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**Intracranial vascular malformation a  
surgical point of view**

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*Introduction:* In this paper we want to describe our surgical experience and strategy in the field of intracranial vascular malformation and the current management of these lesions, in the absence of endovascular preoperative embolisation or neuronavigation facilities.

*Patients and methods:* The retrospective analysis of 192 intracranial vascular malformations admitted and surgically treated in our department between June 1996 and November 2012. From all intracranial vascular malformations 66% (127) are arteriovenous malformations, and 34% are cavernomas (65 cases). The diagnosis was established based on clinical findings, CT, MRI, angiography, and confirmed with pathological findings.

We recorded a minor male preponderance (54% for AVMs and 58% for Cavernomas).

The peak incidence has been found in the 5<sup>th</sup> decade.

*Results:* The major clinical findings were: hemorrhage, seizures, progressive neurological deficit, and headache and according to Spetzler-Martin grading system most cases of AVMs were grade II and III (65%).

All the cases included in the study were treated surgically.

For arteriovenous malformation, postoperative complications were: transient neurological deficits (11%), hydrocephalus (9%), and re-bleeding (9%). The outcome was GOS 5 and 4 in 86% of the cases. In 20% of the cases, the AVMs had associated aneurisms, treated in the same operatory session.

For cavernomas, postoperative complications were predominantly seizures and neurologic deficits (each 11%), and then hydrocephalus, and re-bleeding. The outcome was good (GOS 5 and 4) in 77% of the cases. The mortality rate for the entire series was 1.53% (meaning a case with multiple cavernomas).

*Conclusions:* The best treatment of an intracranial vascular malformation is surgical resection, subtotal resection being in our opinion not a good option in surgery.

**Key words:** intracranial vascular malformation, surgical resection.

**Current aspects in the surgical  
treatment of AVMS – analysis of a  
personal series of 26 cases treated  
surgically and pathologically  
confirmed in 3 years**

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*Introduction:* Microsurgical treatment of AVMs changed in the last years due to access to Gamma-Knife and the development of endovascular techniques in our department in Iasi.

*Patients and methods:* We analyze 26 cases of AVM treated surgically and confirmed by imagistic and anatomo-pathological studies in the 07.2010-06.2013 period.

*Results:* We looked at: Spetzler grade, presentation, previous treatments, localization, preop and postoperative clinical status, pre- and postoperative imagistic, complications.

*Conclusions:* Microsurgical resection plays still a major role in the definitive treatment of AVMs either as a single treatment or in conjunction with endovascular techniques or Gamma-Knife radiosurgery in complex cases.

**Key words:** AVM, microneurosurgery, treatment

### **Microsurgical management of brain arteriovenous malformations: long-term outcome and results**

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*Introduction:* Brain arteriovenous malformations (AVMs) are congenital complex network of dysplastic vessels.

*Material and method:* We retrospectively reviewed medical records of patients with

brain AVMs operated from 1998 to 2013, in the Fourth Department of Neurosurgery, Emergency Clinical Hospital Bagdasar-Arseni.

*Results:* Fifty-three patients with brain AVMs underwent surgery. Mean age was 37.58 years, varying from 17 to 85 years. Eight patients (15.1%) had AVMs Spetzler-Martin grade I, 12 patients (22.6%) grade II, 21 patients (39.6%) grade III, 7 patients (13.2%) grade IV and 5 patients (9.4%) grade V. Forty-six patients (86.8%) had supratentorial and 7 (13.2%) had infratentorial lesions.

We performed total resection of AVMs in 39 cases (73.6%). Fourteen patients (26.4%) had residual nidus. Patients with residual nidus were referred to stereotactic radiosurgery with good outcome.

Thirty-four patients (64.2%) presented increased modified Rankin Score (mRS) following surgery, in 6 cases (11.3%) mRS remained unchanged and 13 patients (24.5%) presented decreased mRS. Mortality rate was 9.4%. Long term follow-up showed excellent quality of life in 22 patients (45.8%), good quality of life 10 cases (20.8%), mediocre quality of life in 8 patients (16.7%) and a poor quality of life in 8 cases (16.7%).

*Conclusions:* Microsurgery is the treatment of choice in AVMs. Surgical results are excellent, with low morbidity rate. Patients with poor surgical results belonged to the group admitted with severe altered state of consciousness, massive hematomas, acute brainstem dysfunction. If for any reason part of the nidus cannot be safely surgically resected, stereotactic radiosurgery can provide definitive cure.

**Key words:** arteriovenous malformation, microsurgery, outcome.

## Current protocol of brain glioma treatment in the neurosurgery clinic of Iasi – a retrospective study of 341 cases

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**Introduction:** Multidisciplinary, multimodality, and maximal safe resection are the current standard in the therapeutic approach towards brain glioma. Although an increasing body of biological data raises promising new possibilities for targeted treatment microsurgical resection, radiotherapy, and chemotherapy still represent the main line of defense against this pathology. However, new technical developments and clinical evidence impose significant changes in the protocols and therapeutic approach.

**Patients and methods:** We have analyzed a series of 341 cases of gliomas which were diagnosed and surgically treated between March 2010 and March 2013 following the current diagnostic and therapeutic protocols, including functional imaging, microsurgical resection, intraoperative neuronavigation and ultrasound, and awake surgery for eloquent areas tumors. We have excluded the patients without histological confirmation and patients with infratentorial lesions or the age under 18.

**Results:** In our series we have observed a slight predominance in males 55.4 %. The main symptom besides headache was the impairment of the motor function observed in 36.3 % cases and seizures in 30.9% cases. The preponderant age group was between 51 and 60 years of age (31% ). The complete resection was obtained in 35.4% of cases and in other 61.8% of cases radical

surgery was not possible because of the tumor infiltration in basal ganglia (21.8%), eloquent areas (49%), and invasion of vascular structures (13.6%). The main complications were: hemorrhage in the tumoral resection bed (13.6%). All patients were directed, after recovery from surgery, to the oncology department for adjuvant therapy (Rxt/Cht). In 36 patients there was a second operation for recurrence and the average time for re-intervention was 15,6 months.

**Conclusions:** Early imaging diagnosis, using high sensitive MRI exams, and maximal safe microsurgical resection are in our series the factors that significantly improve the outcome of brain gliomas aided by a coherent adjuvant therapy plan. Nonetheless, complete cure is difficult to assess and needs long periods of follow-up. We present the most interesting cases of our series and discuss the advantages and disadvantages of our current therapeutic and surveillance protocol for brain gliomas.

**Key words:** glioma, microsurgery, treatment.

## Low grade gliomas surgery - how I do it

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**Introduction:** Low grade gliomas include numerous histopathological types with varying peculiarities considering evolution, diagnosis, imaging and treatment. Despite their slow growing nature, they are not in most of the cases benign tumors, malignant

transformation being described in all histopathological types.

The aim of this study is to highlight some of the elements concerning the role of surgery in the treatment of low grade gliomas

*Patients and methods:* We present a retrospective study of 400 low grade gliomas, representing 40,1 % of 997 operated by the main author (Prof. Dr Florian) between 01.01.2000 and 31.12.2012, accounting for 33,18% out of the total of 3004 tumors operated within the same interval. 224 cases of low grade gliomas met the inclusion criteria for multivariate statistical analysis in order to define the role of radical surgery in low gliomas treatment.

*Results:* From a total of 400 low grade gliomas cases pilocytic astrocytomas represent 23,5 % (94 cases), grade II gliomas (astrocytomas, mixed gliomas) represent 44,5% (178 cases), oligodendrogliomas 10,7% (43 cases) and ependimomas (grade I and II) 15,25% (61 cases). Gross total removal was achieved in 88% of the cases. The improvement of the KPS scale is significantly higher ( $p < 0,05$ ) in patients with gross total removal of the tumor.

*Conclusion:* The extent of removal independently influences the outcome, but no correlation with malignant transformation could be established. Radical surgery must be the goal of the treatment of all cerebral gliomas.

**Key words:** low grade gliomas, radical surgery, outcome, prognosis.

### **Current surgical treatment and prognosis of S U - pratentorial low grade gliomas in adults**

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*Introduction:* The importance of surgical resection for adult patients with supratentorial low-grade glioma (LGG) remains controversial.

*Material and methods:* From June 2003 to June 2013, 84 adult patients with supratentorial low-grade gliomas were treated at "Bagdasar-Arseni" Clinical Hospital (Neurosurgery Clinic III). All patients underwent surgical intervention: gross total resection in 24 patients (>90%), subtotal resection (<90%) in 53 patients and biopsy in 7 patients. This retrospective study assessed whether the extent of resection was associated with improved survival and malignant transformation. The challenge for an optimal management of these patients is to find the balance between an optimal survival and the preservation of neurological function including cognition.

*Results:* In our group, histological subtypes were as follows: oligoastrocytoma in 22 patients (26 %), diffuse astrocytoma in 26 patients (31 %) and oligodendroglioma in 36 patients (43 %). Median preoperative tumor volumes were 46.2 cm<sup>3</sup> (between 8.3 and 174 cm<sup>3</sup>) and postoperative 5.8 cm<sup>3</sup> (between 0 and 132.2 cm<sup>3</sup>). Patients were divided into two groups by the resection grade:  $\geq 90\%$  and  $< 90\%$ . Overall survival

and malignant transformation were analyzed. Better survival rate was correlated with increased excision for diffuse astrocytoma but not for oligodendroglioma (which are sensitive to chemotherapy). Malignant transformation occurred in 11 patients (9 of the patients given post-operative radiotherapy) of subtotal resection group (9 male and 2 female).

**Conclusions:** Overall survival is significantly better and malignant transformation is reduced in patients with excision higher than 90%.

**Key words:** low-grade glioma, biopsy, surgery, overall survival, malignant transformation.

### Supratentorial low grade gliomas new achievements in diagnostic and treatment

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**Introduction:** Low grade gliomas (LGG) are slow growing tumors. The aim of the treatment is to simultaneously combine an optimal extension of resection by preservation of functional integrity with correct grading of tumor malignancy and the adequate adjuvant therapies in order to achieve a long survival, with a good postoperative quality of life. There are some important questions regarding LGG: What is the delimitation of LGG? What are the

therapeutical decisions: observation, surgical removal or biopsy?

