



# Hemiagenesis of Right Hemithyroid with Left Lobe Multinodular Goitre

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. Author CV did the conception of the work, collected the clinical data and informed consent, assisted the patient clinically and wrote the first draft of the manuscript. Authors JO, RL, JB and SL managed the literature searches. Authors CV and RF were the surgeons who operated on the patient. Authors SR, RF and MC assisted the patient clinically and revised critically the manuscript. All authors read and approved the final manuscript.*

## **Article Information**

### **Open Peer Review History:**

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/103238>

**Case Report**

**Received: 11/05/2023**

**Accepted: 14/07/2023**

**Published: 18/07/2023**

## **ABSTRACT**

**Aims:** To present the case of a patient with an uncommon congenital abnormality and discuss its consequence and management.

**Presentation of Case:** We present the case of a 62 year old female patient with no thyroid function abnormalities and no previous neck surgery who was sent to our outpatient clinic for a left sided neck mass with associated discomfort. An ultrasound revealed a left sided multinodular goitre and the absence of the right lobe. A computed tomography scan confirmed these findings. A fine needle aspiration cytology excluded malignancy. A total thyroidectomy was performed and the patient prescribed levothyroxine. There were no intraoperative or postoperative adverse events and the patient remains asymptomatic four years later.

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**Discussion:** Thyroid gland hemiagenesis is a rare congenital disorder consisting in the absence of a thyroid lobe. Left lobe agenesis is the most frequent and females are more commonly affected. Interestingly, thyroid-stimulating hormone and free T3 levels are higher in individuals with this condition and higher risk of thyroid disease has been suggested.

**Conclusion:** Thyroid gland hemiagenesis is rare. Patients are usually asymptomatic and the condition is found incidentally during screening tests or exams driven by other pathology. Its existence should be recognized so that patients can be well studied and treated.

**Keywords:** Thyroid hemiagenesis; multinodular goiter; left lobe multinodular goiter; thyroid congenital abnormality.

## 1. INTRODUCTION

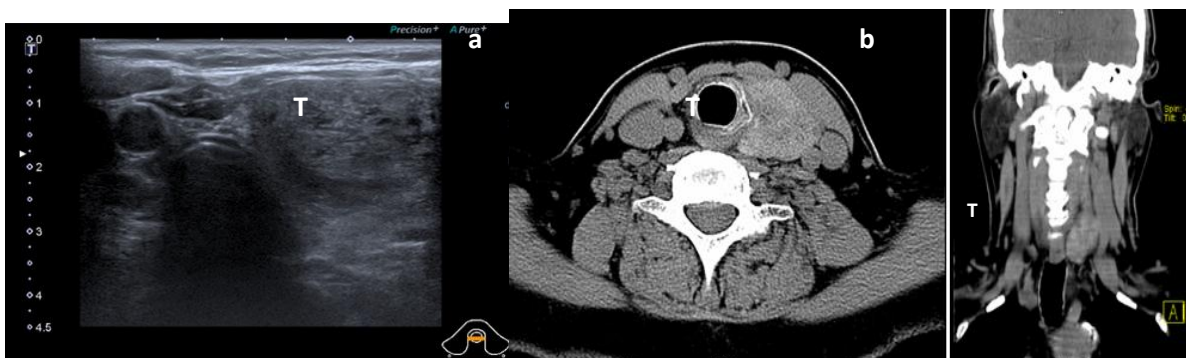
Thyroid gland hemiagenesis and consequent inexistence of one of the thyroid lobes is a rare congenital disorder with an estimated prevalence from 0.05% to 0.5%. It occurs more frequently in females with an estimated 7:1 ratio [1, 2]. Although mainly sporadic, familial clustering has been described [3, 4]. Left lobe hemiagenesis is the most frequent, occurring in up to 87% of the cases with absence of the isthmus in 40 to 50% [5, 6]. Patients with this condition are usually asymptomatic but can develop thyroid pathology and, despite being euthyroid, commonly have higher levels of thyroid-stimulating hormone (TSH) and free T3 (fT3) than individuals with a normally developed gland [2, 4, 6]. In this case report we present a patient with agenesis of the right lobe of the thyroid gland and a multinodular goitre of the existing left lobe. The aim of this case report is to increase awareness of this pathology and its' clinical implications, such as higher risk of associated thyroid pathology.

