A Study of Liver Abscess and Outcome of Its Different Treatment Modalities in a Tertiary Care Centre of Central India

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Abstract

Introduction: *Despite the more severe approach to treatment, fatality rates for liver abscesses remained between 60 and 80 percent. Liver abscesses, primarily caused by parasite infections like amoebic liver abscesses, are widespread in India and a significant cause of morbidity and mortality. Treatment success rates have altered as a result of management strategy.*

Aim: *Study the liver abscess and the outcome of its different treatment modalities in tertiary care centers of central India.*

Methodology: *This study was a descriptive longitudinal study conducted in the Department of General Surgery, SSIMS, Bhilai. 21 liver abscess patients were taken as the study population except for those suspected of malignancy and immunocompromised and cirrhosis patients. Data was collected on hematology, biochemistry, culture, and on treatment modality used. A written informed consent was obtained from all study participants.*

Results: T*he mean age of study subjects was 46.05 years and two-thirds 14 (66.67%) were male. The most common presenting complaints were pain at the right hypochondrium, loose motion, fever, and nausea/vomiting. Half of them were alcoholic and diabetic. The surgical drain was done in 47.62% of cases, P/C drain in 33.33%, and conservative treatment in 19.05% of cases. Cases with surgical drain modality have 45% resolved cases followed by P/C drain (35%) and conservative in 20% of cases.*

Conclusion: *The study concludes that the majority of liver abscess cases were b/w age group of 21-50 years and two-thirds are male. The liver abscess was resolved using the surgical drain method followed by P/C drain and conservative.*

Keywords: *Liver abscess, surgical drain, complain, treatment modality, outcome*

INTRODUCTION

A liver abscess refers to the accumulation of infected material within the liver tissue, caused by various sources like bacteria, parasites, fungi, or a combination thereof. This health issue is widespread worldwide. [1] While bacterial liver abscesses are rare, their existence has been recorded since the time of Hippocrates (around 400 BCE). Bright presented the initial comprehensive review on this topic in 1936. Surgical drainage was hailed in 1938 by Ochsner's classic study as the only effective treatment; yet, despite the more aggressive course of action, mortality remained at 60–80%. [2] The frequency of liver abscesses has remained mostly similar despite the development of new radiologic tools, advancements in microbiologic detection, drainage procedures, and supportive care, which have all decreased mortality to 5–30%. This infection continues to be always lethal if left untreated. According to the etiology, the three main types of liver abscess are as follows:1) In the United States, 80% of hepatic abscess cases are caused by pyrogenic abscess, which is frequently caused by polymicrobial infections. 2) 10% of cases are caused by amebic abscesses caused by Entamoeba histolytica. [3] 3) Less than 10% of cases involve a fungus abscess, which is typically caused by a species of Candida. The origins of this condition have evolved through time. Initially, appendicitis was deemed the primary cause of liver abscesses. However, due to improved early detection and timely treatment, its occurrence has decreased. [4] Conversely, conditions like cholelithiasis and diseases affecting the biliary tract, which can lead to ascending portal tract sepsis, have taken the forefront as the main causes of hepatic abscess formation instead of appendicitis.[5] In India, liver abscesses are frequent, predominantly due to parasitic infections like amoebic liver abscesses. However, in developed nations, parasitic liver abscesses are rare. In Western countries, bacterial abscesses are more prevalent, often arising as a complication of infections elsewhere. [6] Over the past 30 years, advancements in radiology, such as ultrasonography and CT scans, along with interventional techniques, have enabled the introduction of radiologically guided aspiration and drainage for most intra-abdominal abscesses.[7] The primary treatment for amoebic liver abscesses is primarily medical. However, some cases might not respond well to medical management, and bacterial infections can complicate some amoebic liver abscesses. The introduction of antibiotics has significantly reduced the occurrence of pyogenic liver abscesses.

Liver abscesses are the most common manifestation outside the intestines in amoebiasis, affecting 3-10% of those affected. In tropical regions, the prevalence of this condition is notable due to inadequate sanitation and personal hygiene resulting from challenging socioeconomic circumstances.[2] Until the mid-1970s, surgical drainage stood as the primary treatment, but percutaneous drainage techniques were later introduced. In recent times, imaging-guided percutaneous drainage has gained popularity in managing liver abscesses, boasting success rates between 70 to 100%. Surgical intervention is typically unnecessary with this approach.[7] Surgical treatment for pyogenic liver abscesses is currently reserved for specific cases, such as peritonitis indications, the presence of certain abdominal surgical conditions (like diverticular abscesses), failed prior drainage attempts, or the existence of a complex abscess with dense pus, which is multiloculated and has a thick wall. In some circumstances, a laparoscopic technique is also frequently employed. The entire abdomen can be examined using this minimally invasive technique, which also greatly lowers patient morbidity.

