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FUNCTIONAL NEUROSURGERY – SURGERY FOR PAIN 2

SESSION

Thursday, September 6, 2018

Bega Hall

Chairs: Marc Sindou, Kim Burchiel
CERVICAL DREZ-OTOMY IN PAIN TREATMENT

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Objectives
Evaluation of the efficacy of the cervical DREZ-otomy for intractable pain of the superior limbs.

Materials and methods
3 patients operated in our service between 2017-2018, posterior unilateral cervical approach. Two patients had postradiotherapy pain and one had a history of cervico-brachial Zona Zoster with neuropathy. Surgical procedure was done under general anesthesia with TIVA and neurophisiological monitorisation to identify the roots involved in symptomatology.

Results
All three patients had good medium term result with disappearance of pain after the surgery, the patient with zosterian neuropathic pain had a recurrence of symptoms at 1 month after surgery that responded to neuroleptics. All patients developed hipoesthesia in the pain area after surgery. There were no surgical complication.

Conclusions
Cervical DREZ-otomy is an efficient method of treatment for the patients with intractable pain of the superior limbs. It can be done uni/bilateral if both limbs are involved. It needs a correct clinical evaluation of the involved roots and a thorough neurophisiological monitorisation during the surgery for the same reason. The hypoesthesia is a desired result, that gives an immediate feed-back of the efficiency of the surgical act.

References
SURGERY FOR PAIN IN CANCER PATIENTS

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Objectives
Cancer is one of the principal causes of death in western society. However, advances in diagnosis and therapy have greatly prolonged the survival of cancer patients in the past decades. Complete cure form most cancers is however still unavailable and for the most part the consequences of the tumours in the body as well as the therapies aimed at eliminating them are a fact in the day to day life of oncology patients.

Materials and methods
More than 50% of cancer victims will suffer therefore from chronic pain in 20% of them this pain being intractable.

Results
Reliance on classical therapies including oral and intravenous opioids greatly impacts the quality of life of patients with cancer. In this presentation, we review the indications techniques (with video excerpts) and results of neurosurgical methods to control pain in cancer patients.

Conclusions
Current day use of intrathecal neuromodulation, electrical neuromodulation and lesioning techniques (DREZotomy, cordotomy, mesencephalic tractotomy, and trigeminal rhizotomies) are illustrated from the daily practice of a cancer pain center (Universite de Lyon 1 and Leon Berard Oncology Center in Lyon).

References
DORSAL RHIZOTOMY FOR CHILDREN WITH SPASTIC DIPLEGIA – QUADRIPLEGIA OF CEREBRAL PALSY ORIGIN: INTRAOPERATIVE NEUROMONITORING

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Objectives

The utility of intraoperative neuromonitoring (ION), namely the study of muscle responses to radicular stimulation, remains controversial. We performed a prospective study combining ventral root (VR) stimulation for mapping anatomical levels and dorsal root (DR) stimulation as physiological testing of metameric excitability. The purpose was to evaluate to what extent the intraoperative data led to modifications in the initial decisions for surgical sectioning established by the pediatric multidisciplinary team (i.e., preoperative chart), and thus estimate its practical usefulness.

Materials and methods

Nineteen children with spastic diplegia underwent the following surgical protocol. First, a bilateral intradural approach was made to the L2–S2 VRs and DRs at the exit from or entry to their respective dural sheaths, through multilevel interlaminar enlarged openings. Second, stimulation—just above the threshold—of the VR at 2 Hz to establish topography of radicular myotome distribution, and then of the DR at 50 Hz as an excitability test of root circuitry, with independent identification of muscle responses by the physiotherapist and by electromyographic recordings. The study aimed to compare the final amounts of root sectioning—per radicular level, established after intraoperative neuromonitoring guidance—with those determined in the presurgical chart.

Results

The use of ION resulted in differences in the final percentage of root sectioning for all root levels. The root levels corresponding to the upper lumbar segments were modestly excitable under DR stimulation, whereas progressively lower root levels displayed higher excitability. The difference between root levels was highly significant, as evaluated by electromyography as well as by the physiotherapist. Decreases were most frequently decided for roots L-2 and L-3, whereas increases most frequently involved roots L-4 and L-5, with the largest changes in terms of percentage of sectioning.

Conclusions
The use of ION during dorsal rhizotomy led to modifications regarding which DRs to section and to what extent. This was especially true for L-4 and L-5 roots, which are known to be involved in antigravity and pelvic stability functions. In this series, ION contributed significantly to further adjust the patient-tailored dorsal rhizotomy procedure to the clinical presentation and the therapeutic goals of each patient.

References
TRIGEMINAL NEURALGIA AND MICROVASCULAR DECOMPRESSSION

SESSION

Thursday, September 6, 2018
Bega Hall

Chairs: Horia Ples, Ioan-Stefan Florian
RELIABILITY OF MRI FOR PREDICTING CHARACTERISTICS OF THE NEUROVASCULAR CONFLICTS IN TRIGEMINAL NEURALGIA. IMPLICATION IN SURGICAL DECISION MAKING FOR MICROVASCULAR DECOMPRESSION

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Objectives
The choice of MVD, among the several other surgical options, for treating refractory classical TN relies mostly on preoperative imaging. The degree of reliability of MRI while already studied is still a matter of debate. In this study, we approached the question of predictability of NVC in a series of 100 protocolized MRIs from patients with TN that underwent MVD, by re-examination of MRIs blinded from the clinical data and surgical findings including the side of the neuralgia.

Materials and methods
Patients included in the study were those who underwent microvascular decompression after surgical indication had been retained based on a protocolized imagery workup (3D High Resolution T2 cisternography centered on the trigeminal nerve, 3D TOF Angio and 3D T1 with gadolinium) performed at our institution. All MRI were blindly re-examined and neurovascular relations were described on both sides for existence of compression, vessels involved, situation along the root and the degree of compression. These were then compared with actual surgical findings focusing on Cohens’ Kappa correlation coefficient and on receiver operator characteristics statistics to describe the quality of the prediction.

Results
Out of 100 patients, in 94 a conflict had actually been found at surgery, with an MRI sensibility to detect a conflict of 97% and a specificity of 50%. Vessel type was identified with high reliability, Cohens’ Kappa of 0.80, while the grade of the conflict and its situation along the root with poor to average reliability (Cohens’ Kappa 0.38 and 0.40, respectively). The area under the receiver operator characteristics curve to predict the presence of a conflict according to the grades of conflict seen on MRI was 0.93, considered as very good. Positive predictive value was differentiated according to the grade of conflict with a very high value for high grades of conflict.
**Conclusions**

This study shows an overall good reliability of MRI to predict the existence of a NVC. Prediction value is excellent for high grades of compression of the conflict. Some low grades seen on MRI may be false positives when confronted to surgical exploration. This raises the question of what other imaging methods might be used not only to determine the existence of a conflict but also and even more its degree of compression. This is of paramount importance to predict the probability of long term pain relief and therefore incite to propose MVD as the first choice of surgical treatment.

**References**

MICROVASCULAR DECOMPRESSION FOR THE TREATMENT OF AN UNUSUAL CASE OF PAINFUL SPASMS IN FACIAL, MASTICATORY, AND MOTOR OCULAR MUSCLES

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Objectives

Microvascular decompression is a well-recognized technique for the treatment of several cranial nerve hyperactivity syndromes most notably trigeminal neuralgia and hemifacial spasm. Conflicts between nerves and vessels at the root entry zone of the respective nerves are thought to be responsible for demyelination, cross transmission and ultimately kindling that generate the hyperactivity syndrome. Reports of hyperactivity related to compression of the brainstem have been made resulting in both classical syndromes such as hemifacial spasm but also neurogenic hypertension.

Materials and methods

In this report we present an unusual (unique) case of a 42-year-old female admitted for disabling complex and atypical bilateral facial spasms associated with painful masticatory and motor ocular dystonic movements, difficult to fit in the definition of any known cranio-facial dyskinesias.

Results

Microvascular decompression of the left brainstem from an ivaginating PICA led to full and stable recovery of the symptoms at three years follow up.

Conclusions

The report describes on the clinical picture and radiological evaluation but focuses on the microsurgical decompression technique through an intraoperative video.

References

1. Idriceanu TM, Sindou M. Painful spasms in facial, masticatory, and motor ocular dystonic movements, difficult to fit in the definition of any known cranio-facial dyskinesias.

DEEP BRAIN STIMULATION (4)

SESSION

Thursday, September 6, 2018

Bega Hall

Chairs: Mihaela Simu, Stephane Thobois
Deep brain stimulation (DBS) has, since the late eighties, gained a major importance for treating many movement disorders with a reasonable risk-benefit ratio. Some indications are well validated such as subthalamic nucleus (STN) DBS for Parkinson’s disease, VIM thalamic DBS for essential tremor or internal globus pallidus (GPI) DBS for primary dystonia. STN DBS leads to major improvement of motor and several non motor symptoms in PD but does not stop disease progression and may, sometimes, induce difficult to manage behaviors (mania, apathy…). Therefore this therapy should only be proposed by well trained multidisciplinary teams. VIM thalamic DBS induces dramatic improvement for essential but also parkinsonian tremor at the expend of a risk of cerebellar ataxia that can be related to the DBS itself and/or to disease progression. GPI DBS has demonstrated its efficacy for some dystonia such as DYT1, DYT 11, or cervical dystonia but its benefit is much more inconsistent for secondary dystonia except for tardive dyskinesias. Therefore this treatment should be discussed for dystonia on a case by case basis. Several issues remain debated such as the interest of other targets of DBS and the extension of the indications. Finally, new DBS devices increase the possibilities of stimulation parameters adjustments and limit the frequency of pulse generators changes for patients benefit.
CURRENT STATE OF DBS PROGRAMS IN ROMANIA: INDICATIONS, CLINICAL PATHWAYS AND RESULTS

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Introduction

For patients with advanced Parkinson’s disease (PD), the only alternative therapeutic option remains device-aided therapy, including DBS. There are several other movement disorders, like primary generalized dystonia, essential tremor, in which DBS has proven its efficacy and provides the best outcome.

Content

The experience in our center is by far greater in PD, starting in 2005, when the first PD patient underwent surgery. Currently, we follow around 70 implanted patients.

For PD DBS, we follow the same indications and patient recruitment like other centers. It is mandatory the positive diagnosis of idiopathic PD, in advanced stage, having any of the symptoms with impact on QOL with poor control under best pharmacological therapy – refractory tremor, motor fluctuations (wearing off, on-off, delayed on, no-on), motor complications of dopaminergic therapy (dyskinesia), severe off periods.

Despite various clinical phenotypes of PD, having either tremor dominant, or akinetic-rigid forms, we classically target STN.

Results

Having a good patient selection, along with a great neurosurgical team in order to have optimal implantation, we have very good clinical outcomes for the majority of our patients. Nevertheless, it is important to mention few cases in which the management remains challenging, including IPG programming, due to several problems after the procedure (i.e. balance problems).
EPILEPSY SURGERY 1

SESSION

*Friday, September 7, 2018*

*Bega Hall*

*Chairs: Sylvain Rheims, Ioana Mindruță*
Surgical treatment of drug-resistant epilepsy is being performed in a growing number of adults and children. This lecture will give an overview of the rationale, selection criteria, technique, and outcome for the available resective epilepsy surgery procedures.

In case of epilepsy, surgery can be considered if 4 main criteria are fulfilled. 1 - The drug-resistance must be certain, 2 - The epilepsy should be disabling, 3 - The patient must be strongly motivated to undergo surgery, and 4 - To be considered for resective (curative) surgery, most seizures have to been proved to arise exclusively from one area of the brain that is functionally silent. This latter point explains why a complete course of pre-surgical investigation is mandatory, before to take any surgical decision. These presurgical investigation are always constituted by a non-invasive part. In some cases however, these non-invasive pre-surgical investigation may be insufficient to clearly identify the ictal onset zone as well as the eloquent cortical areas. Such situations lead to propose invasive investigation consisting in intracranial electroencephalography (EEG) recordings. Subdural grid electrodes (SGE) implantation is suitable for providing superficial hemispheric cortical recordings. However, interhemispheric or temporo-mesial electrode placement can be tricky and can lead to adverse effects. Moreover, this invasive technique can record neither the bottom of sulci nor the insula and may be risky. Stereoelectroencephalography (SEEG) is another way to obtain intracranial EEG, by using depth electrodes. This technique, which offers the possibility to accurately and safely explore mesial structures, deep sulci and insula, is becoming more and more popular worldwide, and has clearly our preference.

Data obtained from the literature suggest that after temporal lobe surgery, 68 % of the adult patients, on average, are seizure-free. This result may vary, according to the authors, from 50 to 93 %. One randomized controlled study concludes that 58 % of patients treated surgically become seizure-free, compared to only 8 % in the group of patients who do not receive surgery. This clearly shows that temporal lobe surgery is an efficient treatment of drug-refractory temporal lobe surgery. Seizure outcome is similar in the pediatric population. Studies of frontal lobe surgery report that an average of 60 % of patients are
seizure-free after surgery, in adults as well as in children. Too few studies are available to allow for an evaluation of parietal or occipital lobe surgery.

The complication rate of resective surgery is low. Contralateral motor impairment is the main permanent complication related to cortical resection. Postoperative hematomas, infections, or hydrocephalus may also occur. Some postoperative neuropsychological complications are reported in the literature, especially after surgery on the dominant side.

In conclusion, surgery is an important therapeutic option, which has to be considered as soon as the epileptic disease appears to be drug-resistant, particularly in case of temporo-mesial epilepsy.
CLASSICAL TEMPORAL LOBECTOMY 3D VIDEO PRESENTATION

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Objectives
Temporal lobe epilepsy surgery is a well validated procedure for the control of intractable epilepsy. Performing it requires however thorough knowledge of the procedure and surgical anatomy of the temporal lobe and connected structures. In this 3D video we discuss the relevant anatomy as well as the step by step procedure for classical temporal lobectomy.

Materials and methods
A full procedure of temporal lobectomy for refractory epilepsy related to hippocampal sclerosis as been recorded by a team performing more than 30 lobectomies a year. Recordings provide 3D visualisation options as well as imaging integration.

Results
The procedure is presented step by step. Analysis of the relevant anatomy in conjuncture with imaging is the first stage including identification of the temporal sulci and gyri with their posterior landmarks the opercula and borders of the insula on the convexity surfaces, as well as the mesial structures. Next anatomy of the periventricular is discussed namely: the hippocampus with its tiny fimbria bundle, the choroidal fissure and its velum with the attached choroid plexus, fed by the anterior and postero-lateral choroidal arteries followed by connective pathways. This is ten followed by the description of the surgical resection itself: surgical approach, dural opening, opening of the Sylvian fissure, extrapial temporal pole resection, identification of the temporal horn and choroid point, subpial uncus and amgdala resection and en bloc hippocampal resection.

Conclusions
Temporal lobe resection is a safe procedure if proper knowledge of anatomy is ensured and appropriate technique used.

References
SURGICAL TREATMENT OF TEMPORAL LOBE TUMOR-RELATED EPILEPSY

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Aim

Majority of fronto-temporo-insular tumor present with intractable epilepsy. Maximal tumor resection with quality of life preservation and seizure control is currently the first therapeutic option. There are controversial results regarding seizure control and hippocampal resection in cases with tumors not invading the hippocampus. We present our experience concerning seizure control and hippocampal resection in perihippocampal tumors.

Patients and methods

Epilepsy surgery programme at our Department started in 2009. We have operated 50 patients, 35 patients with hippocampal sclerosis and 15 patients with tumors.

Five patients had left sided (dominant) fronto-temporal tumors and one had a right-sided mesial temporal tumor. There were four male and two female patients, median age 32 years. All patients underwent thorough preoperative examination, including neuropsychological testing. In five patients subtotal tumor resection was performed via pterional approach and in the right-sided mesial temporal lesion was resected via subtemporal approach. Follow-up ranged from 7 to 42 months.

Results

Neuropsychological testing showed verbal memory impairment in two patients. Histological analysis revealed grade II glioma in three patients, dysembrioplastic neuroepithelial tumor (DNET), anaplastic ganglioglioma and focal cortical dysplasia in one patient each. All tumors involved the uncus and amygdala. Hippocampectomy was performed in only one patient with clear signs of tumor invading the hippocampus. Seizure control was satisfactory (Engel I = three patients; Engel II = one patient; Engel III = one patient).

Conclusion

The hippocampal resection avoidance in our patients was based upon the intraoperative findings and neuropsychological testing. The series from the literature strongly support resection of a non-tumoral hippocampus in order to achieve seizure control. The individualized functional and not only oncological approach to the patient is necessary.
EPILEPSY SURGERY 2

SESSION

Friday, September 7, 2018

Bega Hall

Chairs: Marc Guenot, Kostas Fountas
NON-RESECTIVE EPILEPSY SURGERY

MARC GUENOT

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In most cases, the selection process for surgical candidates gives way to resective epilepsy surgery. In some cases however, it is not possible to resect the pre-defined epileptogenic zone, sometimes because this zone, although clearly defined, corresponds to a whole lobe, or even a whole hemisphere, sometimes because there are multiple and independant epileptogenic foci, thus making it impossible to consider a resection, and sometimes because a less invasive, although less efficient, alternative to a classical resection can be choosen.

Therefore, non-resective epilepsy surgery is not synonymous with palliative surgery (a paliative technique, unlike a curative technique, which clearly aims at making the patient seizure-free, aims at a decrease of the frequency and severity of the existing seizures to enhance the quality of life).

This lecture will give an overview of the rationale, selection criteria, technique, and outcome for all the available non-resective epilepsy surgery procedures, curative as well as palliative, which can be summarized as follows:

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Legends

MST: Multiple Subpial Transection,
VNS: Vagus Nerve Stimulation,
DBS: Deep Brain Stimulation,
Gamma-Knife: Stereotactic Radiosurgery,
ThermoSEEG: SEEG-guided Radio-Frequency ThermoCoagulation of the epileptogenic focus.

Conclusion

Non resective epilepsy surgery therefore consists in a vast catalogue of surgical procedures. These procedures are heterogenous, some of them using microsurgical techniques, some them being stereotactical, some of them being possibly curative, and some others being purely palliative. Moreover, some of them, such as
vagus nerve stimulation, are widely used, whereas some others, such as multiple subpial transection, are less frequently performed. Whatever the technique, indication criteria and patient’s selection are, as usual, the crucial points.
VAGUS NERVE STIMULATION THERAPY FOR REFRACTORY EPILEPSY: SURGICAL EXPERIENCE AND NEUROLOGICAL OUTCOME IN 330 CONSECUTIVE OPERATED PATIENTS

FELIX-MIRCEA BREHAR, MIRCEA GORGAN, SILVIA MARA BAEZ RODRIGUEZ, GEORGE PETRESCU, ROXANA RADU, ANDREI GIOVANI

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Objectives
Refractory epilepsy remains a challenging health problem with a significant social and economic impact. Vagus nerve stimulation (VNS) represents an important surgical option of treatment for the patients with refractory epilepsy. The authors present here surgical experience and preliminary neurological outcome on a series of 330 operated patients with drug-resistant epilepsy.

Materials and methods
We included in our series 330 patients diagnosed with refractory epilepsy, implanted with vagal neurostimulators between October 2012 and November 2017 in Neurosurgery Clinic, “Bagdasar-Arseni” Emergency Hospital. All patients were investigated with preoperative head MRI and EEG-video monitoring. We implanted in all patients the 103 generator model of vagal neurostimulator (Cyberonics Inc.). We perform in all cases a standard left latero-cervical surgical approach and used the vagus stimulation lead model 303. The medium follow-up period was 31 months.

Results
There were 58 children (17,5%) and 272 adults (82,5%) in this series. The medium age was 28,8 years. There were 162 females (49,1%) and 168 males (50,9%) in our cohort. The average period of hospitalization was 3,6 days. There was no death in this series and no intraoperative incidence. Transient postoperative hoarseness was noticed in 46 patients (13,9%) and disphagia in 21 patients (6,4%). In term of seizures control, 245 patients (74,2%) were responsive to VNS therapy. 103 patients (31,2%) had more than 50% reduction of seizure frequency and 142 patients (43,1%) had less than 50% reduction of seizure frequency. In 85 patients (25,7%) there were no significant reduction of seizure frequency, but there was a slightly improvement in term of reduction of seizures severity with a general improvement of the quality of life. It is important to mention that 28 patients (8,4%) achieved seizure freedom.
Conclusions

VNS represents now a safe, quick and efficient surgical procedure with a minimum period of hospitalization and a short recovery period. The good results on long term improve the quality of life of the patients and facilitate the social and professional reinsertion.

References

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COMPLICATIONS OF INVASIVE EEG MONITORING

KOSTAS N. FOUNTAS, MD, PHD

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The employment of invasive EEG monitoring still constitutes a valuable diagnostic tool in the diagnosis, and the preoperative evaluation of patients suffering medically intractable epilepsy. Invasive EEG via implanted subdural grid and strip electrodes, or stereo-EEG via multiple depth electrodes may be employed in cases of non-lesional epilepsy, and/or in lesional cases, in which there is no agreement between the electrophysiological and the anatomical findings of the preoperative workup. However, the employment of invasive EEG has been associated with various and occasional troublesome complications. Several clinical series have reported the formation of post-implantation hematoma, either epidural or subdural, the development of edema and subsequent death, post-implantation infections, development of temporary neurological deficit, and non-habitual seizure occurrence. The duration of monitoring, the total number of implanted electrodes, and the type of the implanted electrode (subdural vs. depth) are a few among many reported predisposing factors. The pertinent literature is reviewed in a systematic and critical way, in order to identify the actual occurrence of invasive EEG complications, and also to recognize all their predisposing factors. Furthermore, the development of strategies for avoiding any complications or at least mitigate their clinical consequences is discussed, and tips and tricks for minimizing the risk of any invasive EEG complications are presented. Moreover, the future advances in the field of invasive EEG monitoring are reviewed.
FREE TOPICS 1

SESSION

Thursday, September 6, 2018

Europa Hall

Chairs: Jurgen Piek, Lukas Rasulic
SAFETY OF THE SITTING POSITION. A NATURAL RANDOMIZATION STUDY ON 96 PATIENTS

TANIA IDRICEANU, CHLOE DUMOT, EMMANUEL JOUANNEAU, JACQUES GUYOTAT, MARC SINDOU, ANDREI BRINZEU

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Objectives
A debate persists concerning the relative risk and the yet unproven benefit of the sitting position. In spite of several published series hard evidence is yet unavailable. This is mainly due to the absence of comparative studies of homogenous surgical practices and the ethically difficult option of randomization. In this study we compare the sitting position to its alternatives, focusing on safety while keeping parameters such as surgical technique and severity of patients as homogenous as possible.

Materials and methods
Due to the small variances in technique between surgeons at our institution we used Chiari decompression as our model including only patients in whom the intention to treat was in the sitting position. Preoperative trans-esophageal echocardiography was used to dichotomize the two groups. The groups were compared for complication rates, intraoperative course and outcome at day 2, one month and one year.

Results
From 2003 to 2013 121 Chiari decompressions meeting our inclusion criteria were performed 86 sitting, 30 prone. The two groups were homogenous in terms of preoperative status and demographics. Major complications occurred in 3 patients (2 sitting/1 prone p=0.84). Outcome was comparable for the two groups. Hospital length of stay (19/25 days p=.64) was not significantly different. Surgical time was shorter for the sitting position (184/203 minutes, p=0.0002) and bleeding (84/378 cc, p=0.0001) was more important in the prone position. VAE occurred more frequently (21%, p=0.009) in the sitting position without any clinical consequences. No differences in hemodynamic parameters were noted.

Conclusions
Operating patients in the sitting position is not associated with significantly increased risks. Methodological obstacles to high level of proof prospective studies could be overcome using this paradigm.

References
ADVANTAGES OF AUTOLOGOUS FIBRIN SOLUTION (AFS) IN PREVENTION OF MAJOR COMPLICATIONS IN NEUROSURGERY (HEMORRHAGIC COMPLICATIONS AND CSF FISTULAS)

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Introduction
The natural hemostasis is a process of defending the body against bleeding (the damage to a blood vessel through which blood leak is more or less abundant). Efforts have been made to obtain a fibrin product with less disadvantages and this way appear the AFS made from the patient’s own blood.

Material&methods
AFS is an autologous product of patient’s own blood, thus protecting the patient against the risks mentioned above: anaphylactic or incompatible reactions and blood transfusion risks. The AFS preparation process takes place in the operating block and lasts only 25 minutes, and the handling of the machine is easy for the operating team. This AFS is extracted from 120 ml of blood taken preoperative from the patient.

