

Case Report

Huge multinodular goiter with retrosternal extension, a challenge to both surgeon and anesthetist: a case report

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ABSTRACT

Retrosternal goitre, defined as over 50% of the thyroid mass extending below the thoracic inlet, is a rare presentation of goitre. These cases are particularly observed among females in their 5th and 6th decades. Symptoms like breathlessness, facial flushing, and dysphagia, alongside complications like superior vena cava syndrome, increase morbidity. Surgery is the management of choice. While most cases are managed surgically via a cervical approach, some require thoracic intervention due to airway and neurovascular compression, including displacement of critical vessels like the subclavian and carotid arteries. We present a case of 63-year-old female with a huge euthyroid multinodular goiter with no pressure symptoms. Contrast enhanced computed tomography (CECT) neck was suggestive of bilateral enlargement of thyroid nodules, with left sided lobe also getting an additional supply from left brachiocephalic artery. Surgery of retrosternal goitre commonly involves a cervical approach, but thoracotomy maybe needed in cases of malignancy, redo thyroid surgery, or mediastinal goitres. Careful dissection to avoid damage to recurrent laryngeal nerve (RLN) and mediastinal structures is required, especially when nodules extend into the thorax. Tracheomalacia and vocal cord dysfunction, are rare but serious complications. Anesthesia challenges include difficult airway management due to tracheal deviation. Awake fiberoptic intubation is preferred, and patients may require intubation for 24 hours postoperatively due to anticipated airway edema. Large, long-standing retrosternal goitres require thorough preoperative surgical and anesthetic workup, often necessitating ear, nose and throat (ENT) and thoracic surgery backup, with CECT with angiograph aiding operative planning.

Keywords: Retrosternal goitre, Cervical thyroidectomy, Tracheomalacia

INTRODUCTION

Goitre as a neck swelling is common problem worldwide, mostly affecting females in their 5th and 6th decade. Retrosternal goitre is defined as presence of more than 50% of the thyroid mass below the thoracic inlet.¹ Long standing cases have a higher possibility of thoracic approach. In this case report, we discuss a case of massive multinodular goiter with large retrosternal extension displacing the main vessels like subclavian and carotid laterally with compression of the trachea, posing anesthetic and surgical challenges.

Retrosternal goitres are uncommon phenomenon, but they are a source of significant danger due to the compression of airway and critical neurovascular structures, including carotid arteries. Breathlessness and facial flushing are few of the common symptoms due to the compression of these structures. Dysphagia is a late feature. Superior cava syndrome is also an important complication that increases morbidity and risk of mortality.^{2,3} Surgical management is the treatment of choice for retrosternal goiter and is technically difficult in most scenarios. While the majority of cases can be effectively managed through a cervical approach, a minority of them necessitates thoracic approach.

CASE REPORT

A 63-year-old lady presented to our hospital with complaint of painless swelling in the neck for 6 years, with rapid increase in size for past 1 month. Her major concern was cosmetic disfigurement and the gradual increase in size.

She had no concomitant complaints of breathing difficulty, facial flushing, and no features suggestive of hypothyroidism or hyperthyroidism. On examination, right lobe measured 4×8 cm, and left lobe was 10×5 cm, with an enlarged isthmus. Notably, the lower poles of both lobes were not visible during swallowing, and no audible bruits were detected (Figure 1).



Figure 1: Pre-operative image of the patient.

Computed tomography (CT) scan revealed bilateral enlargement of the thyroid lobes, characterized by multiple heterogeneous enhancing nodules. The largest nodule in the right lobe measured 4×4.3×8.3 cm, while the left lobe was 5.8×5.6×12 cm. Non-enhancing cystic areas and coarse calcifications suggested multinodular goiter. The nodules extended into the superior mediastinum, causing displacement of the left and right brachiocephalic veins. Additionally, there was compression of the trachea by both right and left lobes in the intrathoracic part with curvilinear lumen. This was in contrast to the absence of airway symptoms in the patient. There was no evidence of any significant cervical or mediastinal lymphadenopathy (Figures 2a and b). CT Angiography showed that the left lobe thyroid nodules were mainly supplied by branches of left superior and inferior thyroid arteries. Another artery directly arising from the left brachiocephalic artery was seen supplying the left lobe nodules. Indirect laryngoscopy showed mobile bilateral vocal cords. Thyroid function tests and rest of the investigations were within normal limit.

Total thyroidectomy by cervical approach with drain insertion under general anaesthesia was done. Endotracheal intubation was done under fiberoptic guidance due to anticipated difficult airway and curvilinear trachea. Division of isthmus was done after proper exposure of the thyroid, facilitating further handling of the lobes. Dilated veins were present all over the gland. Right lobe was 11 cm in length. More than 70%

of the right thyroid lobe was below the thoracic inlet, with posterior extension. The right recurrent laryngeal nerve was identified and preserved. With gentle dissection, the right lobe was excised. The left lobe was 17 cm in length, with more than 5 cm intrathoracic extension. The left recurrent laryngeal nerve was identified and preserved. The isthmus along with the left lobe was dissected, and the specimen delivered (Figures 3-5).

