

Difficult Airway In A Morbidly Obese Patient With Huge Goiter: A Case Report And Review Of Literature

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Citation

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Abstract

Huge goiters can lead to tracheal compression and hence difficulty in endotracheal intubation. In this report we present a case of a huge goiter presented with difficult airway where the trachea was successfully intubated. A 51-year-old female patient presented to our hospital with shortness of breath due to huge goiter compromising the airway. Her body weight 100 Kg with body mass index (BMI) of 50 Kg/m².

The patient was scheduled to undergo total thyroidectomy. Clinical examination revealed morbid obese patient with orthopnea (she cant lie supine in bed). She was receiving oxygen via nasal cannula 3l/min. Airway assessment showed short bulky neck with Mallampati class IV. Thyromental distance could not be estimated due to the tumor size and due to limited neck movements. The trachea anteriorly could not be palpated except of 1 inch at the cricoid level. The plan was to intubate the trachea

using fiberoptic bronchoscope (FOB). If fails or if the patient lost the airway secondary to topical anesthesia plan B was to insert minitracheotomy in the space felt at cricoid ring and rescue the airway by insufflation of oxygen or alternatively intubating the trachea via rigid bronchoscopy. Awake FOB was successfully performed to intubate the trachea. Extubation of the trachea was performed in the operation room using airway exchange catheter.

In conclusion, the only viable option in our case was awake FOI which was well tolerated. We believe that preoperative airway assessment could predict patients with possible difficult airway. Also preoperative explanation to the patient about the risks encountered with co morbidities remain an essential step prior to awake FOI. Proper planning and discussing the problems with the patient and surgeon are important for safe outcome. Extubating the trachea of those patients in controlled atmosphere in the OR is essential to rescue the airway if tracheal collapse occurs. Finally, issuing a medical alert card is important precaution measurement for subsequent anesthetic exposures.

INTRODUCTION

Enlarged thyroid gland can lead to compromised airway with difficulty in tracheal intubation. Previously we have reported a case of huge goiter where all maneuvers to intubate the trachea including fiberoptic bronchoscope (FOB) failed and the airway was secured via tracheotomy performed under loco sedation technique (1). In this report we present a case of huge goiter presented with difficult airway where the trachea was successfully intubated using FOB.

CASE REPORT

A 51-year-old female patient presented to our hospital with shortness of breath due to huge goiter compromising the airway. Her body weight 100 Kg with body mass index

(BMI) of 50 Kg/m². She is known diabetic on treatment and also she has hypertensive disease on treatment. The biochemical analysis data including thyroid function tests were within normal ranges. Chest x-ray showed widening of the mediastinum and narrow tracheal aerograph due to tracheal compression by the goiter (Figure 1).

Figure 1

Figure 1: Chest x-ray shows severe tracheal compression



ECG was normal. Pulmonary function tests showed picture of restrictive pattern with FEV1 71% of the predicted, FVC 63% of the predicted and FEV1/FVC ratio of 112. CT scan showed severe narrowing of the upper trachea by huge diffuse enlarged thyroid gland which extends retrosternally to the level of left brachiocephalic vein (Figure 2).

Figure 2

Figure 2: CT scan shows thyroid gland enlargement with pinpoint laryngeal aperture (arrow)



Arterial blood gases on room air showed, PaO₂ 85 mmHg, Pa CO₂ 56 mmHg, bicarbonate 32 mmol/l and oxygen saturation 97%. The diagnosis of Graves' disease with goiter and large retrosternal extension with severe tracheal compression was made. The patient was scheduled to undergo total thyroidectomy.

Clinical examination revealed morbid obese patient with orthopnea (she can't lie supine in bed). She was receiving oxygen via nasal cannula 3l/min. Airway assessment showed short bulky neck with Mallampati class IV. Thyromental distance could not be estimated due to the tumor size and due to limited neck movements. The trachea anteriorly could not be palpated except of 1 inch at the cricoid level. Plain neck x-ray revealed the tumor even extended retrotracheally (Figure 3).

Figure 3

Figure 3: Shows compressed cervical trachea and retrotracheal extension of the tumor.



Nasoendoscope was performed by consultant ENT surgeon to assess the vocal cords which revealed only edematous false vocal cords could be visualized with edema of supraglottic structures. The patient and her relatives were told about the risks encountered and they signed high risk consent. The plan was to intubate the trachea using FOB, if fails or if the patient lost the airway secondary to topical anesthesia

plan B was to insert minitracheotomy in the space felt at cricoid ring and rescue the airway by insufflation of oxygen or alternatively intubating the trachea via rigid bronchoscopy. After explaining to the patient the procedure of awake fiberoptic intubation (FOI) premedication consisted of oral midazolam 10 mg one hour before surgery.

Upon arrival of the patient to operation room routine monitoring were established. A 16 gauge i.v cannula was inserted. Radial arterial cannula was inserted for invasive blood pressure monitors and ABG besides blood glucose monitoring.

