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A Comparative Study of Conservative vs. Percutaneous Needle Aspiration of Liver Abscess based on Liquefaction

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Abstract: ***Introduction: Pyogenic liver abscess (PLA) may be defined as solitary or multiple collections of pus within the liver, the result of bacterial infection. Incidence of pyogenic liver abscess is 2.3/1,00,000. {2} 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 amebiasis. Materials and Methods: This study was conducted in department of general surgery, Narayana Medical College, Nellore. Duration of study-August 2018 to July 2022. Total no. of patients-140 patients. Analysis: The results of the study were analyzed using SPSS software v 25.0. P-value was calculated using chi-square test. P-value <0.05 was considered significant. Procedures: Conservative treatment: Intra venous 3rd generation cephalosporins. (1gm BD) and metronidazole therapy (500 mg TID) along with analgesics and antacids were given. Percutaneous needle aspiration was done under ultrasound guidance. Under local anesthesia. Follow up: Patients were followed in general surgery OPD for 1 year and their condition was reassessed clinically and radiologically. Totally 120 patients, 60 in each group completed follow-up period of 1 year. During follow up, a total of 20 patients were dropped (10 in each group) due to non-compliance to treatment (16) and death (4). Death of the patients was due to old age and comorbidities-mainly renal failure. Discussion: In Group-A, more patients were satisfied with conservative treatment than percutaneous needle aspiration. In Group –B, more patients were satisfied with percutaneous needle aspiration than conservative treatment. Conclusion: In group B, very few patients responded to conservative management and almost all patients responded to percutaneous treatment. Even though, there was post procedure pain in percutaneous needle aspiration group, it was less when compared with pre-procedure pain related to liver abscess.***

Keywords: Pyogenic liver abscess, conservative treatment, percutaneous needle aspiration, management, comparative study

1. Introduction

Pyogenic liver abscess (PLA) may be defined as solitary or multiple collections of pus within the liver, the result of bacterial infection. Incidence of pyogenic liver abscess is 2.3/1,00,000. {2} 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 amebiasis.{4} Most common extra intestinal form of invasive amoebiasis-hepatic amoebiasis. 30% of cases of amoebiasis are symptomatic. Among it 1/3rd have concomitant liver abscess. {5} Incidence of amoebic liver abscess is 3.66/1,00,000 population. {6} Earlier days clinicians depend only on clinical examination for diagnosis of liver abscess. Morbidity and mortality of liver abscess was high in olden days because of uncertainty in diagnosis. Now a days morbidity and mortality in liver abscess have been decreased because of USG & CT and latest antibiotics specific against suspected pathogens.

Still considerable amount of morbidity and mortality is persisting due to non-responsiveness of the liver abscess to the treatment. This may be due to amount of liquefaction which plays a major role in the responsiveness of liver abscess to the treatment. The commonly practiced treatment options are conservative and percutaneous drainage. Even then there is no common consensus between clinicians which is ideal treatment option for the management of liver abscess. Hence, we planned to study the responsiveness of liver abscess to various modalities of treatment based on percentage of liquefaction.

2. Materials and Methods

This study was conducted in department of general surgery, Narayana Medical College, Nellore. Duration of study-August 2018 to July 2022. Total no. of patients-140 patients

Inclusion criteria:
All patients presenting to the OPD or ER with prediagnosed liver abscess or diagnosed after presentation irrespective of sex, age, comorbidities.

Exclusion criteria:
1) Liquefaction necrosis >70% or < 30%.
2) Ruptured or multiple liver abscess.
3) Already treated conservatively elsewhere.
4) Abscess size lesser than 5cm, multiloculate abscess.

5) Allergic to metronidazole.
6) Evidence of peritoneal, pulmonary or cardiac extension.
7) Cases of secondaries in liver.

A total of 120 patients were divided in two groups A & B based on percentage of liquefaction necrosis. Group A consists of 60 patients with liquefaction necrosis in the range of 30-50%. Group B consists of 60 patients with liquefaction necrosis in the range of 50-70%. Patients in each group were further randomized by chits' system into conservative management and percutaneous needle aspiration. All patients were thoroughly examined by clinical and radiological studies.

Comorbidities like presence of diabetes mellitus, renal failure, appendicitis, colitis etc. were noted. Routine lab investigations like CBP, DLC, AEC, LFT, coagulation profile, RFT were sent. USG was used a diagnostic modality in all patients. Usg features like – liquefaction necrosis, no. of abscess, uni/multiloculate, size of abscess, capsulated or no capsulated, were noted. Each patient was explained about both treatment modalities, study and informed consent was taken, then randomized by chits system. In Group A, 34 patients (58.33%) underwent conservative treatment, and remaining 26 patients (42.66%) underwent percutaneous needle aspiration. In Group B, 28 patients (42.66%) underwent conservative treatment and remaining 32 patients (58.33%) underwent percutaneous needle aspiration.

