Intramuscular cysticercosis diagnosed on ultrasonography in thigh: A rare case report

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Abstract

Context: Cysticercosis is an infection with the larval (cysticercus) stage of Taenia solium. It is difficult to diagnose cysticercosis on ultrasonography. Ultrasonography was done on Logiq 500 Pro machine with convex probe at 3.5 MHz frequency and diagnosed as cysticercosis with surrounding inflammation in the right vastus medialis muscle of thigh with a linear probe at 9.6 MHz frequency. In this case, we are discussing the role of high resolution sonography which helped in non-invasive diagnosis and treatment. Case Report: A 12 years old male patient presented with a swelling on the medial aspect of the right thigh. There was complaint of pain in the right thigh for the last one week with history of fever since three days. On local examination, a single swelling of size approximately 4x5 cm in the right medial aspect of thigh was present. On ultrasonography there was a well defined isolated cystic lesion of size 3.3 x 2.5 cm intermuscular area. We have successfully managed the patient conservatively with albendazole and steroids only. Conclusion: We conclude that intramuscular cystic swelling in thigh can be diagnosed on high resolution sonography with a great confidence to manage it conservatively. Cost of investigations also reduced. Ultrasonography plays an important role. Child is doing well in follow-up.

Keywords: Cysticercosis; intramuscular; high resolution sonography; noninvasive; diagnosis; medical management

Introduction

Cysticercosis is an infection with the larval (cysticercus) stage of Taenia solium [1]. It is seen as cysts in various human tissues, more commonly in the brain and the orbit. The muscular form of cysticercosis is generally asymptomatic and 3 different clinical manifestations are; the myalgic, myopathic type; the nodular or mass like type; and the rare pseudohypertrophy type [2, 3].

Case Report

A 12 years old male patient presented with a swelling on the medial aspect of the right thigh. There was complaint of pain in the right thigh for the last one week with history of fever since three days. There was also complaint of difficulty in walking. No other relevant history was present. Patient was totally vegetarian. On local examination, temperature was raised with tenderness on the right thigh. There was a single swelling of size approximately 4x5 cm in the right medial aspect of thigh (Fig. 1). Multiple small tiny spots were present over the thigh. There was difficulty in extension of thigh of about 20 degree. Rest of the clinical examination was normal. Routine investigations were within normal limits. Patient was sent for the ultrasonography of the whole abdomen and thigh.

Ultrasonography (USG) was done on Logiq 500 Pro machine (GE Medical Systems, USA) with convex probe at 3.5 MHz frequency and with a linear probe at 9.6 MHz frequency. On ultrasonography there was a well defined isolated cystic lesion of size 3.3 x 2.5 cm intermuscular area (Fig. 2). There was small cystic lesion in the right vastus medialis muscle with surrounding inflammatory phlegmon of 4 x 3 cm. and leaked echogenic scolex was also seen with linear probe. Therefore, on sonography, the
diagnosis of cysticercosis in the right vastus medialis muscle was made with surrounding inflammatory phlegmon (Fig. 3). Rest of the abdomen was normal. The patient was managed conservatively with short course of tapering steroid, prednisolone 2mg/kg/day and on tablet albendazole 15mg/kg body weight/day for 21 days. After three weeks of conservative treatment, on follow up, pain and tenderness completely disappeared and patient was well. On follow up sonography, there was no evidence of phlegmon or cysticercosis in thigh. Patient was followed again after three months and there were no complaints.

**Diagnosis**

Diagnosis made as cysticercosis in the right vastus medialis muscle of size 3.3 x 2.5 cm with surrounding inflammatory phlegmon.

**Discussion**

Soft tissue cysticercosis in humans is caused by encysted larvae of Tapeworm Taenia solium. Cysticercosis is rare in Europe and North America but not in Central and South America, Africa, India, and China [3]. The cases of this potentially fatal infection in the West may be related to immigration and the increase in travel to tropical countries [4]. Tapeworm infection is common in developing countries where the combination of rural society, crowding, and poor sanitation allows greater contact between humans and pigs and thus more opportunities for fecal contamination of food and water [5, 6]. Normally, humans are the definitive hosts for T. solium, the life cycle of which begins with ingestion of viable larvae in inadequately cooked pork.

