CASE REPORT

Subacute Thyroiditis Complicated by Extra-Thyroidal Abscess: A Very Rare Presentation of Tuberculous Thyroiditis

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Abstract
Tuberculosis of the thyroid gland is a very rare condition. We report a case of tuberculous thyroiditis in a young woman who presented with a right-side solitary thyroid nodule associated with features of subacute inflammation of a short duration. Diagnosis was confirmed by fine needle aspiration cytology (FNAC) with positive Ziehl Neelsen staining for acid-fast bacilli (AFB) and positive culture for Mycobacterium tuberculosis. The patient was treated medically with satisfactory resolution of the infection and regression of the nodule.
Conclusion: FNAC provides a confident non-operative diagnosis of thyroid tuberculosis, obviating the need for unnecessary surgical removal of a thyroid nodule readily treated medically.

Key words: Thyroid, Thyroiditis, Thyroid abscess, Tuberculosis.

Introduction

Thyroid gland involvement is rarely encountered in extrapulmonary tuberculosis (TB) (1-3). It may present with any form of thyroid disease. A high index of suspicion is required to consider the diagnosis and confirm it timely (4). Subacute thyroiditis is an even more rare form of TB thyroid that may be even less likely to be considered in the differential diagnosis (5). We report a case of subacute thyroiditis due to tuberculosis with a focused review of the literature. Our aim is to alert practicing clinicians to this possibility and to highlight its clinical management.

Case Study

A 29-year-old Filipino nurse presented with swelling in right lobe of the thyroid gland causing difficulty of swallowing. She was well until a month previously when she experienced sore throat and dysphagia, which continued for four days. She denied dysphonia or stridor. Four days prior to her presentation at the endocrine clinic, she

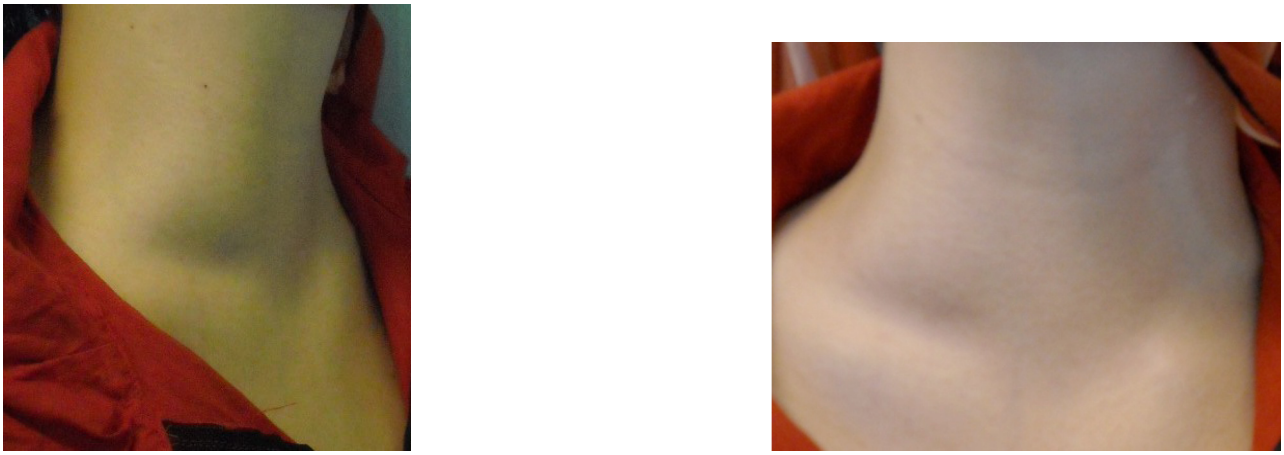

Figure 1. The clinical appearance of the patient thyroid region with large swelling extending to the right supra-clavicular fossa. On presentation to the endocrine clinic at Sheikh Khalifa Medical City.

developed a well circumscribed swelling in the right side of her neck. This became progressively bigger and slightly more painful. No local redness and no systemic fever were present. Review of symptoms revealed a history of palpitations and heat intolerance for one month. She denied night sweats or weight loss. There was no past medical history of significance. There was no family history of thyroid disease. She took no regular medication and had no allergies. Physical examination revealed a generally well young woman. Vital signs included a body weight of 50 kg, normal temperature, pulse rate regular, 100 BPM, BP 116/68 mmHg and respiratory rate of 14 per minute.

