







Muscular Hydatidosis: A Rare Circumstance (Case Report)

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ABSTRACT

Introduction: The larvae of the genus Echinococcus cause the parasitic disease Hydatidosis. Hydatidosis commonly affects the liver and lungs but can occur in any part of the body, including rare sites like musculoskeletal tissue.

Case Report: We reported a case of a 42-year-old male nurse with a painless mass in the anterior region of his right thigh that developed between 2009 and 2023. No history of trauma, lesions, walking difficulties, or impact on daily activities were observed. Abolfazl Hospital in Kashmar admitted him from Bandar Abbas, Southern Iran. The preoperative diagnosis was lipoma. Blood tests were normal. Both sonography and magnetic resonance imaging detected multiple cysts measuring 140*45 mm and 144*51*32 mm, respectively. Imaging exams showed the size, shape, and location of the cyst. Surgery confirmed the diagnosis of a hydatid cyst. Histopathological examination confirmed a Hydatid cyst diagnosis.

Conclusion: Hydatid cysts in muscles could occur rarely in muscle (0.5%–2.5%). Thus, it's important to consider Hydatidosis in the differential diagnosis of soft tissue masses in low-prevalence areas.

Keywords: Echinococcosis, Case Report, Iran, Muscle, Skeletal, General Surgery

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Introduction

The metacestode stage of *Echinococcus* causes Hydatid disease (HD), also known as Hydatidosis, a cystic parasitic infection (1). It poses a serious public health threat. Worldwide reports of human hydatidosis range from 2 to 3 million cases annually (1). It significantly impacts human health through cyst formation within highly critical organs such as the liver and lungs (2).

Areas that commonly practice animal husbandry, such as Mediterranean countries, the Middle East, South America, and Eastern Asia, have a higher prevalence of hydatidosis (3). The larvae hatched from the egg go to the different parts of the body and form the hydatid cysts, mostly in the liver and lungs (3). Unusual locations such as the spleen, peritoneal and pelvic cavities, central nervous system (CNS), bone, pancreas, eye, kidney, heart, ovary, salivary glands, and rare locations include the brain, perianal area, infratemporal region, or neck (3). A covered mass with slow and normal growth, which gradually swells soft tissue for a year without any pain, are its main symptoms (3). Also, this infection is transmitted through infected hosts, such as canines, or by ingesting embryonated eggs through water, food, or soil (4). Iran, as an endemic region, is estimated at a prevalence of 5.0% in humans (4). One of the effective ways of treatment is to use Albendazole 40 to 50 mg/kg in 3 divided doses daily for 7 days before PAIR techniques (5). According to the report of the World Health Organization (WHO), more than one million people in the world are suffering from hydatid disease, which has a low quality of life due to the need for long-term treatment. However, 6.5% of treatments resulted in recurrence, and 2.2% of them resulted in postoperative death. Treatment of hydatidosis costs nearly \$3 billion annually (6). Hydatidosis involves both sexes and all age groups, including adolescents aged 15 to 19 years (7).

Physical examination, blood and liver function tests, various imaging techniques such as ultrasound, computed tomography (CT) scan, magnetic resonance imaging (MRI), and pathology tests are used to confirm the presence of an infection. However, it can be

challenging to detect the disease in cases where it appears in unusual locations due to the lack of clinical symptoms and specific preclinical findings (8). Cysts commonly occur in the liver (75.0%) and lungs (15.0%), but they can also occur in uncommon locations like the brain and spine (9, 10). Hydatidosis occurs rarely in muscles (%0.5–%2.5), which may be due to increased lactic acid and contractility that confine the larval growth (11–12).

This article aims to present a unique case involving the discovery of a hydatid cyst in the vastus intermedius muscle of the right leg. The cyst's unusual location, with no other organs affected, is noteworthy. This report adds to our knowledge by suggesting that hydatid cysts should be considered when diagnosing lumps in rare locations like this.

Case Report

A 42-year-old male nurse residing in *Bandar Abbas* (southern Iran) was admitted to *Kashmar's Abolfazl Hospital* (north-east Iran) in March 2023 due to a painless mass located in front of his right thigh. This painless mass has been growing gradually for more than 14 years. He had no history of trauma, surgery, or other infectious diseases. During physical examination, a soft mass was detected, which initially led to a preoperative diagnosis of lipoma. The laboratory tests, including hematology and biochemistry, showed normal results. Radiological explorations, specifically thigh sonography, revealed the presence of multiple cysts. Color Doppler examination indicated that these cysts lacked blood flow (Figure 1). The Femur magnetic resonance imaging on T1 and T2 weighted revealed a multicystic lesion measuring 144*51*32 mm, located within the vastus intermedius muscle and positioned 14 mm under the skin in the right thigh, suggestive of a hydatid cyst (Figure 2). He underwent surgery, and the mass was successfully removed without any spillage of hydatid fluid during the procedure to prevent further complications. The patient received tablet Albendazole 10 mg/kg/day treatment four days after the surgery (400 mg/day; two 28-day cures 15 days apart).



