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Case Report

Thyroid Tuberculosis: A Case Series and a Review of the Literature

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Objective. Tuberculosis of the thyroid gland is a very rare disease. The incidence of extrapulmonary tuberculosis has been showing a progressive increase in the recent years. We present three cases of primary thyroid tuberculosis. *Methods*. Two cases were diagnosed on the basis of fine-needle aspiration cytology (FNAC), as they presented with thyroid nodule. The third case was diagnosed on histopathology as the patient underwent total thyroidectomy for the left-side nodule which was a follicular lesion on FNAC. Tuberculosis was diagnosed on the other lobe. *Results*. All three patients were given antituberculous treatment for nine months, and their nodular lesions completely resolved after treatment. *Conclusion*. Although rare the, thyroid tuberculosis should be kept in mind in the differential diagnosis of thyroid masses, even in patient with no history and symptom of tuberculosis disease elsewhere.

1. Introduction

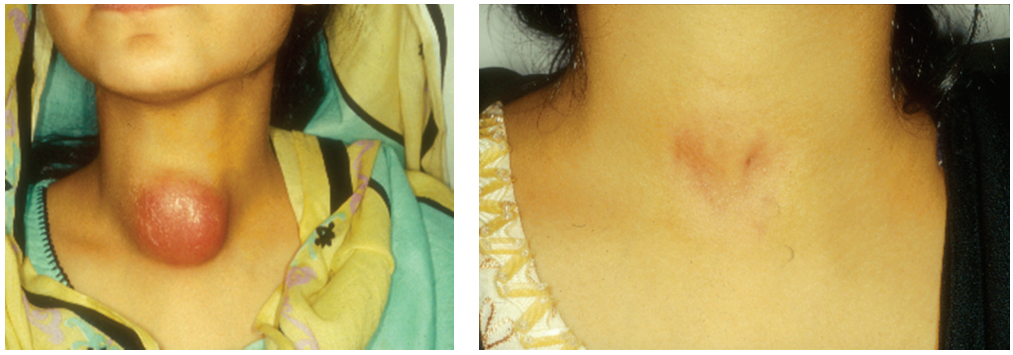
Tuberculosis of thyroid gland is extremely uncommon. The incidence is low even in countries where the prevalence of tuberculosis is high [1]. Compared to pulmonary tuberculosis, extrapulmonary tuberculosis may have different clinical manifestations and may be difficult to diagnose. For accurate diagnosis, clinical and radiological features are nonspecific and histological examination is required [2].

We report three cases of primary thyroid tuberculosis.

Case 1. A 21-year-old female presented with history of fever, anterior neck swelling, and weight loss of 3.5 kg for 3-4 months. The family history was significant for tuberculosis in one brother. On examination, she had marked swelling of anterior neck with no lymphadenopathy. Clinically, she was euthyroid. The systemic examination was unremarkable. Her complete blood count was normal with an ESR of 25 mm/1st hour. Mantoux test was positive. The routine biochemistry were all within the normal limits. Biochemically, she was also euthyroid. Her Technetium 99 thyroid scintigraphy revealed cold nodule in the lower aspect of right thyroid lobe.

Fine-needle aspiration cytology (FNAC) showed caseation necrosis, and pus from nodule did not show AFB, but pus culture was positive for Tubercle Bacilli. Therefore, she was started on antituberculous treatment (ATT) with four drugs regimen for first 3 months followed by 3 drugs regimen for the next 6 months. After treatment, she had complete resolution of swelling (Figures 1(a) and 1(b)).

