



## Thyroid Abscess a Rare Clinical Entity: 2 Cases with Different Clinical Presentations

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### Abstract

A thyroid abscess is an infrequently encountered condition with a rarity that is attributable to anatomic and physiologic characteristics of the gland that impart a unique quality of infection resistance. Primary thyroid abscess resulting from acute suppurative thyroiditis (AST) is an unusual type of head and neck infection and its progression to abscess formation is even more uncommon.

Thyroid abscess represents 0.1% to 0.7% of surgically treated thyroid pathologies. As the diagnosis is rare, it is often missed or delayed in lieu of investigating other more common etiologies of thyroiditis. Hereby, we present two cases, first case an adolescent male who presented with fever, weight loss, dysphagia and signs of thyrotoxicosis but no evidence of any Pyriform sinus fistula. Second case is also a male child who presented as a neck swelling on left side with fever and painful neck movements but in a euthyroid state. Both cases were successfully treated with I&D and recovery was uneventful. We aim to highlight that thyroid abscess though rare, can still occur in different ages and with different features. Hence, high level of suspicion must be kept in mind to treat these rare but potentially life threatening situations.

### Introduction

Thyroid gland is quite resistant to infections, which is attributable to its anatomy and physiology. When features of thyroiditis are present, other more common causes of the same such as subacute and chronic thyroiditis are actively sought for and an abscess may be missed altogether. A clinical diagnosis may be difficult sometimes and an USG/CT should be done. Also an FNAC is helpful to differentiate between Acute infective thyroiditis and other causes of thyroiditis. Thyroid Abscesses have been associated with Pyriform fistula and especially when a left side fluctuant swelling in the thyroid is noted, a fistula must be actively sought for. We hereby present two cases, in individuals of different ages and features, both left side swellings, but without any fistula.

### Case Presentation

#### Case 1

A 15 year old male presented with fever, painful swelling in neck and weight loss for 15 days. Physical examination showed an ill defined swelling in anterior triangle of neck in thyroid region (Figure 1). It was very tender on touch.

Laboratory investigations revealed leukocyte count 27000 with 90% polymorphs; hemoglobin level 11g/dl and ESR 103mm/hour. Thyroid profile revealed raised T3, T4 with low TSH suggesting hyperthyroid state. Patient was started on Tablet Neomercazole (30 mg) per day. After ten days T3 came down to below normal range while TSH was still low. Anti Tg/Anti TPO profile were negative.

Ultrasonography of the neck revealed enlargement and altered echotexture of thyroid with increased vascularity on color Doppler suggesting acute thyroiditis. As the patient did not improve much, scan was repeated after ten days and it revealed total replacement of thyroid parenchyma by a hypoechoic collection showing moving internal echoes with few intervening septa showing vascularity on color Doppler (Figure 2). Barium esophagogram did not show any kind of abnormality including pyriform sinus fistula (Figure 3). Minimal extrinsic impression was seen on left lateral aspect of cervical oesophagus due to enlarged thyroid. FNAC was done which yielded pus (Figure 4). Smears showed gram positive cocci in clusters. Z.N. stain for AFB was negative.

The diagnosis of acute suppurative thyroiditis with thyroid abscess was made. Patient underwent Incision and drainage which yielded about 20 cc yellowish pus (Figure 5). Culture of pus yielded staphylococcus aureus infection. Fever subsided after 3 days of drainage. TLC counts were within

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Figure 1: Pre-operative Clinical Photograph of Patient.



Figure 2: Grey scale USG image demonstrates replacement of thyroid parenchyma by hypoechoic collection showing moving internal echoes with few intervening septae.



Figure 3: Barium swallow of the patient shows no abnormality. Bilateral pyriform fossa are well delineated. No evidence of any pyriform sinus fistula noted.



Figure 4: USG guided pus drainage.

normal limits. He was discharged home five days after admission.

Patient followed up after 1 month with complete recovery (Figure 6) and a euthyroid state.

Antithyroid medications (Neomercazole) have been stopped gradually on tapering dosage and patient is presently off medication.



Figure 5: Intraoperative Incision & Drainage of Abscess.



Figure 6: Follow up after 1 month.

**Case 2**

A 7 year old male child presented with neck pain and dysphagia for fifteen days. Physical examination showed an ill defined, tender and fluctuant swelling in thyroid region on left side (Figure 7 and 8).

Laboratory investigations revealed leucocytosis with mixed neutrophilic and lymphocytic picture (50% neutrophils and 42%



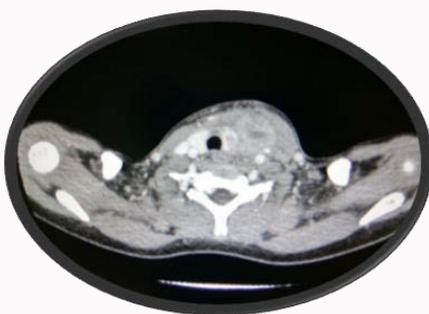
Figure 7: Pre-operative image showing swelling in the neck.



Figure 8: Intraoperative picture of the second patient with abscess.



**Figure 9:** Grey scale USG image demonstrates a heteroechoic area in left lobe of thyroid communicating with a collection adjacent to left lobe of thyroid. Surrounding fat planes were echogenic. Overlying strap muscles, skin and subcutaneous tissue were slightly echogenic and edematous.



