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RESEARCH ARTICLE
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CLINICAL CASE STUDY OF LIVER ABSCESS- CONSERVATIVE VERSUS OPERATIVE MANAGEMENT IN 50 CASES

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Introduction

Liver abscesses, both amoebic and pyogenic, continue to be an important cause of morbidity and mortality in tropical countries. India has the 2nd most burden of liver abscess amongst all other countries. [1,2]

Hepatic abscesses develop insidiously with fever, sweats, weight loss and no local signs other than painless or slightly tender hepatomegaly. In patients it presents with abrupt onset of fever, nausea, severe abdominal pain and polymorphonucleosis. Amoebic liver abscess occurs in population where Entamoeba histolytica is endemic and it affects right lobe in 80% of cases. Right lobe via Portal vein receives the blood from the caecum, ascending colon and right half of transverse colon, where the amoebic involvement is more common. Liver cells undergo liquefaction necrosis and produces an abscess (Portal Pyemia). Amoebic abscess is approximately 10 times more common in male sex as compared to females.

Pyogenic liver abscess can be single or multiple. The right lobe is more than two times affected as compared to left while in 5% cases both lobes of liver are involved.

Pyogenic liver abscess does not show gender difference.

Computed tomography (CT), and Ultrasonography are the imaging studies of choice.[3]

The primary mode of treatment of amoebic abscess is medical. Many cases may be refractory to medical therapy, abscesses larger than 5 cm and secondary bacterial infection may complicate 20% of amoebic liver abscess. In such patients and in patients with pyogenic liver abscesses, percutaneous needle aspiration (PNA) and/or 1percutaneous catheter drainage (PCD) have been the traditional mode of treatment; with surgical drainage being used only in patients who fail to respond to such treatment. [4,5]

Above studies have prompted us to study the subject.

AIM AND OBJECTIVES

The aim of our clinical study was to evaluate the liver abscess and its management strategies in our setup:
Demographic profile (Age, Sex)
Etiology
Chief presenting complaint
Evaluate laboratory investigations profile and correlation with presentation of patients.
The objectives of our study are as mentioned below:
To compare the effectiveness of conservative medical treatment versus operative surgical techniques like percutaneous catheter drainage (PCD), percutaneous needle aspiration (PNA) and surgical drainage in the management of liver abscess
To evaluate effectiveness, resolution rate, complications, mortality associated with Management Strategies as followed:
Antibiotics alone (in uncomplicated abscess measuring more than 2cm and less than 5cm or of any size but difficult to approach or patient unfit for other modalities).
Sonography guided Percutaneous Needle Aspiration +
Antibiotics Coverage (in a non-ruptured Abscess measuring >5cms.)
Sonography guided Percutaneous Pigtail Catheter Drainage +
Antibiotics Coverage (in a non-ruptured Abscess measuring >10cms.) Surgical drainage being used only in patients who fail to respond to above treatment.

INCLUSION AND EXCLUSION CRITERIA

➢ Patients included in the study were:
Patients with USG abdomen is suggestive of Liver abscess.
Patients who gave consent for operative intervention, whenever required.

➢ Patients who were excluded were:
Patients in whom USG abdomen does not suggest presence of Liver abscess.
Patients younger than 18 years were also excluded from the study

METHODOLOGY

➢ Patients with both pyogenic and amoebic liver abscess were selected from Rajarajeshwari medical college and hospital banglore who visited the hospital
between December 2022 and December 2024 were enrolled.
➢ Patient data was collected from all patients attending General Surgery department (OPD), casualty and inpatient departments, irrespective of gender/ background /socio economic status.
➢ Detailed history of patients, investigations done was entered in a proforma.
➢ Patient had USG done at the time of admission and the treatment procedure to be followed was decided based on USG findings.
• All patients were started with Inj. Ceftriaxone 1gm IV 12 hourly and Inj.
Metronidazole 400 mg IV 8 hourly.
• Ultrasonography was done on Day 1, 3, 7, 30 and when required. Relapses were noted and repeat aspirations were performed when necessary. (Day 1 was considered on 2nd day of admission when the decision regarding the management was taken).