Therefore, the present study is conducted to study liver abscess and the outcomes of its different treatment modalities in tertiary care centers of central India.

Aim: Study the liver abscess and the outcome of its different treatment modalities in tertiary care centers of central India.

Objectives of the study:

1. To study the association of liver abscess with demographic profile.
2. To study the morphology of liver abscesses.
3. To study the outcome of different treatment modalities conservative management, percutaneous drainage, and surgery.

METHODOLOGY

This study was a descriptive longitudinal study conducted in the Department of General Surgery, SSIMS, Bhilai. All liver abscess patients were taken as the study population except those who followed exclusion criteria with both genders. Patients suspected of malignancy and immunocompromised patients, cirrhosis of liver patients, and those not willing to participate.

The study duration was 2 years.

Sample Size: The sample size of 94 liver abscess patients was determined using the hospital-based proportion of liver abscess patients (8.75%) using the population correction formula of sample size at 95% confidence level and 5% level of significance.

Data Collection Methods:

Suspected liver abscess is confirmed by hematology, biochemistry, culture, USG abdomen/CT abdomen will be treated with conservative management, percutaneous drainage and surgery. Its outcome will be studied in terms of hospital stay length, USG changes, complications and need of further treatment. Data collection tools: A written informed consent will be obtained from all study participants. Data will be collected by individuals' history/if not able to give history family member will be interviewed. Collected data will be recorded on a case record form. Data was collected in specified formats and entered in Microsoft excel and analyzed using SPSS 20 version.

RESULTS

Table 1: Age distribution of study subjects

Age in years	Frequency	Percent
21-30 years	6	28.6
31-40 years	2	9.5
41-50 years	5	23.8
51-60 years	3	14.3
61-70 years	4	19.0
>70 years	1	4.8
Total	21	100.0

Table 1 shows that the mean age of study subjects was 46.05 years. 61.9% were b/w age group of 21-50 years. Two third 14 (66.67%) were male and rest one third 7 (33.33%) were female.

Table 2: Clinical presentation and medical history of study subjects

Presenting complain	**Freq.**	**Percent**
Fever	14	66.67
Chill and Rigor	10	47.62
Nausea/Vomiting	15	71.43
Rt Hypochondrium Pain	16	76.19
Intercostal tenderness	14	66.67
Icterus	8	38.10
Loose motion	16	76.19

Constipation	6	28.57
Overweight BMI>25	9	42.86
Hepatomegaly	14	66.67
Concomitant medical history	**Freq.**	**Percent**
Alcoholic	12	57.14
Diabetes	10	47.62

Table 2 shows that the most common presenting complaint was pain at the right Hypochondrium (76.19%), Loose motion (76.19%), fever (66.67%), Intercostal tenderness (66.67%), nausea/vomiting (71.43%), and hepatomegaly (66.67%) in study subjects. Medical history shows that 57.14% were alcoholic and 47.62% were diabetic.

Table 3 shows the status of abnormal laboratory parameters in study subjects, it shows that 61.90% had abnormal TLC, 57.14% had abnormal neutrophil, and 38.10% each had abnormal SGPT/SGOT and alkaline phosphates and 33.33% had abnormal total bilirubin.

Table 3: Abnormal laboratory parameters among study subjects

Abnormal Lab. parameters	Frequency	Percent
Total Bilirubin	7	33.33
Alkaline Phosphatase	8	38.10
SGPT/SGOT	8	38.10
Hemoglobin <10gm/dl	6	28.57
TLC	13	61.90
Neutrophil	12	57.14
RFT	4	19.05

Table 4: Blood and aspirate culture sensitivity results of study subjects

Aspirate culture	**Freq.**	**Percent**
E. Coli	2	9.52
Klebsiella	1	4.76
Pseudomonas	1	4.76
No growth	17	80.95
Blood culture	**Freq.**	**Percent**
Growth	1	4.76
No Growth	20	95.24
Total	21	100

Table 4 shows that in aspirate culture no growth was seen in 80.9% of study subjects and 4 cases (9.05%) case had culture growth for E. coli, Klebsiella, and Pseudomonas.

