

Case Report

Tuberculoma vs Neurocysticercosis - A Diagnostic Dilemma

Rajaguru Ganesan*, Suresh Panchanathan**, Uma Devi L***

*Assistant Professor, **Professor, ***Prof and HOD, Department of Pediatrics, Chettinad Hospital & Research Institute, Chennai, India.



Dr. Rajaguru Ganesan, completed under graduation from Thanjavur medical College and Post graduation from JIPMER, Pondicherry. Currently working as Assistant Professor in Department of Pediatrics, CHRI. Areas of interest are cardiovascular and pediatric intensive care.

Corresponding author - [Dr.Rajaguru Ganesan \(gurulingam@gmail.com\)](mailto:Dr.Rajaguru.Ganesan@gmail.com)

Chettinad Health City Medical Journal 2016; 5(2): 82 - 83

Abstract

A 15-year-old female patient presented with vomiting and intractable headache for a short duration of time. Neuroimaging of brain showed a single ring - enhancing lesion which could not differentiate between Neurocysticercosis (NCC) and Tuberculoma. Magnetic Resonance Spectroscopy (MRS) helped to delineate the diagnosis as tuberculoma and the girl was treated with antituberculosis drugs when conventional investigations failed to reveal the diagnosis MRS will be helpful.

Introduction

Diseases such as tuberculoma, neurocysticercosis, Neoplastic, inflammatory and demyelinating disorders presents with ring enhancing lesions of brain. In a tropical country like India single ring enhancing lesion (SEL) of brain in children is caused mostly by tuberculomas and neurocysticercosis. Shape, size, wall thickness and edema surrounding the lesion help in differentiating tuberculoma from NCC. However above mentioned characteristics of single enhancing lesion (SEL) fails in differentiating tuberculoma from NCC because of clinical and imaging similarities. MRS helps in identifying the diagnosis and starting early treatment.

Case Report

A 15 year old adolescent girl appropriately immunized for age presented with severe headache and vomiting for 4 days. There was no weight loss, seizures or fever. There was no loss of consciousness or visual disturbances. No contact with tuberculosis. History was not suggestive of migraine and there was no similar illness in the family members.

Child was well built with Pulse rate of 76/min, BP= 106/70mmHg, RR-18/min. BCG scar was present. There was no lymphadenopathy, Pallor, or Jaundice. Cardiovascular, respiratory and abdominal systems were normal. There were no focal neurological deficit or cranial nerve palsies. Deep tendon reflexes were within normal limits and bilateral plantar reflex was flexor. Power and tone was normal and there were no signs of meningeal irritation. Ophthalmological examination was normal. Hemogram, ESR, Chest X ray was normal and Mantoux test was negative. HIV serology was negative. Cerebrospinal fluid (CSF) was found to be normal (cells 3/ mm³, protein 46mg/dL,

CSF sugar/random blood sugar 64/102 mg/dL, and acid-fast bacilli (AFB) stain negative). GeneXpert of sputum and CSF was also negative. MRI brain with contrast revealed single enhancing lesions measuring 17×12×9 mm involving left hypothalamus and midbrain with peri lesional edema without midline shift (Fig 1). Possibility of Intracranial tumour was ruled out; however the MRI findings were not conclusive of tuberculoma or NCC. Magnetic resonance spectroscopy (MRS) was done and it showed lipid peak in the lesion (fig 2&3). The choline/creatinine ratio was elevated and N-acetyl aspartate (NA) was reduced. So diagnosis of tuberculoma was considered. The patient was started on anti-tuberculosis therapy along with steroids. Child responded well and symptoms resolved.

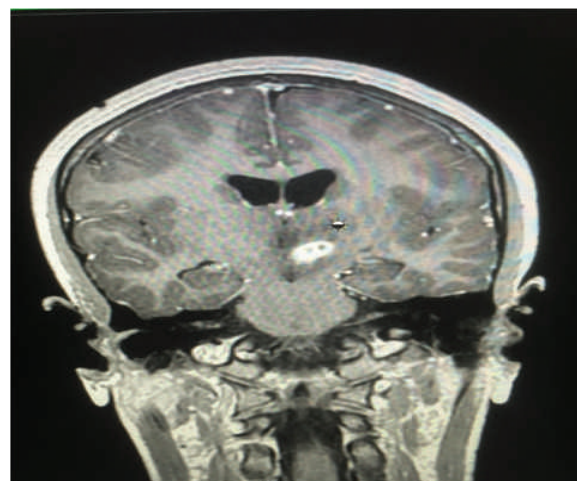


Fig 1 - MRI showing single enhancing lesion measuring 17×12×9 mm involving left hypothalamus and midbrain with peri lesional edema