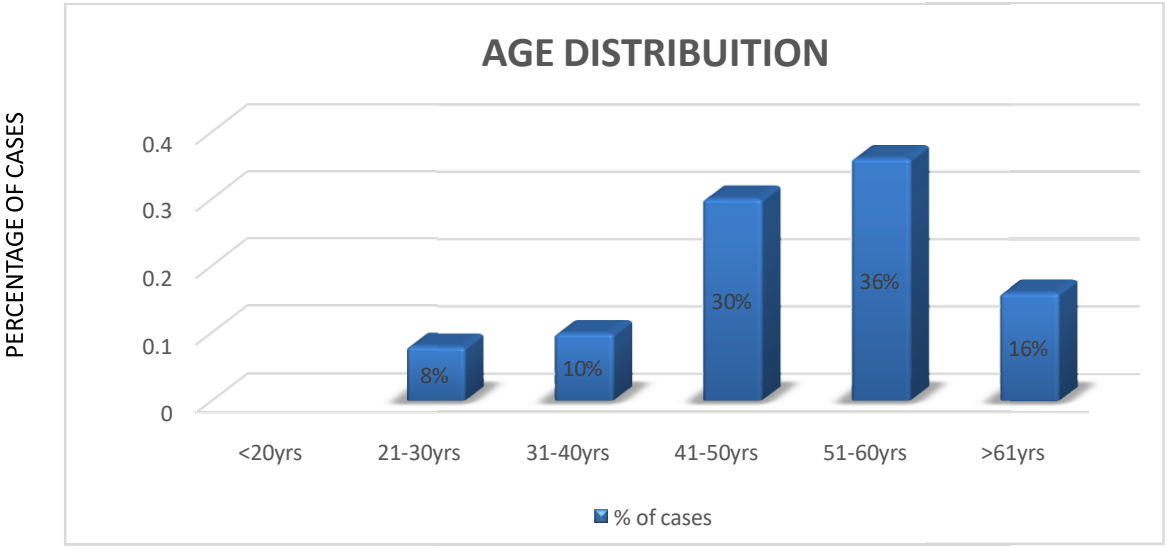
DISCUSSION

I. AGE DISTRIBUTION

AGE GROUP (IN YEARS)	NO. OF PATIENTS (n=50)	% OF PATIENTS
<20	0	0%
21-30	4	8%

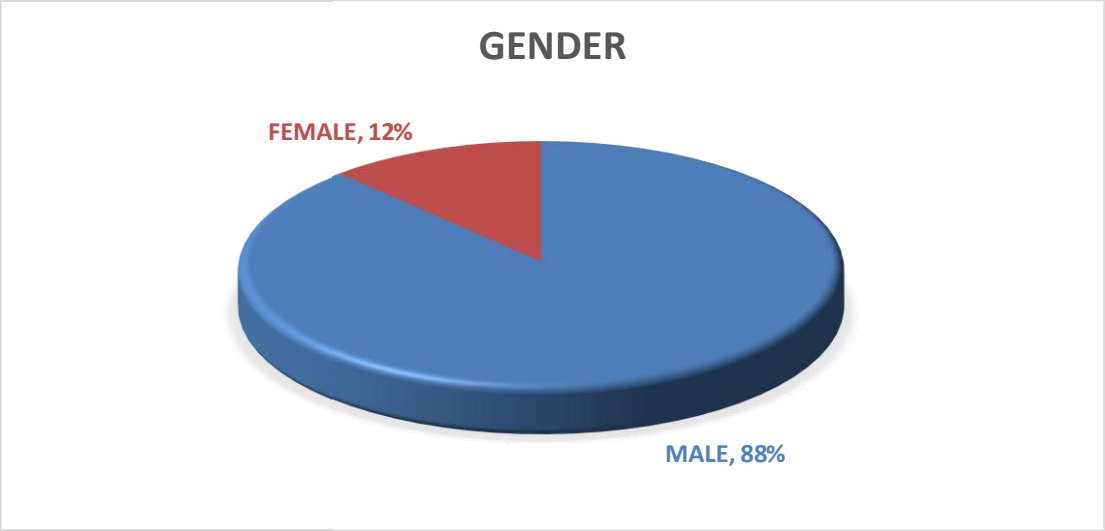
31-40	5	10%
41-50	15	30%
51-60	**18**	**36%**
>61	8	16%
TOTAL	**50**	**100%**

