

Transdiaphragmatic Hepatic Hydatid Cyst Rupture: A Rare Case

ABSTRACT

Echinococcus granulosus, a common parasitic infection prevalent in endemic regions, causes hydatid cysts. Despite its generally benign nature, this disease can sometimes exhibit aggressive behavior, affecting vital organs and leading to severe complications. This case report highlights an unusual instance of a 58-year-old female who arrived at the emergency department with symptoms of fever, fatigue, cough, and pain in the chest and abdomen. Radiological examinations revealed a subdiaphragmatic hydatid cyst in the liver, which had penetrated the diaphragm and extended into the right hemithorax. This report aims to illustrate the imaging characteristics of a rare complication of hepatic hydatid cyst, specifically transdiaphragmatic pleural rupture.

Keywords: *Echinococcus granulosus*, hydatid cysts, rupture

Hydatid cyst (HC) is a major public health problem primarily caused by *Echinococcus granulosus*, a cestode belonging to the Taeniidae family. Humans become accidental intermediate hosts through the fecal-oral transmission route. The liver is the most frequently affected organ, with subsequent involvement of the lungs, brain, and other tissues (1). HC, which is endemic in regions where animal husbandry is prevalent, is currently considered an endemic zoonotic disease in Africa, the Middle East, South America, and the Mediterranean region (2).

HC may remain asymptomatic for prolonged periods. Symptom onset typically depends on the cyst's size and its impact on surrounding organs. Severe complications, potentially resulting in death, can occur in cases that are untreated or insufficiently managed. Imaging techniques are essential not only for the diagnosis of HC but also for evaluating the extent of the disease, its complications, and follow-up. This case report aims to describe the imaging findings associated with a rare complication of hepatic HC, specifically transdiaphragmatic pleural rupture.

CASE REPORT

A 58-year-old female patient with no known comorbidities presented to the emergency department with complaints of fever, fatigue, cough, chest pain, and abdominal pain. Laboratory test results revealed a white blood cell count of 18,000/mm³, C-reactive protein at 131 mg/dL, aspartate aminotransferase at 66 U/L, alanine aminotransferase at 57 U/L, alkaline phosphatase at 250 U/L, and gamma-glutamyl transferase at 80 U/L. The posterior-anterior chest radiograph showed consolidation and pleural effusion in the middle and lower zones of the right lung (Figure 1).

Abdominal ultrasonography (USG) detected a hypoechoic cystic lesion with a heterogeneous internal structure and septations located subdiaphragmatically in segments VII and VIII of the right hepatic lobes. Contrast-enhanced thoracic and abdominal computed tomography (CT) showed a cystic lesion with a subdiaphragmatic location, a septate internal structure, and detached membranes, with lost wall tension, observed in liver segments VII and VIII. The detected cyst had passed the diaphragm and extended into the right hemithorax. Diffuse effusion was observed in the right hemithorax, and collapse was noted in the middle and lower lobes of the right lung. Dilatation was observed in the intrahepatic bile ducts and the right hepatic bile duct. There was an enlarged bile duct adjacent to the identified cyst, suggesting cystobiliary communication (Figure 2). The patient's serological tests and pathological examination confirmed the diagnosis of HC.

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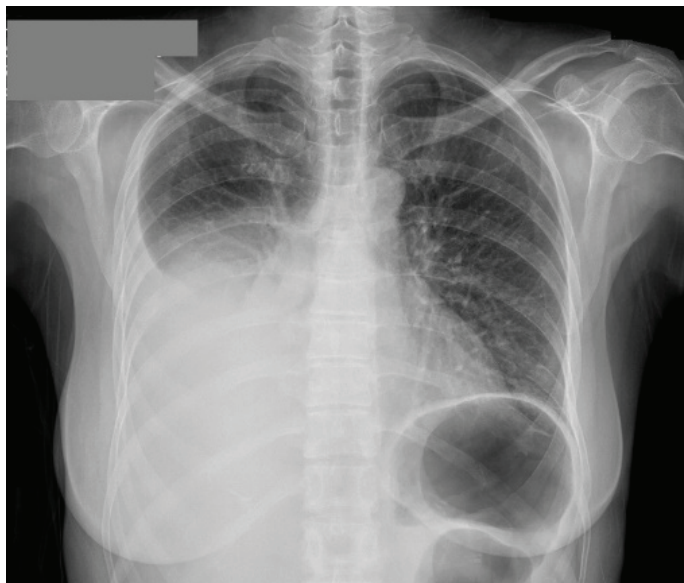


Figure 1. The posterior-anterior chest radiograph showed consolidation and pleural effusion in the middle and lower zones of the right lung.

cysts and their often vague and subtle symptoms, diagnosis and treatment are frequently delayed. When diagnosed and treated promptly, patients with HC can maintain a normal life. Conversely, delayed diagnosis and inadequate treatment can lead to severe complications, including death.

