

## CASE REPORT

# Clinicoradiological improvement of intracranial tubercular abscess with medical management alone

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## SUMMARY

Tubercular abscess is a rare presentation of central nervous system tuberculosis (TB), which commonly presents as tuberculoma or meningitis. Most of the published cases of tubercular brain abscess have been dealt with by surgical treatment along with medical management. We here report a case of intracranial tubercular abscess in a 17-year-old girl presenting with fever, headache and right hemiparesis who showed significant clinicoradiological improvement with medical management alone. Thus, in a country like India where TB is highly endemic, TB should be considered as a possible aetiology for any intracranial lesion with radiological appearance suggestive of an abscess and surgical treatment can be kept as an option in case of neurological deficits, hydrocephalus or treatment failure.

## BACKGROUND

Tuberculosis (TB) has always been a major health problem in developing countries like India but HIV pandemic has led to resurgence of this disease in developed countries.<sup>1 2</sup> Tubercular abscess is a rare presentation of central nervous system (CNS) TB, which commonly presents as tuberculoma or meningitis.<sup>1</sup> Treatment of tubercular abscess includes antitubercular chemotherapy and surgical excision.<sup>2</sup> Most of the published cases of tubercular brain abscess have been dealt with by surgical treatment along with medical management.<sup>1 2</sup> We here report a case of intracranial tubercular abscess in a young girl presenting with fever, headache and right hemiparesis who showed significant clinicoradiological improvement with medical management alone.

## CASE PRESENTATION

A 17-year-old girl presented with mild-to-moderate grade intermittent fever and moderate, continuous throbbing headache in the left frontotemporal region, associated with vomiting since 1 month along with progressive weakness of right half of the body including face 5 days prior to admission. There was also a history of significant weight loss during the past 1 month. There was no history of ear discharge or any history suggestive of sinusitis. On examination the patient was conscious and well oriented with normal general physical examination. Respiratory, cardiovascular and gastrointestinal system examinations were unremarkable. Neurological examination revealed Glasgow Coma Scale of 15/15, upper motor neuron left facial weakness. Her motor examination revealed spasticity along with a power of 2/5 (Medical Research Council (MRC) grade) in the right upper and lower

limbs and extensor right plantar response. Neck rigidity and Kernig's sign were positive.

## INVESTIGATIONS

Laboratory results showed normal complete haemogram, liver function and renal function tests and normal chest X-ray. Erythrocyte sedimentation rate was 80 mm/h; cerebrospinal fluid (CSF) examination revealed 120 white cells (90% lymphocytes), raised proteins (240 mg%) and decreased sugar (20 mg%) with positive PCR for *Mycobacterium tuberculosis*. CSF India ink examination for cryptococcal antigen was negative. Her ELISA for HIV infection was non-reactive. Contrast-enhanced MRI of the brain showed a large, thin ring-enhancing lesion in the left frontal lobe, with core being hypointense on T1-weighted and hyperintense on T2-weighted images suggestive of an abscess (figure 1A–C). Since the patient had neurological deficit, neurosurgical opinion was sought, but considering the location of lesion, open surgery was considered too risky for which the patient's attendants did not give consent and facility for stereotactic biopsy was not available in our medical college hospital. A consensus opinion was formed with the neurosurgeon and medical management including steroids was preferred with close watch on any clinicoradiological deterioration. It was decided that open surgery be performed if further clinicoradiological deterioration occurred.

## DIFFERENTIAL DIAGNOSIS

- ▶ Tuberculoma
- ▶ Pyogenic abscess
- ▶ Fungal abscess

## TREATMENT

The patient was managed conservatively with five-drug antitubercular therapy including isoniazid (300 mg/day), rifampicin (450 mg/day), ethambutol (800 mg/day), pyrazinamide (1500 mg/day) and injectable streptomycin (0.75 g/day intramuscularly) for 3 months followed by isoniazid and rifampicin for a total of 18 months. A short course of injectable followed by oral steroid was also given in a tapering dose over initial 2 months.

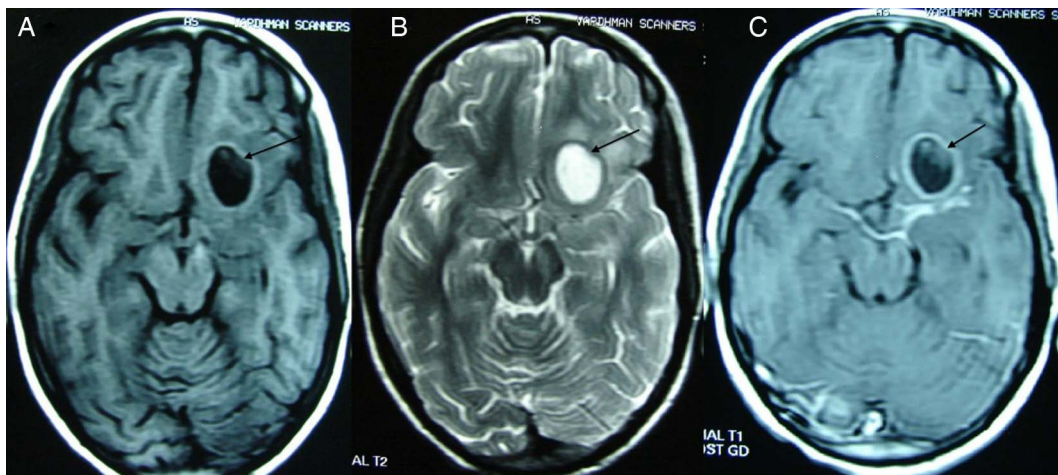
## OUTCOME AND FOLLOW-UP

The patient on follow-up showed significant improvement in neurological deficits with resolution of signs of meningitis and improvement in motor power from MRC grade 2/5 to 4/5 in the right half of body after receiving 3 months of treatment. Periodic MRI of the brain started showing



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**Figure 1** (A) T1-weighted axial MRI showing a hypointense mass lesion with hyperintense rim in the left frontal lobe (arrow). (B) T2-weighted axial MRI showing the hyperintense mass lesion with hypointense rim in the left frontal lobe (arrow). (C) Post contrast T1-weighted axial MRI showing the well-circumscribed thin ring-enhancing mass lesion in the left frontal lobe (arrow).

improvement after 2 months of treatment with complete resolution of lesion at 5 months of treatment (figure 2A–C).

