

Assessment of the Effectiveness of Various Management Strategies in the Management of Liver Abscess: An Observational Study

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Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to evaluate effectiveness of various management strategies in the management of liver abscess.

Material & methods: The present study was carried out in the Department of General Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for the period of 12 months. Total number of patients was 200 included in this study with the diagnosis of liver abscess admitted in the surgery ward. It was an Observational, Prospective and Retrospective study.

Results: Highest incidence was noted in age group of 51-60 years (32%) with a mean age of 48.82 years. Out of total 200 cases, 160 patients were male and 20 patients were female. Out of 200 patients 160 patients had liver abscess cavity of size 51-500cc (80%) followed by 20 patients who had <50 cc size cavity. Out of 200 cases 60 patients were treated with percutaneous needle aspiration with 16G metallic needle, 40 patients were treated with Percutaneous pigtail catheterisation, 20 patients were treated conservatively whereas 20 patients required surgical drainage. In the present study we can observe that 35 of 60 cases had volume aspirated between the range of 51-150 cc which correlates to high no of patients with residual liver abscess less than 20 cc (25 of 60 cases). 30 of 60 cases (50%) were treated with a single aspiration along with antibiotics. 25 of 60 cases (41.66%) required second aspiration attempt. 3 of 60 cases required three attempts of aspiration and only 2 cases required fourth attempt of aspiration.

Conclusion: The present study concluded that conservative treatment with only intravenous antibiotics can be done for liver abscess with size less than or equal to 5 cm and volume less than 50 CC. Percutaneous needle aspiration is the best treatment modality for liver abscess measuring 5 10 cm, Percutaneous pigtail catheter drainage is a choice of treatment for large cavity size more than 10 cm and abscess having thick unliquified pus.

Keywords: Liver abscess, Percutaneous needle aspiration, Pigtail catheter insertion, Surgical drainage

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Introduction

Liver abscess is defined as collection of purulent material in liver parenchyma which can be due to bacterial, parasitic, fungal, or mixed infection. [1] It is a

common condition across the globe. Liver abscess is a life-threatening disease. The classic presentation of fever, right upper quadrant pain, and tender hepatomegaly is

unusual. The frequency of any particular symptoms varies widely among reports. Management of liver abscess was exclusively surgical in the past. Modern treatment has shifted toward broad-spectrum antibiotics and imaging-guided percutaneous needle aspiration (PNA) or percutaneous catheter drainage (PCD). Percutaneous pigtail catheterization reduces chances of exploration by surgery for liver abscess. Surgical intervention is only indicated for ruptured liver abscess, multiple lesions that cannot be effectively managed percutaneously and abscesses that do not respond to less invasive methods.

The differential diagnosis of liver abscess includes amoebic liver abscess, pyogenic liver abscess, fungal liver abscess, necrotic adenoma, and echinococcal cyst. Liver abscesses develop insidiously with abdominal pain, nausea, vomiting, fever, weight loss and no local signs other than painless or slightly tender hepatomegaly. Loss of appetite, jaundice and respiratory symptoms are less common clinical features. In patients it presents with abrupt onset of fever, nausea, severe abdominal pain and leukocytosis. Complications from liver abscesses occur secondary to rupture of the abscess into the peritoneum, pleural cavity, or pericardium. Ruptured liver abscesses occur in 2-17% of patients and are associated with mortality rates between 12% and 50% according to the present literature. [2]

Up to 40% of patients develop complications from pyogenic liver abscesses, with the most common being generalized sepsis. In addition to sepsis, morbidity can include pleural effusions, empyema, and pneumonia. Abscesses may also rupture intraperitoneally, which is frequently fatal. Usually, however, the abscess does not rupture, but develops a controlled leak resulting in a perihepatic abscess. Pyogenic abscesses also can cause hemobilia and hepatic vein thrombosis. [3] From the 1950s to 1990, mortality rates varied from as low as 11% to as high as

88%. [4] With advances in diagnosis and treatment modalities currently the mortality has been reduced to 2.5%. The high mortality rates came from delay or failure to diagnose the abscess, failure to detect smaller intrahepatic abscesses, ineffective surgical drainage, lack of source control, associated malignancy, immune insufficiency, or other major comorbidities.

Thus, this study aims to evaluate the outcome associated with different treatment strategies of liver abscess.

Materials & Methods

The present study was carried out in the Department of General Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for the period of 12 months. Total number of patients was 200 included in this study with the diagnosis of liver abscess admitted in the surgery ward. It was an Observational, Prospective and Retrospective study.

