

Management of a Giant Thyroid Goiter in Limited Resources Hospital: A Case Report

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Abstract

Keywords

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Giant thyroid goiters remain a health problem in areas with limited access to primary health care. Delays in diagnosis and treatment can lead to progressive enlargement, compressive symptoms, and greater surgical challenges. This case report aimed to describe the management of a giant thyroid goiter in a hospital with limited resources. A 61-year-old man presented to the surgical outpatient clinic at Dr. Darsono Pacitan Regional General Hospital with a large mass on the right anterior side of the neck that had been present for 20 years. Initially, the mass was approximately the size of a thumb, but it gradually enlarged to approximately 10 × 10 × 8 cm. Physical examination revealed a firm, lobulated mass that moved with swallowing, extending from below the chin to the suprasternal notch, accompanied by dilated superficial blood vessels. The patient also reported dysphagia, shortness of breath that had begun five days before the examination, and hoarseness that had persisted for five years. No cervical lymphadenopathy, history of radiation exposure, chronic disease, previous surgery, or family history of similar disease was found. Based on the compressive symptoms and the very large size of the mass, unilateral thyroidectomy was performed with good outcomes. This case demonstrates that a giant multinodular goiter can cause compressive symptoms and present surgical challenges; however, it can still be safely managed through a well-planned unilateral thyroidectomy.

INTRODUCTION

As one of the most common endocrine disorders worldwide, benign nodular goiter frequently occurs in regions where iodine deficiency remains a major health problem (Studen et al., 2025; Tovkai, 2022; Xia et al., 2024). Despite international efforts to address this issue through salt iodization programs, millions of individuals in low- and middle-income countries continue to be affected by goiter (Haq et al., 2025; Kissock et al., 2024; Zimmermann, 2023). Thyroid gland enlargement, known as goiter, occurs as a compensatory mechanism due to impaired thyroid hormone synthesis, leading to hypertrophy and hyperplasia of follicular cells. This condition may present in diffuse or nodular forms, with multinodular goiter being the most common clinical manifestation in adults (Barczyński, 2022; Chen et al., 2022; Dunn, 2024; Mazandaran, 2024; Niedziela et al., 2022).

The etiology of multinodular goiter is multifactorial, involving nutritional deficiencies, genetic predisposition, environmental influences, and hormonal imbalances (Haugen et al., 2023; Sharma et al., 2022). Iodine deficiency remains the leading cause globally, contributing to chronic stimulation by thyroid-stimulating hormone (TSH) and progressive gland enlargement (Vanderpump, 2019; Zhao et al., 2025). In addition, autoimmune disorders, defects in thyroid hormone synthesis, and exposure to goitrogenic substances may further exacerbate the development of nodular thyroid disease (Zimmermann & Boelaert, 2015; Sharma et al., 2022; Haugen et al., 2023). These contributing factors collectively explain the geographical variation and epidemiological distribution of goiter cases (Vanderpump, 2019; Zimmermann & Boelaert, 2015; Zhao et al., 2025).

The clinical implications of multinodular goiter extend beyond cosmetic concerns, as progressive enlargement can lead to significant compressive symptoms (Al-Amin et al., 2024; Cheung et al., 2026). Patients may experience dyspnea, dysphagia, hoarseness, and airway obstruction due to compression of adjacent structures, such as the trachea, esophagus, and recurrent laryngeal nerve (Al-Amin et al., 2024; Temesgen et al., 2023). In severe cases, substernal extension of the goiter may result in life-threatening respiratory compromise (Alsalman et al., 2025; Cheung et al., 2026; Pieracci & Fahey, 2021), emphasizing the importance of early diagnosis and intervention.

Although most multinodular goiters are benign, there remains a notable risk of malignant transformation, estimated at approximately 5%–10% in dominant nodules. This risk underscores the need for careful clinical evaluation and appropriate diagnostic strategies, including imaging and cytological assessment. However, in resource-limited settings, access to advanced diagnostic tools, such as computed tomography (CT) scans and fine-needle aspiration cytology (FNAC), may be restricted, posing challenges to accurate diagnosis and management.

