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A Rare Case of Intra Muscular Hydatid Disease

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ABSTRACT: Hydatid cyst is usually seen in lung, liver but intra muscular hydatid cyst is a rare manifestation of hydatid disease. It is caused by Echinococcus granulosus and transmitted through faeco-oral route. Ultra-sound and MRI both play equal role in diagnosis of hydatid cyst and CT helps in visualization of calcifications in hydatid cyst. Here we present a rare case of intra muscular Hydatid cyst involving the thigh and its characteristics on different imaging modalities. Though complications of hydatid cyst are rare, they can be fatal so an early diagnosis of hydatid cyst helps in significant reduction in morbidity.

KEYWORDS: Hydatid cyst, Echinococcus granulosus, Ultra-sound, MRI.

I. INTRODUCTION:

Echinococcus granulosus, an endemic parasite that causes hydatid cyst disease, is a significant public health concern throughout the Mediterranean region, the Middle East, Africa, Asia, South America, and Australia. Because ingested eggs hatch in the intestines and are then carried to the liver through the portal system, the liver and lungs are the two organs that are most commonly damaged in humans[1]. Even in endemic nations, hydatid cyst localisation in the muscle is uncommon (0.7-0.9%). This isolated, primitive type of echinococcosis can be challenging to diagnose and it has to be properly distinguished from soft-tissue tumours.

II. CASE REPORT:

A 40year old female came with the chief complaints of painless swelling in the antero-medial aspect of the right thigh since 1 year. There was no history of trauma. No history of fever. No history of diarrhoea. Patient has mixed diet. On examination, the swelling measured 30x15cm (CCxTr) and there is no associated tenderness, redness, local rise of temperature associated with the swelling.

An antero-posterior (Fig.1.a) and lateral radiograph (Fig.1.b) of thigh showed a large homogenous soft tissue lesion on the anterior aspect of thigh with obliteration of surrounding fat planes. Underlying cortex of femur appears intact with no evidence of bony invasion/cortical erosions/disruption. Screening chest radiograph showed no significant abnormality.

Ultrasonography of the right thigh region (Fig.2a, 2b, 2c) showed multiple cystic lesions with septations noted likely involving the vastus medialis and vastus intermedius with no evidence of internal vascularity, calcifications, solid component. Screening ultrasound of abdomen and pelvis showed no evidence of cystic lesions in liver spleen and pelvis.

Computed tomography of the right thigh showed a large variable sized multi septated cystic lesions measuring 26x10x13cm (CCXAPXTR) in totoinvolving the vastus medialis and vastus intermedius displacing the rectus femoris muscle anteriorly,vastus lateralis laterally and sartorius medially. (Fig3.a, 3.b, 3.c)

On MRI the lesion appears hypo intense on T1W, hyperintense on T2W and STIR sequences, showing no evidence of calcifications or hemorrhage on GRE sequences and with septations appearing hypointense on all sequences. (Fig.6,7,8)

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Figure.1a. Figure.1b

Figure1a.1b AP (Figure.1a) and lateral (1b) radiography of right femur shows homogenous soft tissue lesion (arrow) anterior and medial to the femur with obliteration of surrounding fat planes.

Figure.2a Figure.2b

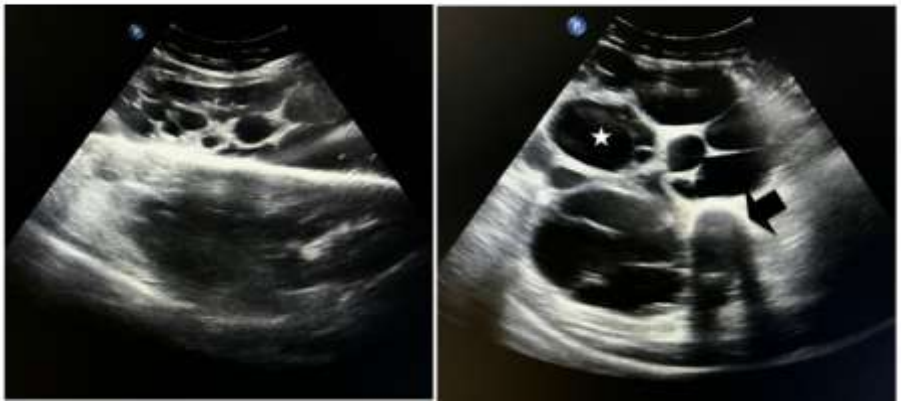

Figure.2a, 2b: Ultrasonography of thigh on sagittal (2a) and axial (2b) planes shows a multiple large multi-septated cystic lesion (asterix) anterior and medial to the femur (arrow).

