Case Report

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Subcutaneous ectopic thyroid tissue presenting as a midline neck mass in a middle-aged woman: a rare case report

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Background: Ectopic thyroid tissue is a rare congenital anomaly resulting from abnormal embryological descent of the thyroid gland. Though typically diagnosed in younger individuals, it may occasionally present later in life with variable anatomical locations and clinical manifestations.

Case presentation: We report a distinctive case of a 48-year-old female who presented with a progressively enlarging, painless midline neck mass associated with dysphagia and dyspnea. Imaging revealed complete absence of orthotopic thyroid tissue and identified a subcutaneous mass anterior to the cricoid cartilage – a highly unusual location. Fine-needle aspiration and histopathology confirmed ectopic thyroid tissue exhibiting nodular hyperplasia with benign characteristics. Surgical excision was followed by exploration to rule out residual thyroid tissue. Postoperative elevation in serum Thyroid stimulating hormone (TSH) levels confirmed the absence of functional thyroid remnants.

Discussion: This case is notable for two uncommon features: the patient's middle age at presentation and the subcutaneous positioning of the ectopic tissue, diverging from the more frequently observed lingual or intramuscular sites. This case is one of the rarely reported cases of subcutaneous anterior-neck ectopic thyroid in an adult and the first with complete absence of orthotopic thyroid tissue in a patient over 45 years old

Conclusion: Clinicians should consider ectopic thyroid tissue – even in older patients and atypical anatomical sites – when evaluating midline neck masses. Preoperative assessments and tailored interventions are essential for preserving thyroid function and achieving optimal outcomes.

Keywords: ectopic thyroid, midline neck mass, nodular hyperplasia, subcutaneous, surgical excision

Introduction

Thyroid ectopy (TE) is an aberrant embryological development, characterized by an abnormal thyroid location tissue beyond the thyroid compartment[1]. According to reports, the prevalence of this disorder is one in 4000 to 8000 individuals with thyroid disease and one in 100 000 to 300 000 people[2]. Male/female ratio: 4/1, most frequently observed in children and adolescents[3]. The most common places are along the midline between the mediastinum and the base of the tongue[4]. Localized swelling and compressive sensations caused by TE in the lingual, sublingual, or laryngeal region can lead to dysphagia, dysphonia, and dyspnea, frequently requiring surgical removal, which is often worsened by challenging intubation and increased perioperative hemorrhage[3]. The primary methods of diagnosis are imaging and clinical examination[1]. Thyroid hormone physiological requirements must be considered in the primarily medical treatment[1].

Although numerous cases of ectopic thyroid have been published, purely subcutaneous anterior-neck locations remain exceedingly rare, with fewer than 10 well-documented adult cases worldwide. Presentation in middle age with complete

HIGHLIGHTS

- A 48-year-old woman presented with a rare subcutaneous ectopic thyroid mass anterior to the cricoid cartilage, an unusual site.
- Diagnosis confirmed through ultrasonography, fine-needle aspiration, and histopathology showing benign nodular hyperplasia.
- Surgical excision with exploration ensured no residual thyroid tissue, with postoperative TSH elevation confirming complete removal.

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absence of a normal thyroid gland has not, to our knowledge, been previously reported, making this case valuable for raising awareness of this diagnostic possibility in older patients with midline neck masses.

Case presentation

A 48-year-old female presented with a progressively enlarging, painless midline neck mass over 2 months, accompanied by dysphagia and dyspnea. On examination, the mass was located approximately 5 cm above the thyroid cartilage, rubbery, mobile, and non-tender, with no palpable cervical lymphadenopathy. Laboratory investigations including thyroid profile were within normal limits.

Neck ultrasonography revealed a well-circumscribed, mixed echogenic mass with both solid and cystic components, demonstrating peripheral and central vascularity on Doppler imaging (Fig. 1). The lesion measured 29 × 23 mm and was situated in the anterior wall of the thyroid cartilage (Fig. 1). Notably, the thyroid bed was devoid of thyroid tissue (Fig. 1).

