Case Report

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Anaesthetic challenges in the management of huge toxic thyroid with tracheal invasion, pulmonary metastases & coronary stent in-situ

Abstract

Introduction: Tackling difficult airway in huge, complex thyroid is itself an anaesthetic challenge with its difficulty to mask ventilate and access the airway; it becomes all the more challenging when it is associated with thyrotoxicosis, tracheal invasion, lung metastases in a patient with poor cardiac function with coronary stent in situ. Here, we describe one such case report which highlights the challenges of such a case and emphasizes the calm, calculated approach of the attending anaesthesiologist for the successful management.

Keywords: Huge thyroid, difficult airway, tracheal invasion, pulmonary metastasis, coronary stent

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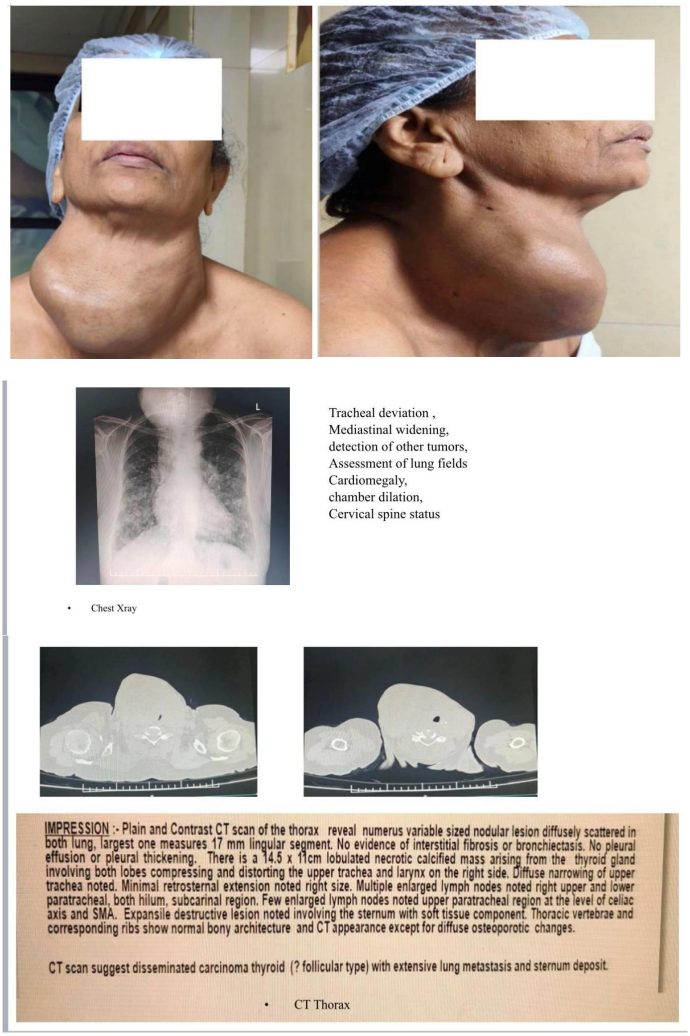
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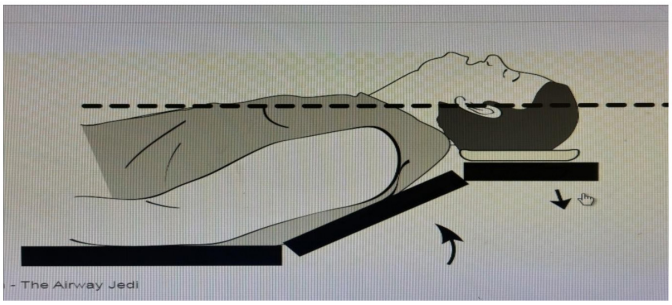
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Case Report