Figure.2c

Figure.2c: Lesion shows no evidence of internal vascularity.

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Figure.3.a Figure.3.b

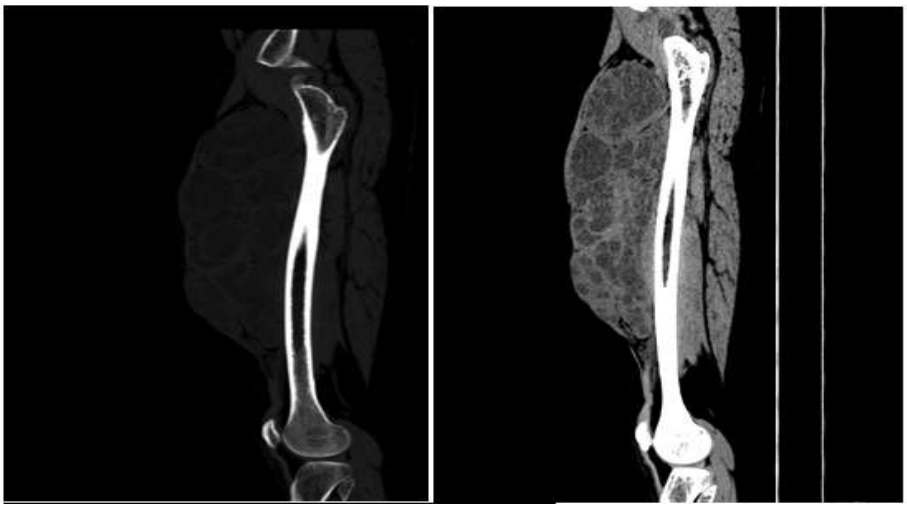

Figure.3a: Sagittal bone window section of the lesion shows no bony invasion with intact cortex of the underlying femur.
Figure.3b: Sagittal soft tissue section of right thigh showing the lesion.

Figure.3.c

Figure.3c: Axial CT of the right thigh showing multiple multiseptated cystic lesion displacing rectus femoris anteriorly, vastus lateralis laterally and Sartorius medially.

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Figure.4.a

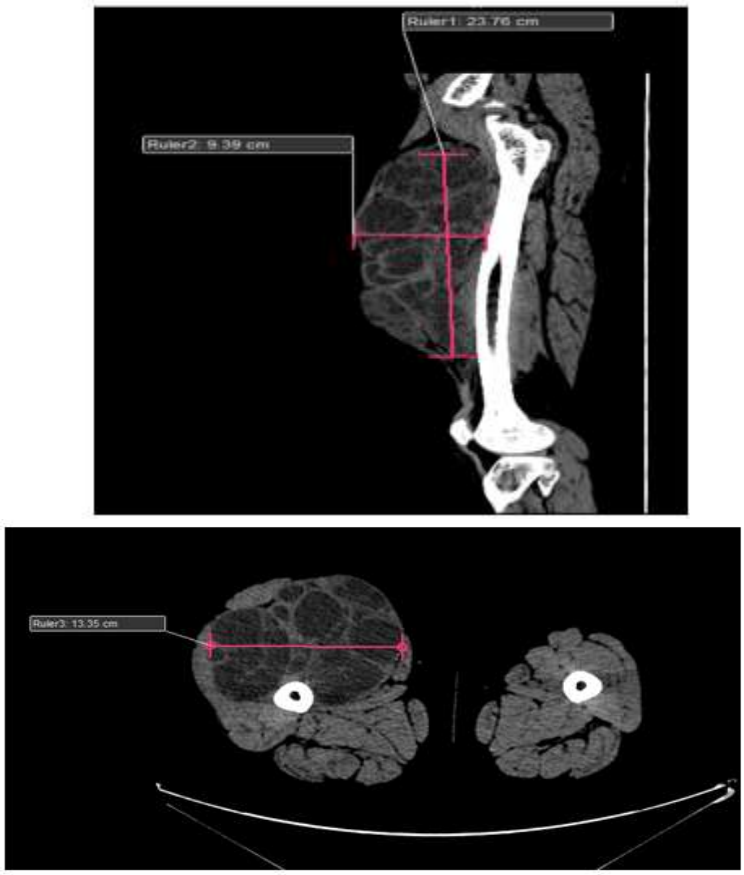

Figure.4.b

Figure.4a sagittal, 4.b axial soft tissue CT sections show the total size of the lesion.

Figure.5: HU value of the content is 10 indicating the cystic nature of the lesion.