• Age of the patients included in this study varied from 21-82 years. The highest incidence was noted in the age group of *51-60 years (36.0%) with a mean age of 55.6 years* which coincides with findings in other studies.



II. GENDER DISTRIBUTION

GENDER	**NO. OF PATIENTS (n=50)**	**% OF PATIENTS**
MALE	44	88%
FEMALE	06	12%
Study	**Age Group (in years)**	**Mean Age (in years)**
Rajak et al[11]	2-72	35
Zerem et al[32]	22-75	51.2 + 14.4
Antonio Giorgio et al[33]	16-86	45.3
Khan et al[34]	-	43 + 17
PRESENT STUDY	**21-82**	**55.6**
TOTAL	**50**	**100%**



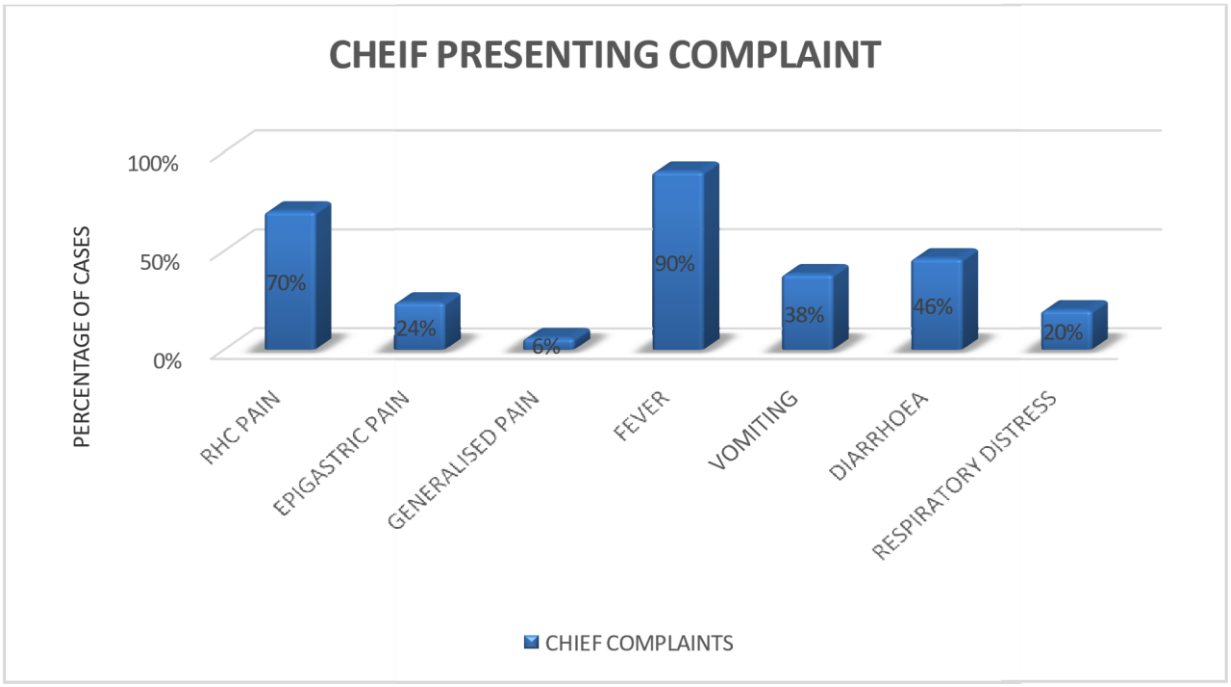
Ø The present study shows high incidence of liver abscess in *male* seen in 44 patients (88%) and 6 females (12%). Similar findings were found in other studies with male incidence being 76% [11], 90% [16] and 80% [35]

