

ORAL COMMUNICATIONS

SPINE AND TUMOR

Prediction of instability in unilateral facet fractures of the subaxial cervical spine

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Keywords : facet fracture, cervical spine, MRI, instability

The literature is not capable of supporting treatment protocols for unilateral facet fractures of the cervical spine. Some authors have recommended anterior fusion in all patients. One study advocated computed tomography (CT) and another study magnetic resonance imaging (MRI) for predicting instability. All these studies were retrospective in nature.

Aim: To investigate the relation between CT and MRI characteristics and the development of anterolisthesis after a unilateral facet fracture of the cervical spine.

Material and Methods

All patients with a unilateral facet fracture of the subaxial cervical spine diagnosed by CT with maximum 2mm of anterolisthesis entered a prospective protocol in which MRI of the cervical spine was performed and patients were treated in a Miami J stiff collar for at least 6 weeks. Patients were followed in the outpatient clinic with regular X-ray or CT imaging for at least 3 months.

Results

Between September 2006 and September 2009 14 patients entered the study. MRI was performed in 13/14 patients. Two were lost for follow up. Three patients developed a clear slippage with significant neck pain for which anterior fusion surgery was performed. Minimal slippage, not considered a surgical indication, was seen in 6 patients. Three patients retained normal alignment. Ligamentous injury at the index level on MRI was 100% predictive of >2mm slippage. No clear relation between slippage and CT characteristics could be found.

Conclusion

Although numbers are limited in this prospective study, development of significant anterolisthesis after unilateral facet fracture could accurately be predicted by ligamentous injury on MRI.

Radioscopic comparison of motion patterns of patients operated with a Bryan Cervical Disc Prosthesis versus asymptomatic volunteers

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Keywords : Cervical spine, kinematics, arthroplasty

Introduction

Cervical disc prostheses are designed to permit normal motion. The scope of this study was to compare quantitative and qualitative motion patterns of patients operated with a Bryan Cervical Disc and healthy volunteers.

Material and Methods

Lateral continuous motion patterns, obtained using fluoroscopy, were compared between 15 asymptomatic volunteers (healthy group) and 10 patients operated for cervical disc disease with a Bryan Cervical Disc inserted at C5-C6, preoperatively and at 1 and 6 years postoperatively (Bryan group).

Intervertebral disc degeneration was assessed using a validated scoring system. Motion patterns were calculated using a motion tool (measurement error: 0.3° and 0.4mm).

Results

There was no significant difference in age or degeneration score between both groups.

No significant difference in range of motion or in continuous angular rotation was observed between the Bryan group preoperatively and postoperatively and the healthy group. Anteroposterior shear and continuous translation in the Bryan group was, preoperatively and postoperatively, significantly smaller than in the healthy group. However, no significant difference in preoperative versus postoperative shear was seen. Moreover, no significant differences in the location of the center of rotation between the Bryan group pre- and postoperatively and the healthy group were found.

Conclusion

Both groups were age and degeneration matched. The results indicate that the Bryan Cervical Disc is able to mimic normal intervertebral rotations and a physiological center of rotation. Compared to healthy volunteers, anteroposterior translations are smaller in the Bryan group, preoperatively as well as postoperatively. Translations did not change after cervical disc arthroplasty.

A prospective review of perioperative and early complications of reconstructive cervical spine procedures in 119 patients in a large spine centre

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Keywords : Cervical spine, reconstructive surgery, complications

Introduction

Instability of the cervical spine can be the result of trauma, tumor, inflammatory disease and most often degenerative disease. Iatrogenic kyphosis sometimes seen after cervical laminectomy confronts us with new challenging decisions. Today several techniques are used to stabilize the cervical spine and even restore cervical lordosis. Recent studies show that there is an increase in the number of these procedures, but reliable information on the complication rate is lacking.

Material and Methods

We reviewed 119 patients who underwent complex instrumented anterior, posterior and circumferential cervical spine procedures. A database was created to collect all relevant clinical data. Prospective registration and evaluation of serious complications resulting in second surgery was performed followed by a thorough evaluation.

Results

Of these 119 patients 9.2% needed a reoperation, 8 in the first postoperative month and 3 in the early postoperative period. In all patients we have a minimum follow up of 3 months. Re-evaluation of surgical strategy resulted in the conclusion that most re-operations could have been prevented by respecting biomechanics.

Conclusion

Although being a tertiary referral centre, we conclude that reoperation rate was higher than anticipated, but comparable to existing literature. Through extensive reviewing of our complications we are able to reduce and anticipate some of these complications. Based on these results we recommend a prospective registration database (e.g. Spine Tango) of complications controlling for case mix and a monthly re-evaluation of complications

Dendritic cell-based tumor vaccination integrated in postoperative radiochemotherapy for newly diagnosed glioblastoma patients: results of a phase I/II trial HGG2006

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Keywords : glioblastoma, vaccination, dendritic, radiochemoimmunotherapy

Introduction

Autologous dendritic cell (DC)-based tumor vaccination has been extensively studied in patients with relapsed high grade glioma and found to be safe, resulting in a substantial group of long-term survivors after relapse. In the HGG2006 trial, tumor vaccination is fully integrated in the state-of-the-art postoperative radiochemotherapy schedule (EudraCT 2006-002881-20) for patients with newly diagnosed glioblastoma. To assess feasibility, clinical and immunological efficacy of DC vaccination in 78 included patients with newly diagnosed glioblastoma (WHO grade IV).

Material and Methods

Autologous monocyte-derived DC are generated after leukapheresis, which is performed after weaning of steroids and before start of radiochemotherapy. Four weekly induction vaccines are administered after the 6 week-course of radiotherapy and concomitant chemotherapy (Temozolomid). During maintenance chemotherapy 4 boost vaccines are given. Adverse events, progression-free (PFS) and overall survival (OS) were recorded, as well as immune response patterns as assessed in patients' blood samples.

Results

All analyses are made on an intent-to-treat basis. Median FU is 20.4 months. No vaccine-related serious adverse events occurred. Median PFS and 2-year PFS are 9.5 months and 24.7% respectively. Median OS and 2-year OS are 20.7 months and 42.7% respectively. Immune response patterns can be distinguished but correlation with survival data is limited. Further subdivision of survival data according to the EORTC RPA classification results in statistical significant survival differences amongst different classes.

Conclusion

Integration of autologous DC-based tumor vaccination in state-of-the-art postoperative radiochemotherapy for newly diagnosed glioblastoma seems safe and possibly beneficial. A double-blind randomized controlled trial is being prepared.

Radiosurgery as alternative or adjuvant treatment to surgery for brain metastases

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Keywords : brain metastases, radiosurgery, Gamma Knife

Introduction:

Brain metastases (BM) are the most common brain tumor and occur in 20 to 40% of patients with cancer. Surgery followed by Whole Brain Radiation Therapy is considered as the standard treatment for single and/or large (>3cm) lesions, especially those causing an important mass effect, and is also valuable to confirm the diagnosis when no primitive is known. Radiosurgery is an alternative to surgery particularly for the treatment of small lesions in functional zones and for patients with a high anesthesia risk, but becomes more recently used for larger indications.

Material and Methods

From December 1999 to December 2009, 751 patients were treated for BM by Gamma Knife radiosurgery in our center. 263 patients were available for follow-up analysis. 62% of the treated patients were bearing multiple metastases. 44% were secondary to lung cancer, 22% to breast cancer and 18% to melanoma.

Results

The overall median survival is 12 months. Factors of good prognosis are a Karnofsky Performance Status >70, a primary tumor controlled and the absence or the control of extra-cranial metastatic disease. No survival differences is found between single (11 months) and multiple BM (13 months; p=0.82). 25%

of the patients experienced multiple radiosurgeries for recurrent BM.

Conclusion

Radiosurgery seems to be an excellent therapeutic option for BM especially for multiple lesions or situated in functional zones, but should also be considered as alternative or adjuvant treatment to surgery for every non-life threatening small BM when primitive disease is known.

The relation between brain tumor and depression

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Keywords : brain tumor, depression

Introduction

The relation between brain tumor and depression is determined by a complex interplay of factors. Particularly, the social network and premorbid depression play an important role. Because there are many psychological and physiological symptoms due to the diagnosis of brain tumor, this study will broaden its perspective to quality of life rather than to depression solely.

