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An Enigmatic Supraclavicular Mass: Scintigraphic Revelation of Thyroid Heterotopia – A Case Report

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Abstract | **Case Report**

***Background*:** Thyroid heterotopia, also known as ectopic thyroid tissue, is a rare congenital anomaly characterized by the presence of normal thyroid parenchyma outside its usual pretracheal location, coexisting with a normally positioned and structured orthotopic thyroid gland. It results from an abnormality in the embryological migration and maturation of thyroid tissue. While often asymptomatic and discovered incidentally, it can occasionally present as a palpable mass, leading to diagnostic challenges. Technetium-99m pertechnetate (99mTcO4-) scintigraphy is the functional imaging modality of choice, offering high sensitivity and specificity for localizing functional thyroid tissue. ***Case Presentation*:** We report the case of a 60-year-old woman with no significant past medical history, who presented with a two-month history of a gradually enlarging, painless right supraclavicular swelling. She was clinically and biochemically euthyroid, with a normal TSH level of 3.80 µU/mL. Cervical ultrasound revealed an extra-thyroidal, solid supraclavicular mass located adjacent to the lower portion of the right internal jugular vein, with echostructure similar to normal thyroid parenchyma. The orthotopic thyroid gland itself was normal in position, size, and morphology. Contrast-enhanced computed tomography (CT) of the neck confirmed a well-defined, enhancing right supraclavicular mass, which appeared contiguous with the right thyroid lobe, initially raising suspicion for a pedunculated thyroid nodule. To resolve the diagnostic uncertainty, a 99mTc-pertechnetate thyroid scintigraphy was performed following intravenous injection of 5 mCi (185 MBq) of the radiotracer. The scan revealed a focus of intense radiotracer uptake ("hot nodule") projecting into the right superior mediastinum, clearly separate from but functionally concordant with the normally positioned, well-visualized orthotopic thyroid gland. This confirmed the diagnosis of functional ectopic thyroid tissue (thyroid heterotopia). ***Conclusion*:** This case highlights the diagnostic challenge posed by ectopic thyroid tissue presenting as a cervical mass in a euthyroid patient with a normal orthotopic gland. It underscores the indispensable role of 99mTc-pertechnetate scintigraphy as the gold standard for confirming the functional nature of such ectopic tissue, differentiating it from other cervical masses, and guiding appropriate management, thereby avoiding unnecessary invasive procedures.

Keywords: Thyroid Heterotopia, Ectopic Thyroid Tissue, Supraclavicular Mass, 99mTc-Pertechnetate Scintigraphy, Thyroid Scintigraphy, Case Report.

INTRODUCTION

Thyroid heterotopia, or ectopic thyroid tissue, is a rare developmental anomaly resulting from aberrant embryological migration of the thyroid primordium [1]. During normal development, the thyroid gland originates from the foramen cecum at the base of the tongue and descends along the thyroglossal duct to its final pretracheal position by the seventh week of gestation [2]. Any disruption in this migratory pathway can result in the deposition of functional thyroid tissue at various sites along this trajectory, most commonly at the base of the tongue (lingual thyroid), followed by sublingual, prelaryngeal, and, less frequently, mediastinal or lateral cervical locations [3, 4].

The term "heterotopia" is specifically used when ectopic thyroid tissue coexists with a normally located and functioning orthotopic thyroid gland, distinguishing it from the more common complete ectopia where the ectopic tissue represents the patient's only functioning thyroid parenchyma [5]. The true prevalence of thyroid heterotopia is difficult to ascertain, as it is often asymptomatic and discovered incidentally

during imaging for unrelated reasons or at autopsy, with reported rates of 1 in 100,000 to 300,000 in the general population [6].

Clinically, heterotopic thyroid tissue can remain silent throughout life or present as a slowly growing, painless mass, leading to a broad differential diagnosis including lymphadenopathy, branchial cleft cysts, thyroglossal duct cysts, and various soft tissue tumors [7]. Importantly, patients are typically euthyroid, as the combined mass of orthotopic and ectopic tissue is usually sufficient to maintain hormonal balance, although hypothyroidism or, rarely, hyperthyroidism can occur [8].

