

**A Comparative Assessment of Two Different Treatment Approaches in the Management of Liver Abscess**Pravin Kumar Agrawal<sup>1</sup>, A. K. Jha<sup>2</sup><sup>1</sup>Senior Resident, Department of General Surgery, Anugrah Narayan Magadh Medical College and Hospital Gaya, Bihar, India<sup>2</sup>Associate Professor, Department of General Surgery, Anugrah Narayan Magadh Medical College and Hospital Gaya, Bihar, India

Received: 01-02-2024 / Revised: 12-03-2024 / Accepted: 24-04-2024

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Conflict of interest: Nil

**Abstract****Aim:** The aim of the study was to evaluate the clinical presentation, and to investigate the effectiveness of continuous catheter drainage in comparison to needle aspiration in the treatment of liver abscesses.**Methods:** This was a single-center retrospective study conducted at Anugrah Narayan Magadh medical College and Hospital Gaya, Bihar, India from March 2020 to February 2021. A total of 70 patients were included in the study, divided into two groups, percutaneous needle aspiration (n=35) and pigtail catheter drainage (n=35).**Results:** In presenting study the age group of the patients ranged from the 20-68 years. Highest incidence (60%) was found in 30-39 years age group. In this study 62 patients were male and 8 patients were female. 63 patients were from rural and 7 were from urban population and the incidence of alcohol consumption was 74.28%. It was observed that fever was present in needle aspiration and catheter drainage 94% and 92% respectively. There was 100% anorexia, pain and tenderness in right upper quadrant and hypochondrium in needle aspiration and catheter drainage respectively. It was observed that leukocytosis was 80% and 100% in needle syringe and catheter drainage. The patients in PCD group showed earlier clinical improvement and 50% decrease in abscess cavity volume as compared to those who underwent PNA. However, there was no significant difference between the duration of hospital stay or the time required for total or near-total resolution of cavity.**Conclusion:** Percutaneous catheter drainage is a better modality as compared to percutaneous needle aspiration especially in larger abscesses which are partially liquefied or with thick pus.**Keywords:** Liver Abscess, Catheter Drainage, Needle Aspiration.

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**Introduction**

A liver abscess is a suppurative cavity in the liver resulting from the invasion and multiplication of microorganisms, entering directly from an injury through the blood vessels or by the way of the biliary ductal system. Liver abscesses are most commonly due to pyogenic, amebic or mixed infections. Less commonly these may be fungal in origin. [1] It is the commonest infection affecting liver. Liver comprises 48% of all the visceral abscesses. [2] Liver abscess is the constant source of mortality in developing country. India being a developing country, a large proportion of population living under poverty line, a good amount of people are predisposed to liver abscess. It is common in India with 2nd highest incidence due to poor sanitation, overcrowding and inadequate nutrition. [3] Prevalence of infection is higher than 5%-10% in endemic areas. [4] For amoebic liver abscesses (ALAs), the primary treatment is medical; however, 15% of amoebic

abscesses may be refractory to medical therapy and 20% of ALAs may be complicated by secondary bacterial infection. [5,6]

In the past, surgical drainage was the traditional mode of treatment in such patients and in patients with pyogenic liver abscesses (PLAs). [7] Over the last two decades, outcomes in patients presenting with liver abscesses have improved as a result of advances in radiological diagnosis and percutaneous treatment options. [8,9,10] Currently, patients are treated with antibiotics along with percutaneous needle aspiration (PNA) or percutaneous catheter drainage (PCD), and surgical drainage is used only in patients who fail to respond to such treatment. [11,12] . Percutaneous catheter drainage, under USG guidance, is safe and effective mode of treatment of liver abscess with low morbidity and no mortality. It results in an early relief of symptoms and faster resolution of abscess cavity. [13] So Modern treatment has

shifted the treatment of liver abscess toward IV broad-spectrum antibiotics and imaging-guided percutaneous needle aspiration (PNA) or percutaneous catheter drainage (PCD). [14,15]

Hence, the present study was planned to compare the above-mentioned treatment modalities and identify the better option for treating patients suffering from liver abscess.

