



## Clinical & Pathological Study of Management of Liver Abscess by Continuous Percutaneous Drainage Using Malecot's Catheter

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Received; 30 September 2016 Accepted; 15 October 2016; © The author(s) 2016. Published with open access at [www.questjournals.org](http://www.questjournals.org)

### ABSTRACT:

**Background & Objectives:** Percutaneous catheter drainage of liver abscess is an effective mode of management. To study the effectiveness of malecot's catheter in continuous drainage of liver abscess and ultrasonography as the suitable imaging modality for diagnosis, guidance and follow up.

**Methods:** This is a prospective study of 50 patients who were treated with continuous percutaneous drainage of liver abscess using malecot's catheter of size 10 to 12 Fr.

**Results:** 50 patients treated with catheter drainage of liver abscess of which all 50 were successfully treated without any failures. Without mortality and some minor complications. This procedure had better results with large solitary abscess compared to multiple abscesses. No 12 Fr catheters were more effective in drainage. USG abdomen was found satisfactory imaging modality in diagnosis, guidance and follow up.

**Interpretation & Conclusion:** Percutaneous catheter drainage using Malecot's catheter of size 11 and 12 and was found to be an adequate and successful mode of management of liver abscess with antibiotic coverage.

## I. INTRODUCTION

Liver abscesses, both amoebic and pyogenic, continue to be an important cause of morbidity and mortality in tropical countries. The advances in radiology like ultrasonography and C T scan since last 30 years and interventional techniques resulted in introduction of radiological guided aspiration and drainage of intra abdominal abscesses<sup>1</sup>. The primary mode of treatment of amoebic abscess is medical<sup>9</sup>; however many cases may be refractory to medical therapy. Also secondary bacterial infection may complicate 20% of amoebic liver abscess<sup>8</sup>. In such patients and in patients with pyogenic liver abscesses, aspiration has been the traditional mode of treatment. Operative drainage is associated with significant (10 to 47%) mortality and morbidity<sup>10</sup>. In recent years, imaging guided percutaneous drainage has been increasingly used to treat liver abscess with reported success rates ranging from 70 to 100%, surgical intervention is typically unnecessary<sup>1</sup>. Percutaneous placement of an indwelling catheter is the method most widely preferred to drain the liver abscesses.<sup>2</sup> Also few studies have shown therapeutic needle aspiration to be a simpler and less costly mode of treatment, but needs repeated aspiration, with more failure rates. Our study consists of 50 cases of liver abscess of different etiology treated by percutaneous continuous catheter drainage using malecot's catheter.

## II. AIMS AND OBJECTIVES

1. To study the effectiveness of malecot's catheter in continuous percutaneous drainage of liver abscess.
2. To study the usefulness of catheter drainage procedure in morbid patients not fit for open surgical drainage, those not responding to medical line of management, recurrent abscesses following needle aspiration and multiple abscesses.
3. To study the role of ultrasonography as a imaging modality for initial evaluation, guided aspiration and follow-up.

### **III. MATERIALS AND METHODS**

A series of 50 cases of liver abscess admitted to our hospital, Dr.PSIMS& RF, chinnoutapalli between October 2013 and October 2015 were studied. In each case an accurate diagnosis was made based on history, clinical examination and investigations including liver function tests and were then subjected to ultrasound abdomen examination.

All the liver lesions suggestive of liver abscess were examined in detail (any other abdominal organs were also scanned for any abnormalities). Gross morphology of liver abscess was examined in detail with special attention to following.

1. Size of liver assessed for hepatomegaly.
2. Number of abscess and their locations were identified in relation to lobes/segmental anatomy of liver.
3. The contiguity of abscess to the liver capsule was noted.
4. Size and volume of abscess described.
5. Echogenicity of the abscess assessed. (hyperechoic, hypoechoic, anechoic).

Diagnostic criteria are quoted below. All patients were hospitalized and depending upon hydration status hydrated and started on parenteral Ciprofloxacin/Third generation cephalosporin and Metronidazole therapy.