Thyroid gland examination revealed an enlarged tender right lobe with the overlying skin warm to touch (Figure 1). Chest, heart sounds, and abdomen were all normal. Basic laboratory tests done the previous week showed an elevated CRP at 20 and an ESR at 53mm/1st hour; low serum TSH at 0.039 mU/l; and marginally elevated serum free Thyroxine at 20.6, normal serum free Tri-iodothyronine at 5.92. Ultrasound thyroid scan showed the right lobe to be 5.9 x 3.4 x 2.2cm with a mixed echogenic mass of 3.6 x 3.8x 2.7cm (Figure 2). The differential diagnosis included sub-acute thyroiditis, septic thyroiditis; lymphadenitis, and extra-thyroidal septic collection with thyroiditis.

The initial management included oral broad-spectrum antibiotics, 20 mg of prednisolone per day orally, 400 mg of Ibuprofen twice daily, and 20mg of Omeprazole. One week later, she looked better clinically, with less swelling, skin warmth and local tenderness. She was afebrile, BP:105/69, RR 14 HR 82. Repeat inflammatory markers improved with ESR at 23, WBC 8.93 (N 64.7%). At this stage, it was thought to discontinue the steroids but continue antibiotics and review in two weeks with the results of FNA.

Follow up revealed further improvement in ESR to 16, WBC 9.3 (N 60.7%) and thyroid function tests showed TSH of 0.45 mU/l with normal serum T4 and T3 at 11.19 and 4.36 respectively compatible with resolving thyroiditis. Ultrasound-guided fine needle aspiration (FNA) was undertaken, with 10 mL pus aspirated. PA chest radiograph was normal (Figure 3). Computed Tomography (CT) of the neck showed development of an intrathyroid fluid accumulation (Figure 4a). A follow up CT scan three weeks later, showed an increase in the size of the abscess within the right lobe of the thyroid measuring 5.0 x3.7 x 1.5 cm. The patient was admitted to the Otolaryngology Division with a plan for open neck exploration (incision and drainage). This proved to be unnecessary, as the mass was clinically markedly improved with IV antibiotics and steroids. The Ziehl Neelsen staining for acid-fast bacilli (AFB) was positive on further examination. Therefore, she was started on anti-tuberculosis drugs including Rifampicin and Isoniazid. Repeat CT performed elsewhere reported as "mass regressed". On continuation of anti-TB treatment, she felt well and the mass disappeared completely. Follow up CT scan performed 12 months later showed only old macrocalcification (Figure 5). The patient had no further problems over two years of follow up.

Discussion and Mini-Review

Historical Note

Earlier authors in the 19th century suggested that TB never involves the thyroid gland and that there was some antagonistic action between goiter and tuberculosis. Von Rokitansky stated that tuberculosis of the thyroid gland does not exist, while Virchow and Hamburger assumed it

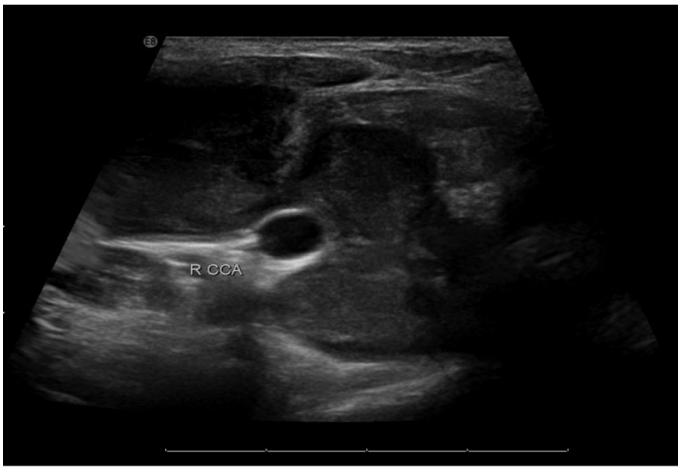

Figure 2. Ultrasound appearance of the thyroid gland in right transverse view showing the thyroid mass with extension into the lateral aspect of the neck.

