

## Occasional Ectopic Thyroid Finding as Presentation of Medium Mediastinal Mass, Video Assisted Thoracic Surgery Approach

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### Abstract

Ectopic thyroid is a rare condition that affects approximately 7 to 10% of the general population, being that only 1% of the mediastinal tumors are thyroid. The treatment usually has two general approaches, depending on the volume and clinical condition, usually associated with compressive symptoms and endocrine disorders and may be clinical management only with vigilance or surgical approach, the latter usually being performed through open thoracic surgery. In the present study, we will report the case of a 70-year-old woman admitted with symptoms of respiratory distress, justified by a radiographic finding of anterior mediastinal mass, who was surgically approached through Video Assisted Thoracic Surgery (VATS) which allowed the diagnosis after anatomopathological study of thyroid tissue in the resected mass.

**Keywords:** Mediastinum; Ectopic Thyroid; Mediastinal Mass; VATS; Thoracic Surgery

### Abbreviations

VATS: Video Assisted Thoracic Surgery; TTF-1: Thyroid Transcription Factors 1; TTF-2: Thyroid Transcription Factors 2; TSH: Thyroid Stimulating Hormone; mmHg: Milimetre of Mercury; bpm: Bets Per Minute; irpm: Respiratory Incursions Per Minute; EICD: Right Intercostal Space

### Introduction

In the clinical reasoning for the differential diagnoses of mediastinal masses, the ectopic thyroid, given its low incidence of approximately 1% of all mediastinal tumors [1], does not occupy a prominent place like other more frequent etiologies, such as teratoma, thymoma and lymphoma.

The thyroid is the first endocrine gland to develop in the embryo, starting its development about 24 days after fertilization from a median endodermal thickening. As the embryo and tongue grow, the thyroid glands down the neck, passing ventrally to the hyoid bone and laryngeal cartilages. Under normal conditions, in the seventh week the thyroid is already in its final shape and in its final location at the base of the neck. Molecular studies have shown an intimate relationship between the expression of thyroid tran-

scription factors TTF-1 and TTF-2, as well as Pax-8 and Hox3 for adequate thyroid morphogenesis [2,3].

There are some theories associated with the ectopic development of the thyroid, one of which is based on the inadequate performance of the descent path of the tongue, with the sublingual thyroid tissue being the most common ectopic presentation. Failures in embryological development are mainly based on mutations in thyroid transcription factors, PAX-8 genes and the thyroid stimulating hormone receptor (TSH) [4].

Other possible causes of this condition are mechanisms of implantation secondary to surgical interventions and trauma, sequestration of an adjacent thyroid nodule without anatomical connection and thyroid tissue as one of the components of a mediastinal teratoma [5].

Usually, patients with this condition are asymptomatic, but they may have clinical symptoms due to the effect of regional compressive mass that it exerts on adjacent structures such as vessels and trachea. Thus, manifestations such as cough, stridor, dyspnoea, dysphonia and dysphagia [6] are directly proportional to their location

and volume. In addition, functional changes in the thyroid can also be reported, especially hypothyroidism, with hyperthyroidism being rarer [7].

### Materials and Methods

Case report and analysis of diagnosis and conduct in digitally published literature regarding the mediastinal mass.

### Case Report and Discussion

A 70-year-old white female patient, housewife and retired, sought medical attention with a complaint of non-productive cough for about two months associated with retrosternal chest pain, respiratory distress with class 2 dyspnea and mild hoarseness. When asked, she denied weight loss and general symptoms such as fatigue, lethargy, cognitive deficits and drowsiness. There were no complaints of skin and gender, such as dry and cold skin or brittle nails and hair. It also denies cardiac, neurological or reproductive symptoms. She reports never having been submitted to any previous surgical procedure. She claims to have systemic arterial hypertension, using Losartana, 50 mg, twice a day. Patient with two pregnancies and no abortion (G2P2A0). I was unable to report family pathological history.

On physical examination, she was conscious, oriented and collaborative, normal-colored, acyanotic, anicteric, without rashes or adenopathies and under inspection, she was overweight. The patient presented normothermia, with blood pressure of 130/70 mmHg, heart rate of 82 bpm and respiratory rate of 16 irpm.

In the respiratory examination, under static inspection, she presented a symmetrical chest, without bulging or retractions, in the dynamic inspection she presented rhythmic breathing movements. On palpation, she presented preserved lung expansion and compliance, with a normal and universally distributed thoracovocal thrill. Under the percussion there was a clear pulmonary sound without alterations. On auscultation there were normal sounds of breathing in both hemithorax, without adventitious sounds. There were no changes in the cardiovascular, abdominal, neurological and extremity exam.

