Case Report

Acute Thyroid Swelling in Renal Transplant Recipient

Abstract

Tuberculosis (TB) of thyroid gland is rare entity even in solid organ transplant recipients who have a high risk of TB. Thyroid TB is easily diagnosed by fine needle aspiration cytology. The majority of cases require only antitubercular drugs for treatment, and surgical intervention is required only in few patients. We here describe a case of thyroid TB presenting as an acute abscess in postrenal transplant recipient with a background of acute rejection treated with steroid and antithymocyte globulin.

Keywords: *Renal transplant, thyroid gland, tuberculosis*

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Introduction

Tuberculosis (TB) of the thyroid gland is rare even in areas where the prevalence of TB is very high.[1] There is no case report or case series of thyroid TB among solid organ transplant (SOT) recipients who otherwise have a very high risk of acquiring TB. The condition usually mimics more common thyroid conditions such as adenoma, carcinoma, lymphoma, or multinodular goiter. This leads to a delay in diagnosis and unnecessary surgical intervention. We describe a case of a renal transplant recipient who had TB of the thyroid gland that presented as acute thyroid abscess.

Case Report

A 51-year-old male patient underwent spousal renal transplantation in February 2014 for chronic kidney disease of undetermined etiology. He was on maintenance hemodialysis through arteriovenous fistula for 10 months before transplant. Pretransplant complement-dependent cytotoxicity crossmatch was negative with six human leukocyte antigen (HLA) mismatch. HLA panel reactive antibody screen by Luminex was negative. Induction was done with rabbit antithymocyte globulin (rATG) 1 mg/kg/day for 3 days (total dose of 3 mg/kg). Maintenance immunosuppression consisted of prednisolone, tacrolimus, and mycophenolate mofetil. Mycophenolate sodium dose was 720 mg twice a day for first 6 months and subsequently reduced to 360 mg thrice a day. Cytomegalovirus (CMV) status was D+/R+ and patient received valganciclovir prophylaxis for 3 months. The immediate posttransplant course was uneventful, and he was discharged on posttransplant day 7 with serum creatinine of 1.03 mg/dl.

He presented to the hospital with a fever and productive cough 2 years after transplant in January 2016. On evaluation, he was found to have acute graft dysfunction with rise of serum creatinine from baseline of 1.1 mg/dl to 3.08 mg/dl. The patient was drug compliant and his trough tacrolimus level was 6.5 ng/ml. Sputum for Gram-stain and for acid-fast bacilli (AFB) was negative. Sputum culture was sterile. High-resolution computed tomography (CT) thorax was normal. Allograft biopsy was done which was suggestive of acute cellular rejection (ACR, Banff Ib) with plasma cell infiltration and negative C4d. He was given pulse methylprednisolone (500 mg intravenous daily for 3 days). There was no response to pulse steroid with serum creatinine hovering around 3.5 mg/dl for the next 7 days. In view of steroid resistant ACR, rATG was administered at dose of 1 mg/kg/day for 3 days. There was no response to rATG, and serum creatinine remained between 3.5 and 3.8 mg/dl on follow-up. Unfortunately, he developed herpes zoster of thoracic dermatome in March 2016. He was treated with acyclovir with temporary cessation of mycophenolate mofetil.

He was again admitted to the hospital in April 2016 with a rapidly increasing painful

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swelling in anterior part of neck with low-grade fever for 5 days. On examination, there was a 4 cm × 4 cm size, rounded, fluctuant, tender midline swelling in anterior neck [Figure 1]. There was no palpable cervical or axillary lymphadenopathy and rest of the clinical examination was unremarkable. There were no signs or symptoms suggestive of hypothyroidism or hyperthyroidism.

Investigations

Hematological investigations revealed hemoglobin of 10 g% and total leukocyte count 12,500/mm^3 with 72% neutrophils. Thyroid function test was normal. Serum creatinine was 4.56 mg/dl. Chest X-ray was unremarkable. CT neck was suggestive of thyroid abscess [Figure 2].

Treatment and follow-up

Incision and drainage was done and around 20 ml pus was drained. Pus was positive for AFB. Culture of pus was positive for *Mycobacterium tuberculosis* and was sensitive to all first-line antitubercular drugs. He was started on the intensive phase of antitubercular therapy consisting of isoniazid, pyrazinamide, ethambutol with moxifloxacin for first 2 months. Mycophenolate was stopped. Tubercular abscess responded to treatment with complete disappearance of fever and neck swelling in 2 weeks. Subsequently, the patient was started on maintenance phase of antitubercular therapy consisting of isoniazid, ethambutol, and moxifloxacin for the next 10 months. During subsequent follow-up, there was gradual rise of serum creatinine, and he was started on maintenance hemodialysis in July 2016. Until the last follow-up, the patient was afebrile and doing well on regular maintenance hemodialysis.

Discussion

India is a country with the highest burden of TB. The World Health Organisation statistics for 2015 gives an estimated incidence of 2.2 million cases of TB in India; the global incidence is 9.6 million. In 2015, the estimated prevalence of TB in India was 2.5 million.[2]

The incidence of TB among recipients of SOT is estimated to be 20–74 times more than the general population.[3] The incidence among renal transplant recipients was 0.35%–1.2% in the United States, 0.7%–5% in Europe, 3.1%–5% in Southeast Asia, and 5%–15% in India and Pakistan.[3] The incidence of TB in south India in pretransplant patients is 8.7%, and that in renal allograft recipients is 12.3%.[4] The reported incidence from North Indian centre is similar.[5] In the study by Das *et al*., the incidence of tuberculous thyroiditis was 0.6%.[6]

Several studies have described risk factors for the development of TB in transplant recipients. Among the risk factors are immunosuppressive treatment with OKT3 or anti-T cell antibodies, diabetes mellitus, chronic liver disease (in kidney transplant recipients), coexisting infections (e.g., *Cytomegalovirus* infection, deep mycosis, *Pneumocystis jirovecii* pneumonia, and nocardia infection), and lesions on a chest radiograph suggestive of previous TB infection.[7] Our patient received rATG both for induction and as part of anti-rejection therapy which might have predisposed him to TB. There was no family history or history of TB or history of any contact.