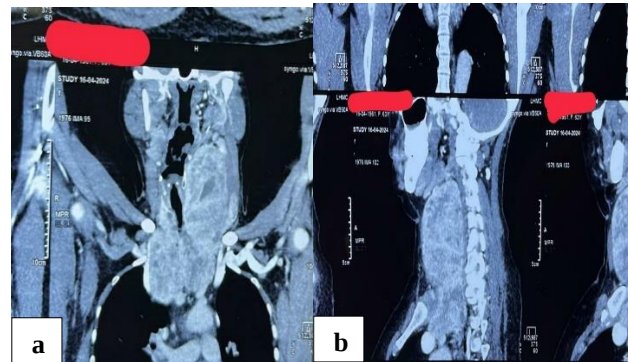


Figure 2 (a and b): CECT Image of the thyroid gland.



Figure 3: Intraoperative image of the thyroid.



Figure 4: Intraoperative image of left lobe (dilated veins visible).

Biopsy report showed follicular nodules with surrounding thyroid parenchyma showing focal lymphocytic thyroiditis.

The postoperative period was uneventful, with patient being extubated after 12 hours without complications. The

drain was removed on post-operative day 2. Patient was started on thyroxine supplementation and is doing fine at 6 months post op (Figure 6).



Figure 5: Specimen of thyroid.



Figure 6: Post-operative image of patient.

DISCUSSION

Retrosternal goitres require meticulous preoperative workup and intraoperative execution for a favourable patient outcome.

Surgical challenges

The surgical approach in most cases is cervical, although the preparations should be made in pre-op period for a sternotomy if required. Anticipation of thoracic approach is necessary, especially in suspected malignancy, redo thyroid surgery, mediastinal blood supply (with anticipated mediastinal bleeding) or primary mediastinal goitre. The division of isthmus aids in delivery of the substernal part of the thyroid, as was done in our case. Extreme care should be taken with dissection in the thorax via the cervical approach, with full regards to avoid breaching the capsule, more so in a case of suspected malignancy. Care should be taken with retrosternal extension of thyroid nodules, as RLN may be displaced and is at a greater risk of injury during surgery. Postoperative complications of thyroidectomy can include hematomas, which may require emergency reoperation and bilateral vocal cord dysfunction necessitating immediate reintubation and tracheostomy. Injuries to

nearby structures like the carotid artery, jugular vein, mediastinal vessels and oesophagus are rare.⁴

Anesthetic challenges

Difficult airway should always be suspected in a large, long-standing retrosternal goitre, due to factors like tracheal deviation and luminal compression at thoracic inlet. Fibreoptic bronchoscopic intubation is the preferred approach in such cases. Teams from ENT department should be available for airway management should the attempt at intubation fail, and thoracic surgeon should be present if a thoracic approach is required. In these patients, due to tracheal deviation and anticipated airway edema, it is preferred to keep the patient intubated for at least 12 hours electively in the post-operative period.⁵

CONCLUSION

Large long standing retrosternal goitres pose formidable surgical and anesthetic challenges, with need for ENT and Thoracic surgery backup being essential in selected cases. CECT neck and thorax is significant in analysing the intrathoracic extension and relation to major vessels and aberrant blood supply; thereby facilitating the operative plan. Cervical approach is feasible in more than 95% cases of retrosternal goitre. There is a need of thorough pre-operative surgical and anesthetic workup due to expected airway difficulty during intubation as well as extubation.

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REFERENCES

1. Simó R, Nixon IJ, Vander Poorten V, Quer M, Shaha AR, Sanabria A, et al. Surgical management of intrathoracic goitres. *Eur Arch Oto-Rhino-Laryngol.* 2019;276: 305-14.
2. Sorouri S, Akbarianrad S, Naseri M. A case report of massive retrosternal goiter in a 54-year-old woman with symptoms of head and neck swelling and dyspnea. *Clin Case Rep.* 2024;12(6).
3. Di Crescenzo V, Vitale M, Valvano L, Napolitano F, Vatrella A, Zeppa P, et al. Surgical management of cervico-mediastinal goiters: Our experience and review of the literature. *Int J Surg.* 2016;28:S47-53.
4. Lal G, Clark OH. Thyroid, Parathyroid, and Adrenal. In: F. Charles Brunicaudi, editors. *Schwartz's Principles of Surgery.* 11th edition. New York, NY: McGraw Hill. 2019;1661-3.
5. Pan Y, Chen C, Yu L, Zhu S, Zheng Y. Airway management of retrosternal goiters in 22 cases in a tertiary referral center. *Therapeutics and Clinical Risk Management.* 2020;20:1267-73.

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