The management of giant multinodular goiter presents unique challenges, particularly in hospitals with limited resources. Surgical intervention, specifically thyroidectomy, remains the definitive treatment for large goiters causing compressive symptoms. However, the procedure requires careful preoperative planning, skilled surgical expertise, and adequate postoperative care to minimize complications, such as hemorrhage, hypocalcemia, and airway compromise. Inadequate facilities and a lack of trained personnel can significantly increase surgical risks and affect patient outcomes.

The novelty of this case report lies in the successful management of a giant multinodular goiter in a resource-constrained hospital setting. Unlike many reports conducted in well-equipped tertiary care centers, this case highlights the feasibility of performing complex thyroid surgery with limited diagnostic and perioperative support. It also emphasizes the adaptability and clinical judgment required in such environments to ensure patient safety and favorable outcomes.

This study is important because of the ongoing burden of untreated or late-presenting goiter cases in underserved populations. Socioeconomic factors, cultural beliefs, and limited access to health care services often delay medical consultation, leading to advanced disease presentations. By documenting this case, the study aims to raise awareness of the importance of early detection and timely management, particularly in rural and low-resource settings.

The objective of this report is to describe the clinical presentation, surgical management, and outcome of a patient with a giant multinodular goiter treated in a limited-resource hospital. Additionally, this study seeks to provide insights into the challenges encountered and the strategies used in managing such cases. The findings are expected to contribute to the existing literature and serve as a reference for clinicians working in similar settings, ultimately improving patient care and surgical outcomes.

METHOD

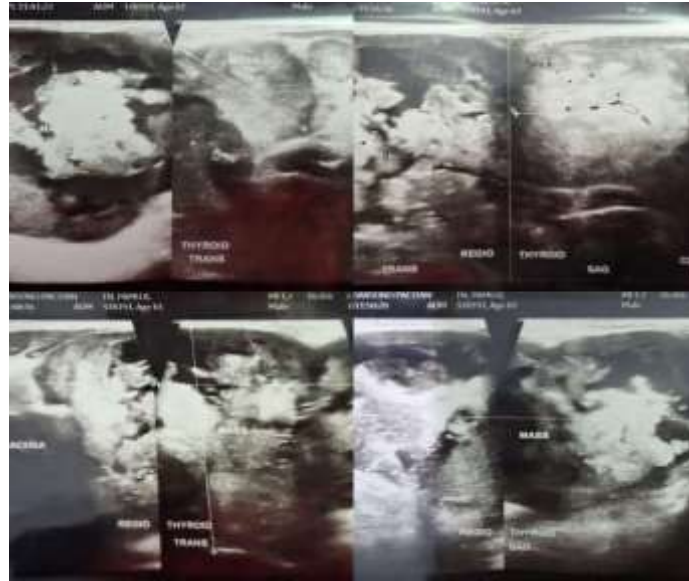
A 61-year-old man presented to the surgical outpatient department of Darsono Hospital Pacitan for evaluation of a large swelling on the right anterior side of his neck. The mass had first appeared 20 years earlier as a thumb-sized nodule and had gradually enlarged into a firm, lobulated solid mass measuring approximately 10 × 10 × 8 cm. The mass extended from below the chin to the suprasternal notch and moved upward with swallowing. The patient reported difficulty swallowing and had visible dilated blood vessels over the mass; however, no palpable cervical lymphadenopathy was found.

Five days before the evaluation, the patient developed shortness of breath, while hoarseness had been present for five years. His medical history was otherwise unremarkable, with no history of chronic disease, previous surgery, trauma, radiation exposure, or family history of similar conditions or malignancy.



Picture 1: Giant goiter before surgical excision

The patient initially sought traditional treatment after friends and family suggested that the condition was caused by supernatural factors. He underwent six months of unsuccessful traditional therapy. Routine blood tests, biochemical tests, and thyroid function tests were within normal limits. However, ultrasonography revealed a markedly enlarged thyroid gland with heterogeneous echotexture, small cystic components, and focal calcifications.



