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Original Research Paper

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EMERGENCY MANAGEMENT OF CRITICAL AIRWAY COMPROMISE IN A LARGE MULTINODULAR GOITRE: A CASE REPORT

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ABSTRACT

Background: Massive multinodular goitre causing acute airway compromise is an uncommon but potentially life-threatening emergency. Progressive tracheal compression may remain asymptomatic for years until sudden decompensation occurs, requiring immediate airway stabilization and surgical intervention. Early recognition and prompt management are essential to prevent respiratory failure. [1,2] **Case Report:** A 57-year-old female with a long-standing history of multinodular goitre and hyperthyroidism presented with acute dyspnea, stridor, and respiratory distress. Initial supportive measures including nebulization, balloon-mask ventilation, and non-invasive ventilation failed to maintain adequate oxygenation. Endotracheal intubation was performed due to worsening airway compromise. Imaging revealed massive bilateral thyroid enlargement with retrosternal extension and severe tracheal narrowing to 5.4 mm, producing a scabbard trachea appearance. The patient subsequently underwent emergency total thyroidectomy with tracheostomy. Postoperatively, bilateral vocal cord mobility was preserved, respiratory parameters improved steadily, and the patient was successfully decannulated on postoperative day 15 with complete symptomatic recovery. **Conclusion:** Acute airway obstruction secondary to compressive multinodular goitre requires rapid airway control and timely definitive surgical decompression. This case highlights the importance of an airway-first approach and demonstrates that prompt thyroidectomy can achieve excellent functional recovery even in advanced compressive disease. [1–3]

KEYWORDS :

INTRODUCTION

Multinodular goitre is a common thyroid disorder that may progressively enlarge over several years. Although many patients remain asymptomatic, large goitres may produce compressive symptoms involving the trachea, esophagus, and surrounding neurovascular structures. Acute airway compromise due to longstanding goitre is relatively rare but constitutes a surgical emergency. Tracheal compression exceeding 70% may precipitate severe respiratory distress, stridor, and impending airway collapse. [1,2]

The management of compressive thyroid swellings requires immediate airway assessment, radiological evaluation, and preparedness for difficult airway intervention. Stell & Maran's Head and Neck Surgery emphasizes early airway stabilization as the primary goal before definitive surgical management. [1] We report a case of massive multinodular goitre presenting with critical airway obstruction that was successfully managed with emergency total thyroidectomy and tracheostomy.

Case Presentation

A 57-year-old female presented to the emergency department with progressively worsening dyspnea and noisy breathing for 1–2 days. She was a known case of hyperthyroidism on tablet Neomercazole 10 mg for eight years. Examination revealed a massive anterior neck swelling associated with inspiratory stridor, tachypnea, and increased work of breathing.

Initial management included nebulization, balloon-mask oxygenation, and non-invasive ventilation. Despite supportive measures, oxygen saturation continued to decline, indicating fixed upper airway obstruction. Due to worsening respiratory distress, endotracheal intubation was performed approximately 24 hours after admission.

Radiological evaluation demonstrated significant airway compromise. X-ray of the neck showed a classical scabbard trachea appearance. Contrast-enhanced CT scan revealed massive bilateral thyroid enlargement with retrosternal extension. The right thyroid lobe measured 11.2 × 5.7 × 10.5 cm, while the left lobe measured 11.3 × 6.5 × 9.8 cm. Severe tracheal compression with approximately 80–90% luminal narrowing was observed, with the narrowest tracheal diameter measuring 5.4 mm at the C7 vertebral level. The enlarged thyroid gland displaced the sternocleidomastoid muscles, carotid arteries, and internal jugular veins while maintaining preserved fat planes.

Following stabilisation and preoperative optimisation, emergency total thyroidectomy with tracheostomy was performed. Intraoperatively, the thyroid gland was markedly enlarged with retrosternal extension causing severe compression and deformation of the trachea. Careful dissection allowed preservation of surrounding neurovascular structures and recurrent laryngeal nerves. [2]

Postoperative laryngoscopic evaluation confirmed bilaterally mobile vocal cords. Respiratory parameters improved steadily, and the patient was successfully decannulated on postoperative day 15 after maintaining adequate room-air oxygen saturation. She remained asymptomatic with normal voice quality and complete resolution of compressive symptoms.

