

Giant Intrathoracic Goiter of Atypical Presentation: A Case Report

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María B. Iriarte¹, Eliana I. Morales^{1,2} , Mauricio Velásquez^{1,3},
Valeria Zúñiga⁴, Luz F. Sua^{1,5} and Liliana Fernández-Trujillo^{1,6}

¹Faculty of Health Sciences, Universidad Icesi, Cali, Colombia. ²Department of Internal Medicine, Pulmonology Service, Fundación Valle del Lili, Cali, Colombia. ³Department of Surgery, Thoracic Surgery Service, Fundación Valle del Lili, Cali, Colombia. ⁴Clinical Research Center, Fundación Valle del Lili, Cali, Colombia. ⁵Department of Pathology and Laboratory Medicine, Fundación Valle del Lili, Cali, Colombia. ⁶Department of Internal Medicine, Pulmonology Service, Interventional Pulmonology, Fundación Valle del Lili, Cali, Colombia.

ABSTRACT

BACKGROUND: The term goiter is used to describe any abnormal growth of the thyroid gland, which can be diffuse or nodular, and can be associated with normal, diminished, or increased thyroid function. Multinodular goiter is a common disease whose prevalence increases at age 50. Clinical manifestations can be due to thyroid function impairment or related to size and location of the gland with compressive symptoms. Intrathoracic location is less frequent, can be mistaken with pulmonary lesions and usually implies a difficult surgical approach.

CASE PRESENTATION: A 66-year-old woman with a history of subtotal thyroidectomy presented with 7-month dyspnea, dry cough. There was no evidence of neck masses, or jugular engorgement. Physical examination was normal. Chest x-ray showed an 11 cm mass in the upper right hemithorax. Computed tomography (CT)-scan, showed calcifications, and compression of the superior vena cava without infiltration, the right subclavian vein and left displacement of the trachea. Distinction between intrapulmonary or mediastinal location was not clear. Biopsy showed thyroid origin, and bilateral thoracotomy was performed with confirmation of a giant multinodular goiter.

CONCLUSIONS: Intrathoracic goiter should undergo surgical or ablative management if compressive symptoms of the airway and cervical or thoracic vessels are present. The large size of the tumor along with the presentation after thyroidectomy and the seeming location in the right upper lobe made this particular case striking. Specially in the elderly, multidisciplinary perioperative management is key for a successful recovery.

KEYWORDS: Goiter, substernal, nodular, thoracotomy

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CORRESPONDING AUTHOR: Liliana Fernández-Trujillo, Department of Internal Medicine, Pulmonology Service, Interventional Pulmonology, Fundación Valle del Lili, Avenida Simón Bolívar. Cra. 98 No. 18-49, Tower 6th, 4th floor. Cali, 760032, Colombia. Email: liliana.fernandez@fvl.org.co; lilianafernandeztrujillo@gmail.com

Introduction

Goiter is defined as the abnormal growth of the thyroid gland diffusely or nodularly. The normal thyroid gland is caudal to the larynx in the anterolateral portion of the trachea and is covered by the thin muscles of the neck, subcutaneous cell tissue and skin, therefore the growth of its lobes usually occurs up and out in the neck where there is less resistance. Intrathoracic goiter represents about 5% of all resected mediastinal tumors,^{1,2} defined as the growth of more than 50% of the thyroid tissue below the thoracic operculum.³ In most cases, it is located in the anterior mediastinum.⁴ Clinical presentation includes dyspnea, palpable cervical mass, odynophagia, dysphagia, dysphonia, stridor and superior vena cava syndrome.² Chest x-ray and computed tomography (CT)-scan are useful for locating the lesion, identifying its limits and defining the best surgical approach.

Case Report

A 66-year-old, non-smoking woman, with a history of subtotal thyroidectomy 33 years ago due to a thyroid nodule.

Consultation with a 7-month moderate dyspnea associated with dry cough in the last 3 months. At admission, vital signs were normal; she had no retractions, cyanosis, or stridor. No evidence of neck masses, or jugular engorgement, no edema or collateral circulation, normal auscultation, and normal abdominal physical examination. Chest x-ray showed an 11 cm mass in the upper right hemithorax with regular edges. In the chest CT scan, the heterogeneous rounded lesion showed calcifications inside, 11 cm in diameter, which compressed the superior vena cava without infiltration, the right subclavian vein and displaced the trachea to the left (Figure 1). Due to the size of the lesion, it was very difficult to differentiate whether it was of mediastinal origin or one of intrapulmonary behavior. In addition, a thyroid gamma scan was performed showing infrastrernal uptake suggestive of supernumerary thyroid glands. A CT-guided biopsy was performed from which four fragments were obtained. H&E staining showed no pathological alteration. Immunohistochemistry showed positive TTF-1 which confirms thyroid gland origin. After a multidisciplinary



