



“A COMPARATIVE STUDY OF USG GUIDED PERCUTANEOUS CATHETER DRAINAGE VERSUS USG GUIDED PERCUTANEOUS NEEDLE ASPIRATION IN THE MANAGEMENT OF LIVER ABSCESS”

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ABSTRACT Background: The incidence of liver abscess both pyogenic and amoebic is steadily increasing. Liver abscess is a potentially curable condition and without treatment the mortality is very high. The aim and objective of the study is to compare and correlate the therapeutic effectiveness of percutaneous needle aspiration and percutaneous catheter drainage in the management of liver abscess and to indicate the various determinants that affect the success of both the procedures. To identify and compare the morbidity and side effects associated with percutaneous catheter drainage and percutaneous needle aspiration. To compare the cost effectiveness of both the treatment options.

KEYWORDS : Liver abscess; Percutaneous Needle Aspiration; Percutaneous Catheter Drainage.

INTRODUCTION

- An abscess is a collection of pus that has developed within the body's tissue¹. It is composed of white blood cells, decomposing tissue and microorganisms.
- Among the intra-abdominal organs liver is the organ most subjected to development of abscess. Liver abscess constitutes 3% of all abscesses and 48% of all visceral abscesses. Liver abscess particularly with amoebic infestation is more common in tropical countries like India because of poor sanitation.
- The entity of liver abscess is known to be an old disease, recognized as early as in the era of Hippocrates (460-370 BC). John Bright provided the first description of pyogenic liver abscess in modern medicine in his 1836 disclosures on jaundice.
- Robert Koch in 1883 described the amoebae as a cause of liver abscess.
- In 1938, Ochsner and DeBakey provided a landmark collective review of pyogenic liver abscesses in the pre-antibiotic era. In his review, the most frequent cause of pyogenic liver abscess was pylephlebitis secondary to acute appendicitis².
- The earliest report of amoebiasis is probably the Sanskrit document *Brigusamhita*, written about 3000 BC, referring to bloody mucoid diarrhea³. *Entamoeba histolytica* was discovered by Friedrich Losch in 1873 in Russia⁴. Robert Koch in 1883 described the amoebae as cause of liver abscess. The connection between amoebic dysentery and liver abscesses was described by the English physician William Budd (1857), but Charles Morehead, professor of medicine and first principal of Grant medical college, Bombay, India, was the first to report a case of hepatic abscess in 1848⁵.
- Although amoebic and pyogenic abscess can occur at any age, it is most frequently encountered in adult life with highest incidence being in the third, fourth and fifth decades of life. The incidence of pyogenic liver abscess is maximum in the age group of 31-60 years and typically follows the complications of cholangitis and other forms of abdominal sepsis. The peak incidence of amoebic liver abscess is between 20 to 60 years of age; thus, it is predominantly a disease of young adults⁹.
- Approximately one tenth of the world population is believed to be infected with *E. histolytica*, with 100,000 deaths worldwide each year due to invasive amoebiasis^{6,7}. Amoebiasis is the third most common parasitic cause of death worldwide⁸.
- With the current increasingly aggressive and successful approach to the treatment of appendicitis, biliary tract disease has become the most frequent cause of pyogenic liver abscess. The incidence of multiple hepatic abscesses also has increased.
- Both the amoebic and pyogenic liver abscesses differ from one another with respect to their epidemiology, etiopathophysiology, clinical syndromes produced and also the complications, yet there is considerable overlap in the symptoms and signs of the two forms of liver abscess.
- The liver abscess though categorized into amoebic and pyogenic,

mixed variety is also common. Pyogenic abscess accounts for 80% of hepatic abscess cases in developed countries. Globally, amoebic liver abscess is more common than pyogenic liver abscess.

- Failure of treatment of pyogenic liver abscess invariably leads to a fatal outcome with mortality rate as high as 80-100%. Although successful results were reported in recent years with medical treatment, surgical drainage has been the regular method of treating pyogenic liver abscess.
- Although, needle aspiration of liver abscess is easier, less costly, the important reason for failure of needle aspiration is its inability to completely evacuate the pus.
- In the contrast to needle aspiration, percutaneous placement of an indwelling catheter provides continuous drainage, hence the problem of incomplete evacuation and re-accumulation are not associated with catheter drainage, accounting for higher success rates. The role of surgical therapy in liver abscess is reduced. But surgical therapy is indicated where there is complication, associated other abdominal pathology and multiloculated, thick-walled abscess cavity with viscous pus.
- The liver abscess remains a commonly encountered problem with great morbidity and mortality despite innovations in diagnosis and new strategies of management, liver abscess can be a perplexing issue for clinicians.

AIMS AND OBJECTIVES

- To compare and correlate the therapeutic effectiveness of percutaneous catheter drainage with percutaneous needle aspiration in the treatment of liver abscess.
- To identify and compare the morbidity and complications associated with both the procedures.
- To compare cost effectiveness of both the treatment modalities.

MATERIAL AND METHODS

Study was conducted on 32 patients suffering from liver abscess, who were admitted in Government General hospital, Kurnool. Patients with liver abscess who satisfied the inclusion and exclusion criteria were included in the study. Patients were treated with IV antibiotics and either percutaneous needle aspiration or percutaneous catheter drainage. All the patients were regularly followed up till total resolution of abscess cavity. Out of 32 patients studied 16 (50%) patients were treated with percutaneous needle aspiration with 18 G spinal needle. 16 (50%) cases were treated with percutaneous catheter drainage using 12Fr pigtail catheter.

Inclusion Criteria:

All patients admitted/ attending OPD in Government General Hospital, Kurnool diagnosed to have liver abscess.

Exclusion Criteria:

- Patients with already ruptured liver abscess.

