

CASE REPORT AND REVIEW OF LITERATURE ON ANAESTHESIA MANAGEMENT OF MASSIVE COLLOID MULTINODULAR GOITRE.

Anesthesiology

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ABSTRACT

Appropriate airway management is an integral part of anaesthesiologist's role. Huge goitres can lead to distorted and difficult airway and difficulty in endotracheal intubation. In this report, we present a case of a 65-year-old male with a huge multinodular thyroid swelling, gradually increasing in size for last 10 years. He had a history of change in voice. History of dysphagia and dyspnea on exertion was also present. He was diagnosed as a case of multinodular colloid goitre (MNG), advised surgery, and was admitted for the same.

A close working relationship between anesthesiologists and surgeons was the key to the safe use of anesthesia and uneventful recovery of this patient. where trachea was successfully intubated by awake fiberoptic intubation technique.

KEYWORDS

Difficult airway, awake fiberoptic intubation, huge thyroid.

1. INTRODUCTION

Diseases of the thyroid like goiters still exist in many endemic parts of the world.[1] Enlargement of the thyroid gland is due to iodine deficiency in 90% of cases and 10% due to selenium deficiency in the African countries like Sudan, Tanzania, South Africa, Zaire, etc.[2] A large goiter did compress and deviate the trachea causing breathing difficulty, swallowing difficulty in our patient that made intubation and extubation both difficult. In addition to endocrine and metabolic effects, the mass extends sub-sternally which makes more challenges for the anesthesiologist to manage the airway. Up to 45% of goiter patients may have a sub-sternal component.[3]

Several techniques are available to select the level of obstruction however it depends on the anaesthesiologist's expertise and familiarity. We describe here the presentation, diagnosis, peri-operative management and outcome of the patient who was managed with an awake fiberoptic intubation and guided extubation.

2. CASE REPORT

A 65-year-old patient was admitted to our hospital with a very large swelling in the midline and both sides of the neck since last 10 years. It was extending from chin to the sternum with retrosternal extension. His symptoms started 10 years ago with palpitations, tremors, and increase in appetite and weight loss. His swelling was small initially and increased in size progressively with change in voice and subsequent hoarseness. When the swelling became large, he started experiencing symptoms of compression which were, shortness of breath and dysphagia.

Gradually, he had increased shortness of breath when he was lying supine, so he started adopting lateral position while sleeping. He had a similar history in family of his sister being operated for the same 5 years back.

On examination, he was hemodynamically stable. There was a single huge swelling anteriorly and at both sides of the neck which was lobulated and cystic on palpation. Swelling was extending retrosternally. There was no obvious resting tremor, no exophthalmos, no lid lag and no palpable lymph nodes.

Thyroid function test was suggestive of Euthyroidism. Body mass index was 40kg/m². His thyroid size was 30 cm × 15 cm × 10 cm. Airway examination showed adequate mouth opening (3 fingers), Mallampati grade-III and short neck, normal neck movements, no loose, malformed & absent teeth.

The swelling did not move with deglutition.

X-ray neck lateral shows large pre& para-tracheal mass suggestive of

Multinodular goitre causing mild compression of trachea and displacement of the trachea to the left on antero-posterior view.

ENT opinion with indirect laryngoscopy shows bilateral mobile cords with incomplete view.



X-ray showing tracheal compression in A-P but not in lateral view

On examination, his pulse rate was 92/Min, BP- 144/84 mmHg, with all other systemic examinations were within normal limit.

Investigations were Hb-14.5gm%, TLC-6840/cmm, platelets were 2.24 lacs/cmm with PT-12.4/15 seconds and INR-1.1. Thyroid function tests were T3-1.320 ng/dl, T4-7.250mcg/dl and TSH-1.68mcgIU/ml. All other haematological and biochemical tests were within normal limit.



Figure 2 Chest X-ray showing deviation and compression of the trachea

In view of previous history, anticipated difficult mask ventilation due to huge size of the tumor and difficult laryngoscopy and intubation, fiberoptic intubation was planned for the patient under loco-sedative technique. Difficult airway management cart was kept ready. A team of cardiothoracic surgeons and perfusionist were informed and were asked to be at stand by for a femoro-femoral cardiopulmonary bypass in the event of inability to maintain airway or a cardiovascular event. The procedure was explained to the patient, and written consent was taken. Patient was kept fasting for 6 hours for solids and 2 hours for

water before OT. Ranitidine 50 mg was given with a small sip of water on night before and morning of surgery. No preoperative sedation was prescribed. The patient was shifted to the OT.

