

Laparoscopic Management for Hydatid Disease of Liver: Experience of Single Center

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ABSTRACT

Objectives: The objectives of this study were to investigate the characteristics and outcome of patients with hydatid disease of the liver who were laparoscopically managed at our clinic and to define technical details of the method.

Materials and methods: Between January 2011 and June 2012, 11 patients with hydatid disease of the liver were considered for laparoscopic surgery in our department. All the patients underwent to laparoscopic surgical interventions.

Results: In all patients, laparoscopic cystotomy, unroofing with laparoscopic cutting and sealing instruments for surgical dissection and omentoplasty were performed. No conversion to laparotomy was necessary. No radiological recurrences was observed in a mean follow-up of 11 months (range: 3-18 months).

Conclusion: Laparoscopy is quite feasible to perform in hydatid disease of the liver and, the use of laparoscopic cutting and sealing instruments allows effective dissection and partial cystectomy. Cyst size and grade is not restrict laparoscopic surgery for liver hydatid disease. Obliteration of the residual cystic cavity decreases postoperative complication rates, so an effective omentoplasty is essential especially for laparoscopic procedures. The use of helical fasteners allows effective omental flap fixation.

Keywords: Hydatid disease, Laparoscopy, Laparoscopic cutting and sealing instruments.

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Conflict of interest: In this study, we want to share our experience with you. We think that, laparoscopic management is practicable for liver hydatid disease in selected cases. But open technique is favored especially peripheral hospitals. We think surgeons can be more brave in this subject. Also about the technique, using laparoscopic cutting and sealing system and helical fastener is helpful.

INTRODUCTION

Echinococcus granulosus, a cestode that is commonly lodged in the liver, causes human hydatid disease. Several endemic regions exist; however, the disease may be observed anywhere in the world.¹ Surgery is the main modality of treatment, despite advances in medical and minimally invasive radiological therapies.² In the last decade, laparoscopic surgery has become apart of the discussion of this issue, and several studies have reported encouraging results.^{3,4} Whatever the technique, surgeons should focus on safe evacuation and sterilization of the cyst's cavity.

Herein, we report our series of patients with hydatid disease of the liver who underwent to laparoscopic surgery, including the use of laparoscopic cutting and sealing instruments for dissection and unroofing completed omentoplasty and fixation of the omentum with helical fasteners.

PATIENTS AND METHODS

Between January 2011 and June 2012, 11 patients (three male and eight female), mean age of 30 years (range: 14-58 years) with hydatid disease of the liver were considered for laparoscopic surgery at our department. Nine patients had single cysts, and two patients had two cysts. Six cysts were in the right lobe, and three were in the left. In the patients who had two, one cyst was in the right and the other in the left lobe. The mean diameter of the cysts was 11 cm (range: 4-22 cm). Diagnostic procedure was based on radiological examinations including computerized tomography (CT), ultrasonography (US), and specific serological examinations. Nevertheless, cysts that were diagnosed on ultrasonographic examination were also confirmed by tomographic studies. No evidence or suspicion of biliary rupture existed upon clinical findings and radiological studies (history of cholangitis or jaundice, evidence of dilatation of the biliary tree, or connection with the cyst). Serological test, such as indirect hemagglutination tests (IHA) and ELISA were positive in all patients. The patients who had evidence of biliary rupture, a history of recurrence, cysts deep or difficult to access in liver (central or posterior localizations), and cysts with calcified walls were not considered as candidates for laparoscopy.

OPERATIVE TECHNIQUE

All patients received general anesthesia. The urinary bladder was catheterized, a nasogastric tube was placed, and antibiotics were administered half an hour prior to the operation. The operation was performed in the lithotomy position. The first trocar was inserted at the umbilicus by open technique and insufflation for pneumoperitoneum. Thirty-degree laparoscope was used to visualize the peritoneal cavity. The operating surgeon stood between the patient's legs; the camera assistant managed the laparoscope from the left for right-sided cysts and from the right for left-sided cysts. Two additional 10 mm trocars were

