ABSTRACTS FROM

Pediatric Neurosurgery in the 21 century: Challenges and opportunities.

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ABSTRACTS FROM THE 9TH ANNUAL MEETING & 10TH CONGRESS OF THE SERBIAN NEUROSURGICAL SOCIETY WITH INTERNATIONAL PARTICIPATION: 100 YEARS OF NEUROSURGERY IN SERBIA: FOCUS. DEDICATION. SPECIALIZATION.

001 HYDROCEPHALUS MANAGEMENT IN THE REGION

The earliest modern neurosurgical service in the Balkan region was established in Serbia 100 years ago. Since the first documented attempt to address congenital hydrocephalus in 1923, the surgical endeavors of regional neurosurgeons have mirrored global advancements in treatment, incorporating state-of-the-art technical advancements up to the present day. The evolving treatment methodology for hydrocephalus, in line with international standards, is influenced by global trends in cerebrospinal fluid diversion techniques such as shunt placement and endoscopic surgery and underscores the importance of evidence-based practices. Nevertheless, hydrocephalus remains a significant concern in pediatric neurosurgical practice, with a high rate of neurosurgical revisions and re-interventions highlighting the need for continual improvements in treatment strategies.

Keywords: hydrocephalus; treatment; Serbia; Belgrade; pediatric neurosurgery

002 EVOLUTION OF CRANIOFACIAL SURGERY

The presentation titled “Evolution of Craniofacial Surgery” provides a examination of the advancements and milestones in the field during the 20th and 21st centuries. It emphasizes the impact of technological innovations, refinements in surgical techniques, and an improved understanding of craniofacial anomalies.

The analysis begins with the early 20th century, highlighting the foundational contributions of pioneers such as Sir Harold Gillies and Professor Paul Tessier. These surgeons advanced the field through the use of large surgical exposures, acute corrections, and rigid fixations, setting new standards in craniofacial reconstruction.

The presentation further explores the evolution of surgical techniques, including the development and application of distraction osteogenesis, both with external and internal devices, as a method to gradually lengthen and reshape bones. This technique has significantly expanded the possibilities for treating complex craniofacial deformities.

Lastly, the discussion covers the introduction of springs and endoscopic craniectomy techniques, which, combined with cranial molding using helmets, have offered less invasive options for correcting craniosynostosis and other congenital conditions.

Keywords: craniosynostosis; craniofacial deformities; distraction osteogenesis;

003 PEDIATRIC CRANIOPHARYNGIOMAS

Several reasons account for the perduring debate on the best management of pediatric craniopharyngiomas. First of all the rarity of this tumor (5% of intracranial tumors) which precludes reliable comparative analysis of the outcomes, then the still insufficient knowledge of its pathogenesis, the factors related to its aggressivness, the pathogenetic background of its progression, the mechanisms at the base of its recurrence, even in case of total surgical resection.

There is a general agreement that young age at diagnosis (<5yrs), large size of tumor, tumor remnants after surgery, lack of postoperative radiotherapy, adherences to neighbooring structures, adamantinomatous type variant all predict tumor recurrence.

Further characteristics of the tumor namely high Ki-67 values, p53 expression, and whorl-like arrays are also considered predictors for recurrence.

Unfortunately, the above mentioned predictors, though valid on a relatively large scale, are not sufficiently reliable in the single patient so precluding the individuation of the optimal cure. With regard to the therapeutic management subtotal resection of the tumor to avoid further hypothalamic damage followed by targeted irradiation is the current more utilized treatment modality. Furthermore, recently insights in the molecular pathology could pave the way for new targeted therapies aimed at controlling tumor recurrence and tumoral remnants progression reducing the associated morbidity related to irradiation as well as reinforging a prudent surgical attitude.

Consquently, nowadays pediatric cranopharyngiomas may become in most of the cases a chronic disease which requires the care of a multi-disciplinary team that, besides the pediatric neurosurgeons, includes neuroncologists, endocrinologists, neuro- radiologists, neuroradiotherapists, and pediatricians.

Nevertheless, the pediatric neurosurgeons is still called to play the major role in deciding the first approach to the tumor, the time and the modalities of the surgical treatment, as the maximal safe excision of the tumor, continues to represent the major benign prognostic variant. Though an aggressive approach is limited in the very young child as the possible secondary damage of the hypothamus may impair the normal development of the patients, the total safe tumor excision remain the surgical goal in the older children once puberty is achieved.

Keywords: craniopharyngiomas; surgery; intracystic therapy

004 CONTRASTING ADULT AND PEDIATRIC NEUROSURGERY: UNDERSTANDING KEY DIFFERENCES

Introduction: Adult and pediatric neurosurgery represent close but different subspecialties within the field of neurosurgery, each requiring specialized knowledge, skills, and approaches tailored to the unique needs of their respective patient populations.

Patient Population: Common conditions in adult neurosurgery in individuals over the age of 18 include degenerative spine diseases, traumatic brain injuries, brain tumors and brain aneurysms which often result from age-related factors and lifestyle choices.

Pediatric neurosurgery specializes in the management of neurological disorders affecting infants, children, and adolescents. Conditions such as congenital anomalies, hydrocephalus, brain tumors, epilepsy, and spina bifida are prevalent in this population.

Adults have fully developed brains and spinal cords, along with stable anatomical structures while pediatric neurosurgery patients present with rapidly developing brains and spinal cords, making surgical interventions more complex and requiring meticulous attention to growth-related factors.

Surgical Techniques and Approaches: Surgical approaches in adult neurosurgery often prioritize maximal tumor resection, decompression of neural structures, and restoration of spinal stability. Procedures may include craniotomies, laminectomies, spinal fusions, and endovascular interventions.

Pediatric neurosurgery techniques emphasize preservation of neurological function, minimizing tissue trauma, and accommodating for ongoing growth and development.

Procedures such as endoscopic surgeries, shunt placements for hydrocephalus, and spina bifida surgeries are common.

Considerations in Postoperative Care: Adult neurosurgery often focuses on pain management, rehabilitation, and prevention of complications such as infections and deep vein thrombosis. Follow-up may involve monitoring for tumor recurrence or progression of degenerative conditions. Pediatric neurosurgery requires close monitoring of neurological development, inplant function, and potential complications such as cerebrospinal fluid leaks or neurological deficits. Follow-up visits are essential to assess growth and development milestones.

Conclusion: Understanding the differences between adult and pediatric neurosurgery is essential for healthcare providers to deliver optimal care and achieve favorable outcomes for patients across the lifespan.

Keywords: Adult, pediatric, neurosurgery

005 BRIDGING THE GAP: GENERAL NEUROSURGEONS TO PEDIATRIC NEUROSURGERY PRACTICE

Neurosurgery, as a discipline, demands a profound understanding of the intricate complexities of the human nervous system, coupled with surgical skill and empathy.

However, within this field lies a distinct subset requiring specialized expertise: pediatric neurosurgery.

This abstract explores the essential process of transitioning general neurosurgeons into the realm of pediatric neurosurgery, highlighting the imperative for additional education and training. It delves into the unique anatomical, physiological, and psychological considerations inherent in pediatric patients, underscoring the necessity for tailored approaches to diagnosis, treatment, and patient-centered care. Furthermore, it examines the associated with this transition, including the acquisition of specialized skills, communication with pediatric patients and their families, and ethical decision-making.

By advocating for the bridging of this gap through comprehensive education and mentorship programs, this abstract seeks to ensure that general neurosurgeons can effectively meet the complex needs of pediatric patients, thereby enhancing the quality of care and outcomes in pediatric neurosurgery practice.

Keywords: General neurosurgery, Pediatric neurosurgery, Education

006 FREQUENCY OF NEUROSURGICAL INJURES AND SEVERITY IN NEWBORNS

The mode of delivery can contribute to the occurrence of head injuries in newborns.

One of the most common, but in the highest percentage of harmless injuries, is cephalhematoma, with a frequency of 1% in newborns.

Subgaleal bleeding may result from the use of forceps or a vacuum extractor or may result from a blood clotting disorder.

Of the serious injuries caused by the use of vacuum extraction, we meet with a skull fracture (11.4 - 15%), bleeding in the brain of the type of minor hemorrhages, the appearance of an epidural or subdural acute hematoma, which is considered a serious complication.

The brachial plexus is the most frequently injured peripheral nerve, and damage occurs due to shoulder impingement (shoulder dystocia) and breech delivery.

Acute conditions with a severe clinical picture and evident findings on brain CT are treated urgently at the Clinic for Neurosurgery in Nis, further follow-up is carried out at the Clinic for Children's Surgery, Intensive care under the constant control of pediatricians, anesthesiologists and neurosurgeons.

The most important thing for these types of injuries is that they are diagnosed on time and adequately treated, either surgically or by applying conservative therapy.

Keywords: Cephalhematoma, subgaletic hemorrhage, epidural hematoma, subdural

007 acute hematoma, intraventricular hemorrhage, parenchymal hemorrhage

008 UPDATE IN TRAUMATIC BRAIN INJURY IN THE PEDIATRIC POPULATION

Traumatic brain injury (TBI) remains a significant public health concern in the pediatric population, contributing to substantial morbidity and long-term developmental challenges. This review provides an updated overview of recent advances in the understanding, diagnosis, and management of pediatric TBI, drawing on the latest meta-analyses and research studies.

Recent developments have emphasized the need for age-specific approaches to TBI, recognizing the unique vulnerability and recovery patterns of the developing brain.

Advances in neuroimaging and biomarker research have enhanced the ability to detect and monitor brain injuries more precisely, offering new insights into prognosis and the potential for targeted therapies. Emerging evidence also highlights the critical role of early intervention and rehabilitation in improving outcomes, with a growing focus on personalized treatment plans that cater to the individual needs of pediatric patients.

Furthermore, the review explores changes in the epidemiology of pediatric TBI, identifying new trends in the causes and patterns of injury. This evolving landscape underscores the importance of updated preventive measures and public health strategies tailored to the pediatric population.