A 67 yr od female patient was admitted with swelling suggestive of thyroid enlargement since 6 yrs, clinical features of hyperthyroidism since 2 yrs & breathing difficulty affecting her sleep such that she could not lie down supine or laterally but had to sit up throughout the night to rest since 6 months. She gives history of pulmonary oedema and ICU admission 3 months back for which she underwent coronary angioplasty & stenting in the Left anterior descending coronary. The cardiologist has identified hyperthyroidism as the cause for breathing difficulty & has put her on antithyroid drugs, dual antiplatelets & antihypertensives. Past history is unremarkable. Clinical examination revealed conscious, oriented patient, BMI 24.6kg/m2, heart rate 76/mt, BP 140/80 supine position,130/80mmHg right upper arm position, no arrythmia, Jugular venous pulse was normal, normal heart sounds, no murmurs, no peripheral limb oedema. Her oxygen saturation was 94% on room air, respiration was thoracoabdominal , respiratory rate-16/mt. Thyroid function test showed normal values of T3,T4 & TSH. She was not in cardiac failure & cardiac function showed poor ejection fraction with evidence of pulmonary artery hypertension. CT scan of neck & thorax revealed huge thyroid swelling with tracheal infiltration, retrosternal extension & bilateral lung metastases. The swelling was 20.2 cm in front of the neck from the thyroid cartilage down to the manubrium sternum with coarse irregular surface; it extended laterally from the posterior border of the right sternocleidomastoid to the anterior margin of the left sternocleidomastoid. No local rise of temperature, no scars/ dilated veins over the swelling. There was retrosternal extension as per dullness on percussion over the manubrium; Pemberton's test not done for fear of initiating respiratory distress as patient was already resting at 60- 80 degrees head-up position. Examination of the airway revealed mouth opening more than 2 finger-breadth, Modified Mallampatti class 2, Upper lip bite test grade 2, no loose teeth/ artificial dentures. Deliken's test proved reduced neck extension. Thyromental & sternomental distances, neck circumference at the level of cricoid could not be done. Temperomandibular joint mobility was normal. Spine was normal; other systems were within normal limits. American Society of Anaesthesiology class 3. Frailty score 3 Posted for total thyroidectomy tracheal repair & prophylactic tracheostomy under balanced general anaesthesia. Informed consent describing the anaesthetic challenges and risk were explained to the patient party & consent for publication also obtained.