**DISCUSSION**

CNS TB comprises nearly 10% of total patients of TB.<sup>3</sup> CNS infection usually occurs secondary to haematogenous spread of tubercular bacilli from lungs.<sup>2</sup>

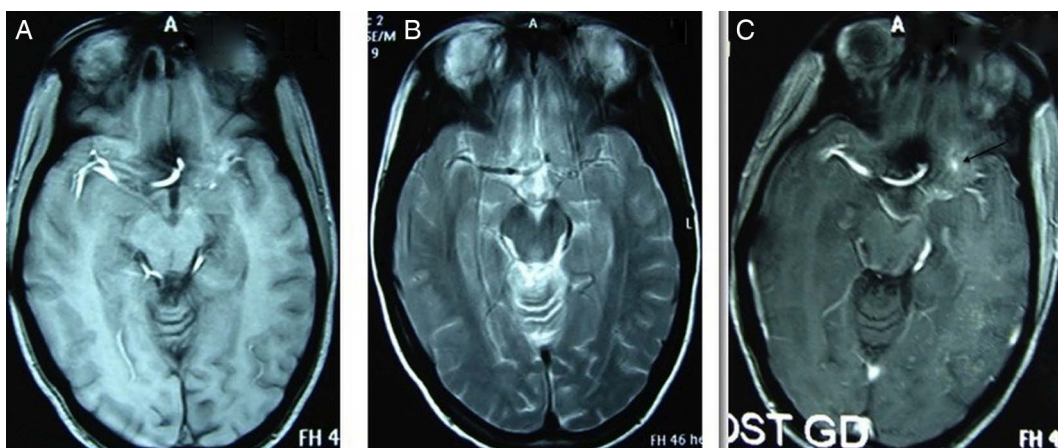
Tuberculoma and tubercular abscess can be differentiated pathologically by the presence of epithelioid granulomatous reaction with giant cells in case of tuberculoma, whereas vascular granulation tissue with acute and chronic inflammatory cells favours tubercular abscess.<sup>3</sup> MRI is an important non-invasive investigation which helps us to differentiate between tuberculoma and tubercular abscess. Tuberculoma usually presents as T2-weighted hypointensity whereas the core of TB abscess appears hyperintense on a T2-weighted image.<sup>4</sup> Our patient’s MRI showed ring-enhanced lesion with T2 hyperintense core. Tubercular abscess should also be differentiated from pyogenic abscess. As the PCR for TB was positive in CSF, it helped us to differentiate between tubercular and pyogenic abscess. MRI of a fungal abscess usually shows projections which are isointense to

hypointense on T2-weighted and isointense on T1-weighted images which were not seen in our patient.<sup>5</sup>

Although biopsy is the gold standard for definitive diagnosis of TB abscess, it may not be essential in an area where TB is endemic.<sup>6</sup> Our patient was not biopsy proven as any invasive intervention was considered too risky due to location of the lesion, but being a resident of an endemic area and CSF PCR positive for TB, a diagnosis of intracranial tubercular abscess was made and the patient was advised antitubercular treatment. Lumbar puncture was performed to look for corroborative evidence for the aetiology of brain abscess. In a study by Wasay *et al*<sup>8</sup> more than 80% of patients with tuberculoma had abnormal CSF. PCR for the diagnosis of tuberculous meningitis had an overall sensitivity of 56% and a specificity of 98% in a meta-analysis done by Pai *et al*<sup>9</sup>

Radical excision was the standard approach before the availability of chemotherapy, but with the use of highly active and freely available antitubercular drugs, surgical treatment is now limited to patients with treatment failure or intracranial hypertension.<sup>6 10–13</sup>

To conclude, in a country like India where tuberculosis is highly endemic, TB should be considered as a strong possibility in case of any intracranial lesion with radiological appearance



**Figure 2** (A) T1-weighted axial MRI 5 months after starting antitubercular treatment showing near-complete resolution of the lesion. (B) T2-weighted axial MRI 5 months after starting antitubercular treatment showing near-complete resolution of the lesion. (C) Post contrast T1-weighted axial MRI 5 months after starting antitubercular treatment showing near-complete resolution of the lesion (arrow).

suggestive of an abscess, and surgical treatment can be kept as an option in case of neurological deficits, hydrocephalus or treatment failure.

### Learning points

- ▶ Tuberculosis should be considered as a strong possibility in case of any intracranial lesion with radiological appearance suggestive of an abscess, particularly in an endemic area.
- ▶ Biopsy of the abscess is although the gold standard for diagnosis, it is not mandatory.
- ▶ Intracranial tubercular abscess may respond well to medical management alone.
- ▶ Surgical treatment of intracranial tubercular abscess can be kept as an option in case of neurological deficits, hydrocephalus or treatment failure.

**Competing interests** None.

**Patient consent** Obtained.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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