Imaging plays a pivotal role in the diagnostic workup. Ultrasound (US) is often the first-line modality, revealing a well-defined solid mass with echotexture similar to thyroid parenchyma [9]. Computed tomography (CT) and magnetic resonance imaging (MRI) provide detailed anatomical information, demonstrating an enhancing mass that may show continuity with the orthotopic gland [10]. However, these anatomical modalities cannot definitively confirm the functional nature of the tissue. This is where nuclear medicine imaging, specifically 99mTc-pertechnetate scintigraphy, proves indispensable. As an analog of iodine, 99mTc-pertechnetate is trapped by the sodium-iodide symporter (NIS) in functioning thyroid follicular cells, allowing for specific visualization of all metabolically active thyroid tissue, whether orthotopic or ectopic [11, 12].

We present a case of a 60-year-old woman with a right supraclavicular mass, in whom 99mTc-pertechnetate scintigraphy was pivotal in establishing the diagnosis of thyroid heterotopia coexisting with a normal cervical thyroid gland.

Case Presentation

A 60-year-old woman presented to the endocrinology clinic with a two-month history of a gradually enlarging, painless swelling in the right supraclavicular region. She reported no associated symptoms such as dysphagia, dysphonia, dyspnea, cough, palpitations, heat intolerance, or weight changes. Her past medical history was unremarkable, with no known thyroid disorders, neck surgery, or radiation exposure. She was not taking any medications and had no family history of thyroid disease.

On physical examination, inspection revealed a subtle but visible bulge in the right supraclavicular fossa. Palpation confirmed a firm, smooth, non-tender, and mobile mass measuring approximately 3 cm in diameter. It moved slightly with deglutition. The orthotopic thyroid gland was palpable in its normal cervical position and felt normal in size and consistency, without nodules. There was no cervical lymphadenopathy.

Laboratory investigations, including complete blood count and routine biochemistry, were within normal limits. Thyroid function tests revealed a euthyroid state, with TSH at 3.80 µU/mL (reference range: 0.4–4.0 µU/mL), free T4 at 1.1 ng/dL (reference range: 0.8–1.8 ng/dL), and free T3 within normal limits. Anti-thyroglobulin and anti-thyroid peroxidase antibodies were negative. Cervical ultrasound (US) was performed using a high-frequency linear transducer. It demonstrated a normal orthotopic thyroid gland with homogeneous echotexture and no focal lesions. In the right supraclavicular region, separate from the thyroid, a well-defined, oval, solid mass was identified, measuring 28 x 18 x 15 mm. The mass was hypoechoic relative to surrounding muscle but exhibited an echostructure remarkably similar to that of the normal thyroid parenchyma. It was located adjacent to the lower portion of the right internal jugular vein and showed no internal calcifications or cystic degeneration. Color Doppler imaging revealed mild internal vascularity. A contrast-enhanced CT scan of the neck was obtained for further anatomical characterization. It confirmed the presence of a well-circumscribed, homogeneously enhancing mass in the right supraclavicular space, just lateral to the lower internal jugular vein and anterior to the anterior scalene muscle. The mass showed contrast enhancement characteristics similar to the orthotopic thyroid gland. Importantly, it appeared to be in continuity with the inferior pole of the right thyroid lobe via a thin, enhancing pedicle, raising the initial differential diagnosis of a pedunculated thyroid nodule. No mediastinal extension beyond the thoracic inlet was noted. To resolve the diagnostic uncertainty and determine the functional nature of the mass, a thyroid scintigraphy was performed. The patient was injected intravenously with 185 MBq (5 mCi) of 99mTc-pertechnetate. Planar images of the neck and upper chest were acquired 20 minutes post-injection using a gamma camera equipped with a low-energy, high-resolution collimator. The scintigraphic images revealed two distinct foci of radiotracer uptake: a normal, bilobed focus of uptake in the expected anatomical position of the cervical thyroid gland, confirming a normally functioning orthotopic thyroid, and a second, well-defined focus of intense radiotracer uptake, distinct and separate from the orthotopic gland, projecting over the right supraclavicular region and extending slightly into the superior mediastinum. The intensity of uptake in this ectopic focus was comparable to that of the orthotopic gland, indicating fully functional thyroid tissue. The scintigraphic findings conclusively established the diagnosis of functional thyroid heterotopia (ectopic thyroid tissue) with a normally functioning orthotopic thyroid gland.

