Single hydatid cyst of liver managed with laparoscopy – a case study

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Abstract

Hydatid disease is not common in human populations of highly developed urban areas. However, increasing immigration, travel and international tourism have led to a recent increase in incidence. Surgery remains the method of choice in the management of hepatic hydatid cysts. Laparoscopic treatment of the disease has been questionable so far, though it is feasible and safe in use. We report a case of an 18-year-old woman, successfully treated with total cystectomy located in a favourable laparoscopic area – the border of the 3rd and 4th segment of the hepatic left lobe. The operation and hospitalization period were uncomplicated. Controlled follow-up laboratory and radiological tests showed no remaining pathology or recurrence in any form. In conclusion we state that the laparoscopic technique provides a feasible and efficacious option of treatment for some types of hydatid cysts located in the liver. It is a safe miniinvasive surgical approach which enables postoperative discomfort to be reduced and results in a quick recovery.

Key words: *laparoscopy, hydatid disease, liver cysts.*

Introduction

Hydatid disease was already known to the ancient Greeks. The Greek word "echinococcus" means "hedgehog berry". Hippocrates noted "livers full of water" for cases of echinococcosis. The zoonotic origin of this disease was suspected from the eighteenth century. The life cycle of *Echinococcus granulosus* was first described in 1855 by Haubner, who experimentally infected a domestic pig with the eggs of *Echinococcus granulosus* and demonstrated a fully developed hydatid cyst of the liver [1, 2]. Echinococcosis is endemic to many countries where flocks of sheep and cattle are raised with dogs. Such areas as South America, the Middle East, India, and Mediterranean countries are endangered. However, increasing immigration, travel and tourism all over the world result in the occurrence of echinococcosis cases even in highly developed countries. The most common sites of hydatid cysts in humans are as follows: liver (50-93%), lungs (18-35%), peritoneal cavity (10-16%), spleen (2-3%), kidney (1-4%), and retroperitoneum (0.5-1.5%) [3-5]. Most cysts of the liver are univesicular (62.5%) and single cysts occur most often in the right lobe (80.77%) of the organ, because of the specification for visceral venous confluence [6]. Many hydatid cysts remain asymptomatic. Most symptomatic cysts are larger than 5 cm in diameter. Abdominal pain is the commonest mode of presentation. Other clinical features are hepatomegaly, jaundice, biliary colic, urticaria, malaise, abdominal lump, fever, anorexia, and cough [7]. Because there is no reliable pharmaceutical treatment, surgery constitutes the main way of intervention for liver hydatid disease.

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The main goal is to resect the cyst without spilling the contents. Progress in recent years in management of liver cystic diseases enables laparoscopy to be implemented [8] as a safe surgical technique for these cases. There are reports on new trocar-cannula systems developed for management of liver echinococcal cysts, such as the Palanivelu Hydatid System (PHS) [7], especially designated to prevent spillage of hydatid fluid during surgical manoeuvres.

Case report

We report a case of an 18-year-old woman infected with *Echinococcus* sp. The patient was treated with albendazole 500 mg per day (10 mg/kg/day) for 2 weeks preoperatively. At hospital admission the patient complained of a dull pain at the right hypochondrium and episodes of nausea and dyspepsia beginning 4 months earlier. Right abdominal tenderness without any rebound symptoms was noted during palpation. There was no right upper quadrant swelling visible in abdominal examination. Results of standard laboratory tests were normal. Higher leucocytosis and eosinophilia were absent. Levels of neoplastic markers (AFP, CEA, CA 19-9, chromogranin A) were within the proper range. Echinococcal enzyme linked immunosorbent assay IgG probe was negative. Ultrasonography and computed tomography (Figure 1) revealed a cyst in the left lobe (segments 3 and 4) measuring 52 × 41 × 42 mm with a highly hydatid index of suspicion classified as Gharbi type I. However, there was a slight radiological suggestion to differentiate it from a gastrointestinal stromal tumour (GIST). Additionally a positron emission tomography-computed tomography (PET-CT) imaging study was performed and confirmed the presence of a single, solid cyst in the hepatic left lobe without any 18F-FDG uptake. Because of the convenient location and size of the pathology, the patient was decided to undergo laparoscopic management under general anaesthesia. The operational technique was based on the principles for surgical treatment of hepatic hydatidosis. The camera port was introduced supra-umblically. Following creation of the pneumoperitoneum, with the pressure value at 12 mmHg, the hydatid cyst was identified at the frontier of the 3rd and 4th segment of the hepatic left lobe (Figure 2). The right hand working port (10 mm) and left hand working port were inserted in the epigastric region and right hypochondrium respectively. The operative field was isolated with laparoscopic gauze packs, soaked in 30% saline to prevent infestation flooding of the peritoneal cavity. Next we punctured the cyst and aspirated the internal fluid. Then the injection of scolicidal agent – 30% saline – into the cyst cavity was performed. After 10 min the agent was aspirated and total cystectomy was performed using a harmonic knife (Figure 3). The cyst was removed in the laparoscopic sac. The hepatic parenchyma was ligated and stapled

