INTRODUCTION: Early detection and evaluation of brain tumors during surgery is crucial for accurate resection. Currently, intraoperative tissue analysis is performed based on macroscopic and microscopical examination of fresh tissue or cryo-sections during surgery. The histopathological diagnosis is, however, time consuming and delay the surgical procedure. Therefore, there is an increasing interest in the development of new methods to perform in vivo histological imaging during surgery. Confocal Laser Microscopy (CLE) is a novel technique which allows non-invasive high-resolution in vivo histological analysis of tissue using a miniaturized endoscopic probe. The CLE technique is based on excitation of tissue-specific fluorophores by a laser beam and the collection of emitted light. The CLE images are based on interference contrast imaging technique which results in a spatially encoded 3D image of the tissue. The CLE images can provide enhanced contrast resolution and enable discrimination of structures that are not visible with traditional histological techniques. As these findings might have impact on our future clinical approach to intracranial neoplasia and other forms of cancer. Confocal laser microscopy is a developing method to provide in vivo histological information of tissue during surgery. The CLE technique is compatible with the current clinical workflows and equipment, with the microscopes and endoscopes in a picture in picture setting and providing immediate and intraoperative histopathologic diagnosis. Aims: 1) to analyze the technical aspects of CLE imaging after topical application of 0.1ml acriflavine. The lesions examined were different types of intrasellar lesions, acoustic neurinomas, spinal neurinomas, brain metastases, medulloblastoma, epidermoid tumor. Healthy tissue adjacent to the samples served as control and was used for better differentiation between normal and pathological tissue. Results: CLE yielded high-quality histomorphology of normal brain tissue and tumors. Different fluorescent agents revealed distinct aspects of tissue and cell structure (nuclear pattern, axonal pathways, hemorrhages). CLE discrimination of neoplastic from healthy brain tissue was easy to perform based on tissue and cellular architecture. The resemblance with histopathology was excellent. CONCLUSION: Confocal endomicroscopy is a developing method for diagnosis of various neurosurgical disorders. It provides real-time images to aid in the diagnosis and management for these conditions. CLE also achieves a more targeted optical biopsy of the abnormal tissue to expedite the therapeutic planning and decisions regarding surgical intervention. Future trends in confocal endomicroscopy include the wide spread use of molecular imaging with labeled peptides to aid in a more accurate diagnosis of malignancies and for therapeutic planning.

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OBJECTIVE: The goal of the performed study was to evaluate the possibility of using three dimensional endoscopic to become a 3D-microendoscope-endocone device in one. We analyzed the ergonomy of the device, the implementation into the surgical workflow, the image quality and the future perspectives such devices could have for the next generation of neurosurgeons. METHODS: Within 12 months, 32 patients (15 male, 17 female, 20-70a) underwent surgery in neurosurgery in using the new 3D-microscope (ME). The new 3D-ME has a) the ability to visualize images from out- to inside with all advantages offered by a microscope, and in the same moment, b) its design is like a small diameter endoscope that allows stereoscopic views extracorporal, intracorporal and panoramic “para-side” of the lesion. RESULTS: In general transcranial surgery with a refinement of the classic keyhole craniotomy to a more daily routine. CONCLUSION: Choosing the correct placed keyhole approach with a refinement of the classic keyhole craniotomy to a more daily routine. CONCLUSION: The 3D-microendoscopy is a very promising surgical concept associated with new technological developments. The surgeon is able to switch to a modern visualization instrument reaching the most optimal surgical approach without compromising safety, effectiveness, and visual information.

RESULTS: Headache and psycho-organic syndrome were the most common presenting symptoms in all patients. Disturbances were associated in detail with psychological deterioration in 25 cases, visual disorder in 19 patients, and anosmia in 17 patients. Intraoperative complications were not existed. Postoperative 2 patients underwent emergency surgery because of an acute subdural bleeding and a pneumocephalus. Overall, 36 of 40 patients (90%) showed a good outcome to our criteria and returned long-term to their previous occupations respectively the elderly patients to their daily routine. CONCLUSION: Choosing the correct placed keyhole approach with a refinement of the classic keyhole craniotomy to a more smaller key “burr”hole approach, with the use of modern and new designed endoscopes it is possible to perform complex skull base procedures with the same safety, efficiency and less complication rates as described in the literature for giant meningiomas even performed with classic keyhole craniotomies.

