A case report on pituitary tuberculosis

Sultana Marufa Shefin[1], Afsana Rubaiya[2], Prof. Mohammed Kamal[3], Md Murshed Hasan Sarkar[4]

ABSTRACT

Tuberculosis is an infectious disease that involves any organ. However, the primary pituitary tuberculosis is an extremely rare disease. Intracranial tuberculomas account for 0.15-5% of intracranial space-occupying lesions, of which, pituitary as the primary site is unusual, and easily misdiagnosed as pituitary adenoma. In this setting, the late diagnosis can result in permanent endocrine dysfunction. We report the case of a 28-year-old woman who presented to the endocrinology department with complaints of progressively increasing headache for 1 month and double vision. On the clinical examination, the patient was conscious and oriented. The routine hematological and biochemical workup showed an increased erythrocyte sedimentation rate (ESR) and increased prolactin levels. MRI of Brain reveals Pituitary macroadenoma with impingement upon the optic chaisma, no other significant abnormality is detected in the brain. No other radiological and/or clinical clue that could elicit the suspicion of pulmonary or extrapulmonary lesions of tuberculosis was found. The Endoscopic Transnasal Transphenoidal Surgery was done. The histopathological examination of multiple irregular tissue from excised tumor was Granulomatous inflammation and the final diagnosis of pituitary tuberculoma was made. We report this rare case of pituitary lesion that may be included in the differential diagnosis of sellar lesions to avoid unnecessary surgical interventions, especially in regions where the disease is endemic.

Keywords

Pituitary Gland, Tuberculosis, Granuloma, Endocrine

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, causing the highest number of deaths as a single infectious agent globally[1]. In 2019, 10 million people were infected with TB globally; 79% were in the 30 high-burden countries, and 1.2 million people died from TB[1]. Bangladesh is one of the 30 high TB-burden countries and accounts for 3.6% of the global Population. The estimated incidence of TB per 100,000 is 221 in Bangladesh, with a mortality rate of 24 per 100,000 population[1]. Approximately 80% of all TB cases in Bangladesh are pulmonary TB[2]. The Global TB Report 2020 estimated that 0.7% of new cases and 11% of previously treated cases are found to be positive for multidrug-resistant TB (MDR-TB), which has an incidence rate of 2.0 per 100,000 population in Bangladesh[1].

TB can involve any human organ or body part; however, the lungs are predominantly involved[3]. Extrapulmonary TB can occur with or without pulmonary TB and comprises 14% of the cases reported in 2017 globally[1,3,4]. TB of the central

1. Sultana Marufa Shefin, Ibn Sina Medical College Hospital, Dhaka, Bangladesh.
2. Afsana Rubaiya, Ibn Sina Medical College Hospital, Dhaka, Bangladesh.
3. Prof. Mohammed Kamal, Consultant pathologist, The Laboratory, Dhaka.
4. Md Murshed Hasan Sarkar, Senior Scientific Officer, BCSIR, Dhaka.

Correspondence

Sultana Marufa Shefin, Associate Professor, Department of Endocrinology, Ibn Sina Medical College Hospital, Dhaka, Bangladesh, E-mail: shefin_neon@yahoo.com

