Original Research Article

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USG guided pigtail catheter placement for drainage of liver abscess as a minimally invasive procedure

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ABSTRACT

Background: The objective of the study was to evaluate the advantages of USG guided pigtail catheter placement for drainage of liver abscess as a minimally invasive procedure.

Methods: This is a retrospective study conducted in Kamineni Institute of Medical Sciences, Narketpally, Nalgonda, April 2017 to August 2017. It included 45 patients who were diagnosed with solitary liquefied liver abscess. The effectiveness of drainage was determined by doing serial USG scans.

Results: Age group varied from 27 to 52 years. Out of 45 patients 41 were men and 4 were women. The male to female ratio was 10:1. All the patients underwent USG guided pigtail catheter insertion for solitary liver abscess. Average hospital stay varied from 2–3 days. No complications were observed during the procedure.

Conclusions: This study concludes that drainage of solitary liver abscess by USG guided pigtail placement as a minimally invasive procedure was good in clinically improving the patient's general condition & decreasing the size of abscess cavity.

Keywords: Liver abscess, Pigtail catheter, Minimally invasive procedure

INTRODUCTION

Liver abscess refers to collection of pus in the liver. Aetiology being pyogenic, amoebic and rarely fungus. They may be solitary or multiple involving either the right lobe or the left lobe or both lobes of liver. Liver abscess could be caused by a single organism, but majority being polymicrobial. The prognosis of patients with liver abscess was related to the type of fluid present within the cavity as mentioned by Hippocrates. Liver abscess continues to be an important cause of morbidity and mortality, at least in the tropical countries. Early diagnosis and treatment has improved patients outcome with the advent of newer modalities in the diagnosis & treatment.

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 guidance.

METHODS

This retrospective study was conducted in the Department of General Surgery at Kamineni Institute of Medical Sciences for a period of 5 months. All the necessary investigations (USG/CECT abdomen, CBP, RBS, Blood Urea, Serum Creatinine, LFT, HIV, HBsAg, HCV, CT, BT, PT, APTT, INR, Blood grouping and typing) were done. Patients with abnormal coagulation profile were initially corrected prior to intervention.

45 Patients were initially treated with Tab. Metronidazole 400 mg TID, Tab Cefixime 200 mg BID, Tab Pantoprozole 40 mg OD, Tab Paracetamol + Tramadol SOS for 1 week.

Patients with a solitary liquefied abscess cavity were admitted for the procedure in the department of General Surgery in Kamineni Institute of Medical Sciences. Patients with multiple liver abscess were excluded from the study.

After explaining the complications of the procedure, informed written consent was obtained and patients were subjected for the procedure.

1 unit of packed red blood cells was reserved for all the patients.

The procedure was performed in the USG suite. Under strict antiseptic conditions using USG guidance & local anaesthesia (2% lignocaine) 10 Fr pigtail catheter was 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 urosac bag. 10 ml of pus was sent for culture and sensitivity. Patients were given Inj. Tramadol 50 mg in 100 ml NS IV twice & T^O, PR, 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 Tab Metronidazole 400 mg TID, Tab Cefixime 200 mg BID, Tab Ultracet BID, Tab Pan OD for 1 week. Patients were counseled about the signs of pertonitis 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.

Statistical analysis

The collected data was entered into Microsoft Excel format and analysis was done using the 16.0 version of Statistical Package for Social Sciences (SPSS).

RESULTS

In this study 45 patients underwent USG guided pigtail catheter insertion for solitary liver abscess.

Describes the symptoms and signs in the patients which included Pain in right upper quadrant (93,3%) was the most common complaint followed by fever (84.4%), generalized weakness (84.4%), chills and rigors (80%), hepatomegaly (48.8%), jaundice (40%), vomiting (35.5%), pallor (33.3%), anorexia (33.3%), weight loss

(28.8%), pleural effusion (15.5%) and diarrhea (11.1%) respectively.

Table 1: Clinical manifestation of liver abscess.

Symptoms	Number of patients	Percentage (%)
Pain in RUQ	42	93.3
Fever	38	84.4
Generalized weakness	38	84.4
Chills and Rigors	36	80.0
Hepatomegaly	22	48.8
Jaundice	18	40.0
Vomiting	16	35.5
Pallor	15	33.3
Anorexia	15	33.3
Weight loss	13	28.8
Pleural effusion	7	15.5
Diarrhoea	5	11.1

Table 2: Laboratory investigations.

Parameters	Number of patients	Percentage (%)
Leucocytosis	40	88.8
Total bilirubin (†)	19	42.2
Anaemia	17	37.7

Includes Laboratory Investigations such as leucocytosis (88.8%), raise in total bilirubin (42.2%), anaemia (37.7%).

Table 3: Lobe involved.

Site	Abscess	Percentage (%)
Right lobe	39	86.6
Left lobe	6	13.3

Includes the lobe involved. right lobe (86.6%) being commonly involved, followed by left lobe (13.3%).

Table 4: Microorganisms isolated in pus after 48 hrs of incubation (aerobic culture).

Organism	No. of patients	Percentage (%)
No growth	32	71.1
E. coli	6	13.3
S. aureus	4	8.8
Klebsiella pneumonia	3	6.6

Includes the microorganisms isolated in pus after 48 hrs of incubation (aerobic culture). No growth (71.1%), *E. coli* (13.3%), *S. aureus* (8.8%) and *Klebsiella pneumonia* (6.6%).

Table 5: Volume of the abscess cavity

Volume	No. of patients	Percentage (%)
100-150	15	33.3
151-200	13	28.8
201-250	10	22.2
251-300	5	11.1
301-350	2	4.4

Describes the volume of the abscess cavity. 100-150 ml (33.3%), 151-200 ml (28.8%), 201-250 ml (22.2%), 251-300 ml (11.1%), 301-350 ml (4.4%).

Table 6: Complications.

Complication	No. of patients	Percentage (%)
Pain at the catheter site	43	95.5
Blockage of catheter	8	17.7
Displacement of the catheter tip	3	6.6

Includes the complications of the procedure: pain at the catheter site (95.5%), blockage of the catheter (17.7%), displacement of the catheter tip (6.6%).

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.7 Beger et al reported clinical improvement in patients with abscess cavity after needle aspiration.⁸ Surgical drainage of liver abscess is planned for patients with incomplete or failure to drain the abscess cavity completely.9 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. 10 Percutaneous drainage is now considered as the treatment of choice in cases of intra abdominal collections and abscess cavities.¹

Patients included in this study were diagnosed with other co-morbidities which included diabetes mellitus, acalculous cholecystitis, gall bladder calculi, urinary tract infection, fistula-in-ano and obesity. 12

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. 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.

The limitations of the study included small group of patients and not differentiating the cause of liver abscess.

This study concludes that USG guided placement of pigtail catheter to drain a solitary liquefied liver abscess is a safe and effective procedure with minimal complications warranting a limited hospital stay, unlike open drainage procedures.

Wide bore catheter placement and selection of the ideal patient are important factors that play a key role in successful drainage of the abscess cavity.

Two studies done by Gupta et al and Malik et al observed similar results in the drainage of liver abscess. ^{13,14}

CONCLUSION

Our study concludes that USG guided pigtail catheter placement for drainage of liver abscess as a minimally invasive procedure is a relatively easy and safe, cheaper procedure.

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