

NEUROSURGERY

COMMENTARY

For this issue, we have selected four articles dealing with different pathologies. All these articles are a testimony to the fact that neurosurgery is advancing and offering the cutting edge, both in technological terms as well as in patient management.

Degenerative lumbar spinal stenosis is a common problem in the aging population. Most of these patients are fragile and need minimal surgical intervention. We are in the era not only of minimally invasive but also minimally destructive surgery. The fear of postoperative instability in the spine after wide decompression has led to minimally invasive and minimally destructive approaches. Francesco Costa et al have dealt with one such approach. Unilateral laminotomy for bilateral disease offers a good alternative for the aging population in whom this disease is prevalent. The surgical technique is well described. This technique helps in preventing the postoperative instability present inherently in other destructive procedures. Moreover, it can be applied to multiple levels where the risk of instability is even higher. Since these procedures were performed by senior surgeons the bias in learning the technique was excluded. The authors' claim that this technique prevents symptomatic postoperative slippage is well supported.

Pyogenic cerebellar abscess is an important neurosurgical pathology, demanding urgent or emergent intervention. These lesions are mostly secondary to chronic suppurative otitis media, which is common in the developing world. Because of the risk of sudden occlusion of CSF pathways and the small size of the posterior cranial fossa, management principles applied to supratentorial abscess cannot be applied to posterior fossa abscesses. Pandey et al have produced the largest study published yet on this subject. Very few studies have compared the results of abscess excision and aspiration. Aspiration runs the risk of acute hydrocephalus but it should be remembered that it is usually performed in the sicker patient population whereas excision offers better control. The authors' claim that excision followed by antibiotics offers better control than aspiration is well supported by their results.

Cavallo et al have presented a multicenter study, evaluating the use of endoscopy in the management of cystic sellar lesions. Endoscopy offers all benefits of the minimally invasive approach. It also brings the surgeon's eyes close to the pathology, providing better visualization than a microscope. The authors have articulately discussed the importance of endoscopy in neurosurgery with particular reference to sellar pathologies, ranging from pituitary macroadenoma to craniopharyngioma and arachnoid cyst. However, there is no comparison with the gold standard – i.e., transsphenoidal resection of pituitary tumors. It is a series from 3 centers with no unanimity in treatment protocol or surgical approach. It offers an important insight regarding the use of endoscopy in cranial procedures in general and sellar pathologies in particular.

Head injury is one of the leading causes of death in the pediatric population. Although mortality in these patients remains high, decompressive craniectomy is an option when non-operative management for ICP control fails. Few studies have looked into the results of decompressive craniectomy in pediatric patients. Jay Jonathan et al have reviewed all the available literature on decompressive craniectomy in children. It deals with indications and outcomes following decompressive craniectomy in traumatic brain injury. The authors have clearly described the algorithm that they follow at their centre. They have also tried to look for risk factors associated with either a good or a poor outcome. It is a single centre study with impressive follow-up. They have looked not only into the clinical but also the psychological aspects of the disease. The sample size compares favorably with the rest of the published material.

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DEGENERATIVE LUMBAR SPINAL STENOSIS: ANALYSIS OF RESULTS IN A SERIES OF 374 PATIENTS TREATED WITH UNILATERAL LAMINOTOMY FOR BILATERAL MICRODECOMPRESSION

OBJECTIVE: Surgical decompression is the recommended treatment in patients with moderate to severe degenerative lumbar spinal stenosis (DLSS) in whom symptoms do not respond to conservative therapy. Multilevel disease, poor patient health, and advanced age are generally considered predictors of a poor outcome after surgery, essentially because of a surgical technique that has always been considered invasive and prone to causing postoperative instability. The authors present a minimally invasive surgical technique performed using a unilateral approach for lumbar decompression. **METHOD:** A retrospective study was conducted of data obtained in a consecutive series of 473 patients treated with unilateral microdecompression for DLSS over a 5-year period (2000–2004). Clinical outcome was measured using the Prolo Economic and Functional Scale and the visual analog scale (VAS). Radiological follow-up included dynamic x-

ray films of the lumbar spine and, in some cases, computed tomography scans. **RESULTS:** Follow-up was completed in 374 (79.1%) of 473 patients—183 men and 191 women. A total of 520 levels were decompressed: 285 patients (76.2%) presented with single-level stenosis, 86 (22.9%) with two-level stenosis, and three (0.9%) with three-level stenosis. Three hundred twenty-nine patients (87.9%) experienced a clinical benefit, which was defined as neurological improvement in VAS and Prolo Scale scores. Only three patients (0.8%) reported suffering segmental instability at a treated level, but none required surgical stabilization, and all were successfully treated conservatively. **Conclusion:** Evaluation of the results indicates that unilateral microdecompression of the lumbar spine offers a significant improvement for patients with DLSS, with a lower rate of complications. (DOI: 10.3171/SPI-07/12/579)

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CEREBELLAR ABSCESSSES IN CHILDREN: EXCISION OR ASPIRATION?