Figure 1. Sonography image of the multicystic mass (140*45 mm) (original).

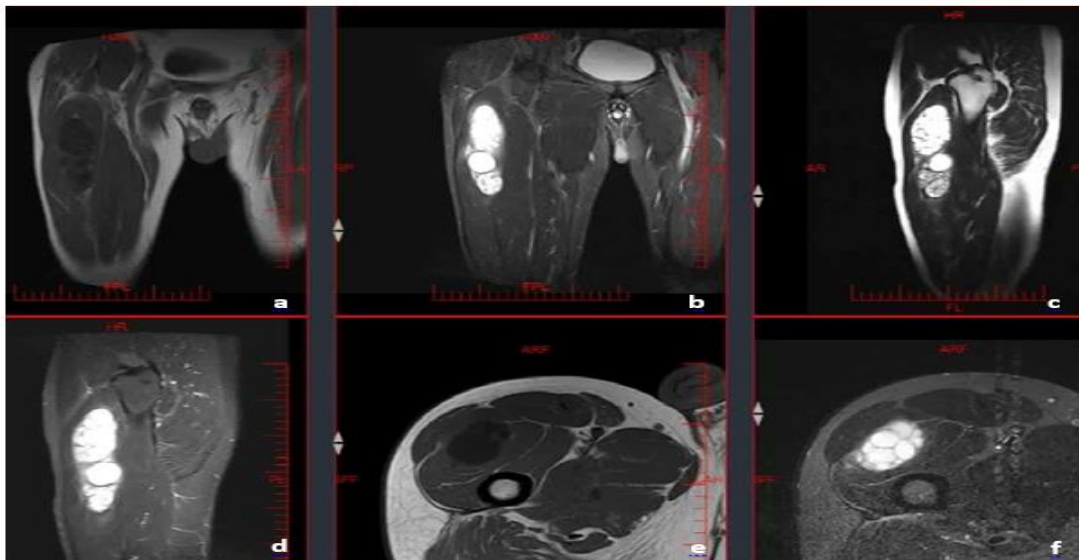


Figure 2. An MRI (magnetic resonance imaging) showing a multicystic lesion in vastus intermedius muscle of the right thigh (original). a: Coronal T1 weighted image; b: Coronal PD weighted image; c: Sagittal T2 weighted image; d: Sagittal PD weighted image; e: Axial T1 weighted image; f: Axial PD weighted image.

Gross pathology showed two soft cystic masses 10*7*3 cm and another 5*3,5*2,5 cm in diameter that contained serous fluid (figure 3). In histopathologic examination, a cross section of a hydatid cyst with a laminated membrane, germinal membrane, and protoscolices was considered as diagnostic keys (severe hemorrhage and increased eosinophil). The tight soft tissue mass biopsy was compatible with Hydatid cyst. The pathological report confirmed the diagnosis as a hydatid cyst.

Ethical consideration

The ethical considerations included compliance with the ethics code (IR.MUMS.REC.1402.214), maintaining integrity in the library collection and data reporting, obtaining written informed consent from participants in accordance with the Declaration of Helsinki, and adhering to principles for conducting interventions involving human subjects.



Figure 3. Hydatid cyst of the right thigh with multiple daughter cysts (original). compatible with infectious non-viral Hydatid cyst.

Discussion

Hydatidosis is endemic in Iran. The acquisition of this infection in humans occurs through the ingestion of *Echinococcus* eggs from infected dogs, sheep, goats, cattle, or pigs, with a mortality rate of (% 1.0-%2.5) (10, 13). The disease can also cause severe economic burdens due to treatment costs, lost wages, and losses in livestock industries. (10). We present a man who had a hydatid cyst in the thigh without any clinical or paraclinical evidence of infection in other organs.

