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## Herculean appearance due to disseminated cysticercosis: Case report

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## ABSTRACT

Cysticercosis is a common tropical disease. Disseminated form is one of the uncommon manifestations and a rare complication of this disease. We report an immunocompetent patient with disseminated cysticercosis who had involvement of the brain and skeletal muscles giving rise to Herculean appearance.

## Keywords:

Cysticercosis

Disseminated

Subcutaneous nodule

Muscle hypertrophy

## 1. Introduction

Disseminated cysticercosis is an uncommon manifestation of cysticercosis caused by *Cysticercus cellulosae* (*C. cellulosae*), the larval form of the tape worm *Taenia solium* (*T. solium*). Most common source of this infection is through faeco–oral contamination with *T. solium* eggs from tape worm carriers like pigs. Widespread dissemination of the cysticerci can result in involvement of almost any organ of the body and presentation may include seizure disorder, enlargement of muscles, subcutaneous nodules and a relative absence of focal neurological signs or obviously raised intracranial pressure, at least until late in the disease. We report a case of an immunocompetent patient presenting as “Herculean appearance” due to muscular pseudohypertrophy, caused by heavy infection of the skeletal muscles.

## 2. Case report

A 55-year-old tribal man, labourer by occupation, unhygienic nonvegetarian presented in medicine department of our hospital with generalized headache. He was treated by general practitioner with off and on analgesics but never become symptom free. He had also noticed swellings all over his body which had gradually

increased in number and size over the previous year. He also had fever and arthralgia. There was no history of seizure, chronic cough, diarrhea, weight loss, decreased appetite or any past history of diabetes, hypertension and tuberculosis. On examination patient had multiple asymptomatic pea-sized subcutaneous nodules all over the body, especially over the trunk and extremities. There was symmetrical generalized hypertrophy of the limbs, prominent in the calf muscles, and also affecting trunk and neck muscles giving the appearance of herculean man (Figure 1, 2). There was muscle tenderness with increased pain on movement of the joints. Investigations revealed hemoglobin of 11.5 g%, total lymphocyte count of 10 800 and differential leucocyte count of Polymorph 70%, Lymphocyte 28%, eosinophil 2%. The erythrocyte sedimentation rate was 34 mm/hour. The level of serum creatinine phosphokinase was 50 (normal value 200). Routine biochemical investigations revealed normal glucose, renal and liver function tests. Tests for HIV using enzyme-linked immunosorbent assay were negative for both HIV 1 and 2. X-rays of the chest and extremities were normal. There was no radiographic evidence of calcification in the muscles. Fundus examination was normal. Ultrasonography of the calf muscles showed evidence of multiple intramuscular cystic lesions. There was no evidence of any increased vascularity. Magnetic resonance imaging (MRI) scan of brain showed multiple cysticercosis in the brain (Figure 3). There was no evidence of hydrocephalus. Surprisingly in spite of multiple neurocysticercosis patient never gave history of seizure. Biopsy of a subcutaneous swelling was taken from the chest.

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Histopathological examination confirmed that the cysts were of *C. cellulosae*. The patient was treated with albendazole 400 mg twice a day, prednisolone 1 mg per kg body weight and phenytoin 300 mg once a day and was discharged after a week. Phenytoin was started in this patient in view of neurocysticercosis. At follow up 3 months later, there was marked reduction in the sizes and numbers of subcutaneous nodules and his headache subsided substantially.



**Figure 1.** Multiple pea-sized nodules all over the body, especially trunk, giving Herculean appearance.



**Figure 2.** Muscle hypertrophy of both calves.



**Figure 3.** MRI brain showing multiple neurocysticercosis.

### 3. Discussion

Human cysticercosis is caused by the dissemination of the embryos of *T. solium* from the intestine via the hepatoportal system to the tissues and organs of the body. Any organs in the body may be affected like subcutaneous tissues, skeletal muscles, the lungs, brain, eyes, liver and, occasionally, the heart. Widespread dissemination of cysticerci throughout the body was reported as early as 1912 by the British Army medical officers stationed in India<sup>[1]</sup>. Subsequently various reports of disseminated cysticercosis came into limelight by various authors<sup>[2–4]</sup>. The clinical features depend on the location of the cyst, the cyst burden and the host reaction. The syndrome of disseminated cysticercosis is characterized by pseudomuscular hypertrophy, palpable subcutaneous nodules, seizures, abnormal mentation and a relative absence of focal neurological signs or obviously raised intracranial pressure, at least until late in the disease<sup>[5]</sup>. Clinically, the presentations of involvement of the body with cysticerci affecting the muscles can be of the myalgic type, nodular type or the uncommon pseudohypertrophic

type. ‘Disseminated muscular cysticercosis syndrome’ results when muscular pseudohypertrophy is often present with palpable subcutaneous nodules and seizures with abnormal mentation<sup>[6]</sup>. Reports of such cases are rare. Muscle hypertrophy is usually asymptomatic in this pseudohypertrophic type and the affected muscles are generally nontender. There may be diffuse symmetrical painful or painless enlargement of all groups of muscles associated with weakness and easy fatigability due to pseudohypertrophy. In our patient there were diffuse muscular involvements of the trunks and limbs, as well as multiple subcutaneous nodules but with normal mentation and without seizure. Diagnosis of cysticercosis involving the muscles is difficult clinically. Cysts which reside in the muscles are difficult to palpate, as they are often deep seated and numerous cysts lying side by side intramuscularly impart a smooth, shiny and tense appearance to the muscles. Ultrasonography is important in diagnosing the presence of cysticerci in these hypertrophied muscles, through revealing cystic lesions with or without calcification. Pathogenesis of muscular hypertrophy in cysticercosis has not been clearly understood. It has been suggested that the dead larva may act as an irritant to the muscles, causing the inflammatory changes; and, response to steroids has raised the hypothesis that it may be a consequence of an allergic response<sup>[7]</sup>. The involvement of the nervous system by cysticerci is known as neurocysticercosis. It is not uncommon in cases of disseminated cysticercosis. Neurocysticercosis can present with a wide range of manifestations like convulsions and signs and symptoms of a space-occupying lesion. One case report by Chopra et al had a case of painless symmetrical and generalized muscular pseudohypertrophy due to cysticercosis, not unlike our case<sup>[8]</sup>. The central nervous system was spared in that case.

Cases of extensive cysticercosis, which had affected the brain and widespread hypertrophy of muscles are rare and Physicians should be aware of the different ways in which this disease present to ensure its early diagnosis and treatment.

### Conflict of interest statement

We declare that we have no conflict of interest.

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