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CASE REPORT

Complicated Giant Splenic Hydatid Cyst: Case Report and Literature Review

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Abstract: Hydatid disease is a zoonotic parasitic infection predominantly caused by the tapeworm *Echinococcus granulosus*. It remains endemic across various regions globally. In nearly 90% of cases, hydatid cysts develop in the liver and lungs; however, other organs, including the spleen, may rarely be affected, particularly in regions with high disease prevalence. A 15-year-old female patient was referred to our pediatric surgery emergency department with a complaint of a splenic cystic mass. The patient had a history of previous surgery for a hepatic hydatid cyst. Clinical evaluation confirmed the diagnosis of a splenic hydatid cyst. During surgical procedure, the cyst was found to be infected, containing straw-colored fluid, with significant adhesions to the diaphragm and surrounding tissues, complicating the procedure. A splenectomy was performed, and the patient had an uneventful postoperative recovery. Diagnosing splenic hydatid cysts can be challenging due to their nonspecific clinical presentation and the rarity of the condition. If left untreated, these cysts may lead to serious complications, including rupture and secondary infection. This case highlights an unusual location of the hydatid cyst in a patient with limited access to appropriate and definitive treatment.

Keywords: spleen, giant, hydatic cyst, diaphragm, complication, splenectomy

Introduction

Hydatid disease is an endemic zoonotic parasitic infection in certain regions of the world, particularly in rural areas where close human-animal interactions occur, especially with livestock such as cattle, sheep, and dogs.[1] Cystic echinococcosis (CE) primarily affects the liver in approximately 60% of cases, followed by the lungs in 20–30% of cases, while other anatomical sites are less frequently involved. The parasite reaches the splenic parenchyma via lymphatic dissemination, hematogenous spread, or retrograde flow through the portal vein during episodes of elevated intra-abdominal pressure. Splenic hydatid disease is particularly rare, accounting for only 0.5% to 8% of all reported cases, making it an exceptionally uncommon presentation of hydatidosis.[2] Complications including secondary infection, intraperitoneal rupture, and anaphylactic shock have been documented, primarily in association with markedly enlarged splenic hydatid cysts.[3] Traumatic or spontaneous rupture of a hydatid cyst can lead to a potentially life-threatening systemic anaphylactic reaction. Additionally, cases of hypersplenism and segmental portal hypertension secondary to splenic hydatid cysts have also been reported.[4]

Case Presentation

A middle-aged shepherd presented with his 15-year-old daughter to our pediatric surgery emergency department, reporting a one-year history of anorexia, fatigue, and motion sickness. According to the father description, they resided in a rural area, sustaining their livelihood through cattle farming. The patient had previously undergone surgical excision of a hepatic hydatid cyst five years earlier in neighboring country. Subsequently, she experienced several episodes of

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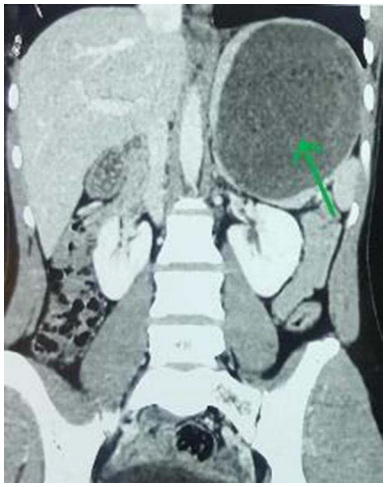

Figure 1 Coronal CT image showing a giant infected splenic hydatid cyst (green arrow). The cyst demonstrates a detached germinal layer, resulting in the loss of the classic multiloculated or "water lily" appearance.

nonspecific symptoms, prompting multiple visits to the local clinic. The attending physician prescribed several courses of anti-helminthic medication, with no significant clinical improvement.

During a subsequent evaluation, the physician requested ultrasonography (USG), and computed tomography (CT) imaging, which revealed a giant splenic cystic mass occupying nearly the entire spleen. The mass measured 10cm × 10cm × 12.2cm in anteroposterior, transverse and cranio-caudal dimensions, with a detached germinal layer resulting in the loss of the classic multiloculated or "water lily" appearance (Figure 1). CT imaging confirmed the absence of recurrence in the previously treated liver but identified CE in the spleen. Laboratory investigations, including complete blood count (CBC), liver function tests (LFTs), and urinalysis, returned within normal limits. To prevent overwhelming post-splenectomy infection (OPSI), the patient received vaccinations against *Haemophilus influenzae, Streptococcus pneumoniae*, and *Neisseria meningitidis* at least two weeks prior to surgery, as recommended. The patient was subsequently prepared for definitive surgical management.

