

Renal Transplant–Associated Thyroid Tuberculosis

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Tuberculosis is common among solid-organ transplant recipients, including renal transplants. Tuberculosis of the thyroid gland is a rare diagnosis. We report on a renal transplant recipient with subacute fever associated with a neck mass diagnosed as thyroid tuberculosis. No prior publication has reported a case of posttransplant thyroid tuberculosis. This is an important diagnostic consideration, in addition to malignant transformation, in the posttransplant setting.

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Freeform/Key Words: thyroid, tuberculosis, transplant

1. Case

A 61-year-old Pakistani female renal transplant recipient was admitted to the hospital with subacute fevers and chills 3 months after transplantation. Transplant immunosuppression included tacrolimus and mycophenolate mofetil, in addition to antimicrobial prophylaxis with valganciclovir and dapsone. Her medical history was also notable for type 2 diabetes mellitus and hypothyroidism, presumed Hashimoto's thyroiditis. Over the preceding 3 weeks, she reported progressive neck swelling. During admission, she was febrile to 39°C. Initial diagnostic evaluation included white blood cells, 6.5 thousand/ μ L (4.5 to 11.0 thousand/ μ L); erythrocyte sedimentation rate, 48 mm/h (0 to 30 mm/h); C-reactive protein >15 mg/L (<3.0 mg/dL); thyrotropin, 0.14 mIU/L (0.47 to 4.68 mIU/L); free thyroxine, 2.2 ng/dL (0.6 to 2.5 ng/dL); negative bacterial blood and urine cultures; and a negative quantiferon Tb gold result (negative serum tuberculosis screen). Empiric broad-spectrum antibiotics did not lead to fever defervescence. Pan computed tomography scan noted a 4.5 \times 3.4-cm hypodensity contiguous with the left thyroid lobe, extending into the superior mediastinum. Thyroid ultrasound demonstrated a complex, fluid-filled neck mass resulting in jugular vein thrombosis (Fig. 1). To evaluate for posttransplant malignant transformation, positron emission topography–computed tomography was conducted, showing left thyroid extreme fluorodeoxyglucose avidity (standardized uptake value = 16.0), in addition to several metabolically active foci within the scalp, skull, left cervical lymph node, right hilum, superior thoracic spine, right hepatic lobe, left wrist, and right thigh (Figs. 2 and 3). Fine needle aspiration (FNA) of the neck lesion drained 25 mL purulent fluid, with pathology noting acid-fast bacilli (AFB) (Fig. 4). Three sputum cultures, in addition to a blood culture, were positive for *Mycobacterium tuberculosis* complex. Within 1 day of initiating antituberculosis therapy, including rifabutin, isoniazid, pyrazinamide, and ethambutol, she was afebrile and subsequently discharged. Five months later, ultrasound did not reflect decreased abscess size, measured as a thick-walled 4.4 \times 3.1 \times 4.9-cm fluid collection, requiring ongoing antituberculosis treatment.

Abbreviations: AFB, acid-fast bacilli; FNA, fine needle aspiration.