In conclusion, the field of pediatric TBI is rapidly advancing, with new research offering valuable perspectives on how to better manage and mitigate the effects of brain injuries in children. Ongoing studies are essential to further refine these approaches and to develop more effective interventions that can improve the long-term quality of life for affected children and their families.

Keywords: traumatic brain injury, pediatric neurosurgery

009 PEDIATRIC RADIOSURGERY IN GAMMA KNIFE ZAGREB: A SINGLE CENTER 20-YEAR EXPERIENCE

Results revealed a high clinical success rate, with significant lesion reduction or stabilization in most cases. The precision of GKRS minimized damage to surrounding healthy tissues, contributing to favorable neurological outcomes. Complications were typically mild and transient, with rare severe adverse effects. Long-term follow-up indicated sustained control of treated lesions and a low recurrence rate.

This experience highlights GKRS as a safe and effective treatment modality for pediatric neurosurgical conditions, advocating for its continued use and further research to optimize protocols and enhance patient outcomes.

Keywords: Gamma Knife; radiosurgery; pediatric

010 THE ROLE OF SRS IN PEDIATRIC NEURO-ONCOLOGY

SRS – Stereotactic radiosurgery delivers a high dose of radiation to a very specific target within the brain. This precision helps minimize damage to surrounding healthy tissues, which is particularly important in children whose brains are still developing.

1. SRS is a non-invasive treatment: Unlike traditional surgery, SRS does not involve any incisions - it is not a surgery. It uses advanced imaging techniques to guide the delivery of radiation, making it a less traumatic option for children. SRS can be conducted on different types of highly sophisticated Radiotherapy machines.

2. Conditions Treated: SRS is used to treat a variety of conditions, including: Brain tumors (both malignant and benign) Arteriovenous malformations (AVMs) Certain cases of epilepsy Other conditions where precise targeting is crucial.

3. Treatment Process: The procedure typically involves multiple sessions (usually one to five), depending on the condition being treated. Each session lasts between 30 minutes to a few hours. Children may need to be sedated to ensure they remain still during the treatment.

4. Outcomes: The success of SRS varies depending on the type (radiosensitivity) and location of the tumor or lesion. It is often used in combination with other treatments such as chemotherapy or conventional radiotherapy.

5. Side Effects: Potential side effects can include swelling, temporary neurological symptoms, or radiation necrosis. However, the precision of SRS reduces the risk compared to other forms of radiation therapy.

6. Advantages for Children: SRS is often preferred in pediatric cases due to its non- invasive nature and the ability to preserve cognitive function by sparing healthy brain tissue.

Overall, SRS is a valuable tool in pediatric neuro-oncology, offering effective treatment options with a focus on minimizing long-term side effects for young patients.

Keywords: Pediatric Neuro-Oncology; Stereotactic Radiosurgery

011 OCCIPITAL SINUS VARIATIONS AND MODIFIED POSTERIOR FOSSA DURAL OPENING

Introduction: The conventional midline suboccipital craniectomy, which is the standard approach for treating posterior fossa lesions, involves tying off the occipital sinus. Possible complications from tying off the occipital sinus include hydrocephalus, cerebrospinal fluid (CSF) leak, and pseudomeningiocoele formation. Preserving the venous pathway, as done in other parts of the skull, should also be attempted in the posterior fossa. This study aims to compare postoperative complications between conventional "Y" durotomy and the proposed crescent durotomy in patients undergoing midline suboccipital craniectomy for posterior fossa lesions.

Materials and Methods: The prospective data of 104 patients who underwent midline suboccipital craniotomy for posterior fossa tumors was analyzed. A comparison of study variables was made between the two durotomy techniques used.

Results: Out of the 104 patients, 39 (37.5%) were women. Among them, 75 patients underwent crescent durotomy, while the remaining patients underwent the conventional "Y" durotomy. The analysis of postsurgical complications showed no significant differences between the two groups in terms of surgical site hematoma (2.7% vs 3.4%; P = 1.000) and edema (1.3% vs 0.0%; P = 1.000). Additionally, the incidence of postsurgical CSF leak (1.3% vs 6.9%; P = 0.187) and cranial nerve deficits (4.0% vs 6.9%; P = 0.617) was similar between the groups. However, more patients who underwent the "Y" durotomy developed postoperative pseudomeningiocoele compared to those who underwent crescent durotomy (2.7% vs 17.2%; P = 0.017).

Conclusion: The "crescent" durotomy, a novel dural opening technique aimed at preserving normal venous flow physiology, showed benefits. The crescent durotomy reduced the need for duroplasty, facilitated comfortable primary closure, and reduced the risk of developing a postoperative pseudomeningiocoele.

Keywords: Crescent durotomy, Posterior fossa tumors, Pseudomeningocele

012 ENDOSCOPIC APPROACH TO PITUITARY TUMORS IN CHILDREN

Pituitary tumors in children (up to 18 years) occur relatively rarely, unlike adult patients.

According to estimates, they make up about 15% of all pituitary tumors1. The incidence of functional adenomas is also higher in this population 2.

The endoscopic approach has developed significantly in the last two decades and has been adopted as the approach of first choice in the majority of neurosurgical centers for tumors of the pituitary gland and skull base. In children, the approach is also applicable, with a few modifications. Modifications are made due to special anatomical features in children. Also, close cooperation between neurosurgeons, pediatric endocrinologists, otorhinolaryngologists, neuroradiologists and anesthesiologists is necessary for planning and performing the operation.

The particularity of the anatomy is first of all reflected in the small dimensions of the structures, as well as the narrow corridor and different degrees of pneumatization of the sphenoid sinus, with sometimes changed positions of the intraoperative landmarks. In a technical sense, the appropriate instrumentation (smaller and thinner instruments) must be available.

During the nasal phase, we sometimes decide on posterior ethmoidectomy and resection of the middle turbinate in order to obtain a wider corridor. The conchal type of sphenoid sinus (non-pneumatized) was previously a contraindication for transsphenoidal endoscopic intervention, due to the high risk of possible injury to important neuro-vascular structures, primarily the internal carotid artery.

With the development of neuroradiological possibilities, primarily neuronavigation, this approach has been made possible recently 3.

Sometimes, in younger children, a special problem can be postoperative adherence to the advice that is usually given after this type of surgery, especially in cases of larger reconstructions. Then good and close cooperation with parents is needed, as well as regarding the toilet of the nasal passages.

The degree of complications in these operations does not differ from that in adults.

Today, this method represents a safe standard for the treatment of these tumors in children with the fulfillment of all the goals of the operation and is accepted by the majority.

Keywords: pituitary tumors, children, endoscopic approach

013 STANDARDS IN OBPP RECONSTRUCTION

Over the last 30 years, surgical reconstruction of obstetric lesions to the brachial plexus has been brought to a certain level of standardized care, to ensure best quality microsurgery and functional outcome.

Nevertheless, some aspects are still debated, like delay to primary surgery, tools used to evaluate donor root quality, association of intra- and extraplexic nerve donors, place of nerve transfers.

We operate total palsies early around 2 months of age and (extended) upper lesions according to their functional recovery potential between 6 and 9 months. Our approach is through a transverse supraclavicular incision, allowing easy access to the supra- and retroclavicular area to identify the lesion, roots and trunks. If at least 2 good quality roots are present, intraplexic reconstruction by direct coaptation or sural grafts is performed.

Extraplexic nerve transfers are added in case of upper root avulsions.

We present details of our surgical strategy according to the extent and severity of lesions and our specific quality assessment of roots using intraoperative neuropathologic morphometric tissue examination, combined with intraoperative direct nerve stimulation.

We also summarize achieved functional results and include a discussion about the reconstructive strategy and its results reported by other specialized centers in the international literature.

Keywords: obstetric palsy; nerve microsurgery; nerve transfers

014 QUALITY IMPROVEMENT IN PERIPHERAL NERVE SURGERY THROUGH HISTOPATHOLOGY

In the management of brachial plexus birth palsies, the quality of the roots eligible for reconstruction is thought to be a key issue. The aim of the present study was to evaluate the correlations between pathological root examination and motor recovery after brachial plexus reconstructions. Quantitative histopathological analysis of intraneural fibrosis was conducted on 72 nerve transections (40 roots, 18 trunks and 14 supra scapular nerves) in 20 patients. Clinical recovery of targeted muscles after surgery was assessed by standardized functional scores. After a mean follow-up of 32 months, patients with a lower fibrosis rate for the suprascapular nerve had greater global Mallet scores ($r=-0.57$; $p=0.042$) as well as a greater active shoulder flexion ($r=-0.66$; $p=0.015$). Correlations were also found between C6 root and upper trunk fibrosis rate and some of the subsections of the Mallet score, active movement scale for the biceps and active elbow flexion. These results seem to confirm the relevance of intraoperative pathological evaluation of the roots and nerves after neuroma resection to optimally define the reconstruction strategy.

Keywords: Brachial plexus birth injuries; histopathological analysis; pathological root

015 analysis; root avulsion; nerve graft NERVE TRANSFERS IN BIRTH BRACHIAL PLEXUS PALSY

Primary brachial plexus exploration and Nerve reconstruction with non-vascularized nerve grafts is the cornerstone in BIRTH BRACHIAL PLEXUS PALSY treatment. When the brachial plexus roots are avulsed or severe damage the nerve graft reconstruction is not a good option and a nerve transfer can be the best option.

The use of nerve transfers in nerve reconstruction is not new, and the technique and results has evolved and has gained acceptance in brachial plexus surgeons over the last decades. The is a time and indication for each nerve transfer, we are going to discusses our results of 29 years of experience in birth brachial plexus palsy nerve transfers.

