ORIGINAL RESEARCH

A retrospective outcome assessment of treatment of liver abscess of >5 cm by means of catheter drainage and the use of antibiotics

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Received: 12 March, 2023 Accepted: 18 April, 2023

ABSTRACT

Aim: This study focused on the outcome of treatment of liver abscess of >5 cm by means of catheter drainage and the use of antibiotics. **Material & methods:** In this retrospective study, patients with liver abscesses of size >5 cm who had undergone percutaneous pigtail catheter drainage procedure in the department of radiology of our institution were included. The study period was of 1 year. Small-sized abscesses were excluded from the study. A total of 100 patients were included in this study. **Results:** In this study, a total of fifty cases of liver abscesses were included. Among these, 80 (80%) were male and 20 (20%) cases were female. The age group affected was 21-66 years, with the mean age being 45 years. Fifty percent of the patients had underlying comorbidity, the most common of which was diabetes in 30% of the cases. The most common symptom was fever which was found in 65% (n = 65) of the cases. Abdominal pain was the next most common, seen in 50% (n = 50) of cases. Right lobe was the most common site of occurrence of abscess (n = 55) in 55% of cases. Among the various laboratory parameters, total leukocyte count (TLC) had increased (>11 × 103/µl) in 37 patients equivalent to 70%, serum bilirubin had raised (>1.2 mg/dL) in 15 patients equivalent to 30%, serum total protein was low (<6 g/dL) in 17 patients equivalent to 34%, and INR had raised (>1.5) in 10 patients equivalent to 20%. **Conclusion:** In contradiction to the earlier belief, percutaneous drainage is a safe and effective means of treatment in liver abscesses of >5 cm with high clinical success rate and reduced duration of intravenous antibiotic requirement as well as hospital stay.

Key words: Liver abscess, malecot catheter, percutaneous drainage, pigtail catheter, USG-guided

INTRODUCTION

Hepatic abscess can be defined as an encapsulated collection of suppurative material within the liver parenchyma[1] which may be infected by bacterial, fungal, and/or parasitic microorganisms.[2] Liver abscesses, both amoebic and pyogenic, continue to be an important cause of morbidity and mortality in both the developed and developing countries[3] Immunocompromised hosts such as those with human immunodeficiency virus (HIV), leukemia and diabetes are more prone to develop liver abscess with high mortality. [4] The management has improved significantly over the years with the advent of potent antimicrobial agents. Over the past four decades, open surgical intervention has shifted to percutaneous intervention in the management of large abscesses. [5] With the advancements of imaging and the development of ultrasound-guided drainage procedures by the 1980s, antibiotic therapy coupled with percutaneous drainage had been accepted as the treatment modality for liver abscesses. [6,7] Following few years US guided percutaneous needle aspiration become popular. Majority of liver abscess were treated by medical management. Indication of percutaneous drainage are size 5.5 cm or more, lesion who appear to be superinfected, large abscess

impending to rupture, thin rim of liver tissue surrounding the abscess (less than 10mm) and failure of medical management following noninvasive treatment for 4 to 5 days.

In US guided catheter drainage, an interventional radiologist uses US guidance to aspirate the pus as much as possible & send a sample of pus for microbiological examination. Follow-up ultrasonography (USG) were done and considered for further aspiration if required. The use of ultrasound for diagnosis and guiding the catheter has reduced the incidence of patient requiring laparotomy.

Moreover, the aim of this study was to find the demographic characteristics; comorbidities; and clinical, radiological, and bacteriological characteristics of liver abscesses as well as the efficacy of catheter drainage in patients with liver abscess >5 cm.

MATERIAL & METHODS

In this retrospective study, patients with liver abscesses of size >5 cm who had undergone percutaneous pigtail catheter drainage procedure in the department of radiology of our institution were included. The study period was of 1 year. Small-sized abscesses were excluded from the study. A total of 100 patients were included in this study. Past medical and surgical history; suspected immediate cause of the abscess; immunologic status; demographic data; laboratory findings; location, number and size of the abscess; type of drainage; pre-and postprocedural duration of antibiotic therapy and duration of hospital stay were recorded and analysed. Follow-up for complete resolution or recurrence was done.

PREPROCEDURAL PREPARATION

1. Written consent of the patient or guardian was taken
2. Total platelet count and prothrombin time (PT)/international normalized ratio (INR) of the patients were checked. The total platelet count had to be above 1 lakh and INR had to be below 1.5
3. USG screening was done to rule out ascites because presence of moderate-to-gross ascites is considered a contraindication for the procedure.

MATERIALS

1. 18G 10/15-cm Chiba needle.
2. Injection xylocaine (1% or 2%).
3. No. 11 blade.
4. 10 F pigtail or Malecot catheter set (plastic dilator and 0.035” stiff guidewires).
5. 2-0 Mersilk suture.
6. Uro bag.
7. 10-mL syringes.
8. Drape sheet, gauze pieces.

PROCEDURE

A pigtail catheter was inserted into the liver abscesses using Seldinger technique. The patient was laid in the supine position. The site of percutaneous drainage was cleaned with betadine and draped. Under USG guidance, 5-7 mL of 2% xylocaine was infiltrated in the skin, deep up to the capsule of the liver, and then a small nick was given on the skin surface. 18G 10/15-cm Chiba needle was inserted percutaneously into the abscess cavity. Then, a stiff guidewire was inserted through the needle and the tract was dilated by placing 8F and 10F dilators over the guidewire. Then, 10 F pigtail or Malecot catheter was inserted into the abscess cavity and connected to an Uro bag to allow gravity drainage of the pus. About 5 mL of the pus was put into a container for Gram stain, culture and sensitivity.

