

Case Report

## **Airway Management of a Large Neck Swelling Scheduled For Total Thyroidectomy**

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### **ABSTRACT**

Airway management in patients with large swelling in front of the neck is often challenging task for anaesthesiologist. We present 85 year old female with a longstanding large swelling in front of the neck. Preoperative airway assessment and neck radiography revealed tracheal deviation to right with no signs or symptoms suggestive of airway compression and no retrosternal extension. Patient was scheduled for total thyroidectomy with a clinical diagnosis of thyroid malignancy. In view of deviated trachea and possible tracheal collapse under anaesthesia, topical airway anaesthesia was provided and awake laryngoscopy and intubation was performed. As the tumour was found to be not arising from thyroid gland and trachea appeared firm patient was successfully extubated at the end of surgery. Patient had a uneventful recovery and postoperative period. Various options of airway control in a patient with large swelling in front of the neck are discussed.

**Key words:** Large thyroid swelling, Difficult airway, Awake intubation.

### **INTRODUCTION**

Airway management skills are essential for anaesthesiologist and a proper preoperative evaluation and more than one plan for airway control is essential in difficult airway situations. The incidence of difficult intubation in patients with large thyroid swellings has been reported as 1 in 20 to 1 in 10. <sup>[1-3]</sup> Airway difficulty may arise during induction, intubation, during surgery or after extubation. Therefore preoperative evaluation to detect signs or symptoms of difficult airway should be thoroughly investigated preoperatively and a plan of action should be discussed well in advance with the team members. Practice

guidelines and algorithms are useful in such circumstances. However anaesthesiologist's judgement and modifying the techniques as per actual clinical scenario may simplify things further. Awake direct laryngoscopy and intubation in a huge thyroid is performed in this patient.

### **CASE REPORT**

85 year old female, hypertensive on treatment for last 10 years presented with diffuse neck swelling of 15 years duration. It started as small swelling on the left side of the neck and rapidly grown since last 2 years to present size. There were no complaints like dyspnea, orthopnea or change in voice.

There was no history suggestive of hypothyroidism or hyperthyroidism. The only complaint from the patient was large heavy swelling in front of her neck.

On examination she was thin built and moderately nourished weighing 54 Kg. Her pulse rate was 72 per minute and BP 130/80 mmHg. There were no signs of respiratory distress. Neck examination revealed a huge neck swelling measuring about 24 X 30cms, base of it was on the left side of neck. Swelling extended from mandible to the upper chest wall. Laterally the swelling extended from trapezius to anterior boarder of right sternocleidomastoid muscle (Figure1&2). The swelling had bosselated surface and was hard in consistency. Skin over the swelling was shiny most part and necrosed with ulcers in few area. Trachea was displaced to the extreme right side. There was no engorgement of neck veins or cervical lymphadenopathy. Systemic examinations were within normal limits. Chest x-ray showed huge neck swelling displacing the trachea to the right side with no evidence of tracheal narrowing or compression (Figure 3&4). Laboratory investigations including thyroid function tests are within normal limits. Indirect laryngoscopy revealed glottis was deviated to right with normal vocal cord function. The patient was scheduled for total thyroidectomy under general anesthesia. Airway assessment revealed mallampati class 2 with restricted neck flexion with neck extension being adequate (Figure 5). The plan was to secure the airway either by direct laryngoscopy or with fiber optic guided awake oral intubation following adequate airway topical anesthesia. Patient was premedicated with tablet pantoprazole 40mg and tablet metoclopramide 10mg on the night prior to surgery and on the day of surgery. Sedative premedication was avoided. As a part of pre anesthetic

preparation availability of blood and difficult airway cart was ensured. Preinduction monitors included pulse oximeter, 5 electrode electrocardiogram and non-invasive blood pressure monitoring. After adequate pre oxygenation, fentanyl 25 microgram iv was given. Oral lignocaine viscous gargle was given and awake check laryngoscopy was done using a short handle laryngoscope using size 3 Macintosh blade. The laryngoscopy revealed Cormack and Lehane grade 2b. Larynx and vocal cords were anesthetized with 10 percent lignocaine spray during the check laryngoscopy. Cuffed Portex® tracheal tube of size 7.0 mm with stylet was kept ready. After giving adequate time for local anesthesia to act, gentle laryngoscopy was done and trachea was intubated (Figure 6). Bilateral air entry checked and confirmed using capnogram. Anesthesia induced with intravenous propofol 75 mg and fentanyl 75 microgram and maintained with oxygen, nitrous oxide, Isoflurane and vecuronium.