Keywords: nerve surgery, BRACHIL PLEXUS PALSY, nerve transfers

016 NERVE TRANSFERS IN OTHER NON TRAUMATIC CONDITIONS WITH HYPOTROPHIC MUSCLES

Background: The treatment of obstetric brachial plexus palsy by primary nerve reconstruction and nerve transfers has been established in the past decades. In the case of a non-traumatic disease leading to flaccid paralysis and the inability to move the extremities, as arthrogryposis multiplex congenita (AMC), which can have a wide variety of causes, the focus has so far been on rehabilitative therapy, with few surgical interventions indicated, like e.g. osteotomies or muscle transfers. Our aim is to establish nerve transfers as a surgical option to improve mobility in non-traumatic hypotrophic muscle diseases.

Patients: We present needs-adapted treatment of a total of 23 patients (aged 4 months to 64 months, 18 with AMC and 5 with TM) using nerve transfers on the upper extremity.

Results: We were able to show that early nerve transfers of the upper extremity could enable reanimation of the hypotrophic muscles in AMC and TM.

Conclusion: This work shows that the treatment of non-traumatic diseases with hypotrophic muscle tissue in children using selective nerve transfers is a successful method. Gaining important functions for managing independent everyday life can be achieved. Those surgical methods are established in the treatment of traumatic nerve injuries and can be carried out safely. From our point of view this represents an important treatment option for pediatric patients with paralysis associated with AMC.

Keywords: Peripheral nerve surgery, nerve transfers, non traumatic lesions

017 ELECTROPHYSIOLOGICAL GUIDANCE FOR SURGERY IN NBPP CONSIDERING DEVELOPMENTAL NEUROPLASTICITY

Neonatal Brachial Plexus Palsy (NBPP) is a debilitating condition that arises from a closed partial or total stretch injury to the brachial plexus, typically involving the spinal roots C5-T1 and mostly following a complicated childbirth. This injury occurs at a critical juncture in the development of the neonatal nervous system, coinciding with the establishment of sensorimotor pathways essential for normal limb function and control.

Therefore, in addition to the immediate consequences of the peripheral nerve damage, the brain is also confronted with the challenge of processing atypical and potentially erroneous sensory and motor signals. This disruption during a critical period of neurodevelopment may lead to defective motor programming, contributing to long- term functional impairments.

The variability in the natural recovery of NBPP is significant, with outcomes dependent not only on the extent and severity of the lesion but also on the child's inherent neuroplasticity and the speed of nerve regeneration.

Accurate preoperative assessment is crucial for identifying which infants might benefit most from microsurgical intervention. Despite the scarcity of research on electrophysiological approaches in NBPP, the available studies suggest that standardized electrodiagnostic evaluations can serve as a key prognostic tool. These assessments, when conducted at specific time frames, can complement clinical evaluations and neuroimaging, offering valuable insights into the extent of nerve damage and the potential for recovery. Integrating electrophysiological data into the surgical decision-making process may enhance outcomes and optimize functional recovery in affected infants.

Keywords: electrophysiology; NBPP; decision-making in surgery; developmental

018 CONTRALATERAL C7 TRANSFER IN CHILDREN

In the last 4 years, we gained some experience in using total contralateral C7 transfers in children affected by severest obpp lesions, traumatic brachial plexus lesions, and suffering from acute myelitis. Fortunately, due to precise and limited dissection, we did not observe permanent donor defects.

We present results related to different targets (lateral, posterior and medial cord) and continue to advocate this transfer in situations of low donor potential. Our presentation includes a literature review on this specific transfer and concerns about cortical plasticity which in children adapts rather easily to the new nerve connection and execution of function.

Keywords: contralateral C7 transfer; children

019 JUVENILE PILOCYTIC ASTROCYTOMA (JPA)

Juvenile pilocytic astrocytoma (JPA) is a rare brain tumor commonly seen in children and young adults. Historically considered a benign neoplasm, it has attracted significant interest due to its unique biological behavior and therapeutic challenges.

JPA is classified as a WHO grade 1 tumor, indicating its generally favorable behavior and slow-growing nature. Genetic markers are crucial for diagnosis and may serve as potential therapeutic targets. The tumor exhibits a variety of imaging characteristics, often manifesting as a large cystic mass accompanied by a prominently enhancing mural nodule. Complete resection may not always be feasible for deep-seated or infiltrative lesions, necessitating multimodal treatment approaches including additional surgeries and adjuvant therapies. The rate of cure exceeds 90%, but long-term follow-up is important due to the risk of tumor recurrence and late treatment effects.

Keywords: Juvenile pilocytic astrocytoma; JPA; surgery; treatment; outcome

020 CYBERNICS MEDICAL AND HEALTHCARE INNOVATION MAKING FULL USE OF CYBERNICS AND NEUROBIONICS

In order to solve various problems, including from the perspective of monitoring the progress, continuous daily treatment and healthcare of patients with Neurological diseases, we have taken up the challenge of promoting "Cybernics Medical and Healthcare innovation" by researching and developing "Cybernics:fusion of Humans, AI-Robotics/Information systems" that fuses Human and CyberPhysical Space.

Cybernics that fuses Bio-Medical Systems and AI/Robotics/Information Systems cover a wide range of fields, from the Cellular level to Regenerative, AI-Robotics, Cyborg technologies, Artificial Intelligence, IoH/IoT, Big Data, Data Integration/ Analysis/AI processing, Medical and Healthcare, International Standardization, Social implementation etc.

The Wearable Cyborg HAL, a representative achievement of Cybernics, is an innovative technology that improves, support and regenerates Neuromuscular functions. By wearing HAL, movements in response to command signals from the brain can be realized, and sensory signals are sent from peripheral receptors in the muscles, joints and skin to the brain simultaneously with voluntary movements synchronized with the intention.

Interactive Bio-Feedback (iBF) between the brain/body system and HAL is constructed as a functional improvement loop. This loop can be repeated without placing excessive strain on the cranial and muscular systems, and the synaptic connections between nerves and nerves, and between nerves and muscles are strengthened and coordinated.

Cybernics treatment with the medical HAL, which has been approved as a new medical device, is being used as a medical device platform in 20 countries for neuromuscular intractable diseases, spinal cord injuries and cerebrovascular diseases. In Japan, medical insurance covers the treatment of patients with progressive neuromuscular intractable diseases (SMA, ALS and muscular dystrophy etc.), for which no treatments for Neurological Diseases have been available, through RCT as official clinical evaluation (for ref.: medical insurance covers 100% up to 9 treatments for 40000 yen, 20000 yen from 10 treatments onwards). In Germany, public workers' compensation insurance covers spinal cord injury patients (for ref.: EUR 500/treatment, 60 treatments packages (total EUR 30000) are 100% covered insurance). Currently, preparation on RCT is on going for Parkinson's disease with the HAL lumbar type, which has a similar principle. In addition, HALs for independence support, mainly the HAL lumbar type and single-joint type, are used in nursing homes and at home as non-medical devices.

The Cyvis, which enables continuous daily monitoring of biological information essential for the pathological conditions of patients with cranial nerve and muscular diseases in and out of hospital, will soon be available as medical equipment. Furthermore, the international collaboration and medical device application of the Photoacoustic Imaging system (AcousticX), which enables 3-dimensional imaging of peripheral blood vessels (e.g. small arteries etc.) easily and without the use of X-rays and contrast media, is also accelerating.

In this presentation, I will talk about the initiatives towards Cybernics Medical and Healthcare Innovation using Cybernics including latest topics.

Finally, I would like to express my sincere thanks to Prof.Dr. Lukas Rasulic for inviting me to The 10th Annual Meeting of the Serbian Neurosurgical Society and to Prof.Dr.

Sami for his help at the 1st Hannover Cybernics & Neurobionics Summit.

Keywords: Cybernics; wearable cyborg; HAL; Neuromuscular; Regenerative; Cyvis;

021 SURGICAL MANAGEMENT OF CLIVAL CHORDOMAS IN CHILDREN

Clivus tumors in children represent a complex subset of cranial tumors that can significantly impact neurological function and quality of life. This conference will provide a comprehensive overview of the surgical interventions available for treating pediatric clivus tumors, focusing on both the challenges and innovative approaches within this delicate area of neurosurgery. We will discuss diagnostic methodologies, including imaging techniques that aid in the accurate identification and characterization of clivus tumors. The session will cover various surgical techniques assessing their respective advantages and drawbacks based on clinical outcomes. Additionally, the importance of a multidisciplinary team in optimizing patient management and addressing potential complications will be emphasized. By analyzing recent case studies and advancements in surgical techniques, our goal is to enhance the understanding and treatment of clivus tumors in children, thereby improving clinical outcomes and patient prognosis.

Keywords: Clivus tumors, pediatric neurosurgery, surgical techniques, multidisciplinary

022 SEVERE CONGENITAL CERVICOTHORACIC DISLOCATIONS IN CHILDREN DUE TO BONE-DYSPLASIA-RELATED VERTEBRAL MALFORMATIONS: SURGICAL TREATMENT AND LONG-TERM RESULTS

Background: Severe congenital cervicothoracic dislocations (CTD) in children due to bone-dysplasia-related vertebral malformations are a rare and challenging pathology.

The dislocations are also known as spondyloptosis, segmental spinal dysgenesis, and severe kyphotic deformity. According to the literature, there are no uniform approaches to the treatment tactics of this pathology.

Purpose of the study: To analyze the long-term results of surgical treatment of children with CTD.

Design: Retrospective cohort case-control study. Patient recruitment period 2005 – 2019.

Methods: We analyzed the results of surgical treatment of the six patients with CTD detected in children with bone-dysplasia-related vertebral malformations. Clinical, including neurological, examination, X-ray, CT and MRI were completed. The main evaluation criteria here were the age; gender, structure of pathology (level and vertebrae changes), spinal cord width at dislocation level and neurological status, clinical symptoms, preop and postop mJOA and VAS), type of treatment; complications and follow-up more than 2 years.

Results: Four patients had the Klippel-Feil syndrome, one - VATER syndrome and one - neurofibromatosis. In five patients, the symptoms developed slowly during the first year of life, in one case the disease manifested itself at the age of 3,5 years with progressive deformity and then paresis. Before the surgery halo traction was performed in four patients, that gave no results due to irreducible dislocation. The traction was followed by posterior resection of the vertebral body with posterior screw-based instrumental fixation. Only in one case, due to the young age (6 months), the patient was initially fixed in a cranial cervicothoracic orthosis for five months (Case 1 girl with KFS, Fig.1).

