



Case Report

Section: Surgery

Surgical Management of a Giant Papillary Thyroid Carcinoma: A Case Report

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HIGHLIGHTS

- Giant goitre with 20-year growth
- FNAC suggested follicular neoplasm
- 4 kg vascular thyroid mass excised
- Histology confirmed papillary carcinoma
- Early surgery reduces morbidity

Key Words:

Giant goitre;
Papillary thyroid carcinoma
Thyroidectomy
Airway management
Difficult airway

ABSTRACT

Introduction: Giant goitres are uncommon thyroid enlargements that may extend over decades, often resulting in compressive symptoms and aesthetic concerns. Although most long-standing goitres are benign, the potential for malignant transformation exists. Early diagnosis and timely surgical management are crucial to prevent complications and ensure optimal outcomes. **Case Presentation:** We report a case of a 63-year-old female who presented with a massive anterior neck swelling that had been progressively enlarging over a period of 20 years. Clinical evaluation and ultrasonography were performed, followed by fine needle aspiration cytology (FNAC), which suggested a follicular neoplasm. The patient was planned for surgical excision under general anesthesia. **Results:** Intraoperatively, a well-encapsulated, highly vascular thyroid mass was identified and successfully excised. The specimen weighed approximately 4 kg (8.81 lbs). Histopathological examination confirmed the diagnosis of papillary thyroid carcinoma with areas of cystic degeneration. The postoperative course was uneventful, and the patient recovered without complications. **Conclusion:** This case highlights the rarity of giant goitres and underscores the importance of early diagnosis, careful preoperative assessment, and meticulous surgical planning. Even in long-standing goitres presumed benign, the risk of underlying malignancy should be considered. Timely surgical intervention not only minimizes morbidity but also facilitates early detection and treatment of occult malignancies, thereby improving patient outcomes.

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INTRODUCTION

Thyroid swellings, or goitres, are among the most frequently encountered endocrine disorders in clinical practice. They generally represent benign conditions, often asymptomatic, and are most commonly associated with iodine deficiency, autoimmune thyroid disease, or multinodular hyperplasia. In the majority of cases, goitres remain stable or grow slowly over time; however, when neglected or left untreated, they may progressively enlarge to a considerable size. Such enlargement can lead to compressive symptoms involving the trachea, esophagus, and major cervical vessels, manifesting as dyspnea, dysphagia, hoarseness, or neck discomfort. These complications may significantly impact the patient's quality of life and can occasionally become life-threatening due to airway compromise or vascular compression [1,2].

A giant thyroid goitre refers to an exceptionally large thyroid enlargement. Although the definition varies slightly across studies, it is generally accepted that a thyroid mass exceeding 10 cm in diameter or weighing more than 500 grams (or 10 grams per kilogram of body weight) qualifies as a giant goitre. These enormous goitres often extend retrosternally, displacing the trachea and great vessels, and may even reach the mediastinum. The long-standing nature of such swellings contributes to the development of compressive and cosmetic deformities, necessitating surgical intervention in nearly all cases [3].

From a surgical perspective, giant goitres pose unique and significant challenges. The presence of extensive fibrosis, anatomical distortion, and increased vascularity makes dissection technically demanding. Retrosternal or mediastinal extension further complicates the procedure, occasionally requiring sternotomy for complete excision. Moreover, there is an increased risk of intraoperative injury to vital structures, including the recurrent laryngeal nerve (RLN) and parathyroid glands, which can result in postoperative complications such as vocal cord paralysis and hypocalcemia [4,5].

Anesthetic management of patients with giant goitres is equally challenging. Tracheal deviation, narrowing, or compression can lead to airway difficulties during intubation and extubation. Preoperative assessment using imaging and airway evaluation is therefore crucial to minimize anesthetic risks. Postoperative airway management should also be approached cautiously due to the potential for tracheomalacia after long-standing compression [6].

Although most multinodular goitres are benign, studies have shown that malignancy can coexist in up to 16% of cases. Papillary and follicular carcinomas are the most common malignancies associated with long-standing multinodular goitres. Therefore, even in apparently benign cases, thorough preoperative evaluation and histopathological examination are essential to rule out malignancy [7].