inserted from the optimum points chosen during exploration. A 5 mm trocar was inserted from optimum points for using second aspirator too. The cyst then was punctured from the apex with a Veress needle and the cyst's fluid was aspirated as much as possible (Fig. 1). The cyst was refilled with 20% hypertonic saline, which is a potent scolical agent and left for 5 minutes. During this procedure, a 5 mm aspirator was placed beside the puncture point to prevent any fluid spillage into the peritoneal cavity. The cyst's content was reaspirated. Thereafter, Veress needle was extracted and puncture was enlarged with electrocautery for replace a 5 mm laparoscopic irrigation and sucking instrument. The cyst was refilled with 20% hypertonic saline and left 5 minutes. During this procedure, fluid spillage was prevented by second 5 mm aspirator (Fig. 2). The cyst's contents, including germinative membrane and daughter cysts, were aspirated. Irrigation with 20% saline was again performed. The superficial and visible part of the cystic wall was dissected with 10 mm laparoscopic cutting and sealing instrument (Ligasure Atlas™, Covidien, Norwalk, Connecticut, USA) and electrosurgical hook, and the specimen was removed from the abdominal cavity within an endobag (Fig. 3). The cystic cavity was then explored with a laparoscope to check whether any remnants of the cyst, biliary rupture, or hemorrhage were present. An adequate portion of greater omentum was pulled and inserted into the cyst's cavity. The omentum was fixed to the cut edges of the cyst wall with a helical fastener (Pro Tack, Autosuture, Norwalk, Connecticut, USA) (Fig. 4). The abdominal cavity was irrigated and aspirated with saline solution. Two drain was placed into the cyst's cavity and rectovesical process. A clear diet was allowed the next day. The drain was removed and the patient was discharged if no bile or ascites drainage were present. Albendazole was administered, 10 mg/kg/day, for a month preoperatively and for 3 months postoperatively, and an intermittent therapy regimen was planned as a 3-week course of drug therapy and 1 week of no treatment. Radiological controls with CT and US were performed in the 6 months, and then annually.

RESULTS

In all patients, laparoscopic cystotomy, partial cystectomy, and omentoplasty were performed. No conversion to laparotomy was necessary, and the procedures were accomplished uneventfully. The mean operation time was 80 minutes (range: 60-130 minutes). No perioperative or postoperative complication was seen.

The mean hospital stay was 6 days (range: 3-9 days). No radiological recurrence was observed in a mean follow-up duration of 11 months (range: 3-18 months).

DISCUSSION

Since 1990s, laparoscopic treatment of hydatid disease of the liver has been carried out in many centers. The general approach is like open surgery. Regardless of the method,

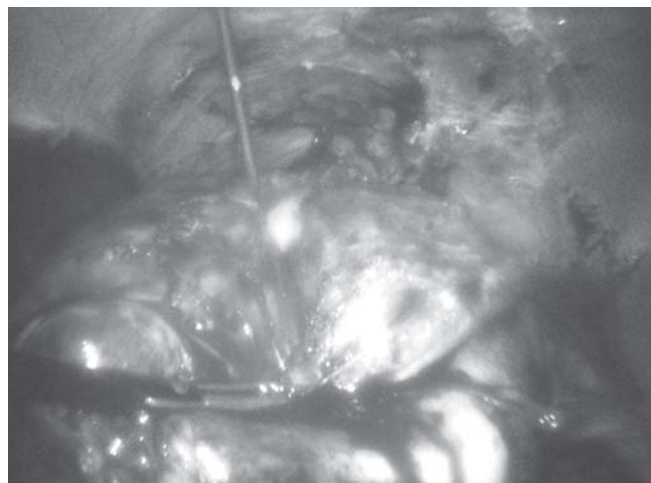


Fig. 1: Aspiration of cyst fluid with Veress needle



Fig. 2: Aspiration cyst contents with 5 mm aspirator and controlling the spillage with another one



