



## ROLE OF ULTRASOUND GUIDED PIGTAIL CATHETER IN DRAINAGE OF LIVER ABSCESS

### Radiodiagnosis

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### ABSTRACT

**OBJECTIVE:** Therapeutic ability of ultrasound guided pigtail catheter in liver abscess drainage. **MATERIAL AND METHODS:** The present study was conducted in 29 patients with liver abscess in Government general hospital, Guntur for a period of 14 months from June 2019 to August 2020. Out of the 29 cases 20 cases have solitary abscess and 9 have multiple abscesses. Pigtailed of various sizes (10F to 16F) were used. Pigtail catheters were introduced under ultrasound guidance using the Seldinger technique. **RESULTS:** Average volume of pus drained in each patient is 1500ml with average duration ranges from 7 to 14 days. Patients were discharged on same day and follow up of the abscess size and catheter position is done with ultrasound. No major complications were recorded. Minor complications include tube dislodgement in 2 patients, infection of tube track site in 1 patient is noted. No mortality is observed. **CONCLUSION:** Pigtail catheter drainage of liquefied liver abscess should be used as firstline method as it is a simple percutaneous technique with low mortality and morbidity.

### KEYWORDS

Liver Abscess, Pig Tail, Complications.

### 1. INTRODUCTION

- A liver abscess is defined as a pus-filled mass in the liver that can develop from injury to the liver or an intra-abdominal infection disseminated from the portal circulation.
- The majority of these abscesses are categorized into pyogenic or amoebic, although a minority is caused by parasites and fungi.
- Most amoebic infections are caused by *Entamoeba histolytica*. The pyogenic abscesses are usually polymicrobial, but some organisms are seen more commonly in them, such as *E.coli*, *Klebsiella*, *Streptococcus*, *Staphylococcus*, and anaerobes. While the incidence is low, it is essential to understand the severity of these abscesses because of the high mortality risk in untreated patients.
- The usual pattern of abscess formation is that there is leakage from the bowel in the abdomen that travels to the liver through the portal vein. Many cases have an infected biliary tract that causes an abscess via direct contact.
- Liver abscesses can be classified in a variety of ways: One is by location in the liver. 50% of solitary liver abscesses occur in the right lobe of the liver (a more significant part with more blood supply), less commonly in the left liver lobe or caudate lobe. Another method is by considering the source: If the cause is infectious, the majority of liver abscesses can be classified into bacterial (including amoebic) and parasitic source (including hydatiform cyst). The objective of this study is to study the efficacy and advantages of drainage of liver abscess cavity by placing a pig tail catheter under USG.

### 2. METHODOLOGY

#### Study design

- It is a prospective study conducted in 29 patients with liver abscess in government general hospital, Guntur for a period of 14 months from June 2019 to August 2020. Out of the 29 cases 20 cases have solitary abscess and 9 have multiple abscess. Pigtailed of various sizes (10F to 16F) were used. Pigtail catheters were introduced under ultrasound guidance using the Seldinger technique.

#### Objectives

- To know the therapeutic ability and complications of ultrasound guided pigtail catheter in liver abscess drainage.

#### Patients and treatment

- Inclusion criteria:** patients with liver abscess larger than 5cm.
- Exclusion criteria:** ruptured liver abscess, liver abscess with thin liver parenchyma < 1cm, unstable patients, and patients with deranged coagulation profile.

The procedure was performed under ultrasound guidance. Under strict antiseptic conditions using USG guidance & local anesthesia (2% lignocaine) 10 to 16 Fr pigtail catheters were placed in the abscess cavity using Seldinger technique. After confirming free drainage of pus and confirming the position of the catheter's tip in the cavity, the catheter was fixed and connected to uro bag. 10 ml of pus was sent for culture and sensitivity. Patients were given Inj. Tramadol 50 mg given BD, PR, and BP were monitored hourly. A review USG of abdomen was done on the same evening and after confirming no free fluid in the peritoneal cavity and no signs of peritonitis / respiratory distress patient was discharged with antibiotics and analgesics for 1 week. Patients were counseled about the signs of peritonitis and to attend emergency department immediately. 1st review was done after a week of catheter placement and USG abdomen was done to check for the decrease in the size of abscess cavity along with CBP.

