

SELECTED ABSTRACTS FROM THE 6TH NATIONAL CONGRESS OF THE ROMANIAN SOCIETY OF NEUROSURGERY

26 – 30 SEPTEMBRE 2007, BUCHAREST, ROMANIA

EARLY REHABILITATION OF HIGHER CORTICAL BRAIN FUNCTIONING IN NEUROSURGERY. HOW TO HUMANIZE HUMAN SKILLS FOLLOWING ACUTE BRAIN LESIONS

KLAUS R.H. VON WILD

Professor of Neurosurgery, Medical Faculty University of Münster, Professor of Neurorehabilitation and Re-engineering of brain and spinal cord lesions, International Neuroscience Institute, Hannover, Germany in coop. with Sascha Skudelny¹, Federico Hernández-Meyer²
¹Creative Director, Media Science University of Siegen, Germany; ²Mag. Pharmacy, Pharmaceutical and Medical Communications, Huétor-Vega (Granada), Spain

OBJECTIVES

Today, increasingly more patients with brain lesions survive the acute stage, however, suffering from severe impairment of higher cerebral functioning (WHO-ICF). Early neurorehabilitation can significantly improve functioning and patients' reintegration.

METHODS

Functional rehabilitation is an original task of neurosurgery. Impairments refer to loss of structures and functions. Disabilities refer to limitations or participating restrictions.

Functioning is an umbrella term encompassing all body functions, activities and participation.

Neurorehabilitation needs a multidisciplinary team approach.

RESULTS

The essential aspect in early rehabilitation is the integration of disciplines and consistent goal setting to regard individual patients' needs. Good structural organization of the team, notice of basic

communication rules, conflict management and a definite decision making increase productive interdisciplinary working. The movie shows our team approach and the daily work on the special ward. Reintegration is demonstrated in two of our patients.

DISCUSSION

Obviously the impairment of mental-cognitive and neurobehavioral functioning and not the loss of physical skills will cause patients' loss of life transactions and final outcome. Rehabilitation is possible because of the individuals' neural plasticity.

CONCLUSION

Functional rehabilitation is a process whereby patients who suffer from impaired higher cerebral functions following injury or disease regain their former abilities or, if full recovery is not possible, achieve their optimum physical, mental, social and vocational capacity. It aims at patients' reintegration. In order to facilitate such goals neurosurgeons should start with team approach as early as possible and will have to work in close collaboration with the neuropsychologist and all other members of the team day by day.

FOCUSED BEAM SURGERY IN CENTRAL SKULL BASE MENINGIOMAS INVOLVING THE PARASELLAR SPACE

L STEINER, MD, PHD, D. SCHLESINGER, PHD

With open-ended follow-up MRI in cases with presumed total extirpation of meningiomas, an increasing number of residuals and recurrences are detected that need radiosurgery.

Little is known about the pathophysiological changes induced by Gamma surgery at the cellular level in tumors. Division of tumor cells is presumably

inhibited by radiation-induced damage to DNA. It has been shown that the Gamma beams obliterate the microvascular supply to tumors. It was proposed that the induction of apoptosis by Gamma radiation to proliferating cells may be responsible for at least part of the effect of Gamma surgery on tumors. Also, such contentions may be premature as they may point the direction to future research. Between March 1989 and December 2004, Steiner treated using the Gamma Knife 150 patients with central skull base meningiomas involving the parasellar space. Of 150 patients, for a variety of reasons 8 patients were lost for follow-up leaving 142 patients available for analysis. There were 102 tumors of 0.4 - 8 cc (mean 4cc). Four tumors disappeared, 64 did shrink, 28 remained unchanged and 6 increased. There was no morbidity or mortality. There were 40 tumors measuring 0.6 - 36 cc (mean 8cc). Two did shrink, 28 remained unchanged and 10 increased. There was no mortality, however, new neurological symptoms occurred in 5 cases.

OUR POLICIES IN INTRACRANIAL MENINGIOMAS IN PATIENT OVER 60 YEARS OLD (EXPERIENCES OF 109 CASES)

PROF. A.V. CIUREA¹, MD, A. TASCUI¹, MD, D. TALIANU¹, MD, F. STOICA², MD, R. RIZEA¹, MD, A. GHEORGHITA³, MD, ARCAN AYSSA¹, MD

Clinic Hospital Bagdasar-Arseni, Bucharest, Romania
¹1st Neurosurgical Dpt., ²Gamma Knife Surgery Dpt.,
³Neuroasthesiological Dpt.

Keywords: intracranial meningiomas, patients over 60 y.o., microsurgery, CT-scan, MRI, MRA, DSA, Simpson Scale, gamma knife surgery (GKS), GOS

INTRODUCTION

Intracranial meningiomas (I.M.) are tumors good bounded, important vascularization, with invasion of dura mater and bones structure. I.M. account for 14,3-19% for primary intracranial tumors; females are most affected. Authors present personal data in I.M. in patients over 60 years old, in connection with all possible complication by associated pathology.

METHOD

The experience of authors base on a cohort of 578 cases I.M. consecutive admitted & operated and pathological diagnosed in the 1st neurosurgical department, "Bagdasar Arseni" Clinic Hospital, in period 1997– 2006 (10 years of experience). Over 60 years there are 109 cases (18,8%) with the female preponderance (1,8:1). The most affected group of age. (in our data) was the 5th decade - 194 cases (33,5%). The most frequent tumors site are parasagittal (26 cases, 24,2%) followed by the convexity (24 cases, 22,2%) and olfactory groove area 21 cases (19,1%). The clinic diagnose is completed with all neuroimagistic armamentarium (CT-scan, MRI/ MRA, DSA). We excluded of our data the multiple I.M. The clinical features were: headache (68 cases, 98.2 %), increased ICP syndrome (47 cases, 67.6 %), visual impairment (42 cases, 61,3 %), seizures (39 cases, 56.8 %), personality changes (27 cases, 38.6 %), cranial nerve palsy I, III, VI (19 cases, 27.5 %), miscellanies (vomiting, ataxia) (9 cases, 13.6 %). The associated pathology was dominated by: systemic arterial hypertensive (68 cases, 62%) and obesity/hypercholesterolemia (37 cases, 34,1%), followed by ischemic cardiopathy (72 cases, 66%), diabetes mellitus (28 cases, 26%), chronic alcoholism (9 cases, 8%), ischemic stroke (13 cases, 12%), atrial fibrillation (40 cases, 32%), miscellanea (76 cases, 70%, e.g. anticoagulant therapy).

