# COMPLEX PYOGENIC LIVER ABSCESS: OUTCOME OF OPEN VS LAPAROSCOPIC DRAINAGE

Rashid Aslam[1], Farrukh Ozair Shah[2], Nadir Shah[3], Mehtab Abdullah[4]

**Correspondence**

[2]Farrukh Ozair Shah, Associate Professor, Department of General Surgery, Hayatabad Medical Complex, Peshawar

: +92-300-9595397

: farrukhos68@gmail.com

[1]Associate Professor/Chairman, Department of General Surgery, Hayatabad Medical Complex, Peshawar

[3]Specialist Registrar, Department of of General Surgery, Hayatabad Medical Complex, Peshawar

[4]Postgraduate Resident, Department of General Surgery, Hayatabad Medical Complex, Peshawar

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***ABSTRACT***

***OBJECTIVES***

*Our study aimed to evaluate the safety and efficacy of laparoscopic drainage as a management of complex pyogenic liver abscesses in comparison to open surgical drainage.*

***METHODOLOGY***

*The comparative research design was used to compare the outcomes, complications, perioperative morbidity, mortality, and potential recurrence of 60 patients with a complex pyogenic liver abscess who were hospitalized at the General Surgery Department of Hayatabad Medical Complex Peshawar and treated either laparoscopically or openly from January 2019 to December 2020. 30 patients had open drainage management, while 30 patients received laparoscopic drainage management. For all patients, pus was examined for culture sensitivity. Patients with a small, solitary and unilocular pyogenic liver abscess that improved with antibiotic therapy and or/and percutaneous drainage were excluded. Each patient had a thorough clinical evaluation, lab tests, ultrasound, computed tomography, or magnetic resonance imaging of the pelvis and abdomen.*

***RESULTS***

*All patients underwent abdominal ultrasonography & sonographic diagnosis was made in 43(71.7%), followed by a computed tomography scan (CT) in 12(20%) & magnetic resonance imaging (MRI) diagnosis was made in 5(8.3%) patients respectively. Diabetes mellitus was present in 15(25%) patients, severe chronic obstructive pulmonary disease in 10(16.7%) and severe anemia in 9(15%) patients. All individuals associated with co-morbidity were considered high-risk patients.*

***CONCLUSION***

*Laparoscopic drainage of liver abscess has a shorter surgical time, lower morbidity rate, and shorter hospital stay as compared to open surgical drainage.*

***KEYWORDS:*** *Laparoscopy, Open Drainage, Pyogenic Liver Abscess*

## INTRODUCTION

Untreated complex pyogenic liver abscess is an uncommon illness that might be lethal. A multilocular liver abscess with a diameter of more than 5 cm is referred to as a complex pyogenic liver abscess.[1] The primary treatment for a liver abscess is percutaneous aspiration or drainage while using antibiotics. If interventional radiology fails, the abscess ruptures, leading to intra-abdominal spillage. Surgical drainage is then advised. Percutaneous drainage in complex pyogenic liver abscesses may aid in enhancing the clinical situation before surgery.[2] The surgical procedure of laparoscopic drainage seems promising.[3] Most of these abscesses are categorized into amoebic or pyogenic although a minority are caused by parasites and fungi.[4] Most amoebic infections are caused by Entamoeba histolytica. The pyogenic abscesses are usually polymicrobial but some organisms are seen more commonly in them, such as E. coli, Klebsiella, Streptococcus and anaerobes. It is essential to understand the severity of these abscesses because of the high mortality in untreated patients.[5] The annual incidence rate is about 2.3 cases per 100,000 people which is significantly higher in low socioeconomic groups and developing countries. Males are more frequently affected than females.[6] To effectively treat large pyogenic multilocular abscesses, drainage is typically required in addition to medications. Due to the high bacterial load, drug inactivation, and poor medium for bacterial clearance, antibiotics alone are useless.[7] The length of the antibiotic's usage is shortened by effective drainage. The techniques include percutaneous catheter drainage and percutaneous needle aspiration.[8] Percutaneous aspiration combined with antibiotics is the best course of treatment for patients with smaller, solitary, and unilocular abscesses, especially those who are young and healthy.[9] Patients with multiple or complex pyogenic liver abscesses, debilitated, older age and

comorbid, diabetes have a greater failure risk with percutaneous aspiration.[10] However, little research has been done locally in the past 5 years, for simultaneous treatment of complex pyogenic liver abscesses. The purpose of this study was to explore the safety and feasibility of laparoscopic surgery for the treatment of complex pyogenic liver abscesses and to compare the therapeutic effects and outcomes of the two methods.