DISCUSSION

Massive multinodular goitre remains an important cause of upper airway obstruction, particularly in regions where delayed presentation is common. Chronic tracheal compression may gradually narrow the airway without producing symptoms due to compensatory physiological adaptation. However, sudden edema, hemorrhage, infection, or progressive enlargement can precipitate acute respiratory decompensation. [1,4]

The presence of stridor, orthopnea, and rapidly worsening dyspnea should alert clinicians to impending airway failure. Imaging plays a critical role in assessing the degree of tracheal narrowing and retrosternal extension. In our case, CT

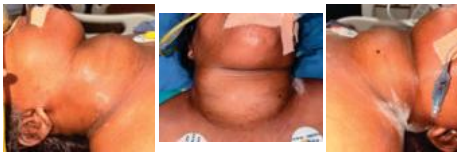
imaging confirmed critical airway compromise with 80–90% tracheal lumen reduction. [2,4]

Airway management in such patients is challenging due to distorted anatomy and risk of complete airway collapse during induction. Early intubation or tracheostomy should be considered before respiratory exhaustion develops. Definitive treatment involves thyroidectomy, which relieves compressive symptoms and restores airway patency. [1–3]

Tracheomalacia is a recognized complication following longstanding compression and may necessitate temporary tracheostomy. In the present case, postoperative recovery was favorable, with preserved vocal cord function and successful decannulation. [2]

Clinical Presentation

The patient presented with acute onset respiratory distress characterized by progressive dyspnea, noisy breathing, inspiratory stridor, tachypnea, and use of accessory muscles of respiration. Examination revealed a massive anterior neck swelling consistent with longstanding multinodular goitre. Oxygen saturation progressively declined despite supplemental oxygen support, indicating impending airway compromise. [1,4]



Investigations

Radiological investigations demonstrated severe airway compromise secondary to thyroid enlargement.

- X-ray neck showed classical scabbard trachea deformity.
- CT neck revealed massive bilateral thyroid enlargement with retrosternal extension.
- Right thyroid lobe measured 11.2 × 5.7 × 10.5 cm.
- Left thyroid lobe measured 11.3 × 6.5 × 9.8 cm.
- Tracheal lumen compromise was approximately 80–90%.
- Narrowest tracheal diameter measured 5.4 mm at C7 level.
- Displacement of bilateral sternocleidomastoid muscles and carotid sheath structures was noted with preserved fat planes.

CT Imaging

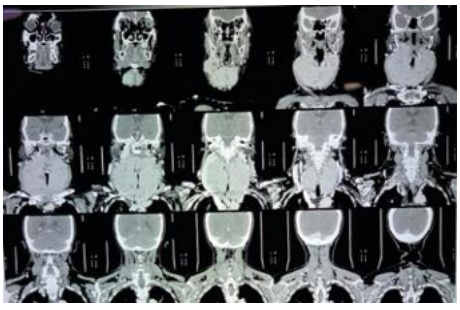


Figure 1. CT Neck Showing Severe Tracheal Compression and Retrosternal Extension.

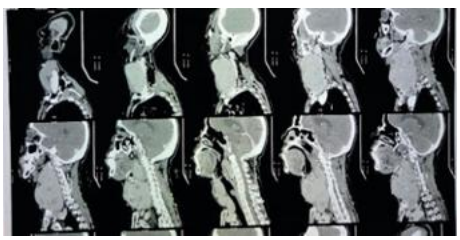
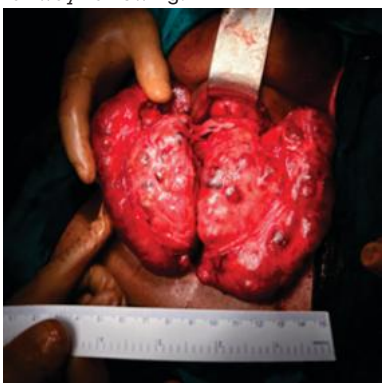


Figure 2. CT Neck Demonstrating Scabbard Trachea with Marked Luminal Narrowing.

Management Options

Management of compressive multinodular goitre depends on the severity of airway compromise and patient stability. Conservative measures include oxygen supplementation, nebulization, and non-invasive ventilation in mild cases. However, progressive respiratory distress requires definitive airway control through endotracheal intubation or tracheostomy. [1,3]

Definitive management consists of thyroidectomy to relieve mechanical airway obstruction. In cases with longstanding compression and suspected tracheomalacia, temporary tracheostomy may be required postoperatively. Early surgical decompression remains the treatment of choice in patients with critical airway narrowing. [2,3]



CONCLUSION

Massive multinodular goitre can present as a life-threatening airway emergency requiring urgent multidisciplinary intervention. Early airway stabilization, prompt imaging, and timely surgical decompression are essential for optimal outcomes. This case reinforces the importance of maintaining a high index of suspicion in patients with longstanding thyroid swelling presenting with respiratory symptoms and demonstrates that emergency thyroidectomy can result in excellent recovery when performed promptly. [1–4]

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