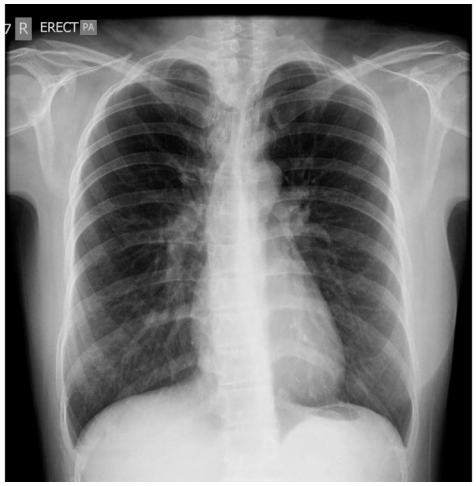

Figure 3. Plain chest X-ray films (PA) confirming lack of any evidence of active pulmonary tuberculosis.

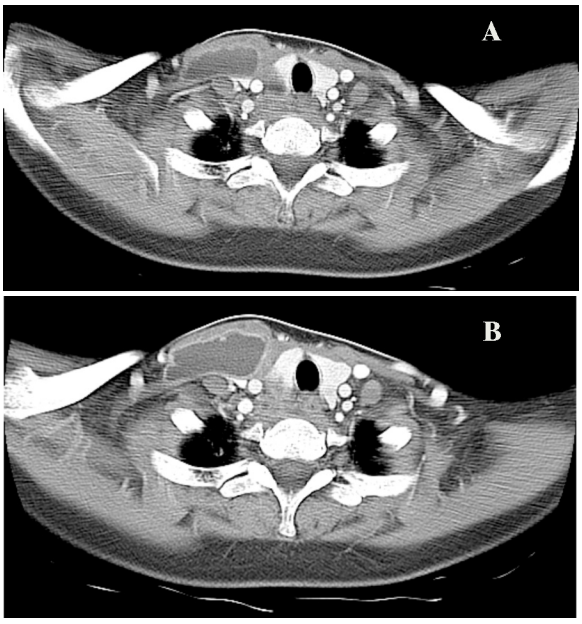

Figure 4. A the early showing the multi-loculated fluid collection at the right side of the thoracic inlet with major communicating pouches measuring 3.9x1.5 1nd 1.6 cm of possible thyroidal origin. B later scans taken on 10.8.2009 computed tomography showing an increase in the size of the abscess measuring 5.0x3.7x1.5 cm.

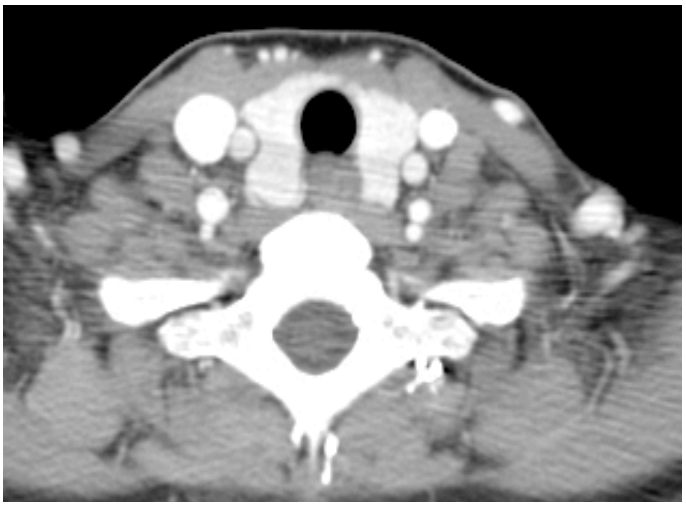

Figure 5. Follow up CT performed 12 months later showing complete resolution of the thyroid lesion and some bilateral lymph nodes the largest is 14 mm in size. No other soft tissue abnormality is seen.