### Materials and Methods

This was a single-center retrospective study conducted at Anugrah Narayan Magadh medical College and Hospital Gaya, Bihar, India from March 2020 to February 2021. A total of 70 patients were included in the study, divided into two groups, percutaneous needle aspiration (n=35) and pigtail catheter drainage (n=35). Written informed consent was obtained from all participants. All the patients who had liver abscess clinically and radio logically [USG/ CT scan] were included in the study. The patients had prior intervention, ruptured liver abscess, biliary tract malignancy, uncorrectable coagulopathy were excluded from the study. In all patients complete blood count, liver function test, PT/INR, X-ray chest, abdominal sonography and C.T. scan as & when required were performed and antibiotics were started, as soon as diagnosis was made. Abscess less than 5cm managed by needle aspiration. Abscess more than 5 cm managed by percutaneous catheter drainage.

**Percutaneous Needle Aspiration:** The patient was subjected to USG of the abdomen and the characteristics of the abscess cavities were recorded. Local anesthesia was infiltrated at the proposed puncture site using an 18 G needle. Under real-time USG guidance using 18/20 G spinal

needle the abscess cavity was entered and pus was aspirated till no more pus could be aspirated further. A sample of pus was sent for culture and sensitivity. A dressing was applied.

**Percutaneous Catheter Drainage:** Seldinger technique used for catheter drainage. Abscess localized by USG, The site of drainage marked under all aseptic condition where minimum depth from skin noted. The site infiltrated with 2% xylocaine and 4 mm skin incision made and through which 18G guide wire introducer needle passed under USG guidance till it will reach the centre of cavity. A Guide wire introduced through the needle and position inside the cavity following which the needle removed keeping the guide wire in situ. Serial dilator then passed over the wire to dilate track up to 12 to 14 F sizes. A PCN MELECOTS catheter of size equal to the size of dilator passed over the wire and positioned in the center of cavity under USG guidance. The guide wire then withdrawn and PCN mele cots catheter fixed to the skin with suture and connect with drainage bag and pus sent for cytology and bacteriology. Amount of pus drainage in 24 hours monitored and catheter flushed daily to prevent blockage with 10ml normal saline. The drainage catheter removed when drainage become less than 20ml to 30ml/24 hours. The effectiveness of treatment was measured in terms of parameters like duration of hospital stay, days to achieve clinical improvement, days to achieve 50% reduction in abscess cavity size and days to achieve total/near total resolution of abscess cavity. The data was measured in numbers (percentage) and mean  $\pm$  SD.

### Results

**Table 1: Demographic details**

Gender	N%
Male	62 (88.57)
Female	8 (11.43)
Age groups in years	
20-29	7 (10)
30-39	42 (60)
40-49	9 (12.85)
50-59	6 (8.57)
60-69	6 (8.57)
Area	
Rural	63 (90)
Urban	7 (10)
Incidence of alcohol	
Yes	52 (74.28)
No	18 (25.72)

In presenting study the age group of the patients ranged from the 20-68 years. Highest incidence (60%) was found in 30-39 years age group. In this study 62 patients were male and 8 patients were female. 63 patients were from rural and 7 were from urban population and the incidence of alcohol consumption was 74.28%.

**Table 2: Symptoms & signs of liver**

Characteristics	Percutaneous needle aspiration(n=35)	Percutaneous catheter drainage (n=35)
Right upper quadrant pain	100%	100%
Right hypochondrium tenderness	100%	100%
Anorexia	100%	100%
Fever	92%	90%
Nausea & vomiting	66%	56%
Hepatomegaly	52%	82%
Respiratory symptoms	16%	32%
Jaundice	12%	12%
Diarrhea	0%	0%

It was observed that fever was present in needle aspiration and catheter drainage 94% and 92% respectively. There was 100% anorexia, pain and tenderness in right upper quadrant and hypochondrium in needle aspiration and catheter drainage respectively.

**Table 3: Laboratory Data**

Investigation	Percutaneous needle aspiration (n=35)	Percutaneous catheter drainage (n=35)
Leukocytosis (>11000)	80%	100%
Elevated S. Bilirubin Total	16%	24%
Elevated SGOT	64%	84%
Elevated SGPT	66%	100%
Hypoalbuminemia	56%	92%
Elevated Alkaline phosphatase	64%	91%
Elevated INR	67%	87%

It was observed that leukocytosis was 80% and 100% in needle syringe and catheter drainage.

