Case Report

Aspergillus Thyroiditis: An Incidental Diagnosis in a Patient of Tubercular Meningitis, A Case Report

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Abstract

Fungal thyroiditis is a rare disorder of the thyroid gland and affects immunocompromised patients in a setting of disseminated disease and contributes to high mortality rates. The commonest fungus implicated is Aspergillus. Here, we present a case of Aspergillus Thyroiditis in a patient undergoing treatment for Chronic meningitis (? Tubercular) who was incidentally detected with the thyroid lesion on follow-up evaluation by 18 Fluorodeoxyglucose Positron Emission Tomography (FDG PET). A Fine Needle Aspiration cytology revealed Fungal hyphae and she was diagnosed with Aspergillus thyroiditis. She also had concurrent aspergillosis of the lung. She was treated with antifungals and is doing well at present.

Keywords:

Aspergillus, Thyroiditis, Immunocompromised, Meningitis

Introduction

Infectious Thyroiditis is a rare disease because the Thyroid gland is relatively resistant to infection. This has been attributed to its thick capsule, its rich blood supply and lymphatic drainage, the high iodine content and production of Hydrogen peroxide [1, 2,]. The incidence of acute thyroiditis is estimated to be less than1% of Thyroid diseases.

Acute Thyroiditis may be due to infection by bacteria (Staphylococcus, Streptococcus), viruses and fungus. Fungal thyroiditis is rarer still and may be caused by Aspergillus, candida, cryptococcus, histoplasmosis and coccidioides out of which, aspergillus is the commonest [2, 3, 4]. It usually occurs in the setting of immunosuppression and disseminated disease [2, 4].

Case Report

A 37-year-old female who had Chronic meningitis (Tubercular) with hydrocephalus and granulomas was undergoing antitubercular treatment since January 2023. She developed antitubercular drug induced hepatitis for which Rifampicin and Isoniazid were stopped. She, also, had optic neuritis and swelling of left ankle. She was admitted in our hospital for further evaluation and management.

At the time of admission, she did not have any fever, headache or seizure and was able to walk using a walker. Magnetic Resonance Imaging of the brain was done before admission and showed significant basal exudates and granulomas with increased hydrocephalus as compared to previous Magnetic Resonance Imaging. At admission, she was conscious, oriented, and alert. She had no fever, and she was normotensive with a normal pulse rate.

Examination of the Cardiovascular system, Respiratory system and abdomen did not reveal any abnormality. There was 6th nerve palsy and ptosis of the left eye. There was weakness of the proximal lower limb and swelling of the left foot. All relevant investigations were done.

Her Cerebrospinal fluid showed a cell count of 15 (all lymphocytes), Protein was 51 mg/dl, Glucose was 84 mg/dl (blood glucose during the Cerebrospinal Fluid draining procedure was 100mg/dl). Mycobacterium tuberculosis DNA was not detected in cerebrospinal fluid.

Hepatitis panel was negative. Liver enzymes were raised (Serum Aspartate Aminotransferase- 248 IU, Serum Alanine Aminotransferase- 296 IU), IgG-4 level was 0.649 g/l and her sputum culture showed Klebsiella pneumonia. Direct Coombs test was negative. She was nonreactive for Human Immunodeficiency virus.

Ultrasonography of whole abdomen did not reveal any significant abnormality and the Visual evoked potential test showed predominantly demyelinating pre-chiasmatic Optic nerve neuropathy, left more than right.

18-Fluro-deoxyglucose positron emission tomography revealed 18-Fluro-deoxyglucose avid cavitary lesions in bilateral lungs, sub-centimetric paratracheal lymph nodes, multiple rim-enhancing brain lesions, left Thyroid nodule, focal splenic lesion, rim enhancing lesions in muscles and lytic lesion in left acetabulum – finding favoring granulomatous infection over metastatic malignancy.

Fine needle aspiration of the Thyroid was done in which the smears showed necrotic material and the cell block showed aseptate acute angle branching hyphae of Aspergillus species (Fig. 1).

Concurrent lung biopsy was done, and it showed Aspergillus hyphae (Fig. 2). Mycobacterium tuberculosis DNA was not detected in Broncho-alveolar lavage fluid. Galactomannan antigen index in broncho-alveolar lavage fluid was 0.40. Fungal culture of broncho-alveolar lavage fluid grew Aspergillus fumigatus.

Discussion

Acute Thyroiditis is a rare disease and can be caused by bacteria, viruses, and fungi. Nikhil Dinakar Thada et al [5] analyzed 415 reported cases of Infectious Thyroiditis (1900 – 1997) and found only 50 cases as due to fungi. Since then, only 12 cases had been reported up to their study done in 2013. Thus, it shows that Fungal thyroiditis is very rare. The commonest fungi to cause acute thyroiditis is Aspergillus. The other fungi implicated are Candida, Histoplasma, Cryptococcus and Coccidioides. Out of these,

Histoplasma is the rarest (LZ Goldani et al [3])

