

Case Report

An anaesthesiologists concern in a patient with posterior mediastinal mass

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ABSTRACT

Large mediastinal masses may cause life threatening cardiorespiratory collapse depending on their location. An 18 years old female underwent ganglioneuroma excision. She had a 15×9.4×9.1 cm left sided cervico-thoracic mass surrounded by major blood vessels with mild encasement of left vertebral artery and left subclavian artery. After placing thoracic epidural, mask ventilation was confirmed with sevoflurane induction, and succinylcholine was given for intubation. Invasive monitoring of blood pressure was obtained with intravenous access in upper and lower limbs. For lung isolation, coopdech bronchial blocker was inserted into left main bronchus. Intraoperatively she was maintained on atracurium infusion, sevoflurane in oxygen air mixture. With a left hemiclamsell incision, mass was carefully separated from surrounding blood vessels and removed en bloc. After surgery patient was extubated and shifted to intensive care unit for observation. Patient was pain free and comfortable. Though our patients anaesthesia management and surgery was uneventful, we would like to discuss the potential complications that may arise with posterior mediastinal tumours as there are few articles discussing about the anaesthetic management of posterior mediastinal tumours.

Keywords: Mediastinal mass, Airway obstruction, Bronchial blocker

INTRODUCTION

Patients with mediastinal mass can pose a great challenge for an anaesthesiologist. The complications associated with mediastinal masses depends on the location, size and pathology of the mass. Though majority of the articles discuss complications related to anterior mediastinal mass, there are a few case reports discussing the complications of posterior mediastinal mass also. Here we discuss about the anaesthetic management of a patient who came for large posterior mediastinal mass excision.

CASE REPORT

An 18 years female, weighing 46 kilograms, 158 centimeters tall, admitted with posterior mediastinal mass

having breathlessness on exertion, fatigue and pain in hands and back more on left side.

Examination revealed mild upper thoracic scoliosis with convexity on right and fullness of left supraclavicular fossa with reduced air entry on left side of chest. Airway examination showed adequate mouth opening, mallampati grade 3 with mild tracheal shift to right.

CT angiography chest revealed a 15×9.4×9.1 cm left sided cervico-thoracic mass lesion extending from 6th cervical to 7th thoracic vertebral level. Mass was cranial and posterior to left pulmonary artery (LPA), lateral to the descending thoracic aorta with close contact with LPA, distal arch and proximal descending thoracic aorta without luminal invasion. Left common carotid artery

(CCA), left vertebral artery, left subclavian artery and left subclavian vein were displaced along the margin of the lesion without vascular invasion with mild encasement. Her CT chest revealed mild upper mediastinal shift to the right with focal areas of air trapping in the bilateral lung parenchyma.



Figure 1: CT Angiogram showing mediastinal mass.

The mass was confirmed to be ganglioneuroma on histopathology report. Pulmonary function test was normal. CT abdomen done to rule out abdominal tumours was normal. Blood investigations including complete blood count, serum creatinine, serum electrolytes, liver function tests were normal with a hemoglobin of 14.4 g/dl. 12 lead electrocardiogram and echocardiogram were normal.

Blood products and ICU bed with ventilator were reserved prior to surgery.

A 20 gauge intravenous canula was insitu on right forearm. After attaching ECG, pulseoxymeter and noninvasive blood pressure, 18G epidural was inserted in T6-7 intervertebral space. With inhalational induction using sevoflurane in oxygen, mask ventilation was confirmed and 50 mg of intravenous suxamethonium given for intubation. 8.5 mm endotracheal tube was inserted orotracheally using CMAC videolaryngoscope. There was no difficulty with intubation with cormac lehane grade I. Inj. Atracurium and 100 micrograms of inj. Fentanyl were given after confirming tube position. Right internal jugular vein was cannulated with triple lumen catheter under ultrasound guidance and right radial arterial line secured for invasive blood pressure monitoring. Right femoral arterial access was also secured and transduced. 14F ryles tube was inserted nasally. Due to distorted anatomy because of mediastinal shift, coopdech bronchial blocker was inserted into left main bronchus under fiberoptic guidance. After giving 8ml of 0.1% Bupivacaine with 150 mcg of inj buprenorphine epidurally, she was maintained on atracurium, sevoflurane in oxygen air mixture. Surgery was done in supine position with left hemiclamsell incision which involved 4th space thoracotomy,

sternotomy and supraclavicular incision. The mass was separated from left subclavian vein and artery complex, left carotid artery and was removed en bloc. The bronchial blocker was removed, left lung expanded and chest was closed with a left intercostal and neck drain. Inj paracetamol 1gm, inj diclofenac 75 mg iv was given for analgesia at the time of closure along with epidural infusion. Patient was extubated and shifted to intensive care unit for observation. She was pain free and comfortable.

