

Rupture of an echinococcal cyst within the colon in a case of disseminated abdominal cystic echinococcosis

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Section: Abdominal imaging

Area of Interest: Abdomen Education

Procedure: Diagnostic procedure

Procedure: Education

Imaging Technique: Ultrasound

Imaging Technique: CT

Special Focus: Parasites Case Type: Clinical Cases

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Patient: 25 years, female

Clinical History:

A young woman from Eastern Europe presented to the emergency room with an acute abdominal pain at the left flank. Routine blood tests showed elevation of white cell blood count ($18.3 \times 10^9/L$) and increase of serum C-reactive protein (4.53 mg/dL, upper normal limit 0.50 mg/dl).

Imaging Findings:

Ultrasonography detected multiple abdominal cystic lesions with different sonographic patterns, disseminated through the whole abdomen; a hepatic cyst as well as a splenic cyst were also present (Fig. 1 a, b). A collapsed cyst was appreciable at the left flank (Fig. 1c).

Abdominal CT confirmed the presence of multiple intra-abdominal cyst, some of them showing a hyperattenuating rim (Fig. 2, 3, 4). The collapsed cyst located at the left flank contained air bubbles and was surrounded by a small fluid collection (Fig. 2d, 3). Communication between the collapsed cyst and the descending colon was also demonstrated (Fig. 4b, c).

The patient was operated on intra-abdominal cysts; the splenic cyst was thereafter successfully treated with percutaneous drainage.

Discussion:

Hydatid disease is caused by *Echinococcus granulosus*; humans are intermediate hosts, dogs and sheep being definitive and intermediate hosts respectively. Infection occurs through contact with a definitive host or intake of contaminated food or water; the liver is the organ mainly involved [1].

Peritoneal echinococcosis is an infrequent condition. It is almost always secondary to a hepatic hydatid disease, which is a complication in 13% of cases, whereas primary peritoneal echinococcosis is rather rare [1, 2]. Mechanism of primary peritoneal seeding remains unclear. Contamination of the peritoneal cavity is due to a spontaneous rupture of an echinococcal hepatic cyst in up to 12% of patients but in most of cases it is secondary to an

intraoperative spillage of the hydatid fluid during surgery for a hepatic disease. In few cases, asymptomatic micro-rupture of a hepatic hydatid cyst, whether spontaneous or post-traumatic, is advocated as a possible pathologic mechanism of peritoneal seeding [1, 2].

Peritoneal echinococcosis usually remains asymptomatic until cysts become large enough to produce a mass effect [1, 2]. Cysts can be isolated or multiple, and may implant everywhere in the abdominal cavity; they can show different imaging patterns according to their own evolutive stage (Fig. 5).

Cysts occupying the whole peritoneal cavity may mimic a multiloculated mass, a condition known as encysted peritoneal hydatidosis [1].

Spontaneous rupture of a hydatid cyst within a hollow viscus is a very rare complication with an estimated incidence of 0.5% of cases [1]; it can clinically present with hydatidemia or hydatidorrhea with regard to the perforation site [1-3].

An echinococcal cyst-enteric rupture is usually diagnosed during surgery, although it seldom may be suspected in pre-surgical radiologic work up [1-3]. Ultrasonography is the first-level method for identifying and classifying a hydatid cyst [4], but CT is the method of choice for detecting and diagnosing an abdominal echinococcosis, whose appearance resemble findings of hepatic disease [1-5]. Some hydatid cyst may characteristically show a hyperattenuating rim on non-enhanced CT scan: this finding is not wholly elucidated, but it may depend on tiny calcium deposit or pericystic fibrotic reaction [6].

Rupture within a hollow viscus can be established when CT detects an air-fluid level within an abdominal cyst. Scans in lateral decubitus can aid in the diagnosis as filling or emptying of the cystic cavity can be demonstrated; the communication between the cyst and the hollow viscus can be seldom demonstrated with CT scans obtained with the contrast medium administered orally or by enema [1].

