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Case Report

Thyroid abscess in a 5 year old child caused by *Enterococcus* species: a rare case report

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ABSTRACT

Thyroid abscess is a rare clinical entity which is attributable to its unique anatomical and physical characteristics which makes it resistant to infection. Thyroid gland is resistant to infection because of its rich blood supply and lymphatic drainage, an iodine rich environment and separation of the gland from other structures of neck by facial planes. In our case report, 5 years old male patient presented with a painful anterior midline neck swelling which was diagnosed as thyroid abscess caused by *Enterococcus* species. The patient was successfully treated with surgical drainage and appropriate antibiotics.

Keywords: *Enterococcus* species, Infection, Thyroid abscess, Thyroid gland

INTRODUCTION

Acute suppurative thyroiditis (AST) is a rare clinical condition.[1] The progression of this condition to thyroid abscess is equally unusual.[2] AST and thyroid abscess represent 0.1% to 0.7% of surgical pathology of thyroid gland.[3] Thyroid gland infection is rare due to its isolated anatomical location, fibrous capsule, rich blood supply, generous lymphatic drainage and high content of iodine. Because of its rarity the diagnosis of thyroid abscess is often delayed. Majority of cases of AST and Thyroid abscess are seen in children with predisposing factors like pyriform sinus fistulas and thyroglossal duct anomalies.[4] The condition is associated with the persistence of a canal originating from the 3rd or 4th branchial pouches that may lead to recurrent thyroid abscess.[5] Pre-existing thyroid disease is also a known predisposing factor in adults, including longstanding thyroid goiter and thyroid malignancies.[6] In most cases infection spreads to thyroid gland via pyriform sinus.[7]

CASE REPORT

A 5 year old male presented to Otorhinolaryngology Out Patient Department of Dhulikhel Hospital with fever and painful left anterior neck swelling for 5 days with preceding history of mild cough for few days. On examination, indurated anterior neck swelling, around 1 cm lateral to the midline of neck on left side was seen. The upper border of the swelling was corresponding to the lower border of thyroid cartilage. Laterally, swelling just crossed the anterior border of left SCM muscle. Inferior border was 1 cm above upper border of left clavicle. Size of the swelling was 3x2 cm (Figure 1) and moving with deglutition. Tenderness was present. The ultrasonography exam showed a 3.4x2.9 cm cystic lesion with low level internal echoes at left lobe of thyroid (Figure 2). Thyroid function test revealed reduced TSH level (TSH-0.008 µg/dl) with normal free T3 and free T4 (Free T3-3.25 pg/ml, Free T4-1.7 ng/dl). The diagnosis of thyroid abscess was made. He underwent incision and drainage under general anesthesia (Figure 3).

Figure 1: Pre-operative examination findings of thyroid abscess -around 1 cm lateral to the midline of neck on left side.

Figure 2: Low level internal echo at left lobe of thyroid gland.

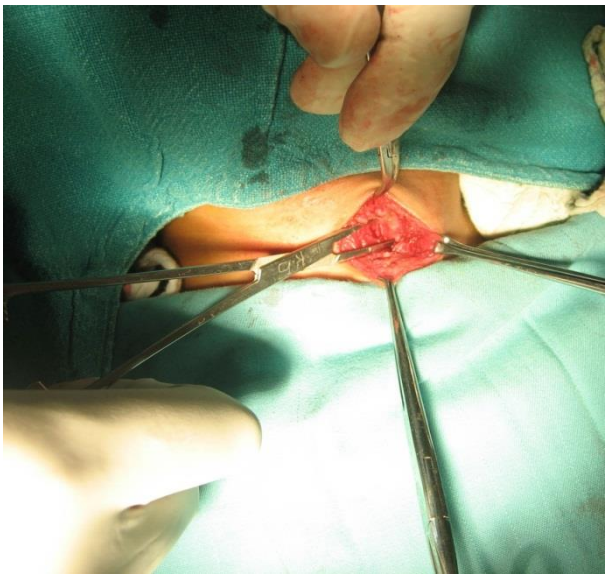

Figure 3: Incision and drainage.

