

Original Research Article

Pattern of liver cysts with their surgical management

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ABSTRACT

Background: Liver cysts are seen in up to 5% of the population. 15-16% of such cysts are symptomatic. Symptomatic cysts are found more commonly in women who are over 50 years of age. Simple hepatic cysts are believed to be congenital in origin.

Methods: The observational study was conducted in the department of hepatobiliary department of surgery of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. Total of 80 cases were randomly selected for the study. Clinical examination and evaluation were done from July 2013 to June 2014. Proper consent was taken from the respective concern. Statistical analysis of the results was obtained by using window-based computer software statistical packages for social sciences (SPSS-22).

Results: Most of the respondents were female (65%). The male-female ratio was 1:1.9. The mean age was 46.4 (\pm SD 10.191) years, ranging from 13-76 years. There were 69 non-parasitic diseases and 11 parasitic diseases. Among them 30 patients were diagnosed as liver cyst incidentally and they required no treatment. Liver function was abnormal in 70% patients. It was found from ultrasonography (USG) and computed tomography (CT) scan of abdomen that right lobe involvement (65% and 28% respectively) is more common than left lobe (21.3% and 12% respectively). The most common complication following surgical interventions was haemorrhage (32.4%).

Conclusions: Females are affected most and M:F=1:1.9, usual affected age groups are of 5th decade and common in rural area. Imaging is the best modality for diagnosis of cystic lesions but serological investigations are also helpful.

Keywords: Liver cysts, Surgical management, Cystic lesion, Liver

INTRODUCTION

Liver cysts are seen in up to 5% of the population. 15-16% of such cysts are symptomatic. Symptomatic cysts are found more commonly in women who are over 50 years of age. Simple hepatic cysts are believed to be congenital in origin and arise from aberrant bile ducts, which are obstructed from the main biliary system. Their wall is made up of a single layer of cuboidal or columnar cells. These cells secrete a fluid with water and electrolyte content similar to that of serum.¹ They usually neither

invade biliary nor vascular elements, but may cause obstruction or compression atrophy of the liver parenchyma when they attain a large size.² These usually tend to be asymptomatic. When the whole liver is involved, polycystic liver disease (PCLD) is presumed to exist. Large cysts may cause symptoms, predominantly pain, nausea, vomiting, obstructive jaundice and early satiety may be caused by the pressure effects of large cysts.³ Various terms have been used for simple hepatic cysts, such as biliary cyst, non-parasitic cyst of the liver, benign hepatic cyst, congenital hepatic cyst, unilocular

cyst of the liver, solitary cyst of the liver. The term solitary cyst is often inappropriate, since simple (thin-walled, fluid-filled) cysts of the liver commonly present as two or more.⁴ One also has to exclude the rare causes of liver cysts such as cystadenoma and cystadenocarcinoma where cyst septations, papillary structures or multiloculated cystic formation may be seen radiologically. Diagnosis is made mainly by USG and CT scan. USG reveals single or multiple cysts. CT scan is an extremely useful investigative modality to localize the cyst, to identify the amount of liver tissue around the cyst and to see the position of the cyst in relation to other nearby structures.⁵ Indications for treatment are chronic symptoms which lead to a general reduction of the quality of life such as hepatomegaly, pain, local bulging, early satiety due to compression of the stomach, biliary duct compression as well as acute abdominal symptoms caused by cystic rupture or hemorrhage into the cyst. Traditionally, surgery has been the method of choice for symptomatic liver cysts. Surgical treatment for hepatic cysts shows a variety of techniques in the medical literature, as simple procedures, such as cyst puncture and aspiration, to more complex procedures, such as hepatic transplantation are reserved mainly for exceptional cases and polycystic liver disease. A diverse number of therapeutic approaches for large cysts have been proposed including percutaneous aspiration with or without injection of a sclerosing agent, internal drainage through cystojejunostomy wide unroofing and varying degrees of hepatic resection. The wide fenestration described as a technique with few complications and a low percentage of recurrences ranges between 0 and 14.3%. Currently, the laparoscopic approach is widely used for the management of hepatic cysts, with results similar to those described through open surgery but with the advantages of laparoscopy. It is considered by some authors as the preferred approach for surgical treatment of simple hepatic cysts.⁶