Does surgical removal alone ever cure LGG? If recurrences appear, is another surgery recommended? What is the efficiency of radiotherapy and chemotherapy in LGG recurrences?

What are the indications of Gamma Knife Surgery (G.K.S.)?

**Materials and method:** Our experience in a series of 160 adult patients with supratentorial LGG, operated over a period of 11 years (January 2002 - December 2012) is presented, focusing on the newest achievements in the diagnosis of gliomas (neuroimaging, immunohistochemical analysis of tumor specimens), surgical treatment (intraoperative electrophysiology) and adjuvant therapies (oncological protocols). Preoperative diagnosis was based on 1T MRI images. Microsurgical resection was performed in all cases: total removal 79 cases (49,3 %), partial removal 81 cases (50,6 %), with no perioperative mortality. The outcome at 6 month (GOS): good recovery 135 cases (84,3%), moderate disability 21 cases (13,1%), severe disability 4 cases (2,5%). The follow-up period was between 12 months – 9 years with the medium range of 4,5 years.

Histological grading was assessed by classical pathologic examination and showed: fibrillary astrocytomas in 102 cases, oligodendriogliomas in 26 cases, oligoastrocytomas in 21 cases, dysembryoplastic neuroepithelial tumor in 5 cases, protoplasmic astrocytoma in 4 cases, ganglioglioma in 2 cases. In our data at 5 years postoperative we find: 11 patients were lost, recurrences to grade III-IV in 49 cases, regrowth grade II-III in 53 cases and 47 cases remain in evidence (grade II). The total number of regrowth-recurrences cases

is 102 (63,8%). It is very important to perform a check-up MRI exam every 6 months. LGG causing long-standing and medically refractory epilepsy are more likely to be associated with multiple epileptogenic foci, therefore intraoperative electrocorticography was used for tailoring the resection, together with intraoperative localization of central sulcus using somatosensory evoked potentials in tumors localized around the central area. Intraoperative electrophysiological monitoring was performed in 31 cases.

Because actually, the final diagnosis requires immunohistochemistry and also, study of the molecular biology of these tumors is an important step for understanding the genesis and biological behavior of these diseases, in the last years of the study we have performed also immunohistochemical analysis of the tumor specimens. We have studied in order to identify, quantify and compare, in a series of 37 cases of glioma surgical specimens (low grade and high grade gliomas), previously classified concerning their histological grade (WHO), the following immunohistochemical markers: Ki-67 proteins and PCNA (markers of the cellular proliferation), p53 (product of the tumor suppressor gene TP53), CD 34, VEGF, VEGFR2, bFGF (markers for angiogenesis). Surgical specimens were immunostained for p53 (Clona DO-7, Biogenex USA); Ki-67 (MIB-1; 1:50, DAKO- Glostrup, Denmark) and proliferating cell nuclear antigen (PCNA; 1:10, PC10 Dakote). Proliferative activity (nuclear immunostain) was measured. P53 immunoreactivity was positive in all grade III and IV gliomas, and in 50% of low grade gliomas.

With a median of 12% and 24% for MIB-1 and PCNA respectively, for all neoplasms in the study, the mean percentage positive nuclear area for MIB-1 and PCNA was 3.06% and 13.11% in low-grade (II) astrocytomas, 14.34% and 29.68% in highgrade (III) astrocytomas, and 18.77% and 44.11% in glioblastoma multiforme (grade IV). One-way analysis of variance showed a significant correlation between the histological grade and MIB-1 and between the histological grade and PCNA. Isolated cases of low grade gliomas with high MIB and PCNA percentage were noticed. CD34, VEGF, VEGFR2 and bFGF expression were determined by immunohistochemistry (CD34, Clone Q band, Immunotech; VEGF, sc-152, Santa Cruz Bioth.; VEGFR2, sc-7269, Santa Cruz Bioth.; bFGF, bFGF88, Biogenex). Immunoreactivity for CD34 was positive in all types of the tumors. Immunoreactivity for VEGF, VEGFR2 and bFGF was seen in both endothelial cells and tumor cells, with increased levels in more aggressive tumors, comparing with normal tissue where immunoreactivity was present only in endothelial cells.

*Conclusions:* LGG could be treated only surgically. We advocate the idea, that patients with LGG and medically refractory epileptic seizures, may undergo tailored resections. Incompletely resected tumors may be managed with irradiation in the tumor bed, or by observation alone. Proliferation in gliomas, measured as MIB-1 and PCNA, correlates significantly with histological grade, providing useful additional information for diagnosis evaluation of the tumor recurrence susceptibility. Angiogenesis markers could indicate the invasiveness tendency of the tumor. Correlated with the proliferation

markers, they express the aggressive tendency of the tumor and consequently, the prognosis.

As a result, the correct treatment and prognosis of the case could be evaluated, especially in LGG where the indication of radiotherapy is debatable. Despite the optimism associated with prognostic in LGG, these tumors usually recur, having a higher grade of malignancy. We consider that new, even more aggressive treatment protocols are needed for their management.

**Key words:** low grade gliomas, supratentorial, microsurgery, intraoperative electrophysiology, immunohistochemistry, neuro-oncology, Gamma Knife Surgery (G.K.S.)

### **Therapeutical decision in pediatric low grade gliomas; our opinion based on 408 cases**

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**Introduction:** Low grade gliomas (LGG) are slow growing tumors. Surgery realise citoreduction and establish the tumoral grading. There are some important points: delimitation of LGG; therapeutical decision: observation, surgery or biopsy; in recurrences, surgery ? radiotherapy (Gamma-Knife ?) ? chemotherapy ? Our goals are to evaluate the necessary factors for the therapeutical decision.

**Patients and methods:** Department’s 408 cases of LGG (including spinal) and literature were used. We consider: pilocytic

astrocytoma (62.99 %), fibrillary astrocytoma (15.44 %), ganglioglioma (11.03 %), gangliocytoma (1.71 %), oligodendroglioma (1.96 %), oligoastrocytoma (4.9 %), pleomorphic xanthoastrocytoma (0.49 %), dysembrioplastic neuroepithelial tumor (1.23 %), ependimoma (0.24 %); 0 central neurocytomas, subependymal giant cell astrocytomas, choroid gliomas of the third ventricle.

**Results:** In our serie, GOS was: GR 87.25 %, MD 9.55 %, SD 2.2 %, D 0.98 %. Recurrences at 5 years were 7.35 % and at 10 years 7.59 %. Surgical resection was 49.26 % total and 50.73 % subtotal.

**Conclusions:** We advocate as much as possible surgical resection, without new deficits, even in critical areas (for focal tumors). Observation or biopsy is indicated only for particular cases. In recurrences, surgery, radiotherapy and chemotherapy should be considered. In the future, molecular biology will help the prognosis and therapy.

**Key words:** low grade gliomas, pediatric, therapy.

### **Cerebellar pilocytic astrocytomas in children – a continous challenge**

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**Introduction:** Posterior fossa pilocytic astrocytomas represent approximately 27-40% of pediatric posterior fossa tumors.

These are benign tumors with a natural history of slow growth, this leading to a delay of diagnosis. Usually at the time when the child is referred to the neurosurgeon the tumor has big dimensions, usually accompanied by hydrocephalus.

*Material and method:* We present our experience in 107 cases of pediatric posterior fossa pilocytic astrocytomas treated in our department from January 2003 to December 2012. The average age at the time of diagnosis was 9,05 years. The period from the setting of signs and symptoms until the moment of diagnosis was 1 day to 2 years (mean period 2 months).

*Results:* Hydrocephalus was present in 87% of cases. Gross total resection was accomplished in 80,38% of cases (evaluation based on postoperative IRM). Outcome was favorable in 95,33% of cases.

*Conclusions:* According to the benign course of most cases of pediatric posterior fossa pilocytic astrocytomas, the goal of surgery is achieving maximum resection of tumor without producing new neurological deficits.

**Key words:** pilocytic astrocytoma, posterior fossa, child.

### **Analysis of 136 patients with intracranial glioblastoma: clinical characteristics, management and prognostic factors**

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*Introduction:* Glioblastomas are the most common primary brain tumours in adults. These tumours have an aggressive behaviour with a median survival after diagnosis about one year. The main therapeutic methods for this pathology are surgical resection, radiotherapy and chemotherapy.

*Material and methods:* Between June 2010 and July 2013, 136 consecutive patients were diagnosed with intracranial glioblastoma and surgically treated in our neurosurgical department from Emergency Clinical Hospital "Bagdasar – Arseni" Bucharest, Romania. Adequate follow-up was obtained for all patients of the study. There were 54 women (39.8%) and 82 men (60.2%) with age between 30 and 78 years old. The mean age at admission was 56.4 years.

*Results:* There were 133 supratentorial tumors, 2 brainstem tumors and one tumor located in the left cerebellar hemisphere. From the 133 supratentorial tumors, 26 were frontal (19.1%), 28 in the temporal lobe (20.5%), 6 in the parietal lobe (4.4%), 3 in the occipital lobe (2.2%), 8 in the basal nucleus (5.8%), 62 tumors were located in more than one lobe, sometimes with invasion in the corpus callosum. Of the 129 supratentorial tumors that were lateralized, 44.1% were located in the left hemisphere (60 patients) and 50.7% in the right hemisphere (69 patients). In two patients we found another associated tumors: one had a meningioma diagnosed and treated 2 years before the glioblastoma was diagnosed and the other patient had a tumor in the left ponto-cerebellar angle. Fourteen patients had needle biopsy, one patient had biopsy



during open surgery, for 118 the tumor was resected during surgery and 3 patients were untreated surgically. The histopathological examination confirmed the diagnosis of glioblastoma in operated patients; in one case sarcomatous elements were also observed.

