International Journal of Orthopaedics and Rheumatology

ISSN Print: 2664-9691
ISSN Online: 2664-9705
Impact Factor: RJIF 5.46
IJOR 2025; 7(1): 90-93
www.orthopaedicsjournal.net
Received: 12-06-2025
Accepted: 14-07-2025

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Isolated tibialis anterior myocysticercosis without traditional risk factors: Diagnostic differentiation and evidence-based algorithmic management approach

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DOI: https://doi.org/10.33545/26649691.2025.v7.i1a.32

Abstract
Isolated intramuscular cysticercosis is an uncommon clinical entity, particularly in patients without traditional risk factors such as pork consumption, exposure to pigs, or rural living conditions. We report the case of a 29-year-old female from a metropolitan setting who presented with a painless, firm swelling in the anterolateral aspect of the left proximal leg, without systemic symptoms or history of trauma. Clinical examination was unremarkable aside from the localized swelling. Radiographic findings were normal, but high-resolution ultrasonography revealed a thick-walled cystic lesion within the tibialis anterior muscle with internal echogenic contents and calcific specks. MRI confirmed a fluid-filled lesion with features suggestive of cysticercosis. Serology via ELISA supported the diagnosis, while neuroimaging ruled out neurocysticercosis. The patient was managed conservatively with albendazole (15 mg/kg/day) for three weeks along with NSAIDs. Rapid symptomatic improvement occurred within three days, with complete resolution within a week. Follow-up ultrasonography and MRI confirmed significant regression of the lesion. No recurrence was observed during follow-up. This case highlights the diagnostic challenge posed by isolated myocysticercosis, especially in patients without conventional risk factors. Imaging modalities like ultrasonography and MRI are invaluable in detecting and characterizing such lesions, while serology offers supportive evidence. Albendazole remains the treatment of choice due to its efficacy and safety profile. This case underscores the importance of considering parasitic infections in differential diagnoses of soft tissue swellings and the effectiveness of a non-surgical, evidence-based management approach.

Keywords: Soft tissue parasitic infection, albendazole therapy, tibialis anterior, intramuscular cysticercosis, myocysticercosis

Introduction
Cysticercosis is a parasitic infection caused by the larval form of *Taenia solium* [1]. While it most commonly affects the central nervous system, isolated intramuscular cysticercosis is rare, especially in individuals without risk factors such as contact with pigs or consumption of undercooked pork [2]. This report describes an unusual isolated intramuscular cysticercosis in the tibialis anterior muscle of a healthy, non-vegetarian female from an urban setting, with dramatic clinico-radiological resolution following pharmacotherapy.

Case Presentation
A 29-year-old female presented with discomfort in the left leg for one month. She reported no history of trauma, meat consumption, comorbidities, or exposure to animals. She resided in a metropolitan area and denied similar symptoms or swelling elsewhere in the body. Clinical examination revealed a diffuse, firm, non-fluctuant, non-reducible, and non-tender swelling over the anterolateral aspect of the proximal leg, with no signs of inflammation or lymphadenopathy [figure 1].

