

Selected abstracts

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CURRENT SURGICAL STRATEGIES IN INTRAMEDULLARY SPINAL CORD EPENDYMOMAS

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(Belgium)*

Introduction: It is well known that the gold standard treatment for low grade intramedullary spinal cord ependymomas (ISCE) is complete surgical removal. That should be the ultimate goal.

Results: Our experience is based on 188 ISCE among 480 operated intramedullary tumors.

In all cases, the surgical approach was done through the posterior midline. Debulking with the CUSA and gently separation of the tumor from spinal cord under magnification were the rule.

Complete removal has been achieved with success in 166 cases (89%) with only two recurrences. Subtotal or partial removal happened in 22 (11%), most of them being patients operating first elsewhere, sometimes with complementary radiation therapy which is a nonsense and coming to us with a recurrence. In those cases, we have been faced with a lack of a clear cleavage plane.

Motor evoked potentials (MEPs) have been of great help to keep a good quality of life after surgery in patients where there was not a clear limit between the tumor and

spinal cord. But when a clear plane was present between the ependymoma and spinal cord, we did not stop surgery even when MEPs were lost, without facing neurological motor deficit postoperatively. It means that MEPs are not an absolute criteria but an alarm to take in consideration.

In partial removal, we had to operate again several years later, sometimes in succeeding to perform a complete removal (8 cases) but in 10 patients, we failed and they regularly have to be operated again. In two patients, the remaining bud stays stable on yearly follow-up MRIs. Two patients have been operated recently.

Our follow-up runs from several months to 24 years. In 128 patients, we have a follow-up longer than 5 years. In all, we recommend a yearly MRI since in two cases, even after complete removal and clean MRI at 5 years, we observed a recurrence after 18 and 19 years respectively.

Conclusion: We should keep in mind that even after complete removal, ISCE may recur many years after a successful surgery. MRI follow-up of those patients should never stop. In 89% ISCE have been totally removed. But in 11% no clear plane of delineation has tempered our surgical aggressivity to keep a good quality of life post-operatively. Surgery again in recommended when those tumors regrow.

There is no indication for radiation therapy either after surgery or in recurrent ISCE.

**SPINAL CORD
HEMANGIOBLASTOMAS.
CLASSIFICATION AND SURGICAL
TREATMENT**

*Prof. Jacques Brotchi, M.D., Ph.D.
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Complete removal of spinal cord hemangioblastomas (SCH) must be neurosurgeons' ultimate goal. We have tried to draw up a simple topographic classification in order to achieve this goal with respect to patients' post-operative neurological status. We have classified the lesions in three topographical categories based on our experience on 56 cases:

- A. Pure intramedullary SCH (n=4)
- B. Subpial posterior and postero-lateral SCH (n=40)
- C. Small subpial lateral or anterior-sided SCH (n=12--10 lateral and 2 anterior)

Different surgical approaches related to topographic classification were used:

Class A. When the hemangioblastoma was not visible we opened the posterior sulcus along the midline using the same procedure as for any other intramedullary spinal cord tumor.

Class B. Classical "en-bloc" resection with careful dissection of the lesion from spinal cord.

Class C. In all the cases a tense syringomyelic cyst was present and aspirated with a 22G needle to deflate spinal cord and give an easy access to the solid nodular tumor after division of the dentate ligament and gentle rotation of spinal cord.

CUSA was never used, nor debulking of the tumor. Surgical technique started by

cutting pia all around the tumor with coagulation and division of all vessels on the way in order to perform "en bloc" resection. Complete removal was achieved in all cases except in one previously operated upon twice and irradiated in another institution. Improvement was observed in 29, stabilization in 25 and worsening in 2 patients. The results were closely related to the pre-operative status. Patients with a good pre-operative neurological status or harboring a large cystic cavity had a better prognosis than others. Radiation therapy has no place in SCH.

**EVOLUTION OF
TRANSSPHENOIDAL SURGERY
FROM MICROSURGERY TO
ENDOSCOPY; THE FOCH
HOSPITAL EXPERIENCE**

*Prof. Stephane GAILLARD, M.D., Ph.D.
(France)*

There is an old tradition for pituitary and skull base surgery in our department, at first by microscopic approach and since few years by endoscopic endonasal approach.

Since 2006, we have gone through a transition from microscope to endoscopic endonasal approach for pituitary disease and skull base tumor surgery. We submit some remarks on this transition from microscope to endoscope based on our experience about more than one thousand endoscopic endonasal procedures.

From 2006 to 2011, more than 1000 endoscopic endonasal approaches for pituitary disease and skull base tumors have been performed in our department by the same senior neurosurgeon (SG).

We had used a simple transsellar approach for the majority of pituitary

adenomas, and an extended endonasal endoscopic approach for other tumors or skull base surgery (Craniopharyngiomas, Meningiomas, odontoid resection....).

The endonasal endoscopic approach for pituitary adenoma surgery decrease rhinologic complications, increase the patient's comfort by avoiding post operative nasal packing, get a better view of the intra sellar and supra sellar areas, reach the same endocrinological results, get a better control of the invasion of the cavernous sinus, and in some cases to allow their removal.

We believe it is very important to separate the two various approaches: the endoscopic endonasal trans sellar approach and the endoscopic endonasal extended approaches, and to avoid at the needless extended approaches.

For the lesions localized between tuberculum sellae and the odontoid, we found an important added value to the use of an endoscopic endonasal approach. But for the lesions localized in the front of the tuberculum sellae the added value of endoscopic endonasal approaches is not evident and must be evaluated in the future in comparison with mini invasive intracranial approaches.

SURGICAL MANAGEMENT ANTERIOR SKULL BASE AND SELLAR MENINGIOMAS

*Prof. Madjid Samii, M.D., Ph.D.
(Germany)*

The complex structure of the anterior skull base and the sellar region determine the risks, associated with surgery in those areas. Meningiomas are the most common tumors, involving these areas. The operative strategy and surgical approach chosen should be selected according to the

precise location of the tumor and the neurological condition of the patient. The approach in itself should not be related to significant approach-related morbidity, but rather should increase the extent and safety of resection. We favour the frontolateral as the most suited approach to these region of the skull base. In the presentation we will present and discuss our experience with surgery of the anterior skull base and the sellar meningiomas and discuss our treatment strategy.

SURGICAL STRATEGIES FOR CRANIOVERTEBRAL JUNCTION PATHOLOGY

*Prof. Madjid Samii, M.D., Ph.D.
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The common pathological entities in the region of the craniocervical junction include congenital, developmental, inflammatory, and neoplastic abnormalities. In our series most frequent were the neoplastic lesions, both intra-and extraaxial. Surgery in the region of the craniovertebral junction is related to significant risk of morbidity and even mortality. Besides removal of the lesion and decompression of the lower brain stem and cervical spinal cord, surgery should avoid or treat any existing instability. All these issues will be discussed in our presentation based on our extensive experience.

MANAGEMENT OF LESIONS IN THE BRAINSTEM

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Background: The fact that the brainstem is packed with neural cell bodies and fiber

tracts, any trial to extirpate lesions at this level may result in significant deficits.

Objective: In the present report the imaging and clinical outcome in low grade astrocytomas, metastatic tumors, as well AVMs following Gamma Surgery (GS) has been compared with the published results obtained after microsurgery or endovascular procedure.

Methods: Retrospective analysis of 21 astrocytomas, 53 metastatic lesions as well 85 AVMs located in brainstem which has been treated with GS. Of 21 astrocytomas the tissue diagnosis was established only in 10 cases before GS. The tumors had been located in midbrain in 16 patients, 4 were in the pons, and 1 in medulla oblongata. The mean tumor volume was 2.5 cm³ and the mean prescription dose was 15 Gy (range, 10-18). The mean volume of the metastatic lesions was 2.8 cm³ (range, 0.5-21) and have been treated with a mean prescription dose of 17.6 Gy (range, 9-25). Mean volume was 1.9 cm³ (range, 0.1- 8.9) in AVMs and the prescription dose was 19.9 Gy (range, 5-32). The mean follow up time with MRI was 83.3 months (range, 24-252).

Results: After treatment with GS, in patients with astrocytoma, tumor disappeared in 4 (20%), shrank in 12 (60%), and progressed in 4 (20%). In metastatic cases the lesion disappeared in 7 shrank in 22, remained unchanged in 3, and grew in 5. The angiographically obliteration in brainstem AVMs was achieved in 50 patients (59%) and radiation induced changes were observed within 34 patients (40%).

Conclusion: When the risks of surgery or embolization for lesions located in the brainstem are high or there are residuals left, GS can be a treatment option especially for nidi within the brainstem parenchyma.

FUNCTIONAL PREOPERATIVE PLANNING FOR BRAIN TUMOR SURGERY IN CRITICAL AREAS

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Preoperative cortical mapping is increasingly recognized as a fundamental procedure for better planning the surgical treatment of brain tumors in critical areas.

Different technologies are currently available to perform a pre-operative identification of functional brain areas. Functional magnetic resonance imaging (fMRI) is probably the most commonly used technique. fMRI has a good spatial resolution, but a low temporal resolution and brain tumors may cause metabolic changes that may blur the identification of functional hypermetabolic areas.

Transcranial magnetic stimulation (TMS) is an electrophysiological technique developed for the investigation of human cortical functions.

Navigated brain stimulation (NBS) is a combination of TMS with 3-D MRI and computer analysis using a neuronavigation system, to provide feedback on the exact position of maximal stimulation. NBS offers different advantages for brain mapping over conventional technologies including the fact that it does not passively record brain activity during voluntary patient movements. Instead, NBS actively stimulates the patient's motor cortex recording EMG changes.

Few clinical studies have shown that preoperative NBS mapping of the motor cortex in brain tumor patients is more reliable than preoperative fMRI mapping and agreed well with the gold standard intraoperative direct cortical stimulation

(DCS). Here we reviewed our experience in pre-operative brain mapping using NBS and NBS combined with subcortical tractography and direct cortical and subcortical stimulation in patients with brain tumors including gliomas and metastases.

Our preliminary data, based on surgical and clinical results in a consecutive series, showed that the NBS had a clear impact on the planning and surgery by changing the indications, the approach and the possibilities of tumor resection.

NBS allowed a precise mapping of the motor cortex and the visualization of its spatial relationship with the tumor. Finally, comparison with DCS confirmed the spatial reliability of the pre-surgical brain mapping achieved by NBS.

TELOVELAR MICROSURGICAL APPROACH TO FOURTH VENTRICLE TUMORS

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Fourth ventricle tumors are rare lesions and represent still today a neurosurgical challenge according to the relationships with vital neural structures and tumor histotype.

This presentation deals with a series of 42 patients, 27 males and 15 females with mean age of 22.5 years (range 1- 66), harboring IV ventricle tumors both secondarily invading the ventricle and primarily growing into the cavity. In all these cases a telo-velar approach was used to enter the ventricle and to remove the tumor. The most frequent histotypes were gliomas and medulloblastomas.

According to post-operative neuroradiological examination, the extent of removal was complete in 38 patients (90.5%) and subtotal in 4 (9.5%). One patient harboring a IV ventricle metastatic lesion died post-operatively. One patient developed post/operative transient VI c.n. palsy (completely recovered at 3 months follow-up). 2 patients (4.8%) had post-operative CSF leakage requiring a permanent VP shunt. No significant damage of cerebellar tonsils and uvula was produced as demonstrated by intraoperative view and post-operative neuroradiological imaging. The approach allowed adequate control of lateral recesses and the rostral portion of the cavity up to the Sylvian aqueduct. Opening of the arachnoidal planes of the tela and inferior medullary velum and dissection of the tumor from the floor of the fourth ventricle are illustrated. Tips and tricks are suggested on the basis of the author personal experience. CSF pathway patency is a significant advantage of the telo-velar approach, as demonstrated by the low incidence of post-operative hydrocephalus requiring VP shunt or third ventriculostomy. Since few years after its original description, telo-velar approach represents the gold standard. This series suggests that the transvermian route has no further role in the surgical strategy for these tumors.

SURGICAL STRATEGY FOR THE TREATMENT OF GIANT AND COMPLEX INTRACRANIAL ANEURYSM

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Since the advent of many high-technology devices in endovascular therapy for cerebrovascular diseases, the role of microsurgical clipping of intracranial aneurysm is gradually replaced by endovascular means. For instance, a wide neck aneurysm was considered as not to be a good candidate for coiling, however, nowadays the combination of coiling and stenting technique can easily solve this problem.

However, due to the high occurrence rate of compaction phenomenon, microsurgical clipping is still the treatment of choice for giant aneurysm. In some giant aneurysm with the complexity of its configuration or its surrounding anatomy, neither clipping nor coiling modality can accomplish a satisfactory treatment, then various bypass procedure with trapping of the aneurysm may be needed as the ultimate method of treatment.

In the past 12 years, a total of 63 EC-IC bypass operations were done for 61 patients. One patient with a stag horn shape aneurysm at the ICA bifurcation underwent two bypasses; one radial arterial graft bypass from the cervical ECA to the MCA and a side-to-side anastomosis of both ACAs at the A3 segments. Another patient has multiple aneurysms of the anterior and posterior circulation underwent two EC-IC bypasses to the MCA and PCA. Two more patients had their STA-MCA bypasses failed initially underwent the second operation for graft bypass.

Of the 31 patients with cavernous ICA aneurysm all patient has a good patent of their graft bypass and one patient experience a transient ischemic attack after the bypass surgery. Of the 14 patients with their aneurysm at the supraclinoidal segment of the ICA, 10 patients underwent

graft bypass and 4 underwent STA-MCA bypass. One patient with graft bypass has her graft occlude and two patients with STA-MCA bypass had their anastomosis occlude. A second graft bypass was performed on each of these two patients with occluded STA-MCA anastomosis. In this group of patients, there is no postoperative morbidity. For the patients with giant MCA aneurysm, two underwent interpositional short graft bypass for the main trunk of MCA, two underwent reimplantation of one of the major branch to the MCA main trunk, the other one had a graft bypass. One of the two patients with interpositional graft bypass developed major stroke after the surgery and eventually died at two months after the surgery. For the posterior circulation, one patient underwent STA-MCA bypass for VA aneurysm and the other patient underwent Occipital artery to PICA anastomosis had their anastomosis occluded. The later patient has his aneurysm trapped during the surgery developed lateral medullary syndrome after the surgery whereas the former did not have his main artery trapped had no postoperative neurological deficit and is waiting for the second surgery.

