## **Original Research Article**

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# Liver abscess, management strategies, and outcome

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#### **ABSTRACT**

**Background:** Liver abscess, a disease troubling mankind from ancient times, has earliest documentation in the Sanskrit document. Where right upper abdominal pain, have potentially lethal consequences, if prompt diagnosis and treatment are not accomplished. However, two major types are known, amoebic and pyogenic, in medical literature. Pyogenic liver abscess constitutes major bulk of hepatic abscess in western countries. The diagnosis is confirmed by ultrasonography, reddish brown (anchovy-paste like material) aspirate from abscess. The diagnosis, treatment and prognosis, of liver abscess have evolved remarkably over past few years. Imaging has improved diagnostic competence and has altered therapeutic strategy. The study aims at early clinical and diagnosis on imaging of liver abscess, to set up some guide lines in view of conservative or either intervention.

**Methods:** The present study was hospital based longitudinal study, carried out in tertiary care teaching hospital from November 2013 to November 2015. A total of 55 patients were enrolled in the study. All patients with suspicion of having liver abscess were confirmed on Imaging and included as present study population. Authors studied mainly presentation, role of conservative treatment, Aspiration, pigtail catheter, Outcome, and post procedural complications. **Results:** All patients presented with Pain right or left upper abdominal pain in abdomen, any chest complaints, majority of present study group patients had fever with or without rigors, deranged liver function. Imaging is the most diagnostic method, and also helped in therapy and follow up.

**Conclusions:** Males are affected more than females, Imaging is the best modality for diagnosis, therapy and follow up. Aspiration or pigtail drainage is the standard method of drainage. Pigtail drainage is the better method of treatment than aspiration.

Keywords: Aspiration, CT, Imaging, Liver abscess, Pigtail drainage, USG

## INTRODUCTION

Liver abscess, has a very long historic and Medical background mentioned in very old literature (3000 BC).\(^1\) A right hypochondriac, or epigastric or left upper quadrant abdominal pain, may have high mortality and morbidity because of some complications, if early diagnosis and management is not done in a given patient.\(^1\) In world literature mainly two major descriptions for aetiology is known, amoebic and pyogenic, Western Literature for liver abscess suggest

Pyogenic liver abscess constitutes major chunk of hepatic abscess. 1-3 Although no distinct clinical criteria exist for distinguishing the two types, the diagnosis of amoebic and pyogenic abscess can be made by following points-younger age, resident or recent travel to areas of endemic Amoebiasis, diarrhoea and marked abdominal pain raise clinical suspicion of amoebic liver abscess. The incidence of amoebic liver abscess varies throughout the world and large number of cases in developing countries (constituting major bulk of total cases) remain unreported. 3,4 Pyogenic liver abscesses, result from ascending biliary tract infection, haematogenous spread

via portal venous system, generalized septicaemia with involvement of liver by way of hepatic arterial circulation, direct spread from intra-peritoneal infection and other causes. Escherichia coli, Klebsiella, and streptococcus, are most commonly found organism followed by staphylococcus and pseudomonas. 1,5 The diagnosis is confirmed by ultrasonography, reddish brown (anchovy-paste like material) aspirate, negative gram stain, resolution with Metronidazole treatment. The diagnosis of pyogenic liver abscess is made by symptoms of picket fence configuration of temperature chart, nausea, vomiting and anorexia. Pain is late symptom and is common with large solitary abscesses.<sup>5</sup> Investigations reveal Leucocytosis, anaemia and positive blood culture for bacteria. The diagnosis, treatment and prognosis of liver abscess have evolved remarkably over past few years.6 Imaging has improved diagnostic competence and has altered therapeutic strategy by allowing the possibility of percutaneous drainage. Rapid diagnosis, effective antimicrobial therapy, treatment of underlying disease, and orderly approach to therapeutic interventions directed towards the abscess remain the mainstay of care for the patient with hepatic abscesses.<sup>7</sup> The concept of minimally invasive drainage, continues to be of paramount importance in treatment of hepatic abscesses.7,8

With these views in mind, a study has been carried out in 55 patients, to evaluate the current features of liver abscess in regard to the presentation, its association with addictions, co morbid conditions and the different modalities of treatment. The study aims at early clinical and imaging wise diagnosis of liver abscess, in view of management with either conservative or intervention (aspiration, pig tail catheterization) to be done in a case of liver abscess in a given population.

