Disseminated cysticercosis: rare manifestation of a common disease

Neha Singh,¹ Deepak Kumar Singh,² Anit Parihar,¹ Ragini Singh¹

¹Department of Radiodiagnosis & Imaging, CSMMU, Lucknow, Uttar Pradesh, India

²Department of Neurosurgery, Dr RMLIMS, Lucknow, Uttar Pradesh, India

Correspondence to
Dr Neha Singh, neha.singh.dr@gmail.com

SUMMARY

We are presenting a case of disseminated cysticercosis involving the brain, spinal cord, orbit, muscles, subcutaneous tissues, liver and spleen of an immunocompetent man. Although cysticercosis is a common tropical disease, such widespread dissemination is an uncommon manifestation. Imaging studies are described with emphasis on hepatic and splenic involvement which has been described only rarely in the published literature.

BACKGROUND

Neurocysticercosis is one of the most common parasitic infections of the brain and a leading cause of epilepsy in developing countries. Late-onset seizures in otherwise healthy individuals from endemic areas should raise high suspicion of neurocysticercosis. Disseminated cysticercosis is an uncommon form of cysticercosis caused by dissemination of the larval form of the pork tapeworm. Simultaneous and extensive involvement of the nervous system, eyes, muscles, subcutaneous tissues and visceral organs is extremely rare and few case reports are available in the published literature.

CASE PRESENTATION

A 16-year-old boy from Mirzapur, India, presented with generalised tonic clonic seizures for 1 year, and severe headache and vomiting for 3 months. He had multiple small swellings all over his body which had gradually increased in number and size over the past 2 months. Fever and arthralgia was also present. The patient was a vegetarian, and farmer by occupation. On examination, generalised hypertrophy of the limbs, trunk, neck and facial

muscles was present. Limbs were hypertonic with exaggerated reflexes. Muscle tenderness was present with increased pain on joint movements. Bilateral proptosis was also noted.

INVESTIGATIONS

Brain and spinal cord MRI revealed numerous well-defined round to oval cystic lesions, hyperintense on T2-weighted images and hypointense on T1-weighted images, but few of them showed an enhancing eccentric nodule on postcontrast images characteristic of a cysticercus. The lesions were involving bilateral cerebral hemispheres, basal ganglia, thalami, brain stem, cerebellum and spinal cord (figure 1). Almost all the muscles of the axial and the appendicular skeleton were studded with the lesions (figure 2). Lesions were also noted involving the orbital (figure 1A) and facial muscles, muscles of mastication, tongue and pharynx (figure 1A,B). A CT abdomen showed similar lesions involving liver and mid-region of the spleen (figure 3). x-Rays of lumbosacral spine and lower limbs revealed multiple rice grain soft tissue calcifications (figure 4).

TREATMENT

The patient was given prednisolone and albendazole therapy for 1 month along with antiepileptics. Prednisolone was started at a dose of 1 mg/kg and it was gradually tapered. Albendazole was given at a dose of 15 mg/kg body weight.

OUTCOME AND FOLLOW-UP

The patient improved with significant reduction in episodes of headache and vomiting. Seizures subsided and the patient was kept under observation

Figure 1 T2-weighted axial, coronal and sagittal images of brain MRI showing numerous well-defined rounded hyperintense lesions with eccentric scolex involving entire brain parenchyma, brainstem, spinal cord (C), orbital (arrow in (A)), facial and tongue (B) muscles.

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Figure 2 T2-weighted axial (A) and coronal images of cervical (B) and lumbar (C) spine showing innumerable cysticerci studding all the visible muscles, subcutaneous tissue and parotid glands (arrow in (A)).

Figure 3 Contrast enhanced computed tomography of abdomen shows multiple hypodense lesions in liver (A) and single lesion in spleen (B).

for a period of 7 days before discharge. On follow-up after 1 month, improvement with reduction in the size of the swellings was evident. Antiepileptic treatment was continued and the patient was advised to come for regular follow-up for 1 year duration.

DISCUSSION

Cysticercosis is a common parasitic infection caused by a helminth, *Tenia solium*. Widespread dissemination of cysticerci can involve any organ or system of the body. The organs most commonly affected are subcutaneous tissues, skeletal muscles, lungs, brain, eyes, liver and occasionally the heart. Most of these organs are involved without any clinical manifestation, but the brain and eye are the sites which almost exclusively become symptomatic.

Disseminated cysticercosis (DCC) is an uncommon manifestation of a common disease. Of 450 cases of cysticercosis analysed by Dixon and Lipscomb¹, only 1 case with widespread dissemination was seen. Extensive search of the published literature revealed approximately 60 case reports of this form. Most of the reported cases are from the Indian subcontinent. The oldest report available on PubMed is by Brkic *et al*² who reported a case of disseminated muscular cysticercosis in 1956.

The most common presentation of DCC is hypertrophy of the muscles, followed by palpable nodules, seizures and memory loss.³ Our patient had all these complaints except memory loss.

Chadha *et al*⁴ reported the first case of DCC having simultaneous intraocular and extraocular cysticerci and described it as unusual. Pushker *et al*⁵ reported another case of orbital

Figure 4 Digital radiographs demonstrate numerous rice grain soft tissue calcifications in paraspinal, gluteal, thigh and calf muscles.

cysticercosis with involvement of brain parenchyma and subcutaneous tissue and described it as the first such case.

Cysticercosis of spinal cord, as seen in our patient, is also uncommon with incidence reported in most series to be 1.5–3%.⁶ Ocular and extraocular tissues are common sites of involvement by the larvae, but simultaneous involvement of brain parenchyma is quite rare. Pushker *et al*⁷ analysed 20 cases of ocular and extraocular cysticercosis, and reported that only 10% cases had associated brain parenchymal involvement. Hepatic and splenic cysticercosis have only been reported thrice in the published literature and their simultaneous involvement is not available in the published literature.^{8–10}

The confirmatory diagnosis of cysticercosis can be made by fine-needle aspiration cytology or biopsy, which demonstrates the detached hooklets, scolex and fragments of the spiral wall of *Cysticercos cellulosae*, but imaging findings were so classical in our case that such invasive tests were not performed.

Learning points

- ▶ Late-onset seizures in otherwise healthy individuals from endemic areas should raise high suspicion of neurocysticercosis and should be evaluated properly.
- ▶ It is important to diagnose disseminated cysticercosis clinically and implement appropriate radiological investigations, so that planned pharmacotherapy can be provided to the patients.
- ▶ Patients who fail to get timely treatment, and even those who are on treatment and still have active cysts, remain at risk of serious complications.

Competing interests None.

Patient consent Obtained.

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