Dilemmas in a parturient with intracranial meningioma with raised intracranial pressure and difficult airway for cesarean section

A parturient with intracranial tumor and raised intracranial pressure (ICP) is a challenge to the anesthetist.\(^1\)\(^-\)\(^6\) We recently encountered a similar patient but more challenging due to the presence of decreased mouth opening secondary to tumor metastasis to bilateral temporomandibular joint. To the best of our knowledge, a similar case is not reported before in literature. The patient was a 55-kg, ASA III, 24-year-old parturient posted for elective cesarean section at 37 weeks of gestation. She was a known case of right sphenoid meningioma since the last 1 year with current size of 5.2 cm on magnetic resonance imaging and presently on treatment of intravenous phenytoin and dexamethasone. She was referred to the anesthesia team 2 days prior to elective cesarean section for preanesthetic examination, which revealed prominent proptosis with chemosis of the right eye with right facial nerve palsy and no vision in the right eye [Figure 1]. Airway examination revealed interincisor distance of 8 mm with decrease mandibular protrusion, nontender bilateral condylar movements, hyomental distance of 5.2 cm, and mallampati grade IV. Fundoscopy revealed a pale disc with total optic atrophy and papilloedema. The rest of the systemic examination and blood investigations were within normal limits.

The main goal in the present patient was to prevent further increase in ICP. To accomplish this, the main challenges were to secure airway with minimal nociception, to administer adequate perioperative analgesia to prevent pain, and to avoid nausea and vomiting in the postoperative period. A decrease in ICP was also not desirable as it could lead to brainstem herniation. Due to the above challenges along with the presence of difficult airway, general anesthesia with awake nasal fiberoptic intubation was planned, as mouth opening was inadequate to accomplish oral intubation. The procedure was explained to the patient a day prior to the surgery. Intravenous phenytoin and dexamethasone were continued in the perioperative period. In the operating room, 0.05% xylometazolin nasal drops were instilled on more patent right nostril. Nebulization with 2% xylocaine 10 mL was given. Intravenous hydrocortisone 100 mg was injected followed by slow injection of midazolam 1 mg over 5 minute. Right nostril was serially dilated with lubricated nasopharyngeal airway (size 6, 7, 8) following which a fiberoptic 6.5 mm was passed with an epidural catheter threaded in the suction port. Through this, 10 mL of 2% lidocaine was sprayed in the oral airway and the catheter port enabled precise deposition of local anesthetic to the vocal cords and trachea. The fiberscope was then removed to allow for the action of local anesthetic. After 2 minutes, it was reintroduced with a softened endotracheal tube (by immersing in hot saline for few minutes) of size 7.5 mm (size determined by nasal and tracheal diameter on chest X-ray). The patient was asked to protrude her tongue and with gentle lifting of her jaw, trachea was intubated without any gag or coughing. Her hemodynamic parameters remained stable. Induction of anesthesia was then done with intravenous propofol 1 mg/kg and atracurium 25 mg. Maintenance of anesthesia was done with Total intravenous anesthesia (TIVA) propofol 120 µg/kg/min without any inhalational gases. Intraoperative invasive ICP monitoring was not available. However, ET\(\text{CO}_2\) 30–32 mmHg, BIS 40–50, and 25° elevation of operative table were maintained to ensure no further increase in ICP. Intraoperative analgesia was provided with intravenous paracetamol 1 g and ketorolac 30 mg. A healthy male baby with Apgar score of 8
was delivered. Her intraoperative period remained uneventful and she was hemodynamically stable throughout surgery. After skin closure, bilateral ultrasound-guided Transversus abdominis plane block (TAP) block with 20 mL each of 0.375% plain ropivacaine was given. TIVA was stopped after skin closure. The total surgical time was 40 minutes. Neuromuscular blockade was reversed with neostigmine and glycopyrrolate. The aim of tracheal extubation was to ensure an awake patient due to difficult intubation and to prevent coughing and bucking over the tube to avoid increase in ICP. At the end of the surgery, the patient had spontaneous opening of eyes and responded to oral commands without coughing over endotracheal tube. Trachea was extubated. Pain assessed by visual analogue score (VAS) at extubation was 1–2. She was shifted to high observation unit for 3 days to monitor for any changes in the level of consciousness. Postoperative analgesia was provided by intravenous paracetamol 1 two to three times a day. Her postoperative period was uneventful and she was discharged on the seventh day with advice to follow-up in neurosurgery outpatient department.

