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Case report

Acute peritonitis secondary to spontaneous rupture of hepatic hydatid cyst: A case report and literature review

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ABSTRACT

Spontaneous intraperitoneal rupture of hepatic hydatid cysts is a rare but serious complication that can lead to significant morbidity and mortality due to risks such as anaphylactic shock and secondary peritoneal hydatidosis. This report presents the case of a 59-year-old male farmer from a rural area of Tunisia who presented with severe abdominal pain, nausea, and vomiting. Diagnostic imaging revealed a large hepatic cyst with free peritoneal fluid, indicating a ruptured hydatid cyst. Emergency surgery involved cyst evacuation, peritoneal lavage, and drainage. Postoperatively, the patient developed a transient biliary fistula but recovered well with albendazole therapy to prevent recurrence. Six months post-surgery, the patient remains asymptomatic. The case underscores the importance of considering hydatid disease in acute abdomen diagnoses in endemic regions and highlights the critical role of imaging and timely surgical intervention. The literature review indicates variability in the prevalence of cyst rupture and emphasizes the need for a comprehensive approach combining surgery and antiparasitic treatment for effective management and recurrence prevention.

Introduction

Cystic Echinococcosis is a common parasitic disease caused by the *Echinococcus granulosus* tapeworm, where humans are accidental hosts. Hepatic involvement is common with an incidence of 65–75 % [1]. Echinococcosis is endemic in the Mediterranean region including Tunisia. Intraperitoneal rupture of the HC is a severe and potentially life-threatening complication. This condition is rare with an incidence ranging from 1 % to 8 % [2] but can lead to significant morbidity and mortality [3]. It represents a pejorative turning point in the evolution of HC: immediately, by the risk of anaphylactic shock and hydatid peritonitis, secondarily, by secondary peritoneal hydatidosis. Patients typically present with acute abdominal signs, such as guarding, and rebound tenderness with anaphylactic reactions occurring in 1–12.5 % of cases [4], and imaging studies such as ultrasonography and computed tomography are crucial for diagnosis [5]. Hydatid peritonitis is often managed with the combination of surgical cystectomy with peritoneal lavage and postoperative albendazole treatment to prevent recurrences [6]. While rare, hydatid peritonitis should be considered in the differential diagnosis of acute abdominal pain in endemic regions, highlighting the importance of early recognition and intervention.

Case presentation

A 59-year-old male farmer from a rural region in Tunisia, without past medical history, presented to the emergency department with a sudden onset of severe abdominal pain, primarily localized to the epigastric region associated with nausea and vomiting. The pain had begun approximately 6 h before admission and was progressively worsening. The patient denied any history of trauma or contact with animals.

On physical examination, vital signs were normal (with a pulse rate of 100/min, blood pressure of 120/70 mm Hg, and a respiratory rate of 20 cycles per minute).

The patient was afebrile at 37.8 °C and abdominal examination revealed generalized rebound tenderness indicative of peritonitis. Laboratory investigations revealed leukocytosis with a white blood cell count of 16,000/μL and elevated C-reactive protein (CRP) levels at 132 mg/L. Liver function tests showed mildly elevated transaminases, with AST at 68 U/L and ALT at 75 U/L. Serum bilirubin and alkaline

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phosphatase levels were within normal limits.

A contrast-enhanced computed tomography (CT) scan of the abdomen was performed, revealing a large cystic lesion, measuring approximately 12 cm in diameter, in the right lobe of the liver (segments V–VII) with free peritoneal fluid accumulation in the perihepatic area, in the parieto-colic gutter and the Douglas pouch (Fig. 1).

These findings were suggestive of acute peritonitis secondary to spontaneous rupture of a hepatic hydatid cyst. Intravenous Hydrocortisone and broad-spectrum intravenous antibiotic prophylaxis (ceftriaxone and metronidazole) were administered and the patient was taken for emergency exploratory laparotomy.

Intraoperative exploration found a puriform-free fluid in the peritoneal cavity with a 12 cm hydatid cyst straddling segments V–VII with clear contents and a ruptured wall (Fig. 2**A**). The daughter cysts were evacuated (Fig. 2**B**) and the cyst cavity was thoroughly irrigated with hypertonic saline solution to inactivate any remaining protoscolices. The peritoneal cavity was also irrigated extensively. The patient underwent an unroofing procedure and a tube drain was placed in the right sub-hepatic space.

A low-flow biliary fistula developed postoperatively but resolved spontaneously within three days. The patient was discharged on postoperative day six with albendazole therapy (15 mg/kg/day) to prevent recurrence. Follow-up at six months showed no recurrence, and the patient remained asymptomatic.

