

RADICAL SURGERY FOR LIVER HYDATID CYST

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ABSTRACT

Background and aims: Surgery is the basic treatment for liver hydatid cyst (LHC). Radical procedures (pericystectomy (PK) and hepatic resection (HR)) offers better results in selected cases than conservative approaches. Aims of this study were to evaluate the results of Radical surgery for LHC and to determine witch of these two procedures is safe in experienced hepato-biliary surgical unit in endemic countries.

Methods: A retrospective cohort study of 143 patients with liver hydatid cyst who underwent radical procedures at a single surgical department in an endemic country were reviewed. Mortality, morbidity and recurrence rates have been analyzed.

Results. Thirty-two patients (22.4%) had a HR and 111 patients (77.6%) had a PK. Mortality rate was 1.4% (n=2) in HR group. Overall morbidity rate was 18.9% and vs 28.1% respectively in PK and HR group (p=.26). Postoperative bleeding occurred in 1.8% in PK group vs 3.1% in HR group (p=.535) and specific LHC operative complication occurred in 17.1% in PK group vs 28.1% in HR group (p=.167). Recurrence rate of LHC was 6.3% in PK group vs 6.6% in HR group (p=.999) after a median follow up of 108 months (54–144) vs 89 months (44–135) respectively.

Conclusion: Radical surgery for LHC is safe. Each of PK and HR had a specific indication. A good screening of patient's guaranteed a good outcome.

Key words: Liver, Hydatid Cyst, Radical Surgery.

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INTRODUCTION

Hydatid disease continues to be a major health problem in sheep-raising areas. Hydatid Cyst grows in the liver in 77% of cases. [1, 2]. Larvae of *Echinococcus granulosus* cross the intestinal wall and via the portal system migrate to the liver, where they are transformed into cysts. Currently, four therapeutic options are available to manage hydatid disease of the liver: surgery, chemotherapy with benzimidazole compounds, interventional methods: radiology (percutaneous needle aspiration, radiofrequency) and endoscopical approaches and follow-up without treatment.1 To date there is no consensus attesting for the best attitude, however,

surgery remains the basic and the gold standard treatment for liver hydatid cyst.

Some controversies still exist regarding the most appropriate surgical technique, which can definitely eliminate the parasite with a lower morbidity and mortality rate and a negligible recurrence rate. Current thinking tends to opposite radical and conservative surgery. Most surgical studies demonstrate that both mortality and morbidity rate of these two approaches are similar. [1-3] Commonly mortality, morbidity and recurrence rates range respectively from 0 to 6.5%,4, 5 10% to 29.5%, [5-7] and 0 to 25%. [8-11] Recent advances in liver surgery during the last decade, with all new technological development help to ensure safe

aggressive liver resection in selected patients especially in non-malignant disease. Even though many authors recommend radical surgery in LHC, no study demonstrate evident benefit comparing to than conservative surgery.¹ Hydatid disease remains a major health problem in sheep-raising areas. Endemic areas are mostly in low-income countries and/or wide and extended territory. Providing care and geographic distribution of tertiary center are not equal. Advance hepatobiliary surgical unit can not be added anywhere. There is no doubt that radical surgery for liver hydatid cyst by expert surgeons in dedicated centers is safe. [13] Purposes of this study were to assess results and safety of radical approach in management of liver hydatid cysts and compare the results of both PK and HR technique in LHC.

MATERIALS AND METHODS

Patients who underwent radical surgery for liver hydatid cyst were identified from an ambispective “liver hydatid cyst” database, from January 1990 to December 2010 in a single tertiary hepatobiliary surgical unit, in endemic disease country. At the admission, the diagnosis of the LHC was established by clinical history, clinical examination and abdominal ultrasonography for all patients. Serological tests were not routinely used. Abdominal computed tomography was performed, on patients showing multiple cysts at US or recurrence of Hydatid disease.