RESULTS

The tumoral removal was totality in 94 cases (86,2 %)

of cases in subtotality in 15 cases (13,8%) (skull base meningiomas). No biopsy in our data. In subttotal removal was possible to realize Gammaknife surgery (GKS). According of Simpson Scale (1957) the I.M. cases were included in grade II (59 cases, 54,1%) followed by grade III (35 cases, 32,1%) and grade IV (15 cases, 13,7%). Pathological aspects: the classic bening cases grade I was predominant (95 cases, 87,2%), followed by the atypical meningiomas (7 cases, 6,71%) and anaplastic cases (5 cases, 4,61%) and malignancy meningiomas (2 casers, 1,83%)

The giants I.M. (over 6 cm in diameter) was

SELECTED ABSTRACTS

represented 14 cases (13,1%). The authors advocate on the microsurgical resection with slow decompression of the brain tissue & copios saline solution irrigation for prevention of ischemic cerebral accident. Also it is necessary the preservation of arterial and especially venous structure to prevent the brain venous infarct. No intraoperative mortality. The important complications were: seizures (50%), cranial nerve palsy (28,5%), visual impairment (19,1%), modified neurological deficit (9,1%). In this cohort, the follow-up period was between 6 month to 8 years (medium rage 4,5 years). Recurrences were noticed in 16 cases (14,6%); in small cases GKS was available as first option. The Glasgow Outcome Scale (GOS) in I.M. (after 3 month), group studied was: good recovery 57 cases (52,3%), moderate disability 35 cases (31,8%), severe disability 7 cases (6,4%), death 10 cases (9%). Majority of deaths is caused by broncho-pulmonary infections, postoperative myocardium infarction and pulmonary thrombo-embolism.

CONCLUSIONS

I.M. are prevalent benign tumors, slow growing, extraxial location with perfect neuroimaging diagnosis. In all cases it is necessary the total removal without any injury of vascular and neural structure, especially with caution in patients over 60 y.o., with cerebro-vascular pathology. In these conditions it is pursued avoidance of ischemic cerebral infarct. Finally, authors advocate for the best preoperative preparation concerning of the risk factors (ischemic cardiopathy, arterial hypertension, diabetes mellitus, chronic hepato-renalopathy, e.g.) for obtained a good outcome & quality of life and family integration.

THE CHALLENGE OF INTRACRANIAL MENINGIOMAS

DR. KEKI E. TUREL, DR. NOOTAN KUMAR SHARMA, DR. SHASHANK JOSHI

Bombay Hospital Institute of Medical Sciences, Mumbai, India

Meningiomas are the second most common supratentorial tumor of Central nervous system (CNS).

They account for around 15% of the tumors of the CNS. 90% of intracranial meningiomas are located supratentorially while less than 10% within the posterior fossa and rest involve the ventricular system. Meningiomas arise from arachnoid cap cells, mostly in the vicinity of arachnoid granulations along dural venous sinuses. Though exact etiology is unknown, these have also been grown in the region underlying old injury sites. Their incidence is two to three folds higher in females. Multiple meningiomas are frequent with NF-2. Meningiomas are extra-axial tumors which produce symptoms as result of mass effect. They are usually irritative or paralytic foci. In advanced cases they cause a rise in intracranial pressure or even erode the overlying bone. Total surgical excision is the best treatment a Neurosurgeon can offer to his patients. It includes excision of main tumor, 1 cm of surrounding dura, involved overlying bone and even dural sinuses if infiltrated by it. While achieving this goal, great care is needed to preserve surrounding brain, cortical veins, dural venous sinuses, and cranial nerves. Thus it is a great challenge for a Neurosurgeon. Owing to their critical situation, some tumors cannot be excised completely. They needed adjuvant therapy like Radiosurgery, Radiotherapy or Gamma knife surgery. Despite complete surgical excision, recurrence is a known phenomenon and poses a big challenge even to the most experienced neurosurgeons. Molecular biological marker studies are found much useful in predicting recurrence. These are Estrogen and Progesterone receptors, Platelet derived growth factor receptors, Tenascin and Ki 67 as proliferative marker.

In the last 205 consecutive operated cases, supratentorial meningiomas were 141 while infratentorial were 64. Location wise distribution of supratentorial were Sphenoid Wing (42 cases), Convexity (36 cases), Parasagittal (21 cases), Suprasellar (17 cases), Falcine (15 cases), Olfactory groove (6 cases), Intra-ventricular (2 cases), Cavernous sinus (1 cases) and Diploic (01). Infratentorial meningiomas were CP Angle (35 cases), Petroclival (10 cases), Tentorial (7 cases), Foramen Magnum (5 cases), Cerebellar convexity (5 cases), and Falcotentorial (2 cases). Recurrence has been documented in 15 cases.

Detailed analysis of our material will be presented and video clips of representative cases and our techniques will be demonstrated.

TRANSBASAL SUBFRONTAL INTERHEMISPHERIC APPROACH FOR MIDLINE INTRACRANIAL LESIONS

PROF. IBRAHIM SBEIH, MBCHB., FRCS., FRCSSN

Department of Neurosurgery, Jordan University of Science and Technology, Ibn Alhaytham Hospital, Amman – Jordan

This approach has been used extensively in our department for the last 15 years. It entails low frontal bone entry with or without opening of frontal air sinus. It also entails sectioning of most anterior part of superior sagittal sinus and cutting of falx most anteriorly. It also entails preservation of both olfactory tracts and interhemispheric approach towards anterior fossa, sellar, and suprasellar lesions. We have used this approach for radical total excision of craniopharyngiomas, suprasellar meningiomas, giant invasive pituitary adenomas and Clivus chordomas. This approach has also been used for olfactory groove meningioma, ant. fossa skull base lesions like sinonasal tumors and adenocarcinoma involving paranasal sinuses, among other lesions.

The advantage of this approach is that it puts the neurosurgeon in a position of total control over neurovascular structures allowing surgical maneuvers on all sides of the tumor thus allowing preservation of blood supply for neural structures and excellent vascular control in cases of bleeding. Smell was preserved in more than 70% of cases and minimal complications were encountered; meningitis and CSF leak.

This approach has advantage over pterional or lateral subfrontal approach in that it allows you to see and control over the far end of the intracranial lesions thus improving upon the surgical results and recurrence rate.