Discussion

Despite the global prevalence of echinococcosis, its acute manifestations remain underreported in Western medical literature, leading to a gap in both diagnosis and management. Literature from the past two decades highlights an alarming trend where misdiagnosis can occur due to the atypical presentation of symptoms, which may mimic other abdominal conditions

Echinococcosis is still a serious health problem in Mediterranean countries such as Tunisia. Even though the liver and lungs are the most affected organs, hydatid disease may involve any organ of the human body [7,8]. Hepatic hydatid cysts typically grow slowly over several years and may remain asymptomatic until complications arise. Several complications have been reported in the literature and the most common ones are: superinfection, cysto-biliary fistula, allergic reactions, rupture into the gastrointestinal system, Budd Chiari syndrome, portal hypertension, broncho-biliary fistula, bronchopleural fistula, intrapericardial rupture, intrapleural rupture, and intraperitoneal rupture [9].

Rupture of a hydatid cyst into the abdominal cavity is a rare life-threatening complication, with an estimated prevalence varying between 0.88 % and 2.4 % in 2 Tunisian studies published in 2016 and 2021 respectively [10,11]**.** This literature review aims to provide an overview of this condition's current knowledge and understanding, including its etiology, clinical presentation, diagnostic approaches, and management strategies.

Intraperitoneal rupture of hydatid cysts can be either trauma-induced or spontaneous. The mechanisms of spontaneous rupture could include gradual cyst wall weakening, resulting from increased intracystic pressure, and infection. Mouaqit et al. [12] demonstrated that three factors were incriminated in intraperitoneal cyst rupture: the young age of patients, the increase in cyst diameter above 10 cm, and the superficial location unprotected by liver tissue.

A thorough understanding of clinical presentation is required for the timely diagnosis of acute peritonitis caused by a ruptured liver hydatid cyst. Patients typically present with sudden onset abdominal pain, often accompanied by fever, nausea, and vomiting. Physical examination shows abdominal tenderness, guarding, and rebound tenderness, indicators of peritoneal irritation. These symptoms are nonspecific and may mimic other acute abdominal emergencies, making diagnosis challenging.

Laboratory findings may include leukocytosis and elevated inflammatory markers, which, while nonspecific, can underscore the presence of an infectious or inflammatory process. Imaging studies, particularly ultrasound and computed tomography (CT) play a critical role in confirming the diagnosis, with 85 % and 100 % sensitivity, respectively, by visualizing the ruptured cyst and any associated free fluid in the abdominal cavity [13]. The integration of clinical, laboratory, and imaging findings is crucial in establishing a definitive diagnosis and guiding further management

There is no unanimity on surgical treatment options for intraperitoneal ruptured hepatic cysts. The goals of surgery include cyst removal, control of peritoneal contamination, and prevention of recurrence. The surgical approach may vary depending on the size and location of the cyst, as well as the patient's overall condition. Traditional open surgical techniques, such as cystectomy or partial hepatectomy, have been widely employed. However, minimally invasive techniques, including laparoscopic cystectomy or percutaneous drainage, have gained popularity in recent years due to their advantages in terms of reduced postoperative pain, shorter hospital stays, and faster recovery [14]. A leakage test, which consists on the administration of a saline solution through the common cystic duct, should be routinely performed in order to rule out the presence of any cyst-biliary fistula.

Postoperative management should include antihelmintic treatment to eradicate any remaining cysts and to prevent disease recurrence and secondary hydatidosis. Many studies recommended albendazole and have demonstrated its efficacy and safety. However, no consensus exists on the duration of use of the medication [15]. Long-term follow-up with imaging and continued antiparasitic therapy is essential to monitor for recurrence and manage any long-term complications.

Conclusion

This case highlights the importance of considering hydatid disease in the differential diagnosis of acute abdomen, especially in endemic areas.