**Conclusions:** Patients with glioblastoma who underwent radical excision of the tumour followed by adjuvant radiotherapy and temozolomide have an improved survival compared to patients undergoing biopsy or subtotal resection. In conclusion, younger age, small tumors, gross or near total resection, radiotherapy and temozolomide therapy are factors that predict prolonged survival. The findings of this study may help guide treatment and prognosticate survival for patients with glioblastomas.

**Key words:** glioblastoma, biopsy, surgery, radiotherapy, chemotherapy.

### **Prognostic factors and survival following surgery for malignant glioma**

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**Introduction:** Despite the remarkable advances in surgical techniques, adjuvant treatment strategies and the use of the operating microscope, malignant brain glioma remains a serious disease that is never cured. Even if the modern diagnostic and surgical procedures contributed to the reduction of the perioperative morbidity and mortality rates in malignant gliomas, the odds of significant long term survival has remained poor and stable for the last three decades.

**Patients and methods:** A retrospective study evaluated 120 consecutive patients diagnosed with malignant supratentorial glioma who underwent surgery at the Vascular Neurosurgical Department of the National Institute of Neurology and Neurovascular Diseases between april 2008-july 2012. There were 72 women and 48 men; age range 21-78 years, mean 52 years. Patient were followed-up until death or up to 14 months after enrollment in the study and survival data were correlated with the histopathological grade and location of the tumor, the extent of surgery, the patient's performance status, the applied adjuvant therapies, complications, tumor recurrences, the time interval from the onset of symptoms to diagnosis and surgical treatment. The postoperative quality of life was assessed with the help of the KPS. Survival curves were calculated by the Kaplan - Meyer method to account for varying periods of follow-up.

**Results:** In multivariate analyses, the extent of resection, age 65 years or younger and a KPS score of 70 or great, and anaplastic oligodendroglioma were associated with a prolonged survival time for patients with malignant gliomas. Multifocal glioblastoma and anaplastic glioma apparently arose de novo are associated with poor prognostic.

**Conclusions:** This study provide evidence to support tumor grade, the extent of resection, patient's age and patient's functional status as prognostic factors for survival in patient with malignant glioma.

**Key words:** malignant glioma, survival, resection, prognostic.

### **Prognostic factors of the microsurgical treatment for recurrent glioblastomas**

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**Introduction:** Glioblastoma is the most common malignancy of the central nervous system with a poor outcome because of its tendency for recurrences. There are divergent opinions regarding the management of glioblastoma recurrence.

**Patients and methods:** The authors of this study present a series of 198 surgical procedures performed for glioblastoma recurrences in 156 patients admitted in our clinic between January 1998 and July 2013. The majority of patients (126 cases) underwent one operation for recurrences, 21 patients have been operated for two times (first and second recurrence), 6 patients for three times and 3 patients for four times.

**Results:** The surgical mortality in this series was 1,2 % and morbidity (new neurological deficits postoperatively) was 9,5%. The medium survival time for recurrent glioblastoma was 30 weeks. The authors correlated the medium survival time, mortality and morbidity with the following preoperative parameters: age, Karnofsky performance status (KPS) preoperative score, tumor location (dominant or nondominant hemisphere) and extension (lobar vs multilobar). Several preoperative criteria were found to be predictive for a better outcome in operated recurrences of glioblastoma: age < 70 years,

KPS score > 80 and location in non-dominant hemispheres.

**Conclusions:** Tumor resection should be considered for the following cases of glioblastoma recurrences: age < 70 years, tumor location in non-dominant hemispheres and symptoms related to tumor mass-effect. Careful selection of the patients, based on analysis of several specific preoperative criteria (age, KPS score, location, mass-effect), is important in order to obtain a better outcome and a good quality of life.

**Key words:** Recurrent glioblastoma, prognostic criteria, mortality, morbidity.

### **Nestin expression in biopsy samples correlates with the invasive phenotype of cerebral gliomas**

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**Introduction:** New evidences suggest that cancer stem cells (CSCs) play an important role in malignant gliomas invasion. Nestin is one of the most used markers for CSCs. The aim of this report was to analysis the relation between nestin expression in biopsy samples and gliomas invasion.

**Patients and methods:** Serial stereotactic biopsies have been performed for 49 patients, admitted in our institution between September 2010 and April 2013 with cerebral gliomas, using Leksell stereotactic system (Elekta, Sweden). All tissue samples included in study were from brain-tumor interface and were formalin fixed and paraffin embedded. Immunohistochemistry was performed

using the EnVision+ Dual Link System Peroxidase kit (Dako, Carpinteria, CA, USA) and primary antibodies anti nestin (Santa Cruz Biotechnology, CA, USA, dilution 1:50). Statistic analysis was performed using SPSS version 19.

*Results:* In forty cases (81,6%) the tissue samples presented three distinct areas: tumor area, intermediate area and distant areas. In nine cases (18,4%) only tumor tissue could be identified. There was a statistically significant correlation between the invasiveness of tumors (assessed by preoperative MR investigations) and the intensity of nestin expression for each area of the samples, as follows: nestin in tumor area ( $p=0,046$ ), nestin in intermediate area ( $p=0,001$ ) and nestin in distant area ( $p=0,011$ ).

*Conclusions:* Our results support the hypothesis that CSCs promote gliomas invasion.

Moreover, nestin could be a clinically relevant marker associated with the infiltrative phenotype of cerebral gliomas.

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**Key words:** nestin, gliomas, stereotactic biopsy, invasion.

### **Surgical approaches in lateral ventricle tumors**

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*Introduction:* Tumors of the lateral ventricle are rare lesions including a large variety of benign or malignant tumors and

cyst formations. The purpose of this study is to discuss the factors that affected the preference for transcallosal or transcortical approach.

*Patients and methods:* It was a retrospective series that comprised 26 consecutive patients who underwent operation for lateral ventricle tumors between 2006-2013.

The main clinical symptoms and signs were associated with the localization and size of the tumors. Cerebral computed tomography and magnetic resonance imaging were used to determine the location and expansion of each tumor. The transcortical approach was used in 15 patients and the transcallosal approach was used in 11 patients.

*Results:* Total tumor resection was achieved in 19 patients. Most frequent histologic tumor's type were glioblastoma (5), choroid plexus papilloma (5), ependymoma (4) and meningioma (4). Signs of increased intracranial pressure were most dominant. One patient died because of postoperative intraventricular hemorrhage. Additional neurological deficits were seen in 3 patients and postoperative seizure occurred in one patient. Two patients, one with postoperative hydrocephalus and the other with postoperative epidural hematoma required reoperation. 15 of 26 patients received postoperative radiotherapy.

The mean duration of postoperative evaluation was 24,32 (range 5-92). We reoperated 2 patients due to recurrence.

*Conclusions:* The nature, size, location and vascularization of intraventricular tumors are the most important elements influencing the choice of surgical approach. Surgeons must evaluate all these factors and prefer the short and safe way to remove the tumor.

**Key words:** transcortical approach, transcallosal approach, prognostic factors.

### Management of intramedullary astrocytomas

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**Introduction:** Primitive IMT represent 8-10% of all primary tumors of the spinal cord. Only 2- 4% of all CNS tumors in adults are IMT. SC tumors are much less common than intracranial tumors with an overall prevalence of approximately an intramedullary tumor for four intracranial tumors, with variations depending on the type of tumor. For example, the location intracranial/spinal for astrocytomas is approximately 10/1, while the same ratio for ependymomas varies from 3/1 to 20/1 depending on the histological type of ependymoma. In particular, mixo-papillary ependymomas are found more frequently in the SC (1).

**Patients and methods:** Patients enrolled in the study were hospitalized and operated in the period 2003-2009 in Neurosurgery I Clinic, Ward II, "Bagdasar-Arseni" Clinical Emergency Hospital for IMT in various locations. 59 patients were included in the study, age between 15 and 70 years, 40% female sex ratio = 1.5. 62 surgeries were performed. All patients were operated on by the same surgical team, same main operator.

**Results:** We prospectively analyzed clinical, imaging and pathological data from all consecutive patients operated for intramedullary tumors in our department (Neurosurgery I Clinic, Ward II) between

January 2003 and August 2009 (80 months). All surgical interventions were performed by the same surgical team. We emphasized the technical difficulties raised by ablation of IMT depending on the type of the tumor and postoperative neurological outcome.

**Conclusions:** Astrocytomas grade I could be completely or partially ablated. Total or almost total ablation is due to the cleavage plane between IMT and normal medullary tissue. In low-grade astrocytomas, where there plane cleavage is present, total or almost total ablation is the goal.

- Astrocytomas grade III and IV and part of grade II astrocytomas (with anaplastic cells elements) were subtotally ablated because of their infiltrative nature.

- There were no major intraoperative complications, postoperative immediately and/or delayed.

- All cases of grade III and IV astrocytomas have clear indication for postoperative radiotherapy.

**Key words:** intramedullary astrocytomas, surgery, postoperative neurological outcome.

### The first year experience in the spinal instrumentation neurosurgery - from microneurosurgery to the spinal neurosurgery

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**Introduction:** Increasing incidence of spinal column pathology as trauma, tumor and degenerative disease led to "explosion"

of spinal fusion surgery in our country. Analysis of own experience in diversity of spinal fusions using same company implants and screws.

*Patients and methods:* Retrospectively, we analyzed 18 spinal fusion cases, performed in the Neurosurgical Clinic of the Institute of Neurology and Neurosurgery, Chisinau, Moldova from November 2012 to September 2013.

*Results:* From all spinal column pathology 8 cases were traumatic and 10 were degenerative. Topographical level of the lesion was: lumbar spine pathology - 13 cases, of which 10 cases were nontraumatic pathology, 3 cases traumatic one. In cervical and thoracic segment all cases were exclusively traumatic, 2 case at cervical level, 3 cases at lower thoracic level. Depending on the type of spinal fusion were performed: 10 cases of transpedicular isolated fusion, of which 6 cases with fixation in 2 levels, 1 case of spinal fixation in 3 levels and 3 cases with fixation in 4 levels.. Exclusively in neurosurgical practice from Republic of Moldova were performed cervical fusion with ADD plus and intersomatica Golden Gate plates.

