

## PERCUTANEOUS CYST DRAINAGE AS A BRIDGE TO SURGERY FOR HYDATID INTESTINAL OBSTRUCTION

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### ABSTRACT

Peritoneal echinococcus is an uncommon presentation of hydatid disease. Owing to its vague and varied symptomatology, its diagnosis can be challenging. We report an unusual clinical presentation of peritoneal echinococcus with concomitant small bowel obstruction. Ultrasound and computed tomography showed disseminated abdominal hydatid cysts emanating primarily from the liver with free abdominal fluid and distended bowel loops. Surgery was the chosen treatment option but given the altered general state of the patient due to prolonged bowel obstruction and the resulting electrolyte imbalances, an alternative management option was sought. Percutaneous drainage was used to serve as a bridge in order to optimize fitness for surgery. At a month's interval, surgery was performed and the patient was discharged on albendazole three days later in a satisfactory general condition. Follow-up at three years showed no signs of recurrence.

**Keywords:** Hydatid disease, Percutaneous drainage, Peritoneal Echinococcus.

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### INTRODUCTION

*Echinococcus granulosus* is the parasite responsible for hydatid disease. Despite the fact that the disease can be ubiquitous in the human body, the organs most frequently involved are the liver (55–60%) and the lungs (30%)<sup>1</sup>. Hydatid disease may remain asymptomatic or present with complications. Sometimes unusual locations as well as cyst metastasis can present a diagnostic challenge.

The rate of intra-peritoneal perforation of hydatid cysts has been reported to be between 1% and 8% in the literature<sup>2</sup>. Large or superficially located cysts are prone to rupture into the pleural space and the peritoneal cavity. They may also drain into the biliary tract or the gastrointestinal system. Cyst rupture is usually due to increased intracystic pressure secondary to trauma or enlargement of the cyst. Intraperitoneal rupture of liver hydatid cyst has a mortality rate of 6% and a morbidity rate of 20-35%<sup>2</sup>.

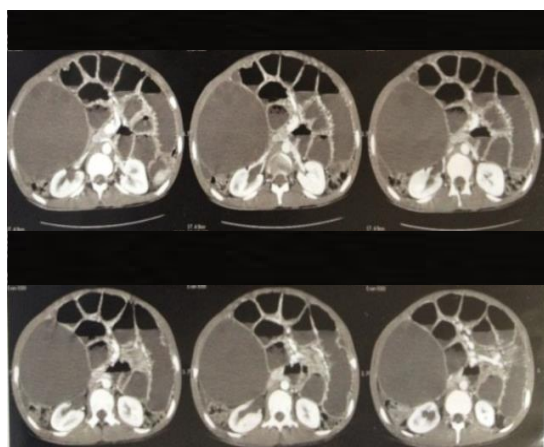
The purpose of this paper is to highlight the unique approach of already established treatment methods that was adopted in the management of this unusual clinical presentation of hydatid disease.

### CASE REPORT

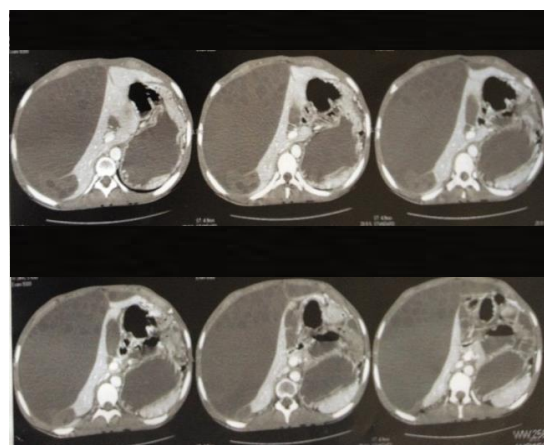
We report the case of a 17-year-old boy, living in rural Morocco with no past medical history, who presented with diffuse abdominal pain, 3 weeks prior to his admission to the emergency department. On examination he showed symptoms consistent with bowel obstruction including a distended abdomen with diffuse tenderness and a digital rectal examination being negative for fecal matter but with no signs of vomiting. The patient was afebrile (37 °C), hypovolemic with a blood pressure of 90/50 mmHg and a pulse rate of 98 bpm. There was also marked weight loss of 7 kg in that 3-week period according to the patient.