INTRACRANIAL MENINGIOMAS: A 6-YEAR'S SURGICAL EXPERIENCE

FLORIAN I.S., MD, PHD, OSLOBANU A. , MD, DURA L., MD, IORDACHE LINDA, MD, TUSNEA D., MD

UMPh "Iuliu Hatieganu" Cluj-Napoca & Cluj County, Emergency Hospital, Neurosurgical Department
Keywords: Meningiomas, preoperative planning, surgical results

BACKGROUND

The surgical treatment of the intracranial meningiomas is still a challenge for the neurosurgeon, considering that its ultimate goal that of total resection in hope of no future recurrence while avoiding postoperative complications is difficult to obtain in some cases.

OBJECTIVES

Our aim is to determine relevant epidemiological, clinical, imagistic, surgical and histological particularities, emphasizing the correlations between these case specifics and postoperative results.

METHODS

The authors designed a retrospective study of 213 cases with intracranial meningiomas treated surgically between 2001 and 2006. We evaluated the operative indications and techniques by correlating the patients' general and neurological status at admission, histopathology, location, size and resection grade with postoperative clinical status and imagistic findings.

RESULTS

From 1051 brain tumors operated by the authors in a 6- years period, 213 cases of histological confirmed meningiomas were included in the study.

The patients' age, sex, associated diseases, neurological status, CT-scan, MRI and cerebral angiography, made up the preoperative evaluation. The most frequent locations were at the convexity (34.5%) and the sphenoid ridge (13.7%). According to histological findings most of the cases were meningothelial (38%), transitional and fibrous meningiomas. The extent of the tumor resection was

SELECTED ABSTRACTS

graded using the Simpson and DeMonte Scales, a grade I or II tumor removal being performed in 86% of cases. GOS and Karnofsky Scale showed good outcome in 80% of cases, while the medium to long-term value of surgery was established by periodical follow-ups, the screened period varying from 4 months to 6 years. The rate of recurrence was 14%, occurring mostly in malign and subtotal removed tumors.

CONCLUSIONS

The immediate outcome of the surgical treatment of meningiomas depends mainly on careful patient selection, rigorous operative planning and extent of resection well correlated with the patients' clinical status, location of the tumour, and its intraoperative microsurgical aspects.

MENINGIOMA NEUROSURGERY IN CONFORMATIONAL RADIOTHERAPY ERA: A SERIES OF 79 CONSECUTIVE CASES

I. POEATA, N. IANOVICI, A. CHIRIAC, Z. FAIYAD, S. GAIVAS, M. IVANOV, B. ILIESCU

"Sf. Treime" University Hospital, Ateneului, Nr. 2, Iasi

Total microsurgical removal of meningiomas defined the main goal of tumor surgery for a very long time. As soon as conformational radiotherapy became available in Romania (Gama-Knife si LINAC), small tumor fragments, in difficult locations can be left on site for radiotherapy. Even more, bone infiltration sites and insertions on dural sinuses could also be subject to irradiation. Last, but not least, radiotherapy can be used to attack the insertion and tumoral bed of 2nd and 3rd degree meningiomas.

To assess the change in the therapeutical view, once complementary radiotherapy is available we analyzed a series of 78 consecutive meningioma cases microsurgically removed between April 2004 – April 2007. There were in our series 44 cases of cranial base meningiomas (11 sphenoid wing, 5 pterion, 4 orbit, 3 cavernous sinus, 2 cranio-facial, 2 pituitary body, 7 cerebello-pontine angle), 16 sinus meningiomas (10 sagittal superior sinus, 4 inferior, 2 lateral), 4 falx

meningiomas de coasa, 3 tentorial meningiomas, 21 convexity meningiomas.

Based on their morphopathology there have been 25 1st grade, 29 2nd grade, and 24 3rd grade. This series contains 4 cases of re-occurrence after initial removals performed in ours or other centers.

We present some illustrative cases and intra-operative images as well as the outcome for the patients included in this protocol. Microsurgical approach was modified, given the availability of conformational radiotherapy in 10% of the cases, incomplete removal of the tumor being considered of a higher risk compared to the risk of radiotherapy.

SURGERY RESULTS OF 100 PETROCLIVAL MENINGIOMAS MAINLY OPERATED BY THE ANTERIOR TRANSPETROSAL APPROACH

TAKESHI KAWASE, KAZUNARI YOSHIDA

Petroclival meningiomas, originated medial to the internal auditory meatus (IAM) were subclassified according to the tumor extension : clival type (C) : located medial to the IAM, sphenoclivar type (SC); with middle fossa extension, petroclival type (PC); with wider attach extended posterior to the IAM. The anterior transpetrosal approach (APA) was applied in 76 cases of C or SC type and the combined petrosal or two –staged operation was used in PC type.

The surgical results of 100 petroclival meningiomas are presented.

RESULTS

Gross total removal was achieved in 60% (71% underwent APA). The patients condition were independent (KPS≥80) in 88%, temporary dependent in 3 %, permanently dependent (KPS≤60) in 7%. There was no surgical mortality. During follow-up for av. 8 years, radiosurgery had been done in 24 patients showing tumor residue, and only 9% showed tumor regrowth. The 3 patients underwent reoperation and two died of tumor malignant change or suicide. Their morbidity was depended on presence or absence of

perforator injury of the brain stem (5%). Permanent double vision occurred in 8 %. Facial hypesthesia was common (20%), but patient's complaint was mild. Facial palsy was as low as 5 %, and no complication to the lower cranial nerves.

CONCLUSION

The APA is a kind of key hole surgery, epidurally accessed to the tumor attachment without exposing the lower cranial nerves. The benefits are the following 5 points:

- 1) early access to tumor feeders,
- 2) removal of middle fossa tumor,
- 3) low risk of CN VII ? XI injury,
- 4) low risk of venous complication,
- 5) hearing preservation.

The technique of key hole surgery and the strategy how to avoid such complications will be presented.

SURGICAL MANAGEMENT OF PETROCLIVAL TUMORS: DEFINING OUTCOME /RESECTION GOALS

**DEEPAK KUMAR GUPTA, ASHISH SURI,
VAISHALI SURI, BS SHARMA**

All India Institute of Medical sciences, New Delhi, India
E-Mail: dkg_nsurgery@yahoo.co.in

Keywords: Petroclival meningiomas, MIB labeling index, Vascular endothelial growth factor, outcome, extent of resection

AIM

Petroclival tumors are rare and require extensive skull base approaches, associated with high morbidity/mortality owing to location/relationship to adjacent neurovascular structures. Materials and methods: 48 cases (mean age: 37±17 yr) of petroclival tumors (36 were meningiomas, 10 chondroma/sarcomas. 2 hemanangiopericytoma) operated over 5 yr period (2001-2005) were analysed.

