Asia Pacific Science Press

Asia Pacific Journal of Clinical Medical Research
ISSN(O):3079-8345
ISSN(P):3079-8337
Vol. 1 No.5 (2025)

Thyrolipoma: A Case Report and Review of the Literature

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Abstract: Background: Thyrolipoma is a rare benign thyroid neoplasm composed of mature adipocytes within a follicular adenoma. Most lesions are asymptomatic, though some may enlarge and compress adjacent structures. **Methods:** We report a 30-year-old man with an incidentally detected thyroid nodule. Ultrasound showed a well-circumscribed, hyperechoic lesion, and shear-wave elastography indicated medium to high stiffness. The patient underwent right hemithyroidectomy, and histopathology confirmed thyrolipoma. **Conclusion:** Surgical excision is curative, with excellent long-term outcomes and no reported malignant transformation. Advanced imaging can aid preoperative assessment, and regular follow-up is recommended to monitor for recurrence or new lesions.

Keywords: Adipose Tissue; Thyrolipoma; Neck Swelling

Published: Dec 29, 2025

DOI: https://doi.org/10.62177/apjcmr.v1i5.974

1.Introduction

Fatty tissue is not normally present within the thyroid gland. Fat-containing thyroid lesions can be classified as neoplastic or non-neoplastic. Thyrolipomatosis is extremely rare and is characterized by diffuse infiltration of adipose tissue throughout otherwise normal thyroid parenchyma, with very few cases reported, whereas thyrolipoma, also termed as adenolipoma or thyroid hamartoma, represents the most common neoplastic type and is defined by the presence of mature adipocytes interspersed within a follicular adenoma[1]. Although most lesions are small and asymptomatic, some may enlarge to the extent that they compress adjacent cervical structures, resulting in dyspnea or dysphagia[2, 3]. Notably, exceptionally large papillary thyroid carcinoma associated with diffuse thyroid lipomatosis cases has also been documented[4, 5].

The pathogenesis of fat-containing thyroid lesions remains uncertain. Proposed mechanisms include developmental aberrations occurring during thyroid capsule formation and hypoxia-driven metaplastic transformation of fibroblasts[2]. In addition, loss of succinate dehydrogenase subunit B (SDHB) expression and large SDHB gene deletions have been documented in both follicular and adipocytic components, suggesting an underlying disturbance in lipid metabolic pathways[6].

The diagnosis of these lesions relies on an integrated assessment that includes clinical findings, imaging characteristics, and histopathological confirmation. Because thyrolipoma is uncommon, radiologists may be unfamiliar with its features and may fail to include it in the differential diagnosis. Nonetheless, timely recognition of this entity is essential for guiding appropriate management and ensuring favorable patient outcomes, a consideration that is especially relevant in resource-limited or rural

clinical settings. This case report aims to provide additional clinical insight and to summarize the existing literature on this rare lesion.

2.Case Presentation

A 30-year-old man was referred to our institution after a thyroid nodule was incidentally detected during routine health screening 10 days earlier. The patient was asymptomatic except for the palpable neck mass. He denied exophthalmos, fever, night sweats, weight loss, palpitations, or changes in appetite or personality. No hoarseness, dysphagia, or choking episodes were reported.

Physical examination revealed no facial edema. The neck was supple with the trachea in the midline, and a localized bulge was observed on the right side of the neck. Palpation identified a smooth, well-defined mass measuring approximately 2 cm × 5 cm, with medium firmness, no tenderness, and good mobility. The mass moved superiorly with swallowing. No palpable cervical lymphadenopathy was noted.

Ultrasound examination demonstrated mildly heterogeneous thyroid parenchyma with increased vascularity. A slightly hyperechoic, homogeneous lesion measuring 50.8 mm × 20.1 mm × 24.9 mm was detected in the right thyroid lobe. The lesion exhibited smooth borders, a regular shape, a longitudinal-to-transverse ratio <1, no calcifications, a uniform peripheral halo, and no posterior acoustic attenuation. Color Doppler flow imaging showed scant internal blood flow (Figure 1). Elastography indicated medium to high stiffness (Figure 2). The lesion was classified as TI-RADS category 3.