A left subcostal incision was made on the patient in the supine position, and a nasogastric tube was placed. Intraoperatively, the spleen was found to be firmly adherent to the diaphragm and adjacent structures in the left upper quadrant. Aspiration using a large-bore needle yielded thick, straw-colored fluid, confirming an infected hydatid cyst. Following meticulous dissection and adhesion release, splenectomy was performed (Figure 2). Histopathological analysis subsequently confirmed the presence of a hydatid cyst (Figure 3A and B). The patient tolerated the procedure well and was discharged with a postoperative regimen of anthelmintic therapy, including Albendazole at a dosage of 15 mg/kg for 21 days.

Discussion

Although the spleen is an uncommon site for CE or hydatid cyst, its susceptibility arises from the bloodstream's ability to disseminate larvae, allowing cyst formation within the splenic parenchyma. Primary splenic hydatid disease may develop through arterial dissemination after larvae traverse the liver and lungs or via the venous route through portal circulation, bypassing these organs. Secondary splenic hydatidosis typically results from systemic dissemination or intraperitoneal spread following the rupture of a hepatic hydatid cyst. Concurrent involvement of the liver and/or lungs occurs in approximately 20–30% of cases. Splenic hydatid cysts are usually solitary, although multiple cysts are observed in approximately one-fourth to one-third of cases.[5–7] CE remains highly endemic and widely distributed across numerous regions globally, particularly in rural and pastoral areas where close human-animal interaction is common. This includes substantial parts of Africa, the Middle East, Mediterranean Europe, Central Asia, South America, and western China.[8]

Approximately 30% of isolated splenic hydatid cysts remain asymptomatic. In other cases, the condition often presents initially as a painless abdominal mass, typically in the left hypochondrium, and is frequently detected

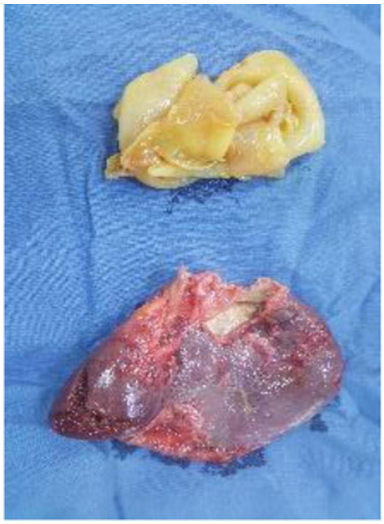

Figure 2 Surgical specimen displaying yellowish-white, folded membranous tissue consistent with hydatid cyst's germinal layer (top). The dark red organ below is a removed spleen with evident capsular disruption.

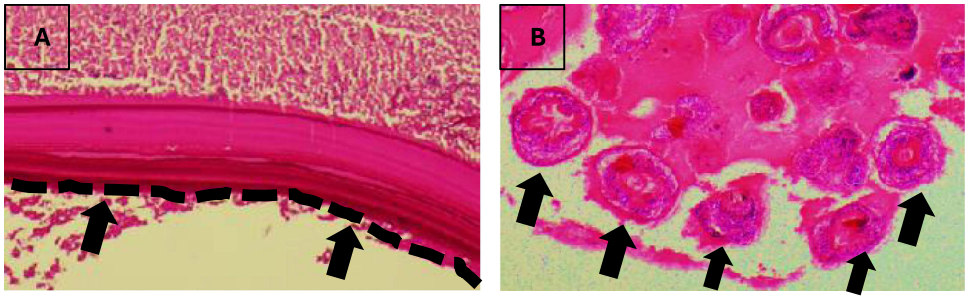

Figure 3 Histopathological examination of a splenic hydatid cyst: (**A**) Laminated layer (indicated by arrows). (**B**) Germinal layer containing protoscolices (indicated by arrows).