Follow up was 3-64 months(mean 33±7mo). Immediate outcome assessed by ADL grading and long term outcome by KPS. Slides were reviewed for VEGF(vascular endothelial growth factor), MIB labeling index and were correlated with brain stem invasion(MRI), preop factors and clinical outcome.

OBSERVATIONS

Mean tumor size was 3.7cm±0.7cm. Giant tumors (>4.5cm) were noted in 27 cases. Brain stem compression with T2 signal change was noted in 11/36 petroclival meningiomas(30%). Middle fossa extensions and cavernous sinus ext was noted in 65% and 19% cases. Preop hydrocephalus noted in 25% cases. Extended middle fossa approach was done in 26 cases while combined (EMF with Retrosigmoid) was done in 12 cases. Gross total excision was done in 55% cases. Histopathologically, transitional variety was most common.

Mean MIB labeling index in gr I meningioma was 2.26%. VEGF positivity was noted in 4/26 cases.

RESULTS

Perioperative mortality was 8%. Postop chest infection noted in 27% cases, worsening of cr nerve function in 14%, culture negative meningitis in 12% cases. In the presence of VEGF positivity, median MIB index was 8.5 %. VEGF positivity and high MIB labeling index was noted in patients with brain stem invasion and this correlated with poor outcome.

CONCLUSIONS

Hydrocephalus, tumor size, brain stem infiltration/peritumoral edema affected surgical outcome. MIB , VEGF hold promising outcome predictor role. Intraop (lack of arachnoid plane, fibrous tumors, vessel encasement) and preop risk variable can help improve neurological outcome. Mortality can be further brought down by preventing chest infection to lower cranial nerve deficit.

SELECTED ABSTRACTS

SURGICAL MANAGEMENT OF THE POSTERIOR FOSSA MENINGIOMAS; A STUDY ON A NUMBER OF 142 PATIENTS

PROF. L. DANAILA, M.D., C. TOADER M.D., F. STEFANESCU M.D., D. PETRESCU M.D., L. GHEORGHITESCU M.D., C. NASTASE PH.D., C. PALADE PH.D.

Second Neurosurgical Department; National Neurology and Neurovascular Diseases Institute

Keywords: Meningioma, posterior fossa, microsurgical technique, cerebellopontine angle, tentorial notch, petroclival, foramen magnum, peritorcular, pineal.

OBJECTIVE

Our study has been developed between 1982 and July 31th, 2007. In this period in our department were operated a number of 1183 patients with meningiomas; supratentorial and in the posterior fossa. Only 142 of this meningiomas were located in the posterior fossa (PF) space. The porpos is to releivate the diversity of location in PF, importantes anatomical structures surrounding the tumors, the greate diversity of approach and the excelent result obtained by microsurgical technique.

METHODS

This 142 patient have been diagnoticated either with computed tomography (CT) or magnetic resonance imaging (MRI). The postoperativ folow-up has taken at six month, one year, three years and five years. Our study is a retrospective analyse.

RESULTS

This yielded 63 omen and 37% man; the ratio was 2: 1. The great ratio of incidence was before and after the climacterium. The groupe of age most frequetly affected has been 45 years sice 65 years. The medium average has been 57,8 years.

The location of this meningiomas were: cerebellopontine angle 34% man and 23 omen, tentorial noch 4% equal at man and women, transverse sinus 19% man and 16 omen, petroclival region 23% equal at man and women, foramen magnum, equal man and women 3%, peritorcular region 3% at women and one patient, a woman developed tumour in the

pineal region. The histopathologically results of the PF meningiomas operated in our department were the folowing: meningotheial m. 41%, transitional (mixed) m. 20%, psammomatous m. 8%, microcystic m.6%, secretory m. 6%, chordoid m. 5%, metaplastic m.4%, atypical m.3%, papillary m. 3%, fibrous (fibroblastic) m.2% and clear cell m. 2%.

Because of the substantial risk of neurological morbidity a gross total resection (GTR) to minimize tumour recurrence rates could not be justified. In our cohort at107 patients have been efectuated GTR and in a number of 35 patient we have been efectuated near total resection (NTR). According to de Simpson scale we clasified our patients like this: Simpson I: doesn't patient exists, Simpson II: 72 patients, Simpson III: 35 patients, Simpson IV: 25 patients and Simpson V: 10 patients.

CONCLUSION

The micorsurgically technique increase the good results that we obtained but intraoperatively defined tumour characteristics played an important role in identifying the subset of patients with an increased risk of postoperative deficits. By selectively pursuing an NTR rather that a GTR, neurological morbidity was reduced significantly without significantly increasing the rate of tumour recurrence.

FIRST NERVE PRESERVATION IN OLFACTORY GROVE MENINGIOMAS

PROF. A.V. CIUREA, MD¹, A. TASCU, MD¹, A. ILIESCU, MD¹, R. RADULESCU, MD¹, M. LISIEVICI, MD², F. BREHAR, MD¹, A. GHEORGHITA³, MD

¹1st Neurosurgical Department, ²Neuropathological Department, ³ATI Department

Bagdasar-Arseni Clinic Hospital, Carol Davila Medical School, Bucharest, România

Keywords: olfactory groove meningioma (OGM), MRI, Simpson scale, GOS, GKS, olfactory nerve preservation, quality of life

BACKGROUND

Olfactory groove meningiomas (OGM) arise in the anterior cranial fossa at the cribiform plate of the

ethmoid bone. OGM represent 8 - 10 % of all intracranial meningiomas. OGM is a slow-growing tumors more often bilateral than unilateral, compressing progressively the cerebral frontal lobes and included olfactory nerves. The authors' aim is to reveal the best surgical management, with total removal and also with minimal complications to contribute in improving of quality of life (QOL). First nerve preservation is one of our option in obtain the perfect QoL in OGM.

MATERIAL AND METHOD

The authors present a retrospective study on 44 cases of OGM operated on from 1990 to 2006 (16 years, 1st Neurosurgical Department, Neurosurgical Clinic, Bagdasar- Arseni Hospital). The patients' age range between 20 to 71 years (mean age 52 years) and the gender distribution F:M was 1.5:1. The clinical features were dominated by: headache 40 cases (90.9 %), anosmia 34 cases (77,2 %), personality changes 28 cases (63.6 %), visual impairment 27 cases (61,3 %), increased ICP syndrome 25 cases (56.8 %). The size of the tumor was more than 6 cm in diameter (giant) in 31 cases (70.4%). All patients underwent microsurgical resection using bilateral subfrontal (30 cases-68.4%), unilateral subfrontal (10 cases- 22,7%) or pterional approach (4 cases - 9,1%).

