



The 7th Annual International Neurosurgery Conference

Neurological Surgery Research ListServ
26-31 December 2011

Cover: from left to right:

Dr Jude-Kennedy Emejulu (*Nnewi, Nigeria*), **Dr Cara Sedney** (*Morgantown, West Virginia, USA*), **Mr Nick Tzerakis** (*Stroke-on-Trent, UK*), **Dr Harold Rekate** (*New York, USA*), **Dr Aparajita Baral** (*Wuhan, China*), **Professor Dr Leonidas Quintana** (*Valparaiso, Chile*), **Dr Mariangela Gonçalves** (*Rio de Janeiro, Brazil*), **Dr Clara Epstein** (*Boulder, Colorado, USA*), **Dr Vita Stagno** (*Naples, Italy*), **Dr Komal Prasad** (*Bangalore, India*), **Mr Guirish Solanki** (*Birmingham, UK*)

Abstracts

1.

ECOG Based Epilepsy surgery for Cortical Scarring

Basant Pant, Prabin Shrestha, Pranaya Shrestha, Pravesh Rajbhandari

Annapurna Neurological Institute

Kathmandu, Nepal
neuronepal@wlink.com.np

Objective

The incidence of epilepsy is high in Nepal; neurocysticercosis and other infective conditions occasionally leave scarring of the cortex. Recently we have started using intra-operative electrocorticography (ECOG) which is useful in to delineate margins of epileptogenic zone, guide resection and evaluate completeness of resection.

Method

Among the 145 intractable seizure cases 31 were complex partial seizure and temporal origin, 34 focal seizure, 62 generalized tonic clonic seizure, 6 drop attack and 12 other. We performed 24 epilepsy surgeries 14 of which was performed under ECOG in this period, Surgery was considered when semiology MRI features and EEG were concordant. Among the operated cases, 13 were complex partial seizure, 4 focal seizure, 2 drop attack and 4 GTCS. In the recent cases we routinely used ECOG and if necessary awake cortical mapping & mainly discuss cortical and hippocampal scarring cases where ECOG was useful.

Results

There was one mortality (4%) and no cases with neurological deficits following surgery. 15 cases (68%) were complete seizure free (Engel I), 4 (18%) had Engle II result and 3 (14%) are having less frequent seizure. All operated cases were given AED for at least 2 years seizure free interval and then tapered off. Anaesthetic consideration was important especially in Awake Anesthesia, ECOG based surgery, and artefact from other equipments in the operation theatre was another factor to be considered.

Conclusion

Intraoperative ECOG can be adapted in most setup and the addition of cortical mapping can give excellent outcome in intractable epilepsy.

2.

Running –induced headaches in aqueductal stenosis patient

Shoko M. Yamada, Akira Matsuno, Shokei Yamada

Department of Neurosurgery, Teikyo University Chiba Medical Center

Department of Neurosurgery, Loma Linda University

merrityamada@hotmail.co.jp

Objective

The treatment of idiopathic aqueductal stenosis (AS) in asymptomatic patients with definite dilatation of the ventricles is debatable.

Case

A 16-year-old boy presented with a 6-month history of intermittent headaches that always followed 3 Km running. Three years earlier, ventriculomegaly was found, after head trauma. At that time, he was free of neurological symptoms, and remained asymptomatic until he started training for running. The ventricular size was unchanged by annual follow-up MRI studies. However, because medications such as non-steroidal anti-inflammatory drugs and triptans were not effective to control headaches, the increased intracranial pressure was suspected, and endoscopic third ventriculostomy (ETV) was performed. Two months after the surgery, MRI showed significant decrease in ventricular size, and all the sulci became clearly identifiable. After surgery, the patient achieved 5 km running without developing headaches.

Discussion

In retrospect, impaired cerebrospinal fluid (CSF) circulation through the aqueduct of Sylvius insidiously caused ventricular dilatation. Yet, the CSF pressure energy is dissipated into the enlarged ventricular walls, and intracranial pressure was maintained below the threshold of increased ICP manifestation. We postulate that the CSF pressure increased slowly but steadily in crescendo during running, as natural response to increased intrathoracic and intraabdominal pressure. The headaches reflected increased CSF pressure in the lateral and third ventricles that reached above the compensatory threshold.

Conclusion

The headaches that occur after long distance running in a patient with dilated lateral and third ventricle and normal fourth ventricle should be considered to be hydrocephalic in nature under stressful activity, and ventricular fluid drainage by third ventriculostomy is a procedure of choice.

3.