After that, at the age of 1 year, the patient underwent posterior occipitospondylodesis complicated by the non-fusion and instability of the instrumentation's cranial end, subcutaneous non-infected seroma in the occiput area and dislocation progression.

As a result, a three-stage treatment was performed that included rearrangement of the posterior structure and its strengthening; anterior C7-Th2 corporectomy with plate fixation and removing the posterior instrumentation to preserve craniovertebral mobility. Two types of surgical approaches were used: posterior instrumental fixation with vertebrectomy from the posterior approach (4 procedures) and combined two- stage surgeries from the anterior and posterior approaches (2 procedures). Case 2 - boy 5 years old with KFS (Fig 2, Video 1). Two stages surgery was performed: 1st stage: C0- Th3 posterior screw fixation and rib graft fusion; 2nd stage: anterior decompression and plate with graft fusion (Fig. 3). Five years FU with excellent clinical result (Fig. 5, Video 2). If to compare the types by the number of complications, several times more complications have been found after posterior instrumented fusion and posterior vertebrectomy (8 complications per 6 patients). Their treatment was long-term, multi- stage and was accompanied by reoperations and neurological complications.

Discussion: Severe congenital CTD due to bone-dysplasia-related vertebral malformations in children are an extremely rare pathology that manifests itself in early age and requires an early surgical treatment. The surgical tactic for such patients is determined individually. Early multi-stage combined surgical treatment has been the best option available so far.

Keywords: Cervicothoracic dislocation; rare spine malformation; Klippel-Feil syndrome

023 CERVICAL SPONDYLOTIC MYELOPATHY; IS IT BECOMING A PATHOLOGY OF YOUNGER PEOPLE?

Cervical spondylotic myelopaty (CSM) is damage of the spinal cord due to repeated microtrauma by bone spurs. It insidiously develops over time and is the most common form of spinal cord injury in adults and ederly. Approximately 10% of people over 55 develop any form of CSM; 85% of people over 60 have radiological changes of cervical spondylosis and risk of progression. In the recent times an increasing of such pathology in younger population, over 40, has been observed. In these cases we found better surgical outcome, certainly due to the better reactivity of the spinal cord in younger population. The reasons of better outcome and the possible causes of earlier onset of CSM are discussed.

Keywords: Spinal cord; spondylosis; cervical myelopaty

024 PEDIATRIC DEFORMITY SURGERY: HISTORY AND MODERN TECHNIQUES OF SCOLIOSIS MANAGEMENT

The ideal surgical method for pediatric scoliosis should enable correction in all three planes, while preventing further progression.

Scoliosis surgery has been evolving during the years. The goal of surgery is to fuse the least number of levels while gaining optimal and lasting correction. Rotational deformity usually remained with traditional surgical techniques.

At IO "Banjica" in the period from 2018 to 2024, 78 patients with adolescent scoliosis were treated with bilateral vertebral (de)rotation method (DVR). The mean age was 14.2 years (12-16). The mean Cobb angle was 61 deg. The mean follow-up time was 2,1 years.

Neurological complication was seen in 2 patients. One patient was operated in a two staged procedure. One postoperative infection was recorded. One revision was done due to hardware problems.

The DVR method shows excellent deformity correction especially in the horizontal plane, with few complications.

Keywords: Scoliosis; Pediatric deformity; DVR; Spine surgery.

025 SPINAL FUSION FOR IDIOPATHIC SCOLIOSIS: WHEN? WHERE? HOW? WHY?

Spinal fusion to treat scoliosis is an extensive surgery that is undertaken after careful consideration of the patient's options. To date there is still much debate about which patients will profit from a fusion surgery and which ones will benefit from conservative treatment. When fusion surgery is performed there is also controversy as to when is the optimum time to perform the surgery, how extensive does the fusion have to be and is there a difference in the surgical approach used.

We present a review of the literature and current examples of clinical cases with a focus on which patients need spinal fusion, when is the best time for an operation, what levels need to be fused and what different techniques are currently being commonly used.

Keywords: Idiopathic Scoliosis; Spinal fusion

026 SURGICAL TREATMENT OF RARE VARIANTS OF SPINAL DEFORMITY IN SPINAL DYSRAPHISM SYNDROME

Spinal deformities are frequently observed in myelomeningocele (MMC) patients.

Scoliosis, for instance, manifests in approximately 94% of thoracolumbar MMC cases and encompasses around 52% of cases overall. The prevalence of kyphosis stands at 10%-20%, while lumbar hyperlordosis occurs in 1.5% of cases.

Progressive spinal deformity stands out as a significant comorbidity associated with MMC. It leads to a reduction in trunk height, giving rise to challenges in sitting, breathing, eating, and urination due to heightened chest and abdominal pressures.

These deformities are rooted in neuromuscular disruptions and vertebral anomalies.

Spinal deformities linked with MMC can be classified into two major categories: primarily neuromuscular kyphoscoliosis or lordoscoliosis, and severe rigid kyphosis or sharply angled kyphosis. Kyphoscoliosis commonly presents in patients with thoracolumbar myelodysplasia, whereas lordoscoliosis is more prevalent among those with cauda equina and conus medullaris dysplasia.

Bracing for patients with MMC and spinal deformities often proves ineffective, potentially leading to rib deformation, diminished respiratory capacity, and neuropathic skin ulcers.

In contrast, early surgical correction holds the promise of enhancing body balance, quality of life, and reducing the need for more aggressive surgical interventions.

The dual growing rod technique emerges as both safe and effective for cases involving moderate neuromuscular kyphoscoliosis or lordoscoliosis at an early age, although it is accompanied by a notable incidence of rod fractures. On the other hand, kyphectomy presents as a demanding procedure with elevated complication rates, particularly skin- related issues. However, for patients grappling with significant rigid kyphosis, viable alternative procedures remain scarce.

Segmental Spinal Dysgenesis (SSD) and Sacral Agenesis (SA) are rare variants of spinal dysraphism syndrome characterized by localised malformations in the spine's development. It primarily affects the thoracolumbar region and is often accompanied by neurological deficits. SSD involves incomplete formation or absence of vertebral structures, often leading to varying degrees of spinal cord tethering.

Surgical intervention is often considered to address neurological deficits and correction of spinal instability and deformity. However, SSD and SA poses challenges due to the complex anatomical alterations.

The main principle of treatment of SSD involves the removal of rudimentary vertebral elements at the level of dysgenesis, spinal mobilization, posterior instrumental fixation and 360 spondylodesis.

Long-term outcomes vary, and multidisciplinary management involving orthopedic surgeons, neurosurgeons, and rehabilitation specialists is crucial for optimizing patient care.

Keywords: myelomeningocele, myeloschisis, neural tube defects, MMC-related kyphosis, postMMC syndrome, spinal dysgenesis, sacral agenesis, caudal regression

027 THERAPY OF BACK PAIN IN CHILDREN AND ADOLESCENTS

The modern way of life, the development of technology, also promote reduced physical activity. Young people and adolescents are increasingly connected to social connections, computers and mobile phones.

Increased load on the spine during long-term sitting, globally reduced physical activity, leads to the weakening of the ligamentous-muscular system of the spine and the development of intradiscal degenerative processes in adolescents.

The clinical picture is most often associated with the presence of lumbar pain syndrome.

Less often, but in the last period, the radicular component of the pain syndrome develops more often. The approach to treatment is usually individual and mostly directed towards physiatry therapeutic procedures. In a certain number of cases, complaints persist even after medication and physical therapy.

The proposal for further monitoring is in the direction of a precise diagnostic assessment in the form of NMR findings. In a large number of cases, a circular expansion of the annulus with a smaller compressive effect is observed, and the presence of annular fissures with disc herniation is less common.

Retrograde analysis of NMR in 26 patients, aged 12 to 17 years, with the presence of lumbar and radicular pain syndrome. In 15 patients, the presence of changes in the NMR findings was observed according to the type of signal change in the intravertebral disc in the direction of the development of Modik I findings. In 8 patients there was a generalized annular fissure with minor protrusion of the intravertebral disc, and in 3 patients there was a complete extrusion with a free fragment. In all patients, the approach to treatment was individual. The first group of patients is treated with nonsteroidal antirheumatic drugs in age-appropriate doses, without corticosteroids, with the use of TENS, HILT-laser and magnetic physical therapy. After reducing the pain condition, most patients focus on gradually strengthening the paravertebral musculature. In the group that did not fully respond to treatment, intra-articular infiltration was performed under ultrasound control, and then physical therapy was repeated. In the group of patients with intervertebral disc protrusions, the protocol was the same as in the first group of patients, and the majority responded positively to the proposed therapy.

In three patients aged 16 and 17 years, intradiscal infiltration of highly concentrated c-PRP was performed under the control of a C arch. The follow-up period after the intervention showed clinical improvement and loss of symptoms after 2 and 3 months from the start of treatment. In 3 adolescents with present disc extrusion, 2 patients were treated operatively, with microsurgical technique, and in one patient, chronic medical treatment was started in the direction of autolysis of the existing fragment.

Conclusion: In the group of young patients with lumbar pain syndrome, we should insist on an individual treatment approach with the application of the most modern treatment methods.

Keywords: back pain, children

028 LUMBAR DISC HERNIATION IN THE PERIOD OF ADOLESCENCE, SINGLE CENTER EXPERIENCE

Background: Symptomatic lumbar disc herniation (LDH) is relatively a rare condition in children and adolescents. The clinical presentation of adolescent LDH often isn't typical what is a reason for delaying the diagnosis and correct treatment.

Objective: We have discussed the risk factors and tried to assess the radiological, clinical and surgical features and outcomes for adolescents with lumbar disc herniation.

