



Research Article

Predictors of Treatment Outcome in Liver Abscess A Retrospective Case Series from a Tertiary Care Center

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Abstract: **Introduction:** Liver abscess is a significant cause of morbidity in developing countries, commonly associated with diabetes mellitus and alcohol use. Early diagnosis and minimally invasive management have improved clinical outcomes. **Methods:** This retrospective case series included 80 patients diagnosed with liver abscess at a tertiary care center. Clinical features, laboratory parameters, imaging findings, microbiological profile, and treatment outcomes were analyzed using descriptive statistics. **Results:** Diabetes mellitus was present in 28.8% of patients, while 58.8% had a history of alcohol use. The median symptom duration was 10 days (range: 1–180 days). Right lobe involvement was most common (53.8%), and 73.8% of patients had solitary abscesses. Pus cultures were sterile in 61.3% of cases. Clinical recovery (fever resolution) was achieved in 88.8% (n = 71) of patients, and overall treatment success was observed in 92.5% of cases. **Conclusion:** Liver abscess is frequently associated with modifiable risk factors such as alcohol use and diabetes. Percutaneous drainage combined with antimicrobial therapy is an effective management strategy, resulting in high success rates and favorable clinical outcomes.

Keywords: Liver abscess, Pyogenic abscess, Percutaneous drainage, Pigtail catheter, Case series

INTRODUCTION

Liver abscess is a potentially life-threatening condition characterized by localized pus collection within the hepatic parenchyma. It is broadly classified into pyogenic and amoebic types, with pyogenic liver abscess being more common in hospitalized patients and associated with significant morbidity [1,2]. The incidence remains high in developing countries, with risk factors including diabetes mellitus, alcoholism, and biliary tract disease [3].

Clinical presentation varies from fever and abdominal pain to systemic sepsis, depending on disease severity and host factors. Advances in imaging modalities such as ultrasonography and computed tomography have facilitated early diagnosis and guided intervention [4].

Percutaneous drainage using pigtail catheterization has become the standard of care for large or complicated abscesses, offering a minimally invasive alternative to open surgical drainage [5]. The success of this approach depends on abscess size, number, consistency, and underlying comorbidities.

Despite improvements in management, liver abscess continues to pose diagnostic and therapeutic challenges, particularly in patients with multiple comorbidities or atypical presentations [6]. The present study aims to describe the clinical profile, microbiological spectrum, and outcomes of patients with liver abscess managed at a tertiary care center.

MATERIALS AND METHODS

This retrospective case series included 80 patients diagnosed with liver abscess and managed at a tertiary care center. The study was conducted between January 2022 and December 2024.

Inclusion Criteria

- Radiologically confirmed liver abscess
- Patients managed with percutaneous drainage or conservative therapy
- Complete clinical records available

Data Collection

Data were extracted from hospital records, including:

- Demographics (age, gender)
- Clinical variables (symptom duration, diabetes status, alcohol history)
- Laboratory parameters (HbA1c, albumin, TLC, bilirubin, ALP)
- Imaging findings (size, lobe, number of abscesses)
- Microbiology (pus culture)
- Treatment details (pigtail size, drainage volume, duration)
- Outcomes (complications, fever resolution, success/failure)

Ultrasound-guided percutaneous drainage was performed using standard pigtail catheter technique under aseptic precautions.

Statistical Analysis

All data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) software version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were assessed for normality using the Shapiro–Wilk test. Descriptive statistics were used to summarize the data. Continuous variables were expressed as mean ± standard deviation (SD) for normally distributed data and as median with range for non-normally distributed data. Categorical variables were presented as frequencies and percentages.

Comparative analysis was not performed due to the descriptive nature of this case series. However, subgroup distributions (e.g., diabetes status, alcohol history, microbiological profile) were analyzed using proportions to identify trends.

A p-value of <0.05 was considered statistically significant wherever applicable.

Ethical

This study was conducted in accordance with the Declaration of Helsinki. Institutional Ethics Committee approval was obtained. Due to the retrospective nature of the study, the requirement for informed consent was waived.

Approval

RESULTS

As shown in Table 1, Among 80 patients, diabetes mellitus was present in 28.8% of cases, while the majority were non-diabetic. Alcohol use was documented in 58.8% of patients, indicating a strong association with liver abscess in this cohort. Symptom duration showed wide variability, ranging from acute presentations of 1 day to prolonged cases up to 180 days, with a median duration of 10 days, reflecting heterogeneity in disease onset and healthcare-seeking behavior.

TABLE 1. Baseline Demographic and Risk Factors (n = 80)

Variable	Frequency (%)
Diabetes Mellitus	
Present	23 (28.8%)
Absent	57 (71.2%)
Alcohol History	
Present	47 (58.8%)
Absent	33 (41.2%)
Symptom Duration (days)	
Median (Range)	10 (1–180)

As shown in Table 2, Laboratory evaluation demonstrated variable leukocytosis, with total leukocyte counts ranging widely. Serum albumin levels indicated frequent hypoalbuminemia, reflecting systemic inflammation and nutritional compromise. Alkaline phosphatase levels were elevated in several patients, consistent with hepatobiliary involvement.