This retrospective study with application of AFS to 26 brain tumor patients without exclusion criteria on enrollment because we wanted to test AFS capabilities and the intra- and post-operative results thanked us (1st January 2015 – 1st May 2018). There were no bleeding, new motor or swallowing deficits or incompatibility reactions. Evolution was also favorable during the follow-up period, which ranges from 6 to 24 months. The postoperative evaluation was done through clinical and imaging examination with CT/MRI. Cost-effectiveness parameters advocate for a very important role in contemporary society.

AFS was used in various cases with deep and difficult-to-reach brain tumors and adherent to vital structures. The purpose of using was hemostasis on the excision area of the tumors, "sealing" the suture line and even better fix the bone flap due to the bonding effect of the fibrin.

Conclusion
The therapeutic results are very satisfactory. There were no new motor, speech deficits or local edema. Also, there were no
cases requiring re-interventions, no cases of allergy or infection. AFS has been shown to be an effective adjuvant for the control and prevention of intra- and post-operative complications.

**Key words**

AN RCT OF POOR GRADE SUBARACHNOID HAEMORRHAGE – TOPSAT2

BARBARA A GREGSON, PHIL WHITE, DIP MITRA, PATRICK MITCHELL
ON BEHALF OF THE TOPSAT 2 INVESTIGATORS

Background
There is evidence of substantial variation in practice for treatment of patients with poor grade SAH. This study aims to compare the efficacy of a strategy of early aneurysm treatment in a population of WFNS grade 4-5 (poor grade) aneurysmal subarachnoid haemorrhage (aSAH) patients in comparison with a strategy of treatment of aneurysm after neurological improvement (to WFNS grade 1-3).

Methods
A prospective, randomised, parallel group study with blinded outcome evaluation comparing two management strategies. Primary outcome is functional outcome at 12 months determined by ordinal analysis of modified Rankin score (mRS).

346 patients aged 18-80 years old and admitted to neuro ITU with WFNS grade 4 or 5 aSAH will be recruited in UK and Europe. Patients will be randomised to early treatment (within 72 h of ictus) or treatment after neurological recovery using a web-based randomisation service. Outcome questionnaires will be sent to patients at 6 and 12 months.

Progress
Sites in the UK, Poland, Latvia and Romania have opened to recruitment. Further sites are completing the start-up processes. Patient recruitment has started with fourteen patients recruited in the UK.

Conclusion
This trial will demonstrate whether early aneurysm treatment achieves a better outcome on average.
TO EVACUATE THE HAEMATOMA OR NOT: NEW ANALYSIS OF THE STICH TRIALS

BARBARA A GREGSON, PATRICK MITCHELL, A. DAVID MENDELOW

Background
The STICH, STICH II and STITCH(Trauma) trials used the same design randomising patients with intracerebral haemorrhage (ICH) to early surgery or initial conservative treatment. All had neutral results which could have arisen because surgery has a uniformly minimal effect on recovery or because surgery has benefit in some cases and detriment in others. We introduce a new non-parametric method of analysis to compare these competing explanations for the neutral results.

Methods
Data from 1541 patients with complete outcome assessments recruited in the two spontaneous ICH trials (STICH, STICH II) were analysed using

a) Standard meta-analysis of prognosis based dichotomised outcome and pre-specified standard subgroups of GCS: 3-8, 9-12, and 13-15;

b) New non-parametric regression of ranked GOSE against ranked GCS and ranked volume.

The same analysis methods were applied to 167 traumatic ICH patients.

Results
Standard meta-analysis showed a non-significant trend to a more favourable outcome with surgery if the presenting GCS was 9-12. (Spontaneous ICH studies OR=0.70 (95% CI 0.48, 1.03; p = 0.07); traumatic ICH OR=0.48 (95% CI 0.18, 1.26; p = 0.14)).

The ranked analysis examined the relationship between outcome and lesion volume or presenting GCS. The same pattern of results was seen in both traumatic and spontaneous ICH. Surgery was harmful for small lesions, neutral for intermediate and showed increasing benefit for larger volumes. With presenting GCS, surgery had no perceptible effect at either end of the spectrum but had a beneficial effect in an intermediate area of GCS 10-13.

Conclusions
The neutral results observed in the STICH trials are due to mixing patients who benefit from surgery with those who are harmed. Patients with a GCS 10-13 or a large ICH are likely to benefit from surgery. Similar effects are seen in traumatic as well as spontaneous ICH data and this method promises to be a valuable tool in assessing the effects of treatments.
FREE TOPICS 2

SESSION

Friday, September 7, 2018

Bega Hall

Chairs: Marcel Ivanov, Kresimir Rotim
MICROSURGERY / ENDOVASCULAR / COMBINED TREATMENT OF INTRACRANIAL VASCULAR LESIONS

KRESIMIR ROTIM

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Introduction
Intracranial vascular lesions treatment includes, nowadays, several options, and requires careful evaluation when deciding which modality to choose. The goals remain simple – permanent occlusion and optimal preservation or even restoration of patient’s neurological function. There are two main groups of treatment, microsurgery and endovascular. With development of multidisciplinary approach there are cases that require, and are eligible for combined treatment. Varieties of factors have to be considered when deciding on treatment modality. Those include whether vascular lesion has ruptured or not, it’s size and location, patient’s age and medical condition and associated factors such as intracerebral hemorrhage (ICH), intraventricular hemorrhage (IVH) or presence of vasospasm.

Aim
We present several cases treated microsurgical, endovascular or with combined approach considering latest recommendations, multidisciplinary decisions making (neurologist, radiologist, neurosurgeon) and availability of an interventional option that had an acceptable risk.

Material and methods
The cases have been chosen regarding the presentation, treatment option and outcome.

Results
On the basis on several cases presented, we have considered indications and so far published several studies results and recommendations regarding treatment options for intracranial vascular lesions, focusing on combined approach.

Conclusion
With development of endovascular treatment techniques, which are approaching the phase of acceptance and appropriate use, the patients with intracranial vascular lesions have gained a therapy option that can be primary, secondary or combined with surgical treatment. The decision on treatment option has to be individually based considering patient/lesion factors and institutional availability of each technique experts.
Complications in neurosurgery may occur in spite of the surgeon's best attempts at prevention. Bleeding is one of the recognized complications in neurosurgery and is one of the most important factors for increasing the morbidity and mortality. Achieving and maintaining hemostasis in neurosurgical procedures is critical to the outcome. Failure to achieve good hemostasis can lead to a significant distress to the surgical team but also to a wide range of complications to the patient, including disseminated intravascular coagulation, significant neurological deficit, infection or even fatal outcome.

Over the last century, hemostatic methods have advanced significantly and the modern surgeon is now faced with an array of hemostatic agents, each with subtly different qualities and proven in different contexts with various levels of evidence.

In the presentation we will review the steps and equipment that can be used before and during the surgery in order to help to prevent the bleeding during spinal neurosurgical procedures or to better control it if it occurs. Intraoperative adjuncts (electrical, mechanical, and chemical) used in neurosurgical hemostasis are reviewed.
OPTIONS FOR SURGERY IN THE MULTIMODAL TREATMENT OF INTRACRANIAL CAROTID SYSTEM ANEURYSMS

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Objectives
Most saccular aneurysms (85-95%) are located in the carotid system. Considering the factors that determine the outcome, the goal of this study is to analyze the postoperative results and outcome of the patients operated for aneurysms of the carotid system between January 2012 /December 2017

Materials and methods
We performed a retrospective study of 354 patients, which had been operated for ruptured carotid system aneurysms in our neurosurgical department by two senior neurosurgeons. The essential neuroimaging investigation used to establish the diagnosis was four vessels cerebral angiography. At admission, according to Hunt and Hess scale, the distribution of the patient was: grade 1 and 2 – 248 (70%), grade 3 – 64 (18%), grade 4 – 32 (9%), grade 5 – 10 (3%). 73.5 % of the aneurysms had a diameter varied between 3-14 mm. All patients underwent surgery using subfrontal or pterional approach. 304 patients (85.8%) were operated within the first 7 days from the clinical onset.

Results
In 20% of the cases (71 patients) we performed postoperative angiography in order to confirm occlusion of the aneurysm. We chose to use this technique selectively for difficult aneurysms. For this group, perfect clipping of the aneurysms was proved in 64 cases (90%). The follow-up period varied widely from 3 to 74 months (mean, 34 months). According to this scale, the postoperative results for the 354 patients included in our study were as follow: excellent and good (mRS 0-2) – 265 patients (75%), satisfactory (mRS -3) – 46 patients (13%), poor (mRS 4-5) – 18 patients (5%), death (mRS-6) – 25 patients (7%). 212 patients had no postoperative neurologic deficits (60%). Best results were obtained in patients who, preoperatively, were included in 1st and 2nd grade of Hunt&Hess scale, in which excellent and good results occurred in 98% of case.
Conclusions

We concluded that, for a team with great experience in neurovascular surgery, surgical treatment of carotid system aneurysms remains a very good option. We have a small experience in endovascular treatment of cerebral aneurysms. In our neurosurgical department, an impartial comparison between the two methods of treatment could not be done.

References

DOWNHILL IN SEVEN DAYS - FROM ANEURYSM TO MASSIVE BRAIN EDEMA

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Objectives
We present the case of a patient diagnosed with Hunt and Hess 2, Modified Fisher 1 subarachnoid hemorrhage who, despite the associated favorable prognosis, had an unexpected clinical course, ending with the patient's demise.

Materials and methods
A 49-year-old male patient, with unmanaged grade III arterial hypertension, was admitted to our clinic, being previously diagnosed with aneurysmal subarachnoid hemorrhage of the above-mentioned grade and superjacent intraparenchymal hematoma. Upon presentation, the patient had a GCS score of 14 points, the neurological examination revealing moderate meningeal syndrome. He underwent emergency cerebral angiography, which demonstrated a ruptured anterior communicating cerebral artery aneurysm with consecutive Hunt and Hess 1, Fisher 2 subarachnoid hemorrhage for which embolization was performed. Following-day CT-scan revealed persistence of the subarachnoid hemorrhage and hematoma with a slight augmentation of the original pattern of blood diffusion. Moreover, the lateral ventricles appeared reduced dimensionally.

Results
During hospitalization, the patient demonstrated constant high systolic blood pressure values (190-200 mm Hg), being hardly responsive to antihypertensive treatment (4 concomitant agents). Progressively, the patient became lethargic and polypneic, yet responsive to stimuli (GCS=13). Despite being transferred to ICU, his neurological status aggravated, along with a decrease in systolic blood pressure values. A new CT-scan was demonstrated slight intraventricular bleeding, with increased severity of cerebral edema, causing “slit ventricles” image. Ventricular drainage is attempted but unsuccessful (intracranial pressure=80 cm of water), compelling for an emergency decompressive bifrontal craniotomy. Unfortunately, the last CT-scan revealed diffuse cerebral edema and tonsilar herniation with brainstem compression leading to the patient’s demise.

Conclusions
This case outlines a severe complication of an aneurysmal subarachnoid hemorrhage with an unexpected, aggravating course, despite its initial favorable prognosis. Furthermore, it questions the optimal moment for performing either ventricular drainage or decompressive
craniotomy. Also, would the removal of the intraparenchymal hematoma have been beneficial? Moreover, the case spotlights the constant controversy of open surgery versus endovascular coiling for aneurysms. According to Michael Lawton’s “Seven Aneurysms”, anterior cerebral communicating artery aneurysms mandate open surgery and not endovascular coiling. In addition, administering novel therapeutic agents, such as Rho-Kinase Inhibitors, which demonstrated cerebral anti-vasospastic and anti-edematous effects, might have improved the patient’s prognosis.

References
DECOMPRESSIVE CRANIECTOMY IN PSEUDOTUMORAL ISCHEMIC STROKE OF THE MCA - RETROSPECTIVE STUDY -

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Objectives
Decompressive craniectomy (DC) is the surgical management removing part of the skull vault over a swollen brain used to treat elevated intracranial pressure that is unresponsive to maximal medical therapy. The most commonest indication for DC is traumatic brain injury (TBI) or middle cerebral artery (MCA) infarction, though DC has been reported to have been used for treatment of aneurysmal subarachnoid haemorrhage and venous infarction. As a procedure, DC was first described by Annandale in 1894.

Materials and methods
The present study is a retrospective one between the years 2015-2018. All patients were admitted in Neurosurgery Clinic Department form Sibiu County Hospital with pseudotumoral ischemic stroke of the MCA who needed a decompressive craniectomy.

Results
Generally, patients older than 60 years are not the ideal candidate because they possess a lower neuronal plasticity and also have more vascular risks factors and other morbidities, but in our study patients older than 60 y.o where operated. Most survival patients have a neurological deficit.

Conclusions
DC has been used, as in the past, for many neurosurgical conditions including intracerebral haematomas and brain infarction. All this evidence makes us to ask ourselves as Tagliaferri et al., stated: have we found a “panacea” for all neurosurgical diseases?

References
SELLAR AND PARASELLAR TUMORS 1

SESSION

Thursday, September 6, 2018

Europa Hall

Chairs: Gail Rosseau, Imad Kanaan
OUTCOME FOLLOWING TRANSSPHENOIDAL SURGERY OF GROWTH HORMONE-SECRETING PITUITARY ADENOMAS: A SINGLE-CENTER EXPERIENCE OVER 8 YEARS

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Objectives
The aim of this study is to analyze a consecutive series of 265 patients with growth hormone (GH) secreting pituitary adenomas who underwent transsphenoidal surgery via endoscopic and/or microscopic approaches, focusing on their hormonal remission rates.

Materials and methods
We retrospectively reviewed 265 patients with GH-secreting pituitary adenomas, operated on between 1 January 2010 and 31 December 2017. There were 11 cases of GH and prolactin (PRL) - secreting pituitary adenomas and 11 cases registered as pituitary apoplexy. Tumors were labeled as macroadenomas or microadenomas according to their diameter measured on MRI and extensions were evaluated based on Knosp and Hardy grading scores. Hormonal remission rates were established as follow: basal serum GH < 2.5 μg/L, nadir GH < 1 ng/L after Oral Glucose Tolerance Test (OGTT) and normal Insulin-like Growth Factor 1 (IGF-1) levels age and sex-matched.

Results
An overall hormonal remission rate was achieved in 58.5% of the patients. Biochemical cure was achieved in 73.6% of microadenomas, 49.1% of macroadenomas and 72.7% of GH and PRL- secreting pituitary adenomas. A favourable biochemical outcome was noted in 78.5% of macroadenomas and 92.3% of microadenomas. The general recurrence rate was 17.7 %. The overall complication rate was 5.6%. Predictive factors which interfered with the hormonal remission in the present study were identified as following: tumor size (AUC=0.887), preoperative GH serum levels (AUC=-0.878, p

Conclusions
Favorable hormonal remission rates can be achieved by transsphenoidal surgery in GH-
secreting pituitary adenomas. Stereotactic radiosurgery and medical therapy remain postoperative adjuvant treatment options.  

**Key words**  
GH-secreting pituitary adenomas, transsphenoidal surgery
CONTEMPORARY SURGICAL MANAGEMENT OF CRANIOPHARYNGIOMAS: WHAT IS SAFE REMOVAL?

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Honorary President of WFNS

Surgical treatment of craniopharyngiomas remains to date challenging because these tumors extend in various directions and are surrounded by important anatomic structures such as the hypothalamus, third ventricle, optic nerves, vascular structures. Although histologically benign, they may recur and are associated with high morbidity. The surgical experience reported in the literature demonstrates that total tumor removal is associated with a lower recurrence rate. Radical excision, however, should be balanced with morbidity depending on hypothalamic, endocrinological disfunction and potential neurovascular injury. There are some crucial factors related to the tumor: 1) the biology 2) the location and extension 3) the adherence to neurovascular structures 4) the cystic appearance and 5) the patient age.

The knowledge of these features is important to tailor the surgical strategy to individual patients.

Many different approaches have been proposed and adopted in the surgical treatment of such lesions, the microsurgical transcranial with several variations and the endoscopic with endonasal transphenoidal and transventricular routes. Recent reports and metanalysis of long term follow up advocated the subtotal resection with additional radiotherapy because it is considered preferable to a total excision leading to severe morbidity.

Safe removal is mostly depending on surgeon skill and tumoral features. The concept of safety in craniopharyngioma surgery needs to be reassessed in the light of these considerations and the available new surgical approaches and adjuvant treatment. Attempting radical resection whereas possible remains the gold standard.
PITUITARY ADENOMA: ENDOSCOPIC VERSUS MICROSCOPIC APPROACH

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Objectives
Endoscopic transsphenoidal surgery has gradually come to be regarded as a preferred option in the treatment of pituitary adenomas because of its advantages of improved visualization and its minimal invasiveness. Only few prospective studies are reported in the literature comparing endoscopic endonasal transsphenoidal approach with microscopic transsphenoidal pituitary adenoma surgery. The aim of our study was to compare and evaluate the surgical outcomes and complications of endoscopic and microscopic transsphenoidal surgery in the treatment of pituitary adenomas.

Materials and methods
Two prospective studies were done at our institute in last two years on transsphenoidal pituitary surgeries. First was a comparative study between endonasal endoscopic transsphenoidal surgery and microscopic transsphenoidal surgery done on 30 consecutive patients and the second one, aimed to analyze the surgical outcomes and complications in a series of 60 consecutive patients of pituitary adenoma who were operated by transsphenoidal approaches (both endoscopic and microscopic). Both studies were conducted between September 2015 to November 2016 on a total of 60 patients. All clinical and surgical data were collected regarding tumor size, symptoms, and residual tumor after surgery, functional remission, symptom relief, and complications. All patients underwent neurological, ophthalmological, and endocrinological examinations before and after resection.

Results
In first study, with endoscopic group complete tumour excision was achieved in 11 (64.71%) patients and in microscopic group it was achieved in 6 (46.15%) patients. In endoscopic group mean operative time was 111.29±21.95 minutes (ranged 80-135 minutes) and in microscopic group it was 134.38±8.33 minutes (ranged 120-145 minutes). In endoscopic group mean blood loss was 124.41±39.64 ml (60-190 ml) and in microscopic group was it was 174.62±37.99 ml (100-220 ml). Post-operative sinusitis was present in 1 (5.88%) patient in endoscopic group and in 2 (15.38%) patients in microscopic group. In second study out of 60 patients 43 were operated endoscopically and 17 were operated microscopically. Perioperatively, arachnoid tear was present in 20 (33.33%) patients. 23 (38.34%) cases were having total resection post-operatively, 20 (33.33%) cases were having subtotal resection and in 17 (28.33%) cases either
partial resection done or biopsy was taken. Grade of tumor resection was significantly associated with preoperative extent of tumor (p-value-0.003). CSF leak was associated with Perioperative arachnoid tear significantly (p-value

**Conclusions**

The present study indicates that the endoscopic transsphenoidal approach is safer and more effective than microscopic surgery in the treatment of pituitary adenomas.

**References**

GIANT PITUITARY ADENOMAS: HOW TO DEAL WITH

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Objectives

Giant pituitary adenomas are defined as lesions larger than 4 cm in diameter, and are extremely difficult to remove totally, with the risk of postoperative pituitary apoplexy from the residual tumor.

Materials and methods

We have retrospectively reviewed the cases treated for pituitary adenomas from 2013 to 2018, and we identified a number of 27 cases that met the criteria for giant pituitary adenomas (>4cm diameter or volume >10cm³). Their medical records were retrospectively reviewed.

Results

A number of 27 consecutive cases were included in the study with a sex ratio M:F of 1.3:1, the main complain was represented by visual disturbance and signs of ICH, most of them were nonfunctional adenomas (15), 4 GH secreting adenomas, 5 prolactinomas and 3 adenomas with mixt secretion (GH+PRL). Only 3 patient had clinical signs of pituitary apoplexy and 11 had imagistic signs of apoplexy. 20 patients had a type C superior extension and most of them, twenty, had a lateral extension Knosp 4 and 8 patients were Knosp 3 (A+B). 4 patients were treated conservatively due to prolactin hypersecretion with good results and 23 patients were operated using endoscopic endonasal approach (14 cases) and transcranial approach (9 cases). In most cases a subtotal resection was achieved (15 cases), partial resection in 5 cases and gross total resection in 3 cases. The postoperative complications were represented by DI (11 cases), meningitis 1 case, seizures (2 cases), CSF leak 2 cases, ischemic lesions (2 cases), and 2 cases of postoperative pituitary apoplexy. In our series there were 4 deaths, 1 preoperative sudden death, 2 postoperative deaths secondary to postoperative PA, and 1 due to diencephalic syndrome.

Conclusions

Giant pituitary adenomas remain a surgical challenge for neurosurgeons with low rates of gross total resection and a high morbidity and mortality compared to micro and macroadenomas.

Key words

Pituitary adenoma, giant pituitary adenoma, endoscopy
SELLAR AND PARASELLAR TUMORS 2

SESSION

*Thursday, September 6, 2018*

*Europa Hall*

*Chairs: Francesco Tomasello, Emmanuel Jouanneau*
CHALLENGES IN MANAGEMENT OF CUSHING DISEASE (CD)

IMAD N. KANAAN, MD, FACS, FRCS, ED

Introduction

Cushing disease is a rare entity caused by ACTH producing pituitary adenoma and accounts for almost 15% of all pituitary adenomas. The evolution of pertinent biochemical and Neuro-imaging investigation during the past decades enhance diagnostic reliability of Cushing disease. The introduction of microadenoma concept and the refinement of transphenoidal surgery made by Hardy are the corner stone in the management of Cushing disease.

Material & Method

A retrospective review of patient material diagnosed to have Cushing Disease was performed including review of the medical literature. The author has selected several cases of Cushing disease from own series in order to highlight the diagnostic and therapeutic challenges that face the treating physician with focus on surgical approach, special diagnostic tests, the role of new technology as well as decision making and strategic plan of management of recurrences and use of alternative treatment options.

Conclusion

The direct endonasal transsphenoidal approach coupled with experience in microsurgical dexterity and assisted by the use of Neuro-Navigation, Endoscope and Intraoperative Imaging; has promoted minimal-invasiveness & patient safety as well as contributed to improve of treatment outcome. However, difficult diagnostic confirmation, tumor invasiveness, absent curative/ alternative medical treatment and variable response to stereotactic radiation therapy continue to be the great challenges that, the treating physicians have to deal with and aspire to find solution for.
PEARLS AND PITFALLS IN MICROSURGICAL APPROACHES TO TUMORS INVOLVING THE SELLAR AND PARASELLAR REGION

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Objectives
Sellar and parasellar tumors pose a great surgical challenge due to their deep location and close relation to important neurovascular structures. In this region a large variety of tumors can be found, including meningiomas, pituitary adenomas and craniopharyngiomas.

Materials and methods
We conducted a retrospective study on patients with tumors involving the sellar and parasellar region who underwent surgery in the IVth Neurosurgery Department in “Bagdasar-Arseni” Clinical Emergency Hospital between April 2013 and April 2018.

Results
There were 103 patients included, of which 60 (58.3%) were female. The mean (±SD) age was 51.17 (11.40) years. Sixty-eight (66%) cases were meningiomas, 28 (27.2%) pituitary adenomas and 7 (6.8%) craniopharyngiomas. Eighteen (17.5%) patients presented with amaurosis and seven (6.8%) with cecity. Gross-total resection was achieved in 51 cases (49.5%), sub-total resection in 50 cases (48.5%) and a biopsy was performed in two cases (2%). On admission the patients were divided on the modified Rankin scale (mRS) accordingly: one patient (1%) had a score of 0, 57 cases (55.3%) were mRS 1, 29 patients (28.2%) had a score of 2, ten patients (9.7%) a score of 3 and six patients (5.8%) a score of 4. Postoperative, twenty-three (22.4%) patients had a better outcome based on mRS score and in two cases (1.9%) a worse mRS score due to associated comorbidities.

Conclusions
The transcranial approach is the optimal choice for large tumors, extending in the parasellar region which encase the large vessels and cranial nerves. The tumor can be approached through a combination of the interoptic, opto-chiasmatic, carotid-oculomotor spaces or translamina terminalis depending on the relation of the tumor to the optic apparatus. The objective of gross-total resection should be weighed against the possibility of new neurological deficits.

Key words
Meningioma, pituitary adenoma, craniopharyngioma, sellar and parasellar region
OUTCOME FOLLOWING NEUROSURGICAL TREATMENT IN CUSHING’S DISEASE

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Objectives
Cushing’s disease (CD) is an endocrine disorder characterized by excess secretion of ACTH, due to a pituitary adenoma, associated with significant morbidity and mortality.

