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Case Report

Cysticercosis of Soleus muscle presenting as isolated calf pain

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ABSTRACT

CNS is the most common site of involvement by cysticercosis. Symptomatic involvement of isolated skeletal muscle by solitary cysticercosis cyst is extremely rare. We report a rare and unusual case of cysticercosis presenting as acute calf pain, which is a diagnostic challenge. But the diagnosis was reached by sero-radiological examination and patient was managed conservatively by medical means.

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Key messages

Symptomatic isolated skeletal muscle involvement by cysticercosis is an extremely rare occurrence. It is easily and conservatively treatable once diagnosed. So it should be kept in the differential diagnosis of patients presenting with isolated calf pain.

1. Introduction

Human cysticercosis, is a parasitic infestation caused by the larval stage of intestinal cestode *Taenia solium* (*T. solium*) (pork

tapeworm). Combination of rural society, overcrowding, and poor sanitation leading to greater contact between humans and pigs and thus more chances of feco-oral contamination, makes tapeworm infection common in developing countries. Contamination occurs via infected food handlers who do not wash their hands properly before working, or by fruit and vegetables fertilized with contaminated human waste. Humans are the definitive hosts for *T. solium*, whose life cycle begins with ingestion of viable larvae in undercooked pork or by auto-infection. The larvae penetrate the gut mucosa, enter the blood vessels and lymphatics, get distributed in the tissues all over the body and get located in brain, skin, heart, liver, lungs and muscles.¹ The larvae transforming to adult tapeworms shed proglottids into human feces that can

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contaminate the pig food supply. Eggs ingested by pigs develop into the larval stage, enter the bloodstream through the intestinal wall, lodge in various pig tissues, and form *Cysticercus cellulosae*, which is the encysted larval form.

Cysticercosis presenting as acute calf pain after isolated muscular involvement is extremely rare. We were able to reach the correct diagnosis by radiological and serological investigations hence non-invasive management by medical means.

2. Case history

A 38 years old non-vegetarian (a regular pork consumer), Indian female farmer from rural background (from Uttar Pradesh state), came to Orthopedics OPD with progressively increasing right calf pain and difficulty in walking over last 15 days. She was normotensive, non-diabetic without any history of trauma, fever, prolonged inactivity or any ongoing or past co-morbidity. On examination, right ankle dorsiflexion was painful and right calf region had deep tenderness without overlying redness, discoloration and pigmentation. Lower limb peripheral pulses (Dorsalis Pedis and Posterior Tibial) were normal. There was no associated ankle or knee edema.

Color Doppler Velocimetry did not show any evidence of deep venous thrombosis or arterial aneurysm. However, the report mentioned additional finding of a non-specific lesion with surrounding inflammation, within the soleus muscle. To reach a conclusive radiological diagnosis, Magnetic Resonance Imaging (MRI) was done which showed the intramuscular location of a solitary cystic lesion of 1.5×0.5 cm with scolex within, in right soleus muscle with faint rim enhancement associated with moderate degree of peri-lesional edema [Figs. 1 and 2]. Screening Brain MRI with extended focus on bilateral orbits did not show any evidence of Neurocysticercosis or Ocular Cysticercosis. Blood investigations showed Hb of 8 g% with total leukocyte count of 12,000 cells/mm³ and differential count revealed eosinophilia of 40%. ELISA for IgG antibodies against *T. solium* was positive, which confirmed the diagnosis. Three consecutive stool samples reports were normal. The patient was treated with Albendazole 400 mg twice daily for 6 weeks along with NSAIDs for first few days for pain

relief. She received oral hematinics supplementation for co-existing anemia. The patient responded and at the end of 6 weeks she was completely asymptomatic. A follow up High Resolution Ultrasound after 3 months showed the resolved lesion.

3. Discussion

Cysticercosis has widespread involvement. The most common site of involvement is Central Nervous System.² Other sites commonly affected eyes, heart, skeletal muscles, subcutaneous tissues, pleura and mucous membrane.