In this series of patients, the overall bypass patent rate is 93%. There is no mortality and four morbidity (5.1%) after the bypass surgery and trapping of the aneurysm..

In conclusion, we still need to train neurosurgeons for mastering various clipping technique in microsurgical treatment of complex aneurysm. However, with the decreasing patient volume for microsurgery, the training of a good microvascular neurosurgeon will be a dilemma. On the other hand microvascular anastomosis technique as neglected by the

majority of neurosurgeons will be a pertinent skill for microvascular neurosurgeons in the future.

SURGICAL TREATMENT OF THE THIRD VENTRICLE TUMORS

Grigore Zapuhliu, Serghei Borodin, Radu Safta

Objective: Tumors of the third ventricle are among the lesions that are most difficult to treat. They pose great technical challenges, given their intimate relationships with the neural and vascular structures of the base of the brain, as well as with the hypothalamo-pituitary axis. We are going to share our experience with the treatment of this particular type of tumors.

Design: We report the technique, outcome and complications seen in 63 cases of third ventricle tumors operated by our neurosurgical team, in the Institute of Neurology and Neurosurgery, from Chisinau, Moldova.

Patients/Materials and Methods: Sixty-three patients with third ventricle tumors, including 47 tumors of the anterior third ventricle and 16 tumors of the posterior third ventricle, were operated in our institution during the period from April 2006 to May 2011. The most common types were craniopharyngiomas (21 cases), colloid cysts (16 cases) and gliomas (8 cases). For the anterior third ventricle the most usually used routes were the interhemispheric transcallosal transforaminal approach, pterional or fronto-lateral approach, and the lamina terminalis approach. Most of the colloid cysts (11 cases) were removed using the fully endoscopic technique. The tumors of the posterior third ventricle, represented by the tumors of the pineal region, were

approached by infratentorial supracerebellar route in 13 cases, combined supra-infratentorial approach in 2 cases, and through the third ventricle, fully endoscopically, in 1 case.

Results: Good and excellent results were obtained in the majority of the colloid cyst cases. A zero mortality rate was obtained in this group of patients. In 14 cases the colloid content and the cyst walls were completely removed. The results were totally different in the craniopharyngioma series, where a high mortality (4 cases) and morbidity rate was observed. Total excision was obtained in 12 cases of craniopharyngioma, subtotal in 7 cases and partial removal in 2 cases. All the patients received post-resection radiation therapy. Five patients were reoperated because of tumor recurrence. The most devastating complications included acute hypothalamic-pituitary dysfunction, diabetes insipidus and formation of a hematoma into the tumor bed.

Conclusions: The tumors of the third ventricle are often histologically benign and the main goal of the surgery is safe and total removal. Knowledge of the surgical anatomy of the third ventricle, high quality image diagnostic techniques, use of microsurgical techniques and neuronavigation favors the treatment of this type of tumors with good results.

FIRST EXPERIENCE OF USING ULTRASOUND INTEGRATED NEURONAVIGATION IN MOLDOVA

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Objective: Reliable intraoperative orientation in neurosurgery remains paramount. Anatomical topographic landmarks, frame based and frameless neuronavigation, intraoperative ultrasound (iUS) allow the neurosurgeon to localize the lesion and surrounding structures, to aid in optimizing the approach and achieve safe maximal resection.

Patients/Materials and Methods: Recent advances in probe technology, image fusion, 3D techniques have provided significant improvements to image quality. By integrating neuronavigation and 2D ultrasound it is possible to create 3D US volumes and to navigate directly based on 3D US data.

We have used a system (SonoWand Invite) where the 3D US volume is reconstructed from 100–200 2D images, created by making a move or tilt over the area of interest with a precalibrated and tracked US probe. The optical tracking system reads the position of the patient reference frame and the US probe. In addition to tissue images it is also possible to make images of vessels (US angiography) based on recordings of the power Doppler signals from the blood stream.

In our practice the main applications of intraoperative ultrasound (iUS) were: neurooncology (tumour localization, tumour resection control - corpus callosum glioblastoma, third ventricular craniopharyngioma, occipital anaplastic astrocytoma, recidivant vestibular schwannoma); vascular (ACoA aneurysm, AVM Spetzler-Martin grade 4), spontaneous intracerebral hemorrhages.

Lesion localization and planning of optimal approach: once the craniotomy has been performed, the iUS can be used to localize the lesion and neuroanatomical

structures such as the ventricle, falx, main vessels and to assess the brain shift (responsible factors - gravity, brain swelling, loss of CSF, tumour debulking). At the end of the procedure, once the dura is closed but before bone replacement, a quick iUS scan facilitates assessment of early haemorrhage or hydrocephalus.

Resection control: in lesions with clear margins before excision, iUS can be used to check if the exeresis is complete.

Vascular structures: power Angio provides information on blood flow and vasospasm in AVM and aneurysm surgery. This allows real time evidence of vessel patency or flow disruption following clipping, and facilitates identification of an aneurysm within a haematoma.

Results: Using neuronavigation system with integrated US in our practice helps us to optimize neurosurgical treatment of the: supra- and infratentorial tumours, AVM, aneurysms, spontaneous intracerebral hemorrhages.

Conclusions: iUS provides low cost real time imaging that is easy to use and has a rapid learning curve. With the future development of ultrasound technology intra-operative 3D US will be used on a daily basis in most neurosurgical departments.

MANAGEMENT OF DIFFICULT TUMORS OF SPINE

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Spine surgery has evolved in the last decades. New techniques by application of detailed knowledge of anatomy and new implants for fixation, difficult tumors of the spine could be removed radically. Especially primary tumors and solitary metastasis are amenable to extramarginal resections.

In this paper, the author will present his experience on spine tumors, especially primary tumor in difficult areas such as craniocervical junction and sacrum. The technical pitfalls and complications will be discussed.

SURGERY FOR KYPHOSIS

Prof. Mehmet Zileli, M.D., Ph.D. (Turkey)

Kyphosis is a difficult topic of spinal surgery and its management contains many controversies. Surgical management needs consideration of different aspects of the kyphotic deformity such as neurological status, the presence of spinal cord compression, angle of the kyphosis, the quality of bone and accompanying diseases. In case of significant cord compression and neurological compromise, anterior surgery should have the priority. However, in smooth angled kyphosis and ankylosing spondylitis patients, deformity can easily be reduced by a posterior only approach. Since they have no neurological deficits, and large spinal canals, most suitable patients for pedicle subtraction osteotomy are the patients with ankylosing spondylitis

In lumbar kyphosis one level pedicle subtraction osteotomy (especially at L2 or L3 levels), in thoracic kyphosis multilevel osteotomies, in cervicothoracic kyphosis an osteotomy at C7-T1 level should be preferred.

Pedicle subtraction osteotomy is a technically demanding procedure that requires surgeons to perform meticulous technique and consider biomechanical issues to achieve satisfactory results and avoid complications. An attempt to correct the rigid fixed spinal deformity is a difficult task and requires the capability of a highly experienced spine surgeon. Although the

physical outcome and patient satisfaction of surgical treatment is quite good, risks and complications should always be considered by both the physician and patient.

SELLAR AND PARASELLAR MENINGIOMAS - HOW TO APPROACH

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Objective: Suprasellar meningiomas originating from the tuberculum sellae, diaphragma sellae and planum sphenoidale are uncommon. Tuberculum sella meningiomas characteristically lie in a suprasellar subchiasmatic midline position. Occasionally meningiomas have no attachment to the tuberculum and appear to arise from the diaphragma sella; these are called diaphragmatic meningiomas. We aimed to determine relevant, clinical, imaging, surgical and histological particularities, correlating these case specifics to the postoperative results. This study was done to evaluate the importance of the size of the lesions and early identification of the symptoms and their effect on the outcome in patients with sellar meningiomas.

Design: We emphasize our surgical techniques for resection of these tumors and we discuss the advantages of different approaches, depending on the size of tumor and the relationship of the tumor to the optic nerves.

Patients/ materials and methods: We retrospectively analyzed our series of 78 consecutive patients, who were admitted and operated for a tuberculum sellae or a diaphragma sellae meningioma between 01.01.2000 and 01.07.2012 at the Department of Neurosurgery of County Emergency Hospital Cluj- Napoca.

All patients were evaluated by MRI and CT scans before surgery, and tumor location, size and relation to neighboring anatomical structures were determined. We discussed the tumor's characteristics that could influence the treatment decision and the choice of the most reliable approach.

Results: We encountered 78 cases of sellar meningiomas; with dural insertion at the tuberculum sellae (40 cases), sellar diaphragm (26 cases) and planum sphenoidale (12 cases). We noted a sex ratio F: M, about 1.8, with female predominance in all age groups. The age of the patients ranged from 24 to 70 years (average 53 years), with the highest number of patients in their 50s. All our cases underwent surgery by transcranial approach; standard fronto-temporal approach was performed in 74 of cases, while in 4 of the cases a bifrontal osteotomy was preferred. The most common ophthalmic presentation was blurred vision, in 90% of cases. Headache, the second most common presentation, was presented in 68% of cases. In 70 patients (90%) complete tumor removal was achieved graded as Simpson 1 and 2. Short-term postoperative complications consisted in: wound infections (2 cases), hematomas (3 cases), hydrocephalus (4 cases), and transient visual alteration (6 cases). During the short follow-up period of our patients, no such recurrence was detected in any of our patients. The mortality rate was 1%.

Conclusions: Most suprasellar meningiomas can be removed completely and safely. The most used surgical approach is the standard fronto-temporal approach, with preservation and even improvement of visual function after surgery. The pterional approach is a well-known pathway, and the direct verification of the optical nerves, the carotid arteries, the pituitary stalk, the meningioma and its relationship with the suprasellar structures represents a safer surgical decision.

SURGICAL MANAGEMENT OF SELLAR AND PARASELLAR MENINGIOMAS

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Objective: Sellar and parasellar meningiomas represent 4 – 10 % of all intracranial meningiomas. Due to their close proximity to the arteries of the anterior circulation, anterior visual pathways, hypothalamus and pituitary stalk they have always been regarded as challenging cases. Traditionally these cases have been operated via intracranial approaches (subfrontal, frontopterional, supraorbital) but advances hardware and technique have included this pathology in the indications of transsphenoidal endoscopic operations.

Material and method: Patients operated in the past 5 years at the Neurosurgery Department of the Targu Mures Clinical Emergency Hospital.

Results: A number of 30 cases have been operated for sellar and parasellar meningiomas: 13 meningiomas of the 1/3 inner sphenoid wing and anterior clinoid, 12 tuberculum sellae meningiomas, 5

planum sphenoidale meningiomas. All cases have been operated by cranial approach (subfrontal, frontopterional). The mean age of the group is 51+/- 17 years, sex ratio F/M is 23/7. Primary symptoms were visual disturbances (loss of sight or visual impairment, diplopia), followed by convulsive seizures and personality changes. 22 cases presented increase in visual acuity, in 5 cases preservation of sight has been achieved while in 3 case patients postoperatively presented decreased visual acuity. We had 1 scalp infection that required surgical removal of the bone and later cranioplasty. In one case there was a severe thrombosis of the intracavernous carotid that resulted in the death of the patient.

Conclusion: Microscopic intracranial approaches are a safe technique and widely used technique. Endoscopic approaches have been proven to be effective in selected cases, but further studies are required.

OPERATIVE TREATMENT OF TUBERCULUM SELLAE MENINGIOMAS

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Objective: Tuberculum sellae meningiomas have a close relationship with the arteries of the anterior circulation, anterior visual pathways and the hypothalamus. The authors report on a series of tuberculum sellae meningiomas,

resection being achieved by different surgical approaches.

Methods and results: A retrospective analysis was conducted on 24 consecutive patients with tuberculum sellae meningiomas, operated on at the 3rd Neurosurgical Clinic, "Bagdasar – Arseni" Clinical Hospital Bucharest, between January 2002 and July 2012. The mean age of the 19 women and 5 men enrolled in the study was 51 years (range 21 – 75 years). The presenting symptom was visual compromise in 83.3 % of the patients (20 cases). In addition, 25 % of the patients (6 cases) had preoperative hormonal abnormalities. The radiological evaluation was made predominantly by MRI and angio MRI. A frontolateral approach was used in 21 patients (87.5 %) and an endoscopic endonasal extended transsphenoidal approach was used in 3 patients (12.5 %). These approaches allowed quick access to the tumor and were minimally invasive with less brain exposure, while keeping the complications to a minimum. Radical tumor removal was possible in all but 2 patients (91.7 %). Postoperatively, vision improved in 19 patients (79.2 %), did not change in 4 patients (16.7 %) and worsened in one patient (4.2 %). There was no perioperative mortality. The follow-up period ranged from 3 to 85 months (median: 46 months).

Conclusion: In the majority of patients with tuberculum sellae meningiomas, total resection is the goal of treatment and can usually be accomplished safely, with minimal postoperative complications and morbidity. The extent and duration of visual symptoms, encasement of the anterior cerebral artery complex and size of the tumor are the important factors that influence the treatment strategies.

UNILATERAL VERSUS BILATERAL SURGICAL APPROACH IN ANTERIOR CRANIAL FOSSA MENINGIOMAS

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

Material and methods: We conducted a retrospective study of 56 patients with large anterior cranial fossa meningiomas, which were evaluated and operated in the Neurosurgical Department of the National Institute of Neurology and Neurovascular Diseases between 2000 – April 2012. The diameter of the meningioma varied between 4.7 – 10 cm. Tumors were operated on through the unilateral frontolateral (42 patients) and bifrontal approaches (14 patients). The extent of the tumor resection was classified according to the Simpson classification. All the 56 patients were followed-up with annual CT or MRI scans and neurologically evaluated in our clinic. The follow-up period ranged widely from 4 to 324 months (mean, 98 months).

