BRIEF COMMUNICATION

Uncommon affliction of a common disease - primary tuberculosis of thyroid gland

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ABSTRACT

Tuberculosis (TB) continues to be a major public health problem in India. With an annual incidence rate of 2.8 million new cases, India accounts for a quarter of the global TB burden. Primary thyroid TB still remains a rare entity even in this era of global TB pandemic. Here we discuss a case of primary thyroid TB in a 22-year-old immunocompetent male patient presenting with a thyroid swelling followed by non-healing sinus tract after fine-needle aspiration cytology (FNAC) procedure. TB is a known common cause for development of chronic sinuses and ulcers. However, the primary involvement of thyroid gland along with formation of non-healing sinus tract post FNAC make it a most unusual case posing a diagnostic challenge to the unsuspecting physician.

KEY WORDS: Fine-needle aspiration cytology (FNAC), sinus tract, thyroid, tuberculosis

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INTRODUCTION

Tuberculosis (TB) is a major public health problem in India with an annual incidence rate of 2.8 million new cases. Primary thyroid TB, however, is an extremely rare entity. Here we discuss a case of primary thyroid TB in a young immunocompetent male presenting with thyroid swelling followed by non-healing sinus tract after fine needle aspiration cytology (FNAC) procedure. Though TB is a common cause of chronic sinuses and ulcers, the primary involvement of thyroid makes it a most unusual case.

CASE REPORT

A 22-year-old male presented in January 2017 with a painful left-sided thyroid swelling of one month's duration associated with fever and fatigue. There was no pallor, icterus or generalized lymphadenopathy. Laboratory investigations revealed hemoglobin-12.4 gm/dl, total leukocyte count-4300/mm^3 with relative lymphocytosis (lymphocytes-52%), raised erythrocyte sedimentation rate (52 mm/hr), elevated thyroid stimulating hormone level (TSH-6.90 μIU/ml, upper limit of normal: 5.5 μIU/ml) with normal T3 and T4 hormone levels. Ultrasonography (USG) revealed a 2.0 cm × 2.0 cm well-defined heterogeneously hypoechoic nodule involving left lobe of thyroid. No cystic or calcific foci were seen. FNAC smears showed granulomatous aggregates of epithelioid cells along with multinucleated giant cells in a dirty background of cell debris, lymphocytes, macrophages, and clumps of colloid [Figure 1a]. A provisional diagnosis of granulomatous thyroiditis was made and the patient managed conservatively. He reported back in March 2017 with complaints of serous discharge from the FNAC site associated with fever and weight loss of 6 kg in one month. There was diffuse enlargement of the left lobe of thyroid. A sinus was noted in the anterior aspect of the neck associated with minimal serous discharge. On USG, the sinus tract was found to track posterosuperiorly from the skin up to the left lobe of thyroid along with persistence of the thyroid nodule. There was no cervical lymphadenopathy. He tested negative for HIV, HBV, HCV infections and blood sugar profile was normal. The sinus discharge was negative for Gram stain, Ziehl-Neelsen (ZN) stain and culture/sensitivity (c/s) testing. His TSH was elevated at 7.98 μIU/ml while T3 and T4 hormone levels were in the lower range of normal (T3-0.8 ng/ml, T4-5.2 μgm/dl). Due to persistent discharge from the sinus tract, a debridement and excision of the sinus was done. Histopathological examination (HPE) of the sinus tract revealed a foreign body type of granulomatous inflammation; however, no caseation necrosis was found

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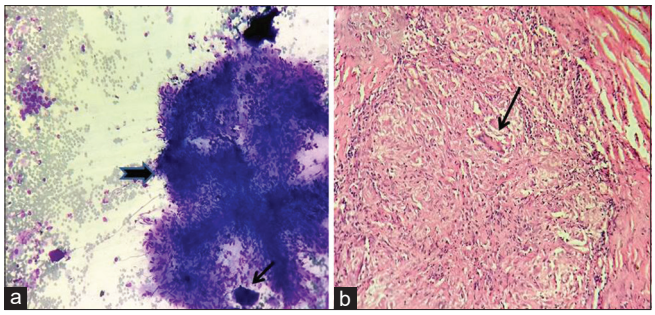