Case 2. A 51-year-old female presented with history of left thyroid lobe swelling for 3-4 years, which was gradually increasing in size with no compressive or any associated symptoms. On examination, she had a left thyroid nodule which was nontender and moving with swallowing with no palpable lymph node. The systemic examination was unremarkable, and she was clinically euthyroid. Her initial workup included FNAC of left thyroid lobe which showed follicular lesion with prominent Hurthle cell. Her Technetium 99 thyroid scintigraphy revealed cold nodule in left lobe of thyroid. Ultrasound of thyroid showed a left sided hypoechoic nodule measuring 3.3×2.4 cm with minimal peripheral vascularity. The right lobe was normal in size with few small solid and cystic nodules. Her chest X-ray was normal. Her complete blood count and routine biochemistry were essentially normal. She underwent total thyroidectomy, and her histopathology report showed, follicular adenomaoncocytic variety (Hurthle cell adenoma), foci of granulomatous inflammation in the left lobe, and



(a) (b)

Figure 1: (a) Large nodule in front of the neck (before Treatment). (b) Complete resolution of swelling after treatment.

benign nodular hyperplasia with foci of chronic granulomatous inflammation along with necrosis with possibility of tuberculosis in the right lobe. She was started on ATT with four drug regimen for the first three months followed by three drugs regimen for the next six months along with Thyroxine 100 ug daily. She completed her treatment and remained asymptomatic as she was before.

Case 3. A 32-year-old male presented with a solitary nodule over the right side of lower neck for three months with progressive enlargement. He had no systemic symptoms. On examination, there was a solitary, nontender, and firm swelling on the right side of neck with no evidence of lymphadenopathy. Systemic examination was unremarkable, and clinically, he was euthyroid. His complete blood count, ESR, and routine biochemistry were within normal limits. Biochemically, he was euthyroid. His Technetium 99 thyroid scintigraphy revealed multinodular goiter involving both lobes. Ultrasound of thyroid revealed multinodular goiter with the largest nodule (4×4 cm) in the right lobe of thyroid. Ultrasound-guided FNAC revealed extensive caseous necrosis suggestive of tuberculosis. His X-ray chest was within normal limits. He was started on ATT with four-drug regimen for three months followed by three-drug regimen for the next six months. Followup examination after six months revealed remarkable regression of the size of the nodule (Figures 2(a) and 2(b)).

2. Review of Literature

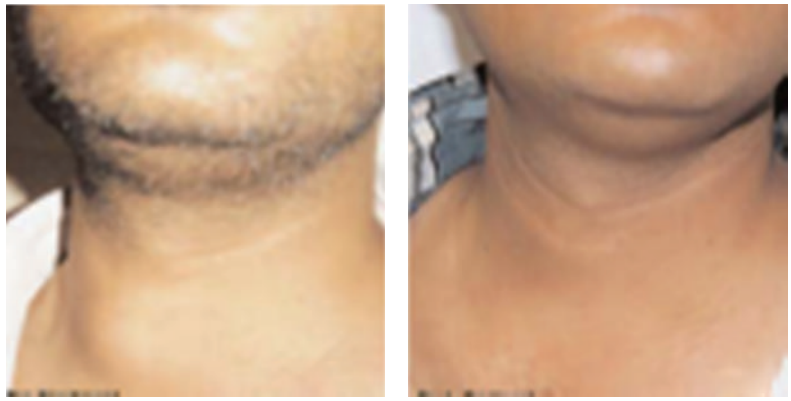
Tuberculosis of the thyroid gland is an extremely rare disease. According to the literature, the frequency of thyroid tuberculosis is 0.1%–0.4% [3].

Extrapulmonary tuberculosis may have different clinical manifestations and may be difficult to diagnose. In the thyroid gland, the tuberculous involvement may be in two main forms. First, which is more common, is miliary spread to the thyroid gland as a part of generalized dissemination. Less common is focal caseous tuberculosis of thyroid, presenting as a localized swelling mimicking carcinoma [2], as cold abscess appearing superficially [4], as multinodular goiter [5, 6], or very rarely as an acute abscess [4]. Thyroid tuberculosis can also manifest itself as a common thyroid nodule or lump or as a nodule with a cystic component [7].