Inclusion Criteria

- All cases of liver abscess diagnosed clinically as well as ultrasonographically or computed tomographically.
- All cases of diagnosed liver abscess being referred to our hospital
- Older than 12 years
- Hospitalized and outpatient patients of both genders
- Patients received the complete treatment
- Patients who come for follow up as advised

Exclusion Criteria:

- Abdominal neoplastic antecedents
- Age group < 12 years
- Congenital cysts
- Abdominal or biliary surgery antecedents
- Patients lost in early follow up

Patients with following symptoms and signs were selected. for screening of liver abscess fever, abdominal pain, diarrhea,

weight loss, anorexia, nausea and vomiting, history of chronic alcoholism and smoking, tender hepatomegaly, jaundice all this patient were subjected to ultrasound abdomen examination.

All the liver lesions suggestive of liver abscess were examined in detail. Computed tomography is also used alternative to ultrasound. Detailed morphology of liver for abscess was examined like size of abscess cavity, number of abscess, lobe of liver involved, volume of abscess cavity. X-ray upper abdomen and chest was done. Routine blood investigation was done like complete blood count, random blood sugar, liver function test, renal function test, coagulation profile, pus for culture & sensitivity and microscopy urine and stool examination.

After history, clinical examination and radiological investigations, all the patients with diagnosed with liver abscess and needs hospitalization were hospitalized and started on third generation cephalosporin and metronidazole therapy then depending on the size of abscess cavity ultrasound guided needle aspiration or percutaneous needle aspiration was done in case of ruptured liver abscess emergency laparotomy was done and for smaller abscess responding to Patients were treated according to respective protocol

Patient on conservative line were followed up daily clinically. Repeat LFT and Ultrasound/ CT abdomen was done immediately if patient condition did not improve drug therapy conservative management was done. after 3-4 days as a routine prognostic factor. Management strategies were as follows; Injectable intravenous antibiotics alone (in uncomplicated abscess measuring less or equal to 5cm/50 cc of any size), Ultrasound abdomen suggestive of unliquefied abscess.

Sonography guided Percutaneous aspiration with Antibiotic coverage (in non-ruptured abscess measuring >5 cm to <10 cm, approachable on USG) with a 16G

spinal needle. The site, depth, direction of aspiration was guided by ultrasonography and pus aspirated was then sent for culture and sensitivity and routine microscopical examination. Antibiotics were started according to sensitivity report. It was done as a day care procedure and was done on the same day of admission as and when possible after thorough blood investigations. Patient was kept indoor next day to look for any post procedure complication. Sonography guided Percutaneous catheter drainage with Antibiotics coverage (in non-ruptured abscess measuring >10 cm and in those requiring repeated aspirations) and catheter was removed 24hrs after drain output was nil and on follow up USG residual liver abscess was found to be less than 5 cm and in non-liquefied state in symptomless patient. Percutaneous catheter drainage was done with a 14Fr pigtail catheter. Surgical drainage being used only in patients who fail to respond to above treatment and in case of diffuse peritonitis due to intraperitoneal rupture and in intrathoracic rupture. All interventions done Ultrasound Abdomen guided were followed by a post aspiration Ultrasound Abdomen to look for residual liver abscess and its liquefaction status and Xray chest PA view to look for iatrogenic complication for example pneumothorax.

Follow up of patients after getting discharged Patients will be followed up for a minimum period of 6 months: Once a week for one month, once in 15 days for next 2 months, once a month for next 3 months; to monitor the efficacy of the treatment given. Patients were consulted immediately if they had recurrent attacks or they had complications of liver abscess.

Statistical Analysis

The data was collected. Statistical data analysed by statistical package for the social sciences (SPSS) version 20 software.

Results

Table 1: Demographic details

Age group (years)	N	%
<20	8	4
21-30	20	10
31-40	24	12
41-50	60	30
51-60	64	32
61-70	20	10
>70	4	2
Gender		
Male	160	80
Female	40	20
Size of abscess		
≤50 cc	20	10
51-500 cc	160	80
501-1000 cc	12	6
>1000 cc	8	4

Highest incidence was noted in age group of 51-60 years (32%) with a mean age of 48.82 years. Out of total 200 cases, 160 patients were male and 20 patients were female. Out of 200 patients 160 patients had liver abscess cavity of size 51-500cc (80%) followed by 20 patients who had <50 cc size cavity.

