

**Case report**

# Thyroid tuberculosis

Konstantinos Terzidis, Panagoula Tourli, Erasmia Kiapekou, Maria Alevizaki

*Endocrine Unit, Department of Clinical Therapeutics and Evgenidion Hospital, Athens University School of Medicine, Athens Greece***ABSTRACT**

**Although the association of thyroid disorders with tuberculosis has been known for a long time, the diagnosis of thyroid tuberculosis is rare. Differential diagnosis can be very difficult without fine needle aspiration. The clinical course of the disease may resemble toxic goiter or acute thyroiditis or may follow a subacute or chronic pattern without specific symptomatology. We describe a 49-year old male patient with thyroid tuberculosis presenting as thyroid enlargement, fever, increased erythrocyte sedimentation rate, normal thyroid function tests, and a chest x-ray indicating the presence of a lesion with distinct calcification in the lower lobe of the right lung. Tuberculosis of the thyroid gland, although very rare, should be considered as a possible diagnosis when localized swelling, cold abscess or thyroid nodule with or without a cystic component are present.**

**Key words:** Fine needle aspiration, Thyroid tuberculosis, Thyroiditis

**INTRODUCTION**

Tuberculosis of the thyroid gland is very rarely diagnosed.<sup>1-3</sup> It was first reported in 1862 by Lebert<sup>1</sup> in a patient with disseminated mycobacterial infection. The first case of primary thyroid infection, presenting as a rapidly enlarging goiter with cervical lymphadenopathy but no evidence of pulmonary tuberculosis, was reported in 1893 by Bruns.<sup>3</sup> In 1926 five cases of thyroid tuberculosis were recognised by Collier and Huggins<sup>2</sup> among 1200 thyroidectomies. In 1932 Rankin and Graham<sup>3</sup> reported 21 cases out of 20,758 partial thyroidectomy specimens from the

Mayo Clinic covering the period from 1920 to 1931, while in 1952 only two cases were identified by Levitt among 2114 consecutive thyroid specimens.<sup>4</sup>

Since then two studies involving fine needle aspiration cytology (FNAC) were conducted and lesions compatible with thyroid tuberculosis were found in 8 out of 1283 and in 18 out of 1565 cases, respectively.<sup>1,2</sup> The exact number of cases reported is difficult to determine, but to our knowledge at least 186 cases (including our case) can be found cumulatively in the English language literature, four of which were children.<sup>5-8,12</sup> Similarly, the true incidence of tuberculous thyroiditis is difficult to estimate possibly due to escape of the etiologic diagnosis.<sup>13</sup>

Establishing the diagnosis of thyroid tuberculosis is in most cases a challenge, since the lesion can often be mistaken for carcinoma, suppurative abscess or hemorrhage into a thyroid cyst. The clinical presenta-

*Address for correspondence:*

Maria Alevizaki MD PhD, Associate Professor in Endocrinology, Athens University School of Medicine, 51, Ioannou Theologou Str, 157 73 Athens, Greece, fax+30-210-7704143, e-mail, mani@otenet.gr

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tion is variable and usually consists of local symptoms related to enlargement of the gland, while thyroid function is rarely affected.<sup>14</sup> Before the application of fine needle aspiration (FNA) as a method of investigating thyroid nodules, all the patients underwent surgical removal of the thyroid lesion (suspected of representing a tumor) and diagnosis was established by demonstration of tubercle bacilli in the biopsy specimens.

