

Case Report

Thyroid abscess: a rare condition in immunocompetent patient

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ABSTRACT

Thyroid abscess is rare due to certain anatomical and physiological characteristics of the thyroid gland. Thyroid abscess can occur due to spread of flora in the upper respiratory tract to perithyroid space and thyroid gland through fistula. We are reporting case of thyroid abscess where the infecting pathogen was *E. coli*. USG and guided FNAC are simple and first line investigations. However there can be abscess formation following FNAC in immune compromised patients. A 50 years old man presented to us with complaints of fever and swelling over the left anterior aspect of neck of 10 days duration. It was associated with pain during swallowing. Ultrasound is investigation of choice as it does not have ionizing radiation, gives a good exposure of thyroid gland, show heterogeneous echo texture and superimposition of abscess is present. It can also show vascularity and internal haemorrhage. Patient was a case of undetected and uncontrolled diabetes mellitus which might have predisposed him to suppurative thyroiditis. Timely detection and surgical debridement of necrosed tissue and specific antibiotic treatment with management of diabetes helped him recover from this life threatening condition.

Keywords: Thyroid abscess, Suppurative thyroiditis, Incision and drainage, Thyroidectomy, Deep neck space abscess, Mediastinitis

INTRODUCTION

Acute suppurative thyroiditis leading to thyroid abscess is rare.¹ Thyroid abscess can occur due to spread of flora in the upper respiratory tract to perithyroid space and thyroid gland through fistula.¹ Early diagnosis is necessary due to high morbidity and mortality associated with thyroid abscess. USG and guided FNAC are simple and first line investigations. However there can be abscess formation following FNAC in immune compromised patients.² Thyroid abscess is rare due to certain anatomical and physiological characteristics of the thyroid gland like good lymphatic drainage, iodine rich environment, hydrogen peroxide production within the gland, secluded anatomic position due to clear fascial planes, complete encapsulation and rich vascular supply of the thyroid gland.³⁻⁵ The common pathogens causing this condition include *Staphylococcus aureus*,

haemolytic *Streptococci* and *Pneumococci*. Rarely anaerobic and gram negative bacteria can also cause thyroid abscess.² We are reporting case of thyroid abscess where the infecting pathogen was *E. coli*.

CASE REPORT

A 50 years old man presented to us with complaints of fever and swelling over the left anterior aspect of neck of 10 days duration. It was associated with pain during swallowing. The swelling had rapidly progressed to diffusely involve the complete anterior aspect of neck and was restricting neck movements. He was a chronic smoker and alcoholic. There was no history of any immune-compromise, steroid intake, earlier thyroid swelling or thyroid disorders, trauma or foreign body in the aero-digestive tract. At the time of presentation patient had diffuse cellulitis of the anterior aspect of

neck, ill demarcated tender swelling present between anterior borders of sternocleidomastoid from suprasternal notch till hyoid. Assessment of movement with deglutition difficult due to the large area of cellulitis. Crepitation was present over the swelling.

There were no palpable lymph nodes. Examination of oral cavity and oropharynx was normal. Patient had tachycardia (heart rate- 140 per minute), tachypnoea with a respiratory rate of 30/minutes and was febrile (103° F).

Peripheral blood smear showed leucocytosis with total count 18400/cumm and neutrophils 74%. The blood sugars (fasting and post prandial) were raised. HBA1C was 12%. Serum T4 was 16.4 mcg/dl and TSH was 0.015 mcIU/ml showing hyperthyroidism. Urine examination was positive for sugars (2+). Urine was negative for ketones. Serology was negative for hepatitis B and HIV.

Ultrasound neck showed a thick walled cystic lesion measuring 3.0×2.9×2.6 cm in left lobe of thyroid with heterogeneous echo texture, superimposed by an anechoic/hyper echoic mass with foci of air and peripheral hyper vascularity.

A diagnosis of acute thyroiditis with deep neck space abscess was made. Patient was admitted and intravenous broad spectrum antibiotics started covering both gram positive and gram negative organisms. Treatment of diabetes mellitus was started simultaneously.



Figure 1: Necrotic muscle and thyroid tissue with thrombosed anterior jugular visualized after draining the pus.