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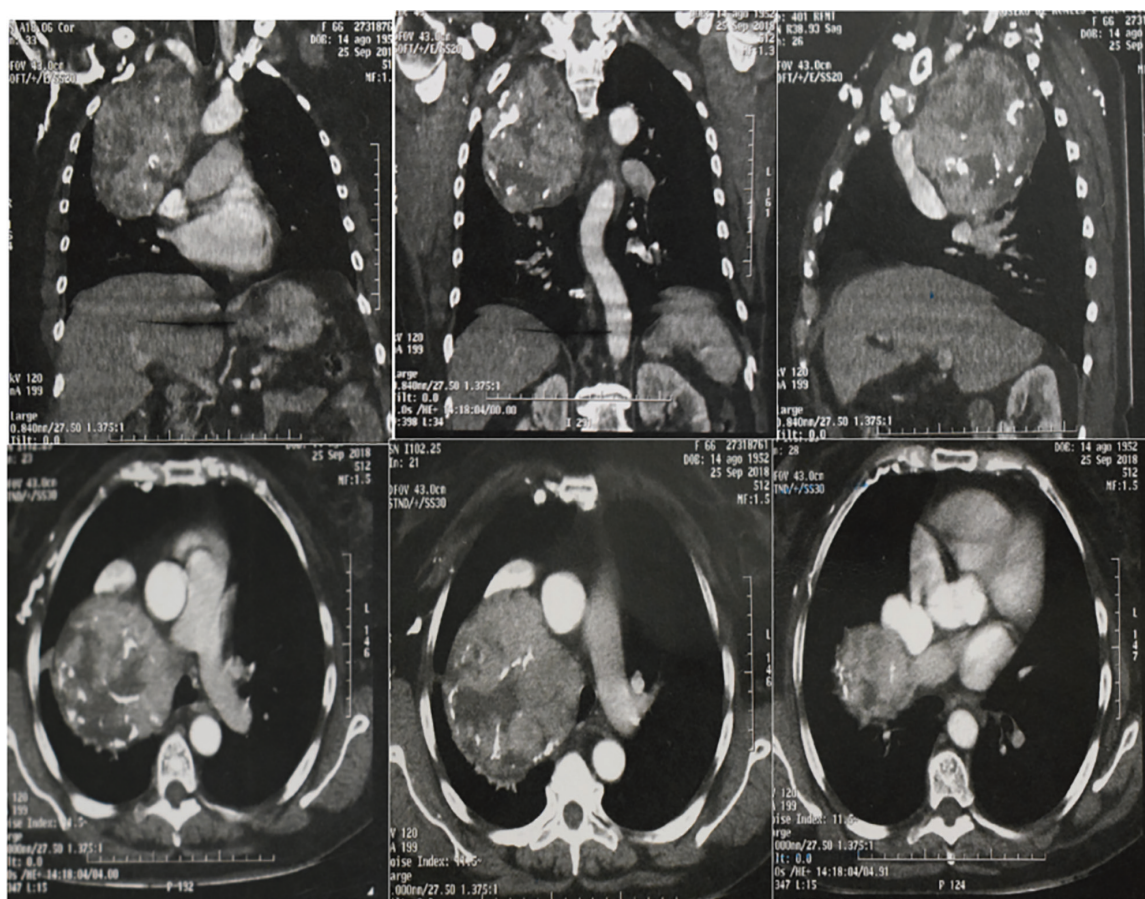


Figure 1. Different projections of the CT scan of the chest where the rounded lesion of defined edges of 11 cm in diameter can be seen in the projection of the right superior lobe of heterogeneous aspect and with calcifications inside.

assessment, a resection of the mass via bilateral thoracotomy was decided, in which the mediastinum and right hemithorax were exposed. Intraoperative findings showed a 16 cm mass of cystic content with large desmoplastic reaction, from the mediastinum which displaced the lung and great vessels but did not infiltrate them. The final histopathological diagnosis was of thyroid tissue with findings of multinodular goiter, without signs of malignancy, with cystic dilations containing colloid material, chronic inflammation and presence of foamy histiocytes (Figure 2). The patient had adequate postoperative clinical evolution.