Materials and methods
The aim of this study was to analyze the results of neurosurgical treatment in 113 patients with ACTH-secreting adenomas from a total of 2436 pituitary adenomas operated on in Neurosurgical Clinic of “Bagdasar-Arseni” Clinical Hospital of Bucharest between 1999-2017. We conducted a retrospective analysis of the cases, focusing on clinical and imagistic features, surgical approach, complications, hormonal remission, recurrence, and mortality.

Results
There were 97 female patients (93.1%) and 16 male patients (6.9%). The most common surgical approach used was the transsphenoidal approach (TSS) - in 105 patients. Seven patients have been treated via transcranial (TC) approach and only one by combined TSS and TC approach. Adjuvant Gamma-Knife radiosurgery was used in 22 cases (19.4%). Postoperative hormonal remission has been noted in 68.1% of cases. The recurrence rate was 7%. The complications included: transient diabetes insipidus (8 cases), permanent diabetes insipidus (1 case), cerebrospinal fluid leak (4 cases), minor nasal problems (5 cases). Only one patient has deceased.

Conclusions
Cushing’s disease is difficult to cure and presents an unpredictable course. One of the important aspects is the endocrinological assessment of the patients, both preoperatively and postoperatively. The success in the management of CD is guaranteed by a team effort, made by endocrinologist, radiologist, neurosurgeon and radiotherapist.

Key words
Cushing’s disease, transsphenoidal surgery, outcome
PITUITARY APOPLEXY CURRENT CONCEPT OF TREATMENT

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Objectives
Pituitary apoplexy is a clinical syndrome consisting of neurological deficits and endocrine abnormalities secondary to hemorrhage and/or ischemia of an undelying pituitary adenoma resulting in tumor necrosis, edema and expansion

Materials and methods
We have retrospectively analysed the records of all patients treated for pituitary adenomas in the period from 2013 to 2018, identifying nineteen patients who had presented with clinical pituitary apoplexy. Their medical records were retrospectively reviewed

Results
There were 15 nonfunctional PA, 2 prolactin secreting adenomas and 2 adenomas with mixt secretion, most of them (15) were macroadenomas, 2 giant adenoms and a microadenoma. Simpromatology was dominated by headache and visual complaints, 3 patients presenting with altered level of consciousness and 5 with oculomotor palsy. 11 patients had no precipitating factors, 3 had anticoagulant teraphy, 2 had treatment with dopaminergic agonists, 1 had cardiac arhythmia, and 2 previously had Gamm-knife surgery. 11 patients were treated conservatorly and 7 had undergone surgery for PA (6 endoscopic and 1 transcranial). In our series 1 patient died from severe cardiac arhythmia. The other 18 had a good outcome with no differences between the surgical and conservatory, rates of visual improvement and oculomotor recovery being similar.

Conclusions
Pituitary apoplexy is a life treathening condition and in the current concept it is a medical emergency rather than a surgical one, with good results for the cases managed conservatively

Key words
Pituitary apoplexy, pituitary adenoma, endoscopy
INTRAOPERATIVE NEUROMONITORING DURING ENDOSCOPIC ENDONASAL SURGERY

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Objectives

Transsphenoidal surgery is the main approach for the most of the pituitary fossa tumors. The morbidity and mortality after pituitary tumor resection has significantly been reduced with endoscopic endonasal surgery (EES). In some cases, the pituitary tumors invade or displace the close nervous and vascular structures, thereby surgical tumor resection carries its risk of injury. Unfavorable surgical outcome, regarding injury of the optic apparatus and optomotor nerves complex is a major concern when performing surgery in the pituitary area. In past years intraoperative neurophysiological monitoring has increased the safety of this surgery. For tumors with a mass effect over the optic pathways, continuous monitoring of the visual function is desirable. Also, monitoring of the cavernous sinus cranial nerves could prove very useful for the prevention of injury to both, the carotid artery and the aforementioned nerves.

Materials and methods

We retrospectively selected and analyzed 3 cases (surgeries) previously diagnosed with pituitary macroadenoma and operated on in our department between 2016-2017. Intraoperatively we monitored in these cases VEP and NC VI motor evoked potentials. For VEP we used intermittent light stimulation with special glasses provided with LEDs. The stimulation consisted of 500-1000 series of visual pulses averaged at 3.3 Hz. VEP recording was performed using corkscrew electrodes placed at points O1, O2, and Oz according to the EEG 10-20 International System with reference electrode Cz. The latency and amplitude of the VEP was continuously monitored during surgery. If the tumor invaded the cavernous sinus, the spontaneous electromyographical activity of the abduccens nerve was also continuously monitored.

Results

Intraoperative monitoring of VEP recordings was feasible in all the patients and
there were no complications attributable to VEP recording. The preoperative visual function of all these patients was impaired, and during the operation no reduced VEP was noted. The postoperative visual function was compared with the preoperative and intraoperative aspects. Regarding the abduces nerves monitoring during surgery, the continuous spontaneous activity on electromyography was monitored and we are noticed some pathological electrical discharges, respectively neurotonic discharges; postoperatively the patient had a transient NC VI palsy.

**Conclusions**

Based on the results of our study, intraoperative VEPs and continuous NC VI monitoring are reproducible and reliable, and thus, suitable for intraoperative neurophysiological monitoring during surgical cases in which the visual pathway is at risk.

**Key words**

Endoscopic endonasal surgery, visual evoked potentials

**References**


NEUROTRAUMA

SESSION

Thursday, September 6, 2018

Europa Hall

Chairs: Wolf Ingo Steudel, Bruno Splavski
CONCEPT FOR THE ESTABLISHMENT OF THE GERMAN NEUROTRAUMA REGISTRY (GNR): FOR A NATIONWIDE CONTINUOUS IMPROVEMENT OF MANAGEMENT IN TBI

PROF. DR. MED. WOLF INGO STEUDEL
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Introduction

The TBI incidence is placed on rank five in Germany. Within the last years, the epidemiology of the causes of accidents has shifted considerably: from road accidents to domestic accidents. Unfortunately, the number of TBI has increased within the last years. The German Society for Trauma Surgery – DGU – implemented a trauma-register decades ago. This register mainly includes patients suffering from a polytrauma, so that only selected data with regard to a TBI are gathered. Therefore, the German Neurosurgical Society (DGNC) has decided to improve the outcomes of patients with TBI.

Methods

In 2016, a team was formed, consisting of Neurosurgeons and Trauma Surgeons from 14 big clinics, mostly University clinics. With regard to its realization, a bottom-up process was chosen. Five steps were defined:

A) The definition of the modules
B) The consensus of the modules
C) The programming of the documentation
D) The test phase with four clinics
E) The pilot phase with 12 clinics

In the meantime, we have reached the pilot phase.

So far, the financing has been done via the Foundation ZNS, the DGU and the DGNC.

Results

In the meantime, we have reached the pilot phase. The establishment of a register means a lot of work and requires the special engagement of all participants.

Conclusion

The establishment of a register means a big challenge. Due to our experiences, the bottom-up process has turned out to be right. The further realization demands further enormous efforts.
THE IMPORTANCE OF VIABLE C5 AND C6 PROXIMAL STUMPS FOR REANIMATION OF ELBOW FLEXION AND SHOULDER ABDUCTION IN BRACHIAL PLEXUS TRACTION INJURIES

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Introduction

In patients with complete brachial plexus palsy, there are authors who prefer nerve transfer and those who prefer direct graft repair to restore priority functions when there is a sustainable proximal spinal nerve. In patients with the upper brachial plexus palsy (C5, C6), the international data strongly favours nerve transfers over graft repair.

Material and Methods

The aim of this study was to evaluate the outcome of the priority functions restoration in patients with upper or total brachial plexus palsy where only direct graft repair from viable proximal nerve stump was performed.

Patients with complete or upper brachial plexus palsy with preserved function of trapezius muscle, scapula levator muscle, rhomboid and anterior saratus muscle were included. Action potentials in the paraspinal muscles were verified by the EMG, while the motor potentials of the proximal nerve stumps were registered intraoperatively during transcranial electrical stimulation. Patients were followed for at least two years.

Results

The average age of the patient was 21 years (16-31), the most common etiology was a traffic accident. 22 out of 36 patients underwent emergency surgery due to related injuries. The most commonly associated injuries were rib fractures, long bone fractures, and brain contusion. The average interval between injuries and nerve grafting surgery was 4 months (3-7). Twenty-four patients showed up with complete brachial plexus
palsy, and 12 patients with upper brachial plexus palsy.

**Conclusion**

Satisfactory functional results can be achieved with direct graft repair from C5 to the musculocutaneous and axillary nerves and by passing the dorsal scapular nerve to the radial nerve branch to a long head of the triceps muscle.

Treatment of Brachial Plexus injuries requires a multidisciplinary approach. A detailed preoperative assessment and intraoperative electrophysiological examination are valuable and necessary in the treatment of brachial plexus lesions. It is obligatory to use a combination of preoperative and intraoperative diagnostic procedures. In cases of infraganglionary injuries, direct graft repair or its combination with nerve transfers must be considered.

**Key words**

Brachial plexus surgery, brachial plexus injury, proximal stump, direct graft repair
OUR EXPERIENCE WITH POST-TRAUMATIC CRANIOPLASTY

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Objectives
Cranioplasties represent surgical repairs of defects or deformities of the skull nearly as old and as frequent as ancient trepanation. Armed conflicts throughout human history have led to the discovery of alternative materials to cover cranial defects including bone, precious metals, bone replacement implants, biocompatible composites and many others. Our paper presents a multicentric study regarding post-traumatic cranioplasty using PEEK, PMMA and Titanium-based implants.

Materials and methods
We reviewed a number of 79 cases which were subjected to cranial reconstruction following traumatic events. Our patients were operated in 4 major neurosurgical centers - 3 centers from Bucharest and 1 center from Timisoara. In 33 cases we used PEEK-based implants, in 25 cases we used PMMA-based implants and in 21 cases we used Titanium-based implants. All patients were operated over a period of 8 years (2010-2018) at 4-6 months following initial trauma. All surgeries were performed in accordance with the widely-accepted indications for cranioplasty taking into consideration final aesthetic aspect and cranial volume conservation.

Results
Our statistics included a number of 7 cases with complications - 3 cases with surgical wound infections, 2 cases with skin erosion and 2 cases with suture related-granulomas. Despite these complications final surgical results were favorable in all cases and the purpose of surgery - brain protection, volume conservation and visual aspect were achieved.

Conclusions
Titanium based implants are a safe and time effective way to reconstruct cranial defects following trauma. Despite potential complications cranioplasties are rewarding surgical interventions both for the surgeon and the patient and have a life-long lasting effect regarding patient psychology and quality of life. Future development in the field of plastic surgery and cranial defect reconstruction - including three-dimensional
printing of implants should soon facilitate perfect surgical outcomes in these patients.

**References**
A 4-CASE STUDY OF ALLOPLASTIC CRANIOPLASTY BY ADDITIVE MANUFACTURING OF 3D PRINTED MODIFIED MOLD

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\textit{Introduction}
Additive manufacturing of 3D printed modified mold has been initiated lately as a method for creating an alloplastic implant for the repair of a skull bone defect. To achieve the best surgical and aesthetic outcome, the ideal implant is expected to be well-built and robust enough, as well as appropriate for the entire bone defect. Hereby, the authors evaluate 3D additive manufacturing of prefabricated mold as a procedure to create an implant used for personalized cranioplasty of large bone defects.

\textit{Methods}
An alloplastic cranioplasty was performed in 4 patients with unilateral large craniectomy. Personalized data imaging from preoperative brain computed tomography (CT) in Digital Imaging and Communications in Medicine (DICOM) format were calculated and adapted into Surface Tessellation Language (STL) format and arranged for 3D printing of the prefabricated mold. A digital subtraction mirror-imaging method was employed to create the implant’s image model. A polymethyl-methacrylate (PMMA) implant was molded using the 3D printed modified and sterilized mold, and integrated into the skull bone defect.

\textit{Results}
Cosmetically excellent skull bone defect restoration was achieved in all patients following reconstructive surgery. No major procedure related postoperative complications were recorded at follow-ups ranging from 6 months to 4 years.

\textit{Conclusion}
Additive manufacturing of 3D printed modified mold to create an implant for a skull bone defect repair is a valuable and advanced reconstructive surgery method. It is primarily effective for the restoration of large bone defects with complicated geometry producing a superb cosmetic outcome.
CONTINUOUS INTRACRANIAL PRESSURE MONITORING IN SEVERE TRAUMATIC BRAIN INJURY IN CHILDREN

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Objectives
Severe traumatic brain injuries in children is a major cause of morbidity and mortality and it is the main cause of death in children older than one years of age. Continuous real-time intracranial pressure monitoring is a recognised standard in TBI intensive-care management and ICP-lowering therapy is recommended when ICP is elevated above 20 mmHg or more. Continuous ICP and mean arterial blood pressure (MAP) monitoring allow calculation of cerebral perfusion pressure (CPP) and establish of an optimal CPP (CPP opt): optimal CPP is the CPP level that maintains the pressure active pattern. We hope that having measured CPP within calculated CPPopt provide better tolerance to raised ICP and improve recovery in childhood brain trauma.

Materials and methods
Children aged 2 to 16 years who require intensive care management after sustaining traumatic severe brain injury are included in this study in three neurosurgical hospital: “Prof. Dr. N. Oblu” Clinical Emergency Hospital Iasi, “Sf. Maria” Children Clinical Emergency Hospital Iasi and "Bagdasar-Arseni” Clinical Emergency Hospital Bucharest, in an ERA-NET NEURON Grant. Routinely measured physiological data in minute-resolutions are captured from the bedside monitors prospectively. Providing ICP monitors was made progressively for each hospital and patient monitoring was incomplete in some cases.

Results
There were a total of 582 children with traumatic brain injury during five months in three neurological departments and 19 patients needed intensive care and only five children have been ICP and blood pressure monitored. In two cases the values of ICP were high and very high and cerebral decompression was performed.
Conclusions
The cases with ICP and CPP monitoring are few and a statistical analysis is not yet conclusive. We hope the findings from such studies and any treatment target recommendations will be directly transferable to a wider clinical audience because no special equipment is required beyond that is currently used for the routine minute-by-minute physiological bedside monitoring. This study is within the grant: “Paediatric Brain Monitoring with Information Technology (KIdsBrainIT): Using IT Innovations to Improve Childhood Traumatic Brain Injury Intensive Care Management, Outcome, and Patient Safety”, grant: COFUND-NEURON III ERANET - KidBrainIT, funding no.2 / 01/06/2017.

References
THE CHALLENGE OF NEUROSURGICAL TRAUMA - PREVENTING DISABILITY AND DEATH

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Objectives

Trauma is one of the leading causes of death and disability in Romania (after cardiovascular disease, neoplastic disease and digestive tract disease) with over 100,000 deaths between 2006-2016. Although trauma could theoretically be always prevented, it poses a great threat by its unpredictable nature, making every trauma an emergency. The object of this study is to identify influenceable factors in providing immediate neurosurgical care for trauma patients.

Materials and methods

We analyze traumatic injuries within the neurosurgical area that have been admitted to our department from the beginning of 2015 until present day. Some of the traumatic injuries we encountered are: traumatic brain injury, spinal cord injury, spine fractures, acoustic trauma, concussion, skull fracture, cuts and puncture wounds, subarachnoid hemorrhage, subdural hematoma. We use the injury severity score to assess each case. We followed the course of trauma patients to see what are the factors that influence rapid access to neurosurgical care and also short, medium and long term effects of acute neurosurgical care.

Results

We identified certain issues that could be modified in order to provide a more efficient pathway for severely injured patients that need urgent neurosurgical care: emergency room management, surgical device availability, population education.

Conclusions

Traumatic neurosurgical injuries are a great challenge for surgeons, because of their sudden occurrence, and need of immediate care. They represent an aggressive action directed towards patients and need an equal aggressive reaction for a favorable outcome.

References

TUMORS 1

SESSION

Thursday, September 6, 2018

Nera Hall

Chairs: Feridun Acar, Michael Spyrou
REVIEW OF AWARE CRANIOTOMY FOR BRAIN TUMOUR RESECTION: INTEREST OF NEUROLOGICAL TESTING. REFERENCE TO A CLINICAL CASE

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Objectives

Both improvements in anaesthesia technique and surgical tactics have led to awake craniotomy expanding its role in brain tumour surgery over the past few decades. Awake procedures permit cortical mapping and the continuous assessment of neurological status parameters, which are otherwise impossible under general anaesthesia. The ability to test patients and eloquent areas during awake procedures makes it a powerful method both for protecting patients from deficits but also improving resection rate.

Materials and methods

A literature search was performed using the Medline and PubMed databases from 1970 and 2017 that compared craniotomy for tumour resection under general anaesthesia and awake procedures. Data of interest included length of hospital stay, operating time, extent of resection, and neurological sequelae.

Results

A total of 9 studies with over 1000 patients roughly equally distributed were included in this review. Mean extent of resection was slightly less under awake conditions versus however postoperative deficits were rarer in awake conditions. Surgery time and hospital length of stay are sorter in awake craniotomy.

Conclusions

Given the effectiveness of awake procedures in preventing deficits they are indicated in tumour resections in eloquent areas. We exemplify through video illustration one procedure performed under optimal conditions for low grade glioma resection adjacent to the speech areas.

References

TUMORS 2

SESSION

Friday, September 7, 2018

Europa Hall

Chairs: Marc Guenot, Adrian Balasa
MICROSURGERY FOR THIRD VENTRICLE TUMORS

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Honorary President of WFNS

The treatment of the third ventricle tumors is a surgical challenge because of the complex anatomy of the structures surrounding this narrow cleft that include hypothalamus, infundibulum, optic pathways, limbic system, and nearby vasculature. A broad array of tumors of the central nervous system may arise within the third ventricular region. Multiple surgical approaches have been developed to treat them including transcortical or interhemispheric transcallosal approaches with the subchoroidal, interforniceal and transforaminal routes or the trans-lamina terminalis approach. Each approach has strengths and weaknesses, and the choice is often made according to the site and nature of the pathology, besides the surgeon’s experience and comfort level. The goals of surgery must be carefully considered so as to minimize neurologic morbidity and mortality. Here we present a personal perspective of the microsurgical treatment of tumors that occur within the anterior portion of the third ventricle. Mainly three different strategies have been adopted in dealing with such tumors: The transcallosal, the transcortical and the translamina terminalis. The transcallosal approach provides a direct corridor to the lesions lying in the third ventricle. There are different advantages to this approach over alternative routes, among others a better exposure using multiple corridors to the third ventricle chamber. Rigid 0° and 30° endoscopes may help in looking for residual tumor and checking CSF pathway patency. The transcortical approach gives a better lateral to medial trajectory, wider access to lateral ventricle cavity and no risk of bridging venous impairment. The translamina terminalis approach allows a better control of the anterior portion of the III Ventricle especially for tumors involving the parasellar cisterns without any neural incision reducing the forniceal manipulation.
PREOPERATIVE DIFFUSION TENSOR IMAGING: A LANDMARK MODALITY FOR IMPROVING OUTCOME IN SUPRATENTORIAL INTRA-AXIAL BRAIN TUMOURS

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Objectives
Diffusion tensor imaging (DTI) depicts the location of white matter tracts and their relationship with intra-axial brain tumours.[1,2] In view of only few, large prospective studies available on the role of preoperative DTI, and the potential of DTI in revealing tumour tract relationship, we studied the role of 'preoperative DTI' in planning safe surgical corridor, predicting the neurological and surgical outcome and tumour characterization in supratentorial intra-axial brain tumours.[3,4] Our study is unique in describing the holistic role of preoperative DTI in supratentorial tumours and is one of the largest prospective studies in search of available literature.

Materials and methods
In this study, we included 128 cases. Preoperative neurological status and tumour volume was assessed. Standard MRI based surgical plan was decided and reviewed for changes after preoperative DTI. Postoperative neurological and surgical outcome was assessed along with evaluation of association of DTI with the tumour type.

Results
DTI based change in surgical corridor was seen in 60(47%) patients. Tracts were divided as displaced, infiltrated and disrupted. Resectibility of tumour was found higher in patients with displaced fibers and lesser in those with disrupted/infiltrated fibers. Neurologically fewer patients deteriorated in displaced category (7.1%) as compared to disrupted/infiltrated (13.9%). Displaced fibers were mainly associated with low grade gliomas (71%) whereas disrupted/infiltrated fibers mainly with high grade (66%).

Conclusions
Preoperative DTI is a landmark tool for planning safe surgical corridor and predicting the tumour type along with neurological and surgical outcome of patients.

References

STRATEGY FOR MANAGEMENT OF LARGE VESTIBULAR SCHWANNOMAS

IMAD N. KANAAN, MD, FACS, FRCS, ED

Microsurgical resection of giant vestibular Schwannomas is a definitive prime treatment option; unlike their smaller ones. Progress in modern imaging and innovation in neurosurgical equipment and standard use of intraoperative monitoring (IOM) are credited for proper diagnosis and enhanced surgical outcome. Representative cases from our large patient’s materials are reviewed with focus on management strategy, surgical techniques and recommendation targeting the integrity of the brain stem and the regional cranial nerves.
TUMORS  3

SESSION

Friday, September 7, 2018

Europa Hall

Chairs: Andrew Brodbelt, Ihsan Solaroglu
TRANSCRANIAL MICROSURGICAL APPROACH OF TUBERCULUM SELLAE MENINGIOMAS

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Objectives
Even in front of dramatic improvement of neurosurgical technology, tuberculum sellae meningiomas still remain a challenging pathology. In the last 15 years, once with development of transnasal endoscopic approach, many debates have arisen whether transcranial or endoscopic approach is the best way to resect a tuberculum sellae meningioma.

Materials and methods
We will present our retrospective series of 24 cases of tuberculum sellae meningiomas operated in the last 10 years by microsurgical transcranial approach. We considered gross total or near total resection of the cases in which the resection exceeded more than 90% and subtotal resection for those under 90% quality of resection. Clinical results were noted by following the visual acuity and visual field.

Results
All cases were operated by fronto-lateral or pterional approach. In 16 cases (75%) we obtained a total or gross total resection of the tumors, one patient died secondary to severe thrombosis of the cavernous segment of ICA. Postoperative visual improvement was noted in 60%, preservation in 30% and long term deterioration of visual acuity in 10% of the cases.

Conclusions
The transcranial microsurgical approach is still the golden standard addressing all types of tuberculum sellae meningiomas. Regardless of the selected surgical approach it is essential to early decompress the optic nerves and to avoid injury to the blood supply of the optical apparatus.
OUR POLICY IN OLFACTORY GROOVE MENINGIOMAS (A MULTICENTER STUDY)

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Objectives

Olfactory Grove Meningiomas (OGM) represent around 8-10% of all intracranial meningiomas. Their insidious development along with their nonspecific and usually subtle clinical presentation, lead to the late detection of these tumors even in the current era of the advanced MR imaging. Even though they have close relationship with vital and delicate anatomical structures, surgical resection is usually event-free and evolution is favorable. Our purpose is to discuss the main surgical strategies for olfactory groove meningiomas considering local anatomy, tumor histology, clinical features, chosen approach and last but not least patient quality of life and 1st nerve preservation.

Materials and methods

We present a multicentric cohort of cases (94 OGMs operated) between 2000 and 2018 with various transcranial techniques. The authors review the main techniques for OGM resection – classic and minimally invasive while at the same time performing a comparison with our own results and technique.

Results

The resection degree for the personal series show (Simpson scale): grade I – 14 cases (10.63%), Grade II – 49 cases (52.48%), grade III – 23 cases (25%), and grade IV – 8 cases (8.3%). The average age was 52 while the sex ratio F/M was 1.5/1. Average follow-up period was 8.2 years. No biopsy was performed (Grade V). Histology was benign in 91 (98.2%) cases and anaplastic in 3 cases (2.7%). In Our personal series 1st nerve preservation was achieved in 23 out of the 30 cases with small and medium OGMs

Conclusions

OGMs are benign tumors with the potential to reach very large dimensions within the skull. Under these circumstances surgeons have a wide armamentarium of surgical techniques at their disposal which enable them to remove very large tumors with relatively low consequences. The most frequent consequence is Anosmia which nowadays is considered to be a major
disability. Given the natural history of the disease and constant improvement in surgical and imaging solutions the authors favor 1st nerve preservation where possible. Given their natural history, relatively infrequent malignancy and slow growth rate, meningiomas are generally considered to be some of the most amenable tumors for surgical resection; on the other hand neurosurgeons must not make the grave error of considering all meningiomas benign as all big case series show some cases with cellular abnormalities and subsequent recurrence.

