Clinical Case Reports

Hyperthyroidism due to involvement of thyroid gland in disseminated tuberculosis: A rare entity

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ABSTRACT

Involvement of the thyroid gland with tuberculosis (TB) is unusual and is commonly associated with hypothyroidism. Involvement of the thyroid as a part of disseminated TB is even rarer. Dissemination is an indication of immunosuppression. We present a 16-year-old immunocompetent girl with disseminated TB involving the thyroid gland and the right radius bone with features of hyperthyroidism. The patient responded well to anti-TB treatment.

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INTRODUCTION

Tuberculosis (TB) is endemic in India and can affect any organ of the body. However, among patients with TB of the head and neck, involvement of the thyroid gland is rare. An increasing number of cases has been reported with the rise in prevalence of human immunodeficiency virus (HIV)–TB. We report a 16-year-old girl with disseminated TB, with thyroid gland TB and TB osteomyelitis of the radius diagnosed in succession over a few months. Dissemination is an indication of immunosuppression. This kind of presentation is unusual in immunocompetent patients. The patient was administered anti-TB treatment (ATT) and responded well.

THE CASE

A 16-year-old girl presented to our clinic with complaints of low-grade fever and cough with minimal expectoration for 2 months. She also complained of loss of appetite. Chest X-ray (Fig. 1) revealed no abnormality. The Mantoux test showed 12-mm induration. Sputum examination for acid-fast bacilli (AFB) was negative. The patient was prescribed antibiotics and supportive treatment and advised to follow-up in 2 weeks.

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On the next follow-up visit after 1 month, she complained of a gradually progressive swelling over the midline of the neck with pain and difficulty in swallowing. On examination, the swelling was 1.5 cm×2 cm in size, smooth, firm, non-tender and moved with deglutition. There was also an enlarged right lower cervical lymph node. She was advised an ultrasound of the neck which showed a heterogeneous lesion with cystic degeneration within the right lobe of the thyroid gland measuring 3.3 cm×2.7 cm×1.5 cm along with multiple enlarged right cervical lymph nodes (Fig. 2). Her thyroid function tests (TFT) showed triiodothyronine (T3) of 2.11 ng/ml, thyroxine (T4) of 0.77 µg/dl and thyroid-stimulating hormone (TSH) of 0.01 µIU/ml. Anti-thyroid peroxidase antibodies were negative. Considering a positive Mantoux, fine-needle aspiration cytology (FNAC) from the thyroid swelling was done, which revealed epithelioid cell granulomas in a background of abundant necrosis suggestive of granulomatous thyroiditis (Fig. 3), while FNAC from the cervical lymph node showed reactive lymphadenitis. Thyroid aspirate was sent for mycobacterial culture, which showed no growth. The patient was given ATT (rifampicin, isoniazid, ethambutol and pyrazinamide) according to her weight. History and clinical examination did not reveal any features of hyperthyroidism. The endocrinologist advised to keep the patient under observation and not to start any anti-thyroid drugs.

After 2 months of initiation of ATT, she developed pain in the distal part of the right forearm with gradual restriction of

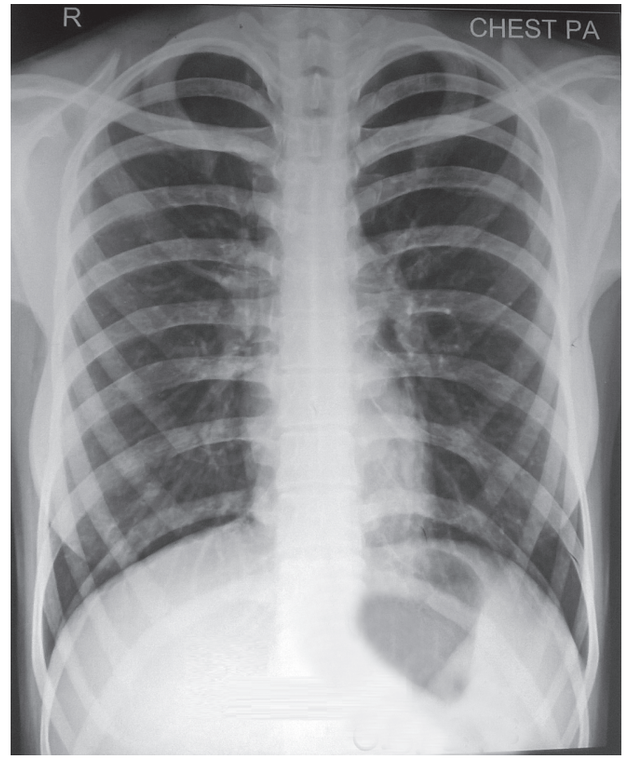

FIG 1. Chest X-ray (postero-anterior view) at presentation showing no pleuro-parenchymal abnormality