*Conclusions:* In all cases we obtained good anterior and posterior compartments fusion.

**Key words:** Spinal instrumentation surgery.

### **Incidental durotomy in lumbar spine surgery: incidence, risk factors and management**

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*Introduction:* Incidental durotomy is a common complication of lumbar spine operations for degenerative disorders. Its incidence varies depending on several risk factors and regarding the intra and postoperative management, there is no consensus. The aim is to present our experience with incidental durotomy in patients who were operated on for lumbar disc herniation, lumbar spinal stenosis and revision surgeries.

*Methods:* Between 2009-2012, 1259 patients were operated on for degenerative lumbar disorders. For primary operations, the surgical approach was mini-open, interlaminar, uni- or bilateral, as for recurrences, the removal of the compressive element was intended: the epidural scar and the disc fragment. There were operated on 863 patients (67.7%) for lumbar disc herniation, 344 patients (27.3%) for lumbar spinal stenosis, and 52 patients (5%) for recurrences. The operations were performed by neurosurgeons with the same professional degree but with different operative volume.

**RESULTS:** Unintentional durotomy occurred in 20 (2.3%) of the patients with herniated disc, in 14 (4.07%) with lumbar spinal stenosis and in 12 (23%) with recurrences.

The most frequent risk factors were: obesity, revised surgery and the physician's low operative volume. Intraoperative dural fissures were repaired through suture (8 cases), by applying muscle, fat graft or curaspon, tachosil, fibrin glue. Four cerebro-spinal fluid (CSF) fistulas were repaired at reoperation.

*Conclusions:* Incidental dural fissures during operations for degenerative lumbar disorders must be recognized and immediately repaired to prevent complications such as CSF fistula,

osteodiscitis and increased medical costs. Preventing, identifying and treating unintentional durotomies can be best achieved by respecting a neat surgical technique and a standardized treatment protocol.

**Key words:** durotomy, dural tear, CSF fistula.

### **Lumbar 14-15 ganglion cyst with cauda equina syndrome. Report of a case**

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*Introduction:* Although juxtafacet cysts are lesions noted as incidental findings associated with spinal facet joints on imaging studies of the spine (computed tomography - CT and magnetic resonance imaging - MRI); in some patients, they may produce symptoms

*Methods:* A female aged 47 years old was admitted for an acute cauda equina syndrome induced by a ganglion facet cyst. Diagnosis was sustained on spinal lumbar MRI and dynamic flexion/extension X-rays.

*Results:* The patient got benefit from microsurgery, with excellent outcome, with no surgery-related complications six months after operation and no fusion.

*Conclusions:* Mostly associated with degenerative facet joints and spondylolisthesis, symptomatic lumbar juxta facet cysts - ganglion and synovial cysts are uncommon lesions of the spine. They can mimic herniated discs, causing low back pain, radiculopathy or even cauda equina syndrome.

**Key words:** ganglion cyst, synovial cyst, juxtafacet cyst, spinal fusion, degenerative spine disease, cauda equine syndrome

### **The value of diffusion tensor mr imaging in cervical trauma assessment**

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*Introduction:* MR imaging, with its high soft-tissue resolution, has been established as the gold standard in evaluating the extent of spinal cord structural damage in cases with spinal cord trauma. However, the conventional MR imaging offers poor data concerning the microstructure of the spinal cord, such as fiber tracts of the white matter. The advent of diffusion tensor imaging made it possible to analyze the level of integrity of functional structures represented by the white matter tracts.

*Patients and methods:* We present our initial experience of using a complex imaging protocol that includes DTI sequences in the cases with cervical spine trauma.

We analyze the clinical and imaging characteristics of 17 patients that suffered traumatic injuries of the cervical spine from various causes.

*Results:* Clinically we established the ASIA score for each individual case. From the imaging data we studied the T2 and FLAIR-weighted images and looked at the signal intensity abnormalities. Correlations were established between the three different measures.

We discuss the prognostic value of each measure separately and in conjunction.

*Conclusions:* Our current data suggest that DTI has a better correlation with the

clinical status of the patient, offers a better explanation for the degree of neurological deficit, and, most importantly has a much better prognostic value for the outcome of the cervical spine trauma that affects the spinal cord.

**Key words:** cervical, trauma, diffusion tensor MRI, outcome.

### Traumatic pathology of the thoracic and lumbar spine

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**Introduction:** Traumatic pathology of the thoracic and lumbar spine is easy to be surgically solved. Surgery itself does not represent a real surgical challenge, but the true challenge regarding this pathology is related to the decision making process. 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.

**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:** Obvious advantages of the transpedicular stabilization, ligamentotaxis and the reconstruction of the vertebral

body. Images of illustrated cases are presented.

**Conclusions:** Based on our experience short intrumentsations, good restoration of the sagittal balance, vertebral body reconstruction are key facts in order to obtain good long term results in spine traumatic pathology.

**Key words:** transpedicular posterior instrumentation, ligamentotaxis, short instrumentations.

### Treatment of traumatic spinal cord injuries tested by CSF phosphorylated neurofilament subunit NF-H (pNF-H) levels

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**Introduction:** Several studies showed that the phosphorylated form of the neurofilament subunit NF-H ( pNF-H) are related to neuronal injuries and its detection provide information about the degree of neuronal loss. The phosphorylated neurofilament subunit NF-H ( pNF-H ) is present into CSF in significant amounts following neuronal injury and may be detected. The pNF-H could be a biomarker of the neuronal injuries and its detection might provide prognosis in humans.

**Methods:** We used a pNF-H ELISA test capable of detecting the levels of phosphorylated NF-H (pNF-H) to patients with spinal cord injury. We studied the pNF-H levels in CSF in patients with spinal cord injury (SCI) and for normal

values of pNF-H we determined the CSF pNF-H level from individuals without neurological damage.

*Results:* The normal values were: 0 to 0.9 ng/mL and the pathological values were till 10.9 ng/mL. The pNF-H values of CSF from the patients with SCI were 6 - 10 times higher than the normal and its higher values were related to an unfavorable outcome.

*Conclusions:* In conclusion the phosphorylated form of the neurofilament subunit NF-H ( pNF-H) is biomarker in SCI in humans and its increased values are consistent with an unfavorable outcome.

**Key words:** biomarker, phosphorylated neurofilament subunit pNF-H, spinal cord injury.

### **Our experience with cerebral hemangioblastomas: neurosurgical management and results**

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*Background:* Hemangioblastomas are highly vascular, well-defined, cystic, cystic with mural nodule or solid, benign tumors, occurring sporadically or in von Hippel-Lindau disease.

*Material and method:* We retrospectively reviewed medical records of adult patients, admitted and operated into the Fourth Department of Neurosurgery, Emergency Clinical Hospital Bagdasar-Arseni with

positive histopathological diagnosis of hemangioblastoma.

*Results:* From 1998 to 2013, 39 patients with brain hemangioblastomas were admitted in our department. In 31 patients hemangioblastoma (79.5%) occurred sporadically and 8 cases (20.5%) had von Hippel-Lindau disease. There were 22 males (56.4%) and 17 females (43.6%). Mean age was 44.38, varying from 18 to 73 years. In 33 patients (84.6%) the tumor was located into the posterior fossa and in 6 cases (15.4%) the tumor was supratentorial. The tumor was intraaxial in 35 patients (89.74%) and extraaxial in 4 cases (10.26%). Patients underwent 67 surgical procedures: 39 underwent primary tumor surgical resection, 10 patients underwent second surgery for tumor recurrence, 4 patients underwent third surgery for tumor recurrence, 8 patients required a ventriculoperitoneal shunt for hydrocephalus, 2 patients underwent shunt revision and 4 patients required surgery for complications, posterior fossa compressive cyst requiring cystic-ventriculoperitoneal shunt, cerebral abscess, extradural hematoma and intraparenchymatal hematoma. All 10 patients (25.6%) with tumor recurrence had subtotal resection. Morbidity rate was 12.82% and mortality was 2.56%. Twenty eight (71.79%) patients had favorable longterm outcome.

*Conclusions:* The most common location for hemangioblastomas was posterior fossa. Subtotal resection is associated with tumor recurrence. Total resection ensures a favorable long-term and a recurrence-free outcome. Hydrocephalus is the most frequent associated pathology.

**Key words:** hemangioblastoma, posterior fossa tumor, surgery.



### **The role of the microsurgical treatment within the multimodal therapy of brain metastases from lung cancer**

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**Introduction:** Cerebral metastases of pulmonary origin represent a pathology with an increasing incidence and a severe prognosis. Often patients come to the neurosurgeon with multiple cerebral metastases and a surgical decision has to be taken based on the benefits and the risks of the microsurgical treatment.

**Patients and methods:** The authors present a series of 78 patients with cerebral metastases with pulmonary origin operated in our clinic between 2006 and 2012 and detailed the therapeutic strategies in relation with the location and number of metastases.

**Results:** There were 20 women (25, 6 %) and 58 men (74, 4%) with a mean age of the series of 55,44 years ( $\pm$ SD 10,46). There was no surgical mortality in this series and no additional neurological deficits postoperatively. 62 patients had one metastasis. The surgical resection was total for all cases with single cerebral metastases. 10 patients had 2 cerebral metastases. In 3 patients both cerebral metastases have been removed by a single-stage surgical approach. In 7 patients the larger metastasis has been totally removed and for the smaller one the Gamma-knife has been performed. Six patients had three or more metastases. In all these cases the largest, life threatening metastasis has been removed

and for smaller lesions, Gamma-knife has been performed.

**Conclusions:** Single symptomatic cerebral metastases have the following surgical indications: age < 75 years, Karnofsky performance status (KPS) > 70, stable primary cancer, midline-shift and the presence of a perilesional hypodense area on CT scan of minimum 3 cm. Patients with multiple cerebral metastases and one symptomatic and surgical accessible lesion have also the same neurosurgical indications. In these cases, neurosurgical procedure removed the life-threatening lesion, while Gamma-knife therapy provided a long term control of the remaining smaller lesions.