Differential Diagnosis List: Disseminated abdominal cystic echinococcosis with cyst-colon rupture, Abdominal abscesses, Cystic metastases from ovarian adenocarcinoma, Cystic metastases from mucinous adenocarcinoma

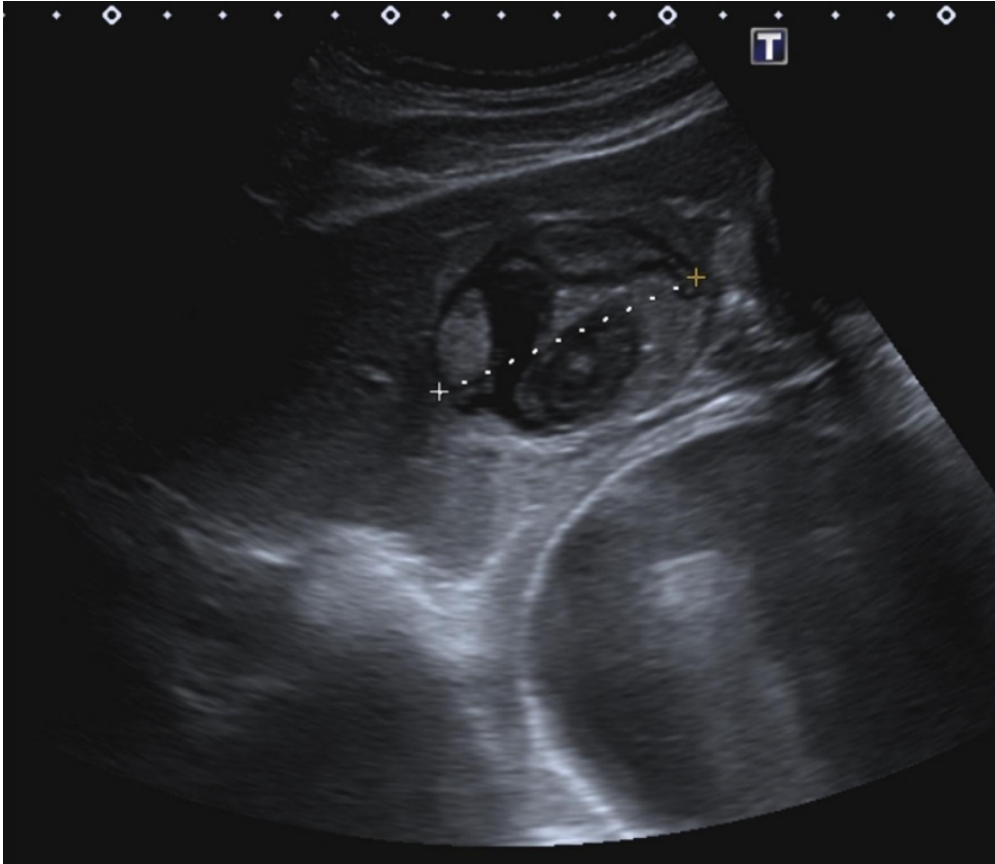
Final Diagnosis: Disseminated abdominal cystic echinococcosis with cyst-colon rupture

References:

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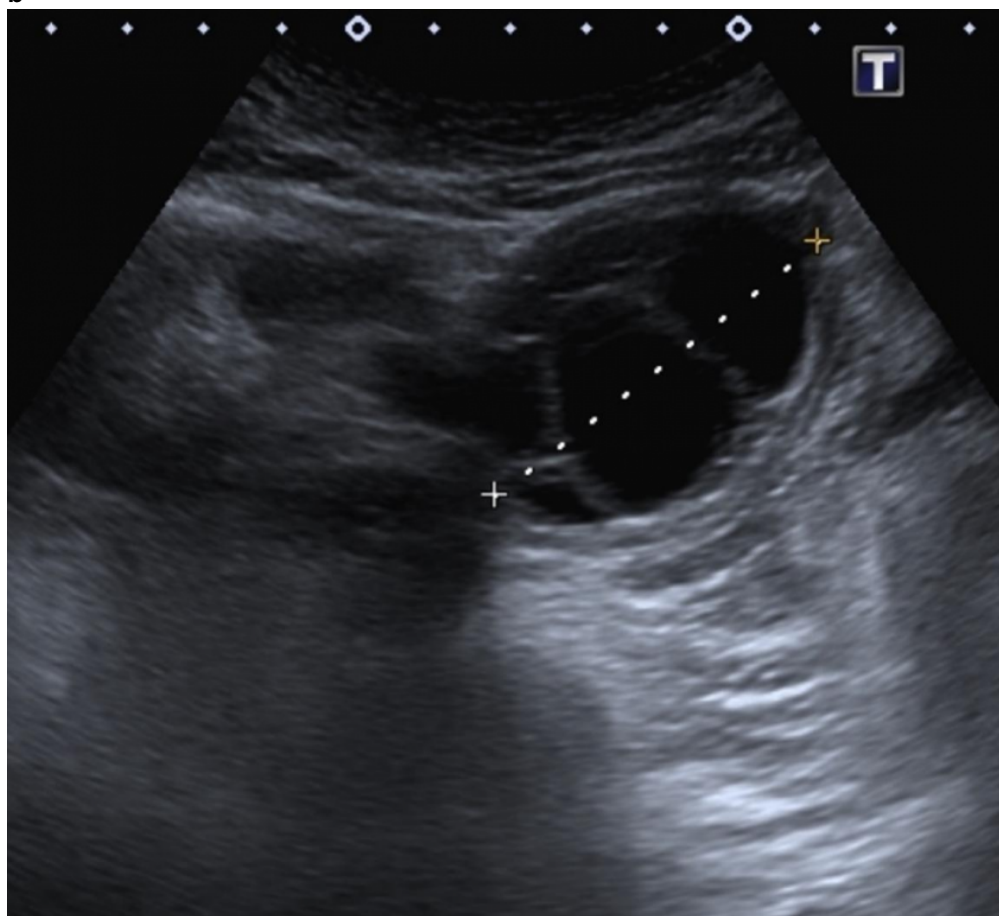
Figure 1

a



Description: The left hepatic lobe contains an inhomogeneous cyst (CE4). A large splenic cyst (CE1) is just below visible. **Origin:** Ospedale San Bortolo, Vicenza, Italy