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Figure.6.a

Figure.6.b

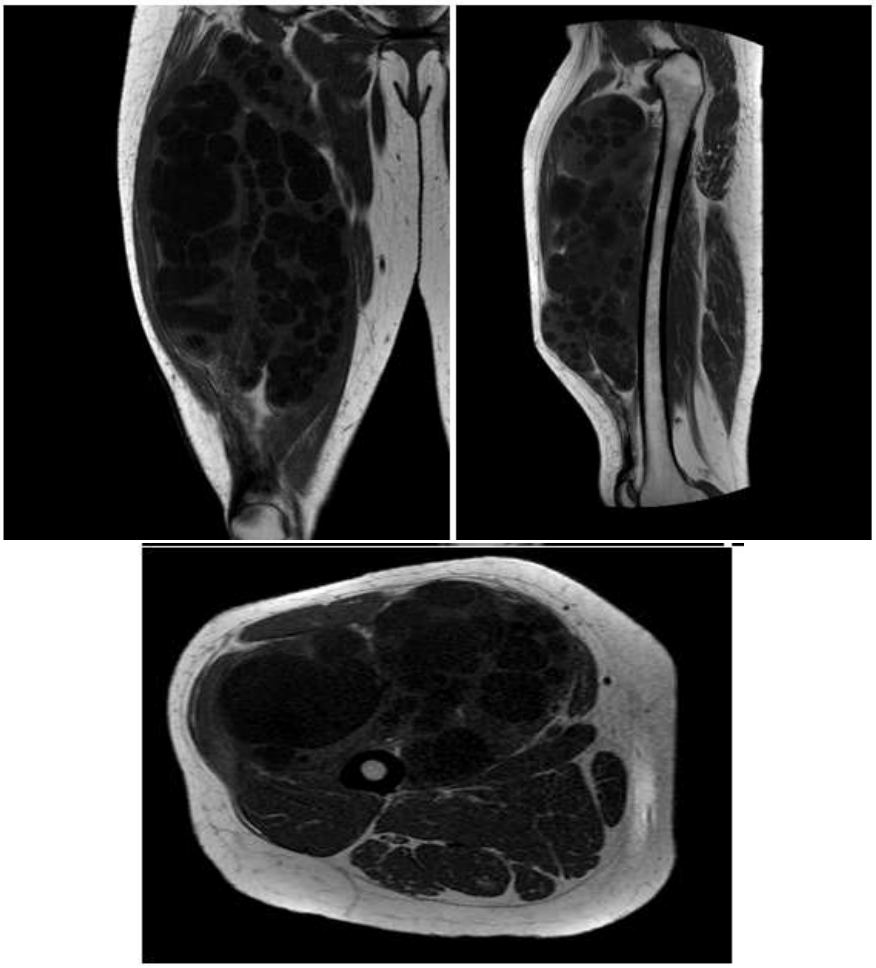

Figure.6.c

Coronal (Fig.6a), Sagittal (6b) Axial (6c) T1W sections shows well defined hypointense lesion with multiple septations.

Figure.7.a

Figure.7.b

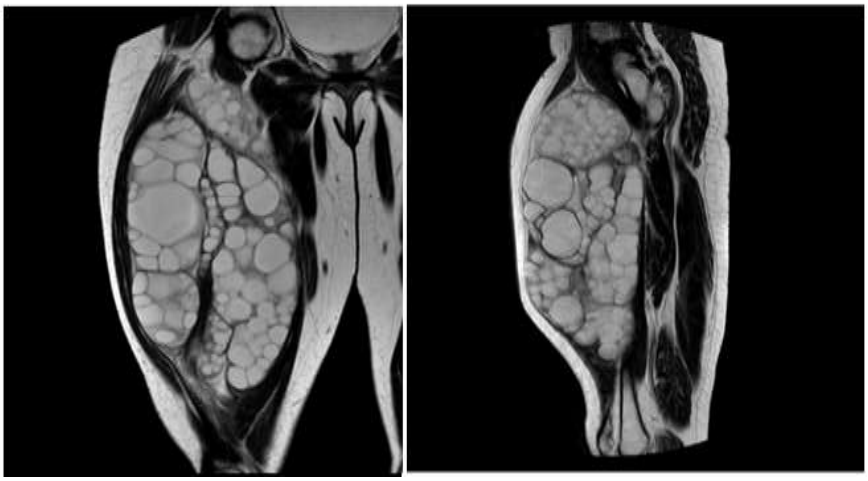

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Figure.7.c

Coronal (Figure.7a), sagittal (7b) and axial (7c) T2W sections show multi septated hyperintense cystic lesion involving the vastus medialis and intermedius displacing the rectus femoris anteriorly and sartorius medially and vastus lateralis laterally. No evidence of surrounding vascular compression/invasion noted.

