

SOLITARY CYSTICERCOSIS AS A RARE DIFFERENTIAL DIAGNOSIS FOR ACUTE CALF PAIN : A CASE REPORT

Orthopaedics

Raghav Arora*

Senior Resident, Department of Orthopaedics, Dayanand Medical College and Hospital, Tagore Nagar, Ludhiana 141001, Punjab, India. *Corresponding Author

Pankaj Mahindra

Associate Professor, Department of Orthopaedics, Dayanand Medical College and Hospital, Tagore Nagar, Ludhiana 141001, Punjab, India.

ABSTRACT

A 27 years old female presented with progressively increasing calf pain and swelling with no history of trauma, diabetes mellitus, fever or prolonged bed rest. On examination there was diffuse swelling over the calf without any redness and local temperature was normal. Calf was soft but tender. Both DP and PTA were palpable. Various differential diagnosis included deep vein thrombosis, cellulitis, pyomyositis, arterial aneurysm, epidermoid cysts, neurofibromas, sarcoma, myxoma. Venous and Arterial Colour Doppler showed no evidence of deep venous thrombosis or aneurysm. Ultrasound revealed a cystic lesion with small echogenic areas. MRI showed a well defined thick walled solitary cystic lesion with scolex, appearing hyperintense on T2 images and isointense on T1 images in the soleus muscle with perilesional edema. ELISA for IgG anti-bodies against *T. solium* was positive. Solitary intramuscular cysticercosis of soleus muscle is very rare and maybe asymptomatic. Clinicians in endemic areas should keep high level of suspicion for this condition to avoid misdiagnosis and wrong treatment. MRI along with serology are useful non-invasive tools to confirm the diagnosis. Isolated intramuscular painful swellings should be evaluated for cysticercosis.

KEYWORDS

cysticercosis, calf pain.

Introduction

Cysticercosis is caused by the larval stage of *Taenia solium* also known as the pork tapeworm with the most common site of involvement being the Central Nervous System [1,2] It is endemic to countries like Mexico, Central and South America, Africa, China, Eastern Europe, and South East Asia including India. [3,4]. Rural society, poor access to sanitation facilities and a greater contact between humans and pigs increases the chances of faeco-oral contamination making tapeworm infection common in developing countries [5]. Cysticercosis may occur by fruit and vegetables fertilized with contaminated human waste or due to infected food handled by food handlers with poor sanitation. Humans are the definitive hosts for *T. solium* while pigs act as intermediate host. *T. solium* infection in human occurs by ingestion of undercooked pork containing cysts.

The acidic gastric secretions break down the shell of the cyst releasing the scolex. The scolex attaches to the gut mucosa and proliferates to become a mature tapeworm by 5–12 weeks. This mature tapeworm then sheds eggs into human faeces that can contaminate the pig food cycle. These eggs when ingested by pigs or humans release oncospheres. These oncospheres penetrate the intestinal mucosa to enter the mesenteric venules and are carried to various tissues via the bloodstream. Cysts may lodge anywhere in the body including brain, skin, heart, liver, lungs and muscles. We present a case of isolated intramuscular cysticercosis of the soleus muscle presenting as calf pain, swelling and tenderness producing a diagnostic dilemma on clinical examination and confirmed on radiological and serological study.

Case Report

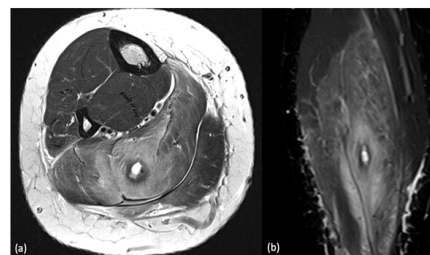
A 27 years old vegetarian, female from urban areas of Punjab state presented to Orthopaedics OPD with progressively increasing right calf pain and swelling causing difficulty in walking for the past 9 days. She had no history of trauma, diabetes mellitus, fever, prolonged bed rest. She was a non-smoker not taking any oral contraceptives or any other regular medication. There were no similar complaints in the past.

On clinical examination there was diffuse swelling present over the calf region without redness, pigmentation or any discoloration. The local temperature was normal and calf was soft but tender on deep palpation. Ankle dorsiflexion was normal but painful while plantarflexion was painless. Both the peripheral pulses (DP and PTA) were palpable. There was no lymphadenopathy.

Venous and Arterial Colour Doppler Velocimetry did not show any evidence of deep venous thrombosis or aneurysm. Detailed ultrasonographic examination revealed a non-specific cystic lesion with small echogenic areas within the muscle. Magnetic Resonance Imaging (MRI) using 3.0 Tesla scanner was done and T1, T2 and STIR

images were obtained. MRI showed a relatively well defined thick walled solitary cystic lesion of 8.0×4.0 mm with scolex within, appearing hyperintense on T2w images and isointense on T1w images in the soleus muscle with mild peripheral enhancement associated with extensive peri-lesional edema. Screening Brain MRI with bilateral orbits was normal with no evidence of Neurocysticercosis or Ocular Cysticercosis. Blood investigations showed Hb of 11 g% with total leukocyte count of 10,000 cells/mm³ and differential count revealed eosinophilia of 42%. Enzyme-linked immunosorbent assay for IgG anti-bodies against *T. solium* was positive. Microscopic examination of three consecutive stool samples was normal.