All patients received preprocedural intravenous (IV) piperacillin, tazobactam 4.5 g TDS, and IV metronidazole 800 mg TDS, which were continued post procedure for 2-3 days, and then the patients were discharged with oral antibiotics, mostly oral cefixime 200 mg BD or ofloxacin 400 mg BD and metronidazole 800 mg TDS for 7-14 days.

FOLLOW-UP

Patients were monitored clinically. USG was done when drain output was <10 mL/day. Duration to attain clinical recovery, duration of hospital stay, duration of antibiotic use, complications, and death were recorded. After discharge, the patients were followed in the outpatient department, clinically as well as by USG on a monthly basis for 6 months.

STATISTICAL ANALYSIS

The data were compiled and analyzed musing commercial Statistical Product of Social Sciences (SPSS) for Windows software (version 20.; SPSS Inc., Chicago, IL, USA)

RESULTS

Table 1: Demographic data, associated habits, comorbidities, signs and symptoms

Gender	N	%
Male	80	80
Female	20	20
Age groups		
11-20	1	1
21-30	3	3
31-40	16	16
41-50	24	24

51-60	20	20
61-70	30	30
71-80	6	6
Lobe involved		
Right	55	55
Left	45	45
Habit/comorbidities		
Diabetes	30	30
Alcoholic/smoker	12	12
GI surgery	2	2
CKD	2	2
Symptoms		
Fever	65	65
Pain abdomen	50	50
Nausea/vomiting	22	22
Signs		
Tenderness of upper abdomen	5	5

In this study, a total of fifty cases of liver abscesses were included. Among these, 80 (80%) were male and 20 (20%) cases were female. The age group affected was 21-66 years, with the mean age being 45 years. Fifty percent of the patients had underlying comorbidity, the most common of which was diabetes in 30% of the cases. The most common symptom was fever which was found in 65% (n = 65) of the cases. Abdominal pain was the next most common, seen in 50% (n = 50) of cases. Right lobe was the most common site of occurrence of abscess (n = 55) in 55% of cases.

Table 2: Abnormal laboratory parameters in liver abscess patients

Parameters	Range and mean (M)	Percentage of patients with abnormal parameters
Total leukocyte count (1000/µl)	6.84-35.75 (17.81)	(>11) 74%
Total bilirubin (mg/dL)	0.45-14.6 (1.98)	(>1.2) 30%
Total protein (g/dL)	3.4-8.2 (6.2)	(<6) 34%
INR	1.05-2.58 (1.39)	(>1.5) 20%

Among the various laboratory parameters, total leukocyte count (TLC) had increased (>11 × 103/µl) in 37 patients equivalent to 70%, serum bilirubin had raised (>1.2 mg/dL) in 15 patients equivalent to 30%, serum total protein was low (<6 g/dL) in 17 patients equivalent to 34%, and INR had raised (>1.5) in 10 patients equivalent to 20%.

DISCUSSION

Liver abscess is a common health problem in tropical countries including India.[8,9] If not treated properly, it carries a high mortality.[10,11] With the advancements of imaging and the development of ultrasound-guided drainage procedures by the 1980s, antibiotic therapy coupled with percutaneous drainage had been accepted as the treatment modality for liver abscesses.[7,12] In this study, a total of fifty cases of liver abscesses were included. Among these, 80 (80%) were male and 20 (20%) cases were female. The age group affected was 21-66 years, with the mean age being 45 years. Fifty percent of the patients had underlying comorbidity, the most common of which was diabetes in 30% of the cases. The study conducted by Mangukiya *et al.* [13] and found that males are more commonly affected. It is in accordance to the literature.[14] The most common comorbidity associated was diabetes mellitus. Yu *et al.* [15] and Jha *et al.* [16] also had similar findings in their studies, while Zerem and Hadzic had found cholecystitis as the most common associated comorbidity.[17]

The most common symptom was fever which was found in 65% (n = 65) of the cases. Abdominal pain was the next most common, seen in 50% (n = 50) of cases. Right lobe was the most common site of occurrence of abscess (n = 55) in 55% of cases which was consistent with the study of Yu *et al.* [15] However, Zerem and Hadzic found pain abdomen as the most common symptom.[17] Oschner *et al.* [18] and Norman *et al.* [19] showed that clinical features of liver abscess may be nonspecific. Hence, ultrasound scan can be very helpful in the diagnosis of this entity, which has reduced the mortality from 40% to 10%-25% in the last two decades.[20,21]

Among the various laboratory parameters, total leukocyte count (TLC) had increased (>11 × 103/µl) in 37 patients equivalent to 70%, serum bilirubin had raised (>1.2 mg/dL) in 15 patients equivalent to 30%, serum total protein was low (<6 g/dL) in 17 patients equivalent to 34%, and INR had raised (>1.5) in 10 patients equivalent to 20%. Many other studies, including that of Rajak *et al.* [22] and Yu *et al.* [15] had also found similar results. Furthermore, in the present study, serum bilirubin was raised in 26% of patients,

INR was prolonged in 18% of patients, and serum protein was low in 32% of patients. The success rate in our study was 90%. Similar success rate was seen in the study by Khan *et al*. [23] and Haider *et al*. [24] The duration of hospital stay varied from 3 to 24 days. Patients with diabetes and renal disorders require longer duration of injectable antibiotics and prolonged hospital stay.

CONCLUSION

This study revealed that for abscesses >5 cm, percutaneous catheter drainage is an effective and safe treatment of choice. As opposed to the earlier belief, it is not associated with longer hospital stay, more nursing care, or increased risk of complications. There was very good success rate with good clinical recovery.

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