incidentally during routine examinations or imaging studies.[7,9] As the cyst enlarges, it may cause localized discomfort or intermittent dull, dragging pain in the left upper quadrant.[7] Additional symptoms can include dyspepsia, constipation due to compression of the colon, and dyspnea resulting from upward displacement of the left diaphragm.[10] Complications such as colonic fistulization,[8] diaphragmatic perforation, or bronchial tree involvement may also occur.[11] The differential diagnosis includes lesions such as epidermoid cysts, pseudocysts, large solitary abscesses, hematomas, intrasplenic pancreatic pseudocysts, and cystic neoplasms of the spleen.[12]

Current diagnostic modalities for splenic hydatic cyst includes USG, and CT, with the later with 95–100 sensitivity rate in comparison the USG.[13,14] The findings are classified based on their radiological appearance, ranging from purely cystic lesions to a completely solid presentation. Imaging may reveal simple cysts without internal architecture, simple cysts containing daughter cysts and matrix, calcified cysts, or complicated cysts.[15]

The primary treatment for splenic hydatid cysts is surgical intervention.[15] Therapeutic approaches range from total splenectomy, which ensures complete eradication of the parasite, to spleen-preserving techniques such as deroofing with omentoplasty, pericystectomy, partial splenectomy, and internal cystojejunal anastomosis.[16] Total splenectomy effectively prevents recurrence and complications associated with the residual cavity. However, it poses technical challenges due to adhesions to adjacent organs caused by chronic pericystic inflammation.[17] Additionally, the procedure carries risks such as gastric or pancreatic injury, difficulties in controlling the splenic pedicle, and potential postoperative complications, OPSI and thromboembolic events.[18]

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Total splenectomy is the preferred treatment for giant splenic cysts that destroy more than 75% of the splenic parenchyma, as the remaining parenchyma is significantly reduced and largely replaced by pericystic fibrosis. Spleen-saving approaches are primarily represented by deroofing and omentoplasty, a straightforward conservative technique first described by Lagrot. This approach is suitable for polar cysts with an accessible protruding dome or in cases where adhesions between the spleen and surrounding organs make total splenectomy a high-risk procedure.[7,19] Puncture, aspiration, injection, and reaspiration (PAIR) is an emerging curative option increasingly advocated for its minimally invasive nature. This procedure is considered safe, offering a significantly shorter hospital stay and lower morbidity compared to total splenectomy.[20] Additionally, PAIR serves as a viable alternative for patients with high anesthesia risk. However, it is only recommended for simple Type I or II cysts and those measuring less than 5 cm in diameter.[7,19]

The index case had a history of liver hydatid cyst, which was surgically treated five years ago. She was subsequently diagnosed with a large splenic hydatid cyst occupying approximately 85% of the splenic parenchyma, leaving only a thin residual layer of splenic tissue. Upon admission, our team decided to defer a prolonged course of pharmacotherapy due to the considerable size of the cyst. Conservative surgical approaches, such as partial splenectomy or cyst fenestration, are preferred when feasible to maintain splenic function. However, for large cysts, total splenectomy may be necessary to prevent severe complications. Laparoscopic surgery provides a safe, efficient, and minimally invasive option compared to open surgery for managing giant splenic hydatid cysts, offering advantages such as quicker recovery, reduced complication rates, and the possibility of preserving splenic tissue, which is not available in most of our public hospitals. The justification for performing a splenectomy was based on several factors: the extensive loss of functional splenic tissue, the large cyst size filled with puss, and, most importantly, the patient's inadequate follow-up. Given that she resided in a remote rural province with limited access to healthcare and a low socioeconomic status, regular monitoring and adherence to medical management were unlikely. Although spleen-preserving techniques or other less invasive approaches could have been considered, the high risk of abscess formation and disease recurrence further supported our decision to proceed with splenectomy.

Conclusion

Splenic hydatid cyst is an uncommon condition and timely intervention is crucial for spleen preservation, as delayed management may lead to complications necessitating splenectomy, especially in cases involving large cysts.

Abbreviations

CE, Cystic echinococcosis; USG, Ultrasonography; CT-Scan, Computerized Tomography scan; CBC, Complete blood count; LFTs, Liver function tests; OPSI, overwhelming post-splenectomy infection.

Ethical Statement

Institutional ethical approval was not required for publication.

Informed Consent

Written informed consent was obtained from the patient's parents for the publication of this case report and accompanying images.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflicts of interest in this work.

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