to exist but to be extremely rare. TB of the thyroid was first recognized at autopsy in thyroid-symptom-free miliary TB (also known as disseminated tuberculosis) patients by Lebert in 1862. A few years later, Chiari described seven cases of microscopic involvement of thyroid in 100 autopsies of patients who had died from disseminated TB in 1878. Soon after, Bruns reported the first clinical case

of TB thyroiditis (1893), and a year later Schwartz reported the first successful drainage of TB thyroid abscess. Five cases of thyroid TB were described by Coller and Huggins in 1926 in a review of 1200 of surgical thyroid specimens. Furthermore, Rankin and Graham studied a large series of 20,758 partial thyroidectomy specimens from the Mayo Clinic between 1920 and 1931. They found only 21 cases of thyroid TB giving an incidence of 0.1%. A similar incidence was confirmed more recently by Levitt in 1952 who found only two cases of thyroid tuberculosis among 2114 consecutive thyroid specimens. The rarity of the condition in recent years was emphasized by Bolis in 1970 who found two cases of fibrocaseous thyroid tuberculosis among 74,393 consecutive thyroid biopsies in an Italian centre. A search of the PubMed online database at the time of submission for "thyroiditis and tuberculosis" revealed 97 entries only, most of which were single or a small number of case reviews.

Size of the Problem

Thyroid gland involvement is rare even in countries with a high prevalence of tuberculosis (TB). Sporadic cases have been reported but a majority are discovered upon postmortem examination (1-5). Thyroid TB was recognized in <0.5% in histological specimens (6) and in 2-7% of cases during autopsy (7). However, it is as high as 14% in cases of miliary tuberculosis (8).

Pathology

TB may involve the thyroid in two main forms. The more common form is miliary spread to the thyroid as part of a generalized dissemination, but this form has never been shown to give rise to clinical thyroid disease. Occasionally, miliary spread may occur in pre-existing thyroid enlargement (9). Less commonly, focal caseous tuberculosis of the thyroid may occur, presenting as a localized swelling mimicking carcinoma. It has also presented as a cold abscess appearing superficially, very rarely as an acute abscess, or as a thyroid nodule as seen in the presenting case (10-12). Fibrosis and adherence to adjacent structures may occasionally give rise to pressure symptoms like dysphagia, dyspnea, or recurrent laryngeal nerve palsy (13-15). Microscopically there is destruction of thyroid tissue with caseating TB granulomata. Thyroid TB can be distinguished from sarcoidosis and subacute (giant cell) thyroiditis by the presence of caseation and demonstration of acid fast bacilli (16). Chronic fibrosis of the thyroid has been described in association with tuberculosis particularly by European authors although the exact relationship of sclerosing thyroiditis to tuberculosis remains unclear (17). Disorders of thyroid function have seldom been described in association with TB thyroiditis. In 1917, Mosiman recorded seven cases to be clinically thyrotoxic but no biochemical confirmation was possible (1).

Why TB of the thyroid is rare is uncertain (20). However, since the thyroid gland is made up of colloid material possessing bactericidal action, blood flow to the thyroid is extremely high and the gland stores an excess of iodine. Destruction of tubercle bacilli may be enhanced by increased physiological activity of phagocytes in hyperthyroidism and the thyroid hormones may have an anti-TB role (20).

Clinical Aspects

Clinical diagnosis of TB thyroiditis can be very challenging, since it may mimic other thyroid disorders and a high index of suspicion is required (21-24). Miliary TB involves the thyroid gland and does not seem to cause clinical thyroid disease. It can present as a localized swelling mimicking carcinoma, common thyroid nodule, thyroiditis, acute abscess, and diffuse goiter (25-27). The thyroid can also be involved due to blood-borne organisms, or disease can be introduced by direct extension from the larynx and cervical lymph nodes (28).