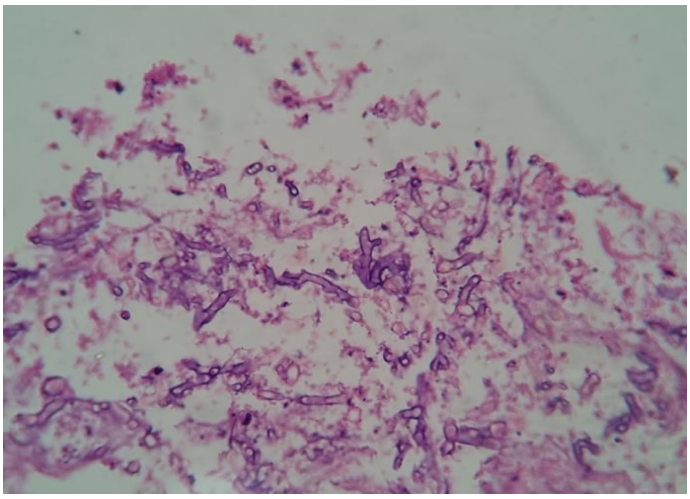

Figure 1: PAS stain, cell block of thyroid FNAC (40x)

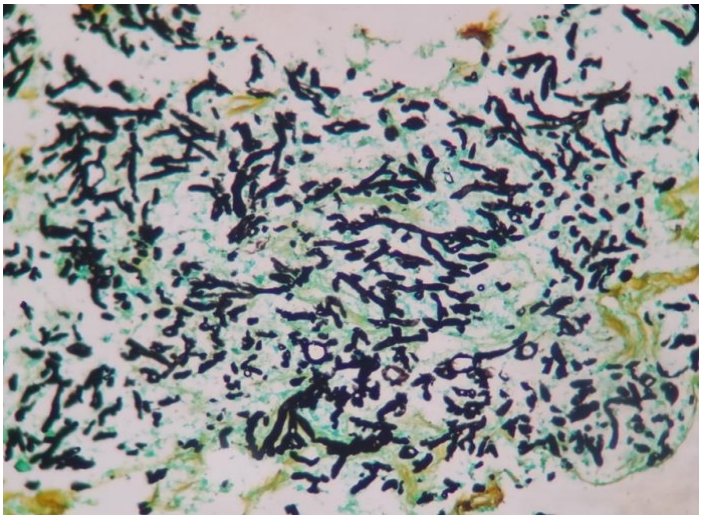

Figure 2: GMS stain, Lung biopsy(40x)

Infectious thyroiditis has mostly been a post-mortem diagnosis in patients who are immunocompromised. It has been commonly described in the setting of widespread disseminated infection in immunocompromised patients, such as those with acquired immunodeficiency syndrome, leukemia, solid organ transplantation, bone marrow transplantation, autoimmune disease, or pharmacological immunosuppression.

Aspergillus species has angio-invasive properties and is disseminated via hematogenous spread and hence can invade the thyroid despite the defense system inherent in the thyroid gland. Mechanism of spread includes neutrophil recruitment, inactivation of innate immunity, inhibition of host defense and suppressed T cell response. Due to its Angio invasive nature and subsequent disseminated disease, Aspergillus thyroiditis causes a high mortality rate [2, 4].

Patients present with swelling in the neck, anterior cervical pain, thyroid enlargement, sometimes associated with dysphagia and

dysphonia. The Thyroid function tests show an initial hyperthyroidism possibly due to the hormones released as a result of thyroid parenchymal destruction. This is followed by a period of euthyroidism followed by hypothyroidism. Other signs and symptoms include fever and thyroid abscess [1,2,5]. This has been confirmed by many studies.

Even though aspergillus thyroiditis affects mostly the immune compromised, it can also be seen in the immunocompetent [5]. Our patient had granulomatous meningitis but she lacked any other evidence of immunocompromise.

Jiaying Tan et al [6] in their web searches reviewed 29 cases of Aspergillus thyroiditis and in their analysis of the co-morbidities, granulomatous inflammation was found to be one of them. Our case also had granulomatous meningitis. They also mentioned that Aspergillus thyroiditis was usually asymptomatic and were diagnosed at post-mortem. Our patient also did not have symptoms of her thyroid disease and it was incidentally detected in the 18-fluodeoxyglucose (FDG) Positron Emission Tomography (PET-CT).

Ante-mortem diagnosis is by Fine needle aspiration cytology and direct microscopy, where the fungal hyphae can be visualized. Special stains can help in the diagnosis. Fungal culture and serology are useful adjuncts in the diagnosis. Infectious acute thyroiditis is a potentially life-threatening disorder.

And the prognosis depends on early diagnosis and prompt treatment. Late diagnosis with late institution of treatment, severity of the immunocompromised status and thyroid hormone overload contribute to the extremely high mortality rates [1]. Early diagnosis and prompt aggressive treatment is advocated by most studies, and this was thought to have contributed to the successful outcome of the patient described by Jiaying et al [6]. In our patient, too, early diagnosis and prompt treatment facilitated her recovery.

Treatment consists of antifungal therapy. Amphotericin B was the mainstay of therapy till the 1990s [6]. Itraconazole, Fluconazole and Voriconazole are also used for treatment. Caspofungin is another drug which has been found useful. Combination therapy is also used and consist of using Itraconazole and Caspofungin. These two acts by inhibition of cell wall and cell membrane biosynthesis.

Conclusion

Even though fungal thyroiditis is a rare condition, it can affect those with depressed immunity and cause disseminated disease. Our patient had thyroiditis and lung infection by Aspergillus possibly due to the immunosuppression caused by her chronic disease even though other evidence of immunocompromise was not found. Therefore, there should be high suspicion for fungal infection in patients who are immunocompromise or have disseminated disease. In cases of acute thyroiditis, it is wise to rule out fungal thyroiditis as this can result in high mortality and severe morbidity. Early diagnosis and prompt treatment can help in reducing the mortality rates.

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Patient gave written consent.

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