Methods: We retrospectively analyzed medical records of all patients with inclusion criteria of being younger than 21 years and surgicaly treated LDH during five year period, 2019-2023.

Results: Among 333 patients operated due LDH we found just 4 patients (1,2%) who were adolescents at the moment of surgery (16-20 years old). All patients were first treated conservatively more than 3 months without any improvement of subjective complains, thus surgical intervention (microdiscectomy) was performed. In two cases it was surgery on two levels. The mean follow-up time for these patients was 32 months and none of the patients had major symptoms during follow-up.

Conclusion: Clinical presentation of LDH in adolescents is usually different comparing to cases in adults. In the absence of a neurological deficit, all available conservative treatment methods should be tried first. When there is implication for surgery and patients are carefully selected, the outcome of lumbar discectomy in adolescence can be satisfactory.

029 PEDIATRIC BRAINSTEM CAVERNOMAS

Among pediatric population, cavernomas represent 20–25% of spontaneous ICH in children. Hemorrhage was observed in 33 to 64% of the pediatric cases at the time of initial diagnosis. Significant fatal hemorrhage is a rare phenomenon compared to AVM's, with a reported annual risk of 0.25% to 6% in cavernomas. Published large series report a higher incidence of infratentorial cavernomas in children over 30%, compared to adult series. Contrarily, reported high incidence has been attributed to the tendency to report such a less common location in the medical literature, rather than reflecting the actual incidence. Nevertheless, brainstem cavernomas, both in adults and children, are presented with focal neurological signs almost always accompanied by cranial nerve involvement along with motor deficits, ataxia and even neuropathic pain. Neurological deficits are secondary to local mass effect rather than direct parenchymal injury although they invariably exhibit varying degrees of micro hemorrhage in the brainstem.

Unlike their supratentorial counterparts, significant morbidity exists with the surgical treatment of brainstem cavernomas. On the other hand, both subsequent amounts of data is present in the literature that brainstem cavernomas have a higher rate of symptomatic hemorrhage than cavernous malformations at other locations. Children with incidentally detected brainstem cavernomas with lesions deep to the surface or prior hemorrhagic episode and acceptable neurologic deficits should be followed conservatively. Nevertheless, once bled and become symptomatic, progressive natural history of brainstem cavernomas ultimately require surgical resection.

Pediatric cavernomas are found to be larger than the adult population and become symptomatic differently from their adult counterparts with their relatively reduced intracranial volume indicating a potential for a greater mass effect. Therefore, it is reasonable to accept that surgery may offer a high probability of altering the natural history of the disease by preventing future hemorrhages and avoiding neurologic decline, as demonstrated on published surgical series. Experience gained from brainstem surgery from low grade lesions of the brainstem in children promotes surgical intervention whose longer life expectancy increases the driving force to seek definitive treatment. As in the supratentorial locations, larger the cavernoma, less eloquent brainstem tissue needs to be traversing to reach the lesion. In respect to the location of the cavernoma within the brainstem; mesencephalic, pontine or intramedullary, one of the standard posterior fossa approaches such as midline suboccipital, retrosigmoid, supracerebellar-infratentorial can be utilized. Lesions that are exophytic or apparent by a hemosiderin-stained area at the surface can be approached through a direct route.

Those imbedded within the neural tissue require careful preoperative planning to estimate the displaced tracts and find the safest entry point with minimal destruction.

Displacement by the lesion may result with unexpected morbidity when previously defined safe entry zones are used. Again, once the lesion is reached, the morphology of the cavernoma allows safe excision with better appreciation of the normal tissue interface compared to tumors and without the risk of unexpected bleeding as in AVM's.

Keywords: cavernous maldormation, brain stem, pediatric vascular disease

030 ANEURYSMS IN PEDIATRIC POPULATION- CASE REPORT, TREATMENT SPECIFIES, REVIEW OF LITERATURE AND PERSONAL RECOMMENDATIONS

Authors present a case of a 15-year-old patient with a sudden attack of non- traumatic subarachnoid hemorrhage associated with impaired consciousness and cardiac arrest. After an emergency transfer to the university children's hospital, hydrocephalus and rupture of an aneurysm on the left posterior cerebral artery were detected. After hemodynamic stabilization, ventriculostomy was performed, intracranial pressure was around 35 cm H2O, DSA confirmed the diagnosis of an aneurysm on the posterior cerebral artery, and due to the size, configuration, and location of the aneurysm, endovascular treatment was performed - stent placement and coiling. During the subsequent intensive care, cardiac arrest occurred once again, however, the condition improved rapidly and 14 days after the attack, the patient was in the standard ward, fully lucid, cooperative, without manifest focal neurological symptomatology and without the need for permanent CSF diversion using a VP shunt.

In the second part of the presentation, the authors focus on the occurrence of such a rare disease in childhood and offer an overview of articles related to aneurysms in children. They further point out certain differences in the treatment of aneurysm rupture and also acute consequences of non-traumatic subarachnoid hemorrhage such as hydrocephalus and vasospasms.

Keywords: aneurysm in pediatric population, occurrence, treatment modalities, outcome.

031 OUTCOME AFTER EPILEPSY SURGERY FOR CORTICAL DYSPLASIA IN CHILDREN, SINGLE CENTER EXPERIENCE

Introduction: Focal cortical dysplasia (FCD) is the most common pathology in children with drug-resistant epilepsy that undergo surgical resection. Isolated FCDs are called type 1 or type 2 according to their histopathological features.Previous studies generally focused on FCD type 1 and type 2 in children. Studies comparing type 2 and type 3 are sparse.

Methods: This is a retrospective study with obtained data from medical records of pediatric patients with intractable epilepsy who had histological diagnosis of FCD following surgical treatment in Istanbul Medipol University, Department of Neurosurgery between January 2014 and September 2021. Demographic characteristics, age of epilepsy onset, febrile convulsion history along with family history of epilepsy, imaging data, and surgical outcome were evaluated.

Results: Twenty-five patients, 10 females and 15 males were included to study. Mean age at surgery was 8.11, and mean follow-up duration was 49 months. 20 (80%) of the patients' MR images showed typical findings of FCD. Temporal lobe was the most affected location (19 (76%) patients). Complete resection was achieved in 18 (72%) patients. 19 (80%) patients were in Engel class I in last follow-up.

Conclusion: There was no statistically significant difference between patients with FCD type 2 and type 3 in terms of seizure freedom. Also, no statistically significant difference was found between the age at surgery, epilepsy duration (both for FCD type 2 and type 3 patients). Complete resection was found to be the most important predictive factor on seizure freedom. Epilepsy surgery is highly effective in selected pediatric patients with FCD.

Keywords: Focal Cortical Dysplasia; drug resistant epilepsy; epilepsy surgery

032 THE RENAISSANCE OF HEMISPHEROTOMY. THE PEDIATRIC PERSPECTIVE

Intractable seizures can be catastrophic, especially in the pediatric population. It is known that hemispheric diseases, such as perinatal middle cerebral artery infarction, malformations of cortical development, Sturge-Weber syndrome and Rasmussen encephalitis are associated with chronic drug-resistant epilepsy. For many decades hemispherectomy was the only surgical procedure for severe, drug-resistant epilepsy.

Despite the increased morbidity and mortality rates associated with this treatment, the post-treatment seizure outcome remains high in these patients.

The first hemispheric surgery for epilepsy treatment published in 1950 by Krynauw from South Africa. Moving forward, these procedures have changed from anatomical resection of large part of the brain to functional disconnection and minimal brain tissue resection. The tendency is to minimize exposure and tissue resection and reduce the surgery-related complication rate, without influencing the effectiveness in terms of seizure outcome. Modern hemispheric disconnection procedures constitute lateral trans-sylvian or vertical hemispherotomies with associated variants and more circumscribed epilepsy surgery procedures, such as the posterior disconnection.

The evolution in this peculiar surgical field focus on the improvement of the safety and the overall outcome of the surgical intervention. Comprehensive training, highly experienced multidisciplinary team, specialized facilities and collaboration between high-volume epilepsy surgery centers are required to guarantee a favorable, long-term postsurgical seizure outcome.

Keywords: Complications; Drug-resistant epilepsy; Functional disconnection;

033 Hemispherectomy; Outcome; Pediatric population ITB IN THE TREATMENT OF CEREBRAL PALSY

Spasticity in cerebral palsy is the result of damage parts of the pyramidal system. It is a painful and disabling motor disorder that contributes to the patient's disability: it makes it difficult or impossible to perform daily life activities, reduces the range of motion, causes pain, leads to contractures, luxations and decubitus wounds.

Indications for surgical treatment of patients with severe spasticity in cerebral palsy are insufficiency of the conventional therapy and intolerance of side effects of the oral therapy. ITB is increasingly used as an alternative treatment and is no longer considered a last option. A programmable pump for intrathecal administration of baclofen can be implanted in children four years of age and older.

ITB does not eliminate the cause of spasticity, but modifies its signal to the brain. It enables precise, targeted treatment, personalized for the specific needs of each patient.

ITB has a good side effect profile and the efficacy of therapy is tested in a reversible procedure before implantation. It can be used with complementary therapies. Greater independence of patients and the possibility of carrying out daily life activities is achieved.

Keywords: ITB, Cerebral Palsy

034 November 1st- Adriatic hall Parallel session- Cranial and spinal malformations ENDOSCOPIC STRIP CRANIECTOMY AND HELMETING FOR SINGLE-SUTURE CRANIOSYNOSTOSIS: WHAT IS HAPPENING?

035 helmet TREATMENT OF CONUS LIPOMAS IN CHILDREN

036 CHIARI MALFORMATION IN CHILDREN

037 consensus SURGICAL TREATMENT MODALITIES FOR CHIARI I MALFORMATION IN CHILDREN AND ADULTS: A COMPARATIVE REVIEW

038 SURGICAL TREATMENT OF SPINA BIFIDA APPERTA – CYSTICA

039 CONTEMPORARY SURGICAL STRATEGIES FOR THE TREATMENT OF INTRACRANIAL ARACHNOID CYSTS

040 November 2nd- Exhibition Hall General Scientific Session 3 SURGERY OF PEDIATRIC CRANIOPHARINGIOMAS: WHAT IS SAFE REMOVAL?