#### **METHODS**

The present study is hospital based longitudinal study, carried out in tertiary care hospital, from November 2013 to November 2015. A total of 55 patients were enrolled in the study (N=55).

#### Inclusion criteria

- Patients suspected of having liver abscess on the basis of history and clinical assessment which were then Confirmed by USG and laboratory work up.
- Patients more than 18 years.

### Exclusion criteria

- Patients aging less than 18 years.
- Abscess associated with malignancy.
- Immunocompromised patients.
- Ascitis.
- Liver abscess which ruptured in peritoneal, pericardial, pleural cavity.
- Who do not want to enroll in the study.

Sample design: 55 patients, admitted with clinical, laboratory and imaging feature of liver abscess.

Study factors: age, gender, occupation, address, socioeconomic status, addiction, comorbidity, complete haemogram, liver function test, USG feature. Culture of aspirated material from liver abscess blood culture treatment modalities, treatment outcome.

#### Methodology

A complete physical examination including examination of abdomen and chest following proper history. Specific Investigations including Hb%, TLC, DLC, liver function test, prothrombin time, blood for HBSAg, HIV, fasting and post prandial blood sugar, ultrasound of abdomen, chest X ray, microscopic examination and culture of aspirated pus, blood culture. The patients were divided into two treatment groups.

Group 1: with abscess cavity <5 cm (150 cc)-they received only medical management and /or percutaneous aspiration.

Group 2- with abscess cavity >5 cm (>150 cc) or smaller abscess which failed to respond to drug therapy alone, left lobe abscess, they in addition treated with USG guided-percutaneous needle aspiration or catheter drainage.

#### Medical treatment

Amoebic liver abscess: all patients with diagnosis of amoebic liver abscess of size < 5cm were treated with Metronidazole divided dose.

Pyogenic liver abscess: All patients with PLA of size <5cm (<150 cc) or if there were small multiple abscess which were either solidified and not amenable for tapping were treated initially with broad spectrum antibiotics till the culture and sensitivity report were available then treatment was guided as per sensitivity report.

### Guided aspiration

The patients with abscess size >5 cm or smaller abscess those who failed to improve clinically left lobe abscess were subjected to imaging guided aspiration. Informed consent was taken from the patients explaining the complications of the procedures for which open surgical intervention might be needed. The patients were examined daily for clinical improvement. Improvement in fever, and USG was done on 3,7,14 day, repeat TLC was done on day 3.

Technique of pigtail catheter drainage (PCD) of liver abscess

The standard pigtail external drainage catheter, ranging from 8.5Fr to 10Fr having multiple side holes and with a

trocar and cannula, drain kept in the abscess cavity. The draining catheter was properly secured in its place and connected to a collecting system. Chest X-ray was done after catheter drainage to rule out pleural effusion or pneumothorax. Catheter output charting was done daily, and a chart was maintained.

The first review ultrasound was done when drainage over last 24 hours had declined to < 10ml. If the abscess had resolved, the catheter was removed. If residual cavity was present, the catheter was flushed with saline and aspirated till no material was found. Further review ultrasound was done every third day and the catheter was removed if the catheter drainage had remained minimal.

Otherwise, the catheter was left until catheter drainage had stopped. Ultrasound was repeated until the cavity had either decreased by 50% or more of its original size or remains static with clinical recovery. Outcome was assessed by: relief of symptoms, Resolution of liver abscess cavity ultrasonographically on third day after treatment started. Improvement of symptoms on third day of particular treatment and

Decrease in total leukocyte count on third day after particular treatment started. Recurrence and readmission in hospital for recurrence of abscess.

#### Statistical analysis

Descriptive statistics: The data was presented in tabular form with mean, standard deviation, range and others for descriptive statistics.

Analytical statistics: Correlation was established using Mc Nemar Fisher t test and qualitative analysis was done using Chi square test. The statistical software used in the analysis was SPSS20.0 EPR Info software.

#### **RESULTS**

Total of 55 patients with a diagnosis of liver abscess were included in the study. The demographic, clinical, laboratory, and imaging data for all patients was collected and recorded on a predesigned record form. The outcome was studied. The observations are as follows:

The mean age of presentation was 45.56 years. The youngest patient was of the age 22 years and the oldest was of 75years (Table 1).