References
TUMORS 4

SESSION

Friday, September 7, 2018

Europa Hall

Chairs: Radu Mircea Gorgan, Ulrich Kunz
MICROSURGICAL MANAGEMENT AND NEUROLOGICAL OUTCOME OF CEREBRAL CAVERNOMAS

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Introduction

Cavernomas are rare, angiographically occult vascular malformations that usually present with an acute onset represented by seizures and headache. Most of these lesions are deeply-seated inside brain parenchyma and have a slow growth-rate before diagnosis, marked by multiple subclinical bleeding episodes. Given their small diameter and deep location, the intraoperative localization and surgical resection represents a challenge in most cases of cavernomas.

Material and methods

We retrospectively reviewed the case files of patients with cavernous malformations who underwent surgery between January 2001 and April 2018 in the IVth Neurosurgery Department in “Bagdasar-Arseni” Clinical Emergency Hospital.

Results

The inclusion criteria (surgical resection, intracranial cavernomas) were met by 153 patients of which 82 (53.6%) were male. The mean (±SD) age was 41.1 (±13.5) years. One hundred and twenty-five (81.7%) lesions were supratentorial and 28 (18.3%) lesions were infratentorial and fourteen patients (9.15%) presented with multiple cavernomas. On admission, 78 (51%) patients presented with seizures, 73 (47.7%) patients with headache, 22 (14.4%) with motor deficits, 24 (15.7%) with sensory deficits and nine (5.9%) with cranial nerves deficits. Forty-six patients (30.1%) presented with hemorrhage from the cavernoma on admission. For deep-seated lesions, the surgical resection was guided by intraoperative neuronavigation combined with 3D ultrasound. Patients with lesions situated in eloquent areas underwent preoperative brain mapping using navigated transcranial magnetic stimulation. Preoperative, based on modified Rankin scale (mRS) there were 77 (50.3%) cases with a score of 1, 39 (25.5%) patients had a score of 2, 32 (20.9%) patients had a score of 3 and five (3.3%) patient had a score of 4. Postoperative, ninety-two (60.1%) patients had an improvement on mRS score and in sixty-one (39.9%) there were no changes. Forty-five patients (57.7% - 45/78) were seizure-free at follow-up and 33 patients (42.3% - 33/78) presented low frequency pattern of seizures,
fully controlled with antiepileptic medication. Complete surgical resection was achieved in all cases.

**Conclusions**

Surgical management is the only curative treatment for intracranial cavernomas. The objectives of surgery are gross total resection and avoidance of secondary neurological deficits. In supratentorial locations excision of surrounding hemosiderin ring is mandatory for seizure control.

**Key words**

Cavernoma, surgical resection, neuronavigation, outcome
CLEAVABILITY OF CONVEXITY MENINGIOMAS

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Objectives
Convexity meningiomas are generally thought of as encapsulated tumours and therefore easily disconnected from adjacent brain tissue. In reality this is far from true and a cleavage plane is often difficult to find in outside the pia matter and therefore brain parenchyma. Participation of the pial vessels to the vascularisation of the tumour and therefore their incorporation into the meningioma can be predicted not only by selective angiography but also by MRI imaging. In fact the presence of FLAIR hyperintensity in the adjacent brain parenchyma attests this pial participation to the tumour vascularisation.

Materials and methods
We present an illustrative case of this difficulty of finding a cleavage plane at least on the entirety of the tumor/brain interface. This video presentation shows the correlation between imaging, pial vascularisation and surgical findings. It also depicts predictability of cleavable areas versus non cleavable areas.

Results
The problem of cleavability within or outside the brain parenchyma is one of practical importance. Pial avulsion in a functional area will lead to irreversible deficits through infarction of the adjacent cortex. Leaving in place invaded pia increases the recurrence rate in the long run.

Conclusions
Preoperative studies become therefore essential in discussing the surgical options and risks with the patient.

References
NEURONAVIGATION: FROM ANATOMICAL DRAWINGS TO SURGICAL MASTERCLASS

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Objectives

Nowadays neuronavigation represents an important part of the neurosurgical arsenal as it dispels old techniques from modern ones based on minimally invasive gestures with maximum impact on patient outcome and quality of life. This paper presents the history of neuronavigation as it evolved from simple drawings of the human brain in the time of Leonardo Da Vinci into modern wonders of technology encompassing modern means of neuroimaging, ultrasonography, image fusion and robotics all in a single device which enables all neurosurgeons to reach the deepest structures of the brain and successfully perform surgery.

Materials and methods

We present the basic principles of craniometry and encephalometry as described by Macewen (1848-1924), Horsley (1857-1916), Durante (1844-1934) and many other pioneers in the field. Neuroimaging with the evolution of radiographs, angiography and computer tomography together with diffuse tensor imaging and functional MRI were the next step in the long road neurosurgeons had to take. Stereotactic surgery both frame-based and frameless are mentioned and last but not least modern methods of neuronavigation are presented in a case-oriented fashion.

Results

We present a series of cases of lesions in critical and eloquent areas in the brain with difficult resections when neuronavigation proved to be an important ally. Currently in neurosurgery intracranial procedures are prohibited without a full neuronavigation documentation. This is required so craniotomies are minimal and targeted and intracranial approaches are minimally invasive without affecting the adjacent structures.
**Conclusions**

Through the impact it had on surgical outcomes and patient quality of life neuronavigation is clearly one of the most important achievements in the field of contemporary neurosurgery and the authors consider it to be one of the essential tools of the trade in our field.

**References**

THREE-DIMENSIONAL NEUROENDOSCOPY FOR INTRAVENTRICULAR LESION TREATMENT IN ADULTS AND CHILDREN

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Objectives

The recent development of 3-D and HD neuroendoscopes may herald improved depth perception and better appreciation of anatomic details. In the case of multidiaphragmatic cystic intraventricular lesions this innovative instrumentation can provide a more precise neuroendoscopic approach inside the de novo altered anatomy.

Materials and methods

Beyond the standard third ventriculostomy for obstructive hydrocephalus and the endoscopic assisted microneurosurgery, we used recently (the first semester of 2018) the 3-D neuroendoscope for the fenestration and elimination of intraventricular cysts. There were two children, one was presented with a large suprasellar arachnoid cyst extending into the third ventricle and the other one with multidiaphragmatic post-infectious cystic intraventricular lesions. Concerning the adult patients nine third ventriculostomies for acute hydrocephalus due to posterior fossa tumor and four for arrested hydrocephalus respectively, 3 pineal biopsies, 2 excisions of colloid cyst of the third ventricle and 1 removal of a subependymal cyst. The maneuvers of bipolar coagulation, grasping, cutting and double-balooning dilatation were made successively through one working channel.

Results

In this short-term follow-up all patients showed clinical and radiological improvement. Two of them kept an internal intraventricular catheter in order to maintain the intradiaphragmatic corridors open. No patient was shunted; there was no postoperative infection or meningocele.

Conclusions

Augmented reality may be improve neuroendoscopy, especially in cases of intraventricular cysts, which distort the expected anatomy. The use of 3D neuroendoscope improved depth perception and task performance.

References

OBJECTIVES

Meningeomas are benign brain tumors. Treatment can be surgery, fractionated radiotherapy (FRT) or stereotactic radiosurgery (SRS). Hamburg Cyberknife Radiosurgery data (CK-SRS) of intracranial meningeomas are presented with 36 month follow up and compared to international data.

MATERIALS AND METHODS

From 2011-2016: 56 patients with intracranial meningeomas were treated with robotic cyberknife radiosurgery (CK-SRS) in our center: diagnosis was made by MRI, histologically confirmed in 12/56 cases, resection before SRS: in 10/56 (21%) cases. Primary treatment in 44/56 (78%), recurrent disease in 10/56 (22%), incomplete resection 2/56 (3%). Target volumes: 20-130 ccm. Fractionation: one, three or five fractions. 35 % of lesions: topographic high risk meningeomas (HRM), located parasellar, very near to optical nerves/pathways or brainstem or optical sheath meningeoma.

RESULTS

MRI-evaluation at 3/6/12/18/24/36 month after treatment. Follow-up (FU) from 6 to 55 months, median 36 months. SRS-Toxicities was low, side effects (SE): mortality: 0% , SE (morbidity): 3%, grade 1: temporary headache in 2 patient, (3 %), no grade ≥ 2 SE, long time evaluation: No eye toxicities. No salvage resection after CK-SRS. Recurrence rate (RR) is 0 % after 36 month. All lesions showed good clinical results (high local control, only mild side effects). HRM could be treated, no side effect on nerves were documented. Our clinical datas are comparable to other international work-groups.

CONCLUSIONS

Cyberknife radiosurgery is effective and safe. CK-SRS is a noninvasive high-dose radiotherapy and has a high rate of local control and lower morbidity. Longer Term follow-up needed, including neurologic examination and quality of life.

REFERENCES

PUB MED (meningeoma and radiosurgery or cyberknife keywords: meningeoma, radiosurgery, cyberknife)
Objectives
There are several surgical approaches to the pineal gland and the pineal region, each with its associated advantages and disadvantages. These tumors are particularly challenging lesions due to their deep location and the proximity of large venous complex draining into the vein of Galen. Among the different techniques described approach the region, the sub occipital transtentorial approach offers a shorter, wider and safer exposure and resection, even for large tumors with infratentorial and lateral extension. The wide surgical corridor extends superiorly to the splenium, inferiorly to the deep cerebellar fissure and the floor of the fourth ventricle, laterally to the thalamus and pulvinar and deeply into the third ventricle and the lateral surface of the cerebral peduncles. In this report we describe the technical key points of this approach based on a series at our institution of 277 patients operated on for pineal region tumor.

Materials and methods
Out of 277 patients operated in Lyon for a pineal tumor, 233 were treated by a sub-occipital approach: 153 males, 125 females, 75 patients of pediatric age. The majority of patients were operated on in a sitting position. Others were operated on in a ventral position or using a supracerebellar infratentorial approach also mostly in a sitting position. These are used for comparison.

Results
Complete tumor removal was possible in a majority of patients. The main surgical sequelae was hemianopsia with an overall 0% perioperative mortality. Surgical technique is illustrated point by point from positioning and the safety of the sitting position to bony, intradural and vascular approaches.

Conclusions
In our opinion, the sub-occipital transtentorial route is the approach of choice for the resection of voluminous tumors located within the pineal region, and is especially advantageous for those extending deeply into the third ventricle, inferiorly into the fourth ventricle and laterally into the thalamus and even into the lateral ventricles.

References
TUMORS  5

SESSION

Friday, September 7, 2018

Europa Hall

Chairs: Horia Ples, Alin Borha
MANAGEMENT OF POSTERIOR THIRD VENTRICLE AND TECTAL LESIONS. A NEUROSURGICAL POINT OF VUE

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Objectives

Posterior third ventricle and tectal plate lesions are rare lesions and represent a challenge for neurosurgeons. The goal of this study was to evaluate the neurosurgical strategy, management and results in such difficult lesions.

Materials and methods

We retrospectively reviewed all patients with posterior third ventricular and tectal plate lesions between 2013 and 2018. Tumors of the anterior third of the third ventricle or corpus callosum tumors invading the third ventricle were not included in these series. Clinical, radiological, surgical, histopathological, and follow up data were analyzed.

Results

17 patients were operated between 2013 and 2018 in our department. There were 7 male and 10 female patients. Mean age was 19 years-old (8 months – 60 years). There were 10 (59%) children in these series with a mean age of 11 years-old (8 months – 18 years). Postoperatively anatomopathological results showed a pineal cyst in 4 cases, a cavernoma in 1 case, germinoma in 3 cases, malignant glial tumor 2 cases, benign astrocytoma in 2 cases, epidermoid cyst 1 case, medullobastoma 1 case, atypical teratoid/ rhabdoid tumor (ATRT) 1 case, pineal papillary tumor 1 case and a primitive neuroectodermal tumor (PNET) 1 case. At the diagnosis, the most common clinical syndrome was hydrocephalus (14 patients) and headache was the most common symptom. Hydrocephalus was managed with third ventriculostomy in all cases. Microsurgical approaches were transchoroidal transforaminal in 4 cases, posterior transcallosal in 2 cases, infratentorial supracerebellar in 3 cases, transparietal transventricular 1 case, interhemispheric transtentorial in 7 cases. A complete or almost complete resection has been achieved in 12 cases, one case was managed via an open biopsy. All pineal cysts (4) were treated by marsupialization. There was no postoperative mortality and no major clinical aggravation. Most common complication was pseudomeningocele in 4 patients. All patients were mRankin cale 0 or 1 at discharge or last
neurosurgical follow-up. One patient died of tumor progression during the follow up.

Conclusions
Posterior third ventricular and tectal lesions are extremely variable, are seen especially in young patients and need a multidisciplinary approach. These lesions can be successfully managed by surgery with carefully preoperatively planning and need an expertise of any surgical corridor for a safe resection.

References
CLINICAL APPEARANCE, NEUROIMAGISTIC FINDINGS AND SURGICAL TREATMENT OF CLIVAL LESIONS – A SINGLE CENTRE EXPERIENCE

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Objectives
Description of clinical appearance in clival lesions observing postoperative neuroimagistic changes and clinical condition. Surgical treatment of Clival lesions and try to establish a standard.

Materials and methods
We performed a retrospective study of the patients evaluated and treated for clival lesions in the 3rd Neurosurgical Department of Bagdasar-Arseni Clinical Emergency Hospital, between 2012 – 2018.

Results
16 patients were identified, 12 female patients (75%) and 4 male (25%). Mean age at diagnosis was 50,5 years old. The following lesions were found: 3 cases of chordoma (18,75%), 2 cases of cavernous hemangioma (12,5%), 2 cases of meningioma (12,5%), 2 cases of extracranial neoplasms metastases (12,5%), and one case of epidermoid carcinoma, chondrosarcoma, fibrous dysplasia, lymphoma, osteosarcoma, plasmocytoma, and ectopic prolactinoma. The mean diameter of the lesions was 25 mm.

Invasion in the adjacent structures was sometimes identified, as following: sphenoid bone in 3 cases (18,75%), temporal bone in 2 cases (12,5%) and cavernous sinus in 6 cases (37,5%). Surgical resection, using transnasal-transsphenoidal approach was performed in 15 cases (93,75%). One case required biopsy, performed also by transsphenoidal approach.

Conclusions
The clivus forms the posterior part of the central skull base. Its upper portion is the basisphenoid and the lower portion is the basiocciput. Its lateral margins are the petro-clival fissures, and it extends inferiorly to the foramen magnum. Chordoma, fibrous dysplasia, myeloma, and metastasis arise within the clivus. Chondrosarcoma, nasopharyngeal carcinoma, invasive pituitary macroadenoma, cholesteatoma and mucocele can be recognized from attention to adjacent structures. The transphenoidal approach is the preferred route to establish a histopathological diagnosis and to provide neurosurgical cure of this lesions.
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SPINE  1

SESSION

*Thursday, September 6, 2018*

*Nera Hall*

*Chairs: Grigore Zapuhlih, David Choi*
ROLE OF NEUROSURGERY IN THE TREATMENT OF VASCULAR SPINAL CORD PATHOLOGY

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Spinal cord vascular lesions are heterogeneous entities that can render devastating neurological sequelae by hemorrhage, venous congestion, mass effect, and vascular steal. These lesions have been challenging entities to treat because of their complicated vasculature and the high vulnerability of the spinal cord. To understand the pathophysiology of spinal vascular lesions, a profound knowledge of spinal vessel anatomy is indispensable.

We present a review of vascular lesions (AV fistulas, haemangioblastomas, cavernous malformations, AVMs) of the spinal cord based on the personal series treated surgically in the Sheffield Teaching Hospital from the last ten years with a focus on modern adjuncts to the neurosurgical treatment of vascular lesions (angiography, ICG, IOM) and microneurosurgical technique.
UNUSUAL CASE OF CERVICAL SPINAL CORD COMPRESSION

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We present an unusual case of spinal cord compression. The patient is a young lady, admitted in our department, three months after she gave birth to a healthy child, for cervical pain, rotation of head and neck to the left side, minor neurologic deficits.

Investigations

X-Ray, CT-scan, MRI exam revealed involvement of three vertebral bodies, anterior and posterior extension of the mass lesion. We operated the patients by posterior and anterior approaches and we fixed the cervical spine by anterior bone graft and metallic implants and external fixation on halo-vest.

Key words

Cervical mass lesion, anterior and posterior cervical approaches, internal and external fixation
MICROSURGICAL RESECTION OF INTRAMEDULLARY HEMANGIOBLASTOMA. MICROSCURGICAL CHALLENGES

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Objectives

Hemangioblastomas are rare, benign and highly vascularized tumors, that may be located anywhere along the central nervous system. In more than 30% of the cases, hemangioblastomas are associated with Von-Hippel Lindau disease. Isolated hemangioblastomas might also appear. Hemangioblastomas account for 5-10% of intramedullary tumors, specifically tumors that grow on or within the spinal cord. Small hemangioblastomas are mostly located on the surface of the spinal cord, along its posterior aspect and the symptomatic tumors might present a relatively large associated syrinx. These tumors are usually treated by surgical resection, sometimes with preceding endovascular embolization to reduce intraoperative blood loss.

Materials and methods

We present a rare case, a 41 years old female, admitted in our department in December 2017, for neck pain, persistent paresthesia distal in the right hand and right foot drop. The spinal cord MRI showed a 1 cm diameter small nodule located in the posterior aspect of the spinal cord at the T1 level, isointense on T1-weighted images, hyperintense on T2-weighted images, with homogenous enhancement and flow void. On FLAIR and T2 sequences a significant edema was visible from the upper cervical cord to the 6th toracal vertebra. The patient was operated on under general anesthesia with intraoperative neurophysiological monitoring, through an posterior approach with T1 laminoplasty and a gross total tumoral removal was performed.

Results

Postoperative course was uneventfully with complete neurologic recovery and a total resolution on the follow-up MRI. The anatomopathological examination confirmed the hemangioblastoma. The patient was further examined and Von Hippel Lindau disease was excluded.
Conclusions

The spinal cord hemangioblastoma is a rare tumor and with a great variety of clinical and imagistical presentations. For all the symptomatic tumors, surgery is the treatment of choice. The VHL mutation analysis is useful in patients with a family history and in those with multiple hemangioblastomas. Keywords: Hemangioblastoma, Von Hippel-Lindau disease, intraoperative neuromonitoring, laminoplasty

References


DOUBLE MINIOPEN TLIF – OUR MAIN HYBRID APPROACH FOR DEGENERATIVE SEGMENTAL LUMBAR INSTABILITY

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Objectives

Often, degenerative segmental lumbar instability is a consequence of an sagittal plane imbalance, with loss of local lordosis. Therefore, local surgical arthrodesis has to improve this parameter as much as possible. Of the posterior/posterolateral arthrodesis techniques, parallel studies show that a better segmental lordosis is obtain by PLIF than by mini-open TLIF, (MisTLIF), with an unilateral cage, straight or banana-shape. Our hybrid mini-open TLIF approach with bilateral insertion of two inter-body cages followed by a proper compression shows same amount of segmental degrees of lordosis obtained as in the classical PLIF technique

Materials and methods

A retrospective analysis of the patients which was operated by this two techniques in the last 30 month in our department was focused on the radiological postoperative results in terms of achieved segmental lordosis

Results

Segmental lordosis achieved post-operatively by PLIF versus modified TLIF technique is similar in both approaches and superior to the classical MisTLIF technique

Conclusions

The possibilities of superior interstromatic distraction when dealing with bilateral discal approach in the case of Miniopen hybrid TLIF versus distraction obtain on the transpedicle screws / cage in the case of the classical MisTLIF technique and the superior possibilities for further compression due to the release of the bilateral foramen are in our opinion the main factors contributing to the improvement of postoperative segmental lordosis

References

SPINE 2

SESSION

Thursday, September 6, 2018

Nera Hall

Chairs: Eugen Cezar Popescu, Tomislav Sajko
PYOGENIC SPINAL INFECTIONS. DIAGNOSTIC TOOLS, TREATMENT

EUGEN CEZAR POPESCU, LUCIAN EVA, BOGDAN COSTACHESCU, IOANA JITARU, ALEXANDRU STAN, ANTONIA NITA

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Objectives
Pyogenic vertebral infections remains a challenge to spine surgeons because they may be associated with several comorbidities, neurological deficits or severe spinal instability.

Materials and methods
In many cases, modern antibiotic therapies may be successfully used.

Results
However, cases with persistent infection, neurologic deficits, instability, often require surgical treatment. Indications for surgery are not always clear, and the use of instrumentation has been controversial.

Conclusions
Indications for surgery are not always clear, and the use of instrumentation has been controversial.

References
THE INDICATION FOR SURGICAL TREATMENT OF THE LOMBAR AND DORSAL SPINE. AO CLASSIFICATION. OUR EXPERIENCE.

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Objectives
Thoracic and lumbar spine fractures are common injuries that can result in significant disability, deformity and neurological deficit. AO fracture classification system is based on fracture morphology, injury mechanism, neurological deficit and injury to posterior ligamentous complex. This study provides an overview of the epidemiology, radiological and clinical evaluation, classification and management principles.

Materials and methods
The present study is a retrospective one between the years 2013-2017. All patients were admitted in Neurosurgery Clinic and Orthopaedic and Trauma Department form Sibiu County Hospital with thoracolumbar fracture. Clinical examination and radiology, CT reconstruction are used in diagnosis of thoracic and lumbar fractures.

Results
The injuries were classified as type A, B or C according to the AO-classification system and the levels of fracture. Early stabilization and fusion was generally accepted for patients with unstable fractures and neurological deficits. The conservative treatment was the choice for patients with less instability, moderate deformity and absence of neurological symptoms.

Conclusions
Vertebral fractures have a significant effect on the quality of life of the patient. CT scan provides the best information on the extent of bone lesions and MRI scanning shows the severity of cord compression and injury to posterior ligamentous complex.

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RECURRENT SPINAL HYDATIDOSIS

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Objectives

Hydatid disease is caused by the larval form of the parasitic tapeworm Echinococcus granulosus. Primary bone localization is rare and it accounts between 0.5% and 4%. Spinal localization accounts for less than 1% of all hydatid disease. We present a very rare case of spinal hydatidosis and the difficult management of this case.

Materials and methods

Our patient, a 34 year-old male, first presented in 2013 with posterior left thoracic pain, and was diagnosed with a space-occupying lesion projected in the area of the 5th and 6th left ribs, developed in the costovertebral space, with extension through the foramina in the spinal canal and osteolysis of the surrounding bony elements, compressing the nervous structures.

Results

We performed a costotransversectomy at CIV-CV levels, partial laminectomy T4-T5, resection of spinous process T5, evacuation of the intracanalar and extrapleural empyema, minimal pleurectomy and irrigation with saline ant iodine solution. He received postoperative treatment with Mebendazole. In 2016 he was again operated for local recurrence. In 2018 he returned with progressive thoracic rachialgia aggravated by mobilization for 1 month, radicular pain with belt-like distribution in the T5-T9 dermatomes on both sides, without motor deficits. MRI of the thoracic region showed multiloculated polycyclic space-occupying lesion with spinal cord compression at T4-T6 levels and bilateral paravertebral extension. The mass was explored with partial laminectomy T3, laminectomy T4, T5, T6 and posterior spinal fixation with pedicle screws and rods system was performed. The surgical field was irrigated with hypertonic saline solution and diluted Betadine solution after removal of the cysts. Mebendazole (MBZ) was given in the pre and postoperative period.

Conclusions

This case is highly interested by the costovertebral particular localization of the cysts and the progressive destruction often compared to a local spinal malignancy. Also the patient did not present with invasion of the liver or lung, no neurological deficits over a follow-up of 5 years and after 3 surgery procedures.

References


THORACO-LUMBAR SPINE INJURIES – A RETROSPECTIVE STUDY

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Objectives
Thoracolumbar spine fractures are common injuries that can result in significant disability, deformity and neurological deficit. There are several classification systems that have been described based on fracture morphology, injury mechanism, neurological deficit and injury to posterior ligamentous complex. The thoracolumbar junction (T10-L2) is uniquely positioned in between the rigid thoracic spine and the mobile lumbar spine. This transition from the less mobile thoracic spine with its associated ribs and sternum to the more dynamic lumbar spine subjects the thoracolumbar region to significant biomechanical stress. Hence, fractures of the thoracolumbar region are the most common injuries of the vertebral column. Analyze and compare the particularities of our patients with thoracolumbar fractures.

Materials and Methods
This retrospective study was conducted on 651 patients with thoracolumbar spine fractures who were admitted in the Emergency Clinical Hospital “Prof. Dr. N. Oblu”, Neurosurgery, Iasi, Romania between 2014-2017. We compare our results with another study conducted in our hospital between 2011-2013.