Results: Total tumor removal (Simpson Grade 1 or 2) was achieved in most of the cases, 51 patients (91%). Meningiomas operated through the bifrontal approach were entirely resected in 12 (85.71%) out of

14 cases. In patients operated through the frontolateral approach (42 patients), total tumor removal was achieved in 39 cases (92.85%). As postoperative complications, were encountered: subdural hygroma, postoperative hemorrhage, cerebrospinal fluid (CSF) leak, postoperative seizures, diffuse cerebral edema and local infection. Postoperative mortality was 7.14% (4 patients). In our series, tumor recurrence occurred in 4 patients (7.14%). All of them required surgery. The recurrence rate was higher in patients with tumors having paranasal extension and which were mainly operated through bifrontal approach. 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 morbidity. Considering the operative morbidity and mortality encountered in the resection of large anterior cranial fossa meningiomas, we could conclude that, the frontolateral approach provided an important improvement compared with the bifrontal one.

**PARASAGITAL AND FALX
MENINGIOMAS A FIVE YEARS
EXPERIENCE IN BAGDASAR -
ARSENI HOSPITAL,
NEUROSURGICAL CLINIC**

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Our work is based on 1084 cases of meningiomas treated between 2007-2012. 151 of this cases where parasagittal and falx meningioma.

Meningiomas are slow-growing, extra axial tumors with arachnoid cap-cell origin. There are curable intracranial tumors, only if they are completely removed, which is not always possible. Most commonly located are along falx, convexity and sphenoid bone they account for 14-19% of primary intracranial tumors. The peak incidence is around 45 years of age with a sex ratio 1,8/1 for women. 1,7% of this are hystologically malignant. They evolve for long time asymptotically. All these cases were initially investigated using CT scan with I.V. contrast and MRI. In approximately 95% of cases we had an angio-MRI. In all cases we performed an angiography, especially to see the sagittal sinus patency, but also the external carotid vascularization with the characteristic tumor blush. In more than 85 percent of cases we performed a total removal of the tumor and in the other 15% a grade II resection on the SIMSON scale was performed (due to large falx insertion). All patients have been cured of the prior existing seizures linked to the

mass effect lesion. In 18% of cases after surgery we observed an increase of a prior existing deficit or a new one occurred. In these cases, 15% of the patients had a deficit 4 out of 5 on the ASIA scale after a six months period. 3% of the cases had a persisting disabling deficit which required help day by day. We have records of 6 patients who died after 8 and 10 months, one of pulmonary oedema and one after myocardic infarction.

Conclusion: We consider for this pathology, that surgery is the best treatment followed by gamma knife therapy where required.

**THE ROLE OF CORTICAL
MAPPING ON SURGICAL
MORBIDITY IN ROLANDIC AREA
MENINGIOMA TREATMENT
PLANNING**

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Objective: This study relives the role of transcranial magnetic stimulation (TMS) in neurosurgical planning for meningiomas located in rolandic area of the brain.

Patients and method: The study included 9 cases of meningiomas in eloquent areas which were operated during the last year. There were 8 females and 1 male with age between 30-70 year old. Preoperative TMS was performed in all cases to give us a brain map of the rolandic area in order to improve the surgical outcome in this type of tumor. From all the 9 cases, 6 were located on the right side and 3 on the left side. In 7 cases the rolandic area was found to be displaced because of meningioma shift in comparison with the opposite side. In all cases total removal (Simpson 1 and 2) was

performed. The tumor resections begin with tumor debulking in cases with rolandic area displacement in order to avoid postoperative morbidity caused by brain edema, microthrombosis, etc. In the other 2 cases the meningioma resection was performed "en bloc". In all cases the ultrasonic aspiration (CUSA) was used for tumor resection under microscopic magnification.

Results: From histological point of view, 5 cases were meningothelial, 2 cases transitional and 2 cases atipic meningiomas. Postoperative morbidity consists in transitory contralateral hemiparesis in 3 cases and transitory aphasia in 2 cases. None of cases in which the rolandic area was not displaced presents postoperative morbidity. All 9 cases presents without neurological deficits 3 months postoperatively.

Conclusions: TMS can be considered an alternative to the intraoperative direct cortical electrical stimulation without adverse effects and with similar results. The advantage of the TMS consists in: non-invasive method, useful in preoperative planning, and an accurate preoperative evaluation of the displacement of functional areas or compression.

In our opinion the TMS is useful in neurosurgical planning for meningiomas located in rolandic area. The type of surgical approach depends on the rolandic area shift relieved preoperatively by TMS. This method avoid postoperative morbidity after total removal of the tumor.

**POSTERIOR CRANIAL FOSSA
MENINGIOMAS - 5 YEARS
EXPERIENCE AND RESULTS
CLINIC EMERGENCY HOSPITAL
"BAGDASAR-ARSENI" BUCHAREST**

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Authors presents a retrospective study based on 103 case series of posterior fossa meningiomas treated in Clinic Emergency Hospital "Bagdasar-Arseni" between June 2007- June 2012, in four neurosurgery departments, sharing the same methods and principles of treatment. Our center in a national reference university hospital deserving about 6 million people. Data was collected and analyzed from electronic data base and hospital registry. They were 20 man and 83 women with a median age of 54.5 years old. Main methods of treatment consisted in: observation, open surgery, gamma-knife surgery and combined methods. 13 patients were observed for one year, and then they decided for: open surgery, 8cases, and gamma-knife surgery, 5 cases. 39 cases were treated only by gamma-knife surgery and followed up after treatment for a medium interval of 43 months. 57 patients supported open surgery in one or more stages, depending on tumor size and location, 26 of them benefited too from a ventriculoperitoneal shunt, 4 in an

acute phase. Tumor size was between 3-5 cm in 33 cases, and over 5 cm in 21 cases. 2 of this category of patients supported 2 and respectively 3 stages of resection. According to Simpson Scale, total resection was achieved in 20.34%, grade II in 11.86 %, grade III in 35.9 %, and grade IV in 28.81%. The most frequent location was petroclival area (37.86%) followed by cerebellar convexity (27.18%) and pontocerebellar angle (24.27%). Most frequent pathological samples showed transitional meningioma (33.9%) followed by meningothelial (15.09%) and fibrous type (13.21%). They were 10 cases with atypical and anaplastic meningiomas (19%). In 95.15 % of cases the postoperative neurological status remained the same or improved. 5 cases (4.85%) presented neurological deterioration, 3 reversed on the follow-up period, and 2 remained permanent. One case with a giant hemifossa tumor deceased by complications related to brain stem decompression. They were 2 CSF postoperative fistulas, one postoperative wound infection, two postoperative cerebellar hematomas, and 17 patients presented decompensations of previous illnesses (heart and lung). They were recorded 5 tumor re-growth in malignant meningiomas, and 4 in the non-malignant group. All cases benefited of treatment: 6 cases- gamma-knife and 3 cases-open surgery. Mean general follow up period was 32 months.

Conclusion: General results of the treatment of posterior fossa meningioma are very good in our clinic, due to homogenous neurosurgical attitude, experienced teams and adequate perioperative treatment. Rate of total resection is significantly affected by lesions

over 5 cm diameter, and lesions located in petroclival area.

MODERN MANAGEMENT STRATEGIES IN POSTERIOR FOSSA MENINGIOMA TREATMENT

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Introduction: Posterior fossa meningioma is the second most common tumor in the cerebellopontine angle, accounting for 10% to 15% of neoplasms in this area. Unlike acoustic neuroma, posterior fossa meningioma presents a real surgical challenge. The variable location of these tumors, their usually large size at diagnosis, their frequent encroachment on neural and vascular structures, and their potentially invasive behavior are some of the criteria that make the resection of these lesions a difficult task.

Material and methods: 29 posterior fossa meningioma patients managed in our department in the last three years were reviewed. 24 patients underwent surgery with 26 surgical procedures. The approaches used were retrosigmoid in 16 cases, far lateral in 2 cases, subtemporal transtentorial in 3 cases, suboccipital in 2 cases and combined suboccipital supracerebellar in one case.

Results: Gross total removal was achieved in 17 cases, with partial resection in the rest of 7 cases. In 2 cases the complete removal was possible just after a second surgical procedure. In 3 cases the subtotal removal was the planned surgical strategy due to

obvious imagistic restrains and the availability of Gamma-Knife adjuvant therapy. Facial nerve was preserved in 79% of the cases with various degrees of dysfunction in the rest. 2 cases presented with significant cranial nerve (other than facial) dysfunction. There were only two cases of perioperative deaths and 2 cases showed radiological recurrence so far. The cases that were not operated were sent directly to GK (3 cases) and observed (2 cases).

Conclusion: Radical extirpation of posterior fossa meningioma with the least possible morbidity requires the flexible utilization of different approaches, the choice of which should be adapted to each individual case. Surgical removal was the treatment of choice of posterior fossa meningioma. However, in selected cases it was felt prudent to delay surgery. The availability of non-invasive radiosurgery brings a salutary therapeutic option for selected cases be it as a first intention treatment or as adjuvant therapy, improving the overall outcome of posterior fossa meningioma patients.

UPPER CERVICAL SPINE TUMOR PATHOLOGY C1-C2 - THERAPEUTIC ATTITUDE

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Surgical treatment of upper cervical spine tumors, whether they are vertebral, epidural, subdural or intramedullary, raises technical and decisional difficulties regarding the approach of the region as well as in maintaining its stability.

The authors performed a retrospective study on C1, C2 spinal tumor pathology, managed surgically in the Spinal Surgery Department of "Bagdasar Arseni" Clinical Hospital, between January 2007 and December 2011.

We included in the study 44 patients, operated for C1, C2 cervical spine tumors, 23 men and 21 women with ages between 13 and 71 years. The pathology included 24 C1-C2 vertebral tumors, 11 subdural tumors, 2 epidural tumors and 7 intramedullary tumors.

Presenting symptoms were cervical pain, occipital neuralgia, medullary compression syndrome, and/or cranio-spinal junction instability.

The purpose of surgery was to establish a histopathologic diagnosis and to decompress the neural elements by attempting a total tumor removal as well as to stabilize the cranio-cervical junction in order to improve the patient's quality of life. The approach was chosen based on tumor location, prognosis and the need for fixation. For 6 patients an anterior approach was used, for 31 patients we used a posterior approach and 7 patients required a combined anterior and posterior approach.

Neurological improvement was observed in 17 patients, with a mean increase of 8 points on ASIA scale, 7 patients worsened immediately postoperatively with a mean decrease of 10 points on ASIA scale and 20 patients without neurological deficits preoperatively remained unchanged. In all cases where the craniospinal junction instability was the cause of occipito-cervical pain we noted the disappearance of pain after surgery.

The development of new surgical techniques and fixation systems paved the way to a successful treatment for these

difficult tumors, some of them considered inoperable in the past.

CRANIO-SPINAL JUNCTION TUMORS: A SERIES OF 24 CASES

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Objective: We present our surgical experience in the treatment of 24 patients with tumors of the cranio-spinal junction that were warded between 2007-2012 in our department.

Design: The pathology of the cranio-spinal junction is complex and the tumors of this region may present diagnostic and management problems.

Methods: In six years we treated twenty-four patients with tumors of the cranio-spinal junction: eight foramen magnum meningiomas, six vertebral tumors C1/C2, four jugular foramen tumors, four cases of lower brainstem tumors and two occipital condyle tumors. All patients were explored preoperatively by MRI or CT.

Results: The suboccipital (midline and paramedian) approach was performed in nine cases, seven of them required additional resection of the posterior arch of C1/C2. In six patients the surgical approach implied only the resection of posterior arch of C1/C2; the far-lateral approach was used in eight patients and in one case we used the transoral approach. All patients

benefited by a microsurgical approach; gross total removal was achieved in 10 out of 24 cases.

Conclusions: The preoperative diagnosis and the operative planning are very important for the surgical handling of cranio-spinal junction tumors. The microsurgical approaches provide the best operative results.

SURGICAL APPROACHES FOR THE CRANIO-CERVICAL JUNCTION TUMOURS

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Choosing the most adequate surgical approach it is an intriguing topic not because it is a difficult region to deal with, but also because there is a place where along neurosurgeons there are other specialties that are disputing the priorities and arguing the best management to perform surgery like ENT surgeons, spinal surgeons or those specialized in cranio-facial surgery.

The great difficulty of approaching this region consists not only in the osteo-muscula ligament complex that permits stability and complex movement of the head, but also in the great number of vital neurovascular structures and their great anatomical variability.

When dealing with a tumor of the CVJ the selection of a certain approach is depending on several factors like tumor location, type and size, neurological and general status of the patient, and the

relation to the dura, namely if the tumor is epi or intra dural. Nevertheless the surgeon's preference and confidence for a certain approach is a factor that is less discussed, but in fact it is a decisive one. In the present thanks to the progresses in the surgical techniques, a tumor located in this region can be circumferentially approached, from anterior, antero-lateral, lateral postero-lateral and median posterior. The idea is to approach the tumor on the shortest distance, and to intersect less neurovascular structures.

The different kind of approaches are presented based on the procedure, extent of exposure, common pathology, advantages offered, limitations, and risk and long-term side effects. The data presented is well illustrated by cases from the authors' personal experience.

OUR EXPERIENCE IN TWO CASES OF DURAL ARTERIOVENOUS FISTULAS AT THE CRANIOCERVICAL JUNCTION

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Background: Dural arteriovenous fistulas (DAVF) at the craniocervical junction are uncommon lesions that may result in various neurological presentations. These lesions are a rare cause of intracranial subarachnoid hemorrhage (SAH).

Methods: We performed a retrospective study on two patients with craniocervical junction DAVF. The clinical and imagistic dates with surgical video recordings were reviewed by the authors. The follow-up six

month dates were also analyzed.

Results: One patient presented with meningeal symptoms due to a subarachnoid hemorrhage, and the other one had a slowly progressive cervical myelopathy (with progressive quadriparesis) associated with a single episode of lost of consciences. This last patient had a C4 – C6 DAVF with single or main ascending venous route into the intracranial vein. Both cases were treated by surgical interventions technique. The overall clinical outcomes were good during an average follow-up period of 10 months. In particular, follow-up angiographs performed one months later revealed the complete disappearance of DAVF in both patients.

