

## Case Report

# The conundrum of acute onset midline neck swellings: a unique case report of a thyroid abscess

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## ABSTRACT

The conditions of the thyroid gland are the most common causes for midline neck swellings and present with a spectrum of clinical features and differential diagnosis, some more fatal than the others. One such rare yet worrisome condition is suppurative thyroiditis progressing to an abscess. A 17 year old male presented with an acute neck swelling with fever, pain, and hoarseness of voice. Investigations revealed leucocytosis with normal thyroid hormone levels. Contrast enhanced CT scan of the neck showed presence of an abscess of the thyroid gland with left sided tracheal shift. Incision and drainage with antibiotic support was done leading to an uneventful recovery. The thyroid gland by virtue of its capsule, rich blood supply, and high iodine content is resistant to infection. Thyroid abscess is a rare condition with high morbidity and mortality. This condition should be a differential diagnosis in cases of acute onset midline swellings. Immediate surgical drainage of the collection with antibiotic support is the gold standard treatment of this condition.

**Keywords:** Suppurative thyroiditis, Thyroid abscess, Neck swelling, Midline neck swelling, Thyroid swelling, Incision and drainage

## INTRODUCTION

Inflammatory conditions of the thyroid gland are rare, among which acute suppurative thyroiditis progressing to abscess of thyroid gland is a further uncommon clinical entity. It accounts for 0.1-0.7% of the pathologies affecting thyroid gland.<sup>1</sup> Acute suppurative thyroiditis usually does not occur without pre-existing infections due to factors such as the rich blood supply, lymphatic drainage, high iodine content, the ability to synthesize peroxide and other oxidizing radical compounds and the presence of fascia that functions as a tight covering encapsulating the thyroid gland, all of which makes the gland resistant to infection.<sup>2</sup> It is known to occur in concurrence with pre-existing pathologies of the thyroid gland such as hyperthyroidism, malignancies of the thyroid and Hashimoto's thyroiditis.<sup>3</sup>

If left untreated, the condition can rapidly progress and extend into surrounding structures and rupture into trachea or oesophagus which becomes a life-threatening condition. It can have a mortality rate of 12% or more.<sup>4</sup> We here present one such unique case in a young male.

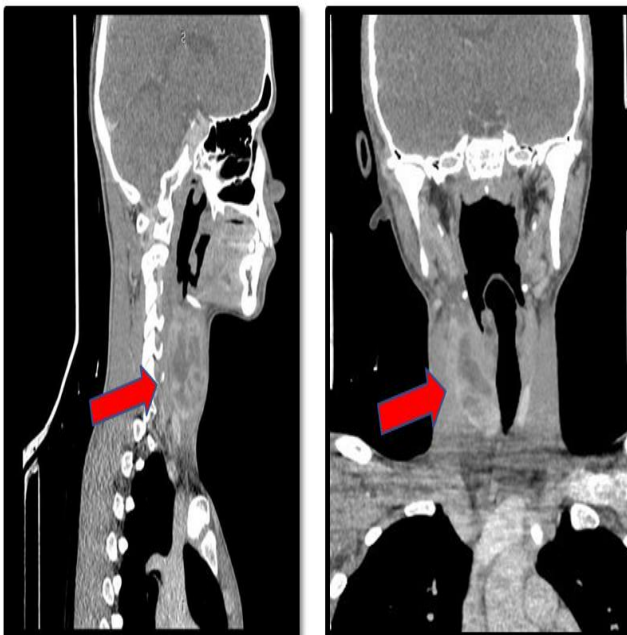
## CASE REPORT

A 17-year-old male patient presented to our OPD with complaints of a painful swelling on the right side of neck for 15 days with restricted movement of the neck, with moderate grade of fever with chills and rigors and hoarseness of voice. On examination, a 6×4 cm firm, tender swelling on right side of his neck corresponding to the right lobe of the thyroid gland (Figure 1), the overlying skin was erythematous with local rise of temperature. Trachea was deviated to left side.

Blood investigations revealed raised WBC counts and thyroid function tests were within normal limits. Video laryngoscopy showed bulging of right wall of larynx with normal vocal cord movements. CECT of neck showed peripherally enhancing multi-septate hypodense with internal non enhancing necrotic collection arising from right lobe of thyroid gland approximately measuring 3.7(AP) ×2.8 (ML) ×5.1 (CC) cm (Figure 2) with mass effect on right common carotid artery and trachea shifted to the left side (Fig. 3). Incision and Drainage was done and broad- spectrum antibiotics and analgesics were started. The pus was drained (Figure 3) and necrotic tissue was excised and sent for culture sensitivity and histopathology respectively. Post operative period was uneventful.



