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Case Report
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Symptomatic Ectopic Middle Mediastinal Thyroid Resected by Robotic Thoracic Surgery - Case Report

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Abstract

A case of middle mediastinal symptomatic ectopic thyroid mass in a 63 years old female, resected successfully with robotic thoracic surgery, was presented and discussed.

Keywords: Robotic thoracic surgery; Ectopic thyroid tissue; Thyroid gland

Introduction

Ectopic Thyroid Tissue (ETT) is a rare condition associated with abnormal migration of the thyroid gland, from the floor of the primitive gut to the neck, during fetal development. Its prevalence is about 1 per 100,000 to 300,000 people and 1 per 4,000 to 8,000 with thyroid disease. It occurs prevalently from 5 months to 40 years old, mostly in women [1,2], and is usually present along the way of the thyroglossal duct. Most of the cases are at the base of the tongue (90%), and mediastinal position is rarely found, accounting for up to 1% of its occurrence [3-5]. As an ectopic thyroid, it is necessary not to have any connection to the thyroid gland, as well as a different blood supply deriving from intrathoracic vessels. It is essential to differentiate ectopic thyroid from secondary substernal goiter, a more common entity, in which part of the gland lies within the thorax like suggested by Cvasciuc et al. [6] classification. Sometimes, it is challenging to differentiate these two conditions, or even from malignancy, in the context of a mediastinal mass [2,5]. Surgery, usually indicated, has been changing with the widespread use of minimally invasive techniques, especially robotics, to treat a variety of mediastinal lesions. It minimizes postoperative pain, respiratory function impairment, while provides better visualization, range of motion, achieving better control and precise dissection of the mediastinum, when compared to more aggressive procedures, like sternotomy or lateral thoracotomy [7].

Case Presentation

A 63 years old female was seen complaining of occasional mild choking sensation, precordial discomfort, and moderated shortness of breath in exertion with three months of duration, worsening in the past week. She has good health and no past hospital admissions. She quit smoking 21 years before this consultation and had a 20 packs-year previous smoking history. Her physical examination was normal, and her BMI was 23.6. Chest X-rays in 2010, 2012 and 2016 were reported as normal. A chest CT-scan showed a right middle 4.3 cm × 3.3 cm mediastinal mass (paratracheal inferior) - Figure 1. The first impression was of an ectopic thyroid tissue because of the suggestive radiologic characteristics of the lesion. Thyroid scintigraphy and SPCT-TC confirmed the impression of the CT scan, The I131 scintigraphy also confirmed that the mediastinal lesion was thyroid tissue completely separated from the topic thyroid, which was present and hypo-functioning with only 9.9% 24 h I131 captation (Figure 2). Preoperative cardiologic and blood tests were normal. The patient was brought to the OR and a robotic 3 arms resection of the lesion was performed with a Da Vinci Si through the right chest (full left lateral decubitus) with all 3 ports in the 7th interspace. The lesion was completely resected (Figure 3) in 45 min; careful hemostasis was performed with Maryland bipolar forceps; the lung was inflated, and the chest tube withdrawn in the OR. The patient went to the floor and was discharged on the next day in excellent condition. The final result was benign usual thyroid tissue in

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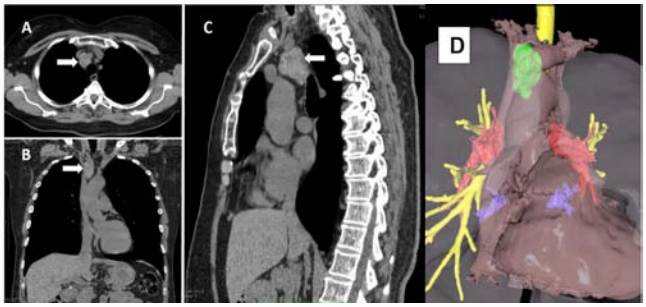

Figure 1: CT scan showing the tumor (arrows) in (A) axial, (B) coronal, (C) sagittal window and (D) the 3D reconstruction.

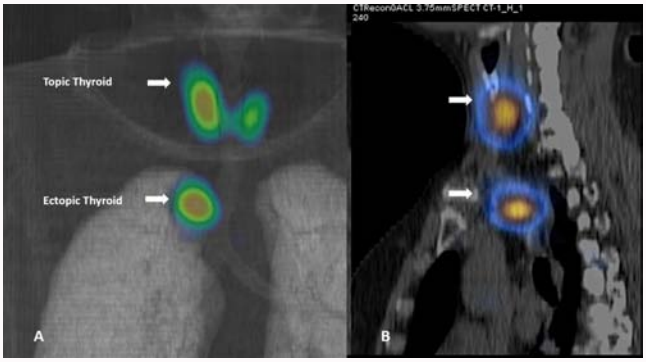

Figure 2: I131 SPECT -TC with 3-D reconstruction (A) and in (B) tomoscintigraphy in sagittal view showing topical thyroid and ectomic thyroid in middle mediastinum (arrows).

the encapsulated mass (Figure 3).

