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CASE REPORT

An atypical case of neurobrucellosis: intracranial mass lesion mimicking tuberculosis clinically and on imaging

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Abstract

Brucellosis is the most common bacterial zoonosis and it causes approx half million human infections per year worldwide. Neurobrucelosis should be considered as possible differential diagnosis when a patient presents with symptomps of neruropasychiatric spectrum and fever. We report a case of neurobrucellosis in a patient who presented with headache, vomiting and an episode of generalized tonic clonic seizure.

Keywords: Brucella, Neurobrucellosis, Zoonosis

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Introduction

Brucellosis is the commonest bacterial zoonosis and it causes approx half million human infections per year worldwide [1]. It is caused by the gram negative, facultative intracellular coccobacilli of the Brucella species. Human brucellosis is a multisystem disease that can present with a broad spectrum of manifestations and various complications; It has a wide spectrum of clinical manifestation due to possibility of extensive involvement of organ systems. It comes under the WHO list of the neglected tropical zoonosis. The common symptoms are fever, myalgia, arthlagia, night sweats and weight loss.

Brucellosis can develop at any stage of the disease and have variable manifestations which include meningoencephalitis, encephalitis, myelitis, subarachnoid hemorrhage, radiculitits, neuropathies and psychiatric manifestations [2,3,4]. In the various literatures, diagnosis of the neurobrucellosis is problematic. Some authors suggest diagnosis of brucellosis is based on neurological symptoms while some suggest diagnosis is based on the microbiological and biochemical evidence [5,6]. A positive response to treatment is very important marker for diagnosis. So, examining the patient's complete history such as occupation, travel history and similar complain in family member can be very helpful to reach the diagnosis.

Case Report

A 17-year-old female patient presented to the Emergency Room with complaints of headache and two episodes of vomiting. Her headache was predominantly in frontal region and throbbing in nature. Her caretaker gave history of single episode of GTCS 3 days ago. Her caretaker has also informed that she has slightly altered behavior since last 5-6 day with slightly slurred speech. On examination it was revealed that she has mild fever (101 F). The fever is not associated with chills and rigors. There was no history of photophobia, blurred vision, motor weakness, abnormal movements, gait problem syncope, tremors or sensory loss.

On examination, her blood pressure was 136/88 mmHg, pulse rate of 88 beats per minute, and respiratory rate of 19 breaths/min. There was no pallor, icterus, lymphadenopathy, clubbing or cyanosis. Per abdominal examination and auscultation findings were normal. There were no cranial nerve abnormalities. Motor examination showed normal muscle bulk normal reflexes and generalized rigidity. Examination of other system did not reveal any abnormality.

Her hemogram revealed mild elevation of WBC count of 11500 per cumm, however rest of the hemogram renal function test renal function test and thyroid function test were normal. Sputum microscopy turned out to be negative for acid fast organism, so was genexpert PCR. Inflammatory markers including ESR and c reactive protein were slightly raised.

Subsequently Magnetic resonance imaging (MRI) with contrast was done to assess any intracranial space occupying lesion or any other pathology. It showed irregular ill-defined area of heterogeneous hyperintensity on FLAIR & T2W images is seen in right frontal lobe. No obvious diffusion restriction seen. On TIW images,

the lesion appear hypointense. Contrast study showed mild to moderate enhancement in right frontal lobe with few patchy areas in periventricular region in right frontal lobe along with linear leptomeningeal enhancement. Increased vascularity was seen in right frontal lobe with enlarged right internal cerebral vein.

As genexpert was negative, patient underwent CSF analysis and right frontal craniotomy with brain biopsy to evaluate the cause of the lesion and to confirm the diagnosis. The results showed positive Brucella antibodies in serological survey with active chronic inflammation in brain biopsy (Figures 1 and 2).