#### **Diagnostic criteria considered in this study**

- 1) Compatible history (with history of alcoholism)
- 2) Tender enlarged liver
- 3) Radiological evidence of raised dome of diaphragm
- 4) USG abdomen – specific finding with regard to liver abscess.
- 5) Response to Antibiotic therapy
- 6) Demonstration of anchovy sauce pus and microbiological examination of pus or bacteria in gram stain.

A certain number of cases that were not responding to parenteral antibiotics therapy within 48-72 hours were subjected to ultrasound guide diagnostic drainage, which showed either characteristic anchovy sauce pus or purulent yellowish pus, which confirms the diagnosis further catheter drainage was done.

### **IV. METHODOLOGY**

In the present study malecot's catheter was used for drainage of liver abscess. This malecot's catheter was originally designed and used for percutaneous nephrostomy. The catheter of size 10 to 12 Fr was placed in 8<sup>th</sup>, 9<sup>th</sup> or 10<sup>th</sup> intercostal space, or the site as guided by ultrasonography under local anesthesia using seldinger's technique. Patient in supine position, 2% lignocaine was used for local infiltration; an 18-gauge needle used to aspirate the contents of the cavity and sent for examination. A small nick was made at entry site of needle; a guidewire was passed well inside the cavity slowly withdrawing the needle. Now the tract was dilated using dilators of required sizes. Catheter was placed in the cavity slowly withdrawing the guide wire; catheter was fixed to the skin and connected to a collecting bag. Culture and sensitivity and Gram stain of the pus was done. Pus was also examined for Trophozoites. Patient's vitals are monitored for 24 hrs.

#### **Catheter care**

Daily irrigation of catheter once or twice with sterile normal saline was done, which prevents the blockage of catheter. Daily estimation of volume, colour and consistency of the drainage fluid was recorded. Catheter is kept in site for an average period of 7 days. The duration may vary in individual cases depending on the quantity of pus. Follow up was done using ultrasonography to note the shrinkage in size of the cavity every 4<sup>th</sup> or 5<sup>th</sup> day. Removal of catheter was decided based on the amount of pus drained (<50ml for three consecutive days). Relief of symptoms and sonological evidence of collapsing cavity or decrease in the size of cavity.

Patients were followed up weekly for 1 month and monthly for next 3 months repeating ultrasonography.

Treatment was considered successful if the following criteria were met

1. The patient improved clinically with subsidence of pain, fever and other symptoms.
2. The imaging of liver showed resolution of the abscess.

### **V. OBSERVATION AND RESULTS**

The age group in this study ranges from the 20yrs-60yrs. Highest incidence is found between 2<sup>nd</sup> – 5<sup>th</sup> decades. Other studies showed incidence of 75-90% in 2-5<sup>th</sup> decades. Our study shows 80% in the age group of 2<sup>nd</sup> – 5<sup>th</sup> decades.

In this study group 46 cases were male and 4 cases are female. Male predominance is reported always in literatures. Sex incidence, ratio being, Male : Female 11.5: 1

### **Socio economic status**

Liver abscess is commonly seen in low socio economic group. In our study almost all patients were from low socio economic group. 43 patients belongs to low, remaining belongs to mid income group. low income group being coolies, drivers, masons, farmers etc.

### **History of alcoholism**

Ochsner and De Bakey attribute higher incidence of alcoholism in males, which predisposes hepatitis and trauma<sup>3</sup>. Very few workers have tried to confirm actual relationship of alcohol to liver abscess but exact pathology is not known. According to some Authors the incidence varies from 20% -62.5%. In our series 40 were alcoholics (80%) and it is more common in persons who consumed alcohol.

### **History of amoebic colitis**

Among 50 patients, 7 patients gave past history of intestinal amoebiasis, concomitant history of diarrhoea present in 14 cases. A previous history /attack of amoebic dysentery as a rule antedate the onset of ALA by days, weeks, month or year. There are cases in which history of amoebiasis may not even be traced and the subject may be carrier.

### **General Physical examination**

Out of 50 cases, 60% of cases were anaemic showed dyspnoea seen in 4 % of cases, clubbing in 16% of cases pedal oedema in 20% of cases.

