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Our approach



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Laparoscopic treatment of hepatic hydatid cysts. Our approach

AIM: In this study, we aimed to evaluate the clinical characteristics and outcome of patients with hydatid cyst (HC) of the liver who were laparoscopically operated at our clinic and to define a new technique and technical details to present our experience in the field of laparoscopic treatment of hepatic hydatid cysts.

METHODS: Between January 2014 and October 2016, 18 patients with hydatid disease of the liver were considered for laparoscopic surgery in Dr. Lutfi Kirdar Education and Research Hospital, Department of General Surgery. All patients were evaluated based on history, physical examination, ultrasound (US), and computed tomography (CT) scan. All ultrasound examinations were classified according to Gharbi. All cases received laparoscopic surgical interventions. Demographic data, clinical presentation, cyst location, operative data, postoperative complications and follow-up results were recorded retrospectively.

RESULTS: Eighteen patients underwent laparoscopic surgery for hydatid cysts of the liver. there were 14 female (78%) and 4 male (22%) patients with a mean age of 42.9 years (range, 19-57). The hydatid cysts were solitary in 11 patients, and multiple in 7 patients had 2 or more cysts (4 patients had 2 cysts, 3 patients had 3 cysts). Most of the cysts on USG were Gharbi type III (8 cysts), 4 of Type II, and 3 of Type I. The average operating time was 75 minutes (range 50 – 135 minutes). Conversion to open surgery was necessary in one patients due to cyst in difficult location.

CONCLUSION: Laparoscopic management of hydatid cysts of the liver can be performed safely and successfully. This technique can be used in patients with unique, small sized, superficially located cysts, and also has the advantages of other abdominal laparoscopic operations.

KEY WORDS: Hepatic hydatid cysts, Laparoscopic surgery.

Introduction

Hydatid cyst (HC) is still one of the major health and social problems in developing countries. It is a parasitosis, occurs via *Echinococcus granulosus*, or less frequently via *Echinococcus multilocularis* and *Echinococcus oligarthrus* ¹. Hydatid cyst can be seen worldwide but in some parts as Australia, South Africa, South America,

Iran and Turkey is seen more frequently. Although, new medical treatments and invasive radiological therapies were introduced in recent years, surgery is still gold standard treatment modality for HC. Laparoscopic surgery have been performed in the patients with HC since 1992 ². Laparoscopic surgery was firstly introduced by Kathkouda et al. Since this beginning, multiple laparoscopic approaches and various techniques were utilized. Currently, there is no standard laparoscopic technique for HC.

In this study, we aimed to evaluate the clinical characteristics and outcome of patients with HC of the liver who were laparoscopically operated at our clinic and to define a new technique and technical details to present our experience in the field of laparoscopic treatment of hepatic hydatid cysts.

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Methods

PATIENTS

From January 2014 to October 2016, 18 patients with hydatid disease of the liver were considered for laparoscopic surgery in Dr. Lutfi Kirdar Education and Research Hospital, Department of General Surgery. All patients were evaluated based on history, physical examination, ultrasound (US), and computed tomography (CT) scan. All ultrasound examinations were classified according to Gharbi and depicted in Table I ³. All patients were also followed via ultrasound examinations. All cases received laparoscopic surgical interventions. Demographic data, clinical presentation, cyst location, operative data, postoperative complications and follow-up results were recorded retrospectively. Albendazole 10 mg/kg/day for 3-6 weeks was administered before surgery and continued after the procedure for at least 6-8 weeks to clear up any spilled hydatid fluid containing

TABLE I - Gharbi classification of hydatid cysts.

Type I	Pure fluid collection - univesicular cyst
Type II	Fluid collection with a split wall—detached laminated membrane—"water lily" sign
Type III	Fluid collection with septa—daughter cysts
Type IV	Heterogenous appearance—presence of matrix—mimics a solid mass
Type V	Reflecting thick walls—calcifications

live scolices. Albendazole administration was correlated with hepatic function tests, leading us to intermittent administration to a number of patients with elevated tests 4 weeks, followed by 2 weeks abstinence. Antibiotics were routinely administered intraoperatively and followed up to the postoperative days. All patients received thromboembolic prophylaxis. The Gharbi classification system was used to address the stage of the disease.

