

## Surgical Management of Complex Hydatid Cyst with Biliary Fistula at the Army Liver Transplant Unit, Rawalpindi

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### ABSTRACT

**Objective:** To examine the surgical management of complicated hydatid cysts with biliary fistula at Army Liver Transplant Unit Rawalpindi.

**Study Design:** Retrospective longitudinal study.

**Place and Duration of Study:** Army Liver Transplant Unit, Rawalpindi Pakistan, from Jan to Jul 2022.

**Methodology:** Our study included 30 patients aged 15-64 years who had undergone surgery for complicated liver hydatid cysts. Simple liver hydatid cysts and hydatid cysts in other organs were excluded. Patients were treated with two surgical approaches: we compared deroofting surgical approach (Group-A) with radical approach (Group-B). For comparison of complications in surgical management, Chi-square test was used.

**Results:** The mean age of patients was 55.77±15.39 years. Out of 30 patients, 12(40.0%) were male and 18(60.0%) were female. In patients of Group-A, 1(4.8%) had respiratory infection, 3(14.3%) had pleural effusion, 4(19.0%) had wound infection, 4(19.0%) had biliary fistula, 3(14.3%) had intra-abdominal abscess, 3(14.3%) had postoperative bleeding, 2(9.5%) had bile leak and 1(4.8%) had no complications. In patients of Group-B, 3(33.3%) had wound infection and 6(66.7%) had no complications. This difference was statistically significant ( $p=0.013$ ), showing that more complications were present in patients managed using deroofting.

**Conclusion:** The best outcomes, those lasting long-term, were achieved using the radical surgical approach as compared to deroofting.

**Keywords:** Complex Hydatid Cysts, Hepatic Echinococcus, Liver, Postoperative Complications.

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### INTRODUCTION

Hydatid disease is a significant parasitic illness which targets liver in 75% of patients.<sup>1</sup> This is a zoonotic illness induced by *Echinococcus granulosus* or, less often, *Echinococcus oligarthrus* and *Echinococcus multilocularis*. Canines are the principal carriers, whereas humans are secondary hosts.<sup>2</sup> Global yearly prevalence of cystic echinococcosis is between 1 and 200 per 100,000.<sup>3</sup> In Pakistan, frequency of the Echinococcosis in various animal species varies from 2.44 to 35%.<sup>4</sup> In Turkey, around 4,000 cases of hydatid illness are diagnosed yearly. Generally, symptoms emerge as a response to the compression of neighboring tissues or viscera due to inflammation in nearby area, or from rupture of the cyst into the bile duct, peritoneal cavity or pleural space.<sup>5</sup>

Liver is most typically afflicted, with 55 to 80% of

individuals exhibiting complicity of right lobe. Based on magnitude of the cysto-biliary connection, clinical manifestation of intrabiliary rupture (IBR) may vary from asymptomatic to septicemia, pancreatitis, liver abscess, cholangitis, cholecystitis and jaundice.<sup>6</sup> Treatment of the liver hydatid cysts is contentious. There are three major kinds of therapy interventions: medical therapy, conservative surgical operation, and radical surgical operation.<sup>7</sup> Among conservative surgery alternatives are external drain and deroofting treatments. Among the radical surgery possibilities are liver resection and pericystectomy.<sup>8</sup>

In parts of the globe where hydatid cysts remain endemic, removal via surgery is the most prevalent treatment option. Surgeons have noted recurrence percentages ranging from 7.7 to 30%, and morbidity percentages ranging from 21 to 80% with conservative surgeries.<sup>9</sup>

In some cases, hydatid cysts are clinically asymptomatic or present with minimal, non-specific

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symptoms, regardless of the fact that they necessitate immediate surgery to prevent sudden and severe, sometimes fatal, consequences.<sup>10</sup>

The aim of current study was to examine the surgical management of complicated hydatid cysts with biliary fistula in our setup.

**METHODOLOGY**

This retrospective longitudinal study was conducted at Army Liver Transplant Unit Rawalpindi, Pakistan, from Jan to Jul 2022.m after approval from the Institutional Ethical Review Committee (IERB approval certificate number 262).

**Inclusion Criteria:** Patients of either gender with age ranging from 15 to 65 years, presenting in Outpatient Department having complex liver hydatid cyst were included.

**Exclusion Criteria:** Pregnant women, patients who had had surgery for complicated hepatic hydatid cysts, those with simple liver hydatid cysts and hydatid cysts in other organs were excluded.

All patients who presented to the OPD during the study duration were included, which came to a total of 30 patients selected through non-probability convenient sampling. Written, informed consent was taken prior to data collection. We considered patients with minimum one of the following: cysto-biliary interaction with reoccurring cholangitis, deterioration of the diaphragm or the chest wall, or interaction of cyst with the bronchial tree, and contact with or compression of major vascular structures.