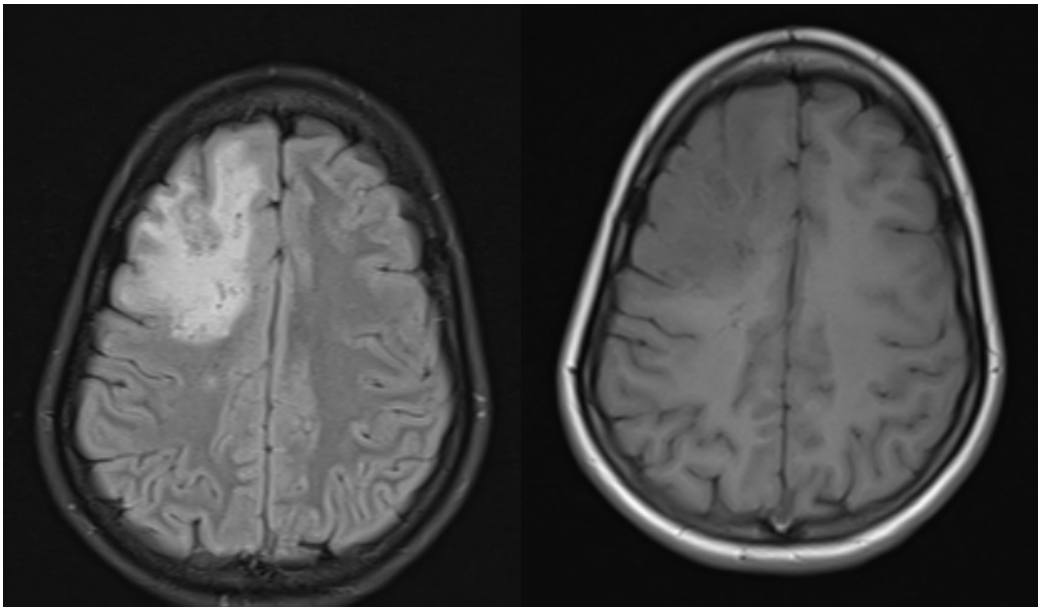

Figure 1. T1 weighted images and FlAIR images of the patient: On flair heterogenous hyperintense lesion noted in right frontal lobe wihich is hypointense on TIWI

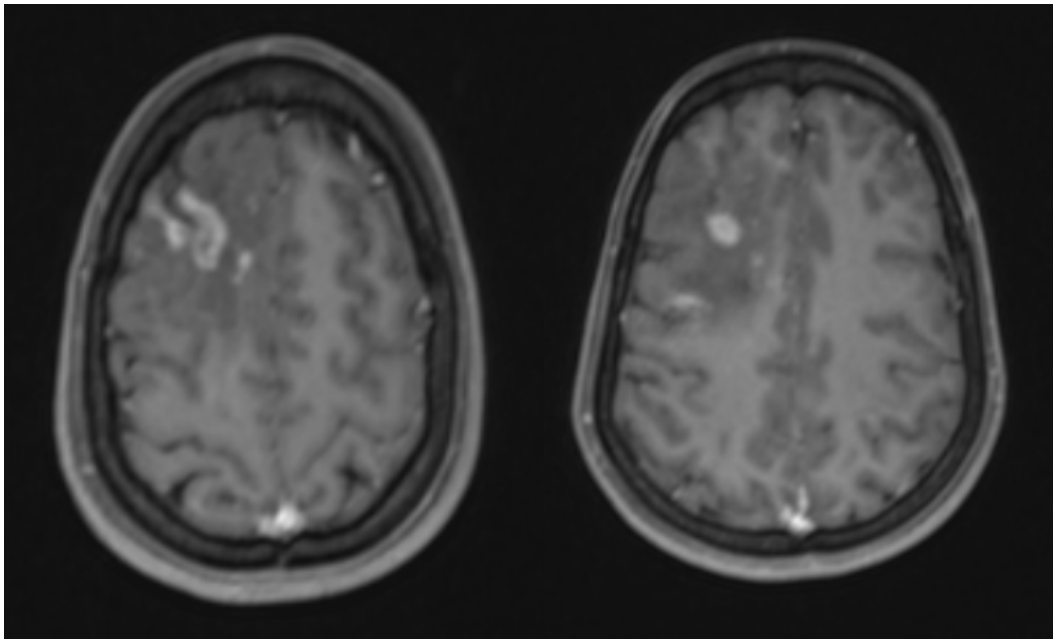

Figure 2. On post-contrast study, moderate areas of enhancement in right frontal lobe with few patchy areas of enhancement in periventricular right frontal lobe along with linear leptomeningeal enhancement

Post-treatment, the patient improved significantly and did not have any complaints. Follow up MRI study with contrast was performed after 40 days which showed significant reduction in the previously mentioned T2 hyperintensities as well as leptomeningeal enhancement (Figure 3).