It is mandatory however, to exclude infestation by *Ecchinococcus* before surgical therapy. Liver hydatidosis in humans is a parasitic disease caused by the larval form of a tapeworm, *Echinococcus granulosus*.⁷ *Ecchinococcus* infestation is suspected in patients residing in endemic areas or has a significant travel history, from radiological characteristics and also from serological evidence. The definitive diagnosis for most human cases of hydatid disease is based on identification of cyst structures by physical imaging techniques, predominantly ultrasonography, computed tomography, and plain X-ray examinations. This should be confirmed by detection of specific circulating antigens and/or serum antibodies by immunodiagnostic tests which play an important complementary role. The enzyme-linked immunosorbent assay (ELISA) which employs hydatid fluid antigen for detection of echinococcal antibodies (IgG) in the serum is the most widely used. This test has a sensitivity of 80-100% and specificity of 88-96% in hepatic cysts. All this information is essential in deciding the most appropriate treatment. The surgical treatment of hydatid disease can either be radical or conservative. The radical procedures

include pericystectomy, hepatic resection, and lobectomy as in cases of hepatic or lung hydatid cyst respectively.⁸

Objective

The aim of the study was to identify the different patterns of the liver cysts (both symptomatic and incidentally found) with their management.

METHODS

The observational study was conducted in the department of hepatobiliary department of surgery of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. Total of 80 cases were randomly selected for the study. Clinical examination and evaluation were done from July 2013 to June 2014. Proper ethical consent was taken from the respective concerns. Other necessary investigations were done if clinically indicated and to prepare the patient for anesthesia. Proper consent was taken from the respective concern.

Inclusion criteria

The study included patients with age group 30-70 years, who were admitted for liver cysts and given their consent.

Exclusion criteria

The study excluded patients with age group beyond 30-70 years, who were critically ill and had not given consent.

Statistical analysis

Statistical analysis of the results was obtained by using window-based computer software statistical packages for social sciences (SPSS-22).

RESULTS

Eighty patients were enrolled for the study. Most of the respondents were female 52 (65%) (Table 2). The male female ratio was 1:1.9. The mean age was 46.4 (\pm SD 10.191) years, ranging from 13-76 years (Figure 1). It is shown in the table that surgery was the main treatment modality including cystectomy (16.3%), deroofting (13.8%), and aspiration (6.3%). Percutaneous procedure includes puncture-aspiration-injection-reaspiration (PAIR) (2.5%) and percutaneous aspiration (1.3%). Conservative treatment was given to 16.3% patients (Table 7). In 30 patients' cysts were found incidentally. The most common complication following surgical interventions was hemorrhage (32.4%). The next two prevalent complications were biliary leakage (29.4%) and wound infection (23.5%). Following percutaneous procedure one patient (33.3%) developed itching. 34 patients were treated surgically and histopathology was done. Histopathology shows non-paracytic cysts are 67.7% and paracytic cysts are 32.3%. Non-paracytic cysts are higher than the paracytic cysts.

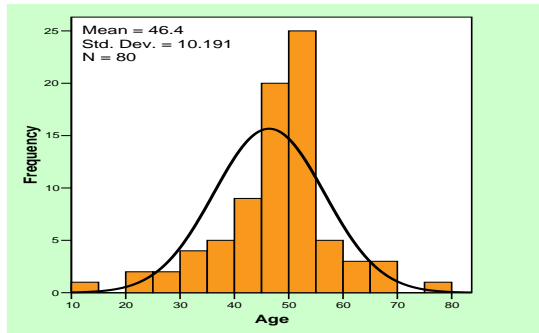


Figure 1: Histogram showing age group distribution of the patients.

Table 1: Distribution of the patients by age group and sex.

Age group (years)	Sex		Total
	Male	Female	
	N (%)	N (%)	N (%)
≤30	1 (3.6)	5 (9.6)	6 (7.5)
31-40	6 (21.4)	7 (13.5)	13 (16.3)
41-50	13 (46.4)	27 (51.9)	40 (50.0)
51-60	5 (17.9)	12 (23.1)	17 (21.3)
>60	3 (10.7)	1 (1.9)	4 (5.0)
Total	28 (100.0)	52 (100.0)	80 (100.0)

*Percentages are given in parenthesis.

Table 2: Distribution of the patients by occupation.

Occupation	Sex		Total
	Male	Female	
	N (%)	N (%)	N (%)
Service	3 (10.7)	9 (17.3)	12 (15.0)
Business	5 (17.9)	0 (0.0)	5 (6.3)
Farming	9 (32.1)	1 (1.9)	10 (12.5)
Laborer	11 (39.3)	4 (7.7)	15 (18.7)
Housewife	-	38 (73.1)	38 (47.5)
Total	28 (100.0)	52 (100.0)	80 (100.0)

Table 4 shown the result of laboratory test findings where serum (S.) bilirubin, serum glutamic pyruvic transaminase (SGPT), erythrocyte sedimentation rate (ESR), random blood sugar (RBS), total white blood cells (WBC) count and eosinophil count was found high among the number of patients 9, 15, 11, 19,8,7 and 3 respectively. On the other hand, 36 patients hemoglobin found decreased.

Table 6: Location of different types of cysts by imaging.