Discussion and Conclusion

Intrathoracic goiter represents about 5% of all mediastinal tumors. The incidence of multinodular goiter increases after age 50,^{1,2} is more prevalent in women, has intrathoracic extension, and at least 50% of the thyroid mass is located under the suprasternal fossa or the fourth thoracic vertebra.³ It can be ectopic or more frequently, acquired,^{3,4} which originates in the cervical thyroid gland and descends through the fascial plane to the mediastinum.⁵ Usually, it is located in the upper mediastinum, although it can be retrotracheal or retroesophageal, producing different symptoms.⁴ Clinical presentation is very diverse and nonspecific, therefore diagnostic images are required.

Chest radiography assesses the location of the mediastinal mass, the displacement or compression of adjacent structures and the presence of calcifications⁵; chest CT is better to characterize limits with intrathoracic structures, it is useful to identify the etiology and plan the best surgical approach. Finally, thyroid gamma scan is used to estimate the functional state, nature, and extent.⁶ It is usually recommended to perform a fine needle biopsy in the cervical location goiters, and in the intrathoracic ones, this is useful for histological analysis prior to surgery.^{7,8}

Whenever obstructive symptoms or compression of cervical and thoracic vascular structures occur, surgical or ablative management is recommended.^{9,7} In some cases, mass resection is performed in order to prevent future obstruction, and it is mandatory when there is high suspicion of malignancy.⁵ Histopathology frequently shows benign lesions, and less than 10% are malignant tumors that generally occur in the elderly.¹ Approximately 50% accounts for multinodular goiter, as in our patient, where iodine deficiency and altered thyroxine synthesis favor tumor growth.² Other causes of intrathoracic goiter are follicular adenoma and chronic autoimmune thyroiditis; therefore, it is important to complete the pathological study including immunohistochemistry.^{1,3}

In cases of intrathoracic goiter, resection can be done by median sternotomy, posterolateral thoracotomy or bilateral

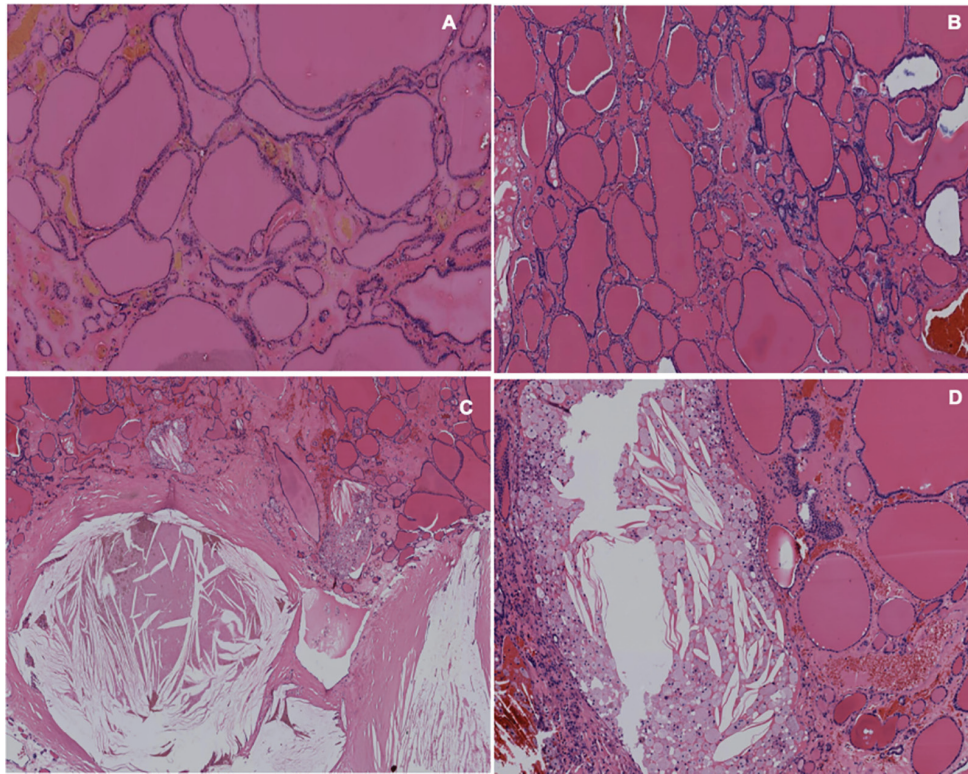


Figure 2. A, B. H&E staining: thyroid tissue with cystic dilations and colloid material is identified. C, D. H&E staining: a cystic lesion with chronic inflammation, cholesterol crystals, and foamy histiocytes is observed.

thoracotomy, as planned with our patient.¹⁰ In the cases where large goiters are present, during the surgical approach the weight of the mass must be considered, for it can lead to large vessel compression and/or trigger an intraoperative arrest; therefore, it is safer to place the patient in supine position, for a better control of the great vessels and the opposite lung. Also, in this case, it was considered that sternotomy offered a difficult approach, for which bilateral thoracotomy was performed.

