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CLINICAL COMMUNICATION

Chylothorax linked to goiter solved by transcervical total thyroidectomy without sternotomy



Quilotorax provocado por un bocio resuelto mediante tiroidectomía total con abordaje cervical sin esternotomía

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Introduction

Chylothorax due to goiter is an exceptional compressive complication; compressive goiter usually causes narrowing of the trachea and compression of the esophagus or jugular vein. Because of anatomical relationship, right-side chylothorax is caused by a very large and low-lying goiter. In those cases usually the surgical approach is a sternotomy instead of transcervical thyroidectomy, that is associated with more surgical complication.^{1,2} We describe the case of an 85-year-old woman, with a chylothorax caused by a large substernal goiter compressing the trachea and the thoracic duct, solved by a transcervical thyroidectomy without the need for neither sternotomy nor thoracic duct repair.

Case report

An 85-year-old woman was attended at emergency department because two days ago she had progressive dyspnea

and noisy breath sounds, without fever, cough, sputum or chest pain. Previously she had an excellent functional status. On physical examination the only remarkable findings were oxygen saturation: 92%, heart rate: 108 bpm, respiratory rate: 24 rpm, dispersed wheezing and decreased sound of the low right hemithorax, without stridor or crackles. Her usual treatment was enalapril (20 mg/d) and methimazole (2.5 mg/d). A chest X-ray showed a big mediastinal mass that caused tracheal deviation to the right, a right pleural effusion and a left diaphragmatic elevation (Fig. 1). The neck and chest computer tomography disclosed a big goiter that had grown into the thoracic cavity reaching the aortic arch, the medial side of the aorta and the carina tracheae. At thoracic inlet the thyroid surrounded the trachea completely and narrowed it. On the right there was a pleural effusion (Fig. 2). Laboratory tests (full blood count, serum glucose, creatinine, protein, albumin, lactic dehydrogenase, cholesterol, triglycerides and TSH) on admission were normal. The ultrasound guided thoracenteses showed a milky fluid, the pleural fluid analysis (pH, nucleated cell count, glucose, cholesterol and LDH) were normal except for triglycerides 726 mg/dl. The diagnosis was right-side chylothorax related to goiter.

More than 30 years ago she had been diagnosed with non-toxic goiter. Six years ago subclinical hyperthyroidism was

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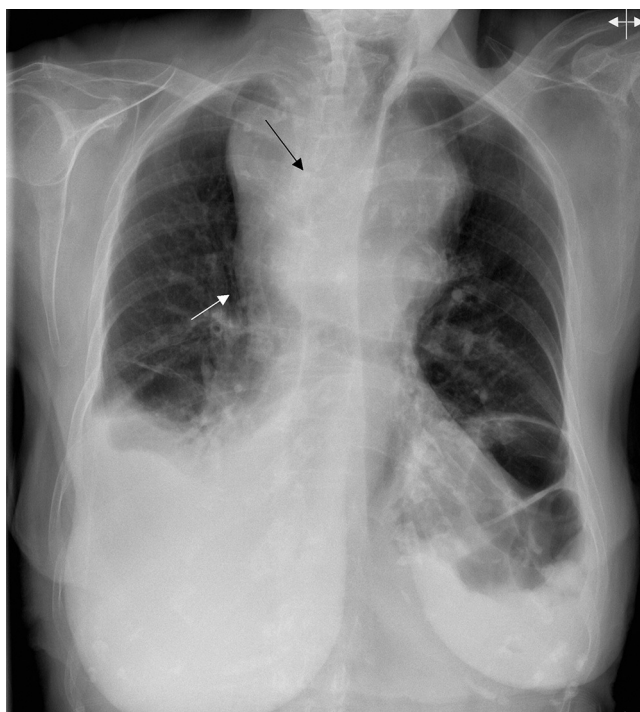


Figure 1 Chest X-ray: a right pleural effusion and a paratracheal mass deviating the trachea to the right and narrowing it (arrows).

detected in serial thyroid function test (TSH: 0.01 mU/L, free T4 1.45 ng/dl). Patient was asymptomatic, without thyroid dysfunction or obstructive symptoms. Goiter was neither visible nor recognized by cervical palpation. Pemberton's maneuver was negative. Antibodies to thyroglobulin, thyroid peroxidase and TSH receptor were negative, and radioiodine uptake on scintigraphy was low-near absent. On chest X-ray there was a big mass causing superior mediastinal widening with gross calcifications, tracheal narrowing on