Given that the patient was completely asymptomatic from a compressive standpoint and remained euthyroid, a decision for conservative management was made in agreement with the patient. No surgical intervention or thyroid hormone suppressive

therapy was indicated. The patient was reassured about the benign nature of the finding and scheduled for regular clinical and ultrasound follow-up at 12-month intervals to monitor for any changes in size or the development of symptoms. At her 6-month follow-up, she remained asymptomatic, and the mass was stable in size on clinical examination.

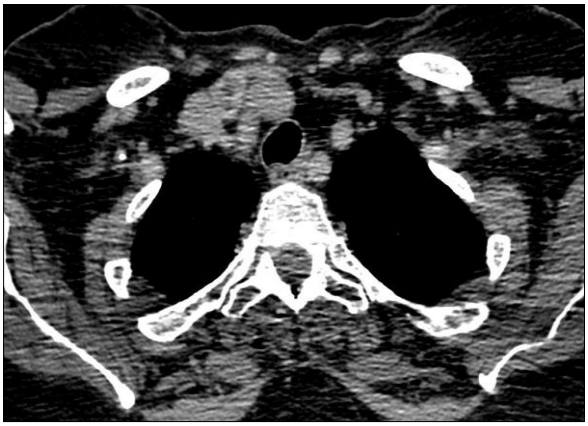

Figure 1: Axial CT image at the level of the thoracic inlet demonstrating a homogeneously enhancing right supraclavicular mass located lateral to the lower internal jugular vein and anterior to the anterior scalene muscle. Note the apparent thin pedicle (arrowhead) connecting the mass to the inferior pole of the right thyroid lobe

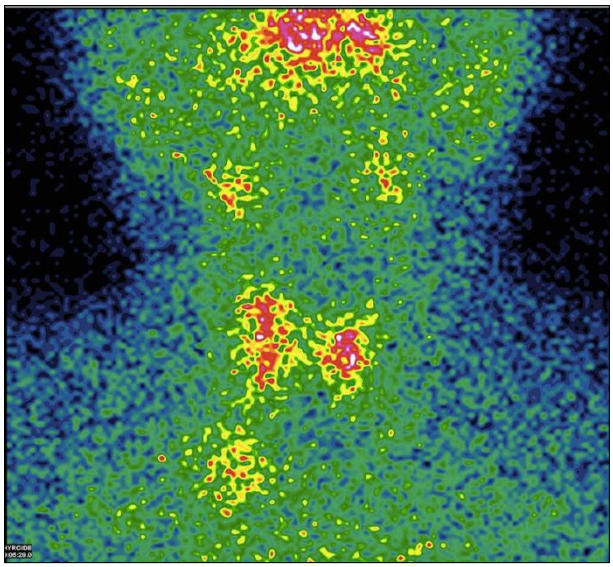

Figure 2: Anterior view 99mTc-pertechnetate thyroid scintigraphy of the neck and upper chest. The image demonstrates two distinct foci of radiotracer uptake: a normal bilobed focus in the expected position of the cervical thyroid gland (orthotopic thyroid), and a second, separate focus of intense uptake projecting over the right supraclavicular/superior mediastinal region (ectopic thyroid). This confirms the diagnosis of functional thyroid heterotopia

DISCUSSION

This case provides a compelling illustration of the diagnostic pathway for an uncommon entity: thyroid heterotopia presenting as a lateral cervical mass in a euthyroid patient with a normally located gland. Thyroid gland development begins around the 24th day of gestation as a thickening of endoderm in the floor of the primitive pharynx, at the site of the foramen cecum [2]. This primordium then descends anteriorly through the developing hyoid bone and laryngeal cartilages, reaching its final pretracheal position by the 7th week. The path of descent is marked by the thyroglossal duct, which normally obliterates. Ectopic thyroid tissue arises when part of this migratory tissue fails to complete its journey and persists at any point along this pathway [1-3].

The most common location for ectopic tissue is lingual (at the tongue base, accounting for 90% of cases), followed by sublingual, prelaryngeal (thyroglossal), and, rarely, intratracheal, esophageal, mediastinal, or lateral cervical [4, 13]. Our patient's right supraclavicular location is a particularly uncommon presentation. It is crucial to distinguish between true ectopia, where the ectopic tissue represents the only thyroid parenchyma (often seen in congenital hypothyroidism), and

heterotopia, where it coexists with a normal orthotopic gland, as in our case [5]. This distinction has significant implications for management, as patients with heterotopia are typically euthyroid and do not require hormone replacement.