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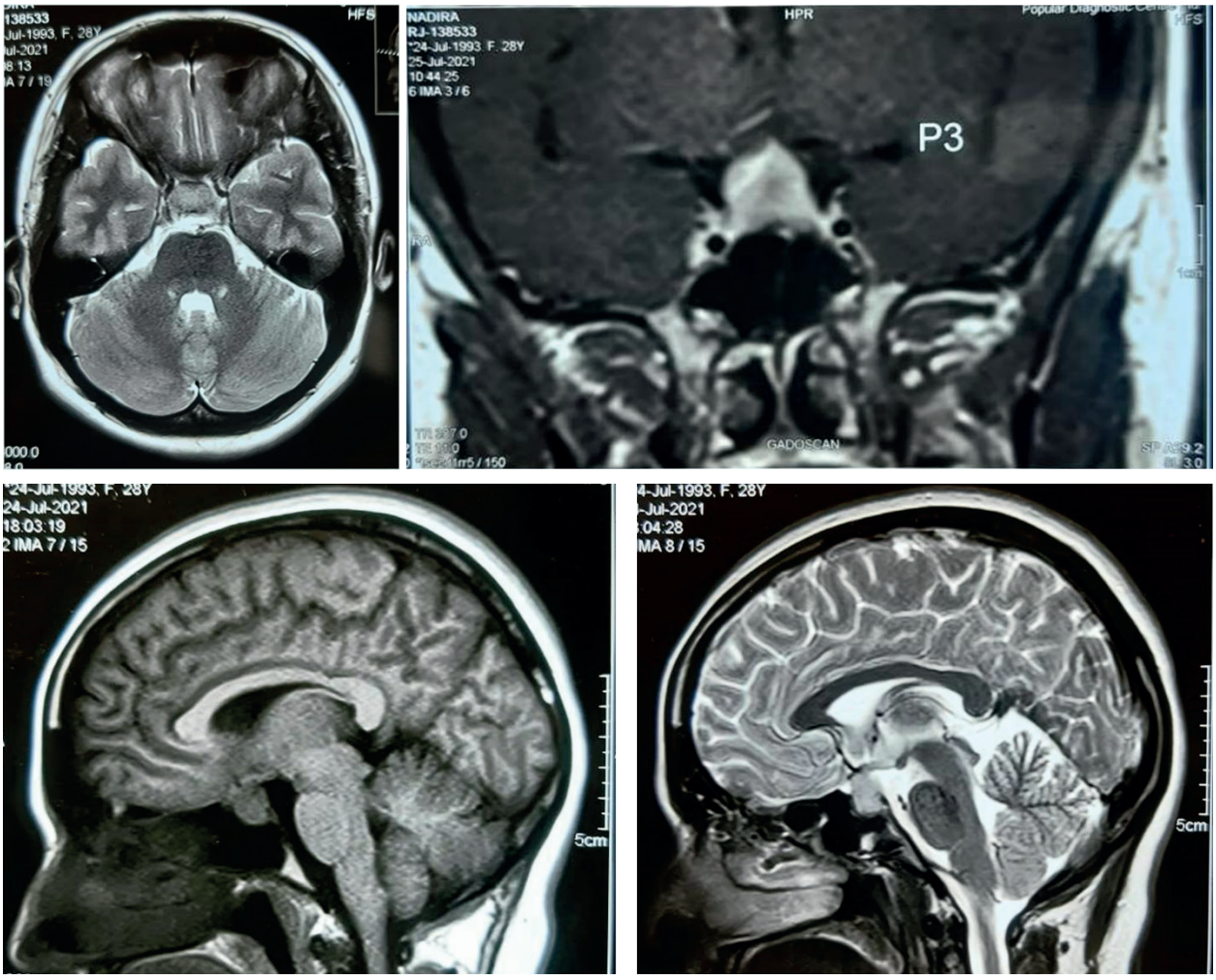

Figure1: Brain MRI. A-T2 axial, B-sagital flair image C-T2 coronal D-T1 coronal - Strongly enhancing a mass lesion measuring 1.7 x 1.4 cm arising from supra sellar region causing compression over optic chiasma without intrasellar or parasellar extension (arrowhead).

nervous system (CNS) constitutes only 1% of the TB cases globally and is more common in areas with high TB prevalence rate[3,4]. CNS TB can involve the meninges, brain, or adjacent bone by the hematogenous spreading of the infection[4]. In primary pituitary gland TB is a sporadic condition, and no previous reports have been published till now in Bangladesh. We present a case of a 28-year-old woman with the radiologiical diagnosis of the pituitary gland enlargement, suspected to be a macroadenoma. However, this case turned into pituitary TB. We report this case because misdiagnosis and wrong treatment may result in permanent endocrine dysfunction.

CASE REPORT

A 28-year-old married, school teacher having one child on regular menstruation presented to the department of Endocrinology and Metabolism, Ibn Sina Medical College Hospital, Kallyanpur, Dhaka complaining of progressively increasing headache for 1 month, and double vision at that time. On physical examination, the patient was conscious and oriented. The patient also complained of vomiting, which starts after taking any kind of food even water. Patient was dehydrated but not anemic and icteric. There was no lymphadenopathy or thyromegaly on clinical examination. Her weight was 53, height was 164 cm and body mass index (BMI)was