Imaging findings	Types of cysts		Total
	Non-parasitic	Parasitic	
USG of abdomen (n=80)			
Cyst in the right lobe of liver	46 (66.7)	6 (12.0)	52 (65.0)
Cyst in the left lobe of liver	15 (21.7)	2 (4.0)	17 (21.3)
Cyst in both lobe of liver	8 (11.6)	3 (6.0)	11 (13.8)
Total	69 (100.0)	11 (100.0)	80 (100.0)

Continued.

Table 3: Distribution of the patients by clinical presentation (n=50).

Clinical features	Types of cysts		Total
	Non-parasitic	Parasitic	
Symptoms			
Abdominal pain	23 (46.0)	7 (14.0)	30 (60.0)
Nausea and vomiting	19 (38.0)	5 (10.0)	24 (48.0)
Yellowish urine	8 (16.0)	2 (4.0)	10 (20.0)
Signs			
Anaemia	22 (44.0)	6 (12.0)	28 (56.0)
Abdominal mass	7 (14.0)	3 (6.0)	10 (20.0)
Jaundice	6 (12.0)	3 (6.0)	9 (18.0)
Co-morbidity			
Asthma	12 (24.0)	1 (2.0)	13 (26.0)
Diabetes mellitus	9 (18.0)	1 (2.0)	10 (20.0)
Allergy	2 (4.0)	3 (6.0)	5 (10.0)

Table 4: Distribution of the patients by laboratory findings.

Laboratory findings	Frequency	%
Liver function tests		
S. bilirubin (↑)	9	11.25
SGPT (↑)	15	18.75
Alkaline phosphatase(↑)	11	13.75
Hematological investigations		
Hemoglobin (↓)	36	45.0
ESR (↑)	19	23.75
RBS (↑)	8	10.0
Total WBC count (↑)	7	8.75
Eosinophil count (↑)	3	3.75

Table 5: Distribution of the patients by number of cysts.

Numbers of cyst	Types of cysts		Total
	Non-parasitic	Parasitic	
Single	52 (75.4)	9 (81.8)	61 (76.3)
Multiple	17 (24.6)	2 (18.2)	19 (23.7)
Total	69 (100.0)	11 (100.0)	80 (100.0)

Imaging findings	Types of cysts		Total
	Non-parasitic	Parasitic	
CT scan of abdomen (n=50)			
Cyst in the right lobe of liver	9 (18.0)	5 (10.0)	14 (28.0)
Cyst in the left lobe of liver	3 (6.0)	3 (6.0)	6 (12.0)
Cyst in both lobe of liver	3 (6.0)	1 (2.0)	4 (8.0)
Total	15 (30.0)	9 (18.0)	24 (48.0)

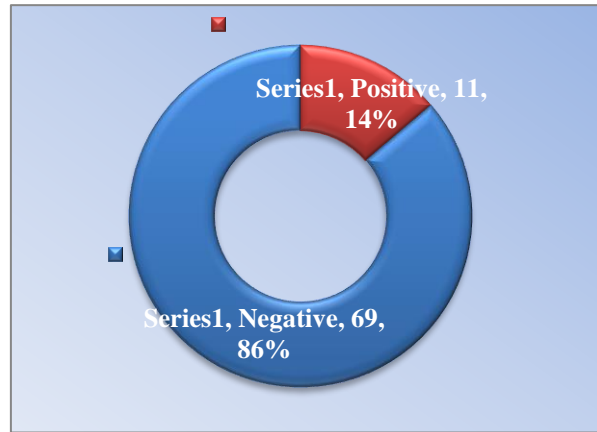


Figure 2: Showing ELISA test result for hydatid disease.