RESULTS

The tumor resection degree (Simpson scale, 1957) was: grade I - 0 cases (0 %), grade II -25 cases (56,8 %), grade III - 12 cases (27,3 %) and grade IV -7 cases (15,9 %). No biopsy was done (grade V). Regarding of pathological aspects, OGM were: classic benign - 41 cases (93,2 %) and atypical - 3 cases (6,8 %). The important postoperative complications were: seizures - 22 cases (50%), worsening of visual function - 6 cases (13.6%), CSF fistula - 3 cases (6.8%), speech disorders - 2 cases (4.5%), etc.

Postoperative anosmia was noticed in 36 cases (81,8%). The outcome realized six months postoperative was: good recovery - 26 cases (59.1%), moderate disability - 14 cases (31,8%) and 2 deaths (4.5%) by pulmonary emboli. The recurrence was noticed in 4 cases (9,1 %) which require a second

surgical approach. The GKS was not available, in our data. Fourteen patients were psychological evaluated (six month's postoperative) and the real improving was noticed after 18 months postoperative. The olfactory nerve was preserved in eight cases (18,1%), only in small and medium size of OGM.

CONCLUSION

OGM is a benign tumor with silent evolution; the bilateral subfrontal approach is the best method which allows a total removal of OGM. The factors which contribute to improve the QOL were: large approach, best visualization of anatomical structures, the gradually tumor debulking, minimal brain retraction, and preserve carefully arterial and visual pathways. The olfactory nerve preservation is possible only in small and medium size of OGM.

RECURRENT MENINGIOMAS: AN UNSOLVED ENIGMA

DR. KEKI E. TUREL, DR. NOOTAN KUMAR SHARMA, DR. SHASHANK JOSHI

Bombay Hospital Institute of Medical Sciences, Mumbai, India

Meningiomas are commonest benign tumors affecting central nervous system. Microsurgical excision is the best treatment a Neurosurgeon can offer to these patients. Complete surgical excision (Simpson's Grade I) should be the 'goal' during first surgery as neurological recovery is guarded during subsequent interventions. Despite complete excision, recurrence is a known phenomenon that can frustrate the best of neurosurgeons.

Histological grading can predict recurrence up to a certain extent. According to pathological behavior, meningiomas can be Aggressive, Invasive, Anaplastic or Sarcomatous. Malignant (Grade III) meningiomas show recurrence in 50% cases. Molecular biological marker studies have shown promise in predicting recurrence. Different receptors viz. Estrogen receptor (ER), Progesterone receptor (PR), Platelet derived growth factor receptor (PDGFR), and Tenascin have been demonstrated on cell membrane of meningioma

SELECTED ABSTRACTS

cells. Ki 67 is a proliferation marker. Different chromosomal abnormalities have been found associated with meningiomas. Chromosome 22q is principal amongst them and carries tumor suppressor gene for NF-2. Other important deletions are 1p and p16. Thus prevention of tumor recurrence is a challenge for Neurosurgeons.

In the last 205 consecutive operated meningioma cases, we have documented 15 cases of recurrence. Amongst them, 13 cases were supratentorial meningiomas. Recurrence rate was higher in male patients. Few of them needed re-surgery while remaining received radiotherapy or watchful monitoring. Monitoring included serial clinical neurological examinations followed by contrast enhanced MRI. We will also present our techniques of microsurgical excision for prevention and treatment of symptomatic recurrence. Detailed analysis of our clinical and data of molecular biological marker studies will also be presented.

FACTORS INFLUENCING SURGICAL OUTCOME IN PATIENTS WITH FOCAL CORTICAL DYSPLASIA

KOSTAS N. FOUNTAS, MD,PHD

Assistant Professor of Neurosurgery, University Hospital of Larisa, School of Medicine, University of Thessaly

Focal Cortical Dysplasia (FCD) represents the most common neuronal migrational disorder. This term describes a wide spectrum of neuropathological abnormalities ranging from mild, well-demarcated cyto-architectural changes to severe and extensive cortical lamination disorders. The association of FCD with epileptogenesis, although not clearly understood, has been well established. In the cases of medically refractory epilepsy secondary to FCD resective (mainly) and nonresective (less commonly) surgery constitutes a valid treatment option. Pre-operative work-up of these patients includes detailed neurological examination, meticulous evaluation of seizure semiology, neuropsychological evaluation, surface ictal and inter-ictal EEG, brain MRI, proton MR Spectroscopy, SPECT

and SISCOM studies, PET scan, Magnetic Source Imaging (MSI) and invasive EEG monitoring. Surgical approach is individualized on each patient with lesionectomy, topectomy, and lobectomy being the most commonly performed procedures. Multiple subpial transaction (MST) technique is reserved for only those cases that the epileptogenic focus involves eloquent cortex.

Several parameters have been identified by different clinical investigators as outcome prognostic factors. Histological subtype of FCD, severity of pathologic changes, extent of operative resection, patient's age, existence of dual pathology, anatomic location of dysplastic tissue, and duration of seizures have considered important in predicting surgical outcome among patients of previously published surgical series. The characteristics of these series and the significance of each of these factors will be analyzed.

The aim of this communication is to outline those parameters that their presence could favorably influence the surgical outcome of FCD surgical candidates.

MEDULLOBLASTOMA

C. DI ROCCO

Neurosurgery, Catholic University, Medical School-Rome, Italy

Medulloblastomas continue to be a subject of great interest to the neurosurgeon. Indeed, the surgical respectability of this tumor is coupled with the still persisting uncertainty about the late outcomes following the multimodality treatment which is necessary to cure at least some of the affected children. Nowadays, improvements in surgical technique and in intra-operative and post-operative care allow safer and more complete surgical removals.

On the other hand, refinements in radiation therapy and chemotherapy assure a better control of eventually residual tumors, consequently arising the question whether the radical excision is still the mandatory goal of the surgical treatment.

Unfortunately, this dilemma remains still unsolved. In fact, in spite of the numerous animal models and the promising results of several molecular studies, which have identified new targets for the chemotherapeutic treatment, in the clinical practice the staging of medulloblastoma is still based on traditional biological parameters such as the age of the patient at operation and the extent of the surgical excision.