Diabetes, old age, malnutrition, and AIDS can all play a role in the occurrence of thyroid TB which makes our case very atypical as our patient was apparently young and healthy (1-6). The acute flu-like illness could have contributed to the disease reactivation secondary to a transient immune suppression. Most of the affected cases are middle-aged women. Clinically, the patient might be complaining of a thyroid nodule, or pressure symptoms like dyspnea, dysphagia, and recurrent laryngeal nerve palsy. Local findings might mimic carcinoma. Lymphadenopathy in the cervical region has been reported. Signs of TB elsewhere in the body are rarely found. The duration of symptoms in thyroid tuberculosis varies from two weeks to one year (29-32).

Diagnosis

Differential diagnosis can be very difficult without fine needle aspiration (33-34). Because of the unusual and rare presentation, suspicion of the thyroid nodule or swelling as being tuberculous on clinical examination was remote, unless it had destroyed much of the thyroid gland and had formed an abscess in a patient with known pulmonary tuberculosis, or when FNAC is positive for tuberculosis. The diagnosis is rarely made clinically. Most of the cases

are diagnosed either post-operatively or on autopsy.

Seed (35) proposed that three criteria be met for tuberculosis of the thyroid gland to be made. These include 1. necrotic or abscessed gland, 2. AFB within the thyroid gland, and 3. demonstration of a definitive TB focus outside the thyroid gland. However, if the first two criteria are met, the third criterion is not essential. The bacteriologic and histological testing is usually diagnostic. Thyroid tests are typically normal, though myxedema and hyperthyroidism have been reported. To establish the diagnosis, FNAC has been used. Epithelioid granuloma and necrosis, with or without Langhan's giant cells and lymphocytes, are seen in the FNAC specimen. If cytology from FNAC is negative, then cervical lymph node sampling may provide evidence of TB. Ultrasound evaluation of subacute granulomatous thyroiditis shows moderate enlargement of the thyroid gland, with multiple small hypoechoic areas. Contrast enhanced CT scan for patients with tuberculous involvement of the thyroid gland, may show a characteristic necrotic center and peripheral enhancement of cold abscess. CT or MRI scan can help to detect the signs of compression caused by an abscess from TB thyroiditis. Gupta et al (36) illustrated by study of archival cytological material the importance of PCR as a potentially useful tool for the detection of *M. tuberculosis* DNA from FNAC of thyroid lesions, which could provide an alternative for rapid diagnosis of thyroid tuberculosis in AFB-negative cases. Isolated tuberculous thyroid abscess is an extremely rare form of infection of the thyroid gland. Our case lends support to previous reports of this nature (17,25).

Management

Treatment of TB thyroiditis is not different from other forms of the disease. The role of surgery is limited after the diagnosis. The choice of treatment should be medical antituberculous therapy. Preoperative diagnosis of thyroid tuberculosis is important because of the availability of medical treatment and the limited role of surgery (37), though many of the recent contemporary reports still indicate late postoperative diagnosis (38-41). However, if an abscess formed, drainage was usually sufficient and further surgery was rarely required. Repeated puncture drainage and anti-TB medication are the least invasive modes of treatment when required and has been successfully utilized (42,43). Even when surgical drainage is needed, anti-tuberculous drugs should be given before and after surgery under standard protocol in a given region (37-43). In our patient, the unintended delay in performing the proposed surgical intervention may have given a chance for the medical treatment to act adequately.

Conclusions

We report a very rare case, presenting as an isolated sub-acute thyroiditis with typical transient, sub-clinical thyrotoxicosis. The course was complicated by an even more rare abscess formation. There was no evidence of TB elsewhere. The diagnosis was concluded by a high index of suspicion and confirmed by FNA. There was a transient early worsening which did need limited surgical intervention and was followed by a good response to anti-TB medication. TB of the thyroid gland, albeit very rare, should be considered in the differential diagnosis when localized swelling, cold abscess or nodule with or without a cystic component are present in the thyroid region. Timely confirmation of the diagnosis, should lead to initiation of the appropriate medical treatment and avert unnecessary surgical intervention.

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