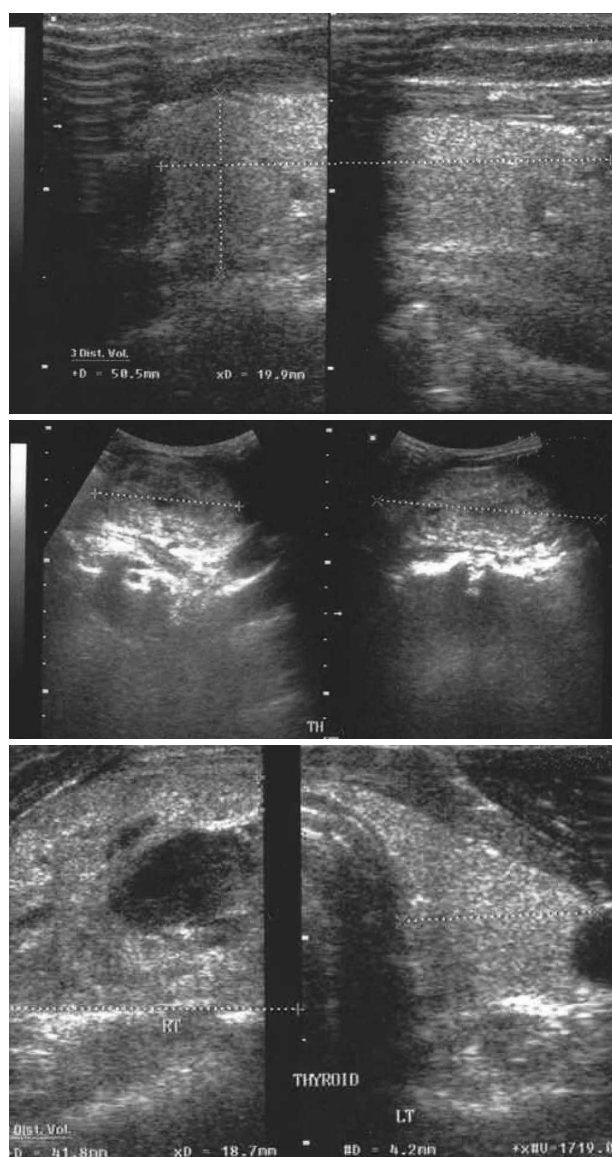
A case of thyroid tuberculosis in a 49-year old male patient is herein presented, possibly denoting reactivation of a latent pulmonary mycobacterial infection.

### PATIENT DESCRIPTION

A 49-year old man presented with a slightly painful neck swelling. A fortnight previously he had sustained a high-grade fever (up to 40°C) which lasted for a week and subsided with paracetamol. He reported a subsequent intermittent low-grade fever and no further tenderness in the neck. He also reported a 2kg weight loss and increased palpitations and sweating. At presentation he had thyroid enlargement, mostly of the right lobe. A large hard nodule (>4cm) was palpable on the right lobe which was mildly tender. The heart rate was 88/min, the blood pressure was 135/80 mmHg and the temperature was 37.3°C.

Thyroid function tests which were performed at the time were normal: serum thyroid stimulating hormone (TSH) 1.09 $\mu$ UI/ml, thyroxine (T4) 79nmol/L, triiodothyronine (T3) 0.77nmol/L, FT4 16.12pmol/L FT3 4.3pmol/L and thyroglobulin (Tg) 190ng/ml. Anti-Tg and anti-thyroid peroxidase (TPO) antibodies were also normal. The blood count was as follows: hematocrit 41%, hemoglobin 12.8g%, platelets 268000/mm<sup>3</sup>, WBC 6800/mm<sup>3</sup>, with normal differential. Erythrocyte sedimentation rate (ESR) was 79mm/h and C reactive protein (CRP) was 120mg/dl (normal value <0.5mg/dl). A thyroid ultrasonography was performed which showed heterogeneity and the presence of a hypoechoogenic nodule on the lower part of the right lobe, with a diameter of 55mm. The nodule was heterogeneous and had cystic degeneration (Figure 1). A FNA was performed which showed inflammatory cells and no signs of malignancy.

A chest x-ray (Figure 2) and a computed tomography (CT) of the chest showed a lesion with distinct calcification in the basal region of the right lower lobe. No other focal lesion was observed in the remaining pulmonary parenchyma. A heterogeneous nodule of the right thyroid lobe with irregular margins was again visualized in the CT, causing mild displacement of the trachea without infiltration. No lymph node enlargement was present.



**Figure 1.** Thyroid ultrasound showing heterogeneity and the presence of a nodule on the lower right lobe, measuring 55mm. The nodule is heterogeneous and hypoechoogenic and has cystic degeneration.



**Figure 2.** Patient's chest x-ray showing a lesion with distinct calcification in the lower lobe of the right lung. No other focal lesion is observed in the remaining pulmonary parenchyma.

Two weeks later the patient was almost afebrile, but the thyroid nodule showed some further enlargement. On the basis of this clinical course the patient underwent thyroidectomy.

Pathologic examination showed an enlarged thyroid gland weighing 60 grams; multiple nodules were present with a diameter of 0.6-4.0cm. The largest hyperplastic nodule in the right lobe had a diameter of 4cm. Within this nodule as well as in a 0.6cm nodule of the left thyroid lobe a granuloma was present with epithelial cells and a central "caseous" necrosis. These morphological signs were compatible with multiple tuberculous foci of the thyroid gland. No signs of malignancy were present.

It was not considered necessary for the patient to receive antituberculous treatment, as the lesion was totally excised and the chest x-ray findings did not show any signs of active disease.