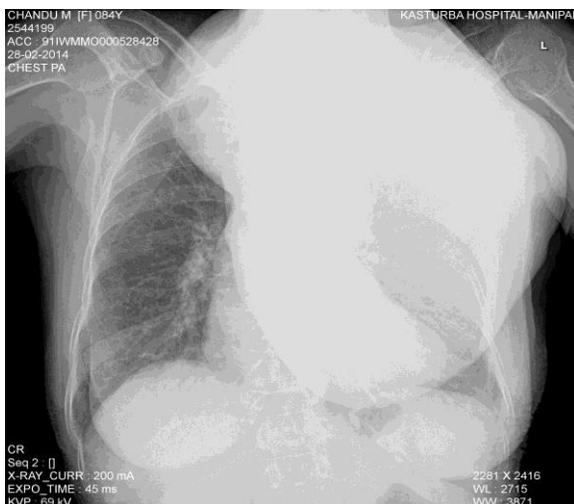
Fig 1. Supine patient with large neck swelling (Picture taken from R side of the patient)

Intraoperatively swelling was found to be arising from the left side of thyroid pushing thyroid and trachea to the right. Both the lobes of thyroid were found to be normal. The swelling was excised completely and it weighed 4.5kg. Her vitals

remained stable throughout the procedure. At the end of surgery anesthetic agents were tapered off and neuromuscular block was reversed. Trachea was found to be firm on palpation during surgery so when patient was extubated once she was awake and breathing well. She was observed in the high dependency area for next 24 hours and later discharged from the hospital on 10<sup>th</sup> postoperative day. Histopathology report revealed neuroendocrine carcinoma of soft tissue.



**Fig 2:** Soft tissue swelling with surface ulcer as visualised from caudal end



**Fig 3:** Chest X ray showing the soft tissue shadow covering most of the left hemi thorax



**Fig 4:** Lateral view of neck and thorax :No compression of larynx and trachea in the neck



**Fig 5:** Patient with full mouth opening and tongue protruded



**Fig 6:** Direct laryngoscopy and intubation

## DISCUSSION

Airway control in patient with large thyroid swellings can be challenging even for a skilled Anesthesiologist. Large and

long standing thyroid swelling can lead to tracheal compression, tracheal deviation and softening the tracheal rings resulting in tracheal collapse during anesthesia. In addition retrosternal extension of thyroid may result in compression of intrathoracic part of the trachea and this is more difficult to manage. The usual difficult airway predictors like mouth opening, neck extension etc. are of little value in predicting difficult intubation in goiter patients. [3] Several predictors of difficult direct laryngoscopy are mentioned by various workers, Mallampatti grades III or IV, restricted mouth opening (<20 mm), thyromental distance (< 60 mm), head and neck mobility, obesity etc. [4-6] Airway obstruction due to trachea collapse following induction is a major fear with large thyroid swelling. Malhotra et al. suggested various options for airway control in patients coming with large thyroid swellings. Inhalational induction with sevoflurane in semi-supine or semi-sitting position and intubation with direct laryngoscopy, awake fiberoptic intubation, awake tracheostomy or ventilation through a rigid bronchoscope etc. [7] Induction with Inhalational anesthesia may not be always safe as airway collapse can occur as patient loses muscle tone under deeper planes. Failure to visualize the glottis, trauma, bleeding, and laryngospasm has been reported with fiberoptic guided intubation. [8] The Fourth National Audit Project provides important information on the use of fiberoptic techniques and describes several challenging cases where the initial decision to perform awake fiberoptic intubation was suitably changed to an awake surgical approach after problems obtaining a view, contamination of the airway, or a very narrow airway. [9] Awake tracheostomy has been performed successfully in the emergency department in an airway

compromised patient however it has got several drawbacks like patient cooperation, technical difficulty and bleeding. [10] Ventilation through rigid bronchoscope is a possibility though it may be more suited to open up the collapsed trachea rather than considering it as an elective option for airway control. In our patient the swelling was long standing, appeared to be arising from thyroid and pushing the trachea to one (right) side. Awake intubation was considered to be safer option as the airway parameters like restricted mouth opening, limited neck extension, retrognathia etc. are not present.

#### **Difficult airway management and the choice of awake technique:**

As per ASA guidelines difficult airway can be classified as difficulty with patient cooperation, difficult mask ventilation, difficult supraglottic airway placement, difficult laryngoscopy, difficult intubation and difficult surgical airway access. [11] For any difficult airway ASA task force recommends basic preparations including 1) availability of equipment for management of difficult airway 2) informing the patient 3) assigning an individual to provide assistance when a difficult airway is encountered 4) preanesthetic preoxygenation by mask and 5) administration of supplemental oxygen throughout the process of difficult airway management. In our patient choice was between fiberoptic and direct laryngoscopy. As we explained the procedure patient was found to be cooperative for check scopy. With topical anesthesia and anxiolytic patient cooperated for check scopy. The introduction of regular Macintosh handle was an issue due to large swelling so short handle was used. During awake check laryngoscopy vocal cords could be visualized. After further local anesthetic spray intubation was smooth and quick. To conclude swelling in front of the

neck can present with difficult airway. Management of the difficult airway needs proper preoperative evaluation and planning depending on the situation is essential. Difficult airway algorithm is a useful guide and Anesthesiologists judgment and adopting the best suited technique in a given situation is important. Simple techniques like awake intubation with direct laryngoscopy can be effective during these testing conditions.

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