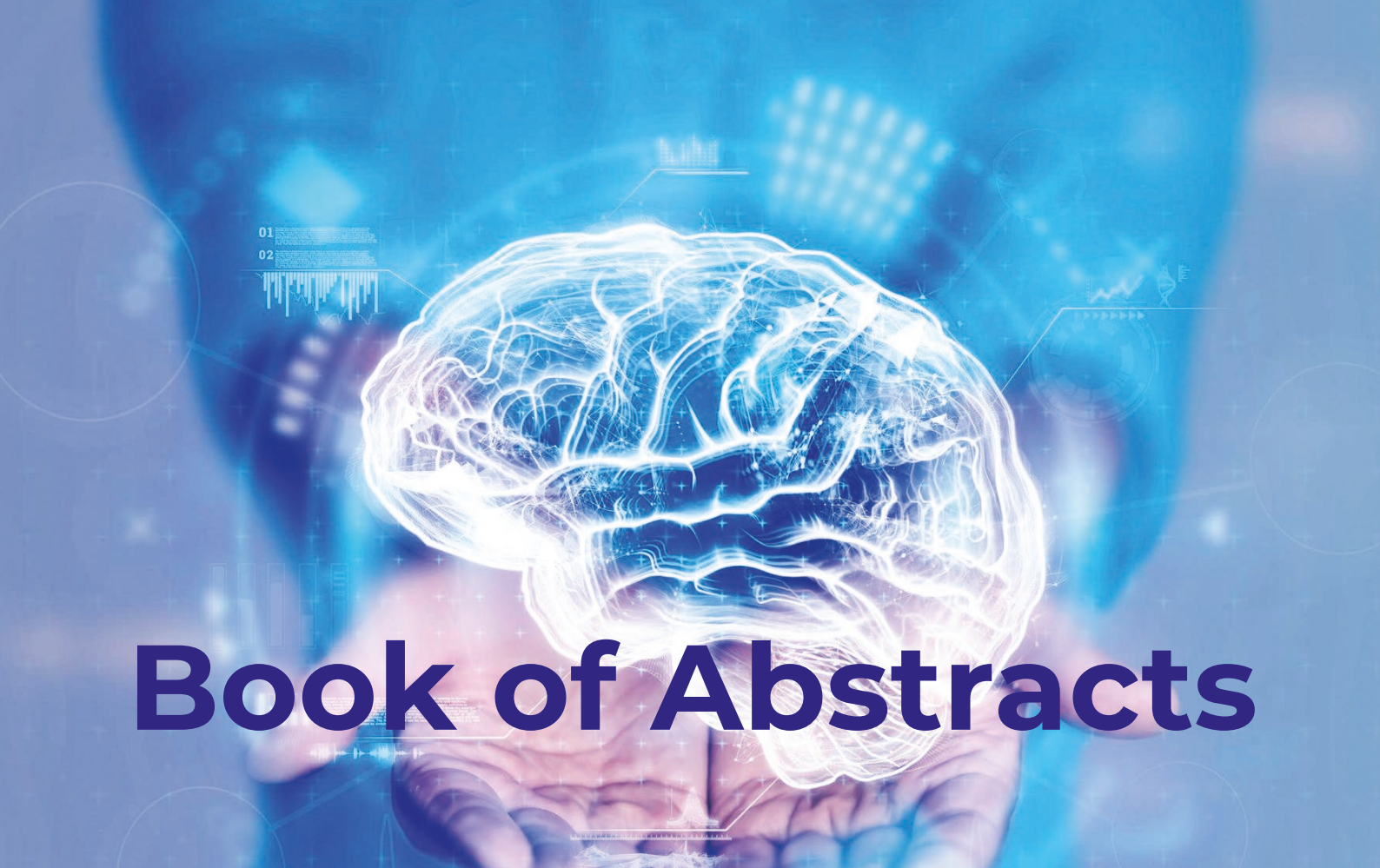




Book of Abstracts

THE ANNUAL CONGRESS OF THE CZECH NEUROSURGICAL SOCIETY

& Joint Meeting with the Polish Society of Neurosurgeons

5 – 7 November 2025

Clarion Congress
Hotel Ostrava



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Physicians' section

Vascular neurosurgery I

REMOTE ISCHEMIC PRECONDITIONING FOR UNRUPTURED INTRACRANIAL ANEURYSM TREATMENT (RIPAT): A PROSPECTIVE, RANDOMIZED, CONTROLLED TRIAL

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Background: Remote ischemic preconditioning (RIPC) has been investigated for its neuroprotective effect in cardio- and cerebro-vascular diseases. Both microsurgical and endovascular therapy of unruptured intracranial aneurysms (UIA) bear relevant threats for procedure-related ischemia. We evaluated a effect of pre-procedural RIPC in patients undergoing elective treatment of UIA on the development of cerebral ischemia and clinical outcome.

Methods: Forty-eight consecutive patients admitted to a tertiary referral neurovascular center with one or more intracranial aneurysms indicated for treatment were randomized 1:1 into two study arms. Group RIPC underwent 3 successive cycles of RIPC for 5 minutes prior to aneurysm treatment, whereas Group Sham served as control. All patients were screened for new cerebral ischemia by magnetic resonance imaging (MRI) within 48h after the intervention and at 6 and 12 months follow-up. Clinical outcome was assessed at 6 and 12 months follow-up using the modified Rankin Score (mRS) and the National Institutes of Health Stroke Score (NIHSS).

Results: Randomized patients demonstrated comparability in all demographics, vascular risk factors, aneurysm localization and initial mRS. Post-treatment MRI detected new ischemic lesions regardless of the size and related symptoms in 46% (11/24) and 29% (7/24) patients in the intervention and sham group, respectively (Chi2, P=0.23). All remained clinically silent. No significant differences were found regarding the mRS and NIHSS scores between the groups at 6-/12-months follow-up (Mann Whitney U, P>0.2).

Conclusion: We found no effect of RIPC in the pre-treatment of UIA. Being possibly underpowered, our monocentric study yet reinsures the necessity of investigation with larger cohorts and provides planning information for sample size calculation and feasibility.

UNRUPTURED INTRACRANIAL ANEURYSM WALL MOTION IMAGING WITH ECG-GATED 4D CTA AND EVALUATION: A TECHNICAL PERSPECTIVE

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Prediction of unruptured intracranial aneurysms (UIAs) rupture remains a pressing clinical challenge. Conventional risk factors used in current clinical practice have notable limitations. Wall pulsation of the aneurysm sac, reflecting compromised biomechanical integrity, has emerged as a promising surrogate marker of rupture risk. Given that most UIAs measure less than 10 mm, the anticipated pulsation amplitude is expected to be below 1 mm. This places high demands on both spatial and temporal resolution, which are optimally met by four-dimensional computed tomography angiography (4D CTA).

This pilot study presents data from a cohort of 10 patients with unruptured intracranial aneurysms. We describe the image processing workflow, including segmentation of the aneurysm sac and adjacent vessels, and analyse the dynamic behaviour of geometric risk factors, throughout the cardiac cycle. The work highlights current limitations of 4D CTA in that context and discusses its potential role in future rupture risk stratification strategies.

FACTORS INFLUENCING THE CHOICE OF SURGICAL APPROACH FOR UNRUPTURED ANTERIOR COMMUNICATING ARTERY ANEURYSMS

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Introduction: The choice of surgical approach for unruptured anterior communicating artery (ACoA) aneurysms is influenced by complex vascular morphology, aneurysm orientation, and arterial dominance. This study aimed to analyze a cohort of surgically treated patients, describe the distribution of anatomical characteristics and surgical approaches, and evaluate the relationship between these factors and radiological and clinical outcomes.

Methods: We retrospectively reviewed 100 patients who underwent surgery for unruptured ACoA aneurysms between 2012 and 2025. Data collected included demographics, aneurysm size and orientation, coronal and horizontal rotation of the ACoA, side of approach, postoperative hypodensity on CT, and changes in the modified Rankin Scale (mRS). Statistical significance was assessed using Fisher's exact test.

Results: The cohort comprised 49 women and 51 men, mean age 56.1 ± 11.8 years (range 28–77). Aneurysm orientation was anterior in 53%, superior in 22%, posterior in 18%, and inferior in 7%. Coronal rotation was present in 47%, horizontal rotation in 15%. A1 dominance was left in 43%, right in 26%, and absent in 31%. Most aneurysms (88%) measured ≤ 10 mm, with 12% > 10 mm. A right-sided approach was used in 51%, left-sided in 43%, and interhemispheric in 6%. The primary determinants of approach side were coronal rotation, aneurysm orientation, and A1 dominance. Postoperative hypodensity occurred in 8% (symptomatic in 4%). mRS deterioration ≥ 1 occurred in 4% of patients and were of higher age (68.8 vs. 55.2 years, $p = 0.034$) and had posteriorly oriented aneurysms ($p = 0.021$). There was no significant association of hypodensity or mRS deterioration with aneurysm size, ACoA rotation, or side of approach relative to rotation or A1 dominance.

Conclusion: In unruptured ACoA aneurysms, the choice of approach side is strongly influenced by coronal rotation and aneurysm orientation. Posterior orientation and advanced age are associated with a higher risk of postoperative complications and should prompt consideration of alternative treatment strategies.

SUBARACHNOID CISTERN IRRIGATION WITH INTRATHECAL NIMODIPINE FOR THE PREVENTION OF DELAYED CEREBRAL ISCHEMIA FOLLOWING ANEURYSMAL SUBARACHNOID HEMORRHAGE

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Objectives: The aim of this study is to evaluate the efficacy and safety of using the IRRFlow® catheter for active irrigation with simultaneous intrathecal administration of nimodipine into subarachnoid cisterns to prevent vasospasm and delayed cerebral ischemia (DCI) in patients with aneurysmal subarachnoid hemorrhage (aSAH).

Methods: This study examined patients over 18 years old with aSAH who were treated with a clip between November 2023 and January 2025 and had an initial Hunt-Hess score of 1–4. After clipping the aneurysm, the maximum available volume of blood was drained from the subarachnoid space by irrigating it with saline. An IRRFlow® catheter was then implanted in the Sylvian cistern and continuously irrigated with a nimodipine solution at a concentration of 0.01 mg/mL diluted in Ringer's solution for 72 hours. Cerebral blood flow velocity was measured daily by transcranial Doppler during the first two weeks.

Results: Ten patients with aSAH underwent IRRFlow® catheter placement. Three patients (30%) were excluded due to the unexpected extraction of the catheter. The initial Hunt-Hess scale ranged from 1 to 4, and the NIHSS score ranged from 0 to 12. No new ischemia was detected on follow-up MRI/CT scans three weeks after aSAH in any patient. Three patients (43%) required temporary cerebrospinal fluid (CSF) drainage (external ventricular drainage, lumbar drainage, or lumbar puncture), and one patient (14%) underwent ventriculoperitoneal shunt placement. One patient (14%) underwent intra-arterial chemical vasodilation. One patient (14%) had a cerebrospinal fluid infection. At discharge, the NIHSS score was 0 for all patients. All patients achieved functional independence (mRS 0–2) three months after aSAH.

Conclusions: Subarachnoid cistern irrigation with intrathecal nimodipine appears to be a safe and effective method for preventing DCI in patients after aSAH. Further prospective studies are needed to confirm these preliminary results.

THE EFFECT OF NONSTEROIDAL ANTI-INFLAMMATORY DRUGS ON THE OUTCOME AFTER ANEURYSMAL SUBARACHNOID HEMORRHAGE – PRESENTATION OF THE PARISAH STUDY

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Aneurysmal subarachnoid hemorrhage (aSAH) constitutes 5% of all strokes and represents a significant clinical condition with an uncertain prognosis. Approximately fifty percent of patients with aSAH are younger than 55 years of age, and one-third die within the first days to weeks following the hemorrhage. The majority of survivors, however, experience long-term neurological or cognitive impairments. Despite advances in medical science, pharmacotherapy, combined with surgical or endovascular interventions to address the source of bleeding, mainly focuses on using calcium channel blockers with neuroprotective properties (e.g., nimodipine) and analgesics. Certain analgesics, particularly nonsteroidal anti-inflammatory drugs (NSAIDs), not only provide analgesic relief but also influence various pathophysiological cascades after aSAH. Some analgesics, for instance, have demonstrated a positive impact on clinical outcomes after aSAH, especially in animal models. Nevertheless, clinical studies that support these experimental findings and provide guidance for everyday clinical practice remain limited.

In our retrospective, single-center cohort study involving 192 patients with aSAH, we observed that the administration of metamizole may be correlated with improved outcomes and a reduced likelihood of delayed cerebral ischemia development in post-aSAH patients. Due to the retrospective design of our research, the findings do not establish a definitive advantage of NSAIDs use but rather highlight the necessity for subsequent prospective investigations. The presentation will outline the design of the randomized, placebo-controlled, double-blind, multicenter clinical trial PARISAH, which aims to evaluate the safety and efficacy of parecoxib in hospitalized aSAH patients.

END-TO-END RECONSTRUCTION IN CEREBRAL ANEURYSM SURGERY

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Fusiform and complex cerebral aneurysms remain among the most technically demanding pathologies in cerebrovascular surgery. While saccular aneurysms are often effectively managed with clipping or endovascular techniques, fusiform lesions—particularly in distal cerebral arteries—frequently fall outside the reach of these modalities due to their morphology, location, and small vessel caliber. Flow diversion devices, though transformative for many aneurysm types, are not always suitable in distal branches or in vessels with complex angioarchitecture, where endovascular access itself may be prohibitive. In such cases, direct microsurgical reconstruction represents a definitive therapeutic option.

End-to-end reconstructions of cerebral arteries across different vascular territories illustrate the potential of this technique in situations where alternative approaches are insufficient. Critical considerations include the relevant anatomy of arterial segments amenable to reconstruction, strategies for achieving tension-free anastomosis, optimal suturing methods, and measures to minimize temporary occlusion time and ischemic risk. Historical and contemporary experiences with end-to-end microanastomosis demonstrate the evolution of this approach from early pioneering attempts to its role in modern practice.

A range of other microsurgical strategies has also been applied to fusiform aneurysms, including clip reconstruction, wrapping, parent vessel sacrifice with or without bypass, and interposition grafts. Each method carries distinct technical principles, anatomical requirements, and limitations that influence their applicability in different scenarios. End-to-end anastomosis adds to this armamentarium by offering a reconstructive option in select cases. Proficiency in advanced microsurgical techniques remains essential for managing complex vascular lesions that are not readily addressed by standard approaches.

USING OF 3D PRINTING AND IT TECHNOLOGIES IN BRAIN ANEURYSM SURGERY - OUR EXPERIENCE

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The study aimed to develop simulation models of intracranial aneurysms and parent vessels through 3D printing technology. The original 3D-DSA/CTA image data were extracted through the communication system (3D Slicer) and after reconstructing were printed using 3D devices - Fused Deposition Modeling (FDM). 3D printing simulation models can perfectly reveal target aneurysms and help neurosurgeons select therapeutic strategies precisely. As an educational tool, the 3D aneurysm vascular simulation model is useful for training residents.

Vascular neurosurgery II

STROKE CARE ORGANIZATION IN THE CZECH REPUBLIC

Michal Bar, Aleš Tomek

Czech Stroke Society

Stroke centres are specialized workplaces that provide comprehensive care for patients with stroke. There are currently 32 primary stroke centres (SC) and 13 comprehensive cerebrovascular centres (CCC) in operation in the Czech Republic. Since 2010, stroke centre status has been granted based on accreditation by the Ministry of Health. Centres must meet personnel, material, and technical conditions set by the Ministry of Health Decree. The stroke network is currently being reaccredited for the period 2026-2031.

Based on pre-hospital triage, primary stroke centres hospitalize acute patients with suspected stroke within 48 hours of the event. In primary stroke centre patients are treated with systemic thrombolysis. In primary stroke centres etiology of stroke is diagnosed and they provide also secondary preventive therapy and acute inpatient rehabilitation. In addition, comprehensive stroke centres perform radiological interventional procedures and vascular neurosurgical operations. All centres must monitor quality indicators and report their values to the Ministry of Health. In total, there are 22 indicators from the field of neurology and rehabilitation for SC and 27 indicators including radiological and neurosurgical for Comprehensive centres. For example, these are the following indicators: Number of patients hospitalized in CCC/SC for the main diagnosis of stroke. Standardized 5, 30 and 90-day mortality of patients with the main diagnosis of stroke. Proportion of patients with the main diagnosis of stroke hospitalized in the stroke intensive care unit. Proportion of patients with the diagnosis of ischemic stroke who received intravenous thrombolysis. Median door to needle time (DNT) time in patients with the diagnosis of ischemic stroke who received intravenous thrombolysis. Proportion of patients with the diagnosis of ischemic stroke who received mechanical recanalization of cerebral arteries. Timely performance of CEA for symptomatic stenosis within 2 weeks of ischemic stroke. Proportion of neurosurgical invasive interventions in patients hospitalized with a diagnosis of I61.

In some parameters, for example, the number of systemic thrombolysis, or the door to needle time the Czech Republic is among the top 3 countries in the EU. The lecture will also present the results of the quality indicators of stroke centres for 2024.

BRAIN CIRCULATION AFTER BYPASS SURGERY - BLOOD FLOW PREDICTION BASED ON 3D MATHEMATICAL MODELLING

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Optimal brain function heavily depends on its blood supply. Reduced blood flow and vascular permeability can lead to brain hypoperfusion and, ultimately, stroke. To develop effective treatment plans, preoperative diagnostic tools are employed; however, uncertainty remains in all preoperative diagnostic protocols. Dedicated mathematical modelling can provide a platform to predict the outcomes of theoretical changes within the examined structure. We present the development of a mathematical brain circulation model to evaluate blood flow. Our findings suggest that high accuracy—achieved by including the entire brain vascular network and its fourth-stage branches—is essential.

Subsequently, we assessed the theoretical outcomes of various treatment strategies using a case study of a patient with impaired brain blood flow due to two separate arterial stenoses. We observed that the progression of stenoses had a greater impact on brain circulation when involving interhemispheric connections compared to progression in the internal carotid artery. Additionally, reactive hypertension was tolerable only in the least severe scenario. Bypass surgery improved brain flow, with different blood distributions depending on whether it was placed in proximal or distal part of middle cerebral artery; meanwhile, it reactively decreased flow in stenotic vessels. Our model may serve as a platform to assist in planning an optimal treatment strategy, reducing the risk of hypo- and hyperperfusion.

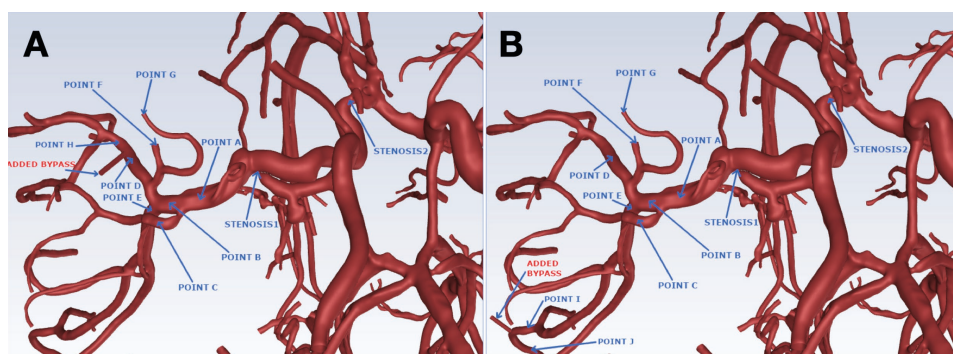


Fig 1. Location of two theoretical by-passes.

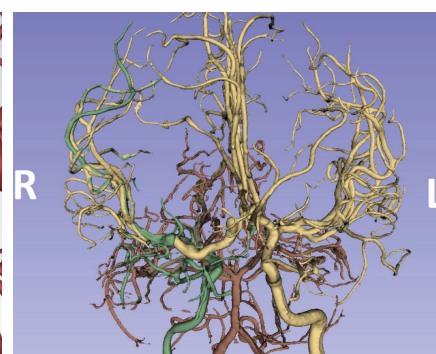


Fig 2. 3D model of brain circulation.

WE CONSIDER UTILIZING NEAR-INFRARED SPECTROSCOPY DURING CAROTID ENDARTERECTOMY VERY USEFUL DESPITE CURRENT RECOMMENDATIONS IN GUIDELINES

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Introduction: Near-infrared spectroscopy (NIRS) is a potential diagnostic tool for selective use of a shunt during carotid endarterectomy (CEA) utilized in several clinical trials. Current guidelines advise against use in clinical practise. We present our experience with using NIRS during CEA under local anesthesia (LA) and general anesthesia (GA).

Methods: We utilized NIRS in 203 patients during CEA between November 2016 and June 2025. During the first 3 years we established cut off values in a study on patients operated for carotid stenosis (CS) during local anesthesia. After that we utilized NIRS in 78 mostly high-risk patients operated for CS during GA.