## DISCUSSION

Tuberculosis may affect the thyroid gland via either the haematogenous or the lymphogenous route or by direct invasion from the larynx or cervical lymph nodes.<sup>7</sup> Focal caseous tuberculosis is the usual result of thyroid involvement, presenting as a localized swelling, cold abscess<sup>3</sup> or thyroid nodule

with or without a cystic component.<sup>7,8,15</sup> Alternatively, miliary spread to the thyroid may occur as a result of disseminated mycobacterial infection leading to the formation of multiple tubercles within the gland.

The clinical course of tuberculous thyroiditis is usually diverse. At presentation, the clinical picture resembles that of acute infectious thyroiditis. Patients present with pain and tenderness in the affected lobe or the entire gland and very occasionally with fever and chills.<sup>16,17</sup> Apart from such a presentation, tuberculous thyroiditis may follow a subacute course resembling subacute granulomatous thyroiditis (De Quervain's) or that of chronic non-suppurative thyroiditis. On rare occasions it can present as fever of unknown origin. Thyroid function tests usually remain within the normal limits or else euthyroid sick syndrome is demonstrated. Occasionally tuberculous thyroiditis is accompanied by thyrotoxicosis<sup>18-20</sup> or hypothyroidism.<sup>21,22</sup> Patients with subnormal immune response (HIV infection or use of immuno-modulating drugs) usually present with atypical clinical (miliary forms) and histological (lymphocyte infiltration or atrophy) patterns of tuberculosis.

While tuberculous thyroiditis is a rare condition, it is also one that frequently may go un- or misdiagnosed. A chest x-ray and a tuberculin skin test (PPD) should be performed if mycobacterial infection is suspected. An accurate method to confirm the diagnosis is FNA of the thyroid gland. Definite diagnosis is established by characteristic histological findings such as epithelial cell granulomas with central caseous necrosis, peripheral lymphocytic infiltration and Langhans giant cells. In fact, caseous necrosis is a cytologic finding specific to tuberculosis. The simultaneous demonstration of acid fast bacilli (AFB) makes diagnosis almost certain. On the other hand, the smear may not reveal AFB positive staining, but this fact does not preclude the diagnosis if the histological features and the clinical presentation are compatible.<sup>23</sup> In such cases, results from the cultures (lasting 4-6 weeks) should be waited for.

The imaging techniques are not very helpful in establishing the diagnosis of tuberculous thyroiditis. Ultrasonography usually reveals a heterogeneous, hypo-echoic mass similar to a neoplastic lesion. Contrast-enhanced CT may help localize the caseous

necrotic lesion. This finding consists of a necrotic center with a peripheral rim enhancement due to acute inflammation causing thickening of adjacent tissues (“dermal sign”).<sup>24</sup>

The differential diagnosis of tuberculous thyroiditis depends on the presence or absence of local pain. If pain is the predominant clinical finding, the differential diagnosis lies between an infectious form of thyroiditis (bacterial, fungal, etc) and subacute granulomatous thyroiditis (De Quervain’s, thyroid sarcoidosis, etc). The culture of aspiration material and the distinct histological findings confirm the diagnosis of tuberculous thyroiditis. De Quervain’s thyroiditis may have similar histopathological features with thyroid sarcoidosis and thyroid tuberculosis but caseous necrosis is absent.

In the event that pain is absent, thyroid tuberculosis might be falsely diagnosed as thyroid malignancy; these conditions may even coexist.<sup>25</sup> Rarely a tuberculous abscess of the supra-sternal notch region may cause dysphagia and mimic an anterior neck mass or thyroid tumor.

Treatment of thyroid tuberculosis consists of antituberculous drugs combined with surgical removal of the affected parts of the thyroid gland<sup>7</sup> or surgical drainage.<sup>15</sup> Lately it has been recognized that antituberculous drugs alone could be efficacious.<sup>22,26</sup> A combination drug therapy consisting of isoniazid, rifampicine and vitamin B6 with or without the addition of ethambutol or a fluoroquinolone seems to be effective. This can lead to significant clinical improvement and avoidance of surgery in the event that preoperative diagnosis is established.<sup>12</sup> Finally, if a thyroid tuberculous abscess is present, drainage combined with antituberculous drug therapy is considered as sufficient and further surgery is rarely required.<sup>27</sup>

In our patient, total thyroidectomy was performed, which took care of the nodular goiter as well. It was not considered necessary for the patient to receive anti-TBC treatment as the chest x-ray findings did not show any signs of active disease.

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