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Thoracic epidural as the sole anaesthetic technique for gastrostomy in a case with difficult airway: a case report

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Dear Editor,

Oral squamous cell carcinoma constitutes one of the most common malignancies of the head and neck region with a global 5-year prevalence reaching 1 million and is highest in Asia, related to tobacco chewing [1]. Feeding gastrostomy is a palliative procedure in locally advanced oropharyngeal malignancies to ensure adequate enteral nutrition. Being an intraperitoneal upper abdominal procedure, it requires adequate analgesia and anaesthesia. General anaesthesia (GA) with controlled ventilation is the norm in such surgery. However, this patient presented unique challenges to GA because of the difficult airway, hyponatraemia, and seizure disorder. Here we present the successful management of this patient using thoracic epidural anaesthesia (TEA) as the sole anaesthetic management without intravenous sedation.

A 70-year-old patient (45 kg body weight, 170 cm height, BMI 15.5 kg m^{-2}) presented to our hospital with painful swelling over the left jaw, progressive dysphagia, productive cough, and weight loss for 3 months. There was a history of carcinoma lateral margin of the tongue, treated with chemotherapy, immunotherapy, and radiotherapy. The patient received 6 cycles of docetaxel and cisplatin, immunotherapy with cetuximab, and 28 cycles of radiotherapy, the last doses about 4 weeks previously. The patient had a history of systemic hypertension and had been on treatment with telmisartan 40 mg once daily for 18 years. At admission, the patient was dehydrated and drowsy but haemodynamically stable. The patient was responding to touch and pain stimuli. The patient developed new onset generalized tonic-clonic seizures. Investigations revealed hyponatraemia with initial sodium levels of 118 mEq L^{-1}. Renal and liver function tests were normal. Neurology evaluation with magnetic resonance imaging of the brain showed no structural lesions. Hypertonic saline was administered, and sodium was corrected to 126 mEq L^{-1} over the following 24 hours. Levetiracetam was administered intravenously. Electroencephalography showed no further seizure activity and sensorium improved to being alert and oriented. Intravenous fluids were administered to ensure hydration as an orogastric tube could not be inserted. Subsequently, a palliative gastrostomy was planned.

On pre-anaesthetic assessment, the patient was found to be frail, and malnourished with generalised wasting; there was a hard, tender swelling on the left angle of the mandible of size 6 cm by 4 cm. Saturation was 95% in room air, heart rate was 78 min^{-1}, with a regular rhythm, and blood pressure was 150/80 mm Hg. Airway assessment revealed reduced mouth opening of less than one finger breadth with restricted neck extension. Mallampati grade could not be assessed because of restricted mouth opening. Investigations showed haemoglobin 11.2 g dL^{-1}, platelets 248 x 10^9/L, prothrombin time 11.1 s, and INR 1.15. ECG showed q waves in inferior leads. Echo showed an ejection fraction of 55% with grade 1 diastolic dysfunction. The chest radiograph was normal. Because of restricted mouth opening, endoscopic gastrostomy was not an option.

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The patient and family had chosen comfort care and did not want endotracheal intubation or tracheostomy. Possible options for providing anaesthesia in this scenario were discussed in detail with them. They were informed about the risks of GA because of the difficult airway and the possible need for an emergency tracheostomy. Spinal anaesthesia had risks of profound hypotension and chances of high spinal leading to respiratory and cardiovascular compromise. Fascial plane blocks may need sedation with inherent risks of airway loss. Using epidural as the sole technique was explained to the patient and family. They consented to endotracheal intubation or emergency tracheostomy in the event of failure of TEA.

