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

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Abstract

Introduction: *Despite the adoption of a more aggressive treatment approach, the mortality rates for liver abscesses have consistently ranged from 60 to 80 percent. Liver abscesses, often attributed to parasite infections such as amoebic liver abscess, are prevalent in India and represent a significant source of both illness and death. The efficacy of treatments has shifted due to changes in management strategies.*

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

Methodology: *This study was a descriptive longitudinal study conducted in department of General Surgery, SSIMS, Bhilai. 21 liver abscess patients were taken as study population except those suspected 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 third 14 (66.67%) were male. The most common presenting complain was pain at right hypochondrium, loose motion, fever, and nausea/vomiting. Half of them were alcoholic and diabetic. Surgical drain was done in 47.62% cases, P/C drain in 33.33% and conservative treatment in 19.05% cases. Cases with surgical drain modality has 45% resolved cases followed by P/C drain (35%) and conservative in 20% cases.*

Conclusion

T*he study concludes that majority of liver abscess cases were b/w age group of 21-50 years and two third are male. Liver abscess was resolved using surgical drain method followed by P/C drain and conservative.*

Key words: *Liver abscess, surgical drain, complain, treatment modality, outcome*

Article history: received 23 May 2023, Accepted 12 June 2023

Introduction

A liver abscess is defined as the accumulation of purulent material within the liver parenchyma, often resulting from bacterial, parasitic, fungal, or mixed infections. This condition is widespread across the globe [1]. Although bacterial liver abscesses are rare, historical records dating back to Hippocrates (400 BCE) and Bright's first comprehensive review in 1936 demonstrate their existence. Surgical drainage was identified as the sole effective treatment in a seminal 1938 study by Ochsner; nevertheless, even with this more aggressive approach, mortality rates remained high at 60-80% [2]. Despite advancements in radiological tools, microbiologic detection, drainage procedures, and supportive care, which have collectively reduced mortality to 5-30%, the frequency of liver abscess cases has remained relatively constant. It's crucial to note that this infection remains fatal if left untreated. Regarding etiology, the three main types of liver abscesses can be categorized as follows: 1) In the United States, approximately 80% of hepatic abscess cases are pyogenic, often resulting from polymicrobial infections. 2) About 10% of cases are amoebic abscesses caused by Entamoeba histolytica [3]. 3) Less than 10% of cases involve fungal abscesses, typically caused by Candida species. The etiology of this condition has evolved over the years. Traditionally, appendicitis was considered a major cause of liver abscess; however, due to early diagnosis and prompt treatment, its incidence has decreased [4]. In contrast, cholelithiasis and biliary tract diseases, which have the potential to cause ascending portal tract sepsis, have now replaced appendicitis as the leading causes of hepatic abscess formation [5]. In India, liver abscesses are common, primarily caused by parasitic infections such as amoebic liver abscess. However, in developed countries, parasitic liver abscesses are rare. Bacterial abscesses are more common in the Western world and often represent a complication of an infection originating elsewhere [6]. Advances in radiology, such as ultrasonography and CT scans, over the last 30 years, along with interventional techniques, have introduced radiologically guided aspiration and drainage for most intra-abdominal abscesses [7]. The mainstay of treatment for amoebic liver abscess is primarily medical; however, some cases may be refractory to medical management. Bacterial infections may complicate certain cases of amoebic liver abscess. With the introduction of antibiotics, the incidence of pyogenic liver abscesses has significantly decreased. Liver abscess is the most prevalent extraintestinal manifestation of amoebiasis, occurring in 3-10% of affected patients.

Article history: received 23 May 2023, Accepted 12 June 2023

The prevalence of liver abscesses is notably high in tropical countries and is often linked to inadequate sanitation and personal hygiene resulting from challenging socioeconomic conditions [2]. Until the mid-1970s, surgical drainage stood as the primary treatment approach. However, with the advent of percutaneous drainage techniques and their increasing utilization in recent years, guided by imaging, the success rates in treating liver abscesses have been reported to range from 70 to 100%. Consequently, surgical intervention is generally deemed unnecessary [7]. Presently, surgical intervention for pyogenic liver abscesses is reserved for specific situations, including indications such as signs of peritonitis, the presence of abdominal surgical pathology (such as a diverticular abscess), failure of previous drainage attempts, and the identification of a complicated, multiloculated abscess with a thickened wall and viscous pus.

