

Colossus in the thorax: the story of a giant subesternal goiter

Coloso en el tórax: la historia de un bocio subesternal gigante

Luis Roberto Hernández Mercado[1]
Yolmarc Alberto Martínez Velazco[1]
Jaime Adolfo Arévalo Carrillo[1]
María Fernanda Oviedo Lara[1]
Jorge Mario Carrillo Sáenz[2]
https://doi.org/10.53903/01212095.359

Key words (MeSH)

Goiter substernal
Thyroid hormones
Tomography
Dyspnea
Trachea

Palabras clave (DeCS)

Bocio subesternal
Hormonas tiroideas
Tomografía
Disnea
Tráquea

Summary

Substernal goiter is a type of goiter in which the thyroid gland extends into the chest, below the sternal notch, protruding into the mediastinum and sometimes exerting pressure on adjacent structures. We present the case of a 70-year-old female patient who consulted the emergency room for a 10-day history of dry cough and odynophagia, with no other associated symptoms. Physical examination revealed telangiectasias in the neck. She reported a history of hypothyroidism at the time of consultation. Imaging studies such as a chest X-ray and CT scan were performed, which showed findings compatible with a substernal goiter.

Resumen

El bocio subesternal es un tipo de bocio en el cual la glándula tiroides se extiende hacia el tórax, por debajo de la escotadura esternal protruyendo hacia el mediastino, en ocasiones ejerciendo presión sobre las estructuras adyacentes. Se presenta el caso de una paciente de 70 años de edad que consulta al servicio de urgencias por un cuadro clínico de diez días de evolución, caracterizado por tos seca y odinofagia, sin otros síntomas asociados. Al examen físico se observan telangiectasias en el cuello. Refiere antecedente de hipotiroidismo al momento de la consulta. Se realizaron estudios imagenológicos como radiografía y tomografía de tórax, en los que se evidenciaron hallazgos compatibles con un bocio subesternal.

Introduction

Goiter is characterized by abnormal growth of the thyroid gland. Normally, it is located just below the larynx, in the anterolateral portion of the trachea, protected by the anterior neck muscles, subcutaneous tissue, and skin. When the thyroid lobes increase in size, they tend to grow in different directions, most frequently upward and forward where there is less resistance (1). Substernal goiter, defined as thyroid tissue growth greater than 50% below the thoracic operculum, accounts for about 5% of resected mediastinal tumors (2). Its most common location is in the anterior mediastinum (3). They may be asymptomatic or manifest symptoms such as dyspnea, palpable cervical mass, odynophagia, voice changes, and, in severe cases, superior vena cava syndrome (4). Imaging studies, such as chest X-rays and computed tomography (CT), are essential for identifying, locating, and defining the margins of the lesion and for accurately planning the most appropriate surgical approach.

Case report

A 70-year-old female patient presented to the emergency department with a ten-day history of dry cough and odynophagia, with no other associated symptoms. She reported a history of hypothyroidism under treatment. On examination, telangiectasias were observed in the neck region. Palpation revealed no relevant abnormalities such as palpable masses or pain on pressure. A chest X-ray was performed, which revealed radio-opacity in the right hemithorax, accompanied by mediastinal widening (Figure 1). Subsequently, a chest CT scan was performed, which showed a large mass in the anterior region of the neck with intrathoracic extension, of non-homogeneous density, some areas of low density and others of high density, with displacement of the esophagus and large vessels. These findings were consistent with thyroid goiter with intrathoracic extension (Figure 2). A fine-needle aspiration biopsy (FNAB) was performed, revealing colloid, macrophages, and some groups of follicular cells without atypia forming macrofollicles, resulting in findings consistent with goiter (Bethesda Category II).

The patient underwent surgery to remove the goiter, a procedure successfully performed by a multidisciplinary team of thoracic and head and neck surgeons. The surgical team planned a comprehensive approach to address both the cervical and thoracic

[1]General practitioner, Universidad de Pamplona. Pamplona, Colombia.

[2]Radiology and Diagnostic Imaging Resident, Hospital Nacional Alejandro Posadas. Buenos Aires, Argentina.

Institution to which the work is attributed: Hospitalization Service, Clínica Salud Social. Sincelejo, Colombia.

regions. Subsequently, material was sent for histopathological study, which showed thyroid follicles of varying sizes, containing colloid, lined with cuboidal epithelial cells, without cellular atypia; findings consistent and concordant with thyroid goiter (Bethesda Category II) (Figure 3).

Discussion

Substernal goiter was first described by Albrecht van Haller (1749), who defined it as the extension of the thyroid gland below the level of the thoracic operculum (5). Substernal goiter has a cervical origin and accounts for approximately 99% of substernal goiters (6). The incidence of this condition increases after the sixth decade of life, is much more common in females, has intrathoracic extension, and generally more than half of the thyroid mass is located below the suprasternal notch or the fourth thoracic vertebra (4). About 80-90% of substernal goiters are located in the anterior mediastinum and 10-15% in the posterior mediastinum. Unilateral expansion is more common, but bilateral extension is also found (7).

