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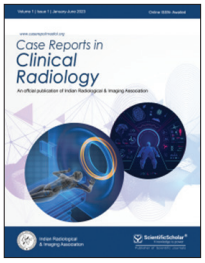

Case Report

Extremely rare pediatric omental and pelvic hydatid cysts with associated omental torsion: A case report

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ABSTRACT

Hydatid disease rarely involves the omentum or deep pelvic regions, particularly in pediatric patients. We report a case of an 8-year-old girl with concurrent omental and deep pelvic hydatid cysts, complicated by omental torsion. Contrast-enhanced computed tomography (CECT) and magnetic resonance imaging accurately localized the cysts, differentiated them from adnexal structures, and revealed the omental torsion. Surgical excision confirmed hydatid cysts at both sites. This case underscores the diagnostic value of multimodality imaging in rare extrahepatic hydatid presentations in children.

Keywords: Case report, Omental hydatid cyst, Omental torsion, Pediatric abdomen, Pelvic hydatid cyst

INTRODUCTION

Hydatid disease, caused by *Echinococcus granulosus*, predominantly affects the liver and lungs. Peritoneal and pelvic involvement is uncommon, reported in only a minority of abdominal cases, and is usually secondary to hepatic disease. However, rare primary omental or pelvic hydatid cysts have been described.[1,2] Omental cysts may occasionally undergo torsion, presenting with acute or subacute abdominal pain and mimicking other surgical emergencies.[3] Deep pelvic cystic lesions in children are uncommon and may arise from developmental, enteric, or infectious etiologies. Accurate radiologic characterization is crucial for differentiating these lesions from adnexal or other pelvic structures, guiding surgical planning, and preventing inadvertent complications. We report a pediatric case of concurrent omental and deep pelvic hydatid cysts with omental torsion, highlighting the imaging features, differential diagnosis, surgical findings, and key learning points from this exceptionally rare presentation.

CASE REPORT

An 8-year-old female presented with insidious-onset lower abdominal pain for 10 days, intermittent and aggravated by bending or micturition. There was no history of fever, vomiting, trauma, or previous surgery. Abdominal examination revealed a firm, mobile hypogastric mass measuring approximately 8 × 8 cm. Vital parameters were stable.

Imaging findings

Computed tomography (CT) abdomen and pelvis

CECT demonstrated a thin-walled unilocular cyst in the lower abdomen (≈6.5 × 8.2 × 6.2 cm) with subtle mural nodular projections [Figure 1]. Adjacent omental fat along the left lateral wall showed concentric swirling of vessels and fat stranding – the classic "*whirl sign*" – consistent with omental torsion. A second multiloculated cyst (≈4.3 × 6.3 × 5.8 cm) was noted in the right rectouterine space, displacing the rectum posteriorly and to the left. The uterus and urinary bladder lie anterior to the lesion, with mild dependent pelvic free fluid. No hepatic, splenic, or mesenteric cysts were seen.

Magnetic resonance imaging (MRI) pelvis

MRI confirmed both cysts as T1 hypointense and T2 hyperintense with thin walls [Figure 2]. The omental cyst demonstrated subtle mural nodularity, and the multiloculated rectouterine cyst displaced adjacent pelvic viscera. The uterus was anteriorly displaced between the cysts and bladder, while both ovaries were distinctly visualized and separate from the lesions, confirming extra-adnexal origin.

Surgery and histopathology

Laparotomy revealed a 10 × 10 cm omental cyst adherent to a twisted, ischemic omental segment, and a 6 × 4 cm multiloculated rectouterine cyst [Figure 3]. Both cysts were completely excised. Gross specimens showed pearly white laminated membranes with clear fluid. Histopathological examination revealed laminated eosinophilic membranes with attached brood capsules and scolices, confirming *E. granulosus* infection. The omental segment showed ischemic changes consistent with torsion. The post-operative recovery was uneventful, and the patient was commenced on albendazole. The patient was discharged in stable condition. She has not yet reported for her scheduled postoperative follow-up at the time of submission.

