

# A simple radiological solution for a neurological dilemma

Kavitha B, Balasubramanian R

## CASE REPORT

A 55-year-old male presented with repeated right focal seizures of 15 days duration (3–4 episodes per day, each episode lasting for 2–3 minutes). There was no associated headache, fever or neck stiffness. There was no past history of diabetes or hypertension. He was not addicted to tobacco or alcohol and was not a pork eater. Clinically, he was well built, nourished and afebrile. There was no pallor or lymphadenopathy, and his pulse and blood pressure were within normal limits. His neurological examination was unremarkable. His blood count was remarkable for 16% eosinophils and his serum chemistry was normal. His chest X-ray was normal. Magnetic resonance imaging (MRI) brain (T1 sequence) showed a solitary left cortical ring enhancing lesion, with no definite scolex visible within it (Figure 1). Hence a possibility of neurocysticercosis (NCC) though strongly suspected, could not be confirmed and an alternative and more common possibility of tuberculoma also could not be ruled out. A serum ELISA test to demonstrate antibodies to cysticerci would not have been helpful as the lesions were not numerous. At this juncture an X-ray of the thigh (Figure 2) yielded the much needed proof in the form of the typical 'rice grain' or 'cigar-shaped' calcified cysticerci embedded in the thigh muscles. The patient was accordingly treated with antihelminthics (albendazole 400 mg b.d. for 14 days)

along with intravenous dexamethasone 4 mg t.d.s. and antiepileptics (carbamazepine 200 mg t.d.s. which was continued) with a good outcome.

## DISCUSSION

Cysticerci are the larval forms of the tapeworm *Taenia solium*, residing in the human tissues like the skeletal muscle, brain, CSF, subcutaneous tissue or eye. Neurocysticercosis is a common parasitic disease of the central nervous system. It poses a diagnostic challenge, especially in a tropical country like India where tuberculoma can have a similar presentation and radiological features like NCC. We presented a case with one such experience.

Seizure (either focal or jacksonian) is the most common presenting symptom of NCC (70–90%). NCC is



Figure 1: MRI of brain (T1 sequence) with contrast showing a solitary left cortical ring enhancing lesion, with no definite scolex visible within it indicated by the red line.

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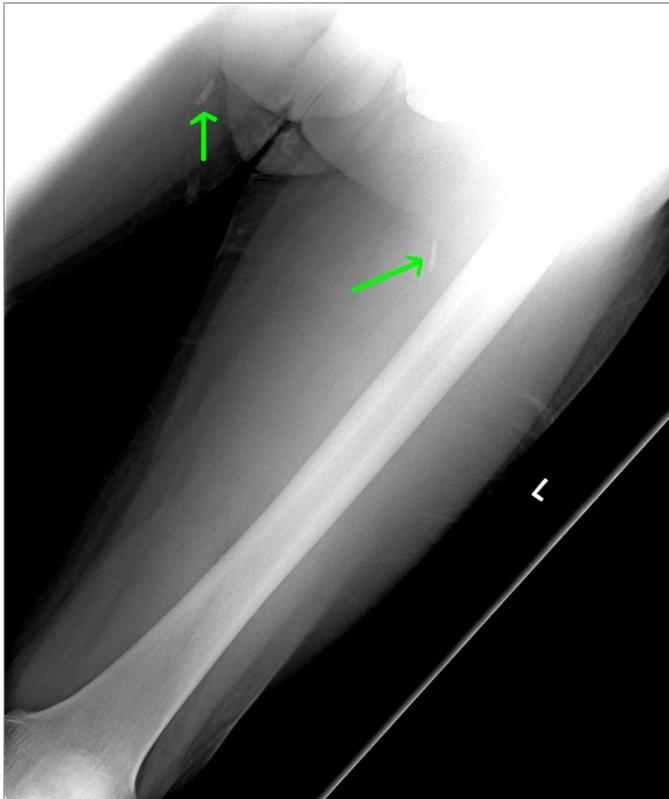


Figure 2: X-ray of the thigh showing the typical 'rice grain' like calcified cysticerci embedded in the thigh muscles, which are indicated by the green lines.

the main cause of acquired seizures in developing countries. Features of obstructive hydrocephalus due to CSF flow obstruction by cysticerci may be present.

**Diagnostic Dilemma:** The diagnosis of NCC can be difficult. A consensus criteria has been put forth by Brutto et al. for diagnosis [1], but, the majority of Indian patients with NCC cannot satisfy several items even of these diagnostic criteria. Non-enhancing cystic lesions on computed tomography (CT) or magnetic resonance (MR) imaging showing scolex are seen in only a small fraction of patients with NCC. In India, the overwhelming majority of patients of NCC have single enhancing lesion; multiple enhancing CT/MR lesions are also uncommon [2]. These single or multiple lesions pose a challenge to both radiologists and clinicians to differentiate it from tuberculoma, which has very similar clinical and imaging features as NCC [3, 4]. This distinction is an important issue because of the contrasting treatment for either lesion.

On MRI, the cysticercus granuloma shows a ring pattern of enhancement after contrast administration. Usually, the lesions are <20 mm in diameter. Calcified eccentric scolex is often seen in a cysticercal lesion. The lesions are often multiple and most often do not have extensive edema [5, 6]. Rajshekhar et al. noted that cysticerci are usually round in shape, 20 mm or less in size with ring enhancement or visible scolex. Cerebral edema severe enough to produce midline shift or focal neurological deficit is not seen often. Tuberculomas are

usually irregular, solid and greater than 20 mm in size. They are often associated with severe perifocal edema and focal neurological deficit [8]. In India, solitary cysticercus granuloma account for 60% of cases of neurocysticercosis [7].

Positive serum EITB assay for the detection of antibodies against *T. solium* has a specificity approaching 100% and a sensitivity of 94–98% for patients with two or more lesions and 60–85% for patients with a single lesion [8]. A major weakness of this test is frequent false negative results in patients with a single intracranial cysticercus lesion (50%) and in calcified lesions [9, 10]. Access to Enzyme-linked immunoelectrotransfer blot (EITB) in India is limited. Our patient had a single ring enhancing lesion and hence we did not consider a serological test, but went for a much simpler and readily available investigation which helped us resolve the doubt. X-ray of the soft tissue shows multiple elongated foci of calcification just about the shape and size of grains of rice. These 'rice grain' calcifications are usually oriented along the direction of the muscle fibers [11]. In some series, calcified larvae have been demonstrated in up to 97% patients examined five or more years after the infection; such a high rate of detection is not to be expected routinely. Some patients with cerebral cysticercosis will have no evidence of calcified cysts in the muscles and are unaware of their infection.

## CONCLUSION

NCC is a commonly encountered parasitic disease in India and worldwide. It poses a diagnostic problem for physicians as it has similar clinical and radiological features of a tuberculoma which is much more common in India. A single ring enhancing lesion could create a dead end especially when serological tests are negative too. In such circumstances, X-rays of the soft tissues like the calf/thigh muscles could reveal the calcified 'rice-grain' like cysticerci along the muscle fibers confirming the diagnosis of NCC.

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## Author Contributions

Kavitha B – Conception and design, Acquisition of data, Drafting the article, Final approval of the version to be published

Balasubramanian R – Conception and design, Analysis and interpretation of data, Critical revision of the article, Final approval of the version to be published

### Guarantor

The corresponding author is the guarantor of submission.

### Conflict of Interest

Authors declare no conflict of interest.

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