ORIGINAL ARTICLE

AN INITIAL EXPERIENCE OF ULTRASOUND GUIDED PIGTAIL CATHETER DRAINAGE OF LIVER ABSCESS AND ITS OUTCOME IN TERTIARY CARE HOSPITAL OF QUETTA

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ABSTRACT

BACKGROUND: Liver abscess is a common clinical problem in tropical countries and is most commonly caused by pyogenic, amoebic or mixed infections. Abscess is usually suspected clinically in cases having fever, tender hepatomegaly and the diagnosis is usually confirmed on the basis of imaging such as ultrasound and computerized tomography. Management includes antimicrobial agents and drainage of abscess. Percutaneous drainage (PD) of abscess is done using needle aspiration or by pigtail catheter drainage. **AIMS AND OBJECTIVE:** To evaluate the role of ultrasound guided pigtail catheterization drainage procedure as a treatment option in cases of liver abscess. **MATERIALS AND METHODS:** It was a prospective study conducted at the Radiology department of Bolan Medical Complex Hospital, Quetta, Pakistan from August 2021 to September 2022. Forty eight patients diagnosed as hepatic abscess were included in this study on the basis of predefined inclusion and exclusion criteria. These patients underwent pigtail catheterization of liver abscess as a part of their treatment. The patients included in the study were diagnosed with liver abscess by ultrasound and CT and were treated in coordination with surgery department. The effectiveness of pigtail drainage was evaluated by doing serial ultrasound scans.The demographic characteristics, hepatic lobe involvement, amount of pus drained and complications were studied in these patients. **RESULTS:** Out of 48 patients, 32 were male and 16 were female with a M: F ratio of 2:1. The age ranged from 10 years to 70 years. The mean age of the study cases was found to be 35-40 years. Right lobe was involved in predominant cases. Eight patients developed procedure related complications out of which 3 had catheter blockage, 2 patients had catheter dislodgment requiring repositioning, 2 patient developed pus discharge from catheter site and remaining 1 patient developed subcapsular hematoma. Average hospital stay varied from 2 5 days. No major complications reported during the procedure. **CONCLUSION:** Percutaneous ultrasound guided pigtail catheter is an effective minor invasive procedure as a treatment option for liver abscess with high success rate and no procedure related mortality.

Keywords: Liver abscess, Pig tail catheter, percutaneous drainage

Introduction

Bacterial hepatic abscess ranked second in liver infectious disease and carried a high mortality. Various organisms are responsible for its etiology including Klebsiellapneumoniae, Escherichia coli, Streptococcus anginosus and anaerobes. Bacterial hepatic abscess is encountered in patients already having liver and

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biliary diseases, immunocompromised, diabetic and patients operated for invasive procedures.[1]

Liver abscess can be described as a collection of suppurative material encapsulated within the hepatic parenchyma, which could be the result of infection by either fungal, bacterial and other parasitic micro-organisms.[2]

Although there is considerate improvement in the sanitation and infection control strategies, amoebic and pyogenic liver abscesses are still posing a threat as an important cause of morbidity or mortality in the tropical and subtropical areas of the world. The use of antibiotics is one of the most important part of treatment for liver abscess, however it is effective in patients with small hepatic abscess. Antibiotics alone in large hepatic abscess, is not effective due to higher bacterial volume as there is inadequate penetration as well as ineffective medium for the complete bacterial removal.[3]

The objective of this study was to study the advantages and efficacy of liver abscess drainage by placing a pig tail catheter under ultrasound guidance.

Materials and Methods

Prospective study conducted in Radiology department of Bolan medical complex hospital, Quetta. The study period was from August 2021 to September 2022. Study was approved by the Ethical Review Committee of the hospital.

Diagnosis of liver abscess was made from clinical history of the patient, physical examination followed by ultrasound. CT scan was performed if required. An informed written consent was obtained from all the patients. All patients (including pediatric age group) with hepatic abscess who underwent image guided pigtail catheter placement were included in the study. Patients having ruptured liver abscess into the peritoneal cavity or pleura, non- liquefied abscess and abnormal coagulation profile were excluded.

After explaining the complications of the procedure, informed written consent was obtained and patients were subjected for the procedure.The procedure was performed in the ultrasound section specified for intervention. Under strict antiseptic conditions using ultrasound guidance and local anesthesia 10 Fr pigtail catheter was placed in the abscess cavity using Seldinger s 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 urine bag. 20 ml of pus was sent for culture and sensitivity. Out patients were counseled about the signs of peritonitis and to attend emergency department immediately. Monitoring of admitted patients were done by clinical team. Serial Ultrasound of the abdomen was repeated every three days. Drains were removed after confirming the collapse of the abscess cavity on ultrasound after discussion with clinical team.

Results

Forty Eight (48) patients underwent ultrasound guided pigtail catheterization for liver abscess. 32 patients were maleand 16 patients were female with a M: F ratio of 2:1.

Age group of present study subjects varied from 10 to 70 years. Maximum patients were between 30 to 50 years. Pain in right upper quadrant was the most common presenting symptom, seen in almost 90% patients. The next common symptom was fever in 82% of patients.

