. There was enhanced communication among team members, emphasising the importance of coordinated efforts in high-pressure situations. Participants expressed increased confidence in their ability to respond to emergencies, attributing this to the practical experience gained during the drill. Many noted that the drill fostered a sense of camaraderie and teamwork, essential for effective crisis management.
Conclusion: The positive feedback from the neurosurgery resuscitation drill underscores its value in preparing surgical teams for emergencies. By reinforcing communication, clarifying roles, and building confidence, the drill has significantly contributed to improving patient safety and outcomes in neurosurgical procedures. Future drills are recommended to maintain and enhance these skills within the team.

Application of radio-frequency identification technology in bone flap cryopreservation

P2-5.4

SW Tam, Danny TM Chan
Division of Neurosurgery, Department of Surgery, Prince of Wales Hospital, Hong Kong SAR, China

Objective: To evaluate the feasibility of radiofrequency identification application to bone flap cryopreservation.
Methods: This experimental study reviews the advantages of radio-frequency identification (RFID) including ultra-low temperature durability and convenience in inventory checking and proposes an RFID management system for cryopreserved bone flap registration, inventory and identification, or verification. It was conducted in three stages: (1) RFID properties testing and proposed system feasibility (for RFID labels' baseline readability, low temperature durability, and scanner reading range); (2) RFID software and bone flap management protocol design; and (3) protocol clinical testing (for claimed advantages of RFID in literature and explore areas of improvement of protocol).
Results: All RFID labels were readable directly but not through bone bank freezer door, after being placed in freezer at -80°C at 0, 1, 2, 3 weeks within claimed reading range of ±60° and 3 m. Isolated labels could be read at ≥60 cm 180° from other labels. As regards management protocol, for registration, personnel affixes customised label(s) to new bone flap(s) and scan them at ≥60 cm 180° from other labels; for inventory, personnel scans current bone flaps' labels in one go after opening the freezer door to check for missing items; for identification, personnel retrieves bone flaps from the freezer storage boxes according to craniectomy dates and scan their labels at ≥60 cm 180° from other labels. For RFID software, an application demonstration usable on phone attached to RFID scanner displaying patient information after reading labels was developed. Stage 3 will be done when the application is fully developed.
Conclusion: Preliminary tests show high feasibility of RFID application in bone flap cryopreservation.

P2-5.5

Is a history of coronavirus disease 2019 infection associated with the development of sinusitis-related intracranial infections? A case series

Vivian HY Pak, Ronald Li, Alain KS Wong, KY Chan, Alberto CH Chu
Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: Centres worldwide have noted an increased incidence of sinusitis and intracranial infections in young and previously healthy patients during the post–coronavirus disease 2019 (COVID-19) era. The case series aimed to investigate the potential association between a history of COVID-19 infection and the subsequent development of sinusitis-related intracranial infections.
Methods: We retrospectively analysed the clinical data between 2016 and 2024 from patients who underwent surgical intervention for intracranial infections with sinusitis on a computed tomography scan and no other identified sources of infection. The study included a pre–COVID-19 period between 2016 to 2020 and post–COVID-19 period between 2020 to 2024. Data were collected on patients' demographics, operation, diagnoses, and microbial culture results. For the post–COVID-19 group, their COVID-19 infection status and vaccination details were also collected.
Results: Two patients were found with intracranial infections and sinusitis between 2016 to 2020. Among the six patients from 2020 to 2024, five had a documented history of COVID-19 infection, whilst one had no prior infection history. All patients in the post–COVID-19 group were vaccinated. Cultures obtained during surgical procedures revealed a range of pathogens, with *Prevotella* species and *Streptococcus intermedius* being the most isolated organisms.
Conclusion: The findings from this case series indicate a possible link between prior COVID-19 infection and an increased risk of developing sinusitis-related intracranial infections. This association may be attributable to the virus's effects on the respiratory and sinus mucosa, potentially leading to altered immune responses. Further research is warranted to elucidate this underlying mechanism of the association and implications for clinical management.

N1

NeuroBot as an artificial intelligence–powered virtual assistant in neurosurgery: a proof-of-concept study

WY Ho[1], PK Chan[1], Q Dou[2], CM Ho[1,3], Vivian CC Hui[4], KY Lai[1], Candice HW Lam[5], CY Li[1], Calvin HK Mak[1], KL Man[1], Prudence KL Mok[6], Ben CF Ng[1], Henry Qin[4], PY Yip[1]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Department of Computer Science and Engineering, The Chinese University of Hong Kong, Hong Kong SAR, China
[3] Nethersole School of Nursing, The Chinese University of Hong Kong, Hong Kong SAR, China
[4] Centre for Smart Health, School of Nursing, The Hong Kong Polytechnic University, Hong Kong SAR, China
[5] Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[6] Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China