**Key words:** cerebral metastases, microsurgical treatment, mortality.

### **Surgery in superior sagittal sinus meningiomatosis - case report**

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**Introduction:** Multiple meningiomas attract a lot of interest because of their relative rarity, unclear aetiology and the problems related to proper management strategy.

**Patients and methods:** We describe a case of 58 years old female that presented with slowly progressive right hemiparesis for 2 years, aphasia for 2-3 months that improved under medical treatment, left crural paresis for 10 days and signs of intracranial hypertension. The MRI imaging showed multiple nodules: right parasagittal precoronar, right paracentral, bilateral

parasagittal pre-lambdoidal. Also, the Seldinger angiography show total obstruction of sinus at the level of pre-coronar nodule and partial at the level of pre-lambdoidal nodules and the possibility of venous drainage through venous ducts in the periphery of lambdoidal tumors. the surgye consisted in parasagittal bilateral bone flap, mainly on the right side, resection of the pre-coronar and paracentral nodules; intracapsular resection of the pre-lambdoidal nodules with keeping some patent venous ducts in the thickness of tumoral capsule and partial resection of the nodule invading the SSS.

*Results:* The patient had a very good postoperative evolution (Karnofsky 70 to 90), the signs of intracranial hypertension dissapeared and she improved the hemiparesis and the walking ability.

*Conclusions:* Radical resection of meningiomas invading the superior sagittal sinus (SSS) presents several hazards. Some surgeons consider SSS invasion a contraindication for complete resection, and others advocate total resection with venous reconstruction.

**Key words:** meningiomatosis, surgical approach, superior sagittal sinus.

### **Sixth nerve palsy secondary to craniocerebral trauma - options of treatment**

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*Introduction:* Due to it's long intracranial course, sixth nerve is one of the most common affected cranial nerves in cranial - cerebral trauma. It may be damaged either by direct mechanism (skull base fractures) or indirectly, by raised intracranial pressure, which compress the nerve at the angle over the tip of the petrosus bone. Neuromuscular dysfunction may be partial (paresis) or complete (palsy) and significantly reduces the quality of the patient's life, by diplopia and confusion. A waiting period of 6 months to one year prior to strabismus surgery must be considered, in order to assess the chance of spontaneous recovery. Treatment may be conservative or surgical, depending on the residual neuromuscular function and time elapsed from the injury.

*Material and methods:* Authors reviewed the files of 17 patients admitted into Oftapro Clinic with sixth nerve palsy, secondary to cranial cerebral trauma, produced by car crash (13 cases) and falls from height (4 cases). 12 patients had unilateral, and 5 patients had bilateral sixth nerve paralysis. In terms of neural muscular dysfunction degree, 12 patients manifested complete sixth nerve palsy, and in 5 cases, the deficit was partial. 9 of the patients underwent surgery alone, botulinum toxin injection alone worked in one case, 5 cases needed combined therapy (surgical, BTX-A, and prismatic correction) and 2 cases showed spontaneous recovery in time.

*Results:* Good ocular alignment or slightly under correction, with restoration of binocular vision (with or without prismatic correction) was obtained in all cases, except one, in whom ocular

misalignment persisted, despite surgery and BTX-A injection (the patient refuses the idea of reintervention). Surgical success was defined as orthoptic ocular alignment in primary position or residual esotropia less than 12 PD (prism diopters), with ability of the eye to move at least at the median line (abduction – 4), associated with binocular vision recovery.

**Conclusions:** Sixth nerve palsy has multiple therapeutic options, depending primarily on the degree of residual neuromuscular function. Good functional results can be obtained if different procedures are applied specifically for each case. A good interdisciplinary collaboration is mandatory for functional recovery of these patients.

**Key words:** Sixth nerve palsy, cranial cerebral trauma, binocular vision, diplopia.

### Normal pressure hydrocephalus - active and passive pathogenetic mechanisms

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**Introduction:** Normal pressure hydrocephalus (NPH) is characterized by normal CSF pressure, less than 18 cm H<sub>2</sub>O, classical clinical triad: gait disturbance, dementia and incontinence in patients with communicating hydrocephalus on CT or MRI.

**Patients and methods:** We analyzed retrospectively the NPH hospitalized patients in three neurosurgical centers

between January 2008 and December 2011. There were only 41 selected cases of patients with NPH, including 24 patients with secondary NPH and 17 patients with idiopathic NPH. **RESULTS:** Ventriculoperitoneal shunt was performed in all 24 patients with secondary NPH and at 9 patients with IdNPH. The short-term and long-term results were good and very good for cases of secondary NPH and good in 60% and poor in 40% in cases of IdNPH.

**Conclusions:** We can consider that secondary NPH and some cases of idiopathic NPH with repeated small increases of ICP, with transependymal migration of CSF and hydrocephalus causes clinical triad because of the open glial-ependymal barrier, as an Active Normal Pressure Hydrocephalus and the shunt has good results ; and other cases of IdNPH have not increases of intracranial pressure, no transependymal migration of CSF and there are pre-existing periventricular deep lesions that causes clinical triad, as a passive hydrocephalus, this is a Passive Normal Pressure Hydrocephalus.

**Key words:** normal pressure hydrocephalus, idiopathic normal pressure hydrocephalus.

### Preliminary results in epilepsy surgery

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**Introduction:** The objective is to investigate results after electrophysiological

diagnosis and resective epilepsy surgery in Department of Functional Neurosurgery.

*Patients and methods:* All patients were referred to our Center after careful assessment by a dedicated epilepsy team from another hospital. The first step was implantation of deep brain electrodes for a tailored well planned resection. There were 12 procedures. Identification of vessels was performed by MR enhancement studies in dedicated IDL environment. CT scans were used for postoperative assessment. A total of 40 procedures were performed in the last 2 years of which there were 4 lobectomies 7 lezionectomy with electrocorticography, 5 supraselective amigdalohyprocampectomies, and one reposition of electrodes. All patients had been prospectively followed in the dedicated Epilepsy Center.

*Results:* In the short term, all patients were seizure-free or improved significantly postop, One patient developed an ischemia. The fusion of preoperative and postoperative images aloud confirmation of precision electrode placement. The resection was selective due to electrophysiology and the final results were analyzed on pre and post operative imaging.

*Conclusions:* Almost all patients are seizure-free or improved since surgery. Many patients who gain seizure freedom can successfully discontinue antiepileptic drugs in future.

**Key words:** Epilepsy, Surgery Deep Brain Electrodes.

**Actual tendencies in the management of spontaneous intracerebral hematoma – analysis of a series of 100 cases and review of the literature**

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*Introduction:* Non-traumatic intracerebral hematoma may be the result of an AVM rupture discoverable n routine angiography. In other cases the clinical and imagistic data suggest the possibility of hematoma in the context of hypertension of amyloid angiopathy. Besides these there are a number of other possible causes: anticoagulation, hemorrhagic infarction, hemorrhagic tumors, cryptic AVMs.

*Patients and methods:* The goal of this paper is to analyze the shifts in the diagnosis and therapeutic approach with the advent of MRI as the main diagnostic tool, in the context of multiple angiographic diagnosis options, continuous improvement of neuroanesthesiology and intensive care, improved surgical techniques, better intraoperative localization and hemostasis. In the same time we look at the change in attitude in favor of a more conservative approach for a vast portion of these cases, while the complexity of the cases increased due to an aging population and the increased life expectancy with additional comorbidities. We analyzed retrospectively 100 consecutive cases with ICH admitted recently in the Department of Neurosurgery in Iasi.

*Results:* The following pathologies were encountered: hypertension in 74 cases, ruptured intracranial aneurysms in 7 cases, cavernomas in 5 cases, AVM in 2 cases, amyloid hematoma in 2 cases, anticoagulation in 2 cases, hemorrhagic infarction in 2 cases, hemorrhagic tumor in 1 case, while 5 cases had no discoverable cause. Surgical removal of the hematoma was performed in 28 cases, 12 of which

were treated in the same procedure for the underlying vascular lesion (aneurysm clipping, cavernoma or AVM nidus resection). In one case the aneurysm was embolyzed and the hematoma treated conservatively. 3 cases had a EVD performed and one case necessitated decompressive craniectomy.

**Conclusions:** In the diagnosis the main dilemma consists in how far the investigations should go in order to discover a etiology underlying the hemorrhage. The treatment is constrained by the decision of surgical evacuation of the hematoma. Whilst additional data was made available it is still a multifactorial decision and it is more often than not influenced by the personal preference of the surgeon in charge of the case.

**Key words:** intracerebral hematoma, spontaneous, treatment, diagnosis.

### **Neurosurgical management of anterior circulation cerebral aneurysms**

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**Introduction:** Ruptured intracranial aneurysms are major neurosurgical urgencies that have a poor natural history with regard to rebleeding and should be treated as soon as possible.

**Patients and methods:** We present our surgical experience in 83 patients who presented 99 anterior circulation cerebral aneurysms, who underwent surgery at the Vascular Neurosurgical Department of the National Institute of Neurology and Neurovascular Diseases between July 2010 - August 2013. There were 38 male and 51

women. Age range 26-78 years, mean 54 years. Anterior communicating artery aneurysms were encountered the most frequent (32 patients). 24 patients were diagnosed with middle cerebral artery aneurysms. One patient had unruptured ophthalmic artery aneurysm. 11 patient harbored posterior communicating artery aneurysms. The rest of the patients presented anterior circulation intracranial aneurysms as follows: anterior choroidal aneurysms (2 patients), carotid artery bifurcation aneurysms (4 patients), distal anterior cerebral artery aneurysms (6 patients), cavernous carotid artery aneurysms (3 patients). Large and giant aneurysms were encountered in 13 patients. 16 patients harbored multiple aneurysms.

Two patients had 5 aneurysms.

**Results:** We analysed the rate of morbidity and mortality and complications related to each type of aneurysm. The overall mortality was 9% and the morbidity was 27%.

**Conclusions:** Aneurysms surgery is and should remain an important element of neurosurgical culture, even as endovascular techniques advance in popularity and sophistication.