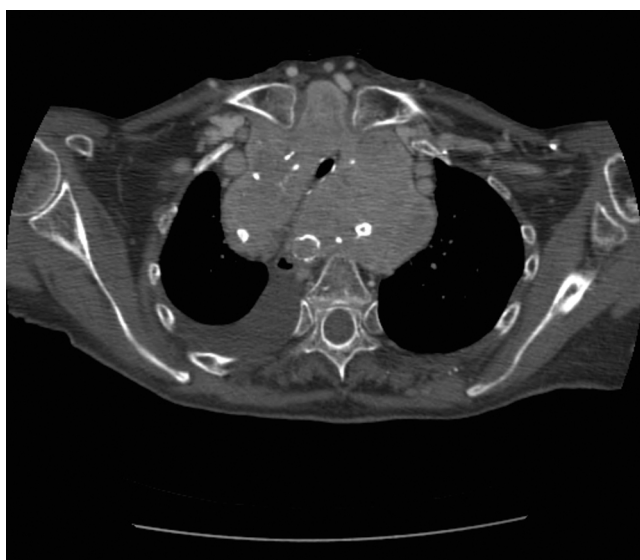


Figure 2 Cervical-thorax CT scan: pleural effusion in the right. Large substernal goiter surrounding, deviating and narrowing the trachea.

its second third, and great deviation to the right, and left diaphragmatic elevation was present too. The neck and chest computer tomography without contrast was similar to the above CT scan description, except that pleural effusion was absent. The diagnosis was big compressive toxic goiter. Initial treatment was methimazole (5 mg/d). She was afraid of surgical complications and refused surgery. In this case radioiodine therapy was not an option because uptake on scintigraphy was very low. She continued with 5 mg of methimazole and left endocrinology revisions.

When chylothorax appeared, surgical treatment was proposed again. Preoperative bronchoscopy showed a significant tracheal stenosis 4 cm below the vocal cords, causing a 25–30% reduction of the tracheal lumen. An expert surgeon performed a near-total thyroidectomy with transcervical approach and manual thyroid removal. Sternotomy was not required. There was no any surgical complication. The pathology was benign multinodular goiter, that weighted 300 g. One week later the patient was asymptomatic. One month later chest X-ray showed pleural effusion had disappeared, left diaphragmatic elevation persisted, and tracheal deviation to the right was significantly smaller than prior to surgery.

Discussion

Substernal or retrosternal goiter refers to an enlargement of the thyroid that has grown through the inlet into the thoracic cavity. The trachea, esophagus and blood vessels may be displaced. When the enlargement is bilateral, especially if the goiter extends posterior to the trachea, it may cause concentric narrowing of the trachea and compression of the esophagus, jugular vein and exceptionally the thoracic duct.

The most common complaint in patients with obstructive substernal goiter is exertional dyspnea.³ Stridor or wheezing at rest appears when the tracheal compression becomes severe (luminal diameter less than 5 mm). Other symptoms frequently induced by obstructive goiter are dysphagia obstructive sleep apnea, cough, and hoarseness.

Chylothorax due goiter is an exceptional manifestation, there are only four cases reported in the English literature,^{4–7} the presumed mechanism is external compression of the thoracic duct. Because the thoracic duct crosses the mediastinum at the fifth thoracic vertebral body, a right-side chylothorax caused by a goiter needs a very large and very low-lying one. It explains why chylothorax is a rare compressive goiter complication. Before pleural effusion was present other symptoms due to upper airway obstruction occur, and probably the goiter is treated early. Clinical manifestations usually are similar to tracheal compression symptoms: progression decreases exercise tolerance and dyspnea. Measurement of the pleural triglyceride content collected by thoracentesis is key to the diagnosis, a concentration greater than 110 mg/dl strongly supports it.

Independently of chylothorax, decision on the correct definitive treatment of an old adult patient with a compressive goiter is a challenger. Surgery is the best option when obstructive symptoms are present; nevertheless it is not free of complications. Surgery of substernal goiter is associated with higher complication rates than surgery for cervical goiters.¹ Major complications are recurrent laryngeal

nerve injury (if it is bilateral with bilateral vocal cord paralysis tracheostomy is required), hypoparathyroidism (more common when goiter is extensive and anatomic landmarks are obscured) and tracheomalacia (due to pressure-induced destruction of tracheal rings by the goiter) that may collapse airway during the postoperative period. Patients with substernal goiter are older with greater surgical risk, specially if sternotomy is required (more probably in very large substernal goiters²).

Radioiodine (¹³¹I) is an option for patients who are poor operative candidates (i.e. elderly patients) or do not want to undergo surgery if obstructive goitrous tissue is functional on thyroid radionuclide imaging. The reduction on thyroid volume may be 30–60% within one to two years of therapy.⁸ In this case radioiodine was not an option because radioiodine uptake on scintigraphy was low-near absent.

Chylothorax was symptomatic, causing her dyspnea. The only therapeutic option was surgery. The current case had significant thyroid extension in both the posterior and inferior direction but could be removed with transcervical thyroidectomy with careful manual dissection without sternotomy. Of the four cases of chylothorax associated with substernal goiter reported previously, only one was completely solved by transcervical total thyroidectomy.⁷

This case highlights this rare complication and the potential surgical treatment. In clinical practise elderly patients with large compressive goiter and narrowed trachea are very frequent. Physician and patients are afraid of surgical complications in this kind of goiters because sternotomy is anticipated. This case reveals that a few aggressive approaches, like transcervical thyroidectomy, are feasible.

Conflict of interest

The authors declare no conflict of interest.

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