

Lessons of the month 1: A diagnostic dilemma: thyroid abscess or subacute thyroiditis?

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ABSTRACT

Thyroid abscess is rare but potentially fatal, whereas subclinical thyroiditis is a self-limiting condition that is more commonly seen. The clinical features of both diseases can be overlapping but the treatment approach differs. We report a case of a painful left thyroid nodule not responding to conventional therapy for thyroiditis or thyroid abscess.

KEYWORDS: thyroid abscess, thyroiditis, painful thyroid nodule

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Introduction

The thyroid gland is known to be resistant to infection due to its fibrous capsule, rich vascularity, generous lymphatic drainage and high iodine content. Therefore, thyroid abscess is extremely rare accounting for 0.1%–0.7% of all thyroid diseases.¹ In contrast, subacute thyroiditis, which is an inflammatory thyrotoxic disease presumably caused by viral infection, is more frequently seen with an incidence of 12.1 cases per 100,000 per year.² Treatment modalities are different: thyroid abscess requires prompt systemic antibiotics, whereas non-steroidal anti-inflammatory drugs (NSAIDs) and beta blockers are the mainstay of treatment for subacute thyroiditis. In this case report, we discuss a patient with painful left thyroid nodule associated with a high-grade fever who did not respond to systemic antibiotics and NSAIDs.

Case presentation

A 42-year-old woman with no significant past illnesses presented with a high-grade fever, sore throat and painful neck swelling for 3 days, without thyrotoxic symptoms. On physical examination, she was pyretic at 38.6°C, normotensive at 120/70 mmHg, and tachycardic with a heart rate of 114 beats per minute. There was a hard and tender left thyroid nodule measuring 2 × 2 cm. Her blood tests showed thyrotoxicosis with free T4 (fT4) of 27.8 pmol/L and thyroid-stimulating hormone (TSH) of 0.079 mIU/L, elevated white blood cells (WBC) of 21×10^9 /L with neutrophil count of 11.2×10^9 /L, and raised C-reactive protein (CRP) of 303.5 mg/L (Table 1). She was treated for thyroid abscess and started on intravenous (IV) antibiotics, a beta blocker and NSAIDs. An urgent ultrasound revealed a heterogeneous and hypoechoic lesion

Table 1. The serial laboratory tests

	Day 1 (at presentation)	Week 4	Normal range
TSH, mIU/L	0.079	3	0.27–4.20
fT4, pmol/L	27.8	15	12–22
CRP, mg/L	303.5	2.4	<5.0
WBC, $\times 10^9$ /L	21	9.6	4–10
Neutrophils, $\times 10^9$ /L	11.2	5.4	2.0–7.0

CRP = C-reactive protein; fT4 = Free T4; TSH = thyroid-stimulating hormone; WBC = white blood cells.

in the left thyroid lobe measuring $2.6 \times 3.7 \times 3.2$ cm, potentially indicating acute suppurative thyroiditis with early abscess formation (Fig 1). Her thyroid scintigraphy showed a region of low uptake in the left thyroid gland measuring about 2.2 cm (Fig 2), which was suggestive of focal thyroiditis or abscess. Based on the clinical, laboratory and imaging findings, she was continued with intravenous antibiotics for a week. However, her fever did not subside and pain persisted. She subsequently underwent fine needle aspiration (FNA). The cytology revealed a colloid nodule with cystic degeneration in the presence of macrophages and lymphocytes. As there was no frank pus seen in the cytology, this was highly suggestive of subacute thyroiditis. Blood and thyroid aspirate cultures had no growth. With these findings, the antibiotics were stopped and NSAIDs were continued for a month. The patient recovered fully without the need for antithyroid drugs. Her

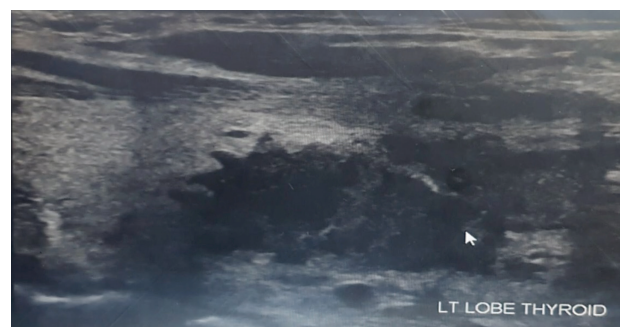


Fig 1. Ultrasound showing a heterogeneous and hypoechoic lesion in the left thyroid lobe.