Material and Methods

24 cases involving brain tumor were investigated, respectively 13 benign and 11 malignant tumors. The patients were requested to grade their quality of life by filling in a questionnaire measuring: physiological and cognitive issues; social, emotional and practical problems and religious issues.

Results

Patients with a malignant brain tumor appear to have more physiological problems than those with a benign brain tumor. More specifically, they seem to be more disturbed by sleeping problems (63 %), fatigue (55 %) and problems with daily tasks (27 %). Half of the patients with a malignant tumor frequently notice concentration problems, compared to only 30 % of people with a benign tumor. Patients with malignant tumor are more distressed by slower reactions (64 %), confusion (27 %), disorientation (45 %) and organizing problems (36 %). They also have more difficulties in the relationship with their partner (18 % vs. 0 %). Although percentages in malignant tumor are often higher than those in benign tumor, emotional problems are equally present in both types of tumors.

Conclusion

There is an important correlation between having a benign or malignant tumor and a deterioration of quality of life. Hence, it is of great importance that we pay close attention to their accompanying features.

Surgical outcome for acromegaly: a single center experience

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Keywords : Acromegaly, Transsphenoidal surgery, Pituitary adenoma

Introduction:

Treatment options for acromegaly include surgery, radiotherapy, radiosurgery and medical treatment. Although more and more patients are medically treated, surgery is still the primary choice for the treatment of growth hormone (GH)-secreting pituitary adenomas. Experience is an important factor determining the outcome in these patients. We recorded the surgical and endocrinological outcomes of acromegalic patients in our center over the past six years.

Material and Methods

From 2004 till 2009, 146 patients were transsphenoidally operated in our center (155 procedures), of whom 40 had a diagnosis of acromegaly. The average age of these patients was 48 years and there was an equal male/female distribution.

Nineteen percent had a microadenoma and 81 percent were treated for a macroadenoma. The GH response during an oral glucose tolerance test (OGTT) and IGF-1 were measured as outcome parameters for remission. Remission was defined as both a normal IGF-1 for age and a GH < 1 µg/L after OGTT.

Results

The overall remission rate was 78 %. All patients with a microadenoma and 68 % of patients with a macroadenoma obtained endocrinological remission. In patients with extension lateral to the carotid artery (n = 3), remission could not be obtained.

Conclusion

These data show that the outcome after surgery for acromegaly is generally good and that remission rates are correlated with the extension of the tumor. Our results compare nicely to those reported in previously published larger series.

PEDIATRIC AND VASCULAR

Early floating forehead advancement procedure in craniofacial synostoses: assessment of technique, results and outcome in 88 consecutive children

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Keywords : Craniosynostoses, floating forehead advancement, results, outcome

Introduction

Early floating forehead advancement (EFFA) is the procedure for orbito-frontal remodeling in infants with craniofacial synostotic deformity. We evaluated the accuracy of our technique, results and outcome.

Material and Methods

88 children (41F/47M aged 4 to 15 months) consecutively referred for craniofacial synostosis (trigonocephaly 45; plagiocephaly 23; brachycephaly 20) were operated between 1995 and 2009. Syndromic forms affected 12/45 trigonocephaly children, 2/23 plagiocephaly children, 13/20 brachycephaly children (Crouzon 4, Pfeiffer 3, Seathre-Schotzen 3, Apert 2, Cloverleafskull 1). All were operated after 6 months except 5 (Crouzon 2, Apert 2, Cloverleafskull 1) operated at 4 months for respiratory reasons. In all, bilateral remodeling of supraorbital rim and frontal bones including deep bitemporal craniectomies was performed without any fixating plate or bone substitute. We assessed the mean blood loss, surgery duration, immediate complication rate, cosmetic results (hypotelorism, bulging forehead, temporal depression, symmetrical orbital growth, resynostosis, parents' satisfaction, neurological outcome) at 6/24 months.

Results

EFFA revealed very accurate for one-stage remodeling craniofacial deformity in all craniosynostoses. Resynostosis, confirmed on CT, occurred within 12 months in 6 (unilaterally at fronto-temporal junction in 4)(trigonocephaly 3, plagiocephaly 2, brachycephaly 1) whatever the technique used and the underlying syndrome. Two-year-cosmetic results tightly depended on surgical learning curve, requiring exaggerated supraorbital rim advancement. No permanent morbidity was observed. The cloverleaf skull died 3 weeks after surgery from tracheostomy complications. All non-syndromic children had good neurological outcome. Three trigonocephalies and one plagiocephaly developed secondarily sagittal suture closure, chiari and hydrocephalus.

Conclusion

EFFA accurately remodeled craniofacial deformity in different anterior craniosynostoses but required very long learning curve to obtain two-year good results. Syndromic cases show same resynostosis rate but present less good cosmetic results and neurological outcome.

Clinical characteristics, radiological findings, and surgical outcome in 25 cases of childhood tight filum syndrome

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Keywords : outcome, pediatric, tight filum, tethered cord syndrome

Introduction

Tight filum syndrome (TFS) may be caused by a thick (fatty) filum (abnormal on T1 MRI), short filum (low-lying conus), or non-elastic filum (strictly normal MRI). We made a detailed analysis of children treated for clinically suspect TFS with or without radiological abnormalities.

Material and Methods

Twenty-five children operated between 2002 and 2009 were retrospectively identified. All children had been carefully evaluated by a multidisciplinary team (child neurologist, neurosurgeon, orthopedic surgeon and urologist) preoperatively. Symptoms, signs and diagnostic test-results were collected, categorized (neurologic, orthopedic, urologic and dermatologic) and compared pre- and approximately 1 year postoperatively. Normal MRI was defined as conus at or above middle third of L2, filum diameter <2mm and no other anomalies.

Results

- Patients: 17 girls, 8 boys, age 2 - 18 years, including 10 syndromal children

- MRI: low-lying conus (n=14) including 2 with thick filum, normal conus and thick filum (n=1), strictly normal (n=10).

- Outcome 1 year postoperatively: neurologic + urologic + orthopedic problems (n=4): 1 improved in all categories; neurologic + urologic problems (n=13): 11 improved in both categories; neurologic + orthopedic problems (n=4): 1 improved in both categories; neurologic problems only (n=4): 3 improved. Radiologically occult TFS (n=10): 8 improved in all affected categories.

Conclusion

Modern MRI is unable to reliably detect every tight filum. The optimal approach for every clinically suspect TFS is careful multidisciplinary evaluation. Children with strictly normal MRI but strong clinical suspicion are very likely to benefit from surgery. Syndromal children are less likely to improve but may be stabilized.

Recovery of third nerve palsy after endovascular treatment of posterior communicating artery aneurysms

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Keywords : Third nerve palsy, posterior communicating artery aneurysm, endovascular treatment

Introduction

High recovery rates after endovascular treatment of TNP-inducing PcomA aneurysms have been reported. However, only few and often small series were reported. Choosing clipping or coiling as treatment modality nowadays is still a matter of debate. We report the ophthalmologic outcome of 20 consecutive patients treated by coiling of TNP-inducing PcomA aneurysms.

Material and Methods

The third nerve function before and after endovascular treatment was assessed and studied retrospectively. Predictive recovery factors known from literature including treatment timing, the degree of preoperative nerve deficit, the association with SAH, coil type, cardiovascular risk factors, and age were analyzed.

Results

Eight patients presented initially with complete nerve palsy (40%) and 12 with partial palsy (60%). Eleven patients had SAH.

The mean aneurysm size was 7.14 mm. Of the 20 patients, 19 (95%) recovered. Recovery was complete in 7 patients (35%), partial in 12 patients (60%), and 1 patient remained unchanged (5%). The mean duration of follow-up was 24.7 months. One patient with complete TNP recovered completely after 5 months of coiling. One case of late complete nerve recovery was observed at 20 months. Clinical presentation with SAH and early management were statistically significant factors that positively influenced nerve recovery ($P = .006549$ and $P = .015718$, respectively). Initial partial TNP seems to influence recovery but did not reach significance ($P = .079899$).

Conclusion

Coiling of PcomA aneurysms is associated with high rates of third nerve function recovery. Complete recovery can be expected even after long periods and in cases of initial complete nerve palsy. The early treatment and the association with SAH seem to promote the nerve recovery.

Brainstem cavernomas: a surgical series of 15 patients

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Keywords : brainstem, cavernoma, vascular malformation

Introduction:

Due to their eloquent location, resection of a brainstem cavernoma can be risky. Therefore most of these lesions were considered inoperable in the past. However, the last 20 year series describing good surgical results have been published. We present a series of 15 patients with brainstem cavernoma who were operated in the University Hospitals Leuven.