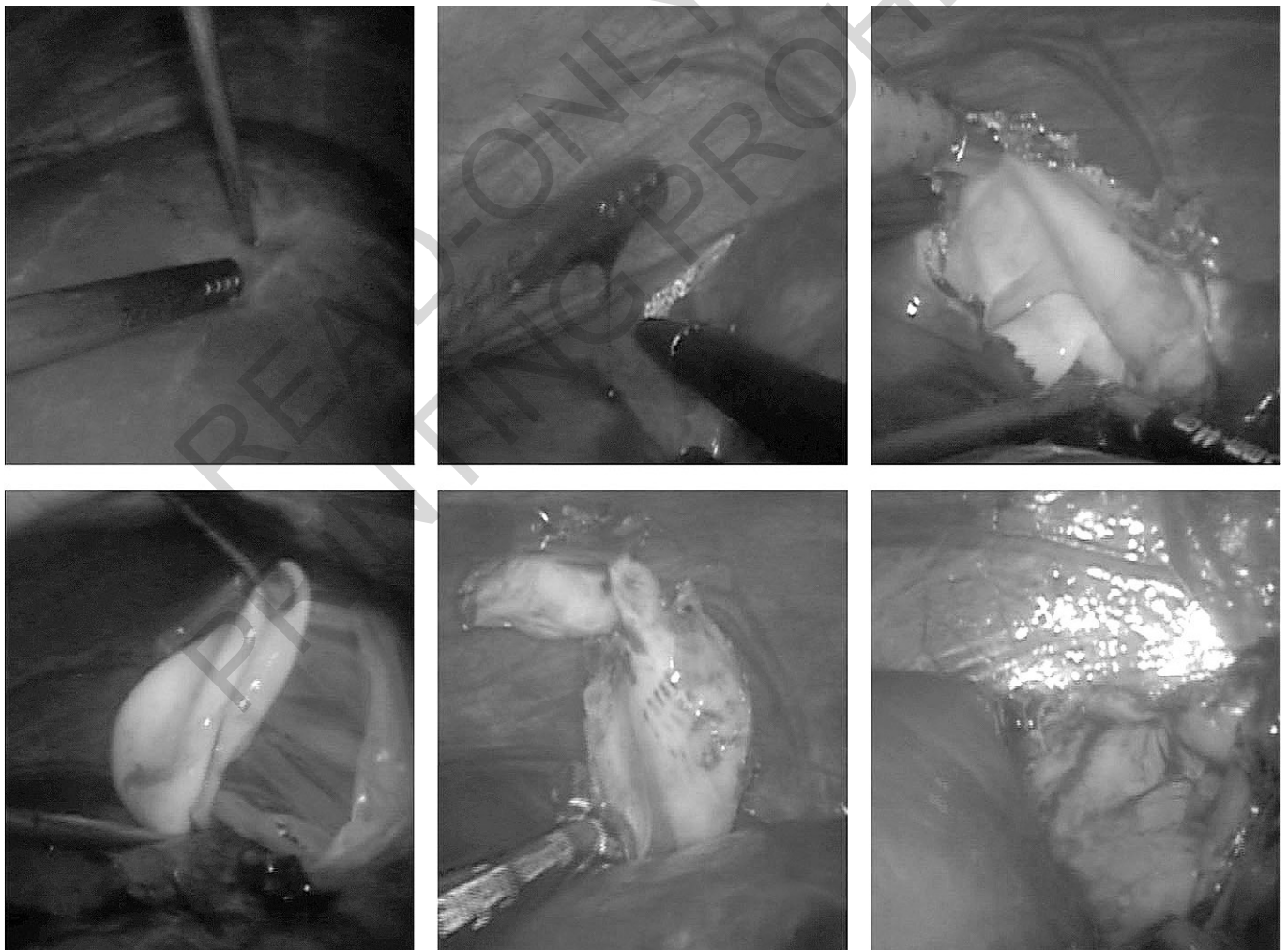


Fig. 1: Details of the surgical procedure.

SURGICAL PROCEDURE

General anaesthesia was our preferred method, after of single intravenous dose of cefazolin 1 g. Surgeons position was correlated with localization of the cyst; left lateral position for right lobe and between legs for left lobe cysts. 10 mm trocar was inserted through umbilicus via open technique. After carbondioxide pneumoperitoneum establishment two trocars were added. We prefer 12 mm/Hg pressure for intraabdominal space. Identification of hydatid cyst is first step. Through meticulous dissection cyst surface was clearly seen. For cysts in the right lobe additional trocar was inserted in subxiphoidal area between subcostal and midclavicular line. We also insert 5 mm trocar near right middle axillary line for suction. For cysts in the left lobe one additional trocar was inserted 2 cm below the intersection of left midclavicular line and subcostal line. 3 to 4 pieces of sponge covered with 20 % sodium chloride were placed around the lesion to prevent the spread and leakage in case of perforation. We replace content of the cyst with hypertonic saline via help of verrees needle. Cyst fluid was checked for bile stains. With the help of aspirator suction cannula we tried to prevent any spillage through the procedure. We injected 20 % sodium chloride to the cyst cavity. After 10 minutes cyst was aspirated via second suction device. We tried to attach cyst wall starting from the puncture site with the help of 10 mm LigaSure™ (Valleylab, Boulder, CO, USA). Plastic bags were used for extraction of the remnant tissues. In case of the bile duct communication, we tried to close it routinely with non-absorbable sutures. In absence of a biliary leak, cavity was cleaned with saline and hamostasis was achieved with cautery. We added omentoplasty technique for suction of remnant tissues. After placement of a 20-F Nelaton drain to the posterior of the liver, surgery was terminated. Details of the procedure is depicted in Fig. 1.