Serial USG of the abdomen and CBP were repeated every week. Drains were removed after confirming the collapse of the abscess cavity on USG.

### 3. RESULTS

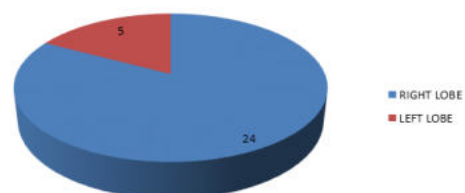
- In this study 29 patients underwent USG guided pigtail catheter insertion for solitary and multiple liver abscesses. Average of 1500 ml of pus is drained in each patient.

| AMOUNT OF PUS DRAINED | NO. OF PATIENTS | PERCENTAGE (%) |
|-----------------------|-----------------|----------------|
| >2000 ml              | 4               | 15             |
| 1500-2000ml           | 10              | 34             |
| 1000-1500ml           | 9               | 31             |
| <1000ml               | 6               | 20             |

24 patients have right lobe involvement and 5 patients have left lobe involvement.

20 patients have solitary liver abscess and 9 patients have multiple liver abscess.

#### LOBE INVOLVEMENT



Cultures were positive in 7 cases (24%) rest of the abscess are sterile.

#### 4. COMPLICATIONS

| COMPLICATION              | NO. OF PATIENTS | PERCENTAGE (%) |
|---------------------------|-----------------|----------------|
| TUBE DISLODGEMNT          | 2               | 6              |
| TRACK SITE INFECTION      | 1               | 3              |
| PAIN AT THE CATHETER SITE | 19              | 65             |
| TUBE BLOCKAGE             | 1               | 3              |
| FISTULA FORMATION         | 0               | 0              |



**LIQUEFIED LIVER ABSCESS BEFORE AND AFTER PIGTAIL INSERTION (WHITE ARROW IN 3<sup>RD</sup> IMAGE)**



**PATIENT AFTER PIG TAIL INSERTION**

#### 5. DISCUSSION

- Liver abscess still continues to be a common & serious cause of morbidity and mortality among the low socioeconomic population in India and needs adequate medical attention.
- Liver abscess caused by various causes can be dealt by percutaneous needle aspiration, percutaneous catheter drainage or open drainage.
- Percutaneous drainage (needle aspiration/catheter drainage) has mostly replaced open drainage.
- Beger et al reported clinical improvement in patients with abscess cavity after needle aspiration.
- Surgical drainage of liver abscess is planned for patients with incomplete or failure to drain the abscess cavity completely.
- Percutaneous drainage of liver abscess by USG guidance is a relatively safe procedure in experienced hands with minimal complications such as hollow viscous perforation, bleeding, septicemia.
- Percutaneous drainage is now considered as the treatment of choice in cases of intra abdominal collections and abscess cavities. But deeper abscess may be difficult to visualize on ultrasound.
- The type of abscess was determined on the basis of amebic serology and pus culture reports.
- Our study included USG guided pigtail insertion for drainage of solitary liquefied liver abscess cavity.
- Complications included pain, blockage of the catheter, and displacement of the catheter tip.
- Patients with displaced catheter tip were readmitted and catheter tip was repositioned using USG guidance.
- The entry site should be reviewed on a daily basis. If output from the collection ceases, it may mean that the collection is no longer present or that the drain is clogged. Re-imaging and/or flushing the drain should be considered before removing the drainage catheter.
- Catheters had to be regularly flushed with normal saline to avoid blockage. Large cavities & cavities with thick pus had to be drained for longer duration. These complications can be avoided by placing a wider bore catheter.
- Wound care should be taken regularly to avoid infection at wound

site.

- Patient is advised active mobility for proper drainage.

#### 6. CONCLUSION

- Pigtail catheter drainage of liquefied liver abscess should be used as firstline method as it is a simple percutaneous technique with low mortality, morbidity and it is a cheaper and safer method.

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