**Table 4: Intervention**

Parameters	Percutaneous needle aspiration (n=35)	Percutaneous catheter drainage(n=35)	P value
	Mean $\pm$ SD	Mean $\pm$ SD	
Mean volume cavity (cc)	178.32 $\pm$ 46.94	355 $\pm$ 210.7	<0.005
Clinical improvement (Days)	5.6 $\pm$ 1.4	4.8 $\pm$ 1.72	<0.005
Time taken to reduce cavity up to 50% (Days)	7.5 $\pm$ 2.8	4.8 $\pm$ 1.4	<0.005
Time taken to total or near total resolution of abscess cavity (week)	10.8 $\pm$ 4.6	10.6 $\pm$ 4.4	>0.005
Average hospital stays (Days)	5.85 $\pm$ 1.24	6.88 $\pm$ 1.28	>0.005

The patients in PCD group showed earlier clinical improvement and 50% decrease in abscess cavity volume as compared to those who underwent PNA. However, there was no significant difference between the duration of hospital stay or the time required for total or near-total resolution of cavity.

### Discussion

Liver abscesses, both amebic and pyogenic, continue to be an important cause of morbidity and mortality in tropical countries. The primary mode of treatment of amebic liver abscess is medical; however, as many as 15% of amebic abscesses may be refractory to medical therapy. [16] Also, secondary bacterial infection may complicate 20% of amebic liver abscesses. [17] In such patients and in patients with pyogenic liver abscesses, surgical drainage has been the traditional mode of treatment. [18,19]

A liver abscess is a pus-filled cavity that occurs due to the incursion of microorganisms either from hematogenous spread or by way of the biliary ductal system. The common etiology of a liver abscess includes amoebic or pyogenic and sometimes mixed infections. In the developed world, a polymicrobial pyogenic abscess is common while amoebic etiology is more prevalent in tropical countries. Despite the improvement in sanitation and the advancement of treatment modalities, amoebic and pyogenic liver abscesses are considered an important cause of morbidity or mortality in the tropical and subtropical areas of the world.<sup>1</sup> The major approach for the treatment of a liver abscess is antimicrobial therapy with or without radiology guided intervention. About one-fifth of patients with liver abscesses remain refractory to antimicrobial therapy. [20] Nowadays, the generous use of sonography and computerized

tomography scanning of the abdomen led to the early diagnosis and treatment of liver abscesses.

In presenting study the age group of the patients ranged from the 20-68 years. Highest incidence (60%) was found in 30-39 years age group. In this study 62 patients were male and 8 patients were female. It was comparable with the study conducted by Singh et al. [1] 63 patients were from rural and 7 were from urban population and the incidence of alcohol consumption was 74.28%. It was observed that fever was present in needle aspiration and catheter drainage 94% and 92% respectively. There was 100% anorexia, pain and tenderness in right upper quadrant and hypochondrium in needle aspiration and catheter drainage respectively. On examination hepatomegaly and Jaundice was seen which were similar to those described in previous studies. [21] It was observed that leukocytosis was 82% and 100% in needle syringe and catheter drainage. The patients in PCD group showed earlier clinical improvement and 50% decrease in abscess cavity volume as compared to those who underwent PNA. However, there was no significant difference between the duration of hospital stay or the time required for total or near-total resolution of cavity and similar finding was reported by Ghosh et al. [21]

Kulhari M et al. reported better clinical outcomes with PCD over PNA in the patients with approximately similar volumes of liver abscess (293.2±130.3 mL in the PCD group and 291.4±138.8 mL in the PNA group, P= 0.925). [22] Rajak et al. also showed that higher abscess volume was associated with PNA failure. [23] Various studies described the comparison between conservative treatment and the percutaneous aspiration approach. Most of these studies were conducted before the widespread use of PCD for the treatment of liver abscesses. Results of these studies showed that PNA was more useful in higher abscess volume. [24-26]

### Conclusion

Our study concluded that the percutaneous catheter drainage is a better and effective percutaneous treatment modality as compared to percutaneous needle aspiration in view of greater volume of pus drained in first sitting, in respect to clinical improvement, resolution of cavity, success rate but there was no significant morbidity - mortality occur during both the procedure.

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