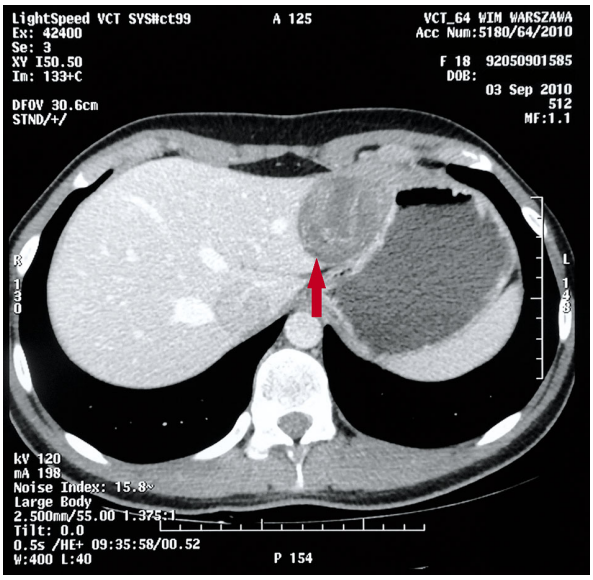

Figure 1. 18-year-old patient's axial computed tomography scans of the liver. Arrow indicates the hydatid cyst (diameter 52 mm × 41 mm × 42 mm) located in the left lobe

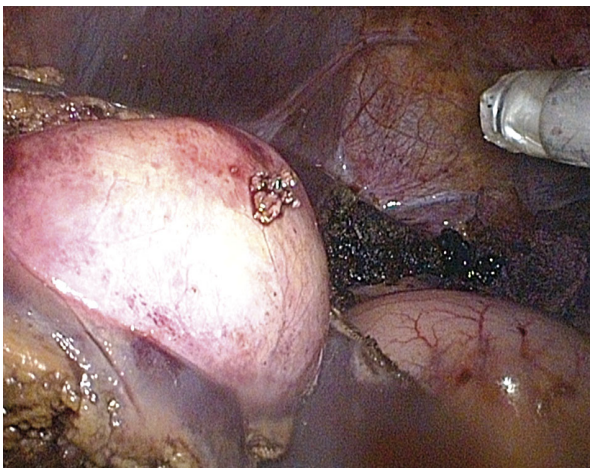

Figure 2. View of the hydatid cyst located in the 3rd and 4th segment of the left liver lobe

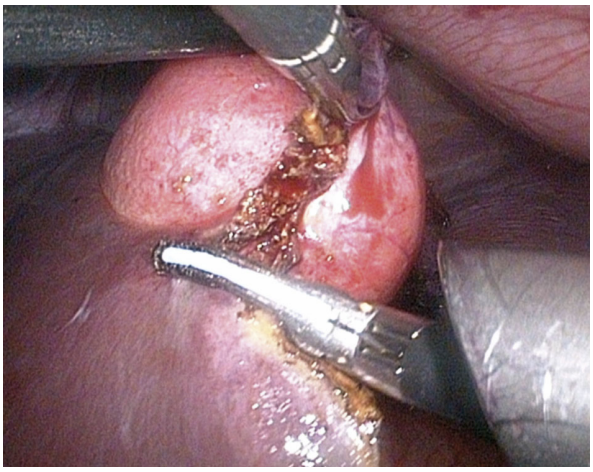

Figure 3. Total cystectomy using the laparoscopic harmonic knife

using laparoscopic clips to prevent bleeding. There was no necessity to fill the remaining cavity because of the marginal localization of the cyst in the left lobe and the absence of dead space. A prophylactic Redon drain was inserted through the left (5 mm) working trocar and placed in contact with the post-cystic cavity. Desufflation was done. The incisions were closed in layers. The postoperative follow-up period was smooth. Following controlled ultrasonography the drain was withdrawn on the third day after the operation. The patient was discharged on the fourth postoperative day. The histopathological results were formulated as *cystis parasitaria probabiliter echinococcica* and confirmed the preliminary diagnosis. The patient was postoperatively treated with albendazole 500 mg a day for 4 weeks. Controlled abdominal CT was performed one month after the surgery and did not reveal any remaining pathology or recurrence.

