http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v11i2.05

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

A Record based Analysis of Percutaneous aspiration Versus Pigtail catheter drainage in the management of Liver abscess at a tertiary care centre in Mandya

Authors
Dr Adithi S Rao*, Dr Narasimhaswamy P, Dr Abhijith VK, Dr Suhas GN, Dr Md Saqeeb
Department of General Surgery, Mandya Institute of Medical Sciences, Mandya – 571401
*Corresponding Author
Adithi S Rao

Overview
A liver abscess is an important health concern in tropical countries. Liver abscesses are most commonly due to pyogenic, amebic or mixed infections. Less commonly these may be fungal in origin. Effective management of liver abscesses includes appropriate antibiotics and drainage of the abscess cavity. Percutaneous abscess drainage by pigtail catheterization is now gaining popularity. We analyzed the role of pigtail catheter drainage over percutaneous aspiration in the treatment of liver abscesses.

Retrospective analytical study conducted in a tertiary care center in Mandya. Patients of age ≥ 18 years admitted with the diagnosis of liver abscess were included in this study. Data was analyzed in two groups: Group A (Percutaneous needle aspiration), and Group B (Pigtail catheter drainage).

The catheter drainage group showed significantly better recovery. The patients in pigtail catheter drainage group showed earlier clinical improvement and 50% decrease in abscess cavity volume as compared to those who underwent percutaneous needle aspiration or conservative management.

Percutaneous pigtail catheterization would be an operative decision for the management of liver abscess. Percutaneous catheter drainage is a better modality especially in larger abscesses which are partially liquefied or with thick pus.

Materials & Methods
This was a retrospective analytical study performed at a tertiary care in Mandya The study duration was January 2021 to July 2022. A total of 56 patients with a confirmed diagnosis of liver abscess were taken.

Patients admitted with clinical features and ultrasound abdomen findings consistent with liver abscess were included in the study. Patients with age <18 years and who refused invasive intervention were excluded from the study. Data regarding clinical features, possible risk factors, comorbidities, laboratory investigations, treatment strategies, and outcomes were collected in predesigned proforma. Patients with positive *Entamoeba histolytica* serology and/or positive stool microscopy for amoebic trophozoites and cysts are considered as of amoebic etiology. Positive pus culture and/or blood culture for bacteria was considered as of

pyogenic origin. Mixed etiology (amoebic and pyogenic) was considered if both were positive.

All patients were started on empirical intravenous ceftriaxone (1 gm bid) and metronidazole (500 mg tid) during hospitalization. Antibiotics were modified according to culture sensitivity and if there was no response to initial therapy. Patients were allocated into three groups based on treatment modalities for further analysis. Group A included patients who underwent percutaneous needle aspiration (PNA), and Group B included those who underwent pigtail catheter drainage (PCD). All patients were discharged with recovery, so the duration of hospital stay in days was taken for outcome analysis.

Results

Table 1: Demography, aetiology, and clinical profile of patients with a liver abscess

Total Patients n=56	Parameters	Number (Percentage)
Gender	Male Female	50(93.75) 6(6.25)
Risk Factors	Alcoholic Smoking Diabetic	22(41.3) 26(44.8) 8(13.79)
Etiology	Pyogenic Amoebic Mixed	48(86) 4(6.8) 4(6.8)
Symptoms	Pain Abdomen Anorexia / Nausea / Vomiting Weight loss	40(68) 26(44) 38(65.5)
Signs	Icterus Pallor Pleural effusion / Ascites	4(6.8) 5(8.6) 20(34.4)

Table 2: Comparative analysis of data between treatment groups

Total Patients n=56	Group A n= 25	Group B n=31
Age (Years)	44±20	45±14
Hb (g)	11.8±1.6	11.0±1.8
TLC	11000±6000	15275±6000
ESR	68±24	83±29
AST	56±42	71±59
ALT	62±46	52±41
Total bilirubin	1.2±0.9	1.4±1.1
Abscess volume	175±130	310±200
Duration of Metronidazole	23±7	24±8
Etiology	Amoebic -24% Pyogenic -22% Sterile	Amoebic -14% Pyogenic -12% Sterile

