

## Soft-tissue cysticercosis of the forearm: A case report

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### ABSTRACT

Isolated muscular cysticercosis is an emerging problem worldwide with varied presentations. Although it commonly affects the brain in the form of neurocysticercosis, it may also present as a pseudotumor-like mass intramuscularly. Although classically associated with measly pork ingestion, it might present in vegetarians too based on several factors. It has a similar presentation to various other diseases often benign, such as lipoma or dermoid, and is thus difficult to diagnose clinically. While ultrasound might give a clue to diagnosis, magnetic resonance imaging (MRI) forms a non-invasive and accurate investigation. Here, we present a case of isolated intramuscular cysticercosis in a 6-year-old female with swelling in the right forearm for the past 1 year. After confirmation of the diagnosis through ultrasound and MRI, medical management was started and surgical excision was planned in view of the abscess. The mass along with the abscess was excised and sent for biopsy. Surgery has to be considered in cases with abscesses although otherwise it might be managed medically.

**Key words:** Benign swelling, Cysticercosis, Intramuscular, Isolated forearm cysticercosis, Life cycle

Cysticercosis is a rising parasitic infection affecting the general population worldwide. There is enough information for neurocysticercosis, its presentation, and management. The isolated intramuscular presentation of cysticercosis is exceptional and only sporadic case reports are available [1]. Cysticercosis is a parasite infection precipitated by encysted larvae of *Taenia solium*, the pork tapeworm [2]. It is native to nations such as Mexico, Central and South America, Africa, India, China, Eastern Europe, and Indonesia, but on account of raised travel and immigration of the public, it has spread globally [3,4]. Humans may be either definitive hosts (adult tapeworm residing in the gastrointestinal area) or intermediate hosts (larval stage in the tissues) for *Taenia solium*. Humans are commonly the definitive hosts for *Taenia solium* and pigs are the usual intermediate hosts [5]. Tapeworm contaminations are universal in underdeveloped countries where there is weak access to cleanliness, hygiene, and close interplay between persons and mammals and where pigs are a major source of food.

Isolated muscular involvement by cysticercosis is rare [6,7] and is difficult to pinpoint on account of similar presentation by various diseases [8].

### CASE REPORT


A 6-year-old female came with complaints of swelling in the right forearm 5 cm distal to elbow for the past 1 year which was initially pea sized and slowly increased in size to the size of a lemon. It was not associated with pain, skin changes, redness, or discharge. The child took a mixed diet and belonged to a low-socioeconomic status family. She had no history of cough, fever, diarrhea, constipation, or tuberculosis in the family. She had no complaints of abdominal pain, visual defects, or central nervous system abnormalities. All routine investigations were normal.

A 3.5 × 3 cm swelling was seen which was mobile, non-tender, non-fluctuant, non-reducible, and firm and was not fixed to the bone but rather to the underlying muscle. It had a smooth surface and margins (Fig. 1).

Ultrasound of the right forearm was suggestive of an approximately 13 × 12 mm sized well-defined rounded anechoic cystic lesion with internal foci of about 2 × 2 mm and surrounding hypoechoic collection of 2 × 2 cm is seen involving the subcutaneous plane of the right forearm. The computed tomography scan of the brain and the ophthalmologic examination were normal. Magnetic resonance imaging (MRI) was suggestive of a well-defined cystic lesion with internal hypointense foci suggestive of a scolex-associated lesion surrounded by a well-defined intermuscular plane of the forearm on the medial aspect,

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thus suggestive of intermuscular cysticercosis with surrounding abscess likely (Figs. 2 and 3).

Intraoperatively, the cyst was found and excised in toto, and the abscess was aspirated. Excision of swelling with drainage of the abscess was done (Fig. 4). The surgery was otherwise uneventful. On biopsy, there was the presence of scolex and epithelioid cell granulomas with giant cells. The patient was started on oral prednisolone and albendazole. On routine follow-up, the patient had no complaints of recurrence or difficulty in forearm movements.

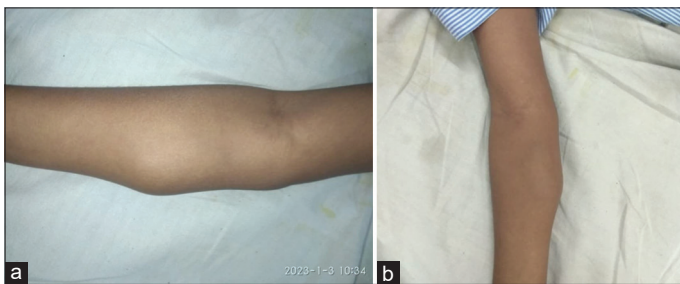
**DISCUSSION**

Cysticercus larvae most frequently lodge in the brain, followed by the eyes, subcutaneous tissue, liver, and skeletal muscles. Symptomless muscle involvement is typical. The majority of the cysts degenerate after 10 years of viability after a strong host reaction [9].

