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Hydatid Cyst and When Surgical Management is Needed

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Abstract

Background: Hydatid cyst is a parasitic infection caused by the cestode Echinococcus granulosus [1]. Humans are incidental hosts, and cystic lesions usually develop primarily in the liver and the lungs. When symptomatic, the disease is managed with albendazole, other adjunct treatments, such as praziquantel, may or may not be added. Surgery is usually reserved for large or complicated cysts (>10 cm) [2,3].

Case presentation: A 61-year-old Tibetan male patient presented to the emergency department with right upper quadrant pain for 3 days, poor oral intake, chills, and night sweats. He had a past medical history of hydatid cysts in 2017, for which he underwent puncture, aspiration, injection, and re-aspiration (PAIR) and received treatment with albendazole. The physical examination showed mild right upper quadrant tenderness with no rebound or guarding. The laboratory tests had notable Liver function tests (LFTs) for transaminitis, elevated alkaline phosphatase, very mild eosinophilia, and elevated C reactive protein (CRP) and erythro-sedimentation rate (ESR). Computed tomography of the abdomen and pelvis with contrast revealed a peripherally calcified cystic lesion in the right lobe of the liver measuring up to 4.1 cm in diameter. There was trace perihepatic fluid overlying the lesion. Ultrasound of the abdomen revealed a heterogenous hepatic lesion with peripheral discontinuous linear echogenicity compatible with the peripherally calcified hypodense hepatic lesion seen by computed tomography scan. After multiple attempts of incomplete/ non-compliance with albendazole and a multidisciplinary discussion of the infectious disease, the decision was made to proceed with surgical resection. The patient underwent a total cystopericystectomy with right posterior liver resection. Adhesions and a walled-off collection were noted between the liver, anterior abdominal wall, and diaphragm. The patient was discharged home with albendazole and close Infectious Disease follow-up.

Conclusion: This case illustrates the failed medical management of hydatid cysts and when to go to surgical management.

Keywords: Hydatid cyst; Surgery; Management; Echinococcus granulosus

Introduction

Hydatid cyst is a parasitic infection caused by the cestode Echinococcus granulosus. Humans are incidental hosts, and cystic lesions usually develop primarily in the liver and the lungs. An uncomplicated and small cyst (<5cm) are usually managed medically, using Albendazole and/or Prazinquantel [2]. Surgery is indicated for large cyst (>10cm), complicated, cysts that have ruptured, and when medical management fails. [2]. This case report presents

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a 61-year-old Tibetan male who exhibited a complex clinical course necessitating surgical management despite initial medical treatment, highlighting the challenges and decision-making process involved in treating hydatid disease. The patient was surgically managed at Elmhurst Hospital which is a public academic affiliated hospital.

Case Presentation

A 61-year-old male patient presented to the emergency department with right upper quadrant pain for 3 days, poor oral intake, chills, and night sweats. The pain radiated towards the right shoulder and worsened with movement and coughing. He denied any nausea, vomiting, diarrhea, shortness of breath, chest pain, recent travels, or known sick contacts. The patient did not have any pets at home and did not eat any undercooked meat. The patient lived in Tibet at the age of 18 on a farm with livestock. His medical history revealed a prior diagnosis of a hydatid cyst in 2017. At the time, the patient was managed with puncture, aspiration, injection, re-aspiration (PAIR), and albendazole. The patient did not complete the treatment course of albendazole. The aspirate did not show any parasites, and echinococcal serology was negative.

The physical examination showed mild right upper quadrant tenderness with no rebound or guarding. The laboratory tests had notable Liver Function Tests (LFTs) for transaminitis (219- 281), elevated alkaline phosphate, very mild eosinophilia, elevated C-reactive protein (CRP) (141), and erythro-sedimentation rate (ESR) (93). The Echinococcal antibodies, Hepatitis B polymerase chain reaction (PCR), and Hepatitis C were all negative. Hepatitis B serology suggested prior infection with immunity.

Computed tomography of the abdomen and pelvis with contrast revealed a peripherally calcified cystic lesion in the right lobe of the liver measuring up to 4.1 cm in diameter and intermediate density Hounsfield units (Figure 1). There was a trace of perihepatic fluid overlying the lesion. Ultrasound of the abdomen revealed a heterogenous hepatic lesion with peripheral discontinuous linear echogenicity compatible with the peripherally calcified hypodense hepatic lesion seen by computed tomography scan (Figure 2).