We tried to address the issue that no special designed throcar is necessary for hydatid cyst surgery. It can be performed with normal 10 mm throcars. Postoperative periods were uneventfull for all the cases, and patients were discharged within 2 days. All patients were followed up for a mean duration of 6 weeks.

Results

Eighteen patients underwent laparoscopic surgery for hydatid cysts of the liver. All patients evaluated with US preoperatively. Distribution of patients according to Gharbi classification is shown in Table I. There were 14 female (78%) and 4 male (22%) patients with a mean age of 42.9 years (range, 19-57). The hydatid cysts were solitary in 11 patients, and multiple in 7 patients had 2 or more cysts (4 patients had 2 cysts, 3 patients had 3 cysts). The mean size of the cysts



Fig. 2: CT scan view for Gharbi 3 hydatid cyst.

7.65 cm (range, 4.6-11.9 cm), and totally 28 cysts were evaluated (22 cysts were located in the right lobe and 6 cysts in the left lobe). Most of the cysts on USG were Gharbi type III (8 cysts), 4 of Type II, and 3 of Type I (Table II). 18 patients had CT, and 14 patients had magnetic rezonans imaging (MRI). CT scans were clearly evaluated (Fig. 2). The mean duration of hospitalization was 3.3 days (range, 2-7 days). Pain was the most frequent presentation occurred in 12 (66.7%) patients. The average operating time was 75 minutes (range 50 - 135 minutes). None of the patients expe-

TABLE II - The baseline characteristics of the patients.

Total no. of patients	18
Male/female	4/14
Age (years) median (range)	42.9 (19-57)
Number of cysts	
Single	11
Double or more	17
Major cyst diameter median (range)	7.65 cm (4.6-11.9 cm)
Cyst location	
Right	12
Left	4
Bilobar	2
Cyst type (Gharbi classification)	
Type I	3
Type II	5
Type III	10

TABLE III - Intra- and post-operative parameters, complications.

Operative time (range)	75 min (range 50 – 135 minutes)
Blood loss (ml)	95±30
Length of hospital stay (days)	3.3 (range, 2-7 days)
Complications	
Surgical site infection	1
Biliary leakage	2
Cystic cavity infection	0
Pleural effusion	1
Anaphylactic shock	0
Conversion to open surgery	1
Recurrence	0
Mortality	0

rienced intraoperative anaphylactic shock. Conversion to open surgery was necessary in one patients due to cyst in difficult location. Complications were observed in 3 patients included port-site infection in 1 and bile leak in 2 patients. Pleural effusion was observed in 1 of 2 patients with bile leak. Postoperative abscesses, empyema and recurrence were not seen. There was no mortality in the series (Table III). Bile leak persisting beyond 6 days and 3 days, which were managed by medical treatment.

Discussion

In majority of cases hydatid liver disease may be symptom free. Localization, size and stage of the cyst play major role for symptoms. Simple discomfort or acute abdomen could be various presentation types of this disease. We should be alarmed, in case of abdominal discomfort, jaundice and pancreatitis.

Ultrasonography is the primary choice for diagnosis due to low cost, and high specificity and sensitivity. CT and MRI may be used for better understanding of biliary anatomy. Serologic methods may be useful for the differential diagnoses in difficult cases ⁴.

Recent literature reports some new methods. In endemic countries, a percutaneous approach of aspiration, injection and reaspiration (PAIR) has been proposed by WHO in select cases ⁵. For avoiding surgical therapies, ultrasound guided needle aspiration accompanied by hypertonic saline could be utilized. This type of treatment could be applied only for cases with Gharbi classification type II or type III ⁶. Surgery remains major modality for successful treatment, especially for type III cysts, type IV cysts, and cysts opening into the bile ducts or peritoneal cavity. We do not apply any treatment for type V hydatid cysts, similar like literature ⁷. Marsupialization, closed total cystectomy, partial pericystectomy, partial pericystectomy with capitonnage, modified capitonnage, partial pericystectomy with omento-

plasty, and typical and atypical liver resections are various surgical options for hydatid cyst ^{8,9}. None of them can be considered as gold standart technique.