**Figure 1: Right sided neck swelling with left sided tracheal deviation.**



**Figure 2: CECT neck showing collection in right lobe of thyroid in sagittal and coronal sections.**



**Figure 3: Intra-op view of abscess being drained from right lobe of thyroid gland (green arrow).**

## DISCUSSION

Suppurative thyroiditis and its further development into thyroid abscess is notably rare. In children, persistent pyriform sinus fistula, congenital anatomical defects arising from 3<sup>rd</sup> or 4<sup>th</sup> branchial arch can predispose to this condition. In adults its seen that conditions such as septicemia, tuberculosis and suppurative lymphadenitis can cause invasion of microorganisms into thyroid gland leading to infection and abscess formation. Individuals with SLE, Hodgkin's lymphoma and other immunocompromised conditions are at risk of developing suppurative thyroiditis. Lastly it may also occur due to iatrogenic causes such as inadvertent inoculation of the thyroid gland during fine needle aspiration cytology procedure and surgeries of head and neck.<sup>1</sup>

*Staphylococcus* and *streptococcus* species are responsible for causing infection in majority of the cases of suppurative thyroiditis. Other microorganisms such as *Candida*, *Brucella*, *Salmonella*, and anaerobes such as *E. coli*, *Pseudomonas aeruginosa* and *Klebsiella* species can cause suppurative thyroiditis. Mycobacterial and fungal infections are more commonly seen in immunodeficient patients.<sup>2</sup> The culture of the abscess collection in our patient produced *Acinetobacter lwoffii* which is rare and hasn't been reported in previous literature.

Patients commonly present with complaints of fever, pain in throat, swelling in neck with erythema of overlying skin, tenderness and painful neck movements. Patient may be febrile with symptoms of difficulty in swallowing, difficulty breathing or noisy breathing and hoarseness of voice similar what we found in our case. Patient may also give h/o upper respiratory tract infection in the recent past, although this may not always be case.<sup>3</sup>

Blood investigations reveal leukocytosis, predominantly neutrophilic, increased CRP and ESR also seen our case.

Due to destruction of thyroid gland by bacteria during course of infection, there may be increase in levels of thyroid hormones and thyroglobulin levels and signs of hyperthyroidism such as weight loss despite of increased appetite, increased sensitivity to cold, sweating, tremors may be present. Rarely patient may present in state of hypothyroidism, but in our case, patient was euthyroid.<sup>3</sup>

Ultrasonography of the neck reveals site of abscess which may be intrathyroidal or extrathyroidal, and may also show inflammatory nodules within the thyroid gland and can also be used for doing FNAC. Computed tomography may be used in advanced cases where abscess is widespread or to precisely outline the margins and extent of spread of the collection. Video-laryngoscopy study can be done to study for presence of pyriform sinus fistula and to note for presence of vocal cord paralysis if any.<sup>3</sup>

If left untreated, the thyroid abscess may increase in size and compress the surrounding structures such as trachea causing stridor, and may rupture. The collection can then spread into the deep neck spaces and cause secondary infections of the neck spaces. It may also rupture into the trachea and oesophagus causing coughing up of purulent material and respiratory distress. The abscess may cause paresis of the vocal cords in case of laryngeal involvement. In addition, downward extension into the mediastinum of the abscess can cause fatal mediastinal abscess. The necrosis of thyroid tissue as a result of infection can cause release of large amounts of thyroid hormones in the blood, which can lead to thyrotoxicosis or sudden onset thyroid storm.<sup>4</sup>

Management of thyroid abscess involves both medical and surgical lines of care. At the time of presentation, the routine blood investigations of the patient must be sent and the patient must be observed for signs of airway compromise. Broad spectrum intravenous antibiotics must be started along with fluid correction in case of severe dehydration. Antibiotic therapy is continued for a period of 14 days until clinical resolution is imperative.

In patients with stable airway, USG guided aspiration of abscess collection with antibiotics is treatment of choice. Repeat aspiration of abscess can be done if needed.

Surgery should be done in patients who do not respond to antibiotic treatment. Urgent drainage should be done in patients with compromised airways. In today's practice CT guided drainage of the abscess is the surgery of choice. If unavailable, Incision and drainage of the abscess with a wide bore needle should be done.<sup>4</sup> Open surgery, with hemithyroidectomy or total thyroidectomy can be done to relieve pressure symptoms in severe cases, and in patients who do not respond to adequate antibiotic treatment and drainage. If there is a pyriform sinus fistula present, it should be ablated with instillation of chemo cauterizing

agent.<sup>5</sup>

After resolution of symptoms, evaluation of thyroid hormone levels should be done at follow up visits to detect and treat hypothyroidism which may occur due to extensive necrosis of thyroid tissue in severe cases of acute suppurative thyroiditis with thyroid abscess.<sup>6</sup>

## CONCLUSION

The development of an abscess of the thyroid gland is an extremely rare condition which requires a high index of suspicion for early detection and treatment since it can occur without any previous history of recent infection. The disease can progress rapidly and spread extensively causing life threatening complications such as airway compromise. Since its recurrence is associated with pyriform sinus fistula in children, surgical excision of the fistula should be done. The treatment of this condition is intravenous antibiotics and surgical drainage. After complete recovery of the patient, evaluation of thyroid hormone levels should be done to due to the risk of developing hypothyroidism.

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