NEUROPROTECTION NEUROPLASTICITY AND VASOGENIC BRAIN EDEMA

HARI SHANKER SHARMA

Laboratory of Cerebrovascular Research, Department of Surgical Sciences, Anesthesiology & Intensive Care Medicine, University Hospital, Uppsala University, Uppsala, Sweden

The microenvironment of the central nervous system (CNS) is precisely and meticulously maintained by a set of dynamic physiological barriers located within the cerebral microvessels of the brain (Blood-Brain Barrier) and spinal cord (Blood-Spinal Cord Barrier) as well within the epithelial cells of the choroid plexus separating the blood and cerebrospinal fluid (CSF) interface (Blood-CSF-Barrier). The physicochemical properties of these cellular barriers are quite comparable to that of an extended plasma membrane. The BBB and the BSCB are quite tight to small molecules (12 Å, Lanthanum ion), whereas BCNSB is less restrictive in nature. On the other hand, the ependymal cell linings of the cerebral ventricles and spinal canal, referred to as CSF-Brain Barrier do not normally restrict passage of several small sized molecules. However, protein transport across these barriers is severely restricted. Entry of proteins into the CNS microenvironment induces vasogenic edema formation that is primarily responsible for cell and tissue injury. These blood-CNS-Barriers (BCNSB) are often compromised under a wide variety of psychological, traumatic, metabolic, ischemic, environmental or chemical insults leading to neuronal, glial and axonal damage. Opening of the BCNSB to various endogenous or exogenous

substances and proteins alters the molecular, cellular, biochemical, immunological and metabolic environment of the CNS leading to abnormal neuronal function and brain pathology. This review is focused on current status of the BCNSB breakdown in experimental models of emotional stress, traumatic injuries, psychostimulants as well as key environmental health hazards, i.e., heat and/or nanoparticles exposure. Breakdown of the BCNSB in these conditions altered gene expression and induced brain pathology and neurodegeneration. Attenuation of the BCNSB disruption with drugs, antibodies or growth factors markedly reduced the development of brain pathology. Taken together, these observations strongly indicate that the BCNSB can be considered as a "gateway" to the neurological diseases.

SPINAL CORD EVOKED POTENTIALS, A TOOL TO PREDICT SPINAL CORD EDEMA AND NEUROPROTECTION

**TOMAS WINKLER MD, PHD,
PROF. HARI SHANKER SHARMA**

Institute for Neuroscience, Uppsala University, Sweden

The functional loss following acute spinal cord injury (SCI) is only partly caused by the initial mechanical trauma. The trauma also initiates release of different chemical agents which in turn induce further damage, secondary injury (SI). With rat experiments we have tried to map which substances are involved in the development of SI. After laminectomy spinal cord evoked potentials (SCEP) are recorded continuously with epidurally electrodes placed rostrally and caudally from the laminectomy area, stimulation of sensory nerves in the right hindlimb. SCI is induced with a longitudinal incision in the right dorsal horn of T10-T11. With this technique, tracts passing the injury zone is left mechanically unharmed.

In untreated animals, rostral SCEP vanishes within a few seconds after SCI and is replaced by a positive injury potential. After 3- 5 h there is sometimes a slight recovery. 5 h after SCI there is a pronounced increase

SELECTED ABSTRACTS

of water content in injured segments.

If the animals are pretreated before SCI with any of several tested drugs, dorsal sensory tract function is maintained (preserved SCEP) and edema and histopathological changes 5 h later are less or absent: pCPA (inhibitory on serotonin synthesis), naloxone (opioid receptor antagonist), indomethacin (inhibitory on prostaglandin synthesis), nimodipine (calcium channel blocker), diazepam (benzodiazepine II agonist), ibuprofen (anti-inflammatory drug), insulin-like growth factor and nerve growth hormone (local application on the spinal cord), cimetidine (blocking histamine H₂ receptors), NO-synthetase inhibitor.

Cyproheptadine (blocking serotonin H₂ receptors) increased SCI.

Some drugs have shown minor effects when applied locally immediately after injury.

Our further studies will concentrate on following questions:

Which substances are involved in later parts of SCI?

Is it possible to interfere with these clinically?

Other ways for administration of drugs to the injured parts of spinal cord?

Are some of these substances also involved in changes during monitoring of spinal cord and brain in the operation theatre?

CLINICAL ASSESSMENT OF IMPAIRED HIGHER BRAIN FUNCTIONING AFTER ACUTE TBI. THE CLINICAL ROLE OF THE GERMAN COMA REMISSION SCALE (CRS) FOR BRAIN PROTECTION

KLAUS VON WILD

Professor of neurosurgery and functional neurorehabilitation
Münster / Hannover, Germany

OBJECTIVE

The extent of persistent handicaps following acute brain damage is essentially the result of cognitive, mental, and neurobehavioral impairments. The rehabilitation of brain damaged patients means brain protection during the early and long-term rehabilitation

process that comprises the comprehensive, closely intermeshing interdisciplinary therapy of the injured patient from the very start and with the deployment of all available staff and technical resources, with the ultimate aim of enabling the patient to be socially reintegrated as fully as possible. The task of early rehabilitation is to diagnose, minimize, and treat the manifold impairments and secondary complications under intensive care conditions in such a way that the individual potential for recovery is maintained and used and at the same time to enhance the plasticity of the central nervous system (Spektrum of Rehabilitation)(1).

METHODS

Our data are based on ten years experience on early neurosurgical rehabilitation of after acute brain damage, predominantly adults, preponderant traumatic brain injured (TBI) that were compared with the results of our prospective Hannover Münster study on quality management of TBI of all age classes (1-8). The Coma Remission Scale (CRS) was published by our own working group in 1993 (2,3,6). CRS is based on the GCS, however, we added two items up to 24 points total score to describe cognitive and neurobehavioral functioning and recovery in the early stage when FIM, Barthel and DRS are not applicable and the modified Early Rehab Barthel already starts to work.

RESULTS

The first probe (Clemenshospital) is based on the results after early rehabilitation of 252 consecutive patients after different kind of brain lesions that were observed at 6 and 60 months after impact (mean 26 months)(1,3-5). The second probe respects quality management of 258 (3.8%) out of 6.783 TBI that received rehabilitation with one year outcome (7,8). The incidence of TBI is 321/100.000, thereof 90% MTBI and 5% severe damages. The percentage of concomitant organ lesion (polytrauma) is 70% respectively one third of the rehab. patients, which is important in respect to both the functional impairments and secondary, tertiary complications during the phase of early and late rehabilitation. 0% of the early rehab patients suffered from at least one secondary complication. In hospitals lethality out of all 5.221

(70.1%) TBI was 19.2% within the first 10 days and 25.3% within the first month. From these figures and our previous studies we may calculate the necessity for neurotraumatological rehabilitation in a total of 55% of all TBI-Patients admitted to the ICU. We did not observe an essentially poorer outcome in polytraumatized patients in respect to the GOS and the FIM.