Ectopic thyroid tissue is often asymptomatic and discovered incidentally [6]. When it presents as a palpable mass, as in our patient, it poses a significant diagnostic challenge. The differential diagnosis for a lateral cervical mass in an adult is broad and includes reactive lymphadenopathy, metastatic lymph nodes (from head and neck or thyroid primaries), lymphoma, branchial cleft cyst, neurogenic tumors, salivary gland tumors, and soft tissue sarcomas [7]. The fact that our patient was euthyroid and had a palpable orthotopic gland initially steered the differential away from complete ectopia but did not exclude a neoplastic process.

Ultrasound is the ideal initial imaging modality. It is non-invasive, widely available, and can characterize the mass as solid or cystic. In our case, the key clue was the echostructure of the mass, which closely resembled normal thyroid parenchyma [9]. This finding, while suggestive, is not pathognomonic, as other soft tissue masses can have a similar appearance. CT provided excellent anatomical detail, confirming the mass's location, extent, and enhancement pattern, which paralleled that of the thyroid [10]. The finding of apparent continuity with the right thyroid lobe via a thin pedicle was intriguing and raised the possibility of a pedunculated thyroid nodule. However, CT cannot distinguish between a truly connected nodule and an adjacent ectopic focus with similar enhancement characteristics. Importantly, a pedunculated nodule would still be considered part of the orthotopic gland, whereas a separate ectopic focus represents a distinct embryological entity. This is where 99mTc-pertechnetate scintigraphy provided the definitive answer. Pertechnetate is trapped by the sodium-iodide symporter (NIS) expressed on the basolateral membrane of functional thyroid follicular cells, exactly like iodine, but it is not organified [11, 12]. This trapping mechanism allows for the specific visualization of all functioning thyroid tissue. The intense uptake in both the cervical region and the supraclavicular mass confirmed that the mass was composed of functional thyroid follicular cells, conclusively establishing the diagnosis of heterotopia [14, 15]. The pattern of uptake definitively ruled out other diagnostic considerations. A malignant or inflammatory mass would not show significant pertechnetate uptake. A thyroglossal duct cyst would typically be midline and, if it contained functioning thyroid tissue, would also show uptake, but its location (midline, infrahyoid) would be different. The confirmation of benign, functional ectopic thyroid tissue in an asymptomatic, euthyroid patient has clear management implications. Surgical excision is generally reserved for cases with significant compressive symptoms, suspicion of malignancy (based on suspicious ultrasound features or growth), or for cosmetic reasons [16]. In the absence of these indications, a conservative approach with regular clinical and sonographic follow-up is the standard of care [17]. Scintigraphy was pivotal in avoiding an unnecessary and potentially complex surgical exploration in this case. The functional confirmation of benign tissue provided the patient and clinicians with the confidence to adopt a watchful waiting strategy.

The possibility of malignant transformation within ectopic thyroid tissue, although rare (<1% of cases), has been reported, primarily as papillary carcinoma [18, 19]. This underscores the importance of baseline imaging and regular follow-up. Ultrasound surveillance is well-suited for monitoring any changes in size, morphology, or the development of suspicious features such as microcalcifications or irregular margins.

CONCLUSION

This case report of a 60-year-old woman with a right supraclavicular mass underscores the critical role of a multimodality imaging approach, with 99mTc-pertechnetate scintigraphy serving as the definitive diagnostic tool. While ultrasound and CT provided valuable anatomical clues, it was the functional information from scintigraphy that conclusively identified the mass as functional ectopic thyroid tissue coexisting with a normal orthotopic gland (thyroid heterotopia). Thyroid heterotopia, though rare, should be considered in the differential diagnosis of lateral cervical masses, even in euthyroid patients with a palpable cervical thyroid. Scintigraphy remains the gold standard for confirming the diagnosis, distinguishing heterotopia from other cervical pathologies, and guiding appropriate management. In this case, its use was instrumental in avoiding unnecessary surgery and establishing a safe, conservative follow-up plan. We recommend that 99mTc-pertechnetate scintigraphy be routinely integrated into the diagnostic workup of any suspected ectopic thyroid tissue to ensure accurate diagnosis and optimal patient care.