Conclusions: DAVF of the craniocervical junction are unusual condition characterized by important severe neurological deficits referable to this region. Our experience showed that microsurgical approach of these lesions a clinical cure of the patients with their clinical improvement.

OUR EXPERIENCE IN CHIARI MALFORMATIONS SURGICAL TREATMENT

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Introduction: "As described and classified over a century ago, herniation of the cerebellar tonsils more than 5 mm into the cervical spinal canal with obliteration of the cerebellomedullary cistern and obstruction of foramen magnum is the primary feature of Chiari I malformation."

Pathophysiology: The Chiari malformation constitutes an heterogeneous and multifactorial entity, in which congenital

forms of Isolated presentation or with a genetic background and forms of acquired etiology exist. No unitary clasification exists to this date.

Clinic and symptoms: One estimate based on extrapolations from a previous study suggested a prevalence of tonsillar ectopia inthe general population of approximately 3.5%. The proportion of these individuals who go on to develop symptoms is unknown. Nevertheless, the disorder can be associated with significant symptomatology, risk of secondary injury due to trauma and the risk of progression and damage of the spinal cord due to associated syringomyelia.

Surgical treatment: The goal of surgery is to relieve cord compression and to reestablish adequate csf flow. There have been no prospective studies in which one treatment form is directly compared with another.

Conclusions: In light of the many theories of pathophysiology, broad clinical presentations, and multitude of surgical interventions with variable outcomes, it is no wonder that a single surgical approach does not exist. We recommend tailoring the surgical approach to treat the dominant clinical problem. Early diagnosis and treatment is critical in obtaining the best outcome for the patient. The presence of syringomyelia is a sign of advanced structural abnormality, as it is associated with the presence of sensory and motor deficits, as well as with the presence of spinal deformity. The preoperative presence of deficit is a predictor of poorer neurological outcome, making a strong case for early surgical intervention.

MINIMALLY INVASIVE SPINE SURGERY: THE WAY OF THE FUTURE

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Minimally invasive spine surgery involves surgical techniques that require smaller incisions, result in less soft tissue disruption, and involve limited surgical corridors. They are typically associated with decreased blood loss, decreased infection rates, and decreased hospital stay.

Historically, Prof. Yasargil used the operative microscope for the first time in 1976 to perform a lumbar discectomy. In the early '90's, laparoscopic cholecystectomy became the method of choice for removing the diseased gall bladder. After 2000, minimally invasive spine techniques became increasingly popular.

The initial operations involved simple spinal decompressions. Through a skin incision of less than 2 cm in length, a system of tubular dilators was used to split the muscle fibers and allow for placement of an 18mm-diameter tubular retractor that rested on the lamina or facet of the diseased segment. The most common operation was the lumbar microdiscectomy, but other pathology, such as segmental spinal stenosis, lateral soft cervical disc herniations, or gunshot wounds to the spine with retained bullet fragments, was also addressed via this tubular retractor.

Later, technological advancements like better instrumentation, illumination and magnification, as well as a better understanding of the anatomical approaches, allowed for more complex operations to be performed using the minimally invasive techniques. Lumbar

fusion patients were by far the main beneficiaries of these techniques. The posterior and transforaminal lumbar interbody fusions (PLIF or TLIF) have become in recent years the preferred method in cities with advanced surgical care like New York and Los Angeles. Other surgical techniques take advantage of new pathways to the lumbar spine. The extreme lateral interbody fusion (XLIF), used at or above the L4-5 level, is indicated in patients with previous midline approaches as well as patients with segmental deformity. The presacral approach (AxialIF) provides similar advantages at the L5-S1 segment and has the lowest complication rate of all fusion procedures. More advanced surgical interventions, like thoracic or high lumbar corpectomies for trauma, infection, or tumor, can also be currently treated with small skin incisions and reduced postoperative morbidity.

The minimally invasive spine surgery techniques are currently the fastest growing trend in the US and are employed by about 80% of the spine surgeons in the large cities with highly educated patients. It is probable that MISS will become the treatment of choice for elective spine patients all across US in the near future.

TRAUMATIC PATHOLOGY OF THE THORACIC AND LUMBAR SPINE - OUR PERSPECTIVE

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Objective & design: The paper presents the surgical treatment protocol in trauma pathology located in dorsal and lumbar spine area. Aspects related to vertebral body surgery, lengths and type of

instrumentation, reason of treatment, and pitfalls in trauma surgery are discussed.

Material and methods: 180 of cases were studied with at least one year post-op follow-up, operated according to the same criteria. The treatment algorithms are presented, including some representative cases of posterior approaches, and of combined (anterior and posterior) approaches. All presented cases are from the author's personal archive and underwent surgery using the same system of stabilization and the same technique.

Results & conclusions: Obvious advantages of the transpedicular stabilization, ligamentotaxis and the reconstruction of the vertebral body. Images of illustrated cases are presented.

THE ADVANTAGES OF THE ANTERIOR APPROACH IN THE TUMOR PATHOLOGY OF THE SPINE

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Objective & design: This paper proposes to highlight the necessity, the advantages of the anterior approaches in spine tumor pathology. The current tendency in this field is total removal of the tumor; in this respect the "en block" resections become the gold standard, especially in primary spine tumors. As a result of the outstanding progresses in the oncological field total removal (ideal "en block") became also a standard in spine metastasis, even in multiple spine metastases.

Material and methods: The paper analyzes 55 complex surgeries of spinal pathology, which had as a result the total removal of

the tumors using combined approaches: anterior and posterior.

All presented cases are from the author's personal archive and they are representative for all regions of the spine, with special emphasize on the transition areas.

Results & conclusions: The present paper underlines the mandatory aspect of the anterior approaches in order to obtain a total tumor resection. Meanwhile practical aspects are presented among which pitfalls, tricks and tips are considered by the author essential in performing these types of surgeries.

MANAGEMENT OF BRAINSTEM LESIONS

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Objective & design: The surgical approach of the brainstem lesions is very difficult because of high density of vital areas at this level of the central nervous system.

Our aim is to share the experience that we achieved in diagnosis, therapeutical protocol, and the neurosurgical approaches of brainstem lesions in the past fourteen years.

Materials and methods: This study consists in a retrospective analysis of 76 cases of patients diagnosed with brainstem lesions and surgically treated in our department between January 1998 and December 2011. We studied epidemiological aspects, pathological findings, clinical features, diagnosis methods, surgical approaches, and outcomes of our case series.

Results: From all brainstem lesions, 62 cases were tumors and 14 cavernomas. Brainstem tumors represent almost 15 % of posterior fossa tumors operated in our department. Our peak incidence is in the first four decades of life. Gender distribution shows a slightly male predominance (35 cases). Signs of intracranial hypertension, motor deficiencies and cranial nerve palsies were the main clinical findings. In each case cerebral MRI was performed, with or without cranial CT scan. Forty nine patients were operated by open surgery. In all cases suboccipital craniectomy in sitting position was preferred, except in two cases of diencephalo – mezencephalic tumor the subtemporal approach was chosen. Using the sitting position, in combination with a meticulous microsurgical technique, ECG, blood pressure, central venous line, end-tidal carbon dioxide, and oxygen pressure monitoring, no clinical evidence of air embolism was detected. Total resection was possible in 20 cases versus subtotal resection in 29 cases of brainstem tumors and we performed only drainage of hydrocephalus in 13 cases, without tumor resection. Histological finding shows that the most common tumors are low grade gliomas. Brainstem cavernomas represent 25 % of all cavernomas treated surgically in our department. Complete surgical removal of cavernoma was successfully performed in all cases using the same sitting position.

Conclusions: Despite of their location, many of brainstem lesions can be totally removed surgically due to their benign nature. In this case the neurosurgical treatment can have healing effect. In the presence of malignancy signs, the possibly maximum tumor resection with or without drainage of hydrocephalus can improve

rapidly the patient clinical status and it creates good conditions for the adjuvant therapy.

OUR EXPERIENCE IN IMAGE GUIDED STEREOTACTIC BIOPSY FOR INFILTRATIVE CEREBRAL GLIOMAS

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Objective: Minimally invasive approaches, like stereotactic biopsy, are frequently required in many cases of infiltrative cerebral gliomas, because the invasive growth pattern precludes the gross total resection of these types of lesions. The authors present their experience in 85 cases of stereotactic biopsies performed for infiltrative cerebral gliomas.

Materials and methods: Eighty-five patients with infiltrative, multicentric and deep-seated gliomas have been included in this study. All patients underwent the stereotactic biopsy according to the standard protocols. Stereotactic and neuroimaging tools used for these procedures included the Leksell stereotactic system and the software: Stereotactic Planning System (SPS), NTPS 8.2.

Results: The histopathological results (according to World Health Organization (WHO) classification) were: 51 cases of glioblastomas (grade IV) (60%), 7 cases of anaplastic astrocytomas (grade III) (8,2%), 13 cases of grade II diffuse astrocytomas (15,3%), 6 cases of grade I astrocytomas (7,1%), one case of grade II

oligodendroglioma (1,2%), 3 cases of anaplastic oligodendrogliomas (grade III) (3,5%), one case of grade I ganglioglioma (1,2%), one case of anaplastic ganglioglioma (grade III) (1,2%), and 2 cases of anaplastic ependymomas (grade III) (2,3%). In 21 cases (24,7%) the immunohistochemistry has been performed in order to obtain an accurate histopathological result. In this series, the early postoperative mortality was 0%, with no cases of clinically significant hemorrhages after biopsy procedures. Temporary increase of neurological deficits has been noticed in 7 patients (8,2%).

CONCLUSIONS

In conclusion, image-guided stereotactic biopsy represents now a safe and accurate diagnostic method for infiltrative, multicentric and deep-seated cerebral gliomas.

THE EXPERIENCE OF THE SURGICAL MANAGEMENT OF THE INTRACRANIAL VASCULAR MALFORMATIONS

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Objectives & design: Nowadays, the multimodal treatment (microsurgery, radiosurgery, interventional neuro-radiology) is used to provide a more effective and less morbid therapy for the arteriovenous malformations. The purpose of this paper is to describe our surgical experience and current management of these vascular disorders, which lead to successful surgical removal in the absence

of endovascular preoperative embolisation, neuronavigation or intraoperative monitoring opportunities.

Material and methods: We report a retrospective analysis of 184 intracranial vascular malformations treated by surgical excision in our medical center between June 1996 and December 2011. From these 67% were diagnosed as AVMs and 33% as cavernomas. The preoperative evaluation consisted of clinical exam, CT, MRI and angiography. Clinical data analysis found the peak incidence in the 5th decade and a slight male preponderance was observed (55%).

Results: In our series the major clinical findings were hemorrhage, seizures, progressive neurological deficits, and headache and according to Spetzler-Marting grading system the majority of the cases were grade II and grade III (64%). Postoperative morbidity consisted of transient neurological deficits (12%), hydrocephalus and re-bleeding. We obtained GOS score of 4 and 5 in 88% of the patients. The association of intranidal aneurysms was observed in 12% of AVMs, and they were addressed in the same operative session. First of all the decision for the surgical treatment should take into consideration the sum of the risks of all the interventions and should be compared to the natural history of the lesions. The non-surgical treatment has a significant impact on the patients suffering from these cerebrovascular lesions, but still has some unsolved problems.

Conclusion: Due to the shortage of endovascular/radiosurgery facilities in our department, surgery remains the single treatment strategy to cure these lesions. Even though many of the cases were admitted with a severe neurological status, a

successful surgical treatment requires besides microsurgical techniques, microsurgical gestures too.

OUR FIRST EXPERIENCE IN STENT AND STENT-ASSISTED COIL EMBOLIZATION OF INTRACRANIAL ANEURYSMS

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Background and purpose: The endovascular detachable coil embolization for cerebral aneurysms treatment has become an important method which poses a significant technical challenges, particularly in wide-necked aneurysms. We present the results of our initial experiences in using a self-expanding neurovascular stent and detachable coils in the management of wide-necked intracranial aneurysms.

Methods: Two consecutive patients with a wide-necked intracranial aneurysm were treated by Neuroform Stent deploying as flow-diverting embolization and Neuroform Stent-Assisted Coil embolization. We assessed patients' history, aneurysm morphology, indications for stenting technique, and technical feasibility and efficacy of the procedures, complications and midterm follow-up data.

Results: In all patients, the stent placement in the desired position with complete or nearly complete embolic effect of the aneurysms was achieved. Both patients had followed a strong anticoagulation regimen immediately after procedure. In one patient, some urologic

complication had occurred with necessitate transfer to a specialized clinic. Six-month follow-up demonstrated no focal neurologic sequelae in any of the patients, except slight memory dysfunction in the patient with vertebro-basilar junction aneurysm.

Conclusion: These preliminary data results indicate that stent-assisted coil embolization can be an easily, safely and effective technique in the treatment of intracranial wide-necked aneurysms. Further studies by long-term angiographic and clinical follow-up are needed to evaluate the permanent vessel patency and long-term durability of stent-assisted aneurysm occlusion.

ANEURYSMS IN CHILDREN – PARTICULARITIES - AN EXPERIENCE OF 40 CASES

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Introduction: Intracranial aneurysms in children are a very rare pathology which generally appears in the literature in limited series of 15-30 cases. Most cases of intracranial aneurysms in children are preponderantly congenital and often associated with other malformations such as polycystic kidney disease, aortic coarctation, Ehlers- Danlos syndrome, thalassemia, etc. A limited number of cases are with familial incidence. Aneurysmal rupture is extremely rare in the first decade of life. The

incidence gradually increases each decade and peaks in the fourth decade of life.

Material & method: The authors present 40 cases of children with intracranial aneurysms (0-16 y.o.), which represent 6.1% of all cases (648 cases) of intracranial aneurysms operated by the authors between January 1997 and December 2011 - 15 years. The mean age was 14,3 years. In all literature data the median age was between 14-18 y.o.