Material and Methods:

We retrospectively analyzed all patients operated for brainstem cavernoma in our center between 1996 and 2009. We compared these results with the results reported in the literature. We also reviewed the pathophysiology, bleeding risks and surgical indications.

Results:

15 patients were operated. There was no mortality. Mean follow-up was 41 months, median 24 months. All patients were at the last follow up visit equal to or improved compared to the preoperative neurological situation, except for one patient who was operated for an asymptomatic lesion. 9 patients had new neurological deficits after surgery, minor in most cases, and transient in 5. 13 patients were eventually able to carry out their normal activities. These results largely resemble those of the other series in the literature.

Conclusion:

Resection of brainstem cavernoma is challenging but also the most effective treatment against renewed bleeding and increasing morbidity. We operated 15 patients with overall good results, similar to surgical series from other centers. Controversy still exists in the literature regarding bleeding risks and surgical indications, but all patients presenting with a (symptomatic) brainstem cavernoma should have neurosurgical evaluation.

Clinical complications after temporary arterial clipping in 100 consecutive patients harboring unruptured intracranial aneurysms

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Keywords : Aneurysm, Temporary clipping, Hypothermia, Burst suppression

Introduction

The surgical treatment of intracranial aneurysm may require a temporary arterial clipping of the principal artery that carries the malformation. Since 1996 we use a protocol that include hypothermia (33°C) and burst suppression during all surgery for aneurysm clipping for the cerebral protection. This protocol allows us to perform temporary arterial clipping without major permanent complications.

We report our experience of temporary arterial clipping during surgery for UIA using our technique and protocol.

Material and Methods

One hundred consecutive patients harboring 138 UIA were included in our study between June 2003 and May 2009. Sixty three females, mean age 50 years (range 25-73 years). Twenty-five patients presented with multiple aneurysms, 42% were located in middle cerebral artery segment, 30% in anterior cerebral artery segment and 28% in internal carotid artery segment. The temporary arterial clipping duration was between 5-10 minutes, with the patient in hypothermia and burst suppression. If more than one temporary clipping was necessary, we wait 5 minutes between each clipping to go on.

Results
Clinical complications were recorded in two patients (2%) in our series. One had a slight permanent hemiparesis associated with transient aphasic disorders and vasospasm, and another had only a slight transient vasospasm.

Conclusion

Our series demonstrate that the management of UIA treatment using temporary arterial clipping of the vessel that carries the aneurysm, with our protocol (hypothermia and burst suppression with temporary clipping during 5-10 minutes) is a safe procedure. Only one case of permanent complication without severe handicap (Karnofsky scale = 90) was noticed.

Management of pericallosal aneurysms

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Keywords : aneurysms, pericallosal

Introduction

Aneurysms originating from the A3 segment of the anterior cerebral artery are rare and form about 5% of all intracranial aneurysms. Due to their specific location and size surgical and endovascular treatment is different from those of other aneurysms. We will report our experience of 16 patients harboring aneurysms of the A3 segment in our center.

Material and Methods

Between September 1996 and June 2007, 16 cases of aneurysms of the A3 segment were treated in our center. Clinical presentation, treatment modality and outcome were retrospectively analyzed.

Results

There were 12 females and 4 males. The mean age was 47 years. There were 6 ruptured and 10 unruptured aneurysms. The mean WFNS score was 2,6 for the ruptured and 1,3 for the unruptured cases. Eleven (68%) patients had multiple aneurysms. Nine patients underwent complete surgical clipping. Six patients had endovascular embolisation. Three were complete, but one showed recanalisation. One had a subtotal occlusion. In two patients coiling was abandoned for technical difficulties. One patient was left untreated due to a poor medical status. The mean GOS was 4,75. One patient with an abandoned coiling procedure suffered a CVA. One patient had a distal A3 occlusion. There were 2 late infections.

Conclusion

In our series 68% of patients had multiple aneurysms. In only 6 patients the aneurysm was ruptured. In 62% of cases the aneurysm was discovered incidentally or due to a rupture of another aneurysm. Total occlusion with coiling can be achieved but is especially difficult in small aneurysms.

STEREOTACTIC AND OTHER

Results of Gamma Knife Radiosurgery for trigeminal neuralgia using a 90-Gy dose

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Keywords : Trigeminal neuralgia, radiosurgery

Introduction

The use of a 90-Gy dose for Gamma Knife (GK) treatment of trigeminal neuralgia (TN) remains controversial. We evaluate pain relief and morbidity in patients treated by GK for TN using a 90-Gy radiation dose, standardized dosimetric parameters and irradiation with LGK-C.

Material and Methods

We treated 204 patients for TN using a standardized methodology: 1) targeting using axial 1-mm sliced Gadolinium-enhanced T1-weighted and T2-weighted MRI; 2) distance of nerve >5mm between target and brainstem; 3) maximum radiation dose of 15 Gy delivered at the first 10mm³ of the brainstem; 4) maximum prescription dose of 90 Gy; 5) irradiation with LGK-C with APS. A minimum follow-up of 1 year was request to be included in the study.

Results

165 patients were included with a mean 24 months follow-up. Plugs were used for 59 patients. Complete pain relief was reached for 123 patients, 90% to 99% pain reduction for 21 patients, 50% to 89% pain reduction for 8 patients and no pain reduction for 13 patients. 87% of the patients have reduced or stopped their medication for TN at last follow-up. Facial numbness occurred in 28% patients and bothersome dysesthesia in 11% patients, including 11 patients treated with plugs. No other complication was observed.

Conclusion

Our dosimetric parameters achieved high rate of initial pain relief. However, our treatment protocol is associated with a significant risk of numbness or bothersome dysesthesia, especially when plugs are used. We do not recommend using plugs when a 90-Gy dose is used.

Early imaging response of brain tumors after Gamma Knife irradiation

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Keywords : radiobiological effect, radiosurgery, Gamma Knife

Introduction

The attended effects of Gamma Knife radiosurgery (GKR) on brain tumors are mainly found only several months to years after irradiation. However, some early clinical and/or radiological changes after treatment have sporadically been observed.

Materials and Methods

A series of 48 tumors irradiated by GKR and controlled by an MRI within the 3 weeks were studied. We co-registered 3D-sequences of the control MRI with the MRI of the planning in GammaPlan, and we created a tumor volume of the same lesion on both imaging. We noted 1) apparition or significant increase of a loss of contrast enhancement in the center of the tumor (often interpreted as a necrotic area); and 2) a significant (i.e. >25% of the initial volume) modification in tumor size.

Results

The tumors included 40 metastasis, 6 hemangiopericytomas and 2 meningiomas. Time interval between irradiation and the control MRI ranged from 1 to 19 days (mean 5 days; median 4 days). No change was observed for 33 lesions (69%). An apparition or a significant increase of a loss of contrast enhancement in the center of the tumor occurred in 8 patients (17%). A significant reduction in tumor size was observed in 9 patients (19%) and a significant increase in tumor size in 1 patient (2%). These early radiological changes were not related to the radiation dose used or other dosimetric parameters but could be related to the tumor size.

Conclusion

Despite the main effects of GKR on brain tumors are visible several months to years, early radiological changes can occur in the following days after irradiation. This observation suggests

presence of early effects of GKR on tumor cells and/or vascularization.

Incorporation of M.E.G. data in the stereotactic planning to improve placement of S.E.E.G. electrodes in the preoperative evaluation for epilepsy surgery

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Keywords : SEEG, MEG, targeting, epilepsy surgery

Introduction

Stereo-electro-encephalography (SEEG) is used for some patients in the preoperative evaluation of epilepsy surgery. Appropriate targeting of SEEG electrodes represents the main parameter of the stereotactic procedure that influences the success of the SEEG procedure to define the exact location of the epileptic focus. To improve the targeting of the epileptic zone by SEEG electrodes, we developed a procedure of incorporation of magneto-encephalography (MEG) data into the stereotactic planning of implantation of SEEG electrodes.

Materials and Methods:

We have performed a stereotactic procedure of implantation of SEEG electrodes in 5 patients using information from MEG data into the stereotactic planning. For each procedure, we have coregistered the 3D-MRI with the 3D images of MEG data into the SurgiPlan software (Elekta®).