The organism is transmitted to humans by ingestion of eggs from contaminated water or food, such as vegetables, or by internal regurgitation of eggs into the stomach due to reverse peristalsis, when the intestine harbours a gravid worm. The eggs hatch in the small intestine, releasing oncospheres that penetrate the bowel mucosa and enter the bloodstream to reach various tissues, where they develop to form cysticercus cellulosae, which is the encysted larval form of T. solium. When the larva dies, it induces a vigorous granulomatous inflammatory response that produces symptoms, depending on the anatomic location [1]. In cysticercosis, the patient usually presents as in asymptomatic way. In our case, patient reported to us with a swelling in middle and medial aspect of right thigh with difficulty in walking and pain.

The clinical symptoms of cysticercosis depend on the number and location of cysticerci, as well as the extent of associated inflammation. The organism most often invades the central nervous system, eye, subcutaneous tissue, skeletal muscle and heart, but occasionally the lungs, liver and kidney may be affected. In the muscular form, three distinct types of clinical manifestations have been described: the myalgic type; the mass-like, pseudotumour or abscess-like type; and the rare pseudohypertrophic type [1, 6]. There are only few reported cases of the muscular cysticercosis diagnosed on ultrasound [5, 7-9].

With the help of high resolution sonography, we have made the diagnosis of the intermuscular cysticercosis which presented clinically as swelling in thigh. The hyperechoic structure within the cystic lesion corresponds to the scolex of the cysticercus. Living cysticerci actively evade immune recognition and do not cause inflammation; however, during the death of larvae, leakage of fluid from the cysts may trigger an acute inflammatory response. This inflammatory response may appear as a surrounding hypoechoic lesion in the muscle which causes local pain and myalgia. One of the sonographic appearances of cysticercosis is the cysticercus cyst with an inflammatory mass around it, as a result of the death of the larva. The second type is an irregular cyst with very minimal fluid on
one side, indicating the leakage of fluid. The eccentric echogenic protrusion from the wall due to the scolex is not seen within the cyst. It may be due to escape of the scolex outside the cyst or partial collapse of the cyst as was seen in our case. The third appearance is a large irregular collection of exudative fluid within the muscle with the typical cysticercus cyst containing the scolex, situated eccentrically within the collection.

This may be due to chronic intermittent leakage of fluid from the cyst, leading to florid inflammatory exudates. This appearance is similar to an intramuscular abscess, but the visualization of the cysticercus cyst within it clinches the diagnosis. In, all three of these types of appearances, the salient diagnostic feature is that of the cysticercus itself, which appears as an oval or round well-defined cystic lesion with an eccentric echogenic scolex in it, as was seen in the present case. The fourth sonographic appearance is that of calcified cysticercosis. It appears as multiple elliptical calcifications in soft tissue similar to the pathognomonic millet seed–shaped elliptical calcifications in soft tissues described on plain radiography. In our case, we have shown the cysticercus as an irregular cyst with leaked echogenic scolex and surrounding inflammatory phlegmon in the right vastus medialis muscle as was shown by Vijayaraghvan and Mittal [1, 3, 6].

Sonography is not widely used in diagnosing muscular cysticercosis; however, with the advent of high-resolution sonography, it can be used liberally for diagnosing muscular cysticercosis, as was done in our case [7, 9]. Sonography shows a well-defined, elliptical cystic lesion, which is a fluid-filled, bladder like structure that contains the larva [1, 6]. Surgical removal is indicated for localized lesions that cause obvious symptoms. Medical treatment with praziquantel or albendazole which are anti-helminthic has been recommended for neurocysticercosis and subcutaneous cysticercosis [6, 7]. We have successfully managed the patient conservatively with albendazole and steroids only. Albendazole as a vermicidal causes degenerative alterations in the tegument and intestinal cells of the worm by binding to the colchicine-sensitive site of tubulin, thus inhibiting its polymerization or assembly into microtubules. The loss of the cytoplasmic microtubules blocks glucose uptake in the larval and adult stages of the susceptible parasites, thereby depletes their glycogen store and it decreases production of adenosine triphosphate leading to immobilization and death of the parasite. Steroids are used as anti-inflammatory as most of the surrounding phlegmon is inflammatory reaction to the cyst.

**Conclusion**

Cysticercosis should always be kept as a differential diagnosis in all kinds of subcutaneous swellings in endemic regions. High-resolution sonography, being noninvasive and nonionizing, plays an important role in establishing the diagnosis in patients with muscular cysticercosis. Therefore, we conclude that intramuscular cystic swelling in thigh can be diagnosed on high resolution sonography with a great confidence without any need of FNAC/biopsy and easy to manage conservatively.

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