Management and Outcome

After multiple attempts of incomplete/ non-compliance with albendazole, and the patient presenting with recurrent abdominal pain, subjective fevers, and poor oral intake, the decision was made to proceed with surgical resection. Preoperative imaging was done and demonstrated a peripheral 4.2 × 3.9 × 5.7 cm hypodense cystic-like lesion in the right lobe of the liver (Figure 3) At this time, all the risks and benefits were explained to the patient during a discussion. The patient was educated on the importance of being compliant with his care moving forward. Barriers to noncompliance were identified and addressed. The surgical team was comprised of 2 attendings and 2 chief residents. An expert in infectious diseases was also present throughout the case to ensure proper handling of the specimen.

The patient underwent an exploratory laparotomy, right posterior liver sectorectomy, a cholecystectomy, and right chest tube placement. Intraoperative, to minimize contamination, an abthera protective covering was used to cover the intraabdominal organs leaving only the liver and gallbladder exposed (Figure 4). Lap pads soaked with 15% hypertonic saline were used to line the area around the liver to protect from possible spillage of cystic content. Adhesions and a walled- off collection were noted between the liver and the anterior abdominal wall and diaphragm (Figure 5). Given the dense adhesions to the diaphragm, the diaphragm involved was resected, and a diaphragmatic defect repair was performed. The liver was examined with ultrasound to identify the lesion and hepatic vein (Figure 6). The right

Figure 1: 4.1 cm in diameter cystic lesion in the right lobe of the liver.

Figure 2: Heterogenous hepatic lesion with peripheral discontinuous linear echogenicity compatible with the peripherally calcified hypodense hepatic lesion.

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hemiliver was mobilized by ligating and dividing the coronary and right triangular ligament (Figure 7). The right and middle hepatic veins were also identified, and the transection place was marked with electrocautery to resect the involved liver segments with the cystic lesion intact.

The hydatic cyst is a fluid-filled lesion most commonly caused by the larval form of Echinococcus tapeworms. The cyst typically has three distinct layers: the inner germinal layer containing brood capsule and scolex (tapeworm head); the middle layer composed of hyalinized acellular laminated membranous structure; and the out layer consisting of fibrotic and/or granulation tissue as well as inflammatory cells. The liver tissue resected from this patient showed a well-circumscribed oval- shaped cyst measuring 7 cm in the greatest dimension. The cyst wall is fibrotic and focally calcified suggesting that the cyst is dead. The cyst cavity contained greenish-yellow jellylike material. The tissue examination revealed the presence of a typical hyalinized laminated membranous structure (Figure 8) and characteristic scolex with hooklets (Figure 9). These findings are consistent with a diagnosis of hydatic cyst.

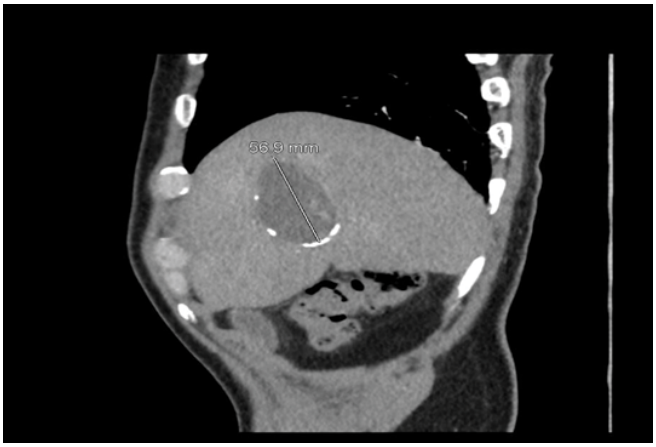

Figure 3: A peripheral 4.2 ×3.9 × 5.7 cm hypodense cystic-like lesion in the right lobe of the liver.