Results: One hundred five patients (85%) were stable throughout the CEA, while 20 patients (15%) clinically deteriorated during surgery. The mean drop in the NIRS after selective internal carotid artery (ICA) clamping in clinically stable patients was 6%, while in patients with clinical deterioration, the NIRS decreased by 14.5% ($p < 0.05$). When the cutoff value for selective shunting was set as a 10% decrease of the ipsilateral CO after selective ICA clamping, the sensitivity of the technique was 100% and the specificity 83.0%. In patients operated under GA we applied selective shunting using the 10% decrease. In the patients operated under GA we utilized a shunt in 28.2% of patients. In those without shunting we observed new hypoperfusion type of diffusion-weighted imaging (DWI) changes on MRI in 2 patients, in both of which the reasons for hypoperfusion most probably resulted from other causes. Bilateral NIRS monitoring allowed differentiation between global and local cause of hypoperfusion.

Conclusion: NIRS is especially useful for selective shunting during CEA in GA. Selective ICA cross-clamping is required to obtain reliable data, which may not be reflected in current guidelines leading to different conclusions. Further, bilateral NIRS monitoring differentiates between focal or global hypoperfusion.

INTRAOPERATIVE IMAGING IN CEREBROVASCULAR SURGERY – WHAT ARE THE BENEFITS AND PITFALLS?

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Introduction: Intraoperative imaging modalities help to optimize safety and outcomes in the surgical management of cerebrovascular lesions. The aim is to present the clinical applications of various intraoperative imaging modalities in vascular neurosurgery, and highlight key considerations for their use. Additionally, new own unpublished data on intraoperative 3D ultrasound power-Doppler will be presented.

Methods: The current literature on intraoperative imaging in cerebrovascular neurosurgery was reviewed and analyzed. The benefits and pitfalls of individual intraoperative imaging modalities were identified, and the most important information was summarized.

Results: Based on current literature, intraoperative Digital Subtraction Angiography (iDSA) remains the gold standard for vascular imaging, especially in aneurysm and arteriovenous malformation (AVM) surgery. It provides high-resolution, dynamic images of vessel anatomy and flow, allowing detection of residual lesions or compromised parent vessels. However, workflow integration requires coordination with endovascular teams and attention to radiation safety. Another drawback is high cost.

Indocyanine Green Video Angiography offers rapid, real-time visualization of blood flow and vessel patency within the exposed surgical field. It is especially valuable in aneurysm and bypass procedures, less valuable AVM. Limitations include inability to visualize vessels outside the field and reduced efficacy in deep or obscured areas. Advanced techniques such as Flow 800 color mapping can enhance visualization of flow dynamics.

Intraoperative Computed Tomography (iCT) is valuable for rapid assessment of hematoma evacuation, clip position, and vessel patency, with high sensitivity for acute bleeding. Limitations include radiation exposure, artifacts from metallic implants and high costs.

Although the benefits of intraoperative Magnetic Resonance Imaging have been reported in the literature, after reviewing the available data we consider its actual impact during most cerebrovascular procedures to be less significant than that of iCT or iDSA.

Intraoperative ultrasound provides real-time, noninvasive imaging of vessels and parenchyma, aiding navigation and assessment of hematoma evacuation. Doppler and 3D ultrasound can further delineate vascular structures. The technique is operator-dependent, and image interpretation, especially using 2D ultrasound, requires experience. Based on own experience, intraoperative ultrasound may help to visualize aneurysm dome and neck in their actual position and accurately localize them using navigation pointer, which we find particularly useful in cases with a large brain-shift caused by hematoma evacuation and/or in cases with extensive adhesions/scars after previous (subclinical) bleeding. Orientation during distal approach to middle cerebral artery aneurysms through the blood-filled Sylvian fissure also appears to be facilitated by the use of 3D ultrasound.

Although the potential benefits of new imaging techniques such as Laser Speckle Contrast Imaging appear to be significant, further research is needed to confirm their true value.

Noninvasive methods of intraoperative blood flow assessment such as a qualitative Microvascular Doppler ultrasonography or quantitative Ultrasonic flowmetry represent additional adjunct that can augment the findings of intraoperative imaging methods.

Conclusion: Although intraoperative imaging methods can be a valuable aid in various cerebrovascular procedures, no imaging modality is superior in every regard. The selection of appropriate imaging methods should ideally be made on a case-by-case basis.

This work was supported by a grant from the Slovak Agency for Research and Development (APVV; grant no. 23-0577).

CLINICAL AND RADIOLOGICAL ANALYSIS OF DURAL ARTERIOVENOUS FISTULA: A SINGLE-CENTRE EXPERIENCE

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Background: The essence of a dural arteriovenous fistula (DAVF) is a direct connection between an artery and a vein of the dura mater. The clinical presentation varies according to the shunt flow and venous drainage pattern, ranging from asymptomatic cases to severe stroke. Here, we aimed to characterise the clinical, angiographic, and therapeutic features of DAVFs treated in our centre between 2014 and 2024.

Methods: We retrospectively reviewed the medical records of 18 patients diagnosed with DAVF. Clinical presentation, angiographic characteristics, treatment modalities, and lesion classification according to Cognard and Borden systems were analysed.

Results: There were 10 (55.6%) males. The median age was 61 (IQR: 55.5–68.3) years. Acute manifestations, including intracerebral haemorrhage (ICH), subarachnoid haemorrhage (SAH), or seizure, occurred in 6 patients (33.3%). Chronic symptoms (e.g., oculomotor disturbances, ptosis, headache, pulsatile tinnitus, or balance disorders) were observed in the remaining cases.

DAVFs were located mainly in the temporo-occipital region (n = 6). Most lesions were supplied predominantly by branches of the external carotid artery (n = 15). Venous drainage involved the superior sagittal sinus (n = 9). According to the Cognard classification, there were type I (n = 7), IIa (n = 1), IIb (n = 3), IIa+b (n = 1), III (n = 2), and IV (n = 4) lesions. According to the Borden classification, types I (n = 7), II (n = 5), and III (n = 6) were observed.

Three patients declined treatment. Endovascular embolisation was attempted in 13 cases, while 2 patients underwent primary surgery. Three embolisation attempts failed; two of these patients subsequently underwent surgery, while one is under observation. In 4 cases with embolisation difficulties (≥ 4 procedures and/or the need for surgery), the lesions were located in the posterior fossa or parieto-occipital region, supplied by multiple arterial feeders, and drained into the superior sagittal sinus or torcular Herophili.

Conclusions: DAVFs present with a broad spectrum of clinical manifestations. Endovascular embolisation is effective in most cases, although complex lesions may require multiple sessions or surgical intervention.

MICROSURGICAL TREATMENT OF DURAL ARTERIOVENOUS FISTULAS, OUR EXPERIENCE IN UNIVERSITY HOSPITAL BRNO

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Introduction: Dural arteriovenous cerebrovascular malformations (dAVFs) are a rare subgroup of cerebrovascular malformations defined by direct connection(s) between the meningeal arteries and dural venous sinuses or leptomeningeal veins without a true nidus of the malformation. Fistula is often multiple located within dura mater or in the wall of a venous sinus. The treatment of these lesions is challenging.

Material and Methods: The patients treated between 2008-2024 at the University Hospital Brno, retrospective study. We assessed all the patients that were treated for dural AV malformation and specifically selected those treated surgically. We reviewed our surgical experience.

Results: Among cranial dAVFs, four cases of frontal (ethmoidal) dural arteriovenous fistulas. In these cases, the surgical treatment was straightforward and effective treatment, solving permanently the problem without additional costs and most importantly with very good functional outcome. The search through the literature was done to review other current surgical options in a variety of locations.

Conclusions: Endovascular treatment is an effective method in the majority of cases with cranial DAVFs, however surgery can play a crucial role in treating some selected cases, especially in ethmoidal cranial DAVFs. When used appropriately, the patients can benefit from surgical treatment without any need for retreatment.

Supported by Ministry of Health, Czech Republic - conceptual development of research organization (FNBr, 65269705)

Pediatric neurosurgery

TECTAL GLIOMA IN CHILDREN – WHAT IS THE OPTIMAL TREATMENT STRATEGY?

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Tectal gliomas are a rare subgroup of paediatric brainstem tumours, typically presenting with obstructive hydrocephalus rather than focal deficits. Their course is usually indolent, but their midbrain location makes radical resection unsafe. Initial treatment therefore centres on cerebrospinal fluid diversion, with endoscopic third ventriculostomy now preferred over shunting. The key clinical challenge lies in distinguishing stable lesions from those at risk of progression.

We analysed 34 patients treated in Katowice alongside published series (355 cases, 2000–2020). In our cohort, no patient died, but tumour progression occurred in 44%, with a mean time to progression of 30 months. Histology showed that tectal gliomas are heterogeneous: about half were pilocytic astrocytomas (WHO grade I), while the remainder demonstrated anaplastic features (WHO grades III–IV). Predictors of progression in our material included tumour area $>3\text{ cm}^2$ and contrast enhancement ($p<0.05$). These findings are consistent with larger series, which also identify volume $>5\text{ cm}^3$ and cystic changes as negative prognostic factors. Reported survival remains favourable, with 5-year OS of 100% and 10-year OS of 83.9%, although long-term progression-free survival falls below 50%.

For progressive tumours, available options include biopsy with molecular testing, radiotherapy, chemotherapy, or multimodal strategies. Observation is appropriate for small, non-enhancing lesions, whereas larger or enhancing tumours require closer follow-up and, in selected cases, histological confirmation. Importantly, pure aqueductal tumours may behave more aggressively and warrant a different approach.

The optimal strategy is therefore stepwise: safe CSF diversion, risk-adapted surveillance, and timely intervention when progression occurs. Incorporating histopathology and molecular markers, including MAPK pathway alterations, will be critical to refine risk stratification and develop precision-based therapies for this rare but clinically significant entity.

PEDIATRIC THALAMIC INCIDENTALOMAS: CHARACTERISTICS, DEVELOPMENT, MANAGEMENT AND PROGNOSTIC FACTORS FOR PROGRESSION.

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Objective: Due to widespread use of modern neuroimaging, incidentaloma findings in children are more frequent. Incidentaloma thalamic location presents a unique challenge due to its deep location, proximity to eloquent structures and non-negligible surgical risks. Identifying features predictive of growth could help inform clinical decisions regarding surveillance and potential intervention.

Material and Methods: Patients were retrospectively identified by keyword (thalamus, thalamic) search from MRI reports (2005–2024). Inclusion criteria were: age less than 19 years; thalamic location of the lesion; no symptoms attributable to the lesion; no known cancer predisposing syndrome. Following inclusion, the following data were collected: patient demography, reason for imaging, symptomatology, radiological characteristics, management strategy and changes observed during follow-up.

Results: In total, 44 patients (26 boys and 18 girls) with 46 tumors were identified. Age at diagnosis varied from 6 days to 18.4 years (mean 10.7 years). The most common thalamic location was the pulvinar. The mean initial tumor volume was 994.6 mm³ (range 4 mm³ - 7887 mm³). Most lesions (95.6%) were best appreciated on T2 or FLAIR images. No lesion exhibited edema or restricted diffusion. Well-defined borders were identified in 18 (39.1%) cases and 5 (10.8%) lesions exhibited contrast enhancement at any time point. During the follow-up period (mean 51 months) 17 lesions exhibited change in appearance: 9 showed signs of regression (5 in signal intensity, 3 in size, 1 in both) and 9 lesions progressed (5 in size and 4 both in size and contrast enhancement). Three patients underwent biopsy for growth (low-grade gliomas); in two of them targeted molecular therapy led to stabilization, the remaining patients are under observation.

Conclusion: Most pediatric thalamic incidentalomas are small, stable, and likely low-grade. However, approximately one-fifth exhibit progressive features, warranting prolonged surveillance. Larger initial volume, extra-thalamic extension, and contrast enhancement are significant predictors of progression and may justify earlier intervention. Individualized management remains essential, balancing natural history with surgical risk.

EPILEPSY SURGERY IN CHILDREN UNDER THREE YEARS OF AGE

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Background: Children with drug-resistant focal epilepsy who undergo surgery in the first years of life represent a very specific subgroup of candidates for resection surgery. The epileptogenic zone in these children is usually extensive or multifocal, located rather outside the temporal lobes.

Methods: The aim of our work was to comprehensively analyze a group of children with focal structural epilepsy who underwent resection or disconnection epilepsy surgery at the Motol Epilepsy Center before the age of three.

Results: Between 2000 and 2024, a total of 75 resection or disconnection surgeries were performed in this age category on 65 patients. This represents approximately 15% of all procedures, but in recent years there has been a significant increase in the number of these surgeries (in 2024, it was already 25% of procedures). Etiologically, various forms of cortical developmental malformations (MCD - 37 children) and tuberous sclerosis (TSC - 14 cases) predominated; vascular lesions (n=5), brain tumors (n=5), hypothalamic hamartomas (n=2), and Sturge-Weber syndrome (n=2). The first surgical procedure performed was focal or lobar resection (n=34), multilobar resection (n=13), hemispherotomy (n=17), and endoscopic removal of hypothalamic hamartoma (n=1). The most common reoperations were completion of incomplete hemispherotomy (n=5), followed by newly indicated hemispherotomy (n=2), multilobar resection (n=2), and lobar resection (n=1). Ten operations were performed de facto for vital indications due to extremely frequent or life-threatening seizures.

Unexpected complications occurred in 16/75 operations (21.3%), but only 2 patients have permanent neurological deficits as a result of unexpected complications. Expected neurological deficits resulting from the nature of the procedure (i.e., the location and extent of the resection or disconnection; e.g., worsening of previous hemiparesis after hemispherectomy) were recorded after 29/75 procedures (38.7%). 82% of patients followed up for 2 or more years after the (last) procedure have been seizure-free for a long time. Antiseizure treatment was discontinued in 34 children (52.3%).

Conclusion: Our data show a high success rate of epilepsy surgery in the youngest age group of children operated on before the age of 3, which is fully comparable to the success rate of surgery in older children. The importance of early epilepsy surgery in this group of patients is also demonstrated by the high number of life-saving surgeries due to extremely frequent or life-threatening seizures. The growing experience of the Motol Epilepsy Center has led to an increase in the frequency of such early surgeries in recent years.

ENDOSCOPY-ASSISTED CRANIOSYNOSTOSIS SURGERY WITH POSTOPERATIVE MOLDING HELMET THERAPY – EARLY OUTCOME

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Introduction: Endoscopy-Assisted Craniosynostosis Surgery with Postoperative Molding Helmet Therapy (EACS-HT) is one of the most popular techniques for minimally invasive treatment of craniosynostosis (CS). In recent years, due to the high cost of helmet therapy (HT) and limited insurance coverage, EACS-HT was not as popular in Poland as in other developed countries.

Methods: A retrospective analysis of a single-center series involving 29 consecutive patients who underwent EACS-HT from 2022 to 2025 was conducted.

Results: Study population consisted of 29 infants (7 female, 22 male, median age: 4 months). Skull deformations included scaphocephaly (n=14), trigonocephaly (n=8), anterior plagiocephaly (n=4), and brachycephaly (n=3). CT scan revealed sagittal CS in 14, metopic CS in 9, unicoronal CS in 6 and bicoronal CS in 3 cases (2 patients with multiple synostosis). Median cranial index (CI) for scaphocephaly was 69. Surgical procedures included endoscopy-assisted wide vertex craniectomy with 4-barrel stave osteotomies for sagittal CS and strip craniectomy for coronal and metopic CS. In 1 case a cardiorespiratory failure requiring ICU stay occurred after the procedure – patient with severe bronchopulmonary dysplasia. Blood transfusion was necessary for 18 patients. All children were referred to a prosthetics lab, where based on head 3D scan a personalized 3D-printed helmet was ordered. Median HT period was 5 months. Almost all patients used 2 helmets. In 26/29 cases a satisfactory cosmetic effect was noted. In all cases where the result was not good HT therapy was not correctly implemented. Median CI for scaphocephaly after treatment was 79.

Conclusion: EACS-HT is a safe and effective method of treating CS. In our material no children required reoperation. In the study population, HT with 3D printed molding helmets was well tolerated. Larger population and longer follow-up is needed to determine long-term outcomes.

ENDOSCOPIC TREATMENT OF CRANIOSYNOSTOSIS

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Background: Craniosynostosis is caused by the premature fusion of one or more cranial sutures. In the case of craniosynostosis, the growth of the skull is restricted and deformed, which can negatively affect the growth and development of the brain. Currently, endoscopic method with subsequent remodeling treatment with cranial orthosis is increasingly used in the surgical treatment of craniosynostosis. The aim of the work is to assess the complications of endoscopic treatment of craniosynostosis.

Methods: The group of patients consists of pediatric patients who underwent endoscopic surgery for craniosynostosis in the time period of years 2018 - 2024. The total number of patients is 100 (60 boys, 40 girls). Distribution of the group according to the type of craniosynostosis: sagittal 40 (28 boys, 12 girls), metopic 43 (26 boys, 17 girls), lambdoid 1 boy, coronary unilateral 7 (1 boy, 6 girls), coronary bilateral 4 (1 boy, 3 girls), metopic + sagittal: 4 (3 boys, 1 girl), coronary bilateral + metopic: 1 girl. The average age at the time of surgery was 6,4 months (2,5-10,1 months).

Results: We found the following complications: 7 cases - intraoperative lesion of the dura mater: in 4 cases the lesion was treated with a dura suture without further complications, in 3 cases a revision operation was performed (liquorrhea occurred in 2 patients, 1 patient has growing bone defect). No tense hematoma in the wound was recorded that would require surgical revision. One patient developed a postoperative decubitus in frontal region. In our group, we did not find any infectious complication, either superficial or deep.

Conclusions: Endoscopic treatment is a safe, less invasive type of surgical treatment for craniosynostosis in children. The most common complication is a lesion of dura mater, which in most cases can be treated during surgery without the need for reoperation.

VARIABILITY OF KINETIC PARAMETERS OF CEREBROSPINAL FLUID FLOW IN THE AQUEDUCT OF SYLVIVUS IN CHILDREN: A PHASE-CONTRAST MAGNETIC RESONANCE IMAGING STUDY ACROSS DEVELOPMENTAL AGES

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Objective: During brain maturation, the biophysical properties of the central nervous system undergo dynamic modifications. This study aimed to determine whether normal brain development in children without hydrocephalus influences the variability of cerebrospinal fluid (CSF) flow dynamics within the aqueduct of Sylvius.

Methods: We conducted a retrospective analysis of 130 pediatric patients (aged 1–18 years) evaluated at the Department of Neurosurgery between 2013 and 2024 for conditions other than hydrocephalus. Phase-contrast magnetic resonance imaging (PC-MRI) was performed using a Toshiba 3T scanner with Qflow software for quantitative flow assessment. The following CSF flow parameters were analyzed: peak velocity (cm/s), stroke volume (μl), and mean flow rate (ml/min). Patients were stratified into three developmental groups: toddlers (1–2 years), preschool children (3–7 years), and older children (8–18 years). Exclusion criteria comprised prior CNS infection, CNS hemorrhage, ventriculomegaly (FOHR > 0.41), and active hydrocephalus.

Results: Significant age-related variability in aqueductal CSF flow was observed. Mean peak velocity was highest in preschool children (11.55 ± 6.6 cm/s), compared with toddlers (9.5 ± 4.95 cm/s) and older children (7.06 ± 5.6 cm/s). Mean stroke volume was likewise greatest in preschool children (13.9 ± 22.4 μl), relative to toddlers (8.9 ± 12.9 μl) and older children (9.73 ± 11 μl). Mean flow rate followed a similar trend: preschool children (3.1 ± 15.22 ml/min) > toddlers (0.78 ± 0.8 ml/min) and older children (0.96 ± 0.81 ml/min).

Conclusions: PC-MRI demonstrates developmental variability in CSF flow dynamics within the aqueduct of Sylvius in children without hydrocephalus. The most pronounced CSF flow activity was observed in preschool-aged children (3–7 years), suggesting that brain maturation during this period is accompanied by distinct hydrodynamic changes in CSF circulation.

CHIARI MALFORMATION IN CHILDHOOD FROM THE PERSPECTIVE OF A NEUROSURGEON

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The term Chiari malformation encompasses several types of malformations of the hindbrain, which are likely unrelated to one another. It was first described in 1891 by Hans Chiari in four types. Later authors expanded the classification to include additional types (eventually eight in total!). From a neurosurgical perspective, however, we currently recognize only three types of malformation.

Chiari I malformation is described as a descent of the cerebellar tonsils below the level of the foramen magnum. The threshold for descent was set at 6 mm during the first decade of life and 5 mm in subsequent years. Syringomyelia occurs in 30-70% and determines the further division of this defect into two subgroups: 1A (syringomyelia) and 1B (without syringomyelia).

This pathogenetically distinguishes Chiari I malformation from Chiari II malformation, which is a consequence of a neural tube defect (and is associated with lumbosacral meningocele) and from Chiari III malformation, which is related to occipitocervical meningoencephalocele.

