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Case Report

Minimal Invasive Treatment of Abdominal Multiorgan Echinococcosis

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Hydatid disease is a severe zoonosis, exerting a high economic and social impact through its numerous complications, leading to disabilities, even death. Because of technical developments, especially the increasing experience of surgeons, laparoscopic surgery has been extended so that it can be successfully applied to abdominal hydatid cysts. We present the case of a 16-year-old patient who came to our clinic for upper abdominal pain. The abdominal ultrasonography and computed tomography (CT) showed 2 cyst-like tumors, with hydatid features: one affecting the eighth liver segment and the other located at the upper pole of the spleen. We performed the surgical intervention using a laparoscopic approach, with an uneventful postoperative follow-up and the patient was discharged home on postoperative day 4. The postoperative images at 6 and 12 months showed a decrease in size of the remnant cystic cavities.

Key words: Hydatid cyst – Laparoscopic treatment – Abdominal echinococcosis – Partial pericystectomy

Echinococcosis or hydatid disease is a severe parasitic disease that affects both humans and animals, having the tapeworms of the genus *Taenia echinococcus* as etiologic agents. It has a wide range, but occurs especially in regions where farming is the main occupation.[1]

The definitive host is usually the dog or other canines. The usual intermediate hosts (sheep or goat) contract the infection when ingested eggs liberate their larvae in their duodenum. Humans become an accidental intermediate host through direct contact with the final hosts of the parasite or by ingesting contaminated food. The most commonly affected organs are the liver (70%), the lung (15%–20%), the spleen (3%–8%), and the kidney (2%–4%), although hydatid cysts have been found in all human body organs, including the striated muscle, central nervous system, thyroid, pancreas, heart, retroperitoneum, and even the subcutaneous tissue.[2]

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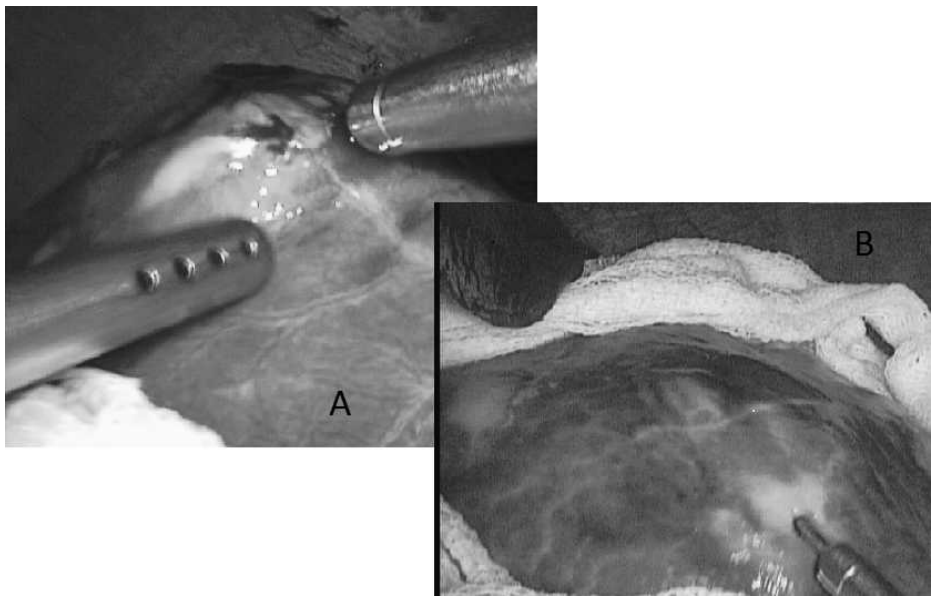

Fig. 1 Puncture and parasite inactivation. (A) Hepatic hydatid cyst; (B) splenic hydatid cyst.

Without treatment, the cysts grow in size and eventually cause complications. Only in exceptional circumstances, spontaneous healing can occur through the parasite's death and calcification. For these reasons, once diagnosed, the hydatid disease must be treated.

