Isolated Muscular Cysticercosis; a Diagnostic Challenge, a Case Report.

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Abstract

Cysticercosis is a parasitic tissue infection caused by dissemination of the larval form of the pork tapeworm Taenia solium. It is highly prevalent in the developing countries. It is endemic in areas of pork consumption, poor hygiene and low socio-economic conditions. Human cysticercosis occurs by ingestion of eggs from contaminated water and vegetables. The human then becomes an accidental intermediate host, with development of cysticerci within organs. Isolated muscular involvement is rare with only few cases have been reported in the literature. We report a case of isolated cysticercosis of the skeletal muscle that presented a diagnostic challenge. It was accurately diagnosed on ultrasound and Magnetic Resonance (MR) imaging, the patient's infection was managed with oral anthelminthic and symptomatic treatment without the need of operative intervention..

Keywords: Cysticercosis, tapeworm, albendazole, MRI

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Introduction

Cysticercosis in humans is infection caused by the larval form of the pork tapeworm *T. solium* [1]. Central nervous system, the eye, striated muscle, subcutaneous tissue, and rarely, other tissues in order of frequency are affected with formation of cysts. In cases of muscular cysts; central nervous system is usually involved. Cysts are usually multiple [2]. Isolated muscular involvement is rare [3]. It presents a diagnostic dilemma for the clinician; as symptoms of this condition are non-specific. Only few cases of isolated muscular cysticercosis have been reported till date in the literature [2-13], with involvement of the biceps being even rarer [3, 6].

We present a case of isolated cysticercosis of the biceps muscle, which presented a diagnostic challenge in resource constrained situation. It was accurately diagnosed on Ultrasound and Magnetic Resonance (MR) imaging and it was treated with oral anthelminthic medication and anti-inflammatory drug.

Case report

An otherwise healthy, 9-year-old, school going girl noticed swelling in the left upper arm which had increased over a period one month. On presentation to our institution, the patient had been suffering with discomfort in mid-upper arm. There were no aggravating or relieving factors.
There were no constitutional symptoms such as fever, night sweats, fatigue, weight loss or anorexia during this period. The patient's physical condition was good and her medical and family histories were insignificant. The patient was consuming mixed diet with consumption of eggs sometimes, but no history of pork or beef consumption. The patient denied any contact with animals or farms. None of the family member or person in neighbourhood had suffered similar illness.

On physical examination an obvious diffuse swelling of left mid-upper arm was noted; the overlying skin was stretched. Tenderness was localized to the medial aspect of the mid-upper left arm. Deep palpation revealed a soft to firm globular swelling 10 x 8 cm in size with indistinct margins. The mass was non-pulsatile and non-adherent to the skin. There was no change in the nature of swelling with movement of the shoulder or elbow joints. There was no local warmth or erythema. Range of motions of the elbow and shoulder joints were within normal limits and there was no evidence of distal neurovascular deficit.

Laboratory investigations were essentially normal with no evidence of anemia or leukocytosis or Eosinophilia. Liver Function Tests were normal.

Radiograph of the upper extremity (Figure 1) showed no obvious abnormalities.

![Figure 1](image1.png)

Ultrasound examination (Figure 2) reported a 7 x 7 cm. well defined cystic lesion in left Biceps muscle with eccentrically located echogenic focus(Calcification) noted in the swelling with changes suggestive of mild inflammation around the lesion.

MR imaging (Figure 3) was carried out; which revealed features of cysticercosis in the biceps brachii muscle.

CT scan of the brain and eyes did not show any evidence of cysticercosis.

The patient was managed on medical line of treatment in the form of oral anthelminthic drug (oral albendazole 15 mg/kg/day divided into two doses daily for 3 weeks) and symptomatic
treatment (Ibubrufen). The patient was followed up. Symptoms were relieved and at the end of four weeks there was some resolution of the swelling on palpation. No further symptoms were noted on follow up at the end of 2 months. Repeat Sonography showed decrease in size of lesion; with no evidence of inflammation (Figure 4).

Discussion

Cysticercosis is a parasitic disease caused by Taenia solium. This condition is endemic in countries such as India and African nations; it may be due to poor hygienic practices and pork is consumed as a food [1].

Human is the only definitive host of T. solium, harbouring adult tapeworm in intestine, whereas both man and Pig can act as intermediate host. Infection in humans is acquired through ingestion of eggs from contaminated water and vegetables[16] or consumption of raw or uncooked meat containing the cysticercus. Ingested eggs hatch in the small intestine, releasing oncospheres that penetrate the intestinal wall and enter the bloodstream to travel to various tissues where they develop to form an encysted larval form of T. solium known as cysticercosis cellulosae. Central nervous system is the most common site of infestation. Other tissues/organs infested are subcutaneous tissue, eye, muscle, liver and lung.

Early inflammatory reaction is not seen as living larvae are not recognized by immune system; but when the larvae die, they induce a vigorous granulomatous inflammatory response that may produce symptoms depending upon anatomic location.

Cysts formed in skeletal muscles usually do not show any symptoms. It may cause muscular pseudohypertrophy when parasite burden is heavy. The other common pseudotumors causing similar presentation such as lipomas, epidermoid cysts, neurofibromas should be considered as differential diagnosis[17,18].

During sonographic evaluation of cystic mass/swelling of muscles or subcutaneous tissues differential diagnosis of cysticercosis should be kept in mind if characteristics morphological features are encountered. Ultrasound can reliably diagnose muscular cysticercosis [2, 18]
Diagnostic criteria for human cysticercosis has been proposed by Del Brutto et al., (2008 [14]. They suggested that CT and MRI are important tools in diagnosis of cysticercosis; apart from immunochemical studies (including detection of anticysticercal antibodies),

Treatment of cysticercosis depends on the site of involvement. Asymptomatic isolated muscular or subcutaneous cysticercosis do not require any specific treatment unless it is painful, which may necessitate surgical intervention. As per case reports published recently; even for painful masses, surgical management is not required. Anthelminthic medication and oral steroid therapy has worked [6,13,15]. In our case, we instituted only oral anti-helminthic (albendazole) and symptomatic treatment. Patient has shown definite improvement.

To manage the inflammatory response steroids are commonly used. The success of our treatment strategy without oral steroid cover suggests that Non-steroidal anti-inflammatory drug may be sufficient as a cover to the inflammatory response in cases of isolated muscular cysticercosis. Non-steroidal anti-inflammatory drugs can be better treatment option to avoid the side effects of steroid therapy.

**Conclusion**

Isolated muscular cysticercosis possesses a diagnostic difficulty for treating physicians and it may present in a variety of forms. In cases presenting with any small muscle and/or soft tissue swelling a possibility of isolated muscular cysticercosis should always be considered. These cysts can be diagnosed with Ultrasound and MRI and can be treated with oral drug regimen of Albendazole and anti-inflammatory medications. Surgical intervention is not required in all the cases of isolated muscular cysticercosis.

**Competing interests**

The authors declare that they have no competing interests.

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