Decompressive Craniectomy For Refractory Intracranial Hypertension: Rationale, Indications and complications

Khaled Abdeen M.D.*, Hisham Aboul-Enein M.D*, Yasser Orz M.D*, Shahira A El-Metainy M.D**.

*Department of Neurosurgery – Alexandria University

** Department of Anesthesiology – Alexandria University

khaledabdeen@hotmail.com

Objective

We hereby study the effect of decompressive craniotomy with augmented duroplasty in patients with suffering from refractory intracranial hypertension causing a critical deteriorating level of conscious.

Methods

We retrospectively reviewed a series of 90 patients who were operated upon for Decompressive craniotomy with augmented duroplasty over a period of 3 year starting from June 2005 to June 2009. All patients were admitted to the neurosurgery department, Alexandria University suffering from severe intracranial hypertension that was refractory to the all conventional anti-edema measures done at the intensive care unit. We classified the patients into 4 main groups according to the cause: group (A) resulting from traumatic brain injury, Group (B) ischemic resulting from middle cerebral artery occlusion causing malignant infarction, Group (C) postoperative after excision of an intra-axial temporal lobe tumor, and Group (D) suffering from spontaneous intracerebral haematoma with surrounding vasogenic edema..

Results

The study included 90 patients 57 of them were males while 33 were females, with a mean age of 47 years (range, 18-66 years), underwent DC. Mean preoperative GCS score was 7/15 (range, 3-8/15),

Unilateral dilated un-reactive pupil was seen in 18 cases and bilateral variants in 6 cases. All patients received a wide DC with duroplasty. Median preoperative time was 8 hours from the time of trauma. The patients' outcome was evaluated by using the GOS. Furthermore, the results were analyzed toward the time of surgical intervention (early or late), the patient's age, and the preoperative GCS using a multivariate analysis.

Conclusion

The encouraging results of our study as well as those of recent published reports emphasize the importance of this procedure in changing and improving the Glasgow coma score of the patients. It was observed that the early the surgical intervention was the better the outcome of patients. Decompressive craniotomy showed minor complications in unilateral temporal lobe edema.

4.**Spinal tuberculosis: role of surgery**

Khaled abdeen M.D, Ahmed G Azab* M.D , Hisham Abo Rahma* M.D , Medhat Elsayy M.D **

Department of Neurosurgery- Alexandria University –Al-Menoufiya University* -AL Menia Univerity**
- Egypt

khaledabdeen@hotmail.com

Objective

To evaluate the indications of surgery, plan of management , rate of fusion ,and instrumentation in spinal tuberculosis

Method

Study design : Twenty five patients with spinal tuberculosis [10 cervical and 15 dorsolumbar] presenting with a 2-6 months history of neurologic deficits were managed surgically .

Methods : In the cervical group: 9 patients were treated by an anterior cervical approach,one patient with C3 tuberculosis was managed by single stage- combined anterior decompression and fusion by iliac bone graft followed by posterior occipitocervical fixation by a Ransford Loop . In the dorsolumbar group: 7 cases were managed by posterior instrumentation [5 cases segmental fixation by transpedicular screws and 2 by Hartshill rectangle with sublaminar wires , 6 by an anterior approach , and another two by circumferential fusion in one session .

Discussions

Tuberculosis of the spine is an ancient disease seen in 5000 - year- old Egyptian mummies , which often results from haematogenous dissemination. Extensive anastomosis of arterial or vertebral venous plexus constitutes the final pathway by which infection reaches the vertebral body or the posterior elements. [5,7,18,22]. This infection causes destruction ,caseation ,and necrosis of vertebrae or may present as an abscess and noted radiographically as prevertebral or paravertebral abscess or move distally along the tissue planes as a cold abscess . Neurologic deficits may be caused by : subluxation of vertebrae ,impingment of bone , disc ,abscess on the spinal cord or nerve root ,local inflammatory responses ,tuberculous vasculitis , and appear earlier when the cervical region is affected due to a narrower canal . [3, 10]

Kyphosis is usually present but seldom severe because the articular processes are usually spared and provide sufficient support to the cervical spine .Patients with cervical tuberculosis typically present before development of severe kyphosis unlike those with thoracic affection . [5,12,15]

Management strategies for spinal tuberculosis range from ambulatory chemotherapy to radical surgical debridement with fusion .[8, 9,14] Some patients with spinal tuberculosis may present with minimal neurological symptoms in the presence of significant epidural compression. Sooner or later, these patients will present with neurological signs, even when on adequate chemotherapy. It is therefore essential to carefully assess the actual degree of spinal cord involvement whenever there is evidence of even minimal neurological compression. If cord compression is found to be significant, anterior decompression is indicated, even if the neurological signs are minimal (10-12). This will prevent patients returning later with further deterioration of neurological symptoms. The British Medical Research Council working on Tuberculosis of the Spine compared long term chemotherapy with immobilization, short course ambulant chemotherapy [Korean study] and chemotherapy with anterior spinal

fusion (modified in Hong Kong operation). Chemotherapy together with modified Hong Kong operation produced the best results, however residual kyphosis and loss of correction remain the major disadvantages. [6,13, 19, 23].