Radical approach was defined as an anatomical liver resection or, whenever possible, a total pericystectomy. Liver was transected by the clamp-crush technique and haemostasis was achieved using sutures or bipolar coagulation. The whole cyst was removed (pericyst) with adjacent healthy liver tissue. Complete cyst resection was performed either by opening its cavity (open cyst) or not (closed cyst) according to cyst size, topography and surgeon’s preference. In the open-cyst technique, all protective measures were applied to prevent intra-abdominal seeding of protoscolices (protection and scolicial agents).^{1, 14, 15} All procedures were performed by open laparotomy. Demographic data, cyst characteristics, surgical

procedure were recorded. Operative mortality, defined as death regardless of the cause within 30 first postoperative days in or out of hospital; hydatid cyst-specific surgical complications “deep abdominal complications (DAC)” [5] and cyst recurrence were the aim endpoints of the study. [11] Statistical methods: Continuous variables were presented as mean value \pm standard deviation or median interquartile range (IQR) and categorical variables were expressed as frequency and percentage. We have conducted an univariable association between each item and the type of radical surgery (pericystectomy and hepatic resection) with the χ^2 test or Fisher exact test. A Mann-Whitney U-test was used to compare non-normally distributed continuous variable. Tests were always two-sided and significance was considered from a P value less than 0.05.

Recurrence rates have been analyzed by the Kaplan-Meier method for patients undergoing surgery and apparently disease-free at the time of discharge from the hospital. Differences in recurrence between subgroups of patients were evaluated using the log-rank test. SPSS® version 13 statistical software package was used for statistical analysis (IBM, Armonk, New York, USA).

RESULTS

One hundred forty three patients underwent radical surgery for liver hydatid cyst. There were 91 women (63.6%) and 52 men (36.4%) with a mean age of 39.53 ± 14.88 years. Forty eight patients (34,3%) had previously undergone surgery for hydatid disease in various localizations, previous hydatid liver surgery in 25 patients and hydatid lung surgery in 24 patients. Although 24 patients (16.8%) were totally asymptomatic. The most common symptom was pain on the right-upper quadrant (34.2%) and the most common finding on the physical examination was a palpable mass at this location (42%). The median duration of symptoms and signs (n=141) was 5 months (interquartile range 25, 75: 2 months; 12 months). Demographic and clinical features of these patients are shown in Tables I and II.

Table I: Patient's demographics and cyst's distribution in the hepatic lobes.

Variables	Number of evaluated patients	Number of subject	%
Age (years)	143		
≤ 40		79	55.2
41- 60		54	37.8
≥ 61		10	7.0
Sex	143		
Female		91	63.6
Male		52	36.4
Past history of hydatidosis	143		
No		94	65.7
Liver		25	17.5
Lung		24	16.8
Number of cysts	140		
One		86	61,4
Two		27	19,3
Three and more		27	19,3
Location of the cyst in the liver	143		
Anterior segment: III, IV, V,VI		72	50.3
Posterior segment: I, II, VII, VIII		71	49.7
Maaouni's distribution of the cyst5	143		
Cyst in the segment IV and /or I		14	9.8
Cyst in the Segment II and /or, III		31	21.7
Cyst in the Segment V and /or VI		13	9.1
Cyst in the Segment VII and /or VIII		38	26.6
Multiple cysts		47	32.9
Diameter of the cyst	143		
≤ 10 cm		62	43.4
> 10 cm		81	56.6
Gharbi morphological type of the cyst	143		
I		18	12.6
II		22	15.4
III		66	46.2
IV		28	19.6
V		9	6.3
Biliary duct dilatation	139	14	9.8
Other Hydatid cyst outside the liver	142		
One abdominal organ		128	90.1
Abdominal hydatidosis		11	7.7
Lung		3	2.1
Preoperative complications of the cyst	143	41	28.7

Table II: Clinical features of 143 patients who presented liver hydatidosis.

Signs	Number of patients	%
Abdominal mass	60	42.0
Right upper quadrant pain	49	34.2
Epigastric pain	28	19.6
Fever	25	17.5
Other symptoms	24	16.8
Jaundice	19	13.3
Weight loss	18	12.6
Asymptomatic	24	16.8

All the 143 patients were operated, 111 of them had Pericystectomy (PK) (77.6%) and remaining 32 patients had Hepatic Resection (HR) (22.4%). The procedure was very difficult, leading to diaphragmatic laceration, hollow viscera

perforation and haemorrhage in 23 patients (16%) due to the importance of inflammatory reaction and adherences. All details of the operative findings and procedures are shown in the Table III.

Table III: Surgical procedures, operative findings and follow up on patients with liver hydatid cyst.