OBJECTIVE: Conventional open surgery of giant meningiomas contains some specific difficulties. In the present study, we retrospectively analyzed the surgical technique, and outcome in 40 patients with giant meningiomas located in the frontal fossa and partly extended into the middle fossa. All patients were treated via a keyhole craniotomy as large as necessary to host the instruments and as small as possible to achieve the best surgical result. METHODS: Within 5 years, 40 patients (12 male, 28 female) underwent surgery in the frontal and temporal base for giant meningiomas (diameter > 5 cm). The mean patient age was 59 years. The follow-up period ranged from 3 to 56 months. Depending on the localization of the tumor, the skin incision was between 2.5 and 3 cm long and was made without shaving the patient’s eyebrow hair. Subsequently, a key “burr”hole craniotomy was performed of approximately 0.8 x 1.2 cm in diameter. RESULTS: Headache and psycho-organic syndrome were the most common presenting symptoms in all patients. Disturbances were associated in detail with psychological deterioration in 25 cases, visual disorder in 19 patients, and anosmia in 17 patients. Intraoperative complications were not existed. Postoperative 2 patients underwent emergency surgery because of an acute subdural bleeding and a pneumocephalus. Overall, 36 of 40 patients (90%) showed a good outcome to our criteria and returned long-term to their previous occupations respectively the elderly patients to their daily routine. CONCLUSION: Choosing the correct placed keyhole approach with a refinement of the classic keyhole craniotomy to a more smaller key “burr”hole approach, with the use of modern and new designed endoscopes it is possible to perform complex skull base procedures with the same safety, efficiency and less complication rates as described in the literature for giant meningiomas even performed with classic keyhole craniotomies.

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INTRODUCTION: Pediatric low-grade astrocytomas of the fourth ventricle are rare tumors, generally revealed by hydrocephalus. However, some patients present with a history of severe anorexia. It might be a harbinger, which could have led to earlier diagnostic. We decided to examine our database in order to evaluate the incidence and significance of anorexia in this context. METHODS: Retrospective monocentric study of cases of low-grade astrocytomas of the fourth ventricle operated between 1991 and 2012 in our pediatric neurosurgery unit of Lille. We particularly observed the clinical presentation and long-term clinical, oncological and radiological evolution. Non-parametrical tests were used (Mann Whitney, Fisher). RESULTS: We reviewed 34 cases, 31 pilocytic astrocytomas and 3 diffuse astrocytomas, 16 boys and 18 girls, (M/F ratio 0,89). Mean age was 8 years old. Seven pre- and 26 postoperative medical records were available in this group. In this group we note a significant difference regarding hydrocephalus (p = 0,19) or tumor location (P = 0,63). In all children with anorexia, body mass index improved markedly in the postoperative follow-up, which lasted on average 6 years. CONCLUSION: Anorexia with stunted body weight is a non-exceptional presentation in children with low-grade astrocytomas of the 4th ventricle. Unexplained or apatrical anorexia with negative etiologic assessment should prompt cerebral imaging. Clinical improvement after surgical resection suggests a possible interaction between tumor tissue and appetite suppressing peptide secretion.

INTRODUCTION: Recenty, the endonasal transsphenoidal approach has been widely used as the standard technique for pituitary surgery instead of the sublabial approach. However, using this approach involves potential conflicts between surgical instruments when entering the nostril and while working inside even with an endoscope. In patients with small nostrils, it requires an additional tension release incision to acquire sufficient working space, especially for the procedure with the sculeum using the microscope because the anterior nasal spine, the medial edge of the maxillary bone crest, the nasal columnella and the middle turbinate mainly limit the speculum opening. METHODS: For children whose nostrils are less than 10 mm in diameter, an additional incision is made across the base of the columnella after the standard endonasal unilateral-septal approach. Disarticulation of the septal cartilage on the nasal crest of maxilla extending to the junction with the perpendicular plate of the ethmoid bone, and elevation of the nasal mucosa from both sides of the nasal floor with the septal cartilage and the incised columnella, which are pushed over to the contralateral side of the nostril, allow the ostium for the speculum to spread to about 20 mm. RESULTS: This approach was used twice in a 9-year-old boy with craniopharyngioma and its recurrence. The boy’s nostril was 9 mm in diameter and a columnellar incision allowed the ostium for the speculum to spread to about 20 mm. The columnellar scar, 7 years later after the second incision, is cosmetically imperceptible and acceptable to the patient without any skin problem. CONCLUSION: This report describes a simple technique, termed the
on 16 September 2017

“Endonasal unilateral-septal midline transphenoidal approach with colocellar incision”, for children with small nostril. Although this is not a common technique of the endonasal approach, it should be considered for children with small nostril to prevent a skin laceration due to excessive speculum spreading.