Electrocardiogram and echocardiogram were requested, both with results within normal parameters. A posteroanterior chest radiography was performed, which verified an opacification in the right thoracic apex (Figure 1) and under contrasted computed tomography of the chest, a predominantly cystic expansive formation was found in the right mediastinum, with liquid content and presenting irregular and coarse septations in between, measured about 9.5 x 8.0 x 8.5 cm (CC x LL x AP) (Figure 2). Determining the



**Figure 1:** Posteroanterior chest radiography in the preoperative period showing opacification in the right thoracic apex.

**Figure 2:** Axial contrast computed tomography showing a cystic mass with liquid content and septations on the right.

effect of extrinsic compression on the trachea and esophagus, in addition to contacting some mediastinal vessels on the right side. There was no identification of pleural effusion, mediastinal lymph adenomegaly or pulmonary parenchymal alteration.

The preoperative period included spirometry with bronchodilator test, new echocardiogram, nuclear magnetic resonance imaging of the skull and computed tomography of the upper abdomen, all of which had results within the normal range.

CTVA was performed with the patient in the left lateral decubitus position under general anesthesia with orotracheal intubation with a left Robert-Shaw 37 FR tube. A 3 cm auxiliary incision was made in the 5<sup>th</sup> right intercostal space (RIS) with a middle axillary line. Incision in 8<sup>th</sup> RIS with anterior axillary line to trocar 10 cm of 30° optics. Identification of a lesion located at the thoracic apex in the anterosuperior mediastinal region. Lesion adhered to the azygos vein. Dissection was started with the use of energy scissors (Ligasure - Medtronic®) in the inferior to anterior direction with the release of the plane between the lesion and the azygos vein (Figure 3). Medial dissection using energy scissors to release tracheal adhesions. Lesion resection after apical plane release with identification of subclavian artery and vein. Withdrawn piece with collection

bag. Insertion by incision of a fenestrated tubular drain trocar in the 28 FR with water seal. Review of hemostasis and aerostasis and plan closure.

After excision, the piece was sent for anatomopathological study that identified colloid goiter with areas of follicular hyperplasia in ectopic thyroid tissue weighing 140 grams.

**Figure 3:** CTVA image of the anterior mediastinal mass at the apex of the chest adhered to the azygos vein.

In the postoperative period, before 42 days, radiographs of the posteroanterior chest and in profile were requested for follow-up (Figure 4), which did not identify any noteworthy alterations.



**Figure 4:** Posteroanterior and profile chest radiographs in the postoperative period for follow-up.

Initially, given the patient's clinic associated with her demographic data, the diagnostic hypotheses that were suggested inspired a lot of caution in the segment, as situations such as coronary artery disease and numerous locoregional, adjacent primary neoplastic processes or metastases could go with the clinic and with the observed radiological presentation in case.

Given the rarity of the presentation, which has been described in the literature only eight times in the past thirty years, six cases in the anterior mediastinum and two in the posterior mediastinum [8], there is an underestimation of the mediastinal ectopic thyroid as a diagnostic hypothesis for mediastinal masses.

The therapeutic approach secondary to the established diagnosis of mediastinal ectopic thyroid remains controversial [8], to this we can attribute the low incidence reported in the literature [1] that hinders the development of studies that evaluate the best and most effective treatment, for this reason the need to report cases like the one presented, in order to foster and nurture future works.

Furthermore, treatment follows two basic lines depending on the patient's clinical presentation. In cases of smaller masses that do not have mediastinal compressive effects, the surgical approach becomes less indicated, as there is a small risk of malignancy, thus opting for patient surveillance. When a case is presented, such as the one reported in this study, which shows clinical and radiological signs and symptoms of compression of respiratory and vascular structures, the surgical approach is formally prescribed, which aims to perform the excision of the ectopic mass [9].

The resection of the ectopic thyroid mass is usually performed by means of thoracotomy or sternotomy [9]. In the case reported, video-assisted thoracic surgery (CTVA) was chosen, following the trend of using minimally invasive surgical techniques. In general, this technique, when compared to the open sky approach, promotes similar efficiency with better quality of life in the postoperative period, better aesthetics, in addition to reducing the hospital stay in the postoperative period. Such comparative information is very well reported in studies that use it for approaches to other intrathoracic disorders that require surgery, and may even be adopted as a standard treatment, as is the case of lung cancer in the early stages [10]. Thus, this study is useful to demonstrate the safety and efficacy profile of CTVA also for cases of mediastinal ectopic thyroid.

## Conclusion

Finally, the study aims to promote the inclusion of the ectopic thyroid in the mediastinum as a differential diagnosis for cases of patients with suggestive clinic and radiological finding of mediastinal mass. Demonstrating that there is no obligation to coexist endocrinological disorders of the thyroid for this diagnostic hypothesis to be raised.

## Conflict of Interest

All authors declare that there is no conflict of interests regarding the publication of this paper.

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