Results

Coregistration of MEG images during the stereotactic planning of implantation of SEEG electrodes was achieved without difficulty in all cases. Information provided by the 3D-MEG images has influenced the targeting of some SEEG electrodes in all 5 plannings. At the end of the SEEG procedure, an epileptic focus could be defined in all patients, and all patients were successfully operated on.

Conclusion

Data provided by MEG can be included on the stereotactic planning of implantation of SEEG electrodes. The use of MEG can improve targeting of the seizure focus by SEEG electrodes.

Successful sensory cortex stimulation in a case of loss of pain relief by motor cortex stimulation

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Keywords : Motor cortex stimulation, sensory cortex, pain

Introduction

Since its introduction by Tsubokawa in 1991 motor cortex stimulation (MCS) has established itself as a first-line treatment for central deafferentation pain. Long-term pain relief, however, is often disappointing, with a slowly decreasing effect in 50% of cases (Nuti et al., Pain 2005, 118: 43-52).

Material and Methods

Loss of pain relief was observed in a patient we had been treating with MCS because of right hemisomatic pain after a left thalamic infarction. The indication of MCS was corroborated by repetitive transcutaneous magnetic stimulation. MCS in October 2005 led to complete freedom of pain, but the effect degraded in June 2007. The initial pain relief could not be attained anymore by increasing the stimulation intensity, and only temporarily after surgical revision and subdural placement of the electrodes. Thereafter strip electrodes were placed over the sensory cortex and connected to the pulse generator (October, 2008).

Results

The two surgical revisions did not reveal any lead fracture nor thickening of the cerebral membranes as possible reasons for the MCS malfunction. Sensory cortex stimulation, at low frequency (30Hz) and low intensity (), was able to restore complete pain freedom and remained equally beneficial until the patient's death in October 2009 due to an unrelated cause.

Conclusion

The fading and finally refractory effect of MCS probably must be considered as habituation. Sensory cortex stimulation was successful in restoring the lost analgesic effect of motor cortex stimulation in our patient and may constitute a solution for analogous cases.

In-vivo evaluation of brain motion and deformation patterns by magnetic resonance imaging and relation with cerebral contusion etiology

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Keywords : MRI, brain, movement, contusion

Introduction

Understanding the mechanism of brain-skull relative motion and its correlation with forces and accelerations at the head level is critical in the development of a tolerance criterion for cerebral contusions. This study aims to quantitatively and qualitatively describe brain motion and deformation patterns in quasi-static circumstances using experimental Magnetic Resonance Imaging (MRI).

Material and Methods

15 human volunteers were scanned in four different head positions (left lateral, right lateral, prone and supine) using a 3Tesla MRI. After performing image analysis and segmentation processes the subsequent intra pair comparison (prone vs. supine and left vs. right) of the obtained 3D head models reveals the whole brain motion, the regional brain motion patterns and the regions where brain deformation is dominant.

Results

Head lateral movement determines a brain translation in the coronal plane and a slight rotation in the axial plane (max. 2.01mm-5.67mm); while a prone-supine head movement leads to a brain rotation in the same plane (max. 2.65mm-12.02mm). Maximum amplitudes were seen at the inferolateral and medial cortex of the frontal and temporal lobes. Brain deformation was also observed. Highest amplitudes for brain displacement and deformation were seen in prone-supine head movement and in older volunteers.

Conclusion

Relative brain-skull motion is most pronounced in the frontal and temporal lobes, which provides a possible mechanism for these lobes being predilection sites for cerebral contusions. The results of the present study are also relevant for the use of navigation in brain surgery, radiation therapy, and for brain cine-MRI modalities.

Propionibacterium acnes in neurosurgery : weak in cultures, stronger under scalp

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DEPT. OF NEUROSURGERY, CHU LIEGE

Keywords : Postoperative infection, Propionibacterium acnes

Introduction

Propionibacterium acnes is a common germ found in sebaceous glands and hair follicles. It may be difficult to identify in cultures and, despite its weak profile, seems to represent an increasing threat after cranial neurosurgery.

Material and methods

We retrospectively analyzed the charts of all the post-cranial surgery infections to Propionibacterium in our department over a ten year period (from January 2000 to December 2009). Lacking information was completed by contacting these patients or their physicians and literature was reviewed.

Results

We identified 21 infections (20 craniotomies and 1 ventricular shunt). Mean gap after surgery was 41 days. Local infectious signs were seen in 13 patients and 7 had neurological signs. Biological and imaging findings were mostly aspecific, while blood cultures were useless. Pus or CSF samples showed germs

on direct exams in 28 % of cases and mean culture time before identification was 6 days. Outcome was good in most of the patients with antibiotics and the removal of contaminated materials.

Conclusion

Propionibacterium acnes can lead to various clinical, biological and radiological patterns of early or even late infections. Beyond usual aseptic techniques, no specific prevention methods are defined. During sampling, attention should be paid to keep rigorous anaerobic conditions starting from the operating room, and to ask for a prolonged incubation time in appropriate enriched media. Generalization of PCR procedures for bacterial identification may surely help. The use of common antibiotics, such as doxycyclin, quinolons and rifampicin with additional surgery makes it usually curable but, as a whole, morbidity could be potentially increased.

POSTER SESSION

Pedicle screw placement for lumbar spine fusion without navigation: is it still acceptable?

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Keywords : spinal instrumentation, pedicle screws, misplacement, pedicle wall perforation

Introduction

As the help of computer-assisted navigation technology has showed increased accuracy for pedicle screw placement than conventional surgery, it is widely and routinely used in diverse spinal procedures. The aim of this study is to evaluate if free-hand screw insertion is still an acceptable technique for lumbosacral fusion surgery and discuss conditions for accurate pedicle screw placement.

Material and Methods

Lumbar and lumbosacral fusions were performed on 22 consecutive patients for degenerative disease, by the same surgeon. A total of 98 pedicle screws were placed using free-hand technique under lateral fluoroscopy. The accuracy of placement was assessed post operatively by CT scan. Pedicle wall perforations were classified with Amiot Grading Scale.

Results

As we considered non visualisation of pedicle wall on the CT as being a cortical perforation, the total medio-caudal perforation rate was 7,1% (7/98). The misplacement rate (defined as a perforation of 2mm or more) was 1% (1/98). This misplaced screw did not require revision surgery as no neurological complication was noted. In a systematic review and meta-analysis, a total of 93.3% (n/N = 3,316/3,555) of the pedicle screws were inserted accurately with navigational techniques.

Conclusion

We conclude that lumbar and lumbosacral pedicle screw placement non assisted by navigation technology remains a safe procedure and can offer as good accuracy as computer-assisted, if appropriate surgical technique, combined with surgical experience is present.

Biomechanical testing of a simulation of non-instrumented lumbar facet joint fusion

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Keywords : lumbar spine, facet fusion, biomechanics

Introduction

Many lumbar arthrodesis types have undergone extensive biomechanical testing. Little is known, though, about the stiffness obtained by non-instrumented facet joint fusion (NIFJF). Although the facet joints are at a distance of the flexion-extension rotation centre, the joint orientation is the key determinant in directing and allowing motion. The aim of the present study is to compare biomechanical characteristics of simulated NIFJF with pedicle-screw fixation (PSF) and pedicle-screw augmented facet joint fusion (PSAFJF).

Material and Methods

Four fresh human cadaveric L4-L5 segments were subjected to quasi-static loading using pure flexion-extension, lateral bending and axial rotation moments ranging between 0 and 5 Nm while measuring intervertebral rotation. The specimens were tested intact and after PSF, NIFJF and PSAFJF respectively. Facet fusion was simulated by introducing a short lateral to medial transarticular screw and filling the joint cavity with polyester resin.

Results

On average, NIFJF reduced the range of motion (ROM) in flexion-extension to 33,73% of the intact situation, in lateral bending to 46,94% and in axial rotation to 49,39%. PSF reduced

ROM to 42,65%, 25,75% and 41,64% respectively, whereas PSAFJF scored 32,52%, 20,57% and 24,05% respectively. Neutral zones were reduced accordingly.

Conclusion

While flexion-extension is the type of motion most facilitated by the lumbar spine, NIFJF reduced this type of motion more effectively than a pedicle screw only construct and pedicle screws did not add much to FJF. NIFJF might be a less aggressive alternative to instrumented arthrodesis types. More research is needed to explore the biomechanical and clinical potential of NIFJF.