Objective: To assess the feasibility of NeuroBot in delivering perioperative care information for patients undergoing neurovascular procedures and to explore healthcare staff perspectives on NeuroBot's utility in neurosurgical care.
Methods: This proof-of-concept study used a mixed-methods approach. An expert panel of 12 neurosurgical nurses and doctors evaluated NeuroBot's responses to a set of frequently asked questions across eight key domains, rating accuracy, relevance, and completeness on a Likert scale of 1 to 6. Mean, median, and interquartile range scores were calculated to summarise these assessments. The intraclass correlation coefficient was used to assess inter-rater reliability. Additionally, semi-structured interviews with healthcare staff provided qualitative insights into NeuroBot's usability, benefits, and perceived barriers. Thematic analysis was applied to identify key themes from the interviews.
Results: NeuroBot demonstrated high accuracy (mean score: 5.69), relevance (median score: 5.83), and completeness (median score: 5.67) in neuroendovascular information delivery, with an inter-rater reliability of 0.71. Healthcare professionals perceived NeuroBot as a useful, acceptable, and innovative tool with potential for seamless integration into clinical practice.
Conclusion: This study suggests that NeuroBot can enhance patient outcomes and support perioperative care in neurosurgery. Findings will inform future refinements, facilitating wider clinical adoption of NeuroBot in neurosurgical settings.

N2

Application of median nerve stimulation by the intraoperative neurophysiological monitoring team to enhance the precise placement of electrodes in deep brain stimulation surgery under general anaesthesia

MY Chang[1], PK Chan[1], KL Man[1], Michael KW See[1], MH Yuen[1], TL Poon[1], Germaine HF Chan[2], Nelson YF Cheung[2]
[1] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[2] Department of Medicine, Queen Elizabeth Hospital, Hong Kong SAR, China

Background: Deep brain stimulation (DBS) is traditionally performed with patients awake to facilitate intraoperative macrostimulation tests. However, many Parkinson's Disease patients are older adults and have severe off-medication symptoms, making prolonged awake surgery intolerable. Recent advancements in imaging and devices, controlled anaesthesia and neurophysiology mapping with micro-electrode recording (MER) have enabled DBS under general anaesthesia (GA). Accurate electrode placement is crucial for satisfactory postoperative outcomes, but various patient-specific factors, such as neuroanatomical variability and disease severity, can lead to poor MER signals. Previous studies have shown that non-invasive median nerve stimulation (MNS) can significantly enhance MER neuronal signals during DBS surgery, allowing neurosurgeons and neurologists to analyse evoked responses alongside MER signals for improved electrode placement.
Objective: This retrospective observational study aimed to evaluate the effectiveness of MNS in enhancing MER during GA DBS surgery at our centre.
Methods: We reviewed MER responses following MNS application in all DBS cases performed under GA from July 2023 to September 2024. Patient demographics (age, sex, body weight), DBS targets (subthalamic nucleus and globus pallidus internus), and anaesthesia agents were charted. Predictors of positive response were analysed. Adverse effects such as postoperative pain and numbness were recorded.
Results: During the study period, 14 patients underwent DBS surgery under GA, with seven of them (50%) showing significant enhancement in MER activity after MNS application. No predictors for positive MNS response were identified and no adverse effects were reported.
Conclusion: Median nerve stimulation is a safe and effective method for enhancing MER signals during DBS surgery under GA, ensuring accurate electrode placement.

N3

Exploratory activity in high dependence unit for staff empowerment and training in a neurosurgery department

CH Cheung, HY Ngan, MT Cheng, KY Li, KY Wong, SC Tong, TM Wong, SP Lai, Priscilla MP Choi
Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China

Objective: To empower high dependence unit (HDU) nursing staff in developing skills for career development, engage HDU staff in teaching and learning activities in clinical area, and enhance understanding and specialised neurosurgical nursing skills for general ward staff working in neurosurgery.
Methods: A workshop with five 1-hour sessions were conducted by HDU nursing staff between May to July 2024. The target participants were nursing staff working in general neurosurgical wards without HDU experience. An evaluation from participants were collected after each session.
Results: In total, 24 attendances were recorded in the HDU workshop. All participants (100%) agreed that the intended learning outcome of the programme was clearly defined; the programme content facilitated the achievement of the intended learning outcome; the programme content was useful in clinical work; the learning–teaching activities were congruent with the overall programme intended learning outcome and content; the programme was interesting; and they would recommend this programme to others. Over 90% of them agreed that the length of the programme was appropriate and were interested in working in neurosurgery HDU in future. The facilitators in the HDU workshop reported that their confidence level in teaching skill was improved.
Conclusion: Exploratory activity in HDU was beneficial for both HDU and general ward nursing staff in terms of skill enhancement and engagement towards the department of neurosurgery.