List of Abbreviations

99mTcO4-: Technetium-99m Pertechnetate
NIS: Sodium-Iodide Symporter
TSH: Thyroid-Stimulating Hormone
US: Ultrasound
CT: Computed Tomography
MRI: Magnetic Resonance Imaging

Declarations

Ethics Approval and Consent to Participate: Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Consent for Publication: Obtained from the patient.

Availability of Data and Materials: All data generated or analyzed during this case are included in this published article.

Competing Interests: The authors declare that they have no competing interests.

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REFERENCES

1. Di Benedetto V. Ectopic thyroid gland. A systematic review. *G Chir*. 1997;18(10):673-678.
2. Moore KL, Persaud TVN, Torchia MG. The Developing Human: Clinically Oriented Embryology. 11th ed. Philadelphia, PA: Elsevier; 2020: Chapter 15.
3. Noussios G, Anagnostis P, Goulis DG, Lappas D, Natsis K. Ectopic thyroid tissue: anatomical, clinical, and surgical implications of a rare entity. *Eur J Endocrinol*. 2011;165(3):375-382.
4. Guerra G, Cinelli M, Mesolella M, et al. Morphological, diagnostic and surgical features of ectopic thyroid gland: a review of literature. *Int J Surg*. 2014;12(Suppl 1):S3-S11.
5. Ibrahim NA, Fadeyibi IO. Ectopic thyroid: etiology, pathology and management. *Hormones (Athens)*. 2011;10(4):261-269.
6. Toso A, Colombani F, Averono G, Aluffi P, Pia F. Lingual thyroid causing dysphagia and dyspnea. Case reports and review of the literature. *Acta Otorhinolaryngol Ital*. 2009;29(4):213-217.
7. Kang HC. Ectopic thyroid: a clinical overview. *J Korean Thyroid Assoc*. 2015;8(1):22-27.
8. Stoppa-Vaucher S, Lapointe A, Turpin S, et al. Ectopic thyroid gland: a clinical and imaging review. *Eur J Pediatr*. 2016;175(12):1867-1876.
9. Takashima S, Nomura N, Noguchi Y, et al. Ectopic thyroid in the submandibular region: CT and US findings. *Radiat Med*. 1998;16(3):205-208.
10. Park JJ, Ahn SH, Hong KH. Ectopic thyroid in the lateral neck: a case report and literature review. *J Audiol Otol*. 2017;21(2):113-116.
11. Meller J, Becker W. The continuing importance of thyroid scintigraphy in the era of high-resolution ultrasound. *Eur J Nucl Med Mol Imaging*. 2002;29(Suppl 2):S425-S438.
12. Datz FL. Handbook of Nuclear Medicine. 2nd ed. St. Louis, MO: Mosby; 1993.
13. Basaria S, Westra WH, Cooper DS. Ectopic thyroid tissue in the adrenal gland. *J Clin Endocrinol Metab*. 2001;86(2):522-525.
14. Williams JD, Sclafani AP, Slupchinskij O, Douge C. Evaluation and management of the lingual thyroid gland. *Ann Otol Rhinol Laryngol*. 1996;105(4):312-316.
15. Kalan A, Tariq M. Lingual thyroid gland: clinical evaluation and management. *J Laryngol Otol*. 1995;109(12):1194-1196.
16. Majumdar A, Mangal NS, Pandey S. Ectopic thyroid tissue in the lateral neck: a diagnostic dilemma. *BMJ Case Rep*. 2013;2013:bcr2013200894.
17. Yoon JS, Won KC, Cho IH, Lee JT, Lee HW. Clinical characteristics of ectopic thyroid in the lateral neck: a STROBE-compliant retrospective study. *Medicine (Baltimore)*. 2020;99(51):e23556.
18. Shah BC, Ravichand CS, Juluri S, Agarwal A, Pramesh CS, Mistry RC. Ectopic thyroid cancer. *Ann Thorac Cardiovasc Surg*. 2007;13(2):122-124.
19. Klubo-Gwiezdzinska J, Manes RP, Chia SH, et al. Clinical review: Ectopic cervical thyroid carcinoma—review of the literature with illustrative case series. *J Clin Endocrinol Metab*. 2011;96(9):2684-2691.