

Retrosternal Goiter with Acromegaly – An Airway Challenge

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Background: Patients with acromegaly may present with a goiter. Moreover, patients with acromegaly are more prone to develop severe airway obstruction and breathing difficulties during induction therapy because of enlargement of the tongue, hypertrophy of soft tissue, and mandibular prognathism as a sequela of the underlying acromegaly. Here, we have described successful airway management in patients with difficult airways with retrosternal goiter and acromegaly. **Case Presentation:** A 29-year-old female presented to our tertiary care hospital with complaints of swelling in the anterior aspect of the neck, headache, amenorrhea, and a change in voice, which she noticed progressively increasing in the last ten years. Examination revealed thyroid enlargement of about 8 cm with regular margins and a smooth surface. To ensure airway safety, airway management was prepared preoperatively, including high-flow nasal oxygen on standby and ear-nose and throat surgeons on standby with small and long ventilating bronchoscopes for tracheostomy if required. A pre-extubation check scope was done, and it showed mobile bilateral vocal cords. A cuff leak test was performed, and the result was negative. The patient was successfully extubated and kept in the recovery room for seven days. **Conclusion:** A careful preoperative assessment and appropriate planning are necessary during intubation and extubation in such patients to avoid life-threatening complications caused by the difficult airway.

Keywords: Case Report; Acromegaly; Retrosternal Goiter; Medicine

Introduction

Patients with acromegaly may present with a goiter. Moreover, patients with acromegaly are more prone to develop severe airway obstruction and breathing difficulties during induction therapy because of enlargement of the tongue, hypertrophy of soft tissue, and mandibular prognathism as a sequela of the

underlying acromegaly. Even a retrosternal goiter in such patients can cause compression of the surrounding major blood vessels or obstruction of the airways.

This increases the case difficulty from an anesthesiology point of view. Comprehensive preoperative assessments, including

medical history, physical examination, and airway imaging, are essential for identifying patients at risk of respiratory and cardiovascular complications. In our case report, we describe the successful anesthetic management of patients with retrosternal goiter who have underlying acromegaly and underwent total thyroidectomy.

Case presentation

A 29-year-old female, weighing 80 kilograms, with a height of 165cm, and with a BMI of 29.4 kg/m², was a known case of previously diagnosed hypertension, diabetes mellitus, and hyperthyroidism. She presented to our tertiary care hospital with complaints of swelling in the anterior aspect of the neck, headache, amenorrhea, and a change in voice, which she noticed progressively increasing in the last ten years.

Examination revealed a thyroid enlargement of about 8 cm with regular margins and a smooth surface. The patient demonstrated features of acromegaly, such as coarse facial features, a broad nose, prominent cheekbones, prominent supraorbital ridges, a long protruding mandible, broadened hands and feet, and an enlarged tongue.

Airway examination revealed- Mallampati grade IV, adequate neck movement, and a thyromental distance greater than 6.5cm (Figure 1).



Figure 1. Airway examination revealed- Mallampati grade IV, adequate neck movement, and a thyromental distance of greater than 6.5cm

An x-ray of the chest in an anteroposterior view demonstrated lateral deviation of the trachea (Figure 2).

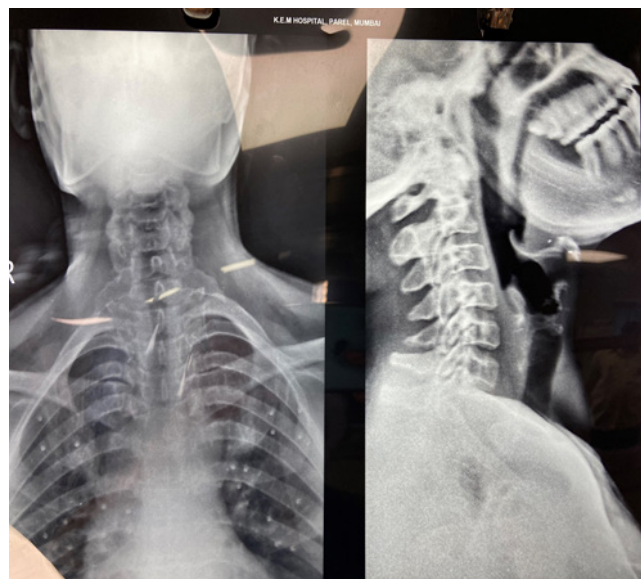


Figure 2. An X-ray of the chest in an anteroposterior view demonstrated lateral deviation of the trachea

Computed tomography of the chest showed a well-defined hypodense lesion in the right lobe of the thyroid, measuring 3.9 cm x4.3 cm x7.8 cm with a 1.6-inch extension into the mediastinum in the prevascular space (Figure 3).

Multiple hypodense lesions were seen in the left lobe of the thyroid gland with the largest one measuring 2.3cm x 2cm (Figure 4). An enlarged thyroid gland was seen, causing compression of the trachea with the lumen maximally narrow at the C7 level, measuring 1.7 cm anteroposteriorly and 9 mm transversely. It displaced the right subclavian artery and the right common carotid artery posterolaterally.

A brain magnetic resonance imaging study demonstrated a pituitary macroadenoma on the left side, mildly compressing the left midbrain and pons. 2D transthoracic echocardiogram showed an ejection fraction of 60% with no evidence of mitral stenosis, mitral regurgitation, tricuspid regurgitation, and pulmonary hypertension. ENT examination revealed an adequate moving chink of the bilateral vocal cords. Complete blood counts and liver and renal function tests were within normal limits, and the adrenocorticotropic hormones were 48.4 IU/ml, which were raised.