The patient was positioned on OR table in semi-sitting position 45° with maximum setting of OR table down and with the use of few footsteps at head part, the anesthetist stood. Intravenous sedation consisted of midazolam 2 mg and sufentanil 5 micg. Local anesthesia was established using 5% xylocaine paste on the posterior third of the tongue along with xylocaine nebulization to oropharynx using 4% xylocaine. The process of loco sedation took 20 min to achieve adequate anesthesia of oropharyngeal structures. After loading a size 7.0 mm reinforced tube to the FOB and following few rehearsals FOI was performed where the edematous false vocal cords were seen and the fiberscope was inserted in between followed by railroading the tube over it. Then the tube was connected to end tidal CO₂ where the CO₂ curve was obtained. Then induction of anesthesia was achieved with i.v propofol 200 mg and sufentanil 10 micg followed by cisatracurium 6 mg. Anesthesia was maintained with mixture of oxygen in air 50 % and 1 MAC sevoflurane. Central venous line was inserted in the right femoral vein. The operation was uneventful with minimal blood loss. The duration of surgery was 120 min and total thyroidectomy performed. At the end of surgery the patient was sent to surgical intensive care unit with the trachea intubated and ventilated. The plan was to keep the lungs ventilated for 24 hr for further evaluation of possible tracheal extubation. She was kept on regular dexamethasone 8 mg i.v 6 hourly and nebulization of the chest with bronchodilators and racemic epinephrine. Next day she was awake and breathing spontaneously on minimum oxygen support, we decided to extubate the trachea in the OR. The patient was sent to OR and surgeon notified to be present in case surgical intervention required since we anticipated tracheomalacia secondary to long standing tracheal compression by the tumor. We have planned that if extubation fails and airway compromise occurs due to tracheomalacia, we will insert the endotracheal tube again and later we will think to deploy a tracheal stent to secure the airway. Airway exchange catheter (AEC) was used and inserted through the tracheal lumen tube and tracheal tube cuff was deflated. Then the tracheal tube was gradually withdrawn over the AEC with adequate spontaneous breathing and stable vital signs. Finally the tracheal tube was removed along with the AEC and the patient was breathing spontaneously adequately. She

was then transferred back to SICU self ventilated with face mask and O₂ 3L/min. The patient remained in SICU for another 48 hours then she was transferred to normal surgical floor and later she was discharged home. We have issued the patient an alert medical card indicating the difficulties encountered during endotracheal intubation and asked her to show it to her anesthetist before any future anesthesia exposures.

DISCUSSION

The appropriate management of airway in thyroid surgery is always a challenge. This can be more compounded by other associated conditions like morbid obesity, short neck and huge thyroid swelling as described in the case presented. This particular patient had edema of supraglottic structures and edema of false vocal cords as visualized by nasal endoscope which most likely due to obstruction of venous drainage caused by the huge goiter. Lacoste et al reported that the anesthetist should expect that 6% of tracheal intubations for thyroid surgery will be difficult (2,3).

Amathieu et al reported that the overall incidence of difficult intubation in thyroid surgery was 11.1% and they found that thyroid surgery was not associated with an increased incidence of difficult intubation and they could not find any specific predictive risk factor for difficult intubation related to goiter disease. Moreover, they concluded that only the usual preoperative criteria like Mallampati, limited neck movements and thyromental distance, were reliable predictors of difficult airway (4).

Bouaggad et al in their study reported the same finding that large goiter was not associated with a more frequent incidence of difficult endotracheal intubation but the presence of cancerous goiter was a major factor for prediction of difficult intubation (5). Voyagis and Kyriakis have reported that goiter when accompanied by airway deformity presents an aggravating factor for difficult intubation (6). Hariprasad and Smurthwaite have reported a successful management of airway using awake FOI in a morbidly obese patient with gross supraglottic edema secondary to thyroid disease (7). Malhorta and Sodhi have reported a strategy for airway management of thyroid disease patient if preoperative assessment has increased concerns regarding the airway. The strategy included the following options: inhalation induction with sevoflurane in the semi-supine or semi-sitting position, awake FOI, tracheotomy

or ventilation through a rigid bronchoscope (8). However,

awake FOI is not without problems. Complete airway obstruction during awake FOI has been reported in whom the use of local anesthetic precipitated acute loss of the airway so that urgent surgical intervention was required (9). The options of airway management of our case were as follow: awake FOI, minitracheotomy or intubation via rigid bronchoscopy. Inhalation induction with sevoflurane was not an option due to the severity of stridor and concerns about loosing the airway during induction, therefore we preferred awake FOI. Mehta et al have reported tracheal intubation via rigid bronchoscope in a patient with compromised airway who underwent combined off pump coronary and thyroidectomy surgery (10). Due to the airway problems encountered with thyroid disease, thyroidectomy under local anesthesia was advocated (11,12,13). However, a patient with huge thyroid causing compromised airway and with stridor who can not lie supine is a major limiting factor for that technique.

In conclusion, the only viable option in our case was awake FOI which was tolerated by the patient. We believe that preoperative airway assessment could predict patients with possible difficult airway. Also preoperative explanation to the patient about the risks encountered with co morbidities remains an essential step prior to awake FOI.

Proper planning and discussing the problems with the patient and surgeon are important for safe outcome. Extubating the trachea of those patients in controlled atmosphere in the OR is recommended to rescue the airway if tracheal collapse occurs. Finally, issuing a medical alert card is important precaution measurement for subsequent anesthetic exposures.

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