Surgical treatment of Chiari malformations II and III, of course, begins with the plastic surgery of the present meningocele. In Chiari I malformation, we indicate only symptomatic patients for surgical treatment; asymptomatic patients are further observed. The essence of the treatment strategy is to increase the volume of the craniocervical junction area by its so-called decompression. The goal of treatment is to restore the physiological circulation of cerebrospinal fluid.

Over the past five years, we have operated on a total of 8 pediatric patients aged from ten days to 14 years for symptomatic Chiari malformation. Seven patients had Chiari I malformation, and in one case, it was Chiari II malformation. All patients recovered without complications after the operation. The patient with Chiari II malformation can walk independently, with a complete sphincter lesion. In one patient, we had to perform ventriculoperitoneal drainage after ten days due to persistent hydrocephalus activity in associated pathology (glioma tecta). In the second patient, it was necessary to supplement syringosubarachnoid drainage after two years due to the recurrence of syringomyelia in a graphically relaxed craniocervical junction. In the other six pediatric patients, relief from the original problems and regression of syringomyelia persisted.

CHIARI MALFORMATION IN PEDIATRIC POPULATION, A SINGLE CENTRE EXPERIENCES

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Introduction: Chiari malformation represents a complex structural and neurological disorder affecting especially the pediatric population. It is characterized by an anatomical abnormality of the posterior fossa, which can lead to various neurological symptoms and complications. The aim of this work is to evaluate current practices in the diagnosis and treatment of pediatric patients with Chiari malformation and to present treatment outcomes from the Department of Pediatric Neurosurgery at FN Brno.

Methods: A retrospective analysis was performed on children diagnosed with Chiari malformation who were treated at our facility between 2015 and 2024 (n=105). Demographic data, clinical manifestations, imaging results, chosen therapeutic approaches, and their impact on long-term outcomes were analyzed.

Results: The study results confirmed the heterogeneity of the clinical presentation of Chiari malformation in children. A special group of children are those asymptomatic and without syringomyelia. The aim of our work was to evaluate the success of conservative and surgical treatments, including complications and the long-term development of neurological deficits.

Conclusion: Our work provides an overview of the current state of diagnosis and treatment of Chiari malformation in children at our facility. The obtained results can contribute to the optimization of therapeutic procedures and the improvement of the quality of life for children with this diagnosis.

Keywords: Chiari malformation, children, diagnosis, treatment, outcomes, neurosurgery.

THE IMPACT OF SURGERY DAY SIMULATION IN VIRTUAL REALITY ON THE PERIOPERATIVE ANXIETY LEVELS IN PEDIATRIC PATIENTS - PRELIMINARY

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Introduction: Previous studies have shown that elevated preoperative anxiety negatively impacts the surgical process—leading to increased anesthetic requirements, a higher risk of perioperative complications, delayed postoperative recovery, a greater need for analgesics, and reduced quality of life. These factors can prolong hospitalization, increase healthcare costs, and reduce overall patient satisfaction. Moreover, heightened anxiety may also affect the psychological well-being of parents or guardians, thereby diminishing their cooperation with medical staff. An effective strategy to reduce preoperative anxiety involves providing clear, comprehensible information about the surgical procedure and the hospital environment. Virtual reality (VR) offers a promising tool in this context by enabling realistic simulation of the day of surgery.

Material and Methods: We are conducting a prospective, randomized study involving children aged 6–18 years scheduled for neurosurgical procedures under general anesthesia. The control group will receive standard preoperative preparation. The intervention group will undergo the same preparation, supplemented by a VR simulation of the operation day using a 360° video, viewed with VR goggles at least one day prior to surgery. Anxiety levels will be measured using the The Revised Children's Manifest Anxiety Scale, Second Edition (RCMAS-2 questionnaire). Compliance during induction of anesthesia will be evaluated using the Induction Compliance Checklist (ICC), behavior during the procedure will be evaluated using the Procedural Behavior Rating Scale - Revised (PBRS-R), and both patient and parent satisfaction will be assessed via questionnaires. Additionally, measurement of salivary cortisol as an objective biomarker of stress at standardized time points is under consideration. Recruitment and data collection will take place from August 2025 to August 2026, with sufficient preliminary data expected by the time of the congress.

Perspective: Based on existing literature on the use of VR for patient education in various medical fields, and the proven benefits of familiarizing patients with the medical environment and procedure, we hypothesize that simulation of the operation day in VR will significantly reduce preoperative anxiety, enhance compliance during anesthesia induction, and improve satisfaction among both patients and parents compared to standard preparation. This approach has the potential to improve perioperative outcomes, enhance the quality of care, and increase overall satisfaction with the healthcare experience.

FORAMEN MAGNUM DECOMPRESSION IN ACHONDROPLASIA: OUR CURRENT APPROACH IN PEDIATRIC NEUROSURGERY

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Achondroplasia is the most common skeletal dysplasia associated with significant craniovertebral junction abnormalities in early childhood. Progressive narrowing of the foramen magnum can lead to cervicomedullary compression, apnea, developmental delay, and, in severe cases, sudden death. Surgical decompression remains the treatment of choice in symptomatic patients or those with a high AFMS grade score.

This presentation summarizes our current experience with foramen magnum decompression in children with achondroplasia. We discuss indications for surgery, imaging criteria, timing of intervention, and technical aspects of the procedure, including suboccipital craniectomy and C1 laminectomy. Special emphasis is placed on intraoperative neuromonitoring and postoperative outcomes.

Our aim is to contribute to the standardization and optimization of surgical care in these patients.

MULTIMODAL SURGICAL APPROACH IN PEDIATRIC SUPER-REFRACTORY STATUS EPILEPTICUS: SELECTIVE AMYGDALOHIPPOCAMPECTOMY, VAGUS NERVE STIMULATION AND ANTERIOR CORPUS CALLOSOTOMY

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Super-refractory status epilepticus (SRSE) is a rare, life-threatening neurological emergency, defined by persistent or recurrent seizure activity exceeding 24 hours despite anesthetic and antiseizure pharmacotherapy. Associated with high morbidity and mortality, its management requires rapid seizure suppression, neuroprotection, and mitigation of excitotoxic injury. Despite emergency epilepsy surgery remains a last resort due to limited evidence, selected procedures such as selective amygdalohippocampectomy (SAH) have shown potential in achieving seizure control, especially in drug-resistant epilepsy (DRE) and selected SRSE cases. This case presents an 8-year-old girl with SRSE on the background of DRE, secondary to encephalopathy in cerebral palsy. The patient exhibited high-frequency (50/day) focal seizures, profound psychomotor impairment, cortical blindness, and bilateral conductive hearing loss. Upon admission, she was in critical condition, unresponsive, with facial clonus, and impaired pupillary reflexes. Neuroimaging and electrophysiology identified an epileptogenic zone within the left mesial temporal lobe, prompting initiation of thiopental coma and neurosurgical intervention. A left-sided SAH was performed, resulting in initial seizure cessation, followed by a single focal recurrence. Two weeks post-discharge, seizure activity reemerged, necessitating implantation of a Vagus Nerve Stimulator (VNS). Subsequent anterior corpus callosotomy was performed in a palliative approach. This trimodal neurosurgical strategy led to seizure remission - Engel II and clinical stabilization. This case underscores the potential of trimodal strategy combining SAH, VNS, and anterior callosotomy in the management of pediatric SRSE. Despite scarce literature supporting such approaches in acute settings, Early identification of surgically amenable epilepsy and timely interventions may have a significant role in relieving patient seizures and improving neurocognitive prognosis.

Neurooncology I

DORSO-MESIOTEMPORAL NEURO-EPITHELIAL TUMORS: TRASCORTICAL APPROACH

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Tumors in the mesiotemporal region belong among the most difficult tumors for surgery. The original extracerebral, Yasargil, transylvian approach allows very good access to the anterior third/half of this region. On the other hand, tumors in the middle and especially dorsal third of this region are difficult to access transylvianly. An alternative option is the transcortical approach, which requires, especially in the left hemisphere, knowledge of the functional “connectome” of the temporal lobe.

We will show our approach, its pitfalls and results in a series of nine patients with dorso-mesiotemporal tumors.

GENERAL RISK AND APPROACH-RELATED RISK OF ISCHEMIC CHANGES AFTER INSULAR GLIOMA RESECTION – A RETROSPECTIVE ANALYSIS

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Introduction: Resection of insular gliomas carries a risk of ischemic changes, which may influence functional outcomes. This study aimed to assess both the overall risk and the approach-related risk of ischemic changes in postoperative imaging, focusing on the type of anesthesia and surgical approach.

Materials and Methods: We retrospectively analyzed 64 patients who underwent surgery for insular gliomas (WHO grade 2–4) between 2020 and 2024 using either a transylvian (24) or transcortical approach (40). Awake craniotomy was performed in 28 cases, while 36 patients underwent surgery under general anesthesia. Postoperative MRI scans were analyzed for ischemic changes in relation to anesthesia type, surgical approach, tumor grade, and preoperative tumor volume.

Results: Ischemic changes were observed in 26 patients (41%), most frequently at the medial margin of the resection cavity (19 patients, 30%). Cortical ischemic changes occurred in 6 patients (9%), while distal ischemic changes beyond the resection cavity were found in 2 patients (3%). The risk of ischemic changes had no statistically significant difference but was more common in patients operated under general anesthesia (awake: 28%; general: 50%; $p = 0.083$). The transylvian approach was associated with a higher ischemic risk (54%) compared to the transcortical approach (32.5%; $p = 0.088$). Medial ischemic changes occurred in 41.6% of patients in the transylvian group and 22.5% in the transcortical group ($p = 0.104$). Cortical changes were comparable between groups (12.5% vs. 7.5%; $p = 0.506$), while distal lesions were rare (one patient per group). The mean ischemic lesion volume was 6.32 cc (medial: 6.01 cc, cortical: 11.76 cc). Tumor grade or preoperative volume also had no significant relation to the risk of postoperative ischemic changes. Neurological deficits requiring rehabilitation were observed in 5 patients (7.8%), of whom 4 (80%) had ischemic changes on MRI: 2 (40%) medial, 2 (40%) cortical, and 1 (20%) distal.

Conclusions: The risk of ischemic changes following insular glioma resection is significant, with a higher incidence in the transylvian approach, particularly for medial ischemic lesions. While not all ischemic changes result in neurological deficits, most persistent postoperative deficits were associated with ischemic changes.

MOLECULAR V.S. HISTOLOGICAL GLIOBLASTOMA: INITIAL DIAGNOSTIC AND CLINICAL EXPERIENCE

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The classification of glioblastoma has evolved significantly with the incorporation of molecular diagnostics, leading to the recognition of „molecular glioblastoma“ as a distinct diagnostic entity. This lecture presents our initial clinical experience with molecular glioblastoma, focusing on its definition, updated classification criteria, and the implications for diagnosis, prognosis, and treatment. In line with the WHO CNS5 classification, glioblastoma is now identified not only by histopathological features but also by specific molecular alterations—such as TERT promoter mutations, EGFR amplification, and combined gain of chromosome 7 and loss of chromosome 10 in IDH-wildtype astrocytic tumors—even in the absence of traditional histological hallmarks like necrosis or microvascular proliferation. We highlight how this refined classification enhances diagnostic accuracy and facilitates earlier identification of high-grade tumors. Through representative cases, we examine the clinical relevance of molecular subtyping and its impact on therapeutic decision-making. This early clinical experience illustrates the growing role of molecular profiling in guiding personalized care for patients with glioblastoma.

DEEP LEARNING IN NEURORADIOLOGY: CURRENT EVIDENCE AND FUTURE DIRECTIONS

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Introduction: Deep learning neural networks (DLNN) support neuroradiology by enabling precise image segmentation and characterization. In this work, we combine a literature review with our study on contrast-enhanced MRI and CT, applying a ‘general-to-specific’ segmentation and human-in-the-loop (HITL) strategies.

Methods: We conducted a scoping review of recent literature on AI in brain tumour imaging, emphasizing MRI applications. In addition, we present our own study, in which we developed a two-stage segmentation pipeline for contrast-enhanced T1-weighted MRI and head CT. Following a “general-to-specific” paradigm, anatomical structures were segmented first, and pathological regions are added in the next step.

Results: The literature review identified rapid growth in AI applications, particularly in glioma grading, molecular marker prediction, and automated volumetric analysis. Our proof-of-concept study demonstrated that sequential anatomical-to-pathological segmentation might improve model interpretability and align with clinical decision-making processes.

Conclusions: AI can enhance neuroimaging by providing reproducible, interpretable, and efficient analyses. Our findings suggest that prioritizing anatomical segmentation before pathology detection provides a more robust and clinically interpretable framework for AI in neuroimaging.

NEOADJUVANT STEREOTACTIC RADIOTHERAPY OF BRAIN METASTASES – PROTOCOL OF A PROSPECTIVE MULTICENTER STUDY

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This multicentre proof-of-concept study, involving 4 centres, aims to establish the value of fractionated NaSRT as a new treatment paradigm for BM in the framework of Czech neurooncology network. Most relevant studies published to date used single fraction radiotherapy and dealt with the inherent bias related to their retrospective nature. We aim to increase the level of evidence for this treatment paradigm together with other similar ongoing studies.

The prospective study will evaluate the efficacy and toxicity of NaSRT in patients with BM. Clinical data gathered will include LC, the incidence of LMD, radiological and clinical signs of RN, overall survival, and incidence of metachronous brain metastases. The MRI characteristics of irradiated and subsequently resected BM will be obtained according to the usual protocol and time intervals specified below. Clinical monitoring will comprise neurological findings, Karnofsky performance status and quality of life (FACT-Br/EORTC QLQ-C30 questionnaire and EORTC QLQ-BN20 questionnaire).

The data obtained from the retrospective control group (estimated for 160 patients) will include the same parameters monitored in the consecutive group of patients who underwent surgery at centres included in our study (with or without adjuvant RT). Formation of this control group corresponding to the NaSRT group will enable the efficacy and risks of NaSRT to be determined in comparison with established treatment modalities.

Secondary experimental outcomes/aims of the study will include tissue processing of the resected BM. To evaluate the effect of NaSRT on the BM we will perform further histopathological and molecular evaluation of the resected BM. In order to capture molecular changes within the microenvironment of the metastatic lesion shortly after the irradiation we will process the native tissue or FFPE tissue samples.

PERIOPERATIVE STRATEGY IN AWAKE BRAIN TUMOR SURGERY

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Awake craniotomies require a coordinated approach involving neurosurgery, anesthesia, and psychology teams. As far as the neurosurgical preoperative strategy is concerned, the advantages of “awake” and “non-awake” surgeries for (1) typical tumor location (Broca's, Wernicke's areas), and (2) less common sites like SMA, M1, and non-dominant insula are discussed on patient examples.

Anesthetic considerations include managing cardiovascular instability, airway obstruction, hypoventilation, and nausea. Relative contraindications are severe obesity, poorly controlled epilepsy, chronic cough, and anticipated difficult intubation.

Psychological preparation involves preoperative evaluation, patient training, and creating a comfortable environment. Intraoperatively, a sleep-awake-sleep approach minimizes patient stress, with relaxed conversation and positive interaction maintained.

The optimal strategy if “awake” or “non-awake” surgery should be preferred depends (a) not only on the location of the tumour, but (b) type of tumor (c) preoperative functionality of nearby eloquent area, (d) expected postop functionality of nearby eloquent area (e) anesthesiological factors and psychological factors should be precisely considered too.

BRAIN GLIOMAS AND RAMAN SPECTROSCOPY

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Introduction: Despite advances in molecular genetics, tumor biology, and new treatment modalities including translational medicine, the treatment of brain gliomas—particularly high-grade glioblastoma multiforme (HGG)—still cannot be considered satisfactory. The gold standard remains maximal safe resection.

Method: After a brief summary of the current state of neuro-oncology for gliomas, the article presents an overview of preoperative diagnostics (MRI, fMRI, MR spectroscopy, FLAIR resection, PET-CT) used for surgical planning, as well as intraoperative safety measures.

This is followed by a review of techniques for tumor boundary identification, including intraoperative MRI and a range of fluorescence and optical methods.

Results: The article reports on the results of Raman Spectroscopy (RS) performed in vitro, in vivo, and directly in the surgical field, as well as experiences with volumetric resection analysis.

Discussion: Due to their diffuse growth, HGGs pose an inherent contradiction when attempting to define tumor margins. Nevertheless, striving for maximal or even supramarginal safe resection remains a cornerstone for improving Kaplan-Meier survival curves.

The authors found that the commonly used ALA blue paradoxically limits intraoperative RS but significantly increases both sensitivity and the extent of resection.

With sufficient multicenter data, RS offers new possibilities for so-called „optical biopsy,” even in the treatment of low-grade gliomas (LGG).

Conclusion: Causal treatment of HGG is unlikely to be found in the operating room but rather in laboratories focused on immunology, cytogenetics, and translational medicine. Safe biopsy or tumor decompression is likely to be the first step toward further treatment. In its current form, RS provides an interesting addition to our surgical armamentarium.

SYSTEMIC THERAPY OF VHL RELATED MULTIPLE INTRAMEDULLARY AND RETINAL HEMANGIOBLASTOMAS BY THE NEW AGENT BELZUTIFAN (WELIREG). MRI AND OCT DOCUMENTED EFFECTS AND RAPID CLINICAL IMPROVEMENT. THE FIRST CASE IN CR.

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Belzutifan (Welireg Merck) is the first systemic drug capable to influence different tumors accompanying VHL gene defect including CNS hemangioblastomas. It is low molecular weight compound for p.o. use. Case: 42 y female with von Hippel-Lindau disease after 3 previous neurosurgical operations (the first in 16 years), LGN radiation of brain stem HBs, partial kidney resection (RCC), enucleation of blind right eye (progress of retinal HBs, later intractable pain due to secondary glaucoma). The main current problem is progress of multiple multi cystic intramedullary HBs out of chance for successful neurosurgical resection. Previous 6 years of antiVEGF therapy (Avastin) lost gradually effect, ataxia and intense pain worsened. But, patient is still in good general condition moving independently, active in her profession. Moreover retinal hemangiomas on her left eye grew but not yet with severe consequences in visual functions. Welireg therapy 120 mg p.o. daily was started in January 2025. Clinical effect came immediately during 5 days: pain related to spinal cord tumors disappeared (she stopped opioids), ataxia diminished, too. MRI findings before start of therapy and after 3, 6 and 10 month will be demonstrated (collapse of cysts, shrinkage of tumors). Effect on eye fundus is seen, too. In relation to therapy is at this moment only mild anemia - not requiring specific care.

Neurooncology II

REMOVAL OF LARGE VESTIBULAR SCHWANNOMAS (VS) BY RETROSIGMOID APPROACH: RESULTS OF A CUMULATIVE SERIES AND CRITICISM OF “PLANNED” PARTIAL RESECTION FOLLOWED BY SRS

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Objective: Evaluate safety and efficacy of removing Samii's grade IV vestibular schwannomas (VS) by retrosigmoid approach (RSA) in a series of patients operated on from 2011 to 2020. On the basis of literary research compare the long-term results after the “planned” partial resection followed by Stereotactic Radiosurgery (SRS).

Methods: Large VS (mean diameter 39,8mm ± 6mm) were excised from 57 consecutive patients by RSA. The strategic goal of the operation was radical resection. Surgical excision consisted of debulking of extrameatal portion, followed by removal of intrameatal part. Last pieces of VS were removed by blunt or sharp dissection. In cases of strong tumor adherence to surrounding structures, a millimetric film remnant of tumor capsule was left, thus yielding a near-total or subtotal resection.

Results: Postoperative mortality was zero. Total or near total (>95%) removal was possible in 41 cases (72%). FN was anatomically preserved in 94,7% and 84,2% of cases had good FN function (House-Brackmann grade I-II) at 6-month follow-up. VP shunt for hydrocephalus was necessary in 5 cases (8,8%).

Discussion: The mean follow-up was 41,8 months, 3 cases showed recurrence or progression of residuals (5%); and one had NF2. We compare a different philosophy “planned” partial surgery followed by SRS, which has appeared in the literature since 2003. However, the longest published median follow-up is only 5 years. Residual volume greater than 6cm³ before radiosurgery had a tumor regrow of 37,7%.

Conclusions: In this series of large VS retrosigmoid approach allowed zero mortality, high rate of functional FN preservation (84,2% HB I-II) and low recurrence rate 5%. The longest published follow-up after planned partial surgery followed by SRS is surprisingly quite short (median 5 years) and shows a regrow in up to 37.7%. There is still a reason to seek a safe radical or near total tumor removal.

TREATMENT OUTCOMES OF CRANIOPHARYNGIOMAS – A SINGLE-CENTER EXPERIENCE

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Introduction: The aim of this study is to present our own experience and treatment algorithm in patients with tumors showing radiological features of craniopharyngioma.