The patient's airway was anesthetized by application of lignocaine 2% jelly in the nostrils, lignocaine viscous 2% gargles, 4 ml of lignocaine 4% nebulization, and lignocaine spray (10%) pre operatively. Inj. glycopyrrolate 0.2 mg i.v. was administered. Xylometazoline was instilled in both the nostrils. Standard monitors (ECG, pulse oxymeter, and NIBP) were attached, and the baseline vitals were recorded. Oxygen was administered via nasal prongs at a rate of 6 L/min. Patient was given 2cc of lignocaine 4% via transtracheal route. Patient was administered 2 mg midazolam and 60 mcg fentanyl i.v. to allay anxiety and for mild sedation. FOB was loaded with a 7.5 mm endotracheal tube. The fiberoptic was advanced through the oral route with the help of the Ovassapian airway. When the larynx was visualized, topical anaesthesia of the larynx and trachea was applied via "spray as-you-go" technique through the drug channel of the fiberoptic bronchoscope using 2 ml of lidocaine 2%. The fiberoptic was advanced into the larynx and trachea gradually till the level of the carina.

The Endotracheal (ET) tube was then threaded over the FOB, and the FOB removed. 80 mg propofol was administered prior to railroading the ET tube through the vocal cord to attenuate the laryngeal and tracheal reflex. The breathing circuit was attached, and the tube placement was confirmed by movement of reservoir bag and capnograph.

Sevoflurane inhalation was started. 150 mcg of fentanyl and 6 mg vecuronium were administered intravenously. The ET was firmly secured, and anaesthesia was maintained with O₂, N₂O, Sevoflurane, Vecuronium, and Fentanyl.

Total 300 mg lignocaine was given to the patient.



Figure 3 Patient after intubation

Total thyroidectomy with cervical extraction of retrosternal goiter was performed. The patient remained hemodynamically stable throughout the procedure. Post-procedure, patient was not extubated in view of probable tracheomalacia and shifted to surgical intensive care unit on T-piece.

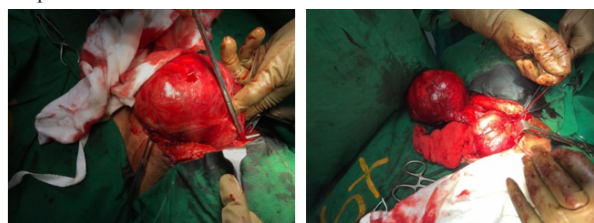


Figure 4 Post thyroidectomy specimen

On postoperative day 2, after patient was maintaining acceptable arterial blood gases on "T-piece trial," tracheal tube cuff was deflated and leak test was performed. Leak was demonstrated around tracheal tube after deflation, so it was considered safe to extubate the patient. A trolley for emergency intubation, rigid bronchoscope and equipments for difficult intubation were kept ready along the bedside of the patient in SICU. Patient was extubated successfully and kept for 24 hours under observation before being discharged to ward.

DISCUSSION

In some parts of the world, thyroid diseases are common due to deficiency of iodine with an incidence of 10–15% in adult populations.[1] Anaesthetic management of a patient with goiter

depends on the size of the goiter, vascularity, compression on the surrounding organs and sub-sternal extension. This requires careful pre anesthetic assessment of the patient with symptoms and control of the disease, airway assessment, blood investigations and imaging studies. WHO has classified goiter according to the size, according to which Class 0-palpable mass within neck structure and Class I-visible, palpable and undermines the curves and the neck line. Class II is a very large goiter with retrosternal extension that makes the tracheal deviation, compression of trachea and esophagus.[2]

Our patient was having a very large goiter (Figure 3). Class II type as per WHO classification. He presented with symptoms of palpitation, increased appetite and anxiety. He also had difficulty in breathing in the supine position and dysphagia to solids over a period of 5 years, as the size of the mass increased. Up to 45% of goiter patients may have a sub-sternal component.[3] The large goiter compresses on the tracheal diameter of >70% of patients, which leads to dyspnea at rest, and then symptoms of dysphagia.[4,5] And, above all, the symptoms also suggest that there was a retrosternal extension present in our patient.

Bouaggad *et al.* found in his study that there was an easy tracheal intubation in 36.9% patients and mild tracheal difficult intubation in 57.8% patients. However, 5.3% patients have moderate to major difficult airway.[2,6] Preoperative imaging studies [Figure 1 & 2] gives us details of the tracheal deviation (tracheal shift of 1 cm from midline), degree of tracheal compression (<15% narrowing of tracheal diameter) and slight tracheal cartilage erosion suggestive of tracheomalacia.[2] Keeping the clinical symptoms in mind and imaging studies, our patient was in need of an awake fiberoptic intubation. This can prevent conditions like "can't ventilate and can't intubate" scenarios occurring after induction of anaesthesia due to a complete tracheal collapse. In this condition, lifting of the thyroid mass or rigid bronchoscopy can only help keep the airway patent.[7] Direct laryngoscopy has no role in this situation.

