

Case Report

Minimally Invasive Treatment of Hepatic Hydatid Cysts in Children

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Abstract

Hydatid cyst is a parasitic disease caused by the tapeworm *Echinococcus granulosus*. This disease is endemic in the countries around Mediterranean basin and many other areas of the world. The most frequently involved organs are the liver and lungs. The aim of this work is to present 4 cases of liver hydatid cyst in 3 children, treated by laparoscopy. This report shows that laparoscopic surgery may be used safely for liver hydatid cysts.

The Laparoscopic open access is achieved at umbilicus by a 10 mm trocar. Carbon dioxide pneumoperitoneum pressure is maintained to 10 mm Hg. Two or three other 5 mm trocars are introduced in the right, left hypochondrium and epigastric region. The cyst is protected by pads filled with hypertonic saline solution 10%. After we proceed to a puncture aspiration of the cyst, sterilization by injection of hypertonic saline solution during 15 minutes, then respiration with veress needle. The cyst is opened and the proligerous membrane is removed. The last step is the resection of the dome and the search for biliary fistula. Patients were discharged from the hospital on 2 or 3rd postoperative day. Post-operatively, the patients were put on albendazole (10 mg/kg) for one month.

Laparoscopy represents an excellent approach for treating hydatid cyst of the liver in children by respecting the good indications.

Keywords: Laparoscopy; Hydatid cyst; Liver; Children

Introduction

Hydatid cyst is a parasitic disease caused by the tapeworm *Echinococcus granulosus*. This disease is endemic in the countries around Mediterranean basin and many other areas of the world. The most frequently involved organs are the liver and lungs [1].

Different therapeutic methods have been suggested to deal with this disease including medication (Albendazole), Percutaneous Aspiration (PAIR), open surgery, and laparoscopic surgery.

Laparoscopic surgery was first applied to a Liver Hydatid Cyst (LHC) in 1993. This minimally invasive approach obeys the same rules as conventional surgery, the surgeon must perform the same surgical gestures as he is used to conventional surgery [2]. Laparoscopic surgery of LHC remains controversial and few study's have been published [3,4].

The aim of this work is to present 4 cases of liver hydatid cyst in 3 children, treated by laparoscopy. This report shows that laparoscopic surgery may be used safely for liver hydatid cysts.

Case 1

A 8-year-old child, was admitted to our department for treatment of a voluminous liver hydatid cyst (Figure 1). The patient underwent

chest x-ray, abdominal ultrasound, and thoracoabdominal CT, which concluded to a left lobe liver hydatid cyst (Figure 2). The Laparoscopic open access was done through umbilicus by a 10 mm trocar. Carbon dioxide pneumoperitoneum pressure is maintained to 10 mm Hg. Two other 5 mm trocars are introduced in the right and left hypochondriums. A 0° laparoscope is then used (Figure 3). The cyst is protected by sterile clean pads filled with hypertonic saline solution 10%. Then we proceeded to a puncture aspiration of the cyst, sterilization by injection of hypertonic saline solution during 15 minutes, then respiration with veress needle (Figure 3-5). The cyst is opened with a coagulator hook and the proligerous membrane is removed and put in a bag (Figure 6). The last step is the resection of the dome and the search for biliary fistula. We drained the residual cavity (Figure 7). The pads were moved. The postoperative course was simple, the redon drain was removed on day 2 and the patient was discharged from the hospital on the third day after surgery (Figure 8). The histopathological examination confirmed the diagnosis of hydatid cyst of the liver. Post-operatively, the patient was put on Albendazole 10 mg/kg/day for one month, the patient was disease free after a 2-year follow-up.

Case 2

A 4-year-old girl, with a history of left pulmonary hydatid cyst treated by thoracoscopy 2 months ago, was admitted to our department for treatment of a liver hydatid cyst. Computed tomography of the abdomen showed a 76 mm lesion at segment 7 and 8 of liver (Figure 5). Four trocars are used a 10 mm trocar at umbilicus, two other 5 mm trocars in the right and left hypochondrium and a 5 mm trocar in the epigastric region. Carbon dioxide pneumoperitoneum pressure is maintained to 8 mm Hg. A 0° laparoscope is then used. We instilled the abdominal cavity with hypertonic saline solution 10%. Then we proceeded to a puncture aspiration of the cyst, sterilization by injection of hypertonic saline solution during 15 minutes, then

Citation: Adjerid R, Norredine O, Foudil S, Mokhtaria A, Maroine F, Mohamed D, et al. Minimally Invasive Treatment of Hepatic Hydatid Cysts in Children. *Int J Minim Access Surg.* 2020;1(1):1006.