Material and Methods: We analyzed 25 patients operated on during the last 5 years. The group included 11 men and 14 women aged 18 to 72 years (mean age: 49 years). Clinical symptoms, radiological characteristics of the lesions, surgical techniques applied, and treatment outcomes were evaluated.

Results: The most common presenting symptoms were: visual disturbances (16), headaches (7), endocrine disorders (10), including symptoms of diabetes insipidus (7), and cognitive dysfunction (10). In 17 patients (68%) the tumor had a cystic component, and in 2 cases (8%) it was located exclusively within the third ventricle. Surgical treatment included: endoscopic transsphenoidal resection (12), craniotomy resection (7), and insertion of a Rickham catheter into the cystic portion of the tumor (6). In all patients with a catheter, except for 2, reoperation was required due to ineffective drainage during follow-up. In the immediate postoperative period, all patients required hormonal supplementation, and symptoms of diabetes insipidus were observed in 17 of 23 patients (85%). Improvement in vision was noted in 10 out of 16 patients (62.5%). In 2 cases, postoperative hydrocephalus developed, requiring ventriculoperitoneal shunt implantation. During long-term follow-up, 2 patients underwent adjuvant radiotherapy due to tumor progression. One female patient died in the perioperative period as a result of hemorrhage into the tumor bed.

Conclusions: The choice of surgical approach was determined by tumor location—especially its relationship to the third ventricle—as well as tumor size and relation to the optic nerves. Despite the significant risk of endocrine complications, surgical treatment allows for durable improvement in visual function.

IMPACT OF RESECTION EXTENT AND STALK SACRIFICE ON CRANIOPHARYNGIOMA OUTCOMES

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Craniopharyngiomas are benign but challenging tumours with high recurrence risk, where surgical strategy must balance tumour control against hypothalamic–pituitary morbidity. Recent meta-analyses show that gross total resection (GTR) via the endoscopic endonasal approach reduces recurrence more effectively than subtotal resection plus radiotherapy, though often at the cost of pituitary stalk sacrifice and higher endocrine dysfunction.

We systematically searched PubMed, Web of Science, and Scopus for studies on endoscopic endonasal surgery for craniopharyngioma, including data on extent of resection, radiotherapy, stalk management, and recurrence. Extracted data were pooled for meta-analysis of recurrence risk, with heterogeneity and bias tests applied, and Kaplan-Meier curves used when raw survival data were available.

The pooled analysis demonstrated that GTR via the endoscopic endonasal approach was associated with a markedly lower recurrence rate compared with subtotal resection (STR) plus radiotherapy (XRT) (10 vs. 30%). Kaplan-Meier survival curves confirmed longer recurrence-free survival after GTR. In parallel, stalk sacrifice was found to further reduce recurrence risk, including in patients undergoing GTR, but at the cost of significantly higher rates of endocrine dysfunction, particularly panhypopituitarism, diabetes insipidus, and other pituitary hormone deficiencies. Together, these findings highlight the oncological benefit of maximal safe resection while underscoring the trade-off with endocrine morbidity.

GTR via the endoscopic endonasal approach offers better recurrence control than STR+XRT, while stalk sacrifice further lowers recurrence but greatly increases endocrine morbidity. Treatment should balance cure with quality of life.

INTRAOPERATIVE 3T MRI IN PITUITARY ADENOMA AND GLIOMA SURGERY: ONE-YEAR EXPERIENCE

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Introduction: Achieving maximal safe resection is a key predictor of disease control in patients with both pituitary adenomas and gliomas. In pituitary adenomas, complete resection is often limited by the narrow and deep surgical corridor and the complex anatomy of the sellar and suprasellar regions. Residual tumor tissue may be hidden dorsally or laterally to the carotid artery or behind the descending supradiaphragmatic arachnoid membrane, and its visualization is challenging even with endoscopic and exoscopic techniques [1,2].

In gliomas, the primary challenge lies in the infiltrative nature of the tumor extending into surrounding brain tissue, often in close proximity to, or within, eloquent cortical and subcortical areas. Furthermore, intraoperative brain shift may alter the apparent tumor boundaries, complicating assessment of resection extent. Intraoperative magnetic resonance imaging (ioMRI) provides real-time, high-resolution imaging during surgery, enabling improved visualization of residual tumor and its relationship to functionally critical regions [3,4].

Objective: To present our first-year experience with 3-Tesla ioMRI during pituitary adenoma and glioma surgeries, focusing on its impact on surgical decision-making, extent of resection, and procedural safety.

Methods: We retrospectively analyzed 36 patients operated on with 3-Tesla ioMRI between October 2024 and October 2025. Twenty patients had pituitary macroadenomas (17 non-functioning, 2 GH-secreting, 1 prolactinoma) and underwent endoscopically assisted microscopic transsphenoidal surgery. Sixteen patients had gliomas (5 low-grade gliomas, 4 glioblastomas, 2 grade 4 IDH-mutant astrocytomas, 2 recurrent glioblastomas, 3 upgraded low-grade gliomas). ioMRI was combined with awake mapping in 2 glioma patients; motor evoked potentials (MEPs) were used in 3 cases, and cortical-subcortical monopolar motor mapping in 5. Thirteen patients (81%) had tumors in highly eloquent areas; 3 were classified as non-eloquent (anterior cingulate). The ioMRI protocol included native and contrast-enhanced T1-weighted and T2-weighted sequences, fused with intraoperative navigation in all cases.

Results:

- **Pituitary Adenomas:** ioMRI confirmed gross total resection in 10 patients (50%). In 5 patients (25%), additional resection was performed after detecting residual tumor on ioMRI, without complications. In the remaining 5 (25%), residual tumor was intentionally left due to high surgical risk. The mean increase in operative time was 25 minutes. No complications related to ioMRI or re-resection occurred.
- **Gliomas:** In all patients, ioMRI prompted further—mostly minor—resection. Postoperative MRI within 72 hours revealed gross total resection (GTR) in 4 patients (25%), near-total resection (NTR), including cases with questionable residuals, in 9 (56%), and partial resection (PR) in 3 (19%). Volumetric analysis will be used for detailed evaluation. No ioMRI-related complications were observed. The average operative time increased by 35 minutes. No patient experienced postoperative neurological deterioration.

Conclusion:

The introduction of ioMRI in our center enabled intraoperative detection of residual tumor in both pituitary adenomas and gliomas, facilitating safe additional resection in a significant proportion of patients. Although operative time modestly increased, ioMRI enhanced intraoperative decision-making and enabled maximal safe resection without increasing morbidity.

References:

1. Staartjes VE, Togni-Pogliorini A, Stumpo V, et al. Impact of intraoperative magnetic resonance imaging on gross total resection, extent of resection, and residual tumor volume in pituitary surgery: systematic review and meta-analysis. *Pituitary*. 2021;24(5):644–656. DOI: 10.1007/s11102-021-01147-2
2. Palá A, Etzrodt-Walter G, Karpel-Massler G, et al. Characterization of tumor remnants in intraoperative MRI-assisted microscopic and endoscopic transsphenoidal resection of less invasive pituitary adenomas. *Neurosurg Rev*. 2022;45(3):1701–1708. DOI: 10.1007/s10143-021-01705-z
3. Senft C, Bink A, Franz K, et al. Intraoperative MRI guidance and extent of resection in glioma surgery: a randomized, controlled trial. *Lancet Oncol*. 2011;12(11):997–1003. DOI: 10.1016/S1470-2045(11)70196-6
4. Schupper AJ, Yong RL, Hadjipanayis CG. The neurosurgeon's armamentarium for gliomas: an update on intraoperative technologies to improve extent of resection. *J Clin Med*. 2021;10(2):236. doi:10.3390/jcm10020236

SPHENO-ORBITAL MENINGIOMAS – RISK-BENEFIT RATIO OF GROSS TOTAL RESECTION AND PROGNOSTIC FACTORS FOR IMPROVEMENT OF PROPTOSIS AND VISUAL FUNCTION

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Background: Spheno-orbital meningiomas (SOMs) are a unique and complex subgroup of skull base meningiomas. They are characterized by significant hyperostosis of the sphenoid wing and an intradural soft tissue component. Involvement of the orbital compartment causes typical compressive clinical symptoms (proptosis and visual impairment). Gross total resection (GTR) is usually the primary goal of treatment. So far, there is no consensus in the literature regarding the benefits of GTR or the positive prognostic factors associated with the improvement of proptosis and visual function.

Objectives: The aim of our study was to identify favorable prognostic factors associated with the improvement of proptosis and visual function and to assess the risk-benefit of radical resection.

Methods: A retrospective single-center review of thirty-five patients who underwent surgery for SOMs between 2000 and 2024 was performed. Preoperative symptoms, surgical, visual, and proptosis outcomes, along with complications, were evaluated. Potential favorable prognostic factors associated with the improvement of proptosis and visual function, as well as the risks of radical surgery, were analyzed statistically.

Results: All patients underwent surgery through a frontotemporal craniotomy. GTR was achieved in 40%, while sub-total resection (STR) was performed in 60% of cases. Among the 26 patients who had preoperative proptosis, postoperative improvement was observed in 24 (92%). Out of 20 patients with a preoperative visual deficit, 14 (70%) experienced postoperative improvement.

A symptom duration of less than 6 months ($p = 0.002$), opening/resection of the periorbit ($p = 0.0014$), and GTR ($p = 0.009$) were statistically significant factors associated with postoperative normalization of proptosis. No statistically significant factor was detected for improvement in vision. GTR was significantly associated with surgical morbidity ($p < 0.001$).

Conclusions: Surgery for SOMs is a therapeutic challenge. Early GTR, including opening/resection of the periorbit, is associated with proptosis normalization. However, GTR is accompanied by increased surgical morbidity.

This study was funded by the grant of Ministry of Health of the Czech Republic – Conceptual Development of Research Organization (Faculty Hospital in Pilsen – FNPI, 00669806)

PREDICTIVE FACTORS OF FAVORABLE VISUAL OUTCOMES AFTER MICROSURGERY OF TUBERCULUM SELLAE MENINGIOMAS

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Tuberculum sellae meningiomas (TSMs) belong, due to their location, to delicate neurosurgical problems. Because of their proximity to the visual structures, tuberculum sellae meningiomas are frequently revealed by ophthalmologic impairment. The goal of surgery is gross total resection and improvement of visual function. The purpose of the present study was to identify the predictors of favorable visual outcomes after surgery of tuberculum sellae meningioma. TSMs represent 4–10% of all intracranial meningiomas. In typical cases, they originate from the sphenoidal limbus, the chiasmatic sulcus, the tuberculum sellae or the diaphragma. With their suprasellar growth they elevate the chiasm and displace the optic nerves, producing symptoms of compressive optic neuropathy. Their main portion is situated prechiasmatically, but they often extend into the infrachiasmatic space or invade the optic canal. In recent decades, the literature has reported increasing numbers of transnasal operations performed with the use of the endoscope. At our department, the endoscope is used only as an assisting tool during the transcranial (lateral supraorbital) approach, in an effort to locate and remove residual tumor hidden in less accessible parts of the operative field—most often behind the ipsilateral optic nerve or carotid artery. In their presentation, the authors present the results of microsurgical operations of tuberculum sellae meningiomas over the past 17 years. They retrospectively analyze their own cohort with regard to the optic nerve function. The predictors of a favorable visual outcome were a symptom duration of <6 months, good preoperative visual acuity without trophic changes of optic nerves, a smaller tumor size with and a softer consistency during microsurgical procedures.

VISUAL OUTCOME FOLLOWING RESECTION OF EXPANSIONS COMPRESSING OPTIC NERVE

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Objective: We recognize 4 segments of optic nerve - intracranial, intracanalicular, intraorbital and intrabulbar. Pathologies compressing optic nerve vary in each segment. Most common pathology compressing chiasm are tumors arising from hypophysis. Intracranial and intracanalicular segment is usually compressed by tumors arising from meninges. Most common pathologies in orbit are non-Hodgkin lymphoma and spinocellular carcinoma.

Most important aspect of surgical therapy of these pathologies is maintaining all neurological functions, or if possible, their improvement followed by decompression of neural structures. Main factors that determine visual outcome are visual status before intervention, tumor characteristics, surgical approach, perioperative neuromonitoring and post-operative management.

The objective of this presentation is to evaluate the visual outcome of patients operated in our department for expansions compressing optic nerve in intracranial, intracanalicular and intraocular segment and define most important factors that determine the final neurological status.

Methods: Retrospective analysis of patients admitted to our department for expansion compressing optic nerve. Analysis of preoperative visual status, surgical strategy, VEP, extent of resection and postoperative visual status.

Results: 35 patients were enrolled in the study; all were operated for an expansion compressing optic nerve. Most common were meningiomas of clinoid process. Authors present surgical approaches and their variations to particular segments of optic nerve in regard to pathomorphology of the process comprising optic pathways. Knowledge of microsurgical techniques, utilisation of neuromonitoring, knowledge of transbasal approaches and techniques for decompression of optic nerve in optic canal are indispensable in dealing with these pathologies.

Conclusion: Diverse anatomical relationships in optic nerve segments and different pathomorphology of expansions requires approach and surgical techniques tailor made for each patient. Ideal choice of craniotomy, use of neuromonitoring, dynamic retraction and microsurgical techniques increase the chance of vision maintenance and improvement of the prognosis of the patient whilst ensuring maximal possible resection of the tumor.

Key words: optic nerve, microsurgery, tumor, VEP

MINIMAL-INVASIVE TRANSORBITAL SURGERY OF INTRACRANIAL TUMOURS – A FIRST CLINICAL EXPERIENCE

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Introduction: Minimally invasive techniques in neurosurgery have advanced significantly in recent years. Among these, transorbital surgery has emerged as a novel approach for accessing intracranial lesions. This report details our preliminary experience, technical considerations, challenges, and outcomes of minimally invasive transorbital surgery.

Methods: Based on preoperative neuroimaging and our prior expertise in orbital exploration, four patients were selected for transorbital surgery: three with meningiomas and one with invasive, expansile Paget's disease. In three cases, an exoscope/microscope-assisted approach was employed, while one case utilized a combined exoscope-endoscope technique. All procedures were performed via an upper eyelid incision, with craniotomy of the lateral orbital rim facilitated by an ultrasonic bone scalpel.

Results: In all cases, the target lesion was successfully accessed and resected as per the preoperative plan. No orbital or vision-related complications were observed, except for transient periorbital edema from automatic skin retractor which resolved spontaneously within approximately one week after the surgery.

Conclusion: The transorbital approach represents a viable surgical pathway for pathologies located in the middle cranial fossa. However, it requires comprehensive knowledge of orbital anatomy and surgical approaches to the orbit. Compared to transcranial approaches, the transorbital method may offer more limited control over lesion resection. Nevertheless, by targeting the lesion's attachment point, this approach minimizes compression or manipulation of healthy brain tissue. Additionally, the transorbital approach yields superior cosmetic outcomes, with no visible scar and no risk of complications associated with temporalis muscle atrophy, which could occur in standard pterional approach.

ENDOSCOPE-CONTROLLED RESECTION OF PINEAL REGION TUMORS

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Tumors of the pineal region present significant surgical challenges due to their deep-seated location and proximity to critical neurovascular structures. Traditional microsurgical approaches—such as the supracerebellar infratentorial or occipital transtentorial routes—offer limited working corridors and suboptimal visualization of blind angles. Endoscope-controlled resection has emerged as a valuable alternative, improving intraoperative visualization, illumination, and maneuverability.

In this lecture, we present our experience with endoscope-controlled microsurgical resection of pineal region tumors in 4 patients, highlighting patient selection, technical nuances, and outcomes. Emphasis is placed on the use of rigid endoscopes, enabling panoramic and angled views that facilitate safe dissection while minimizing retraction-related injury. We detail the surgical workflow, instrumentation, and strategies for managing intraoperative and postoperative complications, including venous bleeding and hydrocephalus.

Clinical cases are used to illustrate key principles, including the importance of endoscopic inspection for residual tumor in blind spots and confirmation of completeness of resection. We also discuss the learning curve, ergonomic considerations, and possible future directions.

Endoscope-controlled techniques represent a significant advance in the resection of pineal region tumors, offering improved safety and efficacy when applied judiciously. Our data support its role in achieving maximal safe resection with reduced morbidity.

TRANSSPHENOIDAL TRANSTUBERCULUM-TRANSPALANUM APPROACH TO THE SUPRASELLAR COMPARTMENTS: ANATOMICAL CONSIDERATIONS, SURGICAL ADVANTAGES, AND MANAGEMENT OF COMPLICATIONS

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The transsphenoidal transtuberculum-transplanum approach has revolutionized access to suprasellar pathologies, offering a direct midline corridor with minimized cerebral retraction. This extended endoscopic approach allows for effective resection of lesions involving the suprasellar and retrochiasmatic spaces, including cystic and solid tumors.

This lecture will review the key anatomical landmarks and relationships critical for safe dissection, including the optic chiasm, cerebral arteries, and pituitary stalk. Advantages over traditional transcranial routes—such as improved visualization, will be highlighted.

The presentation will also cover the technical nuances of bony removal of the tuberculum and planum sphenoidale, reconstruction strategies to prevent CSF leaks, and the management of postoperative complications,

Through a combination of surgical video, anatomical illustrations, and case-based discussion, attendees will gain an integrated understanding of the approach's indications, limitations, and evolving role in the treatment of suprasellar pathology.

IMPACT OF ANATOMICAL VARIATIONS OF SINONASAL TRACT ON QUALITY OF LIFE FOLLOWING ENDO-SCOPIC

TRANSSPHEOIDAL PITUITARY SURGERY

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Introduction: It is important to take sinonasal anatomical anomalies into account in the context of endoscopic transsphenoidal approaches. Different manipulation in the corridor to the skull base have been controversially discussed in the past. There is a lack of objective parameters proving the negative results of different manipulations in the nasal cavity. Although patient's subjective postoperative perception is not always negatively affected. Hence, we decided to analyze our data to see whether the resection of additional nasal structures has or has not an important impact to patient's quality of life.

Methods: Out of 127 patients operated for sellar pathology between January 2018 and December 2024, we analyzed 75 patients. The basic requirement was a primary operation via the transnasal approach and the availability of at least one preoperative imaging modality of the sinonasal and sellar region. Medical records served as a source of demographic data, intraoperative findings and postoperative course. The study of imaging data enabled the assessment of different anomalies. To evaluate patients' quality of life in the preoperative and postoperative period, the standardized SNOT-22 questionnaire was used.

Results: The patient cohort consisted of 37 women and 38 men. The median age of the operated patients was 62 years. Most cases involved surgery for PitNETs (64 patients). A concha bullosa was described in 24 patients (11 bilat.). An Onodi cell was found in 12 patients (4 bilat.). Pneumatization of the sphenoid sinus was presellar in 5.81% and sellar in 94.19%. Various types of nasal septum deviations were identified in 28 operated patients, of whom 19 underwent septoplasty. Turbinectomy was performed in 17 cases. Of these, six patients also underwent the septoplasty. Preliminary statistical comparison of these data with the results of the questionnaire survey suggests that patients who underwent turbinectomy or septoplasty did not report greater subjective difficulties with sinonasal comfort. Data collection on the occurrence of postoperative rhinitis is currently still ongoing.

Conclusion: Forced septoplasty or turbinectomy during the nasal phase of transnasal procedures does not contribute to a clear deterioration of patients' postoperative sinonasal-related quality of life.

MENINGIOMAS IN THE ELDERLY

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Meningiomas represent the most common intracranial tumors in adults, and their incidence increases significantly with age. In the elderly population, meningiomas account for a substantial proportion of newly diagnosed brain tumors, and the aging population leads to a growing need for clearly defined therapeutic approaches. However, older patients represent a specific group with distinct anatomical, physiological, and functional parameters that influence not only the decision-making regarding surgical treatment but also the course and outcome of therapy itself. This lecture addresses the benefits and risks of surgical treatment of brain meningiomas in elderly patients. Key factors influencing surgical outcomes and the rate of complications will be discussed, such as biological age, comorbidities, tumor location and growth dynamics, neurological status, functional reserve, and the expected quality of life after the procedure. Based on available data, the lecture will explore when surgical treatment in older patients is justified and what suitable alternatives may be considered.

Neurotrauma

WHITE MATTER INJURY IN HUMAN AND EXPERIMENTAL HEAD TRAUMA: WHITE SPOTS ON THE BRAIN MAPS AFTER TBI?

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Summary: In traditional descriptions of the consequences of traumatic brain damage (or other brain diseases), the leading cause of brain dysfunction was often attributed to the loss of neuronal cell bodies, which was considered the primary reason for neurological signs related to structural damage of the central nervous system. However, recent observations and studies indicate that disruption or damage to nerve cell projections, mainly axons, also significantly contributes to the outcomes of traumatic brain injury (TBI). Their complex cytoskeleton is especially vulnerable to mechanical forces during injury. Therefore, considering the extensive anatomy and diverse functions of white matter, which is composed mainly of axons, traumatic damage to these structures results in a wide range of clinical symptoms, from subjective cognitive deficits to coma. As a result, post-traumatic axonopathies have gained increased attention from researchers and clinicians studying chronic traumatic encephalopathy (CTE) and disorders of consciousness associated with diffuse axonal injury (DAI).