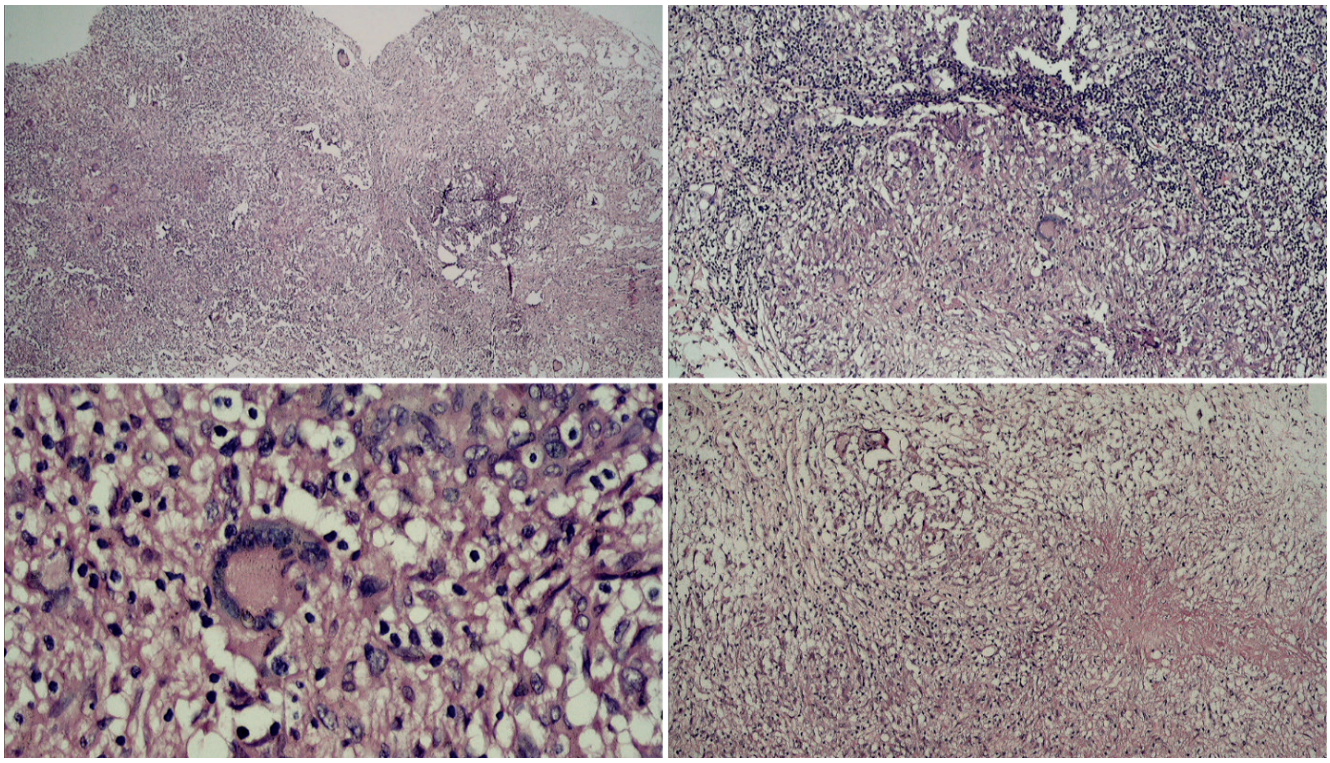

Figure 2. Photomicrograph of the pituitary gland. A – Many well-formed epithelioid granulomas (H& E: 120x); B – Well-formed epithelioid granulomas, Langhans giant cells, along with pituitary parenchymal cells (H&E: 320x); C – Granulomas with pituitary parenchymal cells (H& E: 400x); D – Reticulin stain: Well, preserved pituitary acinar structure (400X).

19.7.Her Glasgow coma score was 15/15 (E4V5M6). The lungs examination was clear on auscultation. The patient was hypertensive on medication. The routine laboratory workup showed hemoglobin of 12.3 g/dl (reference range [RR]; 14g/dl – 16g/dl), leukocytes 3300/mm^3 (RR; 4000 – 11000/mm^3), and platelets 2.36x10^5/mm^3 (RR; 1.5x10^5– 4.5x10^5/ mm^3). ESR was 10 mm in the first hour. The biochemical examination showed Random Blood Sugar level of 8.00 mmol/L(RR; < 7.0 mmol/L), Serum Creatinine 0.7 mg/dl (RR; 0.5 - 1.1 mg/dl), Na+ 1.36 mmol/L (RR; 1.35 – 1.48 mmol/L), K+ 4.4 mmol/L (RR; 3.50 – 5.2 mmol/L), and Cl- 100 mmol/L (RR; 95 - 105 mmol/L). Her chest X-ray revealed normal lung parenchyma. There was no family or close contact history with tuberculosis. No evidence of extrapulmonary lesion that could raise the suspicion of tuberculosis was noted. The contrast-enhanced magnetic resonance imaging (MRI) scan revealed a strongly enhancing hypointense lesion on T1, hyperintense on T2 and intermediate signal on FLAIR images measures about 1.7 x 1.8 x 1.5 cm (TDxAPxCC) is seen in the sella and suprasella region with impingment upon the optic chiasma (Figure 1). A microscopic examination of multiple irregular tissue from sellar SOL represent Granulomatous inflammation, suggestive of tuberculosis (DDx.:Sarcoidosis).

A radiological diagnosis of pituitary macroadenoma was given, and the patient was submitted to a transsphenoidalendonasal tumor excision. The postoperative period was uneventful. The histopathological examination of multiple irregular tissue from sellar SOL represent Granulomatous inflammation, suggestive of tuberculosis (DDx.:Sarcoidosis) (Figure 2).

