

A Study of Management of Liver Abscess in a Tertiary Care Teaching Hospital

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Abstract

Background: Liver abscess is common in developing countries of the world. The mainline of management is percutaneous drainage with medical management. This is a prospective study designed to compare percutaneous needle aspiration (PNA) with percutaneous drainage PCD with the outcome, length of hospital stays, clinical improvement, time for total/ near-total resolution, and duration for IV antibiotics administration.

Method: This prospective study was conducted in the Department of General Surgery, Prathima Institute of Medical Sciences, Nagnoor, Karimnagar. Patients diagnosed with liver abscesses were included in the study. A detailed evaluation of history, clinical examination, and appropriate investigations were done. **Results:** In this study out of n=25 cases of group I comorbidities were found in n=10(40%) of cases which included Diabetes mellitus in n=6 cases and cardiovascular disease in n=4 cases. In group II cases a total of n=9 cases were found with comorbidities and out of which n=6 were diabetes mellitus and n=3 cases were with cardiovascular disease. The mean volume of aspirate in group I was 110.5 ml and in group II it was 101.23 ml. The important organism isolated from cases was E.coli. **Conclusion:** Liver abscess commonly affects males, and it is known to occur commonly in patients with diabetes mellitus. The important causative organism is E.coli, for abscesses that are small conservative medical management is sufficient. However, in large abscess cases, catheter drainage may be opted for because of better results. Surgical procedures may be limited to those cases where peritonitis is known to occur.

Keywords: Liver abscess, Percutaneous catheter drainage, Percutaneous needle aspiration

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Introduction

Liver abscess, known to mankind from ancient times. It has potentially lethal consequences if prompt diagnosis and treatment are not accomplished. The liver abscess can be amoebic and pyogenic in nature. [1] The world distribution of amoebic liver abscesses should parallel that of amoebic infections. Unfortunately, a large number of cases in developing countries (constituting the major bulk of total cases) remains unreported. However, many of the studies have shown that

the amoebic liver abscess is more common of the two types in developing countries. [2, 3] Pyogenic liver abscesses constitute the major bulk of hepatic abscess in western countries, they result from ascending biliary tract infection, hematogenous spread via the portal venous system, generalized septicemia with involvement of liver by way of hepatic arterial circulation, direct spread from intra-peritoneal infection, other causes. [4] *Escherichia Coli*, *Klebsiella*, and *streptococcus* are the most common organism followed by *staphylococcus* and *pseudomonas*. [5] Although no distinct

clinical criteria exist for distinguishing the two types, the diagnosis of amoebic and pyogenic abscess can be made by following points— younger age, resident, or recent travel to areas of endemic amoebiasis, diarrhea, and marked abdominal pain raise clinical suspicion of amoebic liver abscess. [6] The diagnosis of pyogenic liver abscess is made by symptoms of picket fence configuration of temperature chart, nausea, vomiting, and anorexia. Pain is a late symptom and is more common with large solitary abscesses. Investigations reveal leucocytosis, anemia, and positive blood culture for bacteria. The diagnosis and treatment and prognosis of liver abscesses have evolved remarkably over past years. Radiological imaging has improved diagnostic competence and has altered therapeutic strategy by allowing the possibility of percutaneous drainage. Rapid diagnosis, effective antimicrobial therapy, treatment of underlying disease, and orderly approach to therapeutic interventions directed towards the abscess remain the mainstay of care for the patient with hepatic abscesses. The concept of minimally invasive drainage has been and continues to be of paramount importance in the treatment of hepatic abscesses.

Materials and Methods

This prospective study was done in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the patients involved in the study.

Inclusion criteria

1. Patients diagnosed with liver abscess based on history, clinical and radiological assessment.
2. Patients above 18 years of age
3. Male and females
4. Abscess volume > 50 ml on USG
5. Voluntarily participating

Exclusion criteria

1. Patients with recurrent liver abscess
2. Patients with complicated abscess
3. Patients with coagulation disorders
4. Abscess volume less than 50 ml on USG
5. Pregnant ladies

All the selected patients were allotted into two groups. Group I Percutaneous Needle Aspiration (PNA) with medical management. Percutaneous aspiration may be done using 16 G lumbar puncture needle and 50 ml syringe. The standard protocol and procedure were followed for percutaneous needle aspiration. Group II Percutaneous catheter drainage (PCD) with medical management. A complete history was obtained from the patients and the patients were subjected to detailed clinical examination. Investigations included radiology Chest X-rays, USG, and CT scan, if USG is inconclusive. Serological estimation of HBsAg, HIV, HCV, and blood culture was done. The culture and gram staining of aspirated abscess fluid was done. All patients with a diagnosis of liver abscess were empirically treated with Inj ceftriaxone 1 gm and metronidazole 7.5 ml/kg each administered three times a day till the culture and sensitivity report was available. Once culture and sensitivity reports are available treatment was guided as per the sensitivity report.