Modern aneurysms techniques offer excellent solutions and must be saved for those aneurysms that require them.

**Key words:** aneurysms, clipping, subarachnoid hemorrhage, outcome

### Superior cerebellar artery ruptured aneurysms treated by endovascular or surgical techniques – case discussion

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**Introduction:** In the last decade, aneurysms of the cerebral posterior circulation were more feasible to endovascular treatment due to the challenging position of these aneurysms for surgical clipping. We reported two particular cases of a distal superior cerebellar artery ruptured aneurysm treated by endovascular and, respectively, surgical techniques.

**Methods:** Occlusion of the aneurysms was achieved by endovascular placement of two stents, and, in the other case, by surgical clipping.

**Results:** In both cases, the aneurysm was excluded from circulation. Six months, and respectively, twelve months follow-up control angiography demonstrate complete occlusion of the aneurysms. No focal neurological deficits of the both patients were recorded.

**Conclusions:** In experienced hands and in selected cases surgery of aneurysms developed in challenging surgical positions could be as successful and efficient as endovascular therapy.

**Key words:** aneurysm, endovascular, surgery.

### Our last 10 years experience in treatment of tuberculom sellae meningiomas

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**Introduction:** Tuberculom sellae meningiomas present a close relationship with anterior visual pathways, the arteries of the anterior circulation and the hypothalamus.

The authors report on a series of surgically treated tuberculom sellae meningiomas, resection being achieved by different approaches.

**Material and methods:** A retrospective study was conducted on 24 consecutive patients with tuberculom 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 follow-up period ranged from 3 to 85 months (median: 46 months).

**Results:** The main presenting symptom was visual compromise in 83.3 % of the patients (20 cases). In addition, preoperative hormonal abnormalities were highlighted in 25 % of the patients (6 cases). MRI and angio MRI were the main radiological exams.

In terms of surgery, a frontolateral approach was used in 21 patients (87.5 %) and an endoscopic endonasal extended transsphenoidal approach for the rest of the

3 patients (12.5 %). Quick access to the tumor was achieved through these approaches; they were also minimally invasive with less brain exposure, therefore complications were being kept 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 %). No perioperative mortality was recorded.

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

**Key words:** tuberculum sellae meningiomas, frontolateral approach, endoscopic endonasal, extended transsphenoidal approach.

### **Gasserian cystic schwannoma with intracavernous extension and skull base destruction. A microscopic extradural middle fossa approach**

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**Background:** Trigeminal schwannomas account for less than 8% of intracranial schwannomas. They originate within the ganglion, nerve root, or 1 of the 3 divisions of the trigeminal nerve. About 50% of these tumors are limited to the middle fossa, while 30% extend into the posterior fossa

and 20% are dumbbell-shaped and extend into both fossae. Diagnosis is best established with MRI. The differential diagnosis includes meningioma, vestibular schwannoma, epidermoid lesions, and primary bone tumors of the skull base.

**Methods:** A 60 years old female patient was admitted for numbness in the left trigeminal V b region. IRM study revealed an extranevaxial left temporal tumor invading the cavernous sinus, cavum Mecheli and the sphenoidal sinus. Ophthalmologic examination showed papilledema.

**Results:** Surgery was performed and a predominant cystic tumor with solid component was identified and resected. Postoperative neurological evolution was favorable marked only by a CSF fistula has been treated by installing a lumbar drainage for 5 days. After the microdecompression the pain has completely disappear. Histopathological exam was Schwannoma Antoni A.

**Conclusion:** Extranevaxial skull base schwannomas can be surgically removed safely. CSF fistula can be a complication that can be treated conservatively.

**Key words:** schwannoma, skull base, middle fossa approach.

### **Surgical treatment in huge foramen magnum tumor in children – case report**

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**Introduction:** We present the clinical, imagistic, surgical findings and the outcome

at a 12-years old girl with huge foramen magnum tumor.

*Patients and methods:* A 12-years old girl presented with progressive proximal upper right extremity paresis for 3 weeks and spastic tetraparesis mainly on the right side for 3 days. MRI imaging showed a huge foramen magnum gadolinium-enhancing lesion that compressed and displaced the spinal cord. The surgery consisted in suboccipital craniectomy with C1 laminectomy, C2 laminoplasty and microsurgical resection of the tumor.

*Results:* After surgery the patient made good neurological improvements, and the postoperative MRI showed the resolution of spinal cord compression at cervical level.

The anatomopathological report was meningothelial meningioma with many psammomatous bodies.

*Conclusions:* Meningiomas are relatively uncommon in childhood. The intraoperative appearance of the tumor with the extent in the C2 foramen suggested a neurinoma.

The recent onset and rapid progression are discordant with the tumoral size and the fast recovery.

**Key words:** meningioma, foramen magnum tumor, children.

### Radio-induced neurosurgical brain lesions

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*Introduction:* Radio-induced neurosurgical brain lesions occur inside previously radiation area, are not present at the time of radiotherapy, occur after a sufficiently long period of time following radiotherapy, have different histopathological diagnosis compare with the primary tumor and patients lack genetic predisposition for second tumor occurrence. Radio-induced neurosurgical brain lesions are: meningiomas, vestibular schwannomas, gliomas, cavernomas, etc.

*Material and method:* We report 4 cases with radio-induced brain lesions, admitted into the Fourth Department of Neurosurgery, Emergency Clinical Hospital Bagdasar-Arseni.

*Results:* All 4 patients were males. Primary disease was third ventricle tumor in 3 cases and scalp trichophytia in one case. Three patients underwent surgery with tumor resection and were referred to adjuvant conventional whole-brain radiotherapy. One patient suffered from scalp trichophytia and was treated with scalp radiation. Time to diagnosis of radio-induced brain lesion was 13, 17, 17, and 30 years following radiotherapy.

Two patients presented supratentorial meningiomas and two presented cerebellar hemisphere cavernomas. Patients with meningiomas, were symptomatic, presented large tumors and required life-saving surgery. Other imaging findings were diffuse brain atrophy and leukoencephalopathy.

*Conclusions:* Radiotherapy can cause long-term complications and can induce new brain lesions development inside the radiation area. Meningiomas and cavernomas may be radio-induced brain lesions and may occur following previous



radiotherapy. Meningiomas grow to large size, requiring surgery.

**Key words:** radiotherapy, long-term complications, meningioma, cavernoma.

### **Endoscopic transnasal approach for pituitary adenoma – preliminary experience**

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**Introduction:** Pituitary adenomas account for 10-15% of all brain tumors. The current approach to this sellar lesion is the transnasal endoscopic approach. We present our preliminary experience and results using this approach in the treatment of sellar region tumor.

**Methods:** We have included all patients with pituitary adenoma operated on using the endoscopic transnasal approach in the 3rd Neurosurgical Department of Neurosurgery at "Prof Dr N Obu" Clinical Emergency Hospital, Iasi, Romania since the introduction of the technique (May 2013).

**Results:** 6 cases (3 males and 3 females) were operated on using the endoscopic transnasal approach in the last 3 months. 4 of the patients had non secreting pituitary adenoma and 2 of them had prolactinomas with signs of pituitary apoplexy. The mean volume of the lesions was 13.52 cm<sup>3</sup> (range 3.85-28.6cm<sup>3</sup>). Cavernous sinus was invaded in 4 cases, 3 cases had type C suprasellar extension and in 4 cases the sellar floor was invaded. All the patients had single nostril approach (right side) and 3 of them had a deviated nasal septum on the side of the approach. The sphenoid sinus had a simple structure (one single septum)

in 4 cases and 2 had complex structure (3 septum). The mean time of procedure was 181 minutes (range 145 - 230). One single case, the first one, needed reconversion to microsurgery in order to control bleeding. Gross total removal was achieved in one case and subtotal in the other 5 (but with no signs of compression on the adjacent structures). The pituitary gland was identified intra operatively and preserved in 5 cases, postoperatively no patient had new endocrine insufficiency. The main complication was represented by transitory diabetes insipidus in 2 cases, with no cases of infection or CSF leak.

**Conclusions:** The transnasal endoscopic approach is a safe and efficient procedure for treatment of pituitary adenomas, with a low rate of surgical complication, and with high rates of endocrine function preservation given the high optics, which permit the identification and preservation of the normal pituitary gland. Anyhow the duration of surgery is comparable to the microsurgical trans sphenoidal approach and will continue to lower with further gain of experience.

**Key words:** pituitary adenoma, endoscopic transsphenoidal approach.

### **Apoplexy in a recurrent pituitary adenoma – case report**

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**Background:** Pituitary apoplexy is a clinical syndrome characterized by abrupt onset of severe signs of intracranial

hypertension, visual impairment, restriction of visual fields, paresis of ocular muscles, nausea, vertigo, meningismus, and/or decreased level of consciousness. The clinical syndrome is consequent to subarachnoid extravasation of blood and dural irritation, cranial nerve and hemispheric compression from lateral or superior extension of necrotic and/or hemorrhagic material, endocrine abnormalities from acute pituitary dysfunction. Standard therapy of pituitary apoplexy includes decompression via transsphenoidal route and high-dose steroid treatment.

*Case report:* We report a case of a 29-year old woman with a history of transsphenoidal hypophysectomy for a prolactinoma 7 years ago and currently on bromocriptine and glucocorticoid and thyroid hormone replacement, who presented with galactorrhea, sudden severe headache, nausea, vomiting, diplopia and visual impairment on both eyes.

Computer tomography and contrast-enhanced magnetic resonance imaging of the head proved a large sellar tumor with extension to the suprasellar region with intratumoral hemorrhagic zones. The treatment of choice was resection of the sellar mass by transsphenoidal approach. Histological examination revealed a pituitary adenoma mostly acidophil, with intratumoral hemorrhage, highly suggestive for pituitary apoplexy. The outcome was favorable and the patient was discharged in a good condition but with necessity for hormonal replacement as a treatment of pituitary insufficiency.

*Conclusions:* Pituitary apoplexy remains a potentially life-threatening disease.

