



**Research Article**

## **THYROID HEMIAGENESIS WITH HURTHLE CELL CARCINOMA- A RARE CASE**

**Rajkamal Kanojiya, Himal Rathod, Rajat Goyal\*, Shubham Singh, Ashna Jaggi, Nalini Joshi, Rekha Chaudhary and Rishi Deep Jain**

Department of General Surgery, Mahatma Gandhi Medical College and Hospital, Jaipur

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### **ABSTRACT**

**Introduction:** Thyroid hemiagenesis (TH) is a congenital anomaly which is rare in which one lobe fails to develop, it is more seen on the left lobe of thyroid. The exact process for thyroid morphogenesis remain unclear. We present a case of right lobe TH associated with Hurthle cell carcinoma.

**Case presentation:** A 35 years old woman was admitted with a neck lump increasing in size since 1 years. There were no features of hyperthyroidism and hypothyroidism. There was a palpable, painless 2 cm mass in the middle of the neck. Initial ultrasonography (USG) showed an enlarged left lobe, with hypoechoic lesion with cystic component and calcification in it (TIRADS 4). Fine needle aspiration cytology was suggestive of malignancy. Pathology result was Hurthle cell carcinoma. Patient was planned for a thyroidectomy surgery. Intraoperatively, the right thyroid with isthmus was absent.

**Discussion:** Thyroid hemiagenesis can be seen by using USG due to its practicality and cost effectiveness reasons. Follow up included of systematic monitoring of thyroid morphology and hormonal functions should follow the diagnosis of TH. Neck exploration surgery may be needed to be performed to clarify any discrepancy and confirm the diagnosis.

**Conclusion:** Thorough history taking and physical examination might not help to reach the diagnosis of TH accompanying thyroid diseases. However, discrepancy may occur. Hence, surgery may be needed to be performed to clarify the discrepancy and confirm the diagnosis.

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### **INTRODUCTION**

Thyroid gland during its embryologic development, passes through a process of migration, and differentiation continuously [1]. This process is govern by various hormonal and genetic factors. Thyroid hemiagenesis is rare congenital abnormality in which there is an absence of one lobe of thyroid, while the other lobe develop normally, with or without an isthmus. [1,2]. The exact etiology of TH remains unclear, although familial and sporadic cases have been described [1]. The suggested theory is the bi-lobulation failure of the central anlage with the thyroid tissue migrating to one side of the midline [1]. It is considered as a benign abnormality where treatment is not required as single lobe is sufficient to keep euthyroidism state of a person [2]. However, some studies reported thyroid nodules and autoimmune thyroid diseases as the most common abnormalities accompanying TH [2]. Hence, early diagnosis and follow-up is required.

Its prevalence is 0.05%–0.2% based on ultrasound [3,4]. Thyroid malignancies are hardly found with such cases. Based on a literature review, thyroid malignancies were seen in 3% of TH cases [5]. Similarly, ectopic thyroid tissues were also reported in only 3% of cases [6]. It is more common in female

patients and the majority showed left lobe hemiagenesis comprising more than 80% of all diagnosed cases [2,5,7].

Up to now, there is no solitary optimal management of TH because of its small number of cases [8]. We present a case of TH associated with Hurthle cell carcinoma.

#### **Case presentation**

We report a case of a 35 years old woman who was admitted to our hospital with a chief complaint of a neck swelling that has persisted in the last 1 years before admission. The initial size was 0.5 cm and slowly enlarged to 2 cm in 1 years. Symptoms of hyperthyroidism or hypothyroidism were denied and there was no complains of dyspnea, hoarseness of voice or any swallowing problem.

Based on the physical examination, painless palpable mass was present in the middle of the neck. All of her vital signs were stable. Her serum calcium, f3,ft4, and TSH were normal. Thyroid ultrasonography (USG) shown an enlarged left lobe accompanied by hypoechoic lesion with cystic component and calcification (TIRADS 4) (Fig. 1). However, the right thyroid was difficult to evaluate. Fine needle aspiration cytology

\*Corresponding author: **Rajat Goyal**

Department of General Surgery, Mahatma Gandhi Medical College and Hospital, Jaipur

(FNAC) suggestive of hurthle cell neoplasm (BSRTC- GRADE-IV).

CECT scan of Neck which was suggestive of left lobe of thyroid enlarge and shows well defined hypodense lesion measuring 21x25x26 mm with internal area of heterogeneously enhancing soft tissue component and non-enhancing cystic component.no calcification seen.no extension outside thyroid gland seen. possibility of benign (colloid) nodule to be considered.

Right lobe of thyroid and isthmus are not visualized.

There is no evidence of lymphadenopathy in cervical region.