DISCUSSION

Hydatid disease remains a significant health concern in endemic regions, transmitted through contact with infected canines or contaminated food. The liver (≈70%) and lungs (≈20%) are the predominant sites of involvement, while peritoneal hydatidosis is rare (<2%) and usually secondary to hepatic rupture. Primary omental or pelvic hydatid cysts, particularly with torsion, are exceedingly uncommon in children.[1-3]

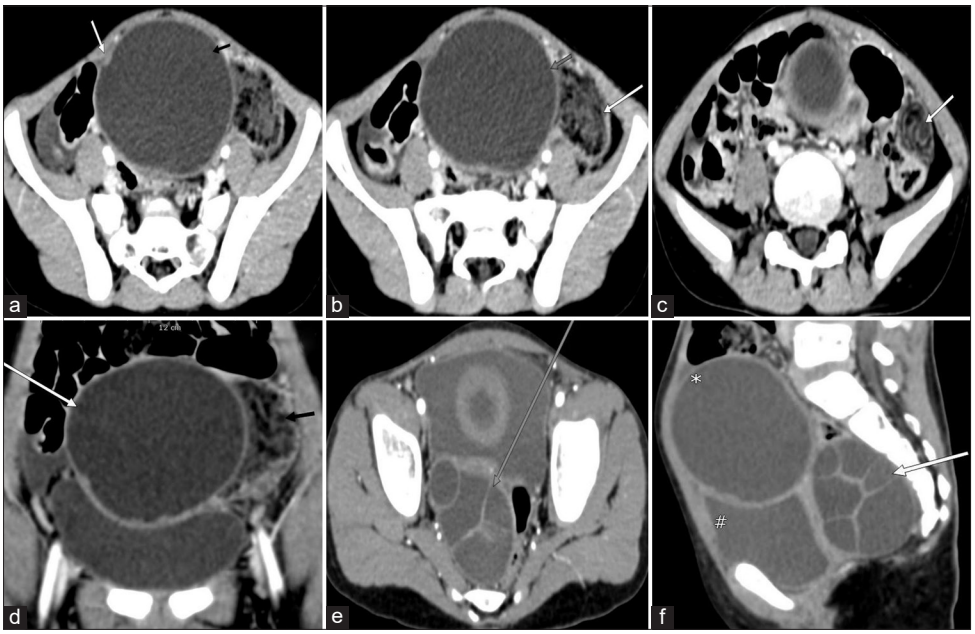

Figure 1: Computed tomography images demonstrating omental and pelvic cysts with associated omental torsion. (a) Axial contrast-enhanced computed tomography (CECT) showing omental cyst (black arrow) with wall nodularity (white arrow). (b) Axial CECT showing adjacent fat-density structure along the left lateral cyst wall (white arrow), suggestive of omental torsion. (c) Axial CECT demonstrating twisted omental vessels (white arrow) – the "whirl sign." (d) Coronal CECT showing omental cyst (white arrow) and adjacent fat-density structure (black arrow) consistent with torsion. (e) Axial CECT image showing multiloculated rectovesical cyst (long grey arrow) with mass effect on the rectum and uterus. (f) Sagittal CECT demonstrating multiloculated rectovesical cyst (white arrow), omental cyst (*), and urinary bladder (#).

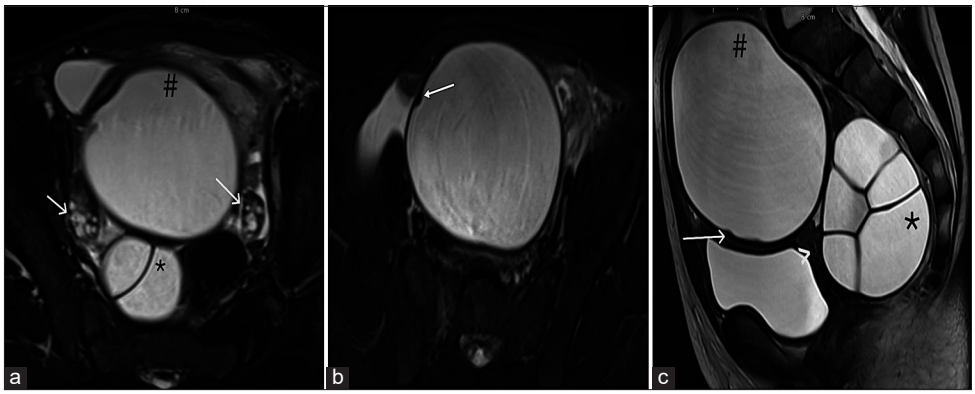

Figure 2: Magnetic resonance imaging showing omental and deep pelvic hydatid cysts. (a) Axial T2-weighted short tau inversion recovery (STIR) image demonstrates a well-defined omental cyst (#) and a multiloculated retrorectal cyst (*) with both ovaries (white arrows) seen separately from the lesions, confirming an extra-ovarian origin. (b) Axial T2-weighted STIR image shows the omental cyst with focal wall nodularity (white arrow). (c) Sagittal T2-weighted STIR image demonstrates the omental cyst (#) with wall nodularity (white arrow) and the multiloculated rectovesical cyst (*); note the compressed uterus (white arrowhead) displaced between the rectovesical cyst and urinary bladder.

