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USG guided pigtail catheter drainage is the first line minimally invasive procedure of choice in the management of liquefied moderate to large size liver abscesses in a tertiary care hospital in Burdwan Medical College in Burdwan , West Bengal.

Dr Sk SEKENDAR ALI and Dr Narendra Nath Mukhopadhyay

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ABSTRACT:-

BACKGROUND:- Usg guided pigtail catheter placement for the management of liver abscess of any etiology has been an important advancement as an initial and minimally invasive procedure.

AIM: To evaluate and assess response , morbidity and complication rates and also advantage of USG GUIDED pigtail catheter drainage in treatment of liver abscess.

METHOD : This is a retrospective study conducted in Burdwan Medical College and Hospital in June 2020 to march 2021. It included 24 patient who were diagnosed with solitary liquefied liver abscess . The effectiveness of drainage was determined by doing serial USG scan.

RESULT: Age group varies from 25 to 55 years. 16 had solitary abscess and 8 has multiple abscess. Pig tail catheter of various size(12F to 18F) were introduced in these patients using the Seldinger technique. The volume of pus drainage was 150 ml to 500 ml while the period of catheter drainage ranged from 7 to 14 days. Complication were immediate included catheter blockage in 2 patients and tract pain in 22 patients and no significant complication during follow up period (3 months). There was no mortality associated with these procedure. Average hospital stay varied from 7 to 10 days .

CONCLUSION: USG guided pigtail catheter drainage is the first line minimally invasive procedure of choice in the management of liquefied moderate to large size liver abscesses .

Keywords:- liver abscess, pigtail catheter,first line treatment of liver abscess, invasive procedure.

I. INTRODUCTION:-

A liver abscess is a suppurative cavity in the liver resulting from the invasion and multiplication of microorganisms, entering directly from an injury through the blood vessels or by the way of the biliary ductal system. Liver abscesses are most commonly due to pyogenic, amoebic or mixed infections. Less commonly these may be fungal in origin. Although amoebic liver abscess occurs more commonly in men between 20 and 40 years of age, but can occur at any age. Approximately 60% are solitary and mainly located in the right lobe of the liver, as a result of the streaming of portal blood flow secondary to the fact that the right lobe is predominantly supplied by the superior mesenteric vein, and because most of the hepatic volume is in the right lobe. When multiple abscesses are present, pyogenic or mixed is the most probable type. Patients usually present with a constant dull pain in the right upper quadrant of the abdomen which may be referred to the scapular region or the right shoulder. These patients usually have fever of between 38°C and 40°C. Liver abscesses, both amoebic and pyogenic, continue to be an important cause of morbidity and mortality in tropical countries(1). However, recent advances in interventional radiology, intensive care, progress in antibiotic therapy, liberal use of sonography and computerized tomography scanning of the abdomen have led to early diagnosis and treatment of patients with liver abscess, thus improving the patient outcome(2). Percutaneous drainage of liver abscess has been an important advancement in the treatment of pyogenic liver abscesses. Percutaneous treatment (needle aspiration or catheter drainage) is now a standard management for liver abscesses(3). It has replaced surgical exploration which now has very limited indications(4). Needle aspiration is less expensive avoids problems related to catheter care and long-term hospital care. Multiple abscesses can be aspirated through different tracts in the same sitting(5). However, needle aspiration has lower success rate than catheter drainage(6). Another problem with aspiration is that repeated needle aspirations (average number per patient ranging from 1 to 5) may be required in a single patient over a short period of time from 5 to 14 days. This may be painful and unpleasant for the patients and hence may not be acceptable to them(7). To avoid these problems associated with needle aspiration, percutaneous pigtail catheter drainage is now used as the first tool in the

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management of liver abscesses(8). The advantage of catheter drainage is that it provides a continuous outlet to the pus and hence the problems of incomplete and repeated evacuations are not encountered(9).