NS-010. ONE MONTH MORTALITY FOLLOWING CRANIOTOMY FOR PEDIATRIC BRAIN TUMORS: OUTCOME ANALYSIS VS. REVIEWING 3,130 CHILDREN FROM SEER DATA

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INTRODUCTION: Thirty day mortality is increasingly becoming a reference metric regarding surgical outcomes. Recent data estimate a 1.6% rate of death within the first 30 days after neurosurgery for patients <16 years of age. However, no detailed analysis of short-term mortality rates following craniotomy for tumor in the pediatric population has been conducted.

METHODS: The Surveillance, Epidemiology and End Results (SEER) database was utilized to identify patients with age <21 years who underwent subtotal or gross total resection of a primary intracranial tumor between 1973 and 2010. One month mortality was estimated by identifying patients for whom time from diagnosis to death was within one month. Standard statistical methods were used to estimate associations between independent variables and mortality. RESULTS: 3,130 patients met criteria for inclusion in the analysis. The crude probability of death within 1 month of the therapeutic procedure (surgery) was 2.0%. Patients less than 1 year of age (n = 1,236) had a risk of death of 12.5%, while those between 1-21 year (n = 2,919) had a risk of death of 1.2% (p < 0.001). Patients of white race had a risk of death of 2.3%, which was higher than other races but did not demonstrate statistical significance (p = .09). No difference in outcome based on geography was identified. No significant differences were identified with analysis of death within 2 months of diagnosis when compared to death within 1 month of diagnosis.

CONCLUSION: We found the crude probability of death within 1 month of craniotomy for a primary brain tumor in children to be approximately 2.0%, consistent with previous data. However, the risk of mortality in infants is considerably higher. Further investigation will be required to identify reasons underlying this finding. Neither race nor geographic location was associated with a clinically or statistically significant difference in 1 month mortality.

NS-011. TREATMENT PARADIGMS FOR SUBPENDEDYMAL GIANT CELL TUMORS IN TUBEROUS SCLEROSIS COMPLEX

David Harter, Matthias Karajannis, Jeffery Wisoff, and Howard Weiner; New York University School of Medicine, New York, USA

Subependymal Giant Cell Tumors (SEGAs) are benign intra-axial brain tumors occurring most commonly in patients with Tuberous Sclerosis Complex (TSC). SEGAs are usually slow-growing, and cause symptoms related to obstruction of CSF pathways. Conventionally available treatment includes craniotomy for tumor removal. The elucidation of the molecular mechanisms related to SEGA formation has allowed for the development and study of inhibitors of the affected cellular pathways (mechanistic target of Rapamycin - mTOR). We review our experience with the surgical treatment of 25 patients with TSC related SEGAs (17 with craniotomy and 8 endoscopically) with respect to tumor control, complications and cost, and discuss the relative merits of surgical and/or pharmacological treatment with mTOR inhibitors.

NS-012. SURGERY OF PINEAL REGION TUMORS USING SUBOCcipITAL SUPRACEREBELLAR APPROACH

Irakli Toidze, Vladimir Tsakhrishvili, Nino Lobianidze, Irma Elizbarashvili, Nino Akhiaishvili, and Tea Maisuradze; Khchimashvili Medical Hospital, Tbilisi, Georgia

OBJECTIVES: Tumors of the pineal region account for 0.5% - 1.6% of brain tumors. The surgical removal of pineal region tumors ranks among the most difficult neurosurgical intervention and neurosurgeons must have high skills for this type of surgery. Surgical treatment with aggressive tumor resection is the preferred method in most cases of this type of tumors. The aim of present study was the assessment of advantages of suboccipital supracerbellar approach to pineal region tumors. METHODS: We present data of 3 patients with pineal region tumors, which underwent open surgery - suboccipital supracerbellar approach ( RESULTS: All patients (Mean age 10,2 years old, 3 male/2 female) underwent neurosurgical intervention used suboccipital supracerbellar approach and gross total removal was achieved. MRI with contrast enhancement had been done in all cases before and after craniotomy, which demonstrated total removal. Pathological investigation were revealed -2 pineocytoma, 3- pineoblastoma. Before and after surgery neurological assessment revealed the following: visual and ocular movement were impaired in 3 patients, imbalance and ataxia were found in 2, but all of them were temporary. All symptoms resolved in 3 months, long-term outcome was good in all patients 3 of them completely recovered, in 2 patients revealed only neurological signs, which were not interfere in everyday life. 2 patients with pineoblastoma underwent radiation therapy. In all cases marked hydrocephalus presented before operation. In two cases third ventricle was connected with cisterna magna by shunt. In 3 patients shunt weren’t needed, because of restored of cerebrospinal fluid flow.