These lesions are much vascularized and are adjacent to large vascular structures; for it is necessary to anticipate bleeding taking into account the possible difficulties in intubation and ventilation secondary to the distortion of the upper airway, in the pre-anesthetic assessment.¹¹ Most cases are euthyroid. In the presence of a toxic goiter, radioactive iodine treatment can be performed in patients with high surgical risk who are not candidates for the interventions described.^{2,7,8} Complications associated with surgical management are nerve injuries, bruises, infections, hypoparathyroidism, and airway injuries.

In conclusion, intrathoracic goiters are usually benign lesions that should undergo surgical or ablative management when compressive symptoms of the airway and cervical or thoracic vessels are present. The large size of the tumor along with the presentation after thyroidectomy and the seeming location in the right upper lobe make this particular case striking. In the elderly, the decision of resection must be accompanied by careful and well-planned multidisciplinary perioperative management to guarantee a successful recovery.

Author Contributions

All authors have significantly contributed to the paper: L.F.T. contributed to the conception and design, literature review, manuscript writing and correction, and final approval of manuscript. M.B.I. contributed to the conception and design, literature review, manuscript writing and correction, and final approval of manuscript. E.I.M. contributed to conception and design, literature review, and final approval of manuscript. M.V. contributed to conception and design, literature review, and final approval of manuscript. V.Z. contributed to literature review, manuscript writing and correction, and final approval of manuscript. L.F.S. contributed to conception and design, literature review, manuscript writing and correction, and final approval of manuscript.

Availability of Data and Materials

All data and material are available for sharing if needed.

Consent for Publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Ethics Approval and Consent to Participate

This report was prepared in accordance with the ethical standards of the institutional ethics committee and with the 1964 Helsinki Declaration. We have approval letter of Ethics

Committee in biomedical research IRB / EC No. 200-2019 of the Fundación Valle del Lili to publish this manuscript.

ORCID iDs

Eliana I. Morales  <https://orcid.org/0000-0001-5868-0377>

Liliana Fernández-Trujillo  <https://orcid.org/0000-0003-0789-9154>

REFERENCES

- Huang WC, Huang C-H, Hsu C-H, et al. Intrathoracic goiter in elderly patients. *Int J Gerontol*. 2013;7:8-12.
- Schlumberger MJ, Filetti S, Alexander EK, Hay ID. Nontoxic diffuse goiter, nodular thyroid disorders, and thyroid malignancies. In: Melmed S, Koenig R, Rosen C, Auchus R, Goldfine A, eds. *Williams Textbook of Endocrinology*. 13 ed. Philadelphia, PA: Elsevier; 2016:449-488.
- Katlic MR, Grillo HC, Wang CA. Substernal goiter: analysis of 80 patients from Massachusetts General Hospital. *Am J Surg*. 1985;149:283-287.
- Foroulis CN, Rammos KS, Sileli MN, Papakonstantinou C. Primary intrathoracic goiter: A rare and potentially serious entity. *Thyroid*. 2009;19:213-218.
- Mahajan MS, Negi DS, Sharma R. Incidental diagnosis of primary intrathoracic goiter on radionuclide 99m-tc pertechnetate radioisotope thyroid scan. *Thyroid Res Pract*. 2012;9:96-98.
- Wong KT, Choi FP, Lee YY, Ahuja AT. Current role in radionuclide imaging in differentiated thyroid cancer. *Cancer Imaging*. 2008;8:159.
- Chen AY, Bernet VJ, Carty SE, et al. American Thyroid Association statement on optimal surgical management of goiter. *Thyroid*. 2014;24:181-189.
- Aguiar-Quevedo K, Cerón-Navarro JJ, Jordá-Aragón C, et al. Bocio intratorácico. *Revisión de la Literatura Médica*. 2010;88:142-145.
- White ML, Doherty GM, Gauger PG. Evidence-based surgical management of substernal goiter. *World J Surg*. 2008;32:1285-1300.
- Hashemy AA, Gallo R, Shah MT, et al. Giant intrathoracic goitre: The challenges. *Int J Surg Open*. 2016;2:6-10.
- Vaiman M, Bekerman I, Basel J, Peer M. Surgical approach to the intrathoracic goiter. *Laryngoscope Investig Otolaryngol*. 2018;3:127-132.