In conclusion, giant thyroid goitres represent a rare but complex

clinical condition that demands careful multidisciplinary management. Early diagnosis, comprehensive preoperative assessment, meticulous surgical technique, and vigilant postoperative care are critical to achieving favorable outcomes and minimizing complications.

CASE PRESENTATION

A 63-year-old woman presented with a progressively enlarging anterior neck swelling over the past 20 years. She remained asymptomatic throughout, with no complaints of dysphagia, dyspnea, hoarseness, or systemic symptoms. She denied any prior history of thyroid disease, radiation exposure, or a family history of thyroid malignancy.

On physical examination, a large multinodular neck mass measuring approximately 20×15×10 cm was noted. The swelling was soft to firm in consistency, non-tender, and did not move with deglutition. There was no associated cervical lymphadenopathy. The trachea was not palpable, likely due to the size of the mass. Prominent dilated veins were observed over the anterior chest wall, though not over the thyroid swelling itself.

Investigations:

- **Thyroid function tests:** Within normal limits (euthyroid state)
- **Ultrasound neck:** Large, complex, multinodular thyroid mass with mixed echogenicity suggestive of possible neoplasm.
- **X-rays chest Antero-Posterior & Lateral view:** A homogeneous soft tissue opacity in pre-tracheal region extending to the superior and anterior mediastinum more on left side with spiculated calcific opacities seen within.
- **Fine-needle aspiration cytology:** Suggestive of follicular neoplasm with papillary changes.
- **CECT Neck & Chest:** Multiloculated cystic lesion with central necrosis, peripheral enhancement, septations, and fatty attenuation; suspicious for malignancy.
- **Procedure:** Total thyroidectomy with resection of fibro fatty tissue and lymph nodes along the jugular vein and in suprasternal fossa was done. The mass was well-encapsulated and highly vascular. No intraoperative complications occurred.
- **Histopathology:** Papillary thyroid carcinoma revealed with cystic degeneration. No extracapsular extension or lymphovascular invasion. The specimen weighed 4 kg (8.81 lbs) among the heaviest reported in India.
- **Postoperative Course:** Patient experienced mild dysphasia which recovered in subsequent days. No hypocalcemia, no voice change or vocal cord palsy occurred. She was discharged on day three and referred for oncologic follow-up.

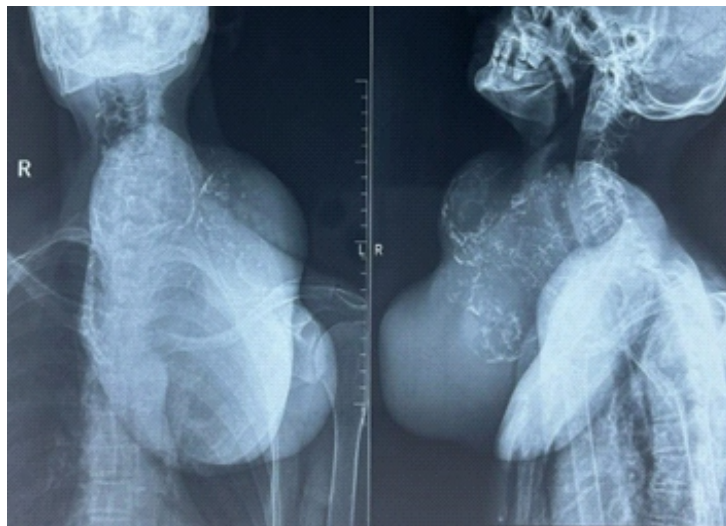
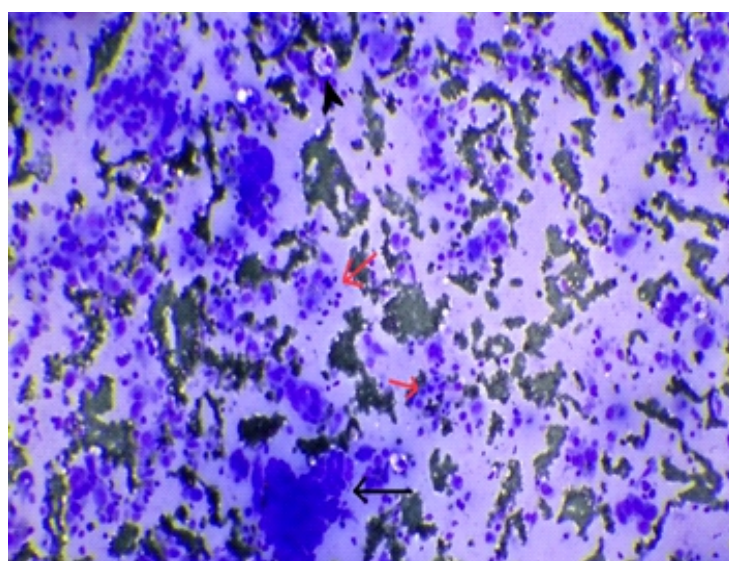