	Number of evaluated patients	Number of subject	%
Surgical treatment	143		
Pericystectomy		111	77.6
Hepatic Resection		32	22.4
Cyst wall (pericyst)	143		
Soft		35	24.5
Fibrotic or calcified		108	75.5
Biliary fistula	143	30	21.0
Biliary fistula treatment	30		
Suture		17	56.7
Catheterisation		8	26.7
Drainage		5	16.6
Common bile duct dilatation	143	16	11.2
Operative diaphragmatic laceration	142	12	8.4
Difficult dissection	143	23	16.1
Overall postoperative complications	143	30	21.0
Deep abdominal complications	143	28	19.6
Mortality	142	2	1.4
Recurrence	141	9	6.4

Two death occurred in hepatic resection group after DAC due to disseminated hydatidosis with multiple associated resection and important weight loss in the first case, and severe non surgical sepsis in the other case. Over all morbidity occurred in 21

patients (18.9%) of the Pericystectomy group versus 9 patients (28.1%) in Hepatic Resection one (p=0.260). Postoperative haemorrhage happened in 2 patients (1.8%) in Pericystectomy group and only in 1 patient (3.1%) of Hepatic Resection group

($p=0.535$). Deep abdominal complications occurred in 19 patients (17.1%) of Pericystectomy group and 9 patients (28.1%) in Hepatic Resection group ($p=0.167$). There were no significant difference

between the Pericystectomy group versus Hepatic Resection group concerning recurrence and the duration of the follow up figure 1. All this data are reported in Table IV.

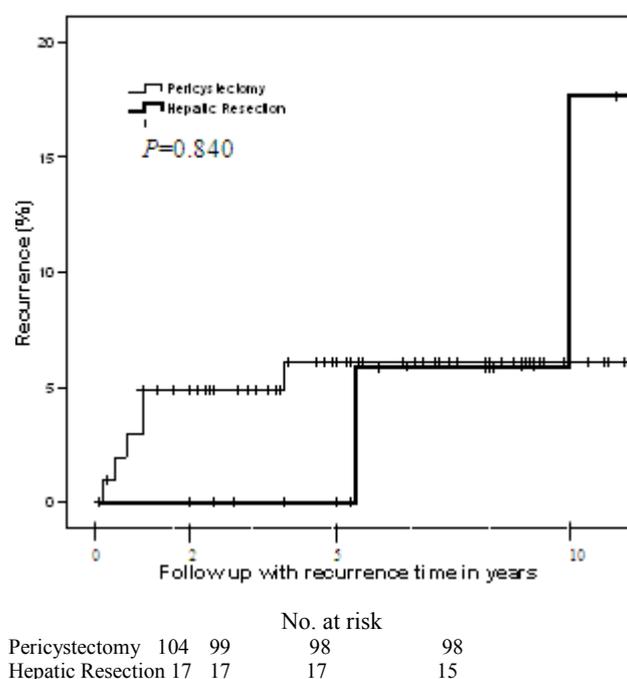


Figure 1 Kaplan–Meier analysis of rates of recurrence of liver hydatid cysts after Pericystectomy and Hepatic Resection surgical treatment. $P = 0.840$ (log rank test)

Table IV: Postoperative outcomes and recurrence rates.

	Pericystectomy (%)	Hepatic Resection (%)	P §
Overall postop. complications	21 (18.9)	9 (28.1)	0.260§
Deep abdominal complications	19 (17.1)	9 (28.1)	0.167§
Postoperative haemorrhage	2 (1.8)	1 (3.1)	0.535*
Postoperative hospital stay (days)‡	8 (6–12)	8 (7–15)	0.180#
Reinterventions	2 (1.8)	2 (6)	0.216*
Follow-up (months)‡	108 (54–144)	89 (44–135)	0.288#
Recurrence	7 (6.3)	2 (6.6)	0.999*
Recurrence rate (%)			0.840†
2 years	4.9 % ± 2.1	0	
5 years	6.1% ± 2.4	0	
10 years	6.1% ± 2.4	17.6% ± 12.1	

* Fisher exact test, §c2 test, ‡values are median (i.q.r.), #Mann–Whitney U test and † log rank test.

DISCUSSION

By the past, some authors supported that radical surgery of liver hydatid cyst, have less post operative complications as biliary leakage and recurrence [8, 13, 14, 16, 17] but carried the

highest operative risk.12, 18 Recently, it has been demonstrated that there was no statistically significant difference between radical and conservative procedures, concerning post-operative mortality, morbidity or recurrence rate.[1]This

study contribute to assess the safety of radical surgery for liver hydatid cysts .

