Atypical manifestations, complications and pathological correlation of hydatid disease.

Poster No.: C-2501  
Congress: ECR 2012  
Type: Educational Exhibit  
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Keywords: Pathology, Parasites, Cysts, Diagnostic procedure, Ultrasound, MR, CT, Biliary Tract / Gallbladder, Abdomen, Liver

DOI: 10.1594/ecr2012/C-2501

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Learning objectives

• In this poster we will review the imaging appearance of atypical manifestations and complications of abdominal hydatid disease before and after surgery as well as the radiopathological correlation.

• To discuss the prevalence of these complications.
Background

Hydatid disease is a worldwide zoonosis; in Europe, it is frequently seen in the Mediterranean region and particularly in agricultural and pastoral areas.

This zoonosis typically demonstrates characteristic imaging findings so usual forms are easy to recognize and they have been widely described. However, there are many atypical features and complications that can occur before or after surgery. Radiologists should be aware of these complications to make the accurate diagnosis.

Most cysts are acquired in childhood and are not diagnosed until adulthood so most of these hydatid cysts are asymptomatic and are diagnosed incidentally in patients in whom radiological techniques are performed for another reason. On the other hand, the majority of symptomatic cases are caused by cyst rupture or infection.

The liver is the organ most frequently involved, but hydatid disease can occur anywhere in the body due to hematogenous spread.

Other usual complications of hydatid disease in the liver have been described in the literature and include rupture and superinfection of the cyst. Rupture occurs in approximately 50%-90% of cases, usually as part of the natural evolution of the disease due to degeneration of the cyst membranes but also secondary to trauma or treatment. There are three types of hydatid cyst ruptures: contained (if endocyst ruptures but not the pericyst), communicating (if the cyst cavity or its content communicates with biliary radicles) and direct rupture (if both, endocyst and pericyst suffer a rupture predisposing to peritoneal, diaphragmatic or pleural spread).

Communication with biliary tree can cause obstructive jaundice or cholangitis.

A ruptured cyst may become infected (up to 25% of ruptured cysts) and present as a liver abscess.

Perforation into hollow viscera or portal vein thrombosis also have been described but are rare complications.

Surgery is the treatment of choice but there is no consensus because it can vary from radical to conservative methods.

Complications may occur in patients with hydatid disease after surgery; the most frequent postoperative complication is infection.
We retrospectively review radiological and pathological findings in over 55 surgically proved cases of complicated hydatid disease of the liver seen at our institution over the past 10 years.

We illustrate the imaging appearance of several complications of hydatid disease and complications related with surgery using ultrasonography, computed tomography, magnetic resonance and trans-Kher cholangiography.

1. Preoperative radiological evaluation.

- Abdominal US was performed as the initial test in 39 patients (71%) particularly in those without signs of complications (fig.1).

- CT abdominal scan was performed as the initial test in 12 patients (21.8%). In 40% of patients CT was an additional complementary examination. CT scan of the abdomen was superior to ultrasound for the detection of extrahepatic hydatid disease, pre and postoperative complications (especially signs of cyst infection or peritoneal seeding).

- In those cases in which communication with biliary tree was suspected or in complicated cases, for surgical planning, a MRI exam was performed (12.7% of patients).

- Trans-Kher cholangiography was performed in 18% of patients to test and verify the communication of the cyst with biliary tree (when MR was not available).

2. Preoperative complications.

2.1. After reviewing radiological findings and pathological results the most frequent preoperative complication in our serie of patients was **superinfection** of the hydatid cyst (12.7%) especially those located in the right lobe of the liver.

Infected cysts are usually poorly defined (fig.3) but sometimes they appear well defined, especially at ultrasound exams. The presence of air bubbles or air-fluid levels or layering may support the diagnosis of infection of a ruptured liver hydatid cyst, although these findings are nonspecific because they can be seen in uninfected cysts and in communicating and direct ruptures.
2.2. **Communication between the cyst and the biliary tree** (with or without cholangitis) was found in 3.6% of cases. This communication usually involves small cholangioles and direct extension into major bile ducts is rare(fig.4).

Imaging findings showed liver cysts, echogenic or slightly hyperdense material in the dilated biliary ducts representing daughter vesicles, fragmented membranes or matrix. We also can see loss of continuity of the cyst wall.

Filling defects that move with change of position or leakage of contrast medium into the cyst cavity may be seen at trans-Kher cholangiography.

2.3. **Endocyst rupture and spread of vesicles to the peritoneum and other intraabdominal organs** were other complications found in our review of patients (12.7%) (fig. 5,6).

Cecal, peritoneal, mesenteric, renal and diaphragmatic were the most frequent locations (fig. 7,8,9,10).

Imaging findings were similar to those in hepatic disease. CT was the most accurate technique for detection of extrahepatic involvement of hydatid disease.

3. **Postoperative complications.**

After surgery the most frequent complications in our study were:

- Cyst-biliary tree fistula (11%) (fig.11).
- Infection or abcess at the surgical site (5.45%) (fig. 12 and 13).
- Blood collection with or without superinfection (5.4%).
- Active bleeding after surgery (1%) (fig 14).
- Accidental rupture of the cyst (1%).
Fig. 1: Abdominal US shows a cyst with ecogenic material in right hepatic lobe.

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Fig. 2: Enhanced abdominal CT scan in arterial fase that shows two defined cyst in the right lobe of the liver consisting with hydatid cysts.

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Fig. 3: Enhanced abdominal CT scan that shows a poorly defined cyst with air bubbles in the right lobe of liver consisting with an infected hydatid cyst.

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**Fig. 4:** Axial T2 weighted MR of the liver that shows Wall rupture with fistula of hydatid cyst with the biliary tree, with daughter vesicles inside a bile duct.

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**Fig. 5:** Axial fat-suppressed T2-weighted MR image that shows a wall rupture of the endocyst with extension of vesicles to the peritoneum.

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Fig. 6: MR cholangiography that shows a wall rupture of the endocyst with extension of vesicles to the peritoneum.

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**Fig. 7:** Axial T2-weighted MR image. Peritoneal hydatid cyst with the typical hypointense layer.

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Fig. 8: Contrast-enhanced abdominal CT scan demonstrates a partially calcified hydatid cyst is seen in the pelvis.

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Fig. 9: Contrast-enhanced abdominal CT scan. Calcified hydatid cyst in the lower pole of right kidney.

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Fig. 10: A hydatid cyst in the mesenterium is seen in this contrast-enhanced abdominal CT scan.

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**Fig. 11:** Trans-Kher cholangiography that shows leakage of contrast medium into the cyst cavity secondary to cyst-biliary tree fistula.

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Fig. 12: Contrast-enhanced abdominal CT scan. Infection of the surgical site after pericystectomy.

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**Fig. 13:** This Contrast-enhanced abdominal CT scan demonstrates an infected postsurgical hematoma and right pleural effusion.

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**Fig. 14:** Contrast-enhanced abdominal CT scan (arterial phase). Acute bleeding in the liver after hydatid cyst intervention.

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Conclusion

Hydatid disease may be seen anywhere in the body due to hematogenous dissemination. Besides, there are many potential complications.

Familiarity with imaging findings of atypical manifestations and pre and postoperative complications of hydatid disease may be helpful in making an accurate diagnosis and consequently its treatment.

Cyst rupture with infection (12.7%), biliary communication with or without cholangitis (3.6%), and endocyst rupture and dissemination of vesicles to peritoneum are the most usual complications before surgery.

After surgery, the most common complications are the collection of blood or abscesses (5.4 %) and biliary communication (11%).

There are other complications less frequently seen.
References