Figure.8.a Figure.8.b

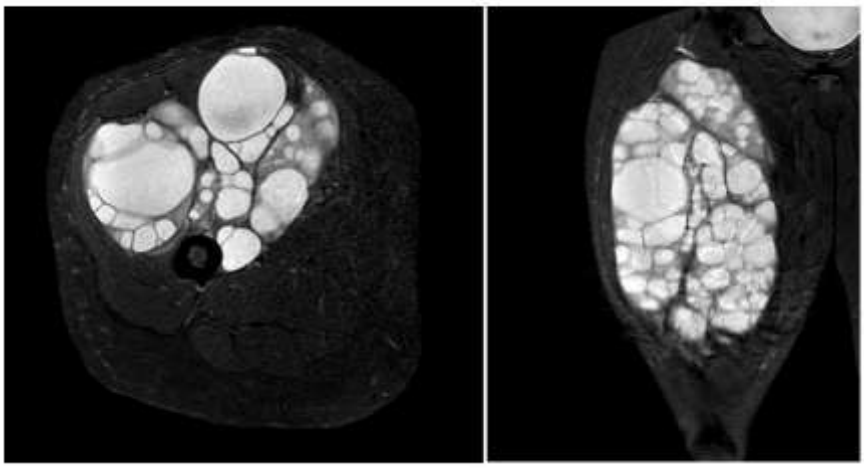

Figure.8a. Axial STIR and coronal STIR (8.b) showing hyperintense lesion no showing suppression.

III. DISCUSSION:

Hydatid cysts are parasitic diseases caused by E. granulosus in 99% of cases and E. multilocularis in 1% of cases. Animals such as dogs, wolves, and foxes are definitive hosts, and humans are accidental intermediate hosts. The disease occurs after the consumption of food contaminated with live parasite eggs.

The adult Echinococcus granulosus (3 to 6 mm long) resides in the small bowel of the definitive hosts, dogs or other canids. Eggs are released by gravid proglottids and passed in the faeces. The egg hatches in the small intestine after being consumed by a suitable intermediate host (under natural circumstances, sheep, goats, swine, cattle, horses, and camels), penetrating the intestinal wall and migrating through the circulatory system into various organs, particularly the liver and lungs [2]. The oncosphere in these organs transforms into a cyst that grows over time, generating protoscolices and daughter cysts that fill the cyst's interior. By consuming the organs of the infected intermediate host that contain cysts, the final host contracts the infection. In 32 to 80 days following ingestion, the protoscolices evaginate, adhere to the intestinal mucosa, and mature into adult stages.

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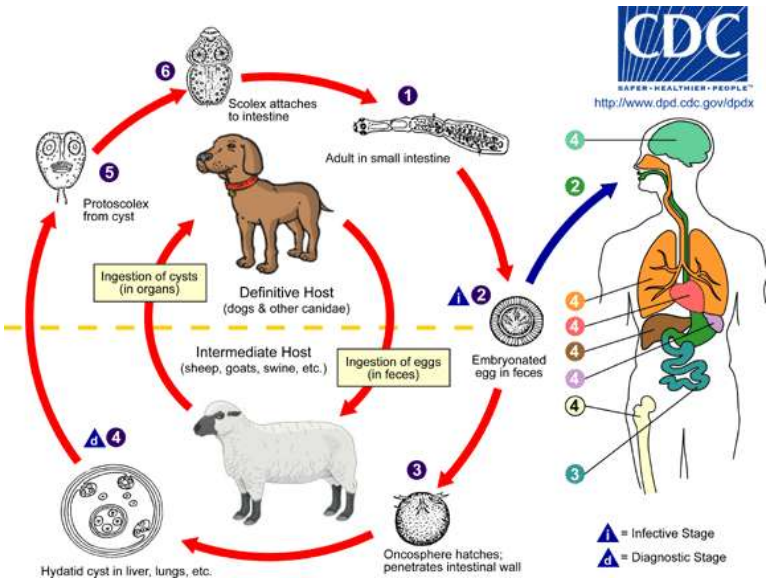

Figure.9

Hydatid cysts can be seen in practically all organs, however muscular tissues are less frequently affected. Hydatid cysts may have an impact on the pectoralis major, sartorius, psoas, quadriceps, and gluteus muscles as well as the thoracic wall muscles. The proximal muscles of the lower leg are thought to be more frequently engaged because of their substantial bulk and abundant blood supply. According to reports, the most typical intramuscular type of hydatid cysts involves the psoas muscle [3]. There have been put forth two alternative theories. The first idea postulates direct implantation caused by a dog bite, whereas the second proposes systemic circulation as the route of delivery from the intestines to the skeletal muscle. If the musculoskeletal system and adipose tissues are implicated following surgery, iatrogenic contamination of hydatid cysts might be taken into consideration. The rare occurrence of hydatid cysts with primary muscle involvement is explained by the high lactic acid concentration in the skeletal muscles owing to its high activity, which prevents settling of the organism at this site [4].