Results
We observed an increase in frequency of thoracolumbar fractures especially in young adults.

Conclusions
Trauma to the thoraco-lumbar spine and spinal cord is potentially devastating injury and it can be accompanied by significant neurologic damage. Patients with incomplete neurologic deficits may regain a large amount of useful function with early or rapid surgical treatment.

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SPINE 3

SESSION

Friday, September 7, 2018

Nera Hall

Chairs: Cedric Barrey, Robert Veres
ENDOSCOPIC TRANSFORAMINAL DISCECTOMY FOR RECURRENT DISC HERNIATION

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Background
Recurrent disc herniation after open surgery is a significant problem as scar formation and segmental instability by further damages to vertebral motion segment may lead to increased morbidity and disability with re-operation. The advantage of the Endoscopic Transforaminal Discectomy (ETD) is that is no need to go through the old scar tissue preventing nerve injury and further damage to posterior spinal and paraspinal structures. The disadvantage may be a long learning curve for the surgeon.

The objective of this study was to review the complications and outcomes of the Endoscopic Transoraminal Discectomy for recurrent herniated discs.

Methods
17 patients over a 3 year period (between 2014-2017) with a MRI proven recurrent lumbar disc herniation with primarily radicular symptoms who did not respond to conservative measures and repeated transforaminal spinal infiltrations were included in this prospective clinical study. They have been assessed by NRS score before, 3 months and 1 year after ETD and MacNab score. All patients were treated in local anesthesia and could be discharged one day after the surgery. The approach was from fare lateral, first the intervertebral foramen was enlarged and a working cannula was inserted into the spinal canal. The prolapsed or extruded part as well all loose intradiscal fragments were removed under endoscopic view with special forceps.

Results
1 year after ETD 89,3% of the patients rated the result of the surgery as excellent and good and 11,7 % as unsatisfactory. Patients recorded an average improvement on their leg pain of 5.8 points and 5.7 points of their back pain on the NRS scale (1-10). According to MacNab criteria 29,4% of the patients were able to return to normal work and activities, feeling fully regenerated, 58,8 % felt occasional non-radicular pain and their efficiency to be slightly restricted and 11,7 % felt their efficiency noticeably restricted.

All patients had a 3-month follow-up for possible complications.
There was no case of infection or discitis, no nerve root irritations or bleeding no early
recurrent herniations and none of them have been re-operated for recurrence after 3 months and within 3 years.

**Conclusions**

Endoscopic transforaminal discectomy appears to be an effective treatment for recurrent lumbar disc herniation with no complications and high patient satisfaction.
THE USE OF NUCLEOPLASTY IN THE DEGENERATIVE PATHOLOGY OF THE SPINE

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Objectives
Intervertebral disc herniation is a major cause of low back pain. Several treatment methods are available for lumbar disc herniation including: conservative treatment, open surgery, nucleoplasty, percutaneous discectomy, intradiscal electrothermal therapy. The high prevalence of lumbar disc herniation necessitates a minimally invasive yet effective treatment method.

Materials and methods
In this study, we present our case-series of patients treated with different methods available in our institution.

Results
Patients were revisited at 7 days, 3 months, and 1-year after procedures and were assessed for the following variables: lower back pain, lower limb pain, common complications of surgery (e.g., discitis, infection and hematoma) and recurrence of herniation.

Conclusions
Our results show that minimally-invasive procedures are very effective in the treatment of degenerative spine diseases. Taking factor such as decreased cost and duration of the surgery, as well as faster recovery in patients into account; we suggest considering nucleoplasty as an effective method of treatment in carefully selected patients.

Key words
Intervertebral disc herniation; nucleoplasty; open discectomy
THE ROLE OF O-ARM AND NAVIGATION IN SPINAL SURGERY. OUR EXPERIENCE AND PERSPECTIVE

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Objectives
To prevent pedicle screw malposition, image-assisted navigation systems have been developed. The O-arm is a full-rotation, multidimensional imaging system that interfaces with the navigation system and allows for immediate real-time image-guidance.

Materials and methods
We used the O-arm and navigation system in 20 patients with several pathologies (traumatic, degenerative, tumoral), evaluated the precision of screw placement in three dimensions and compared with the accuracy of the screw placement using conventional 2D fluoroscopy and free-hand technique.

Results
O-arm navigation significantly reduces pedicle screw misplacement compared to 2D fluoro guided placement or free-hand techniques.

Conclusions
O-arm navigation provides greater accuracy of either open or percutaneous instrumentation placement, with comparable operative times and acceptable radiation dose delivered to the patient.

References
SPINE 4

SESSION

Friday, September 7, 2018

Nera Hall

Chairs: Ihsan Solaroglu, Stefano Ferraresi
INTRADURAL EXTRAMEDULLARY SPINAL TUMORS: TREATMENT AND STRATEGIES FOR QUALITY OF LIFE AFTER SURGERY

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Objectives
Spinal tumors represent a small part of the tumors diagnosed in the neurosurgery department. The majority of these tumors arise from the cellular structures of the spinal cord, filum terminale, meninges or nerve roots. Spinal tumors can be divided into intramedullary tumors with the starting point in the cellular structures of the spinal cord, and extramedullary, extrinsic to the spinal cord. There are described more extramedullary spinal tumors than intramedullary tumors, the most frequently found being nerve sheath tumors and meningiomas. Most of them are benign tumors, being very suitable for complete resection. Although benign, these tumors may clinically present a significant impact on the patient’s quality of life, causing severe deficits.

Materials and methods
We retrospectively analyzed the records of all surgically treated patients with intradural extramedullary spinal tumors who were admitted in the IVth Neurosurgery Department in “Bagdasar-Arseni” Clinical Emergency Hospital between January 2009 and December 2017.

Results
One hundred and five patients were included with a mean (±SD) age of 56.15 (15.25) years and a preponderance of female patients – 80 (76.2%). The lesions were mostly benign (103; 98.1%), including 49 cases of meningiomas (46.7%) and 31 schwannomas (29.5%). Other histopathological types represent the remaining 25 (23.8%) cases. The lesion was situated in the cervical region in 18 cases (17.1%), thoracic region in 51 patients (48.6%) and in 36 cases (34.3%) in the lumbar region. Sixteen patients (15.2%) had a Frankel grade E on admission, 62 (59%) were grade D and 27 (25.8%) were grade C. Gross-total resection was achieved in 101 cases (96.2%). The most common postoperative complication was CSF fistula, which occurred in 4 cases (3.8%).

Conclusions
Intradural extramedullary spinal tumors are significantly affecting the life of the patients by causing major deficits. The management might be very challenging, but
this type of tumors can be completely excised giving the patients a real chance to recover and have a better life. There are many risks but with a well-documented case and an accurate surgical technique the outcome can be good, with a very low rate of complications.

Key words
Intradural extramedullary spinal tumors. quality of life, schwannoma, meningioma
CONTEMPORARY CARE CERVICAL SPINE INJURIES

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Introduction
Cervical spine trauma is one of the most common sites of spinal cord injury (SCI). All injured patients should be screened for cervical spine injuries. CT imaging with multiplanar reconstructions provide high sensitivity for injury detection. Surgical treatment strategies for cervical spine injuries differ widely around the world. Choice of treatment strategy, operative approach, and timing varies depending on many factors including fracture classification, presence of spinal cord injury and whether subluxation or dislocation is present. There is insufficient evidence to support treatment standards and guidelines. Combinations of anterior and posterior approaches vary depending on surgeon choice, available resources and fracture morphology. We reviewed our experience of cervical spine injuries treated at our institution at the last two years.

Materials and Methods
A retrospective cohort review was carried out using the hospital electronic medical records system.

Conclusions
We revealed early aggressive surgical treatment of cervical spine injury is a safe and reliable approach. The majority of cervical spine injury can be managed by anterior approaches alone with good surgical outcomes.

The importance of introduction of the “Damage Control Surgery” in Spine Trauma. This treatment strategy allowed favorable long term result.
POSTERIOR CERVICAL FORAMINOTOMY, THE MOST APPROPRIATE PROCEDURE FOR CERVICAL RADICULOPATHY

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Objectives
Cervical radiculopathy that is caused by either soft herniated disc material or foraminal stenosis is a common problem in active and young patients. In our clinic anterior and posterior surgical approaches are commonly performed to decompress the nerve root. The treatment of cervical radiculopathy due to lateral compressive disease has traditionally been accomplished via an anterior or a posterior surgical approach. There are several well-established series in which the efficacy of both techniques is demonstrated. The authors describe postoperative results after posterior foraminotomy procedure in 60 cases of cervical unilateral radiculopathy in the last 2 years.

Materials and methods
We have developed this technique to perform posterior unilateral cervical foraminotomy followed by microablation of the disk fragment especially in young and active patients (30-50 years old) with unilateral cervical radiculopathy. All patients presented with radicular symptoms and signs. Magnetic resonance imaging was performed in all patients. Postoperatively, all patients returned to functional work status within 4 weeks. The mean length of hospitalization was 3 days. All patients tolerated the procedure well. Postoperatively they experienced improved radicular symptoms, with minimal neck discomfort.

Results
The advantages of this technique include improved visualization of the neural structures compressed in vertebral foramen, a smaller incision, significantly less postoperative discomfort and complications (without vertebral instability), and rapid recovery when compared with a matched group of patients in whom classic anterior discectomy followed by arthrodesis has been performed.

Conclusions
It is well known that the benefit of the posterior approach to lateral disc herniations is that fusion is not required and that the risk of injuring anterior structures, such as the esophagus, carotid artery, and recurrent laryngeal nerve is avoided. The major disadvantage to the posterior approach is that it is associated with significant postoperative neck discomfort. We recommend a cervical collar a few days postoperatively. The posterior approach to lateral disc lesions is an
effective procedure in which a low morbidity rate was achieved in properly selected patients.

References
INTRAOPERATIVE NEUROMONITORING DURING SPINE SURGERY-METHODOLOGY AND CASE PRESENTATION

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Objectives
Intraoperative neurophysiology is mainly used for preventing injury of neural tissues and for finding specific elements during surgery.

Materials and methods
Intraoperative neuromonitoring employs a wide variety of modalities: motor evoked potentials (MEPs), somatosensory evoked potentials (SSEPs), electroencephalography (EEG), electromyography (EMG), brainstem evoked potentials (BAEPs) and visual evoked potentials (VEPs). A multimodal combination of these methods should be strategically selected according to the surgical circumstances. This presentation will review the relevant intraoperative neuromonitoring modalities used today during spine surgery.

Results
Some cases with spine deformity, intramedullary and also intradural extramedullary tumors will be illustrated. Interpretation of the neurophysiological abnormalities is the action of explaining meaning and guiding intervention appropriately. Stable results provide confidence to continue, while deterioration signals need prompt intervention to restore potentials and avoid injury, or decide a surgical stopping point.

Conclusions
It is critical to apply multimodal neurophysiologic monitoring depending on pathology. Correct and prompt interpretation of changes in waveforms of recorded potentials is very important for successful neuromonitoring.

References
PEDIATRIC NEUROSURGERY

SESSION

Thursday, September 6, 2018

Nera Hall

Chairs: Alexandru Vlad Ciurea, Alexandru Tascu
PRIMARY IMPLANTATION OF SHUNT SYSTEM IN LOW BIRTH WEIGHT PREMATURES?

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Low birth weight prematures often has problems of hydrocephalus most after intraventricular hemorrhage. They are very small and they have no normal subcutaneous tissue. So, it is often not usual to implant directly a shunt system because of high rate of complications especially in wund healing.

Patients and methods
We compared 22 primary shunt implantations an 17 with primary implantation of a Rickham reservoir. All get a meds hakim regulated valve system. All had at the time of surgery a weight below 2500 g. Both groups had a medium age of 37 days.

Results
Within one year there were 2 revision after infection, 4 of the ventricular catheter, 1 isolated 4th ventricle and one of valva disfunction. After Rickham reservoir 13 need a shunt system, 3 had infectious problems.

Conclusions
The primary implantation of conventional memos Hakim programmable shunt is also in prematures possible. There are lower infectious problems possible im comparison with the puncture technique. The continuous drainage may be better than the two days puncture after ventricular enlargement. Although these datas may not can proof this.
MANAGEMENT OF HYDROCEPHALUS IN POSTERIOR FOSSA TUMORS IN CHILDREN – HOW NECESSARY IS THE “MYTH” OF VENTRICULAR DRAINAGE?

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Objectives
Most of children with posterior fossa tumors have obstructive hydrocephalus (HY) at the time of presentation. Until 2008 over 85% of them have been treated in our clinic by ventricular drainage as first step, followed by tumor approach in the second stage. A literature review demonstrate that only an average of 30% of pediatric patients with posterior fossa tumors really need a ventricular drainage before tumor surgery. Since 2009 we tried to eliminate this traditional algorithm and change the treatment paradigm by performing an accurate tumor resection followed by a restoration of CSF circulation.

Materials and methods
This is a 10 years (2008–2017) retrospective study of 344 children with posterior fossa tumors. At the time of presentation, 279/344 (81,1%) patients had symptomatic HY. All patients underwent tumor resection with or without a CSF drainage before tumor approach. In this study, 136 (39,5%) patients had a VP-shunt procedure, and 9 patients (2,6%) had an ETV procedure. We have focused to lower as much as possible the need of CSF drainage procedures by treating more effective the obstructive cause of HY.

Results
Drainage procedures have progressively declined year by year from 85,4% (35/41) in 2008, to 11,2% (4/28) in 2017, while tumor approach as first option have increased from 14,6% (6/41) in 2008 to 85,7% (24/28) in 2017. All patients were followed by close clinical and image surveillance to detect aggressive HY and tumor recurrence. The Canadian Preoperative Prediction Rule for Hydrocephalus (CPPRH), a validated prediction model, can be used to stratify patients at point of first contact into high and low risk for persistent hydrocephalus.
Conclusions

In this study we try to demonstrate that a better surgical management of posterior fossa tumors in children may avoid the false necessity of CSF drainage procedures as first option in treatment of obstructive HY.

Key words

Posterior fossa tumors, Hydrocephalus, VP-shunt, ETV
SURGICAL DIFFICULTIES IN AN EXTREMELY RARE CASE OF PEDIATRIC DUMB-BELL TRIGEMINAL SCHWANNOMA

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Objectives

Intracranial schwannomas are rare, benign tumors originating from the Schwann cells of cranial nerves. Trigeminal schwannomas account for 0.07-0.3% of all intracranial tumors and 0.8-5% of intracranial schwannomas. The figures for pediatric patients show an even smaller prevalence of such cases. Our paper presents one case of dumb-bell trigeminal schwannoma in a pediatric patient attempting to showcase the tips, tricks, pitfalls and management strategies available in such cases.

Materials and methods

We present the unusual case of a female patient, aged 11, who was investigated for intercurrent headache, vertigo and impaired eye sight via CT scan. Computed tomography followed by contrast enhanced MRI illustrated a 44x33x23 mm expansive process based on the cerebellar tentorium, pushing against the right hippocampus, the brainstem and 4th ventricle and engulfing the right ICA and cavernous sinus. The neuroimaging description fitted the profile of a “dumb-bell” trigeminal schwannoma. The patient was operated using a multistage microsurgical approach (2 surgeries) achieving total resection without signs of remnant tumor and without significant surgical complications. Intra-operative histopathologic examination confirmed the diagnosis.

Results

Following multistage surgery, multidisciplinary treatment and multimodal therapy the patient’s outcome was favorable with remission of symptoms and improvement in patient quality of life.

Conclusions

Our paper demonstrates that if appropriately planned surgery and multimodal therapy can be successful even in the most unusual cases. As always intracranial pathology in children should be referred to specialized centers outfitted with adequate logistics and pediatric ICU units.
Neurorecovery and multidisciplinary treatment are mandatory especially given the rehabilitation potential of the patient.

**References**
YOUNG NEUROSURGEONS CORNER

SESSION 1

Saturday, September 8, 2018

Europa Hall

Chairs: Virendra Sinha, Ioan-Stefan Florian, Olar Adriana
A SUBSEQUENT EMBRYONAL TUMOUR IN A PEDIATRIC PATIENT: GENERAL DATA AND CASE REPORT

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Introduction
Embryonal tumours (formerly known as primary neuroectodermal tumours - PNETs) are malignant tumours composed of non-differentiated or poorly differentiated neuro-epithelial cells, derived from the neural crest. Embrional tumours usually occur in children and young adults, with aggressive clinical behaviour and poor prognosis, accounting for 2.5 – 6% of primary childhood tumours.

Case report
5 years old child was first admitted in the Pediatric Neurosurgical Clinic of “Bagdasar-Arseni” Hospital in 2017 with headache, nausea and altered conscious state. IRM scan revealed a large left temporo-parietal tumour with peripheral edema. Patient was operated, with good postoperatory outcome (histopathological finding: embrional tumour). After that, he received chemotherapy. 15 months later, he was again admitted in our department with the same symptoms. IRM scan revealed a giant right fronto-temporal tumour with peripheral edema. He underwent surgery, with good outcome (histopathological finding: embrional tumour).

Discussion
Embrional tumours are highly agressive tumours which have a propensity for recurrence and CSF dissemination, infiltrating the surrounding tissue. The peculiaritiy of the case was the occurrence of a new tumour in the contralateral hemisphere (a “mirror” aspect), with the same symptoms.

Conclusions
Surgery is the treatment of choice in embrional tumours, but the adjuvant therapy is mandatory. In spite of the long term poor prognosis, gross total resection and adjuvant therapy provide a good outcome in the first 5 years.
HEMORRHAGIC STROKE IN CHILDREN – ALWAYS A CHALLENGE

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Introduction  
Hemorrhagic stroke in pediatric population usually is an acute event in a previously apparent healthy child. It involves vital risk or a high risk of squeals in a person with long life expectancy. The term hemorrhagic stroke usually includes spontaneous intracerebral hemorrhage (ICH) and non-traumatic subarachnoid hemorrhage (SAH). Incidence is approximately 1-2 per 100,000 children. The main cause of hemorrhagic stroke in children is arteriovenous malformations (AVM) unlike adults in which main causes are hypertension or amyloid angiopathy. In SAH adult protocols are applied successfully. For cases of intracerebral hemorrhage are only recommendations for treating but no protocols or clinical trials.

Methods  
We included in a retrospective study patients younger than 18 years old with hemorrhagic stroke admitted in Pediatric Neurosurgery Department of „Bagdasar-Arseni” Emergency Hospital over an 18 years period (2000-2017). The following factors were analyzed: age, gender, neurological status at admission, CT-scan at admission, DSA, MRI, treatment and outcome.

Results  
We included 149 patients, 80 boys (53.69%) and 69 girls (46.31%) with median age 9.12 years. 98 patients had been admitted with intracerebral hemorrhage (65.77%) and 51 patients with subarachnoid hemorrhage (34.23%). The main cause of intracerebral hemorrhage was ruptured AVM (42.85%). Other causes of ICH were cavernomas, coagulopathies, tumours. In 25.51% of cases with ICH, DSA was negative. In 39 cases (76.47%) of SAH the etiology was ruptured aneurisms. In 10 cases of ICH and in 7 cases of SAH the etiology could not be investigated due to the poor neurologic status of patients (GCS 3-4). 44 patients were admitted with GCS score less than 8. Overall mortality was 14.76%. In this paper we will present our treatment strategy in hemorrhagic stroke.

Conclusion  
Hemorrhagic stroke is one of the top ten causes of death in pediatric population. Usually is an acute event affecting a prior healthy child. Often patients are admitted with bad neurologic status and require emergency treatment. For achieving best results in these cases treatment protocols for hemorrhagic stroke must be adapted to pediatric population.
7 YEARS EXPERIENCE IN NEUROFIBROMATOSIS: CASE PRESENTATION AND LITERATURE REVIEW

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**Introduction**

Neurofibromatosis is an autosomal dominant genetic disorder that causes tumours to form on nerve tissue. These usually benign tumours can develop anywhere in the nervous system, including the brain, spinal cord and nerves, being usually diagnosed in childhood or early adulthood, but also any time during adulthood. Neurofibromatosis is a very complex disease because except the tumours the disease has numerous complications like hearing loss, learning impairment, heart and blood vessel (cardiovascular) problems, loss of vision, and severe pain, that can affect the quality of life.

**Materials and methods**

We retrospectively reviewed the case files of 25 patients with neurofibromatosis operated in our department between January 2011 and June 2018.

**Results**

Reviewing the case files we selected 7 patients (28%) with neurofibromatosis type I and 18 patients (72%) with neurofibromatosis type II. We excluded from the study the patients with severe meningiomatosis who underwent surgical resection, that did not fulfil all the criteria for neurofibromatosis (14 patients), even if severe meningiomatosis is rare outside neurofibromatosis. Most of the tumours were located in the brain (infra/supratentorial) and only a few patients had tumours located on the periferal nerve sheats. Surgery was attempted in most of the cases (92%), 2 patients refusing to underwent surgical treatment (8%). The sex ratio male women was 1:1.7. The medium age of the patients was 48.6 years (range 17 to 72 years). The most common symptoms were headache (48%), vertiginous syndrome and hear loss. Except the surgical procedures, 6 patients (24%) benefited from gamma knife procedures.

**Conclusion**

Neurofibromatosis is a very complex disease. In patients with neurofibromatosis intracranial tumours can have an unforeseeable growth pattern. New tumours can develop over the years and the symptoms are unpredictable. Surgical treatment is best to be reserved for symptom producing tumours. Non-surgical procedures are also an important step for the treatment of neurofibromatosis, but further studies are needed in order to determine their effectiveness.
THE IMPORTANCE OF SURGICAL TREATMENT IN SYMPTOMATIC TARLOV CYSTS

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Introduction

Tarlov cysts are perineural cysts filled with cerebrospinal fluid (CSF). The lesions are mostly found incidentally, very few being symptomatic. The preferred treatment in symptomatic cases is surgery, being considered the only curative option. This study aims to determine the effectiveness of surgical treatment in symptomatic Tarlov cysts.

Material and Methods

We retrospectively analysed the patients diagnosed with Tarlov cysts, who underwent surgical resection between January 2011 and June 2018. Baseline data was assessed by reviewing the case files, clinical, surgical aspects and outcome being also covered.

Results

31 patients were included in the study, with a mean (±SD) age of 47.4 (±17.5) years, 21 (67.7%) being females. The most common localization of the lesion was at the sacrum in 19 (61.3%) cases, followed by thoracic spine in 8 (25.8%) cases and lumbar spine in 4 (12.9%) cases. The median (min; max) follow up was 12 (2; 24) months. The thoracic lesion caused myelopathy in all 8 patients, one with more severe Frankel C paraparesis, the rest being Frankel D at diagnosis. Radiculopathy was present in all lumbar localization of the Tarlov cysts, including low back pain, sciatica and radicular numbness. Patients with sacral lesion experienced sacral pain, perineal numbness and various degrees of urinary and bowel dysfunction. All cases underwent surgery, with complete resection of the lesion and decompression of adjacent nervous structures. Laminectomy was performed in 20 (64.5%) cases, hemilaminectomy in 10 (32.2%) cases and laminoplasty in 1 (3.2%) case. A significant clinical improvement was observed in all patients. The patient with Frankel C paraparesis had a partial and complete remission postoperatively at 6 and 12 months respectively. The pain and numbness decreased significantly immediate after surgery, only one patient experiencing residual numbness at the 6 months follow up. No residual urinary or bowel dysfunction was reported at 6 months after surgery. Postoperative complications included one CSF fistula, treated surgically with complete resolution.
Conclusions

Surgery is the most effective option, regarding the treatment of symptomatic Tarlov cysts, in order to achieve complete resolution of symptoms in the majority of patients, with no significant postoperative complications.

Key words

Tarlov cysts, radicular cysts.
STEP BY STEP TUTORIAL IN USE OF SPINAL NEURONAVIGATION: A SHORT GUIDELINE FOR YOUNG NEUROSURGEONS

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Neuronavigation is a set of computer-assisted technologies used by neurosurgeons to guide or “navigate” within the confines of the skull or vertebral column during surgery and used by psychiatrists to accurately target rTMS (Transcranial Magnetic Stimulation).