II. METHODS:

A retrospective study of 24 patient of liver abscess under went USG guided pigtail catheter drainage at Department of General Surgery , Burdwan Medical College and Hospital ,Purba Bardhaman during period from June 2020 to March 2021 (10 months). The diagnosis of liver abscess was made on the basis of : a) history . b) clinical feature(symptoms and signs) . c) physical examination followed by ultrasound.d)Routine investigations including- CBC,Blood sugar, serum urea creatinine , LFT, PT and INR, serology. CT scan was performed if required .
Study case selected according to following criteria and who gave informed and written consent for the same.

Inclusion criteria : a) age group of our study is 20 to 75 years both male and female
b) abscess cavity size more than or equal to 5 cm x 5cm x 4cm or volume more than or equal to 50ml
c) solitary moderate to large liquefied liver abscess in both lobe of liver.
d) number of abscess less than 3 with abscess cavity easily accessible for drainage.
Exclusion criteria : a) patient having ruptured liver abscess including peritoneum or pleura
b) solitary liver abscess less than 5cm x5 cm x 4cm
c) multiple liver abscess (3 or more in number).
d) non liquefied abscess .

TECHNIQUE:

For pigtail drainage 12 to 18 F pig tail catheter was selected according to viscousity of pus under USG guidance (low frequency 3 to 5 MHz , C5-2 curved probe) using Seldinger technique.Patient and patient's relatives were explained in their own language about the procedure and its related complications. Informed and written consent was taken. Liver abscess located by USG and the site for drainage was marked. Antiseptic dressing and draping were done. Drainage site was infiltrated with 2% liggnocaine with 1:80000 adrenaline solution (10 – 15 ml). Skin incision of 5 mm was made at drainage site via 11 no. Stab surgical blade. Under real time sonogram guidance the initial puncture needle (18 G 21 cm long was inserted through the skin incision site and guided to the centre of the abscess cavity. The stellate was taken out and pus was was aspirated to confirm the position . and the aspirated pus was sent to the laboratory for culture and sensitivity. A J-tip guide wire was inserted throught the needle and the needle was taken out without displacing the guide wire . The tract was dilated adequately by using of dilator. Pig tail catheter was introduced and positioned to the centre of the cavity. Gide wire was withdrawn and pigtal was connected to a closed drainage bag and fixed to the skin. Sterile dressing was applied. The output was monitored at stat , first 24 hours and 48 hours then daily.

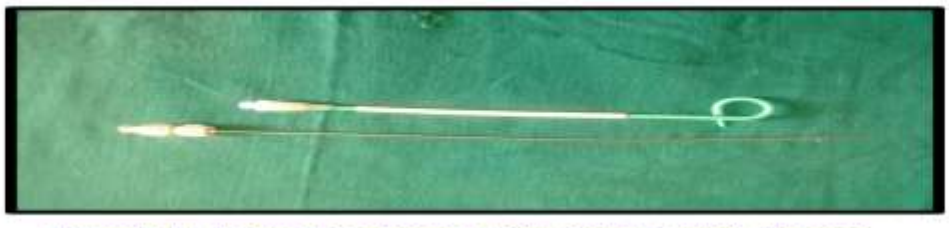

Figure 1: Pigtail catheter with needle and stellate.

Figure 2: Dilators of various size.

And also patient managed with intravenous metronidazole 800 mg TDS , Injection Gentamycin 80 mg BD and ciprofloxacin 500mg BD, Injection Pantoprazole 40 mg OD and also Injection/ Tab paracetamol and Tramadol SOS for first week, 3 patients required Inj. Vitamin K (10