Table 1: Age distribution.

Age group	Frequency	Percentage
> 20-30	8	14.5
>30-40	13	23.6
>40-50	11	20
>50-60	13	23.6
≥ 61	10	18.2
Total	55	100

Gender distribution: There were 43 males (78.18%) and 12 females (21.81%) enrolled in the present study with 34 patients in Amoebic liver Abscess 21 in Pyogenic liver Abscess. The overall male to female ratio of 3.6:1. The male:female ratio in Amoebic group is 2.4:1 and in pyogenic group it is 9.5:1 (Table 2).

**Table 2: Gender distribution.** 

			Total	
		Male	Female	Total
Type of abscess	Amoebic Liver Abscess	24	10	34
	Pyogenic Liver Abscess	19	2	21
Total		43	12	55

**Table 3: Clinical symptoms.** 

Variable	Amoebic Liver Abscess	Pyogenic Liver Abscess	Total	%	p- value
Pain	34 (100%)	21 (100%)	55	100	
Fever	32 (94%)	20 (95%)	52	94.54	0.859
Vomiting	20 (59%)	16 (76%)	36	65.50	
Chills and rigors	19 (55%)	14 (66%)	33	60	
Jaundice	16 (47.05%)	9 (42.85%)	25	45	0.761
Diarrhea	14 (41.17%)	5 (23.80%)	19	34.50	
Cough	9 (26.47%)	6 (28.57%)	15	27.30	

Table 4: Clinical signs.

Signs	Amoebic	Pyogenic	Total	%	p- value
Lump in abdomen	12 (35.29%)	7 (33.33%)	19	34	
Hepatomegaly	23 (67.64%)	18 (85.71%)	41	74	0.135
Inter costal tenderness	24 (70.58%)	14 (66.66%)	38	69.1	0.76
Respiratory signs (decrease air entry)	16 (47.05%)	6 (28.57%)	22	40	

Clinical manifestations: (Table 3) All 55 (100%) patients presented with pain in abdomen. Fever is the next common symptom, about 94% of study population had fever at the time of presentation. Chills and rigors: At the time of presentation- 60% of the study population had chills and rigors in Amoebic liver abscess and 55% had chills and rigors in Pyogenic liver Abscess, the percentage of patients with chills and rigors was more in Pyogenic group. History of vomiting was found in 69.9%

(n=58) of the cases, in Amoebic liver abscess 59% and in pyogenic liver abscess 76% had vomiting. About 45% of study population had jaundice. Amoebic liver abscess 47%, the prevalence of jaundice was more as compared to Pyogenic group 42.85%. Cough was present in 27% of study subjects (Table 4).

Addiction: In the present series, 60% of patients were Alcoholics. 55.88% were alcoholic in Amoebic liver Abscess and 66.66% in Pyogenic liver abscess, Comorbidity -The overall prevalence of Diabetes in study population was 32.72%. In Amoebic liver abscess 38.23% patients were Diabetic and in Pyogenic group, about 23.8% had Diabetes, Tuberculosis was found in 17.64% of the study population, in Amoebic group 11.8% had tuberculosis and in pyogenic group it was 9.5%. On per abdomen examination lump was found to be present in 34% of the cases (n=19). However, lump was present in 35.29% of the Amoebic group, and 33.33% of Pyogenic group. Hepatomegaly was found to be present

in 74% of the cases (n=41). However, Hepatomegaly was present in 67.64 % of Amoebic group and 85.71% of Pyogenic Liver Abscess, more number of patients in Pyogenic group had palpable liver as compared to Amoebic group. About 69% of study population had inter costal tenderness. In Amoebic liver Abscess more number of patients 70.58% had tenderness as compared to Pyogenic group where it was 66.66%. Study population who had inter costal tenderness was 69%. In Amoebic liver Abscess more number of patients 70.58% had tenderness as compared to Pyogenic group where it was 66.66.

On examination of chest there was decreased air entry on Right side in about 40% of the subjects, in Amoebic liver abscess there were 47% of patient as compared to Pyogenic group where there were 28.57% with decreased air entry on Right side. In the present study, 38.18 % (n=21) of the cases had counts less than 11000 while 61.181% (n=34) had counts more than 11000.

