



Laparoscopic pericystectomy for liver hydatid cysts

Description of results observed during a long follow-up period

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Abstract

Background: The laparoscopic approach for managing of liver echinococcosis is a controversial issue because of scarce experience worldwide. The aim of this report is to describe the technical details of our laparoscopic method and present our results.

Methods: Consecutive cases of liver echinococcosis managed by laparoscopic surgery are reported. Thoracic x-ray and abdominal ultrasound had been performed previously. The following aspects were considered as selection criteria: unique cyst located in segments III, IV, V, VI, and VIII; diameter less than 7 cm; and no evidence of infection or calcification. An evacuating puncture was performed, germinative membrane removed, and pericystectomy performed, which extirpated the pericystic structure with the surrounding liver parenchyma. Specimens were removed in a plastic bag through one of the ports. Surgical morbidity, hospital stay, time until return to work, and evidences of hydatid recurrence were measured.

Results: Surgery was performed on eight patients (5 women and 3 men) with a mean age of 44.9 years (range, 22–83 years) who had a liver hydatid cyst with a mean diameter of 6.6 cm (range, 5–7 cm). During a mean follow-up period of 30 months (range, 23–44 months), no morbidity or hydatid recurrence were verified. Hospital stay was 2 days in all cases, and return to work was within 15 days.

Conclusions: This laparoscopic technique, applied with selective criteria, can be a useful alternative for treating patients with liver hydatidosis because its results are comparable with those for open surgery studies involving similar follow-up time.

Key words: Echinococcosis — Liver hydatid cyst — Liver hydatidosis — Laparoscopic surgery

Hydatidosis still represents a public health problem in some developing countries where states must assume most of the costs related to patient studies and treatment. Hepatic location is the most common problem and still holds an important place in the surgical practice in some countries of South America.

Surgery remains the gold standard in terms of therapy for patients with echinococcosis despite significant economic costs, hospital stay advances in medical treatment, and interventional radiology [1, 24], which at this writing are described in no more than a few reports.

Laparoscopy, however, has demonstrated certain comparative advantages over traditional surgery with different but equivalent techniques [19]. The laparoscopic approach to liver echinococcosis may be a good territory for exploring and evaluating the virtues of minimally invasive surgery, especially if it can be made safer for patients, with lower recurrence, morbidity, and mortality rates.

Previous reports of laparoscopic surgery for liver hydatidosis exist in the literature, some of which are case reports [7, 9, 18, 20, 23, 25], some a series of fewer than 10 cases [4, 17, 21, 26], and others a series of more than 15 cases with early results [2, 3, 10, 22]. However, controversies about the role of laparoscopy in the management of liver hydatid cysts have not been resolved.

We developed a laparoscopic method for liver hydatid cyst treatment in 1996 [14]. that we have used routinely in open surgery [15]. The aim of this report is to present the laparoscopic approach used in our department to manage selected cases of liver hydatidosis in

an endemic area, and to describe our results, as measured during a mean follow-up period of almost 3 years.

Materials and methods

Design

This study prospectively and descriptively analyzed a series of patients with liver hydatidosis managed consecutively by laparoscopic surgery in the Department of Surgery at the Hospital Regional de Temuco, Chile, between October 1997 and July 1999.

Inclusion criteria

All patients with liver hydatidosis, regardless of age or gender, were considered initially, but the following cyst aspects were rigorously determined: unique cyst located in segments III, IV, V, and VIII; ultrasonographic diameter less than 7 cm, and no suspicion or evidence of biliary communications, cyst infection, or calcification [14].

Exclusion criteria

Previous upper abdominal surgery and advanced systemic diseases were considered. The following cyst characteristics were regarded as exclusion criteria: multiple liver hydatid cyst, evidences of cyst infection or abscess, cyst location near vascular liver elements, and cyst location in segments I, II, and VII. Cysts located in segment VI were considered on a case-by-case basis, depending on relations between cyst and diaphragm or retroperitoneum [14].

Study protocol

As in all cases treated by our surgeon research team, general routine and liver laboratory tests were performed. Also, specific serologic tests (specific immunoglobulin G and E), abdominal ultrasound, abdominal computer tomography, and thoracic x-ray were performed to determine basal medical status, verify cyst situation, and exclude other echinococcosis locations [12, 14, 15], after which patients underwent laparoscopic pericystectomy. As with the patients who underwent open surgery [12, 15], no laparoscopic patients received systemic preoperative scolical agents.