The clinical presentation is often subacute, but it may be acute in case of abscess or thyroiditis [5, 8]. The patient may be asymptomatic [7]. The thyroid function is preserved in the vast majority of cases, and the description of cases with thyroid hormones abnormalities is extremely rare. The description of thyrotoxicosis due to tuberculous thyroiditis is reported as "a clinical syndrome of hyperthyroidism" which occurs generally at the beginning of glandular involvement due to its destruction [3, 9]. The hypothyroidism is caused by extensive glandular destruction by caseous necrosis. In the literature, only three cases of hypothyroidism due to thyroid TB have been reported yet [2, 10, 11].

The thyroid tuberculosis is usually not investigated because of its rare occurrence. A past history of tuberculosis concomitant with cervical lymphadenopathy and the sites of tuberculous involvement might lead to the correct clinical diagnosis. If mycobacterial infection is suspected, a chest X-ray and a tuberculin skin test (PPD) should be performed [12]. The diagnosis is made only after fine-needle aspiration cytology (FNAC) or after histopathological examination of the surgical specimen when FNAC is negative [13–15]. The characteristic histological findings include epithelioid cell granulomas with central caseous necrosis, peripheral lymphocytic infiltration, and Langhan's giant cells [16]. In fact, *caseous necrosis* is a cytologic finding specific to tuberculosis. The simultaneous demonstration of acid fast bacilli (AFB) makes diagnosis almost certain. In this situation, a mycobacterial culture is helpful [15].

The imaging techniques are not very helpful in establishing the diagnosis and have been described only sporadically due to the disease's rare occurrence [17]. Ultrasonography usually reveals a heterogenous, hypoechoic mass similar to a neoplastic lesion. An abscess is anechoic and may show internal echoes [4, 17]. Contrast-enhanced CT may help localize the caseous necrotic lesion [18]. A recent study has been done which has described the MRI features of thyroid tuberculosis [19]. The normal thyroid gland is homogenously hyperintense relative to the neck muscles on



(a) (b)

Figure 2: (a) Large solitary nodule over the right lower neck before treatment. (b) Complete resolution of the swelling after anti-tuberculous treatment.

both T1 and T2 weighted images. The tuberculous thyroid shows intermediate signal intensity due to the presence of densely cellular inflammatory granulation tissue, with tuberculous granulomas with or without minimal necrosis [19]. However, this appearance in the thyroid gland is nonspecific, and thyroid carcinoma can have a similar feature. The subcutaneous abscess appeared hypointense on T1 and hyperintense on T2 weighted images and may show peripheral rim enhancement on contrast-enhanced MR imaging [19].

Thyroid tuberculosis should be differentiated from all the main diseases of the thyroid. The differential diagnosis of tuberculous thyroiditis depends on the presence or absence of local pain. If pain is the predominant clinical finding, then the differential diagnosis lies between an infectious form of thyroiditis and subacute granulomatous thyroiditis (De Quervain's, thyroid sarcoidosis, etc.) [20].

Many diseases may cause granulomatous inflammation in thyroid, like granulomatous thyroiditis, palpation thyroiditis, fungal infection, tuberculosis, sarcoidosis, granulomatous vasculitis, and foreign body reaction. However, caseation necrosis is seen only in tuberculous inflammation. In the event where pain is absent, thyroid tuberculosis might be falsely diagnosed as thyroid malignancy; the two conditions may even coexist [20].

Initially, treatment of thyroid tuberculosis consisted of antituberculous drugs combined with surgical removal of the affected parts of the thyroid gland [21] or surgical drainage [3]. Now, it has been recognized that complete resolution usually follows an appropriate antituberculous drug treatment only [22]. But in cases with large abscess, surgical drainage or resection followed by antituberculous treatment is considered as sufficient, and further surgery is rarely required [22].

In conclusion, Thyroid tuberculosis is rare, but should be considered as differential diagnosis of thyroid masses especially in countries like Pakistan, where there is a high prevalence of tuberculosis. Past history of tuberculosis elsewhere in the body or presence of cervical lymphadenopathy and high ESR values may help in the diagnosis, but thyroid tuberculosis can occur even in the absence of these features. FNA is the main diagnostic method to diagnose the disease. The treatment is mainly based on the antituberculous agents, but surgery or drainage may be required for large abscess along with antituberculous drug therapy.

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