Chemotherapy is the mainstay of treatment and is the best surgical adjunct to excision of the diseased bone, replacing the gap with a bone graft [Hong Kong operation] .[6] Anterior debridement is performed for localized disease because there is high incidence of progressive angulation and a low rate of fusion after treatment by chemotherapy alone. Radical anterior surgery with interbody fusion offers good clinical improvement with early mobilization. [16,17]

Parthasarathy et al, [14] described the surgical indications for tuberculosis spondylitis:

1- Patients on ambulant chemotherapy who develop progressive kyphosis.

2-Patients with cord compression whose neurological status deteriorated in spite of chemotherapy.

3- An initial angle of kyphosis more than 30 degrees. We followed the recommendations of Parthasarathy et al [24] but we operated upon any patient who had compression of the cord or neurological deficits. We preferred early surgery because it allowed lesion biopsy to confirm the diagnosis and to correct or prevent progression of kyphosis.

Some authors prefer the posterior approach and rigid posterior stabilization; if there is no abscess requiring evacuation or the disease involves more than 2 vertebral bodies. They agree that the posterior approach has the advantage of allowing placement of implants away from the disease focus, less operative time, less blood loss and a decrease of complications that could happen with the anterior approach like division of the diaphragm or segmental vessels. [1,2,11,15,16,17, 26]

The treatment of dorsolumbar tuberculosis by single stage posterior decompression, correction, and stabilization is recommended by some where the anterior approach is not mandatory. This approach is not recommended in patients with Potts paraplegia or in the presence of a huge abscess requiring drainage.

Güven [27] reported on the relative strength of the posterior arch bone is greater. Biomechanically bilaminar claws or pedicle screws provide better fixation than anterior screws into the cancellous vertebral body. In our study, 9 cases were operated upon by the posterior approach and posterior instrumentation. The kyphosis angle was decreased to an average of 13 degrees and all cases had solid fusion. We succeeded in obtaining samples for histopathology and all patients achieved improvement in their neurologic deficits.

Surgical extirpation of the disease focus and its replacement by graft in a structurally sound position (the modified Hong Kong method) has been shown to be the most effective method [23]. One difficulty is that the graft may be subjected to over loading and the forces transmitted across the graft may result in its fractures. In addition graft fixation in cancellous bone slots may be inadequate and results in graft slipping with spinal movement. The graft may be resorbed or may sink in cancellous vertebral bodies allowing additional increase in kyphosis [16,17,26]. The modified Hong Kong method has been criticized by some surgeons as being unnecessary because spontaneous anterior fusion can occur without treatment [1,6,7,9,11].

Parthasarathy et al [24] concluded that anterior fusion offers two particular benefits, rapid union and arrest of progression of the gibbus deformity and that it was unwise to rely on anterior strut graft to prevent vertebral collapse. In our study, there were 4 cases treated by the anterior approach. All had corpectomy with interbody fusion by autograft plus plate and screws in two cases and in the other two cases we used Titanium mesh filled with bone plus plate and screws. So we did not depend only on strut graft but also on instrumentation. No graft resorption appeared. The kyphosis angle in late follow-up decreased significantly.

In general, the use of interbody grafts in patients with spinal osteomyelitis is acceptable. Autologous grafting in the setting of an active infection was first reported for chronic vertebral osteomyelitis by Wiltberger[28] in 1952. Fibula allograft were shown to be effective in the cervical spine. Ozdemir et al [29] and Govender [2] attempted to address concerns regarding implantation of devitalized bone in an actively infected spine by assessing the efficacy of allograft fibular fusion and anterior instrumentation as an alternative treatment for tuberculous spondylitis. Bone fusion was achieved in 96% of cases. Kemp et al [30] reported a 63 % incidence of fusion and a 32 % incidence of graft fracture in autogenous rib grafting and reported 94.5% fusion rates of iliac crest grafting, which they advised to use of an iliac crest as a block across the entire width of the vertebral bodies. They reported no graft-related complications. The results in this study are similar to, no graft related complications.