THYROID SCAN <sup>99m</sup>Tc:- s/o increased flow and cold nodule at lower pole of left lobe of thyroid gland as described-suspicious for mitotic pathology.

Patient underwent thyroidectomy under GA.

Patient in supine position with extended neck (Rose Position). Painting and Draping done.

Approx 5 cm incision was made in a skin crease positioned approximately two finger breadths superior to the sternal notch. The subcutaneous tissues and platysma were divided with help of electro- cautery. Subplatysmal flaps was raised inferiorly upto sternal notch and superiorly to the thyroid cartilage. The strap muscles were divided in the midline and was retracted laterally.

The *left* thyroid lobe was mobilized from its attachments. The thyroid then retracted medially and the middle thyroid vein was identified. It was ligated and divided. The thyroid gland was retracted inferomedially. The superior pole vessels were ligated and divided close to the thyroid gland, with care so as not to injure the external branch of the superior laryngeal nerve.

Next, the thyroid gland was retracted medially and muscles retracted laterally. The inferior thyroid artery was identified. The recurrent laryngeal nerve was identified and followed superficially along its path to aid in continued safe dissection. The vessels to the thyroid in this area were ligated and divided with great care to avoid injury to the recurrent laryngeal nerve and to preserve their distal branches. The superior and inferior parathyroid glands were seen and was mobilized off of the thyroid gland to preserve their blood supply. The trachea was seen, and the thyroid was dissected medially from its attachments to the trachea up to the ligament of Berry. There is absence of isthmus with right lobe of thyroid .The specimen was marked with a suture at the superior pole for orientation and was sent for histo-pathology. Haemostasis achieved & Incision closed in layers.

In the follow up sessions, there were no signs and symptoms on this patient. The patient's treatment was continued on Tab. Thyroxine.



Fig Cect Neck

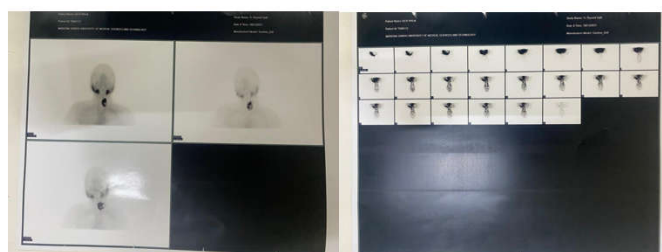


Fig Thyroid Scan <sup>99m</sup>Tc

## DISCUSSION

Thyroid hemiogenesis is a rare congenital anomaly with prevalence of 0.05% to 0.2% [3,4]. According to literatures, TH is more common in women than men and more is frequently on the left thyroid lobe [10]. Our case shows thyroid hemiogenesis of right lobe with isthmus associated with hurthle cell carcinoma.

Thyroid dysfunction is shown in 38-47% of cases [2,5]. Hence, a thorough follow up is important for each patient. Ruchala *et al.* also proposes that patients suspected with TH need to be followed up since the thyroid pathologies are likely to develop [2].

Hemiogenesis might be due to impairment or lobulation defect [12]. The mechanism is lobulation impairment instead of descent abnormality.

The absence of a thyroid lobe results in no symptoms but coincidentally diagnosed through evaluations of the other thyroid abnormalities [12]. Some people, the thyroid gland may be asymmetric, with majority of the right lobe being larger than the left lobe [14,15]. Thyroid Hemiogenesis with coexistent thyroid disease includes Grave's disease, thyroiditis, adenoma, nodular goiter, and carcinomas (including primary or metastatic cancer) [13].

Diagnosis of TH based on suspicion when physical examination or thyroid imaging shows no apparent thyroid tissue on one side. USG with 7.5–12 MHz frequency is most widely available technique to examine thyroid [16]. USG is easily, cost effective, and without any radiation exposure [17]. TH existence mimics primary or secondary malignancies, amyloidosis, and unilateral inflammations. [18]. Hence, thyroid scans need to be confirmed by another modality to know the exact thyroid morphology.

Study by Azmat *et al.*, which stated a key finding of thyroid cancer accompanying TH suspicion is a metastatic cervical node. However, the relation between TH and thyroid cancer is rare [6]. USG is operator dependent [8]. TH was confirmed when there is no thyroid lobe intraoperatively. Instead, we only found parathyroid gland in that plane.

## CONCLUSIONS

Extensive history and clinical examination is not sufficient in establishing the diagnosis of TH with thyroid diseases. Thyroid hemiogenesis can be diagnosed with the help of an imaging modality, especially ultrasonography. Hence, an exploration may be required to clarify the discrepancy and confirm the diagnosis.

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