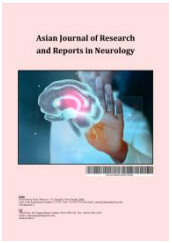

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Abducens Nerve Palsy as the Only Presenting Symptom for Solitary Cerebellar Tuberculoma in an Immunocompetent Young Adult

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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Case Report

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ABSTRACT

Aims: Depending on the location and quantity of tuberculomas, central nervous system tuberculoma can present with a myriad of symptoms and infrequently solely as Abducens nerve palsy.
Presentation of Case: An apparently healthy 20-year-old female has been presented here, who had no other neurological deficits other than left lateral gaze palsy and one day history of headache.
Discussion: Magnetic resonance imaging of the brain revealed a solitary, peripherally enhancing space occupying lesion of left cerebellum with no evidence of hydrocephalus or meningitis or exudates. Taking in account of the high endemicity of TB in India, it was presumed to be a tuberculoma and was excised surgically via suboccipital craniotomy. Histopathological examination confirmed the diagnosis and the patient improved subsequently on initiation of anti-tubercular drugs and steroids.

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Conclusion: Despite the low prevalence of solitary infratentorial tuberculomas as compared to metastases and other brain neoplasms in this region, differential of cerebellar or any intracranial tuberculoma should always be borne in mind, whenever any patient presents with any cranial nerve palsy.

Keywords: Abducens nerve palsy; CNS tuberculosis; tuberculoma; cerebellar; space occupying lesion.

1. INTRODUCTION

Tuberculosis (TB) and its complications are a significant health problem in developing countries like India. Central nervous system (CNS) forms 10 to 15 % of extrapulmonary sites of tuberculosis [1]. Tubercular Meningitis (TBM) is the most frequent form of CNS tuberculosis (TB) and less common forms are tuberculomas [2]. These are conglomerated caseous masses, which arise from deep-seated granulomatous foci acquired during early bacteremia and may occur either in isolation or less commonly with tubercular meningitis [3]. Constitutional symptoms, such as weight loss, fever, or malaise; a history of active or known TB elsewhere in the body; close contact with a patient with an open case of TB; a high frequency of seizures, even in conjunction with a cerebellar lesion; a positive Mantoux test result; and an increased sedimentation rate are features that help differentiate tuberculomas from other brain lesions; but these constitutional symptoms were absent in our patient. Children and the elderly are the groups most frequently impacted by immunocompetent patients, however, in the past ten years, there have been adult cases of solitary infratentorial tuberculoma documented globally [4,5]. The most frequent clinical manifestation of tuberculoma is focal neurological deficiency; nevertheless, it is extremely uncommon for the disease to manifest as isolated sixth nerve palsy without meningitis or hydrocephalus [6]. Tuberculomas of the central nervous system can be diagnosed by MRI brain with contrast and MR spectroscopy. It is one of the important differential diagnoses of the cystic lesions with peripheral contrast enhancement with associated edema on MRI brain [7]. The mainstay of treatment for intracerebral TB includes Anti tubercular therapy (ATT) and corticosteroids. The necessity of performing tissue diagnosis in order to promptly institute suitable therapy and in the event of a significant mass effect necessitating surgical decompression can serve as justification for surgical treatment of tuberculoma [8].

We report a case of solitary cerebellar tuberculoma in a 20-year-old female. The initial diagnosis of tuberculoma was confirmed by the presence of caseating granulomatous inflammation and detection of *Mycobacterium tuberculosis* in the excised sample.

2. PRESENTATION OF CASE

A 20-year-old female patient with no noteworthy past medical history was brought in with complaints of unusual eye movements, a two-day development of anomalous left eye gaze, and a one-day continuous low-intensity headache. The results of the general physical examination were normal. A thorough neurological examination revealed diplopia while gazing to the left lateral side and horizontal gaze paralysis of the left eye. There was no prior history of vomiting, nausea, headache, ear discharge, fever, stiff neck, or eye infection.

The patient's vital signs, such as blood pressure, temperature, and blood sugar, were consistently steady at presentation. Her results for the respiratory and cardiovascular systems were normal on the systemic assessment. A bilateral flexor plantar reaction and no neck stiffness were found during the nervous system assessment. She also showed no cerebellar signs or abnormalities in her gait. Upon ocular examination, the left eye was found to have restricted lateral movement, with no other gaze restriction, nystagmus, or pupillary abnormalities in either eye. No indications of ocular discomfort or localised inflammation were present. The fundus examination revealed a normal optic disc and vessels in both eyes.