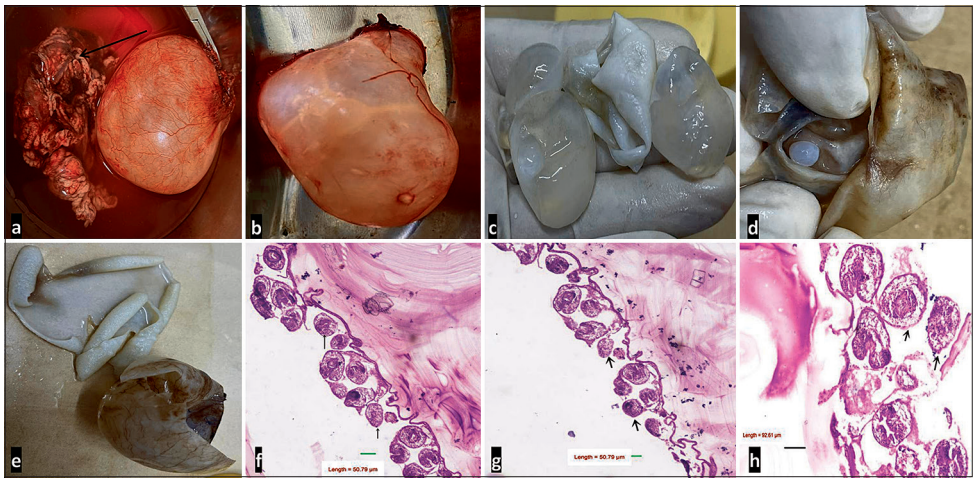

Figure 3: Gross surgical and histopathological findings of omental and pelvic hydatid cysts with omental torsion. (a) Resected omental specimen showing a smooth-walled cystic mass with a twisted, discolored (black arrow) segment of attached omentum – indicative of omental torsion and ischemic changes. (b) Multiloculated, smooth-walled rectovesical cystic mass. (c and d) Cut sections of the omental cyst revealing a pearly white daughter cyst within a larger cystic cavity filled with clear fluid – typical of hydatid disease. (e) Cut section of the rectovesical cyst showing pearly white laminated membranes. (f-h) Histopathological images (hematoxylin and eosin) from both omental (f) and rectovesical (g and h) cysts at 100x (f and g) and 200x (h) showing laminated membranes and brood capsules (black arrows).

Pathogenesis

Primary peritoneal hydatidosis may occur through hematogenous spread, lymphatic dissemination, or transcoelomic seeding following unnoticed minor cyst rupture. In this case, the absence of hepatic involvement and the presence of isolated omental and pelvic cysts favor a diagnosis of primary peritoneal hydatidosis. Omental torsion in this setting likely results from mechanical traction and altered mobility caused by the mass effect of the cyst, compounded by sudden changes in intra-abdominal pressure or minor trauma. The parasitic cyst may serve as a pivot point, predisposing the omentum to twisting.

Role of imaging

Cross-sectional imaging is critical for diagnosis and surgical planning. CT provides excellent delineation of cyst morphology, wall features, and complications such as torsion. The "whirl sign" – twisting of omental vessels and fat – is pathognomonic for omental torsion.[4,5] MRI complements CT by accurately defining relationships with pelvic viscera;

Table 1: Differential diagnosis of omental and pelvic cystic lesions in children.

Entity	Usual site	Imaging features	Distinguishing features
Hydatid cyst	Omentum, peritoneum, pelvis	Unilocular or multilocular, mural nodules, daughter cysts	Multiple cysts, endemic region
Lymphatic malformation	Mesentery, retroperitoneum	Multiloculated, fluid-fluid levels	No mural nodularity or calcification
Enteric duplication cyst	Adjacent to bowel	Double wall ("gut signature") may communicate with bowel	Peristaltic activity, GI continuity
Omental/Mesothelial cyst	Omentum, mesentery	Simple, unilocular, thin-walled	No mural nodules or enhancement
Tailgut cyst	Retrorectal	Multiloculated, posterior to rectum	Midline or presacral location, non-communicating

GI: Gastrointestinal

confirming extra-adnexal location; and differentiating from ovarian, mesenteric, or enteric cysts.

