

Background: Cerebral vasospasm is defined as a delayed but reversible narrowing of the cerebral blood vessels. Stellate ganglion block (SGB) causes sympathetic denervation, which may lead to dilatation of intracerebral vessels and an improvement in cerebral blood flow. Our study assessed the efficacy of ultrasound guided SGB in relieving symptomatic cerebral vasospasm following aneurysmal clipping using digital subtraction angiography (DSA) technology. **Materials and Methods:** Twenty patients who underwent clipping for cerebral aneurysm and developed cerebral vasospasm later were included in the study. DSA was performed. Vasospasm was classified with respect to diameter at the mid A1 and mid M1 segment of anterior cerebral artery (ACA) and middle cerebral artery (MCA) respectively. Location of vasospasm, parenchymal filling, and venous sinus filling time were calculated. Ultrasound guided SGB was given using 10 ml of 0.5% injection bupivacaine on the same side of vasospasm or the side contralateral to the deficit. The neurological condition and DSA parameters were reassessed after 30 min. **Results:** Five patients had neurological improvement; among these, four patients had vasospasm involving a single vessel. The mean vessel diameter measured at the mid A1 segment of ACA ($P = 0.002$) and mid M1 segment of MCA ($P = 0.003$) increased significantly. Twelve patients had an increase in vessel diameter. Vasospasm grade improved in three patients. The mean parenchymal filling time and mean venous sinus filling time did not decrease significantly after SGB ($P = 0.163/0.104$ respectively). **Conclusion:** Our study shows that SGB results in improvement in vessel diameter of large cerebral blood vessels. It had no impact on the cerebral microvasculature as evidenced by lack of significant changes in parenchymal filling time and venous sinus filling time. Thus, SGB has a limited role in management of patients with cerebral vasospasm.

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Anaesthetic considerations for intraoperative neurophysiological monitoring in neurosurgical cases

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Introduction: Intraoperative neurophysiological monitoring (IONM) is the standard of care for a wide range of surgeries where neurological insult is anticipated. The choice of anaesthesia depends on the signals being monitored, patient's comorbidities and the intraoperative course of physiological parameters. We report here a retrospective case series to highlight the

anaesthetic considerations in various neurosurgeries. **Methods:** We reviewed all neurosurgical cases ($n = 43$) which required IONM in the last 3 months (since the inception of IONM services in our hospital). This included cerebellopontine angle tumours ($n = 15$), compressive spinal cord myelopathies ($n = 10$), spinal cord tumours ($n = 4$), tumours of caudaequina ($n = 3$), brain tumours in the vicinity of speech area ($n = 4$), brain tumours in the vicinity of motor area ($n = 3$), sellar-parasellar tumours ($n = 2$), trigeminal neuralgia ($n = 1$) and spinal nerve root tumour ($n = 1$). Various neurophysiological techniques used in these cases for neuromonitoring included transcranial electrical motor evoked potentials (MEPs), somatosensory evoked potentials (SSEPs), free-run and triggered electromyography (EMG), direct cranial and peripheral nerve stimulation, motor mapping, language mapping, bulb cavernous reflex testing, raw and processed electroencephalography (EEG). In cases requiring MEPs and SSEPs, we used total intravenous anaesthesia and avoided relaxants. Soft bite block helped avoid tongue bites. In cases where EMG alone was monitored, only muscle relaxants had to be avoided and inhalational agents could be used. Awake craniotomy under local anaesthesia with an 'asleep-awake-asleep' technique was used for language mapping. Systemic blood pressure and core body temperature also had to be maintained for optimal neurophysiologic signals. EEG and bispectral index monitoring were used to assess the depth of anaesthesia. **Results:** By customising anaesthesia according to neurophysiological requirements, we achieved good baseline monitor ability in 42/43 cases (one patient had severe neurological deficit that baseline signals could not be recorded). Monitoring was successful in all 42 cases except one (monitoring had to be discontinued in a case, as inhalational agent was kept above 0.5 minimum alveolar concentration). **Conclusion:** Good signal acquisition for a reliable neuromonitoring is teamwork between neurosurgeons, surgical neurophysiologists and anaesthesiologists. Inhaled anaesthetics are to be used frugally/not at all, in cases requiring MEP monitoring.