There were more boys (24 cases, 59%) than girls, like in all official data. The clinical features are dominated by headache (98%), neck stiffness (94%), vomiting (92%), focal neurological deficit (81%), an altered level of consciousness (67 %), seizures (46 %), fever (36%).

The majority of patients has Hunt & Hess Scale grade II at admittance (21 cases, 53%). All neuroimagicistic investigations were done in the first 48 hours. The anterior communicating artery aneurysm (14 cases, 35,3%), followed by middle cerebral artery aneurysms (11 cases, 26,5%) and carotid artery bifurcation aneurysms (8 cases, 20,5%) were preponderant.

There was one case concerning multiple aneurysms. Many aneurysms are large and giant (14 cases, 35,2%). The particularities of the microsurgical approach are: easy aneurysmal dissection, no atheromatous plaques in the cerebral vessels and an easy management of brain edema via versatile anesthetic control.

In these conditions the surgical timing is essential. All aneurysms were clipped directly, with non-important complications in the pediatric intensive care unit (P.I.C.U.).

There was one case of preoperative mortality in our data. All cases received a

perfect neuro-rehabilitation therapy. In our data no embolization was performed.

Conclusions: Intracranial aneurysms in children are very rare and were discovered and treated in neurosurgical pediatric departments.

Early microsurgical approach is mandatory and has excellent results (good recovery).

Aneurysms represent an important challenge for all neurosurgeons.

QUALITY OF LIFE AND GLOBAL OUTCOME IN INTRACRANIAL CAVERNOUS ANGIOMAS

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Introduction: Intracranial cavernomas (IC) count of 0.02 - 0.53% of all intracranial lesions and 8-15% of all AVMs. The association with AVM is found in 10-30% cases. The lesions become symptomatic when the size of the lesion is bigger than 1 cm. These vascular malformations have started to be easily diagnosed with the introduction of routine MRI scans.

Material and method: The cohort of 109 consecutive operated cases of intracranial cavernomas were admitted in the 1st Department of Neurosurgery of the Bagdasar-Arseni Hospital in the period of time between January 1998- January 2012 (14 years). All cases received a complex

neuroimaging diagnosis based on CT, MRI & DSA Angiography. The cases were operated and followed up in the Bagdasar-Arseni Hospital in Bucharest for a period ranging from 6 months to 9 years.

The sex distribution was 55 males and 54 females aged between 11- 56 years old with a peak of incidence in 31 year olds.

The cavernomas localization was as follows: supratentorial in 75 cases (68,8%), infratentorial in 24 cases (22,0%), deep, basal ganglia & multiple 10 cases (9.1%). The lesions were located: Frontal lobe 34 cases (31.2%), Parietal lobe 15 cases (13.7%), Temporal lobe 23 cases (21.1%), Occipital lobe 3 cases (2.7%). Multiple 3 cases (2.7%), deep and basal ganglia 7 cases (6.4%) brainstem 19 cases (17.4%), and cerebellum 5 cases (4.5%). In what concerns multiple cavernomas, we proceeded with surgery only for those either manifesting mass effect or presenting with hemorrhagic attack.

The clinical symptoms were characterized by seizures 70 cases (64.2%), neurological deficits 16 cases (14.6%) hemorrhage 23 cases (21.1%).

A special chapter of the study was dedicated to non-operated cases. They were: 7 cases multiple lesions, 9 asymptomatic and 5 lesions deep situated. In 2 cases of deep situated lesions, the therapy with gamma-knife surgery was applied.

Results: In this series of 109 operated patients, the Global Outcome Scale (GOS) at 6 months was: good recovery 82 cases (75.2%), moderate disability 18 cases (16.5%), severe disability 9 cases (8.2%), vegetative state 0 cases (0%) and death 0 cases (0%). The severe disability appears especially in brainstem cavernomas, but, in time, the cases improved exponentially.

The follow-up period was between 6 months and 9 years, with a mean range of 7,6 years. Out of the 70 cases exhibiting seizures, all cases were operated: in 52 cases (74,2%) we performed a lesionectomy with perifocal gliosis excision and in 18 cases (25,7%) only lesionectomy.

Conclusions: Intracranial cavernous angiomas (cavernomas) are rare lesions characterized by epilepsy in the majority of cases or intracerebral hemorrhagic onset. When the main symptoms are seizures, the best prognosis results after the excision of the lesion and the perilesional gliosis. The Neuronavigator-guided approach achieved in all cases the removal of the lesions with a good accuracy in the "Target", avoiding the post-operative deficits and improving the clinical Outcome. Furthermore, it avoids the discomfort of the stereotactic frame. In multiple lesions, the hemorrhagic or mass effect lesion must be managed. The option of gamma-knife surgery (GKS) in cavernomas is disputed. In asymptomatic cavernomas, the best management is clinical follow-up and MRI observation.

TWENTY YEARS OF LUMBAR DISK SURGERY

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Objective: The objective of the study was to determine the 20 -year clinical outcomes of discectomy for the treatment of lumbar disc herniation.

Design: This report retrospectively evaluates 1500 cases of surgical lumbar discectomy performed by one neurosurgeon to evaluate the indications and efficacy of lumbar discectomy.

Materials and methods: Only 1500 patients who underwent lumbar discectomy, based on specific objective criteria, were reviewed. Diagnosis and localization of the root compression were determined preoperatively by the lumbar myelogram during the years 1989 – 1994, by lumbar computed tomographic myelography during the years 1995 – 2002 and spinal MRI during the years 2003 – 2010.

Results: 81% patients were rated as excellent, 16% as good, 2 % as fair, and 1 % as poor. Only 2,5 % patients required additional surgery due to a recurrence of herniation. 72% of the patients were able to maintain their primary occupations.

Conclusions: The 20-year follow-up study showed that the clinical outcomes of surgical lumbar discectomy are very good and satisfactatory.

PERCUTANEOUS NUCLEOPLASTY VERSUS OPEN DISCECTOMY IN PATIENTS WITH LUMBAR DISC PROTRUSIONS

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Introduction: Degenerative disc disease can be treated conservative or operative by many approaches.

Nucleoplasty by coblation is a minimally invasive procedure increasingly applied for treatment of lumbar disc herniations.

Material and method: During 1 year period (september 2009-september 2010) two cohorts of 80 patients each were operated by nucleoplasty and open discectomy respectively. There were not significant differences regarding sex distribution, age, or level of disease. Inclusion criteria are different: MRI evidence of contained disc

herniation \leq 6 mm for nucleoplasty, $>$ 6 mm for open discectomy. Common criteria were radicular pain resistant to conservative treatment for a period of at least 6 weeks, one level protrusion, and virgin spine at the level of interest.

Nucleoplasty was performed in an outpatient setting, with the patient in lateral decubitus. The entry point was situated at 10-12 cm from midline. With a bipolar RF probe six channels were created in the nucleus by advancing the RF probe in ablation mode and withdrawing it in coagulation mode using coblation energy which dissolve nuclear material through normothermic molecular dissociation. Open discectomy was performed in a standard fashion by interlaminar approach with foraminotomy.

Results: VAS score was reduced at 3 months follow-up with 40% and 60% for nucleoplasty and open discectomy respectively, and at 1 year follow-up 60% and 78% respectively.

All patients with coblation return to work 3 days later. Most of discectomy patients remain work-off for 3 months followed by temporary retirement. Results of Roland-Morris questionnaire show an improvement at 12 months of 60% in nucleoplasty group, and 78% in discectomy group. Patients satisfaction after nucleoplasty was 73%.

Conclusions: Nucleoplasty is a relative new technique, situated at middle way between conservative and open surgical treatment of patients with degenerative disc disease and lumbar disc protrusion.

Nucleoplasty is efficacy and safe procedure.

DORSAL RHIZOTOMY IN CHILDREN WITH SPASTIC PARAPLEGIA: A NEW SIMPLIFIED SURGICAL TECHNIQUE

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Introduction: Over a hundred years the lumbosacral dorsal rhizotomy is the neurosurgical indication in spastic children with cerebral palsy.

Objective: Analysis of clinical and functional results obtained with a new simplified surgical technique, quintessence of the two technical principles that govern dorsal rhizotomy: anatomical approach and selective functional approach.

Method: We illustrated eight cases of spastic paraplegia children: five ambulatory spastic subjects operated at L5-S1 spinal root level and three non-ambulatory cases with more severe functional spastic paraplegia, clinically presented as quadriped crawlers or bunny hoppers, operated at L4-S1 spinal root level. Statistical analysis using the Wilcoxon test (SPSS program) shows both a clinical improvement on Ashworth, Tardieu and Penn scales and an improvement on main functional scales as Gillette, test get-up and go or Physician Rating Score.

Discussions: Our anatomical and electrophysiological intraoperative observations are the basis for a new technical approach that respects both the classical selective sectoral surgical direction promoted by Gros and Sindou, the partial limited one of Lazareff and the partial limited one promoted by Peacock, Steinbok and Mittal.

Conclusion: Postoperative clinical and functional improvement allows presentation of the main advantages of our surgical technique: nerve root ablation standardization and reduction of operative time.

CEREBROLYSINE: AN IMPORTANT FACTOR FOR THE IMPROVEMENT OF THE LIMITS OF THE BRAIN

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The development of the human bipedal posture has led to major modifications in the structure of the CNS and especially that of the cerebral cortex. The cerebral cortex or pallium (shell) is a structure 2-4 mm thick being made out of aprox. 50 billion neurons, about 500 billion neuroglial cells and a dense capillary bed. Microscopy reveals the cortex to have both a laminar and a columnar structure. The general cytoarchitecture varies in detail from one region to another, permitting the cortex to be mapped into dozens of histologically different areas, each with its own functionality – the so called areas of Brodman. The normal human brain contains about 100 billion (10¹⁴) neurons which give birth to a very complex network containing from 60 trillion synapses, (6x10¹⁸) up to 240 trillion synapses (24x10¹⁹) The literature data states that a

number of 85.000 neurons die each day (aprox. 1 per second). In these circumstances a human being could live up to the age of 300 years. Furthermore, each living cell ends its life cycle with the phenomenon of apoptosis. There are a series of factors that increase the rate of occurrence for apoptosis in neurons. These include the neuronal refractory period, vascularization, nutritional needs, lesions, Blood Brain Barrier modifications, endogenous and exogenous toxicity, vascular dementia, neuronal flux variations, stress, structural damage, narcotics and last but not least drugs.

To limit the effects of the factors mentioned above we feel that a physiological nutritional balance has to be installed, social interactive factors have to be as well taken into account. The balance between activity and rest, the importance of pauses and food, the prevention of head injuries, the reduction of stress factors, the decrease of exposure to radiations, and the restriction of alcohol consume, avoiding smoking and drugs and cell phone use. Furthermore, the work of Dr. Masaru Emoto has proven that the human consciousness and emotions have an important effect on the molecular structure of the water. The effect is very important given the fact that the human brain is 77-78% composed of water.

Cerebrolysine brings a significant improvement in cerebral function. A mixture of low molecular polypeptide, extracted from pig brain, the drug, increases motor function, enhances cognitive performances, increases memory & attention and improves the bioelectrical activity in the brain. In the literature there are more than 500 substances studied for neuroprotective properties but

Cerebrolysin with its low molecular weight passes easily through the BBB. The effect of Cerebrolysin for neuroprotection consist in activation of Calpain system. The important additional Cerebrolysin effects are: cerebral excitability and hypoxia, improving EEG signal and motor activity after mild brain ischemia and also antioxidative properties.

In conclusion, after presenting various data regarding the anatomy and physiology of the brain, the authors militate for what would be referred as a Cerebral Hygiene – just as bodily hygiene. Cerebral hygiene would lengthen the functional period of the human nervous system in the conditions of the improvement of average lifespan and it's quality. All the substances with neuroprotective effects (like cerebrolysin) are very efficient in improving the cerebral function.

Last but not least we advocate that Cerebrolysin is proven clinically as a protector factor in TBI and ischemic brain lesions.

TRAUMATIC DIFFUSE AXONAL INJURIES

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Background: Traumatic brain injury (TBI) is a common cause of morbidity and mortality emphasized by the fact that it affects all age groups. Diffuse axonal injuries (DAI) associated with TBI are a great challenge to physicians due to the difficulty of early diagnosis and effective treatment. No efficient criteria for prognosis of the disease have been developed so far, due to the lack of efficient

imaging and other diagnostic techniques. The purpose of this study is to evaluate prognostic criteria for mortality, functional and neurocognitive outcome.

Material and method: A systematic review of literature was performed, using the PubMed, MBase, The Cochrane Library, Willey Online Library, Scopus, Science Direct medical databases between January 1990 and July 2011. 11.398 articles were found using the keywords "diffuse axonal lesions/injury", "traumatic brain injury", "treatment of traumatic brain injury", "treatment of diffuse axonal injury", "prognosis of TBI/DAI", "outcome after TBI/DAI", "neurocognitive impairment after TBI/DAI", "patient perspective after TBI/DAI". The analyzed articles were indexed according EFNS criteria. Article abstracts reporting original research and reviews were consulted. 77 articles were finally selected for inclusion.

Results: DAI is a predisposing factor for memory, executive and behavioral dysfunction. A reduced score on GCS scale, older age, pupillary reflex abnormalities and corpus callosum lesions are associated with a poor outcome. Younger age is associated with dysautonomia, being correlated with a poorer outcome. MRI is more accurate than CT for diagnosis and prognosis of DAI. DWI and DTI have prognostic value in evaluating functional outcome, with DTI being an efficient biomarker for microstructural changes and neurocognitive impairment. No efficient biomarkers for DAI were highlighted until now.

Conclusions: Clinical case history and advanced imaging techniques can improve our ability to diagnose DAI and have the potential to become valuable instruments in establishing prognosis for this condition.