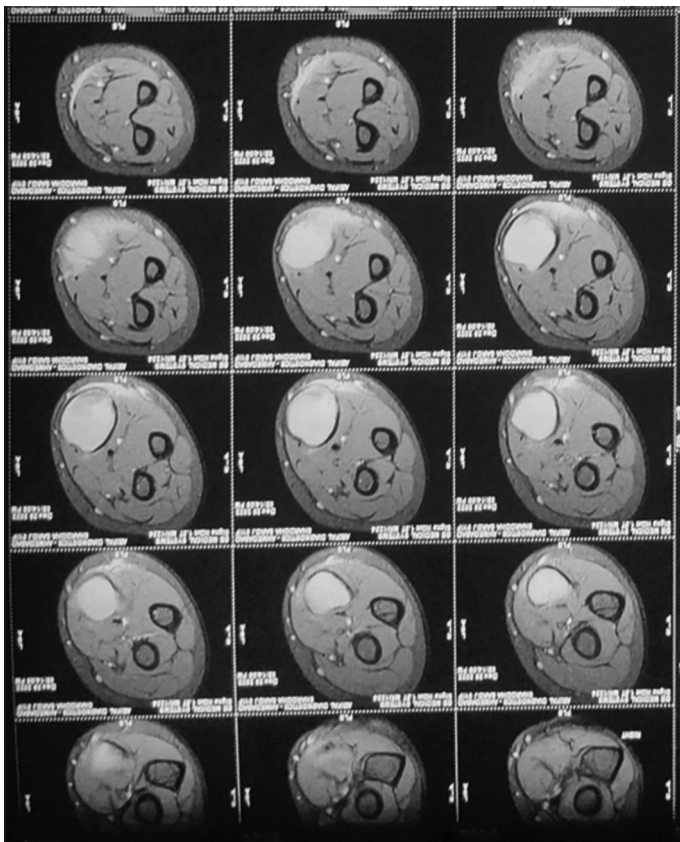
Recent studies show that person-to-person transmission is due to non-hygienic handling of food or by direct contact and the role of infected pigs is to preserve the life cycle of *T. solium*. This explains the occurrence of cases of cysticercosis in non-endemic regions where most of the population is vegetarian and where pig husbandry is non-existent.

The solitary presentations of cysticerci are confusing as they present with vague misleading symptoms and there are no pathognomonic clinical symptoms. In such difficult clinical scenarios, radiology-based investigations such as ultrasound and MRI play a pivotal role in diagnosis. The differential of solitary cysticercosis of the muscle should always be considered in the clinical scenario of intractable pains of the limbs [10].

Adequate investigations must be carried out in advance to rule out ocular and neurological involvement in isolated intramuscular cysticercosis as it may be a disseminated disease in presentation. Our patient presented with a mass-like pseudotumor along with



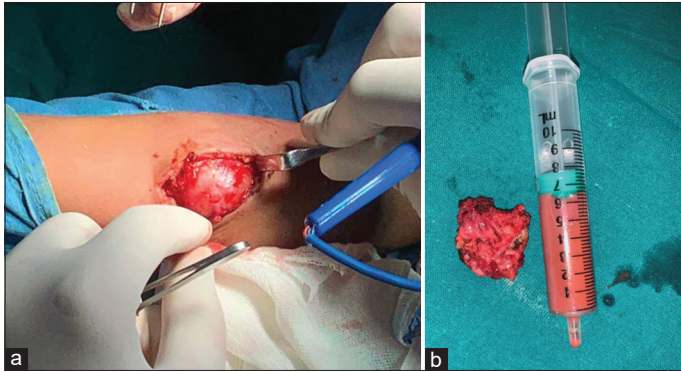
**Figure 1: (a) Right forearm swelling distal to elbow medially; (b) swelling distal to elbow medially**



**Figure 2: Magnetic resonance imaging scan of forearm suggestive of intermuscular cysticercosis with surrounding abscess**



**Figure 3: Sagittal view showing abscess**



**Figure 4:** (a) Intraoperative photo of cyst with abscess; (b) Postoperative photo after draining abscess along with cyst

an abscess, whereas it might also present in the form of myalgia or pseudohypertrophic [11-13]. Patients with muscular cysticercosis are mostly asymptomatic as was seen in our case. Symptoms such as redness, swelling, or pain may be observed after death or degeneration of the parasite with leakage of the antigens and cellular response of the body.

Treatment options include medications, surgery, or watchful waiting. It is based on multiple factors, including symptoms and the location, number, stage, and size of cysts. For cysts outside the CNS, surgical removal is the optimum management although if asymptomatic, no specific treatment is required. Surgery may be required in case of intramuscular cysticercosis if there is an abscess or neurovascular compromise due to the growth of the cyst. Medical treatment may alone be curative and should be considered if the site or number of the lesions makes surgical excision unfeasible. Concomitant intestinal taeniasis which is found in 25% of the cases should be investigated and treated as well. The two drugs most commonly used are praziquantel and albendazole as anticercarial agents. In addition to this, steroids must be administered to prevent any anaphylactic reaction due to larval antigens. Albendazole is a vermicide that binds to colchicine-sensitive sites of tubulin, prevents its polymerization, and causes degenerative changes in the tegument and intestinal cells of the worm. This decreases the glycogen stores of the parasite and leads to immobilization and death of the worm.

Clinically, it might be challenging to distinguish intramuscular cysticercosis from cystic lesions of the echinococcus (hydatid cyst) or coenurus, which can be distinguished by imaging. In addition, lipoma, epidermoid cyst, fibroma, neurofibroma, myositis, cold abscess, and intramuscular abscess are differential diagnoses for soft-tissue cysticercosis [14].

## CONCLUSION

Soft-tissue cysticercosis although uncommon must be taken as a diagnostic probability. Ultrasound is an easily available

investigation with accurate diagnostic probability. MRI too plays an important role in benign swellings with doubtful diagnosis. Adequate sanitation and hygiene play a pivotal role in prevention. Medical management must be considered with albendazole and steroids but in some cases resistant to medical management or in cases of abscess formation surgery might be necessary.

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