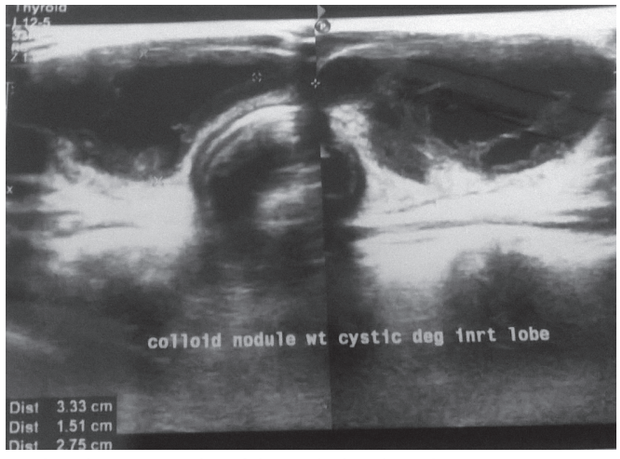

FIG 2. Ultrasonography of the neck showing a heterogeneous lesion with cystic degeneration within the right lobe of the thyroid gland measuring 3.3 cm×2.7 cm×1.5 cm

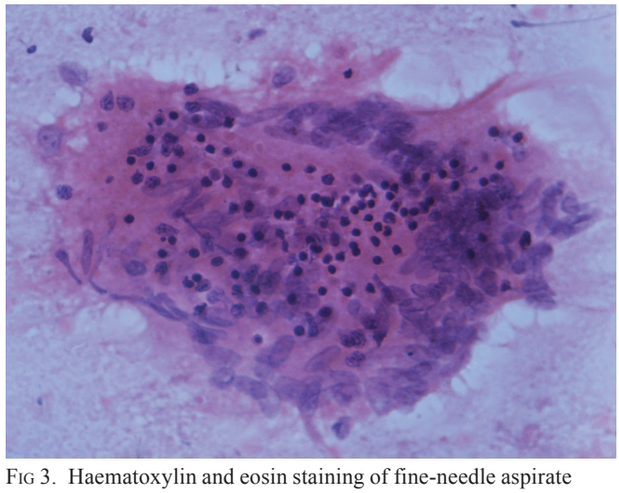

FIG 3. Haematoxylin and eosin staining of fine-needle aspirate from thyroid swelling showing well-formed granulomas comprising epithelioid histiocytes, giant cells and lymphocytes in a background of abundant necrosis

mobility. She also developed swelling over the right wrist joint. X-ray of the right wrist (anteroposterior view) showed periosteal elevation in the lower part of the radius (Fig. 4). A magnetic resonance imaging (MRI) of the right forearm was done, which showed periosteal elevation, pus and sequestrum formation with necrotising fasciitis and bone oedema in the lower third of the radius (styloid process), suggestive of chronic TB osteomyelitis (Fig. 5).

After consultation with the orthopaedic surgeon, ATT was continued as the patient was clinically improving and had gained weight. At the end of 6 months, fever and cough had subsided, neck swelling had regressed, appetite had improved, joint mobility had marginally improved, but mild pain and swelling persisted. ATT was continued for 3 more months and was stopped after satisfactory clinical improvement was achieved. TFT repeated at completion of ATT were normal.

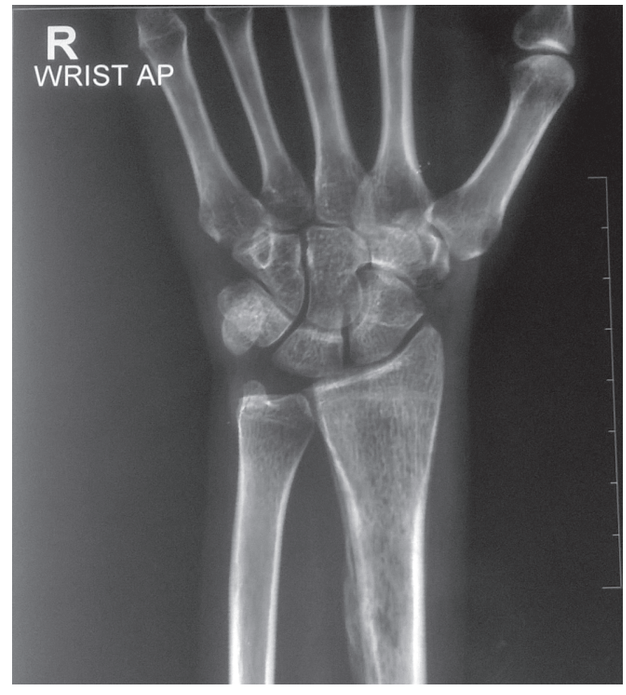

FIG 4. Anteroposterior X-ray of the right wrist showing periosteal elevation in the lower part of the radius

