

Anesthetic Challenges for Total Thyroidectomy in Patient with Large Thyroid Mass with Retrosternal Extension: A Case Report

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Abstract

Anaesthetic management of patients with large thyroid mass can be extremely challenging to an anaesthesiologist due to difficult intubation, blood loss, long duration of surgery, cardiovascular compromise during manipulation of gland and post-operative tracheomalacia. Here we present a case report of the successful anaesthetic management in a patient with a huge thyroid swelling with retrosternal extension scheduled for total thyroidectomy.

Keywords: Airway; Awake fiber-optic intubation; Retrosternal thyroid

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Introduction

The anaesthetic challenges associated with large thyroid mass are difficult intubation, blood loss, long duration of surgery, cardiovascular compromise during manipulation of gland and post-operative tracheomalacia [1,2]. A detailed pre anaesthetic assessment of symptoms, airway assessment, blood investigation including thyroid profile and imaging studies like CT scan are the cornerstones for the anaesthetic management [3]. Here we present a case report of the successful anaesthetic management in a patient with a huge thyroid swelling with retrosternal extension scheduled for total thyroidectomy.

Case Report

A 47yr old female with 45kg weight diagnosed as a case of large thyroid swelling with retrosternal extension was scheduled for total thyroidectomy. She had a history of swelling in front and left side of neck since 15 years. She had history of difficulty in swallowing solid food and ulceration on swelling since last one year. She also had a history of hoarseness of voice for 6 months. He had no other comorbidities and symptoms of hypo or hyperthyroidism. Clinical examination showed a diffuse swelling in the anterior part of neck measuring about 15 x 15cms extending laterally on left sides, the lower border of the swelling was not palpable, and a dull note was felt on percussion over the sternum (Figure1). Pemberton's sign was positive. Neck movements were restricted both in flexion and extension also on side to side movements. All basic blood investigations, ECG, 2D-ECHO, thyroid function tests were within normal limits. Indirect Laryngoscopy (IDL) revealed normal structure and function of the vocal cords. CT scan of chest showed thyroid enlargement with left lobe of thyroid causing significant compression over adjacent trachea and extending inferiorly in retrosternal area. Larynx was also found deviated towards right side due to mass effect. We planned for general anaesthesia with an awake fiberoptic intubation for surgery.

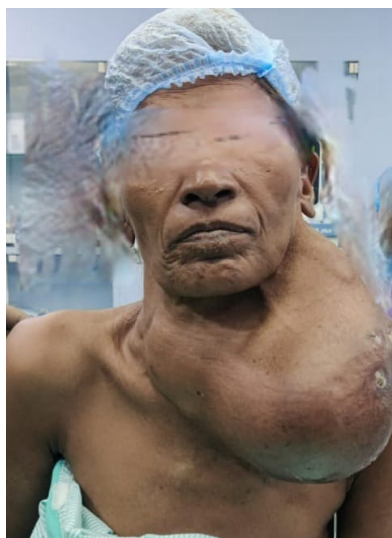


Figure 1: Preoperative anterior view of neck shows large thyroid mass.

She was explained about procedure of awake fiberoptic intubation and consent was taken for tracheostomy and postoperative ventilator. Patient was nebulised with 2ml of 4% lignocaine and gargling was done with 10% viscous lignocaine 20 minutes prior to shifting to operating room. Patient was premedicated with inj glycopyrrolate 0.2mg and ondansetron 4mg intravenously. After preoxygenation for 3 minutes, awake fiberoptic nasal Intubation was done with flexometallic tube with difficulty due to deviated larynx (Figure 2). Intratracheal placement was confirmed with auscultation and end tidal CO₂ and the tube was fixed. Inj propofol 100mg, inj atracurium 0.5mg/kg and Inj fentanyl 100µg were given and put on mechanical ventilator. General anaesthesia was maintained using oxygen, air (50:50%), sevoflurane, inj atracurium infusion. Intraoperative ECG, HR, SPO₂, ETCO₂, NIBP, temperature and urine output were monitored. Intraoperatively ABG was done which showed hypokalemia and so potassium chloride 10ml was given. Surgery went uneventful but Intra-operatively trachea was found soft so tracheostomy was done. After completion of surgery inj dexamethasone and calcium gluconate was started and the patient was shifted to ICU with tracheostomy tube *in situ* in view of the risk of tracheomalacia due to the huge thyroid mass. She was put on mechanical ventilator for 24h then on spontaneous respiration. Patients was discharged after 7 days and tracheostomy tube was closed after 30 days.



Figure 2: Fiberoptic view of distorted laryngeal opening.

Discussion

Large thyroid mass can cause upper airway obstruction due to displacement and rotation of larynx and trachea and edema of adjacent structures [4]. Retrosternal extension can cause compression of tracheobronchial tree, pulmonary artery or superior venacava leading to symptoms like dyspnoea on lying down, cough and stridor, dysphagia, choking, engorgement of neck veins and superficial veins on the chest wall [3]. Our patient also had some of these symptoms. CT scan can accurately measure the site of tracheal obstruction and can predict size of endotracheal tube [5]. Similarly CT scan detected deviation and compression of trachea in our case which help us to decide to plan of intubation. General Anaesthesia (GA) with awake fiberoptic intubation is preferred when operating such large thyroid mass because of airway obstruction may occur when muscle tone decreases following the induction of GA as we also planned in our case [6]. Awake intubation maintains natural airway, spontaneous ventilation and protects from risk of reflux [7]. A pre-operative fiberoptic bronchoscopy to reassess the airway and to rule out airway obstruction followed by awake fiberoptic intubation is safe, logical and practical in patients with retrosternal goitre [8].

Regional anaesthesia with airway blocks, cricothyrotomy/tracheostomy was not feasible due to anatomical restrictions caused by the large mass. Sedation could have resulted in further deterioration of airway. We did awake fiberoptic intubation in this patient under topical anaesthesia and nebulization with lignocaine as transtracheal block was not possible in this patient. Mediastinal mass syndrome can occur at every stage of anaesthesia up to post-operative period or simply by changing position. Surgical manipulation can cause compression of trachea causing difficult ventilation. Thyroidectomy is also associated with a potential risk of developing a difficult airway in the postoperative setting because of serious complications like damage of the recurrent laryngeal nerve, bleeding, oedema and strider [9]. Tracheomalacia should be anticipated in a long standing goiter and less invasive therapy like prolonged positive airway pressure or transient tracheostomy can be performed as we also found in our patient so tracheostomy was done after surgery [10]. Depending on the severity an airway stent or tracheal surgery might be indicated.

Conclusion

A comprehensive preoperative assessment of patient including airway along with good communication, psychological and pharmacological preparation of the patient can be crucial to the success of awake intubation. Meticulous intraoperative hemodynamic monitoring and being prepared to deal with acute perioperative airway and other complications results in favourable outcome.

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