



Study of Liver Abscess Drainage by Needle Aspiration v/s Pigtail Catheter Drainage in a Tertiary Care Hospital

Authors

Dr Raj Depani¹, Dr Tirth Bharat Shah², Dr Shubham Patel³, Dr Sharad M Patel⁴

^{1,2,3}Resident Doctor, Department of General Surgery, Smt SCL HOSPITAL, NHL MMC, Ahmedabad

⁴Professor, Department of General Surgery, Smt SCL HOSPITAL, NHL MMC, Ahmedabad

Abstract

Aim: To compare effectiveness and outcome of USG guided needle aspiration and percutaneous catheter drainage in patients diagnosed with liver abscess.

Methods: This is a prospective observational study of liver abscess drainage over the period of 28 months from 1st June 2019 to 31st Oct 2021 at the department of General Surgery, Smt. SCL General Hospital, Ahmedabad.

Study consists of 130 patients, presented in the outpatient and emergency department at the hospital, selected by random sampling method and diagnosed by ultrasonography.

Results: Majority (63.8%) patients treated by percutaneous aspiration had a mean liver abscess cavity of 6cm size 158cc. Pigtail catheter drain was placed in 25.38% patients having large abscess with average size 7.5cm and 565cc volume. Recurrence was seen in 24% patients who were percutaneously aspirated whereas in catheter drainage, recurrence rate was 9%. Average duration of hospital stay was 7.83 days & 9.71 days in patients treated by percutaneous aspiration and pigtail catheterisation respectively.

Conclusions: Percutaneous needle aspiration is preferred in patients with single or multiple liver abscess with cavity size of >5cm and >50cc volume. In abscess with cavity size >10 cm and single cavity in adults can be treated with Percutaneous catheter drainage.

Keywords: Liver abscess, Pigtail Catheter drainage, Needle aspiration.

Introduction

The first description of Liver abscess is credited to Hippocrates in the year 4000 BC. It was mentioned in association with blood and mucus diarrhoeal stools. Liver abscess was first drained in the Hippocratic era and successfully practiced the draining of pus.

Liver abscesses are purulent collections in the liver parenchyma that result from bacterial, fungal, parasitic or mixed infection.

Pyogenic liver abscess (PLA) may be defined as a solitary or multiple collections of pus within the liver due to bacterial infections commonly *Streptococcus milleri*, *Escherichia coli*, and other enteric organisms such as *S. faecalis*, *Klebsiella* and *Proteus vulgaris*.

Amoebic liver abscess is the most frequent extraintestinal manifestation of *Entamoeba histolytica* infection, which enters the portal venous system from the colon.

Fungal liver abscesses have recently been recognized with increased frequency in immunosuppressed states secondary to chemotherapy, infection with the human immunodeficiency virus (HIV), and in patients with haematological malignancies during periods of neutropenic resolution.

The clinical presentation of both the types may be elusive with combination of fever, right upper quadrant pain and hepatomegaly with or without jaundice.

Liver abscesses continue to be an important cause of morbidity and mortality in tropical countries. However, recent advances in interventional radiology, intensive care, progress in antibiotic therapy, and use of sonography and computerized tomography scanning of the abdomen have led to early diagnosis and treatment of patients with liver abscess, thus improving the patient outcome.

Previously liver abscess was regarded as a high morbidity disease requiring open surgical drainage, with mortality rates between 9% and 80%. If untreated, it was uniformly fatal. In the last quarter of a century we have witnessed a major paradigm shift in the management of pyogenic hepatic abscesses/amoebic liver abscesses, with a concomitant decrease in mortality to 5-30%. Percutaneous drainage of liver abscess has been an important advancement and is traditionally used in the treatment of both types of liver abscesses.

Methods

This is a prospective observational study of liver abscess drainage over the period of 28 months from 1st June 2019 to 31st Oct 2021 at the department of General Surgery, Smt. SCL General Hospital, Ahmedabad.