This lecture will analyze the biochemical and molecular basis of changes that underpin axonopathy in brain injuries of both traumatic and non-traumatic origins. It will also explore how laboratory tests, especially biomarkers of axonal injury, can track these changes. Furthermore, a brief overview of imaging diagnostic methods that can confirm DAI/CTE and help localize axonopathic lesions will be provided. This presentation, grounded in the latest scientific research and preliminary treatment attempts, aims to shed light on recent insights into the pathophysiology of traumatic axonal injury, both acute and chronic. Additionally, therapeutic implications from the perspective of clinical neurosurgery will be discussed.

APPLICATION OF NON-LINEAR RECURRENCE QUANTIFICATION ANALYSIS FOR CEREBRAL AUTOREGULATION MONITORING

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Introduction: Intracranial pressure (ICP), arterial blood pressure (ABP), and transcranial Doppler flow velocity (FV) signals have long been used in neurocritical care to study cerebral autoregulation (CA), with the aim of monitoring brain perfusion and providing support when necessary. However, there is no consensus on how best to process and extract information from these signals. This study evaluates the feasibility of assessing CA using recurrence quantification analysis (RQA)—a nonlinear method for analyzing complex systems—as an alternative to traditional linear, correlation-based indices.

Materials and Methods: From a database of 160 head-injured patients treated in the Neurocritical Care Unit at Addenbrooke's Hospital, Cambridge (UK), recordings from 18 patients who developed spontaneous bouts of severe ICP elevations—plateau waves—were eligible for retrospective analysis. ABP, ICP, and FV signals were segmented into stable phases of the plateau wave and the preceding baseline. Nonlinear RQA correlations were calculated for both periods, and the results were statistically compared. Established linear CA indices were assessed as a reference.

Results: The nonlinear correlations followed a pattern similar to that of the linear CA indices and successfully differentiated the plateau wave phase with a comparably high level of statistical significance ($p < 0.0001$), while showing higher values and reduced data dispersion.

Conclusion: Nonlinear RQA correlation can be successfully applied to CA assessment. In the pursuit of a reliable, robust CA index suitable for widespread use in neurocritical care, a nonlinear approach may offer a promising alternative to traditional linear, correlation-based indices.

CAPTIVE BOLT GUN BRAIN INJURIES, MULTICENTRIC RETROSPECTIVE STUDY

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Introduction: Captive bolt guns, primarily used in livestock slaughter, are rarely implicated in human cranial injuries. However, isolated cases of suicide or assault involving these devices have been documented, particularly in regions with agricultural activity. Despite their severe clinical consequences, such cases remain underrepresented in the medical literature. This study aims to describe the clinical, radiological, and outcome characteristics of patients who sustained penetrating traumatic brain injury (TBI) due to captive bolt guns.

Methods: A retrospective, multicenter observational study was conducted across major Level I trauma centers in the Czech Republic between 2005 and 2025. Patients were included if they sustained a penetrating cranial injury from a captive bolt gun, were admitted alive (GCS ≥ 3), underwent initial CT imaging, and had complete outcome data. Demographic, surgical, and radiological variables were extracted and analyzed. Outcomes were assessed using the Extended Glasgow Outcome Scale (GOSe), and binary outcomes (favorable vs. poor) were statistically evaluated.

Results: Seventy-seven patients met inclusion criteria. The mean age was 58 years (range 17–91), with 97% of cases resulting from suicide attempts. The mean GCS at admission was 6.6, with a median of 3 (range 3–15). The mean best-achieved GOSe was 2.7. Infectious complications were observed in 9.1% of patients. A poor clinical outcome (GOSe ≤ 4) occurred in up to 75% of cases. Radiological analysis identified key intracranial features associated with poor prognosis.

Conclusion: Captive bolt gun injuries to the head, although rare, result in severe neurological impairment and high rates of poor outcomes. Radiological characteristics at admission may help predict prognosis and guide surgical decisions. These findings contribute to the limited body of knowledge surrounding this unique and devastating mechanism of brain injury.

FIRST RESULTS AND EXPERIENCES OF NINR PILOT PROJECT

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NINR pilot project implements the B1 phase of the phase-model of neurorehabilitation. This is defined as an early rehabilitation phase during which intensive care must still be provided, including the possibility of artificial pulmonary ventilation if necessary. Patients are admitted to the NINR if they have been transferred from an intensive or acute neurosurgical care following traumatic brain injury, inflammatory brain disease, a brain tumour, a stroke or cerebrospinal fluid flow and resorption disorders. Inclusion is possible within one month of the onset of impairment, according to the inclusion criteria. An 'early index' (VI) is performed on the patient at the neurosurgery inpatient unit, prior to possible inclusion in the NINR pilot project. Adult patients may be referred to the NINR if they have a VI of between -325 and 100 and are categorised as 3 (requiring increased supervision), 4 (immobile) or 5 (unconscious). The maximum duration of care covered by the NINR for any one patient is 12 weeks. If it is necessary to extend the length of stay in the NINR beyond 12 weeks due to a delayed prognosis, a 'indication seminar' will be held with representatives of the health insurance company to assess the justification for a further stay in the NINR and recommend the next course of action.

The NINR stay will be terminated if, during the maximum 6-week continuous NINR stay, there is no improvement in the patient's inpatient care category; if the BI value of 30 is reached at any time during the 12-week NINR stay; if the 12 weeks have elapsed; if no decision has been made at an 'indication seminar' to extend the stay; or if any of the above contraindications arise and the patient is not expected to return to the NINR. The therapy programme includes up to 12 weeks of intensive therapy, involving 3–4 hours of therapy per day (e.g. physiotherapy four times per day for 30 minutes, occupational therapy once per day for 30 minutes, speech therapy once per day for 30 minutes, nursing rehabilitation care and interdisciplinary team meetings once per week). The project is currently established at the three aforementioned workplaces in the Czech Republic. Progress in this early form of neurorehabilitation will be presented based on assessments using the Early Index (VI) and the Barthel Index (BI). By the end of June 2025, the project had delivered early neurorehabilitation to 122 patients admitted after an average of 18 days of acute illness. The mean rehabilitation time at NINR was 45.8 days. At entry, the artificial pulmonary ventilation was necessary in 53.6%, with an exit rate of 9.7%. 79.5% patients with tracheal cannula were admitted and 29.5% were discharged. Figures 1 and 2 present the early and Barthel indexes graphically. 38% of patients were able to progress to the next phase of rehabilitation, 30% were transferred to NIP or DIOP units and 11% were discharged to home care.

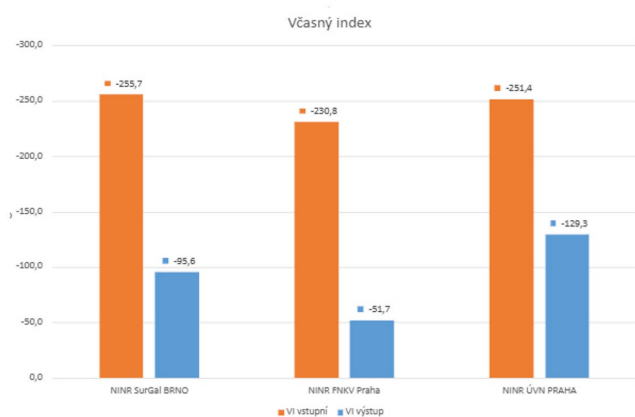


Fig. 1

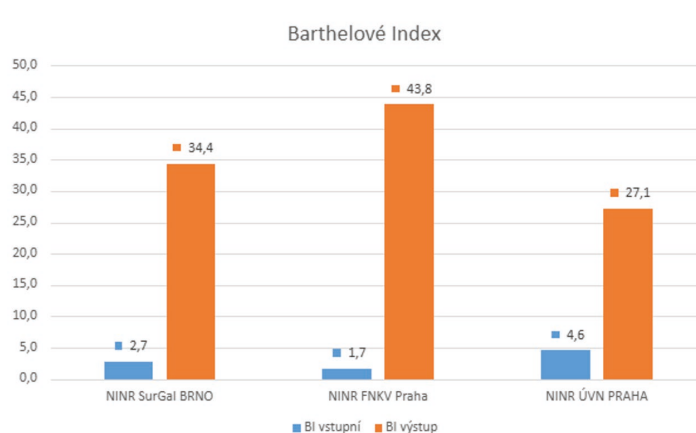


Fig. 2

EMBOLISATION OF THE MIDDLE MENINGEAL ARTERY AS A TREATMENT OF CHRONIC SUBDURAL HEMATOMA

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Background: Chronic subdural hematoma (cSDH) is a common neurosurgical condition, with rising incidence due to population aging and the widespread use of antiplatelet and anticoagulant therapy. While burr hole trephination remains a standard and effective treatment, recurrent collections present a persistent clinical challenge.

Methods: We retrospectively analysed a cohort of 40 patients with cSDH who underwent middle meningeal artery (MMA) embolisation, either as a standalone procedure or in combination with trephination. Clinical outcomes and radiological regression were assessed.

Results: Radiological regression was achieved in 97.5% of patients. One patient required another hospitalisation for recurrence despite embolisation. In three patients, MMA embolisation was employed as the primary and sole therapy. The technique was also successfully utilised in patients unsuitable for trephination due to significant comorbidities.

Conclusions: MMA embolization represents a safe, effective, and technically straightforward treatment modality for recurrent cSDH. It may serve as both an adjunct to surgery and, in selected patients, a viable standalone alternative.

SUBGALEAL DRAINAGE WITH ONLY ONE BURR HOLE FOR CHRONIC SUBDURAL HEMATOMAS: OUR 1-YEAR EXPERIENCE

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Study design: A prospective monocentric case series

Objective: With an incidence of 8.2–14.0 per 100,000 person-years, symptomatic chronic subdural hematomas (cSD-Hs) are one of the most frequent pathologies in neurosurgery. Recently, the TOSCAN train reported in a post hoc analysis that subgaleal drainages have a better risk profile and similar efficacy compared to subdural drainages (Häni et al., Journal of Neurosurgery, 2019) The authors used two burr holes covered by a subgaleal drainage. The aim of this study was to evaluate the efficacy of subgaleal drainage placement with only one burr hole.

Methods: The investigation was conducted in one center from November 2021 until November 2022. Fifty patients were included were seen one month after surgery in the outpatient clinic for imaging and clinical follow-up. Data on gender, anticoagulation medication, radiological features and surgery-related complications were collected.

Results: Fifty patients were included in this study (17 female, 33 male). Twenty-eight (56.0%) patients took anticoagulation therapy. In 5 (10.0%) patients a rebleed occurred requiring consecutive second surgery. None of our patients suffered from an infection, epileptic seizure or drainage misplacements.

Conclusion: Subgaleal drainages with only one burr hole represent a safe and feasible surgical treatment option also in patients with anticoagulation therapy.

Spinal neurosurgery

PERIOPERATIVE ANALGESIC CONSUMPTION ACROSS DIFFERENT SURGICAL MODALITIES OF LUMBAR DISCECTOMY: A COMPARATIVE ANALYSIS OF OPEN, TUBULAR, AND ENDOSCOPIC APPROACHES

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Background Lumbar discectomy can be performed via open surgery (OPEN), tubular microscopic discectomy (METRX), or full-endoscopic techniques (ENDO). In our previous comparative research, ENDO demonstrated several advantages: the lowest and longest-lasting reduction in back pain, lower radicular pain up to one month postoperatively, minimal disability one year after surgery, reduced risk of herniation recurrence, earlier mobilization, shorter hospitalization, and a markedly shorter duration of temporary work incapacity. However, how this surgical modality influences perioperative analgesic requirements remains unclear.

Objective To compare opioid and non-opioid analgesic consumption across open, tubular, and endoscopic discectomy. Secondary aims were to assess whether age, sex, and preoperative use of opioids or gabapentinoids influence perioperative analgesic consumption.

Design This was a retrospective analysis of perioperative analgesic use within the dataset of a prospective clinical trial comparing outcomes of lumbar discectomy performed using three different techniques (OPEN, METRX, ENDO). A total of 305 consecutive adults underwent single-level primary lumbar discectomy: 110 OPEN, 49 METRX, and 146 ENDO. Due to the short hospitalization associated with ENDO, the analysis for all techniques was restricted to the preoperative day (D-1), day of surgery (D0), and the first postoperative day (D1). We evaluated opioid and non-opioid consumption, further stratified by oral versus parenteral administration.

Results ENDO patients had the lowest opioid and non-opioid consumption on D0 and D1 across all techniques ($p < 0.001$). Compared with OPEN, the frequency of opioid use in the ENDO group was approximately twofold lower on D0 and threefold lower on D1. The type of surgery did not affect the frequency of oral analgesic administration on D0 or D1. The highest rate of parenteral analgesic use on D0 and D1 was observed in OPEN patients, and the lowest in ENDO patients ($p < 0.001$). Notably, 75.7% of ENDO patients did not require any parenteral analgesics on D1.

Patient age did not significantly influence total perioperative analgesic consumption across surgical groups. Female sex was associated with higher analgesic requirements on D1 irrespective of surgical technique ($p < 0.001$), with significant correlations in the OPEN ($p = 0.006$) and ENDO groups ($p = 0.022$). Preoperative gabapentinoid use (28.4% of patients) had no effect on postoperative opioid or non-opioid consumption. Preoperative opioid use (31.4% of patients) did not influence D1 analgesic requirements in any group, though on D0 a significant correlation was observed in the OPEN cohort only ($p = 0.0017$).

Conclusions Full-endoscopic lumbar discectomy is consistently associated with the lowest perioperative consumption of opioid and non-opioid analgesic, as well as the least frequent need for parenteral analgesics, compared with tubular and open techniques. These findings suggest that selecting endoscopic surgery may reduce risks related to parenteral drug administration and may facilitate nursing care.

PERCUTANEOUS FIXATION OF LEVINE-EDWARDS TYPE II HANGMAN'S FRACTURE

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Introduction: The optimal treatment strategy for Hangman's fracture, regarding to preservation of maximum range of motion, remains a subject of discussion.

Material and methods: Between 2016 and 2024, we performed percutaneous navigated fixation of typical or atypical type II Hangman's fractures in a total of 11 cases. In all patients, C23 disc rupture was excluded by magnetic resonance imaging. The average age was 57 years (range 27-87 years). The group consisted of 5 women and six men. The most common causes of injury were a traffic accident and a fall. Depending on the type of fracture, a combination of fixation was used in the form of two transpedicular screws (7 patients) or a combination of a transpedicular and translamina screw (3 patients). In one case, fixation was performed with only one transpedicular screw. All screws (compression cannulated with a diameter of 3.5 mm) were inserted after guided insertion of a K-wire (O-Arm, Treon, and S7 MDT) in a length corresponding to the MPR reconstruction, with a preference for bicortical insertion.

Results: All surgical procedures were performed without any neurological or early postoperative complications. Open surgical revision was not indicated in any case. At the first CT control after 3 months, fusion was identified in 91% of patients, and in only one patient was it confirmed on a CT control after 12 months. When evaluating the final decrease in rotation (CT rotational imaging), there was an average decrease in C1/2 rotation compared to healthy patients of the same age and sex of 12.8°, and a decrease in total cervical spine rotation of 15.4°.

Conclusion: Percutaneous fixation using navigated transpedicular and translaminar screws is an effective and safe method with excellent clinical and radiological results in selected type II Hangman's fractures without disc damage. Despite minimal invasiveness and reconstruction of physiological position, there is a slight restriction of rotation.

Lodin J, Terč J, Cihlár F, Sameš M, Cihlár J, Vachata P. Dynamics of atlantoaxial rotation related to age and sex: a cross-sectional study of 308 subjects. *Spine J.* 2023 Sep;23(9):1276-1286. doi: 10.1016/j.spinee.2023.05.008. Epub 2023 May 12. PMID: 37182705.

Certo F, Altieri R, Garozzo M, Visocchi M, Barbagallo GMV. Direct Transpedicular C2 Fixation for the Surgical Management of Hangman's Fractures: A „Second Youth“ for the Judet Approach. *Acta Neurochir Suppl.* 2023;135:291-299. doi: 10.1007/978-3-031-36084-8_45. PMID: 38153484.

ACCURACY AND TECHNICAL NUANCES OF ROBOTICALLY ASSISTED LUMBOSACRAL INTERBODY FUSIONS – RESULTS OF 100 OPERATED PATIENTS

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Aim: Analysis of pedicle screw accuracy, complications, surgical time and technical nuances of 100 patients operated via the ExcelsiusGPS robotic system.

Dataset: One-hundred adult patients undergoing lumbosacral interbody fusion

Methods: Patients underwent either open interbody fusion, minimally invasive interbody fusion or open interbody fusion combined with a non-instrumented decompression. All surgeries were assisted by the ExcelsiusGPS robot, and an intraoperative control CT scan was performed in all cases. Patients were followed at 6-week, 3-month and 6-month intervals.

Results: A total of 418 pedicle screws were implanted and 413 (99%) had optimal placement (Gerzbein-Robbins A) with the remaining five having minor asymptomatic cortical breaches of the pedicle wall violation (Gerzbein-Robbins B). The superior pedicle wall was breached once, and the inferior pedicle wall was breached four times. In seven cases the CT scan had to be repeated due to transferring errors, and in two cases, screw trajectories had to be replanned due to dynamic reference base shift during screw implantation. The mean surgical time was 154 minutes for single-level procedures and 202 minutes for multiple-level procedures, our study did not show a significant decrease in surgical time. During early follow-up, two patients underwent surgical revisions due to the presence of seromas.

Conclusion: Second generation robotic platforms have a high percentage of optimally implanted pedicle screws decreasing malposition related complications. The main drawback is an increase in surgical time due to set-up of the robotic and navigation platforms.

THE FAR-OUT SYNDROME ASSOCIATED WITH BERTOLOTTI SYNDROME

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The compression of L5 nerve root between transverse process and ala of the sacrum is termed far-out syndrome (FOS). Besides degenerative changes such as extraforaminal stenosis and spur formation, other causes of nerve root compression may occur. Pseudoarticulation between elongated transverse process and ala of sacrum in patients with

lumbosacral transitional vertebra (LSTV) and II. type of Bertolotti syndrome may contribute to clinically significant L5 and also L4 nerve roots compression. Patients with LSTV are prone to various degenerative changes and therefore multiple compression are possible, including lateral recess stenosis and FOS. Diagnosis of Bertolotti syndrome may be difficult and involves MRI, CT and EMG examination and invasive procedures. The Wiltse approach using microscopic technique is a standard operational technique for decompressive procedure. Full endoscopic decompressive surgery and anterior approach are alternative options. Intraoperative spinal navigation may be useful for orientation. We present our experiences with 2 cases of FOS due Bertolotti syndrome treated at our institution. Diagnostics and possible therapeutic options are discussed.

PERCUTANEOUS FIXATION TECHNIQUES IN THE CERVICAL SPINE – THE FIRST 50 CASES

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Various techniques were presented for minimally invasive fixations in the area of the cervical spine. However, a dedicated fixation system allowing for truly percutaneous screw placement was not available until 2022. The technique is demanding and there were only around 300 cases done worldwide as of 5/2025.

We are presenting a consecutive series of first 52 cases involving both subaxial (pedicle screw placement) and upper cervical spine, including custom-made and asymmetric solutions for various pathologies. A total of 218 screws were placed (132 UCS, 86 transpedicular subaxial) and we introduce and discuss the proper operative technique, indications, as well as problems and limits. Since this is a completely new area of operations, we describe our journey of stepwise improvements leading to increased safety and accuracy of screw placement as well as the development of MIS fusion techniques.

LONG-TERM CLINICAL OUTCOMES AND MULTIFIDUS MUSCLE ATROPHY AFTER MIDLINE LUMBAR FUSION WITH CORTICAL BONE TRAJECTORY SCREWS FOR DEGENERATIVE LUMBAR SPINE INSTABILITY AND SPONDYLOLISTHESIS

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Background: Midline lumbar fusion with cortical bone trajectory screws (MIDLF/CBT) has been introduced as a less invasive alternative to traditional posterior lumbar interbody fusion, aiming to minimise perioperative damage to the paravertebral musculotendinous system. While clinical outcomes of MIDLF appear favourable, concerns persist regarding its potential long-term impact on paraspinal musculature, particularly the multifidus muscle, which is critical for spinal stability.

Methods: Two complementary cohorts were analysed. In a prospective study, 64 patients with degenerative lumbar instability underwent MIDLF and were evaluated clinically and radiologically over a 2-year period. Outcomes included pain (VAS), disability (ODI), functional status (MacNab), and radiographic fusion. In a retrospective case series of 16 patients, pre- and postoperative MRI scans were used to measure multifidus muscle width at the operated and adjacent segments, with paired comparisons assessing postoperative atrophy.

