

visualization of posterior fossa structures. *Results:* The superior, middle and inferior neurovascular complexes of the cerebellopontine angle were better visualized with 3D comparing to 2D endoscope. A detailed view of the porus trigeminous and structures associated with the tentorial incisura was also attained with 3D endoscopy. *Conclusion:* The high quality and resolution obtained by 3D endoscopy makes it a potentially valuable surgical and teaching tool in the armamentarium for endoscopic posterior fossa surgery. The stereoscopic view of the critical neurovascular structures of the posterior fossa, offered by 3D images, allows for a more detailed dissection in the difficult area of the cerebellopontine angle.

## P.086

### Importance of ventricle-to-brain ratio (VBR) and volume of CSF drainage in the treatment of very low pressure hydrocephalus

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*Introduction:* Low pressure hydrocephalus is a known complication of prolonged hydrocephalus sometimes treatable with continued low-pressure drainage at subatmospheric pressures. Clarke et. al. and Filipidis et. al. have reported poor outcomes when treating very low pressure hydrocephalus (VLP). We present 4 cases of very low pressure hydrocephalus (VLP) following transnasal endoscopic resection of suprasellar lesions and hypothesize that poor prognostic cases can be identified thereby avoiding prolonged futile treatments. *Methods:* We performed a retrospective chart review of 4 cases of VLP and tried to identify metrics contributing to successful treatment. We examined the Pearson correlations between Glasgow Coma Scale and ventricle-to-brain ratio (VBR); volume of CSF drained; net fluids; and serum sodium, urea, and creatinine. *Results:* Our investigation reveals that Glasgow Coma Score is positively correlated with increased CSF drainage and negatively correlated with increased ventricle-to-brain ratio. The most important determinant of good outcome is brain compliance as measured by the brain's ability to maintain a good GCS score in the face of wide ranges in ventricle-to-brain ratio (VBR). *Conclusion:* We propose that futile prolonged subatmospheric drainage be avoided by declining treatment in patients who have ventriculitis and patients who have a narrow range of ventricle-to-brain ratio (VBR) concurrent with a good neurological examination.

## P.087

### Tele-assistance during neurosurgical education: Remote Education, Augmented Communication, Training and Supervision (REACTS)

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*Introduction:* Tele-medicine has gained in popularity worldwide, particularly to help offer medical expertise, healthcare delivery and education to developing nations. There is little literature reporting the implementation or analysis of tele-assistance in the setting of surgical education. We have implemented a tele-assistance system,

called Remote Education, Augmented Communication, Training and Supervision (REACTS), as a tool to augment mentor-student education in the operating room. This system allows the mentor to observe the student during surgery remotely through screen sharing technology with integrated visual and audio interaction. The goal of this study is to assess the safety and the benefit of REACTS as an educational tool. *Methods:* Prospective observational study to evaluate the safety and qualitative benefit of REACTS. *Results:* REACTS was used in 20 cases, including 5 placement of EVDs, 5 pterional craniotomies, 5 Sylvian fissures dissection, 5 lumbar discectomies, and 5 lumbar spine decompressions. No untoward or adverse events were observed. It was judged to be a positive influence on resident and fellow education by the mentors. The main pitfall in its use is to appropriately select the learner for a given procedure. *Conclusion:* REACTS surgical system is a safe, and a useful adjunct tool for neurosurgical operative education.

## P.088

### Management of inadvertent injury to superior sagittal sinus in parasagittal meningioma: technical note

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*Background:* Parasagittal meningioma is a common type of intracranial meningiomas. Surgical resection of such lesions can result in injury to superior sagittal sinus. In rare occasions, extended craniotomy might be required for uncontrollable hemorrhage from a lacerated venous wall. *Objective:* In order to avoid extended craniotomy, we attempted a surgical technique that would provide more sustained control over the lacerated venous sinus. *Method:* A 56 year old lady underwent surgical resection for parasagittal meningioma. The lateral wall of the superior sagittal sinus was prepped while scraping the tumor capsule from the sinus wall. Owing to difficulty in controlling the bleeding site, a tack up falx-assisted tension suture was attempted with a mass of Gelfoam and Surgicel over the laceration. *Results:* Adequate control for the venous sinus laceration. *Conclusion:* The falx-assisted suturing technique is quick, easy to perform and efficient in maintaining a constant tamponade effect over the lacerated site. We highly recommend such technique prior to extending the craniotomy over an injured venous sinus.

## NEUROSURGERY (NEURO INTERVENTIONAL)

## P.089

### Is Digital Subtraction Angiography (DSA) necessary for Computed Tomography Angiography (CTA) negative subarachnoid hemorrhage (SAH) patients' management?

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*Purpose:* CTA is becoming the frontline modality to reveal aneurysms in patients with SAH. However, in about 20% of SAH patients no aneurysm is found. In these cases, intra-arterial DSA is still performed. Our aim was to evaluate whether negative findings