Fine-needle aspiration (FNA) cytology yielded atypical and unclassified cells. A diagnosis of ectopic thyroid tissue was established. Surgical excision was performed.

Intraoperatively, the mass was found directly beneath the skin, anatomically anterior to the cricoid cartilage, extending superiorly to the hyoid bone, without further extension or anatomical connections (Fig. 2). Following the excision of the mass, exploration was performed to ensure the absence of any residual thyroid tissue (Fig. 3)

Histopathological examination confirmed the presence of thyroid tissue exhibiting nodular hyperplasia with adenomatous and degenerative changes, consistent with a benign ectopic thyroid nodule (Figs 4 and 5).

The TSH level became elevated after surgery, eliminating the need for scintigraphy for follow-up and indicating the absence of any remaining thyroid tissue in the patient.

Follow-up 1 month later showed no signs of recurrence, and the patient reports no complaints.

Discussion

Ectopic thyroid tissue is a rare developmental anomaly resulting from aberrant morphogenesis during the thyroid gland's descent from the primitive foregut to its final location anterolateral to the second and fourth tracheal cartilages[5,6]. Its estimated prevalence ranges from 1 in 100 000–300 000 individuals, rising to 1 in 4000–8000 among patients with thyroid disorders[5]. Females, particularly those of Asian origin, are disproportionately affected[5]. Endocrine fluctuations related to puberty, pregnancy, and menstruation may contribute to glandular enlargement and symptom onset, accounting for the condition's sevenfold prevalence in women[7]. While ectopic thyroid tissue can present at any age from infancy to early adulthood, it is most commonly diagnosed in younger individuals[5,6]. Cases in middle-aged or older adults are rare; therefore, our report of a 48-year-old female patient with a rapidly enlarging neck mass represents an unusual presentation.

Radiological and laboratory investigations revealed complete absence of orthotopic thyroid tissue, with moderately maintained thyroid hormone levels. The observed enlargement likely reflects increased metabolic demand and compensatory growth of the ectopic tissue, driven by elevated serum TSH[6].

Thyroid development begins around day 24 of gestation, arising from endodermal cells in the primitive hypopharyngeal floor. The gland migrates to its final position near the hyoid bone and laryngeal cartilage[6]. During this process, the thyroglossal duct connects the developing thyroid to the tongue and typically regresses between the 6th and 8th weeks, leaving the foramen cecum at the tongue base[6]. Aberrations in this migration may result in ectopic thyroid tissue along the ductal pathway[6].

Common ectopic sites include the base of the tongue, submandibular and sublingual regions (between the geniohyoid and mylohyoid muscles), and pre-laryngeal areas (above the hyoid bone)[6]. Uncommon locations include the pharynx, esophagus, trachea, mediastinum, heart, breast, lungs, adrenal glands, and mesentery of the small intestine[6]. Approximately 90% of documented cases involve the tongue base[5,6,8]. In our case, the ectopic thyroid tissue was subcutaneous – an unusual location, anterior to the cricoid cartilage, and extended superiorly to the hyoid bone without anatomical continuity with native thyroid structures. Although the precise etiology remains unclear, mutations in thyroid transcription factor 2 (TTF-2) have been proposed as a potential cause of incomplete descent[6]. Classification systems help correlate anatomical location with clinical manifestations and inform therapeutic decisions[5].

Symptoms vary widely and depend on the site and size of the ectopic tissue. These may include dysphagia, dysphonia, snoring, sore throat, bleeding, odynophagia, obstructive sleep apnea, midline neck swelling, poor feeding, and signs of hypothyroidism such as dry skin and constipation[3,7,9]. Acute symptoms may be exacerbated by hemorrhage or inflammation within the ectopic tissue[7,9]. Our patient's symptoms included progressive dysphagia and dyspnea over 2 months, corresponding with mass enlargement.