Typical hydatid cysts may show daughter cysts, detached membranes ("water-lily sign"), or calcified walls.[1,2] However, atypical lesions can appear unilocular or multilocular with subtle wall irregularities.

In endemic regions, the presence of multiple cystic lesions in distinct compartments without solid enhancement or bowel communication should prompt consideration of hydatid disease, even in the absence of classical features.

Previous literature describes only a few cases of extrahepatic peritoneal or omental hydatid disease, mostly in adults and frequently associated with a hepatic primary or prior surgery.[1] Adult reports, such as that by Karagülle *et al*., have noted omental hydatid cysts presenting with acute abdomen and torsion, often mimicking appendicitis or adnexal pathology.[3] Pediatric cases are extremely rare; the report by Khalili *et al*. described primary omental torsion in a child with a similar presentation.[4] Surgical reviews, including that by Itenberg *et al*., emphasize the diagnostic utility of CT in detecting the "whirl sign" and the importance of timely surgical management.[5] Compared with these, our case is unique for demonstrating concurrent omental and deep pelvic hydatid cysts without hepatic involvement in a child, both histologically confirmed – an exceptionally rare dual-site manifestation successfully treated with complete excision and albendazole therapy.

Besides torsion, reported complications include secondary infection, rupture with anaphylaxis, intraperitoneal dissemination, adhesions, and compression of adjacent viscera. Imaging may reveal wall thickening, air-fluid levels (infection), or irregular cyst margins with peritoneal free fluid (rupture). Recognition of these features is vital for timely surgical intervention and prevention of recurrence.

Omental torsion is a rare surgical emergency that may occur secondary to cystic lesions, tumors, or focal adhesions. Radiologically, the whirl sign is diagnostic. In hydatid disease, torsion can arise due to altered weight distribution or adherence of the cyst to adjacent structures, predisposing the omentum to twist. Early recognition allows prompt surgical management, preventing infarction and necrosis.[4,5]

DIFFERENTIAL DIAGNOSIS

Extrahepatic cystic lesions in children may mimic developmental or lymphatic cysts. Imaging and clinical correlation are crucial for differentiation [Table 1].

Management and outcome

Complete surgical excision remains the mainstay of treatment, with care to avoid cyst rupture and spillage. Albendazole therapy is recommended postoperatively to minimize recurrence risk.

CONCLUSION

Public health relevance

Hydatid disease continues to pose a burden in endemic regions due to close human-animal contact and inadequate deworming of domestic dogs. Awareness among radiologists and clinicians is essential for early recognition of atypical presentations and prevention of complications through timely intervention.

Clinical significance

This case highlights:

- Rare dual-site extrahepatic hydatid disease without hepatic involvement
- Omental torsion as a diagnostic and surgical challenge.
- The crucial role of CT and MRI in localization, differential diagnosis, and detection of complications.

TEACHING POINTS

1. Hydatid cysts should be considered in the differential diagnosis of multiple intra-abdominal cystic lesions – even in the absence of hepatic involvement, particularly in endemic regions.
2. The CT "whirl sign" is a key diagnostic indicator of omental torsion, a rare but important surgical emergency that may complicate cystic lesions.
3. In hydatid disease, atypical extrahepatic cysts may lack pathognomonic features; a high index of suspicion and correlation with endemicity are essential for accurate diagnosis.

MCQs

1. Which imaging feature is most characteristic of omental torsion?
   a. Target sign
   b. Whirl sign
   c. Beak sign
   d. Onion skin sign

Answer Key: b

2. The most common route for peritoneal hydatid disease is:
   a. Direct invasion through bowel wall
   b. Hematogenous dissemination
   c. Seeding from ruptured hepatic cyst
   d. Lymphatic spread

Answer Key: c

3. MRI confirmation of extra-adnexal cystic lesions depends on:
   a. Absence of internal septations
   b. Normal ovaries visualized separately from the cysts
   c. High T2 signal
   d. Mural enhancement

Answer Key: b

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