

Miliary tuberculosis of the brain

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Section: Neuroradiology

Imaging Technique: MR

Case Type: Clinical Cases

Authors: S. Cakirer (1), O. Kilickesmez (2)

Patient: 15 years, female

Clinical History:

A 15 year-old female patient had a history of pulmonary tuberculosis treated 3 years ago. She referred with a recent seizure attack. She had headache, malaise, chorea, and night fevers for the last few days as additional findings.

Imaging Findings:

A 15 year-old female patient had a history of pulmonary tuberculosis treated 3 years ago. She referred with a recent seizure attack. She had headache, malaise, chorea, and night fevers for the last few days as additional findings.

MRI study of the cranium was performed on a 1.5 T MR scanner, with SE T1, FSE T2, FLAIR, and post-gadolinium SE T1 weighted sequences on three planes. Lumbar puncture was performed, and cerebrospinal fluid (CSF) examination revealed low glucose levels with a few lymphocytic cells.

Discussion:

Central nervous system (CNS) involvement occurs in 2-5 % of all patients with tuberculosis (TB). CNS TB may be observed in several forms: a) intracranial or spinal tuberculous granulomas (tuberculomas), b) tuberculous abscess formation which is relatively rare, and more common in HIV-positive patients, c) meningitis, and d) osteomyelitis of the skull or spine, often associated with epidural abscess. Clinical findings vary with the form of the disease. The causative organism is mycobacterium tuberculosis in 95 % of the cases. The bacilli disseminate from a pulmonary source hematogenously to the cerebrum. They often lodge at the gray-white matter junction, where they form tuberculous granulomas. Histopathologically tuberculomas develop in the following four stages: nonspecific focal cerebritis, granuloma, central caseation, and involution. TB abscess is much larger than tuberculoma, and it is formed by semiliquid pus which contains large numbers of organisms. TB abscess may be multiloculated, and it has a greater degree of surrounding edema. TB meningitis typically causes a thick basilar exudate that is associated with meningeal enhancement. TB meningitis may cause communicating or non-communicating hydrocephalus, infarctions secondary to tuberculous periarteritis in the territories of perforator vessels, and thrombosis. Differential diagnosis of CNS TB includes multiple brain metastases (which are associated with more edema and usually seen in adult patients); sarcoidosis (which are associated with rare parenchymal nodules and have common multiple dural and/or leptomeningeal nodules); and other infectious diseases (which are usually more heterogeneous lesions and associated with more edema).

Differential Diagnosis List: Miliary tuberculosis of the brain

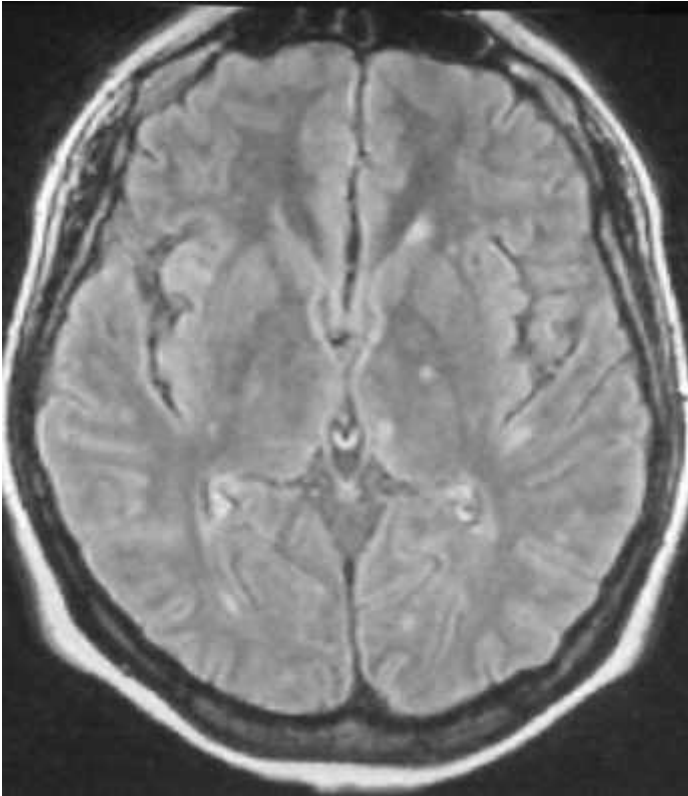
Final Diagnosis: Miliary tuberculosis of the brain

References:

- Pui MH, Memon WA. Magnetic resonance imaging findings in tuberculous meningoencephalitis. Can Assoc Radiol J 2001 Feb;52(1):43-9. (PMID: [11247265](#))
- Shah GV. Central nervous system tuberculosis: imaging manifestations. Neuroimaging Clin N Am 2000 May;10(2):355-74. (PMID: [10775956](#))
- Gupta RK, Kohli A, Gaur V, Lal JH, Kishore J. MRI of the brain in patients with miliary pulmonary tuberculosis without symptoms or signs of central nervous system involvement. Neuroradiology 1997 Oct;39(10):699-704. (PMID: [9351104](#))
- Eide FF, Gean AD, So YT. Clinical and radiographic findings in disseminated tuberculosis of the brain. Neurology 1993 Jul;43(7):1427-9. (PMID: [8018121](#))
- Gee GT, Bazan C 3rd, Jinkins JR. Miliary tuberculosis involving the brain: MR findings. AJR Am J Roentgenol 1992 Nov;159(5):1075-6. (PMID: [1414778](#))

Figure 1

a



Description: Axial PD-weighted image shows multiple hyperintense nodular foci scattered within the neural parenchyma with a tendency to gray-white matter junction. **Origin:**

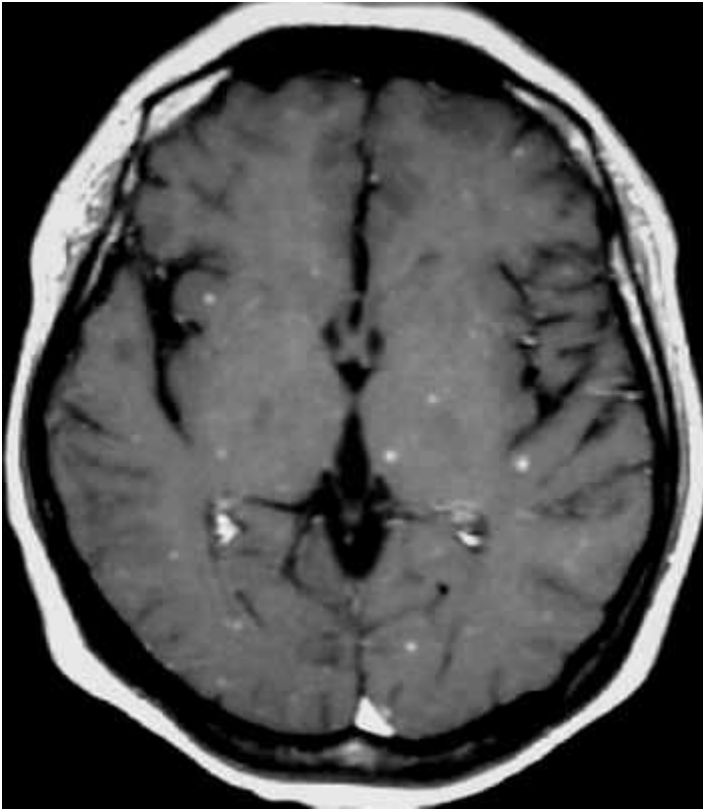
b



Description: Sagittal post-gadolinium SE T1-weighted MR image shows some nodular areas with peripheral contrast enhancement, located at leptomeningeal surfaces of the brainstem and cerebellum.

Origin:

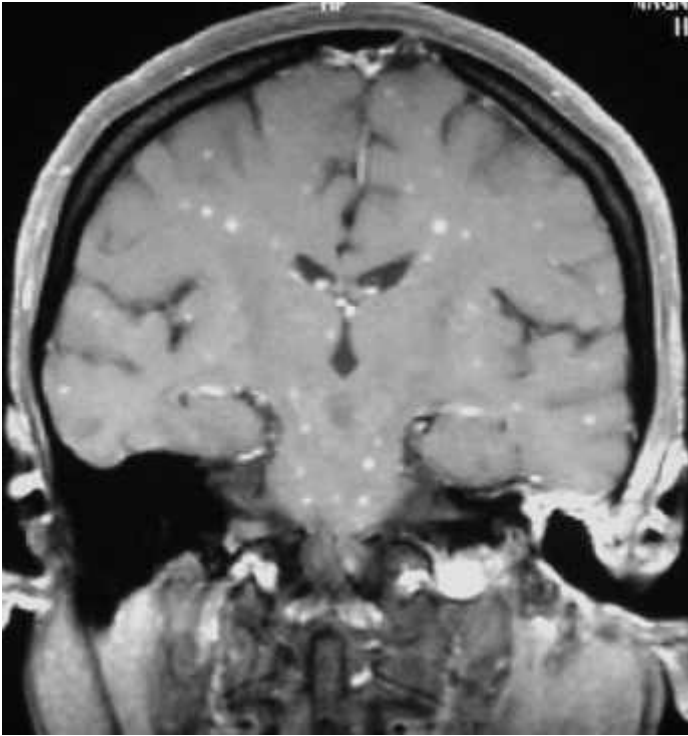
c



Description: Axial post-gadolinium SE T1-weighted MR image reveals multiple contrast enhancing nodular areas scattered within the neural parenchyma with a tendency to gray-white matter junction.

Origin:

d



Description: Coronal post-gadolinium SE T1-weighted MR image reveals multiple contrast enhancing nodular areas scattered within the infra- and supratentorial neural parenchyma with a tendency to gray-white matter junction. **Origin:**