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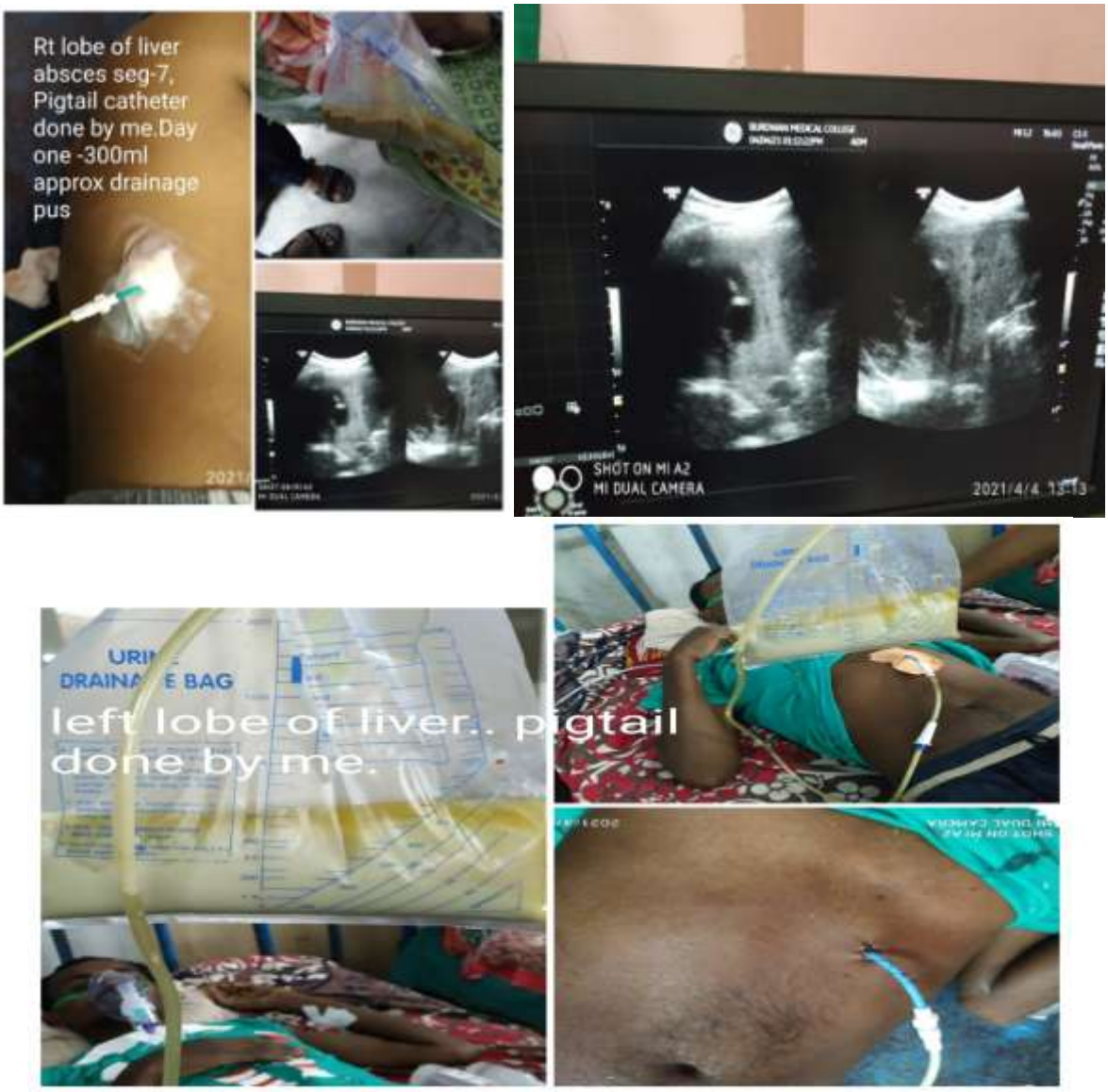
mg) IM OD for 3 days . Alternate day USG study were donepost procedure to monitor the cavity size volume and to confirm the position of tip of the catheter. Clinical improvement in the patient condition was noted interms of relief from pain , fever and decreased total leucocyte count . Th pig tail catheter was emoved whwn drainage became serous or was 10ml or less in 24 hours for two consecutive days and USG was suggestive of reduced size/ collapsed cavity without any residual pus. On removal of the catheter sterile dressing were applied.

All patients were advised for follow up after 15 days ,1month and 3 month and were assessed clinically and ultrasonographiacally to see for residual cavity and recurrence of non resolving abscess. Study subject patients records was entered in study formula . Finally all data was entered in Microsoft excel 2017 and statistically analysed by calculating mean, median, average and percentage.