The technique of using neuronavigation consists of two phases:

A. Pre-surgical preparation:
   1. preoperative CT examination of the level of interest
   2. transfer of the preexisting CT data into navigator computer workstation
   3. preoperative surgical planning

B. Intra-surgical preparation:
   1. surgical exposure
   2. patient registration into the navigator system
   3. the attachment of DRB (dynamic reference base) to the spine
   4. the electrooptical camera tracks the spatial position of the patient by the way of signals from DRB
   5. the surface of the vertebral level of interest is touched /scanned with a registration probe- to create a contour map of the vertebra, which is then automatically mapped to CT data
   6. the accuracy of the several anatomic landmarks within the operative field
   7. check the positions of the real and virtual probes had to correspond
6 YEARS EXPERIENCE IN LOW GRADE GLIOMAS: CASE PRESENTATION AND LITERATURE REVIEW

OCTAVIAN MIHAI SIRBU, IOANA MIRON, ANA-MARIA IONITA, BOGDAN DAVID, GEORGE POPESCU, MIRCEA RADU GORGAN

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Introduction

Diffuse low-grade gliomas (LGG) are tumours of the glial tissue, which are generally slow-growing, but have the potential to undergo anaplastic progression. For the best part of the past century, glial tumours have been grouped based on histological appearance but nowadays the molecular findings are taken into consideration. The management of suspected diffuse intracranial low-grade glioma (WHO grade II) is controversial including observation through serial imaging, biopsy, or surgical resection.

Materials and methods

We retrospectively reviewed the cases of 119 patients with low grade gliomas (World Health Organization Grade I and II) diagnosed in our department between January 2012 and December 2017.

Results

Reviewing the case files we selected 12 patients with ganglioglioma (WHO grade I), 52 patients with diffuse astrocytoma, 14 patients with oligoastroctoma and 41 with oligodendrogliomas. There were 52% men and the medium age at diagnostic was 40.1 years old. Most patients presented seizures as the main revealing symptom. The majority were located in frontal and temporal lobes and 59% were in the dominant hemisphere (34 frontal lobe, 17 parietal lobe, 56 temporal lobe, 8 subtentorial, 4 occipital lobe). In 110 cases surgery was performed, biopsy being reserved for only 6% of cases (especially infratentorial or for deep nuclei). In 47% of surgeries a total removal was possible, subtotal resection being associated with eloquent areas. In those cases preop fMRI, DT-MRI or Transcranial cortical mapping were performed in order to increase the extent of resection. At an average of 3 years followup there were 9% reintervention for imagistic tumoral progression and in 7% an increase in tumoral grading was noted. In these cases radiochimiotherapy was performed.

Conclusion

In our experience, consistent with recent studies, the patients with early surgical resection have a better overall survival rates. The goal is to obtain the maximum degree of tumor resection while preserving the patient’s quality of life. Advances in noninvasive fiber tracking (DT imaging) or fMRI have allowed better planning of the surgical act. The benefit-
to-risk ratio of surgery has improved thanks to the development of cortical mapping methods, including preoperative functional neuroimaging as well as invasive electrical stimulation;

Key words
Low grade gliomas, astrocytoma, oligodendroglioma
YOUNG NEUROSURGEONS CORNER

SESSION 2

Saturday, September 8, 2018

Europa Hall

Chairs: Virendra Sinha, Ioan-Stefan Florian, Olar Adriana
THE ROLE OF SURGERY IN THE OUTCOME OF COMATOSE YOUNG ADULT PRESENTING WITH NONLESIONAL INTRACEREBRAL SPONTANEOUS HEMORRHAGE

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Introduction
The ICH worldwide incidence ranges between 10 to 20 cases per 100,000 population and increases with age. ICH is rare before the age of 45 years and becomes increasingly more frequent with advancing age. Among the group 80 years and older, it occurs 25 times more frequently than in the general population.

The role of surgery in the outcome of the patients is still controversial taking account of the multiple variables and factors and the high mortality of the comatose patients.

Objectives
The aim of this study is to evaluate the management and the outcome of the young comatose patient with nonlesional intracerebral spontaneous hemorrhage.

Material and methods
This study is a retrospective one using the data of the patients with nonlesional intracerebral spontaneous hemorrhage between 2012-2018 in the Neurosurgical Department of the “Bagdasar-Arseni” Hospital, Bucharest. We also presented a case of a young comatose patient to exemplify the main aim of the study.

The mean age of the 74 patients enrolled in the study is 62,2 years (ranging from 36 to 91). The follow up period ranged from 1 month to 4 years.

Results
The global mortality of the 74 patients was 40%. In the comatose patient group the mortality was 75 % and in the non comatose group 3%. In the comatose patient group - 46% were young patients (under 60 years old) and 19 over 60. The mortality in the conservative managed patient in this comatose group was 100%. For the young patients who underwent surgery the mortality rate was 53 % and in the older subgroup 72 %.

Conclusions
The neurological status of the patient plays the most important role in the outcome of the patient presenting with nonlesional intracerebral spontaneous hemorrhage.

In comatose patient an independent outcome factor is the age of the surgery. A multimodal management including surgery...
and neurocritical care can result in favorable clinical outcome.

References
OUTCOMES FOLLOWING SURGICAL RESECTION OF THIRD VENTRICLE COLLOID CYSTS

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Objectives
Colloid cysts are rare, benign lesions, accounting for 0.5% to 1.0% of all primary intracranial tumors. The aim of this study is to analyse a consecutive third ventricle colloid cysts case series. We focused on clinical and paraclinical findings, surgical resection rates, with special attention to the postoperative outcomes, based on treatment strategy.

Materials and methods
We retrospectively reviewed a series of 85 patients diagnosed with third ventricle colloid cysts, admitted in our department of neurosurgery between January 2003 and December 2017. Endoscopic resection was performed in 35% of cases. Microscopic excision was used in 39% of cases. Ventriculoperitoneal shunting was necessary in 12% of cases.

Results
There were 41 females and 44 males, with a mean age of 39 years (range 18 - 67 years). Preoperative clinical examination revealed headache (77%), vertigo and dizziness (26%), nausea and vomiting (20%), balance disorders (19%), memory loss (13%), and blurred vision (11%). Total resection was achieved in 64% of endoscopic group compared to 93.75% of the microsurgery group (p < 0.001), but with higher morbidity in the second group (12% compared to 18.75%). The common complications were short-memory loss (2%) and seizures (2%). There were no deaths related to the surgery. To date, MRI revealed 10% recurrence rate in the subtotal endoscopic group and 3% recurrence rate in the microsurgery group.

Conclusions
Colloid cysts have favorable outcomes after resection, despite their deep location and relationship with vital neural and vascular structures. Endoscopic approach represents the first choice treatment of colloid cysts due to fewer surgical complications and faster recovery.
SURGICAL VERSATILITY OF COMBINED TRANSORAL AND POSTERIOR APPROACH IN CRANIO-CERVICAL JUNCTION PATHOLOGY – CASE SERIES

MD. ANDREI POPEȘCU, MD. CRISTIAN FILIP, MD. MARIUS POĐEA, MD. NIKI CALINA

Introduction
Surgical treatment of the upper cervical region pathology, whether infectious, tumoral or traumatic, raises a series of difficult choices regarding the approach of the area as well as in maintaining its stability.

The transoral approach, although is a challenging and not a commonly used approach, is the most direct operative approach to pathology of the superior spinal cord. In selected patients this approach is efficacious in the treatment of extradural compressive lesions from the cervicomedullary junction to C4 vertebra.

Case series
A retrospective study on cranio-cervical pathology, managed surgically through a trans-orlal approach followed by posterior stabilization in the Spinal Surgery Department of Bagdasar Arseni Clinical Hospital was performed and a total of two cases was found.

1) A 49-year old female presenting with upper cervical pain, occipitocervical instability and C2 root irritation syndrome. The resonance magnetic imaging examination revealed an osteolytic mass at C1-C2 level. Transoral biopsy and vertebroplasty was performed, followed by occipitocervical fixation.

2) A 65 year old male presenting with cervical pain and Arnold neuralgia, without neurological deficits. Cervical spine MRI revealed a mass that involved C1 and C2 with epidural component and retropharyngeal extension. Transoral approach of the region was performed and the histopathological exam revealed osteomyelitis. Due to the extent of the osteolysis, a posterior approach for stabilization was performed 2 months later.

Conclusions
The transoral approach is a safe, efficacious approach for the treatment of selected patients with compressive pathology of the upper cervical spine. If bone destruction or occipitocervical instability is present, posterior fusion is mandatory. Metallic fusion is ideal for achieving short term immobilization but bone graft fusion is necessary for long term stabilization. Patients must be selected judiciously and a detailed paraclinical imaging examination is advised preoperatively to fully define the extent of compression and/or destruction, reducibility and instability present in an individual patient.

Key words
Transoral approach, cranio-cervical pathology, posterior stabilization
CASE REPORT: SURGICAL TREATMENT OF DEEP-SEATED OCCIPITAL PARAMEDIAN RUPTURED AVMS

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Introduction
AVM’s surgical treatment is based on a careful evaluation of the patient’s clinical presentation, treatment risk based on the natural history of an untreated AVM and a comparison of the effectiveness of alternative treatments, such as embolization and radiosurgery. The surgical outcome has been linked to the size of the nidus, the relationship with the eloquent areas and the deep venous drainage, all of which conclude the Spetzler-Martin grading score of AVMs.

Material and methods
We present 3 cases of young patients with surgically treated deep-seated paramedian occipital ruptured AVMs, analysing the differences between the mode of presentation and the treatment outcome. Two of the cases presented with sudden onset of neurological symptoms after the AVM rupture, of which one was during pregnancy, and the last case was known with ruptured AVM 5 years prior surgery, initially conservatory treated.

Results
The surgical treatment outcome was favourable in most of the cases. Two of the patients had postoperative visual disturbances, homonymous hemianopia and one had no neurological deficits.

Conclusion
Deep-seated Paramedian Occipital AVMs represent a surgical challenge through their relationship with the optic radiation, multiple deep feeders from Posterior Cerebral Artery, Posterior Choroidal Artery, deep venous drainage toward Pineal Region Venous Complex and deep and tight operating field. Despite all this obstacles, surgery represent a valid option with excellent results, with an appropriate surgical strategy and technique.

Key words
Occipital lobe, ruptured AVM, pregnancy AVM
COMPUTATIONAL FLUID DYNAMICS IN CEREBRAL ANEURYSMS

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Objectives
Cerebral aneurysms have a high rupture rate, leading to subarachnoid hemorrhage which is associated with important mortality or disability rates. By evaluating the risk of rupture, the optimal timing of treatment can be determined. Computational fluid dynamics (CFD) uses numerical methods to study the flow of fluids and over the past few years it gained increasing interest in assessing the hemodynamics of cerebral aneurysms.

Materials and methods
Imaging studies such as computed tomography angiography (CTA), magnetic resonance angiography (MRA) and 3D rotational digital subtraction angiography of patients with intracranial aneurysms were analyzed and by performing a segmentation of the lumen of the aneurysm, its parent vessel and surrounding arteries a 3D surface was reconstructed. Using a 3D computer-aided design (CAD) software a 3D volume was created and finally a computational mesh was generated. Computational simulations were then run using a CFD software.

Results
CFD simulations were run for aneurysms with various locations, including anterior communicating artery, middle cerebral artery and basilar artery. Blood parameters such as viscosity and density and also flow conditions and wall properties were appropriately adjusted. For each case multiple hemodynamic parameters (pressure, velocity, vorticity) were studied. Different flow patterns were observed between the cases depending on the geometry of the aneurysm and the existence of a previous rupture. In a case of a basilar tip aneurysm there was a concentrated inflow jet which lead to a complex flow pattern. A simple flow pattern was usually observed in unruptured saccular aneurysms.

Conclusions
Computational fluid dynamics can be used as a research tool to study the hemodynamic parameters of cerebral aneurysms, offering new insights about their formation, growth and risk of rupture, in order to choose the optimal type of treatment for the patient.

Key words
Computational fluid dynamics, intracranial aneurysms
ALEXANDRU OBREGIA - A ROMANIAN PSYCHIATRIST WHO PIONEERED THE SUBOCCIPITAL TAP

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Objectives

In the 19th century – doctors had limited knowledge about neuroanatomy and were focused primarily on diagnosis through clinical data while paraclinical investigations were overlooked. This is because the investigation and understanding of the nervous system has been historically a tedious endeavor, partly because of its complexity but mostly due to human error.

Materials and methods

Up until the 16th century anatomist used to decapitate the cadavers during autopsy, thus draining all the liquids from the cranium and spine. This technique contributed to the lack of knowledge regarding the cerebrospinal fluid. The first one to describe the presence of CSF as “water” surrounding the brain was Hippocrates (460-375 BC), but the discovery of CSF is attributed to Emanuel Swedenborg (1688-1772). He was the first anatomist to understand the nutrition role of the CSF and its location. Alexandru Obregia (1860-1937) is one of the forgotten pioneers of cerebrospinal fluid investigation techniques. He envisioned, performed, and wrote about the very first in vivo suboccipital puncture in 1908. The invention of this investigation technique was a considerable step forward in understanding of the cerebrospinal fluid and was Alexandru Obregia’s most important work. His work inspired Toma Ionescu (1860-1926) to create the general rachianesthesia procedure in 1919, which allowed surgeons to perform a new range of procedures safely. The human knowledge of the CSF reached new levels with Harvey Cushing’s description of the third circulation in the human body, through his discovery of the choroid plexus in 1914 and with William Mestrezat’s first complete description of the chemical composition of CSF in 1912.
Results
The universal medical literature bears witness that the suboccipital puncture was performed in other countries only after 5 years by Antonio and Bramman in 1913 and after 11 years by Wegeforth, Ayer and Errik in 1919, thus confirming without a doubt Alexandru Obregia’s priority in this historical finding.

Conclusions
Alexandru Obregia is an important Romanian medical pioneer due to his contributions in the field of CSF investigations and psychiatry. His contributions must not be forgotten from history, nor replaced.

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GLOMUS JUGULARE TUMOR PRESENTING AS A PETROUS APEX COLESTEATOMA: CASE REPORT

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Cholesteatomas are lesions usually found within the temporal bone, being considered benign and possessing a slow growth as they erode the bone. Glomus Jugulare tumors are a rare pathological entity that arises from neural crest cells. Alongside vestibular Schwannoma, glomus tumors represent one of the conditions most likely to result in loss of hearing. Due to their highly-vascularized characteristic, they pose a surgical challenge and are currently treated preferentially through non-invasive measures. We present the case of a 57-year-old female patient who presented with hearing deficit and persistent ringing in her left ear, alongside balance and gait disturbances and alterations in taste of the left half of her tongue. The contrast-enhanced computed tomography scans revealed a tumor eroding the medial third of petrous portion of the left temporal bone. She had been investigated in another center, however the results of the imaging studies performed before intervention did not suggest a glomus tumor. A multidisciplinary team (Neurosurgeons along with ENT surgeons) have chosen a left transpetrous approach. After bone removal, a reddish bulging hemorrhagic tumor was encountered. The decision of discontinuation of surgery was prevented by the continuous bleeding, so with careful coagulation and progressive removal, an almost complete tumor resection and rigorous hemostasis were achieved. The patient was discharged a week after surgery, free of tinnitus and headache, though with a mild facial paresis on the left side. We also present a summative review of the relevant literature.
ANTERIOR ODONTOID SCREW FIXATION: HOW WE DO IT?

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Odontoid fractures comprise 10-15% of all cervical fractures. These types of injuries frequently occur in older patients who suffer a minor trauma, or in younger patients following a significant trauma. The mechanism of injury is flexion in most cases, but it can be occasionally produced by extension.

Common symptoms are high posterior cervical pain, 8% of patients have scalp or limbs sensation deficits and 10% have a major deficit (motor impairment ranging from monoparesis to quadriplegia). Although in literature report, 82% of patients with type II odontoid fracture have no complaints or neurological deficits.

Our aim is to present a 49 years old patient who was admitted with mental status slightly altered, facial trauma and pneumothorax associated. He also complained of thoracic, cervical and facial pain, clinical assessment revealed no neurological deficits. The spine tomography confirmed a type II odontoid fracture with pseudarthrosis associated. The patient underwent a surgical fixation of odontoid fracture. The presentation shows step-by-step the surgery performed.
MULTIPLE INTRACRANIAL ANEURYSMS – 20 YEARS OF EXPERIENCE IN CLUJ-NAPOCA

CRISTINA CATERINA ALDEA, IOAN ȘTEFAN FLORIAN

Introduction
If a patient harbors multiple intracranial aneurysms none of them can be considered inoffensive. Many studies suggest that the risk of clipping all aneurysms simultaneously is less than the risk of a bleeding again from an untreated aneurysm. However, existing data on the outcome of treating bilateral MIAs using a unilateral approach is uncertain. The purpose of this study is to review our main author’s experience with single stage single opening strategy in multiple cerebral aneurysms.

Material and Methods
This single center, single surgeon retrospective study is based on 101 patients with multiple aneurysms operated on by the main author at the Neurosurgical Clinic of Cluj-Napoca University Hospital between 01.01.1997- 31.12.2017. The goal in all cases was single stage operation- unilateral fronto-pterional approach- with all aneurysms clipping. We analysed the complication rate, mortality, state at discharge between groups with unilateral and bilateral aneurysms of the anterior circulation.

Results
101 patients had together 257 aneurysms. Most patients presented with 2 aneurysms (57, 6 %). The maximum number of aneurysms was 6 (1 patient) and 13 patients had mirror MCA aneurysms. The male to female ratio was 1:3. There were no statistically significant differences between the 2 groups regarding the rate of complications or the outcome (p>0,05). When we compared patients with mirror middle cerebral aneurysms to the rest of the lot, no statistically significant difference could be observed, either (p>0, 05). 61% of patients were discharged with GOS of 4 and 5.

Conclusions
In experienced hands, unilateral fronto-pterional approach with clipping of all aneurysms in a single stage operation, is a feasible option for both unilateral and bilateral multiple cerebral aneurysms of the anterior circulation, with few exceptions.

Key words
Multiple aneurysms, single stage operation, fronto-pterional approach, surgical clipping
PEDIATRIC SPINAL CORD EPENDYMOMA - A CASE REPORT

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Introduction

Ependymomas represent some of the most common CNS tumors, representing 3-5% in adults and 10% in children. The most common location is the infratentorial space. Surgical resection is the primary treatment. While the utility of radiation and chemotherapy being controversial and not well defined regarding low grade gliomas (in adults), in children the standard of care is gross total resection followed by radiotherapy.

Case Presentation

We present a case of a 6-year-old boy who was admitted in our department presenting right sided hemiparesis and left upper limb weakness associated with headache, nausea, vomiting and vertebral deformity since he was 3 years old. The MRI investigation revealed a C6-D10 spinal cord tumor with associated syrinx. He underwent surgery with gross total removal of the lesion. Extemporaneous histopathological analysis showed benign ependimal cells tumor. Subsequent complete histopathological examination confirmed a WHO grade II clear cell ependymoma. Postoperative neurological evaluation showed improvement of skills. Control neuroimangistics reported D9-D10 tumor remnant which remains under surveillance.

Discussion

This case illustrates the contrast between the notable mass effect caused by the tumor volume and the remarkable neurological outcome of this particular case calling attention to the importance of a correct and quick diagnosis in such patients.

Key words

Spinal chord ependymoma; case report; surgical treatment
CASE REPORT: RUPTURED ANTERIOR COMMUNICATING ARTERY ANEURYSM IN A 24 YEARS OLD MAN

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Introduction
Aneurysmal subarachnoid haemorrhage is a significant cause of death among young and middle aged adults and an important morbidity factor. The exact pathophysiological mechanism of aneurysmal rupture is not entirely understood. It is important to identify risk factors for aneurysmal rupture in order to treat them accordingly.

Material and methods
We present the case of a 24 years old young man who was admitted in our service with a severe headache with sudden onset followed by loss of consciousness that appeared after strenuous physical exercise. The CT angiography revealed interhemispheric subarachnoid haemorrhage, with the presence of a ruptured anterior communicating artery aneurysm (Hunt & Hess 2, Fisher 3). Upon admission the patient was slightly disoriented, with a GCS of 14 points, meningeal irritation signs, no motor deficits or signs of intracranial hypertension, intact cranial nerves, with the mention that there were no other known risk factors for the rupture of the aneurysm.

Results
The treatment of choice was surgical, by clipping the aneurysm using a left subfrontal approach and the outcome was favourable, with no haemorrhagic complications or vasospasm. There was a slight postoperative cerebral oedema which resolved with depletion treatment, using mannitol.

Conclusion
Ruptured intracranial aneurysms are the most common cause of non-traumatic subarachnoid haemorrhage and it is important to stress that they represent a neurological emergency with potentially devastating consequences with the possibility of having only mild neurological signs at presentation and the correct diagnosis can be easily dismissed in the absence of proper imagistic investigations.

Key words
Ruptured cerebral aneurysm, risk factors, young adults.
RECURRENT OPTIC NERVE GLIOMA IN A 6-YEAR-OLD CHILD

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Introduction
Optic nerve gliomas are rare tumors, 90% of them being observed in children and accounting for 3-5% of brain tumors in children. Usually gross total removal of the tumor provides 100% cure, but surgical removal is proposed only for tumors that are still growing, causing significant visual impairment.

Case description
We present the case of a 6 and a half-year-old boy brought to the emergency department in the County Hospital Cluj, Neurosurgery Clinic in April 2018 for repeated episodes of nausea and dizziness in last 24 hours. On presentation, the patient exhibited severe mental retardation, left spastic hemiparesis, gait disorders, divergent strabismus, but none of these symptoms were with acute onset. The dizziness and nausea were later correlated with motion sickness. However, at the age of 1, the boy was operated for a suprasellar tumor which had a peripheral cystic mass. Clinically, the patient presented at the time (2013) with right eye movement disorders and spontaneous slow-beating nystagmus. A gross total tumor removal was performed and the postoperative evolution was favorable, with no neurological deficits. After discharge, the parents did not bring the boy in for follow-up. Considering the history of the patient, we decided to perform a head CT scan that revealed a tumor with multiple cystic masses within the right lateral ventricle. Thus a reintervention was performed and the tumor and cysts were totally removed. Postoperatively, the patient was stable, conscious, with no new symptoms.

Discussion
This case illustrates the importance of regular imaging follow-up of patients with operated gliomas, even if the lack of clinical signs or symptoms.
ANAPLASTIC OLIGODENDROGLIOMA RESEMBLING ARTERIOVENOUS MALFORMATION

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Introduction
Reports on the incidence of oligodendrogliomas in the literature varies considerably but the greatest incidence is found between the age of 30 and 55 years, with males afflicted somewhat more frequently than females. In contrast, the greatest incidence of arteriovenous malformation (AVM) is found between the age of 40 and 50 years and 61-66% occur in females. Oligodendrogliomas are closely associated with AVMs, both in terms of histopathology and radiology. The computer tomography (CT) imaging is the most widely clinically employed diagnostic method used in our clinic, but occasionally produces unclear results that can hinder a definitive oligodendroglioma or an AVM diagnosis.

Case report
A 36-year-old man who suffered from left hemiparesis on the morning prior to admission to the emergency department was referred to our hospital for medical care. After clinical examination was performed, non-enhanced CT scan highlighted in the right fronto-parietal area a large, high-density mass with calcification within that lesion which did not enhance after contrast. Angio-CT scan raised the suspicion of AVM with diffuse nidus. Due to the patient's impaired function and the results of the radiological examination, a surgical resection was performed. Next step was intraoperative ultrasound and histopathological examination of the specimen that raised the suspicion for a anaplastic glioma diagnostic. The results of the final pathological examination revealed an anaplastic oligodendroglioma (WHO III), and the postoperative treatment combined adjuvant radiation and chemotherapy.

Conclusions
Certain lesions appear to be AVM rich in vessels during preoperative diagnosis, but are subsequently confirmed as oligodendrogliomas through the final pathological assessment. The present case was notable due to the unclear CT imaging which made susceptible of misinterpretation in the preoperative stage.

Key words
Oligodendrogliomas, arteriovenous malformation (AVM), computer tomography (CT) imaging
SOLITARY LANGERHANS HISTIOCYTOSIS OF THE ORBIT

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Introduction
The histiocytosis condition is uncommon, and descriptions of isolated eosinophilic granuloma of the orbit generally have been limited to single case reports, small case series, or minor subsets of full-spectrum LCH series.

