

Original article:

Management of liver abscesses: Role of Interventional Procedures

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Abstract

Introduction: Interventional procedures along with chemotherapy are found to be useful in the treating of Liver Abscess(LA) cases. Percutaneous Needle Aspiration (NA) is safe, easier and convenient procedure than Catheter Drainage(CD). In Indian context, NA outcome has got great significance.

Objectives: To study the outcome of interventional procedure in management of LA.

Material and methods: This cross-sectional study was among patients with LA. A total of 34 cases were subjected to NA along with chemotherapy. Outcome was measured as successful based on clinical response, laboratory findings, cavity size reduction and duration of hospital stay. Patients did not responding to NA were subjected to CD. Statistical analysis was done using Fisher's exact test.

Result: Overall 68% cases responded to NA, 58% of Amoebic, 100% of Pyogenic. Majority (62%) of Pyogenic cases required more than one sitting, whereas majority (87%) of amoebic cases improved in single sitting. Significant association was observed between type of LA, number of sitting and number of cavities with outcome of NA. However, volume of abscess cavities was not significantly associated with NA outcome. Mean duration of improvement in all the parameters was seen to be lower in Amoebic cases in comparison to Pyogenic. Patients not responding to NA were well responded to CD.

Conclusion: NA can be the first line of intervention in all types of LA cases. However CD is the option for second line of treatment.

Key words: Liver abscess, Amoebic liver abscess, Pyogenic liver abscess, needle aspiration, catheter drainage

Introduction:

Amoebic Liver Abscess (ALA) is fairly common in India; but Pyogenic Liver Abscess (PLA) is not a rare entity. Other sources of liver abscesses like fungal and tubercular are, of course rare. Early and accurate diagnosis of these patients has remarkably reduced the high morbidity and mortality of liver abscesses-a fact anonymously accepted by all. Recent advances in Interventional Radiology and liberal use of Ultrasonography (USG) and Computerized Tomography (CT) have revolutionized the diagnosis of liver abscess. But not only in diagnosis, USG and other Imaging-Guided Procedures have been found to be very effective and safe in the treatment of LAs. The overall improvement of patient outcome of these procedure has virtually cornered the traditional method of surgical drainage of LAs.¹⁻³ Surgical procedures are associated with high (10-47%) morbidity and

mortality rates.^{4,5} However, the role of antibiotics and anti-amoebic drugs in combination to any such procedure has remained uncontroversial till today

Percutaneous USG/CT guided Needle Aspiration (NA) has been reported to have success rates of 70-100%.⁶⁻¹¹ Again, it is comparatively safer and less costly than Catheter Drainage (CD).^{12,13} However, many studies have shown CD to be more effective and the preferred method than NA, particularly in resistant type of Amoebic and comparatively larger LA.^{8,14-19} Considering all the facts, the present study was conducted to see the outcome of different interventional procedures in treating LAs.

Methodology:

This was a cross sectional hospital based study. A total of 48 cases of LA attending Surgery Department of Gauhati Medical College Hospital between June 2009 and May 2010

were initially enrolled. Out of them, 34 cases were subjected to interventional techniques. Exclusion criteria were age < 20 years, having smaller abscesses (less than 5cm in diameter), patients who responded well to conventional medical therapy, and patients having features of peritonitis. Informed consent was taken prior to the study. All patients were hospitalized and worked up in terms of detailed history and clinical examination. Complete haemogram, Liver Function Tests, Amoebic serology, pus culture, chest X-ray, USG and CT scan of abdomen (in selected cases) were done. Coagulation profile was evaluated before a scheduled procedure and managed accordingly. All 34 patients were treated with antibiotics (Cephazoline and Gentamycin) and anti-amoebic drugs (Metronidazole and Chloroquine) for 10 and 14 days respectively. Diabetics were treated by Insulin. Needle Aspiration (NA) was done in all 34 patients under local anaesthesia and using real time USG guidance. Using 18 gauge needle, contents were aspirated to completely evacuate the cavity followed by irrigation of the same with normal saline. A sample of pus was sent for microbiologic tests to determine the causative organism. Patients were followed up and evaluated for outcome of NA. Outcome has measured as successful based on clinical response (subsidence of fever) and laboratory findings (Total leucocytes count {TLC}), cavity size reduction (based on USG) and duration of hospital stay. USG was done after 2 days and second aspiration was performed if the cavity was still found to be >5cm. A third aspiration was done in the same way if required.

The patients who did not respond after 3 settings of NA were subjected to Catheter Drainage (CD). A 12 Fr Pig Tail Catheter was placed in the abscess cavity under USG guidance and modified Seldinger technique. Done under local anaesthesia, the catheter was fixed to the skin and connected to a bag. Apart from temperature and TLC, the daily output was recorded – amount, colour and consistency. Catheter was removed when fever subsided completely (for continuous 2 days), normalization of elevated TLC and when catheter output dropped to less than 10ml/24 hours for 2 consecutive days and also follow-up USG showed

complete disappearance or negligible residual cavity (<2cm in diameter). In all cases, periods of hospitalization were recorded.

Statistical analysis was done using Fisher's exact test and $p < 0.05$ has been considered as significant.

Results:

A total of 34 patients underwent interventional procedures in the present study. Male female ratio was 4:1. Age of the patients varied from 20-73 years and highest number of patients (38%) belonged to the range of 41-50 years. Major clinical features were right upper abdominal pain (100%), fever (94%) and hepatomegaly (35%). Nine patients were diabetic (Type 2)-7 ALA and 2 PLA. Majority (77%) had leucocytosis (>11,000). Pus culture was positive in 10(29.4%)—8 PLA and 2 ALA cases. These 2 ALA cases, in fact had superadded bacterial infections, hence were included in ALA group. Esch. Coli were isolated in 6 (75%) cases, whereas Pseudomonas and Staphylococcus were found in 1(12.5%), each in the remaining cases. Twenty cases had positive amoebic serology (>0.90 EIA).