Results: In the prospective cohort (mean age 58.9 ± 10.7 years, 64.1% women), MIDLF led to significant and durable improvements in back and leg pain (VAS, $p < 0.001$) and disability (ODI from 66.8 ± 9.8 to 33.9 ± 16.5 ; $p < 0.001$). At 24 months, 86.9% of patients reported fair to excellent outcomes, and radiographic fusion was achieved in 73.4%. No major neural or vascular complications or hardware failures were observed. In the MRI cohort (mean age 57 ± 10 years, 62.5% women, mean follow-up 37 ± 25 months), multifidus muscle width decreased significantly at the operated (-3.3 mm, $p = 0.02$) and inferior adjacent segments (-7.4 mm, $p < 0.01$), whilst superior adjacent reduction was not statistically significant.

Conclusions: MIDLF/CBT is a safe and effective method for the surgical treatment of lumbar spine instability, providing substantial clinical improvement and high fusion rates. However, despite its limited invasiveness, significant multifidus atrophy occurs at and below the operated segment, potentially influencing postoperative rehabilitation. These findings underscore the dual reality of MIDLF/CBT: favourable long-term clinical outcomes with measurable paravertebral muscle compromise. Future studies should compare MIDLF with other stabilisation techniques and explore strategies to mitigate postoperative muscle atrophy to further optimise patient recovery.

Varia

POSSIBILITIES OF PERIOPERATIVE PREDICTION OF THE EFFECT OF MICROVASCULAR DECOMPRESSION IN TRIGEMINAL NEURALGIA AND HEMIFACIAL SPASM

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Microvascular decompression is a highly effective surgical method in the treatment of trigeminal neuralgia and hemifacial spasm. However, the treatment effect is evaluated only based on the postoperative clinical outcome in the patient. The authors present a perioperative approach on a pilot cohort that allows monitoring the effect of microvascular decompression during surgery, thus enabling the identification of the primary cause in cases of multiple conflicts.

ENDOSCOPIC VENTRICULAR LAVAGE VERSUS CONVENTIONAL EXTERNAL DRAINAGE IN SPONTANEOUS INTRAVENTRICULAR HAEMORRHAGE

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Introduction: Spontaneous intraventricular haemorrhage (IVH) carries high mortality and is traditionally managed with external ventricular drainage (EVD), yet catheter occlusion, prolonged intensive-care stay and chronic hydrocephalus limit its effectiveness. Neuroendoscopic ventricular lavage permits direct clot evacuation and CSF pathway restoration. We compared lavage + EVD with EVD alone in matched adults with spontaneous IVH.

Methods: In this single-centre retrospective cohort-matched study, 23 consecutive lavage patients were matched 1:1 to 23 EVD controls for age, admission Glasgow Coma Scale and modified Graeb score. The primary endpoint was shift in 90-day modified Rankin Scale (mRS). Secondary endpoints were radiological clot clearance, EVD time, ICU length-of-stay and ventriculoperitoneal shunt (VPS) implantation rate.

Results: Baseline characteristics were comparable. Endoscopically treated patients achieved 66.7 % greater clot clearance (mean Δ mGraeb = 13 ± 5.8) and halved catheter duration (3 ± 2.5 days vs 7 ± 5.7 days, $p < 0.001$). ICU stay was reduced three-fold (8 ± 5.4 days vs 25 ± 19.3 days, $p = 0.002$). VPS was required in 13 % of ENDO versus 26 % of EVD patients ($p = 0.03$). Ordinal logistic regression demonstrated an independent shift toward better functional outcome with lavage group (adjusted common OR = 2.9); median 90-day mRS improved from 5 to 3 ($p = 0.005$).

Conclusion: Neuroendoscopic ventricular lavage combined with EVD provides superior radiological clearance, shorter catheter and ICU requirements, lower shunt dependence and significantly better early functional recovery than EVD alone in spontaneous IVH. These findings support endoscopic treatment as a valuable adjunct to standard drainage.

EARLY EXPERIENCE WITH INTRAOPERATIVE NEUROMONITORING IN ENDOSCOPIC EVACUATION OF SPONTANEOUS INTRACEREBRAL HEMORRHAGE

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Introduction: Spontaneous intracerebral hemorrhage (ICH) is a severe neurological condition associated with high morbidity and mortality. According to the recent ENRICH randomized trial, early minimally invasive endoscopic evacuation of ICH may improve functional outcomes. Intraoperative neuromonitoring (IOM) is routinely used in neurosurgery, but its application in endoscopic ICH evacuation has not been previously reported. The aim of this study is to evaluate the predictive role of IOM in this procedure.

Materials and Methods: Since 2023, we have prospectively followed patients undergoing minimally invasive endoscopic ICH evacuation. Somatosensory evoked potentials (SSEP) and motor evoked potentials (MEP) were monitored perioperatively. Changes in IOM before and after hematoma evacuation were assessed. Also, its relationship to functional outcome, residual hematoma volume, and timing of surgery were evaluated.

Results: Minimally invasive endoscopic ICH evacuation was performed in 14 patients (mean age 56.5 years). Follow-up ranged from 3 to 12 months. IOM was applied in 4 patients. In these cases, immediate postoperative improvement in MEP correlated with better functional outcomes during follow-up.

Conclusion: Minimally invasive endoscopic ICH evacuation appears to be a safe and promising method. Perioperative MEP improvement may represent a useful predictor of long-term functional recovery. Larger studies with longer follow-up are required to confirm these preliminary findings.

This work was supported by the internal grant of the Slovak Medical University, No. 7/2024-SVG1: New approaches to the surgical treatment of spontaneous intracerebral hemorrhage.

FROM THE PAST TO THE PRESENT:

EVOLVING THEORIES IN THE PATHOPHYSIOLOGY OF NORMAL PRESSURE HYDROCEPHALUS

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Introduction: Normal pressure hydrocephalus (NPH) is a neurological syndrome characterized by the classical triad of gait disturbance, urinary incontinence, and cognitive impairment. It is considered a potentially reversible condition; however, its precise etiopathogenesis and nosological classification remain inadequately delineated. Rather than resulting from a singular, well-defined cause, NPH is increasingly recognized as a multifactorial disorder involving complex pathophysiological interactions.

Methods: A comprehensive review of the literature was conducted to synthesize current knowledge on NPH, with a focus on recent advancements in pathophysiological mechanisms and diagnostic criteria. Particular attention was given to emerging hypotheses implicating glymphatic system dysfunction, alterations in cerebrovascular pulsatility, metabolic and osmotic dysregulation, astrogliosis, and neuroinflammatory processes in disease pathogenesis.

Results: Recent evidence has refined the conceptualization of NPH, improving diagnostic accuracy and patient selection for cerebrospinal fluid (CSF) diversion procedures. Advances in neuroimaging and biomarker research have enhanced classification and prognostic stratification. However, significant gaps persist in defining NPH within the neurodegenerative spectrum. The overlap of its clinical and pathophysiological features with Alzheimer's disease and Parkinsonian syndromes underscores the need for distinct biomarkers. Ventriculomegaly, largely attributed to impaired CSF drainage and glymphatic dysfunction, leads to periventricular white matter compression and neuronal dysfunction. A more integrative classification system incorporating molecular and imaging biomarkers is crucial for optimizing diagnostic precision and treatment outcomes.

Conclusion: Future research should focus on elucidating the interplay between genetic predispositions, glymphatic dysfunction, and inflammatory responses rather than investigating isolated mechanisms. A comprehensive approach is essential to distinguish causative factors from associations, improving patient stratification for CSF diversion procedures. Clarifying NPH's position within neurodegenerative disorders remains imperative, particularly given the increasing burden of age-related cognitive decline.

PHASE-CONTRAST MRI CEREBROSPINAL FLUID FLOW PARAMETERS AS PREDICTIVE MARKERS OF ETV EFFICACY IN IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS: PROSPECTIVE OBSERVATION STUDY.

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Introduction: Idiopathic normal pressure hydrocephalus (iNPH) is a neurological disorder characterized by the clinical triad of gait disturbance, cognitive impairment, and urinary incontinence, accompanied by ventricular enlargement without elevated intracranial pressure. Endoscopic third ventriculostomy (ETV) represents an alternative and controversial treatment modality to ventriculoperitoneal (VP) shunt placement. The aim of this study was to evaluate the efficacy of ETV in patients with iNPH and to determine the predictive value of cerebrospinal fluid (CSF) flow parameters measured by phase-contrast magnetic resonance imaging (PC-MRI).

Methods: This prospective, single-center, non-randomized study included 31 patients with iNPH who underwent ETV. Pre- and postoperative measurements of peak velocity (PV), aqueductal stroke volume (ASV), and Net ASV were obtained in the aqueduct. Clinical outcome was assessed using the Kiefer score, and the NPH recovery rate was calculated; ETV was considered effective when the recovery rate was ≥ 3 . Statistical analyses included correlation tests, logistics regressions, receiver operating characteristic (ROC) curve analysis, and cross-validation.

Results: Clinical improvement following ETV was observed in 32.3 % of patients. Responders had significantly higher preoperative ASV values and Net ASV. The calculated ASV cut-off value of 280 μ l predicted a positive clinical outcome with 90 % sensitivity and 71 % specificity. Although PV showed lower overall predictive power, it demonstrated high negative predictive value (93 %), with a cut-off determined at 8.1 cm/s. Multivariate regression identified preoperative ASV as the only independent predictor of ETV success. Lower cognitive impairment scores were associated with a higher likelihood of clinical improvement.

Conclusions: ETV may be an effective treatment option in a carefully selected subset of INPH patients, particularly those with hyperdynamic CSF flow. A preoperative ASV value $\geq$ 280 μ l appears to be a clinically relevant predictor of response. These findings support the importance of individualized treatment strategies in INPH and highlight the need for larger randomized trials to validate the observed associations.

BEYOND IDIOPATHIC INTRACRANIAL HYPERTENSION - OPTIC NERVE DECOMPRESSION FOR VISION PRESERVATION IN CEREBROSPINAL FLUID FLOW DISORDERS: A MECHANISM-BASED APPROACH

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Objective: To evaluate the long-term visual outcomes following optic nerve decompression in patients with CSF flow disturbances and to propose a mechanistic framework for surgical qualification based on infusion testing and orbital MRI, independent of IIH diagnostic criteria.

Methods: This retrospective study analyzed 30 eyes from 26 patients with progressive visual impairment and evidence of CSF flow abnormalities. All underwent standardized lumbar infusion testing to quantify CSF outflow resistance (Rcsf), Pressure Volume Index (PVI), and opening pressure. Orbital MRI was used to assess perioptic CSF collections or optic canal narrowing. Based on these data, patients received either Optic Nerve Sheath Fenestration (ONSF) or Endoscopic Optic Nerve Sheath Decompression (EONSD). Visual function was evaluated using Visual Field Mean Deviation (VF MD), Visual Evoked Potentials (VEP), and OCT Retinal Nerve Fiber Layer (RNFL) thickness at baseline, 6 months, and 24 months.

Results: VF MD improved by a median of +1.89 dB, and P100 latency decreased by –5 ms at 24 months. Papilledema resolved in 87.5% of affected eyes. RNFL thickness remained stable or modestly increased across the cohort, with a trend toward greater thickening following EONSD (+9 μ m at both 6 and 24 months) compared to ONSF (minimal change at 6 months (+1 μ m), slight thinning at 24 months (–2 μ m)), although differences were not statistically significant. No significant differences in functional outcomes were observed between procedures. Patients were stratified into three CSF-pathophysiological subgroups: IIH with elevated ICP, abnormal hydrodynamics without raised ICP, and normal ICP and hydrodynamics with MRI-confirmed perioptic CSF collection. Visual improvement occurred across all subgroups, including those outside IIH criteria.

Conclusions: Optic nerve decompression guided by CSF infusion testing and orbital MRI effectively stabilizes or improves visual function in patients with CSF-related optic neuropathy, including those without elevated ICP. A mechanism-based classification into three surgical phenotypes enables individualized treatment beyond syndromic definitions. This approach may redefine surgical eligibility and expand access to vision-preserving interventions in CSF-mediated optic nerve dysfunction.

SURGICAL TREATMENT OF SPONTANEOUS INTRACRANIAL HYPOTENSION – CASE SERIES

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Introduction: Spontaneous intracranial hypotension (SIH) is a clinical syndrome characterized by orthostatic headache due to spontaneous cerebrospinal fluid (CSF) leakage into the extradural space. The underlying cause may be a longitudinal dural tear, meningeal diverticulum, or a direct CSF–venous fistula (CVF). SIH is often underdiagnosed, with an estimated incidence of 5 per 100,000 per year, most frequently presenting between the ages of 40 and 50, and with a female predominance (1.5:1). The aim of this study is to present our initial experience with surgical management of SIH.

Methods: Given the specific challenges in diagnosing SIH and recent advances in understanding its pathophysiology, we present a series of illustrative case reports. Diagnosis was established using imaging methods, with dynamic CT myelography (DCTM) being the key modality to confirm SIH and localize the CSF leak.

Results: In all cases, DCTM successfully identified the site of CSF leakage, which was subsequently treated surgically. In cases of CVF, partial hemilaminectomy was performed, followed by bipolar coagulation and dissection of the fistula. Patients experienced marked regression of their clinical symptoms after surgery.

Conclusion: These case reports demonstrate that surgical treatment may represent a valuable therapeutic option in selected patients with SIH. Accurate localization of the CSF leak using advanced imaging is essential, and clinicians should consider CVF particularly in patients without epidural fluid collection.

BRAIN GENE THERAPY - NEW HOPE FOR PATIENTS WITH NEURODEGENERATIVE DISEASES

Paweł Obierzyński

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Gene therapy is a very promising treatment method, the use of which can bring help to patients suffering from degenerative, metabolic or oncological diseases of the central nervous system. Gene therapy uses genetic engineering methods to introduce the correct version of the gene into the organism or inactivate the mutation responsible for the development of the disease. The most common way to deliver a transgene into the patient's organism is to use a viral vector, i.e. attenuated virions that interact with host cells. The team of the Interventional Neuro Center from the Mazovian Bródnowski Hospital in Warsaw is currently conducting clinical trials with gene therapy in Huntington's disease, Parkinson's disease, frontotemporal dementia and congenital deficiency of aromatic L-amino acid decarboxylase.

RECONSTRUCTIVE TECHNIQUES IN CEREBROSPINAL FLUID LEAK REPAIR: A LONG-TERM COMPARATIVE STUDY OF SURGICAL STRATEGIES

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Background: Cerebrospinal fluid (CSF) leakage represents a significant challenge in neurosurgery, associated with risk of recurrence and infectious morbidity. Precise localization remains diagnostically challenging, often requiring advanced imaging such as cisternography. The optimal reconstructive technique, particularly regarding graft material and the role of CSF diversion, remains debated.

Methods: A retrospective analysis was conducted on 150 patients who underwent surgical repair of CSF leaks between 2007 and 2025 at the Department of Neurosurgery, Medical University of Białystok. Surgical reconstructions were categorized into autologous grafts, synthetic materials, and multilayer techniques, the latter representing the majority of cases. Each approach was further evaluated with or without adjunctive CSF diversion (lumbar or external ventricular drainage). Over time, surgical strategies were progressively refined, reflecting institutional experience and technical advances. Primary outcome was postoperative recurrence; secondary outcomes included complications and reoperation rate.

Results: The overall recurrence rate was 7.3%, while the frequency of reoperation was 5.1%. Multilayer repair demonstrated the lowest recurrence compared with single-material techniques. Adjunctive CSF diversion reduced recurrence in selected high-flow cases but was associated with procedure-related complications in a minority of patients. Conservative treatment was effective in selected cases, resulting in spontaneous remission without surgical intervention. Progressive improvement in outcomes was observed throughout the study period in line with refinement of reconstructive methods.

Conclusions: Multilayer reconstruction combining autologous and synthetic materials proved to be the most effective surgical strategy, with markedly lower recurrence compared to single-material techniques. Conservative management remains a valid option in selected low-flow leaks. The results underline the importance of clinical experience and continuous refinement of surgical practice in optimizing outcomes of CSF leak repair.

CRANIOPLASTY IN CLINICAL PRACTICE AND EXPERIMENTAL SURGERY – LIMITS AND PERSPECTIVES

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Introduction: Cranioplasty is an elective procedure with curative, cosmetic and protective goals and it is most frequently employed following a decompressive craniectomy. Despite its simplicity, the rate of complications remains high. A number of materials is being used, ranging from autologous bone to personalized implants, each with its pros and cons. This presentation gives a brief review of materials and methods used in cranioplasty and summarizes the published data from Neurosurgical department in Pilsen. Lastly, it presents a proof of concept project of an experimental material implantation in an animal model.

Material and methods: The data comes from a group of 149 patients undergoing cranioplasty in years 1998-2012, a group of 30 patients undergoing a cranioplasty in a high risk terrain using porous polyethylene in years 2014-2023 and the results of the implantation of experimental material in a laboratory rat model.

Results: Our results support the use of porous polyethylene in high risk terrain. The experimental 3D printed material presented a higher percentage of a new bone in comparison to a control group, however the results are not statistically significant.

Conclusion: The autologous bone remains the most commonly used material for cranioplasty, particularly for its accessibility and biocompatibility.

The use of porous polyethylene in high risk terrain is a highly reliable option.

The animal model project has achieved its proof of concept goal.

RETROSPECTIVE ANALYSIS OF NEUROMODULATION UTILISATION AT OUR DEPARTMENT

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Introduction: Neuromodulation represents an advanced therapy for chronic pain management through modulation of neural activity using electrical stimulation. This study evaluates clinical outcomes of neuromodulation therapies, including spinal cord stimulation (SCS), occipital nerve stimulation (ONS), and peripheral nerve field stimulation (PNFS) in patients with refractory chronic pain.

Methods: A retrospective analysis was conducted at the Department of Neurosurgery, University Hospital Olomouc, including 70 patients who underwent neuromodulation between 2019 and 2024. Indications included Persistent Spinal Pain Syndrome Type 2 (PSPS-T2), Persistent Spinal Pain Syndrome Type 1 (PSPS-T1), complex regional pain syndrome (CRPS), and failed cervical spine surgery syndrome. Pain relief was assessed using the Visual Analogue Scale (VAS) before and after implantation.

Results: Patients experienced significant pain reduction following implantation. In PSPS-T2 patients (n=40), mean VAS scores decreased from 5.58 to 1.80 (a 67.2% reduction). Similar trends were observed in PSPS-T1 (64.5% reduction), CRPS (85% reduction), and other conditions, with an overall average pain reduction of 58.3%. Percutaneous electrodes and non-rechargeable implantable pulse generators (IPG) were most commonly used.

Discussion: Neuromodulation is an effective treatment for refractory chronic pain, substantially reducing pain intensity across various conditions. Optimization of patient selection and stimulation parameters remains essential to maximize clinical benefit.

Conclusion: Neuromodulation provides effective pain relief in refractory chronic pain syndromes, with significant reductions across multiple indications. Future studies should assess long-term efficacy and cost-effectiveness.

THE FIRST PAN-AFRICAN TRAINING COURSE IN NEUROSURGERY: ESTABLISHING A SUSTAINABLE CONTINENTAL MODEL FOR ADVANCED NEUROSURGICAL EDUCATION

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EANS Global & Humanitarian Committee

Background: Sub-Saharan Africa faces a critical shortage of trained neurosurgeons, with surgical access disparities contributing to more preventable deaths than malaria, tuberculosis, and HIV/AIDS combined. Sustainable solutions require continent-based training initiatives that strengthen local expertise and foster international collaboration, rather than relying solely on training abroad, which risks long-term workforce attrition.

Objective: To introduce and evaluate the inaugural First African Training Course in Neurosurgery, developed in collaboration with the European Association of Neurosurgical Societies (EANS), the Continental Association of African Neurosurgical Societies (CAANS), the College of Surgeons of East, Central and Southern Africa (COSECSA), and the West African College of Surgeons (WACS). The initiative aims to establish a four-year, EANS-style structured educational cycle for young neurosurgeons across Africa.

Methods: The first course was held in May 2025 at the Muhimbili Orthopaedic Institute (MOI), Dar es Salaam, Tanzania—one of the most advanced neurosurgical centers in Sub-Saharan Africa. The curriculum focused on vascular and skull base neurosurgery and combined lectures, interactive case discussions, and practical workshops. Faculty were distributed equally between African specialists (n=13) and European neurosurgeons (n=13) to ensure balanced expertise exchange. Ninety-four young neurosurgeons and residents, representing all major regions of Africa, participated.

Results: The course successfully delivered a high-level educational program with robust faculty-participant interaction. Structured evaluations demonstrated high participant satisfaction, a strong perception of professional relevance, and significant reinforcement of cross-border academic collaboration. Importantly, the diverse faculty composition provided a platform for mentorship and peer networking, fostering long-term South-South and North-South partnerships.

