Case Report

Case Report of Awake Nonintubated Anterior Mediastinal Mass Excision in a New Tertiary Care Institute

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Abstract

Perioperative management of anterior mediastinal mass may be difficult to manage for anesthesiologists as well as thoracic surgeons. General anesthesia is preferred approach for such surgeries, but there is the risk of compression of the trachea after induction. A more physiological and less invasive method is thoracic epidural anesthesia without endotracheal intubation. An anterior mediastinal mass was excised successfully in the fully awake patient under high thoracic epidural block in a tertiary care institute. This approach may be replicated further in the management of patients with compromised pulmonary reserve with a reduction of length of stay in intensive care unit and hospital.

Keywords: Awake anesthesia, awake thoracic surgery, epidural anesthesia, mediastinum

Introduction

Thoracic epidural anesthesia (TEA) has been successfully tried in decortication, lobectomy, video-assisted thoracic surgeries, and coronary artery bypass grafting. It maintains hemodynamic stability and analgesia perioperatively. Anterior mediastinal mass can be a surgical as well as the anesthetic challenge. It can cause compression of the trachea and nearby vascular structures.[1] It can be benign such as thymoma, thymic cyst, thyroid, thymic hyperplasia, and cystic hygroma, or malignant such as thymic carcinoma, thyroid carcinoma, lymphoma, or germ cell tumors.[2] A case is described here, in which an awake non intubated sternotomy for anterior mediastinal mass excision was done first time in our institute under regional anesthesia technique.

Case Report

A 30-year-old male presented with complains of moderate chest pain for 1 month, localized in the retrosternum, which aggravated on exertion, and was not associated with radiation, and breathlessness. He had a history of inflammatory bowel disease for the last 5 years and was on irregular medication. During the follow-up visit, a contrast-enhanced computerized tomography scan revealed an anterior mediastinal mass [Figure 1]. The biopsy ruled out the germ cell tumor and confirmed it to be thymoma. It was a well-circumscribed lesion measuring around 90 mm × 56 mm × 30 mm. It did not compress the trachea but was extending up to the arch of the aorta and adherent to it. Hence, it was planned to excise the mass with a diagnostic and curative intent. On preoperative evaluation, complete blood count, renal function test, liver function test, and coagulation profile were within normal ranges. The patient was counseled by the surgeon and anesthesiologist together and the plan of awake surgery was explained in depth and all queries of patient and relatives were resolved. On the evening before surgery, a written and well-informed consent was taken by the patient. He was advised tablet alprazolam 0.5 mg on the night before and in the morning of surgery to alleviate anxiety.

Minimum staff were allowed during the preoperative and intraoperative period to keep the operative room (OR) environment calm. The patient was shifted to OR and electrocardiogram, pulse oximetry, invasive blood pressure in the right femoral artery and two intravenous (IV) access with 16

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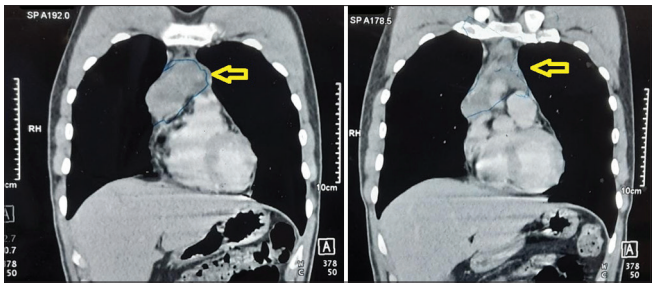

Figure 1: Computed tomography thorax showing the anterior mediastinal mass

G cannula were secured. The patient lied down on the operating table and adjusted to OR environment. 1 mg of Midazolam was administered intravenously to decrease anxiety followed by an intramuscular injection of Morphine 0.1 mg/kg. The upper posterior thoracic region was cleaned and draped in sitting position and 18 G epidural was placed at the level of T1-T2 by loss of resistance technique. The epidural catheter was inserted 4 cm into the epidural space. A mixture of local anaesthetic solution consisting of 5 ml lignocaine 2%, 10 ml Bupivacaine 0.5% and 25 µg fentanyl was administered over 5 min. The sensory and motor blockade was checked with cold saline and pinprick method. The level of anesthesia was achieved till T8 level as desired for sternotomy. Oxygen was given via nasal prongs at the rate of 2 l/min. There was a decrease in heart rate and blood pressure but was <20% of baseline values. This was expected after sympathetic blockade due to regional anesthesia. Atropine and Mephenteramine were loaded and two iv fluids in pressure bags were connected to peripheral iv lines to manage any significant hemodynamic change. The operating team constantly communicated and reassured the patient. There was a back-up of the supraglottic airway and flexo-metallic endotracheal tube in OR. In addition, an ENT specialist was called to standby with a rigid bronchoscope to secure the airway in the scenario of not able to ventilate or intubate. After midline sternotomy, a retractor was applied to open the chest minimally to access the mass. Minimal retraction helped to prevent any difficulty in breathing. The mass was successfully excised *en-bloc* and measured around 10 cm × 4 cm [Figure 2]. He had mild discomfort during handling of pericardium around arch of the aorta and during contact with the parietal pleura. He felt minimal pain from periosteum contact while doing hemostasis. As the level of anesthesia achieved was only till T8, local anesthetic was infiltrated to put mediastinal drain before the closure of sternum. The patient did not require any maintenance dose of epidural anesthesia intraoperatively. The patient was given mild sedation after the procedure with IV fentanyl 25 µg along with IV ondansetron 8 mg as antiemetic prophylaxis. The procedure was completed in less than an hour. A mixture of bupivacaine 0.0625% with fentanyl l2 µg/ml was administered at the rate of 2 ml/h in epidural infusion. Ringer lactate was used intraoperatively as maintenance fluid. The blood loss was estimated to be 200 ml and total urine output during procedure was 500 ml. Blood transfusion was not required. Arterial blood gas was within the normal limits. The patient was shifted to