Sundararaj et al [32] noted that the incidence of graft related problems and progression of kyphosis is significantly less when compared with anterior surgery alone. The post operative loss of correction is insignificant. In our study we had two cases operated upon by posterior stabilization and anterior debridement with interbody fusion. [1,5,9,10,15,19]

Moorthy et al [33] in their study on uninstrumented ventral surgery for subaxial spine tuberculosis, documented evidence of good bony fusion in 12 of 14 patients. Instrumentation is not a contraindication in the presence of infection if debridement is adequate reaching normal bleeding bone. [19&24] There is no additional risk of persistent infection after adjuvant instrumentation. This study demonstrated the safety of instrumentation in the presence of tuberculous infection, as shown in the studies of Ogun et al. [29] and Yilmaz et al. [34]. In the present study, instrumentation was used to achieve following advantages: proper correction and stable alignment are maintained, graft related complications are minimized, rigid stability is provided, fusion is stimulated by rigid fixation and early mobilization of the patient.

The posterior instrumentation should be done as a first stage procedure to correct the kyphosis. Stability of graft and anterior debridement allow restoration of a normal sagittal profile of the anterior column and removal of affected foci. This procedure satisfies the cosmetic and functional demands of patients with kyphosis. Gibbus deformity if severe can give rise to cardiorespiratory failure or late onset paraplegia. Neither of these occurred in our study but we need a longer period of follow-up to monitor patients for such complication. [10,14]

Conclusion

The early surgical treatment of tuberculous spondylitis with posterior instrumental stabilization, anterior interbody fusion or with combined approaches under umbrella of 9 months anti-tuberculous medication were found helpful in arresting the disease, providing early fusion, correcting and preventing progression of kyphosis. There was no added risk in using implants either anteriorly or posteriorly even in the presence of large quantities of pus.

5.

Techniques on Intramedullary Tumor Removal

Basant Pant, Prabin Shrestha, Pravesh Rajbhandari

Annapurna Neurological Institute
neuronepal@wlink.com.np

Objective

Intramedullary tumor presents a unique technical challenge to the treating surgeon due to the critical location of the lesion within a tight neuronal bundle. The margin of error in intramedullary tumor is within millimeters where loss of dissection plane even in terms of millimeter is detrimental and can lead to disastrous result.

Method

We describe our result on of intramedullary tumor recently operated in our setup. We found that the operative outcome was directly related to the preoperative neurological status of the patient. Except for few cases whose neurological status worsen slightly immediately following surgery, but all of them regained their function within few weeks of surgery. Here we describe our surgical technique in a step wise manner. We also describe some modification of operating tools to increase the ease of surgical dissection and maintain the cleavage of the tumor. We did not feel the need of ultrasonic aspirator or SSEP to guide us in our surgery and the only tools needed for this surgery is good quality microscope and surgical tools. There were 2 case of resurgery cases where both of the cases were operated elsewhere previously. We found sectioning of dentate ligament or sectioning dorsal nerve rootlets useful technique where cord needed to be manipulated.

Discussions

Although this technique was more useful in cases of extramedullary tumor rather than intramedullary tumor. In cases of hemangioblastoma we found that the lesion ws projecting to the surface in all cases and whenever feasible this was the entry point to the tumor rather that midline cordotomy.

6.**Cerebral Vasospasm-Pathophysiological basis for its Treatment**

Leonidas Quintana M.D.

Dept. of Neurosurgery, Valparaíso University School of Medicine, Valparaíso, Chile

leonquin@gmail.com

Objective

To review the most renowned pathophysiological bases to explain the cerebral vasospasm due to subarachnoid hemorrhage

Method

Analysis of the most remarkable pathophysiological hypothesis are discussed, to explain how is produced the Cerebral Vasospasm at the Willis circle, or ultrastructural alterations at the wall of their main branches, and at the microcirculation level of the brain parenchyma .

Discussion

A)Lipid peroxidation to the cell membranes of the different layers of arterial wall through free radical reactions. B) endothelial “dysfunction”and damage with detachment and increased platelet aggregation, increased production of platelet derived growing factors, prostaglandins, endothelin, decreased action of nitric oxide, and as a consequence of all this physiopathological cascade, activation of myofibroblasts and subendothelial compaction with ultra structural arterial wall damage that produces narrowing of the arterial lumen, at the branches of Willis circle.

C) signs of inflammatory reaction inside the wall of the great arteries of the cerebral base, D) Cortical Spreading Depression, that involucrate membrane dysfunction, trans-membrane ionic alterations.