Cement-augmented pedicular screws in treatment of osteoporotic pathology. Technical aspects and preliminary results

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DEPT. OF NEUROSURGERY, CHU LIEGE

Keywords : Cemented augmented pedicular screws, pedicular screwing, osteoporosis, vertebral fracture

Introduction

Treatment of vertebral pathology in osteoporotic patient represents a challenge for surgeons due to the high risk of screw loosening. Cement augmented pedicular screws are a good and reliable solution for these patients.

Materials and Methods

We present a series of patients in whom 82 pedicular screws were placed (Ulrich, Tango[®]) from November 2009 to January 2010. Cement augmented screws were placed in patients with osteoporosis (T score < -2,5), as a first choice technique for vertebral fractures, or in degenerative pathology, or as a rescue technique after failure of simple pedicular screws.

Screws were placed using the usual transpedicular technique. A quantity of 2 ml of cement was injected through the implants under X-ray control, unless abnormal migration appeared. Cement was used in order to increase the pull out force, and therefore increase the stability of the system.

We assessed the position of the screws on the post-operative spinal CT scanner according to Ronming Xu grading, the migration of the cement, and reviewed the possible intraoperative and postoperative medical complications.

Results

The immediate post operative evolution of the patients was excellent. Cement was well tolerated. There was no wound infection, no radicular pain, and no cerebrospinal fluid leak. In the follow-up period neither screw loosening, nor breaking of the material were observed.

Conclusion

Cement augmented screws represent a safe and reliable technique for patient with osteoporosis.

Xanthogranuloma of the suprasellar region

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Keywords : xanthogranuloma, suprasellar, tumor, supra-orbital

Introduction

Xanthogranulomas, also known as cholesterol granulomas, are granulomatous lesions characterized by cholesterol clefts, hemosiderin deposits, multinucleated foreign body giant cells, macrophage accumulation and fibrous proliferation.

Cholesterol granulomas in the head region are found in the middle ear, petrous apex, paranasal sinuses and choroid plexus. Xanthogranulomas of the sellar, and especially the suprasellar, region are very rare. A considerable number of tumors previously identified as craniopharyngeoma may in fact have been xanthogranulomas.

Results

A 22-year-old man is presented, complaining of a 6-week history of unstable gait, fatigue and a bifrontal headache since

three days. Clinical examination showed no abnormalities. MRI scan reveals a 9x18x25 mm intra- and suprasellar lesion. Because of the different intensity of the intra- and suprasellar part of the lesion, the compression of the optic tract and the absence of major endocrinological deficiencies, only the suprasellar part was removed using a supra-orbital approach. Histological examination of the lesion however showed cholesterol clefts, macrophages, fibrous tissue, calcifications, nonspecific inflammatory infiltrate and iron loaded macrophages. KL-1 immunohistochemical staining showed no epithelial structures or keratin.

The patients fatigue, gait problem and headache subsequently improved. The hyperprolactinemia and -cortisolemia normalized at 6 weeks after the operation. 12 weeks postoperative a growth hormone deficiency was diagnosed, for which substitution therapy was initiated.

Conclusion

Compared to classical craniopharyngeomas, xanthogranulomas characteristically occur in adolescent and young adults, predominantly at an intrasellar location, with smaller size and more severe endocrinologic deficiencies, but are more easily resected with good treatment outcomes. Therefore, xanthogranulomas should be differentiated from classical craniopharyngeomas.

Unexpected progression of tectal astrocytoma after 35 years of indolence

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Keywords : late-onset progression, tectal plate astrocytoma

Introduction

Tectal tumors are a relatively rare type of (low-grade) brainstem gliomas with a usually benign clinical course. Small, pediatric, intrinsic tectal gliomas without tumor extension or contrast enhancement rarely display invasive clinical behaviour and can be managed conservatively with yearly long-term MRI follow-up examinations. We present a case report of clinical and radiological progression of a tectal region pilocytic astrocytoma after 35 years of indolent behavior.

Material and Methods

In 1974, a 16 year old boy was diagnosed with hydrocephalus and a focal lesion in the upper tectal plate extending into the pineal gland region. A ventriculo-peritoneal shunt was placed and patient was taken into follow-up. He remained clinically stable for many years, not showing any radiological change on CT or MRI scan. However, 35 years later, MRI scan showed growth of the lesion, extending into the mesencephalon and displaying high metabolism on FET-PET scan. Subtotal resection was performed using an occipital trans-tentorial approach.

Results

Pathology showed arguments for pilocytic astrocytoma, without any signs of malignancy. No postoperative treatment was scheduled, but one month later the patient developed a partial internuclear ophthalmoplegia and control MRI scan showed further growth in the mesencephalon with increased contrast enhancement. Radiotherapy (30 X 2 Gy) was then administered.

Conclusion

This case shows the critical importance of life-long follow-up with serial MRI in these patients' management. These tumors should be biopsied or resected only if there is obvious radiological and/or clinical evidence of invasion and progression.

Pan-spinal dissemination from a supratentorial primitive neuroectodermal tumor

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Keywords : sPNET, metastasis, surgery

Introduction

Supratentorial primitive neuroectodermal tumors (PNET) are uncommon tumors of the CNS which occur only rarely in the adult. They are highly malignant and histologically correspond to WHO grade IV. Metastasis in the cerebrospinal pathways is a frequent complication of this tumor.

Material and Methods

This 30 year old man presented a supratentorial PNET located in the left frontal lobe and was treated by surgery, radiotherapy and adjuvant chemotherapy. He remained free of recurrence for one year until he presented meningeal signs caused by cerebrospinal metastasis of the tumor.

Discussion

In addition to local recurrence, cerebrospinal metastasis is a frequent and early complication of PNET. It has been reported in 39% of patients at the time of diagnosis and in 46% at time of recurrence in two previous series. This tendency to spread early in the cerebrospinal pathways is shared with other embryonal tumors such as medulloblastoma.

Diagnostic and follow up should therefore include brain and full spine MRI as well as CSF cytology. Particularly, the combined finding of high protein content and lymphocytic pleocytosis in the CSF should raise a high suspicion of cerebrospinal metastases.

Treatment should include a complete tumor resection, craniospinal axis irradiation followed by a boost irradiation. Adjuvant chemotherapy strategy is based on pediatric protocols consisting of cisplatin, etoposide and cyclophosphamide.

Conclusion

Supratentorial PNETs are rare tumors in the central nervous system with a trend towards early cerebrospinal dissemination. The treatment should include surgical resection followed by chemotherapy and cranial and panspinal irradiation if CSF invasion by tumor cells is demonstrated.

Fusion of preoperative MRI and intraoperative US images in brain tumour surgery

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AZ ST-LUCAS, GENT

Keywords : brain tumor, ultrasound, fusion

Introduction

Intraoperative MRI, CTscan or US are possible solutions for correction of imaging, needed by brain shift. We discuss the possibilities of US, combined with the preoperative MR data with contouring of well-known structures and fusion of images.

Material and Methods

Preoperative MR and/or CT images are used during the planning, with contouring of the tumor boundaries, but also of landmarks, as gyri, ventricles, vessels and/or skull, and indicated with standardized colors.

Trajectory definition is done as perpendicular to the skull as possible, providing an horizontal position of the bone opening during surgery.

During the procedure, before dural opening, the different landmarks and tumor boundaries are compared, first in the axial, coronal and/or sagittal planes, then in the two planes perpendicular to the trajectory, and parallel to them.

First the deepest structures are checked, then the more superficial anatomic landmarks with comparison between the preoperative MR data and the intraoperative US; easy and fast recognition of the most structures is made possible by the use of the standardized colors, with shortening of the learning curve for the use of US.

During surgery and tumor removal, the shift is gradually measured, and eventual tumor remnants can be better evaluated.

Conclusion

We present a method of comparison between intraoperative US images and preoperative planning with contouring of well-known brain structures with standardized colors. The intraoperative shift of the tumor and brain structures is evaluated faster and more accurately, with better verification of eventual tumor remnant.

Eosinophilic granuloma of C5 mimicking a tumor in a teenager

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Keywords : Eosinophilic granuloma, Langerhans cell histiocytosis, cervical, osteolytic

Introduction

Eosinophilic granuloma (EG) is a solitary, non-neoplastic proliferation of histiocytes. It represents the most frequent and benign form of Langerhans cell histiocytosis (LHC). We present the case of a teenager in whom a metastasis alike osteolytic lesion in the cervical spine proved to be an EG.