Figure 2: Excised mass measuring around 10 cm × 4 cm

intensive care unit (ICU) for observation. Oral fluid was started 4 h after surgery. The patient was mobilized after removing the mediastinal drain and urinary catheter after 24 h. The epidural infusion was removed after 24 h as the patient had pain with VAS score of 3 on the next day of surgery. He remained hemodynamically stable throughout his ICU stay. The patient was discharged on the fourth postoperative day with advice of regular follow-up.

Discussion

General Anesthesia is the preferred approach for anterior mediastinal mass as it provides a secure airway, relaxed musculature, good exposure, and a wide field for surgeons. Acute respiratory decompensation may be precipitated by positional changes, loss of muscle and diaphragm tone, alterations in lung compliance and chest wall structure during anesthesia and surgery.[3]

It is prudent to have less invasive and more physiological way for any kind of surgery. Anterior mediastinal mass can be operated under regional anesthesia with high thoracic epidural, intercostal, paravertebral, peripheral field block, and ipsilateral stellate ganglion block. The TEA is one of the reliable and successful technique. This does not require the patient to be intubated or sedated and the procedure can be performed only with somatosensory and motor blockade till the desired dermatome of T1-T9 level.[4] Field block with local anesthetic infiltration or intercostal nerve block can be used as an adjunctive technique to TEA before incision.[5] The maximum permissible block is till level C6 which can be diagnosed with signs of Horner's syndrome. There is risk of hematoma formation after epidural placement. If there is a bloody tap during the procedure, then the patient should be monitored closely till the next 48 h for any signs of nerve compression.

As the patient is fully conscious and spontaneously breathing, he can be a surrogate for monitoring of cerebral function intraoperatively. The patient may become anxious and may

Table 1: Pros of awake thoracic epidural anaesthesia

Pros
Decreased stress response compared to general anaesthesia
Useful in patients with impaired pulmonary reserve
Avoids complication of general anaesthesia
Intubation-related trauma
Pneumonia
Ventilator-associated lung injury
Impaired cardiac performance
Adverse effects of neuromuscular blocking agents
Maintains normal neurological and cardio-pulmonary physiological state
Reduced oxygen demand and optimized redistribution of coronary blood flow
Prevents gastric distension and secure cough reflex thus protecting the airway
Analgesia during perioperative period
Early recovery and mobilization
Less cost and reduced stay in hospital

Table 2: Cons of awake thoracic epidural anesthesia

Cons
Technically demanding as surgical maneuvering is difficult with limited exposure and rib retractions
Possibility of pleural opening and pneumothorax
Regional anesthesia induced hypotension and bradycardia
Nausea and vomiting due to unopposed parasympathetic response
Local anesthetic toxicity
Procedural risk like spinal cord injury and postdural puncture headache

panic once the motor and sensory blockade sets in due to the feeling of not being able to breathe. It can be prevented by providing a good comfortable position for patient, maintaining calm environment, and continuous reassurance.

Awake thoracic surgery has been done successfully in spontaneous pneumothorax, pericardial or pleural effusion, bullous emphysema, resection of pulmonary nodules, lung volume reduction surgery, decortication for empyema thoracic, biopsy for anterior mediastinal mass, and lobectomy for lung cancer.[6] Contraindications to awake surgery are obesity, neurological conditions, uncontrolled gastroesophageal regurgitation, central hypoventilation syndrome, difficult intubation, technical contraindications to general anesthesia, and the need to protect the contralateral lung from spillage of endobronchial contents.[7,8] The pros and cons of awake TEA are summarized in Tables 1 and 2.

In case of failure of the thoracic epidural block, rescue anesthesia by endotracheal intubation, supraglottic devices like laryngeal mask airway and I-Gel should always be available. If the tumor is large and may cause tracheal compression after induction, then rigid bronchoscopy and airway stenting can be done before surgery.[5] Awake flexible fiberoptic intubation with the maintenance of spontaneous ventilation before induction can be considered and the endotracheal tube is advanced to the distal noncompressed airway beyond the obstruction.[9]

The toxicity of local anesthetics is also a risk factor if there is systemic absorption. It can present as peri-oral muscle twitches, loss of airway protective reflexes, seizures, arrhythmia, motor, autonomic blockade (urinary retention, weakness), respiratory depression, and coma.

In conclusion, TEA with awake non intubated patients can be a safe and more physiological way in thoracic surgeries. A proper history, radiological examination, risk assessment, and team approach to the management of the patient is essential. Thoracic surgery under epidural anesthesia can be a more viable and safe option in near future.

Declaration of patient consent

The authors certify that appropriate consent forms have been obtained from the patient. The patient has given consent for reporting her clinical information in the journal with concealed identity. The name and initials will not be revealed at any stage. Anonymity cannot be guaranteed but due efforts will be taken to conceal any identification.

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Conflicts of interest

There are no conflicts of interest.

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