Most of Studies demonstrates that mortality and morbidity for radical and conservative approaches are similar. [1-3, 6, 12], Commonly LHC postoperative mortality ranges from 0 to 6.5%, [1, 4, 19] and can reach at 9.2% after radical surgery.¹⁵ This high rate is often due to preoperative complications, disseminated disease and important preoperative weight loss. [5, 19, 7, 20, 21] The reason why, all interventions on liver hydatidosis should be considered as potentially major surgery⁵ and radical surgery should only be carried out by experienced hepatobiliary surgeons in tertiary unit. Assumed risks should be balanced with patient conditions and cyst characteristics. [1, 5, 15]

Our data demonstrate that specific morbidity of LHC radical surgery representing by deep abdominal complication occurred in 19.6% with no statistical difference the PK group 17.1% and HR group 28.1% ($p=0.167$). This complication range from 10% to 29.5%.⁵⁻⁷, [19, 22, 23] Passing through healthy hepatic parenchyma allows a better identification and management of biliary fistula. [5, 24] Linear cut edge offer additional possibility of bilistasis and haemostasis. The bile leakage represents the main source of immediate postoperative complications. In the current study, postoperative haemorrhage occurred in only 2 patients of PK group 1.8% and one patient of HR group 3.1% ($p=0.535$). However, even this complication is rare, all precautions should be taken to avoid its occurrence. In fact, all LHC interventions should be considered as potentially major surgery, [1] Therefore, *Radical approaches* in liver hydatid cyst should only be performed in tertiary units. Median hospital stay was similar (8 days) in both groups with no significant statistical differences between the PK and HR groups although other studies reported higher hospital stay of 13.8 days^[15] and 17±9.2 days. [25]

It is widely reported that recurrence rate increases with the time of the follow up.¹¹ It becomes symptomatic 3 to 4 years after surgery. [3, 7, 21, 25] Median follow in our study exceeded 7 years, and no statistical difference was assessed comparing recurrence rate of both groups ($p=0.288$). Some authors, [12] reported no recurrence after a Radical surgery for LHC with median follow up of only 15 months (range 1-36), knowing that a follow up of at least 5years is needed for more accurate results. [12]

Patients with hydatid liver cysts usually present a surgical challenge to surgeon staff even in endemic

area. It has been demonstrated that Radical surgical resection does not prevent recurrences of liver hydatid cyst and neither reduce morbid-mortality of this surgery when compared to conservative surgery. [1, 12] Concept of radical and conservative surgery should be exceeded. Liver hydatid cyst, as a benign liver disease, should be treated with the intention of preserving healthy liver tissue, thus the management should be tailored to the patient. If a patient carries more than one cyst, surgical staff should assess the best attitude for each cyst. Combination of different therapeutic option is possible and the a same patient may undergo both *Radical and Conservative approaches* if needed without changing aims of this surgical management. *Radical approaches* should be an alternative to *Conservative approaches* and vice versa for each cyst these two concepts should not be in competition or opposed but need to be evaluated as a strategie. Managing liver hydatid cyst, should lead physician to take into consideration cyst's characteristics (central or peripheral location, neighbouring or not hepatic and glissonian pedicles) and to seek for biliary fistula as a matter of major decision tool. Therefore performing *Radical approaches* should start by opening the cyst after field protection, to decompress it's content and make easier liver mobilization. This step offers the opportunity to look for biliary fistula in side the cavity and assess the thickness of the pericyst. Then the decision to perform a total pericystectomy or hepatic resection can be taken. Otherwise, in case of large cysts located deeply in liver or appended to major vascular-biliary structures of the liver, posterior cysts or in patient with altered statement, the decision of unroofing the cyst combined to one of various procedures of residual cavity management can be hold. It have been reported a helpful scoring system to direct patient to an experienced surgeon in hepato-biliary surgery unit.⁵ Five items are to assess: presence of preoperative complications of the cyst, 3 or more cysts in the liver, biliary fistula, thick pericyst, and capitonage. Patients with none of this factors or only one, can be operated in any surgical unit. In case of presence of two or more of this factors the patient should be directed to tertiary unit. Since both approach (*Radiacal and conservative*) offer similar results, this scoring system can be used to select patients in tertiary unit to be included liver resection in surgeon residency program.

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