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Case Report

Camouflagic presentation of a shwannoma as an anterior mediastinal mass with significant airway collapse -a case report

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Abstract

The anaesthetic management of diagnostic and surgical procedure in patients with anterior mediastinal mass presents life-threatening challenges. This is usually caused by extrinsic compression of the airway, obstruction to the venous return or cardiac output. Common symptoms of cardio respiratory compression are positional dyspnoea, orthopnoea, stridor, syncope, and superior venacaval syndrome. A previously asymptomatic person may develop catastrophic airway collapse or cardiovascular compromise under anaesthesia hence careful evaluation and discussion between a multidisciplinary team is essential. We report management of a case of shwannoma presenting as anterior mediastinal mass resulting in collapse of upper one third of trachea with twenty percentage luminal opening. The purpose of our reporting is to emphasise that patients with significant tracheomalacia and eighty percentage decreased tracheal lumen may be asymptomatic, thus a thorough evaluation and skeptical vigilance and pre-emptive thinking is required to deal with the challenges posed by them. The use of endobronchial ultrasound, impulse oscillometry and negative expiratory pressure tests may be valuable for assessing the cause of the central airway collapse and for further management of these patients.

Keywords: endobronchial ultrasound; mediastinal neoplasms; tracheomalacia; ultrasonography

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Introduction

Airway compression and obstruction by external mass may pose difficulty to anesthesiologists. A large degree of airway obstruction may remain asymptomatic and present for anesthesia and surgery. We report anesthetic management of a case of anterior mediastinal mass resulting in collapse of upper third of trachea with twenty percentage luminal opening in a relatively asymptomatic patient.

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Case Report

A 48 year old female had the complaints of cough and multiple episodes of blood in the sputum for the past ten days. On examination she was averagely nourished with pulse rate of 72/min, blood pressure of 130/80 mmHg and respiratory rate of 12/min. Bilateral harsh breath sounds were heard on auscultation. All other systemic examination findings were within normal limits. Airway examination revealed modified mallampatti class 1, adequate mouth opening and neck extension. All her blood investigations done were normal. Pulmonary function test showed expiratory flow truncation. Computed tomography of chest showed patchy fibrosis, collapse, consolidation involving bilateral lung with an anterior mediastinal mass compressing and displacing the trachea to the right. Bronchoscopy showed compression of upper 1/3 rd of trachea with 20% luminal opening (figure 1a and 1b).

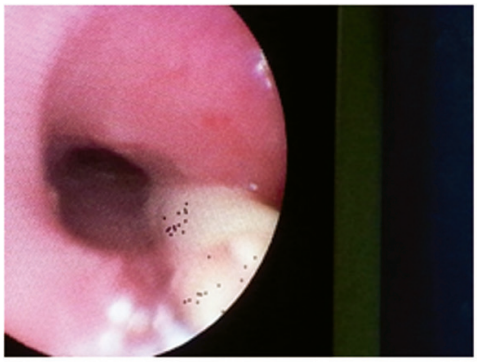

Figure 1a: Bronchoscopic view on inspiration

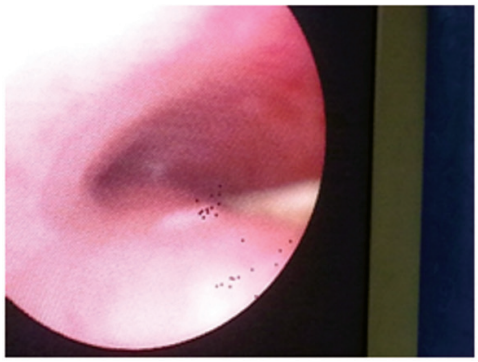

Figure1 b: Bronchoscopic view on expiration showing tracheal collapse

Thus, a provisional diagnosis of an anterior mediastinal mass was made and she was posted for sternotomy and excision of the tumour. She was advised triflo breathing exercise, salbutamol and budesonide nebulisation and antibiotics and standard premedication.

In the operation theatre standard monitors were applied and a 16 G venous access was taken on right hand, left radial arterial line and right internal jugular central venous line were accessed. Her airway was anesthetized using 4% lignocaine nebulisation for awake fibreoptic intubation. Superior laryngeal nerve and transtracheal block was done with 2% lignocaine. Trachea was intubated with a 6.5 armoured tube under fibreoptic guidance. After overcoming the airway obstruction by splinting the trachea with the armoured tube through the effected region upto the carina, endotracheal tube was fixed. General anaesthesia was induced with sevoflurane. After checking that there was no airway obstruction with positive pressure ventilation, muscle relaxant was administered. The surgery lasted for 2 hours was uneventful. Postoperative bronchoscopy revealed a 60% collapse of the tracheal lumen hence patient was sedated with midazolam and morphine infusions in the intensive care unit and kept under mechanical ventilation. Postoperatively, multimodality imaging studies including Computed tomography (CT), white light bronchoscopy, endobronchial ultrasound, and physiologic assessments were done to assess airway wall structure, and to identify flow-limiting segments. The flow-volume curve showed marked reduction of the expiratory flow. White light bronchoscopy confirmed the findings of tracheobronchomalacia and airway wall edema from chronic inflammation. Endobronchial ultrasound, using a 20 MHz radial probe revealed expiratory collapse (horizontalization) of the hyper-echogenic layer corresponding to the weakened airway wall cartilage; sub-mucosal layer was thick due to chronic inflammation. There was evidence of edema and chronic inflammation of the small airway. Thus in addition to tracheomalacia, the presence of small airway disease, have resulted in negative transmural pressure gradient causing excessive invagination of the posterior wall resulting in 60% collapse of the airway. So she was put on antibiotics, dexamethasone, mucolytics, nebulization with salbutamol and budesonide and positive pressure ventilation. A repeat fibreoptic bronchoscopy on the third day revealed improved mucosal changes, and 50% airway collapse, so she was given an extubation trial which was successful. The patient was asymptomatic and was shifted to the ward on the next day.