Figure 1: Photomicrographs of (a) initial FNAC of thyroid swelling showing well-formed epithelioid granulomas (notched arrow), multinucleated giant cells (thin black arrow) in a background of inflammatory cells and clumps of colloid (Leishman-Giemsa, 40 × magnification) (b) HPE of sinus tract showing epithelioid granulomas and multinucleated giant cell (long arrow) with surrounding fibrosis (H and E, 40 × magnification)

[Figure 1b]. ZN stain for Acid Fast Bacilli (AFB) was negative. He was discharged following an uneventful recovery. He reported back again after 3 weeks with complaints of recurrence of sinus tract at the surgical site. Repeat USG neck showed same findings as before with persistence of the sinus tract. USG-guided FNAC from the left lobe of thyroid showed well-formed epithelioid granulomas in a background of extensive caseous necrosis, suggestive of tubercular inflammation [Figure 2]. ZN stain for AFB on FNAC smears was negative. Mantoux test, chest radiography, and abdominal USG were normal. The sinus discharge was sent for polymerase chain reaction assay for Mycobacterium tuberculosis (MTB-PCR) which was reported as positive. He was started on anti-tubercular therapy (ATT) and responded with gradual complete disappearance of symptoms. A repeat USG of the thyroid gland showed linear echogenic striae (indicative of fibrosis) and disappearance of the nodular lesion. He has been on regular follow-up with no disease recurrence.

DISCUSSION

The incidence of thyroid TB ranges from 0.1% to 0.6% in surgically resected specimens and thyroid lesions subjected to FNAC.[1-3] Thyroid gland was traditionally considered immune to TB owing to its high vascularity and bactericidal property of iodine and colloid. Since the first description of this entity by Bruns in 1893, only a few isolated case reports and case series have been published. TB may afflict the thyroid gland either through hematogenous or lymphatic dissemination (miliary TB in immunosuppressed patients) or secondarily through direct extension from adjacent cervical lymph nodes. The primary seeding of the thyroid gland by tubercular bacilli in an immunocompetent patient in the absence of involvement of other organs is rare. It mostly affects middle-aged females who present with a solitary, slow growing thyroid nodule. Most patients are euthyroid. Occasionally patients may initially present with hyperthyroidism due to release of hormones from destroyed follicles. Progressive gland fibrosis may lead to subsequent hypothyroidism, though it is encountered rarely as in our patient.[4,5]

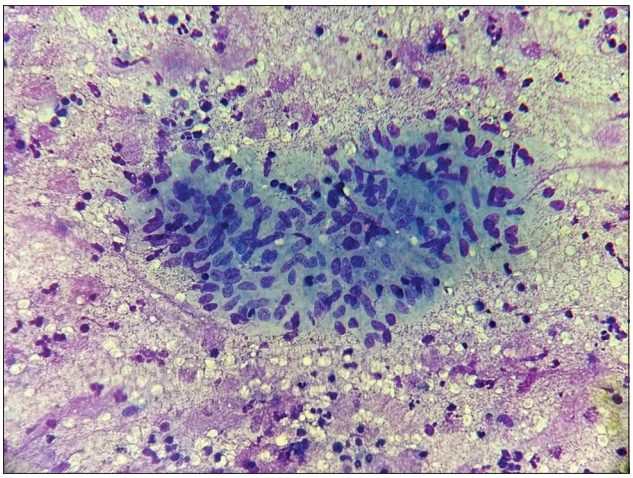

Figure 2: Photomicrograph of repeat FNAC of thyroid swelling showing well-formed epithelioid granulomas in a background of extensive caseous necrosis (Leishman-Giemsa, 40 × magnification)