Surgical technique

Surgery was performed with the patients under general anesthesia and placed in supine position. The surgical procedure was performed by the American technique, with the surgeon on the left side of the patient, the assistant and the scrub nurse on the right side, and the camera assistant standing beside the surgeon. Working space was obtained with a pneumoperitoneum of 12 mmHg using carbon dioxide after a supraumbilical puncture with a Veress needle. Laparoscopic exploration was performed with a 0° laparoscope introduced via the umbilicus. Another 10-mm port was used at the epigastrium as a work channel, and two additional 5-mm ports were placed according to the location of the cyst. After the cyst was located, the operating field was isolated by surrounding the cyst with gauzes soaked in polyvinylpyrrolidone. The cyst fluid then was vacuumed and evacuated with a gross needle inserted percutaneously at the cyst pole. Scolical agents were not injected into the cyst [14].

Next, the germinative membrane was removed by direct suction with gross suction tubing through the epigastrium trocar or in a plastic bag. The cyst cavity was explored under direct view, with the camera inserted inside the cyst to exclude unsuspected biliary communications and other cyst structures. The cyst cavity was profusely irrigated with polyvinylpyrrolidone and finally cleaned with normal saline solution.

Pericystectomy was performed using electrical curved scissors and a hook, with the resection made through healthy liver parenchyma. A

pericystic lozenge was left in relation to cava or suprahepatic veins and/or liver pedicle. Finally, specimens were extirpated in a plastic bag by the epigastrium port. As in open surgery, no drainages of any type were used. [12, 15].

Follow-up protocol

All the patients were followed and controlled at months 1, 3, 6, 12, 24, and 36 with general laboratory analyses, specific serologic tests, and abdominal ultrasound intended to verify clinical evolution and prevent morbidity and recurrence.

Main outcome measures

Surgical morbidity, hospital stay, time until return to work, and evidence of hydatid recurrence were measured.

Results

During the study period, eight patients (3 men and 5 women) with a unique liver hydatid cyst, whose mean age was 44.9 years (range, 22–83 years), underwent surgery by a laparoscopic approach. All these patients generally had normally, hepatic laboratory parameters. As coexistent disease, gallstones, arterial hypertension, pregnancy, and lung hydatidosis were verified (Table 1).

Cysts with a mean diameter of 6.6 ± 0.7 cm. (range, 5–7 cm), were located at segments III, IV, V, and VIII (Table 1). Two patients had gallstones, so a complementary cholecystectomy was performed. In one patient with a segment III cyst, a biliary communication was verified during the laparoscopic cyst exploration, and an absorbable suture stitch was performed and finished with an external knot.

No evidence of anaphylaxis was detected, and no conversion to open procedures was required. The mean surgical time was 105 ± 35 min (range, 55–180 min). The hospital stay was 2 days in all cases, and work to return was within 15 days. During a mean follow-up period of 30 months (range, 23–44 months), no morbidity or hydatid recurrence was verified.

Discussion

Laparoscopic techniques previously reported for liver hydatidosis can be divided by a schematic point of view into two different groups: cyst resection [7, 9, 18, 22, 23, 26] and cyst evacuation (hydatid liquid, germinative membrane and/or vesicles) by simple suction with different and special devices [3, 20, 21, 25]. The evacuation method has certain risks such as hydatid dissemination and anaphylaxis (at the moment of the evacuating puncture), and problems derived from residual cavities may develop. In fact, some groups have reported a 23% and 27% conversion rate [2, 22], and a 4% to 25% morbidity rate [2, 21, 22]. However, although the case studies are few, good results have been reported with resective methods (complete and partial pericystectomy) [7, 9, 18, 22, 23, 26], probably because there was a better selection of cases.