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Comparison of awake endotracheal intubation using intubating laryngeal mask airway and fibreoptic bronchoscope in patients with unstable cervical spine

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Background: Anaesthetists often encounter patients at their initial resuscitation phase after acute spinal cord injury. Therefore, they are ideally placed to influence

the degree of functional recovery that may take place. The selection of airway management technique must be carefully considered. Clinical experiences in intubating patients with cervical spine injuries via the intubating laryngeal mask airway (ILMA™, Fastrach) encouraged us to undertake a prospective, randomised controlled study to compare upper cervical spine excursion during oral tracheal intubation using fibreoptic intubating scope with that during intubation via the ILMA™ (Fastrach). **Methodology:** Thirty-two patients aged between 18 and 65 years, belonging to American Society of Anesthesiologists status I-III physical status were included in the study. Patients who were morbidly obese or with oropharyngeal pathology or mouth opening <2 cm and those who refused to give the consent were excluded from the study. Patients were randomly assigned to one of two groups. Group fibreoptic bronchoscope: patients in whom trachea was intubated using fibreoptic intubating scope and group ILMA: patients in whom intubation was performed via the ILMA™ (Fastrach). Three lateral cervical spine X-rays were taken. In each group, during the different intubating procedures, excursion of the cervical spine was radiographically documented. **Results:** Cervical spine excursion during intubation with ILMA™ was more as compared to that during intubation with fibreoptic intubation at C1-C2. There was no neurological deterioration in either group post-intubation. Patients in both the group tolerated the procedure well. The incidence of sore throat was more in patients intubated with ILMA™. **Discussion/Conclusion:** In conclusion, findings of our study suggests that ILMA™ is not inferior to fibreoptic scope for awake intubation in patients with unstable cervical spine with respect to success rate of intubation, post-intubation neurological function, degree of cervical spine motion on fluoroscopy, haemodynamic changes and patient satisfaction.

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Effect of 0.45% saline and plasmalyte A used during intraoperative and post-operative period on serum osmolality in patients undergoing craniopharyngioma surgery

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Background: Electrolyte imbalance and acute diabetes insipidus (DI) are the most common complications in patients undergoing craniopharyngioma surgery. Data are sparse regarding the choice of fluid in patients undergoing craniopharyngioma excision. We

compared the effects of iso-osmolar plasmalyte A and hypo-osmolar 0.45% saline infused perioperatively on perioperative serum osmolality, serum sodium level and incidence of DI. **Methodology:** A prospective randomised double-blind study was conducted in 28 patients undergoing transcranial excision of craniopharyngioma. The patients received either plasmalyte A or 0.45% normal saline intraoperatively and till 7th post-operative day. Serum and urine osmolality, serum and urine sodium, urine specific gravity, Glasgow coma scale and total dose of desmopressin required were measured in the perioperative period and for up to 7 days post-operatively. **Results:** Demographic data were comparable. A statistically significant difference was found between the two groups in serum osmolality at 2 h ($P = 0.033$), 3 h ($P = 0.009$) after the start of surgery, at the end of surgery ($P = 0.013$) and on post-operative day 0 ($P = 0.015$) with 0.45% saline group having serum osmolality <300 mosm/kg as compared to plasmalyte group. The urine osmolality at 2 h ($P = 0.03$), at post-operative day 0 ($P = 0.015$) and post-operative day 1 ($P = 0.010$) was more than 300 mosm/kg in 0.45% saline group as compared to plasmalyte A group. Plasmalyte A group had hypernatremia ($P = 0.015$) as compared to 0.45% saline group on post-operative day 1. **Discussion:** 0.45% saline has better effect than plasmalyte A on serum osmolality in patients undergoing transcranial resection of craniopharyngioma.

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Quest for the Holy Grail: Assessment of dynamic parameters of fluid responsiveness in patients with acute aneurysmal subarachnoid haemorrhage

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Introduction: Delta down (DD) >5 mmHg, superior vena cava collapsibility index (SVCCI) >36% and aortic velocity time integral variability (VTI AoV) >20% are reliable predictors of fluid responsiveness in critically ill patients. The aim of this study was to assess the utility of DD, SVCCI, VTI AoV as predictors of fluid responsiveness in patients with acute subarachnoid haemorrhage (SAH) undergoing neurosurgery for clipping of intracranial aneurysm. **Methods:** After Institutional Ethics Committee approval, prospective pilot study was done on fifteen patients undergoing surgical management of intracranial aneurysm after informed consent. Post-recording baseline vitals, anaesthetic parameters, DD, SVC diameters, VTI AoV, stroke volume, cardiac output and cardiac index (CI), patients received fluid loading (FL) of 15 ml/kg of