COMMENTARY

The aim of (early) neurological-neurosurgical rehabilitation is brain protection in respect to the patient's final social reintegration. Frequent secondary and tertiary complications after acute brain damage require careful clinical assessment of impaired functioning during the course of acute (intensive) care and rehabilitation. We recommend the CRS assessment tool of choice during early functional recovery, for example in combination with the EFBI, Disability Rating Scale (DRS), and Functional Independence Measure (FIM). CRS follow up demonstrates clinical restoration of brain plasticity and impairment of functioning too secondary to numerous impending complications.

NEUROPROTECTION AND NEUROPLASTICITY - A DUALISTIC VISION OF A CONTINUOUS PROCESS

DAFIN F. MURESANU, PROFESSOR MD PHD

Neurology, UMPH Cluj-Napoca, Romania

Neuroprotection and neuroplasticity, processes that are apparently independent, with different control, represent in fact two sequences of the same process.

Every lesion triggers a neuroprotective endogenous reaction, after a latency period. A reparatory endogenous process (known as endogenous neuroplasticity) follows this answer also.

Continuously understanding the nature of both forenamed processes, and the manner of switching from neuroprotection to neuroplasticity, will lead to the improvement of specific pharmaceutical strategies. This presentation analyzes, on one hand, the fundamental biological processes that are continuously going on in the nervous system (neuroprotection, neuroplasticity, neurotrophicity and neurogenesis), and, on the other hand, the molecular pathophysiological mechanisms (excitotoxicity, inflammation, misfolding proteins, apoptosis like processes, free radicals, etc.). Another goal of this presentation is to present and analyze the perspectives of basic and clinical researches in this field. Although there is an increasing number of available treatments, only a very few molecules had some positive outcomes.

The causes of the unsatisfactory results of the clinical studies are divided in two major categories: the first category is directly related with the complexity of the pathophysiological cascades that cannot be controlled with a single molecule that targets a single mechanism (wrong strategy). The second category is related with the transfer modality from the experimental research in clinical research and with the incorrect design of the clinical studies.

Neurotrophic factors are among the few active molecules that positively control both processes. Because neurotrophic factors manage to control the sensitive balance of the two named processes, their chances of large-scale applicability as a treatment in different neurological disorders are highly significantly.

3N THERAPIES (NEUROPROTECTION, NEUROPLASTICITY & NEUROREHABILITATION) IMPORTANT FACTORS TO IMPROVE THE GLOBAL OUTCOME IN INTRACRANIAL ANEURYSM

PROF. A.V.CIUREA¹, M.D, ASSOC.
PROF. D. MURESANU⁴, MD, ASSOC. PROF.
G. ONOSE, MD², A. ILIESCU¹, MD, A. CHEFNEUX³,
MD, R. RADULESCU¹, MD, R. RIZEA¹, MD

¹Neurosurgical Department, ²Neurorehabilitation Department, Clinical Hospital 'Bagdasar-Arseni', Bucharest, Neurosurgical Department, ³Iuliu Hateganu, Neurological Department, Cluj-Napoca, România

Keywords: intracranial aneurysms, neuroprotection, Neuroplasticity, Neurorehabilitation subarachnoid hemorrhage, Hunt & Hess Scale, 3D CT Angiography microsurgery, embolization, rebleeding, vasospasm, Nimotop, 3H therapy

BACKGROUND

The intracranial aneurysm (I.A.) represent a prevalence between 0,2-7,9% in the literature. The variability depends of hospital referral. Neuroimaging findings and autopsy pattern. The pathology of intracranial aneurysm is a dominant element in neurosurgical activity, because of multiple preoperative and management problems.

IA affected preponderantly the active age (40 and 60 years old) and the male sex.

The cerebral circulation must be evaluated in totality and aneurysms in particular and the accuracy management is necessary for limitation of important life-threatening complication (rebleeding and ischemic stroke). Therapeutic solution: Early neurosurgical approach or endovascular aneurysm obliteration. Actually the 3N therapies represent an important steps to improve the global outcome in cerebral vascular aneurysm.

MATERIAL & METHODS

The author present a study about 468 consecutive operated patients with intracranial aneurysms, operated in first Neurosurgical Department between 1997-2006 –

10 years - (30 children and 438 adults). Most cases (195 cases-45,5%) were between 41 and 50 years old.

The predominant sex is male 291 cases (68%) (2,1: 1). The symptoms were dominated by: headache (98%), stiffneck (94%) and focal neurologic deficit (91%). Most patients were Hunt and Hess 2 (243 cases, 36,7%), Hunt and Hess 3 (102 cases, 15,4%) at admittance. The associated pathology was: systemic arterial hypertension (321 cases, 75%) and obesity/hypercholesterolemia (146 cases, 34,1%), ischemic cardiopathy (60 cases,16%), diabetes melitus (60 cases,16%), chronic alcoholism (49 cases,13%), ischemic stroke (45 cases,12%), atrial fibrillation (38 cases, 10%), miscellanea (53 cases, 14%, anticoagulant therapy). The main investigations were: CT scan, DS angiography. Actually, the most important were 3D DS Angiography and 3D CT Angiography.

The common localization of intracranial aneurysms was the anterior communicating artery 151 cases (35,3 %); the other locations were: medium cerebral artery 127 cases (29,7%), posterior communicating artery 77 cases (17,9%), internal carotid artery 57 cases, (13,3%), basilar top 8 cases (1,8%) and vertebral artery 8 cases (1,8%). Multiple aneurysm represent in our data 40 cases (8,5%). All cases were operated, as soon as possible after the subarachnoid hemorrhage (SAH) and IA angiography diagnosis. "Early surgery" eliminates the risk of re-bleeding and facilitates the treatment of vasospasm which peak is between 6-8 days post SAH. From all complications two are very critical for life and morbidity: aneurysm rebleeding and cerebral ischemia. The therapeutic operative measures for intraoperative aneurysm rupture prevention are: mild hyperventilation (PaCO₂ 30-35 mmHg); elevation of the head; deliberate hypotension; temporary clip. The most important intraoperative aneurysms surgery is the perfect microsurgical approach which realized the perfect aneurysm dissection with all perforates, collaterals and magistral arteries; the clip application on the aneurysm neck is the surgical procedure to cure the vascular malformation (gold standard - aneurysm obliteration). Also as intraoperative neuroprotective measures we mention: local papaverine solution administration, abundant saline water washing.