3. Procedures

Conservative treatment: Intravenous 3rd generation cephalosporins. (1gm BD) and metronidazole therapy (500 mg TID) along with analgesics and antacids were given. Percutaneous needle aspiration was done underultrasound guidance. Underlocal anesthesia and sensitivity and accordingly antibiotic therapy was started. Free hand needle technique was used. After aspiration of the pus, it was sent for culture and sensitivity and accordingly antibiotic therapy was started. Primary outcomes included collapse of cavity and complete resolution of symptoms. Secondary outcomes included reduced tenderness and leukocyte count. Repeat usg was done after 1 week-size of abscess & amount of fluid in abscess cavity was assessed. After 1 week leukocyte count was repeated and deference was tabulated and compared statistically. Pain of the patient pre procedure and post procedure (after 1 week) was assessed using universal pain assessment scale and patients' satisfaction was tabulated.

Analysis
The results of the study were analyzed using SPSS software v 25.0. P-value was calculated using chi-square test. P-value<0.05 was considered significant.

Followup
Patients were followed in general surgery OPD for 1 year and their condition was reassessed clinically and radiologically. Totally 120 patients, 60 in each group completed follow-up period of 1 year. During follow up, a total of 20 patients were dropped (10 in each group) due to non-compliance to treatment (16) and death (4). Death of the patients was due to old age and comorbidities-mainly renal failure.

4. Result

Table 1: Demographic representation of no. of patients

	Group A (n=60)	Group B (n=60)	P value
Conservative	34 (56.67%)	28 (46.66%)	0.067
Percutaneous needle aspiration	26 (43.33%)	32 (53.33%)	0.067

There was no significant difference between no. of patients randomized in each group.

Table 2: Demographic representation based on sex

	Group A (n=60)	Group B (n=60)
Male	52	54
Female	8	6

Males were more commonly affected than females in both groups.

Table 3: Based on Age

	Group A (n=60)	Group B (n=60)
<20 years	2	4
20-30 years	6	8
30-40 years	8	4
40-50 years	10	8
50-60 years	20	16
60-70 years	10	12
>70 years	4	8

Most common age group involved was 40-70 years.
There was no significant difference in age group distribution

Table 4: Based on comorbidities

	Group A (n=60)	Group B (n=60)
Diabetes mellitus	20	24
Renal failure	4	6
Appendicitis	2	2
Colitis	2	2

Most common age group involved was 40-70 years.
There was no significant difference in age group distribution

Conservative treatment was more effective in group A Percutaneous needle aspiration was more effective in group B.

Table 5: Demographic representation of no. of patients

	Group A (n=60)			Group B (n=60)			P-value
	Before treatment	After treatment	difference	Before treatment	After treatment	difference	
Conservative	6.46 +/-1.23	2.34 +/-0.98	4.12 +/-0.25	12.32 +/-1.26	10.46 +/-0.76	1.86 +/-0.5	0.02
Percutaneous	7.28 +/-2.22	5.08 +/-1.08	2.2 +/-1.14	13.86 +/-1.22	2.68 +/-0.52	11.18 +/-0.7	0.03

Conservative treatment showed significant reduction in size in group-A when compare to group-B. Percutaenous needle aspiration treatment showed significant reduction in size in group-B when compared to group-A.

Table 6: Based on decrease of abscess size

	Group A (n=60)			Group B (n=60)		
	Not Satisfied	Partially Satisfied	Fully Satisfied	Not Satisfied	Partially Satisfied	Fully Satisfied
Conservative	5	5	25	17	3	5
Percutaneous	15	2	8	2	3	30

Patients in percutaneous group were largely unsatisfied because of repeated puncture and pain even after resolution of symptoms.

Table 7: Based on patients' satisfaction

Patient's Satisfaction	Pain Score
Fully Satisfied	0-2
Partially Satisfied	3-5
Not Satisfied	6-10

Table 8: Based on decreased leukocyte count

	Group A (n=60)			Group B (n=60)			P-value
	Before treatment	After treatment	Difference	Before Treatment	After Treatment	Difference	
Conservative	18,643 +/-1238	9,245 +/-1,658	9398 +/-420	22.467 +/-1,179	18,268 +/-945	4199 +/-234	0.043
Percutaneous	19,338 +/-920	10,868 +/-998	8470 +/-78	23,298 +/-952	8,461 +/-843	14837 +/-109	0.033

There was significant decrease in leukocyte count in group-A patients undergoing both conservative and percutaneous needle aspiration.

In Group-B, there was no decrease in leukocyte count in conservative group, while there was decrease in percutaneous group.

5. Discussion

In Group-A, more patients were satisfied with conservative treatment than percutaneous needle aspiration. In Group –B, more patients were satisfied with percutaneous needle aspiration than conservative treatment. In Group A, patients responded well to conservative treatment when compared to percutaneous needle aspiration. In group A, though change in abscess size was similar and leukocyte count was reduced in conservative and percutaneous needle aspiration, patients were largely dissatisfied in the percutaneous needle aspiration group, because of more pain due to repeated multiple aspirations required for complete drainage. This indicates that for patient's suffering from liver abscess with liquefaction necrosis (30-50%), conservative treatment is a better modality of treatment.

6. Conclusion

In group B, very few patients responded to conservative management and almost all patients responded to percutaneous treatment. Even though, there was post procedure pain in percutaneous needle aspiration group, it was less when compared with pre-procedure pain related to liver abscess. Hence, large no. of patients felt satisfied with the procedure. This indicates that for patient's suffering from liver abscess with liquefaction necrosis (50-70%), percutaneous needle aspiration is a better modality of treatment. Therefore, higher percentage of liquefaction necrosis required drainage while lower percentage responded to conservative treatment.

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