The clinical presentation is very diverse and broad, requiring diagnostic imaging. Chest X-rays are essential, as they assess the presence of a mediastinal mass, as well as compression or displacement of nearby structures. On the other hand, CT is much more effective and accurate in defining the boundaries of the mass and its proximity to chest structures, and plays a fundamental role in the precise planning of the surgical approach (8).

A giant substernal goiter can cause a variety of symptoms, such as breathing difficulties, vascular compression, dysphagia, and even sudden death. In some patients, preventive resection is performed to avoid future complications, and when malignancy is suspected, resection should be performed in all cases. Histopathologically, benign lesions characteristic of goiter are usually observed, and less than 10% of cases are malignant lesions, which generally occur in older adults. The surgical approach in cases of substernal goiter can be performed by median sternotomy, posterolateral thoracotomy, or bilateral thoracotomy, as planned by the multidisciplinary team (4).

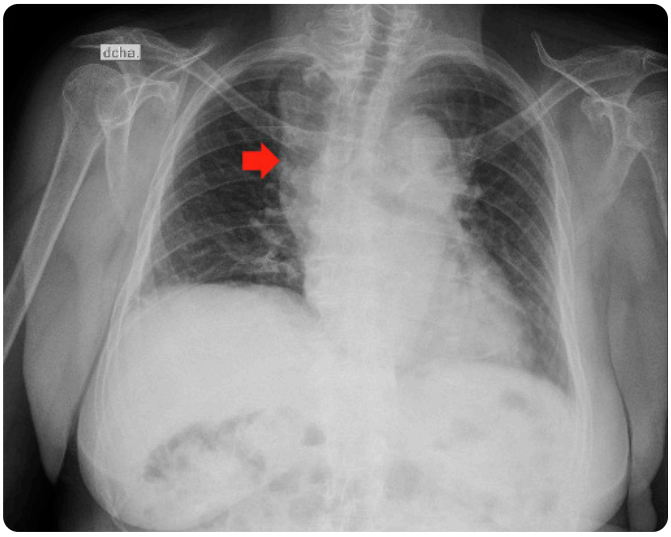


Figure 1. Chest X-ray, single anteroposterior projection, showing upper right mediastinal widening with tracheal displacement (red arrow).

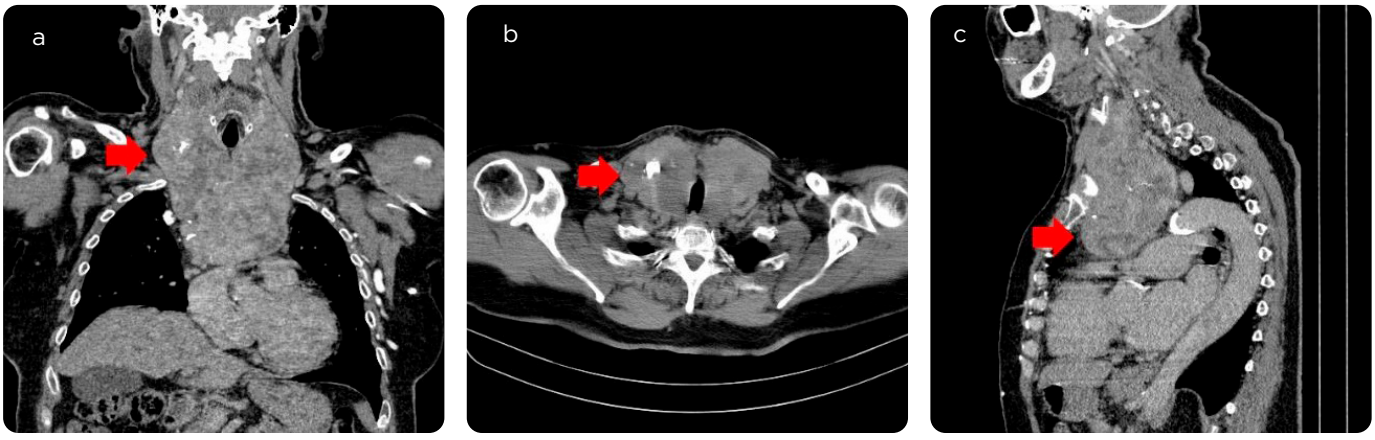


Figure 2. CT scan. a) Coronal section, b) axial section, and c) sagittal section. A large mass is observed in the anterior region of the neck with intrathoracic extension, with heterogeneous density including areas of low density, intermediate density, and some dystrophic calcifications. The goiter protrudes into the anterior mediastinum, displacing the trachea and vascular structures.