Emergency incision and drainage under general anaesthesia was performed by horizontal neck crease approach (6 cm long Kocher's incision). Intraoperatively, loculated pus pockets were found in the entire left lobe and lower pole of right lobe of thyroid gland. Left lobe and lower pole of right lobe of thyroid were necrotic with foul smelling pus (Figure 1, 2). Complete drainage could not be achieved due to multiple loculations and septations within the thyroid gland. Hence definitive surgical management was planned and subtotal thyroidectomy was performed leaving behind a small part of the right lobe which was appearing normal (Figure 3). After thorough antiseptic and saline wash, the wound was closed with a suction drain No. 14 (Figure 5).

Culture and sensitivity of pus revealed growth of *E. coli*, sensitive to piperacillin+tazobactam, meropenem and imipenem. Based on the culture and sensitivity report, injection meropenem was administered for 5 days. Suction drain was removed after 5 days when the discharge subsided. Patient improved clinically and was discharged with oral antibiotics in 1 week after suture removal.



Figure 2: Necrotic tissue after removal of necrosed thyroid lobe and isthmus.



Figure 3: Excised specimen showing necrosed left lobe + isthmus + lower part of right lobe of thyroid gland.



Figure 4: Postoperative picture with suction drain *in situ*.

DISCUSSION

Acute suppurative thyroiditis progressing to thyroid abscess is a rare clinical condition.¹ Commonest route of

spread of infection to thyroid gland is haematogenous but exact source has not been clarified. However when suppurative thyroiditis occurs, particularly in immune-compromised patients, it leads to rapid progression, toxicity and airway compromise.⁶ Mortality rates due to suppurative thyroiditis vary from 3.7 to 12.1%. Mortality rate can be higher if patient is immunosuppressed.⁷ This condition is more common in females aged between 20-40 years.⁸ Left lobe of the thyroid gland is commonly involved but the cause for the same is unknown.⁹ A preceding upper respiratory tract infection, pharyngitis or otitis media are commonly associated with this condition.¹⁰ In children the main cause of thyroid abscess is a hypopharyngeal (branchial) fistula.¹¹ Therefore hypopharyngoscopy is an important diagnostic procedure in children presenting with suppurative thyroiditis. If the abscess is localized USG guided needle aspiration is ideal.¹²

The micro-organisms causing suppurative thyroiditis are *Streptococci* and *Staphylococci*. However, *Eikenella*, *Klebsiella*, *Brucella*, *Aspergillus*, *Salomonella*, and *Acinetobacter* can occasionally cause this condition. Polymicrobial infections have also been implicated.¹⁰ A thyroid abscess due to *Klebsiella* have been reported in infants and following kidney transplant.¹³

Patients present with variable conditions like swelling over anterior aspect of neck, especially on left side, fever, bitemporal headache,odynophagia, stiff neck, hypothermia, left sided otalgia etc. Infants can present with emesis and diarrhea.¹⁴ Patients can be euthyroid or hyperthyroid at presentation. However mycobacterium thyroiditis can present with hypothyroidism.⁷ Thyrotoxicosis can occur secondary to destruction of thyroid gland by bacteria.^{15,16} Sometimes symptoms are subtle and can mimic other conditions making early diagnosis difficult. It can lead to complications like mediastinitis, internal jugular vein thrombophlebitis, septicemia and tracheoesophageal fistula.¹²

Ultrasound is investigation of choice as it does not have ionizing radiation, gives a good exposure of thyroid gland, show heterogeneous echo texture and superimposition of abscess is present. It can also show vascularity and internal haemorrhage.⁶ CT scan shows extent and spread along tissue planes and can guide aspiration of abscess.^{17,18} MRI delineates the findings better in soft tissue and abscess appears hyperintense in T₂ weighted images. Radio nucleotide scan with Technetium 99 and Gallium have been used in literature.¹⁹

Our patient was a case of undetected and uncontrolled diabetes mellitus which might have predisposed him to suppurative thyroiditis. Our patient had presented with fever,odynophagia and neck swelling and hyperthyroid state which was similar to few studies shown in literature. In our patient USG showed features suggestive of abscess in the thyroid gland. In view of multiple loculations and

septations definitive surgical management was planned and subtotal thyroidectomy was performed to remove the necrotic tissue in toto. Timely detection and surgical debridement of necrosed tissue and specific antibiotic treatment with management of diabetes helped him recover from this life threatening condition.

CONCLUSION

Suppurative thyroiditis due to *E. coli* is rare, with a high morbidity and mortality. Often the source of infection is unknown. Immunocompromise can predispose to this condition. Early detection and aggressive management can be lifesaving.

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