041 ENDOSCOPIC TREATMENT OF ARACHNOID CYSTS

042 November 2nd- Exhibition Hall ISPN Session VIII- Craniofacial/ Spasticity PERSONALIZED CRANIAL REMODELING FOR SCAPHOCEPHALY: A UNIFIED APPROACH

043 November 2nd- Hall Mediterranean Nursing symposium Neuro-oncology SMALL PATIENTS, GREAT ACHIEVEMENTS- FROM THE FIRST STEPS TO MODERN INNOVATION

044 HEALTH CARE OF A CHILD WITH A PLACED NASOGASTRIC TUBE

045 SUPRASELLAR TUMOR IN CHILDREN- CASE REPORT

046 PINEAL TUMORS IN CHILDREN- CASE REPORT

047 THE ROLE OF THE SCRUB NURSE IN PEDIATRIC NEURO- ONCOLOGY SURGERY

048 treatment outcome NURSING INTERVENTIONS OF A TRACHEOTOMIZED CHILD ON MECHANICAL VENTILATION IN THE NEUROSURGICAL INTENSIVE CARE UNIT

049 CONTEMPORARY ASPECTS IN THE CARE AND TREATMENT OF CHILDREN WITH TUMORS OF THE CENTRAL AND PERIPHERAL NERVOUS SYSTEM

050 NEURORADIOLOGICAL IMAGING IN PEDIATRICS

051 HOLISTIC, CONTINUOUS TREATMENT AND CARE OF THE CONSEQUENCES OF DARK RAIN

052 PSYCHOLOGICAL SUPPORT OF CHILDREN WITH BRAIN TUMORS

053 with brain tumors, communication, psychological comorbidities CHEMOTHERAPY APPROACH IN THE TREATMENT OF CHILDREN WITH TUMORS OF THE CENTRAL NERVOUS SYSTEM

054 BRAIN TUMORS IN CHILDREN

055 November 2nd- Hall Mediterranean Nursing symposium General PSYCHOLOGICAL HELP AND SUPPORT OF NURSES TO SICK CHILDREN AND THEIR PARENTS IN THE DAY HOSPITAL OF THE NEUROSURGICAL CLINIC

056 HEALTHCARE STANDARDS IN THE TREATMENT AND CARE OF CHILDREN WITH CRANIOSTENOSIS

057 BEHIND THE SCENES: THE INDISPENSABLE ROLE OF THE SCRUB NURSE IN CRANIOSYNOSTOSIS SURGERY

058 treatment outcome HYDROCEPHALUS IN CHILDREN

059 INTRATHECAL DRUG ADMINISTRATION

060 SPECIFICS OF CHILDREN'S PALLIATIVE CARE

061 4. American Academy of Pediatrics. Guidance for Pediatric End-of-Life Care in 2022, available at: https://publications.aap.org/pediatrics/article/149/5/e2022057011/186860/Guidance-for-Pediatric-End-of-Life-Care?autologincheck=redirected MODERN ASPECTS IN THE NEUROSURGICAL TREATMENT AND HEALTHCARE OF CHILDREN

062 HEALTH CARE OF CHILDREN WITH CEREBROVASCULAR DISEASES

063 STANDARDIZED HEALTH CARE PROCEDURES IN CHILDREN WITH INTRACRANIAL HEMORRHAGE

064 SPINAL SARCOMA IN CHILDREN

065 NURSING INTERVENTIONS IN HEAD INJURIES

066 RESPIRATORY PHYSIOTHERAPY IN CHILDREN AFTER NEUROSURGERY- CASE REPORT

067 HEAD INJURIES IN CHILDREN

068 November 2nd- Hall Mediterranean Nursing symposium Craniocerebral and peripheral nerve injuries NURSING INTERVENTIONS IN CRANIOCEREBRAL INJURIES

069 NURSE'S ACTIVITIES IN TREATING TRAUMATIC CONDITIONS IN CHILDREN IN THE NEUROSURGICAL OUTPATIENT CLINIC OF THE EMERGENCY CENTER

070 Diagnosis Of Craniocerebral Injuries In Children • • Rtg, CT.

071 CHILD CARE IN NEUROSURGERY

072 CARE OF A CHILD WITH A CRANIOCEREBRAL INJURY

073 NURSING STANDARDS IN PEDIATRIC PATIENTS WITH PERIPHERAL NERVE INJURIES

074 CRANIOCEREBRAL INJURIES IN CHILDHOOD

075 TEAMWORK IN PEDIATRIC PERIPHERAL NERVE SURGERY – A SCRUB NURSE'S VIEWPOINT

076 transplantation CARE OF A CHILD WITH CRANIOCEREBRAL INJURY

077 FREQUENCY OF CONCUSSIONS IN PRESCHOOL CHILDREN

078 November 2nd- Hall Mediterranean Special session Treatment of pediatric chiasmatichypothalamic tumors ONCOLOGICAL TREATMENT OF PEDIATRIC HYPOTHALAMIC- CHIASMATIC TUMORS

079 November 2nd- Adriatic hall IANA Session PEDIATRIC POSTERIOR FOSSA EPENDYMOMAS

080 COMPLICATIONS IN PEDIATRIC NEUROSURGERY

081 November 2nd- Adriatic hall Parallel session Innovative approaches APPLIED ARTIFICIAL INTELLIGENCE DECISION SUPPORT SYSTEM FOR PEDIATRIC NEUROSURGERY

082 SUPRAORBITAL KEYHOLE APPROACH FOR TREATMENT OF LARGE BRAIN ABSCESSES IN A 15-YEAR-OLD PATIENT

083 CONTROVERSIES IN THE ENDOSCOPIC MANAGEMENT OF COLLOID CYST

084 ventriculostomy, PATHOPHYSIOLOGY OF NEURAL SIGNALING NITRIC OXIDE AND ITS PHARMACEUTICAL DEVELOPMENT

085 3D PRINTING MODELS – USEFUL TOOLS IN CRANIOPLASTY AND PEDICLE SCROW NAVIGATION IN IDIOPATIC SCOLIOSIS SURGERY

086 November 3rd- Exhibition hall Panel EANS Section of Pediatric Neurosurgery &ESPN Pediatric Neurosurgery- Special topics SURGICAL ISSUES IN THE MANAGEMENT OF PINEAL REGION TUMORS IN THE PEDIATRIC AGE

087 PEDIATRIC TUMOR SURGERY- HOW TO IMPROVE BOTH SURGICAL AND POST SURGICAL OUTCOME

088 MULTIMODAL APPROACH FOR THE TREATMENT OF COMPLEX HYPOTHALAMIC HAMARTOMAS

089 interstitial thermal therapy; MRgLITT November 3rd- Exhibition hall Young Neurosurgeons' forum & competition for awards NEUROSURGICAL TREATMENT OF RUPTURED PONTINE CAVERNOUS MALFORMATIONS IN CHILDREN – OUR EXPERIENCES AND CONTROVERSIES

090 Retrosigmoid Approach; Telovelar Approach EXPERIENCE OF USING MINIMALLY INVASIVE MICROSURGICAL DECOMPRESSION (MMD) IN PATIENTS WITH DEGENERATIVE MONOSEGMENTAL LUMBAR SPINAL STENOSIS

091 decompression 17-YEAR-OLD TEENAGE GIRL WHO SURVIVED MULTIPLE GUNSHOTS TO THE HEAD AND BODY FROM AN AK-47 RIFLE IN MASS MURDER: CASE REPORT

092 treatment, AK-47 HYDROCEPHALUS POST-FORAMEN MAGNUM DECOMPRESSION: A PAEDIATRIC CASE STUDY OF COMPLICATIONS AND RECOVERY

093 Fig 2: An MRI of the brain reveals bilateral tonsil herniation, periventricular cerebrospinal fluid seepage, and upstream hydrocephalus Fig 3: Magnetic resonance imaging (MRI) scans taken after the operation reveal a decrease in tonsillar herniation, oedema, compression of the medulla and upper cervical cord, and dilatation of the lateral and fourth ventricles PLEUROPULMONARY BLASTOMA (PPB) WITH CENTRAL NERVOUS SYSTEM METASTASIS: CASE REPORT

094 LESSONS LEARNT IN DOING ENDOSCOPIC THIRD VENTRICULOSTOMY IN CHILDREN

095 ENDOSCOPIC SURGERY FOR BASAL ENCEPHALOCELES IN CHILDREN

096 RUPTURED SYLVIAN ARACHNOID CYST IN CHILDREN

097 SURGICAL MANAGEMENT OF CEREBELLAR PEDUNCULAR TUMORS IN PEDIATRIC POPULATION: CHALLENGES AND PITFALLS. REPORT OF 12 CASES

098 cerebellar peduncle (ICP); middle cerebellar peduncle (MCP) DANDY-WALKER SYNDROME- CASE REPORT

099 preterms November 3rd- Hall Mediterranean Parallel session- Neuro-oncology NEONATAL BRAIN TUMORS

100 SURGICAL TREATMENT OF PEDIATRIC TUMORS OF PINEAL REGION

101 SURGICAL TREATMENT OF LOW-GRADE EPILEPSY- ASSOCIATED NEUROEPITHELIAL TUMORS (LEAT) IN CHILDREN

102 Glioneuronal tumors; Ganglioglioma; Dysembryoplastic neuroepithelial tumor; Lesionectomy; Epilepsy surgery DPG (DUPLICATION OF THE PITUITARY GLAND)-PLUS SYNDROME: A CASE REPORT EMPHASIZING CLINICAL FEATURES, MANAGEMENT CONSIDERATIONS AND REVIEW OF THE LITERATURE