Discussion

The incidence of complications related to airway obstruction under general anesthesia in patients with mediastinal masses has been reported to be 7% to 18%.[1] There are numerous reports of sudden refractory cardio-respiratory collapse on induction of GA in symptomatic,[2,3,4] as well as asymptomatic patients.[5,6]

The appropriate strategy for airway management is defined by the anatomy of tracheo-bronchial obstruction. The airway can be secured with awake fibreoptic bronchoscopy using local anesthesia supplemented either by judicious intravenous sedation or after an inhalational induction. Tracheal compression with an adequate segment of normal distal trachea usually permits the placement of an appropriately sized reinforced endotracheal tube beyond the site of obstruction. However, if the endotracheal tube cannot be negotiated beyond the obstruction, various methods like change of patient position, use of double

lumen tube, microlaryngeal tube, emergency thorocotomy and femoro-femoral bypass have been advised to prevent mortality.[4] In our patient, the mediastinal mass had resulted in obstruction in the upper 1/3 of trachea overcame by armoured endotracheal tube.

Another concern is tracheomalacia in these patients, which can complicate both intubation and extubation of trachea. Paired inspiratory-expiratory dynamic computed tomograph scanning can reveal the degree and potentially the etiology of central airway collapse. While many investigators use 50% or more reduction in airway cross-sectional area between inspiration and expiration to identify tracheomalacia, this definition leads to over diagnosis, considering that 78% of normal individuals reportedly exceed this criterion.[4] Endobronchial ultrasound using a 20 MHz radial probe identifies hypo- and hyper-echoic layers that correlate with the laminar histological structures of the central airways.[7,8] It also differentiates between tracheobronchomalacia and excessive dynamic airway collapse. In tracheobronchomalacia the cartilage is destroyed or weakened, while in excessive dynamic airway collapse it appears that the cartilage is intact and the posterior membrane is thinner than normal, likely due to atrophy of elastic fibers.[9,10] In our patient conventional investigations demonstrated obstructive ventilatory impairment and expiratory central airway collapse most likely caused by tracheobronchomalacia, the endobronchial ultrasound confirmed the presence of small airway disease and treatment of which contributed to the successful extubation. The use of endobronchial ultrasound, impulse oscillometry and negative expiratory pressure test proved vital for assessing the cause of the central airway collapse and further management.

In conclusion, relatively asymptomatic patients with significant airway collapse may present for surgery and presents a considerable challenge to anaesthesiologist. The maintenance of spontaneous ventilation before securing the airway is the cornerstone of management. Providing general anesthesia requires a careful individualized anesthetic plan with multiple therapeutic options readily available to prevent or manage complications.

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References

1. Keon TP. Death on induction of anesthesia for cervical node biopsy. Anesthesiology 1981;55:471-2. http://dx.doi.org/10.1097/00000542-198110000-00028 [PMID:7294388]
2. Bray RJ, Fernandes FJ. Mediastinal tumours causing airway obstruction in anaesthetized children. Anaesthesia 1982;32:571-5. http://dx.doi.org/10.1111/j.1365-2044.1982.tb01229.x [PMID:7081704]
3. Levin H, Rursztein S, Heifetz M. Cardiac arrest in a child with an anterior mediastinal mass. Anesth Analg 1985;64:1129-30. http://dx.doi.org/10.1213/00000539-198511000-00017 [PMID:4051210]
4. Robie DK, Gursoy MH, Pokorny WJ. Mediastinal tumours - Airway obstruction and management. Semin Pedia Surg 1994;39:259-66. [PMID:7850366]
5. Prakash UB, Abel MD, Hubmayr RD. Mediastinal mass and tracheal obstruction during the general anesthesia. Mayo Clin Pro 1988;63:1004-11. http://dx.doi.org/10.1016/S0025-6196(12)64915-5 [PMID:3172849]
6. Bittar D. Respiratory obstruction associated with induction of general anesthesia in a patient with mediastinal Hodgkin, s disease. Anesth Analg 1975;54:399-403. [PMID:1169031]
7. Lee EY, Litmanovich D, Boiselle PM. Multidetector CT evaluation of tracheobronchomalacia. Radiol Clin North Am 2009;47:261-9. http://dx.doi.org/10.1016/j.rcl.2008.11.007 [PMID:19249455]
8. Murgu S, Kurimoto N, Colt H. Endobronchial ultrasound morphology of expiratory central airway collapse. Respirology 2008;13:315-9. http://dx.doi.org/10.1111/j.1440-1843.2007.01216.x [PMID:18339038]
9. Carden KA. Tracheomalacia and tracheobronchomalacia in children and adults: an in depth review. Chest 2005;127:984-1005. http://dx.doi.org/10.1378/chest.127.3.984 [PMID:15764786]
10. Kalra, A. Excessive dynamic airway collapse for internist; a new nomenclature or different entity. Postgrad Med J 2011;87:482-6. http://dx.doi.org/10.1136/pgmj.2010.111948 [PMID:21565878]