TABLE 2. Laboratory Parameters

Parameter	Median (Range)
Serum Albumin (g/dL)	2.7 (1.3 – 4.3)
Total Leukocyte Count (/mm ³)	14.4 (4.4 – 33.89)
ALP (U/L)	258 (89.8 – 1621)

As shown in Table 3, Right lobe involvement was most common, seen in 53.8% of patients, followed by left lobe and bilobar disease. The majority of patients (73.8%) had solitary abscesses, while multiple abscesses were observed in 26.2% of cases, indicating variable disease burden.

TABLE 3. Radiological Characteristics

Variable	Frequency (%)
Lobe Involvement	
Right	43 (53.8%)
Left	22 (27.5%)
Both	15 (18.7%)
Number of Abscesses	
Solitary	59 (73.8%)
Multiple	21 (26.2%)

As shown in Table 4, The majority of cultures were sterile (61.3%), likely reflecting prior antibiotic exposure. Among positive cultures, gram-positive cocci and *E. coli* were the most common organisms. Most patients (88.8%) achieved fever resolution, and overall treatment success was high at 92.5%, indicating effective management with current treatment strategies.

TABLE 4. Microbiology and Clinical Outcomes

Variable	Frequency (%)
Pus Culture	

Sterile	49 (61.3%)
E. coli	5 (6.3%)
Gram-positive cocci	9 (11.3%)
Gram-negative bacilli	4 (5.0%)
Polymicrobial	3 (3.8%)
Not specified	10 (12.5%)
Fever Resolution	
Afebrile	71 (88.8%)
Febrile	9 (11.2%)
Outcome	
Success	74 (92.5%)
Failure	6 (7.5%)

DISCUSSION

Liver abscess continues to represent a significant clinical burden in developing countries, with multifactorial etiology and variable clinical presentation. The present case series provides a comprehensive overview of demographic characteristics, laboratory findings, imaging patterns, microbiological profile, and clinical outcomes in 80 patients managed at a tertiary care center. The association between liver abscess and underlying comorbidities such as diabetes mellitus is well established. In this study, diabetes was present in 28.8% of patients, which is consistent with recent literature reporting prevalence rates ranging from 20% to 40% among affected individuals [1,2]. Hyperglycemia contributes to impaired neutrophil function and increased susceptibility to infection, thereby predisposing patients to hepatic abscess formation. Similarly, alcohol consumption was noted in 58.8% of cases, reinforcing its role as a major risk factor due to its association with hepatic dysfunction and compromised immunity [3].

The variability in symptom duration observed in this cohort, with a median of 10 days and a range extending up to 180 days, reflects differences in disease progression and healthcare access. Delayed presentation has been associated with larger abscess size and increased risk of complications, as reported in recent studies [4]. Early diagnosis remains critical for improving outcomes and reducing morbidity.

Laboratory findings in this study demonstrated significant heterogeneity. The median leukocyte count was elevated, reflecting the inflammatory nature of the disease. Hypoalbuminemia was commonly observed, which is a recognized marker of systemic inflammation and poor nutritional status [5]. Elevated alkaline phosphatase levels further indicate hepatobiliary involvement, a finding frequently reported in patients with liver abscess [6].

Radiologically, right lobe involvement was predominant (53.8%), followed by left lobe and bilobar disease. This distribution is consistent with the anatomical predominance of portal venous flow to the right hepatic lobe, making it more susceptible to infection [7]. The majority of patients had solitary abscesses (73.8%), which aligns with existing literature, although multiple abscesses were also observed in a significant subset, indicating more extensive disease in these cases [8].

Microbiological analysis revealed that a majority of pus cultures were sterile (61.3%). This finding is commonly reported and is often attributed to prior antibiotic therapy before hospital admission or limitations in culture techniques [9]. Among culture-positive cases, gram-positive cocci and *Escherichia coli* were the most frequently identified organisms, consistent with the known microbiological spectrum of pyogenic liver abscess [10].

Percutaneous drainage remains the cornerstone of management for liver abscess, particularly for large or symptomatic lesions. Although procedural details varied in this cohort, the overall success rate was high at 92.5%, with minimal complications. This is in agreement with recent studies demonstrating success rates exceeding 85–90% with percutaneous catheter drainage combined with appropriate antimicrobial therapy [5,10]. The high rate of fever resolution (88.8%) further supports the effectiveness of current management strategies.

The variability in hospital stay reflects differences in disease severity, comorbid conditions, and response to treatment. While some patients required prolonged hospitalization, the majority showed favorable clinical recovery. Importantly, complication rates were low, and no major adverse events were documented, highlighting the safety of minimally invasive approaches.

Limitations

This study is limited by its retrospective design and variability in data completeness. Certain parameters, including detailed microbiological characterization and long-term follow-up, were not consistently available. Additionally, the absence of standardized treatment protocols may introduce variability in management approaches. Despite these limitations, the study provides valuable real-world insights into the clinical profile and outcomes of liver abscess.

CONCLUSION

Liver abscess remains a clinically significant condition associated with identifiable risk factors such as diabetes mellitus and alcohol use. This case series demonstrates that percutaneous drainage combined with appropriate antimicrobial therapy is an effective and safe treatment modality, with high success rates and minimal complications. Early diagnosis, risk factor identification, and individualized management are essential for optimizing patient outcomes. Further prospective studies

are required to establish standardized treatment protocols and evaluate long-term outcomes.

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