### **Clinical Manifestation**

#### **Symptoms**

In our study of 50 cases of liver abscess, 49 cases gave history of right upper quadrant pain, which was dull aching, and a few patients gave history of pain referring to right shoulder. Fever with chills and rigors seen in 38 cases, weight loss was complained in 30(60%) cases, anorexia in 34(68%) cases as seen in other studies<sup>11</sup>. 14 cases gave history of diarrhoea and 12 patients had history of chest pain in association with dyspnoea, cough in 10 cases, in most cases cough was dry in nature. Very few were known cases of COPD has cough with expectoration.

#### **Signs:**

On examination: 30(60%) patients have variable degrees of anaemia(Hb<10 gm/dl), jaundice seen in 22 cases. Tachycardia in 62% of the cases. Tender hepatomegaly is a significant finding seen in 92% of cases along with the 64% of cases had intercostals tenderness; colonic tenderness in few cases. In the present study, in 2 cases liver abscess had ruptured into the peritoneum, without any signs of peritonitis and were managed with catheter drainage.

#### **Investigations:**

Routine – haematological most of our patients showed anemia, about 60% patients had Hb<10gms/dl, polymorphonuclear leucocytosis in 40 patients, Neutrophils were predominantly increased in these patients. Bleeding time and clotting time were normal in all the patients; liver function tests were normal in 34% of cases. Abnormal values with respect to raised bilirubin in 22 patients (48%), and enzymes (raised alkaline phosphatase in 20 patients) and one important significant finding was low albumin level in 54 % of cases. With albumin - globulin (A:G) ratio reversed in 32 cases. Azotemia was found in 10 patients. Amoebic cysts and Trophozoites were searched in stools and the pus aspirated from amoebic liver abscess. Amoeba was detected in 6 patients in stools and culture of pus yielded organisms in 5 cases.

#### **Radiological**

All patients were subjected to screening of chest with chest x-ray including upper abdomen. 30% of cases had elevated or right dome of the diaphragm with restricted movements. The elevated right dome of the diaphragm was due to upper enlargement of liver, which occurs, in liver abscess. 20% of the cases had pleural effusion, basal lobe consolidation seen in 2 cases. Cardiomegaly and involvement of pericardium was not seen in any of the cases. COPD and chronic bronchitis in chest x-ray was seen in most of middle-aged male patients. Air fluid level seen below right diaphragm in 1 case, probably due to gas forming organisms.

#### **Ultrasound abdomen:**

USG is a very important tool, both in diagnosis and therapeutic management of liver abscess. It is non-invasive, 80-90% accurate, capable of delineating liver lesions as small as 2 cms in diameter.

#### **Site of Abscess :**

38 cases (76%) were having abscess only in right lobe while 4 were diagnosed with abscess in left lobe of liver as seen in studies by Hughes et al<sup>12,13</sup>. 8 cases were found to have abscess in both lobes. The long axis measurement of abscesses varied from 2 to 20 cms with a mean of 8.3 cms. The smallest abscess was 300cc and the largest measured 2200cc.

**Size of abscess:**

The long axis measurement of abscesses varied from 2 to 20 cms with a mean of 8.3 cms. The smallest abscess was 300cc and the largest measured 2200cc.

**Number of cavity:**

Most of the abscesses are solitary; however multiple abscesses are not usual. In the present study, 38 cases (76%) had solitary abscess including 4 cases of left lobe abscess. 12 (24%) cases showed multiple abscesses.

**Management**

50 cases were subjected to catheter drainage yielding varying quantities of pus from 300 ml to 2200 ml, depending on the size of the abscess. All patients showed good response and proceeded towards resolution. There were only few attended complications due to catheter drainage. We found that catheter drainage was very easy can be done under local anaesthesia even thick abscess can be drained. We preferred malecot's catheter of size 10 to 12 Fr with a stylette. The patient has symptomatic recovery from fever, pain and dyspnoea etc in 48 – 72 hours. Patients felt better after drainage. Pus aspirated was variable in consistency.