During postoperative period we noticed the following complications: vasospasm, obstructive hydrocephalus, seizures, cerebral edema, and general complications.

The following neuroprotective measures for postoperative complications preventions are: 3H therapy (hypertensive therapy, hypervolemic, hemodilution). Nimotop therapy could be used in preoperative period also, for cerebral ischemia prevention. (3-7 ml/h depends on arterial systemic pressure), but 3H therapy could be applied with maximum efficiency only in postoperative period (after aneurysm clipping). The Glasgow Outcome Scale (GOS) in our data (at 6 months postoperator) shows: good recovery 286 cases (66.8%), moderate disability 101 cases (23.6%), severe disability 21 cases (4.9%), persistent vegetative state 5 cases (1.1%), death 15 cases (3.5%).

Actually, an important number of IA will be treated by endovascular embolization. The Guglielmi detachable coils (GDC) represent an electrolytically detachable platinum coils placed via endovascular techniques. This GDC is feet for vertebro-basilar aneurysm in which the open microsurgical approach is difficult. Our experience in 1st neurosurgical dpt. consist in 24 cases of embolization. Also in this procedure appears many complication: aneurysm rupture, cerebral ischemia, neurological deficit and consciousness status modification.

CONCLUSIONS

IA represents an important neurosurgical challenge. Also IA by the rupture and complication is the real lifethreatening diseases. Complete vascular exclusion is the treatment of choice by open microsurgical approach or endovascular embolization. The important measures to avoid rebleeding and cerebral ischemic stroke in intracranial aneurysms are perfect evaluation and early approach, perfect aneurysm dissection and neuroprotective measures (pre, intra and postoperative). Neuroprotective agents – useful to avoid cerebral ischemic stroke The timing of aneurysm surgery is one of the key of avoidance lifethreatening complication.

UNRUPTURED CEREBRAL ANEURYSMS PRESENTING WITH ISCHEMIC EVENTS

MICHEL W BOJANOWSKI, MD, FRCS(C) AND
NANCY MCLAUGHLIN, MD

Neurosurgery, Centre Hospitalier de l'Université de Montréal, Montréal, Canada

BACKGROUND

In rare circumstances an unruptured cerebral aneurysm may present with ischemic events. The goal of this study was to evaluate results following aneurysmal treatment of such patients.

METHODS

Within the 166 consecutive patients treated for an unruptured aneurysm, 9 presented with ischemic events. Potential cardiac, hematologic or extracranial vascular etiology were eliminated.

RESULTS

At admission, all patients were investigated with a cerebral MRI and angiography. An acute ischemic lesion in the symptomatic territory was demonstrated in 5 patients. The aneurysm responsible of the ischemic event was located on the internal carotid artery (n=3), the middle cerebral artery (n=4), superior cerebellar artery (n=1) and the basilar artery (n=1). They measured 10mm or less (n=5); 11-20mm (n=2); more than 20mm (n=2). Four aneurysms were partially thrombosed on imagery. Three patients were treated endovascularly of which two had residual neck and one a recurrent aneurysm. All required a second embolization. Five patients were treated surgically. Of these, one thrombosed the aneurysm's parent vessel and two had distal emboli with neurological deficits. The aneurysm was completely excluded in 4/5 operated patients. Embolization of the basilar aneurysm was impossible. All treated patients had a favorable prognosis.

CONCLUSION

Aneurysms presenting with ischemic events are often small and located on the anterior circulation. Although the risk of thromboembolic events following surgery are high in this series, the functional prognosis is favorable.

MULTIPLE INTRACRANIAL MENINGIOMAS WITH DIFFERENT PATHOLOGICAL SUBTYPE

ASSOC. PROF. GORGAN MIRCEA,
NEACSU ANGELA, BUCUR NARCISA,
PRUNA MIHAI VIOREL,
CALINA NIKI ADRIAN, MARTIN DAN,
LISIEVICI MIHAI, VASILIU-BACOVIA DANIEL

First Neurosurgical Clinic, Fourth Neurosurgical Department,
Clinic Emergency, Hospital "Bagdasar-Arseni", Bucharest
Keywords: Multiple meningiomas, different pathological
subtype, treatment strategy

The term "multiple meningioma" is used to describe the simultaneous or sequential appearance of two or more independently situated meningiomas, not necessarily of the same pathological subtype. In the pre-CT (computed tomography) era, the frequency of multiple meningiomas without neurofibromatosis was reported to be less than 3%. Since the introduction of CT and MRI, the frequency of multiple meningiomas without signs of neurofibromatosis has ranged between 4.5% and 10.5%; Nevertheless, the concomitant occurrence of multiple intracranial and spinal meningiomas in the same patient is rare. 15% of cases with multiple meningiomas present different pathological subtypes.

Authors present the case of a 63 y.o. woman, admitted for left proptosis and hemicrania evolving for three months. At the screening CT scan with contrast were discovered two lesions: a left fronto-temporal mass, intensely contrast enhancing, with peritumoral

edema, inserted on the sphenoid wing, extended in the infratemporal fossa and ethmoidal sinus; the other lesion was cystic, located parieto-temporally, in the corticosubcortical area, with a small tumoral nodule located deeply. MRI defined the details and the size of the lesions: 63/65/71 mm left solid tumor suggesting a sphenoid wing meningioma, and a 67/62/72 mm right parieto-temporal cystic lesion with moderate mass effect.

Authors insist on neurosurgical strategy for treatment of multiple intracranial masses with different consistency-solid and cystic. Adequate surgical planning was done after MRI with contrast examinations, who were strongly suggestive for multiple intracranial meningiomas. Surgical approach was done in two steps, according to treat first the cystic lesion because we supposed that is a recent developed lesion with high risk of sudden volume increase followed by neurological deterioration. On another way, attacking first the solid tumor, we could have a high risk to decompensate the cystic lesion. Neurological and general evolution after two steps neurosurgery was without incidents with a very good outcome. Pathological examination revealed two different types of meningioma: microcystic and transitional.

CONCLUSION

Despite the multiplicity of sites, multiple meningiomas do not differ in prognosis from benign solitary meningiomas. When cystic and solid tumors coexist supratentorial, bilaterally, the first approach is on the cystic lesion that precludes the uneventful complications.