CEREBROLYSIN TREATMENT IN TRAUMATIC BRAIN INJURY – A RETROSPECTIVE, MULTI-CENTRIC COHORT STUDY

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Introduction: Traumatic brain injury (TBI) represents a leading cause of death and disability and mainly affect the young adults. Neuroprotection remains an important strategy for TBI, targeting deleterious pathophysiological processes which lead to secondary tissue damage and related functional deficits. Cerebrolysin is the only clinically available drug that contains active fragments of different neurotrophic factors with low molecular weight that are able to pass the blood-brain barrier. The primary objective of this study was to test the outcome in Cerebrolysin treated patients compared to the control group, at 10 and 30 days post-TBI, and the secondary objective to evaluate the safety of Cerebrolysin for TBI patients.

Material and method: In this study were included 7769 adult patients with traumatic brain injury (TBI), admitted in 10 departments of Neurosurgery in Romania, between 2005 -2010. From the medical records, general data were collected at admission (gender, age, etiology, medical

history, concomitant medication, Glasgow Coma Scale score, clinical neurological examination, CT result, whether a surgical intervention was performed). At days 10 and 30 post- TBI patients were ranked on Glasgow Outcome Scale (GOS) and Modified Rankin Disability Score (RDS). 1618 patients received cerebrolysin and 6151 patients were in the control group.

Results: In mild TBI, treatment with Cerebrolysin, both 20 ml and 30 ml/day regimens, significantly improves GOS and RDS scores at 10 days as compared to control patients. Treatment with Cerebrolysin in medium TBI, both 20 ml and 30 ml/day regimens, significantly improves GOS and RDS scores at 10 and 30 days as compared to control patients. Moreover, a significant dose dependent effect is seen for Cerebrolysin on GOS score at 10 and 30 days. Treatment with Cerebrolysin, both 20 ml and 30 ml/day regimens, significantly improves GOS and RDS scores at 10 and 30 days as compared to control patients in severe TBI.

Moreover, a significant dose dependent effect is seen for Cerebrolysin on GOS score at 10 and 30 days. The frequency of usual adverse events is similar between the control group and Cerebrolysin groups. No severe adverse events were noticed in Cerebrolysin groups.

Conclusions: This large retrospective study shows significant beneficial effects on outcome of early Cerebrolysin treatment in TBI and supports the basis for a large Cerebrolysin prospective study in TBI.

NEED OF IMMEDIATE NEUROPROTECTION IN TRAUMATIC SPINAL CORD INJURIES

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Objective: Analysis of current status and effectiveness of immediate neuroprotection in traumatic spinal cord injuries.

Design: Traumatic spinal cord injury (SCI) has major effects and these patients have not any treatment. In acute complete traumatic SCI, methylprednisolone as a standard treatment option is insufficient and it is necessary to add new immediate procedures at the standard treatment performed today.

Materials and methods: The study included analysis of two groups of 50 patients with cervical and thoracic traumatic SCI who received (A) surgery for decompression, to realign and to stabilize the spine and (B) standard methylprednisolone treatment and surgery and (C) 5 cases of traumatic SCI with standard methylprednisolone and surgery treatment and also adenosine triphosphate (ATP) to improve blood flow at the site of injury and indomethacin as local anti-inflammatory.

Results: No significant differences were found between groups A and B at 6 months and 18 months postinjury; the 5 patients in group C had a more rapid stabilization of spinal injury.

Conclusions: Although the number of cases is small and further study is needed it

can be estimated as immediate use of neuroprotection, even at the scene of spinal injury, may improve prognosis of these patients.

IMAGISTIC DIAGNOSTIC TRAPS - MULTIPLE FACES OF MENINGIOMA

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Introduction: An accurate and reliable imagistic diagnosis represents a key element in the surgical planning. Numerous aspects of the surgical setup and strategy are based on the possible behavior of a certain intracranial mass occupying lesion. The progress of MR technique and the various algorithms that help a differential diagnosis between various intracranial pathologies brought a significant improvement in our ability to formulate a more accurate preoperative imagistic diagnosis. However, the variability in intracranial tumor development allows for a good probability of misdiagnosis.

Material and methods: We analyze the meningioma cases that presented with imaging aspects that were far from the classic appearance of this tumor over a period of 3 years. The selected cases are discussed in terms of imaging characteristics, preoperative assessment, and discuss the potential places of misjudgment and possible strategies to improve the preoperative imagistic diagnostic.

Results: The controversial imagistic cases represented 7% of the total meningioma cases newly diagnosed and operated in our department over a period of 3 years (2010-

2012). The error generators were represented by extensive cystic components that disrupted the homogenous structure typically associated with meningioma, excessive necrosis and intratumoral bleeding, or a combination of atypical imagistic composition with less frequent localization.

Conclusion: Although a lesion with a typical imagistic appearance and clear diagnostic features especially on MR images, meningiomas present in specific cases a very unusual imagistic anatomy that can mimic cerebral or bony malignancies. In these cases the correct diagnosis is usually an intraoperative surprise. Careful analysis of the preoperative imaging data and a cautious preoperative planning allow for a good diagnosis and a successful surgery.

INTRAOBITAL MENINGIOMAS - REAL NEUROSURGICAL CONTROVERSIES

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Objective & design: Primary intraorbital meningiomas are tumors developed from the optic nerve dural sheath, ectopic arachnoid cells within the orbit or from the arachnoid cells around the superior orbital fissure. Secondary intraorbital meningiomas are extended from the surrounding intracranial regions into the orbit.

Material and methods: We present our personal cases, the medical records of all patients with intraorbital meningiomas admitted in the Neurosurgical Department of the Cluj County Emergency Hospital between 1969 - 2012. In this period of time, 858 cases of orbital masses were admitted,

68 cases were intraorbital meningiomas (7.9%) Clinical data, neuroimagistical aspects, treatment and postoperative course of the disease and the quality of life are discussed.

Results: - Primary intraorbital meningiomas are rare, 11 cases (12.7%). The most important primary intraorbital meningiomas were optic sheath meningiomas (6 cases - 6.9%) and intraorbital ectopic meningiomas (5 cases - 5.8%).

- Secondary intraorbital meningiomas were more frequently found in neurosurgical practice, 57 cases (87.3%): internal sphenoid wing meningiomas with intraorbital extension, 26 cases (30.2%), cavernous sinus meningiomas with intraorbital extension, 9 cases (10.4%), multiple meningiomatosis with intraorbital extension, 6 cases (6.9%), olfactory groove meningiomas with intraorbital extension, 5 cases (5.8%), clinoid meningiomas with intraorbital extension, 3 cases (3.4%), orbital roof meningiomas with intraorbital extension, 3 cases (3.4%). In 2 cases, secondary intraorbital meningiomas were associated with NF type1. Recurrent intraorbital meningiomas - 1 recurrency in 8 cases, 2 recurrences in 6 cases 3 or more recurrences in 3 cases.

The treatment is individually recommended in each case, depending on the location, dimensions and growth rate of the tumor, - consists of ON decompression, tumor biopsy, partial or total removal of the tumor, according to the balance of risk and benefits after surgery.

Conclusions: In the intraorbital meningioma cases, not only the treatment, but even some diagnostic and neuroimagistical data are controversial. In primary optic sheath meningiomas radical

surgery always lead to visual loss, in deep apically located meningiomas, postoperative sequelae are hardly acceptable. In this cases, late surgical treatment is recommended. Secondary intraorbital extensions of the intracranial meningiomas present the better postoperative outcome after total removal. In some cases, subtotal extension and radiotherapy is the best choice.

IN VITRO INFLUENCE OF 2-METHOXYESTRADIOL ON GLIOBLASTOMA STEM CELLS

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Objectives and design: Glioblastomas (GBM) are the most frequent type of glial tumors. Although extensive research has been done in search for a curative treatment, the actual multimodal treatment still offers only poor prognosis. 2-methoxyestradiol (2-ME) is a natural steroid hormone, formed by hydroxylation and O-methylation of the estradiol molecule. Our purpose was to investigate the effect of 2-ME on the proliferation of glioblastoma stem cells and if it influenced the effect of other consecutive therapies.

Material and method: Cultures of glial tumor stem cells-isolated from the GBM of a 55 year old female patient, characterised by a very high proliferation rate, were treated with increasing doses of 2, 10, 25 and 50 μM 2-ME and 10 μM 2-ME and 100 mg of Temozolomide. Cells were then kept either in normal or hypoxic conditions for

48 h. Radiation therapy consisting of a unique dose of 6 Gy was then applied to some of the cultures. Proliferation rate was measured at 72 h using the MTT protocol.

Results: Hypoxia didn't exert any significant influence over proliferation. The 25 μM 2-ME dose inhibited proliferation both in hypoxic and normal conditions ($P < 0.05$, 95% CI of 0.225-0.039, 0.11-0.0734 respectively). The 50 μM 2-ME dose had the same inhibitory effect ($P < 0.05$, 95% CI of 0.235-0.047, 0.13-0.0632 respectively). This effect was visible both in irradiated and non-irradiated cells. The combination of 2-ME and temozolomide had the same inhibitory effect both in irradiated and non-irradiated cultures.

Conclusions: We conclude that 2-ME could be a viable part in the multimodal therapy of glioblastoma. The effect of 2-ME is not dose dependent. Also the inhibitory effect on proliferation of GBM stem cells is independent of consecutive applied radiation or other chemotherapy.

CERVICAL SPINAL CORD HERNIATION AT SEVEN YEARS AFTER SURGERY FOR CERVICAL EPENDIMOMA

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Objective: We describe the case of a man, 50 years old, who was operated for a cervical ependimoma 7 years ago. He presented with a 2-year history of

progressive tetraparesis and the imaging studies showed a postoperative cervical spinal cord herniation.

Design: Herniation of the spinal cord is a relative rare pathology and can be spontaneous, iatrogenic and posttraumatic.

Materials and methods: A 50-year-old male patient presented with progressive tetraparesis that began 2 years ago; he had surgery 7 years ago for a cervical ependimoma, that was removed totally. Imaging studies showed a spinal cord herniation at C2-C3 level through a posterior dural defect. The surgery was the resection of the dural scar around the spinal cord herniation and reconstruction of dura with a musculo-adipose patch.

Results: Postoperatively, the patient made significant neurological improvements, and MRI showed the resolution of spinal cord compression.

Conclusions: Spinal cord herniation is a reversible cause of medullary dysfunction. The treatment of choice, particularly if there is associated a neurological deficit, is the surgical repair of the dural defect. Because this condition is rare and relatively unknown, there is often a delay in the diagnosis and surgical treatment. This pathology must be recalled when addressing a patient with progressive neurologic disturbance, especially if the patient has a clinical record of surgery involving the spinal cord.

POSTERS

PERCUTANEOUS INTERSPINOUS DEVICE FOR LUMBAR SPINAL STENOSIS

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Introduction: The percutaneous interspinous distraction devices are an alternative to conventional open surgical procedures in the treatment of symptomatic degenerative lumbar spinal stenosis. A new interspinous process implant, Superior, is used under local or general anesthesia, to treat patients with lumbar spinal stenosis.

Material and method: A cohort of 103 patients were operated between July 2007 - July 2008. All patients had back pain, neurogenic claudication with relief in flexion. MRI of the lumbar spine showed moderate foraminal or canal stenosis. In 18 patients Superior was implanted at 2 levels. In 85 patients it was implanted at 1 level: L4/5 (n=45), L3/4 (n=40). The mean follow-up was 35 months.

Results: VAS, SF-12 and ODI were improved in all but 15 patients. In 2 patients the implants were collapsed after 1 and 2 months. Two other patients underwent formal laminectomy with fusion.

Conclusion: Implantation of Superior is a minimally invasive alternative to traditional spinal surgery, a safe and effective treatment for patients with moderate lumbar stenosis.

LUMBAR EPIDURAL LIPOMATOSIS IN A PATIENT WITH HODGKIN LYMPHOMA

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Background/Objectives: Spinal epidural lipomatosis (SEL) is a pathological condition in which fat tissue is deposited in the spinal canal around the thecal sac in excess, causing neurological symptomatology (7, 9, 12). Fat tissue is present in our body almost everywhere. When the normal quantity is exceeded is created a pathological situation.

Case presentation: We present a 33 old man case with fat tissue excess deposited in lumbar spine canal. The pathological history of our patient includes a nodular form of stage IA Hodgkin lymphoma diagnosed in 2011 for what he went combined radio-chemotherapy. He also has been diagnosed with grad I obesity. In last month he presented with rapidly progressive symptoms like lower back pain, paraparesis and sphincters dysfunctions.

Findings: Thoracic magnetic resonance imaging (MRI) establishes a lumbar lipomatosis located in L3-S5 spinal canal. Pathology results confirm the imagistic diagnostic. Under surgery was performed a median laminectomy with fat tissue excision with good results in patient symptomatology.

Conclusion: Cortisone chronic therapy may lead to SEL. However in our case, Hodgkin lymphoma therapy led to cortisone complications. Neurological symptomatically patients should be treated surgically.

DORSAL RHIZOTOMY IN CHILDREN WITH SPASTIC PARAPLEGIA: A NEW SIMPLIFIED SURGICAL TECHNIQUE

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Introduction: Over a hundred years the lumbosacral dorsal rhizotomy is the neurosurgical indication in spastic children with cerebral palsy.

Objective: Analysis of clinical and functional results obtained with a new simplified surgical technique, quintessence of the two technical principles that govern dorsal rhizotomy: anatomical approach and selective functional approach.

Method: We illustrated eight cases of spastic paraplegia children: five ambulatory spastic subjects operated at L5-S1 spinal root level and three non-ambulatory cases with more severe functional spastic paraplegia, clinically presented as quadriped crawlers or bunny hoppers, operated at L4-S1 spinal root level. Statistical analysis using the Wilcoxon test (SPSS program) shows both a clinical improvement on Ashworth, Tardieu and Penn scales and an improvement on main functional scales as Gillette, test get-up and go or Physician Rating Score.

Discussions: Our anatomical and electrophysiological intraoperative observations are the basis for a new technical approach that respects both the classical selective sectoral surgical direction promoted by Gros and Sindou, the partial limited one of Lazareff and the partial limited one promoted by Peacock, Steinbok and Mittal.

Conclusion: Postoperative clinical and functional improvement allows presentation of the main advantages of our surgical technique: nerve root ablation standardization and reduction of operative time.