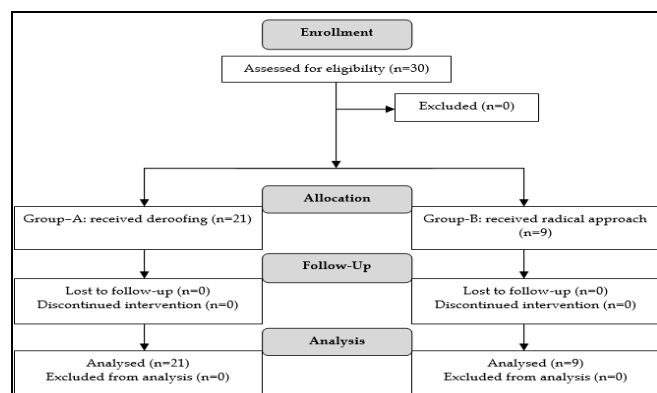


Figure-1: Patient Flow Diagram (n=30)

Prior to surgery, every patient had standard blood tests, chest X-rays, a liver ultrasonography (US), and a computed tomography (CT) scan. Demographic data, age, gender were gathered from the patient. Surgical procedures and cyst attributes were recorded

after scanning. Patients were treated with two surgical approaches: we compared 21 patients who received deroofing surgical approach (Group-A) with 9 patients who underwent radical approach (Group-B), as seen in Figure-1. In deroofing procedures, the cysts were deroofed and marsipulization of the cysts were done. In radical approach, cystectomy, pericystectomy, lobectomy and segmentectomy were done.

The collected data was analyzed using Statistical Package for Social Sciences (SPSS) version 23. For quantitative variables Mean±SD was calculated and for qualitative variables frequency with percentages was determined. For the association of complications in surgical management chi-square test was used. The p value ≤ 0.05 was considered as significant.

**RESULTS**

We enrolled 30 patients in our study. The mean ages of patients were 55.77±15.39 years. Out of 30 patients 12(40.0%) were male and 18(60.0%) patients were female.

The signs and symptoms were: abdominal pain present in 13 patients, palpable abdominal mass present in 18, fever in 9, jaundice in 7, nausea/vomiting in 5, anorexia in 9, upper abdominal tenderness in 5, recurrent cholangitis in 6, abdominal distension in 12 and elevated ALT/AST in 10 patients, as seen in Figure-2.

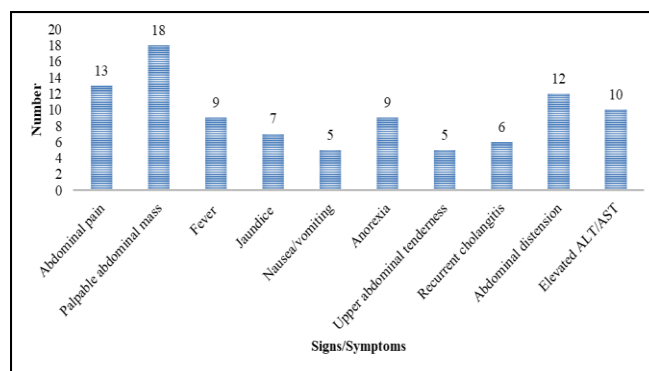


Figure-2: Frequency of Signs / Symptoms (n=30)

In the current study, 16(53.3%) patients had right lobe cysts, 7(23.3%) had left lobe cysts and 7(23.3%) had bilobar cysts. The mean cyst size was 17.60±1.69 cm, of which 17(56.7%) patients had single cysts and 13(43.3%) had multiple cysts, which can be seen in Table-I.

The results of classifications of complex hydatid liver cyst type were as 12(40.0%) had Type-I cyst (Cysto-biliary communication with recurrent

cholangitis), 10(33.3%) had Type-III cyst (Contact or compression of vascular structures) and 8(26.7%) had Type-IV cyst (Multiple bilobar cysts), which can be seen in Table-II.

**Table-I: Characteristics of the Cysts (n=30)**

Characteristics	Values
<b>Location</b>	
Right lobe	16(53.3%)
Left lobe	7(23.3%)
Bilobar	7(23.3%)
<b>Number of Cysts</b>	
Single cyst	17(56.7%)
Multiple cyst	13(43.3%)
Cyst size in cm (Mean ± SD)	17.60±1.69

**Table-II: Classification of Complex Hydatid Cyst Type (n=30)**

Complex Hydatid Cyst Type	n(%)
Type-I	12(40.0%)
Type-III	10(33.3%)
Type-IV	8(26.7%)