III. RESULT:

Age group of present study subject varies from 20 to 75 years. Maximum patients were between 30 to 55 years. Out of 24 patients there were 23 males and 1 female which suggeated male predominance. Pain in right upper quadrant of abdomen is the most common presenting symptom among 100% patients.The second most common symptom is fever in about 92 % of patients.

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Clinical symptoms	Number of patients	Percentage (%)
Pain abdomen	24	100
fever	22	92
vomiting	12	50
diarrhoea	10	41

Tenderness in right upper quadrant is the most common clinical sign in about 12 patients which is about 50 % of total patients. The second most common sign is hepatomagaly in 8 patients which was about 33% of patients.

Clinical Signs	Number of patient	Percentage (%)
Right upper quadrant tenderness	12	50
Hepatomegaly	8	33
Jaundice	8	33

Routine haematological investigations showed PMN leucocytosis(>11,000 per cumm) in about 83 % of patients, anemia (Hb < 9gm%) in about 58 % of patients, raised serum Bilirubin (>2gm%) in about 33 % of patients, raised serum ALP (>290) in about 29 % of patients and PT-INR raised in about 12% of patients.

Parameters	Number of patients	Percentage(%)
anaemia	14	58
PMN Leucocytosis	20	83
Serum Bilirubin	8	33

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ALP	7	29
PT -INR	3	12

Predominantly right lobe of liver was mainly involved. In our study 16 patients had abscess cavity in right lobe which is about 68% of patients, 4patients had abscess cavity in the left lobe of liver which is about 16 % of patients , and 4 patients had involvement of both lobes of liver which is about 16 % of patients.

Site – lobe involved	Abscess in number of patients	Percentage(%)
Right lobe	16	68
Left lobe	4	16
Abscess in both lobes	4	16

The average duration of drainage of pus in present study was about 7-14 days. The maximum amount of pus drainage ranged from 150 to 250 ml in 2 patients which is about 8 % of patients , 250 to 500 ml in 16 patients which is about 67 % of patients, 500 to 750ml in 6 patients which is about 25 % of patients.

Amount of pus(ml)	Number of patients	Percentage(%)
150-250 ml	2	8
250-500 ml	16	67
500-750 ml	6	25

Culture report showed no growth in 20 patients which is about 83 % of patients , 4 of the patients showed evidence of positive culture report . E.coli was the most common organism isolated from the pus samples which is about 12 % of the patients.

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Organism	Number of patients	percentage
No organism	20	83
E.coli	3	12
others	1	4

Present study doesnot reveal any major complications but some minor problems .Early Complications of the pig tail catheter procedure included pain at catheter site in about 22 patients which is about 92% of the patients, catheter blockage in 2 patients which is about 8 % of the patients.

Complications Early	Number of patients	Percentage(%)
Pain at the catheter site	22	92
Blockage of catheter	2	8
Others ---------- Late complications during follow-up	0 ---------- 0	0 ---------- 0

During the drainage period 7 patient showed serous to bilious discharge into the catheter bag from day 6 to day 9 of the procedure. Average amount was 25 ml to 50 ml in total.

No late complication was reported during the follow up period.

Clinical improvement , USG suggestive of total resolution or reduction of cavity size to< 3cm and no evidence of relapse / recurrence on follow up after 3 months indicated successful management.

IV. DISCUSSION:-

The management of liver abscess has drastically changed with significant reduction in mortality and morbidity after the advent of antibiotics and imaging modalities. Currently, there are two alternative methods for drainage of pus from a large liver abscess(10). Percutaneous therapeutic procedures have been increasingly performed compared with open surgical drainage(11). This paradigm shift has been fuelled by a drive for a low-risk and less invasive procedure. Percutaneous treatment (needle aspiration or catheter drainage) is now a standard management for liver abscesses.8 It has replaced surgical exploration which have very limited indications now a days. The present study evaluated the role of USG guided percutaneous pig tail catheter drainage in the management of liver abscess in 24 patients over a period of 10 months

