Case Report

An anaesthesiologist's concern in a patient with posterior mediastinal mass

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INTRODUCTION

Patients with mediastinal mass can pose a great challenge for an anaesthesiologist. The complications associated with mediastinal masses depend 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.

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. 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.

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 comprise. They may compress posterior structures like left atrium and ventricle. 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. 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 fibreoptic 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 fibreoptic 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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