Respiratory and cardiovascular systems were clinically within normal limits. Chest X-Ray showed clear lungs and a clearly outlined chest cavity. Patient was seronegative and routine blood tests revealed nothing out of the ordinary except a raised Erythrocyte Sedimentation rate(ESR) viz. 28mm/hr. Gadolinium Contrast Enhanced Magnetic Resonance Imaging (CEMRI) of the brain revealed a well defined,

irregularly outlined T1 isointense (Fig. 1), T2 hypointense (Fig. 2) peripherally enhancing lesion measuring 29mm*28mm*20mm in the left cerebellar hemisphere with mild perilesional edema and mild adjacent leptomeningeal enhancement. Ventricles were normal. The sulci and cisterns were unremarkable. No significant shift of midline structures was observed.

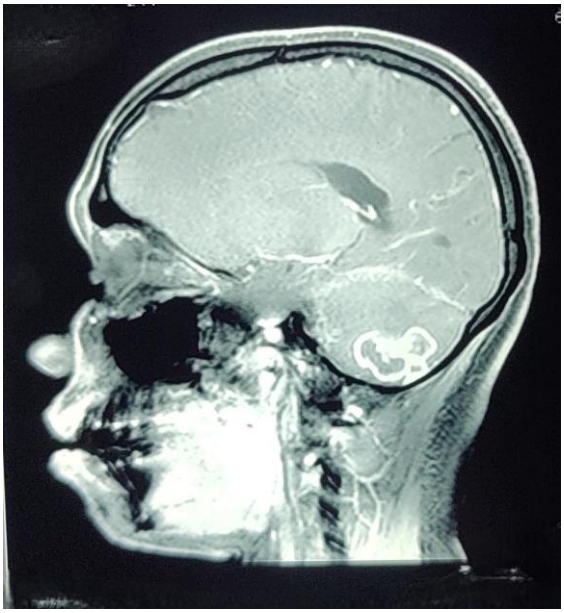

Fig. 1. Irregularly outlined T1 isointense

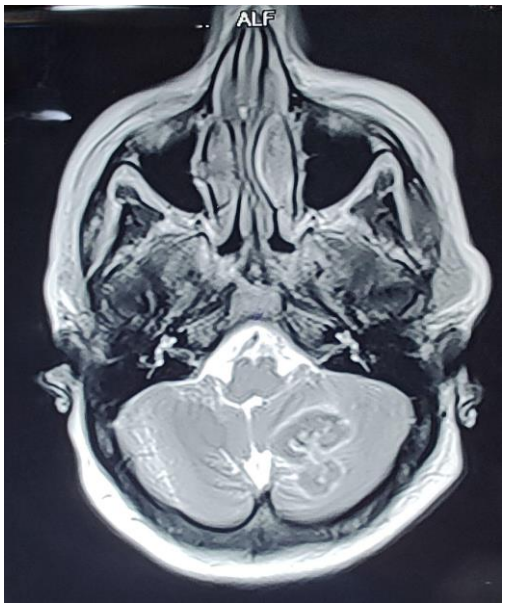

Fig. 2. Irregularly outlined T2 hypointense

Suboccipital craniotomy was performed under general anaesthesia and a firm, dirty white coloured, avascular, encapsulated lesion was excised, measuring approximately the same as described on CEMRI (Figs. 3, 4). Primary dural closure was done, bone flap replaced and the patient was extubated. Post operative recovery was unremarkable. Due to high clinical suspicion of tuberculoma, anti tubercular drugs (ATT) viz. Rifampicin-10 mg/kg, Ethambutol-15mg/kg, Pyrazinamide-25 mg/kg, Isoniazid-5mg/kg and intravenous dexamethasone were started for this patient. Histopathological analysis of the specimen revealed caseating granulomatous inflammation and presence of acid fast bacilli in Ziehl-Neelsen stain.On postoperative day 2, the left ocular gaze restriction had disappeared and the patient no longer complained of diplopia or headache. She was discharged on post operative day 10 after removal of the skin sutures with the instructions to continue ATT and to continue nutritional rehabilitation.