**Table 5: Liver function tests in patients.** 

Signs	Amoebic	Pyogenic	Total	Percentage	p-value
Bilirubin >1.2	14 (41%)	10 (48%)	24	44	0.64
Raised Alkaline Phosphatase	16 (47.1%)	11 (52%)	27	49.09	0.701
Raised Aspartate Transaminase	9 (26.5%)	4 (19%)	11	20	0.529
Raised Alanine Transaminase	8 (23.5%)	4 (19%)	12	21.8	0.342

Table 6: Comparison of imaging features of liver abscess.

Name of Author	RT lobe Abscess %	LT lobe Abscess %	Both lobe Abscess %	Single Abscess	Multiple Abscess %
Wood TF, Rose	55	16.6	28.4	73.3	27.7
Jeffrey Jr RB	73	17	10		
Khanna S et al	81	19	0	77 .	23
Kebede A et al	84	6	10	61	39
Present study	84	3.3	11.7	64	36

In the present study, about 44% of patients had raised Bilirubin, overall 49% of study population had raised Alkaline Phosphatase levels, about 20% of the study

population had raised Aspartate Transaminase with mean value of 75.59 U/L. Alanine Transaminase was raised in 21% of study subjects with mean value of 88.02 U/L (Table 6).

Table 7: Ultrasonography of abdomen of patients site in liver.

	Amoebic	Pyogenic	Total	Percentage	p-value
ght lobe of liver	30 (88%)	16 (76%)	46	84	0.171
ft lobe	0	2 (9%)	2	3.3	
oth lobe	4 (12%)	3 (15%)	7	12.7	
1	ft lobe	ft lobe 0	ght lobe of liver 30 (88%) 16 (76%) ft lobe 0 2 (9%)	ght lobe of liver 30 (88%) 16 (76%) 46 ft lobe 0 2 (9%) 2	ght lobe of liver 30 (88%) 16 (76%) 46 84 ft lobe 0 2 (9%) 2 3.3

Ultrasonography is simple, inexpensive, and quick to perform; with a diagnostic accuracy of 90%. Abscesses, (Figure 1) located peripherally in contact with the liver capsule and varies from 2 to 21 cm in size (mean 7.75 cm). USG is very important in therapeutic intervention

for guided aspiration and pigtail insertion. It is also of great use in follow up of patients who had liver abscess. Especially in the acute situation, a computed tomography (CT) scan does not add to the diagnostic accuracy of ultrasound except in the evaluation of imminent rupture

of abscess. In an atypical or chronic case, CT may be of value; it shows better rim enhancement with contrast

enhancement in pyogenic liver abscess and high density of the contents in necrotic liver tumours (Figure 2).

Table 8: Ultrasonography of	or abdomen or	patients.
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		Type	Total	p-value	
		Amoebic Liver Abscess	<b>Pyogenic Liver Abscess</b>	Total	p-varue
Single/ multiple	Single Abscess	25	10	35	
		74%	48%	64.0%	0.05
	Multiple Abscess	9	11	20	0.05
		26%	52%	36.0%	
Total		34	21	55	Chi square
10181		100.0%	100.%	100.0%	3.76



Figure 1: Ultrasonography of abdomen showing abscess in right lobe of liver.

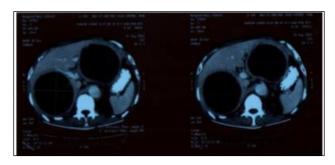


Figure 2: CT scan of a patient with multiple liver abscess-both lobes with large volume.



Figure 3: USG guided percutaneous aspiration of liver abscess.