**IS “METABOLIC COUPLING”
ACROSS PRIMARY MOTOR AREAS
AND CEREBELLUM ALTERED IN
CERVICAL MYELOPATHY?**

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Introduction: In patients with cervical spondylotic myelopathy (CSM), proton magnetic resonance spectroscopy (1H-MRS) studies reported abnormal cerebral metabolites concentrations within radiologically normal-appearing motor-related brain areas. Recently, we found significantly higher choline, a marker of cell membrane integrity, in primary motor cortices (M1), and generally lower N-acetylaspartate, a marker of neuronal integrity, and higher myo-inositol, a putative marker of glial cells, in M1 and cerebellum¹. In some instances, choline levels relate to clinical severity¹. Although brain metabolic demands might be accomplished through pathways that link metabolites across multiple areas, how altered metabolite concentrations within one area are related to metabolite changes within another in cervical myelopathy is yet to be determined. Thus, our goal was to identify whether correlations among metabolites or “metabolic coupling” between M1 and cerebellum was altered in CSM patients.

Methods: In moderately impaired CSM

patients, N-acetylaspartate, myo-inositol, and choline were quantified (LCModel) in left and right M1 and cerebellum using PRESS at 1.5 Tesla (TE=30ms, TR=1500ms, flip angle=90, spectral width=1000Hz, 15x15x15mm in M1, 20x20x20mm in vermis). Thirteen CSM patients (confirmed by T2-weighted MRI) were studied before surgery. Spearman Rank Order correlation was used to determine the putative relationships between metabolites within (intra-regional) and across (inter-regional) our regions of interest. The mean metabolite correlation between these specific regions was compared between CSM patients and 14 age- and sex-matched healthy controls (Mann-Whitney U-test).

Results: Intra-regional correlations: Generally lower mean correlations between all metabolites were found in left M1 (-0.02 ± 0.27 vs. 0.35 ± 0.08 , $p=0.08$) and cerebellum (0.33 ± 0.30 vs. 0.57 ± 0.14 , $p=0.2$). Myo-inositol-choline correlation was the most altered (0.15 vs. 0.42 in left M1, 0.09 vs. 0.59 in cerebellum). Inter-regional correlations: Significant weaker metabolite correlations between right M1 and cerebellum were found (-0.12 ± 0.36 vs. 0.16 ± 0.10 , $p=0.03$). A trend to weaker correlations was also found between right M1 and cerebellum (0.04 ± 0.38 vs. 0.21 ± 0.20 , $p=0.2$). Cerebral myo-inositol-cerebellar choline and cerebral N-acetylaspartate-cerebellar N-acetylaspartate correlations were significantly decreased in CSM patients (left M1-cerebellum: -0.68 vs. 0.12 , 0.07 vs. 0.67 respectively; right M1-cerebellum: -0.62 vs. 0.10 , -0.17 vs. 0.33 respectively).

Conclusions: These preliminary results are the first evidence for the presence of weaker “metabolic coupling” (as measured

by correlation coefficients) within and between M1 and cerebellum in patients with cervical myelopathy, suggesting an alteration of neuron-glia interactions and consequently perturbed neuronal function. By moving beyond analysis of change in metabolite concentration within individual brain region, these results can increase our understanding of how 1H-MRS markers of metabolic processes are related in patients with cervical myelopathy.

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ABLATION OF DEEP BRAIN CEREBRAL TUMORS USING STEREOTACTICALLY GUIDE

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“By using the stereotactic guide in deep brain ablation lesions, huge advantages are conferred, approach to the lesion being done with minimal damage to the brain parenchyma and avoid areas eloquent.

In Neurosurgery Clinic I of Bucharest Emergency University Hospital there have been few cases of deep brain lesions operated using stereotactic guide.

We present the case of a 34 years old man operated for deep temporal lesion.

The surgery was a success using stereotactic guide and patient was discharged without neurological deficits.

RUPTURED ANEURYSM OF ABERRANT FRONTOPOLAR ARTERY EMERGING FROM ANTERIOR COMMUNICATING ARTERY: A CASE REPORT

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Introduction: Aneurysms are often associated with anomalies of cerebral arteries and they should be identified pre and intra-operatory. A large number of studies focused on the anatomical variations of the anterior cerebral – anterior communicating artery (ACA – AcoA) vascular complex. In this region we are interested in the frontopolar (Fpa) which normally branches off ACA distal to AcoA (A2 segment). Literature reports of the aberrant origin of the frontopolar artery, refer only to its anomalous origin from the A1 segment of ACA, from a common vascular trunk with orbitofrontal artery and from callosomarginal artery, but no reference mentions its origin from the AcoA. Aneurysms of the ACA branches are very rare and they are frequently saccular and rather small.

Case presentation: We present a case of a ruptured, fusiform aneurysm located on an aberrant FpA originating in the AcoA. A 19 year old man presented with severe headache, nausea and photophobia. Computer tomography (CT) showed focal subarachnoid hemorrhage in the interhemispheric fissure while cerebral angiography (Seldinger) revealed a prominent aneurysm emerging from an artery with the origin in the AcoA. Intraoperative diagnosis was that of voluminous, fusiform aneurysm stemming from the left FpA that arises from the left side of the anterior communicating artery.

The aneurysm was successfully clipped via pterional approach. The postoperative outcome was favorable and the patient had no neurological deficit.

Conclusion: Our review of the literature revealed no reports on the aberrant origin of the FpA from the AcoA nor an aneurysm related to this anomaly. This may be because injuries of the FpA have little clinical impact and this particularity of FpA from AcoA is extremely rare. The particularity of the presented case consists also in the unusual shape and the considerable size of the aneurysm that led to clinically significant complications. So we call attention to another rare anomaly of the ACA branches. All these points emphasize how important is for neurosurgeons to recognize the anatomical variations of the cerebral arteries in order to reduce poor postoperative outcome.

EMERGENCY DECOMPRESSIVE CRANIOTOMY FOR INCIDENTAL MIGRATION OF COILS INSIDE ICA-CASE REPORT

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The team presents the case of a 30 years old woman admitted to our department for SAH predominant in the anterior basal cisterns, in a good neurological condition (WFNS 1, GCS 15, Fisher 1). DSA

angiography revealed an left ICA saccular aneurysm located on the C6 segment, 3.2 mm distal of the origin of ophtalmic artery and 2.4 mm proximally of the left P Com artery. The maximum size was 16.01 mm /4.51 mm. The patient solicited endovascular embolisation. The procedure was performed according with standards. At starting the neuroradiologist remarked vasospasm and injected 20 ml Nimotop IV in 20 minutes. He introduced safely the microcatheter and the coil

(standard 11/30) inside the aneurysm. After coil detachment the coil was displaced and a new microcatheter was introduced in order to correct the position. A new control angiography in the next 15 minutes, revealed the irreducible displacement of an important part of coil inside the left carotid artery with complete occlusion. The circulation was partially compensated by vertebral arteries and controlateral ICA. A rapid decompressive craniotomy was decided in combination with IV anticoagulant, taking into consideration the next factors: dominant hemisphere, good neurological status pre-embolisation, young age, possible circulatory compensation through an efficient Willis polygone. The patient was immediately operated and after 24 hours she was weaned from advanced life support with a mild right hemiparesis and drowsiness. She recovered completely in 6 days and cranioplasty was performed after 3 weeks. Two months after, the patient returned to her previous life.

Conclusion: Emergency decompressive craniotomy in acute incidental ICA occlusion is a life saving procedure. When Willis polygone is efficient for circulatory compensation the postoperative quality of life might be the normal one.

OPERATIVE STRATEGIES IN RUPTURED POSTERIOR INFERIOR CEREBELLAR ARTERY ANEURYSMS

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Introduction: Posterior Inferior Cerebellar Artery (PICA) aneurysms represent approximately 3% of all intracranial aneurysms. The most frequent location is on the vertebral artery-PICA bifurcation. The distal locations are less frequent but these aneurysms have a more fragile aneurysm wall and are more prone to re-bleeding.

Materials and methods: The authors of this study present their experience in four patients with ruptured PICA aneurysms admitted and operated in our clinic between 2004 and 2012. All patients have been investigated by CT scan, 3D CT-Angiography or 3D DSA and have been operated using operative strategies according to the location of aneurysm on PICA segments. In three patients the aneurysm was clipped using a Yasargil vascular clip and in one case a wrapping has been performed. The follow-up period was between 4 months and 7 years (mean 3, 5 years).

Results: In our series there was one death at three days postoperatively secondary to a pulmonary embolism. The other three patients had a good outcome with no neurological deficits postoperatively. All three patients required ventriculoperitoneal shunts during the follow-up period, between 5 and 31 days after the operation.

Conclusions: The PICA aneurysms remain a neurosurgical challenge even for the most experienced neurosurgeons. The operative strategies must be adapted to the location of the aneurysm on the PICA segments and to the size and the configuration of the aneurysm.

FAR - LATERAL APPROACH FOR A GIANT DUMBBELL-SHAPED C2 CERVICAL SCHWANNOMA - CASE REPORT

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Introduction: Schwannomas are some of the most common extramedullary tumors, whose location at the cranio-vertebral junction is very rare. Giant tumors appear as dumbbell-shaped tumors and they develop mainly extradural with a huge extension outside the spine. The intradural position followed by penetration of the dural sac is very rare, especially when it is in front of the spinal cord. The far-lateral approach allows adequate exposure of the lesion to prevent manipulation of neural and vascular structures.

Case presentation: We report a case of 63 years old man, admitted in our clinic for neck pain and left body dysesthesia. Cervical MRI highlights a giant left C2 dumbbell-shaped intradural - extradural tumor (4/3 cm) which shifts spinal cord to the right side. Surgery was performed by a far-lateral approach with total resection of the posterior arc C1, left hemilaminectomy C2 and left suboccipital craniectomy. Complete resection of paravertebral component of the tumor was done, with left C2 nerve root section. After incision of the dura mater, the intradural component is

distinguished, which ascend in the posterior cranial fossa in front of the spinal cord and the bulbo-medullary junction. The left XI nerve was preserved and the dentate ligament was sectioned. After tumor debulking, the total resection was completed. Outcome was favorable with improvement of preoperative symptoms. The pathological diagnosis was schwannoma.

Conclusion: Far – Lateral approach is one of the best ways for surgical resection of these tumors and provides optimal visualization, without spinal cord manipulation.

BRAIN ABSCESS IN 95 PATIENTS: FACTORS INFLUENCING OUTCOME AND MORTALITY

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Objective: To analyze the management and variables determining morbidity, mortality and outcome in 84 subjects with brain abscesses treated over a 12-year period.

Methods: A retrospective study was performed on a series of 84 patients with brain abscesses surgically treated with open craniotomy excision between January 2000 – December 2011, in the Fourth Neurosurgical Department by the same team. Such variables as age, gender, clinical presentation, number of days to diagnosis, location, number of lesions, predisposing factors, mechanism of infection, etiological agent and therapy were analyzed independently.

Results: In our series, the average age was 42.96 years (range: 11-75), 72.62% (n=61) were males and 27.38% (n=23) females. The median number of days to diagnosis was nine (range: 2-45 days). Majority of cases (76.19% - 64 cases) presented a supposed medical condition favoring dissemination of a previous Most frequent clinical presentation included headache (40.47%, n=34), fever (35.71%, n=30), focal neurologic deficits (29.76%, n=25), increased intracranial pressure (28.57%, n=24) and seizures (11.90%, n=10). Mechanism of infection was hematogenous spread (35.71%, n=30), contiguous spread (33.33%, n=28), post-neurosurgical procedures (13.09%, n=11), and open head injury (5.95%, n=5). The route of transmission was unknown for 23.8% of the patients (n=20). According to our treatment policy all cases except two, (treated by burr-hole and aspiration) benefited of open surgery and removal of the lesions by craniotomy with resection of the capsule, without local recurrence. Outcome was favorable in 82.14% (n=69) of the subjects. Six cases remained with permanent motor deficit (7.14%), only one patients had new neurological deficits postoperatively. Four patients (4.76%) remained with controllable seizures. General morbidity was 26.19% (n=22), and mortality stood at 7.14% (n=6). Out of a total 33.33% (n=28) of complications, 64.28% were secondary to medical causes (66.66%, n=4, of deaths were due to medical causes not directly related to surgery) .

Age was related to favorable postoperative outcome. The mean age of patients with good outcome was 40.57 ± 16.25 years, and 55.48 ± 20.34 years in the case of subjects with poor GOS

scores. Compared with other mechanisms of infections, hematogenous spread correlated with unfavorable outcome.

Conclusions: Co-morbidities, advances age and hematogenous spread were predictors of poor prognosis. Most of the complications following brain abscess management were not directly related to surgery.

ANTERIOR CLINOIDAL MENINGIOMAS: MICROSURGICAL MANAGEMENT AND OUTCOME IN A CONSECUTIVE SERIES OF 38 PATIENTS

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Objective: Anterior clinoidal meningiomas are difficult and challenging to remove completely and safely especially when they compress, or displace the adjacent critical neurovascular structures. The purpose of this paper is to delineate the advantages of the surgical techniques in achieving an improved extent of tumor excision and enhancing the patients' overall outcome.

Methods and results: A retrospective analysis was performed on 38 consecutive patients with anterior clinoidal meningiomas who underwent surgical resection at the "Bagdasar – Arseni" Clinical Hospital between January 2007 and December 2011. The patients' age ranged from 18 to 75 years old with an average age of 47 years old. There were 25 females

(66%) and 13 males (34%). The presenting symptoms were mostly visual impairment; others symptoms were also encountered, such as raised intracranial pressure syndrome, cranial nerve palsies, seizures, mental changes, hemiparesis. The diagnosis was made predominantly by the MRI and angio MRI. Angiography was still useful to show relationship between the tumor and arteries. All patients had preoperative and postoperative ophthalmological evaluations. A fronto-temporal approach was used in 29 patients (76.3 %) and cranio-orbital approach with resection of the zygomatic arch was used in 9 (23.7 %). In 8 cases (21 %), according to the grading scale of Al-Mefty, the masses were group I, having originated from the lower part of the clinoid; in 27 cases (71 %) the masses were group II, having originated from the upper or lateral part of the clinoid process; and in 3 cases (8 %) the masses were group III since they arose from the optic foramen. The complete removal was obtained in 26 cases (68.4 %). Postoperatively, 18 patients showed an improvement (47.4 %), 11 were unchanged (28.9 %) and 9 presented further deficits (23.7 %). Three patients (7.9 %) died after surgery: one from pulmonary thrombembolism, one from cerebral ischemia after severe vasospasm of the internal carotid artery (unresponsive to treatment) and one from acute renal failure. The mean follow-up was 26.4 months. During this period, there were three recurrences and one patient underwent resection again. Adjuvant radiotherapy was not performed.