103 ENDOSCOPIC THIRD VENTRICULOSTOMY AND CAUTERIZATION OF CHOROID PLEXUS – INDICATIONS AND SOME TECHNICAL CONSIDERATIONS

104 (CPC); hydrocephalus; flexible endoscope; maturity November 3rd- Hall Mediterranean FREE TOPICS- Neurotrauma & PNS

105 PERIPHERAL NERVE SHEATH TUMORS IN NEUROFIBROMATOSIS TYPE 1

106 Outcome, Quality of Life NEWBORN HEAD TRAUMA VERSUS PHYSIOLOGICAL HEAD TRAUMA

107 GUNSHOT BRAIN INJURY – THE LOST RACE?

108 OUTCOME OF SURGICALLY TREATED ACUTE EPIDURAL HEMATOMA, 32 MONTHS PROSPECTIVE OBSERVATIONAL STUDY

109 DECOMPRESSIVE CRANIECTOMY COMPLICATED BY AN EPIDURAL HEMATOMA: A CASE REPORT

110 HEAD TRAUMA IN A CHILD WITH STRUGE-WEBER SYNDROME OVERLAPPING KLIPPEL-TRENAUNAY SYNDROME

111 RADIOLOGICAL EXAMINATION IN CHILDREN WITH MINOR HEAD INJURY – DILEMMA BASED ON A CASE REPORT

112 EPIDEMIOLOGY OF PAEDIATRIC HEAD INJURIES IN GOVERNMENT GENERAL HOSPITAL, KAKINADA, ANDHRA PRADESH

113 A CASE OF CHRONIC SUBDURAL HEMATOMA: A RARE COMPLICATION OF TRAUMATIC BRAIN INJURY IN PEDIATRIC PATIENT WITH FAVORABLE OUTCOME FOLLOWING MINIMALLY INVASIVE SURGERY

114 neurosurgery; minimally invasive surgery; SEPS; good outcome GUIDELINES FOR THE TREATMENT OF SEVERE TBI IN CHILDREN. CONTROL OF ICP

115 INTRACRANIAL PENETRATING TRAUMA IN A PATIENT WITH A PREVIOUSLY EMBOLIZED ANEURYSM

116 ATLANTO-OCCIPITAL DISLOCATION- A CASE REPORT OF AN 8 YEAR OLD CHILD INJURED IN MOTOR VEHICLE ACCIDENT

117 fusion, Cranial nerve palsy, Trauma NON-TRAUMATIC BILATERAL PERIORBITAL HEMATOMA IN A SEVEN-YEAR-OLD CHILD: A CASE REPORT AND THE IMPORTANCE OF DIFFERENTIAL DIAGNOSTICS

118 November 3rd- Hall Adriatic Parallel session- Neuroanesthesia CHILDREN NEUROANAESTHESIA BASICS

119 There are also non-medical problems to be solved: working in non-pediatric hospital, obtaining adequate equipment and materials for children, unexperienced staff, relatively small number of patients, lack of pediatric expertise, difficult engaging necessary consultants. Pediatric neuroanaesthesiologists need to know the differences between the typical operations: • Tumour: increase in incidence; all ages; often progressed therefor urgent operation needed; variety of types and localizations; intraoperative patient positions; intraoperative neuromonitoring(IONM); postoperative complications and multiple operations; • FCP(posterior cranial fossa): various pathological entities; brain stem affected; patient positioning(prone, sitting, “park bench”); IONM; postoperative complications and multiple operations; • VP shunt: cranial size and shape; often urgent operation; large operative area; frequent complications and reoperations; • ETV: diagnostic or therapeutic procedure; head bent frontwards; possibly unpredictable operation (duration, bleeding, plan changing); • Premature cranial synostosis: variety of types and shapes; presence of other malformations and syndromes; cranial, facial, neck and upper airways deformities; positioning; duration of the operation (often long lasting); massive blood loss (intraoperative and postoperative); • Vascular problems: pathological vascular formations; hematomas (preoperative diagnostics, therapeutic radiological procedures, blood transfusions); • Vertebral column and spine: all ages; variety of pathological entities; positioning; IONM;

120 AIRWAY MANAGEMENT CHALLENGES IN PEDIATRIC NEUROSURGERY

121 neuroanesthesia RESPIRATORY INFECTIONS IN CHILDREN AND ANESTHESIA IN NEUROSURGERY

122 children's neuroanesthesia INTRAOPERATIVE FACIAL NERVE MONITORING: COULD IT BE LIFE-THREATENING?

123 POSTOPERATIVE ANALGESIA FOR PEDIATRIC CRANIOTOMY PATIENTS

124 SITTING POSITION IN PEDIATRIC NEUROSURGERY

125 TRAUMATIC BRAIN INJURY IN CHILDREN AND ADOLESCENTS: EXPERIENCES AT PICU IN SPLIT, CROATIA

126 MANAGEMENT OF PEDIATRIC TRAUMATIC BRAIN INJURY

127 monitoring; pediatric traumatic brain injury NEUROPHYSIOLOGICAL MONITORING FOR NEUROSURGICAL INTERVENTIONS IN PEDIATRIC PATIENTS

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129 Neurooncology
130 CLINICAL OUTCOMES OF PEDIATRIC CLIVAL CHORDOMAS: A RETROSPECTIVE ANALYSIS

131 AUDIT AND BREAKTHROUGH INTO CLASSIFICATION, TREATMENT AND PROGNOSIS OF PEDIATRIC EMBRYONAL BRAIN TUMORS: THE ERA OF MOLECULAR TARGETED THERAPY

132 PEDIATRIC GLIOBLASTOMA : SURGICAL SERIES STUDY OF 18 CASES

133 CONGENITAL GLIOBLASTOMA STUDY OF A RARE PATHOLOGICAL ENTITY

134 PEDIATRIC GLIOBLASTOMA: A SURGICAL SERIES OF THIRTY- FIVE PATIENTS

135 PEDIATRIC PILOCYTIC ASTROCYTOMAS OF THE POSTERIOR FOSSA: STUDY OF A SURGICAL SERIES OF 28 CASES

136 CLINICAL CHARACTERISTICS AND PARAMETERS RELIABLE AS PREDICTORS OF THE NEED FOR THE VP SHUNT PLACEMENT AND THEIR RELATION TO THE TREATMENT OUTCOME

137 resection A RARE CEREBELLAR METASTASIS IN A YOUNG GIRL

138 DIFFUSE LEPTOMENINGEAL GLIONEURONAL TUMOR PRESENTING WITH HYDROCEPHALUS IN A PEDIATRIC POPULATION: A CASE REPORT

139 Ventriculoperitoneal shunt; Pediatric neurosurgery HYDATIC CYST OF THE POSTERIOR FOSSA: A CASE REPORT

140 INTRASELLAR CHORDOMA : A DIFFICULT PREOPERATIVE DIAGNOSIS

141 NEUROSURGICAL MANAGEMENT OF EOSINOPHILIC GRANULOMAS IN PEDIATRIC PATIENTS: ANALYSIS OF A SINGLE-CENTER EXPERIENCE AND REVIEW OF THE LITERATURE

142 neurosurgery
143 CALCIFYING PSEUDONEOPLASMS OF THE NEURAXIS (CAPNON), A CASE REPORT AND REVIEW OF LITERATURE

144 pseudoneoplasm MULTIDISCIPLINARY APPROACH TO PINEAL REGION TUMORS IN PEDIATRIC POPULATION

145 tumor; AT/RT November 3rd- Hall Baltic FREE TOPICS-
146 Spinal disorders
147 NEUROREACH – MAKING SURGERY IN NEUROSURGERY ACCESSIBLE- AN INTRADURAL SPINAL CATHETER DEVICE

148 PREOPERATIVE PLANNING WITH 3D PROTOTYPING IN THE SURGICAL TREATMENT OF CONGENITAL SPINAL DEFORMITIES

149 THE EPIDURAL FIBROSIS COMPLICATING LUMBAR DISC HERNIATION SURGERY VIA INTERMYOLAMELLAR APPROACH: PROGNOSTIC STUDY AND IDENTIFICATION OF RISK FACTORS

150 TWO-STAGE SURGICAL TREATMENT OF PATIENTS WITH CAUDAL REGRESSION SYNDROME AND SPINAL DEFORMITY

151 APPLICATION OF INTRAOPERATIVE SPIRAL COMPUTED TOMOGRAPHY AND MODERN NAVIGATION IN SPINE SURGERY

152 diseases COMPARISON OF OUTCOMES OF EARLY AND LATE SURGICAL INTERVENTIONS IN LIPOMENINGOMYELOCELE (LMMC) AND LIPOMENINGOCELE (LMC)

153 SPINAL CORD PERFUSION PRESSURE AFTER TRAUMATIC SPINAL CORD INJURY, A NEW PERSPECTIVE

154 SPINAL ARACHNOID CYST- PARADIGM OF ITS ETIOPATHOGENESIS AND ITS ROLE IN MANAGEMENT IN A TERTIARY CARE CENTER

155 THE EFFECT OF ORAL CLONIDINE IN REDUCTION OF POST- OPERATIVE PAIN IN DISC SURGERY

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157 Miscellaneous
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160 REFERRED SHOULDER PAIN DUE TO THE POSITIONING OF THE VENTRICULOPERITONEAL SHUNT: A CASE REPORT AND LITERATURE REVIEW OF AN UNUSUAL COMPLICATION

161 shoulder tip pain
162 PROFESSOR VOJISLAV SUBOTIC, THE FIRST PEDIATRIC NEUROSURGEON IN SERBIA

163 EFFECTIVENESS OF LUMBAR DRAINAGE IN PEDIATRIC PSEUDOTUMOR CEREBRI: A RETROSPECTIVE STUDY

164 AI GENERATED – PIN LESS NAVIGATION FOR LOCALIZING BRAIN TUMORS USING AUGMENTED REALITY

165 Localization in neurosurgery, newer advancements, SKIA ENDOSCOPIC MANAGEMENT OF ISOLATED FOURTH VENTRICLE HYDROCEPHALUS: A RETROSPECTIVE ANALYSIS OF 44 CASES

166 ventriculoperitoneal shunt FIRST RESULTS OF THE PILOT PROJECT “FOLLOWING INTENSIVE NEUROREHABILITATION FOR PATIENTS AFTER SEVERE BRAIN INJURY” (NINR)

167 RECONSTRUCTION OF SKULL BASE IN CRANIOFACIAL CLEFTS SURGERY

168 SURGICAL CORRECTION OF SCAPHOCEPHALY: A COMPARISON OF THE MORPHOLOGICAL RESULTS IN ENDOSCOPY AND RECONSTRUCTION GROUPS

169 HEMISPHEROTOMY IN THE TREATMENT OF DRUG-RESISTANT EPILEPSY IN CHILDREN

170 LONG-TERM OUTCOME OF SURGERY IN CHILDREN WITH DRUG RESISTANT EPILEPSY AND FOCAL CORTICAL DYSPLASIA

171 THE EFFICACY OF TOPICAL VANCOMYCIN IN PATIENTS WENT FOR CRANIOTOMY TO REDUCE THE RISK OF SURGICAL SITE INFECTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

172 The reported number of surgical site infection after using topical vancomycin were only 12 compared to 88 of the control group. The overall effect size was RR=0.22, 95% CI (0.09, 0.53), P=0.0007, I2= 44%.