About 30% of patients had Right sided pleural effusion.18% had bilateral pleural effusion. In present study maximum number of the patients (84%) had right lobe involvement, right lobe involvement was maximum in Amoebic (88%) as compared to Pyogenic group (76%), both lobe involvement more common in pyogenic liver abscess (15%) as compared to Amoebic (12%), there was no left lobe involvement in Amoebic Abscess. In present study it was found that multiple liver Abscesses came out to be pyogenic liver abscess (52%) where there is a single Abscess cavity, it came out to be Amoebic liver abscess (74%). The P value is 0.05 is significant. single abscess cavity is in close association with Amoebic liver abscess (Table 5) (Figure 1). Out of 55 patients, those with abscess larger than 5 cm, guided drainage was done, 9 patients were treated conservatively on Medical line of management, 9 patients underwent Aspiration under USG guidance 31 patients underwent pigtail catheterization and in 6 patients with multiple abscess combine Pigtail catheter as well as Aspiration was done (Table 6). Out of 55 patients 9 patients underwent USG guided Aspiration 31 patients (Figure 3). Pigtail catheterization was done and in 6 patients combined approach was made (Figure 4). Pus culture of aspirated fluid 66.66% of pyogenic abscess showed growth, none of the amoebic abscess showed growth on culture medium, the P (<0.001) value is significant the aspirated fluid from Amoebic liver Abscess is sterile.



Figure 4: Percutaneous aspiration after marking site of aspiration-USG guided marking.

On Gram staining of the aspirated fluid, 14 patients were positive in pyogenic group and maximum were Gram negative bacilli, no organism was seen in amoebic liver abscess (Figure 5).



Figure 5: Anchovy sauce appearance of pus-amoebic liver abscess.

The result suggest that Amoebic liver Abscess are sterile and none of present patients had secondary bacterial infection. Out of 44 patients within which pus was aspirated, 14 patients showed growth of organism and all 14 patients belonged to Pyogenic liver abscess group Most commonly found organism on pus culture sensitivity was Staphylococcus (43%) followed by E. coli and Pseudomonas (22%).

About 90% of the patients had symptomatic relief on 7th day in Aspiration +Pigtail group followed by Pigtail group and 11% of aspiration and conservative were having no relief even on day 7 (Table 8). About 16.4%

patients had recurrence, in Conservative management followed by Aspiration (44.44%), no recurrence was found in Pigtail Catheter drainage. There is negligible recurrence if pigtail catheterization is done in a cavity more than 5 cm in diameter (Table 9,10).



Figure 6: Large volume abscess cavity-pigtail catheter put in abscess cavity for continuous drainage-to obtain best possible outcomes.

Out 55.9 patients were managed conservatively, blood culture was sent to know the causative organism and some of the cases of Pyogenic abscess showing no growth on pus culture, blood culture was sent out of 13, and 10 were positive, for staphylococcus (39%) followed by *Klebsiella* and *E. coli* and *pseudomonas* (22%) (Table 7). Decrease in volume of abscess cavity on USG is maximum in Pigtail aspiration and Pigtail groups with a significant P value it was followed by aspiration and then by conservative treatment. Relief of symptoms on day 3, no significant relief was found in either of the groups. Symptomatic relief was maximum in Aspiration group followed by Pigtail and then by conservative group.

Table 9: Culture of aspirated material from liver abscess.

		Type of	■ Total	n valua	Cignificance	
		Amoebic Liver Abscess	<b>Pyogenic Liver Abscess</b>	1 Otal	p-varue	Significance
C 11	0	14	14			
Aspirate	Aspirate Growth	0.0%	66.66%	25.5.0%	< 0.001	Significant
culture	N	34	7	41		
	No growth	100.0%	33.33%	74.5%		
T-4-1		34	21	55		
Total		100.0%	100.0%	100.0%		

Readmission was maximum in conservative group followed by aspiration; no readmission was noted in pigtail and Pigtail+Aspirations. states that pigtail catheterization is a better modality of treatment. The outcome of various line of management were tabulated and compared in terms of reduction in volume of abscess

after particular treatment, days of hospital stay, number of aspirations number of days of pigtail and volume of abscess cavity on third day. Maximum reduction in volume of the abscess cavity after intervention was found in Pigtail Cather group as compared to others. The Hospital stay was maximum in Pigtail Cather group as compared to others with a significant P value (Table 11).

Table 10: Microscopic examination of aspirated material from liver abscess.

		Type of	fabscess	Total
		Amoebic Liver Abscess	<b>Pyogenic Liver Abscess</b>	Total
	Corres Docitions Correi	0	6	6
	Gram Positive Cocci	0.0%	28.5%	11%
Gram staining of	Gram Negative Bacilli	0	8	8
pus aspirated		.0%	38%	14.5%
•	No Staining	34	7	41
		100.0%	33.33%	74.5.0%

Table 11: Various modalities of treatment.