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Publisher Name: Medtext Publications LLC

Manuscript compiled: June 04th, 2020

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Figure 1: Epigastric mass.

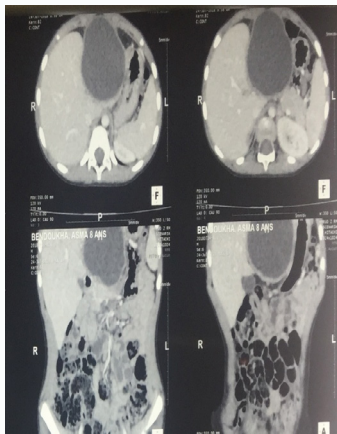


Figure 2: CT; left lobe liver hydatid cyst.

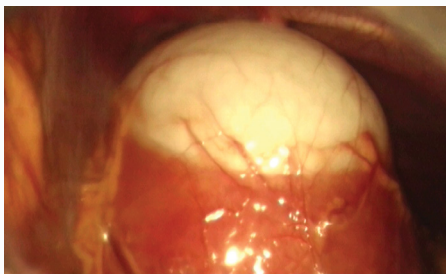


Figure 3: Liver hydatid cyst.



Figure 4: Puncture aspiration of the cyst external view.

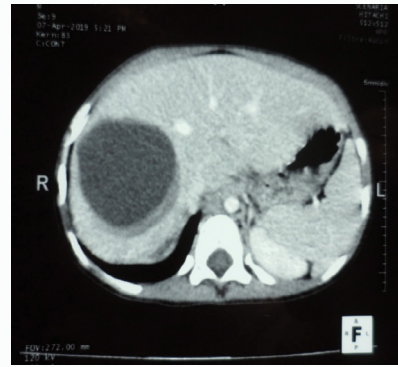


Figure 5: CT; 76 mm hydatid cyst of liver.



Figure 6: Puncture aspiration of the cyst internal view.

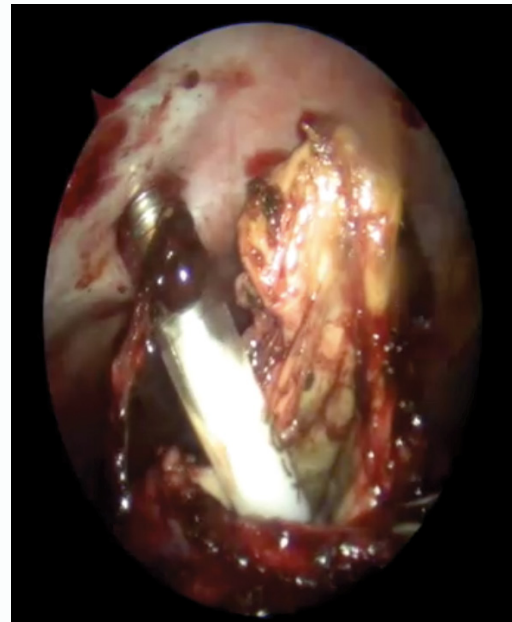


Figure 7: Aspiration of proligerous membrane.

respiration with veress needle (Figure 6). The cyst is opened with a coagulator hook and the proligerous membrane is aspirated (Figure 7). After resection of the dome and the search for biliary fistula. We drained the residual cavity. The postoperative course was simple, the

redon drain was removed on day 1 and the patient was discharged from the hospital on the second day after surgery. Post-operatively, the patient was put on Albendazole 10 mg/kg/day for one month.

Case 3

A 14-year-old girl, presented with history of abdominal pain of 6 months duration, abdominal ultrasound showed two liver lesions; a 77 mm × 54 mm cyst at segment 4 and a 78 mm × 67 mm cyst at segment 7 (Figure 8). Serological test for hydatid disease was positive 1/2560, the patient was treated by laparoscopy, and a 0° laparoscope is then used. We instilled the abdominal cavity with hypertonic saline solution 10%. Then we treated the cysts one after the other using the same steps technique “puncture aspiration of the cysts, sterilization by injection of hypertonic saline solution during 15 minutes, then respiration with veress needle” (Figure 9). The proligerous membranes were removed with endobag® (Figure 10). After resection of the dome and the search for biliary fistula. We drained the residual cavities. The patient was discharged from the hospital on the second day after surgery. Post-operatively, the patient was put on Albendazole 10 mg/kg/day for one month.