Case description
We present a case of a 21 years old caucasian male who has presented to the doctor’s cabinet, and had the following symptoms: orbital pain, diplopia, minimal exophthalmos, swelling, erythema, and he presented normal eye movements. Physical examination of the orbit after 24 hours of admission revealed extremely rapid growing proptosis, painful and coloring. Orbit examination revealed that the patient’s movements of the eyeballs had limited adduction and abduction of the right eye, O.D. Paraxial R. Exophthalmos. Orbital examination showed exophthalmos RE - painful, nonaxial, nonpulsatile, non reducible; rapidly growing; swelling of the eyelids; superior eyelid - lateral 1/3 part; reddish coloration of the skin and inferior and medial dislocation of the eyeball. After physical examination we thought what the diagnosis would be, and we had the following possibilities: intraorbital expanding mass in the superolateral region of the right orbit, orbital cellulitis, dacryoadenitis, subperiosteal abscess or ruptured dermoid cyst. So we asked for CT examination of the orbit, and paraclinical examinations. And the diagnosis after neuroimagistical examination was intraorbital tumor with sphenoid bone destruction, extended into the temporal fossa epidural space with differential diagnosis: metastatic tumors, lacrimal gland tumors and bone tumors. Pathologic examination after surgery showed numerous eosinophils, histiocytes and limphocytes (HE X200) and positive staining the nuclei and cytoplasm for S-100 protein (immunihisto X400).

Discussion
This is a very unusual case for a young caucasian adult that illustrates that for condition of bone defect in the great wing of the sphenoid and communication of the orbit with the temporal fossa, minimal intervention is recommended and complete removal is not always the best choice but subtotal curettage often lead to complete resolution. And other therapeutic possibilities can be biopsy of the tumor – chemotherapy; intralesional corticosteroids or low dose radiation and chemotherapy for recurrences.

Conclusions
Eosinophilic granuloma of the orbit often produce adjacent bone erosions of the orbit. In
our case, the erosion produced complete communication between the orbit, cranial cavity and temporal fossa. 3D CT and virtual navigation permit a very good spatial localization and the inspection of the eroded bone, before and after surgery. We consider that intratumoral hyperdense structures on CT-scan are incompletely destroyed bone columns not only intratumoral calcifications.
FROM MULTIPLE CONFLICTS TO NO CONFLICT IN TRIGEMINAL NEURALGIA

MIHAI STANCIUC

Purpose
The trigeminal neuralgia caused by neurovascular compression is a neurosurgical pathology and requires preoperative identification as exact as possible of the neurovascular conflict.

However there are some cases in which the vascular conflict is missing, even in surgery. The aim of this paper is to review some of the conflicts or no conflicts that accour in this pathology.

Material and Methods
Patients included underwent brain Magnetic Resonance Imaging (MRI) with positive clinical diagnoses of trigeminal neuralgia. We isolated these patients in 3 groups, one with multiple vascular conflicts, regardless of arterial or venous; one with only 1 conflict, venous or arterial; one with no conflict whatsoever but all the clinical symptoms. All patients were operated and microvascular dissection was performed in a standard manner. Intraoperative findings recorded included the presence of compression and the vessel(s) causing the compression and the presence of adhesions and no vascular conflict. All patients were followed up in the outpatient clinic.

Results
Several techniques that could be used during microvascular decompression for trigeminal neuralgia in the absence of neurovascular conflict have been described. The success rates of these techniques, pain recurrence rates and rates of complications are also reported, as to the experience of our department reguarding this type of pathology.

Conclusion
There is no gold standard, but several techniques could be successfully used in the absence of neurovascular conflict.
THIRD VENTRICULOSTOMY IN INFANTS YOUNGER THAN ONE YEAR OLD

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The use of endoscopic third ventriculostomy in infants younger than one year for treatment of hydrocephalus is still a controversial subject. In this article we present a series of 56 infants younger than 1 year with hidrocephalus, treated with endoscopic third ventriculostomy associated with coagulation of the choroid plexuses from 2005 to 2017 period. In cases where ventriculostomy failed we resorted to repetition of the ventriculostomy or converting to endoscopic assisted ventriculoperitoneal shunt. We showed that in 85% of the cases no other treatment was needed, 6 cases needed shunt conversion, and in only 2 cases the endoscopic third ventriculostomy neede to be redone.

Neuroendoscopic surgery could be the first method of choice for hydrocephalus in children younger than 1 year. Neuroendoscopic surgery is useful in the treatment of hydrocephalus regardless of etiology.

Key words
Infant hydrocephalus; ventriculocisternostomy; therapy
NURSING SYMPOSIUM

SESSION

*Saturday, September 8, 2018*

*Bega Hall*

*Chairs: Oliver Lukacs, Mariana Bolota*
COUGH ASSIST

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Introduction
Cough Assist is a modern appliance that acts as a vacuum cleaner and is increasingly used in hospitals to help patients and eliminate lungs as effectively as possible.

Material / Methods
Intubated or extubated patients, patients with severe respiratory problems (predominantly bronchopneumonia, intubated patients)

Conclusions
Applying Cough Assist hastens the weaning of the ventilator, avoiding the oro-tracheal intubation of the patient’s neurosurgery.

Key words
Vacuum cleaner, lungs, respiratory, intubation
NURSING PLAN FOR PATIENTS WITH CERVICAL DISC HERNIATION

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Objectives

A cervical herniated disc is diagnosed when the inner core of a disc in the neck herniates, or leaks out of the disc, and presses on an adjacent nerve root. It usually develops in the 30-to-50-year-old age group. While a cervical herniated disc may originate from some sort of trauma or neck injury, the symptoms commonly start spontaneously. The following facts explain the findings in herniated cervical disc: 1. In the cervical region, the nerve root exist above the pedicle of its like numbered vertebra (opposite to the situation in the lumber spine, due to the fact that there are eight cervical nerve roots and only seven cervical vertebrae). 2. Each root exists passes through its neural foramen in close relation to the undersurface of the pedicle. 3. The intervertebral disc space is located close to the inferior portion of the pedicle (unlike the lumbar region).

Materials and methods

The study was conducted on a group of 80 patients operated with cervical disc hernia in Polisano Hospital for a period of 3 years. (2014-2016). The used method was the direct retrospective observation method (interview – anamnesis), clinical exam and usual paraclinical examination. The data was collected from the observation files of the patients. In this purpose we prepared for every patient a work file that includes: personal data and identification of the patients, the reasons for the admission, heredo-collateral history, living and work conditions, the condition of the patient at the admission and at the discharge with the observation of the satisfying level for the 14’th fundamental needs and the nursing plan care.

Results

From the 80’th patients enrolled in this study, 44 males and 36 females, the incidents of the cervical disc hernia is higher in the urban life than in the rural one, and can be triggered at any age from 30 to 90 years but the highest incident period was 60-80 years.

Conclusions

Conclusion: The cervical disc hernia is more often present at females rather than at males. The incident of patients is much higher in the urban area than in the rural area. The role of the nurse is very important in the recovering of the patient because he can identify the needs and help them in mobilizing and healing. Key words: cervical disc hernia, surgery, disease, nursing plan.

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POLYTRAUMA PATIENT CARE PROVIDED BY TRAUMA TEAM. AN EMERGENCY NURSE’S PERSPECTIVE

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Introduction

The management of the polytrauma patient has some specific intervention “times”, which bear great importance for the patient’s survival odds: the “platinum minutes” (the first ten minutes, referred as such with the purpose of highlighting their major importance for the case management and patient’s survival chances. They are the busiest time frame of the on-site intervention, which is strongly influencing the percentage of trauma avoidable deaths) and the “golden hour”, meaning that within the first hour since the accident occurred the patient should reach the emergency department (ED) or the trauma center.

First aid in trauma is the first sequence that impacts not only the patient’s survival chances in polytrauma, but also the functional outcome, which can be shaped by the proper procedures performed by the rescuers.

The trauma team

The arrival of every trauma patient should be pre-notified by the prehospital team that is transporting the patient to the ED. In this manner, the in-hospital polytrauma team can be timely informed of the patient’s clinical status, the on-site intervention and the mechanism of the trauma event. These data allows us to think of the possible lesions the patient might have sustained and develop the management plan based on complete possibilities. Also, the in-hospital personnel and resuscitation equipment can be properly prepped and organized by the members of the trauma team.

The trauma team is multidisciplinary and well trained, with every member being well aware of one’s precise duties in managing such critical patients. Ideally, such a team would be formed by:

- Team lead physician (experienced physician who will coordinate the intervention, gathering and synthesizing information and developing the treatment and investigation plan),
- “A” doctor (physician responsible of the airway, emergency physician or anesthesiologist),
- Surgical specialist (depending on the particular lesions – orthopedic, thoracic, general surgeon and so on),
- “C” doctor (physician responsible of the circulatory status),
Radiologist physician and radiology technician (responsible of the imagistic investigations – bedside or CT),

ED nurses (assisting the medical staff and performing various – obtaining vitals, i.v. access, drawing blood, urinary and gastric catheter placement)

Scribe (resident physician, ED nurse (or even social worker) documenting the whole information and orders during treatment).

The main objectives of the trauma team are (according to Advanced Trauma Life Support protocol): 1) identification and treatment of immediately life-threatening lesions, 2) resuscitation and stabilization of vital signs, 3) lesions’ prioritizing based on their impact on vital status, 4) patient preparation and transport to the medical facility capable of definitive treatment (operation room, intensive care unit).

**Ed nurses within the trauma team**

Within the ED, the nurse actively contributes to evaluation, treatment and monitoring of trauma patient, which involves many times changing one’s initial role. Therefore, it is important to know how the nurse algorithm is working step by step:

- reduce ICP (intracranial pressure) and prevent the increase of ICP by putting the head of the bed at 45 degrees,
- avoid hypo/ hyperthermia by maintaining the temperature between 35-37° C,
- maintain normal blood flow by giving fluids (isotone fluids) with an adequate rate as to maintain vitals and avoid secondary lesions (if possible, monitor ICP),
- nothing orally (aspiration risk),
- maintain open airway and assess adequate ventilation - monitor RR, SpO2, EtCO2, respiratory pattern,
- avoid jugular vein compression by cervical collars too tight, the rotation of the head and so on,
- monitor circulation: MABP (mean arterial blood pressure), BP, CR (capillary refill), HR (heart rate), ECG,
- monitor blood gaze, electrolyte, coagulation,
- medication – ensure proper administration rate, observe expected and side effects, act in case of other effects.

Certain maneuvers are performed by emergency nurses and thus it is important for one to have adequate skills:

- Vital signs monitoring – know the devices, errors of measurements and how to avoid
- Obtain vascular/intra bones access - maintain the open line
- Keep the airway clean – aspirate the tracheae and intubation tube
- Clean the bruise/wounds – temporary homeostasis
- Prepare for intubation, chest drainage, and other invasive procedures
- Prepare medication – dilution, automatic syringe;

As a nurse, being part of a trauma team requires significant adaptability to playing various parts in a very short time interval and during a complex medical choreography. On a single patient, one ED nurse might be required to perform monitoring, i.v. access and blood samples, administer medication, perform CPR and assist airway. In order to be successful, it is mandatory for one to possess good technical skills (and have them up to date) and to have communication abilities that enables one to keep everyone in the loop.
THE ROLE OF PHYSIOTHERAPY IN CEREBRAL ANEURYSM

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Introduction
Brain aneurysms are abnormal dilation of the cerebral arteries, which develops as a result of weaknesses in the arterial wall. Brain aberrations are of several types: sacral, dissect, mucosal, and pseudoaneurysms. Applying various physiotherapy techniques, ensuring a multimodal approach to these patients, to prevent joint abrasions, respiratory infections, scarring.

Material / Methods
They were selected with either orotracheal and extubate intubated patients with the conditions for starting physiotherapy. Applied specific physiotherapy techniques (passive mobilizations, diagonal Kabath, tapothy, thoracic vibrations, postures for bronchial drainage, prone position, hammock positioning, wheelchair positioning), aiming at their effectiveness by assessing the patient.

Conclusions
Applying physical therapy techniques speeds up patient rehabilitation, thus increasing the success rate by releasing patients to recovery centers to continue treatment.

Key words
Aneurysm, physiotherapy, infections, rehabilitation
THE PATIENT WITH VERTEBRAL-MEDULLARY TRAUMA

ANDREI TIBREA

This article identifies specific nursing care issues for patients with vertebral-medullary injuries and highlights the importance of the nurse’s role in the rehabilitation of the patients suffering from vertebral-medullary trauma.

First of all, we mentioned the definition of vertebral-medullary traumas in order to have a better understanding of the nursing care implications when treating patients with spinal cord traumas.

Vertebral-medullary traumas (TVM) are the spinal traumas that cause spinal cord injury. The medullary injury is the result of an aggression on the spinal cord, which totally or partially compromises its functions (motor, sensory, vegetative and reflex).

In spinal cord injuries rehabilitation the nurse’s role is very important. One of the major needs of the TVM patients is to breathe properly and to improve blood circulation. The nurse should focus on: assisted breathing, tracheal aspiration, oxygen therapy 4 - 6 liters, tapotement, tracheal exudate, maintaining blood pressure (BP) within normal limits (brachycardia, BP collapse), gentle mobilization, administration of anticoagulants (following the doctor’s prescription), inspection of venous catheters.

Other need of the patient with vertebral-medullary trauma includes keeping the patient clean and neat and protecting the sensitive skin and mucous membranes. A proper nursing care can prevent the bedsores by keeping the skin clean and dry, using anti-bedsores mattress, therapeutic rubber pillows, repositioning (turning) the body at least every three hours in bed and by keeping the sheets taut and smooth.

In vertebral-medullary traumas, the patient’s rehabilitation is greatly influenced by the nursing process. The primary goals of rehabilitation are prevention of secondary complications and depend in great measure on the vigilance, professionalism and dedication with which the nurse performs the profession, thereby positively influencing the prognosis of the disease.
CRITICAL PATIENT CARE IN T.I.

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Introduction

Most surgical neurosurgery patients reach the intensive care unit. Patients operated by cerebral aneurysms, subarachnoid haemorrhages, hematomas, glioblastomas, brain tumors, intraventricular drainage, traumatic brain injury patients. From the operator block, they reach the T.I., intubated and mechanically ventilated (extubate later), or spontaneously breathe.

Material / Methods

Patients admitted to the T.I., postoperative, medical treatment and nursing (toilet, dressing, medication, careful observation of vital functions), the latest generation medical equipment used by salon nurse, the effectiveness of new nurse guides and protocols.

Conclusions

The importance of salon assistance, the importance of methods used to assist and close collaboration of the medical team, leads to exceptional results in nursing patients. Thanks to nursing, patients are better protected from nosocomial infections, wound infections, scarring.

Key words

Intensive care, aneurysm, brain, protocols
SPECIAL CARE FOR THE PATIENT WITH BRAIN TUMOR

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Introduction
Brain tumors are masses of malignant cells that can grow in the brain or its envelopes. They are generally divided into two categories: 1. Primary brain tumors that develop from brain cells and brain cells 2. Brain metastases that develop into the brain as a starting point for another cancerous process in the body.

Material / Methods
Patients admitted to neurosurgery, postoperatively, are given medication and dressing.

Conclusions
Applying drug treatments, patients have reduced postoperative pain, and wrinkle mode, also reduces the risk of infection.

Key words
Tumor, brain, patient, drug, nurse
PREHOSPITAL MANAGEMENT OF PATIENTS WITH HEAD TRAUMA

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Introduction

The therapeutic success in case of a trauma patient depends on prompt, quick and organized intervention of an experienced medical staff based on precise protocols. The general principle of these protocols is: identify and treat first the life-threatening lesion or “damage control”

Initial evaluation for a head injury trauma patient

The initial evaluation is represented by the primary evaluation for identifying the life-threatening lesion, followed by the secondary evaluation, “from head to foot”, once the patient is stabilized, at the incident. The primary evaluation shall be performed by a mnemonic formula: ABC (Airway, Breathing, Circulation) and is accompanied by gestures to save the airline routes, evaluation of the respiration and circulation.

The primary assessment - has as main objective the identification and treatment of life-threatening immediate lesions.

• A- Airway- airway management
• B- Breathing - evaluation of the respiration
• C- Circulation - evaluating the flow and control of the hemoragy
• D- Disability - the assessment of the neurological status
• E- Exposure – the examination of environmental factors, the possible toxic;

The secondary assessment- once the patient is stabilized, move on to the second step of the Protocol, the assessment of the anatomical regions: skull, vertebral column, chest, abdomen, pelvis and legs.

History is also performed at the incident, take data about the patient history and exams are made to confirm injuries.

The objectives of the secondary assessment:

• detailed examination of the patient, "from head to foot", on the anatomical regions
• achieving a complete medical history
• Integration of clinical information, biological and radiological for establishing a balance sheet lesion as fully
• therapeutic plan for the patient

Such the examination steps in case of a head-injury where the medical assistant is involved in the team are:

1. Medical history - must be obtained from the witnesses or even from the patient history detail in order to be able to assess the following

a. The mechanism of the lesion- includes obtaining information relating to the approximate speed on the car at the time of the accident, the degree of destruction of the vehicle, the ejection of the motor vehicle, falling from a height, and how many meters,
weapon of attack, type of the gun or of the firearm or not, the consumption of alcohol or other. It must be maintained a high index of suspicion related to the possibility of injury to join cranio-cerebral or upper cervical column, when there is an important mechanism in the development of severe cranial lesion.

b. Events – the possibility of a multiple mechanism of multisistemic trauma

c. Neurological exam

a. Symptoms described by the patient: loss of consciousness, headache, disturbances of vision, hearing, speech, pain at the level of the neck and the column;

b. The appearance of the neurological modification reported during transportation to the Emergency Department (Ecchymosis), history of nausea and vomiting, anisocoria.

c. Identification of any plagues or faults on the hairline, Ecchymosis by the eye, the ear (Battle sign), indicating fractures of the skull.

d. Fracturi deschise ale craniului, deformități faciale sau cranio-cervicale, indicând leziuni la nivelul scheletului cranio-facial sau de coloană cervicală.

e. Bleeding in the groove of the eartag or otorinoree with LCR may indicate the existence skull fractures and increased risk of infection.

f. Evaluation and reevaluation:

i. The level of consciousness and awareness

ii. The pupils: the size, shape and reaction to the light on each side. The creaking unilateral or bilateral of the pupil represents a surgical emergency and must be carried out a quick scan imaging.

iii. The consumption of alcohol or other substances.

iv. Re-examination of vital signs

a. Management ABC

b. The appearance of intracranial hypertension: the combination of hypertension, bradycardia associated with airway changes (Cushing reflex)

c. Signs of complications: tachycardia, hypotension blood pressure, neurological damage.

d. The assessment of the patient for any injuries associated with TCE

The role of the medical assistant in the team of trauma:

• Triage the patients (if there are multiple victims): code red/yellow (patients who need immediate assistance)

• ABC evaluation

• Monitoring of vital signs (AV, TA, TRC, RR, SpO2, EtCO2)

• Life-saving maneuvers in the primary evaluation:
  o Peripheral venous access/intraosos
  o Airway management
  o Ventilation by mask and balloon
  o Preparing intubation materials, chest drain, defibrilation

• Medication

• The mobilisation and immobilize the patient

• To assist the doctor in carrying out the various maneuvers

Case study

Event scene – quick evaluation

ABC evaluation

Emergency maneuvers

Collaboration at the secondary evaluation

Anamnestic data transfer/history

Transport monitoring

Problems of the monitoring during the transport (specific operation)

Patient features
PATIENT MANAGEMENT WITH HERNIATED DISC

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Introduction
Disc harness is a neurological condition characterized by the sliding of the pulse nucleus along the spinal cord and the spine, which is clinically pronounced by the occurrence of very intense back pains in the area.

Material / Methods
Operated and hospitalized patients were selected at the neurosurgery department where postoperative treatments were applied by salon nurse, panting techniques, and drug treatments.

Conclusions
Applying drug treatments, reducing postoperative pain, and pacing the incisions, reduces the risk of infection.

Key words
Hernia, neurologic, nurse, infection, pain
POSTOPERATIVE CARE AT THE NEUROSURGICAL PATIENT ON THE T.I.

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Introduction
Most surgical neurosurgery patients reach the intensive care unit. Patients operated by cerebral aneurysms, subarachnoid hemorrhages, brain tumors, intraventricular drains, patients with cerebral trauma. The patient comes from the operator block to the intensive care unit, intubated and mechanically ventilated (extubate later), or spontaneously breathe.

Material / Methods
Patients admitted to the T.I., postoperative, drug treatment and nursing (toilet, dressing, medication, careful observation of vital functions)

Conclusions: Due to nursing, patients are better protected from nosocomial infections, wound infections, scarring.

Key words
Intubated, nurse, drugs, infections, neurosurgery
POSTERS

SESSION

Friday, September 7, 2018

Poster Committee: Virendra Sinha, Stefano Ferraresi, Dan Voinescu
UNILATERAL VERSUS BILATERAL SURGICAL APPROACH IN LARGE ANTERIOR CRANIAL FOSSA MENINGIOMAS (TWO COMPARATIVE CASES)

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Objectives

Large anterior cranial fossa meningiomas arise at the cribriform plate of the ethmoid bone and the area of the suture adjoining the planum sphenoidal. These tumors, which are mainly represented by olfactory groove meningiomas, cover the entire crista galli to the posterior part of the planum sphenoidal, and could grow symmetrically to the anterior sagittal sinus and falx or mainly to one side.

Materials and methods

Two cases of patients with large anterior cranial fossa meningiomas are presented. The diameter of the meningioma was 7 and, respectively, 6 cm. Preoperative symptoms include headache, mental and visual disturbances. Tumors were operated through different approaches: unilateral frontolateral and, respectively, bifrontal approach. The extent of the tumor resection was classified according to the Simpson classification. Both patients were followed-up with annual CT or MRI scans and neurologically evaluated in our clinic.

Results

Total tumor removal (Simpson grade 1) was achieved in both cases. There were no paranasal extensions in these two patients. Microsurgical techniques were used for the resection of the frontal base of the tumor, or where the capsule was adherent to the optic chiasm or anterior cerebral arteries. No postoperative complications were encountered. At two years follow-up there were no recurrences. None of the patient underwent postoperative radiation or radiosurgery.

Conclusions

For the removal of large anterior cranial fossa meningiomas we used two different surgical approaches: unilateral frontolateral approach and bifrontal approach. The use of microsurgical techniques allowed total removal of the large meningiomas, with low rates of mortality and mortality. The frontolateral approach permitted, even in large meningiomas, high rates of total tumor
resection with low recurrence rates and less brain exposure.

References
C1 AND C2 VERTEBRAE TUBERCULOSIS OSTEOMYELITIS: FAVORABLE OUTCOME WITH TRANSORAL APPROACH AND POSTERIOR FUSION

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Objectives
Cervical vertebral osteomyelitis is rare, isolated cases of the upper cervical spine being the least common. While an early and correct diagnosis is critical to prevent catastrophic neurological injury, the diagnosis of cervical vertebral osteomyelitis is often difficult because of its rarity and variable symptoms. We present a case of C1 and C2 vertebrae osteomyelitis treated with a combined, anterior transoral approach, with complete evacuation of epidural and retropharyngeal abscess and posterior approach with occipital-cervical mixed fusion that presented a favorable outcome.

Materials and methods
65 year old patient was admitted to our clinic for worsening upper cervical pain, investigations revealing C1-C2 osteomyelitis with epidural and retropharyngeal abscess. A 2 stage surgery was planned with a transoral approach for abscess evacuation and decompression first and a secondary posterior approach with occiput, C3, C4, C5 metallic and bone graft fusion. The time between the 2 procedures was 2 months, the reason being avoiding infection spread in the posterior region of the spine and muscle tissue. Patient was ambulatory in this period, with HALO immobilization which was removed after the second procedure.

Results
After 2 surgical procedures and tuberculosis treatment patient returned to a normal life, with no neurologic deficit and no instability in the upper cervical spine.

Conclusions
This case illustrates the difficulty in managing C1-C2 osteomyelitis cases, requiring careful planning for each case. It remains as a major challenge and heightened awareness about this condition hopefully can avoid diagnostic delay and correct management for an optimal outcome.

Key words
Cervical spine, osteomyelitis, spinal infection
MANAGEMENT OF TUBERCULUM SELLAE MENINGIOMAS - THE LAST 15 YEARS EXPERIENCE

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Objectives
The main objective of this study is to analyse a series of patients treated microsurgically in our Department of Neurosurgery for a tuberculum sellae meningioma, with special attention to ophthalmological and functional outcomes.

Materials and methods
The study was retrospective and was conducted on 37 consecutive patients with tuberculum sellae meningiomas, operated on at the 3rd Neurosurgical Clinic, “Bagdasar – Arseni” Clinical Hospital Bucharest, between January 2002 and June 2017. The follow-up period ranged from 2 to 88 months (median - 47 months). The mean age of the 29 women and 8 men enrolled in the study was 53 years (range 21 – 79 years).