Tuberculosis and Sarcoidosis are both chronic diseases with similar symptoms, immunologic and radiologic features. Sarcoidosis is a multi-system inflammatory disease with non-caseating granulomas with unknown aetiology. It is more common in African-Americans and northern Europeans population[5]. Based on the above histomorphology, a diagnosis of Pituitary tuberculoma

was given. Suspicion of sarcoidosis was ruled out as the patient didn't develop any multi-system disorder or lymphopaenia with non-caesiting granuloma and her chest X-Ray was normal.

Treatment for tuberculosis was initiated with a 2-month combination of isoniazid, rifampin, pyrazinamide, and ethambutol, followed by 7 months of isoniazid and rifampicin. Her headache rapidly resolved and restored normal vision. Post operative hormonal assessment was Pan hypopituitarism and permanent Diabetes Insipidus. She put on Steroid hormone for adrenal support, Hormone replacement therapy for gonadal support, Thyroid hormone supplements, Sublingual mineril for diapedes insipidus. Now she is doing very well and return back to her job.

DISCUSSION

Tuberculous involvement of the pituitary is extremely rare. The mechanism by which TB bacilli spread to the pituitary gland without apparent involvement of other body organs remains unclear. Hematogenous spread and extension from a tuberculous infection of the paranasal sinuses have been suggested in previous reports [6,7]. Headache and visual disturbances were the most common presenting symptoms and absence of constitutional symptoms of TB, such as fever, was characteristic. Specific cause of headache in pituitary tuberculoma can be associated meningitic process or infarction caused by inflammatory vasculitis [8]. Fever was almost always present in patients less than 12 years of age while it was much less frequent in adult patients. Females were more frequently affected than males (2:1) and 69% of the patients were females. More than 85% of the affected individuals were less than 45 years. Only 30% of the cases had past or concurrent history of extrasellar tuberculous involvement. About 70% of the cases were reported from India.

Endocrine involvement was present in 77% of the patients and it was difficult to detect preferential involvement of any hormonal axis. More than half of the patients (58%) who had hormonal evaluation showed anterior pituitary hypofunction. Growth hormone reserve was not assessed in most of the patients. It appears that any axis can be randomly involved without obeying the general order of involvement as noticed in pituitary adenomas.

The diagnosis of primary pituitary TB is usually very challenging and differentiation from pituitary adenoma on clinical and radiologic basis is often difficult. The prognosis of pituitary TB depends on the timing of diagnosis and initiation of proper anti-tubercular medications. Early diagnosis and prompt use of these medications can result in complete recovery of endocrine and neurologic function. However, late diagnosis and treatment may result in permanent endocrine dysfunction. MRI is considered the best radiological modality to diagnose pituitary lesions; however, differentiation between pituitary tuberculoma and adenoma on the basis of MRI findings can be very difficult.

Surgical intervention is usually reserved for diagnostic or decompressive purposes[9,10]. The role of surgery is to establish tissue diagnosis and relieve compressive symptoms[8]. The preferred route for surgery is the trans sphenoidal route[11], as it avoids cerebrospinal fluid contamination and tubercular meningitis[12]. Even with incomplete excision, post operatively patient can developed fresh hypothyroidism.

Hormone replacement therapy may be needed if pituitary functions are affected. In our patient, final diagnosis of primary pituitary TB was made based on typical histologic findings. Unfortunately, polymerase chain reaction (PCR) for rapid identification of *Mycobacterium tuberculosis* DNA was not performed on the pituitary tissue due to the lack of initial suspicion of TB. PCR is being increasingly used as a suitable method for sensitive and fast detection of *M. tuberculosis* complex DNA in histological material including formalin-fixed tissues and dried scraped material[13]. There was no evidence of other systemic or pulmonary TB in the current case after extensive radiologic investigations.

CONCLUSION

The non-specific radiological findings challenge the pre-operative diagnosis of primary pituitary TB. However, a high clinical suspicion, especially in endemic regions, can minimize unnecessary invasive procedures and surgical interventions. Primary pituitary tuberculosis should be included in the differential diagnosis of sellar lesions to avoid unnecessary surgical interventions. The early clinical suspicion and prompt use of anti-

tubercular drugs help to prevent irreversible endocrine dysfunction. We report this rare case of pituitary TB with the demonstration of Clinical presentation and histological finding.

Footnotes

This study was carried out at Ibn Sina Medical College Hospital, Dhaka, Bangladesh.

Ethics statement: Patient`s attendant have given their written informed consent to publish their case including publication of microphotograph of slides.

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Conflict of interest: The authors have no conflicts of interest to declare

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