The analysis of involved hepatic area showed that in majority of the patients (82%) right lobe of liver was involved whereas left lobe involvement was seen in remaining (10%) of patients. Both lobes were involved in 8% of cases. In 38 (80%) cases solitary abscess was seen whereas in remaining 10 (20%) of cases multiple abscesses were seen on ultrasound.

Out of 48 patients, only 3 patients (10%) required repositioning of the catheter.

Pig tail was left in situ from 0-7 days for 18 patients, 07-15 days for 27 patients and 15-20 days for 3 patients. Average days being 07-12 days. The maximum amount of pus was drained during the first 24 hours (Tab.1) in maximum patients (43)%.

The analysis of cases on the basis of complications showed that in patients who had undergone Pigtail catheter drainage of liver abscess there were no procedure-related complications in 40 cases (84%) (Fig.1) and the procedure was uneventful. Out of remaining 8 patients, 3 patients had catheter blockage, 2 had catheter dislodgment requiring repositioning,

02 patients developed pus discharge from catheter site and remaining 01 patient developed subcapsular hematoma. 06 patients had mild pain at the site of catheter insertion. There was no mortality in any of the studied cases.

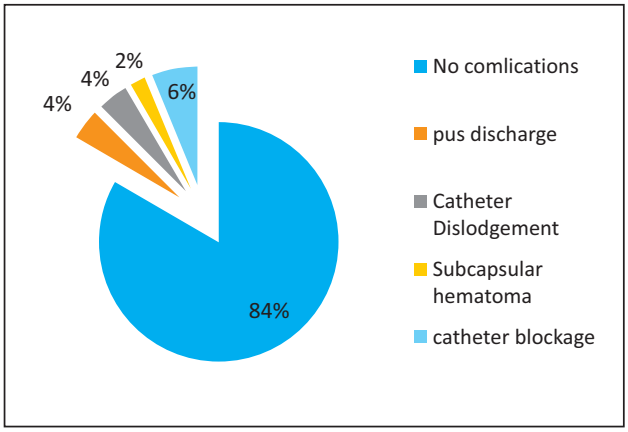

Figure 1: Complications experienced during pigtail catheter placement and drainage.

Amount of pus	No. of patients	Percentage %
150-200	2	4
201-250	5	10
251-350	10	20
301-350	10	20
351-400	21	43
Total	**48**	**100**

Table 1: Amount of pus drained (24 hours).

Discussion

The drainage of the liver abscess is considered effective treatment as it helps in minimizing the bacterial load and speed up the penetration of antibiotics into the abscess collection. Over past years, the outcomes in patients having liver abscesses have significantly improved as a result of radiological diagnosis and PD options. Currently percutaneous drainage and surgical incision and drainage are the first line of liver abscess drainage. There has been discussion on the abscess size and selection of drainage method, many surgeons supported the use of PD with abscess size around 3 - 6 cm and surgical drainage in abscess with a larger size. With the availability of antibiotics and advancement in imaging modalities, the management of liver abscess brought significant reduction in mortality and morbidity. PD includes needle aspiration and pigtail catheter placement for drainage of pus from a liver abscess with minimal trauma, accurate drainage and speedy recovery of patients.[4]

Percutaneous aspiration of hepatic abscess has become an integral component in the management of liver abscesses and has almost replaced the conventional surgical drainage. Percutaneous approach includes two options that is needle aspiration and catheter drainage. Needle aspiration is less expensive, needs less patient care and shortens the hospital stay.However, needle aspiration is associated withlower success rate. As compared to catheter drainage, needle aspirations sometimes require multiple attempts in a patient with short interval. As a result it is unpleasant and painful for the patients. To overcome these problems pigtail catheter drainage is now considered the mainstaymethodin the treatment of hepatic abscesses.[5]

Percutaneous therapeutic treatments have been increasingly preferred compared with surgical drainage, the reason being less invasive with reduced hospital stay.[6]

The main reason of failure of PD as reported by earlier studies has been due to the thick and viscid pus, which cannot be easily drained. Another cause is early premature removal of the catheter. If there is residual collection, it should be either exchanged with wider bore catheter or should do repositioning to maximize catheter drainage. The need of catheter adjustments were required for patients with large collections or the catheters with accidental mispositioning or pulling. The catheter size should be decided keeping in view the viscosity of pus with regular flushing either with normal saline or antibiotics.[7]

The complications were usually pain and discomfort at the insertion site, catheter blockageand displaced catheter tip which was repositioned under US guidance. To avoid catheters blockage flushing with normal saline was done regularly. The large cavities and thick pus required longer time period of catheter placement. Further wider bore catheters were used to drain thick pus.[8]

Percutaneous abscess drainage has been now standardized as the method of choice for the treatment

of abscesses, as it is better tolerated by patients, eliminating general anesthesia and shorter hospital stay. Mortality and morbidity rate after surgical intervention of liver abscesses is reported more than the percutaneous drainage.[9]
In our study, no mortality or major complication has been reported. Percutaneous catheter abscess drainage was relatively safe procedure with only few patients reported with minor complications.

Conclusion

Ultrasound guided pigtail drainage achieve the same results as surgical drainage. Ultrasound guided pigtail catheter placement for drainage of liver abscess as a minimally invasive procedure is a relatively easy, safe, and cheap procedure with much less morbidity and therefore more acceptable to the patients as compared to the open procedure.

Conflict of interest: None

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