Table 5: Treatment modality and treatment outcome among study subjects

Treatment modality	**Freq.**	**Percent**
Conservative	4	19.05
P/C drain	7	33.33
Surgical drain	10	47.62
Treatment Outcome	**Freq.**	**Percent**
Resolved	20	95.24
Residual	1	4.76
Total	21	100

Table 6: Site of abscess, number, and size of lesions in study subjects

Site of abscess	**Treatment modality**			**Total**	**P value**
	Conservative	**P/C drain**	**Surgical drain**		
RT Lobe	0	1	1	2	0.130
	0.0%	50.0%	50.0%	100.0%	
LT Lobe	0	0	5	5	
	0.0%	0.0%	100.0%	100.0%	
V, VI segment	4	5	4	13	
	30.8%	38.5%	30.8%	100.0%	
VII, VIII segment	0	1	0	1	
	0.0%	100.0%	0.0%	100.0%	
Total	4	7	10	21	
	19.0%	33.3%	47.6%	100.0%	
Number of lesions	**Treatment modality**			**Total**	**P value**
	Conservative	**P/C drain**	**Surgical drain**		
Single	4	7	6	17	0.066
	23.5%	41.2%	35.3%	100.0%	
Multiple	0	0	4	4	
	0.0%	0.0%	100.0%	100.0%	
Total	4	7	10	21	
	19.0%	33.3%	47.6%	100.0%	
Size	**Treatment modality**			**Total**	**P value**
	Conservative	**P/C drain**	**Surgical drain**		
< 5 cm	2	0	1	3	0.155
	66.7%	0.0%	33.3%	100.0%	
5-10 cm	1	6	6	13	
	7.7%	46.2%	46.2%	100.0%	
>10 cm	1	1	3	5	
	20.0%	20.0%	60.0%	100.0%	
Total	4	7	10	21	
	19.0%	33.3%	47.6%	100.0%	

Table 5 shows that among study subjects surgical drain was done in 47.62% of cases, P/C drain was done in 33.33% of cases and conservative treatment was done in 19.05% of cases. Treatment outcome shows that liver abscess was resolved in 95.24% of cases.

Table 6 shows that in 2 (9.52%) cases abscess was seen in the right lobe, in 5 (23.81%) cases abscess was seen in the left lobe, in 13 (61.40%) cases abscess was seen in V, VI segment and in 1 case abscess was seen in VII, VIII segment. A single lesion was seen in 80.95% of cases and multiple lesions were seen in 19.05% of cases. A 5-10 cm size lesion was seen in 61.9% of cases, a>10 cm lesion was seen in 23.81% of cases, and a <5cm lesion was seen in 14.29% of cases. The statistical association was checked b/w site of abscess, number, and size of lesions, and treatment modalities. No statistically significant (p>0.05) association was found between them.

Table 7: Outcome of its different treatment modalities in study subjects

Treatment Outcome	Treatment modality			Total	P value
	Conservative	P/C drain	Surgical drain		
Resolved	4	7	9	20	0.561
	20.0%	35.0%	45.0%	100.0%	
Residual	0	0	1	1	
	0.0%	0.0%	100.0%	100.0%	
Total	4	7	10	21	
	19.0%	33.3%	47.6%	100.0%	

Table 7 shows that cases with surgical drain modality have 45% resolved cases followed by P/C drain (35%) and conservative in 20% of cases. one case with residual was of a surgical drain. No statistically significant (p>0.05) association was found between them.

DISCUSSION

The present study is conducted to study liver abscess and the outcome of its different treatment modalities in tertiary care centers of central India. The mean age of study subjects was 46.05 years. 61.9% were b/w age group of 21-50 years. Two-thirds of 14 (66.67%) were male and the rest one-third 7 (33.33%) were female.

Abbas MT et al (2014) reported from a similar study in Qatar that the mean age was 47.4 ± 18.5 years. There were 61 (91%) males and six (9%) females. [8] Sreeramulu PN et al (2019) studied liver abscesses and outcomes with various treatment modalities the mean age was 49.5 years which included male patients most commonly [9].

In the present study the most common presenting complaints in study subjects were pain at the right Hypochondrium (76.19%), Loose motion (76.19%), fever (66.67%), Intercostal tenderness (66.67%), nausea/vomiting (71.43%) and hepatomegaly (66.67%). Medical history shows that 57.14% were alcoholic and 47.62% were diabetic. In an observational study by Gehlot et al. (2018), the various modalities for managing liver abscesses and their surgical outcomes were investigated. The most prevalent signs and symptoms noted included abdominal pain, fever, nausea, vomiting, and weight loss.

Krishnanand et al. (2019) conducted a clinical study focusing on liver abscesses. Their findings revealed that diabetes mellitus (35%) and alcoholism (23.3%) were the primary predisposing factors in reported cases of liver abscesses. [5]

Surendran et al. (2022) delved into the clinical presentation, management, and prognosis of liver abscesses. Their research highlighted a higher incidence among men (97.97%), primarily linked to alcohol intake, with amoebic liver abscesses (ALA) accounting for 95% of cases. Patients commonly exhibited symptoms such as abdominal pain (100%) and fever (57%).[11]

In the present study among study subjects surgical drain was done in 47.62% of cases, P/C drain was done in 33.33% of cases and conservative treatment was done in 19.05% of cases. Treatment outcome shows that liver abscess was resolved in 95.24% of cases. In the present study cases with surgical drain modality have 45% resolved cases followed by P/C drain (35%) and conservative in 20% cases. one case with residual was of a surgical drain. No statistically significant ($p>0.05$) association was found between them.