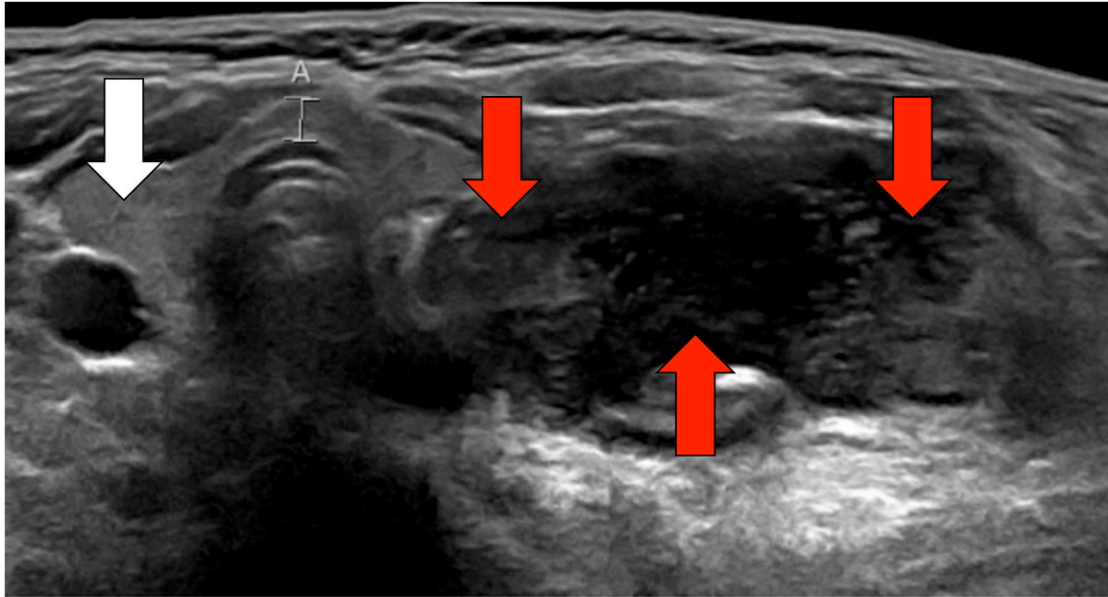


Figure 1. Ultrasound image of large cystic and solid lesion contiguous with the left thyroid lobe, $4.8 \times 3.0 \times 4.8$ cm. White arrow highlights normal thyroid parenchyma. Red arrows highlight abscess.

2. Discussion

The thyroid has antimicrobial properties, due to its colloid, vascularity, and iodine stores [1, 2]. The diagnosis of thyroid tuberculosis is rare: 0.1% of thyroidectomy surgical specimens have documented tuberculosis, albeit data was collected in 1932 [3]. More recently, 0.6% of thyroid FNA specimens diagnosed tuberculosis in data from India [4]. Initial presentation occurs in the context of either a neck mass, concurrent pulmonary tuberculosis, or without symptoms, as some cases are diagnosed only after thyroidectomy. Refer to Table 1 to review published thyroid tuberculosis cases. Laboratory evaluation in these cases typically displays normal thyroid function in addition to an elevated erythrocyte sedimentation rate reflecting inflammation. Imaging in these cases demonstrates solid, hypoechoic nodules that typically correlate with AFB-positive thyroid specimen (Table 1). It is of utmost importance to differentiate thyroid tuberculosis from cancer, to prevent unnecessary thyroidectomy in the setting of tuberculosis [5, 6]. Moreover, the differential diagnosis includes bacterial abscess and benign thyroid nodule, such as a fluid-filled cyst. In our case, we were concerned about infectious and malignant etiology, in the setting of fever and increased metabolic activity on positron emission tomography scan. The majority of thyroid tuberculosis cases are due to disseminated infection [7], with few cases associated with pulmonary tuberculosis [2]. FNA should be conducted as part of the diagnostic evaluation, albeit some lesions are not AFB positive and would warrant further histopathologic evaluation [8, 9]. FNA may yield thyroid tissue subjected to caseous necrosis, associated with epithelioid granulomas. Most thyroid tuberculosis cases are diagnosed postthyroidectomy or after autopsy [10]. Many of these cases have been diagnosed in young to middle-aged women, similar to our case [11]. Use of multiple antituberculous medications leads to eradication of disseminated infection. One percent of cases experience treatment failure, due to tubercular resistance [2, 12]. In our case, it is possible that posttreatment imaging does not reflect decreased residual disease due to difficulty treating an abscess medically. Although disappointed that our patient's neck mass did not resolve with appropriate medical management, past cases have demonstrated resolution with antituberculosis therapy (Table 1). It is not known whether thyroidectomy as primary treatment is warranted for disseminated infection when thyroid tuberculosis is suspected. No prior publication has reported thyroid tuberculosis in the posttransplant setting, most likely



Figure 2. Coronal section of positron emission topography–computed tomography, demonstrating diffusely increased metabolic activity in the left thyroid, skull, liver, and soft tissue. Arrows highlight regions of increased metabolic activity.