Lab findings revealed acute renal failure (Creatinine: 54.8 mg/L; BUN: 3.23 g/L), severe hyperkalemia and hyponatremia (K+: 6.37 mEq/L;

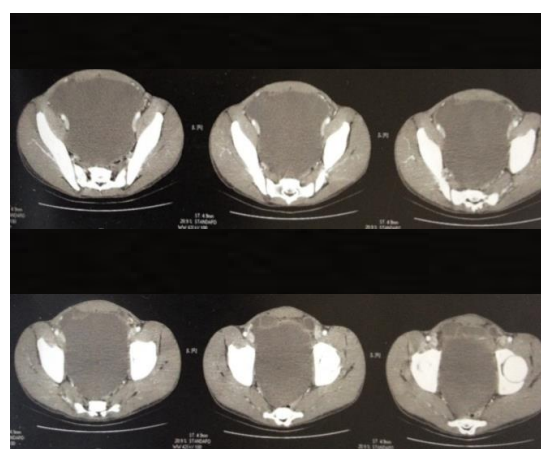
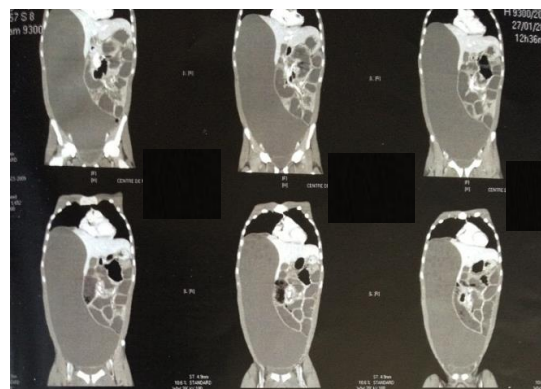
Na+: 119 mEq/L) and elevated CRP levels (49 mg/L). However, hydatid serology was negative. An abdominal ultrasound (US) was performed that showed a moderate ureterohydronephrosis with fluid in the abdominal cavity. A computed tomography (CT) scan showed a large liver cyst of 12cm in diameter located predominantly in the right lobe with peritoneal hydatidosis. The cyst stretched right down to the pelvic region with 2 other hydatid cysts of 5cm and 2.5 cm in the 6<sup>th</sup> and 3<sup>rd</sup> segments of the liver respectively according to Couinaud's classification. Bowel diameter was markedly increased with multiple air-fluid levels, confirming bowel obstruction (Figures 1-4).



**Fig 1.** Abdominal CT scan at admission showing dilated small bowel loops with air-fluid levels

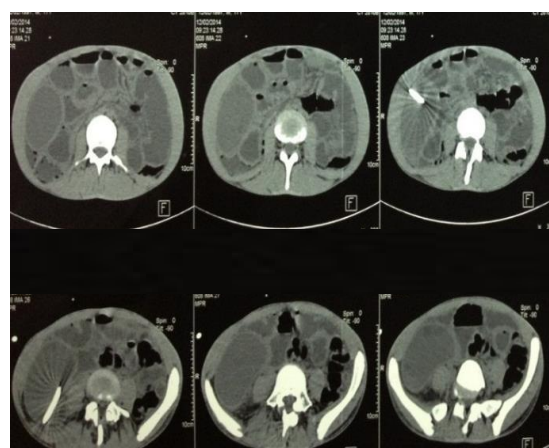


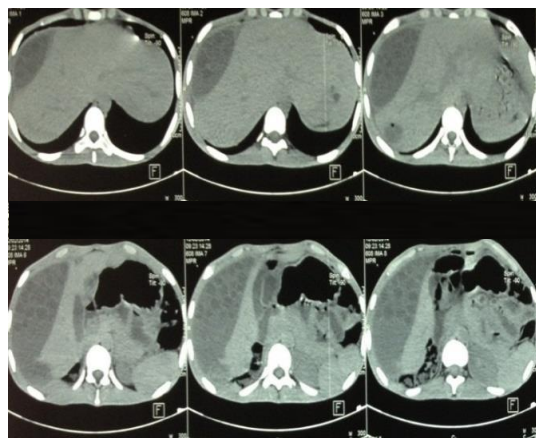
**Fig 2.** Abdominal CT scan at admission showing the hydatid cyst occupying the liver