Differential diagnoses for a midline anterior neck mass in an adult include thyroglossal duct cyst, dermoid cyst, lipoma, sebaceous cyst, lymph node, branchial cleft cyst remnant, and rarely, malignancy (metastatic thyroid carcinoma or primary subcutaneous sarcoma). In the absence of a normal thyroid gland on imaging, ectopic thyroid must be considered early to avoid inadvertent total thyroidectomy without replacement planning[7]. Diagnostic evaluation should incorporate thyroid function tests and scintigraphy; most cases demonstrate elevated TSH with reduced T3 and T4[7]. Scintigraphy aids in identifying ectopic tissue and excluding orthotopic thyroid presence[9]. CT and MRI are useful for assessing size, location, and relationships to adjacent structures[9], while ultrasound and CT are limited in conclusively identifying thyroid origin without tissue sampling[10]. Despite potential complications, biopsy remains essential for definitive diagnosis, particularly in lateral cervical ectopic thyroid (ETT), as no imaging or serologic test alone can distinguish benign from malignant forms[10]. FNA boasts a diagnostic accuracy of 95%–97% for neck masses[10,11].

In our case, clinical examination revealed a soft, mobile, non-tender midline neck mass located approximately 5 cm above the thyroid cartilage. Laboratory findings were unremarkable. Ultrasound demonstrated a well-circumscribed lesion, prompting FNA to confirm histology.

Figure 1. From top to bottom: (A) Color Doppler ultrasound revealing both central and peripheral vascularity within the ectopic mass, consistent with functioning thyroid tissue. (B) Ultrasound demonstrating a well-circumscribed subcutaneous mass anterior to the laryngeal framework, showing mixed solid and cystic echogenic components (Yellow arrow). (C) Ultrasound showing complete absence of orthotopic thyroid tissue in the thyroid bed. The expected location of both thyroid lobes appears empty (blue arrows).

Figure 2. The mass after excision measuring (4.5×4×2.7) cm and 22.5 g in weight.

Management of ectopic thyroid depends on anatomical location, symptom severity, hormonal function, and comorbidities[7,10]. Preoperative technetium-99 m or I-131 scintigraphy is strongly recommended whenever ectopic thyroid is suspected and the orthotopic gland is not visualized on ultrasound, to confirm that the ectopic tissue is the only functioning thyroid tissue and to guide the need for immediate postoperative levothyroxine replacement[9,10]. Asymptomatic patients may be monitored clinically or treated with suppressive hormonal therapy to minimize gland size[7,9,10]. Surgery is indicated for failure of medical therapy, significant symptoms, or complications such as bleeding, cystic degeneration, or malignancy[7,10,11]. Preoperative assessment for orthotopic thyroid is vital to prevent postoperative hypothyroidism[11]. Radioiodine ablation is an alternative for elderly patients or those unable to undergo general anesthesia[7,9]; however, it is contraindicated if functioning orthotopic tissue is present.

Our patient underwent complete excision of the mass, followed by exploration to confirm the absence of residual thyroid tissue. Histopathology revealed nodular hyperplasia with adenomatous and degenerative changes consistent with a benign ectopic thyroid nodule. Postoperative elevation in serum TSH supported the absence of remaining functional thyroid tissue, eliminating the need for scintigraphy and guiding future management.

This case report is limited by its single-case nature, which restricts generalizability to broader populations with ectopic thyroid tissue. While a 1-month follow-up showed no adverse complaints, longer-term data were not available to assess outcomes such as thyroid hormone replacement efficacy or potential recurrence. The absence of preoperative scintigraphy, due to postoperative TSH elevation confirming complete thyroid tissue removal, may have limited the ability to detect minute residual thyroid tissue preoperatively.

Figure 3. Demonstrates the larynx, trachea, recurrent laryngeal nerve, and parathyroid gland. Exploration was carried out to confirm the absence of any thyroid tissue.