Study consists of 130 patients, presented in the outpatient and emergency department at the hospital, selected by random sampling method and diagnosed by ultrasonography.

Inclusion Criteria

All cases of liver abscess diagnosed clinically and radiological investigations during study period randomly allocated in study.

Exclusion Criteria

- Patients below 3 and above 70 years of age
- Patients requiring exploratory laparotomy
- Traumatic liver abscess
- Liver malignancies
- Chronic liver disease

Cases with abscess cavity < 5 cm or < 50cc volume were treated by medical therapy alone. Failures to relieve symptoms within 2 to 3 days were treated by percutaneous aspiration. Those with abscess cavity > 5 cm or >50cc volume were treated by Percutaneous aspiration. Bilateral abscess cavities that were small and multiple were managed by medical therapy and when any one of the cavity size > 5 cm or >50cc volume was managed by Percutaneous aspiration. Abscess cavities restricted to the left lobe were treated by drug therapy if they were multiple and cavity size < 5 cm. Those with single abscess cavity size >10 cm in adults and >5cm and <10 yr age were treated with Percutaneous catheter drainage. In case of multiple cavities if the size of any cavity >10cm were treated by Percutaneous catheter drainage. Those abscess cavities with subcapsular rupture were treated with percutaneous catheter drainage. Abscess cavities with intra-abdominal rupture were managed by open surgical drainage. With all due permission, data was collected from the case papers and hospital records. Statistical analysis was done by appropriate statistical tools.

Results

Socio Demographic Data

Out of 130 patients in the study, 99 (76%) were male and 31 (23.8%) were female. The mean age distribution of the study group is 31.9. The commonest age group for liver abscess was 31-40 years.

Table 1: Presenting Symptoms

The commonest symptom was abdominal pain seen in 85% of patients followed by fever in 81.5%, Nausea and vomiting in 35.3%, jaundice and diarrhoea in 10% patients.

Symptom	No. of Patients
Abdominal pain	111(85.3%)
Fever	106(81.5%)
Nausea & Vomiting	49(37.7%)
Jaundice	13(10%)
Diarrhoea	13(10%)
Cough	12(9.23%)
Altered sensorium	0
Signs	
Abdominal tenderness	65(50%)
Hepatomegaly	77(59.2%)
Ascites	22(16.9%)
Anemia (Hb <10g/dl)	32(24.6%)

Table 2 Association

Alcohol is the most important risk factor for liver abscess. 50% of the patients in the study were alcoholic.

Associations	No. of Patients
Alcohol	65(50%)
Pulmonary Tuberculosis	6(4.6%)
Hypertension	4(3%)
Pancreatitis	4(3%)
Diabetes type 2	2(1.5%)
Pregnancy	1(0.7%)

Table 4: Treatment Analysis

Treatment	No. of Patients	Mean Cavity Size (Cm)	Mean Cavity Volume(Cc)
Conservative	09	3.8	031
Percutaneous Aspiration	83	6	158
Pigtail catheter drainage	33	7.5	565
Aspiration + Pigtail Drain	05	8.8	624

83 (63.8%) patients treated by percutaneous aspiration had mean liver abscess cavity of 6cm size 158cc. Pigtail catheter drain was placed in 33 (25.38%) patients having large abscess with

Table 3 Anatomical Location of Liver Abscess

Parameters	No. of Patients
Lobe Involved	
Right lobe	101(77.6%)
Left lobe	19(14.6%)
Both lobes	10(7.6%)
No. Of Abscess Cavity	
SINGLE	80(61.5%)
MULTIPLE	50(38.5%)
Type Of Liver Abscess	
Amoebic	53(40.8%)
Pyogenic	58(44.6%)
Mixed	10(7.7%)

In the study the right lobe was involved in 77.6% of cases whereas the left lobe and both lobes were involved in 14.6% and 7.6% of patients respectively. Single abscess cavity and Multiple abscess cavities were found in 61.5% and 38.5% of cases. Prevalence of amoebic liver abscess was 40.8% and that of pyogenic liver abscess was 44.6% patients. 7.7% patients had mixed amoebic and pyogenic abscess. None of the patients with fungal liver abscess isolated.

average size 7.5cm and 565cc volume. 5 (3.8%) patients which were treated by aspiration had to eventually undergo placement of pigtail drain as the mean cavity size was 8.8cm 624cc.