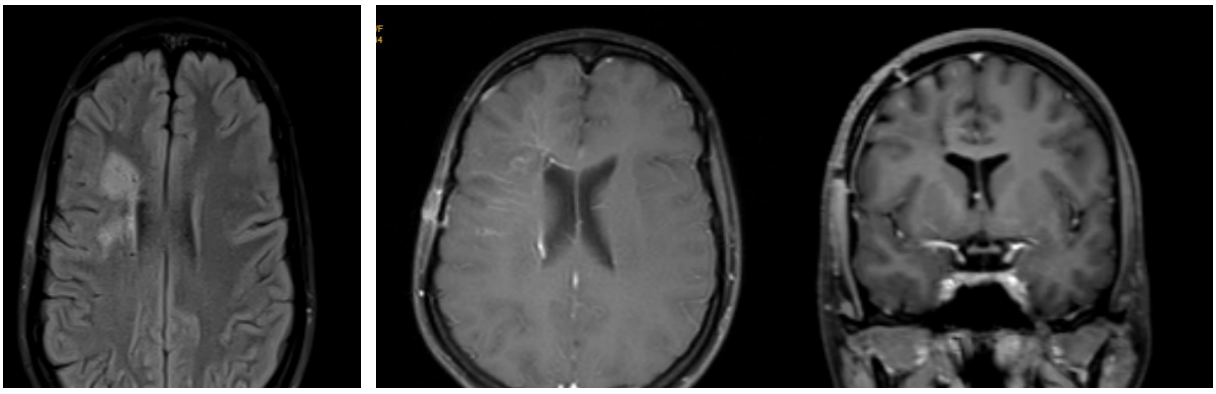

Figure 3. Post treatment follow up MRI suggest significant reduction in the previously mentioned T2 hyperintensities as well as reduced lepto meningeal enhancement on post-contrast study.

Discussion

Brucellosis is a deceptive infectious disease in India, especially due to high prevalence of tuberculosis. There are only few reports on brain involvement of brucellosis, however involvement of cervical cord and vertebral column are more common. Clinical presentation is often variable and depends upon the site of involvement. It is observed that headache, hearing loss, blurred vision, altered behavior and confusion are common association with neurobrucellosis. Along the cranial nerves facial, vestibulocochlear and abducense are more commonly affected than other cranial nerves.

Brucella bacteria can affect the CNS directly or indirectly by result of cytokine and endotoxin release in the neural tissue. Infection triggers the immune mechanism leading to a demyelinating state of brain parenchyma as well as spinal cord [7].

Neurobrucellosis is often a diagnostic puzzle due to lack of proper diagnostic radiological criteria. However, CSF indicating lymphocytic pleocytosis and increased protein with positive CSF culture for brucella organism and positive Brucella IgG with neurological dysfunction not explained by other neurological disease should make high suspicion of neurobrucellosis in a patient in with imaging modalities our suspicious of infective meningitis or meningoencephalitis [8].

Neurobrucellosis on CT scan show diffuse white matter changes with meningeal enhancement. Hydrocephalus with basal ganglia hemorrhage and cerebral edema are other common findings. MRI is better modality, on T1 weighted images changes of arachnoiditis can be seen. T2/ FLAIR demonstrate diffuse hyperintense lesions commonly affecting the white matter with areas of focal demyelination. Contrast study demonstrate granuloma or abscess with ring enhancement. Changes of meningoencephalitis are also better visualised on contrast study. It is important to note that many of the radiological finding seen in Neurobrucellosis can overlap the findings of CNS tuberculosis and hence it is important that differential diagnosis of neurobrucellosis should be considered in radiologically suspicious CNS tuberculosis patient's in which gene xpert turns out to be negative or there is no favorable response to antitubercular therapy. Other important differential diagnosis is demyelinating disorder like acute disseminated encephalomyelitis and multiple sclerosis; however focal area of demyelination with changes of meningitis and meningoencephalitis should be associated with neurobrucellosis .

Conclusion

Neurobrucellosis has favorable response with drug therapy, so it is important that diagnosis of neurobrucellosis should be considered in clinically and radiologically suspicious cases. Neurobrucellosis should be considered as an important differential diagnosis of various demyelinating disease and tuberculosis in India when there is no favorable response to treatment or serological studies not supporting them. Neurobrucellosis can have wide spectrum of presentation so proper clinical and radiological evaluation become essential for diagnosis of Neurobrucellosis.

Conflicts of interest

The authors declares that they do not have conflict of interest.

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