NS-013. CHOROID PLEXUS PAPILLOMA IN CHILDREN: AN ANALYSIS OF 18 CASES

Awadhesh Jaiswal, Sushila Jaiswal, Anant Mehrotra, Arun Srivastava, Rabi Sahu, and Sanjay Behari; SGPGIMS, Lucknow, Uttar Pradesh, India

INTRODUCTION: Choroid plexus papilloma (CPP) is a common intraventricular tumor particularly in children. Total microsurgical excision of tumor is the treatment of choice. AIM: To study the surgical outcome of CPP. MATERIAL AND METHOD: The study was performed by retrospective review of the records of patients of CPP. RESULTS: 18 cases of CPP (11 males and 7 females) were managed over last 8 years. Age ranged from 2 months to 16 years. CPP was in lateral ventricle (14 cases), both lateral and third ventricle (3 cases) and in fourth ventricle (1 case). All patients presented with raised intracranial pressure as predominant symptoms. Total microsurgical excision of tumor was achieved in all cases. Intraoperative EVD was put in all cases which were later removed. Postoperative VP shunts (3 cases) and subdural peritoneal shunt was done in 1 case. One patient died in post operative period due to anaesthetic complications. Follow up was available in 14 cases, ranged from 3- 28 months and all 14 cases had no recurrence. CONCLUSION: Total microsurgical excision of CPP bears good outcome.

NS-014. PAEDIATRIC MENINGIOMAS: A STUDY OF TWELVE CASES

Sushila Jaiswal, Awadhesh Jaiswal, Anant Mehrotra, and Sanjay Behari; SGPGIMS, Lucknow, Uttar Pradesh, India

BACKGROUND: Paediatric meningiomas are rare intracranial neoplasms representing 0.4- 1.1% of the paediatric-age tumors and 5.5-18% of all intracranial meningiomas. OBJECTIVE: To determine clinical presentations, radiological and histopathological spectrum of paediatric meningiomas. MATERIAL AND METHODS: The study was performed by retrospective review of the medical records of the patients of pediatric meningioma, operated in our department. RESULTS: The study includes 12 cases (9 males, 3 females; age range 4- 18 years) managed over 10 years. The commonest presentation was headache followed by seizures behaviour abnormalities and visual dysfunction. The duration of symptoms ranged from 0.5- 36 months. The commonest location of meningioma was frontal region followed by intraventricular, temporal, posterior fossa, falx-tenorial, petro- temporal and tempo-parietal. On CT, the tumor was isodense (1 case), hypodense (1 case) and hyperdense (5 cases). Contrast enhancement was present in all the cases. On MRI, the tumor was isointense (7 cases) and hypointense (5 cases) on T1 weighted images and was isointense (6 cases) and hyperintense (4 cases) on T2 weighted images. Tumor had enlargement on gadolinium injection. Total surgical excision was achieved in 10 cases. Histology revealed meningothelial meningioma (4 cases), transitional meningioma (4 cases), atypical meningioma (2 cases), rhabdoid meningioma (1 case) and papillary meningioma (1 case). Following surgery, radiotherapy was advised in all WHO grade II and III cases. Follow up was available in 8 cases and ranged from 8-98 months (mean-24.2 months). Recurrence was noted in 4 cases. CONCLUSIONS: Meningiomas are uncommon in the paediatric population, have male predominance and higher rate of malignant and atypical features on histology. Surgery followed by radiotherapy is the main stay of treatment. Their recurrence rate is high.