Around 6 ml of pus was drained. He was treated with intravenous ceftriaxone and metronidazole. Pus culture and sensitivity report yielded *Enterococcus* species sensitive to cefriaxone. Metronidazole was given to cover anaerobic organisms empirically. His post-operative period was uneventful and improved clinically. He was discharged on 7th post-operative day. His 3 months follow up was uneventful**.**

DISCUSSION

Infection of thyroid gland is rare because of the features which make it resistant to infection. Its encapsulation, rich vascularity and wide lymphatic drainage, high glandular iodine content and separation from other structures by fascial planes contribute to its resistance to infections.[8-10] However, congenital thyroid gland pathology such as pyriform sinus fistula can also lead to AST11-size of citation number. Acute suppurative thyroiditis has been associated with immunosuppression especially Human Immunodeficiency Virus.[12] Since 1950, Schweitzer and Olson noted that only 39 cases of thyroid abscess have been reported in the medical literature. Out of the 39 cases, 16 were in children.[13]

Thyroid abscess has been observed to be more common in females than in males but there are reports demonstrating that the disease occurs in male and female in a 1:1.[14,15] It is commonly seen in children and young adults between 20 to 40 years of age.[16] Age range may vary considerably between 16 days to 79 years.[15] Our patient was a five year old male. Involvement of left lobe is more prevalent than the right.[5] In our case left side was involved**.** Laboratory features usually leukocytosis, elevated ESR with typically normal thyroid function test.[17] However, one study showed 12% patients were reported to have thyrotoxicosis and 17% had hypothyroidism.[18] Destruction of thyroid follicles is attributed to thyrotoxicosis.[19]

Ultrasonography and computed tomography may demonstrate the underlying configuration and extent of the abscess and potential local irregularities in thyroid gland anatomy.[20] Fine needle aspiration cytology can differentiate between AST and sub acute thyroiditis, and also identifying organism along with its antibiotic susceptibility.[21] The most common organisms are *Staphylococcus aureus*, *Streptococcus* species and anaerobes.[22] Duraker et al reported salmonella to cause vocal cord paralysis in a patient presenting with stridor and thyroid abscess.[23] Rarely mycobacterium tuberculosis has also been reported.[24] Rarely, Lemierre's syndrome (post anginal septicemia due to anaerobes) and infectious mononucleosis in adolescents have been reported with thyroid abscess.[25] The culture and sensitivity of pus from our case revealed *Enterococcus* species. No earlier case reports of thyroid abscess caused by *Enterococcus* species could be found. So, our case may be the first reported case of thyroid abscess caused by *Enterococcus* species. *Enterococcus* is a large genus of lactic acid

bacteria of the phylum firmicutes. *Enterococci* are Gram-positive cocci that often occur in pairs (diplococci) or short chains, and are difficult to distinguish from streptococci on physical characteristics alone. Two species are common commensal organisms in the intestines of humans: *E. faecalis* (90–95%) and *E. faecium* (5–10%).[26] The exact reason for thyroid abscess caused by *Enterococcus* species is unknown. However, hematogenous spread is most likely cause for distant infection. Concurrent bacteremia by same organisms may be the one of most likely causes.

The definite management of thyroid abscess is incision and drainage along with broad spectrum antibiotic therapy consisting covering aerobic, anaerobic and oral flora. Antibiotic can be changed according to the sensitivity profile. Destruction of thyroid or parathyroid glands, internal jugular thrombophlebitis, local or hematological spread to other organs, fistula formation into the esophagus or trachea can occur as complications of thyroid abscess.[27]

CONCLUSION

Thyroid abscess itself is a rare clinical entity and this case exemplifies case of thyroid abscess caused by an unusual causative organism: *Enterococcus* species. Since no case report of thyroid abscess caused by *Enterococcus* species could be found till date, our case can be the first case of thyroid abscess due to this kind to be reported. The source of infection in our patient was not known. With proper examination and investigations early diagnosis can be made. Early intervention and proper treatment with surgical drainage and broad spectrum antibiotics can prevent possible complications. Since this disease can be associated with anatomical abnormalities such as pyriform sinus fistula, it should be ruled out. It also shows that any case of fever of unknown origin should be investigated in the line of AST and thyroid abscess as well.

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