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Discussion

The anaesthetic challenges were: 1. H/O pulmonary oedema followed by angioplasty on dual antiplatelets within 3 months, 2. H/O hyperthyroidism, 3. clinical evidence of difficult airway, 4. evidence of retrosternal extension and tracheal invasion. 5. Patient was unable to be shifted from the steep upright position for any kind of preoperative direct laryngoscopy to assess state of the vocal cords; extreme degree of anxiety & fear of surgery could trigger myocardial onslaught or thyroid storm .6. Sedatives could not be administered preoperatively due to fear of airway loss, tracheal invasion could lead to tracheal tear/oedema during intubation. Fibreoptic intubation and postoperative ventilator consent including consent for tracheostomy was taken. Hypoxia was seen on preoperative Arterial blood gas so patient was shifted to the theatre with oxygen at 15L/mt via face mask in the 80 degree headup position with transport pulse-oximeter as per the latest Difficult Airway Society guidelines for anticipated difficult intubation.[1,2] A well-running intravenous line was set up with balanced salt solution running at 80ml/hr from 6am on the morning of surgery Anti-aspiration prophylaxis was given intravenously. The operation theatre was set up as per standard protocol for difficult intubation along with different sized flexometallic endotracheal tubes ranging from 5.5 to 7mmID, fibreoptic scope preloaded with flexometallic tube sized 6mmID and working Videolaryngoscope was set up. The size of the endotracheal tube was based on the CT findings of the tracheal dimensions. The patient was shifted to the operation table with the supplemental oxygen on flow, standard ASA pre-induction monitors were applied. Meanwhile, she was given titrated doses of fentanyl upto a total of 20mcg along with 1mg midazolam, 4mg ondansetron, 8mg dexona iv to enable us to place an appropriate facemask over the nasal cannula. Once the correct size of mask was identified, with monitors in place, we preoxygenated with 10 Litres 100% O2 followed by titrated doses of iv 16mg etomidate plus 20mg propofol & slowly shifted to air-O2 mixture with 2-3% sevoflurane delivered by the closed circuit. We decided to access the airway with the patient spontaneously breathing in adequate plane of anaesthesia using the Videolaryngoscope using it as a guide for hybrid intubation with the preloaded fibreoptic scope with flexometallic tube size 6mm. As the tube reached the laryngeal inlet, we gave additional 10mg propofol and atracurium 25mg in order to facilitate non-traumatic intubation to prevent tracheal injury. All this was done in the 80 degree headup position and once airway secured, the patient was repositioned for thyroidectomy, yet patient could be brought down to only 45 degrees because of the huge thyroid limiting the front of neck access. The advantages of intubation in the head-up position[3] are that a clearer view of the glottis is obtained,diaphragm is in the lower position hence ventilation & oxygenation are better; however this is usually done in 25-30 degrees head up,whereas, in this patient it was done in the 80 degree head-up position. There is enhanced comfort and ergonomics for the operator.[1] Anaesthetic induction was done with the surgeon scrubbed in and prepared for emergent surgical access with the cricothyrotomy set kept open. A second intravenous line and arterial line for intricate haemodynamic monitoring were put. Post-induction monitors included end tidal capnography, neuromuscular monitor, temperature probe, urine output. Ryles tube was inserted to aid in the dissection of tracheal-oesophageal plane. The whole intraoperative period went uneventful and calculated fluid replacement along with 3 packed cells was given. Bolus dose of 1gm Tranexamic acid iv was given. Surgery was maintained on 50% air-oxygen mixture 2-3% sevoflurane and 80mcg fentanyl and 1 gm paracetamol tackled analgesia. Calcium 10% 10ml iv was given & mechanical pump as a prophylactic measure against deep vein thrombosis was put. Surgeon detected tracheomalacia intraoperatively as evidenced by softening of trachea & infiltrated part was excised & primary closure done. Hence prophylactic tracheostomy was done. Once surgery was over, patient continued to be ventilated till full clinical recovery of neuromuscular function was attained & ABG was normal. With tracheostomy in situ, since patient was fully awake and obeying our commands, we decided to disconnect the ventilator & give support only if needed. W ith this decision in mind, we shifted her using transport pulse oximeter to the surgical ICU where she made a remarkable fast recovery. The antiplatelets were restarted after proper haemostasis was ensured. Calcium was supplemented through the ryles tube which was removed on the 3rd postoperative day. She was shifted out on the 4th postoperative day with stable vitals, 98% saturation on room air, no respiratory distress and sleeping comfortably in the supine position. She was discharged home on the 10th postoperative day with metal tracheostomy & advice to return if needed or to contact the local hospital in any emergent need. Exactly 6weeks later, she got readmitted to our hospital with a blocked metal tracheostomy due to profuse bleeding through it. Immediately it was removed, suction done andreintubated with 5.5mm size endotracheal tube through the tracheostome for delivering 100% oxygen. She was sedated and ventilated. Fibreoptic lavage was done and it revealed continuous bleeding from one of the bronchial metastasis. Blood was replaced though bronchial bleed continued; meanwhile she developed persistent bradycardia and asystole. Attempt at resuscitation failed. The bleeding was due to spontaneous rupture of the bronchial secondary or effect of the antiplatelets which were restarted[4] or as a part of sepsis. The anaesthetic challenge was a perfect balance between problem of stent thrombosis due to early cessation of antiplatelets versus bleeding due to restoration of antiplatelets as soon as surgical haemostasis is achieved.Since the patient was perfectly alright till 6weeks later, we presume the bleeding to be spontaneous from the bronchial secondary precipitated by an underlying cough secondary to a respiratory infection. The histopathology of the specimen had revealed follicular carcinoma thyroid with tracheal invasion. The intraoperative problems we faced were: 1. difficult intubation/failed intubation, 2. intubation in the steep head-up position,3. anxious patient with history of hyperthyroidism which if not controlled, could lead to thyroid storm 4.ongoing coronary stent with dual antiplatelet therapy, 5. hypoxia, 6. bleeding, 7. bronchospasm, 8.block of small endotracheal tube with blood/secretions,9. disconnection from circuit due to head-up position & heavy drapes, 10. migration of the endotracheal tube post-intubation/post-positioning, 11. hypocalcaemia,12. failed extubation, 13. acute myocardial infarction or pulmonary oedema. The postoperative problems we anticipated were:1. continued ventilation leading to dehiscence of the tracheal anastomosis, 2. bleeding, 3.haematoma, 4.block of the tracheostomy tube, 5. hypocalcaemia, 6. myocardial infarction, 7. pulmonary embolism, 8.stent thrombosis and malfunction, 9. injury to recurrent laryngeal nerve/oesophagus, 10. pulmonary complications and infection.

Citation: Philip S. Anaesthetic challenges in the management of huge toxic thyroid with tracheal invasion, pulmonary metastases & coronary stent in-situ. *J Anesth Crit Care Open Acce.* 2026;18(4):104–106. DOI: 10.15406/jaccoa.2026.18.00661

Conclusion

A thorough knowledge of the anatomy, physiology and expected problems is essential to manage complicated cases along with airway management skills using various devices; above all, keeping a cool, calm exterior in the event of adversity with detailed documentation and communication to the team members including surgeon, family members can help manage complex cases which can guide others in the future.

Conflict of interest

None.

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