Discussion

Surgery remains the treatment of liver hydatid cyst, alone or in combination with chemotherapy (Albendazole). The first minimally invasive approach is radiological, and represented by the PAIR technique (Puncture, Aspiration, Injection and Reinjection). 39% of patients who have a type 1 hydatid cyst can be safely managed by this technique according to WHO recommendations [5].

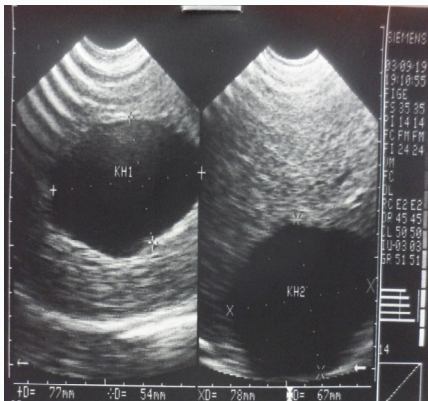


Figure 8: Liver lesions; a 77 mm × 54 mm cyst at segment 4 and a 78 mm × 67 mm cyst at segment 7.

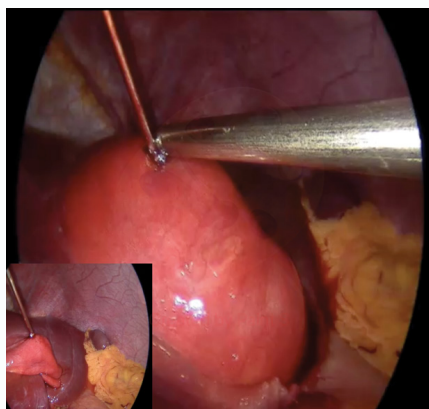


Figure 9: PAIR with veress needle.

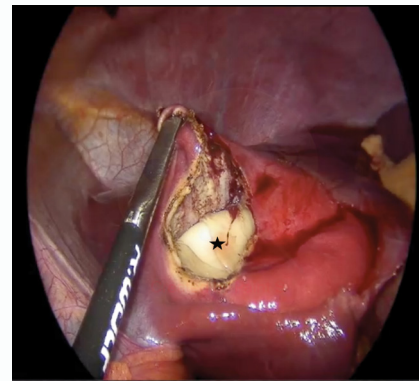


Figure 10: Proligerous membrane*.

PAIR technique under radiological guidance has been advocated as an alternative to surgical intervention. However cyst puncture carries the risk of spillage, which may be uncontrolled due to the percutaneous nature of the procedure, leading to the spread of the disease, an anaphylactic shock, and leaving the proligerous membrane in place [3,6,7].

Nowadays, considering the advances in the new methods developed for the surgical treatment of liver echinococcosis, laparoscopy is one such newly developed procedure presented in the world. Laparoscopy is performed by evacuating hydatid fluid and using scolicidal agents with soaked scolicidal gauzes or by performing pericystectomy, biliary opening closure and introduction of the endoscope into the cyst cavity for inspection and to make sure that no daughter cysts or laminated membranes were overlooked [8]. The advantages of laparoscopic surgery of liver hydatid cyst are good cosmetic results and rapid recovery. However, correct indications and rigorous surgical technique are required to avoid the complications of this surgery [9]. Laparoscopic treatment of liver hydatid cyst has long been discussed because of the risk of spillage of hydatid fluid. In open surgery secondary peritoneal hydatidosis occurs in 5% to 14% of cases by echinococcal leakage fluid but in laparoscopic surgery this hydatid fluid leakage rate reported is 11.7%. The recurrence rate after open surgery for hydatid cysts ranges from 0% to 30%, in contrast to 0% to 9% in laparoscopic studies. A rate of conversion of 1.7% has been reported in the literature case studies. Although open surgery is commonly performed for uncomplicated and complicated liver hydatid cysts, laparoscopy is mostly used for uncomplicated, peripherally and anteriorly located small liver hydatid cysts [3,10].

Conclusion

Laparoscopy represents an excellent approach for treating hydatid cyst of the liver in children by respecting the good indications. Thus, the interest of doing prospective studies to establish the advantages of laparoscopic surgery in the treatment of hydatid liver disease.

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