Fig. 3: Resection of partial cyst wall with electrosurgical hook and Ligasure

the surgical principles are sterilization of the cyst cavity, careful evacuation of the cyst's content without intraperitoneal spread, investigation of the biliary rupture, and obliteration of the cyst's cavity. To succeed in laparoscopic hydatid disease surgery, these objectives are best reached with the studiously selection of patients. As for current opinion, most laparoscopic surgeons prefer

simple drainage procedures with or without partial cystectomy.^{3,4}

In our series, we excluded the patients who had deep parenchymal cysts, allocated posterior liver, evidence of biliary rupture and recurrent cysts. Posterior or deep in liver parenchymal cysts are difficult for laparoscopic approach. Deep allocated liver hydatid cysts are increased risk of biliary rupture and inconvenience the laparoscopic exploration. Some authors suggest to exclude the patients with cysts larger than 15 cm, grade IV-V cysts.⁵ In our series, we did not limited cyst size and grade. For one of the case who had 22 cm cyst allocated right lobe, we performed laparoscopic partial pericystectomy and omentoplasty (Fig. 5). We performed laparoscopic surgery for 7 patients; four of them have grade III and three of them have grade IV hydatid cysts. None of 7 patients experienced biliary rupture. We have seen that the laparoscopic approach is suitable for the large and grade III-IV cysts for the liver hydatid disease. We used lithotomy position and standing between the legs of patient. Some authors report they used different positions like a lateral decubitus or supine. We use 20% hypertonic saline for scholosomal solution as like the authors. In some recent reports, different techniques and