**Fig 3 and 4.** Abdominal CT scan at admission showing a fluid filled abdomen and pelvic floor

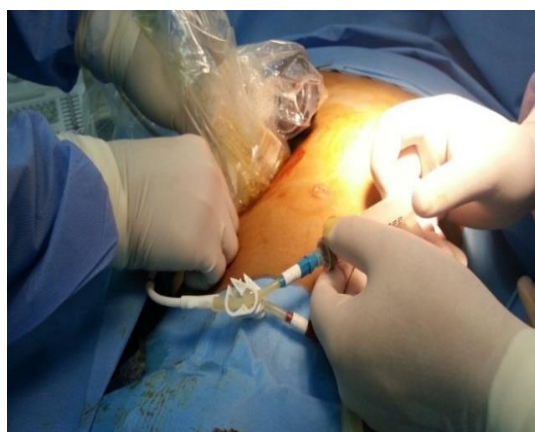
US-guided drainage of the abdominal was carried out after adequate emergent fluid resuscitation on the patient (Figures 5-6).





**Fig 5 and 6.** Abdominal CT scan after percutaneous drainage showing a marked decrease in fluid levels and the absence of bowel distension

Four liters of purulent liquid was drained from the abdomen (Figures 7-9).



**Fig 7.** Ultrasound guided percutaneous drainage of peritoneal hydatid disease



**Fig 8.** Ultrasonic image during drainage



**Fig 9.** Aspirated fluid from peritoneal cavity

No scolicides were injected in the peritoneal cavity. The percutaneous cyst drainage helped to alleviate the obstructive syndrome and to restore a normal chemistry panel with restored kidney function. There was also marked improvement of the patient's vital signs and restoration of normal blood pressure with a normalized pulse rate. In the days that followed, the patient underwent preoperative medical preparation based on a daily oral dose of 800mg of albendazole. A second US performed a week later showed a decrease in bowel diameter but the persistence of the hydatid cysts and residual abdominal fluid.

The patient underwent surgery a month after his hospital admission. A large midline incision was performed and on exploration of the abdominal cavity, there was marked portal hypertension with an abdomen littered with hydatid cysts (>15 in number of various sizes). A perforated hydatid cyst located on the VI<sup>th</sup> liver segment was likely responsible for the initial hydatid peritoneal dissemination. A cyst discovered on the VII<sup>th</sup> liver segment contained 2 biliary fistulae. A partial pericystectomy was performed for the hepatic lesions and a simple ablation for the peritoneal lesions with removal of surrounding adhesions. All the cysts in the abdominal cavity were removed. A full pericystectomy for the hepatic lesions was not possible due to the intimate contact of the lesions with the post-hepatic inferior vena cava. A large drain was placed in the residual hepatic cavity. The immediate post-operative course was uneventful with the drain giving out serous fluid discharge of 200cc cumulatively over a period of 2 days.



The patient was discharged on post-operative day 3 with a continuing dose of oral albendazole (10 mg/kg/day) for a period of 6 months. After a yearly follow-up over a three-year period, the patient is well with no signs of hepatic or peritoneal recurrences.

## DISCUSSION

Peritoneal echinococcosis is an unusual finding and in most cases, it is secondary to cystic involvement of the liver. Given the rarity of primary peritoneal echinococcosis, published literature contains only a few reported cases. Moreover, the physiopathology of primary peritoneal infection by the parasite is yet to be fully understood<sup>3,4</sup>.

Rupture of hydatid cysts in the peritoneal cavity is a rare occurrence and presents a challenging situation for surgeons. Various clinical scenarios may be presented, but in the case of an acute abdomen, emergent surgery is required for the removal of the intraperitoneal fluid and eradication of cysts<sup>4</sup>. It may rarely present as an obstructive syndrome as is the case in our patient. On the other hand, rupture into the peritoneum may sometimes be silent and go undiagnosed for several years with a resulting disseminated peritoneal hydatidosis<sup>5</sup>.