Results
Visual compromise was the main presenting symptom in 86.48 % of the patients (32 cases). MRI with gadolinium enhancement and MR Angiography were the main radiological exams. Preoperative hormonal abnormalities were highlighted in 27 % of the subjects (10 patients). Regarding the surgical procedure, a fronto-lateral approach was used in 31 patients (83.8 %) and an endoscopic endonasal extended transsphenoidal approach was performed for the rest of the 6 patients (16.2 %). Perioperative complications were kept to a minimum. Radical tumor removal was possible in all but 3 patients (91.9 %). After surgery, vision improved in 29 patients (78.4 %), remained steady in 7 patients (18.9 %) and worsened in one patient (2.7 %). Perioperative mortality was not recorded.

Conclusions
Total resection is the main surgical treatment’s goal in patients with tuberculum sellae meningiomas. Minimal postoperative complications and morbidity are equally important. The treatment strategies are mostly influenced by the size of the tumor, the extent and duration of visual symptoms and by the encasement of the anterior cerebral artery complex.

References
Objective
The objective of this presentation is to present a giant hydatid cyst of posterior fossa, a very rare case we operated successfully. Cerebral localisation of hydatid cyst is rare (1-2% of all hydatid cyst localisation). The localisation of the cyst in posterior fossa is exceptional. When the patient is child is even rarer.

Materials and methods
A boy, 6 years old was emergently admitted in our hospital for ataxic gait, left dysmetrie, headache, nausea, visual troubles, 5% dehydration syndrome. Emergent CT scan with and without contrast revealed a giant hydatid cyst in posterior fossa, acute triventricular hydrocephalus, tonsillar hernia. The patient was operated (infratentorial craniectomy, microsurgical total resection). Dowling Orlando technique Radiological diagnosis was confirmed by histological exam of the cyst.

Results
Clinical postoperative results was progressive favorable. Intracranian hypertension syndrome disappeared and cerebellar syndromes diminished considerably. Radiological contrast CT scan confirmed total resection of the cyst. Postoperative surveillance: 12 months

Conclusions
The patient presented lived in a house with pigs and dog without veterinary surveillance and without proper hygienic measures. The surgical treatment with resection of the cyst intact is essential. Favorable postoperative prognosis depend of total intact resection of the cyst.

Key words
Cerebral hydatid cyst, Posterior fossa

References
THE ACTUAL COURSE OF TREATMENT FOR VESTIBULAR SCHWANNOMA, SURGERY AND GAMA KNIFE REHABILITATION, KARNOFSKY SCORE 95%: CASE REPORT

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Objectives
The analysis is the outcome after surgery and Gama Knife radiosurgery.

Materials and methods
A woman is accusing headache and hearing loss. Subtotal resection surgery and radiosurgery for the remaining tumor were performed.

Results
Follow-up examination showed tumor residue disappeared; neurological functions were preserved.

Conclusions
The patient resumed normal activity.

References
Case study performed by Doctor Valentin Munteanu, Doctor Ana Andreea Pancu, 2018, Neurosurgery Clinic, Bucharest, Romania
EXTRANEURAL METASTASES IN A 20-YEAR-OLD FEMALE WITH MEDULLOBLASTOMA

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Objectives
Medulloblastoma (MBM) is the most common malignant tumor of childhood and occurs exclusively in the posterior fossa. It presents high invasive growth with spreading of tumor cells into the leptomeningeal space along the neuroaxis early in the course of the disease. Extraneural metastases are rare, occurring in 1 to 5% of the patients. The objectives of this abstract is to demonstrate metastases of MBM are rare but possible.

Materials and methods
Patient and methods A 18-year-old female patient, presenting with headache, nausea, vomiting, gait and walking disturbances was admitted in the 3rd Neurosurgical Department of “Bagdasar-Arseni” Emergency Hospital in August 2016. Neurological examination showed intracranial hypertension syndrome and cerebellar syndrome, mostly on the left side. The cerebral MRI scan revealed a large intracranial supratentorial and infratentorial expansive process located in the left cerebellar hemisphere and extended towards the left temporo-occipital area, compressing the pons, mesencephalon and 4th ventricle from the left side and determining slight hydrocephalus in the 3rd and lateral ventricles. Primary neurosurgical intervention was recommended, using a left occipital craniectomy, approaching the posterior fossa and extended to the parieto-occipital area, directed transcortical through the left cerebellar hemisphere.

Results
Results The postoperative follow-up showed reduced intracranial hypertension and diminished symptoms of the left cerebellar syndrome. The anatomopathological examination revealed a desmoplastic/nodular medulloblastoma. The patient was referred to “Gaziosmanpasa” University Hospital in Istanbul, for adjuvant radiotherapy and chemotherapy (Vincristine). 2 years after the initial surgery, the patient was admitted presenting left 3rd nerve palsy and left cerebellar syndrome. The clinical examination also revealed a tumor proliferation of the left parotid gland and multiple enlarged lymph nodes in the left cervical and axillary regions. The histopathological examination of the
parotid tumor was lymph node medulloblastoma metastasis. The cerebral CT scan showed no intracranial recurrences of the MBM.

Conclusions

Although MBM is a common childhood malignant tumor, it can also occur in adults. Extraneurial metastases are rare, but possible, even without intracranial recurrence. Current treatment strategies include neurosurgical resection and adjuvant radiotherapy and chemotherapy.
CRANIOPHARYNGIOMAS - SURGICAL RESULTS AND OUTCOME AFTER MICROSURGICAL RESECTION IN A SERIES OF 64 PATIENTS

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**Objectives**

The aim of this study is to analyse a series of craniopharyngiomas microsurgically resected via transsphenoidal and/or transcranial approaches. The authors focused on clinical and paraclinical findings, surgical resection rates and postoperative outcomes.

**Materials and methods**

We retrospectively reviewed 64 cases of craniopharyngiomas, which underwent microsurgery via transsphenoidal (46.9%) and transcranial approaches (53.1%), between January 2010 and December 2017. There were 30 females and 34 males, with a mean age at diagnosis of 34.7 years. Preoperative clinical examination revealed visual impairment (82.8%), hormonal dysfunction (46.9%), headache (56.2%) and hydrocephalus (28.1%).

**Results**

Gross tumor resection was achieved in 57.8% of patients, near-total resection in 23.4% and subtotal resection in 18.8% of patients. Subtotal resection was followed by radiotherapy. Along postoperative follow-up (with a mean period of 67 months), recurrence was noted in 23.4% patients. They underwent reoperation afterwards. The overall visual outcome was favorable in 78.1% of patients. Mortality rate was 3.1%. Morbidity included transient diabetes insipidus (20.3%), morbid obesity (9.4%) and additional neurological deficits (4.6%).

**Conclusions**

Craniopharyngiomas can achieve a favorable outcome after microsurgical resection, despite their high rate of recurrence and progression. Surgical resection of these lesions still remains challenging due to their deep location and relationship with vital neural and vascular structures.

**Key words**

Craniopharyngioma, transsphenoidal, transcranial, outcome
CORRELATION BETWEEN NEUROIMAGING FEATURES AND INTRAOPERATIVE EVALUATION OF THE COLLOID CYSTS OF THE THIRD VENTRICLE

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Objectives
Open microsurgical and endoscopic approaches are the two main surgical options for excision of colloid cysts of the third ventricle. Controversy remains as to which is superior. Tumor consistency plays an important and underrecognized role in the surgeon's ability to resect this type of lesion, especially with evolving trends toward minimally invasive surgical approaches. In order to choose the best therapeutic method, we correlated the imaging tests from craniocerebral CT/MRI and the intraoperative aspect of the cysts.

Materials and methods
The authors reviewed the current management in colloid cysts of the third ventricle by analyzing a group of 71 patients diagnosed with colloid cysts of the third ventricle and operated on between 2000-2018 in the Neurosurgery Department of the Clinical Hospital of Emergency “Bagdasar-Arseni” (Bucharest). All 71 patients underwent surgery (open microsurgery in 37 patients and endoscopic approach in 34 patients) and the pathology report confirmed the diagnose of colloid cyst. All the patients were evaluated preoperatively by craniocerebral CT and MRI.

Results
The CT scan images were noted as following: 81.7% hyperdense, 14.1% isodense, and 7.1% hypodense aspect. On MRI scan, the features were the following: T1 sequence - 64.7% hyperintense, 28.2% isointense, 7.1% hypointense aspect; T2 sequence - 24% hyperintense, 24% isointense, 52% hypointense aspect; FLAIR sequence - 38% hyperintense, 10% isointense 52% hypointense aspect. Intraoperatively, it has been observed that all the hypodense and isodense CT scan tumors were aspirable and only 20% of the hyperdense CT scan tumors were aspirable (p=0.002). Hyperdensity of the lesion on the CT scan means high consistency tumor (solid or with solid parts).
Conclusions

We can confirm that the neuroimagistic aspects of the colloid cysts of the third ventricle on the craniocerebral CT and MRI scan may help the neurosurgeon to choose the most appropriate therapeutic method for each patient - open microsurgery for solid lesions and endoscopic approach for aspirable lesions.

Key words

Colloid cyst, endoscopy, microsurgery, CT, MRI
OBJECTIVES
Third ventricular tumors are rare lesions accounting for less than 1% of all intracranial masses. The aim of this study is to analyze a series of third ventricle tumors, microsurgically resected, with special attention to the postoperative outcomes.

MATERIALS AND METHODS
We retrospectively reviewed 107 cases of third ventricle tumors, which underwent surgery via transcortical microscopic (52.3%) and endoscopic approaches (47.7%), between 2010 and 2017. The male/female ratio was 1.1/1 with a mean age of 38.3 years. Preoperative clinical examination revealed headache (76.6%), high intracranial pressure signs (62.6%), visual impairment (28.0%), hormonal dysfunction (10.3%), mental disturbances (22.4%) and memory loss (20.6%).

RESULTS
Gross tumor resection (GTR) was achieved in 86.9% of the patients in the microsurgical group compared to 71.0% of the patients in the endoscopic group (p < 0.001). There was a higher morbidity in the first group (18.7% compared to 12.1%), consisting of short-memory loss (1.8%), seizures (1.8%) and transient diabetes insipidus (2.8%). Radiotherapy was used in some cases. The histological tumor types were the following: colloid cysts (50.4%), craniopharyngiomas (16.8%), ependymomas (6.5%), gliomas (8.4 cases), and meningiomas (2.8%). Other types of tumors were noted in 15.1% of cases. Along postoperative follow-up (with a mean period of 67 months), 75.7% of patients had a good clinical outcome. There were no deaths related to the surgery. To date, MRI revealed a recurrence rate of 7.4% in colloid cysts and a recurrence rate of 16.7% in craniopharyngiomas.

CONCLUSIONS
Third ventricle tumors can achieve favorable outcomes after surgery, despite their deep location and relationship with neural and vascular structures. Patients with subtotal resection require frequent neuroimaging investigation during follow-up, in order to early detect tumor recurrence.

KEY WORDS
Third ventricle tumors, transcortical approach, endoscopic approach
CERVICAL MYELOPATHY – THE IMPORTANCE OF THE APPROACH, OUR EXPERIENCE

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Objectives
Surgical intervention for cervical stenosis with myelopathy or/and radiculopathy involves either an anterior or posterior approach for adequate decompression of the spinal cord and associated nerve roots. Combined anterior-posterior surgery is also a possibility. The choice of the approach is still a debatable issue in the neurosurgical world.

Materials and methods
A retrospective analysis of the patients which was operated for cervical myelopathy. We use the data obtain from 38 patients (2015-2018), focusing on the criteria we use for choosing the approach.

Results
Results demonstrate that both anterior and posterior decompression +/- instrumentation are effective procedures to improve the neurological outcome of. However, sagittal alignment may be better restored using the anterior approach. In cases involving a preexisting cervical kyphosis, an anterior or combined approach might be necessary to restore the lordotic cervical alignment. When pseudarthrosis, adjacent segment degeneration from the anterior approach or insufficient restoring of lordosis from a posterior approach a combined anterior-posterior approach is ideal.

Conclusions

References
-Combined Anterior-Posterior Decompression and Fusion for Cervical Spondylotic MyelopathyJosh Richard Bram, BS Susan Fiore, MS John J. Labiak, MD Raphael P. Davis, MD Author in Am J Orthop. 2017 March;46(2):E97-E104
SURGICAL MANAGEMENT OF A CHALLENGING THIRD-VENTRICLE INVASING CRANIOPHYARYNGIOMA: CASE REPORT

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Objectives

Craniopharyngiomas are relatively benign (WHO grade I) neoplasms that typically arise in the sellar region. They account for approximately 1-5% of the primary brain tumors and can occur anywhere along the infundibulum (from the floor of the third ventricle to the pituitary gland).

Materials and methods

A 56-year-old female patient was admitted to our neurosurgical department with a 4-month history of headache, balance disorders and episodes of diplopia. Neurological examination showed intracranial hypertension syndrome and optochiasmatic syndrome. The cerebral MRI revealed a large intracranial sellar and suprasellar mass (28/21/26 mm) partially occupying the 3rd ventricle and involving the right internal carotid artery. Primary neurosurgical intervention using a right frontal craniotomy was performed, followed by a favourable clinical evolution. An adamantinomatous craniopharyngioma was confirmed by the pathology exam.

Results

At the 1-year post-operative follow-up, the patient was readmitted for panhypopituitarism, severe hypomnesia and hypoprosexia. The cerebral CT scan showed a calcified suprasellar tumoral remnant which occupied a part of the 3rd ventricle.

Conclusions

Although the adamantinomatous craniopharyngioma is a common childhood benign tumor, it can also occur in adults. Extension in the 3rd ventricle and calcification of the tumor are normal findings. The treatment usually consists in surgery, associated with radiotherapy especially useful for incomplete resection. The surgical approach depends on the size and sellar versus suprasellar extent. Some lesions can be accessed via a transsphenoidal approach, whereas others require a craniotomy, as illustrated in our case. Keywords: Adamantinomatous craniopharyngioma, sellar region, third ventricle.
References

SURGICAL MANAGEMENT OF GIANT CRANIOPHARYNGIOMA

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Objectives
Craniopharyngiomas are tumors that develop from residual cells of Rathke’s pouch and tend to arise from the antero-superior margin of the pituitary gland. Craniopharyngiomas do not undergo malignant degeneration, but difficulties in cure make them malignant in behaviour.

Materials and methods
We report the case of a 66-year-old female patient with impairment of visual acuity, headaches and vomiting. Neurological examination showed signs of intracranial hypertension and optochiasmatic syndrome. The first cerebral MRI displayed a tumor (2.8cm/1.9cm/1.5cm) that was located in the sellar region, with intra- and suprasellar development, compressing the cavernous sinus. The transsphenoidal approach was performed as a primary neurosurgical intervention, followed by a secondary one using a transcranial fronto-temporal approach. Postoperative, the patient developed an intraparenchymal hematoma localized in the right fronto-temporal region, with efraction into the ventricle system. Secondary internal hydrocephalus has occurred and required a ventriculoperitoneal shunt.

Results
The clinical evolution was favourable following the initial surgery, with the remission of the optochiasmatic syndrome and intracranial hypertension syndrome. After the second surgery, the patient’s condition has improved, his previous 10 GCS points increased to 14 GCS points at discharge.

Conclusions
Although the craniopharyngioma is recognized as a benign tumor, its development in the sellar and paraseellar region makes it malignant through localization. Due to the impossibility of total resection they are susceptible to multiple neurosurgical interventions.

References
INVERTED PAPILLOMA WITH INTRAORBITAL EXTENSION

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Objectives

Skull base inverted papilloma (IP) is an unusual entity for many neurosurgeons. IP is renowned for its high rate of recurrence, its ability to cause local destruction, and its association with malignancy. It has the propensity for invasion into adjacent structures, such as the orbit and CNS, even in the absence of malignancy. Intracranial involvement of inverted papilloma is unusual and is usually seen in recurrent cases.

Materials and methods

A 44-year old female patient was admitted in our department with a 4-month history of headache, 2 episodes of epistaxis, nausea and vomiting. Signs of intracranial hypertension syndrome were found on neurological examination. The gadolinium-enhanced T1WI cerebral MRI revealed a well-defined non-enhancing oval mass in the sellar region extending into the right cavernous sinus, right maxillary artery and right orbit. ICA and maxillary artery injection showed moderate vascularization with neovascularisation primarily form the right side. The transsphenoidal approach was performed and only partial resection of the tumor was achieved.

Results

At the 2-year post-operative follow-up, local recurrence was identified and treated surgically with partial resection. The patient’s status has improved after each intervention, with resolution of the intracranial hypertension syndrome. Histopathological examination confirmed the diagnosis of Schneiderian inverted papilloma. Further immunohistochemical staining was recommended, for assessing the malignant potential.

Conclusions

Despite the fact that inverted papillomas are benign tumors, they have a high potential for malignant transformation. Therefore, regular follow-ups are necessary for early
identification of malignancy and prompt intervention.

Key words
Inverted papilloma, transsphenoidal approach.

References
THE RESULTS OF REVASCULARIZATION OF THE CAROTID AREA IN PATIENTS WITH TRANSFERRED ISCHEMIC STROKE

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Objectives
In following article were analyzed the results of reconstructive operations of carotid arteries in 35 patients with occlusive disease of carotid artery (CA) and who had ischemic stroke (IS). Also, we studied the efficiency of reconstruction of carotid artery in these patients, depending on the weight of neurologic deficiency (ND) and term of carrying out of operation. The given research specify to efficiency of reconstruction of carotid arteries in preventive maintenance of repeated strokes and surgical rehabilitation.

Materials and methods
The study deals with stupefaction phenomenon of cerebral tissue caused by internal carotid artery stenosis before and after endarterectomy. Carotid endarterectomy was performed in 35 patients with ischemic stroke, selected based on NASCET criteria, after expiration of conventional hours of therapeutic window. In this study were used following methods: neurological exam with systematization of data according to Barthel and Ashworth index, Fugl Meyer scale, superior and inferior Rivermed scale, investigations (cerebral CT and MRI), Doppler exam of carotid vessels and carotid angiography.

Results
The carotid endarterectomy initially being applied as method of secondary prevention of ischemic stroke, proved to be treatment option as well (significant improvement of disability degree in ischemic stroke patients).

Conclusions
The results of this study lead to the conclusion that ischemic cerebral tissue preserves the recuperation capacity after conventional hours of therapeutical window (stupefaction phenomenon of ischemic cerebral tissue). This is the etiopathogenic basis of the preconditioning phenomena of cerebral tissue largely described in scientific medical literature of the last period (animal models).

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CORTICAL AND CEREBELLAR NEUROMETABOLIC ALTERATIONS IN CERVICAL SPONDYLOTIC MYELOPATHY

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Objectives
In cervical spondylotic myelopathy (CSM), proton magnetic resonance spectroscopy (1H-MRS) studies reported low N-acetylaspartate (NAA), a neuronal marker, in primary motor cortices (M1), although non-significantly related to clinical severity*. Although other brain regions, e.g. cerebellum, might be informative, no such studies have been reported. Our goals were: (i) to quantify concentrations of choline (Cho), a cell membrane integrity marker, NAA, and myo-inositol (mI), a glial marker, in M1 and cerebellum, and (ii) to determine whether these metabolites correlate with the clinical severity in CSM patients.

Materials and methods
We used PRESS at 1.5 Tesla (TE=30ms, TR=1500ms, flip angle=90, spectral width=1000Hz, 15x15x15mm in M1, 20x20x20mm in vermis) in 10 patients (confirmed on T2-weighted MRI). Relative metabolite concentrations (LCModel) were compared with those in 14 age- and sex-matched healthy controls (two-tailed Student’s t-test). Fine motor coordination and disability were assessed by 9-Hole Peg Test (9-HPT) and modified Japanese Orthopedic Association (mJOA) scale respectively. Spearman correlation coefficient was used to determine the correlations between metabolites and clinical scores.

Results
Cho was significantly higher in left (p=0.008) and right (p=0.003) M1, but not in cerebellum. Although we found generally lower NAA and higher mI in M1 and cerebellum, the differences did not reach statistical significance. Cho in cerebellum was positively correlated with 9HPT left arm (r=0.75, p=0.01) and negatively with mJOA (r=-0.64, p=0.04) scores. A moderate trend was also found between left M1 Cho and 9HP left arm scores (r=0.53, p=0.11).

Conclusions
High M1 Cho suggests remote increased membrane turnover due to inflammation/gliosis. Inflammatory response in left M1 and cerebellum was related to clinical severity. Thus, 1H-MRS might be a sensitive method to quantify relevant metabolite changes in CSM, and consequently
increase our knowledge of the factors leading from these changes in remote areas to neurological deficits.

References

PRE-SURGERY MORPHOMETRIC SPINAL CORD MEASUREMENTS PREDICT RECOVERY IN CSM

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Objectives

Prediction of recovery after decompressive surgery in cervical spondylotic myelopathy (CSM) remains an important topic in spinal surgery. Despite vast research on this subject, no group of predictors has proven reliable for predicting individual gain following surgery. For instance, although CSM often affects multiple spinal levels, the current morphometric measurements assess spinal cord (SC) compression only at the level of maximal SC compression. In the present study, we investigate whether pre-surgery multi-level morphometric SC measurements could predict recovery at 3 months in CSM.

Materials and methods

Prior to surgery, CSM patients underwent magnetic resonance imaging (MRI) and functional (mJOA, 9-Hole Peg, Walking test) evaluations. The compressed SC area at each spinal level between C3 and T1 was traced on the T2-weighted images (MedINRIA, Medical Image Navigation/Research Toll by INRIA, Cedex, France) and quantified (MIPAV, http://mipav.cit.nih.gov/). For each patient, the compressed area was further normalized to a reference SC area measured at C2/C3 where SC is usually spared. To express the severity of SC compression, a compression index (CI) was proposed for each spinal level: 0 for no compression (normalized area, NA=0.90-1), 1 for mild (0.75≤NA)

Results

Our preliminary data showed that pre-surgery TCI negatively correlated with pre-surgery mJOA and Δ mJOA and positively with Δ 9-Hole Peg test. Specifically, at higher SC compression on multiple levels, lower functional recovery was reported.

Conclusions

In summary, the pre-surgery multi-level morphometric measurements are an objective and sensitive measure of SC impairment in CSM, through measurements of compressed SC area as well as the extension of SC compression over multiple spinal levels, which predict functional recovery at 3 months after surgery. Such measurements would be especially useful for clinicians to set realistic therapeutic goals and it can also be helpful as an individual prognostic indication to patients and relatives.
Objectives
The purpose of this report is to present a rare case of spinal hemangioblastoma treated with Cyberknife after second recurrence, a literature review and future perspective.

Materials and methods
Cyberknife radiosurgery has been an attractive treatment option for spinal hemangioblastomas, especially for lesions that are surgically inaccessible, multiple lesions and elderly patients. Although there has been a multitude of studies examining the utility of radiosurgery in intracranial hemangioblastomas, radiosurgery has only recently been used for spinal hemangioblastomas due to technical limitations. The Cyberknife is an well-established image-guided "frameless" dedicated radiosurgical device. This robotic instrument has distinct advantages over frame-based systems, including improved patient comfort, increased treatment degrees of freedom, and the potential to target extracranial lesions.

Results
A 78-year-old man with long history of spinal hemangioblastoma, primary operation (level C5, 1999), recurrence operation (03.2013) and multiple co-morbidities (KPI 50%, ECOG=3) will be presented. After first operation, pathological analysis revealed a highly vascular and cellular tumor, with findings consistent with hemangioblastoma. Clinically no neurological complications after operation. After recurrence operation (03.2013) neurological dysfunction occurred in terms of abnormalities of ataxic gait and mobility in stable matter. In 09.2017 the left leg mobility decreased and the follow-up magnetic resonance imaging presented an intradural mass at the C5 spinal level. The interdisciplinary tumor conference recommended a CyberKnife approach to keep the present neurological function, quality of life and avoid hospitalization. The patient ultimately underwent a 14 Gy CyberKnife radiosurgery in 57 minutes for the tumor (70% isodose, volume 1.265 ccm) without side effects. In the following month, the peripheral neurologic symptoms stabilized. Unfortunately, 6 month after radiosurgical treatment a malignant cerebral tumor was diagnosed and the patient died after early follow-up.
Conclusions

In our case, CyberKnife appears to be safe and useful after second recurrence. A literature review revealed a lack of data for Cyberknife radiosurgery of spinal hemangioblastoma in primary, subtotal resected or recurrent setting. Thus, this missing follow-up information after different treatment scenarios, including optimal CyberKnife treatment strategies, in spinal hemangioblastoma led to the panning of a pattern of care evaluation including retrospective data collection within the German Cyberknife Network.

References

PubMed (spinal hemangioblastoma and radiosurgery or cyberknife) Keywords: hemangioblastoma, radiosurgery, cyberknife