HC ruptures may happen spontaneously, due to medical interventions, or as a result of trauma (4). Intrabiliary rupture of a hepatic hydatid cyst, while uncommon, is the primary complication of a hepatic hydatid cyst and typically occurs in the right hepatic duct (3). The incidence of thoracic rupture of liver HC ranges from 2% to 11% (5). Symptoms such as coughing, difficulty breathing, fever, hemoptysis, flank pain, chest pain, and secondary pneumonia from bronchial pressure can occur due to the rupture of a hydatid cyst on the liver's diaphragmatic surface (4). Transdiaphragmatic migration of hydatid cysts from the posterior segments of the right hepatic lobe is a common complication, likely due to the proximity to the diaphragm. The bare area of the liver, which lacks peritoneal covering, is identified as the most frequent route for this migration (3).

Factors that increase the risk of rupture include cysts larger than 10 cm in diameter and superficial cyst locations. Additionally, younger age, particularly in children and adolescents, is a risk

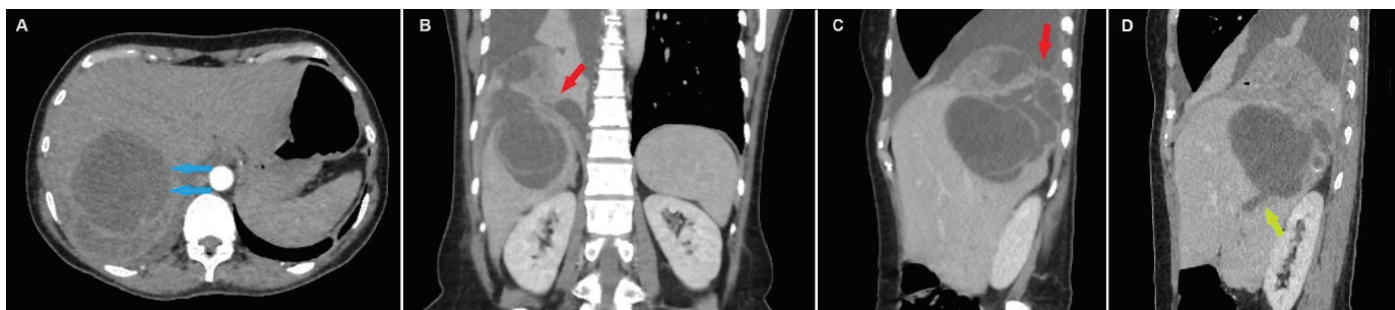


Figure 2. Axial section (A) contrast-enhanced computed tomography CT, shows a cystic lesion with a subdiaphragmatic location, septate internal structure, and loss of wall tension and separated membranes observed in liver segments VII and VIII (blue arrows). On coronal and sagittal sections (B, C), the detected cyst had passed the diaphragm and extended to the right hemithorax (red arrows). The sagittal section (D) is an enlarged bile duct adjacent to the identified cyst, and its appearance suggests cystobiliary communication (green arrow).

DISCUSSION

HC is a serious infection in endemic countries such as Türkiye. Carnivorous animals, particularly dogs, serve as the main hosts for the parasite *Echinococcus granulosus*. Humans, who are not typically part of the parasite's natural life cycle, become accidental hosts. HC can manifest at any age, from infancy to 75 years, but is most frequently seen in individuals between the ages of 21 and 40 (1). The liver is the most frequently affected organ, with subsequent involvement of the lungs, brain, and other tissues (2). It is essential to consider hydatid disease in the differential diagnosis when a cystic lesion is found in patients from endemic regions. In such areas, including Türkiye, hydatid cysts are a significant health issue.

HC is mostly asymptomatic and often represents incidental clinical or radiological findings (3). The diagnosis is based on the identification of cyst structures by imaging techniques and confirmation by the detection of specific serum antibodies via immunodiagnostic tests (1). Symptoms depend on the organ involved, the cyst's location, or resulting complications. Due to the slow growth of hydatid

factor due to the higher likelihood of trauma in these groups (6,7). Chest radiographs can detect pleural effusion, indications of bronchopneumonia, and an elevated diaphragmatic dome, especially in the right lung (5). CT scans play a vital role in determining the number and characteristics of cysts, assessing complications, and examining other organs. The treatment of hydatid disease is particularly challenging due to the absence of standardized treatment protocols. Surgical intervention is considered the treatment of choice (8).

CONCLUSION

In conclusion, hydatid cysts can cause severe, life-threatening complications. Healthcare providers should always consider hydatid cysts and their possible complications in patients from endemic areas who present in the emergency department.

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