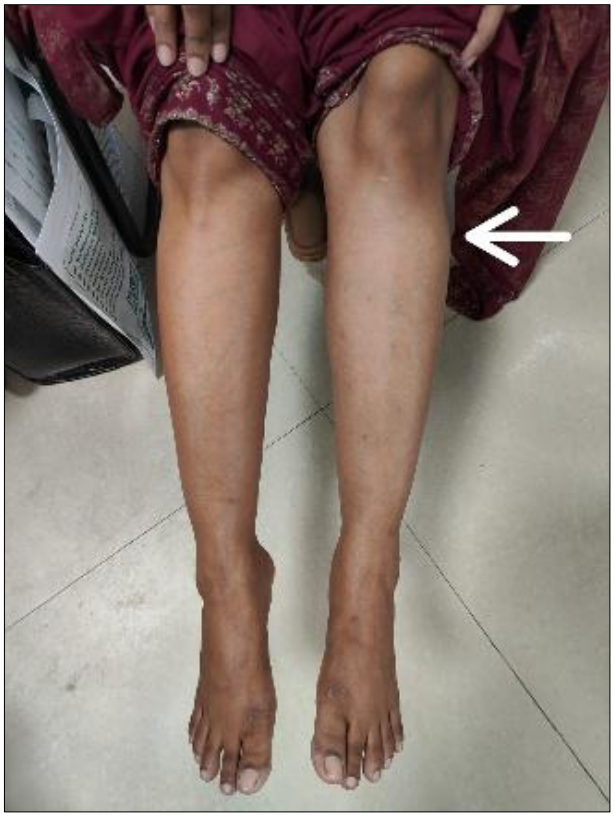

Fig 1: Diffuse swelling in the left leg [white arrow]

Radiography of the leg was unremarkable. However, ultrasonography (USG) showed a well-defined, thick-walled cystic lesion measuring 15.2 x 16 mm within the left tibialis anterior muscle, containing internal echogenic material and specks of calcification [Figure 2A]. MRI of the leg demonstrated a fluid-filled cystic lesion that was hypointense on T1-weighted and hyperintense on T2-weighted sequences with an eccentric mural nodule [Figure 3A, 3B]. Serological testing via ELISA confirmed the presence of antibodies against cysticercus antigens. MRI of the brain and eye was normal, fundoscopy was also normal, ruling out disseminated or neurocysticercosis. Stool examination revealed a normal study. The patient was treated conservatively with albendazole (15 mg/kg/day)-400 mg preferably with a fatty meal for three weeks, and diclofenac 75 mg twice daily. Symptomatic improvement was noted within three days of initiating therapy, and symptoms completely resolved within a week. Follow-up imaging (USG and MRI) after six months showed significant radiological improvement, and no recurrence was observed [Figure 2, 3].

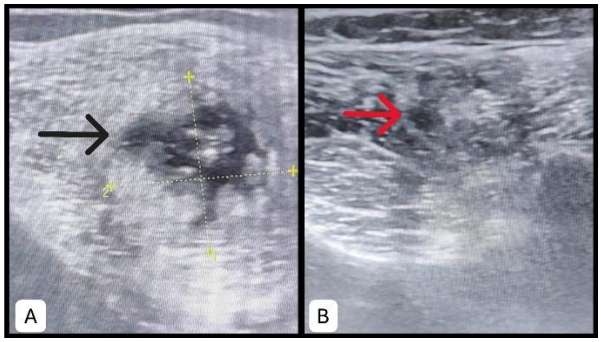

Fig 2: Ultrasonographic appearance of the cyst, A- at presentation [blackarrow], B- 6 months following treatment [red arrow]

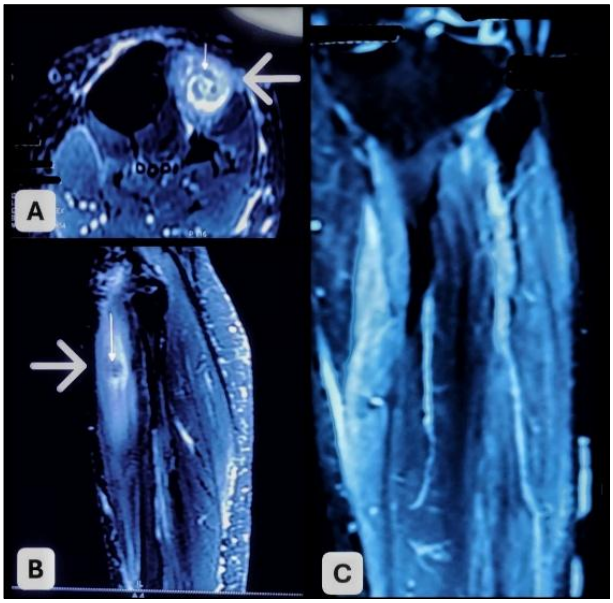

Fig 3: Magnetic Resonance Imaging [A, B]- At Presentation, Axial and Coronal cuts (white arrows showing cyst), [C]- 6 months following treatment shows no cyst (Coronal cut).