STUDY	**MALE**	**FEMALE**
RAJAK ET. AL [11]	76%	24%
SHYAM MATHUR ET. AL [16]	**90%**	**10%**
MANGUKIYA ET AL [35]	80%	20%
PRESENT STUDY	**88%**	**12%**

III. CHIEF PRESENTING COMPLAINT

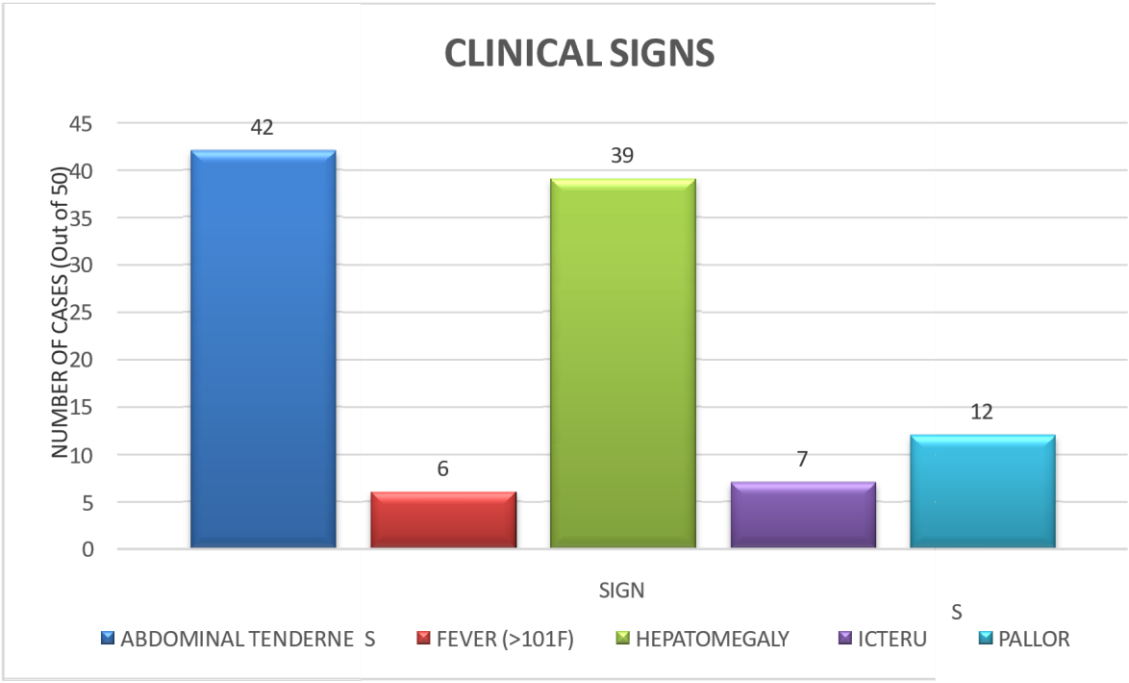
CHIEF COMPLAINT	**NO. OF PATIENTS (n=50)**	**% OF PATIENTS**
RHC PAIN	**35**	**70%**
EPIGASTRIC PAIN	12	24%
GENERALISED PAIN	3	6%
FEVER	**45**	**90%**
DIARRHOEA	23	46%
VOMITING	19	38%
RESPIRATORY DISCOMFORT	10	20%