Conclusion

The most accepted medical and surgical treatments are presented, based on the explained pathophysiological mechanisms. We should keep in mind that Cerebral Vasospasm hasn't been resolved.

7.

Transmaxillary approach to the orbit; surgical technique

Ersin Erdogan (1), Kaan Berat Guclu (2), Kaan Atac (3), Sinan Kocaturk (2)

Ufuk University Medical School Departments of Neurosurgery (1), Otorhinolaryngology and Radiology

drersinerdogan@yahoo.com

Objective

For access to the orbital region, different approaches (lateral, medial, transethmoidal, cranial) have been described. In this presentation we present the case of a 43-year-old woman with a tumor of the orbital base, which was diagnosed incidentally and the surgical resection was performed by transmaxillary approach to the orbit

Method

We present the case of a 43-year-old woman with a tumor of the orbital base, which was diagnosed incidentally. She was admitted to neurosurgery clinic with headache behind her left ear. Computer tomography (CT) and MRI scan revealed a well-defined contrast enhancing mass with a smooth surface. Tumor was behind the left bulbus oculi, which measured 15×13×22mm. CT scan impression was suggestive of cavernous haemangioma. The surgical resection was performed by transmaxillary approach to the orbit.

Discussion

Cavernous haemangioma is the most common primary orbital tumour in adults, accounting for 6% of all orbital lesions. Orbital cavernous hemangioma (CH) radiologically occurs as a well-defined encapsulated intraconal mass with sharply demarcated border from the optic nerve, extraocular masses and surrounding fatty tissue. CHs are firm with a hard and compact capsule and could be totally removed by careful circumferential dissection. Kennerdell et al. think that the transmaxillary approach is preferable to remove inferoposterior orbital tumors. The transmaxillary approach to the orbit offers suitable direct access to the inferior orbital region within a short operative time range and without a craniotomy. The transmaxillary route provides excellent exposure of the optic, oculomotor, ciliary nerves, ciliary ganglion, retinal and ciliary posterior arteries, ocular muscles, orbital fat tissue, and other vital structures. So, the incidence of complications related to exposure of these structures may be reduced.

Conclusion

We recommend the transmaxillary approach to remove orbital tumors as an alternative to the standard techniques of orbital surgery.

8.

Regression of chronic hindbrain hernia following posterior calvarial augmentation in children: New insights into pathology of hindbrain hernia.

Guirish Solanki, Umar Farooq, Paul Davies

Institution: Birmingham Children's Hospital, Institute of Child Health

Introduction: It is well known that reduced posterior fossa (PF) volume is linked to Chiari & Syringomyelia formation. We hypothesise that in some cases, there is an additional effect of supratentorial (ST) crowding that effectively reduces the functional infratentorial space and may be a major factor leading to tonsillar hernia & syringomyelia.

Objectives:

1. To assess this hypothesis with pre and post-op morphometric measurements in supra and infratentorial compartments.
2. To assess the effectiveness of posterior calvarial augmentation (PCA) as an alternative surgical option to PF craniectomy for hindbrain hernia.

Methods: Thirteen children undergoing posterior calvarial augmentation between 2002 to 2008, were reviewed. Parameters measured included tonsillar hernia, midline sagittal posterior fossa (PF) and supratentorial (ST) cross-sectional area (SA) and height, PF angles (apical, clival) on MRI. No Posterior Fossa or Foramen Magnum decompression, dural expansion, durotomy or cerebellar tonsillar resections were performed. There were no C1 posterior arch or C2 laminectomies performed for cranio-cervical junction decompression.

Results: The records of 13 children, 9 boys and 4 girls were reviewed. The Male:Female ratio was 2.25. All thirteen children improved symptomatically. Tonsillar hernia regression was noted without surgical PF expansion or tonsil resection. Median tonsillar hernia regression was 50% ($p < 0.001$). Supratentorial height increased by 14% ($p < 0.001$). The supratentorial surface area increased by 7.36% ($p < 0.0031$). The PF height flattened with a reduced clival angle of -7.9° ($p < 0.0031$). The apical angle increased by $+8.0^\circ$ ($p < 0.0241$). The PF Surface Area increased by 12% ($p < 0.001$) post operatively.

Conclusion:

1. Hindbrain hernia may be partly due to supratentorial crowding. In this study, its expansion has been shown to neutralize or reverse the hindbrain hernia. Specifically, Posterior Calvarial Augmentation led to 50% reduction in tonsillar hernia associated with a combined increase in supratentorial and PF compartments.
2. Posterior Calvarial augmentation appears to be an effective surgical option for correction of hindbrain hernia in this group of children.