- 1Patients with very small volume abscess (smaller than 5cm in greatest dimension or 50ml in volume), multiple or multi-loculated abscess.
3. Patients below the age of 12.

OBSERVATIONS AND RESULTS:

Table 1: Age Wise Distribution

Age groups	PNA group	%	PCD group	%	Total	%
<=30	4	25.00	0	0.00	4	12.50
31-40	4	25.00	2	12.50	6	18.75
41-50	1	6.25	7	43.75	8	25.00
51-60	6	37.50	6	37.50	12	37.50
>=61	1	6.25	1	6.25	2	6.25
Total	16	100.00	16	100.00	32	100.00

Chi-square with Yates's correction = 9.1672 P = 0.0571

Interpretation: The maximum numbers of cases were in age group of 51-60 years of age.

Table 2: Microbiologic Distribution Of Organisms Isolated In Two Groups

Organisms isolated	PNA group	PCD group	Total	%
E. coli	2	3	5	15.63
Klebsiella	2	0	2	6.25
Non fermenting gram-negative bacilli	0	2	2	6.25
Pseudomonas	0	1	5	3.13
No growth	12	10	22	68.75
Total	16	16	32	100.00

Interpretation:

There is no statistically significant difference between the two groups. Most abscesses were sterile. E. coli was most commonly isolated pathogen in PLA. Only two amoebic abscesses showed trophozoites in aspirated pus.

Table 3: Comparison Of Cases In Each Group By Types Of Abscesses

Types Of Abscesses	PNA group	%	PCD group	%	Total	%
Amoebic	2	12.50	5	31.25	7	21.88
Pyogenic	14	87.50	11	68.75	25	78.13
Total	16	100.00	16	100.00	32	100.00

Chi-square with Yates's correction = 0.7315 P = 0.3925

Interpretation:

Among 32 cases 25 were pyogenic and 7 were amoebic, The PNA and PCD groups are comparable in the type of abscesses.

Table 4: Comparison Of Cases In Each Group By Location Of Abscess

Location of abscess	PNA group	%	PCD group	%	Total	%
Left lobe	3	18.75	1	6.25	4	12.50
Right lobe	12	75.00	15	93.75	27	84.38
Both lobes	1	6.25	0	0.00	1	3.13
Total	16	100.00	16	100.00	32	100.00

Chi-square with Yates's correction = 0.2868 P = 0.5937

Interpretation:

Majority of abscesses are located in the right lobe due to streamlining of portal blood to right lobe of liver.

Table 5: Comparison Of Cases In Each Group By Complications

Complications	PNA group	%	PCD group	%	Total	%
Present	0	0.00	1	6.25	1	3.13
Absent	16	100.00	15	93.75	31	96.88
Total	16	100.00	16	100.00	32	100.00

Chi-square with Yates's correction = 0.0001 P = 0.9999

Interpretation:

The complications are higher in PCD group but is not statistically significant.

Table 6: Comparison Of Cases In Each Group By Success

Success	PNA group	%	PCD group	%
Yes	13	81.25	16	100.00
NO	3	18.75	0	0.00

Total	16	100.00	16	100.00
Chi-square with Yates's correction = 1.4712 P = 0.2251				

Interpretation:

The success rate is higher in PCD group but is not statistically significant.

Table 7: Number Of Aspirations In PNA Group

Number Of Aspirations	No. of cases	% Of Successful Cases
One	7	53.84
Two	4	30.76
Three	1	7.69
Four	1	7.69

Interpretation:

Most patients required only 1-2 aspirations for clinical improvement.

Table 8: Cost Comparison Between PNA And PCD Group

	PNA	PCD
Average cost of the procedure in rupees	445.51	1065.61

P<0.05

Interpretation:

There is a statistically significant difference between the two groups in terms of cost of the procedure. PNA is cheaper than PCD.

DISCUSSION

Age Wise Distribution

In our study, maximum number of cases was in 51-60 years age group. The youngest patient we recorded was 24 years and the oldest was 75 years. The mean age was 47.84 years.

Success Rate

In this study, PCD has a higher success rate (100%) as compared to PNA (81%). Three patients in PNA group had failure of which two patients had readmission, one at 14 days and another at 2 months from discharge. Both were then treated with reaspiration and had uneventful follow up. Another patient had no clinical improvement despite three aspirations due to rapid reaccumulation of pus, hence a PCD was placed. Post PCD the patient improved and was discharged.

Number Of Aspirations In PNA Group

Most patients required only one or two aspirations (84.62%), however the success rate is much lower in patients with single needle aspiration, with three out of seven cases (42.85%) with single aspiration resulting in failure advocating improved efficacy of PNA with repeated aspiration.

Cost

Average cost of procedure in rupees was 445 in PNA group and 1061 in PCD group which is statistically significant. This attributes to the cost of the catheter. Hence PNA is more cost effective than PCD group.

Complications

In this study, no complications occurred in the PNA group while one patient had complications related to catheter placement. The patient developed bile leak on day 2 and was conservatively managed with uneventful recovery. There was no statistically significant difference in between the two groups in respect to complications.

CONCLUSION

- Percutaneous catheter drainage (PCD) is a better modality as compared to percutaneous needle aspiration, especially in larger abscesses (>500ml).
- Percutaneous needle aspiration is a cost effective method with its use limited to abscesses with smaller size (< 300-500ML). The success rate of PNA increases with increase in number of aspirations.
- PNA continues to be the treatment of choice in abscesses smaller than 5cm in greatest dimension and in abscesses with difficult access through percutaneous route such as posteriorly located abscesses.
- There is no statistically significant difference in terms of complications associated with PCD and PNA groups of liver abscesses.
- Thus, concluding PCD as first line treatment option in large abscesses and PNA as a suitable alternative in smaller abscesses.

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