Most common form of involvement is disseminated form where multiple cysts are present. Solitary cysts are asymptomatic and hence go undetected. The clinical spectra of disease depend on the location of the cyst, the cyst burden and the host reaction. Isolated cysticercosis cyst of skeletal muscle is rare.^{3–5} The skeletal muscle involvement may be asymptomatic to mild tenderness and either muscle atrophy or hypertrophy.²

Cysticercosis of the calf muscles is an extremely rare cause of acute calf pain and hence is a diagnostic challenge.⁶ In our case, the patient presented with calf pain of short duration with difficulty in walking but on local examination there was no nodule, muscular atrophy or hypertrophy except localized deep tenderness. Moreover, patient was a non-vegetarian farmer thriving from endemic zone, with history of pork consumption.

Imaging modalities CT and MRI are useful in anatomical localization of the cysts, CT is sensitive for detecting small calcifications while MRI is more sensitive as it identifies scolex and the cyst.⁷ Muscular form of cysticercosis, if confined to muscles, is mostly asymptomatic, but three clinical manifestations have been described, the myalgic or myopathic type; the nodular type; the pseudohypertrophy type.⁸ The pain associated with myalgic type is due to the inflammatory process due to release of antigens from the cyst causing focal myositis as was in our case.

Plain radiograph are not of much help in acute cases, as it more sensitive to pick up the calcified lesions. Ultrasonography can be helpful in demonstrating cystic lesion. But in our case it couldn't detect the lesion conclusively. MRI is the diagnostic modality of choice for soft tissue cysticercosis imaging.³ Our patient too had acute presentation and was

Fig. 1 – Axial image (MRI) of right leg showing the solitary cysticercosis cyst showing ring enhancement and scolex within (dark shadow marked with arrow).

Fig. 2 – Coronal image (MRI) of right lower limb showing solitary cyst with scolex within (dark round shadow) appearing hyperintense on T2W image with mild peri-lesional edema in soleus muscle.

subjected to MRI to reach diagnosis. History, clinical and radiological examination (MRI in this case) helped in ruling out other common causes of acute calf pain like Deep Venous Thrombosis, cellulitis, Baker's cyst, muscular injury, Popliteal artery aneurysm and Achilles tendon rupture.

Lab findings of blood profile showed eosinophilia raised IgG E and most importantly a positive ELISA tests for IgG antibody against *T. solium*. Only a minority of patients with cysticercosis will harbor a tapeworm, rendering the stool sample ineffective for the diagnosis as was in our case. Hence imaging along with serological investigations helped in reaching correct diagnosis of a very rare entity by non-invasive methods. And after correct diagnosis we could treat the patient medically without any need of surgical intervention. Similar isolated cyst has been reported in literature in biceps, triceps and masseter muscle, but they were diagnosed after surgical excision.^{9,10}

Use of steroids along with the antihelminthic treatment has been recommended for disseminated cysticercosis and neurocysticercosis where there is extensive release of parasitic antigen from dying parasite. But in isolated lesion, only Albendazole therapy is enough. Sohoni et al. also managed a solitary myocyst with 6 weeks antihelminth therapy, although other authors have used 28 days Albendazole therapy.^{5,11}

Cysticercosis is preventable and eradicable by teaching key preventive measures in basic sanitation which includes pork inspection, well washed vegetables, well-cooked meat consumption of boiled or filtered water and careful hand washing before meals.

4. Conclusion

This case highlights a rare presentation of cysticercosis infestation as 'conservatively treatable isolated calf pain', once diagnosis is established. Cysticercosis should be kept in the differential diagnosis of patients with isolated or unilateral calf pain especially coming from endemic regions. High-resolution sonography and MRI are important in reaching the diagnosis in muscular cysticercosis and conservative management.

Conflicts of interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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