Conclusion: Although the use of modern microsurgical technique has clearly improved the outcome of clinoidal meningiomas, the chance for surgical cure remains problematic, especially in cases

with adherences to the internal carotid artery and its branches, involvement of the cavernous sinus and orbital structures.

OUTCOME OF TRANSSPHEOIDAL SURGERY FOR CLIVAL CHORDOMAS

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Objectives: Chordomas are uncommon tumors, arising from remnants of the primitive notochord and frequently located within the clivus. The location of the tumor determines the path of its growth and the surgical approach. The authors describe their experience with surgical access to the clivus via an extended endonasal transsphenoidal approach and discuss the utility of incorporating an endoscope into an open surgical procedure.

Material and methods: Between January 2001 and December 2011, 21 patients underwent extended endonasal transsphenoidal surgery for clival chordomas (13 males and 8 females, mean age – 47 years). In one case, an additional suboccipital approach was necessary to accomplish resection of an intradural extension of tumor. Patients were followed up from 6 months to 11 years. 27 endonasal transsphenoidal approaches were performed in 21 patients (two patients had second surgery and two patients had two additional surgeries). In 15 cases, the approach was endoscopically assisted.

Results: Postoperative MRIs after the initial operation showed gross total resection in 8 cases (38.09 %). Near total

removal (> 90%) was achieved in 7 cases (33.33 %). Subtotal resection was noted in 6 cases (28.57 %). Tumor regrowth imposed additional surgery in 4 cases (19.04 %). Use of the endoscope was associated with gross total or near-total removal. Gamma-knife radiosurgery was used in 4 cases (19.04 %).

Conclusions: The extended endonasal microscopic transsphenoidal approach yields excellent access to the clivus, medial cavernous sinus and intradural space anterior to the brainstem. The addition of the endoscope allows for a more panoramic view and permits widening of the approach in all directions.

RESULTS AFTER SURGERY FOR NON-FUNCTIONING PITUITARY ADENOMAS

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Aims: Clinically non-functioning pituitary adenomas range from being asymptomatic to causing significant hypothalamic and pituitary dysfunction and visual field defects. The object of this study was to evaluate the efficacy and safety of surgery in our cases of non-functioning pituitary adenomas.

Methods: The authors performed a retrospective analysis of 154 patients who underwent resection of non-functioning pituitary adenomas from January 2009 through May 2011. There was 87 male and 67 female (mean age = 52.3 years; follow-up = 6 - 28 months).

Results: Tumors were usually large at the time of diagnosis, commonly presenting with headache (109 cases – 70.7 %), visual field defects (56 cases – 36.3 %) and hypopituitarism (80 cases – 51.8 %). Pituitary apoplexy was the presenting symptom in 33 cases (21.4 %). Transsphenoidal surgery was the primary treatment for adenomas, whereas transcranial surgery was reserved for the cases in which the sphenoid sinus was not pneumatized or when the tumour was mainly extrasellar. Gross total removal was achieved in 95 out of 154 patients (61.7 %). Residual tumours or tumour regrowth imposed additional surgery in 34 cases (22.0 %). The improvement of vision was achieved in 85.7 % of cases. Postoperatively, patients showed varying improvement of pituitary function. There were no serious operative complications. Stereotactic radiosurgery was used for control of residual tumours.

Conclusions: Transsphenoidal surgery remains the treatment of choice for rapid decompression of neighbouring structures in non-functioning pituitary adenomas, often bringing to normalisation or improvement of visual and pituitary function.

ENDOSCOPIC ENDONASAL TRANSSPHEOIDAL SURGERY FOR PITUITARY ADENOMAS

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Aim: To assess the effectiveness of the endoscopic endonasal transsphenoidal

approach in the management of pituitary adenomas.

Methods: We retrospectively analyzed 152 patients with pituitary adenomas who was operated on between January 2003 and December 2011 (85 women and 67 men; mean age = 43 years; follow-up = 6 months - 9 years). The series consisted of 49 GH-secreting adenomas, 20 PRL-producing adenomas, 21 mixed GH&PRL-producing adenomas, 8 corticotroph adenomas, one case of thyrotroph adenoma and 53 non-functioning pituitary adenomas.

Results: Among the 20 patients with prolactinomas, 14 patients exhibited normalized prolactin levels postoperatively. In the acromegalic patients, there were 12 macroadenomas and 58 microadenomas. Among the macroadenomas, endocrinologic remission was observed in 4 cases, minimal improvement in 2 cases and no changes in 6 cases. Among the microadenomas, endocrinologic remission was observed in 34 cases, improvement in 10 cases, minimal improvement in 4 cases and no changes in 10 cases. When a residual tumor in the cavernous sinus was identified, gamma-knife surgery was used. The 8 patients with Cushing's disease had resolution of hypercortisolism clinically and chemically. The surgery was curative also in the case of thyrotroph adenoma. Postoperative morbidities included cerebrospinal fluid leak in 4 cases (2.63%), temporary diabetes insipidus in 8 cases (5.26%) and sinusitis in 2 cases (1.31%).

Conclusions: The endoscopic endonasal transsphenoidal approach is an effective surgical option for pituitary adenomas. A low incidence of complications has been observed, likely because of the improved visualization of the anatomy and the decreased surgical trauma.

1001 LUMBAR DISC HERNIA - MICROSCOPIC APPROACH - RESULTS - A 5 YEAR EXPERIENCE

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Removal of a herniated disc with the use of the operative microscope was first performed by Yasargil in 1977. However, it began to be used more and more only in the late 1980s. The merits of this technique are that it allows every type of disc herniation to be excised through a short approach to skin, fascia and muscles as well as a limited laminectomy. For these reasons, it has been, and still is, considered the "gold standard" of surgical treatment for lumbar disc herniation, and the method used by the vast majority of spinal surgeons.

The series that we present here was selected as only lumbar disc hernia without any other associated pathology (lumbar stenosis, spondylolisthesis, etc). All cases have been treated by microdiscectomy technique. We use Zeiss Vario Opmi+ S88 microscope. In all cases the intersomatic control have been achieved by being at the end of the surgery the anterior longitudinal ligament, all fragments being taken away, the root being left mobile and free beyond the ganglia and the junction foramina being controlled and left mobile and free by any disc fragments. After removal of the disc the space was washed with bethadine solution. The suture has been carried on with Vicryl 2-0 in a continuous way, as well as the subcutaneous tissue. Skin closure with 3-0 silk, continuously.

No infections after 5 years we encountered, and for five patients we do perform another surgery at the same level,

two of them after mild lumbar trauma.

The other patients went well with kinetotherapy, and from 32% of cases with mild to severe deficits before surgery, more than 90% recovery was very good (4+ out of 5 motor scale).

MULTIPLE LITTLE INTRACRANIAL ANEURYSMS WITH FAMILIAL INHERITANCE

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In this particular case, the authors have studied a family in which two of the members on the same genetic line—mother and daughter have suffered intracranial bleeding from ruptured aneurysm. The congenital nature and the patterns of inheritance of the disease are discussed. The indications for elective investigation of the asymptomatic relatives and surgical prophylaxis on asymptomatic aneurysms are also discussed.

Material and method: Two cases, same hereditary line, same nosocomial pattern, rare case of multiple intracranial aneurysms. Surgical treatment of ruptured and unruptured aneurysm, same part, same time.

Results: Operated patient done well without neurological deficits after one year.

Conclusions: Making good judgment based on complete investigations lead to a good outcome. Further investigations on family hereditary aneurysm small lesions should be performed. Familial intracranial

aneurysms are uncommon. Multiple familial intracranial aneurysms are much more uncommon. According to our review of the literature, only few families are known to have more than one of their members with multiple aneurysms. Our report describes a family in which mother and daughter had multiple intracranial aneurysms.

ROLE OF NEURONAVIGATION IN ELOQUENT AREA LESIONS

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This work is meant to present the important role of neuronavigation either in localizing small lesion especially in eloquent areas but as well the help during surgery in modifying the technic and simplifying the judgment during surgery.

We have now 17 cases of cerebral lesions in a 6 year period, (5 cavernomas, 5 meningiomas, 4 metastasis, 3 gliomas).

In all cases we perform an contrast cerebral IRM and angio-IRM, and planned the surgery according with the calculations made on the console. The shortest route has been choosed, the as possible fine dissection has been carried on, and in 8 patients we have an improved neurological deficit after the surgery, 6 cases with seizures free postoperative course, 2 cases with hemorrhage in tumoral bad witch necessitate evacuation and one with melanotic metastasis with a 46 days free of symptoms with good radiologic control, and after with a smaller recurrence in the same place.

We do learn after using the neuronavigation system that even the work

is more time consuming in planning the surgery the satisfaction by easing the surgery itself worth using.

PITUICYTOMA - MR IMAGING, CLINICAL SIMPTOMS AND OUTCOME

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We report a case of pituicytoma, a rare primary tumor of the neurohypophysis. A 48-year-old woman presented with progressive visual complaints, bitemporal hemianopsia, and headache with vomiting. In the past year the patient have been hospitalise in psihiatric departement for acute depressive state, during the last being scanned on CT wich disclosed a large suprachiasmatic multicistic mass lesion and had been refferd to us.

Imaging studies revealed distinctive features of a mass lesion that thickened the pituitary stalk with a multicistic protrusion extending into the hypothalamus, temporal lobe, mesencefalon and cavernous sinus.

Pituicytomas are very rare primary tumors of the adult neurohypophysis, and only a few case reports of true pituicytomas exist in the literature.

Pituicytes are glial cells of the neurohypophysis that support the large axons of vasopressin and oxytocin-producing hypothalamic neurons. Pituicytomas are considered low-grade astrocytomas of the neurohypophysis, distinct from intracranial granular cell tumors (GCT) and pilocytic astrocytomas. They are histologically benign, but their hypervascular nature makes surgical resection difficult. In the literature local recurrence after subtotal resection is

common. The imaging characteristics of pituitaryomas are nonspecific, but MR imaging are essential for surgical planning and can reveal details about the extension and structures being compressed by the tumor.

SACRAL ARACHNOIDIAN CYST – CASE REPORT, SURGICAL TECHNICAL METHOD

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We present a case of a young woman, 39 years old, medical nurse, who came first time in our hospital with moderate nuchal pain, easily relieved by common antalgic treatment. She has been investigated with cervical spine MRI which show moderate modifications of cervical discs.

Two weeks after his first presentation, suddenly present slowly growing pain in the lumbar region, from light pain to unbearable pain and has been address in emergency to another hospital for emergency treatment.

The day after we admitted the patient and perform an lumbo-sacral MRI which show multiple sacral S2-S3 cysts of 5 cm in contact, with pressure on the sacral anterior wall and bone destruction both anteriorly and posteriorly, the pressure effect making the maximum thickness of the bone around 1 mm.

Any treatment at all could this time kill the pain so we propose surgery and the patient accepted willingly.

A linear midline lumbosacral incision and we found a translucent bone under 1mm thickness that we removed under the microscope. The cyst on the left side appear

immediately and we made a linear incision, drain the fluid and observe the root inside floating free. A reshape of the cyst wall was performed by cutting free 1 cm on both side of the incision edge, superposed the margins on another 1cm common soil and making a noninterrupted, nonresorbable 5-0 suture.

The pain disappears the day after the surgery, no deficits, no urinary disturbances.

Ten days a small leakage at the incision site appears of CSF which has been solved with bed rest and local pressure.

Eight months after the surgery the patient is back on her job.

ANTERIOR CIRCULATION INTRACRANIAL ANEURYSMS - PERSONAL SERIES

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Cerebral aneurysms represents the most common cause of nontraumatic subarachnoid hemorrhage. Overall, about half the patients die within the first month of their hemorrhage. They represents major cerebrovascular emergencies, whose management requires a tight collaboration between neurologist, neurosurgeon and neuroradiologist. The treatment modalities are numerous, but surgical clipping remains the most effective and safe method of management. Surgical clipping of the neck of the aneurysms and flow preservation in all the efferent vessels remains the gold standard of intracranial aneurysms therapy. Intracranial aneurysms may pose formidable surgical problems, even to the most experienced

neurosurgeons. Surgical approaches must be large, with minimal retraction and maximal surgical exposure.

We present a series of 48 intracranial anterior circulation aneurysms in 42 consecutive patients admitted to the Neurosurgical Department of the National Institute of Neurology and Neurovascular Disease, between September 2010–September 2012, and whose management consisted in surgical clipping in 91,8%.

SURGICAL NUANCES IN DISTAL ANTERIOR CIRCULATION INTRACRANIAL ANEURYSMS

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Distal anterior cerebral artery (DACA) aneurysms, also called the pericallosal artery aneurysms are rare, being encountered in about 6% of all intracranial aneurysms and

are located distally to the anterior communicating artery (ACoA) on the A2–A5 segments of the ACA, the most common at the A3 segment, anterior to the genu of the corpus callosum. DACA aneurysms are small, and often with wide necks and presents more often with intracerebral hematomas than ruptured aneurysms in general and are associated with anomalies of the ACA. Surgical clipping is a safe and effective treatment method, which requires detailed knowledge of the microanatomy of the anterior cerebral artery and the surrounding structures. The challenge is to select the appropriate approach, locate the aneurysm deep inside the interhemispheric fissure, and to clip the neck adequately without obstructing the branching arteries.

We present a personal series of four cases who underwent surgical clipping between February and August 2012 in the Neurosurgical Department of the National Institute of Neurology and Neurovascular Diseases.