The ideal treatment for hepatic hydatid disease should aim at the complete eradication of the parasite and the prevention of disease recurrence, with minimal morbidity and mortality.<sup>6,7</sup>

Treatment depends on a host of factors, such as location, size and stage of the cysts/lesions, and the availability of therapeutic options in each center<sup>8</sup>. Removal of all the cysts is the ideal therapeutic option, however in case of hemodynamic instability during surgery, the operation should be aborted and a planned reoperation should be considered when the patient's condition improves. In all cases, medical treatment should be associated, with albendazole (10 to 15 mg/kg per day) often being preferred, for at least 3 months<sup>8</sup>.

Three major management options are available for cystic echinococcosis including anti-parasitic agents, ultrasound-guided aspiration, and surgery. However, limitations exist for each of these modalities depending on the specific case. All three

therapeutic means were used in our case due to the unusual presentation of the disease in our patient. Surgery is the mainstay treatment of peritoneal echinococcus, with either removal of the whole cyst or destruction using ethanol, hypertonic saline, or cetrime solution<sup>9</sup>. The other therapeutic options are used in case of surgical contraindications including complex or widespread injury, advanced patient age, pregnancy, comorbidities, multiple and difficult to access cysts, partially inactive or calcified liver cysts, or patient refusal of surgery<sup>10</sup>. As in our case, the general state of the patient made him a poor candidate for emergent surgery on admission.

The reduction of the risk of cystic echinococcosis recurrence can be improved by the preoperative use of antiparasitic agents such as albendazole and mebendazole. It also helps to soften and decrease intracystic pressure, thus simplifying surgical cyst removal.<sup>4</sup> In our case, the patient received a month's course of albendazole preoperatively.

Percutaneous Aspiration Injection Reaspiration (PAIR) and catheterization are considered effective and safe treatment options for unilocular hepatic cysts, however, they have limited proven efficacy in complex or complicated cyst stages. Modified percutaneous techniques such as MoCaT (Modified Catheterization Technique), PEVAC (Percutaneous Evacuation), or PPCD (percutaneous puncture, drainage and curettage) have been reported for multivesicular cysts and seem more promising in this regard but need long-term evaluation<sup>8,11</sup>.

Percutaneous puncture of echinococcal cysts were previously strongly discouraged because of the high risks of anaphylactic shock<sup>12</sup> and spillage of cyst fluid with subsequent peritoneal seeding. However, since the early 1980s several authors have reported cases of hydatid cyst puncture either accidentally or deliberately without associated side effects, which led to the development of the PAIR method.<sup>11,13</sup> PEVAC has been developed for the treatment of multivesicular and univesicular cysts complicated with cystobiliary fistulas. In PEVAC, the cyst content is simply aspirated and evacuated using a large bore catheter and a scolicalid is used only if no cystobiliary fistula is present. There are a number of early and late complications that can

occur in the course following percutaneous treatment. Early complications include hypersensitivity reaction, and increases in serum aminotransferase and biliary fistulae, while cyst recurrence and dissemination of cyst contents may appear in the long-term.<sup>8</sup>

The risk of anaphylactic reactions resulting from percutaneous treatment of echinococcal cysts has been found to be lower than that following administration of certain antibiotics, and the fear of anaphylactic shock is no longer justified as an argument to avoid this therapeutic option.<sup>14,15</sup>

Percutaneous management of peritoneal echinococcus presents several limitations when employed as the only therapeutic option. Our case aims to highlight the use of percutaneous evacuation as a bridge to surgery in patients in whom fitness for surgery needs to be optimized. Our choice of an initial percutaneous approach was premised on the urgency of the treatment of the intestinal obstruction rather than the peritoneal echinococcus itself. Surgery was later performed in improved conditions to allow for optimal results postoperatively.

## CONCLUSION

Hydatid intestinal obstruction is a rare form of manifestation of hydatid disease. In selected patients who have an altered hemodynamic and general state of health and cannot tolerate emergent surgery, percutaneous evacuation can be considered as a bridge to surgery for better preoperative preparation successful surgical management and optimal results.

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