Written consent for the procedure was obtained. Standard monitoring, including non-invasive blood pressure (NIBP), electrocardiography (ECG), and pulse oximetry (SpO_2), was attached. The blood pressure was 160/90 mmHg, HR 85 min^{-1}, oxygen saturation 95% on room air, and respiratory frequency 20 min^{-1}. The patient was placed in a sitting position, and 2% lignocaine (5 mL) was used to infiltrate intervertebral space T_9–T_{10}. A midline approach was used under complete aseptic precautions. An 18-gauge Tuohy needle was inserted at the T_9–T_{10} intervertebral space. The epidural space was identified using the "loss of resistance to air" technique. An epidural catheter was passed through the needle, then the catheter tip was advanced 4 cm cephalad beyond the tip of the needle and secured with a sterile dressing. Absence of a haemodynamic response to a test dose of 3 ml of 2% lignocaine with 1 : 200 000 adrenaline confirmed the correct placement. A bolus dose of 6 ml of 0.5% bupivacaine was administered. The sensory block level was assessed along the abdominal midline with an alcohol swab. There was no motor blockade. After 15 min of injection, the sensory block reached T6, and the surgery was initiated. The blood pressure decreased to 85/60 mmHg at 20 min after the epidural injection, 10 mg of intravenous ephedrine was administered, and the blood pressure stabilised. A supplemental dose of 4 ml of 0.25% bupivacaine was given 30 min into the surgery. The duration of the surgical procedure was 45 min and TEA provided adequate analgesia and relaxation for the entire duration. No supplemental intravenous analgesics were required in the postoperative period and the pain score remained 0/10. The patient remained stable and was discharged home the next day.

This case represents the successful use of regional anaesthesia in the form of TEA in open gastrostomy. We avoided GA, the associated airway risks, and postoperative complications in a patient being treated with palliative intent.

Regional anaesthesia options for gastrostomy include spinal anaesthesia (SA), TEA, bilateral erector spinae plane block (ESPB) or bilateral thoracic paravertebral block (PVB), or a combination of bilateral rectus sheath block (RSB) and transversus abdominis plane block (TAP). Spinal anaesthesia cannot be titrated to effect, has a fixed duration of analgesia, and given the frail general status of the patient, may have resulted in profound hypotension. Gastrostomy requires a sensory level of T_6, which necessitates a higher volume of local anaesthetic in SA, increasing the risk of high spinal anaesthesia. Though there are published case series, and systematic reviews on the efficacy of fascial plane blocks for abdominal surgery, they are used as part of a multimodal analgesic strategy [2–6]. Field blocks provide somatosensory pain relief but not analgesia of the peritoneum and hence cannot be used as a standalone modality in gastrostomy. These are given bilaterally, which utilizes more volume of local anaesthetics. A high volume of local anaesthetics increases the risk of systemic toxicity, especially with a low body weight [7]. Use of intravenous sedation with blocks could be catastrophic in our case with a difficult airway. Thoracic epidural anaesthesia provided distinctive advantages in this situation with the ability to give titrated doses, adequate muscle relaxation, postoperative pain relief, and avoidance of intravenous sedation. A PubMed search using the terms "epidural AND gastrostomy" revealed only one such previously published case using TEA as the sole anaesthesia modality for gastrostomy [8].

Regarding the type of local anaesthetic, 0.5% bupivacaine was used as it provided extended-duration anaesthesia. Opioids were not added to reduce the risks of postoperative ileus, respiratory depression, nausea, and vomiting [9]. Epidural placement in the thoracic spine is thought to be trickier than lumbar epidurals; however, the incidence of complications in experienced hands is very low, approaching a serious adverse event rate of 0.1% [10]. It is worth highlighting that neuraxial anaesthesia, despite the benefits mentioned, can fail to provide adequate analgesia in some patients, with reported rates of failure ranging 5–16% [11]. Hence, we had planned for GA with flexible bronchoscopy-guided intubation and tracheostomy as a backup in the operating room.

Having an advanced care directive should not be confused with not giving the same level of treatment as any other patient. As anaesthesiologists, we have the responsibility to provide the highest standards of anaesthesia to patients while respecting their wishes for palliative care. Open gastrostomy is usually performed in elderly frail patients with multiple comorbidities. This case shows that TEA can be useful as a standalone anaesthesia modality in this situation. This option should be considered, and risks and benefits weighed when planning such procedures.

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