

## Focal Thyroiditis Mimicking Multiple EU-TIRADS 5 Nodules: A Case of Radiologic-Pathologic Discordance

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DOI: <https://doi.org/10.36347/sasjm.2026.v12i03.006>

Received: 09.01.2026 | Accepted: 24.02.2026 | Published: 13.03.2026

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### Abstract

### Case Report

**Background:** The EU-TIRADS classification system is a cornerstone of thyroid nodule management, yet its specificity is limited by benign pathologies that mimic malignancy. Focal Hashimoto's thyroiditis can create inflammatory "pseudonodules" with high-risk sonographic features, leading to a EU-TIRADS 5 classification and potentially unnecessary invasive procedures. **Case Presentation:** A 45-year-old female with newly diagnosed hypothyroidism was found to have an 11 mm EU-TIRADS 4 nodule. A three-month follow-up ultrasound revealed progression to two markedly hypoechoic, irregular nodules classified as EU-TIRADS 5. Fine-needle aspiration cytology was discordant, yielding a benign (Bethesda II) result. A subsequent 6-month control ultrasound demonstrated complete resolution of the discrete nodules, which had coalesced into a focal, ill-defined hypoechoic plaque. Serological testing confirmed high titers of anti-thyroid peroxidase antibodies, establishing the diagnosis of focal Hashimoto's thyroiditis. **Conclusion:** This case highlights the importance of integrating clinical context, serology, and imaging evolution in the assessment of suspicious thyroid nodules. In hypothyroid patients with EU-TIRADS 5 nodules that are discordant with benign cytology, short-term active surveillance is a critical problem-solving tool that can confirm an inflammatory etiology and prevent unnecessary intervention.

**Keywords:** Focal Thyroiditis, Hashimoto's Thyroiditis, EU-TIRADS, Ultrasound, Pseudonodule.

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## INTRODUCTION

High-resolution ultrasound (US) is the primary imaging modality for the evaluation of thyroid pathology, serving as the cornerstone for risk stratification systems such as EU-TIRADS. While these classification systems have significantly improved the management of thyroid nodules, the overlap in sonographic features between malignant lesions and focal inflammatory processes remains a diagnostic challenge. Chronic lymphocytic thyroiditis (Hashimoto's thyroiditis) typically presents as a diffusely enlarged, heterogeneous gland with micronodularity and increased vascularity [1]. However, it can also manifest as focal nodular disease, creating "pseudonodules" that mimic true neoplasms.

Distinguishing these focal inflammatory lesions from malignancy is difficult. Langer *et al.*, [2] described the classic appearance of focal thyroiditis as solid, hyperechoic nodules with ill-defined margins. Similarly, Zhang *et al.*, [3] found that focal Hashimoto's nodules were significantly more likely to be iso-

hyperechoic and lack malignant features such as marked hypoechogenicity or microcalcifications. Consequently, when an inflammatory lesion presents with "high-risk" features such as marked hypoechogenicity or irregular margins it is often misclassified as EU-TIRADS 5, leading to unnecessary invasive procedures. The distinction is further complicated by the presence of reactive lymphadenopathy in Hashimoto's thyroiditis, which can be mistaken for metastatic disease [4].

We present a case of focal thyroiditis in a patient with no prior history of autoimmune disease, appearing as multiple evolving EU-TIRADS 5 nodules. This case illustrates a significant radiologic-pathologic discordance where initial imaging strongly suggested malignancy, but short-term ultrasound surveillance and serological correlation revealed the evolving nature of an inflammatory "pseudonodule" [5].

**Citation:** A. Haoufadi, A. El Hassani, S. Ben Elhend, B. Slioui, R. Roukhsi, E. Atmane, A. Mouhsine, S. Bellasri. Focal Thyroiditis Mimicking Multiple EU-TIRADS 5 Nodules: A Case of Radiologic-Pathologic Discordance. SAS J Med, 2026 Mar 12(3): 188-191.