173 PERIOPERATIVE PARENTAL ANXIETY IN NEUROSURGERY

174 Outcomes SURGICAL MANAGEMENT OF HYDRANENCEPHALY: CASE SERIES AND PREFERENCE OF KOCHER'S POINT

175 November 3rd- Hall Baltic FREE TOPICS-
176 Miscellaneous
177 ENDOSCOPIC MANAGEMENT OF LATERAL VENTRICULAR ARACHNOID CYST

178 VENTRICULOATRIAL SHUNT PLACEMENT IN A 10 YEAR OLD CHILD WITH PREVIOUS V-P SHUNT AND PERITONITIS. CASE REPORT

179 OVERDRAINAGE SYNDROME PRESENTED WITH BILATERAL CSDH IN 5 YEAR OLD CHID AFTER VENTRICULOPERITONEAL SHUNT PLACEMENT. CASE REPORT

180 valve DIFFERENTIATED METHOD IN SURGICAL REVASCULARIZATION OF THE BRAIN FOR THE TREATMENT OF PEDIATRIC PATIENTS WITH MOYAMOYA ANGIOPATHY

181 THORACIC GANGLIONEUROMA WITH SPINAL CANAL INFILTRATION IN PATIENT PRESENTING AS ACUTE PARAPLEGIA. CASE REPORT.

182 NUANCES OF VENTRICULOPERITONEAL SHUNT PLACEMENT AND SHUNT REVISIONS

183 shunt placement
184 MANAGEMENT AND COMPLICATIONS OF SPINAL INTRADURAL INTRAMEDULLARY MATURE CYSTIC TERATOMA: A CASE STUDY

185 EFFICACY OF SYRINX SHUNTING FOR MANAGEMENT OF CHIARI MALFORMATION TYPE I IN THE PAEDIATRIC POPULATION

186 syringoperitoneal; syringopleural MULTIPLE INTRACRANIAL ONCOTIC ANEURYSMS FOLLOWING ATRIAL MYXOMA RESECTION IN A PATIENT WITH CARNEY COMPLEX

187 A RETROSPECTIVE STUDY OF ENCEPHALOCELE MANAGEMENT: INSTITUTIONAL EXPERIENCE

188 CONVEXITY ARACHNOID CYST- A RARE COMPLICATION OF VENTRICULO PERITONEAL SHUNT IN PEDIATRIC PATIENT

189 ENDOVASCULAR TREATMENT RESULTS IN PEDIATRIC SPETZLER–MARTIN GRADES I–IV INTRACRANIAL ARTERIOVENOUS MALFORMATIONS

Martin grading system Table 1: Clinical characteristics of the patients GEN-

DER AGE SYMPTOM

AVM

LOCALIZATION NİDUS DRENAGE VEIN

ELOQUENT

AREA

S-M

GRADE

INTRANIDAL

ANEURYSM

EMBOLIZATION

DEGREE

FOLLOW UP

IMAGE FINDINGS mRs M 13 HEMORRHAGE R FRONTAL LOBE 2 CM SUPERFICIAL (-) I (+) COMPLETE THERE IS NO

RESIDUE /

RECURRENCE IN

77. MONTH MRI

COULDN'T BE

EVALUATED

M 7 HEMORRHAGE R VERMİAN 2 CM

DEEP+SUPER-

FICIAL (-) II (+) PARTIAL+GK

THERE IS NO

RESIDUE /

RECURRENCE IN

30. MONTH CTA 1

M 11 HEMORRHAGE R FRONTAL LOBE 1,5 CM DEEP (-) II (+) COMPLETE THERE IS NO

FILLING IN 60.

MONTH DSA 0

F 10

HEMORRHAGE,8

MONTHS BEFORE R BASAL GANGLİA 3,3 CM DEEP (+) IV (-) NIDUS

COULDN'T

REACHED; GK

THERE IS NO

RESIDUE /

RECURRENCE IN

63. MONTH MRI 1

M 7 HEMORRHAGE L FRONTOBAZAL 2 CM SUPERFICIAL (-) I (+) PARTIAL+

SURGICAL

RESECTION

THERE IS NO

RESIDUE /

RECURRENCE IN

3. MONTH DSA /

30. MONTH CTA 0

F 13 HEMORRHAGE L FRONTAL LOBE 2 CM SUPERFICIAL (+) II (+) PARTIAL+

SURGICAL

RESECTION

THERE IS NO

RESIDUE /

RECURRENCE IN

37. MONTH MRI 1

M 10

NO BLEEDING,

ELECTIVE L FRONTAL LOBE 4 CM SUPERFICIAL (-) II (-) SUBTOTAL+

SURGICAL

RESECTION

THERE IS NO

RESIDUE /

RECURRENCE IN

23. MONTH MRI

COULDN'T BE

EVALUATED

F 16 HEMORRHAGE R OCCIPITAL LOBE 2 CM SUPERFICIAL (-) I (+) COMPLETE THERE IS NO

RESIDUE /

RECURRENCE IN

12. MONTH DSA/

24. MONTH MRI 0

F 13

HEMORRHAGE,7

MONTHS BEFORE L PARİETAL LOBE 3,5 CM SUPERFICIAL (-) II (-) COMPLETE THERE IS NO

RESIDUE /

RECURRENCE 3.

MONTH CT 0

M 11 HEMORRHAGE

L CEREBRAL

HEMISPHERE

MULTİLOBAR >6 CM

DEEP+

SUPERFICIAL (+) IV (-)

PARTIAL (NO

ADDITIONAL

TREATMENT)

THERE IS

APPARENT

REGRESSION IN

15. MONTH MRI

COULDN'T BE

EVALUATED

M 14

HEMORRHAGE,12

MONTHS BEFORE

L POSTERİOR

CALLOSAL 1 CM DEEP (-) II (-) COMPLETE

THERE IS NO

RESIDUE /

RECURRENCE IN

13. MONTH MRI 0

F 8 HEMORRHAGE R THALAMIC 3,3 CM DEEP (+) IV (+) PARTIAL+GK THERE IS

REGRESSION IN

RESIDUAL PART

IN 21. MONTH

MRI 0

F 10

NO BLEEDING,

ELECTIVE L PERICALLOSAL 5,5 CM DEEP (+) IV (+) PARTIAL+GK THERE IS

REGRESSION IN

RESIDUAL PART

IN 13. MONTH

MRI 2

F 12 HEMORRHAGE L FRONTAL 3,2 CM SUPERFICIAL (+) III (+) COMPLETE W/O FOLLOW-UP COULDN'T BE

EVALUATED

CTA: Computed Tomography Angiography; DSA: Digital Subtraction Angiography; GK: Gamma Knife; L: Left; mRs: modified Rankin scale; MRI: Magnetic Resonance Imaging (+Contrast); R:Right; S-M: Spetzler-Martin

190 USUAL AND UNUSUAL VP SHUNT COMPLICATIONS

191 TRANSITIONING FROM ADULT TO PEDIATRIC NEUROSURGERY – RESIDENT'S POINT OF VIEW

Transitioning to pediatric neurosurgery from an adult neurosurgical practice can be demanding for neurosurgery residents. Over the past year, our department has integrated pediatric patients into our practice, requiring a rapid adaptation to the distinct physiological, anatomical, and psychological needs of children. Children are not just "small people", they represent a unique category of patients with all the specificities of clinical presentation, examination and treatment, that makes neurosurgical practice with them extremely challenging from the resident's point of view.

One of the biggest challenges in pediatric neurosurgery lies in technical complexity of the procedures. The head, brain, and nervous systems of a child are not simply small versions of adults. Because of this fact surgery and postoperative care are different compared to adults and the margin for error is lower, even small mistakes can have serious consequences for a child's further development and quality of life.

There is a call for more training and education during transition from adult to pediatric practice. Residents need to learn about pediatric neuroanatomy, injury mechanisms, and treatment protocols. This kind of education demands an appropriate training program that can offer theoretical and clinical approach besides guidance from highly experienced neurosurgeons.

Emotional difficulties and related ethical dilemmas abound in pediatric neurosurgery practice. Treating young patients, whose life is in danger or in risk of being severely changed, often means dealing with families under immense stress, and residents must learn how to manage their own emotional responses while still providing compassionate care to both the patients and their families. In situations when you delivering difficult news and managing parent's expectations residents must show empathy and professionalism, which can be difficult to achieve for inexperienced doctors. Also, the emotional burden of treating severely disabled children can be profound and the resident must find his own way to deal with it.

Keywords: Transitioning; neurosurgery resident; emotional challenges; resident

192 training LONG-TERM OUTCOME OF SURGERY IN CHILDREN WITH DRUG RESISTANT EPILEPSY AND FOCAL CORTICAL DYSPLASIA