Picture 2. Neck Ultrasonography of Patient

Due to the patient's compressive symptoms and the limited resources available at the facility, computed tomography and fine-needle aspiration cytology could not be performed. Therefore, the patient was scheduled for unilateral thyroidectomy based on the clinical and ultrasonographic findings. Despite the large mass, endotracheal intubation was performed without difficulty. The operation was initiated through a transverse cervical incision placed two fingerbreadths above the suprasternal notch. Because of distorted anatomical landmarks, careful dissection was performed. Subplatysmal flaps were created, followed by dissection between the strap muscles and the thyroid capsule. The goiter was gradually mobilized using careful blunt and sharp dissection with gentle traction, allowing safe separation from the surrounding soft tissues. The affected thyroid lobe was then completely removed.



Picture 3: Giant goiter removed after excision.

The patient was transferred to the general surgical ward for close observation. Tracheostomy was not required because no tracheomalacia was detected. The excised thyroid tissue measured $10 \times 10 \times 8$ cm and weighed 2.6 kg. Histopathological examination confirmed

a colloid goiter. No postoperative signs of hypocalcemia were observed, and the patient had an uneventful seven-day hospital recovery. On the seventh postoperative day, the sutures were removed, and the patient was discharged in stable condition. A one-year follow-up showed a favorable outcome.

RESULT AND DISCUSSION

A goiter is an enlargement of the thyroid gland, and a multinodular goiter describes an enlarged thyroid that contains several nodules ranging from a few millimeters to multiple centimeters in size. While a typical adult thyroid gland weighs between 10 and 25 grams, iodine deficiency remains the leading cause of goiter globally, impacting roughly 200 million of the 800 million people with iodine-poor diets. Research shows that lacking enough iodine is closely linked to serious conditions like endemic cretinism, endemic goiter, and subcretinous intellectual disabilities.

Thyroid gland disorders represent some of the most frequent endocrine issues worldwide, with their global incidence, geographical distribution, and tissue patterns heavily influenced by age, gender, diet, and environmental factors. A wide range of origins can trigger a goiter, including errors in thyroid hormone production, a lack of iodine, autoimmune disorders, and nodular conditions. Endemic goiters specifically develop when the body attempts to remain in a euthyroid state, forcing the thyroid gland to expand due to increased TSH stimulation brought on by insufficient thyroid hormone and paracrine growth factor production.

Thyroid nodules can appear individually or in groups, and they may or may not produce hormones. When a thyroid gland becomes universally enlarged, it can press against the windpipe, food pipe, and the nerve controlling the vocal cords. This pressure can result in breathing difficulties, high-pitched breathing sounds, shortness of breath when lying flat, trouble swallowing, or a raspy voice. These symptoms are especially dangerous if the enlargement extends below the breastbone, as any rapid swelling in that restricted area can severely block the airway. While these signs can also indicate cancerous growths, the likelihood of cancer in a prominent nodule within an enlarged, bumpy thyroid is roughly ten percent. These types of cancers often develop at an incredibly slow pace, remaining undetected for a decade or more.

Operating to remove the tissue is the most effective treatment because it provides instant relief from pressure symptoms. However, given the poor results some patients experience, these complex surgeries should be avoided if a hospital lacks the proper equipment and skilled staff needed for recovery care. While radioactive iodine therapy can shrink a goiter by nearly half, it might not reduce the size enough and can actually cause temporary swelling from fluid buildup. Additionally, this alternative treatment is often inaccessible in poorer nations.

The medical report describes a sixty-one-year-old man who sought treatment for a lump on the front of his neck that had been slowly growing for about forty years. What started as a minor swelling eventually became large enough to cause severe crowding in his throat, resulting in shortness of breath, difficulty swallowing, and a raspy voice. During the physical exam, the doctor noted a large, solid, and bumpy mass about the size of a small grapefruit that stretched from just under his chin down to the top of his breastbone. The lump shifted when the patient swallowed, confirming it was part of the thyroid, and visible surface veins indicated that the mass had a high blood supply and had been causing pressure for a long time.