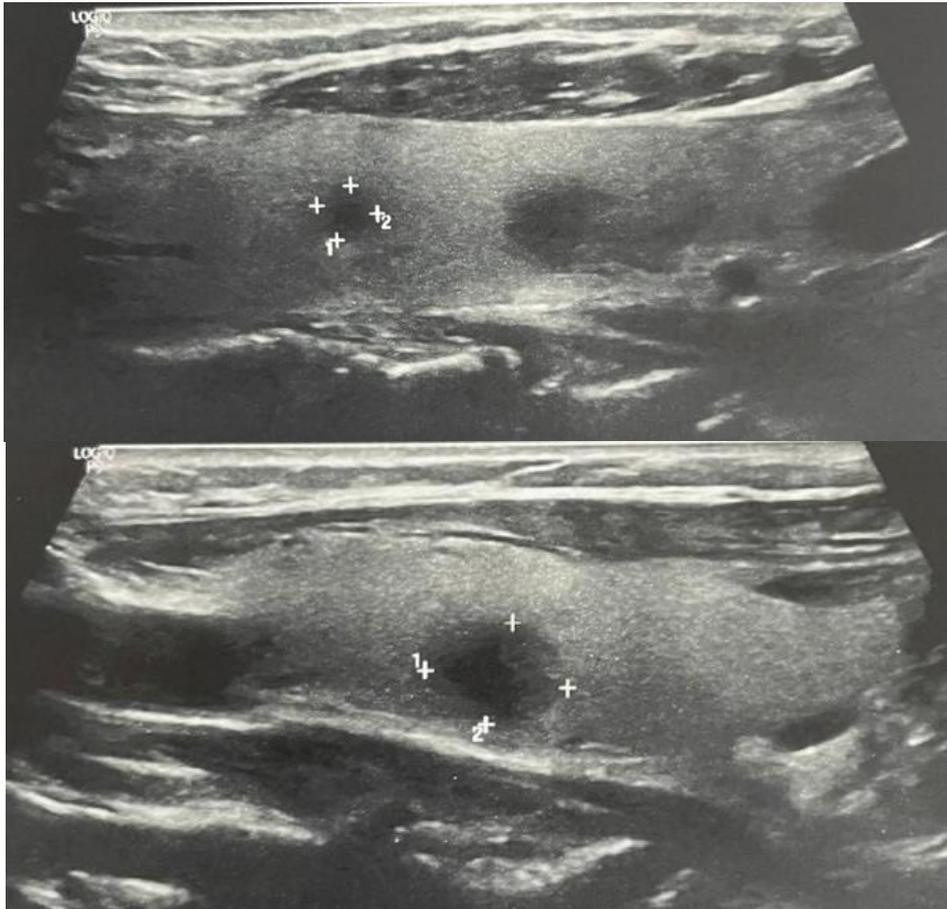
## CASE REPORT

A 45-year-old female presented for evaluation of thyroid nodules detected on incidental imaging performed at an outside institution.

The initial ultrasound examination revealed a solitary, solid, moderately hypoechoic nodule in the right superior lobe, measuring 11 mm in maximum diameter. The lesion was classified as EU-TIRADS 4. Given the size and intermediate risk stratification, fine-needle aspiration (FNA) was not immediately indicated, and active surveillance was recommended. Thyroid function

tests at this time were consistent with primary hypothyroidism (Elevated TSH, Low FT4 and T3).

A follow-up ultrasound performed three months later demonstrated interval radiologic progression. Two distinct nodules were now identified in the right superior and mid-lobe regions, both measuring approximately 11 mm. Unlike the initial study, these lesions presented with high-risk features, including marked hypoechoogenicity, irregular margins, and peripheral vascularity. No microcalcifications or suspicious cervical lymphadenopathy were identified. Based on these findings, the lesions were reclassified as EU-TIRADS 5, warranting tissue sampling.

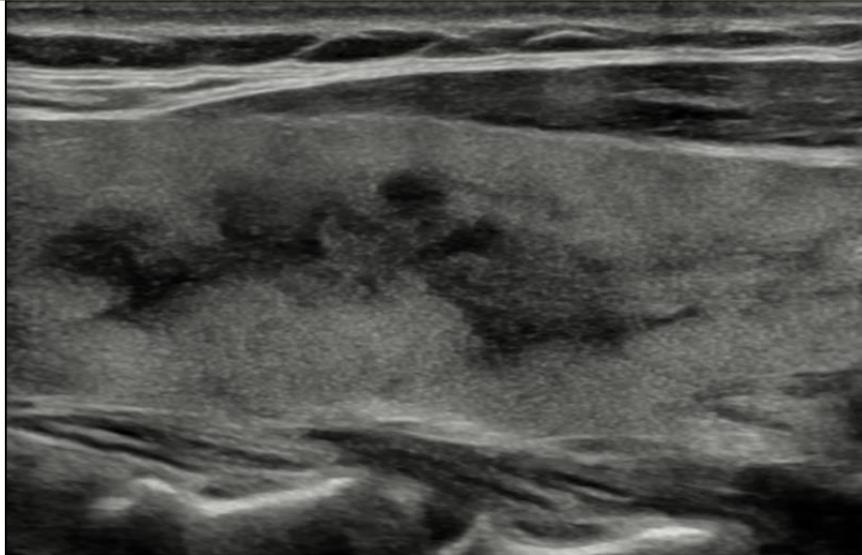


**Figure 1: High-risk sonographic features at 3-month follow-up**

Grayscale ultrasound of the right superior thyroid lobe demonstrates two solid, markedly hypoechoic nodule measuring 11 mm (calipers) with irregular margins. These features resulted in a EU-TIRADS 5 classification, prompting FNA.