## METHODOLOGY

The 60 patients in this comparative study with complex pyogenic liver abscesses treated by either laparoscopic or open surgical drainage at Hayatabad Medical Complex Peshawar between January 2019 and December 2020 were included. Results, complications, perioperative morbidity, mortality, and potential recurrence were all compared. Patients were equally divided into two groups i.e. A & B. Group A consisted of 30(50%) patients who were managed by open surgical drainage while group B consisted of 30(50%) patients who were managed by laparoscopic drainage. All patients had thorough clinical evaluations and baseline investigations. All patients underwent abdominal ultrasonography, and 12 patients underwent computed tomography because they had a well-defined low-attenuation lesion with an enhancing peripheral rim and a single multiloculated cystic appearance. Five patients underwent magnetic resonance imaging MRI because they had a multiloculated cystic lesion with a low T1 and high T2 signal and an enhancing peripheral rim. For all patients, pus was examined for culture sensitivity. Each patient signed a written permission form after receiving a thorough description of the procedure and its potential risks. The research comprised patients with complex pyogenic liver abscesses measuring greater than 5 cm in diameter, multilocular, and resistant to percutaneous drainage or antibiotics. Patients with pyogenic liver abscesses that were small, isolated, and unilocular and responded to prophylactic antibiotics and/or percutaneous drainage were excluded. SPSS 25.0 was used to analyses the data, and a P value of 0.05 or above was deemed statistically significant.

## RESULTS

A total of 60 patients were included. Age ranged between 20-60 years with a mean age of 40 years. All patients underwent abdominal ultrasonography & sonographic diagnosis was made in 43(71.7%), followed by computed tomography scan (CT) in 12(20%) & magnetic resonance imaging (MRI) diagnosis was made in 5(8.3%) patients respectively. Diabetes mellitus was present in 15(25%) patients, severe chronic obstructive pulmonary disease in 10(16.7%) and severe anemia in 9(15%) patients. All individuals associated with co-morbidity were considered high-risk patients. Mean operative time was 80 minutes in group A & 90 minutes in group B (P=0.999), mean hospital stay was 4 days in group A & 8 days in group B (P=0.001), post-op wound infection was 1(3.3%) in group A & 3(10%) in group B (P=0.05), abscess recurrence was 1(3.3%) in group A & 1(3.3%) in group B (P=0.111) & oral feeding was started earlier in group A as compared to group B (1 *vs* 3) P value 0.04). Abscess recurrence was successfully treated with percutaneous drainage. One laparoscopic operation was converted to open surgical drainage due to unsatisfactory laparoscopic drainage. Postoperative complications occurred in 5(8.3%) patients, 2(3.3%) in group A and 3(5%) in group B. In group A, 1(1.7%) patient had biliary leakage & 1(1.7%) had right hydrothorax which was relieved in 4 days after closed drainage. In group B, early postoperative ileus occurred in 1(1.7%), subphrenic abscess occurred in 1(1.7%) and infective incision site occurred in 1(1.7%) who were treated by antibiotics & repeated change of dressings. Pus culture sensitivity revealed that 44(73.3%) patients had positive microbial reports while 16(26.7%) had reported no growth. The most common organisms identified were Klebsiella Pneumoniae 25% and Escherichia Coli 16%, followed by Streptococcus spp (12.5%), Anaerobes (10.4%) and polymicrobial (15%). No mortality was noted in both group.