This case demonstrates that apoplexy can occur and should be suspected even in a

patient with a previous history of hypophysectomy.

**Key words:** pituitary adenoma, pituitary apoplexy, transsphenoidal approach.

### **Colloid cyst – an unusual location.**

#### **Case report**

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*Background:* Colloid cysts represents 0.2 - 2% of brain tumors and less than 1% of symptomatic brain tumors. They are found throughout the neuroaxis but over 99% of them develop in the third ventricle. Colloid cysts of the pituitary gland are very rare pathological lesions occurring in sellar region.

*Case presentation:* A 67-year-old woman presented to the endocrinology department with a 3-months history of frontal and retroocular persistent headache. No focal neurological deficits and no signs of intracranial hypertension were present and hormonal biomarkers were in normal range. Magnetic resonance imaging (MRI) of the brain showed a relatively homogeneous sellar mass extended superiorly into the suprasellar cistern and impinge on the optic chiasm. Visual field examination shows optochiasmatic syndrome. Tumor removal proceeded in a standard way by transsphenoidal approach and the pathologic examination confirmed the diagnosis of colloid cyst. At the 3rd month follow-up visit the patient did not show any endocrinological or focal neurological deficits. MRI brain images

revealed total resection of colloid cyst and no compression on optic chiasma.

**Conclusions:** The absolute differentiation of pituitary macroadenomas from rare non-pituitary origin sellar tumours is often not possible prior to invasive therapeutic or diagnostic procedures.

**Key words:** colloid cyst, transsphenoidal approach.

### Glucose and insulin expression in various types and grades of brain tumors

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**Introduction:** In the last years, many authors suggest the existence of an association between different components of metabolic syndrome and various cancers. Two important components of metabolic syndrome are hyperglycemia and hyperinsulinemia.

Both of them had already been linked to increased risk of cancers: pancreas, breast, endometrial or prostate. However the correlation of the glucose and insulin level with various types and grades of brain tumors remains unclear.

**Material and methods:** In this article we analyzed the values of plasma glycemia and insulin in 267 patients consecutively diagnosed with various types of brain tumors.

**Results:** Our results showed no correlation between the glycemia and brain tumor types or grades. High plasma levels of insulin were found in brain metastasis and astrocytomas while the other types of brain tumors (meningiomas and glioblastomas) had lower levels of the peptide. The expression of insulin was also higher in brain metastasis and grade 3 brain tumors compared with the grades 1, 2 and 4 brain tumors.

**Key words:** insulin level, brain tumor, astrocytoma, glioblastoma, meningioma, brain metastasis.

### Spinal associated with von recklinghausen’s disease

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**Introduction:** The neurofibromatosis type 1 (NF1) was first described by Von Recklinghausen and Festscher, and has been known as the Von Recklinghausen’s disease also. It is inherited as an autosomal dominant trait, therefore, is a hereditary condition.

At least eight forms of neurofibromatosis have been recognized, but the most common is the (NF1), with a prevalence of 1:2200 to 3000 births. When associated with Von Recklinghausen’s disease, the tumors are usually multiple, and may occur at numerous levels of the spinal cord. The signs and symptoms of this condition vary widely among affected people. The most common sign on the skin are multiple neurofibromas that can occur anywhere in the body. Another highly characteristic feature on the skin is the presence of café au lait (coffee with milk) pigmentation. Lisch

nodules (pigmented hamartomas of the iris), translucent brown-pigmented spots on the iris, are found in nearly all affected individuals. Bone lesions, cardiovascular and neurological abnormalities are others manifestations of this disease. Abnormalities that involve neurological system includes central nervous system tumours, macrocephaly, mental deficiency, seizures, short stature and scoliosis.

*Patients and methods:* A 32 years-old female patient was referred to our department, due to full motor loss (immobilized to bed), localized at the level of the inferior members and urinary and defecation disfunctions. In general physical examination we notice the presence of papules, subcutaneous nodules and café au lait pigmentation in many parts of the body. After MRI-examination we observed the presence, of subdural tumoral lesions at the L2-L5 levels. Complete resection of the lesions was performed, through a L2-L5 laminectomy, confirming the initial diagnosis. Thoracic and abdominal CT also showed multisystemic involvement. The general clinical, imagistic and intraoperative findings, completed with the histopathological examination confirmed the diagnosis of Von Recklinghausen's disease. A modest neurological improvement was observed during the initial postoperative course. The patient could walk independently 5 days later, with the preservation of urinary and defecation functions. Postoperative follow-up was difficult in this case, she came back to our institute one year after surgery. Clinical signs were bilateral cervicobrachialgia, paraparesis, bilateral sensitive radiculopathy C3- C7 levels. MRI showed multiple subdural, extramedullary tumoral masses at the C2-C6 levels, with intraforaminal

extension. A C2-C6 laminectomy was performed with the microscopical resection of the tumoral masses. After surgery the patient had favorable outcome with the remission of preoperative clinical signs.

*Results:* The best results are obtained with patients showing minimal neurological deficits during the pre-operative period. Little improvement may be expected from the patients who develop complete transection syndrome during the postoperative period.

*Conclusions:* Is one of the few genetic diseases, which requires neurosurgical implications.

Prenatal diagnosis is possible, but difficult. There is about a 5% increase in risk for various cancers, including brain tumor. Plexiform neurofibromas can become malignant. There is also an increased rate of scoliosis in NF1, with progresses around the time of pubert.

**Key words:** Von Recklinghausen's disease, neurofibromatosis 1, neurofibroma.

### **Cerebral avm-related intracranial hemorrhageclinical considerations**

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*Introduction:* Arteriovenous malformations (AVMs), part of intracranial vascular malformations group, are leading cause of intracerebral haemorrhage in young adults and the most common presenting symptom for patients with AVMs is brain hemorrhage that can cause devastating neurological deterioration.

*Patients and methods:* Between 2009 and 2013, medical records of 44 patients referred to University Hospital “N. Oblu” Iasi, presented with intracranial hemorrhage caused by cerebral arteriovenous malformation (AVM), which was diagnosed by CT scan. Factors followed in terms of their influence on the level of consciousness at admission were: volume of intraventricular hematoma, acute hydrocephalus, intraparenchymal hematoma.

*Results:* Diagnosis of AVMs was confirmed with MRA, angio CT scan, and/or Seldinger angiogram. Nineteen patients had intraparenchymal supratentorial, five had intraparenchymal posterior fossa, twenty had intraventricular hemorrhage. Clinical status ranged from mild impairment to profound coma.

*Conclusions:* All factors we follow significantly contributed to the development of serious disturbance of consciousness in the acute stage following intracranial hemorrhage. Left untreated, can cause a progression of symptoms that can lead to permanent disabilities or death.

**Key words:** Cerebral arteriovenous malformations, Intracranial hemorrhage.

### **Posttraumatic epicranial arterio-venous fistula – case report**

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Posttraumatic arterio-venous fistulas are rare lesions which occur at various periods of time after the initial traumatic injury. Epicranial locations are usually related to

open wound injuries of the scalp which involve major feeding arteries of the scalp. The authors of this presentation report the case of a 28 year-old male which presented an open injury of the scalp with the involvement of the right superficial temporal artery. The wound was treated in another department. At one month after the initial injury, patient presented tinnitus and right hemicrania. Patient was admitted in our department and local exam revealed a subcutaneous pulsatile right temporal mass and right temporal bruit.

Patient had no neurological deficits.

Cerebral angiography (which included external carotid catheterization) showed an arteriovenous fistula between right superficial temporal artery and right external jugular vein. We chose to treat surgically this lesion due to its superficial and accessible location.

A linear right temporal preauricular incision was performed and after subcutaneous dissection, an arteriovenous fistula with feeders from right superficial temporal artery was found, located superficial to temporal muscle fascia. Total resection was performed.

Postoperative cerebral angiography showed total removal of the lesion. Patient was discharged with no neurological deficits. Tinnitus and bruit remitted completely.

Posttraumatic epicranial arteriovenous fistulas are rare lesions which are suitable to surgical resection due to their superficial and accessible location.

**Key words:** arteriovenous fistula, posttraumatic, surgical resection.

### **Complications related to severe cerebral vasospasm after aneurysmal subarachnoid hemorrhage**

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**Introduction:** Vasospasm is a common complication that may occur after aneurysmal subarachnoid hemorrhage. Irritating blood breakdown products cause the walls of an artery to contract and spasm. The prolonged smooth muscle contraction involves some alteration in the structure of the arterial wall (hypertrophy, fibrosis, degeneration), that reduces blood flow to a specific vascular territory causing a secondary stroke.

**Patients and methods:** Our study includes 1294 cases of cerebral aneurysms, diagnosed angiographic (38,64%), out of 3348 cerebral angiographies, performed in Neurosurgical Department of National Institute of Neurology and Neurovascular Diseases, during a period of 5 years. Of all discovered aneurysms, 1186 (91,65%) were broken and they started with subarachnoid and/or cerebral hemorrhage. The remaining 108 (8,35%), were incidentally detected during investigations for other diseases. 1242 (95,98%) of all detected aneurysms were treated with surgical clipping and only 28 (0,84%), were treated with endovascular procedures. The remaining 24 (0,71%) were not treated, either because of refusal, or because bad conditions that resulted in death. A total of 423 cases with broken aneurysms (35,66%) had a deterioration of awareness and neurological deficits, secondary outbreaks of cerebral hemorrhage and/or angiographic

demonstrated vasospasm. The vasospasm was present in a number of 318 cases (26,81%).

The meaning of the present paper, we have defined the severe vasospasm, that change of vascular diameter, angiographic, demonstrable, responsible exclusively for major neurological deficits, stable and irreversible after the conventional therapy applied in accordance with medical protocols, which led to the invalidity or death.

**Results:** 129 patients (10,88%) had a good recovery, after correct treatment of vasospasm with nimodipine in continuous intravenous perfusion or local intra arterial, 113 (9,53%) survived with a minimal disability, 50 (4,21%) survived with major focal neurological deficits and 26 (2,19%) died. Both, the correct treatment of aneurysms and the postoperative presence of vasospasm were angiographic demonstrated in all cases.