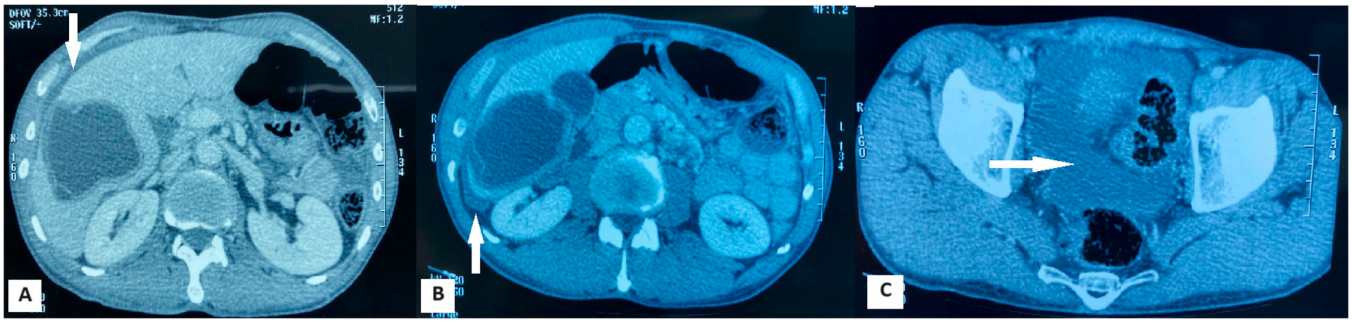

Fig. 1. Axial contrast enhanced computed tomography images demonstrate showing a large cystic lesion in the right lobe of the liver with free peritoneal fluid accumulation in the perihepatic area (A), in the parieto-colic gutter (B) and the Douglas pouch (C).

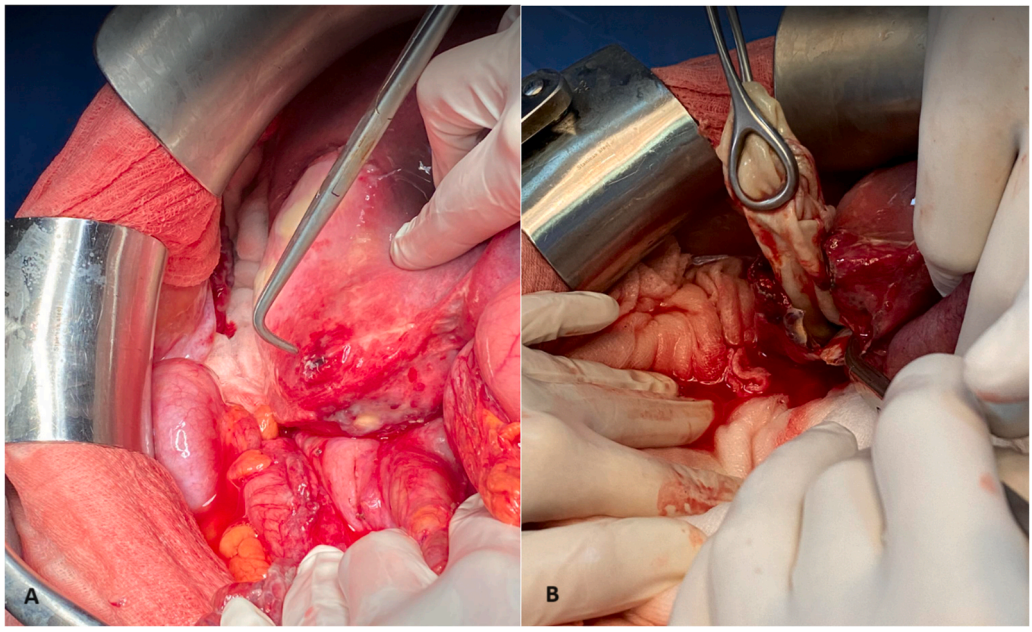

Fig. 2. Intraoperative view of the ruptured hepatic hydatid cyst (A). Extraction of the daughter cysts from the cystic cavity (B).

Acute peritonitis secondary to spontaneous rupture of hepatic hydatid cyst is a rare but potentially life-threatening condition. Prompt diagnosis and surgical intervention are crucial for successful management. Imaging modalities, such as ultrasonography and CT scan, play a vital role in confirming the diagnosis and assessing the extent of peritoneal involvement. Surgical techniques, both open and minimally invasive, have been employed, with the choice depending on individual patient factors. Postoperative management involves the administration of antibiotics and anthelmintic therapy, along with close follow-up to monitor for potential complications and recurrence.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request. Institutional approval was not required.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author statement

We the undersigned declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed.

We further confirm that the order of authors listed in the manuscript has been approved by all of us.

We understand that the Corresponding Author is the sole contact for the Editorial process. He/she is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs

CRediT authorship contribution statement

Zoghlami Ayoub: Visualization, Validation. **Rebii Saber:** Visualization, Investigation. **Zenaidi Hakim:** Visualization, Data curation. **Zaafouri Elmontassar Belleh:** Visualization, Investigation, Data curation. **Ben Ismail Imen:** Writing – original draft, Supervision, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Conflict of Interest

There are no conflicts of interest to declare.

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