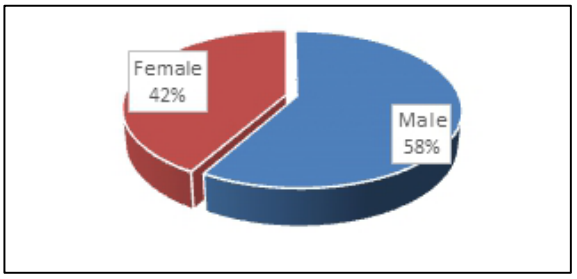


**Figure 1: Gender-Wise Distribution**

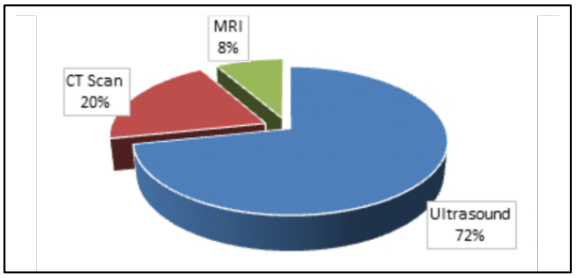


**Figure 2: Imaging Findings of Liver Abscess**

**Table 1: Results of Groups A (Open Surgical Drainage) & B (Laparoscopic Drainage)**

| Variables | Group A | Group B | P-Value |
|---|---|---|---|
| Mean Operative Time | 80 minutes | 90 minutes | 0.999 |
| Mean Hospital Stay | 04 days | 08 days | 0.001 |
| Wound Infection | 01 | 03 | 0.005 |
| Recurrence | 01 | 01 | 0.111 |
| Oral Feeding Started | 01 day after surgery | 03 days after surgery | 0.04 |

**Table 2: Postoperative Complications (n=5)**

| Complications | f | %age |
|---|---|---|
| **Group A (n=2)** | | |
| Biliary leakage | 01 | 1.7% |
| Rt Hydrothorax | 01 | 1.7% |
| **Group B (n=3)** | | |
| Post op ileus | 01 | 1.7% |
| Subphrenic abscess | 01 | 1.7% |
| Infected incision site | 01 | 1.7% |

## DISCUSSION

The pyogenic liver abscess had a death rate of greater than 50% before the 1970s. The mortality rate has significantly decreased because of advances in imaging, surgery, and efficient broad-spectrum antibiotics.[11,12] For successful care, complex pyogenic liver abscesses typically need surgical drainage, either open surgical drainage or laparoscopic drainage along with broad-spectrum antibiotics.[13] Sixty patients met the criteria for a complex liver abscess during the research period (more than 5 cm in diameter, multilocular). Systemic antibiotics were given to all patients. In our study (25%) of patients had diabetes mellitus, which is comparable to the Serraino et al study having 23% of diabetes patients.[14] In our analysis, two patients who experienced recurrence had diabetes. Preoperative ultrasonography, CT, MRI, and intraoperative laparoscopic ultrasound all assist in determining the location, size, number, multiloculated, pus volume and septa of abscesses. All patients underwent abdominal ultrasonography, which was diagnostic on its own in 43 (71.7%) of cases, however, in 12 patients CT scan was and in 5 patients an MRI scan was needed to confirm the diagnosis. This is like research by Bachler P et al in which ultrasonography was diagnostic in 69.4% of cases, CT scan in 22.1%, and MRI in 8.5%.[15] In this study, 73.3% of our patients received positive culture results, whereas 26.7% had results that showed no growth. In our study Klebsiella Pneumoniae 25% and Escherichia Coli, 16% were the two most frequent species found.[16] This is similar to the findings of Mogahed M et al but different from those of Liu L et al who reported that 25 out of 66 cases had positive results (37.9%), with Klebsiella Pneumoniae being found in (60.0%) of cases as the most prevalent pathogen.[17,18] In the laparoscopic drainage group, the length of the operation and hospital stay were shorter, and oral feeding began earlier. This research and that of Malik A et al are similar in terms of hospital stay and oral feeding, but not in terms of the operation time, probably as a result of simultaneously managing the biliary disease.[19] Contrary to the study conducted by Malik et al in which mortality occurred in 19 of 169 patients with pyogenic liver abscesses and it was higher in the nonsurgical drainage group (16.6%) than in the surgically drained group, there was no perioperative mortality in the current study.[19] This is comparable to Jin FT et al study (0%).[20] Regarding the recurrence rate, it was 3.3% in two cases, both of which were effectively treated with percutaneous drainage followed by antibiotics: one in group A and one in group B.

## LIMITATIONS

One of the limitations of our study is that it is a single-center study with a limited number of cases. To establish the efficacy of laparoscopic liver abscess drainage, a multi-centric and large sample size study is recommended.

## CONCLUSION

Both open surgery and laparoscopic draining of complex pyogenic liver abscesses are effective and safe. Although open drainage is the preferred method of care for patients with severe conditions or who have failed percutaneous drainage, laparoscopic drainage has a shorter hospital stay, lower morbidity rate, and shorter operative time. Conversion to open surgical drainage is advised when laparoscopic drainage is unsatisfactory or fails.

**CONFLICT OF INTEREST:** None

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## CONTRIBUTORS

1. ***Rashid Aslam*** – *Concept & Design*
2. ***Farrukh Ozair Shah*** – *Data Analysis/Interpretation*
3. ***Nadir Shah*** – *Data Acquisition*
4. ***Mehtab Abdullah*** – *Data Analysis/Interpretation*