The surgery duration was 5 hours with blood loss of 350 ml and 200 ml urine output. Total 2200 ml of crystalloid was given and 1 whole blood was transfused during surgery.

DISCUSSION

Mediastinum is divided, for clinical purposes, into superior and inferior mediastinum and inferior mediastinum is further subdivided into anterior, middle and posterior mediastinum.¹ The posterior mediastinum is bounded by the pericardium and trachea anteriorly and the vertebral column posteriorly and contains major structures like esophagus, descending aorta, lymph glands, vagus, thoracic duct, hemiazygous veins, autonomic nerves. Neurogenic tumours are the most common posterior mediastinal masses. They include nerve sheath and sympathetic ganglion tumors. Sympathetic ganglion tumors, like ganglioneuromas, are typically seen in the first decade of life and are less common.²

Adult or adolescent cases of ganglioneuromas are rare. Ganglioneuromas are usually slow growing tumors. Symptoms may arise from mass effect or from local extension into the spinal canal. Large mediastinal masses may cause life threatening cardiorespiratory collapse depending on their location. This can occur during preoperative, intraoperative or even postoperative period. Posterior mediastinal masses have a greater propensity to cause hemodynamic compromise. They may compress posterior structures like left atrium and ventricle.³ Proximity to major vessels can lead to compression of the blood vessels or massive blood loss and hence warrants invasive hemodynamic monitoring and adequate wide bore intravenous access. There may be pericardial encasement by tumour causing constriction or effusion. Superior vena cava syndrome may present, when the mass compresses superior vena cava (SVC), with upper body edema, shortness of breath, jugular venous engorgement, headache and visual disturbances.

Although problems of airway obstruction and difficult ventilation are commonly associated with anterior mediastinal masses, there are reports of perioperative airway obstruction with posterior mediastinal masses also.⁴ Tumors may compress or weaken segments of tracheobronchial tree. Compression on cardiorespiratory system may be position dependent. Therefore, it is

important to be cautious during patient positioning. It is also imperative to know the preoperative position in which the patient is more comfortable with least symptoms of airway obstruction. Preoperative history of tachypnea, orthopnea and nocturnal dyspnea can also be suggestive of possible airway compression. Chest radiographs, computed tomography, magnetic resonance imaging and two dimensional echo cardiogram all help to detect any compression of respiratory and cardiovascular systems. When airway compression is suspected, flow volume loops in sitting and supine position and flexible fiberoptic bronchoscopy under local anaesthesia may be indicated for dynamic assessment of airways.

During induction of anaesthesia, sedative premedication is usually avoided. Additional intravenous access in lower extremity is preferable especially if superior vena cava obstruction is present. Intravenous or inhalational induction with maintenance of spontaneous ventilation is important to avoid airway obstruction under anaesthesia. In patients with evidence of airway compression, awake fiberoptic intubation is recommended. If obstruction occurs, change of position to lateral or semidecubitus may be helpful. Other options include rigid bronchoscopy, pushing endotracheal tube past the obstruction and upward traction on the sternum.

Cardiopulmonary bypass may be necessary in patients with complete airway obstruction or vessel occlusion with cardiovascular collapse. With cases in which there is high anticipation of landing in such situations, it is wiser to plan and arrange for cardiopulmonary bypass procedure electively in advance. Arterial blood pressure monitoring is more reliable and we secured additional arterial line access in the lower limb which was also transduced, as the mass was very close to subclavian vessels. Blood components should be arranged and easily available in the event of major blood loss.

Postoperatively complications include tracheal obstruction with tracheomalacia in patients with long standing and large masses. This may require change of position or even reintubation. Reexpansion pulmonary edema is also known to occur after removal of mediastinal mass.

CONCLUSION

A proper planning, high anticipation of possible complications with multidisciplinary approach is pivotal in the management of patients with mediastinal mass irrespective of its exact location.

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