Figure 1 A slightly hyperechoic mass in the right thyroid lobe, with minimal internal vascularity detected on Doppler imaging.

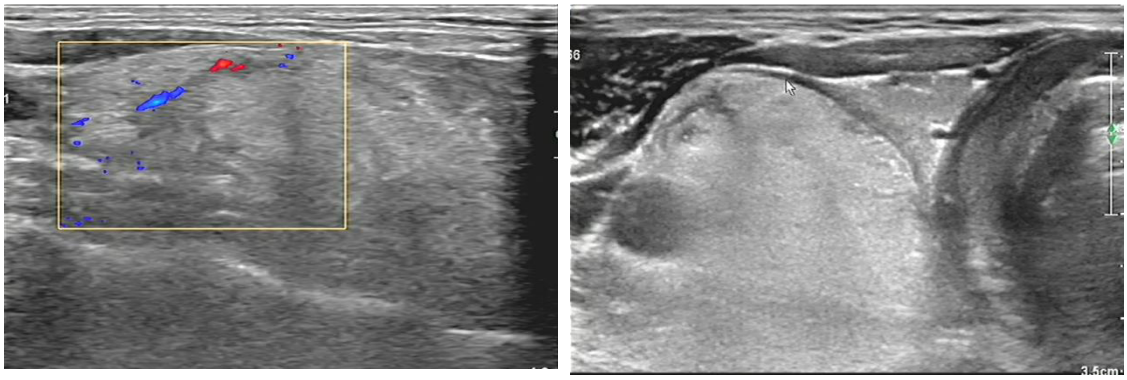
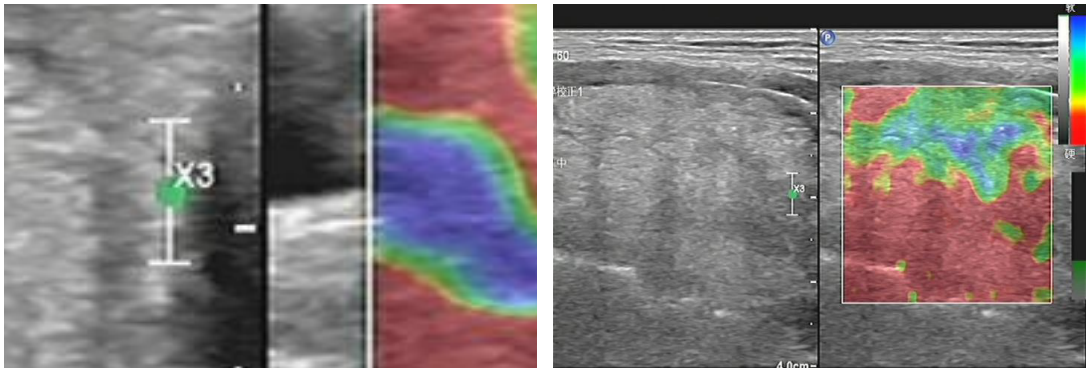


