

Laparoscopic Management of Hydatid Cyst in Children

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Abstract

Hydatidosis is a zoonosis produced by the larval stage of *Echinococcus granulosus*, with an endemic distribution, mainly in the rural areas. Frequently it is localized in the liver (60%) or in the lungs (30%), with most of the patients being asymptomatic. The positive diagnosis is based on ultrasonography, CT or MRI scans, as well as immunological studies (ELISA). The management of hydatidosis includes medical treatment with Albendazole in association with surgical treatment, which may be achieved by open surgery or laparoscopic approach. We present the case of a 5 year-old patient, who was admitted to hospital for recurrent episodes of epistaxis, shortness of breath and abdominal fullness and was diagnosed with hepatic and pulmonary hydatidosis. We decided to perform a laparoscopic Lagrot pericystectomy and postoperative medical treatment with Albendazole, with favorable outcome.

Keywords: Hydatid cyst; Echinococcosis; Liver; Surgical resection; Laparoscopy; Pericystectomy

Background

Hydatidosis is a zoonosis produced by the larval stage of *Echinococcus granulosus*, with an endemic distribution, mainly in the rural areas [1]. Frequently it is localized in the liver (60%) or in the lungs (30%), with most of the patients being asymptomatic [2]. The positive diagnosis is based on ultrasonography, CT or MRI scans, as well as immunological studies (ELISA) [2,3].

The management of hydatidosis includes medical treatment with Albendazole in association with surgical treatment. Surgical procedures vary from puncture-aspiration-injection-reaspiration (PAIR) to partial resection and they can be divided into conservative or radical surgeries [2]. When talking about the conservative procedure (Lagrot pericystectomy) the hepatic parenchyma is not damaged and the pericystic cavity is saved or partially removed, whereas in the radical procedure the pericystic membrane is removed along with a portion of the hepatic tissue. Surgical treatment may be achieved by open surgery or laparoscopic approach [4,5].

We present the case of a 5 year-old patient, diagnosed with hepatic and pulmonary hydatidosis, in which we decided to perform a laparoscopic Lagrot pericystectomy.

Case Report

We report the case of a 5 year-old patient, who was admitted to hospital for recurrent episodes of epistaxis, shortness of breath and abdominal fullness. The chest X-ray showed a round opacity over the left diaphragm, with congestion of the parenchyma around the hilum. The thoracic CT revealed an 18mm image in the left inferior pulmonary lobe and it accidentally revealed a hypodense image in the left hepatic lobe (Figure 1). Laboratory exams show moderate leukocytosis with eosinophilia, and normal inflammatory markers.

The patient was then referred to our clinic. The preoperative abdominal ultrasonography showed a liver with compact structure, echogenic and normal size, right lobe of 11 cm, caudate lobe of 2 cm and left lobe of 6.5cm. In the left lobe, under the diaphragm, the ultrasound revealed a round image, with well-defined borders, transonic, with laminated membranes on the inside, measuring 4.5×2.4×2.7cm, localized between segment 2 and 3 of the liver, avascular on Doppler exam. Chest X-ray revealed a cystic mass in the left inferior pulmonary lobe (Figure 2). Treatment with Albendazole and antibiotic (Ceftriaxone) was initiated before surgery.

We decided to proceed with a laparoscopic approach, inserting the optic trocar at the umbilicus (5 mm) and 3 work trocars: one in the right upper quadrant (5 mm), one in the epigastrium (5 mm) and one in the left upper quadrant (10 mm). Intraoperative, a cystic mass measuring 6×4 cm could be observed between segment 2 and segment 3 of the left hepatic lobe. Hypertonic sodium chloride was injected in the cyst 3 times and then the content was aspirated. Afterwards the cyst was incised and the laminated membrane was extracted with the help of an Endobag. The need for a partial cystectomy with sub hepatic drainage was due to the proximity between the posterior wall of the cyst and segment 2 of the left lobe of the liver. On postoperative day 4 the peritoneal drainage was removed.

Due to the small size of the pulmonary hydatid cyst, we decided not to remove it and to continue medical treatment with Albendazole. Postoperative evolution was favorable; the patient being discharged on day 5 after surgery. Follow-up ultrasonography studies showed right and left liver lobes with normal structure, no lesions, and the chest X-ray revealed the decrease of the left pulmonary opacity (Figure 3).

Discussions

Hydatidosis is a zoonosis produced by the larval stage of *Echinococcus granulosus*, its symptoms depending on the affected organ: liver (60%), lung (30%), bones or brain [2]. Most patients are asymptomatic; symptoms usually appear when the cyst ruptures. However, some may present abdominal pain in the right upper quadrant or epigastrium, nausea, vomiting, fever [6]. Hepatic hydatidosis may lead, after the rupture of the cyst, to peritoneal or biliary dissemination and anaphylactic shock [5]. Bacterial infection of the cyst can lead to hepatic abscess, cholestasis, portal hypertension or Budd-Chiari syndrome.