Post-operative management

During the postoperative period all patients received intravenous aqueous diclofenac injections 12th hrs. for 1 day unless contraindicated and thereafter oral analgesics are given on the patient's demand. Post-procedure chest x-ray done to look for pneumothorax/catheter position. Pus was sent for culture and gram staining. Ultrasonography was done every day for the assessment of residual volume. The patients were examined daily for clinical improvement. Improvement in fever, chill, and rigor, right hypochondriac pain, anorexia, malaise, nausea, and vomiting before and after institution of therapy were noted. Serial blood investigations documenting clinical improvement were done. IV antibiotics were stopped based on total leucocyte count (4500-9000) and volume reduction by 50%. Patients were discharged once clinical, biochemical, and hematological parameters improved with at least 50% reduction in abscess cavity patient is discharged with oral antibiotics for 4 weeks.

Follow-up

3 months Patients are followed up every week in the first month followed by biweekly in the second month followed by once in last month.

Patients are assessed for residual volume / recurrence/ new cavity.

Statistical Analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at a 5 % level of significance.

Results

A total of n=50 cases were included in the study and were equally allotted into two groups. Group I (PNA) with medical management Group II Percutaneous catheter drainage (PCD) with medical management. The maximum number of cases belong to 31 – 40 years age group in group I cases the mean age of the patients of group I was 39.5 years. In group II the maximum number of cases also belong to 31 – 40 years the mean age was 36.5 years.

Table 1: Age wise distribution of cases in the study

| Age in years | Group I (PNA) N (%) | Group II (PCD) N (%) |
|--------------|------------------------|-------------------------|
| 20 – 30 | 2 (8.0) | 0 (0.0) |
| 31 – 40 | 12 (48.0) | 15 (60.0) |
| 41 – 50 | 10 (40.0) | 9 (36.0) |
| 51 – 60 | 1 (4.0) | 0 (0.0) |
| 61 – 70 | 0 (0.0) | 1 (4.0) |
| Total | 25(100) | 25(100) |

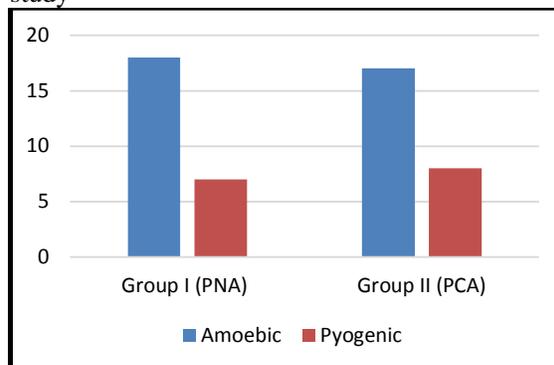
Out of the n=50 cases of the study in a group, I n=15(60%) were male cases and n=10(40%) were females and in group II n=16(64%) cases were males and n=9(36%) cases were females. In this study out of n=25 cases of the group, comorbidities were found in n=10(40%) of cases which included Diabetes mellitus in n=6 cases and cardiovascular disease in n=4 cases. In group II cases a total of n=9 cases were found with comorbidities and out of which n=6 were diabetes mellitus and n=3 cases were with cardiovascular disease. The location distribution of abscess in the cases of the study revealed in group I right lobe was involved in n=17(68%) of cases and left lobe involvement in 32% cases. In group II right lobe was involved in 18(72%) cases and the left lobe involvement in 28% of cases. The mean volume of aspirate in group I was 110.5 ml and in group II it was 101.23 ml. The important organism isolated from cases was

E.coli. The volume-wise distribution of cases of the study has been depicted in table 2.

Table 2: volume distribution among the cases of the study

| Volume (ml) | Group I (PNA) | Group II (PCD) |
|-------------|---------------|----------------|
| 50 – 100 | 5 (20.0%) | 8 (32.0%) |
| 100 – 200 | 15 (60.0%) | 11 (44.0%) |
| > 200 | 5 (20.0%) | 6 (24.0%) |
| Total | 25 (100%) | 25 (100%) |

Figure 1: Type of abscess found in the cases of study



In group I the length of hospital stay in most of the cases was below 16 days only in 16% of cases it extended beyond 16 days. In group II most of the duration of hospital stay was below 16 days and 12% of cases had stayed beyond 16 days depicted in table 3.