The hydatid cyst has three layers: (a) the outer pericyst, composed of modified host cells that form a dense and fibrous protective zone; (b) the middle laminated membrane, which is acellular and allows the passage of nutrients; and (c) the inner germinal layer, where the scolices (the larval stage of the parasite) and the laminated membrane are produced. The middle laminated membrane and the germinal layer form the true wall of the cyst, usually referred to as the endocyst, although the acellular laminated membrane is occasionally referred to as the ectocyst. Daughter vesicles (brood capsules) are small spheres that contain the protoscolices and are formed from rests of the germinal layer [6]. Before becoming daughter cysts, these daughter vesicles are attached by a pedicle to the germinal layer of the mother cyst. At gross examination, the vesicles resemble a bunch of grapes. Daughter cysts may grow through the wall of the mother cyst, particularly in bone disease. Cyst fluid is clear or pale yellow, has a neutral pH, and contains sodium chloride, proteins, glucose, ions, lipids, and polysaccharides. The fluid is antigenic and may also contain scolices and hooklets. When vesicles rupture within the cyst, scolices pass into the cyst fluid and form a white sediment known as hydatid sand [7].

Muscle hydatidosis's main clinical symptom is a localized, palpable mass. Patients may also complain of discomfort and limited range of motion. Biochemistry and routine hemogram findings are frequently normal. Eosinophilia is expected in parasite infections, however not all patients will have it. For an accurate diagnosis of slow-growing cystic masses in the musculoskeletal system, imaging techniques including ultrasonography, computed tomography, and MRI are crucial [8]. The main technique utilized to diagnose these individuals is USG. USG is generally accessible, non-intrusive, affordable, and repeatable.

There are several classification for hydatid cysts based on their US appearances; the initial classification by Gharbi et al. and the WHO classification are the most commonly preferred ones [9]. Gharbi et al. classified liver hydatid cyst into five different types;

Type I is pure fluid collection,
Type II is fluid collection with a split wall (detached membrane),
Type III is fluid collection with septa and/or daughter cysts,
Type IV is heterogeneous echo pattern (hyperechoic with high internal echoes), and
Type V is reflecting walls (cyst with reflecting calcified thick wall).

The three characteristics of hydatid cysts on USG that stand out the most are daughter cysts, split membranes, and double-line signals. Furthermore, CT is more effective in revealing wall calcifications, bones, and their connections to nearby structures. On a CT scan, the hydatid cyst can appear in a variety of ways and seldom displays the conventional features. Although it is well recognized that USG can be useful in locating hydatid cysts in skeletal muscles, it is highlighted that MRI results are significantly more useful. For the identification and characterization of soft tissue masses, MRI is a crucial imaging technique. Because a cyst wall is a fairly particular marker, MRI is more sensitive than CT when a cyst wall is present. Among the several radiologic methods, MRI is thought to be the most accurate method for showing the wall of hydatid cysts.MRI imaging can reveal multitude patterns of intramuscular hydatidosis, based on the stage of evolution of the cystOn T1-weighted images, a simple live hydatid cyst's wall is isointense in comparison to the fluid within it, while on T2-weighted images, the wall appears as a low signal intensity rim surrounding the high signal intensity contents (also known as the "rim sign") [7]. The contents of the mother and daughter cysts are often isointense on both T1- and T2-weighted imaging when a hydatid cyst with daughter cysts is in this stage. The parasite membranes are visible floating inside the hydatid cyst at this stage and appear black on both T1- and T2-weighted imaging [10]. The cyst spontaneously collapses and calcifies at its final developmental stage, leaving a zone of calcification in the host tissues.MRI is superior to conventional radiologic methods in complex situations with perilesional edema.

IV. CONCLUSION:

Intra muscular hydatid disease is rare manifestation and prompt diagnosis is very important in view of dreadful complications of the hydatid disease. Diagnosis on USG and CT can sometimes be challenging and MRI plays a vital role in differentiating hydatid cyst from other lesions.

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CONFLICT OF INTEREST: There are no conflicts of interest to declare by any of the authors of this study.

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