b



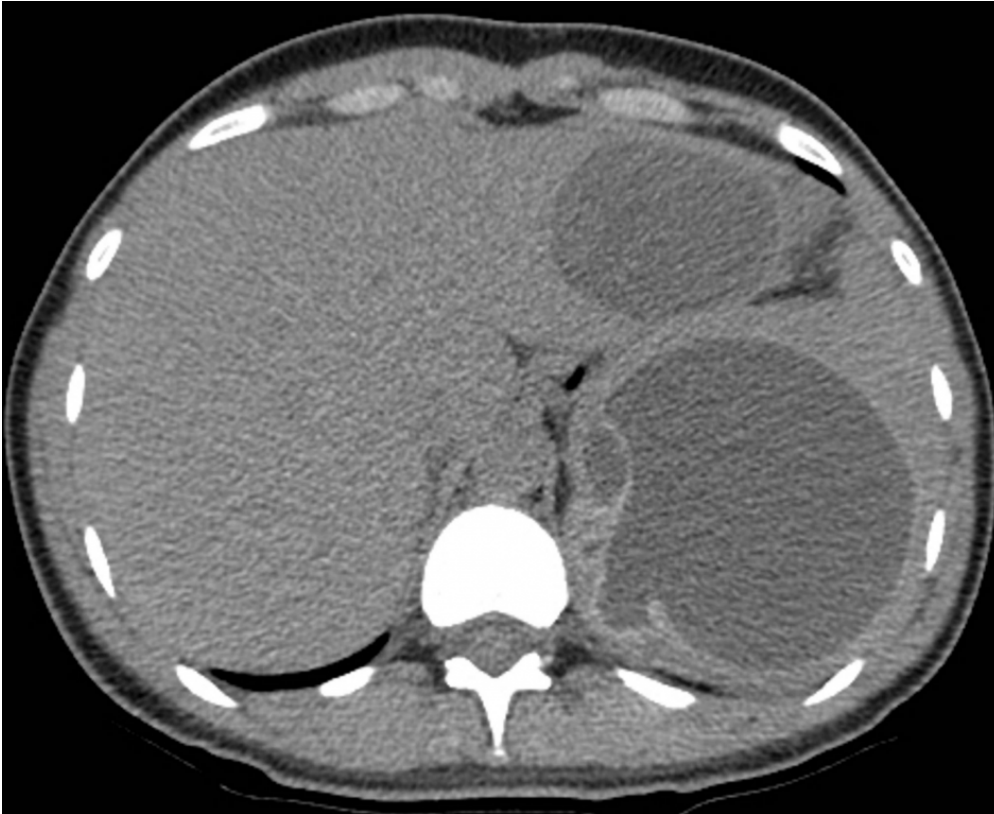
Description: A CE2 cyst is evident among bowel loops. **Origin:** Ospedale San Bortolo, Vicenza, Italy



Description: A CE3 collapsed cyst is detected at the left flank. **Origin:** Ospedale San Bortolo, Vicenza, Italy

Figure 2

a



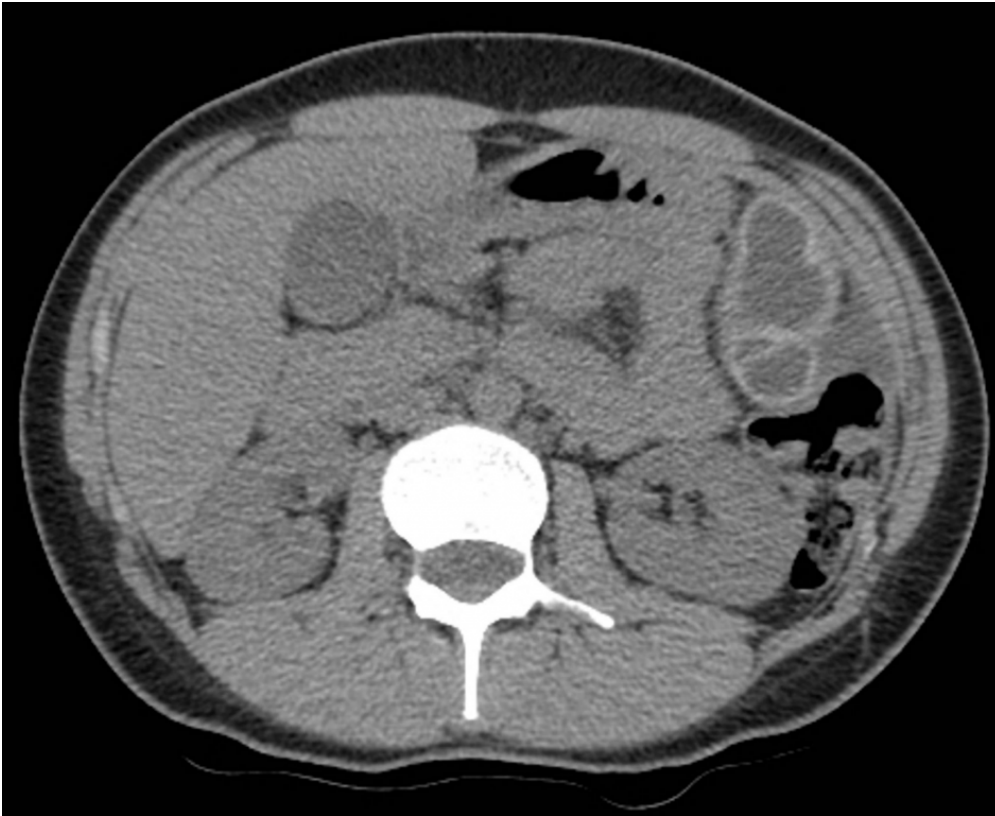
Description: Uniloculated hepatic cyst and large splenic cyst with irregular border and hyperattenuating septum, consistent for contained rupture. **Origin:** Ospedale San Bortolo, Vicenza, Italy