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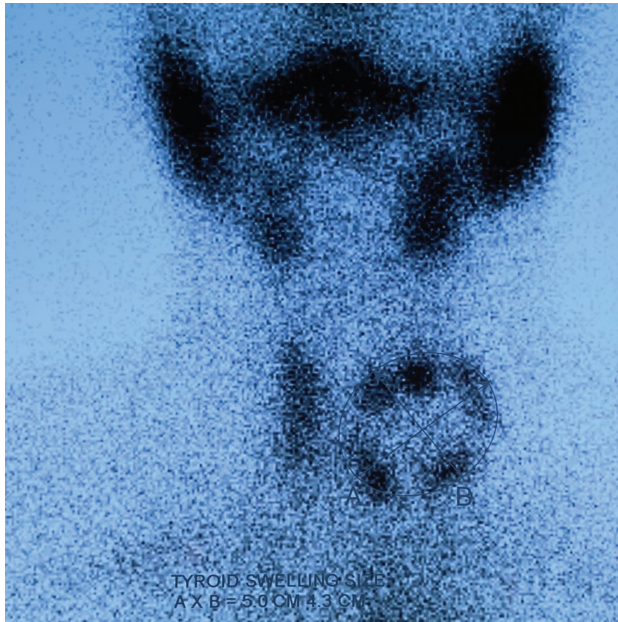


Fig 2. Thyroid scintigraphy showed a region of low uptake in the left thyroid gland suggestive of focal thyroiditis or abscess.

biochemical parameters reverted to normal (Table 1), and the thyroid nodule resolved spontaneously after 2 months.

Discussion

Subacute thyroiditis is a thyrotoxic condition characterised by neck pain, fever and a tender diffuse goitre, commonly seen in young and middle-aged adults with higher incidence in women.² It was first defined by Swiss surgeon de Quervain in 1902 as a self-limiting inflammatory disorder of the thyroid gland.³ A post-viral inflammatory response in subacute thyroiditis leads to giant cell infiltration into the thyroid follicles. This results in follicular swelling and stretching of the capsule causing pain and tenderness, and follicle disruption with release of stored thyroid hormone into the circulation leading to hyperthyroidism.⁴ Although subacute thyroiditis often presents with tender diffuse goitre, there are exceptions, such as in our patient, as well as the case of a patient with a painful thyroid nodule reported by Li *et al.*⁵

Thyroid abscess is most often seen in children with local anatomic defects, such as a pyriform sinus fistula or third and fourth bronchial arch anomalies.^{6,7} In adults, it is seen in patients with Hashimoto's disease, large goitre or thyroid cancer, and people who are immunocompromised, older or debilitated. It could also arise via haematogenous or lymphatic spread or from iatrogenic infections after FNA.^{6,7} The clinical manifestations in both subacute thyroiditis and thyroid abscess can be similar, although 83.1% of the patients with bacterial suppurative thyroiditis were euthyroid.⁸ Both diseases show markedly elevated erythrocyte sedimentation rate (ESR) and CRP. The WBC is normal or slightly elevated in subacute thyroiditis but is significantly elevated in a thyroid abscess.⁶ Due to the overlapping clinical features, it was difficult to make the initial diagnosis in this patient. She had high-grade fever

and a tender thyroid mass, with an elevated WBC and CRP. Antibiotic therapy was therefore started on the presumptive diagnosis of thyroid abscess and NSAIDs were given for pain relief. The most common cause of thyroid abscess is acute bacterial infection with *Staphylococcus* and *Streptococcus* species being the major pathogens, while mycobacterial and fungal infections tend to be more chronic and common in immunocompromised patients.^{1,8,9}

The mainstay of treatment in subacute thyroiditis is to suppress the thyroid inflammation with salicylates and other NSAIDs. In severe cases, steroids are the most effective therapy.⁴ In thyroid abscess, the key is to treat the infection with antibiotics. If antibiotic treatment fails, surgical drainage and/or thyroid surgery is necessary. In this case, NSAIDs were started early to alleviate her symptoms and thus benefited her when the diagnosis was revised to subacute thyroiditis. As a thyroid abscess has the potential to progress very rapidly, inadequate treatment can be fatal, resulting in mortality of over 12%.^{7,8}

Ultrasound is usually sufficient to identify a thyroid abscess as it is easily accessible, but in certain cases it may not be obvious.⁹ Heterogeneous and hypoechoic features, as described in our case, are rather non-specific.¹⁰ It is also difficult to differentiate subacute thyroiditis from a thyroid abscess using a thyroid uptake scan as both may show low uptake.⁹ Computed tomography is rarely needed unless ultrasound is inconclusive or local anatomic defects are suspected. Hence, clinical judgement, cytopathologic findings from FNA and cultures may be helpful in differentiating both. Presence of giant cells, granulomas, inflammatory cells (lymphocytes, macrophages and neutrophils), degenerated follicular epithelial cells, with a background of thick colloid with cellular debris are the key cytological characteristics of subacute thyroiditis, while there will be aspiration of pus in thyroid abscess.^{6,10} Imaging studies on our patient revealed the possibility of either one of the two diseases. By doing FNA, we were able to conclude the diagnosis of subacute thyroiditis. She eventually recovered with NSAIDs and beta blockers.

Conclusion

This patient case highlighted the importance of differentiating between a thyroid abscess and subacute thyroiditis. ■

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