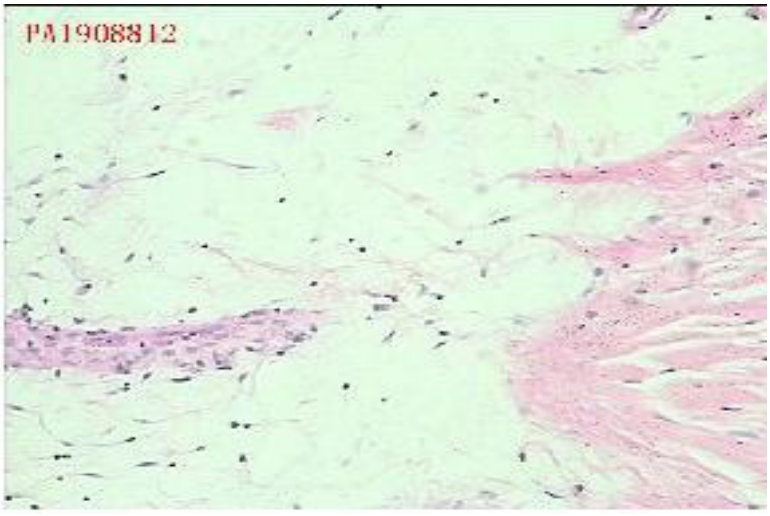
Figure 2 Shear-wave elastography demonstrating medium-to-high stiffness of the lesion.



Given the patient and family's preference for surgical management and the absence of contraindications in preoperative evaluations, a right hemithyroidectomy with exploration of the right recurrent laryngeal nerve was performed under general anesthesia. Intraoperatively, the right lobe was enlarged and appeared gray-red in color. Sectioning revealed a well-circumscribed yellow mass with a greasy texture and a clear boundary from the adjacent thyroid parenchyma.

Histopathological examination demonstrated abundant mature adipocytes within the lesion, confirming the diagnosis of thyroid lipoma (Figure 3). Postoperative recovery proceeded without any notable complications.

Figure 3 Histopathological examination showing abundant mature adipocytes within the lesion.



3.Discussion

Clinically, thyrolipoma presents similarly to other benign thyroid nodules. Most cases manifest as progressive neck enlargement or localized compressive symptoms, while thyroid function generally remains within the normal range. This entity can occur across a broad age spectrum, including in pediatric patients[7]. In our case, the patient was a middle-aged man in whom a neck mass was incidentally detected during a routine physical examination, with no associated symptoms. Radiological evaluation revealed a well-circumscribed lesion without evidence of compression of adjacent structures.

Treatment of thyrolipoma disease typically consists of surgical excision, which is considered curative, and long-term outcomes are overwhelmingly favorable, with no documented instances of malignant transformation. For our patient, the cervical mass was incidentally detected during a routine physical examination. Following confirmation of the diagnosis, a hemithyroidectomy was promptly performed to achieve definitive management and to mitigate the risk of future enlargement or symptomatic compression. Several published cases have reported patients remaining asymptomatic for more than a decade after surgery; in one report, a woman remained symptom-free even 24 years following hemithyroidectomy[8]. Our patient has not experienced any recurrence to date and will continue to undergo regular surveillance. Nevertheless, extended follow-up is advisable to detect any potential recurrence or the emergence of new lesions.

Ultrasound echogenicity of thyroid lesions generally correlates with their fat content, with low-fat lesions appearing hypoechoic and high-fat lesions hyperechoic. In the present case, the lesion was hyperechoic on two-dimensional ultrasound, exhibiting relatively homogeneous internal echoes, well-defined margins, a uniform peripheral halo, and no posterior acoustic attenuation. Reports on contrast-enhanced ultrasound or elastography of thyroid lipomas remain extremely limited[9]. Here, we employed shear-wave elastography, providing novel imaging evidence regarding the elasticity characteristics of thyrolipoma. With the advancement of ultrasound technologies and the accumulation of reported cases, clinical recognition and understanding of this rare entity are progressively improving.

In conclusion, thyrolipoma is an important differential diagnosis to consider in cases of thyroid nodules, the need for surgery in these situations must be re-evaluated through additional research using cytological criteria.

Statements & Declarations

Funding

This work was supported by the Fuling District Science and Technology and Health Joint Medical Research Program (Chongqing) (grant number 2024KWLH008) and the Fuling District Research Project (Chongqing) (grant number FLKJ,2024AAN3046).

Conflict of Interests

The author(s)declare(s) that there is no conflict of interest regarding the publication of this paper.

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