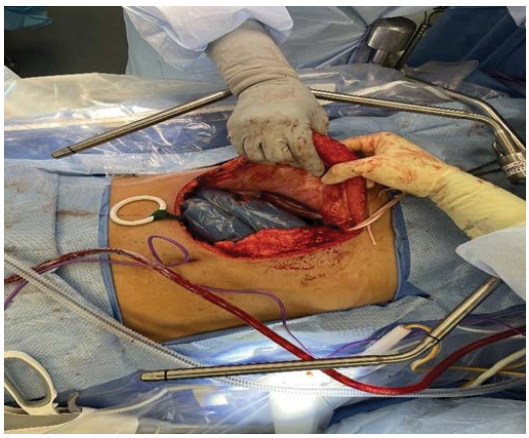

Figure 4: An abthera protective covering was used to cover the intraabdominal organs leaving only the liver and gallbladder exposed.

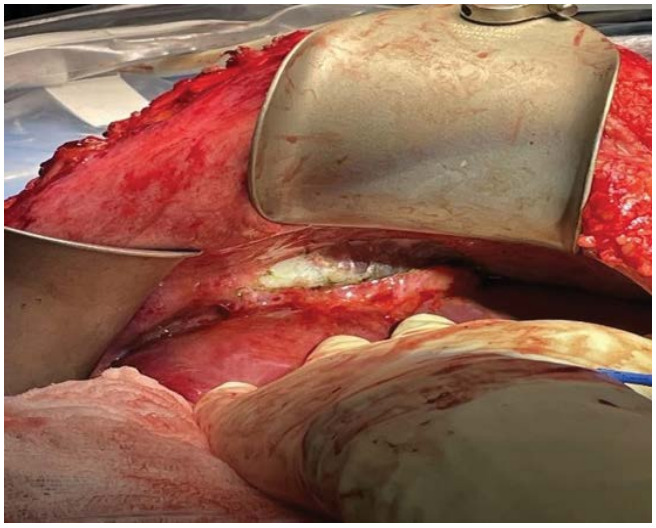

Figure 5: Adhesions and a walled-off collection were noted between the liver and the anterior abdominal wall and diaphragm.

Figure 6: The liver was examined with ultrasound to identify the lesion and hepatic vein.

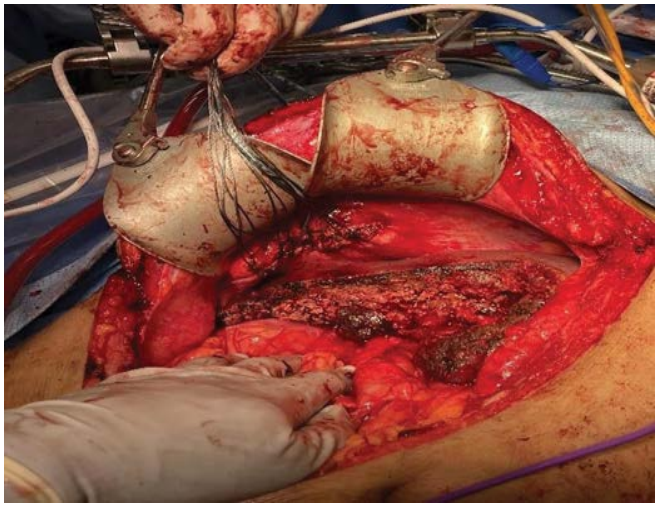

Figure 7: The right hemiliver was mobilized by ligating and dividing the coronary and right triangular ligament.

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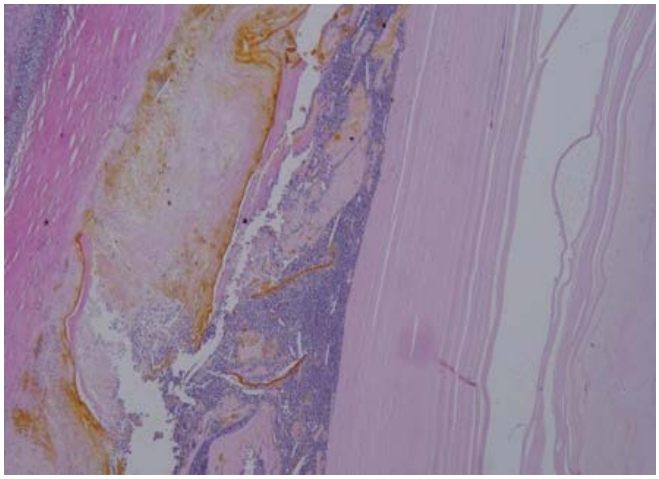

Figure 8: Hydatic cyst wall. The cyst wall is composed of an acellular laminated membranous structure (Right) and the adjacent liver tissue shows a fibrous wall and inflammatory infiltration (left).