The patient was managed conservatively with Albendazole 400 mg twice daily for 4 weeks along with anti-inflammatory drugs for the initial relief of pain. The patient was regularly followed up and was completely asymptomatic after 4 weeks. A repeat ultrasound of the calf revealed healed lesion without any evidence of edema in the surrounding tissue.



27 years old female, presenting with calf swelling and pain. MRI right leg: (a) T2 axial and (b) STIR coronal show thick walled hyperintense cystic lesion in the soleus muscle with extensive perilesional edema.

DISCUSSION

Cysticercosis is caused due to human infection with the larval form *Taenia solium* and leads to systemic illness caused by the dissemination of larvae. It is common in developing countries where humans and pigs exist in close association aided by poor sanitation. Ingestion of encysted pork does not cause cysticercosis; rather it produces an intestinal infection of the adult tapeworm and a carrier state for the *T. solium* eggs. The oncosphere form of *Taenia solium* invades the intestinal mucosa and through the bloodstream reaches various tissues. Clinical presentation of cysticercosis is variable depending upon the number of cysts, the tissue involved and inflammation around the cyst. The disseminated form of cysticercosis involves multiple cysts at multiple locations but rarely it may present as isolated muscular cysticercosis. [6-9] Solitary involvement of the soleus muscle is very rare with very few cases reported in literature. Such cases presenting with acute calf pain and inability to walk present as a diagnostic challenge. Endemic areas of cysticercosis also usually have a high incidence of other infectious diseases such as tuberculosis,

invasive fungal infections and opportunistic infections. In such a situation cysticercosis may not be the first choice for a diagnostician with other more common differential diagnosis such as deep vein thrombosis cellulitis, Baker's cyst, pyomyositis, arterial aneurysm and tendo-achilles rupture. Other conditions that may have similar clinical features include epidermoid cysts, neurofibromas, pseudoganglia, lipomas, neuroma, sarcoma, myxoma.

Ultrasound and MRI could be helpful in early diagnosis of intramuscular cysticercosis. High-resolution ultrasound being non-invasive and non-ionizing modality is advantageous over MRI as it is quick to perform and can be repeated at a low cost. On ultrasound the intramuscular cyst is surrounded by exudative collection around the cyst. This occurs due to inflammatory host reaction. MRI is the gold standard for diagnosis of intramuscular cysticercosis. On MRI the cyst is directed along the direction of muscle fibres and appears hypointense on T1w images and hyperintense on T2w images with edema around the lesion seen as post contrast enhancement[10]. In the initial stages when the parasite is alive the perilesional edema maybe minimal while in later stages the lesion may appear as a calcified mass. Blood work up is nonspecific and usually inconclusive with normal total leucocyte count.[10] Raised ESR and eosinophilia that maybe suggestive of a helminthic infection. Serological studies for Taenia Solium infection include Enzyme Linked Immunosorbant Assay (ELISA), Complement Fixation Test and Enzyme Linked Immunotransfer Blot (EITB). EITB using specific lentil lectin glycoprotein antigens from T. solium cysts has a 100 % specificity and 98% sensitivity. Availability and cost factors of these tests in developing countries are a limiting factor in their utilisation for diagnosis of cysticercosis.

Presence of parasite on histological examination confirms the diagnosis but with the advent of non-invasive diagnostic modalities such as MRI and high resolution ultrasound, the need for confirmative biopsy remains controversial. Fine needle aspiration cytology (FNAC) could be used as a cheap and reliable alternative to biopsy. However, the tissue obtained on FNAC may not be representative of the cyst and scolex leading to false negatives. Stool samples usually turn out negative for eggs as patients of cysticercosis would rarely harbour the mature worm in their gut.

Ultrasound and MRI alongwith serological studies are adequate to confirm the diagnosis of cysticercosis. Treatment options include medical or surgical management. Surgical intervention maybe required in cases of large cysts causing neurovascular compromise or deformity [12]. Lesions situated in deep tissue including those involving the extraocular muscles are difficult to treat surgically. Lesions involving critical organs of the thorax and abdomen make surgical removal technically not feasible. Surgical removal may also lead to rupture of the cyst wall causing leakage of fluid invoking a severe inflammatory response. Medical management of cysticercosis involves use of anti-helminthic therapy. Praziquantel (50 mg/kg/day) or Albendazole (15 mg/kg/day) for a duration of 2-4 weeks are considered effective. These drugs act on the glucose metabolism of the parasite causing its death. Death of the parasite causes release of antigens causing extensive inflammatory reaction. Prednisolone or Dexamethasone maybe used to prevent this deleterious inflammatory host reaction. Lifestyle modifications, improvement in sanitary conditions and education of people in endemic areas about safe practices and hygiene are important in reducing the prevalence of cysticercosis. Vaccination using recombinant oncosphere antigen may prove helpful in breaking the life cycle of the worm.[13-15]

CONCLUSION

Solitary intra muscular cysticercosis maybe asymptomatic or present as a painful tender swelling at various sites in the body. Clinicians in endemic areas should keep high level of suspicion for this condition to avoid misdiagnosis and wrong treatment. Haematological investigations are inadequate to reach a diagnosis. Thus high resolution ultrasound and MRI along with serology are useful non-invasive diagnostic tools to confirm the diagnosis. Isolated intramuscular painful swellings should be evaluated for cysticercosis as a differential diagnosis among other more common causes. Conservative medical management maybe adequate for complete resolution.

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