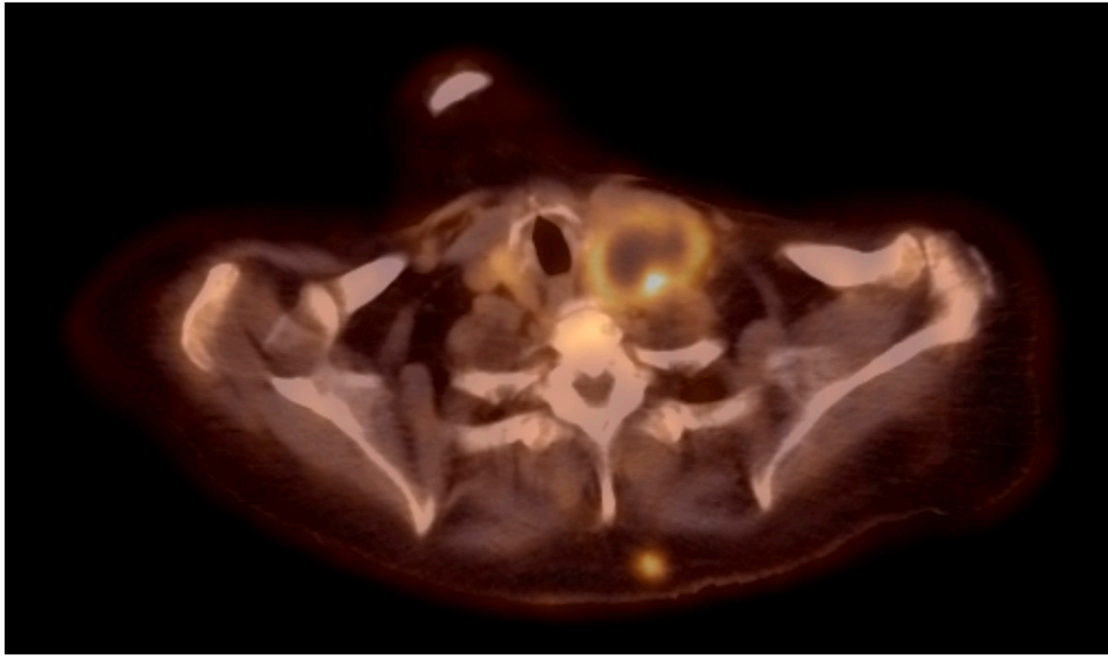


Figure 3. Axial section of positron emission topography–computed tomography demonstrating a prominent left-sided thyroid lesion.

due to the rarity of thyroid tuberculosis. With the use of immunosuppression, posttransplant thyroid tuberculosis activation and malignant transformation should be considered in the setting of occult fever. Our patient was at increased risk to develop tuberculosis due to

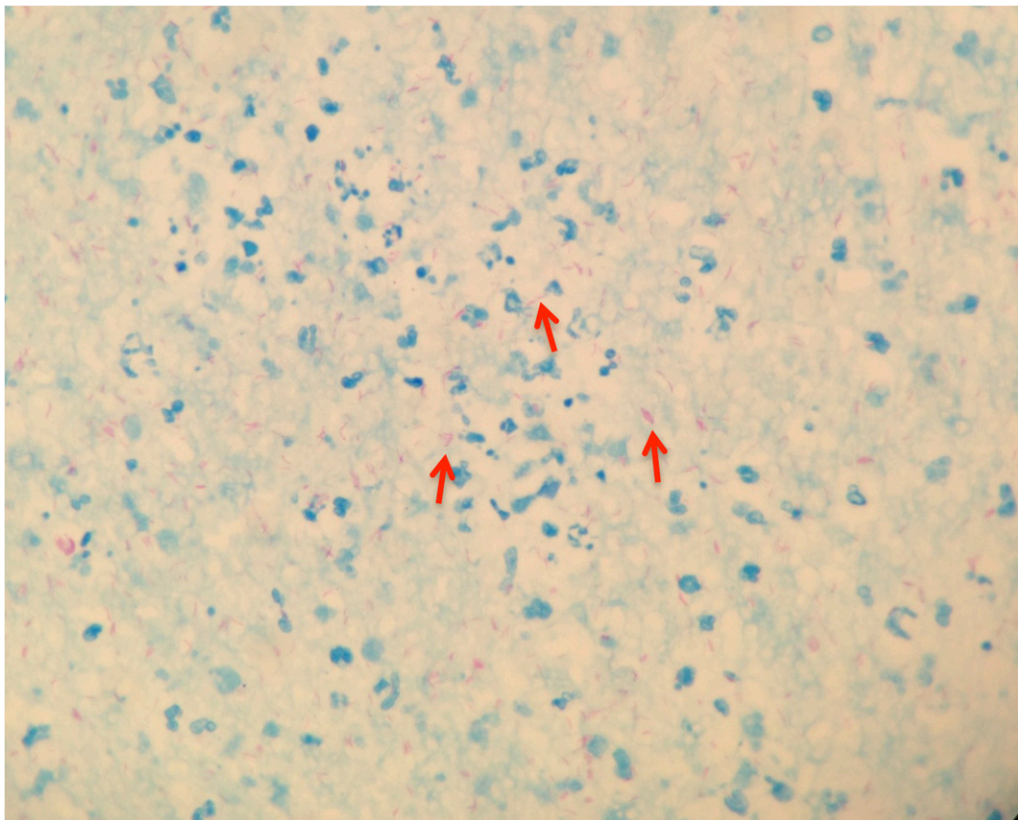


Figure 4. AFB stain of FNA purulent fluid. Arrows indicate AFB.