Ultrasound-guided FNA was performed on the dominant lesions. Cytopathology yielded a Bethesda Category II (Benign) result, consistent with a benign follicular nodule/fluid. Despite the discordant high-risk imaging features, the benign cytology and the patient's hypothyroid status suggested an inflammatory etiology.

The patient was referred to our department for a second opinion and 6-month control ultrasound. Grayscale imaging revealed the resolution of the previously discrete "nodules." In their place, a focal hypoechoic plaque with ill-defined margins and mixed vascularity was observed occupying the right mid-lobe. The surrounding parenchyma displayed a regular contour with moderate vascularity on Color Doppler, distinct from the focal lesion. No discrete nodular lesions were identified. Subsequent serological testing confirmed strongly positive anti-thyroid peroxidase (anti-TPO) antibodies, establishing the diagnosis of focal Hashimoto's thyroiditis.



**Figure 2: Inflammatory evolution and resolution at 6-month follow-up**

Grayscale ultrasound of the right thyroid lobe demonstrates the resolution of the previously seen discrete nodules. They have now coalesced into a focal, ill-defined hypoechoic plaque without a true nodule configuration. This morphological change from distinct nodules to a confluent inflammatory plaque confirmed the benign etiology.

## DISCUSSION

This case highlights a critical diagnostic pitfall in thyroid imaging: the "great mimicry" of focal lymphocytic thyroiditis. While the EU-TIRADS system is highly effective for risk stratification, it relies entirely on morphological features that can overlap significantly with inflammatory processes. In our patient, the rapid appearance of hypoechoic nodules with irregular margins warranted a high-risk classification (EU-TIRADS 5), yet the pathology was benign.

The literature typically describes focal thyroiditis as a less aggressive-looking entity. Langer *et al.*, [2] reported that focal thyroiditis most commonly presents as solid, hyperechoic nodules with ill-defined margins. Similarly, Zhang *et al.*, [3] found that marked hypoechogenicity—a hallmark of malignancy—was significantly less common in focal Hashimoto's (29.6%) compared to malignant nodules (42.3%). Our patient's presentation was therefore atypical; the marked hypoechogenicity and irregular margins mimicked an infiltrative carcinoma, misleading the initial assessment. These irregular margins in thyroiditis are often due to "pseudolobulation" caused by fibrous septae and lymphocytic infiltration rather than true invasion [1].

However, a subtle clue was present that might have raised suspicion for an inflammatory etiology: the absence of microcalcifications. Zhang *et al.*, [3] noted that microcalcifications are significantly more frequent in malignant nodules (44.4%) than in focal thyroiditis

(3.6%). In retrospect, the combination of multiple synchronous high-risk nodules, the absence of microcalcifications, and the background of hypothyroidism should prompt the radiologist to consider unequal or focal thyroiditis.

The evolution of these lesions upon follow-up confirmed the diagnosis. As described by Lim and Shanik [5] in cases of subacute thyroiditis, inflammatory "pseudonodules" are transient. Our patient's 6-month control ultrasound demonstrated the dissolution of the discrete "nodules" into a vague, hypoechoic plaque. This morphological change, correlated with elevated anti-TPO antibodies, validated the diagnosis of focal Hashimoto's thyroiditis. This case underscores the value of short-term active surveillance for discordant cases (high-risk imaging with benign cytology) to avoid unnecessary repeat biopsies or surgery.

## CONCLUSION

Focal Hashimoto's thyroiditis can present as multiple EU-TIRADS 5 nodules, creating a significant diagnostic challenge. When high-risk sonographic features are found in the setting of hypothyroidism, the absence of microcalcifications should prompt consideration of an inflammatory etiology. The presence of elevated anti-TPO antibodies can provide crucial diagnostic confirmation. In cases of radiologic-pathologic discordance, where imaging is suspicious but cytology is benign, short-term ultrasound follow-up is a powerful, non-invasive tool that can demonstrate the transient nature of these inflammatory pseudonodules, thereby preventing unnecessary surgical intervention.

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