Case Report

A 16-year-old female patient from the rural area, without significant pathologic or heredo-collateral medical history, came to the ambulatory care unit complaining of abdominal pain in the epigastrium and left hypochondrium, accompanied by fatigue and low tolerance to effort.

The patient was in good general condition. The abdomen was slightly sensitive to deep palpation in the left hypochondrium, without muscular defense areas or signs of peritoneal irritation.

Laboratory tests revealed the presence of a mild eosinophilia (eosinophils, 5.1%); the other biochemical tests had normal values. Anti-Echinococcus antibodies showed a higher level than normal.

Abdominal ultrasound revealed a corticalized, 70 $\times$ 65 mm, cystic tumor at the level of the eighth liver segment, with a 3-mm echogenic membrane. The spleen showed another 85 $\times$ 85 mm, cystic tumor with a 3-mm hyperechogenic membrane. Another ultrasound of the abdominal viscera revealed normal relations. Pulmonary radiography also displayed normal relations.

Based on clinical and paraclinical data, the case was interpreted as multiorgan abdominal echinococcosis (liver and spleen) and resulted in the necessity of an initial drug treatment with albendazole (Zentel) at a dosage of 10 mg/kg body weight/day in two doses, adminstered after meals, for 5 days, followed by surgery.

The surgical procedure chosen for treating both lesions after the inactivation and removal of the parasite was the same: laparoscopic partial pericystectomy. The splenic cyst was treated first.

Any adhesion between the cysts and neighboring organs was lysed and the hydatid lesions were isolated from the rest of the peritoneal cavity by wicks soaked in 20% hypertonic saline solution. The tip of a puncture cannula was pushed inside the cystic cavity and a 20% hypertonic saline solution was injected (Fig. 1). Another vacuum cannula, inserted through the other working trocar, was maintained in the vicinity of the puncture point to prevent any hydatid spillage. After 5 minutes the hydatid content was aspired. Starting from the puncture site, a cystotomy was undertaken and the germinal membrane (Fig. 2) with the soaked wicks and the sectioned pericyst were extracted in a plastic bag (endobag). Lagrot partial pericystectomy (using ForceTriad^{TM} forceps - Valleylab, Boulder, Colorado) was performed as treatment of the residual

Fig. 2 The germinal membrane is extracted and placed into a plastic bag (endobag)

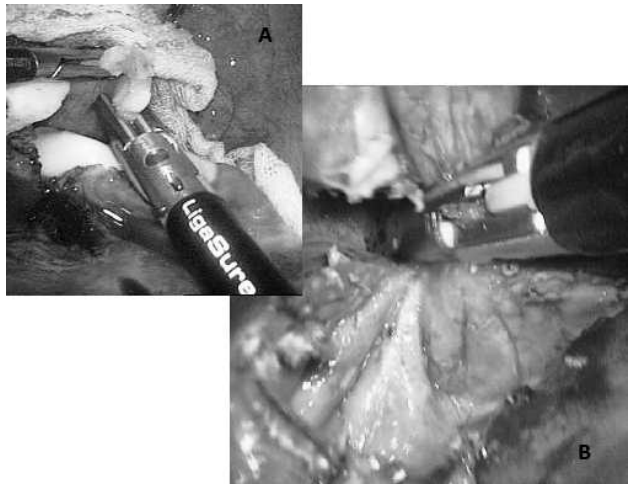

Fig. 3 Treatment of the residual cavity (Lagrot pericystectomy). (A) Splenic hydatid cyst. (B) Hepatic hydatid cyst.

cavity (Fig. 3). Drainage of the remaining cavities (liver and spleen) was done at the end of the laparoscopic surgery.

The histopathologic examination of the collected surgical material supports the diagnosis of hepatic and splenic hydatid cysts.