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INTRODUCTION: Since mid 2012, MRI-guided laser interstitial thermal ablation has been utilized as a novel treatment for intracranial lesions. It has been applied primarily in epilepsy patients, but experience with pediatric brain tumors is accruing. This preliminary report from a multicenter consortium evaluates its efficacy and clinical outcomes. METHODS: Four major pediatric brain tumor centers reviewed their early experience using MRI-guided laser thermal ablation in a variety of pediatric brain tumors. Patient demographics, tumor type, length of stay including ICU care, prior surgical treatments, and complications were evaluated. RESULTS: 13 children underwent 13 thermal ablation procedures. One additional procedure was aborted due to the mechanical limitations of the headframe and laser positioning. Ages ranged from 8 to 12 years. There were 10 primary tumors and 3 recurrent tumors. Twelve were low-grade glioma variants (grade I or II), and 1 was a grade III ependymoma. Length of hospital stay was 1 day in 7 patients, 2 days in 3 patients, 5 to 6 days in 2 patients, and 1 to 21 days in the remaining 2 (post-operative complications). Nine of the 12 procedures were performed electively, compared to 4 post-operative complications with laser ablation. No other patient experienced local tumor recurrence or growth. CONCLUSIONS: This report demonstrates the early effort to work collaboratively in a multicenter fashion to critically evaluate the indications, efficacy and outcome for novel therapies such as MRI-guided laser thermal ablation.

NS-016. OMMAYA RESERVOIR-RELATED INFECTIONS AND OTHER COMPLICATIONS IN PEDIATRIC PATIENTS WITH BRAIN TUMORS
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1Department of Oncology, University Children’s Hospital of Zurich, Zurich, Switzerland; 2Department of Neurosurgery, University Hospital of Zurich, Zurich, Switzerland

BACKGROUND: Intraventricular catheter systems with subcutaneous reservoirs, including Omaya reservoirs (OR), are used for the administration of intraventricular chemotherapy in children with brain tumors. Little is known about the incidence of infectious or other complications in this population. OBJECTIVE: To describe the incidence and nature of infections and other complications related to OR. METHODS: Retrospective analysis of Omaya reservoir-related complications in 591 consecutive patients with a brain tumor diagnosed between 1980 and 2011 and treated at our institution. RESULTS: 22 patients with a median age of 3.1 years (range, 1.4 - 13.9 y) at diagnosis received a total of 32 OR (median number per patient, 1; range 1 - 3) between 1998 and 2011. 18 complications (36%) in 12 (55%) patients were recorded. Seven patients (32% of patients, 22% of reservoirs) had a OR-related infection with coagulase-negative staphylococci, diagnosed at a median of 10 days (range, 2 - 203) after implantation; in four patients 2 - 10 days after implantation/after 0 - 1 infections, probably as a surgical complication; in three patients 51 - 66 days after implantation/after 9 - 29 infections rather as a complication of manipulation. None of the patients with infection had received a perioperative prophylaxis with intraventricular anti-infectious agents. One patient had received intraventricular cefazoline. Reservoirs from infected patients were explanted, patients were treated with intravenous and/or intrathecal antibiotics: There were no long-term sequelae or deaths. Other complications included catheter misplacement, n = 5; wound dehiscence, n = 6; leakage of cerebrospinal fluid (CSF), n = 12; subcutaneous CSF collection in a patient with hydrocephalus, n = 1. With the exception of 3 devices (misplacement, n = 2; subcutaneous CSF collection, n = 1), all of them were explanted. CONCLUSION: Infections were the most frequent OR-related complication. Further research on larger collectives is needed to identify risk factors and to evaluate preventive measures such as the administration of intrathecal antibiotics.

INTRODUCTION: Diffusion tensor imaging (DTI) is a promising, non-invasive magnetic resonance imaging (MRI) method for studying the anatomical organization of major white matter fiber tracts. A technique which currently is receiving increased attention, is the application of DTI fiber tracking in the investigation of patients with intracranial tumors. Therefore, has been used in neuronavigation systems, allowing the correct and precise tumor identification and, consequently, safe resection. METHODS: Structural magnetic resonance imaging, and diffusion tensor imaging were performed on 12 patients before they underwent lesion resection using neuronavigation. 11 patients presented brain tumors and six of them were localized in posterior fossa. One case, the diagnostic of the supratentorial lesion was brain abscess. The clinical feasibility of this approach was evaluated in 12 cases of lesion resection. In addition, system performance was evaluated by measuring the latency between surgical tool tracking and visualization of the white matter tracts. RESULTS: Lesion resection was performed successfully in all 12 patients. The seeded white matter tracts close to the lesion and other critical structures, as defined by the structural images, were interactively visualized during the intervention to determine their spatial relationships relative to the lesion and critical deep cortical areas. CONCLUSION: Tractography can be used combined with neuronavigation for guiding resection of tumors. Even more important, this series shows why tumor resection surgery based on tractography mapping may sometimes lead to better clinical outcomes (mainly in low grade gliomas) even though in posterior fossa, without presenting notable brain shift.