Discussion

Isolated intramuscular cysticercosis is a rare clinical entity, with only a few reported cases in the literature, whereas the intramuscular form is present in the majority of disseminated forms [3]. The more common sites of involvement include the central nervous system and the eyes, where cysticercosis may present with seizures, neurological deficits, or visual impairment. In contrast, isolated myocysticercosis often lacks such dramatic symptoms, making clinical suspicion and diagnosis challenging. A study in South India reported a seroprevalence of 1.28/1000 in urban areas and 1.02/1000 in rural areas for cysticercosis [4]. Our patient is a vegetarian, which emphasizes that the absence of pork or meat consumption does not exclude the diagnosis of cysticercosis. Cysticercosis of muscle typically presents in one of three forms: myalgic, myopathic, or nodular [5]. As observed in this case, the nodular form often presents as a firm, painless swelling without signs of inflammation or systemic involvement. Routine blood investigations may reveal mild eosinophilia, although this finding is non-specific and infrequent.

Ultrasonography (USG), particularly when performed with a high-frequency linear probe (7.5-10 MHz), is considered a reliable and precise diagnostic tool for myocysticercosis [6]. Four sonographic patterns have been described in the literature, including a cyst with an eccentric hyperechoic scolex, an irregular cyst with surrounding inflammation, a calcified cyst, and a large cyst with surrounding muscle edema. In this case, USG revealed a well-defined, thick-walled cystic lesion with internal echogenic contents and specks of calcification, suggestive of the classical cysticercosis appearance. MRI further aids in confirming the diagnosis by precisely identifying the anatomical location and extent of the lesion. The typical imaging appearance includes a fluid-filled cystic lesion that is hypointense on T1- weighted and hyperintense on T2-weighted sequences, with an eccentric mural nodule representing the scolex. Serological tests support the diagnosis, particularly in endemic areas. The enzyme-linked immunoelectrotransfer blot (EITB) is superior to enzyme-linked immunosorbent

assay (ELISA), with reported sensitivity of 98% in patients with multiple cysts and 60-85% for single cysts, compared to ELISA's 50-87%. The specificity of EITB approaches 100%, whereas ELISA varies from 63-95% [7]. Although fine-needle aspiration cytology (FNAC) may provide tissue diagnosis, which reveals the collection of eosinophils, neutrophils, histiocytes, hooklets/scolex, and granuloma formation. However, its sensitivity is low and not routinely required. In most cases, histological or serological confirmation is not essential when imaging findings are characteristic [8]. Stool examination can be done to detect intestinal teniasis [7]. Diagnostic criteria for human cysticercosis have been laid down by Del Brutto [9]. Medical management is the mainstay of treatment in isolated myocysticercosis. Albendazole is the preferred anthelmintic agent due to its favorable side effect profile compared to praziquantel, which has been associated with gastrointestinal disturbances, neuropsychiatric symptoms, and inflammatory reactions, including myositis, meningismus, and ocular complications [10]. Albendazole exerts its antiparasitic effect by inhibiting microtubule polymerization and glucose uptake in the parasite, leading to ATP depletion and death of the larva [11]. Non-steroidal anti-inflammatory drugs (NSAIDs) are preferred over corticosteroids in isolated cases to minimize inflammation and symptomatic discomfort. Whereas steroids can be added in the presence of neuro- and oculocysticercosis [1, 12]. This case demonstrates a need for accurate diagnosis strategy [Figure 4] which results in complete symptomatic resolution of the disease and no recurrence. Follow-up imaging confirmed significant regression of the lesion. Preventive strategies against cysticercosis include improving sanitation, ensuring proper cooking of pork, and controlling domestic pig farming practices in endemic regions.