Hb- Haemoglobin, TLC- Total leukocyte count, ESR- Erythrocyte sedimentation rate, AST- Aspartate aminotransferase, ALT- Alanine aminotransferase

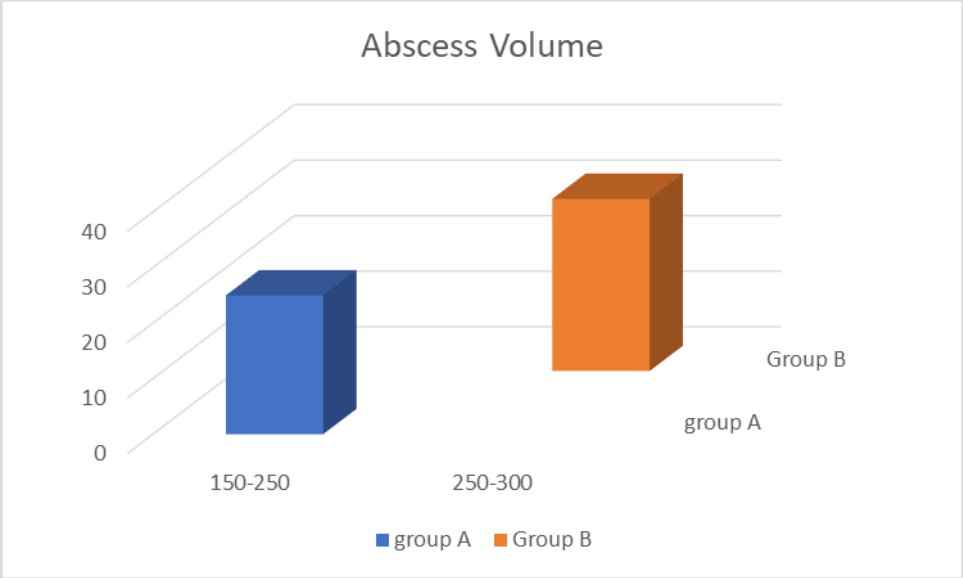

Fig 1 : Comparison between Abscess volume of the two groups (p=0.26)

Discussion

In recent years, imaging-guided percutaneous treatment (needle aspiration or catheterdrainage) has replaced surgical intervention asthe primary treatment for liver abscesses[5,7-11].

The main advantages of needle aspiration over catheter drainage include the following: Needle aspiration is less invasive and less expensive; it avoids problems related to follow-up catheter care, so less medical or nursing care is required; and multiple cavities can be aspirated in the same session[14, 15].

However, as our study shows, needle aspiration if limited to two attempts, has a significantly lower success rate than catheter drainage (50% versus 100%) similar to a study by Rajak et al[22]

The success rate of percutaneous needle aspiration in the various series reported in the literature varies from 79% to 100%[14-18]. The relatively lower success rate (60%) of percutaneous needle aspiration in our study is possibly related to the fact that repeated aspiration was attempted only once in cases of nonresponse to the first aspiration; this procedure is in contrast to that in most of the other studies, in which repeated aspirations were done up to three or four times[9,14,15,17,18].

In our study also, the success rate after one aspiration was only 44%; it increased to 60% after two aspirations. A higher success rate would likely have been achieved if multiple repeated aspirations were attempted. However, subjecting the patients to multiple needle aspirations (with the average number of aspirations per patient ranging from 1.4 to five[9, 14-18]) over a short period varying from 5 to 14 days[14-17] is a traumatic and unpleasant experience for the patients and may not be acceptable to many. Moreover, even multiple attempts do not guarantee a 100% cure rate[9,14-18]. For these reasons, we preferred to subject the patients to percutaneous catheter drainage after failure by second aspiration. The average size of the abscess in our study was larger than in other series [14,15,18].

In contrast to some of the earlier reports that show that the initial size of the abscess cavity did not affect the ultimate outcome[15,16], we believe that large abscesses are more difficult to evacuate completely in one attempt, necessitating repeated aspirations.