To ensure airway safety, airway management was prepared preoperatively, including high-flow nasal oxygen on standby

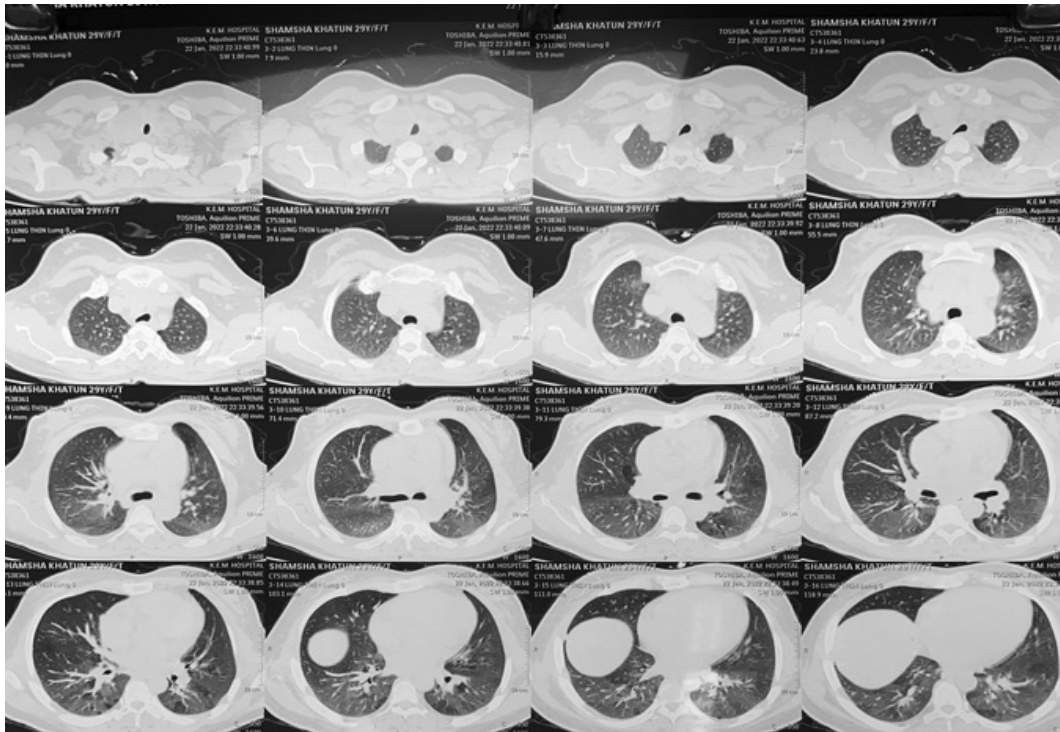


Figure 3. Computed tomography of the chest demonstrated a well-defined hypodense lesion in the right lobe of the thyroid, measuring 3.9 cm x4.3 cm x7.8 cm with a 1.6-inch extension into the mediastinum in the pre vascular space



Figure 4. Multiple hypodense lesions were seen in the thyroid glands' left lobe, with the largest measuring 2.3 cm x 2 cm .

and ear-nose and throat surgeons on standby with small and long ventilating bronchoscopes for tracheostomy if required. After receiving written informed consent, the patient was taken inside the operating room. Standard American Society of Anesthesiologists monitors were attached, and two wide-bore intravenous lines were secured. Preoxygenation with 100% oxygen was started. Injection of fentanyl at 2 mg/kg, injection of Loxicard at 1 mg/kg, and injection of propofol at 2 mg/kg, and after confirmation of ventilation, injection of succinylcholine at 2 mg/kg was given.

Apneic oxygenation was started, and laryngoscopy was attempted with the bougie-guided CMAC blade 3, which failed. Preoxygenation was done for 3 minutes, and apneic oxygenation was started. A second attempt with the CMAC D blade was successful, and the airway was secured with a 6.5 mm cuffed flexometallic tube after confirming bilateral air entry. Anesthesia was maintained with oxygen, nitrous oxide, and sevoflurane. A total thyroidectomy was successfully performed with a blood loss of 150 ml.

A pre-extubation check scope showed mobile bilateral vocal cords. A cuff leak test was negative. The patient was successfully extubated and kept in the recovery room for seven days, after which they were shifted to the ward and discharged on the 7th postoperative day.

Discussion

Retrosternal goiter causes tracheal compression and deviation, which not only causes a difficult airway but also puts stress on the cardiovascular system, which can lead to circulatory failure or postoperative tracheomalacia. The incidence of difficult intubation with any thyroid swellings is 2-12.7%, and that of failed intubation is 0.3-0.5%, so the first aim was to find out whether there exists a difficult airway and then select an anesthesia induction protocol and tracheal intubation method.

Chest X-ray shows whether tracheal and bronchial deviation or compression is present. Chest CT facilitates accurate measurement of the airway diameter, which helps in selecting the appropriate endotracheal tube size; it is also helpful to find out the maximum compression level. Apneic oxygenation was used to increase safe apnea time. Before extubation, a check scope was done to look for bilateral vocal cord movement to rule out an injury to the recurrent laryngeal nerve, which is easily

ignored as an essential cause of postoperative asphyxia.

Tracheomalacia is a significant concern after massive retrosternal goiter resection (incidence according to Huins et al. showed as <1%, Chauhan et al. and Sudan et al. reported was about 0.05%). Therefore, a cuff leak test and extubation were performed when the patient was fully awake.

Conclusion

Here, we have described successful airway management in patients with difficult airways, retrosternal goiter, and acromegaly. A careful preoperative assessment and appropriate planning are necessary during intubation and extubation in such patients to avoid life-threatening complications caused by the difficult airway.

Informed consent

The study was done after taking written informed consent from the patient.

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