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## Case Report

# Radiologically detected intranodal thyroid tissues in ipsilateral cervical lymph nodes after hemithyroidectomy in a pediatric patient<sup>☆</sup>

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## ABSTRACT

This case report illustrates the presence of intranodal thyroid tissues in ipsilateral cervical lymph nodes after hemithyroidectomy for multinodular goiter in an adolescent patient. It highlights the rare radiological finding of thyroid tissues within cervical lymph nodes detected by ultrasonography and computed tomography, which is a great mimicker of nodal metastasis.

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## Introduction

Benign intranodal thyroid inclusions are occasionally detected in cervical lymph nodes with the incidence ranging from 0.6% to 4.7% and the majority found microscopically on autopsy or surgical specimens [1]. On the contrary, the discovery of intranodal thyroid tissues as a radiological finding is rarely reported. Our case demonstrates histologically proven intranodal thyroid tissues in multiple ipsilateral cervical lymph nodes after hemithyroidectomy as detected by ul-

trasonography and computed tomography (CT), which has not been reported in the literature previously to the best of our knowledge.

## Case presentation

The patient was a 15-year-old Chinese man with unremarkable past medical history who presented to a family physician with neck swelling for several months. There was no signif-

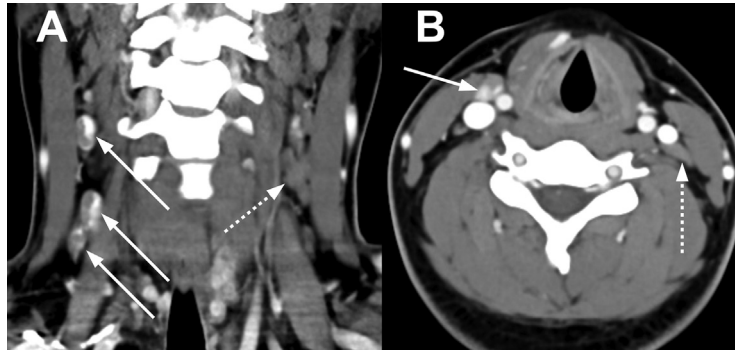
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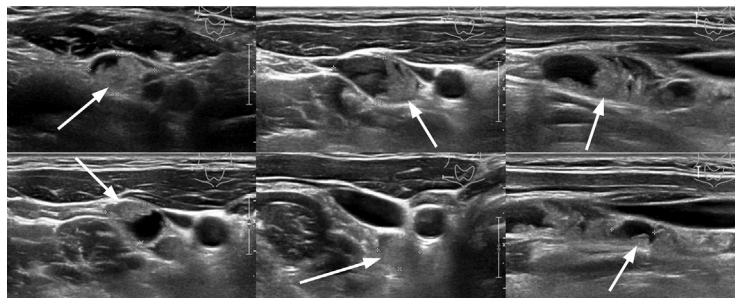
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**Fig. 1 – Coronal (A) and axial (B) contrast-enhanced computed tomography of the neck showing eccentric enhancing soft tissues in several right sided cervical lymph nodes (arrows), corresponding to intranodal thyroid tissues. No such enhancing thyroid tissues are seen in the normal left cervical lymph nodes (dotted arrows).**



**Fig. 2 – Ultrasonography showing eccentric intranodal echogenic soft tissues, corresponding to intranodal thyroid tissues (arrows).**

icant family history nor prior radiation exposure. He did not complain of any symptom of hyper- or hypothyroidism. He had no constitutional symptoms. He had no swallowing or breathing difficulty. Physical examination showed a 7 x 5cm goiter with no thyroid bruit. No enlarged lymph node was detected. There was no sign of thyroid dysfunction.

The patient had right hemithyroidectomy done in an overseas institution 1 month after initial presentation. The pathology report showed nodular goiter with some cellular hyperplasia but no evidence of malignancy. He was started on thyroxine after the operation. There was no documented preoperative imaging study.

The follow-up sonography 10 months after the operation showed several prominent lymph nodes with hyperechoic intranodal soft tissues in the right upper and mid neck. The largest 1 measured 1.3 × 0.5 × 2.6 cm. There was no increase in intranodal vascularity. Several complex cystic nodules were also seen in the residual thyroid gland.

Ultrasound-guided fine needle aspiration cytology was then carried out for 1 of the prominent right cervical lymph nodes, as well as for the thyroid nodules with suspicious features. The cytology results showed thyroid follicular cells with positive TTF1 in the right upper cervical lymph node. There was no evidence of malignancy in the selected thyroid nodules.

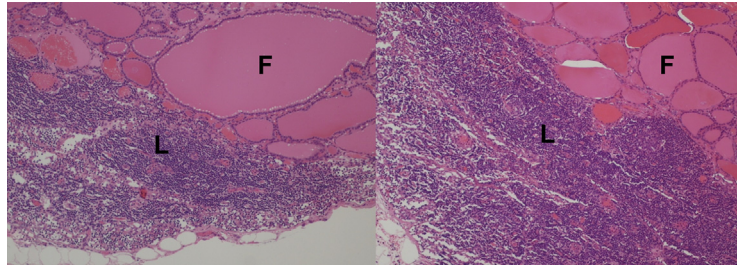
CT of the neck with intravenous contrast injection was done for further evaluation. Multiple prominent right cervical

lymph nodes were detected in level II to IV, measuring up to 0.7 cm in short axis. Most of these nodes contained eccentric hyperdense components up to 0.4 cm with marked contrast enhancement (Fig. 1), which could represent intranodal thyroid tissues in keeping with the cytology results. In addition, there was an incidental finding of a triangular-shaped hyperdense enhancing lesion measuring 0.9 × 0.4 × 1.2 cm in right anterior neck deep to the right infrahyoid muscles. This lesion showed similar enhancement pattern to that of the thyroid gland, suggestive of thyroid tissue of ectopic location.