About one-third to one-half of all cases of active TB after transplantation are disseminated or occur at extrapulmonary sites, compared to only about 15% of cases in the general population.[8] Although extrapulmonary TB is common in transplant recipients, the involvement of thyroid is very rare. Reasons for the uncommon involvement of thyroid by infections is unknown, but possible explanations are its encapsulation, high iodide content, rich blood supply, and extensive lymphatic drainage. Suppurative thyroiditis is usually caused by bacterial infection, but fungal, mycobacterial, or parasitic infections can also occur.[9]

Thyroid TB is usually seen secondary to tubercular infection of other organ or tissue due to hematogenous spread. Clinical presentation of thyroid TB varies widely. More common is miliary spread to thyroid gland as part

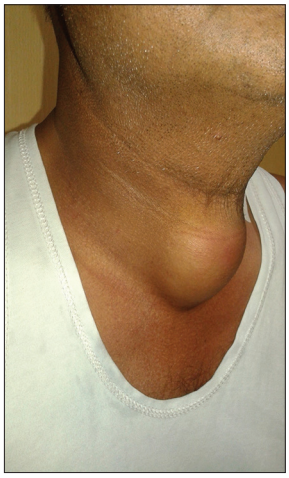

Figure 1: Rounded midline swelling in anterior neck

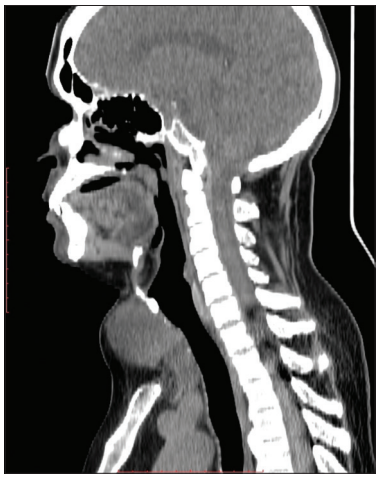

Figure 2: Sagittal section of computed tomography scan of neck showing thyroid abscess

of the generalized dissemination or, less commonly, focal caseous TB presenting as a thyroid nodule mimicking carcinoma or in late stages forming a cold abscess.[10] Five patterns have been described: multiple lesions associated with miliary TB, goiter with caseation, cold abscess formation, chronic fibrosing TB, and acute abscess.[11] Our patient presented with an acute abscess.

Thyroid function usually remains normal, but cases of hypothyroidism due to extensive glandular destruction by caseous necrosis have been described.[12] A case of hyperthyroidism preceding hypothyroidism has also been described signifying tubercular thyroiditis.[13]

The diagnosis is usually made by fine needle aspiration cytology (FNAC) or after histopathological examination of the resected surgical specimen when FNAC is negative. Characteristic finding of central caseous necrosis with peripheral lymphocytic infiltration and Langhans giant cells is typical of TB. In addition, the presence of AFB confirms the diagnosis. On histopathology many conditions affecting thyroid cause granulomatous inflammation such as granulomatous thyroiditis, TB, fungal infection, sarcoidosis, granulomatous vasculitis, and foreign body reaction. However, caseous necrosis is seen only in tuberculous inflammation.[14]

Treatment with antitubercular therapy has been shown to result in complete resolution of thyroid TB in the majority of cases, although adjunctive drainage of abscess can be useful in case of the large abscess.[14]

Antitubercular therapy in transplant recipients differs from that in the general population due to potential interactions between rifampicin and immunosuppressive medications. Potential drug interactions of rifampicin with calcineurin inhibitors, mycophenolate, mammalian target of rapamycin (mTOR) inhibitor and corticosteroid increase risk of allograft rejection. Rifabutin is a good option as it has similar efficacy and less risk of drug interaction but experience in transplant recipients is limited.[15] When rifampicin is used, the dose of calcineurin inhibitor and mTOR is increased 3–5-fold because of induction of cytochrome P450 3A4 by rifampicin. Close monitoring of drug levels and close follow-up of patients is also required. In developing country like India, this increases cost of posttransplant care. In patients with severe or disseminated forms of TB or with suspicion of resistance to isoniazid, rifampicin should be used. In localized, nonsevere form of TB, rifampicin sparing regimen can be used. Duration of treatment is controversial in view of lack of studies in SOT recipients. In rifampicin-based regimen total duration of therapy is 9 months. In rifampicin sparing regimen, treatment should continue for 12–18 months with use of isoniazid and ethambutol. The addition of third drug such as levofloxacin or pyrazinamide may be considered which may help to reduce the duration of maintenance phase.[15]

Conclusion

TB of the thyroid is rare and may mimic more common thyroid conditions such as adenoma, carcinoma, lymphoma, or multinodular goiter. This diagnosis should always be considered in a patient with neck swelling especially among residents of endemic countries and in SOT recipients.[1]

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Conflicts of interest

There are no conflicts of interest.

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