One important reason for failure of needle aspiration is the inability to completely evacuate the thick viscous pus that may be present in some of the abscesses[9,15]; this pus was seen in three of our patients. Rapid reaccumulating of the abscess after needle aspiration is another problem, described by Dietrick[17] and seen in 12 of our patients after first aspiration and eight patients

after second aspiration. In some of the patients (five in our series), this rapid refilling could have been due to biliary communication; however, in most patients no obvious predisposing factor existed, and the continuing inflammatory process itself probably contributed to the reaccumulation of fluid. In contrast to percutaneous needle aspiration, percutaneous placement of an indwelling catheter provides continuous drainage; hence, the problems of incomplete evacuation and re-accumulation are not associated with catheter drainage, accounting for the high success rates of catheter drainage reported in most of the earlier studies [7, 9-1 1,19] and also seen in our series.

The only reasons for failure of percutaneous catheter drainage, as reported in some of the earlier series [10, 19], have been either thick pus not amenable to percutaneous drainage (this problem can be over- come by using larger bore catheters) or premature removal of the drainage catheter (strict adherence to the criteria for catheter removal can prevent this problem[11]). No recurrence occurred in any of our cases during the follow-up period.

Our study suggests no meaningful difference in either the time taken for recovery or the duration of hospitalization among the patients successfully treated with either technique. In keeping with the findings of earlier reports[7, 9-1 1, 14-19], both treatment techniques resulted in rapid clinical relief, with most patients showing resolution of fever, local symptoms, and leukocytosis within 3 days of the procedure.

The average hospital stay (12 days) of the patients who underwent percutaneous catheter drainage in our study was shorter than that reported in two earlier series[7,19]. One possible explanation is that all the patients in those series had pyogenic liver abscesses and continued to be hospitalized for the definitive treatment of the predisposing conditions such as diverticulitis, gall stones, gall bladder carcinoma, and so forth even after removal of catheter and resolution of the abscess.[7,19]. No such predisposing conditions were recognized in the small number (n = 1 1) of patients with proven pyogenic liver abscesses encountered in our study. The shorter hospital stay could also be related to the fact that, unlike the practice in previous studies, we did not wait for total radiologic resolution of abscess cavity before discharge; the average volume of abscess at the time of discharge was 50 ml. Also, twenty of our patients were discharged with catheters in situ when they became clinically stable but had persistent drainage from the catheter.

The time required for complete sonographic resolution of abscess cavities after percutaneous treatment ranges from 2 weeks to 9 months[9,18]. In fact, total resolution may not occur, and small residual cavities may persist for years. Such cavities are usually indistinguishable from simple hepatic cysts[20]. In a series of 30 patients, Singh and Kashyap[9] noted much faster and more complete resolution of abscess cavity after percutaneous catheter drainage than after percutaneous needle aspiration. However, the results of our study suggest that although initial collapse of the abscess cavity is achieved earlier in patients undergoing catheter drainage than in those undergoing needle aspiration, the time needed for total resolution of the abscesses is similar in the two groups. Complications have been reported with both catheter drainage (12% in the series of Lambiase et al.[21]) and needle aspiration (4% in the series of Baek et al.[14]). Baek et al. and Giorgio et al.[15] describe the much lower incidence of complications with percutaneous needle aspiration than with catheter drainage as one of the major advantages of needle aspiration.

However, our study and some recent reports suggest that both procedures, if properly performed, are essentially safe procedures with minimal complications[5, 7-15].

Although secondary bacterial infection remains a distinct theoretic possibility with an indwelling catheter, this complication has been rarely reported in liver abscesses[7, 9-1 1, 19]. One limitation of our study is that the patients included formed a heterogeneous group with abscesses of both

amebic and pyogenic causes existing in both groups and many abscesses were of indeterminate cause.

In conclusion, although both percutaneous needle aspiration and catheter drainage are safe methods for the nonsurgical treatment of liver abscesses, catheter drainage is more effective than needle aspiration, which, if limited to two attempts, is associated with a higher recurrence rate and especially in large abscesses and in abscesses with thick viscous pus.

Among the successfully treated patients, no significant difference exists in the time required for clinical improvement, the duration of hospitalization, and the time needed for resolution of the abscess cavity in the two treatment groups.

Lobe involvement and etiology were not found to affect the outcome of different treatment strategies in our study.