Table 1. Liver hydatid disease treated by laparoscopy: clinical characteristics ($n = 8$)

Characteristic	Cases (n)	Frequency (%)
Coexistent diseases		
Lung hydatidosis	2	25.0
Gallstones	2	25.0
Arterial hypertension	1	12.5
Alcoholism	1	12.5
Pregnancy	1	12.5
No coexistent disease	1	12.5
Ultrasound pattern		
Ecolucid	6	75.0
Heterogeneous	2	25.0
Liver segment location		
III	1	12.5
IV	4	50.0
V	1	12.5
VIII	2	25.0

As we describe in the follow-up protocol, all the patients were followed with general laboratory analyses, specific serologic tests, and abdominal ultrasound to verify clinical evolution and prevent morbidity and recurrence. This ensures the validity of the reported results by verifying coexistent disease, gallstones, arterial hypertension, pregnancy, and lung hydatidosis. In cases of liver hydatidosis, the laparoscopic approach offers additional advantages in terms of lower morbidity, shorter hospital stay, faster surgery recuperation, and the possible resolution of concomitant abdominal surgery problems. In fact, two of our patients had gallstones, so a complementary cholecystectomy was performed.

In one patient with a segment III cyst, a biliary communication was verified during the laparoscopic cyst exploration. An absorbable suture stitch was performed and finished with an external knot. We think that laparoscopic treatment of biliary communications is not a necessarily complicated procedure because of the magnified direct view allowed by the laparoscope, which could be an advantage of laparoscopy over open surgery. Otherwise, we prefer not to include patients with the disorder previously diagnosed because the conversion rate will be higher, and even morbidity could be logically expected.

No evidence of anaphylaxis was detected. This serious complication is another hydatid surgery-related problem that must be considered with the laparoscopic approach. In this respect, we must mention that in another study protocol, which we are using now in relation to scolices survival [16], we have observed already that no more than 55% of Gharby cyst type 1 [6] has vital and infectious potential. On the other hand, hydatid sand, which has infectious parasite structures, goes to the bottom of cysts by gravity in only 30 minutes. The average time that surgeons require to puncture cysts after patients enter the operating room and are placed on the surgery table is at least 1 h. Thus, the real risks of spillage are lower than we think. Although allergic reactions are described in open surgery [5], the prevalence of allergic symptoms in patients with gross spillage such as traumatic cyst rupture are not excessively high (17% to 25%) [8], and of the approximately 250 patients who underwent laparoscopical treatment for liver hydatid

cyst, only one patient reportedly experienced anaphylactic shock during surgery [11].

We considered a mean surgical time of 105 min with a maximum value of 180 min (first patient) to be acceptable in terms of the following patient outcomes: absence of morbidity, short hospital stay, and prompt return to work. We applied laparoscopic pericystectomy to a small series of liver hydatid cysts. The technique was exactly the same as the one we used in open surgery on our patients. Only the approach was changed, giving the advantage of better visual control of the cyst cavity under magnification, which allowed the detection of small open bile ducts and remains of germinative and child vesicles.

With no conversions, no anaphylaxis or morbidity, and no recurrences verified during a long follow-up period, the favorable results with the laparoscopic approach may be comparable with those of open surgery, but only in very selected cases. If we look at other studies with a greater number of cases and poor selection criteria, not only can conversions be verified, but also some morbidity.

Probably only a prospective multicentric and randomized study can provide sufficient scientific evidence to clarify most of the controversies related to the real applicability of laparoscopy for hepatic hydatid disease. An economic study then would allow us to decide what to do and how to do it. In the meantime, we believe that until we have more adequate laparoscopic instruments for this type of surgery, it is important to select patients closely who will undergo laparoscopy, with the idea of offering our patients the highest degree of safety and the most useful techniques for the treatment of their problem. A good example of this may be old cysts with a fluid viscosity that probably will not allow appropriate suction of their contents, or cases with suspected cyst infection [13], in which conversion will be necessary and morbidity can be expected. For these reasons, we prefer to demonstrate our experience with a small number of cases that project excellent results. This permits us to maintain our position of offering this surgical technique only to certain patients.

Finally, we can say that the described technique constitutes a valid surgical alternative in patients whose liver echinococcosis is within the aforementioned rigorous selection criteria because it can offer short hospital stay, absence of recurrence and morbidity, and prompt return to work. It is possible that in a short time, with major technological development, engineering can provide better laparoscopic instruments that permit resection of greater or more complicated cysts and those located near major hepatic vessels or in blind laparoscopic areas. Currently, however, we believe we must act cautiously, exercising extremely rigor in the selection criteria and avoiding unnecessary risks for our patients.

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