Conclusion

This case illustrates the uncommon presentation of ectopic thyroid tissue in a middle-aged adult, reinforcing the importance of including ectopic thyroid in the differential diagnosis of midline neck masses – particularly when the orthotopic gland is absent. Notably in our case, the ectopic tissue was found in an exceptionally rare subcutaneous location anterior to the cricoid cartilage, deviating from the more typical lingual or intramuscular sites. Although such presentations are exceedingly rare in older populations, ectopic thyroid tissue can produce significant compressive symptoms, as demonstrated in our patient. A targeted diagnostic approach incorporating imaging, hormonal analysis, and FNA was essential for accurate identification and surgical planning. Histopathological findings and a postoperative surge in TSH confirmed the complete removal of functional thyroid tissue. Ultimately, this case emphasizes the need for vigilant clinical awareness and a coordinated multidisciplinary approach to ensure optimal outcomes and avoid postoperative hypothyroidism.

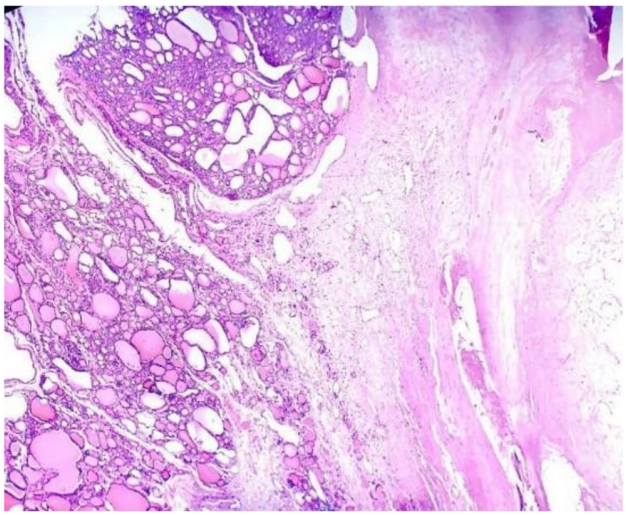

Figure 4. The histological study of the mass shows a thyroid tissue with nodular hyperplasia and adenomatous and degenerative changes such as fibrosis, calcifications, and cystic formations.

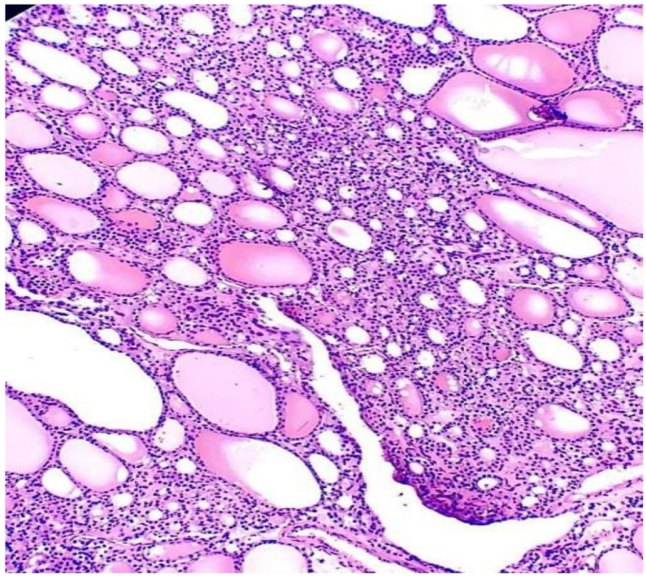

Figure 5. Another histological slide showing the same degenerative changes.

Methods

This case report has been reported in line with the SCARE 2025 checklist[12].

Ethical approval

Ethics clearance was not required by our institution for the study as it involves a case report adhering to evidence-based medicine principles, with approval obtained locally from the department of General Surgery.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Patient consent

The patient provided informed consent for the publication of this report.

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