Discussion

Therapy of echinococcosis is still a complex problem. Using benzimidazole carbamates (albendazole in a dosage of 10-15 mg/kg body weight alone or in combination with praziquantel in a dose of 40 mg/kg body weight) is recommended for a standard pharmacological approach. Puncture, aspiration, injection, re-aspiration (PAIR) associated with aforesaid drugs is often reserved for uncomplicated hepatic echinococcosis. [9]. Yet surgery remains the mainstay of treatment for liver echinococcosis. The laparoscopic approach is still a controversial issue. One of the main concerns of the treating surgeons is spillage of cyst contents, which can lead to anaphylactic reactions or recurrence in various forms. The use of minimally invasive techniques in treatment of hepatic hydatid disease (HHD) began in the early 1990s when Khoury (1991) performed percutaneous drainage [10]. The first report of laparoscopic drainage of hepatic hydatid cysts (HHC) was published in 1992 by Saglam [11]. So far there have not been carried out any randomized clinical trials comparing laparoscopic *vs.* open surgical treatments. The treatment should be individualized to the location, number, size and morphology of the cysts. Generally, the exclusion criteria for laparoscopic procedures are as follows: multiple liver hydatid cysts (more than three); deep intraparenchymal cysts; cysts with a thick, calcified wall; posterior lesions situated in "a blind area" for laparoscopic procedures such as segments 1, 2 and 7 or close to the inferior vena cava; cysts characterized by a heterogeneous complex mass (CT Gharbi type 4); cysts less than 3 cm in diameter; suspicion of existing communication between cysts and/or biliary duct; and serious coagulation abnormalities [12]. Using laparoscopy is mostly suggested for alterations located in segments 3, 4, 5, 6, and 8 with no evidence of calcification, biliary communication or cyst infection. The first report of anaphylactic shock complicating laparoscopic treatment of hydatid cysts [13] strongly exaggerated the fear which seemed to discourage many surgeons from readily adopting minimally invasive techniques of management with liver echinococcal cysts [14]. Some reports note a 23% to 27% conversion rate and 4% to 25% morbidity rate after laparoscopy [15]. Laparoscopic surgery as well as the open technique follows the principles of treating hydatid cysts: to eliminate scolices by evacuation of contents without spillage, to sterilize the cavity with scolicidal agents, to check for any biliary communication and to obliterate the residual cavity [4]. There are many different laparoscopic techniques involved in hydatid disease surgery, including simple drainage, puncture and aspiration of contents with marsupialization, unroofing with omentoplasty and omentoplasty using helical fasteners, partial cystectomy or total pericystectomy, and anatomical hepatic resections (lobectomy or partial hepatectomy) [16]. However, any miniinvasive surgical option can be complicated by anaphylactic shock due to spillage of the contents of cysts during puncture manoeuvre, bleeding, bile leak from the residual cavity, biliary fistula or cholangitis. The risk of intra-operational spillage may

be reduced by using special hypobaric laparoscopic systems, generating the value of pneumoperitoneum pressure equal to the intracystic one (i.e. large cannula with large-bore suction catheter adhering to the liver by cyanoacrylate or fibrin glue, and perforator-grinder-aspirator apparatus) or by using PHS, following the principles of procedures reducing the peritoneal contamination risk [3, 4, 6, 7, 11, 16]. The PHS system has revolutionized the treatment of hydatid cysts because it either allows for safe evacuation of the fluid or enables intracystic magnified visualization for cyst biliary communications [7]. Postoperative biliary complications may be assisted with endoscopic retrograde cholangiopancreatography (ERCP) in postoperative management [17]. Endoscopic retrograde cholangiopancreatography [18] with sphincterotomy of the ampulla of Vater is especially suggested for cases with high-output external biliary fistulas (> 300 ml per day) of more than 1 week duration or with low-output fistulas of more than 3 weeks duration [19]. One of the main advantages of laparoscopic surgery is the offer of a lower morbidity outcome and shorter hospital stay [20]. This technique reduces postoperative pain and incidence of wound infection. It allows for early ambulation and a more aesthetic result. Unquestionably, the time range of hospitalization after laparoscopy has been reduced to 3-12 days according to the opinions of some authors [8]. Laparoscopy is associated with possible resolution of concomitant abdominal problems (simultaneous cholecystectomy, appendisectomy, ovarian cystectomy, etc.). Also it enables visual magnification to be implemented for better detection of small open bile ducts in the remaining cyst cavity. Following the procedure, it allows direct suturing or cauterization in the case of bile leaks. In our case study, we tried a safe and feasible method of puncture and aspiration of the cyst contents followed by total cystectomy and cauterization using the laparoscopic harmonic knife.

In summary, the laparoscopic technique provides a feasible and efficacious option of treatment for selected types of hydatid cysts located in the liver. It is a safe miniinvasive surgical approach which enables postoperative discomfort to be reduced and results in quick patient recovery.

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