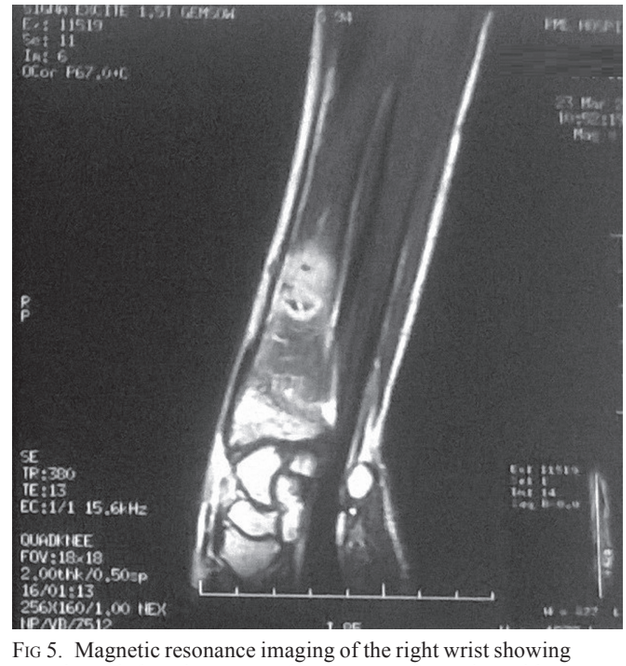

FIG 5. Magnetic resonance imaging of the right wrist showing periosteal elevation, pus and sequestrum formation with necrotizing fascitis and bone oedema in the lower third of the radius (styloid process)

DISCUSSION

The first few cases of TB of the thyroid gland were reported in the late 1800s.[1] Although a diagnosis of thyroid TB is not uncommon in autopsy studies, with Slavin *et al*. reporting a

TABLE I. Comparison of previously reported patients of thyroid tuberculosis (TB) and hyperthyroidism with our case

Author	Age/sex	Clinical features of hyperthyroidism	Examination findings	Thyroid function tests	Ultrasound of thyroid	Other organ involvement	Diagnosis established	Treatment
Kapoor *et al*., 1985[12]	38/female	Yes	Soft, non-tender goitre, no cervical lymphadenopathy	Not done	Not done	Nil	Histopathology of operated specimen	ATT
Murphy *et al*., 2004[13]	28/male	Yes	Firm, non-tender multinodular goitre, cervical lymphadenopathy	Raised T4, reduced TSH, TPO negative	Bilateral multiple nodules	Yes (mediastinal lymphadeno-pathy)	FNAC AFB positive	ATT + Anti-thyroid drugs
Raman *et al*., 2014[14]	38/male	No	Tender nodular goitre, no cervical lymphadenopathy	Raised T4, reduced TSH, TPO negative	Multiple nodules with cystic degeneration	No	FNAC AFB positive	ATT
Present case; 2018	16/female	No	Firm, non-tender goitre, cervical lymphadenopathy	Raised T4, reduced TSH, TPO negative	Heterogeneous lesion with cystic degeneration	Yes (bone TB)	FNAC granulomatous thyroiditis, AFB negative	ATT

T4 thyroxine TSH thyroid-stimulating hormone TPO thyroid peroxidase FNAC fine-needle aspiration cytology AFB acid-fast bacilli ATT anti-TB treatment

prevalence of 14%,[2] the prevalence of TB thyroiditis is uncommon in histopathological specimens. In an Indian study by Das *et al*., they reported a 0.6% prevalence of TB in samples of thyroid aspirations (FNAC).[3] With a rise in HIV-associated immuno-suppression, a few cases of thyroid TB have been reported in these patients.[4]

Involvement of the thyroid gland might be through the haematogenous route (miliary TB) or infection from contiguous sites such as cervical or mediastinal lymph nodes.[5,6] There have been isolated reports of congenital transmission of TB to the thyroid gland through infected mothers.[7]

The available information about thyroid TB is a result of isolated case reports and a few case series from resected specimens of thyroidectomy. The clinical features include swelling and pressure symptoms such as dyspnoea, dysphagia and hoarseness of voice. The most common presentation is a solitary thyroid nodule with cystic components.[8] Other presentations are sub-acute thyroiditis, chronic thyroiditis, acute or cold abscess or sometimes mimicking thyroid malignancy.[9]

The diagnosis of thyroid TB is established by the presence of epithelioid granulomas with central necrosis on cytopathological or histopathological examination or the presence of AFB in the tissue. Caseation necrosis is an important feature differentiating the diagnosis from sarcoidosis and subacute (giant cell) thyroiditis.[10] Certain characteristic features on MRI of thyroid TB have been described by Madhusudhan *et al*.[11] They reported that intermediate signal intensity on a T2-weighted image suggests a diagnosis of thyroid TB.

Involvement of the thyroid gland by TB does not usually cause thyroid hormone dysfunction. Even when encountered, it is more commonly hypothyroidism due to progressive gland destruction. Hyperthyroidism has been rarely reported (Table I).[12–14]

In our patient, we suspected a simple goitre. The presence of cystic degeneration within the gland and multiple enlarged cervical lymph nodes, along with a positive Mantoux test, led us to perform an FNAC, leading to the diagnosis of TB. The appearance of osteomyelitis of the radius in due course strengthened the diagnosis of disseminated TB, despite the patient being immunocompetent.

Conclusion

A painless swelling in the midline of the neck in an adolescent girl suggests a hypothyroid goitre in most of the cases. However, considering the high load of TB in India, it is essential that cases of goitre be evaluated for TB (even in the absence of TB focus elsewhere), especially if the cytology reveals granulomatous thyroiditis. Early and correct diagnosis leads to complete cure and prevents dissemination of disease.

Conflicts of interest. None declared

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