**Conclusions:** Recovery and prognosis are highly variable and largely dependent on the severity of the initial vasospasm.

**Key words:** cerebral aneurysm, subarachnoid hemorrhage, vasospasm, cerebral angiography.

### **Subarachnoid haemorrhage in multiple intracranial aneurysms**

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**Background:** Intracranial aneurysms are common and are located on the large arteries of the circle of Willis and its branches. Autopsy series uncover them in 0.4-3.6% of individuals, whereas cerebral

angiography documents incidental aneurysms in 3.7–6.0% of patients. Therefore, roughly 2% of all individuals harbor aneurysms. Approximately 80–85% of these lesions are in the anterior cerebral circulation, and the rest are in the posterior circulation. Cerebral aneurysms are multiple in 25% of cases

*methods:* Case A – a 51 years old woman was admitted for headache, dysarthria, severe episthaxis, and balance disorder. Case B - a 64 years old man was admitted for headache, neck pain, balance disorder and vomiting.

*Results - case A -* Four-vessel angiography disclosed saccular aneurysm at the bifurcation of the left MCA, with maximum diameter of 4.46 mm and neck of 2.36, and another one aprox. 3mm distance from the first aneurysm anterior oriented with maximum diameter of 4.73mm, neck of 2.27mm. Case B- Four vessel angiography disclosed ruptured aneurysm with daughter sac inserted at the origin of the left pericalosal artery, with 3,9/3.5mm diameter, 2mm neck. In both cases CT scan revealed SAH.

*Conclusion:* Familial aneurysms are generally larger at time of rupture and more likely to be multiple than sporadic aneurysms. The development of large and multiple aneurysms may be related to genetic factors that determine defects of the arterial wall.

**Key words:** Intracranial ruptured aneurysms, four-vessel angiography, SAH, genetic factors.

## **Surgical treatment of basilar apex aneurysm-case presentation**

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Posterior circulation aneurysms represent a special challenge to neurosurgeons because of the deep location and intimate reports with brainstem, cranial nerves and perforating arteries.

Despite progress in neurosurgical techniques, neuroanesthesiology, neuroradiology, the surgical treatment of basilar apex aneurysms shows a higher morbidity and mortality than aneurysms of anterior circulation.

The inability to perform microsurgical clipping of basilar apex aneurysms has led to the development of other treatment modalities such as endovascular therapy. However, endovascular coil occlusion is less durable than microsurgery, as shown by its higher rates of aneurysm recanalization and regrowth and microsurgery provided better outcome in some specific basilar apex aneurysms.

In this paper we present the case of a patient with subarachnoid hemorrhage Hunt & Hess I because of a rupture of basilar apex aneurysm successfully treated by microsurgical clipping using a subtemporal route. Outcome was assessed by Glasgow Outcome Scale : GOS-GR.

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### **Volumetric assessment of intracranial aneurysms from 3d rotational angiography**

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*Introduction:* The 3D rotational angiography is an increasingly used method for cerebral aneurysms treatment planning. Volume measurement techniques of intracranial aneurysms from 3D rotational angiography vary on different factor settings and, therefore, are operator-dependent.

*Methods:* In this study we evaluate the application and the precision of ellipsoidal approximation (mathematics and computer technique) and software methods to measure intracranial aneurysms volume starting from planar (DR and SD) and 3-dimensional (3D) angiographic images. Retrospective assessment of aneurysm volume was achieved with two measurement methods by using two-dimensional copies or 3D reconstruction images (digital or printed form in sagittal and coronal angiography section) obtained with a Siemens Artis Angiograph with rotational digital subtraction possibilities. The reliability of the methods was statistically compared in a clinical setting of 42 angiograms and 100 measurements performed by the same users.

*Results:* Based on statistical analysis obtained from the Friedman test we found statistically significant differences at  $p \leq 0,05$  threshold between the three techniques of analysis [ $\chi^2(2) = 8.714, p = 0.013$ ]

*Conclusions:* This study suggests that both techniques could be used for clinical applications with similar efficiency results.

**Key words:** aneurysm, 3D rotational angiography.



## **The effect of epidural instillation of dexamethasone on local scaring tissue after lumbar microdiscectomy**

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**Background:** Lumbar disc herniation is a pathological condition that appears in 1% to 3% of the general population, being influenced by age, usually between 30 and 50 years, gender, male to female ratio is higher in male (2:1), working conditions, with higher incidence on patient who have an intense physical work, professional drivers etc.

In the literature the overall recurrence rate is around 7 to 12% of the total cases operated by microdiscectomy. In the senior authors series the recurrence rate is 3.5%.

**Methods:** The authors have analyzed the incidence of local compressive tissue after lumbar disc herniation microdiscectomy requiring surgical removal comparing the patients where Dexamethasone was used intraoperative and those where corticoid instillation was not performed. Length of the surgical procedure, difficulty of dissection and the volume of the compressive/adherent epidural tissue were chosen as the comparison criteria.

**Results:** As a result of corticoid epidural instillation after microdiscectomy the adherential scaring process is reduced dramatically with the condition of performing a proper foraminectomy when the genuine microdiscectomy is done. The overall volume of compressive scar requiring surgical removal after microdiscectomy was not influenced by the use of dexamethasone and may depend on

personal factors. The duration of the surgical procedure, the ease of the dissection process itself and the much lower occurrence of dural tear are the main benefits of the epidural corticoid instillation.

**Conclusion:** The epidural instillation of one vial of dexamethasone after microdiscectomy represents a simple gesture devoid of risk that is useful for those cases where a second surgical decompressive procedure is needed.

**Key words:** epidural instillation, Dexamethasone, microdiscectomy.

## **Lumbar-pelvic stabilization using iliac screws in a case of a lumbar-sacral giant tumor**

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**Introduction:** The first lumbar-pelvic stabilization was described in 1982 by Allen and Ferguson. Indications for sacroiliac fixation include lumbosacral destructive processes (tumors, infections, trauma), pseudoarthrosis L5-S1, L5-S1, high grade spondylolisthesis, symptomatic lumbar spine deformities. Symptoms consist in pain (in about 96% of cases), radiculopathy or cauda equina syndrome. The investigation of choice is the MRI with sagittal, coronal and axial acquisitions.

**Case presentation:** A 58 y.o. woman, with breast cancer, was admitted in our clinic with low back pain, bilateral L5-S1 sciatica and cauda equina syndrome, Frankel D. Lumbar spine MRI shows a spinal tumor

that destroyed the L5, S1 vertebral bodies, causing severe L5, S1 nerve roots and dural compression. The surgical treatment was performed by a total L5 vertebrectomy and partial S1 (involved by tumor) and the spinal canal and the neuroforamina was decompressed. Spinal reconstruction was achieved using acrylic cement with contention in vertebral body L4 and S2 segment of the sacrum.

Surgical stabilization was performed with titanium polyaxial screws into L3-L4-S1 bilateral pedicles and two titanium screws (with a length of 90 mm) in both iliac wings. We used the Zodiac Spinal Fixation System by Alfa Tech. The technique of the placement of iliac screws after the posterior superior iliac spines (PSIS) were identified, the iliac screws insertion points were located at about 1 cm inferior to the PSIS and 1 cm proximal to the distal edge of PSIS. The screws were about 90 mm in length and 8.5 mm in diameter. The two iliac screws were connected to the system via two connectors. Postoperative outcome was favorable and local pain disappeared. Neurological deficits begin to improve and the spinal stability was achieved. No postoperative complications. Hystological examination: metastasis of adenocarcinoma (possible breast cancer). The patient was discharged 8 days postoperatively.

**Conclusions:** The lumbar-pelvic fixation is a relatively easy technique, and stabilisation with transiliac screws is sometimes necessary, when the tumor invades the lumbar-sacral junction and the spinal stability was definitely compromised.

**Key words:** lumbar-sacral junction, vertebral tumor, lumbar-pelvic fixation.

### **Titanium expandable cage – an excellent choice for the surgical treatment of cervical spinal metastasis**

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**Introduction:** Spinal metastases are the most common malignant lesions of the spine (over 94 %). Clinical symptoms consist in neck pain (90%) and various degrees of motor deficits (over 50% of patients). The most common type are osteolytic when osseous destruction can lead to fracture of the vertebral body, spinal instability and deformity of the spine. Because the majority of cervical metastases develops in the vertebral body, the anterior cervical approach is most suitable for surgery. The surgery goals are: decompression of spinal cord, spinal reconstruction and spinal stability. Cervical spine reconstruction after corpectomy can be done using several methods, such as: bone graft, bone cement, titanium Mash, expandable cage. The expandable cages are cylindrical devices, with different shapes and sizes which facilitates stability of the spine. The cage can be filled with bone allograft or bone substitute.

**Case presentation:** A 69 y. o. woman, was admitted in our clinic for neck pain, incomplete tetraplegia, with C6 level (Frankel D). Cervical MRI reveals a C6 vertebral body tumor, with spinal cord compression and vertebral collapse. No history of neoplastic disease, but the CT scan of the thorax showed an expansive process in the right inferior lobe. No other

lesions - in the brain or abdominal cavity. The surgery was performed by an anterior cervical approach with C6 corporectomy, spinal cord decompression and spinal reconstruction using titanium expandable cage (CAGE-LOC by BIOTEK), filled with bone substitute (Synthetic Phosphocalcic Hydroxyapatite - Nanogel). Extension mechanism was secured by 2 screws that block the mechanism extension. Pathological examination found metastatic adenocarcinoma, probably pulmonary origin. Postoperatively the patient's evolution was favorable, drainage was suppressed at 24 hours after surgery.

Second day, she was mobilized. She was discharged at 7 days after surgery.

*Conclusions:* Fully ablation of the cervical spinal metastasis can be easily performed through a cervical anterior approach. Once the corporectomy was done, reconstruction of the vertebral body and spine stabilization are mandatory. The expandable cages represent an excellent and safe option for the vertebral reconstruction.

**Key words:** spinal metastasis, cervical vertebral body, expandable cage.