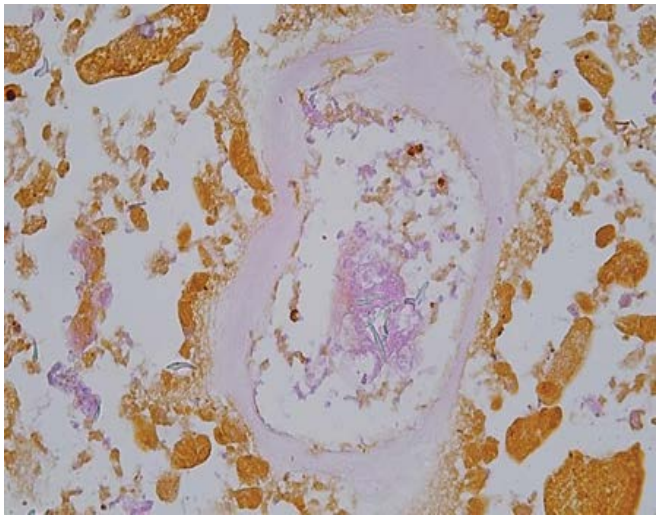

Figure 9: The scolex, tapeworm head, shows a cluster of characteristic hooklets.

Per ID, the patient remained on Praziquantel, Ancef, and Albendazole. The post-op antibiotic course was narrowed to albendazole and praziquantel, and Liver Function Tests (LFTs), and white blood count (WBC) continued to a downtrend postop. Blood culture drawn demonstrated gram-negative rods and the patient was started on Cefepime which was subsequently transitioned to Ertapenem. The patient was discharged home with a course of albendazole and close infectious disease follow-up.

Discussion

Surgery was the sole treatment for hydatid cysts up until the 1980s. Although conservative approaches have since emerged, surgery remains the most effective treatment. Anti-parasitic drugs and percutaneous treatments are used in selected patients to avoid surgical complications. The Gharbi classification, which uses ultrasonography to evaluate liver hydatid cysts, guides treatment decisions [4]. According to this classification, all viable cysts except small ones should be treated surgically or with puncture, aspiration, injection, re-aspiration (PAIR). Gharbi type III, compressive type IV and V cysts, cysts associated with the biliary tract, and those unsuitable for puncture, aspiration, injection, re-aspiration (PAIR) require surgery. Surgical treatment involves inactivating cyst contents, opening the cyst, and removing the germinative membrane, with total pericystectomy or partial hepatectomy for peripheral cysts [4].

Conclusion

This case report illustrates the complexities and decision-making challenges involved in treating hydatid cysts, especially in patients who exhibit non-compliance with medical management. Despite the use of conservative approaches, surgical intervention remains crucial for large, complicated, or recurrent cysts. The patient's history of noncompliance and the presence of recurrent symptoms underscored the necessity for surgical management. This case emphasizes the importance of patient education and compliance in managing hydatid disease, as well as the continued relevance of surgical intervention in ensuring effective treatment outcomes. This case highlights the need for a multidisciplinary approach, including preoperative planning, intraoperative precautions, and postoperative care to minimize complications and ensure comprehensive treatment (Figure 10).

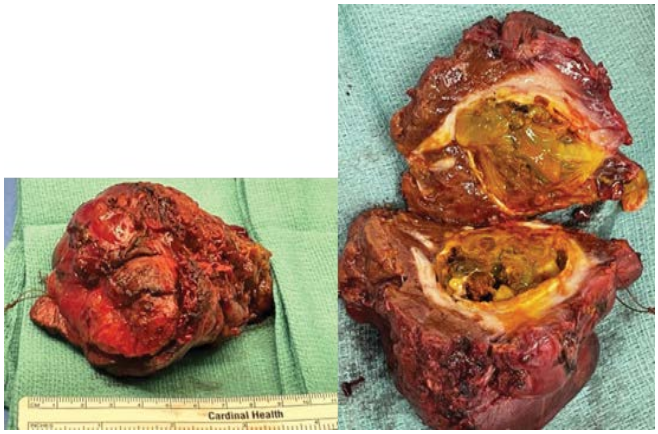

Figure 10: Resected liver portion with hydatid cyst.

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