Blood work showed that the patient's hormone levels were perfectly balanced, meaning his thyroid was functioning normally. An ultrasound revealed a severely swollen thyroid gland filled with varied tissue patterns, fluid-filled pockets, and hardened calcium spots, all pointing to a multinodular goiter. Because the hospital lacked advanced medical equipment, the team could not perform a CT scan or a needle biopsy. This situation highlights a frequent obstacle in low-resource medical facilities, where doctors must rely heavily on their own clinical experience and judgment to make treatment choices.

Using the patient's symptoms and ultrasound results, doctors diagnosed him with a massive multinodular goiter that was compressing his throat, making surgery necessary. The medical team successfully removed the entire thyroid gland while the patient was fully asleep under general anesthesia. During the operation, the immense size of the gland made it difficult to recognize normal throat anatomy. The surgeons had to cut very carefully to protect nearby critical structures, including the parathyroid glands and the nerve controlling the vocal cords. Ultimately, the team overcame these obstacles and finished the surgery with no issues during the procedure.

The removed thyroid gland, which had a mass of 2.6 kg and dimensions of roughly 10x10x8 cm, validated the diagnosis of a giant goiter. A tissue analysis identified it as a benign colloid multinodular goiter with absolutely no signs of cancer. Following the operation, the patient did not experience low calcium levels or breathing difficulties, leading to a smooth recovery. He was discharged from the hospital on his seventh postoperative day and demonstrated excellent health at his one-year follow-up, proving that surgical treatment was highly successful for his condition.

The findings of this case are consistent with previous studies indicating that multinodular goiter commonly presents in older individuals and may remain asymptomatic for years before causing compressive symptoms. The gradual enlargement observed in this patient reflects the natural history of untreated goiter, particularly in regions with iodine deficiency or limited access to healthcare services. The presence of compressive symptoms highlights the importance of timely intervention to prevent life-threatening complications.

In resource-limited settings, the absence of advanced diagnostic tools poses a significant challenge in the management of thyroid disorders. However, this case demonstrates that with thorough clinical evaluation and basic imaging such as ultrasonography, appropriate surgical decisions can still be made. Similar findings have been reported in other studies where reliance on clinical expertise compensated for the lack of sophisticated diagnostic facilities. This underscores the importance of surgical skill and experience in achieving favorable outcomes.

Surgical management remains the gold standard for giant multinodular goiter, particularly when compressive symptoms are present. Although alternative treatments such as radioactive iodine therapy exist, their availability is often limited in low-resource settings and may not provide immediate relief of compressive symptoms. In this case, total thyroidectomy effectively resolved the patient's symptoms and prevented further complications. The absence of postoperative complications further supports the safety and efficacy of the procedure when performed carefully.

This case also highlights the influence of sociocultural factors on healthcare-seeking behavior. The patient initially sought treatment from traditional healers due to cultural beliefs, resulting in delayed medical intervention. Such delays are commonly observed in rural

populations and contribute to the progression of otherwise manageable conditions into advanced stages. Therefore, public health education and awareness programs are essential to encourage early diagnosis and treatment. Overall, this case emphasizes that even in limited-resource settings, successful management of complex surgical cases is achievable with proper clinical assessment, surgical expertise, and careful postoperative care.

CONCLUSION

Preventable medical conditions continue to occur in certain regions of the world, particularly in areas with limited access to basic health care because of social, cultural, financial, and political barriers. Goiters can be prevented or managed effectively when identified at an early stage. The World Health Organization has issued guidelines for preventing iodine deficiency disorders, which should be implemented in rural areas through regular health programs and community education to prevent advanced cases. In this case, unilateral thyroidectomy was performed successfully without major complications. Although the surgical technique used was standard, the procedure was challenging because of the large size of the mass and the distorted anatomy surrounding critical structures. Improving outcomes in unilateral thyroidectomy, which remains widely performed, requires careful evaluation and planning when managing massive goiters. Specifically, safety protocols and appropriate facilities, including adequate equipment and trained personnel, should be prepared in advance. Beyond relieving compressive symptoms and cosmetic concerns, giant goiters should be treated before substernal extension occurs, as sudden enlargement within the confined thoracic inlet may become life-threatening. Thyroidectomy remains an effective, safe, and appropriate treatment for patients with massive multinodular goiters causing compressive symptoms.

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