Anesthetic management of a similar kind of patient is not reported in literature. In patients with increased ICP, spinal anesthesia may cause transtentorial herniation and thus is not favored.\textsuperscript{[1‑6]} Potential advantage of regional anesthesia is an intraoperative awake patient, which could help in early diagnosis of a deteriorating neurological event.\textsuperscript{[1‑6]} General anesthesia risks a rise in ICP due to hemodynamic variations during intubation, vasodilatation due to inhalational agents, and inadequate depth. In the present patient, spinal anesthesia was not preferred to avoid sudden fall in ICP. Keeping increased ICP in mind, segmental epidural anesthesia was probably an option in the present patient but was decided against as securing an emergency airway device in case of any inadvertent event would have been very difficult. General anesthesia with propofol was chosen as propofol decreases the Cerebral blood flow (CBF), cerebral metabolic rate of oxygen (CMRO\textsubscript{2}), and ICP and is also cerebroprotective.\textsuperscript{[5,6]}

In view of minimal mouth opening, postoperative sedation was prevented by avoiding intravenous opioids and by avoiding use of opioids in Local anesthetic as an adjuvant in TAP block. Avoidance of opioids was also done to prevent nausea and vomiting, which may further increase ICP.

Increased ICP along with difficult airway in a parturient is a challenge to an anesthetist. The need to deliver adequate analgesia along with avoidance of sedation and nausea vomiting in the mother while maintaining brain and fetal circulation are the goals in such a patient. This requires judicial combination of drugs and procedures to ensure successful outcome of mother and fetus.

**Declaration of patient consent**
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**
There are no conflicts of interest.

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Dear Editor,

Patients are at high risk for both deep vein thrombosis (DVT) and pulmonary embolism (PE) during a stay in an intensive care unit (ICU).

[1‑5]
The majority of ICU patients are severely ill requiring sedation and mechanical ventilation.[4,5] However, little is known about the incidence and particularities of venous thromboembolic complications (VTE) in patients with septic shock requiring ICU admission. In the best our knowledge, only one prospective study was done on this subject showing a high incidence of VTE in patients with severe sepsis and/or septic shock, regardless of the use of universal, guideline-recommended thromboprophylaxis.

[1]

During the period from January 01, 2017 to December 31, 2017, we prospectively studied 60 successional enrolled patients with established septic shock in the ICU of Habib Bourguiba University Hospital, Tunisia. Patients that were recruited in the study included those that developed septic shock as a result of bacterial infection during the study period. Thromboprophylaxis was recorded for all patients. Spiral computed tomography scan and venous compression ultrasound were used to confirm the diagnosis of thromboembolic complications (TEC). PE is suspected by the presence of unexplained hypoxemia and/or shock as well as arterial hypotension during diagnosis in our institution, and spiral computed tomography is used for PE confirmation. However, venous compression ultrasound is performed when the patient developed clinical features of thrombophlebitis and/or when there are contraindications of spiral computed tomography. During the study period, 24 patients (40%) developed VTE complications, despite all patients receiving guideline-recommended thromboprophylaxis. Mean Simplified Acute Physiology Score II (SAPSII score), [6] which is intended to evaluate the severity of disease for patients admitted to Intensive care units aged 15 or more, was significantly higher in the thromboembolic complications free group

[Table 1].

VTE was found to be associated with prolonged ICU stay and longer mechanical ventilation. However, the mortality rate was not significantly higher in patients with acute thromboembolic complications

[Table 1].

Critically ill patients are usually at high risk for PE and DVT. Also, TEC is a crucial challenge these patients face. Moreover, septic shock is considered a risk factor for VTE, including upper and lower extremity DVT and pulmonary embolism (PE).

[1,2]
The underlying pathogenesis of VTE in sepsis remains incompletely understood but is believed to be the result of multiple factors. In addition to risk factors for hypercoagulability, as originally described by Virchow, incorporating the 3 original triad (stasis; endothelial injury; and hypercoagulability), severe inflammation observed in patient with sepsis and/or septic shock represents the fourth factor for thromboembolic complications.

[1]

Inflammation increases pro-coagulant factors, and also inhibits natural anticoagulant pathways and fibrinolytic activity, leading to DVT and PE.

[2]

In fact, the inflammatory process initiated by septic shock may be strained by coexisting tissue hypoxia and systemic inflammation leading to endothelial damages and DVT complications.