Postoperative course was uneventful, resulting in the resumption of bowel movements on the first day after surgery, and in the removal of the drainage tubes the third and fourth day after surgery, when the patient was discharged. The treatment with albendazole (Zentel) was continued from the first day after the surgery. The administered albendazole dose was of 10 mg/kg body weight/day in two doses, administered after meals, for 4 weeks (3 therapeutic cycles with a break of 2 weeks). Postoperative follow-up (performed at 3, 6, and 12 months after surgery) consisted of clinical examination, laboratory tests (liver tests and complete blood count), abdominal ultrasound/contrast-enhanced abdominal computed tomography (CT), chest radiography, and anti-echinococcus IgG determination (only once, 1 year after the surgery). Laboratory tests showed normal values in all examinations, and abdominal ultrasound and CT showed the reduction in size of both residual cavities. There was no recurrence of hydatid disease.

Discussion

The management of disseminated hydatid disease is complex and requires a multidisciplinary approach.[3,4]

Surgery is still a rule in healing hydatid disease. When possible, surgical removal of all hydatid cysts in a single procedure is most desirable.[3,5] Surgical treatment of abdominal multiorgan hydatidosis may be conventional or laparoscopic. Currently, the laparoscopic treatment of abdominal hydatid disease is considered to be a feasible and safe measure in selected patients, with low morbidity and mortality, obeying the principles of open surgery and benefiting from the advantages of minimally invasive surgery: comfort after surgery, minimal pain, short hospitalization, rapid social reintegration.[6,7] The increased risk of intraperitoneal dissemination is considered to be the great drawback of the laparoscopic approach.[8] This would be determined by the impossibility of correctly isolating the peritoneal cavity and by the presence of the pneumoperitoneum. The moment of puncture represents the maximum vulnerability period.

We believe that the precautions we have taken by isolating the pericyst with wicks soaked in scolicidal solutions, continuously maintaining a vacuum in the vicinity of the puncture site, inactivating and aspirating the hydatid content with the same vacuum, without ripping it from the puncture site, as well as evacuating the germinal membrane in a plastic bag (endobag), are no less important than the safety measures taken in conventional surgery.

Another advantage of the laparoscopic treatment is that the laparoscope can be inserted inside the cystic cavity, allowing its inspection. The image of the pericystic cavity's interior displayed on monitors is actually 2 to 3 times larger than the actual size. If a biliocystic communication is observed, this can be approached by applying a clip or an X-shaped wire.

Also, remnants of the germinal membrane can be identified and removed, reducing the incidence of recurrence or suppurative complications.

Our case is also remarkable because it presents multiple abdominal lesions (liver and spleen), but does not show pulmonary involvement.

Choosing the optimal surgical procedure for the treatment of liver hydatidosis depends on the location and size of cyst, the presence or absence of complications (including biliary ones), and the surgeon's experience.

Regarding the surgical treatment of splenic hydatidosis, most investigators agree with the use of conservative surgery of the spleen rather than splenectomy.[9–12]

We believe that laparoscopic surgery used for the treatment of abdominal hydatid cysts (splenic or hepatic) should not be regarded as a new surgical technique but rather as a means of a minimally invasive approach (with all its benefits) of a popular surgical technique.[13] As with other surgical interventions, laparoscopic treatment of abdominal hydatidosis complies with the conventional tempo of the surgical intervention.

Although albendazole is mainly used in treatment of inoperable cysts, there is evidence suggesting that the drug can decrease the recurrence of disease.[14] Because of the high rate of recurrent hydatid disease after treatment with only surgery or with only albendazole, we strongly recommend the multidisciplinary approach (treatment with albendazole, both preoperatively [7–10 days] and postoperatively [3 cycles]). Other investigators share the same beliefs,[3,4,14,15]

We used 20% hypertonic saline solution as the scolicidal agent for parasite inactivation (for both liver and spleen) and isolation of the peritoneal cavity, being recommended by most investigators.[6,12,16]

The therapeutic solution for multiorgan hydatid cysts is complex and requires a multidisciplinary approach. The laparoscopic treatment of the hepatic and splenic echinococcosis, with the well-known advantages of minimally invasive surgery, offers a viable alternative to conventional surgery in the treatment of abdominal hydatid cysts, worthy to be considered when appropriate. The advantages are perfect visibility of the lesion and of the perilesional structures, better detection of the intracavitary biliary fistulas, minimal postoperative pain, lower incidence of wound infection, and a short hospitalization period and superior aesthetic results.

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