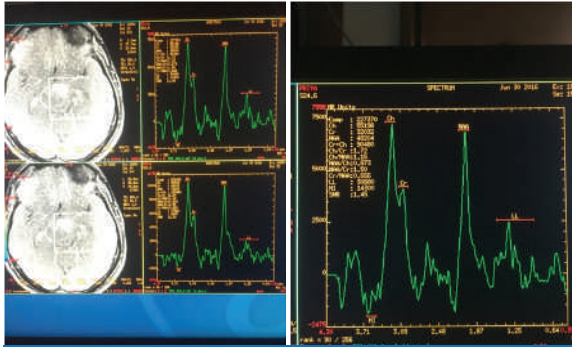


Fig 2 & 3 - MRS of the lesion showing elevated lipid and decreased N acetyl aspartate peaks with increased choline/creatinine ratio favoring diagnosis of tuberculoma

Discussion

Neurotuberculosis accounts for 1% of total tuberculosis, and it carries high risk of mortality and morbidity in children. Although tubercular meningitis is the most common form of CNS tuberculosis it can also present as tuberculoma, tubercular abscess, tubercular encephalopathy and tubercular vasculopathy¹. history, physical examination and lab investigations are important for making the diagnosis in patients with ring enhancing lesions of the brain.

Tuberculoma usually appears as hyperintense on T2-weighted and slightly hypointense on T1-weighted images². With contrast they appear as nodular or ring - like enhancing lesions whereas Cysticercus granuloma appears hypointense and there will be perilesional edema on T2-weighted images in MRI and shows enhancement of ring after contrast medium administration. Usually, the lesions are regular with size < 2cm, eccentric scolex is often seen in a cysticercal lesion³ within contrast Tuberculomas appear larger with irregular outline, cause more edema with midline shift^{4,5}.

MRS is superior in revealing the dilemma, in cases with single enhancing lesion of brain. MRS of tuberculoma shows elevation of lipid and choline peak elevation

with decreased levels of creatinine and N acetyl aspartate, choline / creatine ratio > 1 is suggestive of tuberculoma⁶. When MRI fails to delineate the difference between NCC and tuberculoma like in our case, definitely MRS is a promising diagnostic tool to differentiate tuberculoma from other SEL⁷.

References

- 1) Israni AV, Dave DA, Mandal A, Singh A, Sahi PK, Das RR, et al. Tubercular meningitis in children: Clinical, pathological, and radiological profile and factors associated with mortality. *J Neurosci Rural Pract.* 2016;7(3):400-4.
- 2) Gupta RK, Pandey R, Khan EM, Mittal P, Gujral RB, Chhabra DK. Intracranial tuberculomas: MRI signal intensity correlation with histopathology and localised proton spectroscopy. *Magn Reson Imaging.* 1993;11(3):443-9.
- 3) Del Brutto OH. Neurocysticercosis: A Review. *Sci World J [Internet]* . 2012 Jan 4 [cited 2016 Sep 12];2012. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3261519/>
- 4) Shetty G, Avabratha KS, Rai BS. Ring-enhancing lesions in the brain: a diagnostic dilemma. *Iran J Child Neurol.* 2014;8(3):61-4.
- 5) Seth R, Kalra V, Sharma U, Jagannathan N. Magnetic resonance spectroscopy in ring enhancing lesions. *Indian Pediatr.* 2010 Sep;47(9):803-4.
- 6) Pretell EJ, Martinot C, Garcia HH, Alvarado M, Bustos JA, Martinot C, et al. Differential diagnosis between cerebral tuberculosis and neurocysticercosis by magnetic resonance spectroscopy. *J Comput Assist Tomogr.* 2005 Feb;29(1):112-4.
- 7) Singh G, Rajshekhar V, Murthy JMK, Prabhakar S, Modi M, Khandelwal N et al. A diagnostic and therapeutic scheme for a solitary cysticercus granuloma. *Neurology.* 2010;75(24):2236-45