## 2. PRESENTATION OF CASE

We present the case of a 62 year old female patient, with history of appendectomy and

hyperlipidemia, medicated with a statin, with no previous history of neck surgery or thyroid function abnormalities. She was referred to General Surgery outpatient clinic for a left neck mass. An ultrasound of the neck revealed absence of the right thyroid lobe with a 13mm adenopathy on the right side of the neck and a multinodular goitre on the left lobe (Fig. 1). The left thyroid lobe presented with about 80mm of longitudinal axis, which is clearly above the normal dimensions, and multiple nodules, some coalescing, with a maximum width of 14 and 21mm and no suspicious characteristics. A computed tomography (CT) scan of the neck was performed (Fig. 2), to clarify the anatomy, that confirmed the inexistence of a right thyroid lobe and revealed a left lobe insinuating into the upper mediastinum.

Fine needle aspiration cytologies were performed to the bigger nodule and the adenopathy that showed a colloid nodule and normal lymph node tissue, respectively. A total thyroidectomy was proposed to the patient, with its' risks and benefits being explained, and she accepted the procedure.



**Figs. 1 and 2. Neck ultrasound and CT (a – axial, b – coronal) showing presence of only the left thyroid lobe (T)**



**Fig. 3. Total thyroidectomy surgical specimen after conservation in formaldehyde**



**Fig. 4. Six months postoperative surgical scar**

A total thyroidectomy was performed. Intraoperatively, an isolated left thyroid lobe with the macroscopic appearance of a multinodular goitre was found (Fig. 3) and the absence of right thyroid lobule and isthmus was confirmed. The right paratracheal space was intact. The surgical procedure went unremarkably with a normal identification of the other anatomical structures, without any unexpected findings or events. The histological examination of the specimen was consistent with a multinodular goitre with colloid nodules.

The patient was prescribed levothyroxine and control and stability of thyroid function were rapidly reached. She is very satisfied with the final cosmetic result (Fig. 4) and remains asymptomatic after four years.

### 3. DISCUSSION

Being a rare finding, thyroid hemiagenesis pathogenesis and clinical significance remain uncertain, with some studies affirming that there

is increased susceptibility to develop additional thyroid pathologies [4]. Generally asymptomatic, the diagnosis is commonly incidental during screening or other pathology related imaging examinations [1, 7, 5]. Ultrasound of the neck can confirm or exclude the suspicion as well as diagnose other thyroid pathology. A study with 65 patients with THA suggested that thyroid hyperplasia and goitre result from long-term elevation of serum TSH with chronic overstimulation [8].

Previous neck surgery should be excluded, specifically hemithyroidectomy, as neck scars are not always obvious and it can lead to a similar image in computed tomography and ultrasound. Imaging examinations that can confirm the diagnosis, besides the ultrasound, are the CT, MRI and scintigraphy [7, 9, 5, 6]. Excluding vascular congenital abnormalities is relevant for surgical planning as unilateral absence of superior and inferior thyroid artery and right sided aortic arch are described as being associated to thyroid hemiagenesis [2, 10].

As patients with hemigenesis of a thyroid lobe can develop any thyroid pathology, apparently even having a bigger risk than the normal population, they should be managed as every patient with thyroid disease [8, 4]. Our patient had a neck mass with discomfort associated, already entering the upper mediastinum, so thyroidectomy was considered the correct treatment to be offered.

#### 4. CONCLUSION

Thyroid hemigenesis is rare, generally being asymptomatic. The thyroid gland is constituted by its' normal tissue and can develop its' usual pathologies. Alterations in thyroid function can as well be present or not. Preoperative recognition of the condition is important for surgical planning but, when surgery is needed, there seems to be no association with surgical technical challenges or outcomes different than normal.

#### CONSENT

Authors declare that written informed consent was obtained from the patient for publication of this case report and accompanying images.

#### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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The peer review history for this paper can be accessed here:  
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