duration. The problem of failure of this procedure as reported by earlier studies has been due to the thick and viscid pus, which cannot be easily drained by percutaneous drainage or early premature withdrawal of the catheter(12) These problems can be avoided by using adequate sized pigtail catheters depending on the viscosity of pus and following a strict protocol for catheter flushing and removal. One of the major problems is a prolonged duration of the catheter. Percutaneous catheter drainage is a safe procedure with very few reported complications. Which includes haemorrhage, perforation of hollow viscera, peritoneal spillage, catheter displacement or blockage and septicaemia(11) But recent studies show very low complication rates. Our study did not have any major complication although the incidence of minor complications was 8 % (2 patients). The chief limitation of our study is small number of subject included in study group; also the etiology of abscess was not uniform, patients with amoebic and pyogenic liver abscesses could not be segregated due to the nonavailability of serological tests. We recommend large scale study and randomized comparative study with other modality of treatment for liver abscess will help in confirmation of safety, effectiveness in treatment of liver abscess.

V. CONCLUSION:-

Percutaneous pigtail catheter drainage is a safe and effective mode of treatment of liver abscesses, both amoebic and pyogenic. It results in an early relief of symptoms and faster resolution of abscess cavity. The low morbidity and high success rate in treating liver abscesses by this minimally invasive method suggests that this therapy should be the first line of management in liquefied moderate to large sized liver abscesses.

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REFERENCES

[1]. Pitt HA. Surgical management of hepatic abscesses. World J Surg. 1990;14:498-504.
[2]. Courtney M. Townsend, R. Daniel Beauchamp, B. Mark Evers, Kenneth I. Mottox. Liver abscess. In: Courtney M. Townsend, R. Daniel Beauchamp, B. Mark Evers, Kenneth I. Mottox, eds. Sabiston Text Book of Surgery. 17th ed. USA: Elsevier; 2004: 1534-1542.
[3]. Pope IM, Thomas PG. Pyogenic liver abscess. In: Pope IM, Thomas PG, eds. Amoebiasis and Biliary Infection; Surgery of Liver and Biliary Tract. 2nd ed. TH Blumgart: Churchill Living Stone; 1974: 1135-1157.
[4]. percutaneous drainage. Am J Surg. 1985;149:487- 94.
[5]. Giorgio A, Tarantino L, Mariniello N, Francica G, Scala E, Amoroso P, et al. Pyogenic liver abscesses: 13 years of experience in percutaneous needle aspiration with USG guidance. Radiology. 1995;195:122-4.
[6]. Simon CH. Yu, Simon SM. Ho, Wan Y. Lau, Deacons TK. Yeung, Edmund HY. Yuen, Paul SF. Lee, et al. Treatment of pyogenic liver abscess: prospective randomized comparison of catheter drainage and needle aspiration. Hepatology. 2004 Apr;39(4):932-8.
[7]. Rajak CL, Gupta S, Jain S, Chawla Y, Gulati M, Suri S. Percutaneous treatment of liver abscesses: needle aspiration versus catheter drainage. AJR Am J Roentgenol. 1998;170:1035-9.
[8]. Wong KP. Percutaneous drainage of pyogenic liver abscess. World J Surg. 1990;14:492-7.
[9]. Sukhjeet Singh, Poras Chaudhary, Neeraj Saxena, Sachin Khandelwal, Deva Datta Poddar, Upendra C. Biswal. Treatment of liver abscess: prospective randomized comparison of catheter drainage and needle aspiration. Ann Gastroenterol. 2013;26(4):332-9
[10]. Enver Zerem, Amir Hadzic. Sonographically guided percutaneous catheter drainage versus needle aspiration in the management of pyogenic liver abscess. AJR Am J Roentgenol. 2007 Sep;189(3):W138-42.
[11]. Singh O, Gupta S, Moses S, Jain DK. Comparative study of catheter drainage and needle aspiration in management of large liver abscesses. Indian J Gastroenterol. 2009 May-Jun;28(3):88-92.
[12]. vanSonnenberg E, Mueller PR, Schiffman HR, Ferrucci JT Jr, Casola G, Simeone JF, et al. Intrahepatic amoebic abscesses: indications for and results of percutaneous catheter drainage. Radiology. 1985;156:631-5