b



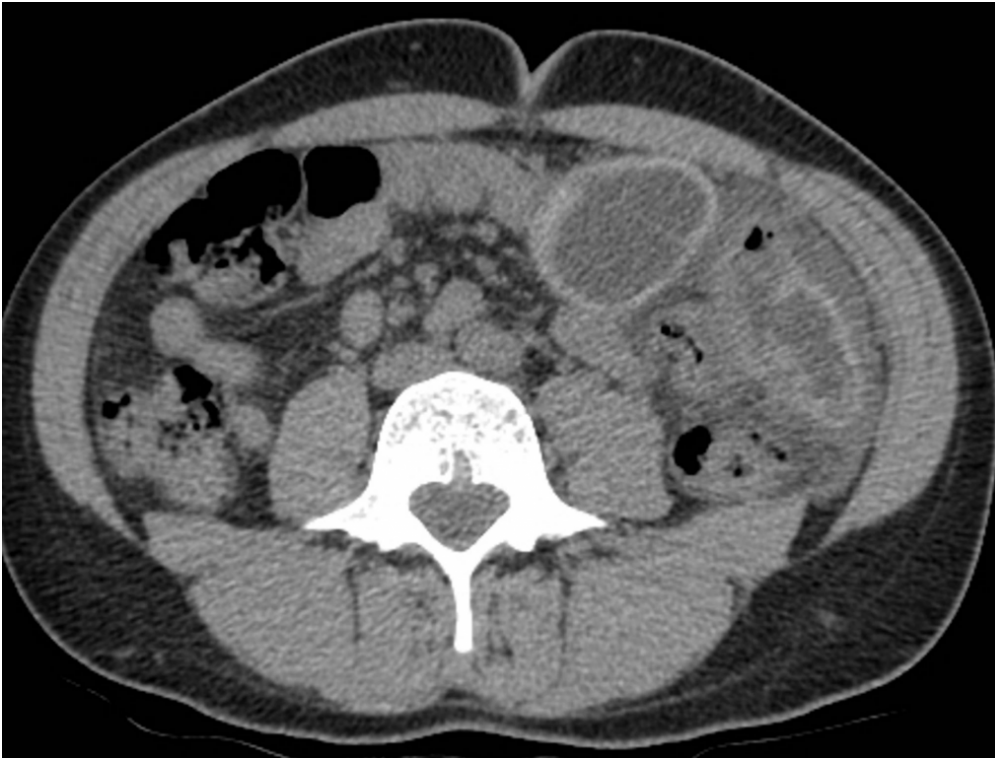
Description: The hepatic cyst shows hyperattenuating rim on caudal level. **Origin:** Ospedale San Bortolo, Vicenza, Italy

c



Description: Collapsed cyst with hyperattenuating rim at the left flank. **Origin:** Ospedale San Bortolo, Vicenza, Italy

d



Description: On a more caudal level, air bubble within the collapsed cyst is appreciable; fluid collection surrounds the descending colon. Another cyst with hyperattenuating rim is also shown. **Origin:** Ospedale San Bortolo, Vicenza, Italy