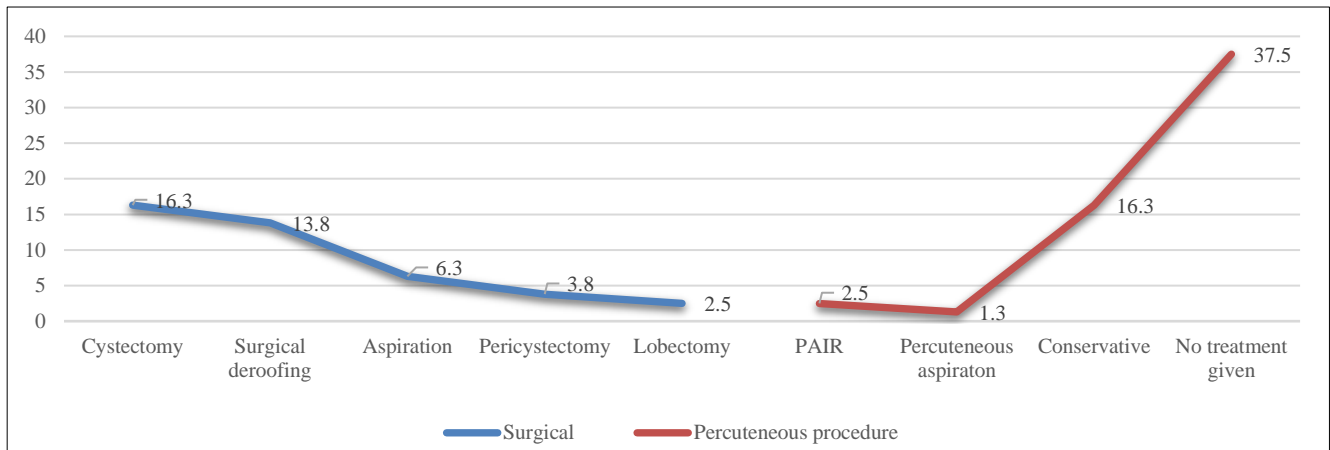


Figure 3: Different treatment modalities of the study patients' group.

Table 7: Different treatment modalities of the study patients' group.

Treatment modality	Frequency	Percent
Surgical		
Cystectomy	13	16.3
Surgical deroofing	11	13.8
Aspiration	5	6.3
Pericystectomy	3	3.8
Lobectomy	2	2.5
Percutaneous procedure		
PAIR	2	2.5
Percutaneous aspiraton	1	1.3
Conservative	13	16.3
No treatment given	30	37.5
Total	80	100.0

Table 8: Types of cysts on the basis of histopathology report of the study patient group.

Histopathology	Frequency	Percent
Non-paracytic cysts	23	67.7
Paracytic cysts	11	32.3
Total	34	100

DISCUSSION

Abdominal pain was the leading complaint of both parasitic (14%) and non-parasitic groups (46%). These findings support the findings of nausea and vomiting was the second leading symptom.⁹ Regarding signs commonest one was the anemia (56%) but there is no similarity with

any standard study so far and this may be due to reduced Hb% of our females as a common sign without any disease. Abdominal mass (20%) is a presentation which is dissimilar.^{9,10} Jaundice (18%) was an important presenting feature of this study which is consistent with some international studies.¹¹

Table 9: Follow-up up to six months after treatment (n=50).

Follow-up by treatment modality	No. of recurrence	Percent
Surgical intervention (n=34)	8	23.5
Percutaneous procedure (n=3)	1	33.3
Conservative treatment (n=13)	NA	NA

Liver function was abnormal in 43.8% patients which are not similar with the study of Langer.¹⁰ Among the liver function tests raised serum bilirubin was present in 11.3% patients, raised SGPT in 18.8% cases and raised alkaline phosphates 13.8% cases. Abnormalities in routine blood chemistry were noted in all the patients. Hematological investigations revealed reduced Hb% in 45% cases, raised ESR in 23.8% cases, raised RBS in 10% cases, and raised total WBC count in 8.8%.

The most common complication following surgical interventions was haemorrhage (32.4%). The next two prevalent complications were biliary leakage (29.4%) and wound infection (23.5%). Following percutaneous procedure one patient (33.3%) developed itching. Follow up of this disease were carried out by history, clinical examination and ultrasonogram of abdomen. Recurrence of disease is defined as increasing in size at the original operative site, or as the appearance of a cyst in a new site.¹² After surgical intervention recurrence occurred in 23.5% cases while for percutaneous procedure the recurrence rate was slightly higher i.e., 33.3%. These findings are not similar with Dugalic and little but similar with Mangistrelli, Pitt and Jahed pre-operative diagnosis was evaluated with the postoperative findings and final diagnosis was established. Our study shows parasitic cysts are less common than non-parasitic cysts. Most of the patients reside in rural area and females are mostly affected. Surgical treatment is still safe and effective than other modalities. Recurrence rate was 23.5% (four cases) for the simple liver cysts.¹³

Liver and liver-kidney transplantations were reserved for patients with end-stage PLD alone and in association with end-stage renal disease, respectively.¹⁴ Treatment modalities include percutaneous drainage, open deroofting, hepatic resection and lately, laparoscopic deroofting.¹⁵ Selection of patients with truly symptomatic hepatic cysts is crucial before considering interventional techniques. For simple cysts, radical laparoscopic deroofting is usually curative.¹⁶

Limitations

This was a cross-sectional study with a small sized sample. So, the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION

Most of the time cysts are asymptomatic but may present with abdominal pain, nausea and vomiting, itching, jaundice, and abdominal mass. Females are affected most and M:F=1:1.9, usual affected age groups are of 5th decade and common in rural area. Imaging is the best modality for diagnosis of cystic lesions but serological investigations are also helpful. Though newer treatment (PAIR) is introducing now a days but surgical treatment is still appreciable due to minimum recurrence and less complication.

Recommendations

This study can serve as a pilot to much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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