Case report

A 16 year old boy was referred to our department because of neck pain since 2 years and difficulties in swallowing since 2 weeks. Clinical examination showed no signs of myelopathy. CT and MR imaging documented an osteolytic, slight contrast enhancing lesion of C5, extending in the prevertebral area. No other systemic lesions were found. A CT-guided biopsy was undertaken and pathological examination revealed an EG. Besides immobilization, no further treatment is administered thus far.

Discussion

EG is a disease of children and adolescents, with a male to female ratio of two to one. EG is found in the skull, mandible, spine and long bones. Vertebral involvement accounts for approximately 8% of cases, being the cervical localization the least affected. Spine lesions are normally found in the vertebral body and present with pain. Spinal cord compression is described. The radiological appearance is an osteolytic lesion and its differential diagnosis includes metastasis, Ewing and osteosarcoma and osteomyelitis. In localized disease, often a biopsy alone is enough to incite healing.

Conclusion

EG in the cervical spine remains a rare entity but entails an important differential diagnosis in osteolytic lesions, especially in young people, since its prognosis is good.

Cervical meningomyelocele: case report of a rare entity

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Keywords : Meningomyelocele, cervical, dysraphism

Introduction

Cervical meningomyelocele (MMC) is a very rare congenital malformation and belongs to the spectrum of skin-covered (occult) dysraphisms. To the author's knowledge, only sixteen similar cases have been described before. We describe a seventeenth patient.

Case report

A 32 year old pregnant woman was referred to our department after prenatal ultrasound assessment documented a cervical mass. A myelocele was suspected. Delivery through cesarian was uneventful. MR imaging showed a subcutaneous meningocele in a neurologically normal child. Three days after birth a surgical correction of the cele was performed. A protective external ventricular drainage was removed after one week. Pathological examination revealed a meningomyelocele. Up until the current age of one and a half years, this kid has shown a completely normal (neurological) development.

Discussion

In an era of preventive strategies against spinal dysraphism, meningoceles have become a rare entity, especially in western countries. Cervical MMC are even more uncommon. Only small series and sporadic case reports are found in current literature. Prenatal diagnostics are often lacking. Surgical repair is mandatory. Neurological outcome is over all found to be better than other spinal dysraphisms.

Conclusion

This case contributes to the scarce existing literature in that it shows prenatal diagnosis of cervical MMC as an extremely rare condition in a kid that was successfully surgically treated with a favourable neurological outcome.

Rupture of a flow-related vertebral confluence aneurysm in an older patient with subclavian steal syndrome

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Keywords : subclavian steal, vertebral confluence aneurysm

Introduction

Flow-related aneurysms are associated with different medical conditions that are causative or predisposing to aneurysm development immediately distal to locations of increased blood flow. Arteriovenous malformations, high-flow tumors and some anatomic/embryologic variations are among the most common, associated conditions. Subclavian steal syndrome with an increased flow and aberrant flow diversion in the vertebrobasilar system can predispose to vertebral confluence aneurysms, often with wide necks and irregular shapes.

Material and Methods

We present a 74-year old female patient with subclavian steal due to a complete occlusion at the left subclavian artery origin, suffering from a subarachnoid hemorrhage (WFNS III, Fisher III).

Results

DSA revealed a vertebral confluence aneurysm with a wide neck and global vertebral artery hypertrophy. Attempted GDC embolisation failed due to repeated herniations of the coils into the left vertebral and the basilar artery. Flexible stent placement to assist the coiling seemed impossible due to the exact location of the aneurysm. The patient underwent successful surgical clipping procedure through a left, far-lateral juxtacondylar approach.

Conclusion

Subclavian steal syndrome-related vertebral confluence aneurysms are a rare but challenging condition. Endovascular coiling is often impossible due to the wide neck, the irregular shape and turbulent local flow characteristics leading to the frequent herniation of coils with parent vessel occlusions. Sometimes, flexible stents can successfully assist the coiling procedure. Surgical clipping is often demanding and accompanied by significant risks due to the location, ventral to the brainstem and the absence of proximal control. Regular screening in these patients might be advocated.

Uncomplicated 8 years follow-up of a pineocytoma: case report. Review of natural history and recent attitudes in case of pineocytoma, pineal parenchymal tumors WHO grades II-IV and papillary tumor of the pineal region

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Keywords : Pineocytoma follow-up case-report review adjuvant therapy

Introduction

In 2007 WHO Classification defined new tumor entities: Pineocytoma, Pineal Parenchymal Tumors WHO Grades II-IV and Papillary tumor of the pineal region (PTPR). Previous studies were usually regrouping those recent subgroups and specific attitude was not well defined. Recommendations

include surgery alone and follow-up, or combined with radiosurgery, or with local, craniospinal or combined radiotherapy or with radio-chemotherapy.

Material and Methods

Young women operated at the age of 18 years, in March 2002 in a context of subacute triventricular hydrocephaly. A large cyst was obstructing Sylvius aqueduct. It was originating from a multicystic small tumor of the pineal gland. A minimally invasive neuroendoscopic procedure was performed by Pr Jacques Camaert that resolved the hydrocephaly. A biopsy was made and the diagnosis of pineocytoma was established. In 2002, there were no consensus on the necessity of adjuvant therapy and we decide to follow the patient by MRI.

Results

No recurrence appeared. 8 years later, patient is neurologically intact, working and raising her family normally.

Natural history of Pineocytoma, Pineal Parenchymal Tumors WHO Grades II–IV and Papillary tumor of the pineal region and recent attitudes are reviewed.

Conclusion

Attitude for adjuvant therapy or not for pineocytoma at the time of surgery is less variable (from radical resection and follow-up to radiosurgery). A better consensus is achieved with pineal parenchymal tumors WHO Grades II–IV (chemo-radiosurgery or chemo-radiotherapy depending on dissemination) but is not yet determined for papillary tumor of the pineal region (radical surgery and radiosurgery or radio-chemotherapy in evaluation).

Neuropathic hemi-thoracic and leg pain after multiple spinal interventions treated with spinal cord stimulation: a case report

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Keywords : neuropathic pain, neuromodulation, percutaneous lead, surgical lead

Introduction:

Chronic neuropathic pain occurs in around 10% of patients who underwent spinal surgery. It is characterized by intractable pain and varying degrees of functional incapacitation occurring after spine surgery. We present a special case of complex chronic neuropathic pain after several spinal operations at thoracic and lumbar level treated with neuromodulation.

Case report:

A 38-year-old man was admitted to our pain clinic suffering intractable neuropathic pain at his right-side thorax, lower back and both legs. The patient had a history of multiple surgical interventions via right-sided thoracotomies for a thoracic disc herniation at level Th7- Th8. More recently, he underwent a lumbar laminectomy for a spinal stenosis at level L3-L4.

Progressively he experienced a typically burning pain at his right-sided thorax and both upper thighs. Medical treatment, physiotherapy and psychological guidance were ineffective. Only high-frequency Transcutaneous Electrical Nerve Stimulation (TENS) partly diminished the pain. Subsequently, a spinal cord stimulator (SCS) combined using a plate and a percutaneous electrode at the same time was surgically placed under epidural anesthesia. The percutaneous lead covered Th. 4-6 and the surgical plate Th. 8-9. Post-operatively, the patient had excellent pain relief in the affected regions.

Discussion

Neurostimulation is a well-known, minimally invasive and effective treatment for patients with intractable pain syndromes. Due to product innovations (specific electrodes and multipolar batteries) in neurostimulation, neuropathic pain might be controlled in even extreme complex pain syndromes).

Tumor control and functional outcome after Gamma Knife Radiosurgery for cavernous sinus meningioma using a 12-Gy dose

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Keywords : cavernous sinus meningioma, radiosurgery, Gamma Knife

Introduction

Meningiomas located in the cavernous sinus (CS) represent a therapeutic challenge for the neurosurgeon. Gamma Knife radiosurgery can be proposed as unique treatment or as a complement after partial surgical resection of CS meningiomas.

Materials and Methods

A series of 116 patients were treated for a CS meningioma in our Gamma Knife Center using a standardized procedure and dosimetry: 1) target volume delineation on the basis of information from 3 different imaging (axial 1-mm sliced Gadolinium-enhanced T1-weighted, T2-weighted and CT densitometric 3D volume acquisitions); 2) dosimetric planning using multiple small collimators; 3) prescription of 12-Gy at the 50% isodose; 4) irradiation with LGK-C with APS. Fifty-nine patients (51%) were previously operated; 82 patients (71%) had a neurological deficit from the CS meningioma. Patients were followed clinically and by serial MRI. Patients with a complete follow-up of minimum 2 years after treatment were included in the study.