In 2016 research by Christopher S and colleagues [12], the focus was on exploring diverse treatment methods for liver abscesses and their resulting clinical impact. Their findings indicated that percutaneous needle aspiration and percutaneous catheter drainage proved more efficacious compared to conservative medical approaches for treating liver abscesses. Yet, the study highlighted the significant influence of patient co-existing conditions and the abscess size on

treatment outcomes. Sreeramulu PN et al (2019) investigated the presentation of liver abscesses and evaluated outcomes with various treatment methods. The primary approach involved continual drainage of the abscess through percutaneous insertion of a pigtail catheter. In a single case, surgical intervention was performed due to rupture.[9] Surendran S et al (2022) explored the clinical presentation, treatment approaches, and prognosis of liver abscesses. Their treatment methods included single aspiration in 30.3% of cases, percutaneous catheter drainage in 25.25%, laparotomy and drainage in 22.22%, and conservative management in 3.03% of cases. [11]

CONCLUSION

The study concludes that the majority of liver abscess cases were in the b/w age group of 21-50 years and two-thirds are male. The most common presenting complaints were pain at the right hypochondrium, loose motion, fever, Intercostal tenderness, and nausea/vomiting. Half of them were alcoholic and diabetic. One-fifth of cases had culture growth and E. coli followed by Klebsiella and Pseudomonas were the main microorganism. Surgical drain followed by P/C drain and conservative treatment were more used treatment modalities. The liver abscess was resolved using the surgical drain method followed by P/C drain and conservative.

REFERENCE

1. Ghosh S, Sharma S, Gadpayle AK, Gupta HK, Mahajan RK, Sahoo R, et al. Clinical, laboratory, and management profile in patients of liver abscess from northern India. Journal Tropical Med. 2014;1:8.
2. Ochsner A, DeBakey M, Murray S. Pyogenic Abscess of the Liver II. An Analysis of Forty-Seven Cases with Review of the Literature. *Am J Surg*. 1938. XL:292-319.
3. Othman N, Mohamed Z, Yahya MM, Leow VM, Lim BH, Noordin R. Entamoeba histolytica antigenic protein detected in pus aspirates from patients with amoebic liver abscess. *Exp Parasitol*. 2013 Aug. 134 (4):504-10
4. Huang CJ, Pitt HA, Lipsett PA, Osterman FA,Lillemoe KD, Cameron JL, Zuidema GD: Pyogenichepatic abscess: Changing trends over 42 years. AnnSurg. 1996;223(5):600-7. discussion 607-6093.
5. Farges O, Leese T, Bismuth H. Pyogenic liverabscess: an improvement in prognosis. Br J Surg.1988;75(9):862-5

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6. Kumar V, Abbas AK, Aster JC. Liver, gall bladder and biliary tract. In Robbins basicpathology. 9th edition. Philadelphia: Elsevier Saunders. 2013:635.
7. Rajak CL, Gupta S, Jain S, Chawla Y, Gulati M, Suri S. Percutaneous treatment of liver abscesses: needle aspiration versus catheter drainage. AJR Am J Roentgenol.1998;170(4):1035-9
8. Abbas MT, Khan FY, Muhsin SA, Al-Dehwe B, Abukamar M, Elzouki AN. Epidemiology, Clinical Features and Outcome of Liver Abscess: A single Reference Center Experience in Qatar. Oman Med J. 2014 Jul;29(4):260-3. doi: 10.5001/omj.2014.69. PMID: 25170406; PMCID: PMC4137581.
9. Sreeramulu PN, Srinivasan DS,Vikranth SN, Suma S. Liver abscess: presentation and an assesment of the outcome with various treatment modalities. Int Surg J 2019;6:2556-60.
10. Gehlot P S, Choudhary A et al (2018) did an observational study on Different Modalities of Management of Liver Abscess and its Surgical Outcome. International Journal of Science and Research (IJSR). Volume 8 Issue 8, August 2019
11. Krishnanand, Kurmi N.S.Clinical study of liver abscess. Surgical Update: Int J surg Orthopedics.2019;5(1):46-53. doi:10.17511/ijoso.2019.i01.08.
12. Surendran S, Vallipriya V. Study of clinical presentation, management and prognosis of liver abscess. Int Surg J 2022;9:1142-5.
13. Christopher S, Kumar A, Achar S.Liver abscess-various modalities of treatment and its clinical outcome. Int Surg J2016;3:1868-74.