Patients with thyroid TB may present with an acute abscess leading to rapid glandular enlargement mimicking a carcinoma, a cold abscess with sinus tract formation, goiter with caseation and multiple nodular lesions in the setting of miliary TB in patients with diabetes mellitus, HIV infection or chronic alcoholism. There may be accompanying systemic and local symptoms in the form of fever, weight loss, dysphagia, and dyspnea due to laryngeal nerve palsy.[1-7]

Although a confirmatory diagnosis can only be made on FNAC and histopathology, imaging by USG, Computerized Tomography (CT), or Magnetic Resonance Imaging (MRI) may help suggest the diagnosis. USG may reveal a solitary hypo-echoic mass mimicking a neoplasm, multiple hypoechoic nodules or anechoic cystic lesions with irregular walls and internal debris. Contrast-enhanced CT may show the enlarged gland with hypodense lesions. Due to central necrosis and peripheral inflammation, some lesions exhibit a rim of enhancement (dermal sign). CT will also show extension of abscesses into the soft tissues of the neck, any associated lymphadenopathy or involvement of the spine. On MRI, tuberculous lesions appear intermediate in signal intensity on both T1W and T2W sequences due to marked cellular inflammation. Cervical lymphadenopathy is also well appreciated on MRI.[8,9]

The diagnostic hallmark on FNAC and histopathology is the presence of caseating epithelioid granulomas accompanied by multinucleated Langhan's type giant cells. Although they may be seen in several other thyroid pathologies (most notable being de Quervain's thyroiditis), any caseous necrosis even if focal should raise a suspicion of TB.[1-3,6,7] The various causes of granulomatous inflammation of thyroid and their characteristic histopathological findings are depicted in Table 1.[10] In our patient, a careful review of the initial FNAC slides showed focal necrosis which was probably overlooked by the unsuspecting pathologist. Also, a guided approach with the help of USG should be practiced in case of a highly vascular organ like thyroid which may prevent

Table 1: Granulomatous Diseases of the thyroid gland

Histopathology findings	*Non-Infective Etiology*					*Infective Etiology*	
	De Quervain's Thyroiditis	*Palpation thyroiditis*	*Sarcoidosis*	*Granulomatosis with polyangitis*	*Plasma cell granulomas*	*Tuberculosis*	*Fungal infections*
Epithelioid granulomas	+	+	+	+	-	+	+
Multinucleated giant cells	+	+	+	+	-	+	+
Necrosis	-	-	-	+	-	+	+
Necrotizing leucocytoclastic vasculitis	-	-	-	+	-	-	-
Polyclonal plasma cell rich infiltrate in a fibroblastic stroma	-	-	-	-	+	-	-
Polymorphous inflammatory infiltrate, eosinophil predominant	-	-	-	+++	-	-	+
Predominant lympho-histiocytic infiltrate	+	+	+	-	-	+	+
ZN stain/MTB-PCR	-	-	-	-	-	+	-
Fungal stains (PAS/GMS)	-	-	-	-	-	-	+
C-ANCA/P-ANCA				+			

hemodilution and lead to better yield of diagnostic material.[7] ZN stain for AFB is usually negative. A confirmatory diagnosis can be made by TB culture or MTB-PCR analysis of aspirated material or resected tissue.[1-7]

ATT remain the cornerstone of treatment. Patients with abscess or sinus formation may require initial surgical intervention followed by medical management. As most patients with thyroid TB are immunocompromised, an aggressive management of other comorbidities may help in earlier resolution of symptoms and prevent complications.[1-4,6]

CONCLUSION

Primary thyroid TB is a rare entity in immunocompetent patients. Caseating epithelioid granulomas accompanied by Langhan's type giant cells are the hallmarks both on FNAC and histopathology and the diagnosis may be confirmed on MTB culture or MTB-PCR analysis of aspirated material or resected tissue.

Ethics statement

The study was performed in a manner to conform with the Helsinki Declaration of 1975, as revised in 2000 and 2008 concerning Human and Animal Rights and the authors followed the policy concerning Informed Consent.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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