Table 5: Outcome And Hospital Stay Duration Compared In Both Treatment Modality

Treatment Modality	No. of Patients	Recurrence (No. of Patients)	Average Duration of stay (Days)
Conservative	09	0	5.65
Percutaneous Aspiration	83	20	7.83
Pigtail Catheter Drainage	33	03	9.71

Recurrence was seen in 24% patients who were percutaneously aspirated whereas in catheter drainage, recurrence rate was 9%. Average

duration of hospital stay was 7.83, 9.71, 5.65 in patients treated by percutaneous aspiration, pigtail catheterisation and conservatively respectively.

Discussion

Age distribution was consistent with the previous studies of Sukhjeet Singh et al^[1] and Arpit Bansal et al^[2], having a mean age of 31.9 years. The highest incidence of liver abscess was noted in the age group 31-40 years of age (26.9%) followed by 41-50 years of age (15.38%) in this study. Male to Female patient ratio is 3.19:1. Male preponderance is possibly due to alcohol consumption and portal sepsis.

Fever and abdominal pain over right hypochondrium are the most common manifestations^[1,2] of liver abscess. In the present study, these two symptoms of Fever and Abdominal pain occurred in 81.5% and 85% patients. Abdominal pain & fever are due to inflammatory involvement of liver & small intestine due to pyogenic and amoebic infections. Alcoholism is an important etiological risk factor associated with liver abscess^[3]. 50% of the Adult Male cases of the present study were found to be alcoholics.

Right lobe was involved in 77.6% of cases of the present study. The predilection of liver abscess in the right lobe is because of straight directional flow of portal circulation through portal vein and it receives most of blood draining from the right colon. In the study, the left lobe and both lobes were involved in 14.6% and 7.6% of patients. This is compared with the study of Sukhjeet Singh et al^[1] who recorded 78% involvement in the right lobe, 15% in left lobe and 7% in both lobes.

Single abscess cavities were found to be 61.5% and multiple abscess cavities in 38.5% of patients of this study. This is compared with the study conducted by Arpit Bansal et al^[2] who recorded single abscess in 12.4% and multiple abscesses in 87.6%. Patients who had multiple small abscesses and single abscess with cavity < 5 cm size or < 50cc volume with no any active complaint were successfully managed conservatively. The conservative management was done in 6.9% of cases.

In 59% patients who had abscess >50 cc or cavity size >5cm were treated with percutaneous

aspiration. Patients showed improvements in their symptoms and signs within 24-72 hrs of the aspiration.

According to Antonio Giorgio^[4], Percutaneous needle aspiration is an efficient, effective and low cost technique that can even be performed on an outpatient basis. It is safe, free from significant complications. Percutaneous catheter drainage is preferred in patients in which the patient shows no improvement after > 2 time percutaneous aspiration^[2].

Conclusion

Percutaneous needle aspiration is preferred in patients with single or multiple liver abscess with cavity size of >5cm and >50cc volume. In abscess with cavity size >10 cm and single cavity in adults can be treated with Percutaneous catheter drainage.

Both percutaneous aspiration and pigtail catheter drainage are almost equally effective methods for drainage of liver abscess. Although percutaneous aspiration is a simple procedure and can be performed on an outpatient basis, multiple aspirations may be required if the abscess is not completely liquefied. While pigtail catheter drainage is preferred for partially liquefied, single and large abscess, it results in longer duration of hospital stay and poor patient compliance.

References

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