**Figure 10:** CECT neck of the patient shows a non-enhancing area in left lobe of thyroid which is communicating with a heterogeneously enhancing collection in perithyroidal region. This is consistent with thyroid abscess with contained rupture in perithyroidal region.

lymphocytes). Thyroid profile revealed normal T3, T4 with increased TSH levels. Anti Tg/Anti TPO profile were negative.

Ultrasonography of the neck revealed a heteroechoic area in left lobe of thyroid communicating with a collection adjacent to left lobe of thyroid. Surrounding fat planes were echogenic. Overlying strap muscles, skin and subcutaneous tissue were slightly echogenic and edematous (Figure 9). Barium esophagogram did not show any kind of abnormality including pyriform sinus fistula. CECT neck showed a heterogeneously enhancing left thyroid lobe with few hypodense non enhancing areas within it (Figure 10). This was in continuation with a hypodense collection adjacent to left lobe of thyroid. A radiological diagnosis of left thyroid lobe abscess with contained local spread was made. FNAC of the swelling yielded pus. Z.N. stain for AFB was negative. Gram stain showed gram negative bacilli with few gram positive cocci.

The diagnosis of subacute suppurative thyroiditis with thyroid abscess was made. Patient underwent surgical operation. Surgical drainage yielded about 5 to 10 cc yellowish pus. Culture of pus yielded *Staph aureus* infection. Fever subsided 2 days after drainage. She was discharged home four days after admission. Tab levothyroxine (25 micrograms per day) which was started in post operative period, was discontinued after 15 days as patient returned back to euthyroid state.

## Discussion

Thyroid abscess and acute suppurative thyroiditis are not common, representing only 0.1% to 0.7% of surgically treated thyroid pathologies [1]. For this reason, diagnosis is often delayed, which may lead to a life-threatening situation [2]. Rarity of this condition is attributable to anatomic and physiologic characteristics of the gland

that impart a unique quality of infection resistance. These include rich blood supply and lymphatic drainage, high glandular content of iodine which can be bactericidal and separation of the gland due to total encapsulation from other structures of neck [3].

Since the gland has no external connections the route of infection was a mystery. Takai et al. [4] reported 15 patients with acute suppurative thyroiditis where a pyriform fistula was the apparent route of infection. The pyriform sinus fistula is an internal pharyngeal fistula and has been shown to be the most common underlying abnormality in patients with AST. The fistula ends in or adjacent to the thyroid and allows bacterial infection to develop in or around the gland. The left side is more commonly involved than the right. Thyroid abscesses usually start after upper respiratory tract, pharynx, or middle-ear infections [5]. A case of thyrotoxicosis caused by acute suppurative thyroiditis after repeated fine-needle aspiration (FNA) has been described. Thyroid infection had possibly been induced by needle-track seeding, because atopic skin favors colonization by *S. aureus* because of local immunologic deficiency [6]. Rare cases such as fish bone penetration through the esophageal mucosa into the thyroid gland space of the neck after several weeks of swallowing has been reported [7].

The most important causal organisms are *Staphylococcus aureus*, *Streptococcus* species, and anaerobes. These infections account for approximately 70% of cases [8]. Other causes include *Escherichia coli* following urosepsis, *Bacteroides fragilis* in post-hysterectomy [9], *Klebsiella*, *Salmonella typhoid*, *Salmonella brandenburg*, *Eikenella corrodens*, *Fusobacterium mortiferum* [10], and aspergillosis [11]. Rare cases have been reported from Lemierre's syndrome [12] (post-anginal septicaemia due to anaerobes) and infectious mononucleosis in adolescence [13] presenting with thyroid abscess. Plain x ray may show tracheal displacement and soft tissue swelling over thyroid region. Barium swallow is mandatory to rule out pyriform sinus fistula because it is a common cause of recurrent thyroid abscess and its total resection effectively prevents a relapse. In the acute inflammatory stage, USG showed a hypoechoic lesion spreading in and around the affected thyroid lobe, destruction of the lobe, and abscess formation in the neck. A careful review of the US studies demonstrated that the following findings are characteristic of acute suppurative thyroiditis: a perithyroidal hypoechoic space, effacement of the plane between the thyroid and perithyroid tissues, and the hypoechoic lesions being unifocal. The former two are not seen in subacute thyroiditis, and hypoechoic lesions in subacute thyroiditis are usually multiple and often bilateral [9].

CT scans demonstrated similar features with clearer anatomical involvement and edema in the ipsilateral hypopharynx. These findings allowed easy diagnosis of AST. However, in the early inflammatory stage USG showed an unclear hypoechoic area in the affected lobe and CT scans showed a nonspecific low-density area. These findings often led to erroneous diagnoses of subacute thyroiditis. In the late inflammatory stage, USG and CT scans often showed atrophy and an unclear hypoechoic or low-density area in and around the affected lobe. To detect pyriform sinus fistulae, barium swallow studies are more sensitive than USG or CT scans [9].

Role of FNAC is to differentiate acute suppurative thyroiditis and subacute thyroiditis because the management lines are different for these. It can also identify the bacteriological origin i.e. GPC or GNB and thus helps to make a selective antibiotic selection [14].

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