During aspiration, initially supernatant fluid, later thick fluid was obtained; colour varying from reddish or chocolate brown to brownish yellow color was noted. All the samples of pus were subjected to microscopy for *Entamoeba Histolytica* Trophozoites, gram stain. Trophozoites were absent in all the specimens. The specimens showed growth of organisms on culture and sensitivity in 20 cases.

2 patients had ruptured abscesses as evidenced by ultrasound, but with out any signs of peritonitis and were treated with catheter drainage successfully.

The blockage of catheter was observed more in smaller size catheter specially 10Fr which was mainly used in the beginning of the study, later 12 Fr catheters was successfully used in most cases with very less incidence of blockage. Common problems encountered are local pain or discomfort due to catheter, peri-tubal leak in few cases, accidental displacement of catheter and local wound infection after removal of catheter in 1 case, managed by debridement and local antiseptic ointment. The average period of continuous catheter drainage was around 8 days maximum being 15 days, minimum of 4 days. Average duration of hospital stay is 10 days. All 50 cases were treated without any failure.

## VI. Discussion

The management of liver abscess has drastically changed with significant reduction in mortality and morbidity after the advent of imaging modalities and antibiotics. Percutaneous placement of indwelling catheter provides continuous drainage; hence the problem of incomplete evacuation and reaccumulation are not associated with catheter drainage. Accounting for very good success rate of catheter drainage as reported in earlier studies.

In our study majority are male patients (46 cases) and only 4 female cases just like Gerzof, Sonnenberg studies<sup>4</sup>. Pain and fever were the most common symptoms in our study, comparable with the study by Rajak et al 1998<sup>1</sup>. The abscess characteristics like site of abscess, location of abscess, no of abscesses was comparable with the same study and other standard studies. Etiology of the abscess was not comparable with western studies, because incidence of amoebic abscess in tropical countries like ours is more. In pyogenic abscess most common cause was pyelophlebitic route, while most common cause in western series is biliary, excluding cryptogenic.

**Success rates:**

Relief of symptoms and sonological evidence of collapse of cavity were considered as the criteria for success of the study. In our study success rate of 100% was seen comparable with Rajak, et al.<sup>1</sup>(1998) and Eric von Sonnenberg<sup>4</sup>(1985) with 100% success rate. K.P.Wong<sup>6</sup> with success rate of 85%, and Gerzof, et al.<sup>5</sup> with 83% success rate.

**Duration of Drainage:**

The median duration of drainage in our study was 8 days, as compared to Rajak, et al. (7 days), KP Wong (25 days), Sonnenberg (4 days). Jaipal Singh et al<sup>7</sup> showed an average duration of 4.5 days and Gerzof showed a mean drainage period of 18 days.

Size of the catheter in other studies varied from 8 Fr to 14 Fr with variable success rates, in our study 12 Fr catheters was found effective with same level of discomfort as for lesser sizes.

## **Complications**

Most common complaint being local discomfort or pain. Blockage of catheter seen in 16 cases, local wound infection in 1 case. Biliary fistula occurred in 1 case, where catheter was kept for longer time. All complications were attended without difficulty. Blockage of catheter was less frequent with 12 Fr catheters, even for thick pus.

## **VII. SUMMARY**

50 cases of liver abscess diagnosed clinically and radiological evidence of elevated right dome of diaphragm and with ultrasound abdomen.

Liver abscess is seen between the age group 20 year – 60 years and maximum in 2nd and 5th decades of life. Males predominate and 80% were alcoholic, might be an associated risk factor for liver abscesses. History of altered bowel habit was present in the presenting illness, & in past history. Most of them belong to low socio economic status and having poor living condition (sanitation). Most of them had lost their weight and were malnourished. Pain abdomen, right-sided chest pain, associated with fever in the presenting complaint, with pain being the commonest symptom. Jaundice, clubbing, pedal oedema, tachycardia are the findings in general physical examination. Liver function tests show abnormality in 32 patients and they have hypoalbuminaemia. Elevation of right dome of diaphragm, right-sided pneumonitis, and pleural effusion were common radiological findings. HIV and HbsAg assessment done in all patients.