Figure 1: X-rays chest Antero-Posterior & Lateral view



Note- Arrow head: Cystic macrophage; Black arrow: Papillae formation; Red arrow: Follicles.

Figure 2: Fine-needle aspiration cytology



Figure 3: CECT (coronal section) showing a large, multiloculated thyroid lesion with central necrosis and peripheral enhancement.

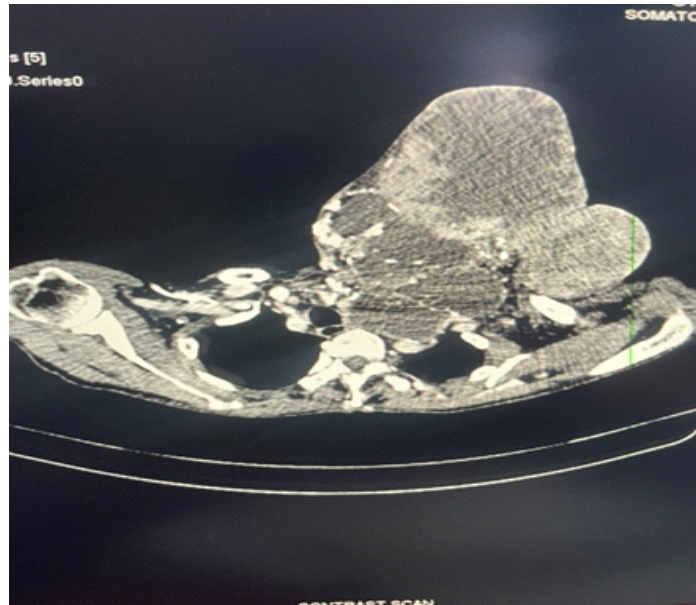


Figure 4: CECT (Transverse section) showing relation of the lump with trachea, esophagus, & blood vessels.



Figure 5: Pre-operative photo showing a giant anterior neck swelling measuring approximately 20×15×10



Note- Black arrow head: carotid artery; Blue arrow head: clavicle; Red arrow head: midline

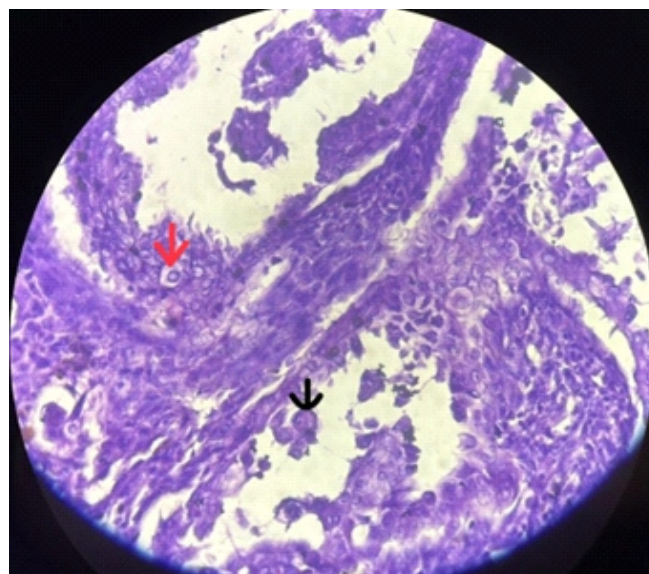
Figure 6: Intraoperative image



Figure 7: Post-operative (excised lump)



Figure 8: Gross specimen



Note- Red arrow: Orphan Annie eye; Black arrow: Psammoma body

Figure 9: Microscopic image showing characteristic “Orphan Annie eye” nuclei (red arrow) and psammoma bodies (black arrow), confirming papillary thyroid carcinoma.