ALA was confirmed in 26 (76.5%) cases and PLA in 8 (23.5%) cases. In 22(65%) cases the abscess was solitary. Remaining 12 cases had multiple abscess cavities. Volume of the abscess cavities was between 80-400ml. In case of multiple abscesses, volume of the biggest cavity was considered. Out of all 34 cases, subjected to NA, 23(68%) cases responded well and recovery was dramatic. In 58% of ALA and all 8(100%) PLA cases, NA was successful. A significant association was found between type of LA and outcome of NA. (Table 1). Majority (87%) of ALA cases responded in single sitting, whereas majority (62.5%) of PLA cases required more than one sitting. The difference was found to be significant (Table 2). Majority (86%) of patients with solitary cavity showed improvement with NA whereas in case of multiple cavities it was only 33.3%. A significant association was found between numbers of cavities with success of NA (Table 3). On the other hand, no significant association could be elicited between volume of abscess cavities and success of NA ($p=0.1143$) (Table 4). In regards to different parameters for improvement and

duration of hospital stay, it was found to be much less in cases ALA (Table 5).

Patients not responding to needle aspiration (n=11) were subjected to Catheter drainage (CD). Interestingly, the

unsuccessful cases(11) were ALA, all of them responded to second line of intervention i. e. CD. No patient in the present study had complication like bleeding and septicaemia.

Table 1. Distribution of cases according to outcomes of Needle Aspiration (NA)

Type of Liver Abscess	Outcomes		Total (%)
	Successful (%)	Unsuccessful (%)	
Amoebic Liver Abscess(ALA)	15(57.69)	11(42.31)	26(100)
Pyogenic Liver Abscess(PLA)	8(100)	0(0)	8(100)
Total	23(67.6)	11(32.4)	34(100)

Figure in parentheses indicate row wise percentages.

P= 0.034

Table 2. Distribution of successful NA cases according to the number of sittings

Number of Sittings	Successful NA cases		Total (%)
	ALA (%)	PLA (%)	
Single sitting	13(86.67)	3(37.5)	16(69.6)
More than one sitting	2(13.33)	5(62.5)	7(30.4)
Total	15(100)	8(100)	23(100)

*n=23, as 23 cases were successful

Figures in parentheses indicate column wise percentages.

P= 0.026

Table 3. Relationship between number of cavities and outcome of NA.

Number of Cavities	Outcomes		Total (%)
	Successful (%)	Unsuccessful (%)	
Solitary	19(86.4)	3(13.6)	22(100)
Multiple	4(33.3)	8(66.7)	12(100)
Total	23(67.6)	11(32.4)	34(100)

Figures in parentheses indicate row wise percentages.

P= 0.005

Table 4. Relationship between volume of abscesses and outcome of NA.

Volume	Outcomes		Total (%)
	Successful (%)	Unsuccessful (%)	
<300 ml	18(78.3)	5(21.7)	23(100)
>300 ml	5(45.5)	6(54.5)	11(100)
Total	23(67.6)	11(32.4)	34(100)

Figures in parentheses indicate row wise percentages.

P= 0.114

Table 4. Distribution of successful NA cases according to mean duration of recovery markers.

Recovery markers	Mean Duration (in days)	
	ALA	PLA
Fever subsidence	3	7
TLC < 11, 000/ cubic mm	6	15
>50% reduction of Cavity Size	8	10
Hospital Stay	11	17

Discussion:

Amoebic LA is more common in tropical areas than Pyogenic LA. USG is the preferred method not only for diagnosis of the cases, irrespective of the type but also for guidance during interventional procedures. Image guided needle aspirations was successful in 2/3rd of the cases. This is in conformity with many previous studies where it was reported to be effective in 70-100%⁶⁻¹¹. It is safe, economical and patient friendly^{12,13}. The important observation in the present study is that NA was successful in all the Pyogenic LA cases. This is in conformity with study done by Ch Yu S and his co-worker⁹ but contrary to some other studies^{10,17}. High success rate in single sitting of aspiration was also reported by Abusedra and his co-woker¹⁷. On the contrary, Giorgio et al¹³ performed on an average 2.2 aspirations in 115 patients and had 98% success. Similar finding was reported by Sukhjeet Singh et al¹⁸. The significant relationship between the number of cavity and NA in the present study was not in conformity with other studies done across the globe^{9,17}.

The volume of cavity had no significant association with the outcome of NA. Similar finding was also reported by other authors^{6,18}. The mean duration of hospital stay was found to be 11 days in ALA cases and 17 in PLA, which is much higher than some previous studies^{11,18}.

CD was successful in all 11 cases not amenable to multiple NA. Many studies have revealed CD to be more effective than NA, particularly the resistant type of amoebic and complicated abscesses.¹⁴⁻¹⁹. This could be due to the fact that the thick and viscid pus of amoebic LA can pass through wide bore catheter easily. Because of continuous drainage, re-accumulation is prevented. The limitation of the study was the design of the study-- absence of a randomized control group.

Conclusion:

NA is the first line of treatment in all cases of liver abscess. CD is the second line of interventional procedure. Almost all cases LA can be managed by these two techniques and role of open drainage is reserved for a few complicated cases.

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