All patients underwent detailed ultrasound abdomen examination. Solitary abscess noted in 38 cases, and multiple abscesses seen in remaining 12 cases. All patients were managed with catheter drainage. Success rate was 100% without any case failure. 2 patients had USG evidence of rupture without peritonitis, were managed successfully. 12Fr catheter was found to have less incidence of blockage compared to smaller sized catheters. Prognosis was good in our series.

## **VIII. CONCLUSION**

Liver abscess is commonly seen in middle-aged alcoholics with male preponderance. Liver abscess is seen most commonly in low socio economic group with poor sanitation. Pain in right hypochondrium, fever, tender hepatomegaly, intercostal tenderness with history of alcoholism is diagnostic of liver abscess.

Radiological investigation supports the diagnosis. Ultrasound abdomen is simple non-invasive tool, which confirms the site, size and number of liver abscess. It also guides in the placement of catheter in difficult cases, very useful in monitoring and follow up of the patient.

All cases were treated with catheterization; in few cases ultrasound was used as guide, where the abscess was found to be deep. There were few complications like local discomfort or pain in most of the cases. Catheter blockage was present in 16 cases. Local wound infection seen after removal of catheter in 1 case. All complications were attended without difficulty. Continuous percutaneous catheter drainage is an effective mode of treatment of liver abscess, not responding to medical line of management and should be the first choice before considering open surgical drainage. 12Fr catheter is a suitable size for all types of abscess. Prognosis is good in present series.

## **REFERENCES**

- [1]. Rajak C L, Sanjay Gupta, Sanjay Jain, Yogesh Chawla, Madhu Gulati, Sudha Suri ,Percutaneous Treatment of Liver Abscesses: Needle Aspiration versus Catheter Drainage. *Am J Roentgenology* 170:1035-1039
- [2]. Michael J.Zinner, Seymour I. Schwartz, Harold ellis, Maingot's Abdominal Operations, 10th edition, vol 2, Appleton and Lange, Chapter 51: 1513-1545
- [3]. Ochsner A, DeBackey M, Murray S pyogenic abscess of liver. An analysis of 47 cases with a review of literature. *Am J surg*, 1938; 40:292-319
- [4]. Eric Von Sonnen berg et al, Percutaneous Drainage of Abscess, Editorial Comments, *Radiology* 1992; 184:27.
- [5]. Gerzof SG, Robbins A. H, Johnson W C, Percutaneous catheter drainage of abdominal abscesses five years experience. *Eng J. Med*, 1981; 305:653
- [6]. Wong K P, Percutaneous drainage of Pyogenic liver abscess, *World journal of surg*, 1990; 14:492
- [7]. Jaipalsingh, Ajay kashyap, A comparative Evaluation of percutaneous Catheter Drainage For Resistant Amoebic Liver Abscess, *Am J Surg*, 1989; 158:58-62
- [8]. Sherlock S, Dooley J. 9th ed. Oxford: Blackwell Sci Pub; 1993. Diseases of the liver and biliary system; pp. 471–502.
- [9]. Thompson JE Jr, Forlenza S, Verma R *Rev Infect Dis*. 1985 Mar-Apr; 7(2):171-9. Amebic liver abscess: a therapeutic approach.
- [10]. Satiani B, Davidson ED *Am J Surg*. 1978 May; 135(5):647-50. Hepatic abscesses: improvement in mortality with early diagnosis and treatment. 11. Chiu CT, Lin DY, Wu CS, Chang-Chien CS, Sheen IS, Liaw YF *Taiwan Yi Xue Hui Za Zhi*. 1987 Apr; 86(4):405
- [11]. A clinical study on pyogenic liver abscess 12. Hughes MA, Petri WA Jr *Infect Dis Clin North Am*. 2000 Sep; 14(3):565-82, viii. Amebic liver abscess. Hoffner RJ, Kilagblian T, Esekogwu VI, Henderson SO *Ann Emerg Med*. 1999 Sep; :351-5. Common presentations of amebic liver abscess.