**Table-III: Results of Complications across Groups (n=30)**

Complications	Study Groups		Total	p-value
	Group-A n=21 n(%)	Group-B n=9 n(%)		
Respiratory infection	1(4.8%)	0(0.0%)	1(3.3%)	0.013
Pleural effusion	3(14.3%)	0(0.0%)	3(10.0%)	
Wound infection	4(19.0%)	3(33.3%)	7(23.3%)	
Biliary fistula	4(19.0%)	0(0.0%)	4(13.3%)	
Intra-abdominal abscess	3(14.3%)	0(0.0%)	3(10.0%)	
Postoperative Bleeding	3(14.3%)	0(0.0%)	3(10.0%)	
Bile Leak	2(9.5%)	0(0.0%)	2(6.7%)	
No Complications	1(4.8%)	6(66.7%)	7(23.3%)	

In Group-A patients, 1(4.8%) had respiratory infection, 3(14.3%) had pleural effusion, 4(19.0%) had wound infection, 4(19.0%) had biliary fistula, 3(14.3%) had intra-abdominal abscess, 3(14.3%) had postoperative bleeding, 2(9.5%) had bile leak and 1(4.8%) had no complication. In patients of Group-B, 3(33.3%) had wound infection and 6(66.7%) had no complications with p-value (p=0.013). From results it was cleared more complications present in deroofting managed patients.

**DISCUSSION**

Surgical intervention has been regarded as the backbone of therapy for hydatid cyst disease for decades.<sup>11</sup> Preventive initiatives in endemic regions and the usage of benzimidazole compounds have resulted in a successful containment of the illness.<sup>12</sup>

Furthermore, developments in minimally invasive therapeutic techniques, like puncture-aspiration-injection-reaspiration (PAIR), have decreased the necessity for the surgical operations.<sup>13</sup>

However, surgery contributes a significant part when nonoperative treatments have been unsuccessful or are deemed infeasible even in the complex or complicated hydatid cysts. Over 19.5% patients exhibited a cysto-biliary connection, a typical consequence of the hepatic echinococcosis that has been documented in 26-80 percent of incidence.<sup>14</sup> Cysto-biliary interaction is a well-known predictor of outcome but early surgical intervention improves outcome. According to the size and placement of cysts, individuals may be with no symptoms or experience sepsis, liver abscess, cholangitis or jaundice.<sup>15</sup>

Fistulization may develop in both small- and large-diameter biliary channels. In whole or partial pericystectomy, simple suture repair is performed in the case of small leakages, but a T-tube is put in common bile duct in situation of substantial biliary connections. It is noteworthy to highlight that cysto-biliary connections have been linked with postoperative problems. In fact, intrabiliary collapse of cyst elevates morbidity after operation by 16-55 percent, and death by 1.25-7 percent.<sup>16</sup>

In the present research, 5 patients had surgical operation for deterioration of diaphragm by cyst wall, and in 2 of these cases there was also connection with bronchial tree. In 2-16% of instances, hepatic hydatid cysts are associated with thoracic problems.<sup>17</sup> We have categorized the situations in which cysts are in connection with or compress significant vascular systems as complicated. We noticed similar characteristics in 31.4% of individuals in this study, the majority of whom showed no symptoms. Full or partial occlusion of the portal vein or its primary branches could lead to reduced portal vein influx and hepatic morphological and operational alterations, such as atrophy of affected lobe and eventual contralateral lobe hypertrophy.

Location of cyst is a significant component in determining surgical therapy selection. Whenever the cyst wall is in direct touch with or in close proximity to main arteries like main portal branches or portal vein, hepatic veins and vena cava, there is a greater possibility of intraoperative and postoperative hemorrhage during surgical removal of cyst.<sup>18</sup> Conventionally, surgery of liver hydatid cysts includes both conservative and radical treatments. The majority of conservative techniques, including extraction of cystic material, deroofting, and marsupialization, involve draining and clearance of the cystic contents.<sup>19</sup>

The objective of radical procedures like complete, subtotal, and partial pericystectomy is to eradicate the cyst with a rim of neighboring liver tissue.<sup>20</sup> The optimal surgical therapy for hydatid cysts of liver is still a topic of discussion.<sup>21</sup> Pang *et al.*, showed in a new meta-analysis that radical methods lower the incidence of postoperative problems and cyst reappearance in comparison to conservative surgical intervention.<sup>22</sup>

While prospective trials contrasting conservative against radical methods have not been conducted, we feel radical surgery must always be performed whenever possible.

### LIMITATION OF STUDY

The sample size of current study was limited and duration of study was also short. There is need to conduct a comprehensive prospective study with large sample size at multiple centers to briefly address the issue.

### CONCLUSION

In Pakistan, surgical management of liver hydatid cysts still remains a challenge and also linked with complications. The best outcomes, those lasting long-term, were achieved using the radical surgical approach as compared to deroofting.

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### Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

MS & NMW: Data acquisition, data analysis, critical review, approval of the final version to be published.

UB & HS: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

MUK & MN: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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