References

1. Thompson JE, Forlenza S, Verma R. Amebic liver abscess: a therapeutic approach. Rev Infect Dis1985:7:171-179
2. Sherlock S. Dooley Y. Disease of the liver and btharv.cv. cIen:. 9th ed. Oxford: Blackwell, 1993:471-502
3. Theron P. Surgical aspects of amoebiasis. Br Med J 1947:2:123-126
4. Satani B, Davidson ED. Hepatic abscesses: improvement in mortality with early diagnosis and treatment. Am J Sung 1978:135:647-650
5. Gerzof SG, Johnson WC, Robbins AH, Nabseth DC. Intrahepatic pyogenic abscesses: treatment by percutaneous drainage. Am JSurg 1985:149:487-494
6. Lee JF, Block GE. The changing clinical pattern of hepatic abscesses. Arc-h Sung 1972:104:465-470
7. Artar B, Levendoglu H, Cuasay NS. CT-guided percutaneous aspiration and catheter drainage of pyogenic liver abscesses. Am J Gasimenteml1986;8:550-555
8. Seeto RK, Rockey DC. Pyogenic liver abscess: change in aetiology, management. and outcome. Medicine 1996:75:99-I 12
9. Singh JP, Kashyap A. A comparative evaluation of percutaneous catheter drainage for resistant amebic liver abscesses. Am J Surg 1989;l58:58-62
10. Van Sonnenberg E. Muller PR, Schiffman HR. et al. Intrahepatic amebic abscesses: indications for and results of percutaneous catheter drainage. Radiology 985:156:631-635
11. Saraswat VA, Agarwal DK, Baijal 55, et al. Percutaneous catheter drainage of amoebic liver abscesses.1992:45:187-189
12. Robert JH, Miresew D, Ambroseui P. Khoury G, Greenstein Al. Rohner A. Critical review of the treatment of pyogenic liver abscess. Surg Gyneco-Obstetrics 1992;l74:97-l02
13. Hashimoto L. Hermann R, Broniatowski 5G. Pyogenic hepatic abscess: results of current management. Am Sung 1995:61 :407-41 1
14. Back SY. Lee MG, Cho KS, Lee SC, Sung KB, Auh YH. Therapeutic percutaneous aspiration of hepatic abscesses: effectiveness in 25 patients. AIR1993; 160:799-802
15. Giorgio A, Tarantino L, Marmniello N. et al. Pyogenic liver abscesses: 13 years of experience in percutaneous needle aspiration with US guidance. Radiology 1995;l95: 122-124
16. Stain SC. Yellin AE, Donovan AJ, Brien HW. Pyogenic liver abscess: modem treatment. Arch Surg1991:126:991-996
17. Dietrick RB. Experience with liver abscess. Am J Surg 1984:147:288-291
18. Giorgio A. Amoroso P. Francica G, et al. Echoguided percutaneous puncture: a safe and valuable therapeutic tool for amebic liver abscess. Gastrointestinal Radio 1988;l3:336-340

19. Bertel CK, vanHeerden JA. Sheedy PF II. Treatment of pyogenic hepatic abscess. Arch Sung 1986;121:554-558
20. RaIls PW, Quinn MF, Boswell WD Jr, Calletti PM. Radin DR. Halls J. Pattern of resolution in successfully treated hepatic amebic abscess: sonographic evaluation. Radiology 1983;l49:541-543
21. Lambiase RE, Deyoe L Cronan L Cronan JJ, Dorfman GS. Percutaneous drainage of 335 consecutive abscesses: results of primary drainage with I -year follow-up. Radiology 1992;l84: 167-179
22. Rajak CL, Gupta S, Jain S, Chawla Y, Gulati M, Suri S. Percutaneous treatment of liver abscesses: needle aspiration versus catheter drainage. AJR Am J Roentgenol. 1998 Apr;170(4):1035-9. doi: 10.2214/ajr.170.4.9530055. PMID: 9530055.
23. Kumar S, Midha N K, Ahari K, et al. (December 20, 2021) Role of Pigtail Catheter Drainage Versus Percutaneous Needle Aspiration in the Management of Liver Abscess: A Retrospective Analysis. Cureus 13(12): e20528. doi:10.7759/cureus.20528.