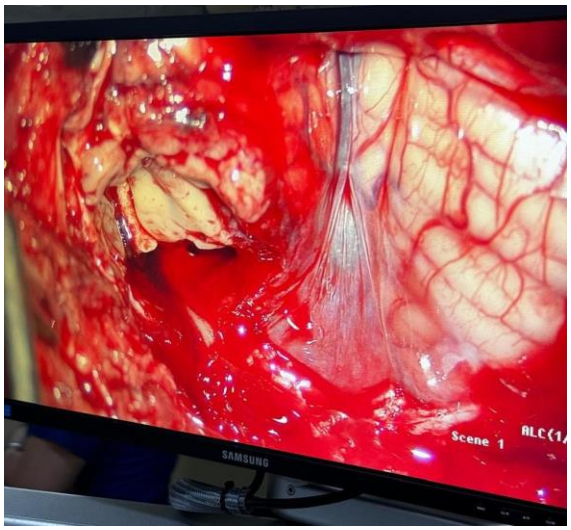

Fig. 3. Suboccipital craniotomy

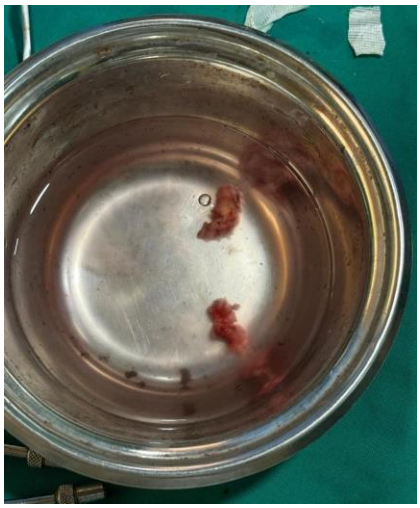

Fig. 4. Encapsulated lesion

3. DISCUSSION

Either direct extension from local infection or haematogenous dissemination from distant systemic infection can cause central nervous system tuberculosis. One theory for the involvement of the central nervous system (CNS) in tuberculosis [9] is haematogenous seeding subsequent to the initial infection. Mycobacterium tuberculosis (M.tb) can infect endothelial cells directly or spread via infected phagocytes to reach the central nervous system (CNS), where it can then cause tubercle formation—most frequently in the meninges or cortex of the brain. Tuberculous meningitis (TBM) is caused by the rupture of a nearby tubercle into the subarachnoid space, but tubercles that do not rupture can develop into tuberculomas [9].

Important differential diagnosis for an intracranial tuberculoma is a tumour. It can mimic primary central nervous system tumours with a variety of symptoms, including seizures, localised neurological impairments, and elevated intracranial pressure, depending on their size and location [10]. Horizontal gaze limitation was the only clinical manifestation that our patient had. Metastases are the most common lesions occupying the posterior fossa space. These are followed by high-grade gliomas, vestibular schwannomas, brainstem gliomas, demyelinating lesions, hemangioblastomas, arachnoid cysts, epidermoid cysts, and pilocytic astrocytomas, of which tuberculomas make up approximately 5% [11]. Because solitary lesions can mimic tumours or abscesses, which may present as headaches, seizures, hydrocephalus, cerebral artery involvement, cranial nerve palsy, and localised ischaemia, primary diagnosis of a cerebellar tuberculoma may be perplexing.

Effective care of tuberculosis depends on prompt diagnosis. The gold standard for tuberculosis diagnosis has historically been acid-fast bacillus (Mycobacterium tuberculosis) culture and sensitivity testing of the pathology specimen. There is a greater dependence on radiological investigations due to the lack of sensitivity and specificity of molecular and biochemical tests as well as the difficulties to obtain the pathology sample in the majority of cases of central nervous system tuberculosis (CNS TB) [7]. MRI plays a vital role in diagnosis because of its inherent sensitivity and specificity in detecting such abnormalities. Non-caseating tuberculoma is frequently iso-/hypo-intense on T1 and hyper-intense on T2-weighted imaging. Homogeneous enhancement is exhibited with gadolinium. Caseating solid tuberculoma is frequently hypo-intense on T1 and notably hypo-intense on T2-weighted images [11]. Abducens nerve palsy is the most common isolated cranial nerve palsy as the nerve has a long peripheral course. The differential diagnosis of abducens nerve palsy demands extensive investigation to find the proper cause as the nerve can be affected at any point in its long intracranial course. An isolated abducens nerve injury can be due to vascular, neoplastic, degenerative, infectious, inflammatory or traumatic aetiology. A high index of suspicion must be kept for diagnosis of tuberculous meningitis or intracranial tuberculoma in any patient from a developing country having multiple or isolated cranial nerve palsy [12]. The decision for surgical excision of a suspected tuberculoma is undertaken for obtaining biopsy, if the definitive diagnosis is unclear. Surgical resection is mainly done to relieve symptomatic or potentially life-threatening mass effect or hydrocephalus, to treat medically refractory seizures and in the posterior fossa lesions with large size and symptoms [8].

4. CONCLUSION

Common symptoms of CNS tuberculoma include headache, seizures, and problems in gait when there is a cerebellar lesion. It is extremely uncommon for isolated sixth cranial nerve palsy to be the earliest symptom of tuberculoma, as it was in our patient. When symptoms are present and the lesion is substantial, surgical excision of the space-occupying lesion in the posterior fossa is required. Steroids and antitubercular medication are beneficial, but long-term clinical and radiological monitoring is essential for positive results. Even in young patients without traditional symptoms, clinicians need to be on the lookout for unusual tuberculosis presentations. This case illustrates the extraordinary possibility of remission and amelioration in cerebral tuberculomas after suitable therapeutic approaches.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

CONSENT

Author has declared that written informed consent was obtained from the patient (or other

approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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