Figure 10: Post op day 3

DISCUSSION

Giant goitres are defined as thyroid masses >10 cm or weighing >500 g [1]. They are rare in iodine-sufficient areas but persist in resource-limited regions. They present surgical and anaesthetic difficulties due to size, vascularity, and anatomical displacement.

A large retrospective study involving 3,311 patients who underwent surgery for goiter found that 8.54% had incidental thyroid carcinoma, predominantly papillary carcinoma [8].

Key Challenges and Complications:

- *Hemorrhage and Hematoma:* Potentially life threatening due to airway compression. Although rare (incidence of 0.1–1.1%), the consequences are severe, and therefore meticulous hemostasis is crucial. [2].
- *RLN Injury:* Risk increases with distorted anatomy; intraoperative nerve monitoring (IONM) reduces injury rates. Transient RLN palsy occurs in approximately 5–8% of cases, while permanent injury is reported in 0.3–3% [4,5].
- *Hypoparathyroidism:* Displacement or devascularization can cause hypocalcemia; autotransplantation is preventive. Incidence of permanent hypoparathyroidism after thyroidectomy ranges between 1.3–3.0% [6].
- *Tracheomalacia:* Chronic tracheal compression may cause collapse post-extubation [7].

Wound complications: Seroma formation is minimized with adequate drainage [9].

Anaesthetic Considerations:

Preoperative airway assessment is vital [10]. Awake fiberoptic intubation and videolaryngoscopy are preferred in high-risk airways [11], that is what we did in this case as well. Post-operative airway compromise from hematoma, tracheomalacia, or RLN injury requires close monitoring. This case underscores the importance of early surgical intervention, especially in longstanding thyroid swellings, for avoiding complications and timely malignancy detection.

CONCLUSION

Giant thyroid goitre necessitate careful preoperative planning and specialized surgical expertise. Early intervention is crucial to prevent complications, improve oncological outcomes, and ensure safer anesthesia management. A case involving a 4 kg (8.81lbs), one of the largest in the world, papillary thyroid carcinoma underscores the importance of timely evaluation for longstanding goiters. Additionally, another remarkable case from Sudan in 2011, where a diffusely enlarged thyroid gland weighing 4.7 kg (10.4 lbs) was successfully operated on, represents one of the largest thyroid glands ever removed globally [12].

CLINICAL SIGNIFICANCE

The clinical significance of this study lies in its potential to bridge the gap between research findings and practical healthcare applications. It emphasizes the importance of translating scientific observations into meaningful improvements in patient care, diagnosis, and treatment outcomes. By highlighting real-world relevance, the study contributes to evidence-based medical practice and supports informed clinical decision-making. Ultimately, the findings aim to enhance patient quality of life, optimize therapeutic strategies, and promote better disease management in clinical settings.

ABBREVIATIONS

FNAC: Fine Needle Aspiration Cytology

PTC: Papillary Thyroid Carcinoma

USG: Ultrasonography

HPE: Histopathological Examination

GA: General Anesthesia

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AUTHOR CONTRIBUTIONS

All authors significantly contributed to the study conception and design, data acquisition, or data analysis and interpretation. They participated in drafting the manuscript or critically revising it for important intellectual content, consented to its submission to the current journal, provided final approval for the version to be published, and accepted responsibility for all aspects of the work. Additionally, all authors meet the authorship criteria outlined by the International Committee of Medical Journal Editors (ICMJE) guidelines.

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CONFLICT OF INTEREST

Authors declared that there is no conflict of interest.

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CONSENT FOR PUBLICATION

All necessary consent for publication was obtained by authors.

DATA AVAILABILITY

All data generated and analyzed are included within this research article. The datasets utilized and/or analyzed in this study can be obtained from the corresponding author upon a reasonable request.

USE OF ARTIFICIAL INTELLIGENCE (AI) & LARGE LANGUAGE MODEL (LLM)

The authors confirm that no AI & LLM tools were used in the writing or editing of the manuscript, and no images were altered or manipulated using AI & LLM.

AUTHOR'S NOTE

This article serves as an important educational tool for the scientific community, offering insights that may inspire future research directions. However, they should not be relied upon independently when making treatment decisions or developing public health policies.

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