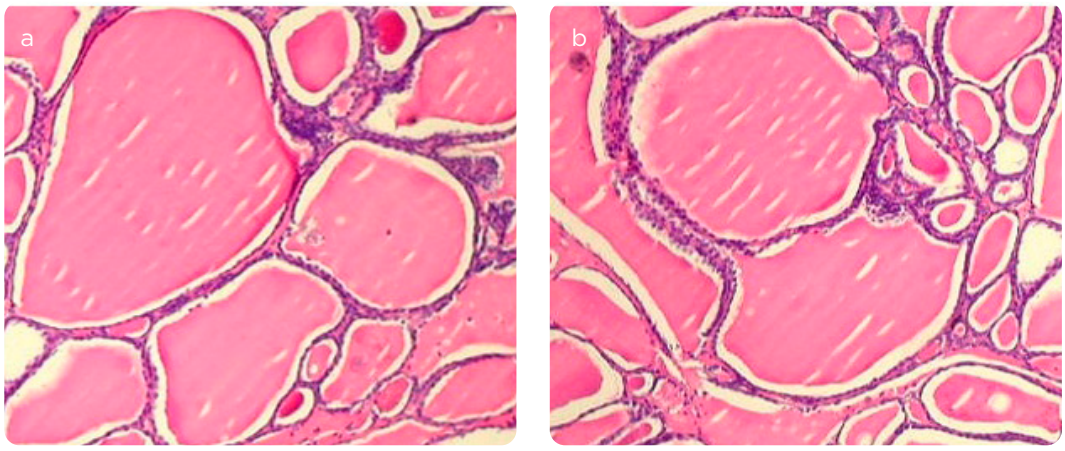


Figure 3. a and b) Histopathological image of the goiter: large, distended follicles and other smaller ones with colloid inside, lined with simple cuboidal epithelial tissue.

Surgical complications from resection can be classified as short-term, medium-term, and long-term. Short-term complications include transient hypocalcemia, temporary injury to the recurrent laryngeal nerve, hemorrhage, and infection. In the medium and long term, permanent hypoparathyroidism and permanent damage to the recurrent laryngeal nerves may occur. However, surgical success is mainly evaluated by the completion of the procedure and the absence of symptoms in the patient, which improves their quality of life and overall biopsychosocial well-being (1).

Conclusion

In conclusion, the case of the patient with substernal goiter presents significant complexity due to the location and possible complications associated with this pathology. The patient's surgical procedure was successful, with good postoperative evolution and no significant complications; the need for a multidisciplinary team to optimize results is highlighted. Close follow-up of the case is essential, considering both the risks inherent in surgery and the possibilities of postoperative recurrence. This report highlights the importance of early diagnosis and adequate surgical planning to optimize patient outcomes and recovery.

References

1. Huang WC, Huang CH, Hsu HS, et al. Intrathoracic goiter in elderly patients. International J Gerontol. 2013;7(1):8-12. https://doi.org/10.1016/j.ijge.2012.01.027
2. Maloof F, Wang CA, Vickery AL Jr. Nontoxic goiter-diffuse or nodular. Med Clin North Am. 1975;59(5):1221-32. https://doi.org/10.1016/s0025-7125(16)31970-8
3. Unlu MT, Aygun N, Kostek M, et al. Substernal goiter: From definitions to treatment. Sisli Etfal Hastan Tip Bul. 2022;56(2):167-76. https://doi.org/10.14744/semb.2022.30806
4. Iriarte MB, Morales EI, Velásquez M, et al. Giant intrathoracic goiter of atypical presentation: a case report. Clin Pathol. 2020;13. https://doi.org/10.1177/2632010X20916741
5. Rugiu MG, Piemonte M. Surgical approach to retrosternal goitre: do we still need sternotomy? Acta Otorhinolaryngol Ital. 2009;29(6):331-8. PMID: 20463839
6. Mack E. Management of patients with substernal goiters. Surg Clin North Am. 1995;75(3):377-94. https://doi.org/10.1016/s0039-6109(16)46628-4
7. Knobel M. An overview of retrosternal goiter. J Endocrinol Invest. 2021;44(4):679-91. https://doi.org/10.1007/s40618-020-01391-6
8. Mahajan MS, Digamber NS, Rajkumar S. Primary intrathoracic goiter: Incidental diagnosis on 99m-Tc pertechnetate radioisotope thyroid scan. Indian J Endocrinol Metab. 2012;16(6):1063-6. https://doi.org/10.4103/2230-8210.103047

Correspondence

Luis Roberto Hernández Mercado
Calle 14 # 22b-81 Corozal, Sucre, Colombia
luirrohernandez@gmail.com

Received for evaluation: January 22, 2024
Accepted for publication: April 26, 2024