Body parts including the liver (75.0%) (9, 14), lungs (15.0%) (9, 15), spleen (2.5%–5.8%) (16), kidney (2.0%–4.0%) (17), central nervous system (0.5%–4.0%) (18), muscle (0.5%–2.5%) (11), heart (0.5%–2.0%) (19), pelvic cavities (0.2%–2.0%) (20), ovary (0.2%–1.0%) (21), spine (0.2%–1.0%) (22), and pancreas (0.2%) can be affected by hydatidosis (23). The incidence of hydatid cysts in skeletal muscles is not clear, and there are few reports of thigh muscle tissue involvement (0.3%–4.7%) because the parasite should pass through the lung and liver barrier (11–12). We did not find any reports of hydatid cysts in the thighs in the non-endemic areas of southern Iran (Bandar Abbas). Therefore, the spread of the disease should be considered in non-endemic areas because it may increase even during city trips.

The symptoms of hydatidosis depend on where the cyst is located, size, type, and affected organ (24). The signs vary from fever, nausea, and abdominal pain for liver cysts to coughing and chest pain for lung cysts. Likewise, it may be completely asymptomatic in the early stages of the disease. So, the patient had

experienced the presence of a painless mass with gradual growth in the front of the right thigh since 2009. When cysts are localized in unusual body sites, they can cause particular problems, especially in diagnosis and treatment (24). We may help health by providing this report.

The patient's occupation, residence, and family history can aid in the differential diagnosis of hydatidosis (25). A previous study showed that the prevalence of hydatidosis in slaughtered livestock in northern Iran is significantly higher than in southern regions (2). Therefore, transmission of Hydatidosis occurs primarily through contact with infected livestock. It is hypothesized that regional trends in human outbreaks may be related to population patterns of slaughtered animals (2). Therefore, hydatidosis is an occupational disease (4). Interestingly, our patient, being a nurse, was expected to possess sufficient knowledge about the transmission and prevention of the disease. However, this finding contradicts the results of other studies. Therefore, it is essential to consider factors such as non-endemic areas and different occupations. Further efforts are needed to raise awareness about hydatidosis, promote early diagnosis, and enhance care within the local communities of southern Iran.

Preoperative diagnosis of subcutaneous hydatidosis is very important and is usually associated with diagnostic difficulties (26). The serology test has high sensitivity (80.0%-100.0%) for liver cysts but lower sensitivity for lungs (50.0%-56.0%) and other organs (25.0%-56.0%) (25). Diagnostic radiology, including sonography and magnetic resonance imaging, is used for the diagnosis of

hydatidosis (11, 25). Sonography and MRI revealed features that were suspicious for hydatidosis and indicated the location of the cyst in the vastus intermedius muscle, respectively (25). However, it is important to note that these imaging findings have limited predictive value. Finally, the pathological findings confirmed the diagnosis of hydatidosis, which plays an important role in diagnosing hydatidosis (12).

In the Kashmar region of the Khorasan Razavi province, even with hosts such as dogs, hydatidosis is not endemic. Compared to the recently mentioned studies (11 and 27), this case was in a non-endemic region. The knowledge and skill of the medical team and even the patient, who was a nurse compared to a child and housewife in the recent studies, led to an on-time diagnosis and successful treatment of hydatid disease. The result of the serology and hematology tests of this study was negative, the same as in recent studies, which shows the low value of these tests in diagnoses of hydatidosis. The treatment regimen based on the type and location of the mass and the physician's discretion has been different compared to recent studies.

Conclusion

This report described a man who suffered from a hydatid in his thigh muscle with no clinical symptoms or specific laboratory findings from the south of *Iran (Bandar Abbas)* since 2009. Based on the prevalence of the disease in endemic regions, this case report highlighted the importance of hepatitis in non-endemic areas and unusually located cases in the country. It should be considered that hydatid prevention and control measures mainly rely on better knowledge and performance of educational programs, recognition of the risk factors of hydatid transmission by vectors, and differential diagnosis in non-endemic regions. This case report emphasizes the importance of skill and knowledge of the medical team in non-endemic areas of hydatidosis in Iran, but there is a need to train medical staff in the field of diagnosis and treatment.

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Conflict of interest:

The authors declare that no conflict of interest exists.

Author contribution

Conceptualization: AK, MA, GK, Methodology: AK, SS, GK, Validation: AK, MA, Formal Analysis: SS, PT, Investigation: SS, PT, SN, GK, MA, Resources: MA, PT, Data Curation: SN, GK, MA, writing– Original Draft Preparation: AK, SS, PT, SN, GK, Writing– Review & Editing: MA, PT, Visualization: AK, GK, Supervision: MA, Project Administration: AK, MA, Funding Acquisition: MA

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