Excisional biopsy of one of the prominent right upper cervical lymph nodes was performed and revealed several large thyroid inclusions within the lymph node. There was no nuclear feature of papillary carcinoma.

Given the benign histological results, the management plan at that juncture was conservative management with interval follow-up imaging. In the follow-up sonography 8 months later, most of the previously detected prominent right cervical lymph nodes with hyperechoic intranodal soft tissues showed enlargement (Fig. 2). Patient hence opted for completion left hemithyroidectomy and right level II to IV selective neck dissection, which were performed uneventfully.

The histological examination of the enlarged right cervical lymph nodes showed thyroid tissues in the subcapsular regions extending into the lymph node parenchyma. These were formed by varying-sized thyroid follicles, some of which are huge macrofollicles. There were no nuclear features of papil-



**Fig. 3 – The histology of right neck lymph node in hematoxylin and eosin stain showing multiple thyroid follicles (F) of different sizes. There are no nuclear features of papillary thyroid carcinoma. Normal lymphocytes (L) are also seen.**

lary thyroid carcinoma. There was focal CD56 staining while negative for galectin-3 and BRAF V600E (Fig. 3). Microscopic examination of the thyroid revealed multiple colloid nodules without nuclear features of papillary thyroid carcinoma. Focal areas of fibrosis with aggregated histiocytes were noted. There was no evidence of malignancy.

The patient was compliant on thyroxine, calcium and vitamin D supplements, and followed up by pediatric endocrinologist, oncologist and surgeon.

## Discussion

Several theories were proposed to explain the presence of thyroid tissues within cervical lymph nodes. In our case, all the involved cervical lymph nodes were found on the same side ipsilateral to that of hemithyroidectomy. The most appropriate mechanism would be “benign metastasis” of thyroid tissues attributed to the hemithyroidectomy. The thyroid tissues may travel to ipsilateral lymph nodes via the lymphatic route [2,3], which could explain the laterality of the involved lymph nodes. Implantation related to the operation is also a plausible mechanism [4]. Another theory to justify the presence of thyroid tissues in cervical lymph nodes is the inclusion of the unencapsulated thyroid tissues in the jugular lymph sacs during the descent of thyroid gland from foramen caecum to its anterior cervical locations, which usually gives rise to midline or near-midline ectopia like lingual thyroid [5]. Aberrations during the migration and development of ultimobranchial bodies, which give rise to follicular cells and C cells in thyroid gland, is another possibility [1,6]. These are laterally positioned and theoretically more likely to form ectopic thyroids in the lateral cervical lymph nodes. Yet, these embryological aberrations may not account for the presence of intranodal thyroid tissues in our case as the involved lymph nodes were found after the operation but not congenitally. Others asserted that all these benign-looking intranodal thyroid tissues may in fact represent metastasis from well-differentiated occult thyroid carcinoma [4,7]. These are difficult to differentiate both radiologically and pathologically.

There was interval enlargement of the intranodal thyroid tissues after hemithyroidectomy in our patient. In the absence of metastatic cells, the mechanism of its growth remains uncertain but one postulation is that it acts as a compensation after the body losing some of the normal functional thyroid

tissues, as seen in some studies demonstrating growth of the remaining thyroid lobe after hemithyroidectomy [8,9].

Criteria of benign intranodal thyroid inclusion was proposed previously, including small size, equal or less than 2 involved lymph nodes with inclusion, subcapsular or cortical location, small and similarly sized follicles, and lack of psammoma bodies, desmoplastic stroma, and nuclear features of papillary thyroid carcinoma [1,5,10]. Our case did not fulfil these proposed criteria. In addition, our case showed interval enlargement of the involved lymph nodes. Total thyroidectomy with neck dissection was therefore warranted despite the results of excisional biopsy showing normal thyroid tissues with no features of malignancy. Close clinical follow up of the patient would also be necessary given the unusual histological features to ensure the benignity of the condition.

The case report from Lee et al. [11] showed radiologically detected intranodal thyroid tissues in a single left upper neck lymph node in a patient with papillary thyroid carcinoma. The sonographic and CT appearances of the intranodal thyroid tissues were similar to that in our case. However, our case differed in the locations of the intranodal thyroid tissues which were found in multiple right cervical lymph nodes following right hemithyroidectomy. The clinical context in our case was also different since there was no evidence of primary thyroid malignancy.

## Conclusion

This case illustrates macroscopic intranodal thyroid tissues detected radiologically, which could be a great mimicker of nodal metastasis. Multidisciplinary team discussion is essential for management planning.

## Patient consent

I confirmed that the written informed consent for publication of this case report (Title: Radiologically detected intranodal thyroid tissues in ipsilateral cervical lymph nodes after hemithyroidectomy in a pediatric patient) was obtained from the patient.

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