Table 2: Various treatment choices for liver abscess and Amount of liver abscess aspirated

Method of treatment	N	%
Conservative with antibiotics only	20	10
Percutaneous needle aspiration	120	60
Percutaneous pigtail catheterisation	40	20
Open surgical drainage	20	10
Volume aspirated		
≤50 cc	5	8.34
51-150 cc	35	58.33
>150 cc	20	33.33
Total	60	100

Out of 200 cases 60 patients were treated with percutaneous needle aspiration with 16G metallic needle, 40 patients were treated with Percutaneous pigtail catheterisation, 20 patients were treated conservatively whereas 20 patients required

surgical drainage. In the present study we can observe that 35 of 60 cases had volume aspirated between the range of 51-150 cc which correlates to high no of patients with residual liver abscess less than 20 cc (25 of 60 cases).

Table 3: Number of attempts of aspiration, Post procedural outcome

Attempts of aspiration	N	%
1	30	50
2	25	41.66
3	3	5
4	2	3.34
Outcome		
Successfully treated	190	95
Mortality	10	5

30 of 60 cases (50%) were treated with a single aspiration along with antibiotics. 25 of 60 cases (41.66%) required second aspiration attempt. 3 of 60 cases required three attempts of aspiration and only 2 cases required fourth attempt of aspiration.

Discussion

Liver abscess is a life-threatening disease. The classic presentation of fever, right upper quadrant pain, and Indiatender hepatomegaly is unusual. The frequency of any particular symptoms varies widely among reports. Management of liver abscess was exclusively surgical in the past. Modern treatment has shifted toward broad-spectrum antibiotics and imaging-guided percutaneous needle aspiration (PNA) or percutaneous catheter drainage (PCD). Percutaneous pigtail catheterization reduces chances of exploration by surgery for liver abscess. Surgical intervention is only indicated for ruptured liver abscess, multiple lesions that cannot be effectively managed percutaneously and abscesses that do not respond to less invasive methods. Amoebic liver abscess (ALA) is a common infection caused by parasite *Entamoeba histolytica* which is capable of invading virtually every organ in the human body. [5] ALA is the third leading cause of death due to parasitic diseases after malaria and schistosomiasis. [6] 10% of the world's population is infected with *E. histolytica*. [7] 40 million develop invasive disease and 40000 deaths occur annually.

Highest incidence was noted in age group of 51-60 years (32%) with a mean age of 48.82 years which coincided with findings in study done by Giorgio et al and Rajak et al study shows mean age of 35 years. [8,9] Out of total 200 cases, 160 patients were male and 20 patients were female which was consistent with the findings of other study done by Mangukiya et al. [10] Out of 200 patients 160 patients had liver abscess cavity of size 51-500cc (80%) followed by 20 patients who had <50 cc size cavity. Rajak et al compared percutaneous needle aspiration (PNA) and Percutaneous catheter

drainage (PCD) in a randomized study involving 50 patients with liver abscess. Those investigators concluded that PCD was more effective than percutaneous needle aspiration. In that study, lack of response to a second attempt at percutaneous needle aspiration was considered failure of treatment. [9-13]

Usually, needle aspiration is preferred for smaller abscesses and catheter drainage is done in larger ones. However, no clear-cut guidelines have been laid. Yu et al. included only pyogenic abscesses and showed no significant difference between the two techniques. [14] Qazi et al. found that catheter drainage was better terms of success rate, but they limited the number of aspirations to two which may be a reason for lower success rate of percutaneous aspiration. [15]

30 of 60 cases (50%) were treated with a single aspiration along with antibiotics. 25 of 60 cases (41.66%) required second aspiration attempt. 3 of 60 cases required three attempts of aspiration and only 2 cases required fourth attempt of aspiration. This result supported the design of the study by Rajak et al. [9]

Conclusion

The present study concluded that conservative treatment with only intravenous antibiotics can be done for liver abscess with size less than or equal to 5 cm and volume less than 50 CC. Percutaneous needle aspiration is the best treatment modality for liver abscess measuring 5 10 cm, Percutaneous pigtail catheter drainage is a choice of treatment for large cavity size more than 10 cm and abscess having thick unliquefied pus. More than two aspirations can be done with good results. Intermittent needle aspiration considered as first-line management of small liver abscess. Others should be treated with percutaneous drainage if abscess is large and liquefied, but single percutaneous aspiration does not always yield good results. Percutaneous pigtail catheter drainage is more effective in

large liver abscess. Percutaneous catheter placement is an acceptable modality of treatment in large abscess that demands repeated aspirations. Surgery is extremely useful for complicated cases. Laparoscopic drainage is useful in patients who have concomitant other biliary pathologies.

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