Empowerment of patient caregivers on post-craniectomy care

N4

MY Fung, HH Poon, WK Wong, KY Yeung
Department of Neurosurgery, Princess Margaret Hospital, Hong Kong SAR, China

Objective: To enhance the knowledge and care provided by patient caregivers of post-craniectomy patients in the department of neurosurgery.
Methods: This study employs both quantitative and qualitative approaches, initiated in March 2024 and ongoing. An educational programme was designed and implemented for caregivers. A survey was conducted to evaluate caregivers' satisfaction, complemented by interviews to assess the perceived effectiveness of the educational programme in enhancing caregivers' knowledge and caregiving skills.
Results: Preliminary results indicate positive trends in caregiver outcomes. The majority of caregivers reported increased confidence and competence in managing post-craniectomy care after receiving the educational interventions. Survey results demonstrated a significant improvement in caregivers' understanding of essential care practices, with high satisfaction rates regarding the education material's content and clarity. However, some caregivers expressed stress and showed anxiety about the burden of long-term patient care, highlighting the need for additional psychological support.
Conclusion: The implementation of the educational programme has significantly enhanced the knowledge and caregiving capabilities of patient caregivers in the department of neurosurgery. These findings suggest that targeted educational interventions can improve caregiver preparedness and ultimately lead to better patient outcomes in post-craniectomy care. Further research is recommended to explore the long-term effects and potential adaptations of the educational materials. Additionally, to alleviate carer stress, it is suggested to provide psychological support to caregivers.

Diagnosis of brainstem death training programme

N5

KW Lam, SM Lo, KT Ho, Jacky CK Chan, CW Chan, TK Tsao, KY Choi, MS Boo, LF Li
Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China

Objective: Brainstem death (BSD) is the irreversible cessation of all brainstem functions and creates a critical care challenge for nurses working in neurosurgery intensive care units (Neuro-ICU). This programme aimed to equip nurses with the competency to identify potential BSD patients, enhance nurses' knowledge and skills of clinical examination for BSD, and prepare nurses for the care of patients with BSD.
Methods: A training programme was conducted for 20 Neuro-ICU nurses from 22 May to 30 July 2024. Participants completed a pre-test with 13 multiple-choice questions, followed by a 30-minute face-to-face training session. Four weeks later, a post-test assessed knowledge retention. The total scores for each participant were calculated out of 13. The mean scores of the pre-test and post-test were calculated to determine the average knowledge level of participants before and after the training.
Results: The results showed that the mean pre-test scores of 8.61 out of 13 improved to 11.22 out of 13 post-test across diagnosis, clinical tests, and ancillary tests of BSD. The correction rate for 'Diagnostic Criteria and Definitions' increased from 64.8% pre-test to 78.3% post-test. For 'Cranial Nerves and Reflexes', the correction rate improved from 68.3% pre-test to 92.1% post-test. The most significant improvement was observed in 'Clinical Procedures and Confirmatory Tests', which increased from 60.7% pre-test to 94.7% post-test.
Conclusion: The training programme significantly improved the nurses' understanding and competency in diagnosing BSD, particularly in clinical procedures and confirmatory tests.

N6

Performing nursing audit on management of patients with intracranial pressure monitoring in seven neurosurgical centres of Hospital Authority

Nobel CK Hung[1], KL Man[2], MS Boo[3], CK Chan[4], SW Chau[5], Priscilla MP Choi[2], MK Chu[6], Like WM Wong[1], MY Chang[2], HW Cheng[7], HY Ho[4], KW Lam[3], WS Lau[6], KY Lo[7], SW Lee[1], ML Ng[5], Monica YY So[4], KY To[5], WM Wu[3]
[1] Department of Neurosurgery, Prince of Wales Hospital, Hong Kong SAR, China
[2] Department of Neurosurgery, Queen Elizabeth Hospital, Hong Kong SAR, China
[3] Department of Neurosurgery, Queen Mary Hospital, Hong Kong SAR, China
[4] Department of Neurosurgery, Tuen Mun Hospital, Hong Kong SAR, China
[5] Department of Neurosurgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China
[6] Department of Neurosurgery, Princess Margret Hospital, Hong Kong SAR, China
[7] Department of Neurosurgery, Kwong Wah Hospital, Hong Kong SAR, China

Objective: To evaluate the standard of nursing practice in management of patient with intracranial pressure monitoring in seven neurosurgical centres of Hospital Authority and identifying areas for improvement.
Methods: This was a clinical nursing audit based on the Advanced Nursing Standard developed by the neurosurgery subgroup of the Specialty Advisory Group of Surgery and Neurosurgery of Hospital Authority, conducted from September 2023 to December 2023. A convenience sampling method was used to collect ten samples from each neurosurgical centre. A total of 70 samples were collected from clinical areas during the audit period.
Results: The overall compliance rate was 99.6%. Compliance rate of the critical items was 100%. For the non-critical standard criteria, the average compliance rate was 99.35%. Individual participant compliance ranged from 94.4% to 100%. Major findings include a need to strengthen areas in setting up alarm limit, explaining the procedures and complication to patient, and documentation of pain and discomfort of patient.
Conclusion: Strengths and weaknesses on current nursing practice in management of patient with intracranial pressure monitoring were identified. It facilitates in guiding the recommendation and improvement work in nursing care in future.

AUTHOR INDEX