OBJECTIVE: Cerebellar abscesses are common neurosurgical emergencies in developing countries, and have a distressingly high mortality rate of 10 to 15% even today. There is still no consensus on the standard approach to these lesions, and controversy persists over whether these lesions should be treated with primary excision or aspiration. **METHODS:** The authors retrospectively analyzed 82 cases of cerebellar pyogenic abscesses in children treated at their institution over a period of 10 years. This represents the largest such series being described in literature. All lesions except 1 were otogenic in origin. The clinical and radiological features are discussed. **RESULTS:** Primary excision was undertaken in 66 patients (80%) and aspiration in 16 patients (20%). Five patients in whom the abscesses were initially treated with aspiration subsequently underwent elective

excision. Nine (12.6%) of 71 patients in whom the abscesses were excised had residual abscesses on postoperative imaging; in those who had undergone aspiration as the primary treatment, 6 (54.5%) of 11 patients had recurrent abscesses. There were no deaths among the patients who underwent excision of the abscess. Also, excision of posterior fossa abscesses required fewer repeated procedures with lower recurrence rates, and statistically lower rate of complications. **CONCLUSION:** Compared to primary aspiration, the authors found that primary excision is the preferred method for Treating cerebellar abscesses

THE ROLE OF THE ENDOSCOPE IN THE TRANSSPHEOIDAL MANAGEMENT OF CYSTIC LESIONS OF THE SELLAR REGION

Cystic mass lesions within the sella turcica are common, and they include cystic pituitary adenomas, craniopharyngiomas, Rathke's cleft cysts, arachnoid cysts, and other entities. Until recently, such lesions were typically removed by a microsurgical transsphenoidal route. Given the increased use of the endoscope in transsphenoidal surgery, we evaluated the potential benefits of this tool in the treatment of such lesions. Between January 1997 and March 2005, 76 consecutive patients with sellar-suprasellar cystic lesions treated in three Neurosurgical Divisions underwent transsphenoidal removal in which the endoscope was used at least during the sellar step of the procedure (endoscope-assisted or fully endoscopic). The series consisted of 26 pituitary macroadenomas, 20 Rathke's cleft cysts, 18 craniopharyngiomas, 10 arachnoid cysts, one craniopharyngioma associated with an adrenocorticotropic hormone-secreting adenoma, and one chordoid glioma. Rigid 4-mm endoscopes (0°,

30°, and/or 45°) were used, and the advantages and limits of the endoscope during the sellar step of the procedure were recorded. Endoscopic exploration after lesion evacuation was generally easier and of greatest efficacy when the residual cystic cavity was larger as opposed to smaller. The use of angled endoscopes was optimal in larger residual cavities. Early descent of the suprasellar cistern, bleeding inside the residual cyst cavity, and a small sella were the most common causes preventing thorough exploration of the residual cavity after its evacuation. In no cases did the endoscope cause injury during the sellar cavity exploration. Endoscopic exploration of the sellar cavity during transsphenoidal surgery offers both general and specific advantages in the treatment of a variety of different cystic sellar lesions. Its routine use during transsphenoidal surgery for such lesions is recommended to achieve maximal and safe tumor removal.

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OUTCOME FOLLOWING DECOMPRESSIVE CRANIECTOMY IN CHILDREN WITH SEVERE TRAUMATIC BRAIN INJURY: A 10-YEAR SINGLE-CENTER EXPERIENCE WITH LONG-TERM FOLLOW UP

Objective: The authors examine the indications for and outcomes following decompressive craniectomy in a single center pediatric patient population with traumatic brain injury (TBI). **Methods:** A retrospective review of data was performed using a prospectively acquired database of patients who underwent decompressive craniectomy at the authors' institution between January 1995 and April 2006. The patients' neuroimages were examined to evaluate the extent of intracranial injury, and the patients' records were reviewed to determine the admission Glasgow Coma Scale (GCS) score, the extent of systemic injuries, the time to craniectomy, and the indications for craniectomy. Long-term functional outcome and independence levels were evaluated using the Glasgow Outcome Scale (GOS) and a Likert patient quality-of-life rating scale. Twenty-three craniectomies were performed in children during the study period. The mean patient age at craniectomy was 11.9 years (range 2–19 years). In all patients, the computed tomography scans obtained at presentation revealed

pathological findings, with diffuse axonal injury and traumatic contusions being the most common abnormalities. The median presenting GCS score was 4.6 (range 3–9). Nineteen patients (83%) suffered from other systemic injuries. One patient (4%) died intraoperatively and six patients (26%) died postoperatively. Postoperative intracranial pressure (ICP) control was obtained in 19 patients (83%); an ICP greater than 20 mm Hg was found to have the strongest correlation with subsequent brain death ($p = 0.001$). The mean follow-up duration was 63 months (range 11–126 months, median 49 months). The mean GOS score at the 2-year follow-up examination was 4.2 (median 5). At the most recent follow-up examination, 13 (81%) of 16 survivors had returned to school and only three survivors (18%) were dependent on caregivers. **Conclusions:** Although the mortality rate for children with severe TBI remains high, decompressive craniectomy is effective in reducing ICP and is associated with good outcomes in surviving patients.