	Group 'A' abscess size <5 cm (<150cc)		Group 'B' abscess size ≥5 cm (>150cc)			Total
	Medical management	USG guided aspiration	USG guided pig tail catheter drainage	USG guided pig tail catheter drainage+ Aspiration	Surgical exploration	
Study subjects	9	9	31	4	2	55

Table 12: Outcome of various lines of management.

		N	Mean	Std. deviation	Std. error	Minimum	Maximum	p- value
Reduction in volume on USG	Aspiration	9	57.78	31.043	10.348	17	100	<0.001
	Pigtail	31	331.87	148.674	26.703	148	840	
	Aspiration+ pigtail	4	191.25	52.341	26.171	140	250	
Hospital stay	Aspiration	9	11.22	3.193	1.064	8	17	<0.001
	Pigtail	28	13.36	4.840	0.915	5	21	
	Aspiration+ pigtail	4	11.75	2.630	1.315	8	14	
No. of aspirations	Aspiration	9	1.67	0.866	0.289	1	3	<0.001
	Aspiration+ pigtail	4	3.00	1.414	0.707	2	5	
Pigtail days	Pigtail	29	8.52	3.078	0.572	4	17	<0.001
	Aspiration+ pigtail	4	6.75	1.893	0.946	4	8	
USG-3 <sup>rd</sup> DAY	Aspiration	9	28.67	16.210	5.403	10	68	<0.001
	Pigtail	31	139.26	68.757	12.349	37	320	
	Aspiration+ pigtail	4	89.75	19.190	9.595	68	110	

Number of aspirations were maximum in aspiration compared to aspiration and pigtail combination. Number of days of pigtail catheter drainage were more in isolated pigtail as compared to combination of pigtail and pigtail +aspiration. Volume of the abscess cavity was minimum in aspiration group as compared to others (Table 12).

#### **DISCUSSION**

The present study includes 55 patients, and as Many as two recent studies, show that the common age group is between 30-50 years. The mean age of presentation was 45.56 years. The youngest patient was of the age 22 years and the oldest was of 75 years. Reports in the

literature shows that there is a male preponderance in a ratio ranging from 10:1 to 17:1. 10,11 A retrospective analysis in 1978 by Kapoor et al reported that the male: female ratio was 5.66:1, which had remained constant. 11 In present study, the overall male to female ratio of 4:1. The male: female ratio in Amoebic group is 3:1 and in pyogenic group it is 10:1. Study carried out in (2004) Karachi, showed that 48% of pyogenic hepatic abscesses, 67% of patients with amoebic liver abscess got fever. 12 Majority of present study population was suffering from fever (94.55%) at the time of presentation and 60% of the study subjects got associated chill and rigor. Incidence of pain in abdomen in recent report varied up to 88.6%. 13 But from India Kapoor et al showed 75% patients

presented with abdominal pain.14 Present study result simulates the result of this study 100% of the patient in Amoebic and 100% of pyogenic had abdominal pain (Right hypochondriac). A larger Indian study carried out in 2005 showed 31.94% patients got jaundice.<sup>15</sup> In present study 45% of population had jaundice. Amoebic liver abscess, 47% patients had jaundice, the prevalence of jaundice was more as compared to Pyogenic group-42.85%. When comorbidity was studied in present series. The overall prevalence of diabetes in study population was 32.72%. In Amoebic liver abscess 38.23% patients were Diabetic and in Pyogenic about 23.8% had diabetes, Mathur et al found that about 21% cases were diabetic. 10,16 Tuberculosis was found in 17.64% of the study population, in Amoebic group- 11.8% had tuberculosis and in pyogenic it was 9.5% had tuberculosis. Present study showed that most of the cases (61.81%) had leucocyte count ranging from 11800 to 34500 cells/mm<sup>3</sup> with mean value of 11,500. Earlier studies had reported the mean TLC to be 15000cells/mm<sup>3</sup> with the range 7500cells/mm<sup>3</sup> to 25000cells/mm.<sup>17</sup> 2006 reports found E. coli to be most frequent organisms found. Study by D' Angelica M et al they found E. coli followed by Klebsiella as most frequent organism. 18-22 In present study the most common organism found was Staphylococcus aureus. In present study blood culture was positive in 10 cases (47.61%) and Staphylococcus was found to be most frequent in 39% of PLA. Earlier studies Wood TF, Rose had reported right lobe abscesses in 55% cases of liver abscesses, multiple abscesses were 27.7% and isolated left lobe abscesses 16.6% and 28.4% of both lobe abscess.<sup>23-25</sup> In present study subjects (64%) had solitary liver abscess (74% of ALA and 84% of PLA) and 84% of present patients had their right lobe involved (88% of ALA and 76% of PLA).