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 with the purpose of studying the liver abscess and the outcome 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 the tertiary care center 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 abscess.
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 Department of General Surgery, SSIMS, Bhilai. All liver abscess patients were taken as the study population except those who follow 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 were determined using hospital-based proportion of liver abscess patients (8.75%) using 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 analysed 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 complain was pain at 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% has 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% cases, P/C drain was done in 33.33% cases and conservative treatment was done in 19.05% cases. Treatment outcome shows that liver abscess was resolved in 95.24% cases.

Table 6 shows that in 2 (9.52%) cases abscess was seen in right lobe, in 5 (23.81%) cases abscess was seen in 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. Single lesion was seen in 80.95% cases and multiple lesions were seen in 19.05% cases. 5-10 cm size of lesion was seen in 61.9% cases, >10 cm lesion was seen in 23.81% cases and <5cm lesion was seen in 14.29% cases. 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 has 45% resolved cases followed by P/C drain (35%) and conservative in 20% cases. one case with residual was of surgical drain. No statistically significant ($p>0.05$) association was found between them.

Discussion

The present study is conducted with the purpose to study the liver abscess and outcome of its different treatment modalities in tertiary care centre 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 third 14 (66.67%) were male and 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) study the liver abscess and outcome with various treatment modalities the mean age was 49.5 years which included male patients most commonly [9].

In present study the most common presenting complain in study subjects was pain at 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.

Gehlot and colleagues (2018) conducted an observational study focusing on the various approaches to managing liver abscesses and assessed surgical outcomes. The prevalent signs and symptoms noted in their study included abdominal pain, fever, nausea, vomiting, and weight loss.

In a clinical study by Krishnanand et al. (2019) on liver abscess cases, it was found that diabetes mellitus (35%) and alcoholism (23.3%) were the most frequent predisposing factors [5].

Surendran and co-authors (2022) undertook a study to investigate the clinical presentation, management, and prognosis of liver abscesses. Their findings highlighted a higher incidence of the disease among men (97.97%), predominantly those with a history of alcohol consumption. Amoebic liver abscess (ALA) was observed in 95% of cases. Abdominal pain (100%) and fever (57%) were identified as the predominant symptoms among the patients [11].

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

Christopher and colleagues (2016) conducted a study investigating liver abscess and the effectiveness of different treatment modalities, along with their clinical outcomes. The study concluded that percutaneous needle aspiration and percutaneous catheter drainage were more

effective than conservative medical management in treating liver abscesses. However, the study also noted that the outcome could be influenced by the co-existing medical conditions of the patients as well as the size of the liver abscess [12].

Sreeramulu and colleagues (2019) conducted a study focusing on liver abscesses, their presentation, and the assessment of outcomes with different treatment modalities. The primary treatment approach involved continuous drainage of the abscess cavity through the percutaneous insertion of a pigtail catheter. In a specific case where rupture occurred, surgical intervention was performed [9].

In a study by Surendran and team (2022) on the clinical aspects of liver abscess, various treatment approaches were employed. The treatments included single aspiration in 30.3% of cases, percutaneous catheter drainage in 25.25% of cases, laparotomy and drainage in 22.22% of cases, and conservative management in 3.03% of cases [11].

Conclusion:

The study concludes that majority of liver abscess cases were b/w age group of 21-50 years and two third are male. The most common presenting complain was pain at right hypochondrium, loose motion, fever, Intercostal tenderness and nausea/vomiting. Half of them were alcoholic and diabetic. One fifth 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. Liver abscess was resolved using surgical drain method followed by P/C drain and conservative.

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