Discussion

The thyroid gland is usually located anterolaterally to the 2nd to the 4th tracheal ring. Its development begins at the 24th day of gestation, with an endodermal diverticulum at the base of the tongue (foramen cecum) and descends to its final position between 5 to 7 weeks, passing through the thyroglossal duct, which generally obliterates and disappears in the end. Any defect during this process is related to the presentation of ETT [1].

The morphogenesis of the thyroid gland is not clearly elucidated. Transcription factors, especially TITF-1 (Nkx2-1), TITF-2 (foxe1), and PAX-8 seem to be involved in morphogenesis and differentiation of the gland, but there is no strong relationship between them and the migration disorders of the thyroid gland. The presence of many pluripotent cells in the mediastinum may be another explanation for ectopic mediastinal thyroid tissue, once it is a reasonable explanation also for other lesions found in this compartment [3].

The hormonal status of these patients is related to euthyroidism to mild hypothyroidism, with high TSH levels, but there are reports of hyperfunction. Other thyroid tests are usually normal [8].

Chest image studies are the usual presentation of ectopic thyroid tissue, with visualization of a mediastinal mass. However, symptoms of thyroid dysfunction or compression of mediastinal structures (dysphonia, dyspnea, dysphagia, superior vena cava syndrome) may eventually occur [4,9]. Computerized Tomography (CT) shows a hyperdense, well-circumscribed mass with similar attenuation with the thyroid gland (about 70 ± 10HU) as seen in Figure 1, with intensely enhancing mass in the postcontrast phase.

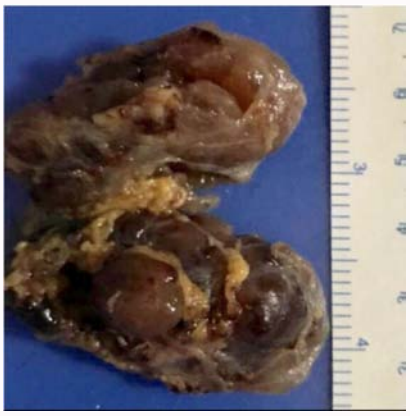

Figure 3: Operative specimen-encapsulated lesion that was represented by pure thyroid tissue (cut in the middle).

Magnetic Resonance Imaging (MRI) findings are usually the same as CT for diagnosis but can give some extra useful information for surgical evaluation as the presence of surrounding tissue invasion. In suspected cases, radionuclide studies using Tc-99m, I-123 or I-131 are preferred methods, because allows functional and anatomic characterization of the mass, and could be useful for posterior biopsy guidance and treatment [9,10]. However, absent iodine uptake is possible, probably when necrosis of the mass occurs. F18-FDG-PET/CT could be performed if malignancy is suspected since there are reports of malignant potential of these lesions [1].

A percutaneous imaging-guided biopsy is sometimes desirable to determine the nature of the mass, to make a differential diagnosis with other mediastinal lesions, or rule out malignancy, especially when conservative management is a real possibility. In surgical cases, however, its indication should be carefully discussed, considering the risks of complications related to the injury of adjacent anatomical structures and benefits of a prior tissue diagnosis [3,9]. In some cases, an EBUS biopsy was a valid possibility but was unnecessary in our case because the scintigraphy examination was positive.

Some cases of ETT could be managed conservatively, usually lingual or neck ectopic thyroid tissue. Intrathoracic lesions, otherwise, are surgically resected due to high risk of compression of surrounding vascular or tracheobronchial structures, or the possibility of malignant potential. Moreover, differential diagnosis with other mediastinal masses can be made [1,5]. Traditionally, these lesions have been approached by median sternotomy. With the introduction of minimally invasive thoracic surgery and lately, with the increasing of robotic surgery experience, mediastinal lesions could be safely resected by this way, carrying less morbidity. The robotic system allows a three-dimensional magnified view, more precise dissection, and more range of motion. Moreover, the trauma and functional respiratory impairment of a median sternotomy or a thoracotomy are minimized, allowing faster recovery and discharge [7] as it happened to our patient.

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