Table 1. Thyroid Tuberculosis Published Cases

Citation	Cases	Clinical Details	Imaging	Laboratory	FNA	Surgical Pathology
Rankin and Graham 1932	104	Miliary tuberculosis predominance 6 tuberculous abscesses 94 partial thyroidectomy cases 8 s/p incision and drainage Only 2 preoperative tuberculosis diagnoses reported	None reported	21 cases suspicious for hyperthyroidism	Not reported, as majority of cases were diagnosed postoperatively at this time	Tubercle and giant cell abundance detected in surgical cases
Lioté et al. 1987	1	Painless neck mass without generalized symptoms	US: right thyroid hypoechoic nodule and 3 ipsilateral enlarged lymph nodes Chest x-ray: enlarged paratracheal lymph nodes	Thyroid function reported normal AFB-negative sputum samples Bronchial biopsy noted tuberculous granuloma with caseation, giant cells	Not conducted	AFB-positive surgical specimen
Das et al. 1992	8	Age ranged from 14 to 65 years old Six patients presented with clinically detected nodule Two patients presented with neck abscess	US: 4 solitary nodules, 2 extra extrathyroidal lesions, 1 extrathyroidal vs cystic isthmic lesion, and 1 case Not imaged	None reported	Of 1283 thyroid aspirates over 2 years, 8 (0.6%) diagnosed tuberculosis Five AFB-positive aspirates	None reported
Khan et al. 1993	4	Case 1: thyrotoxicosis Case 2: thyroid sinus tract Case 3: dysphagia, fever Case 4: progressive thyroid enlargement	Case 2: US notes right hypoechoic nodule Case 3: US notes multiple hypoechoic nodules	Case 1: elevated T4 Case 3: elevated ESR (115 mm/h)	Cases 2–4: epithelioid granulomas	Coalescing, caseating epithelioid granulomas, giant cells detected in surgical specimen
Mondal and Patra 1995	18	Age ranged from 36 to 52 years old Three cases with cervical lymphadenopathy Four cases with pulmonary tuberculosis	Iodine thyroid scan: all cases demonstrated solitary nodules	Thyroid function reported normal in all cases Elevated ESR in 4 cases	Of 1565 thyroid aspirates over 9 years, 18 cases (1.15%) noted tuberculous thyroiditis	All cases demonstrated epithelioid granulomas with necrosis
Pazaitou et al. 2002	3	One case presented with generalized symptoms (weight loss, diaphoresis) One preoperative tuberculosis diagnosis Two postthyroidectomy tuberculosis diagnoses	Iodine thyroid scan: 2 cases demonstrating cold thyroid nodules	Thyroid function reported normal in all cases ESR >100 mm/h in all cases	One aspirate yielded white fluid, positive AFB stain One aspirate yielded lymphocytes	Each thyroidectomy specimen was AFB positive
Tas et al. 2005	1	Report of clinically apparent neck mass, dyspnea, dysphagia, and hoarseness for 6 days	CT: right thyroid cystic mass with paraglottic extension	Thyroid function reported normal	Not conducted	Pathology reported caseating tuberculosis
Ghosh et al. 2007	1	Report of clinically apparent neck mass for 2 years, with overlying abscess for the preceding 3 months	US: 4.3 × 2.8 × 4.2 cm heterogeneous hypoechoic mass Iodine-131 thyroid scan: decreased uptake in the left lobe	Thyroid function reported normal Elevated ESR (118 mm/h)	Blood-mixed aspirate with whitish material	No surgical intervention
Modayil et al. 2009	1	Report of clinically apparent neck mass for 6 weeks, without generalized symptoms	US: right lower thyroid 3.5 × 1.8-cm cyst, right level II lymphadenopathy Posttreatment US: no lesion detected	Thyroid function reported normal Elevated ESR (40 mm/h)	10 cc frank pus aspirated <i>Mycobacterium tuberculosis</i> culture positive	No surgical intervention

Table 1. Continued

Citation	Cases	Clinical Details	Imaging	Laboratory	FNA	Surgical Pathology
Gupta et al. 2012	1	Report of clinically apparent neck mass for 8 days, without generalized symptoms	US: right thyroid thick-walled cyst with central fluid and echogenic debris	Thyroid function reported normal	Purulent necrotic aspirate, inflammatory cells	No surgical intervention
Bahgat et al. 2012	1	Report of clinically apparent neck mass for 1 month, without generalized symptoms	CT: thyroid cyst with irregular border, contrast enhancing	Thyroid function reported normal Elevated ESR (50 mm/h)	Not reported	Incision and drainage yielded epithelioid and Langhans' giant cells

Abbreviations: US, ultrasound, ESR, erythrocyte sedimentation rate, s/p, status-post.

mycophenolate mofetil administration, renal insufficiency, and diabetes mellitus and previously living in an indigenous tuberculosis region [13]. In our case, disseminated tuberculosis was diagnosed, associated with a tuberculous neck mass contiguous with the thyroid gland with some features similar to previously published cases [14–16].

3. Summary

The differential diagnosis of immunosuppressed posttransplant patients with fever and suspected neck abscess should include thyroid and disseminated tuberculosis, warranting FNA. The aspirate should be sent for AFB stain and culture for diagnostic evaluation.

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