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Received November 18, 2014; Accepted December 20, 2015; Published December 27, 2015

Citation: Bălănescu RN, Topor L, Moga A. Laparoscopic Management of Hydatid Cyst in Children. Journal of Surgery [Jurnalul de chirurgie]. 2015; 11(4): 173-175 DOI:10.7438/1584-9341-11-4-11

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Figure 1: CT exam showing a hypodense image in the left hepatic lobe.



Figure 2: Cystic mass in the left inferior pulmonary lobe.

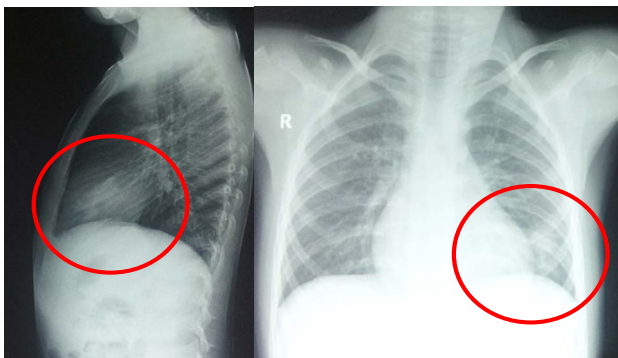


Figure 3: Chest x-ray 1 month after surgery showing a decrease of the left pulmonary opacity.

Laboratory data reveal eosinophilia, with otherwise normal blood cell counts. Positive diagnosis usually is established based on imagistic investigations (abdominal ultrasonography, abdominal CT), confirmed by serological tests: specific antibodies (90% sensitivity) [1-3].

Choosing the type of treatment depends on each case. Using only medical treatment is controversial, this option being reserved for disseminated hydatidosis or when the patient has a surgical contraindication; otherwise, treatment consists of Albendazole associated with the surgical removal of the cyst. The purpose of the surgical treatment is to excise the components of the cyst, prevent peritoneal dissemination of scolices during the intervention, and resolve the communication between the cyst and adjacent structures

and the management of the remaining cavity. Surgical treatment possibilities vary from puncture-aspiration-injection-reaspiration (PAIR) to surgical radical procedures consisting in complete removal of the cyst and hepatectomy [2,4,5].

The purpose of conservative surgery is to sterilize and evacuate the content of the cyst, including the hydatid membrane, by puncture of the cyst, followed by aspiration of the entire content and partial resection of the cyst. After the partial resection, bacterial infection may appear. The purpose of radical surgery is to ablate the entire cyst, with or without hepatectomy. However, in this case the intraoperative risks and postoperative complications are higher.

Laparoscopy was not accepted immediately or used in the treatment of hepatic hydatidosis, due to the concerns of some authors who considered that the rate of recurrence and risk of intraoperative dissemination is much higher than in open surgery [7]. However, many studies have proved that the short term recurrence rate for laparoscopic intervention is low (1-9%), compared to that of open surgery (0-30%) [8,9].

Rapid development of laparoscopic techniques encouraged adapting the procedures used during open surgery to minimally invasive approach. Minimally invasive surgery has become an advantage in the case of hydatid hepatic pathology, due to the good view over the cystic cavity, the possibility to observe and resolve a biliary fistula with the help of clips, bipolar clamp or harmonic device, allows identifying and removing the rests of the germinal membrane, therefore reducing the recurrence risk and the infectious complications [10].

Numerous laparoscopic techniques were described: complete pericystectomy (used in the case of small cysts with a superficial localization), puncture aspiration followed by marsupialization and omentoplasty, cystectomy and hepatectomy (used in case of large cysts, deep localization) [1,8].

Contraindications for laparoscopic treatment of the hydatid cyst are: rupture of the cyst in the biliary duct, cyst localized in segments 7 and 1 of the liver, cysts measuring more than 15cm, a large number of cysts or cysts with thick or calcified walls [11,12].

Postoperative morbidity associated to laparoscopy varies in the literature from 8 to 25% and includes biliary fistula, infection, fluid buildup around the liver [9], and the recurrence rate after open surgery is between 0-30%, whilst in the case of laparoscopy is 1-9% [8].

The difficulty of laparoscopic approach consists in extracting the cyst without rupturing the membranes and disseminating the cystic content, especially under the increased intraabdominal pressure induced by gas insufflation [9]. Even if the laparoscopic procedure takes longer than open surgery, postoperative recovery and hospital stay proved to be shorter in the first case [6].

Conclusions

Hydatidosis is a complex pathology, in which the treatment is chosen depending on the patient. Medical treatment is used as an adjuvant of the surgical treatment, whose purpose is to excise all the components of the cyst, preventing peritoneal dissemination. Laparoscopic approach allows a better perspective regarding the treatment of hepatic cystic pathology, permitting a good view over the cystic cavity, with the possibility of resolving an eventual biliary fistula, reducing the rate of complications and recurrence.

Conflict of interests

Authors have no conflict of interest to disclose.

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