Blind nasal endotracheal intubation needs inhalational induction, which may lead to total airway obstruction. Multiple attempts and trauma to the airway that leads to infrequent success in blind intubation was mentioned by Ovassapian *et al.* in their study.[8]

Keeping in mind of the advantages and drawbacks of all procedures for management of the difficult airway, we managed the case with an awake fiberoptic intubation. Saxena *et al.* mentioned that awake fiberoptic intubation prevents much bleeding and edema that leads to higher success of airway management.[9] Sendasgupta *et al.* and Tan and Esa stated in their studies that awake fiberoptic intubation offers more hemodynamic stability, better patient tolerance and patency of the airway.[10,11] Ghai *et al.* suggested that early fiberoptic intubation should be planned when there is suspicion of significant airway obstruction.[7,12] Eldawlatly *et al.* stated that the success of awake fiberoptic is based on preoperative airway assessment that predict difficult airway, proper planning, and it is well-tolerated if explanation is given to the patient about procedure, risk and comorbidities.[13] Eldawlatly *et al.* had also stated that the airway access under local anesthesia constitutes better alternative to failed fiberoptic intubation.[14]

An awake extubation is as important as awake intubation in the case of a large goiter with chronicity. Chronic, huge goiters cause tracheal cartilage erosion and tracheomalacia post extubation. Though there were no signs on imaging study in our case, we decided to go for a gradual awake extubation after the leak test[15,16]

CONCLUSION

A single universal technique of intubation may not be favourable in all circumstances. Careful selection of technique has been done as per risk versus benefit of various available techniques based on available evidence-based studies. Proper preoperative airway assessment, preparation and timely decision and skilful management reduce the morbidity and mortality in difficult airway cases involving thyroid enlargement.

In conclusion, awake FOI using loco-sedative technique is a viable option in selected group of patients having compromised airway. Preoperative airway assessment could predict patients with possible difficult airway. Proper planning and discussing the problems with the patient and surgeon are important for safe outcome.

REFERENCES

1. Farling PA. Thyroid disease. *Br J Anaesth*. 2000;85:15–28.
2. Bartolek D, Frick A. Huge multinodular goiter with mid trachea obstruction: Indication for fiberoptic intubation. *Acta Clin Croat*. 2012;51:493–8.
3. Hegedüs L, Bonnema SJ. Approach to management of the patient with primary or secondary intrathoracic goiter. *J Clin Endocrinol Metab*. 2010;95:5155–62.
4. Dy B, Wise K, Farley D, McGlinch B. Extreme tracheal compression due to substernal goiter: Surgical and Anesthetic management. *World J Endocr Surg*. 2012;4:71–3.
5. Netterville JL, Coleman SC, Smith JC, Smith MM, Day TA, Burkey BB. Management of substernal goiter. *Laryngoscope*. 1998;108:1611–7.
6. Bouaggad A, Nejmi SE, Boudarka MA, Abbassi O. Prediction of difficult tracheal intubation in thyroid surgery. *Anesth Analg*. 2004;99:603–6.
7. Ambareesha M, Upadhyay M, Ranjan RK, Kamath S. Pre-operative fiberoptic endoscopy for management of airway in huge thyroid. *Indian J Anaesth*. 2003;47:489–90.
8. Ovassapian A, Tuncbilek M, Weitzel EK, Joshi CW. Airway management in adult patients with deep neck infections: A case series and review of the literature. *Anesth Analg*. 2005;100:585–9.
9. Saxena KN, Kumar S, Taneja B, Gaba P. Awake fiberoptic intubation in the sitting position in a patient with a huge goitre. *Case Rep Anesthesiol*. 2011. 2011:3526.
10. Sendasgupta C, Sengupta G, Ghosh K, Munshi A, Goswami A. Femoro-femoral cardiopulmonary bypass for the resection of an anterior mediastinal mass. *Indian J Anaesth*. 2010;54:565–8.
11. Tan PC, Esa N. Anesthesia for massive retrosternal goiter with severe intrathoracic tracheal narrowing: The challenges imposed - A case report. *Korean J Anesthesiol*. 2012;62:474–8.
12. Ghai A, Hooda S, Wadhwa R, Garg N. Gross tracheal deviation: Airway challenges and concerns – Two case reports. *Acta Anaesthesiol Belg*. 2011;62:203–6.
13. Eldawlatly A, Alsaif A, Alkattan K, Turkistani A, Hajjar W, Bokhari A, et al. Difficult airway in a morbidly obese patient with huge goiter: A case report and review of literature. [Last accessed on 2015 Feb 08];*Internet J Anesthesiol*. 2006 13:1.
14. Eldawlatly A, Takroui M, Elbakry A, Ashour M, Kattan K, Hajjar W, et al. Perioperative management of huge goiter with compromised airway. [Last accessed on 2015 Feb 08];*Internet J Anesthesiol*. 2002 7:2.
15. Fisher MM, Raper RF. The 'cuff-leak' test for extubation. *Anaesthesia*. 1992;47:10–2.
16. Srivastava D, Dhiraaj S. Airway management of a difficult airway due to prolonged enlarged goiter using loco-sedative technique. *Saudi J Anaesth*. 2013;7:86–9.