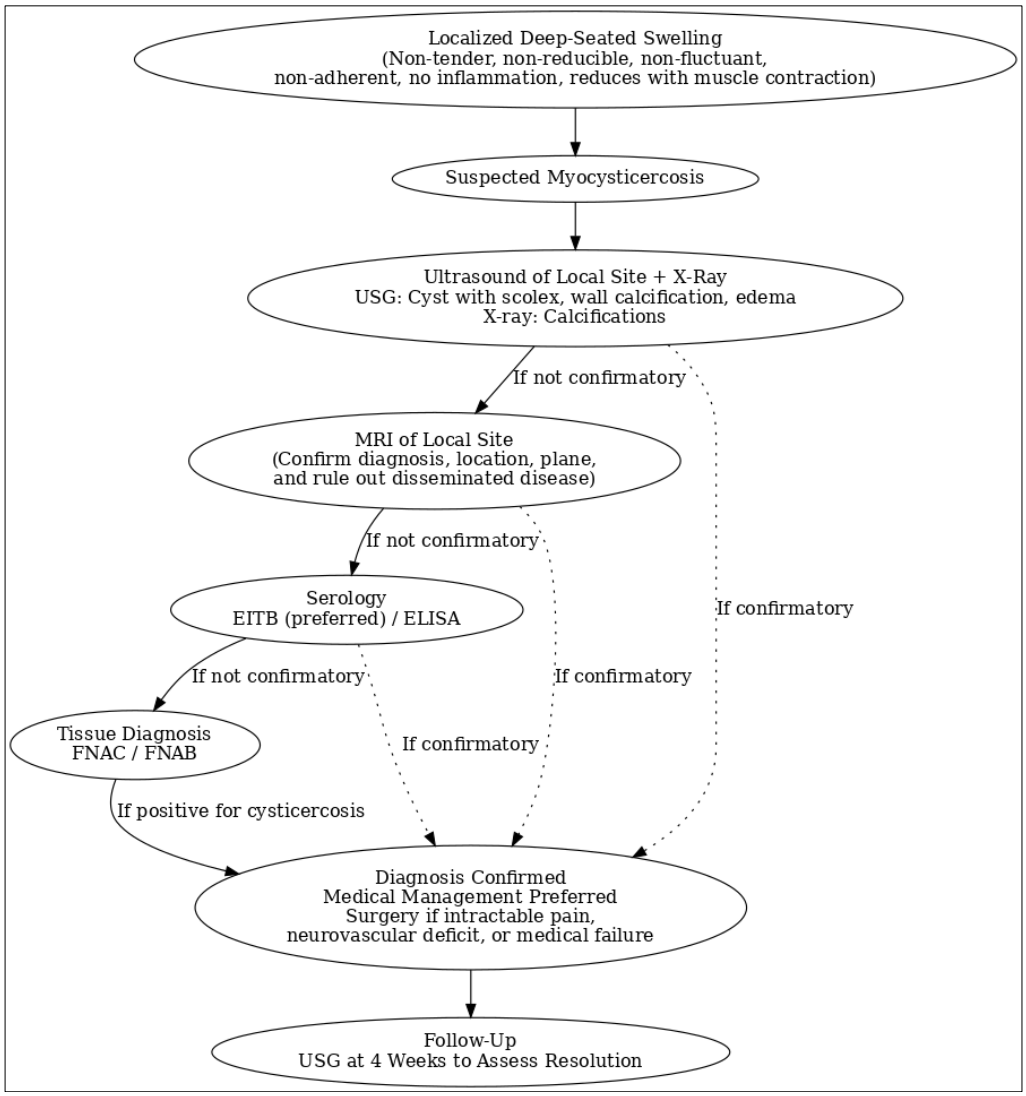

Fig 4: Diagnostic Algorithm for Myocysticercosis [Author's own creation]

Conclusion

Isolated intramuscular cysticercosis, particularly without traditional risk factors such as pork consumption or exposure to pigs, poses a diagnostic challenge due to its rarity and non-specific clinical presentation. This case highlights the importance of maintaining a high index of suspicion for parasitic infections even in atypical settings. High-resolution imaging modalities like ultrasonography and MRI, supplemented by serological testing, can confirm the diagnosis without invasive procedures. Early pharmacological treatment with albendazole and NSAIDs can lead to complete clinical and radiological resolution, avoiding unnecessary surgical intervention. Incorporating a structured, evidence-based diagnostic algorithm ensures prompt recognition and effective management of this uncommon condition.

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work. Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Conflict of Interest

Not available.

Financial Support

Not available.

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How to Cite This Article

Shashidhar MC. Isolated tibialis anterior myocysticercosis without traditional risk factors: Diagnostic differentiation and evidence-based algorithmic management approach. International Journal of Orthopaedics and Rheumatology. 2025; 7(1): 90-93.