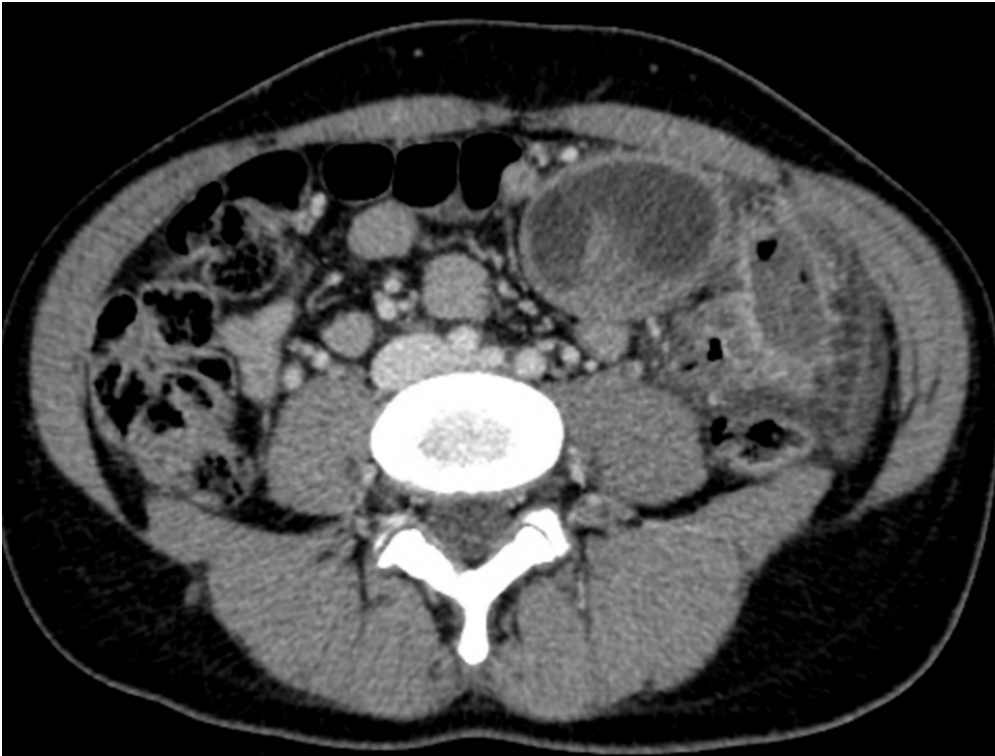
Figure 3

a



Description: The collapsed cyst appears inhomogeneous on post-contrast image. **Origin:** Ospedale San Bortolo, Vicenza, Italy

b



Description: The cyst appears medially attached to the descendent colon, displaced and angulated.

Origin: Ospedale San Bortolo, Vicenza, Italy

Figure 4

a



Description: Sagittal reformations (left side) shows multiple cyst in different evolutive phases. **Origin:** Ospedale San Bortolo, Vicenza, Italy

b



Description: Coronal reformation **Origin:** Ospedale San Bortolo, Vicenza, Italy

c



Description: Magnification of Fig. 4b: cysto-colonic communication (arrow). **Origin:** Ospedale San Bortolo, Vicenza, Italy

Figure 5

a

Type	Status	Sonographic findings
CL	Active if CE	Unilocular anechoic cystic lesion; usually non-parasitic
CE 1		Uniformly anechoic cyst; with fine echoes settled in (hydatid sand)
CE 2	Active	Cyst with multiple septations (multivesicular appearance within the mother cyst)
CE 3	Transitional	Unilocular cyst with detached laminated membranes (water lily sign) with/without daughter cysts
CE 4	Inactive	Inhomogeneous hypoechoic or hypo- and hyperechoic contents; no daughter cysts; sometimes showing the ball of wool sign
CE 5	Inactive	thick calcified wall

Description: WHO classification of hydatid hepatic cyst according with status and ultrasonographic appearance (from ref. 4) **Origin:** Ospedale San Bortolo, Vicenza, Italy