Conclusion: The First African Training Course in Neurosurgery represents a milestone in sustainable global neurosurgical education. By combining African leadership with European educational frameworks, the program strengthens local capacity, mitigates risks of brain drain, and sets the foundation for an autonomous Pan-African training cycle rotated across regions. This initiative underscores the critical role of equitable, transcontinental collaboration in reducing global disparities in neurosurgical care.

Keywords: Neurosurgical education, Global surgery, Africa, EANS, Training course, Capacity building, International collaboration

SURGICAL PROCEDURE OF DISTAL NERVE TRANSFER IN ULNAR NEUROPATHY

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The outcomes of reconstructions following proximal ulnar nerve injuries are generally unsatisfactory. The distal nerve transfer method offers an alternative with a very favorable prognosis regarding nerve regeneration and functional recovery. The advantage of distal transfer lies in the short reinnervation distance and the presence of only a single direct coaptation between nerves of matching calibers. Therefore, this procedure is suitable even for delayed or neglected cases.

For reconstruction, the most suitable donor appears to be the muscular branch to the pronator quadratus muscle from the median nerve. The nerve coaptation can be performed either end-to-end or end-to-side, with both techniques having specific indications and applications.

We present a series of patients indicated for ulnar nerve reconstruction using this method. Additionally, we report case studies of end-to-end reconstruction in proximal nerve lesion and end-to-side reconstruction in severe cubital tunnel syndrome.

Morning presentations

TRANCORTICAL – TRANSVENTRICULAR – TRANSCHOROIDAL APPROACH TO THE AMBIENS CISTERN

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Access to the tentorial incisure is a challenge for neurosurgeons, and the structures of the crural and ambient cisterns are vitally important, they include important tracts (motor and optic tract), the posterior cerebral artery (PCA), and the oculomotor nerves (III and IV). If we use the transsylvian approach or subtemporal approach (in oncology with resection of the temporal neocortex), we can identify these structures early on, including the posterior communicating artery (PCom) and anterior choroidal artery (AChoA). However, it is difficult to see the entire ambient cistern from the front. In particular, access to the posterior segment of the PCA (P2p) or the posterior hippocampal complex in neuro-oncology is difficult. In addition to the possibility of a supracerebellar transtentorial approach to the posterior hippocampus, in cases of higher superior extension of the tumor sub-parasplenially we can enter transcortically - transventricularly through the temporal horn or atrium of the ventricle. However, the anatomy of this area is difficult, and the neurosurgeon can easily become topically disoriented. Here, the anatomy of the choroid fissure (tenia thalami and fornix/fimbriae) helps us identify the thalamus and the posterior part of the hippocampus. We present three cases of surgery where this orientation helped us (two glioma and one ependymoma). In an anatomical study of cadaver hemispheres, we highlight some of the anatomical landmarks in this area.

1. Egemen E, Celtikci P, Dogruel Y, Yakar F, Sahinoglu D, Farouk M, Adiguzel E, Ugur HC, Coskun E, Güngör A. Microsurgical and Tractographic Anatomical Study of Transtemporal-Transchoroidal Fissure Approaches to the Ambient Cistern. *Oper Neurosurg.* 2021 Jan 13;20(2):189-197.

2. Siwanuwatn R, Deshmukh P, Zabramski JM, Preul MC, Spetzler RF. Microsurgical anatomy and quantitative analysis of the transtemporal-transchoroidal fissure approach to the ambient cistern. *Neurosurgery.* 2005 Oct;57(4 Suppl):228-35; discussion 228-35.

3. Kadri PAS, de Oliveira JG, Krayenbühl N, Türe U, de Oliveira EPL, Al-Mefty O, Ribas GC. Surgical Approaches to the Temporal Horn: An Anatomic Analysis of White Matter Tract Interruption. *Oper Neurosurg.* 2017 Apr 1;13(2):258-270.

100TH BIRTHDAY OF G. YASARGIL. SIGNIFICANCE FOR WORLD AND OUR NEUROSURGERY

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Prof. Mahmut Gazi Yasargil, MD (G.Y) (1925 - 2025) is one of the most respected personalities of the World Federation of Neurosurgical Societies (WFNS). G.Y. is the second neurosurgeon in history to receive the title „Man of the Century 1950-2000“. The first such title was given to H. Cushing (1869-1939), who was awarded the title „Man of the Century 1900- 1950“ and is considered the founding father of independent neurosurgery. Prof. G.Y. is considered the founder of the new modern form of the field, which is microneurosurgery. His influence on the field can be described as visionary. He inspired the development of new microscopes, microsurgical instrumentation, entirely new surgical techniques and the need for detailed microanatomy. The Yasargil aneurysm clamp completely changed the field and is still in use today. Together with R.M. P. Donaghy, he was instrumental in the development of the revolutionary extra-intracranial anastomosis.

Born on 6 July 1925 in Turkey, he studied in Germany and Switzerland in 1944-49 and graduated from the University of Basel in 1950. For most of his life, from 1973-93, he worked as head of the Neurosurgery Clinic at the University of Zurich. Since 1994 he has been a professor in the Department of Neurosurgery, University of Arkansas for Medical Sciences. He has been incredibly active in neurosurgery until he turns 100 (June 10, 2025). He has written 340 papers and 13 excellent monographs from which several generations have learned. He is an honorary member of many universities and institutions around the world, and is an honorary citizen of many cities such as Turkey, Argentina, and Texas. Laboratories bearing his name have been established. He has received countless honours. He is one of the most important personalities in Turkey.

The importance of G.Y. for the level of our neurosurgery is quite exceptional. It started in 1971 and continues to this day. In 1971, G.Y. participated in the 4th European Congress of Neurosurgery in Prague. This was the last international event after the occupation of the Republic in 1968, followed by almost 20 years of isolation. The congress was entirely in the spirit of classical neurosurgery. At that time there was scepticism about microscopes in neurosurgery. Of the 800 participants, only about 10 people attended the „insignificant“ section on vascular microsurgery. On behalf of V. Benes, the secretary of the congress, I provided the section with a projection. Thanks to G.Y. I understood that this is the future of neurosurgery. In the following years, under very difficult conditions, microsurgery was introduced in the Neurosurgical Clinic of the Central Military Hospital to the whole neurosurgery, even to spondylo-surgery. It was the work of academician Z. Kunc, prof. I. Fusek and other doctors. All this time and especially after gaining freedom in 1989, I managed to maintain above-standard relations with G.Y. Only a small thanks to G. Y. was the award of an honour from the Faculty of Medicine of the Charles University on the 7th anniversary of his death. Congress of the Central European Neurosurgical Society (CENS) in Prague 2012. The University of Zurich prepared an event to celebrate Prof. G.Y., the Yasargil 100th Anniversary Symposium on June 4-5, 2025. G.Y. was born on July 6, 1925, but unfortunately passed away a month before the celebration on June 10, 2025. Still, the celebration will take place with our RIP wishes, but already to heaven.

Poster section

1. MULTIFOCAL MEDULLOBLASTOMA MIMICKING LYMPHOMA: AN ATYPICAL CASE IN AN ADULT

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2. STEREOTACTIC GAMMA KNIFE RADIOSURGERY FOR BLADDER CANCER BRAIN METASTASES

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Bladder cancer only rarely metastasizes to the brain and so the optimal management strategy is not well defined. Between April 1994 and January 2020, 22 patients with brain metastases from primary bladder cancer were treated with a single gamma knife treatment at our department at Na Homolce Hospital. The monitored group of patients consisted of 6 women and 16 men aged 46–82 (median age 69.5) years. The minimum marginal dose ranged from 15 to 22 Gy (median 19 Gy), and the median volume of irradiated brain metastases was 4.44 cm³. The median follow-up period after radiosurgical treatment was 5 months (range 2–40 months), and the median survival of patients for whom death data were available was 6 months. Stereotactic single-dose irradiation with a gamma knife is a minimally invasive therapeutic method with a high degree of local control, no risk of mortality, and minimal morbidity, and therefore plays an important role in the treatment of brain metastases.

3. SURGICAL TREATMENT OF SOLITARY BRAIN METASTASES – SINGLE CENTER EXPERIENCE FROM THE NEURO-ONCOLOGY CENTER, UNIVERSITY HOSPITAL OLOMOUC

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Brain metastases are tumors originating outside the brain tissue, spreading intracranially. Approximately 80% are located supratentorially, 15% in the cerebellar region, and about 5% in the brainstem. Their epidemiology and especially incidence are difficult to assess, as it is believed that these patients are underdiagnosed. The incidence is estimated at approximately 12 to 35% of all cancer patients. Pathological studies show that in about 25% of patients with diagnosed cancer, brain metastases are found during autopsy. Brain metastases indicate relatively advanced cancer with reduced survival time. Despite these negative impacts, there is a particular group of patients benefiting from further treatment, whether surgical or oncological. The main role is played by the improvement in surgical treatment options. The predominant approach is surgical extirpation, which, like all tumor expansions, must be as radical as possible, yet safe. The aim of this study was to evaluate the efficacy of surgical treatment in patients operated on within a single Neuro-Oncology Center and to assess prognostic factors and the impact of surgical treatment on overall patient survival.

4. ANOMALOUS VENOUS DRAINAGE OF THE POSTERIOR FOSSA IN A PATIENT WITH ARNOLD–CHIARI MALFORMATION

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5. TEMPORARY CONTINUOUS LUMBAR DRAINAGE, A VALUABLE TOOL FOR THE DIAGNOSIS AND PREDICTION OF SHUNT SURGERY OUTCOME IN IDIOPATHIC INTRACRANIAL HYPERTENSION

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To our knowledge, temporary lumbar drainage has been described only as a therapeutic tool for refractory idiopathic intracranial hypertension (IIH) to medical treatment. We introduced the lumbar drainage test (LDT) in the diagnostic stages of 54 patients with suspected IIH.

LDT might help to diagnose atypical cases of IIH that do not meet standard diagnostic criteria. In our cohort, this group represents 29,6% of cases (16 out of 54).

This significant portion of patients, who yet do not meet standard diagnostic criteria, might still profit from the treatment of IIH. LDT also suggests a certain prognostic value of future therapy. Furthermore, it helps to distinguish cases that overlap with other diagnoses, for example, multiple sclerosis or optic disc drusen.

From our clinical experience, LDT poses a safe and effective diagnostic test that detects these atypical or uncertain cases.

6. CHARACTERISTICS OF ASYMPTOMATIC GLIOMAS WITH IMAGING FEATURES OF LOW-GRADE GLIOMA – A SINGLE-CENTER EXPERIENCE

Tomasz Dziedzic, Katarzyna Blacha, Michał Senger, Kacper Koczyk, Marchel Andrzej, Przemysław Kunert

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Objective: The increased availability of neuroimaging has led to more frequent detection of asymptomatic brain lesions with radiological features of low-grade gliomas. The aim of this study was to analyze clinical, radiological, and histopathological differences between symptomatic and asymptomatic tumors, as well as to assess the usefulness of advanced imaging beyond standard morphological sequences in the treatment decision-making process.

Methods: A retrospective analysis was conducted on 96 patients with brain tumors showing radiological characteristics of low grade gliomas who underwent surgical treatment. Patients were divided into two groups: symptomatic tumors (ST; n = 66; 68.8%) and asymptomatic tumors (AT; n = 30; 31.2%). Asymptomatic tumors were defined as incidental findings without seizures, signs of increased intracranial pressure, or focal neurological deficits.

Results: In the symptomatic group, seizures were the predominant clinical symptom, while in the asymptomatic group, nonspecific headaches were most common. Among patients with AT, histopathological diagnoses included 19 WHO grade 2 gliomas (63.3%), 5 grade 3 (16.6%), 2 grade 4 (6.7%), and 4 grade 2 tumors with a grade 3 component (13.4%). The most frequent tumor locations were the frontal lobe (60%), temporal lobe (26.7%), and insula (26.7%). There was no significant difference in age between the groups (AT: 40.8 vs. ST: 39.8 years). Tumor volume was smaller in the asymptomatic group: 18.49 vs. 47.55 cm³. In the subgroup of asymptomatic grade 2 gliomas, the mean tumor volume was 10.94 cm³, while in higher-grade tumors it was 24.5 cm³. MR spectroscopy suggested the presence of a tumor in 94.7% of AT patients and in 100% of ST patients. Elevated perfusion on MR perfusion imaging was observed in 31.6% of AT patients and in 71.4% of ST patients.

Conclusions: Asymptomatic lesions with radiological features of well-differentiated gliomas reveal histopathological characteristics of higher-grade tumors (above WHO grade 2) in nearly half of the cases. These findings support a proactive diagnostic and therapeutic approach in this group of patients. MR spectroscopy may be a valuable tool in the preoperative assessment.

7. CANCELLED

8. FOCAL CORTICAL DYSPLASIA ASSOCIATED WITH EPILEPSY: DIAGNOSTIC AND THERAPEUTIC PERSPECTIVES

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Focal cortical dysplasia (FCD) is one of the most common causes of pharmacoresistant epilepsy, particularly in children and young adults. Accurate detection and localization of FCD are crucial for surgical planning and achieving favorable clinical outcomes. The presentation will address the challenges of diagnosing FCD using modern neuroimaging techniques, including advanced MRI sequences and quantitative post-processing methods, which significantly increase the sensitivity of detecting focal cortical abnormalities.

Special attention will be given to electrophysiological evaluation using deep intracerebral electrodes (stereo-EEG), which allows detailed mapping of the epileptogenic zone, especially in cases where FCD is difficult to identify using imaging alone.

The presentation will focus on the surgical treatment of FCD and long-term outcomes of resective procedures. Data will be presented along with factors influencing prognosis, such as completeness of resection and accuracy of preoperative localization.

The authors will provide an overview of current diagnostic and therapeutic strategies for patients with FCD and epilepsy, aiming to improve individualized treatment and achieve optimal clinical results.

9. NEOPTERIN, TRYPTOPHAN AND KYNURENINE AS BIOMARKERS IN GLIOBLASTOMA - A PROSPECTIVE TRIAL

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Glioblastoma (GBM) is a highly aggressive brain tumor with limited prognostic markers to predict patient outcomes reliably. This study investigates the perioperative levels of tryptophan, kynurenine, and neopterin in patients with GBM to assess their potential as biomarkers for prognosis. Twenty-four patients with supratentorial GBM and 24 age- and gender-matched healthy controls were included. Blood and urine samples were collected at four time points: preoperatively, three days postoperatively, prior to adjuvant therapy, and post-adjuvant therapy. Analytical measurements of tryptophan, kynurenine, and neopterin levels were conducted using liquid chromatography-tandem mass spectrometry, and statistical analyses were performed to determine their correlation with survival outcomes. The analysis revealed significant perioperative fluctuations in neopterin, kynurenine and tryptophan levels in GBM patients. Moreover, a strong trend of an association between preoperatively obtained blood level of kynurenine and survival probability was observed.

10. OUR EXPERIENCE WITH CIRQ-ASSISTED BIOPSY OF DEEP BRAIN LESIONS - A RETROSPECTIVE SINGLE-CENTER STUDY

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Background: Deep or radiologically ambiguous brain lesions remain diagnostically challenging. Robotic frameless stereotaxy with CIRQ® (Brainlab) offers precise targeting and a streamlined workflow.

Objective: To report our initial clinical experience with CIRQ-guided stereotactic biopsies, emphasising safety, accuracy, diagnostic yield and the impact of prior systemic malignancy.

Methods: All CIRQ-assisted biopsies performed from October 2023 to July 2025 were reviewed retrospectively. Recorded variables included demographics, lesion site, operative time, safe trajectory planning, histopathology, postoperative imaging/complications and oncological history.

Results: Twenty-two patients (mean age 66 ± 14 years; 59 % women) underwent biopsy. Lesions involved the frontal (5), temporal (3), occipital (3), corpus callosum (2), thalamus (1), basal ganglia (1) and ventricular trigone (1) regions, with 6 multifocal/diffuse cases. Nine patients (41 %) had known cancer: 3/9 (33 %) lesions were metastases, 1/9 (11 %) a recurrent astrocytoma and 5/9 (56 %) new primary tumours.

Mean procedure time was 35 ± 14 min. Diagnostic yield reached 100 % (glioblastoma 27 %, primary CNS lymphoma 27 %, metastases 23 %, meningiomas 9%, non tumorous lesion 4%).

Minor haemorrhage occurred in 7/22 (32 %) cases, visible only on routine CT and entirely asymptomatic. Bleeding was most common in metastases (3/4; 75 %) but rare in glioblastoma and lymphoma (1/6 each; 17 %). No re-operations, registration errors or technical failures occurred. Small pneumocephalus (68 %) and bone fragments in the tract (41 %) had no clinical impact.

Conclusion: CIRQ-guided stereotactic biopsy is time-efficient, provides a definitive histological diagnosis (100 % yield), and is associated with a low complication rate. We recommend its routine use for deep or eloquent brain tumours.

11. CRANIOPLASTY USING SYNTHETIC MATERIALS

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Cranioplasty is nowadays a routine procedure in neurosurgery, where a bone defect in the skull is reconstructed either with an autologous implant - the patient's own bone or using synthetic materials. There are several indications for performing cranioplasty for example - after decompressive craniectomies (DKE) following traumatic brain injuries, ischemia or hemorrhage, intracranial tumor processes infiltrating bone tissue or craniofacial malformations. Cranioplasty requires appropriate timing and precise execution of the surgical procedure in order to avoid possible complications. The choice of material with which the bone defect will be reconstructed is also very important. Therefore evaluation and comparison of the most commonly used synthetic materials, with regard to the rate of infectious complications, affordability or cosmetic effect is a current topic. In the presentation authors present a group of patients who underwent cranioplasty with synthetic implants at the Neurosurgical Department of the University Hospital Bratislava, Ružinov, from June 2020 to June 2025. For specific materials several characteristics were compared - functionality, material durability, the need for revision/extraction of the implant due to infectious complications or aesthetic effect. Cranioplasty is part of complex care for patients not only after craniotrauma and DKE but also with other skull defects. In addition to the functional, it has also an important aesthetic effect for patients and facilitates their reintegration into everyday life. In cases where it is not possible to use one's own bone, synthetic implants represent a suitable and durable alternative. Currently, several materials with different properties are available on the market; in our group, we have evaluated the most common complications and pitfalls of using artificial bone substitutes, in order to optimize the selection of the most suitable material for patients.

12. ENDOSCOPIC TREATMENT OF INTERVERTEBRAL DISC HERNIATION

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13. A RARE VARIANT OF THE OCCIPITAL SINUS

– CASE REPORT AND RETROSPECTIVE IMAGING ASSESSMENT

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Introduction: The oblique occipital sinus (OOS) is a rare anatomical variant in which the occipital sinus runs obliquely in relation to the midline and has a dilated lumen. During posterior fossa surgery, accidental injury to this structure may result in massive, potentially fatal hemorrhage. The aim of this study is to present a case of patient with massive intraoperative hemorrhage related to OOS injury and to evaluate the prevalence of this variant based on imaging studies, as well as to analyze their usefulness in detecting it.

Methods: We present a case report of a patient who experienced massive intraoperative hemorrhage from the OOS during a midline suboccipital craniotomy. Additionally, a retrospective analysis was conducted on contrast-enhanced T1-weighted MPR (multiplanar reformation) MR images and DSA studies performed in our Department between 2021 and 2025. Only patients who underwent both examinations were included in the analysis.

Results: In a group of 100 patients meeting the inclusion criteria, OOS was identified in 2 individuals (2%). In one of these cases, the OOS drained contralaterally to unilateral hypoplastic transverse and sigmoid sinuses. The OOS was visible on contrast-enhanced T1 MPR MR images in both patients, but only in one case was it detectable on DSA.

Conclusion: The OOS is a rare but clinically significant anatomical variant that can be detected on routinely performed preoperative contrast-enhanced MPR MR imaging. Its preoperative identification may significantly reduce the risk of serious intraoperative complications.

14. QUANTITATIVE MAGNETIC RESONANCE IMAGING IN PATIENTS UNDERGOING SURGERY FOR CERVICAL SPONDYLOTIC MYELOPATHY – A PILOT STUDY

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Cervical spondylotic myelopathy (CSM) is a common cause of neurological deficits resulting from degenerative changes in the cervical spine. Early diagnosis of spinal cord alterations is crucial for the optimal timing of surgical therapy, which remains ambiguously defined. The aim of this pilot study is to utilize quantitative magnetic resonance imaging (MRI) to identify microstructural changes in the spinal cord in patients with degenerative cervical spine changes and spinal cord compression but without overt radiological signs of myelopathy. The study further focuses on evaluating postoperative changes following surgical treatment, including decompression and intervertebral disc replacement. The study will include patients diagnosed with degenerative cervical spine disease who will undergo surgical treatment. Quantitative MRI will include T1w, T2w, and T2*w sequences, as well as diffusion MRI, with data processed using the open-source tool Spinal Cord Toolbox (SCT). Measurements will include morphometric metrics, such as spinal cord cross-sectional area, and microstructural changes in both white and gray matter, reflecting atrophy and demyelination. The results will be compared with clinical examinations and electrophysiological tests (MEP, SEP) at time points of 3 months, 6 months, and 1 year post-surgery. The pilot results will be presented at the congress. This study presents an innovative approach to quantitatively assess early structural changes in the spinal cord, which may contribute to refining indications and the timing of surgical intervention for patients with CSM. The results of this study could lead to better personalized treatment and optimization of the surgical approach for these patients. Supported by Ministry of Health, Czech Republic – conceptual development of research organization (FNOI, 00098892)

15. YOU MAKE YOUR OWN LUCK

Jozef Papík, Petr Nesnídal, Marek Grubhoffer

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Introduction: Within the case report, we present a patient with recurrent limb and spinal injuries, from which he has not learned, and after risky behavior while intoxicated, he causes another serious injury.