Initially first report for laparoscopic treatment of hydatid cyst of the liver was published in 1994 ¹⁰. Many studies detailing laparoscopic management of liver hydatid disease can be found through literature search. Indications, contraindications, advantages, and disadvantages of this technique have been elucidated ^{8,11}.

In our current study we aimed to apply a recently new tecnique, with the help of normal throcars. There is no need for special designed applicators for his type of surgery, and procedures can be performed safely. Hydatid cyst can be treated with this minimally invasive technique without any complication ¹². It is well known that laparoscopic surgery has many advantages over open approach. According to literature some groups claim that laparoscopy has minimal incidence of anaphylaxis and spillage in experienced hands ¹³. We tried to address the issue that this new technique should be kept in mind as one of the surgical therapy modalities. In our new technique for he cysts in the right lobe left lateral position with 45 degree tilt is the best approach, surgeon standing on the left side facing the screen. For the cysts on the left lobe we prefer reverse trendelenburg position surgeon standing between the legs of the patient. For left lobe cysts additional trocars should be applied. The rate of conversion to open procedures varies. Conversion is required due to inaccessibility, calcification, or other complications of the cyst, and occasionally due to technical factors. Both the rate of conversion and complications can be reduced by proper selection of cases with cysts only in the easily approachable area of the liver like segments II, III, IVB, V, and VI, avoiding calcified cysts ¹⁴. In our series of consecutive unselected patients, conversion was required in a single case (5.5%) due to difficult location. Recurrence is a major problem in hydatid disease surgery. Ultrasonography is not enough to detect relapses following surgical treatment of liver hydatid cyst alone. The recurrence rates of the surgical techniques range between 0-25% ¹⁵. In our study, no recurrence observed.

Conclusion

Laparoscopic management of hydatid cysts of the liver can be performed safely and successfully. This technique can be used in patients with unique, small sized, superficially located cysts, and also has the advantages of other abdominal laparoscopic operations. It aids early recovery with good cosmetic results. We believe for single and multiple Gharbi type 1 and 3 hydatid cysts laparoscopic approach should be applied due to advantages over open surgery. In experienced hands due to minimal spillage rate, minimal complications and low incidence of morbidity and mortality laparoscopy shold be gold stan-

dard surgical technique. Revision of the technique according to the left side of the cyst in the left side of the cyst is shortening the operation time and also providing convenience in surgery.

Riassunto

Studio finalizzato a valutare le caratteristiche cliniche e l'esito di pazienti con cisti idatidea del fegato che sono stati operati per via laparoscopica nella nostra clinica e di definire una nuova tecnica e dettagli tecnici per presentare la nostra esperienza nel campo della terapia laparoscopica epatica cisti idatidee.

Tra gennaio 2014 e ottobre 2016, sono stati considerati per la chirurgia laparoscopica presso il Dott. Lutfi Kirdar, Ospedale per l'Istruzione e la Ricerca, Dipartimento di Chirurgia Generale 18 pazienti con malattia idatidea del fegato. Tutti i pazienti sono stati valutati sulla base di anamnesi, esame fisico, ecografia (US) e tomografia computerizzata (TC). Tutti gli esami ecografici sono stati classificati secondo Gharbi. Tutti i casi hanno ricevuto interventi chirurgici laparoscopici. I dati demografici, la presentazione clinica, la posizione della cisti, i dati operativi, le complicanze postoperatorie e i risultati del follow-up sono stati registrati retrospettivamente.

14 pazienti erano di sesso femminile (78%) e 4 maschi (22%) con un'età media di 42,9 anni (intervallo 19-57). Le cisti idatidee erano solitarie in 11 pazienti, e in 7 pazienti multiple avevano 2 o più cisti (4 pazienti avevano 2 cisti, 3 pazienti avevano 3 cisti). La maggior parte delle cisti su USG erano di tipo Gharbi III (8 cisti), 4 di Tipo II e 3 di Tipo I. Il tempo medio di funzionamento era di 75 minuti (intervallo 50-135 minuti). La conversione alla chirurgia aperta si è resa necessaria in un paziente a causa della posizione difficile della cisti. Possiamo concludere che la gestione laparoscopica delle cisti idatidee del fegato può essere eseguita in modo sicuro e con successo. Questa tecnica può essere utilizzata in pazienti con cisti uniche, di dimensioni ridotte e superficialmente localizzate e presenta anche i vantaggi di altre operazioni laparoscopiche addominali.

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