Results

Mean tumor volume was 5.62 cc (SD 3.4). Median Conformity Index was 1.5 (range 1.17-2.37). A median number of 18 isocenters were used (range 3-34). Follow-up data of 88 patients were analyzed; mean follow-up was 4.4y (range 2-9y). Tumor control was achieved on last follow-up in 81 patients (92%); tumor volume significantly decreased in 23 patients (26%) and remained unchanged in 58 patients (66%). Neurological status improved for 13 patients, was stable for 72 patients and worsened for 3 patients (3%). No significant differences were found in tumor control and clinical outcome between patients previously operated and patients without prior surgery.

Conclusion

The use of a 12-Gy dose for Gamma Knife radiosurgery of CS meningioma is a safe and effective procedure associated with a > 90% rate of tumor control and a < 5% morbidity.

Tumor control and functional outcome after Gamma Knife Radiosurgery for petroclival meningioma using a 12-Gy dose

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Keywords : petroclival meningioma, radiosurgery, Gamma Knife

Introduction

Because of their critical location, petroclival meningiomas (PCM) are difficult to resect completely and surgery is associated with significant morbidity. Gamma Knife radiosurgery (GKR) can be proposed as unique treatment or as a complement after partial surgical resection of PCM.

Materials and Methods

Sixty-one patients were treated by GKR for a PCM with a 12-Gy margin dose at the 50%-isodose. For 34 patients (56%) GKR was the unique treatment of the PCM; for 27 patients GKR was used for a residue of a recurrence of tumor after surgical removal. A neurological deficit related to the meningioma was present in 31 patients (51%) before GKR. Patients were followed clinically and by MRI performed once a year. Patients with a complete follow-up of minimum 2 years after treatment were included in the study.

Results

Mean tumor volume was 3.42 cc (SD 2.7). The Conformity Index ranged from 1.15 to 2.21 (median 1.44). A median number of 16 isocenters were used (range 2-36). Data of the follow-up of 46 patients were analyzed; the mean follow-up was 4.5y (range 2-9y). Local tumor control was achieved on last follow-up in all patients (100%). The tumor volume significantly decreased in 21 patients (46%) and remained unchanged in 25 patients (54%). Neurological status improved for 5 patients (11%) and was stable for 41 patients; no patient worsened. Two patients require surgery for an extension of the meningioma outside the radiosurgical target volume.

Conclusion

PCM treated by BGK with a 12-Gy margin dose can achieve high local tumor control rate and low morbidity.

Major tumor shrinkage of hemangiopericytomas after Gamma Knife irradiation

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Keywords : hemangiopericytomas, radiosurgery, gamma knife

Introduction

Hemangiopericytomas are very rare malignant vascular tumors that represent 2 to 4% of meningeal tumors. These highly vascularized tumors exhibit a high incidence of local recurrence and distant metastasis. Radiosurgical treatment of hemangiopericytomas has been reported in only few studies, and evolution of the tumor volume after Gamma Knife radiosurgery (GKR) has not been specifically studied.

Materials and Methods

We report data from a patient harbouring multifocal hemangiopericytomas after several surgical removals, whole brain radiotherapy and chemotherapy. Gamma Knife treatment was performed to control the different tumor locations and was repeated when new lesions appeared in non-irradiated areas. Evolution of tumors volume after irradiation were measured and analyzed in serial MRI co-registered with the initial MRI on GammaPlan®.

Results

A total of 10 lesions were treated in 3 different Gamma Knife sessions. The mean tumor volume was 2.75cc (range 0.73-10.5cc). The median follow-up period was 24 months. The mean margin dose was 16.9 Gy (range 15-18 Gy); the mean maximum dose was 33.7 Gy (range 30-36 Gy). Of the 10 lesions irradiated, 6 have completely disappeared on the last follow-up MRI and 4 lesions showed a >90% reduction of their size.

Conclusions

GKR can be an effective treatment of multifocal hemangiopericytomas. A very important reduction of the size of these tumors can occur, even for large lesions, when a high radiation dose is used (margin dose >15 Gy).

Proposal for standardized anatomic-functional representation for cortico-subcortical mapping

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Keywords : cortical mapping, direct cortical electrical stimulation, labeling

Introduction

Direct cortical stimulation and mapping are usually performed similar to the method used by Penfield, with a hand-held electrical stimulator, applied on the cortex in an empirical way. Positive sites are indicated by sterile tags, but this method is inaccurate and time consuming.

Material and Methods

We propose a new method, in which anatomical and functional gyral labeling are performed in the preoperative navigation

planning, if possible using a curved-surface "pancake" projection.

First an anatomical mapping is performed on the MRI-data, with conventional colors indicating the different gyri.

In these boundaries, segmentation is performed in parcels, areas of approx 1 sq. cm; these are labeled with 2-cipher numbers increasing from the "point 0" (cross-point between frontal, parietal and temporal lobes).

While performing the cortical electrical stimulation on these precise points with a navigated probe, data are collected during three tests, and indicated on the map, with letters standardized for motor mapping, and numbers for speech mapping. The obtained functional mapping can then be integrated immediately in the navigation system and the operation microscope.

Conclusion

A concept of a standardized representation of the cortex is proposed, for pre- and intraoperative integration of anatomical and functional data, with standard colors corresponding to gyri, standard numbers for cortical sites, and standard letters or numbers indicating motor and speech function areas, respectively.

Our method provides a better integration of preoperative data in the procedure, as well as more accurate and reproducible stimulation locations, allowing constant visualization of functional data in the operation microscope.

Extrusion of a ventriculoperitoneal shunt catheter through an appendicovesicostomy: Case report

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UZ LEUVEN

Keywords : Hydrocephalus, Ventriculoperitoneal shunt, Mitrofanoff appendicovesicostomy

Introduction

Migration of a ventriculoperitoneal shunt catheter is a rare but well recognized complication in hydrocephalus treatment. Perforation into different organs or through natural or artificial orifices has been described. With risk of meningitis swift and aggressive treatment is necessary. In this case the shunt catheter has extruded through a Mitrofanoff appendicovesicostomy.

Material and methods

A 38-year-old male with ventriculoperitoneal drainage, presented with intermittent difficulty with bladder catheterization through an appendicovesicostomy. There was intermittent extrusion of a silicone catheter through the stomy. There were no clinical or laboratory signs of infection. On visual inspection there was no CSF drainage via the extruded catheter.

Results

Endoscopic inspection through the vesicostomy showed the peritoneal catheter eroding through the base of the Mitrofanoff. The shunt was externalized below the valve through a supraclavicular incision, while the peritoneal catheter was removed through the Mitrofanoff. After removal of the shunt, a bladder catheter was left in situ for two weeks. During admission the patient appeared drainage independent and the ventriculoperitoneal shunt could finally be removed completely. Urological follow up after three months showed complete healing of the Mitrofanoff appendicovesicostomy. The patient performed intermittent catheterization without any problem.

Conclusion

We present the extrusion of a ventriculoperitoneal shunt catheter through a Mitrofanoff appendicovesicostomy, a hitherto undescribed complication of hydrocephalus treatment.

Postoperative sialadenitis with chronic brachial plexopathy

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DEPT. OF NEUROSURGERY, CHU LIEGE

Keywords : sialadenitis, neck swelling, brachial plexopathy, retrosigmoid approach

Case report

A 41-year-old woman with obesity (BMI=35,14), presented a right acoustic schwannoma. An ablation by a right retrosigmoid approach was proposed. A 7,5G tube was chosen, a soft roll placed under the right axilla, the head rotated to the left. In the early postoperative time, a left cervical edema was noted and extubation could not be obtained. Cervical CT proved a right sialadenitis to the left submandibular gland and complete pharyngeal obstruction. In the following days, the patient exhibited a left upper extremity weakness. The electromyography showed upper brachial plexopathy. The patient could be extubated at day 7. Amylases were elevated and rapidly normalized. At 2-month follow-up the upper extremity mobility is not fully recovered.

Discussion

Postoperative sialadenitis is rare. The cervico-facial edema can involve the upper trunk of brachial plexus. It has been reported after procedures needing head rotating and it always begins to the opposite side. These observations are consistent with a mechanical tube-to-salivary gland conflict. The endotracheal tube may compromise salivary outflow when it compresses the salivary system inside oral cavity.