Case Report: A 41-year-old patient with a history of repeated trauma to the limbs and spine over the past 20 years, often in connection with drunkenness. Seventeen years ago, he underwent his first surgery on the cervical spine for a herniated intervertebral disc at C5/6, with complete resolution of neurological symptoms. However, he continued with risky behavior. Three years ago, while intoxicated, he mounted his friend's back, fell onto his back, and hit his head on the ground.

Following the fall, he developed motor and sensory disturbances in both upper and lower limbs. Upon admission to the trauma surgery ward, he was quadriparetic, with paraplegia in the lower limbs. CT and MRI examinations confirmed a dislocation fracture of the cervical vertebrae at C6-7 with spinal cord compression. The patient was indicated for surgical intervention. After stabilization and preoperative preparation, a comprehensive stabilization of the fracture was performed under general anesthesia — reduction, decompression of the spinal canal at C6-7, posterolateral decompression, and stabilisation of the C5-C7 vertebrae from both anterior and posterior approaches. During the subsequent postoperative period, the patient underwent regular intensive rehabilitation care. Despite spinal cord trauma, there was a gradual improvement in bladder and bowel function, as well as motor functions. Two years after the injury, residual paresthesia and monoparesis of the left upper limb persisted. The patient is able to walk without support.

Conclusion: Spinal injuries with spinal cord compression are severe conditions associated with a high risk of permanent neurological deficits. The presented patient did not take into account the weakening of his spine due to previous surgeries and caused a dangerous injury, which was successfully managed only thanks to the high professionalism of the surgical team and interdisciplinary cooperation.

Nurses' section

Spinal and trauma session

THE NURSE AS A KEY TEAM MEMBER IN THE CARE OF THE PATIENT AFTER SPINAL SURGERY, WITH A FOCUS ON PREVENTION AND MANAGEMENT OF POSTOPERATIVE COMPLICATIONS

Kateřina Dusíková, Lenka Balalová

Neurosurgery Clinic University Hospital Ostrava, Czech Republic

The post-operative period after spondylo-surgical procedures represents a key phase in the patient's treatment, when a number of complications can occur that can significantly affect the patient's overall condition and quality of life. During this period, the general nurse provides basic care, prevention, early recognition and management of the most common postoperative complications such as infection, prevention of thromboembolism, healing disorders, pain or neurological deficits within a multidisciplinary team. He also performs specific nursing interventions and provides education. Our goal is to highlight the critical importance of the nurse's role in ensuring a safe, effective postoperative course and reducing the risk of complications.

SURGERY FOR CERVICAL INTERVERTEBRAL DISC HERNIATION + CASE STUDY

Marcela Berková, Adriana Pechová

Neurosurgery Department St. Anne's University Hospital Brno, Czech Republic

We have chosen the topic of surgery of cervical disc herniation for this work. The work describes diagnostics methods, preoperative preparation and postoperative care of patients of our Dpt. of Neurosurgery. The work contains a case study focused on the surgical process during hospitalization of a patient with cervical disc herniation at our clinic.

ACCELERATED FORMS OF REHABILITATION AFTER MINIMALLY-INVASIVE SPINE SURGERY

Peter Mačej

Rehabilitation Institute Hrabýne University Ostrava, Czech Republic

The development of spinal surgery makes it possible to perform minimally invasive interventions in the treatment of LDD (lumbar disc degeneration). The lumbar spine is most often indicated for surgery. At present, several types of operations (decompression, fusion, dynamic stabilization) are performed in the surgical solution of vertebrogenic problems in the lumbar spine. What type of operation and operative technique the operator chooses depends on the graphic documentation of the affected section of the spine and the clinical picture. At present, the minimally invasive surgical technique called minimally invasive spinal surgery (MISS). The procedure allows less tissue damage, less blood loss, earlier verticalization and a shorter hospitalization period. This fact points to the necessity of accelerated forms of rehabilitation in spinal surgery. We followed 250 patients whose average length of hospitalization after mini-invasive procedures at NCHK in Ružomberok in 2022 was 4.84 ± 0.81 days. We appeal to the need for preoperative preparation, which will speed up postoperative rehabilitation.

Keywords: Accelerated forms of rehabilitation. Mini-invasive surgery. Neurosurgery. LDD.

RARE SPINAL INJURY

Magdalena Nevařilová, Jana Esterková

T. Bata Regional Hospital Zlin, Neurosurgery Department, Czech Republic

The penetrating spinal cord injuries are very rare type of damage, which usually result in serious neurological deficit. We are presenting unique case of a patient, who suffered a glass shard piercing his neck after falling through glass door. The next day he showed up to the hospital on his own to have his small, bleeding wound checked. X-Ray and CT examinations of the cervical spine had been made. Results described an object penetrating the spine canal with a spinal cord compression at a C1/2 level. Neurological examination showed central monoparesis of right upper extremity. The patient was transported to an operating theatre for a neurosurgical procedure to be done.

NEW TRENDS IN SURGICAL WOUND CARE AT THE NEUROSURGERY CLINIC, UNIVERSITY HOSPITAL BRNO

Magda Slouková

Neurosurgery Clinic LF MU and University Hospital Brno, Czech Republic

This lecture will discuss nursing care for surgical wounds and introduce a new method for treating surgical wounds using tissue glue. The presentation will be complemented by visual documentation.

NURSING CARE FOR VASCULAR ACCESS

Pavla Grénová

Neurosurgery Clinic LF MU and University Hospital Brno, Czech Republic

The lecture will present nursing care procedures for vascular access, focusing on CVK, PICC, and Midline catheters, complemented by visual documentation.

Vascular and neurooncology session

FLUSHING OUR WAY TO A BETTER OUTCOME: IRRAFLOW IN NEUROSURGERY

Nikola Kubicová, Michaela Siroťiarová

Neurosurgery Clinic – ICU, University Hospital Ostrava, Czech Republic

Neurosurgical diagnoses often require effective lavage and drainage, especially in cases of infections, bleeding or postoperative complications. IrraFlow represents an innovative method for active lavage of cerebrospinal fluid, which combines controlled flow with the possibility of drug administration. This lecture aims to introduce the principle of operation of the Irra Flow device and discuss its potential and clinical use for neurosurgery. The advantages of active lavage compared to passive drainage methods will be presented. Indications, contraindications and technical aspects of the system will also be mentioned. The aim of the lecture is to familiarize nursing staff with the possibilities that the IrraFlow device offers for optimizing the care of patients with neurosurgical diagnoses.

SUBARACHNOID HEMORRHAGE AND ITS TREATMENT OPTIONS

Natálie Palečková, Nicole Bartolčicová

Neurosurgery Clinic University St. Anne´s Hospital Brno, Czech Republic

Subarachnoid hemorrhage (SAH) is an acute neurological event caused by bleeding into the subarachnoid space, most commonly due to the rupture of an intracranial aneurysm. Less frequent causes include traumatic injury, arteriovenous malformations, or coagulation disorders. Clinically, it presents with sudden, severe headache, often accompanied by impaired consciousness, meningeal irritation, and other neurological symptoms. Diagnosis is based on clinical presentation and brain CT (most sensitive within the first 72 hours), and in some cases, lumbar puncture. Angiographic imaging (CT/MR angiography or digital subtraction angiography) is also performed to identify an aneurysm or other vascular pathology. Treatment depends on the etiology and severity of the condition. Conservative management includes stabilization of vital functions, analgesia, blood pressure control, vasospasm prevention, anti-edematous therapy, and prevention of secondary complications. Neurosurgical or interventional radiological treatment options include: aneurysm clipping (surgical closure of the aneurysm neck), endovascular coiling (filling the aneurysm with platinum coils), and in some cases cerebrospinal fluid drainage (external ventricular drainage or shunt). Prognosis depends on the speed of diagnosis, the location of the hemorrhage, the extent of brain damage, and the patient's overall health. Despite advances in diagnosis and treatment, SAH remains associated with high morbidity and mortality.

SAH IN THE SPOTLIGHT: ADVANCES IN THE TREATMENT OF ANEURYSMS AND AVMS.

Renáta Gurská, Vlasta Obůrková

Neurosurgery Clinic, University Hospital Ostrava, Czech Republic

Subarachnoid hemorrhage (SAH) is a life-threatening condition with high morbidity, most commonly caused by ruptured intracranial aneurysms or, less frequently, AVMs. Treatment approaches have evolved significantly, with microsurgical clipping and endovascular coiling remaining the mainstay methods. In selected cases—especially large or wide-neck aneurysms—flow diverters are increasingly being used as a minimally invasive alternative.

This presentation includes data from University Hospital Ostrava, comparing the number and outcomes of procedures performed in the operating room and through digital subtraction angiography (DSA) over one year. We focus on differences in indications, techniques, and benefits of each method.

The conclusion highlights the importance of individualized therapy, multidisciplinary decision-making, and selecting the optimal approach based on lesion location, morphology, and patient condition.

CARE FOR PATIENTS WITH BRAIN ANEURYSMS

Věra Berková, Lenka Vlčková

Department of Neurosurgery, University Hospital Pilsen, Czech Republic

Authors present patient with brain aneurysm. Team of experts (neurosurgeons and interventional radiologists) made a decision to use endovascular treatment – simple coiling vs coiling and stenting. Intervention is performed under general anaesthesia. Patient is admitted in the morning from standard bed to ICU. Here endotracheal intubation is performed and venous access and urinary catheter are inserted. Afterwards the patient is transferred into angiosuite. Patient returns back to ICU after intervention and careful extubation is performed there. Intervention is monitored by electrophysiological team to check potential complications.

FROM MENINGOENCEPHALITIS TO EMERGENCY NEUROSURGERY

Marcela Benková, Viktorie Kaletová

Clinic of Infectious Medicine- ICU, University Hospital Ostrava, Czech Republic

Meningoencephalitis is an inflammation involving both the brain tissue and the meninges. This condition is life-threatening and frequently associated with neurological complications, including, in this case, epileptic seizures and a subdural empyema — a purulent collection between the dura mater and the brain. Subdural empyema is a neurosurgical emergency that demands prompt intervention. We present the case of a 43-year-old patient who developed meningoencephalitis, complicated by a right-sided subdural empyema, epileptic seizures, and left-sided pneumonia.

The case demonstrates the severity and complications of the central nervous system infections and highlights the importance of a multidisciplinary approach involving neurology, neurosurgery, infectious diseases, and intensive care.

PSEUDOCYSTS AND OTHER CAVITIES

Alice Vlčková, Hana Vašulková, Daniel Vejražka

Neurosurgery Clinic-ICU, University St. Anne's Hospital Brno, Czech Republic

In our lecture, we would like to focus on the problem concerning pseudocysts and other cavities in the brain, their development, differentiation, and treatment.

Varia I

USE OF THE PICO 7 SYSTEM IN NEUROSURGERY

Ivana Pospíšilová, Michaela Gřešulová

Neurosurgery Department Regional Hospital Liberec, Czech Republic

This lecture introduces the use of a new vacuum drainage system called PICO 7 in neurosurgery.

The lecture contains a case report of a patient with repeated operations on the thoracic and lumbar spine with a chronic infection.

HEMATOCEPHALUS AND SECONDARY HYDROCEPHALUS A CASE REPORT OF A PATIENT REQUIRING REPEATED CSF DRAINAGE AND VP SHUNT IMPLANTATION

Adéla Macharáčková, Michaela Vilamová

Neurosurgery Clinic University Hospital Ostrava, Czech Republic

Hematocephalus, defined as intraventricular hemorrhage, can lead to the development of obstructive hydrocephalus and often requires staged neurosurgical management. This case report describes a complicated treatment course involving multiple cerebrospinal fluid (CSF) drainage procedures and final implantation of a ventriculoperitoneal (VP) shunt.

Case Report: A female patient was admitted with a sudden onset of severe headache accompanied by nausea and vomiting. Brain CT revealed massive intraventricular hemorrhage (hematocephalus). An external ventricular drain (EVD) was inserted but was repeatedly complicated by partial obstruction and catheter malposition. A new EVD was surgically placed on the right side and follow-up CT showed regression of the hematocephalus. After removal of the drain the patient's clinical condition deteriorated and CT revealed ventricular dilation. An external lumbar drain was inserted, resulting in clinical improvement. Subsequently a VP shunt was implanted, and the lumbar drain was removed.

This case highlights the complexity of managing hematocephalus complicated by secondary hydrocephalus. In addition to initial ventricular drainage, further interventions such as lumbar drainage and eventual VP shunt implantation may be required to restore CSF dynamics and achieve clinical stabilization.

WHAT ABOUT INFECTION PREVENTION NOT ONLY IN ADULT PATIENTS?

Pícha Jan DiS., Veronika Wittnerová

Neurosurgery Clinic for Children and Adults 2.LF UK and University Hospital Motol Praha, Czech Republic

Infection prevention in neurosurgical patients is essential for a successful treatment outcome and minimizing complications that can significantly affect patients' quality of life. This presentation focuses not only on adult patients but also on a broader range of age groups and their specific needs. We will outline the basic principles and practical approaches to reducing the risk of postoperative complications, the importance of patient education, and the role of nurses in prevention. Additionally, we will present the results of implementing specific procedures and infection prevention standards used at the Neurosurgical Clinic of University Hospital Motol. The aim is to support an effective and comprehensive approach to infection prevention in neurosurgery and to strengthen multidisciplinary collaboration in patient care.

Varia II

ARE WE ABLE TO DISTINGUISH COGNITIVE AND BEHAVIORAL CHANGES IN ELDERLY PATIENTS CAUSED BY BRAIN TUMORS FROM AGE-RELATED NEURODEGENERATIVE CHANGES? NEUROPSYCHOLOGICAL OBSERVATIONS ON THE TOPIC – CASE STUDIES AND EXPERIENCES FROM CLINICAL PRACTICE

Zuzana Hummelová, Martin Barák, Radim Jančálek

Department of Neurosurgery, Faculty of Medicine, Masaryk University and St. Anne's Faculty Hospital Brno

According to available epidemiological studies, 70 to 80% of people over the age of 65 experience some form of mild occasional cognitive problems. These changes are considered part of normal aging and do not significantly affect every day functioning. The prevalence of mild cognitive impairment in this age group varies according to studies, most often ranging from approximately 10 to 26%, with 10-15% of these patients progressing to dementia each year. According to the WHO (2023), 5-8% of the population over the age of 65 has dementia, and the risk of developing it increases with age.

Brain tumors are a disease which quite frequently causes cognitive, behavioral, and affective changes. According to research, 40-80% of patients report some cognitive difficulties at the time of disease manifestation, and up to 90% of patients experience these difficulties to some extent throughout the course of the disease and treatment. The most common symptoms are reduced mental performance, attention disorders, „foggy“ thinking, short-term memory disorders, difficulties with word retrieval and communication (that means attention, memory, speech, executive functions). The incidence of affective disorders varies, with symptoms of depression and anxiety disorders or prefrontal changes, developing most frequently.

According to the above, it can be assumed that in patients with brain tumors manifesting in older age groups, there may be a combination of the effects of both processes on cognitive performance, affective and behavioral functioning. Early differential diagnosis of these diseases is a prerequisite for adequate treatment of patients. Using the case study of a female patient, who underwent surgery at our clinic for a brain tumor, and who was simultaneously diagnosed with dementia, we would like to illustrate the neuropsychological form of the clinical manifestation of the symptoms and share our practical diagnostic experience.

FROM THEORY TO PRACTICE: IMPLEMENTING NEUROCOGNITIVE APPROACHES IN REHABILITATION

Karla Kočí, Nikola Kubicová, Eva Kaňáková

Neurosurgery Clinic University Hospital Ostrava, Czech Republic

This lecture focuses on the importance of implementing neurocognitive rehabilitation in the care of patients with a neurosurgical diagnosis. Neurosurgical interventions can lead to various cognitive deficits that significantly affect the quality of life of patients and their ability to return to normal activities. Neurocognitive rehabilitation, aimed at improving impaired cognitive functions such as attention, memory, executive function and language, is a key element of comprehensive care for these patients. The implementation of neurocognitive rehabilitation in a neurosurgical setting requires a multidisciplinary approach involving neurologists, neurosurgeons, clinical psychologists, occupational therapists and speech therapists. The lecture also describes methods for assessing cognitive functions and emphasizes individualized therapeutic strategies.

FROM NEUROSURGERY TO PALLIATIVE CARE

Veronika Zlatušková, Linda Šachová

Neurosurgery Department – ICU, City Hospital Ostrava, Czech Republic

Diffuse astrocytoma is an aggressive and difficult-to-treat disease that remains an important challenge in neuro-oncology. The case of a young man born in 1993 who, despite a difficult diagnosis, shares his treatment process on social media illustrates the importance of multidisciplinary and palliative care. The patient's disease manifested with intermittent visual disturbance, which led to the examination and subsequent discovery of a tumor in the posterior fossa. Resection was performed with histological confirmation of diffuse astrocytoma. Despite neurosurgical intervention, the tumor remained in a difficult-to-access location and further resection would risk severe neurological deficits. For this reason, palliative care was chosen. Despite the progression of the disease, the patient continues to lead an active life and represents an example of an extraordinary fight against the disease.

BACK TO LIFE

Aneta Růžicková, Jana Vohlídalová

Neurosurgery Department, Regional Hospital Liberec, Czech Republic

This lecture presents aspects of cranioplasty and includes a case of a patient who has suffered a craniotrauma.

HOW TIME WENT BY

Lucie Kolářová, Kateřina Levá Foldová

Neurosurgery Clinic University Hospital Plzeň, Czech Republic

Auhors present in short video our Clinic since 1999, when we moved to new buildings in quarter Lochotín-Pilsen. Patient´s capacity increased from 33 to 50 beds for adults and two beds for children. Establishmet of new Intensive Care Unit including 10 beds and electrophysiological laboratory were milestone. New part of team was speech therapist. Neurosurgical Clinic cares for patients from Pilsener a Carlsbad regions and sometimes from other regions of Czech Republic and abroad. Doctors and nurses of Clinic participate in education of future nurses and medical students.

Varia III

CAT OR DOG?

Zuzana Husáková Mered'ová

Neurosurgery Clinic University Hospital Olomouc, Czech Republic

The presentation deals with the issue of zootherapy, therapy based on contact with animals, which contributes to the improvement of the physical and psychological state of patients. It draws attention to the principles of animal welfare and an ethical approach that guarantees their well-being and voluntary participation in therapy. Therapy presents various forms of zootherapy and areas of its use in healthcare, education, social care and special programs. It also includes standards for animals and therapists, emphasizing professional training, respect for the therapeutic plan and safe cooperation of all participants. The goal of zootherapy is to support the psyche, motivate activity, develop educational skills and improve interpersonal relationships.

BRAIN IN A FOG AND BACK IN PAIN: NEUROTRAUMA FROM BOTH SIDES OF THE BED

Bc. Michaela Křížová, Bc. Elishka Suková

Neurosurgery Clinic for Children and Adults, 2.LF UK and University Hospital Motol Praha, Czech Republic

Patients with neurotrauma often present with cognitive impairments such as confusion, disorientation, or emotional instability—commonly described by patients themselves as a „brain fog.“ While they face these challenges, nurses must provide complex care that is both physically and mentally demanding. This presentation offers the perspective of nurses working on general wards who care for patients after head or spinal injuries. We will highlight the specific aspects of caring for this patient group, including limited mobility, behavioral disturbances, and complicated communication. Emphasis will be placed on the crucial role of nurses not only as providers of physical care but also as sources of psychological support. Working with patients after neurotraumatic injury requires professional knowledge as well as empathy, patience, and the ability to handle emotionally challenging situations. Despite the demanding nature of the topic, we recognize the importance of perspective and subtle humor as valuable tools for maintaining the mental well-being of healthcare professionals. The aim of this presentation is to shed light on the complex demands of neurotrauma care and to emphasize the need for supporting healthcare workers to ensure sustainable and high-quality care.

ENGAGEMENT IN GREECE – A CASE STUDY OF A PATIENT WITH AVM

Iva Klímová

Neurosurgery Clinic LF MU and University Hospital Brno, Czech Republic

The lecture will present a case study of a patient with AVM, where the bleeding attack occurred during her vacation in Greece. The lecture will map out her stay in the hospital abroad and the subsequent care at NCHK at the University Hospital Brno.

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