The study carried out by Rajak CL showed that 67% patients had amoebic subtype.  $^{26}$  In present study 61.81% of patients were found to have amoebic liver abscess and 38.18% of patients were found to have pyogenic liver abscess. So present result corroborates with their result that amoebic liver abscess is more prevalent than pyogenic liver abscess. In present study 60% of the subjects attained  $\geq$ 50% reduction in abscess cavity size following therapy. Percutaneous pigtail catheter drainage was successful in terms of  $\geq$ 50% reduction in abscess cavity size in 70% patients as compared to percutaneous needle aspiration which was successful in 66.66% patients and in combination of both the treatment pigtail and aspiration it was 75%.

Present study revealed that PCD was more successful in terms of recurrence of abscess, relief of symptoms and decrease in size of abscess cavity. 22.22% patients who underwent PCD required readmission in hospital as compared to PNA. About 41.4% patient of PCD had their symptoms relieved within three days, however in USG, PNA also shows 44.4%-almost equivalent result. Hospital stay of more than a week was 100% in PNA as compared to PCD which is 83% in present study corroborates with

the result of the study performed by Agrawal et al where they reported that clinical relief attained in PCD group was in shorter duration than in PNA where it took a longer time. <sup>27-29</sup>

The major advantages of PNA over PCD are: it is less invasive and less expensive; avoids problems related to catheter care; and multiple abscess cavities can be aspirated easier in the same setting. 30,31 However, in present study authors had a success rate of PNA, which was significantly lower than with catheter drainage (71% versus 100%, P < 0.005). There are some problems with catheter drainage like nuisance to the patient, pain, cellulites at the insertion site and sometimes catheter dislodgement. The success rate of PNA in the literature varies from 79-100%.31 Another important reason for failure of needle aspiration is the inability to completely evacuate the thick viscous pus that may be present in some of the abscesses. Rapid re-accumulation of pus in the abscess is another reason described for failure of needle aspiration. Placement of an indwelling drainage catheter addresses, all three of these issues as it provides continuous drainage, drains thick pus because of wider calibre catheter, and prevents re-accumulation. This explains the higher success rates (71%) observed in present study and several previous studies.32 The only reasons for failure of PCD as reported in some of the earlier series have been either thick pus not amenable to percutaneous drainage (this can be overcome by placement of a wider bore catheter) or premature removal of drainage catheter.<sup>32</sup> No recurrence occurred in any of present cases during the follow up period. However, both treatment modalities resulted in rapid clinical relief with most patients showing resolution of signs and symptoms within the first 3 days of the procedure.

#### **CONCLUSION**

Present study includes 55 cases of liver abscess following are the conclusions of present study. The most common age group affected by Liver abscess was third and fifth decade of life. Males are more commonly affected than females. Ultrasonography is the standard modality for diagnosis as well as therapeutic drainage of abscess and also follow up. Authors found that the incidence of amoebic liver abscess was more as compared to pyogenic liver abscess. Pyogenic liver Abscess most common pathogen was Staphylococcus followed by Klebsiella. There is increasing association of diabetes with both types of abscess. Image guided drainage is the best modality of treatment for liver abscess. In case of larger (>5cm) or 150cc, Ultrasound abscess percutaneous pigtail catheter drainage is a superior therapeutic approach than percutaneous needle aspiration if there are multiple abscess cavity the larger abscess cavity should be drained by pigtail catheter and smaller ones should be aspirated. Patients treated with ultrasound guided percutaneous catheter drainage improved rapidly than those treated with needle aspiration. Abscess cavity resolves better in case of catheter drainage than needle

aspiration. Pigtail is better than aspiration group as compared to recurrence and readmission, but the hospital stay of Pigtail is longer.

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Institutional Ethics Committee

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