Conclusion

This is the first case of postoperative sialadenitis combined to chronic brachial plexopathy. Postoperative sialadenitis associated with extensive edema is a life-threatening complication that must be early recognized to avoid emergency tracheotomy. The only treatment to recommend is prolonged intubation and surveillance. To avoid intrabuccal compression, it is suitable to fix the tube onto the same labial commissure as the operated side.

Topographical anatomy of the vertical parasagittal hemispherotomy according to Delalande based on cadaveric brain dissections

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Keywords : Epilepsy surgery, Hemispherotomy, Microsurgical anatomy, Fiber dissection technique

Introduction

Hemispherotomy is a validated surgical intervention for intractable epilepsy originating from one hemisphere. Hemispherotomy and other disconnective procedures are based on the functional disconnection of the epileptic network rather than the removal of the epileptogenic zone. Two different techniques have been described: the first consists of a vertical parasagittal approach; the second uses a lateral/perinsular approach. This study was performed to illustrate the vertical parasagittal hemispherotomy according to Delalande.

Material and Methods

Eight macroscopically normal hemispheres were obtained by routine autopsy. Two of them were obtained after arterial and venous perfusion of the head with colored latex. We visualized the relevant anatomical structures by fiber tract dissection using Klingler's technique in the 6 other specimens. Peroperative images are presented to correlate with the anatomical specimens.

Results

The vertical parasagittal hemispherotomy consists essentially of a procedure, performed through a cortical shaft extending to the lateral ventricle. First, an intracallosal resection is performed, followed by a white matter dissection lateral to the thalamus. After completing the callosal resection anteriorly, a transverse disconnection is made, starting at the posterior part of the gyrus rectus and ending in the anteriorly exposed temporal horn.

Conclusion

The vertical parasagittal hemispherotomy remains an anatomical challenging procedure. This topographical

anatomical study illustrates the different steps in order to support a three-dimensional understanding. The anatomical landmarks as discussed above can be used not only during this procedure, but also in other disconnective technique.

Peripheral nerve neuropathy, caused by synovial cysts: a review of 14 cases

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Keywords : peripheral neuropathy, synovial cyst, compression neuropathy

Introduction

The presumed rare peripheral nerve entrapment caused by synovial cysts occurs more frequently than expected. In contrary to most performed case studies which describe the neuropathy of a single nerve, this study involves 5 different compression neuropathies. Literature describes three theories of pathogenesis; degenerative, synovial and tumoral theories, each of which possibly explains observations made by a number of investigators.

Material and Methods

The review includes 6 peroneal, 1 tibial, 3 ulnar, 3 radial and 1 digital nerve involvements. Preoperative EMG was performed in 60%, MRI in 35% and ultrasound in 15% of cases. Treatment performed involved surgical resection of the synovial cysts. Unexpected cyst involvement was noted during surgery in 50% of cases.

Results

The outcome was good to excellent in all patients, with recovery of sensory - motor function. Cyst recurrence was observed in 20% of cases; 1 patient underwent additional surgery, 2 other patients received alternative treatments. MRI findings show a clear peduncle connecting the cyst with a nearby articulation. This observation strongly suggests and underlines our support of the synovial theory as the mechanism of pathogenesis involved.

Conclusion

With only 50% of preoperative knowledge of involvement of a synovial cyst, we suggest that usage of imaging should become a more standardized tool, since characterization of the cyst improves surgical circumstances of therapy. Furthermore, the preliminary usage of ultrasound could be an alternative to the higher cost and invasiveness of MRI. To conclude, this article combines recent acknowledgments related to the subject with our clinical experience.

Cerebral amyloid angiopathy related inflammation and intracerebral hemorrhage: a case report

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Keywords : Amyloid angiopathy inflammation hemorrhage

Introduction

Cerebral amyloid angiopathy (CAA) is defined by deposition of amyloid in cerebral blood vessels. Lobar cerebral hemorrhage is the most frequent presentation, next to dementia, cognitive impairment and transient neurological symptoms. Rarely, patients present with inflammation of the CAA-affected blood vessels. This is associated with subacute cognitive decline, seizures, headaches and hyperintense lesions on T2-weighted MRI. Intracerebral hemorrhage is only very rarely found in CAA-related inflammation. We present a patient with this exceptional combination.

Material and Methods

A 63-year-old man with a history of acute myeloid leukemia (AML) treated with bone marrow transplant and immunosuppression, presented with seizure. CT-scan showed a left frontal lobar hemorrhage and two hypodense lesions in the

left hemisphere. The patient displayed a progressive neurological decline. MRI of the brain showed a large T2- and FLAIR hyperintense lesion of the whole left hemisphere and multiple micro-hemorrhages in both hemispheres. Intracerebral lymphoma or infection was suspected and a large biopsy was performed.

Results

The biopsy showed amyloid deposition and microglial activation with perivascular clustering. The patient was treated with steroids, and improved considerably.

Conclusion

CAA with related inflammation usually presents with a subacute cognitive decline, seizures, headaches and hyperintense lesions on T2- or FLAIR- weighted MRI. Macro-hemorrhages are the classical presentation of CAA but are less common in CAA-related inflammation. This type of CAA usually responds well to treatment with steroids.

Low-Pressure Hydrocephalus: a case where normal intracranial pressure leads to neurological deterioration

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Keywords : Low intracranial pressure, neurological deterioration, hydrocephalus

Introduction

The majority of drain dependent hydrocephalic patients present with overt neurological symptoms like headache and mental status changes, nausea and vomiting, when their drains malfunction. These symptoms are attributed to a raised intracranial pressure. We report a case however with ventriculomegaly and severe neurological symptoms, normally associated with high ICP. Yet, the measured ICP before shunt revision was low to low normal.

Material and Methods

A 37 year old female patient was admitted to the neurosurgical ward with complaints of headache, diplopia and dysesthesia in both arms. Since 25 years she had a ventriculo-atrial drain for hydrocephalus eci. Hydrocephalus with ventriculomegaly was confirmed by CT scan. Measurement of the ICP through lumbar puncture as well as puncture of the Rickamreservoir showed a low pressure of 7 cmH2O.

Results

Worsening of her condition led to an urgent drain revision with negative results on occlusion. She did improve for a few days until a rapid deterioration re-occurred and the whole drain was replaced by a ventriculo-peritoneal drain with a programmable valve. Only in the lowest resistance setting she improved to a normal condition and 18 months later she is still doing fine.

Conclusion

Low pressure hydrocephalus is a not well known condition and can only rarely be found in literature, which will briefly be discussed. The cause of this disease is probably found in viscoelastic alterations of the brain. Only lowering ICP to low values restores neurological function.

Endoscopic fenestration of a giant arachnoid cyst : case report and review of the literature

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Keywords : Arachnoid cyst, fenestration, endoscopic

Introduction

Most arachnoid cysts arise asymptotically in the middle cranial fossa. We describe a symptomatic giant cyst in the temporo-Sylvian area, extending to the anterior cranial fossa. Treatment is discussed with respect to current evidence in literature.

Material and Methods

A six year old boy with a normal neurological development presented to the pediatrics department because of a temporal asymmetry of the skull. CT and MRI imaging documented a large arachnoid cyst in both the middle and the anterior cranial fossa, with a thin bossing skull bone overlying this cyst. Cysto-cisternostomy was indicated and was performed in an endoscopic way. Fenestration was successful, without adjunctive shunt needed. Postoperative recovery was uneventful.

Results

Arachnoid cysts are resulting from congenital malformations that are mostly found incidentally and can be managed conservatively. Symptomatic patients are surgical candidates. Treatment options include cysto-peritoneal shunting, craniotomy and endoscopic fenestration. In most studies shunts are shown to be most effective in a rapid reduction in size of the cyst. Nevertheless endoscopic fenestration is found to be safe and effective as well and contains no shunt-related complications and shunt-dependency. Obviously this procedure is less invasive than an open craniotomy. From an anatomical point of view suprasellar arachnoid cysts are considered superior candidates for an endoscopic approach. Further advances in neuroendoscopic tools will probably continue to favour this treatment.

Conclusion

This case contributes to the existing knowledge that symptomatic arachnoid cysts are best treated by endoscopic fenestration, which proves to be safe and efficient in long term decompression.