Table 3: The duration of hospital stay in two groups of patients

| Hospital stay (days) | Group I (PNA) | Group II (PCD) |
|----------------------|---------------|----------------|
| 10 – 12 | 6 (24%) | 5 (20%) |
| 13 – 16 | 15 (60%) | 17 (68%) |
| > 16 | 4 (16%) | 3 (12%) |
| Total | 25 (100) | 25 (100) |

In group I the mean length of hospital stay was 12.4 days in most of the cases was below 16 days only in 16% of cases it extended beyond 16 days. In group II the mean duration of hospital stay was 10.50 and most of the duration of hospital stay was below 16 days and 12% of cases had stayed beyond 16 days depicted in table 3. In group, I the IV antibiotics were administered in 20(80%) cases for 8 – 12 days and in group II the administration of antibiotics was done for 7 – 9 days. The mean time of administration of antibiotics for group I was 11.5 days and in group II was 8.5 days the p-values were <0.05 hence considered significant. In the PNA group, the meantime for resolution in the cases was 10.5 days, and in group II the

meantime for resolution of cases 12 days. The total time of resolution was 6.5 weeks in group I and 5.5 weeks in group II the p values were <0.05 and considered significant.

Discussion

This prospective study was conducted to compare the results of percutaneous needle aspiration and percutaneous catheter drainage in the management of liver abscesses. The contemporary image-guided percutaneous treatment has replaced surgical treatment as the procedure of choice. Surgical drainage is usually reserved for patients who have failed percutaneous drainage, those who require surgery for the management of complicated liver abscesses, and some patients with multiple macroscopic abscesses. The procedures have played important role in reducing morbidity and mortality among the cases and are seen as an alternative to laparotomy. In the current study out of n=25 each in a group, I (PNA) mean age of the patients of group I was 39.5 years and, in group II, (PCD) mean age was 36.5 years. Onkar Singh et al.,^[8] in their study found in the PNA group the mean age was 42 yrs and PCD group is the mean age was 40 yrs. In the studies conducted by Mahajan et al.,^[9] and Sukhjeet et al.,^[10] most of the patients (67%) in the age group of 21-40 years this is in agreement with the observations of the current study. In our study, we found male predominance in the cases of liver abscess in both groups of cases. Mahajan et al.,^[9] found 83.3% males Onkar Singh et al.,^[8] found 74.6% males, and Sukhjeet et al.,^[10] found 83.3% males in the study. In Asian countries, the isolation of *Klebsiella* to be the most important isolated bacteria in liver abscess and has reported good outcomes with PNA and systemic antibiotics. The major advantages of PNA are it is less invasive and less expensive, avoids problems related to catheter care; and multiple abscess cavities can be aspirated easier in the same setting.^[11] There are some problems with catheter drainage like a nuisance to the patient, pain, cellulitis at the insertion site, and sometimes catheter dislodgement. Although, needle aspiration is a much simpler procedure when compared to catheter drainage repeated procedures are quite unpleasant Another important reason for the failure of needle aspiration is the inability to

completely evacuate the thick viscous pus that may be present in some of the abscesses. Rapid re-accumulation of pus in the abscess is another reason described for the failure of needle aspiration. Placement of an indwelling drainage catheter addresses all three of these issues as it provides continuous drainage, drains thick pus because of wider caliber catheter, and prevents re-accumulation. This explains the duration of administration of IV antibiotics was significantly less in the PCD compared to the PNA group (10.5 days and 12.0 days respectively) which was similar in Onkar Singh et al.,^[8] The total time of resolution was 6.5 weeks in group I and 5.5 weeks in group II the p values were <0.05 and considered significant while in Mahajan et al.,^[9] and Sukhjeet et al.,^[10] there was no significant difference in the two groups. In our study both the procedures were found to be safe if performed with minimal complications. There was no mortality in either of the study groups.

Conclusion

Within the limitations of the current study, it can be concluded that liver abscess commonly affects males, and it is known to occur commonly in patients with diabetes mellitus. The important causative organism is *E.coli*, for abscesses that are small conservative medical management is sufficient. However, in large abscess cases, catheter drainage may be opted for because of better results. Surgical procedures may be limited to those cases where peritonitis is known to occur.

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