Fig. 4: Fixation of omentum to the cyst cavity with helical fastener

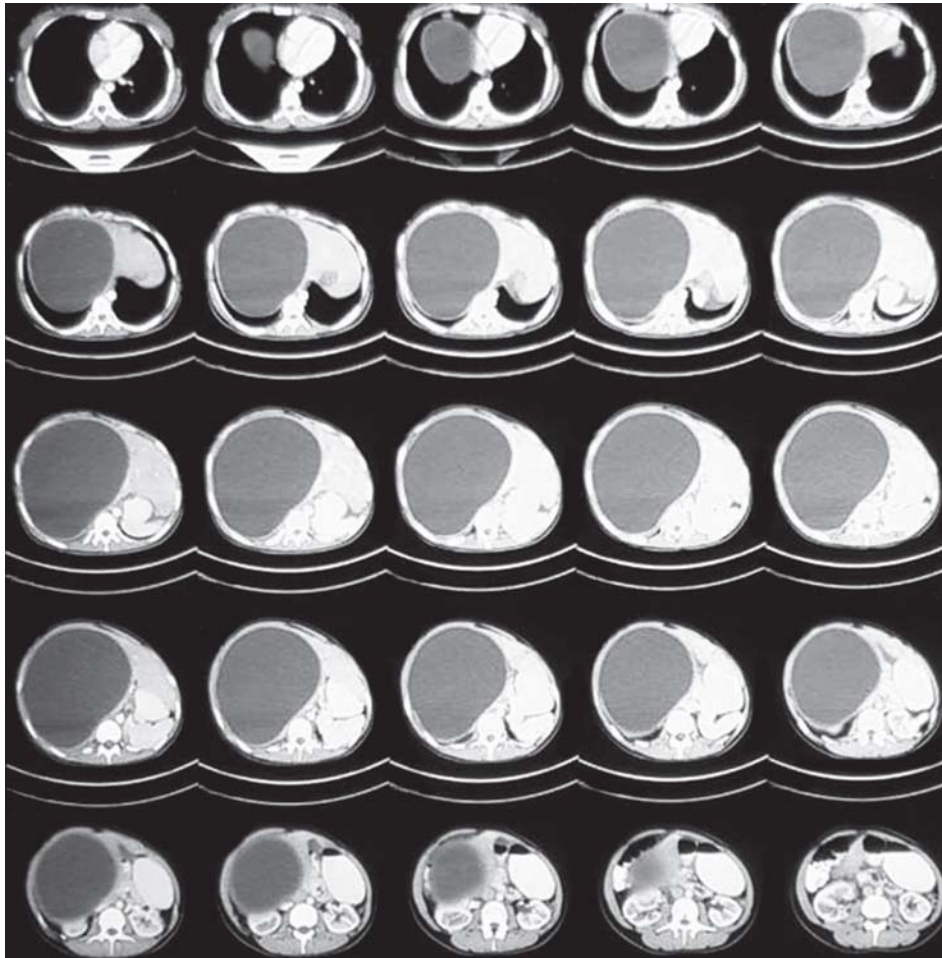


Fig. 5: Computer tomographic image of giant hydatid cyst in right lobe

instruments had been used to sterilize the cyst contents and to prevent any fluid spillage into the peritoneal cavity. Acarli et al report aspirator and grinder apparatus system to sterilize cyst contents.⁶ Altinli et al used inserting a locking trochar into the cyst cavity to minimize the contamination and laparoscopic aspirator for prevent the fluid spillage.⁵ Al-Shareef et al used liposuction device for perforation and aspiration cyst contents.⁷ In our series we aspirated germinatif membrane and dougher cysts with 5 mm aspirator and controlled the spillage with second 5 mm aspirator which was inserted from another trochar.

Ligasure combined with electrocooter for dissection of the cyst wall from the adhesions and resection of cyst wall for unroofing is safe and fast technique. Omentoplasty was recommended for prevention of postoperative abdominal complications.⁸ For this purpose, some authors have defined original omentoplasty techniques for laparoscopic hydatid disease surgery. Ertem et al reported an omentoplasty technique with staples.⁴ Altinli et al modified it by securing an omental flap to the edges of the excised cavity with helical fasteners and we agree that it is really fast and effective.⁵ In our series, we operated two patients who had two cysts that allowed easy access. We did not added any more trochar for second cyst. The preoperative CT images and patient body type can be helpful to decide laparoscopic or open approach with the multiple hydatid cysts.

Laparoscopic surgery for liver hydatid disease has been performed since 1990. Several authors improved various techniques in elapsed time. However, the laparoscopic approach for hydatid disease was limited in the central clinics which interested in a growing number of physicians already prefer open surgery for hydatid disease especially in peripheral states. The common reasons to avoid laparoscopic surgery depend on spillage of cyst contents in to the abdominal cavity, communion with biliary tree, fair of anaphylaxis and postoperative recurrence risk.^{6,8,9}

CONCLUSION

With growing experience, laparoscopy seems to be quite feasible in hydatid disease of the liver. However,

laparoscopy should not limit the surgeon's performance in every surgical step of hydatid disease surgery. In many instances, omentoplasty with helical fasteners provides an easy and effective obliteration of the cyst's cavity during laparoscopic access.

REFERENCES

1. Ammann RW, Eckert J. Cestodes echinococcus. *Gastroenterol Clin North Am* 1996;25:655-89.
2. King CH. Cestodes. In: Mandell GL, Benett JE, Dolin R (Eds). *Principles and practice of infectious diseases* (5th ed). Philadelphia, PA: Churchill Livingstone Inc 2000:2957-63.
3. Seven R, Berber E, Mercan S, Eminoglu L, Budak D. Laparoscopic treatment of hepatic hydatid cysts. *Surgery* 2000;128:36-40.
4. Ertem M, Uras C, Karahasanoglu T, Erguney S, Alemdaroglu K. Laparoscopic approach to hepatic hydatid disease. *Dig Surg* 1998;15:333-36.
5. Altinli E, Saribeyoglu K, Pekmezci S, Uras C, Tasci H, Akcal T. An effective omentoplasty technique in laparoscopic surgery for hydatid disease of the liver. *JLS* 2002;6:323-26.
6. Acarli K. Controversies in the laparoscopic treatment of hepatic hydatid disease. *HPB Surg* 2004;6:213-21.
7. Al-Shareef Z, Hamour OA, Al-Shlash S, Ahmed I, Mohamed AA. Laparoscopic threatment of hepatic hydatid cysts with a liposuction device. *JLS* 2002;6:327-30.
8. Dziri C, Paquet JC, Hay JM, et al. Omentoplasty in the prevention of deep abdominal complications after surgery for hydatid disease of the liver: A multicenter, prospective randomized trial. *French Associations for Surgical Research. J Am Coll Surg* 1999;188:281-89.
9. Khoury G, Jabbour-Khoury S, Soueidi A, Nabbout G, Baraka A. Anaphylactic shock complicating laparoscopic treatment of hydatid cysts of the liver. *Surg Endosc* 1998;12:452-54.

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