• *Abdominal pain* was present in all cases (92% of patients) which is similar to most studies.
4 pa(ents has right hypochondriac + epigastric pain in common.
• *Fever* was the most consistent symptom occurring with abdominal pain in 45 cases (90%).
• *Diarrhea* occurring in 23 patients (46%)
• 10 Patients (20%) presented with presented with *respiratory symptoms* like cough, breathlessness



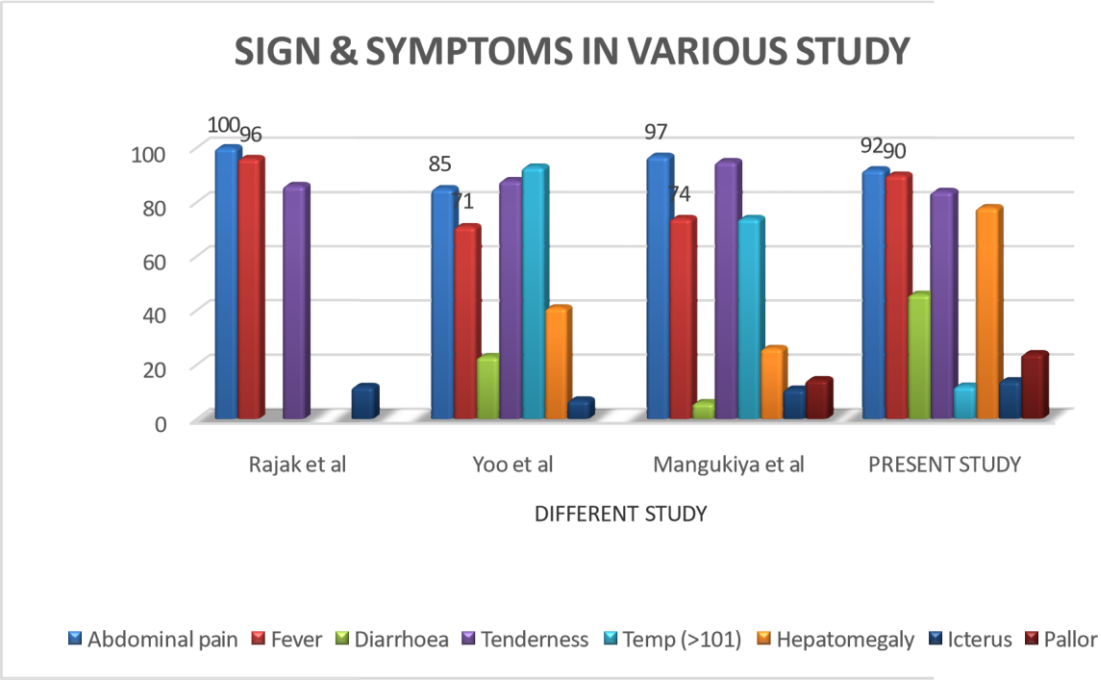
IV. CLINICAL SIGN

SIGN	NO. OF PATIENTS (n=50)	% OF PATIENTS
ABDOMINAL TENDERNESS	42	84%
FEVER (>101F)	6	12%
HEPATOMEGALY	39	78%
ICTERUS	7	14%
PALLOR	12	24%



• *Abdominal tenderness* was elicited in right hypochondrium and some cases in epigastrium in all 42 cases (84%).
• *Fever* defined as temperature > 38.5C (>101F) was present in 12% of the cases.
• *Hepatomegaly* defined as liver span >14 cm was seen in 39 (78%) of cases.
Hepatomegaly was usually tender, smooth, soft to firm.
• *Icterus* was observed in 7 (14%) of cases clinically while 12 (24%) had pallor on general examination
Ø Rajak et al [11] in their study done in 1998 only four clinical parameters. These include fever, pain abdomen, tenderness and jaundice.
• Present study differed from other studies discussed above in having higher incidence of history of diarrhea and hepatomegaly combined with icterus on clinical examination

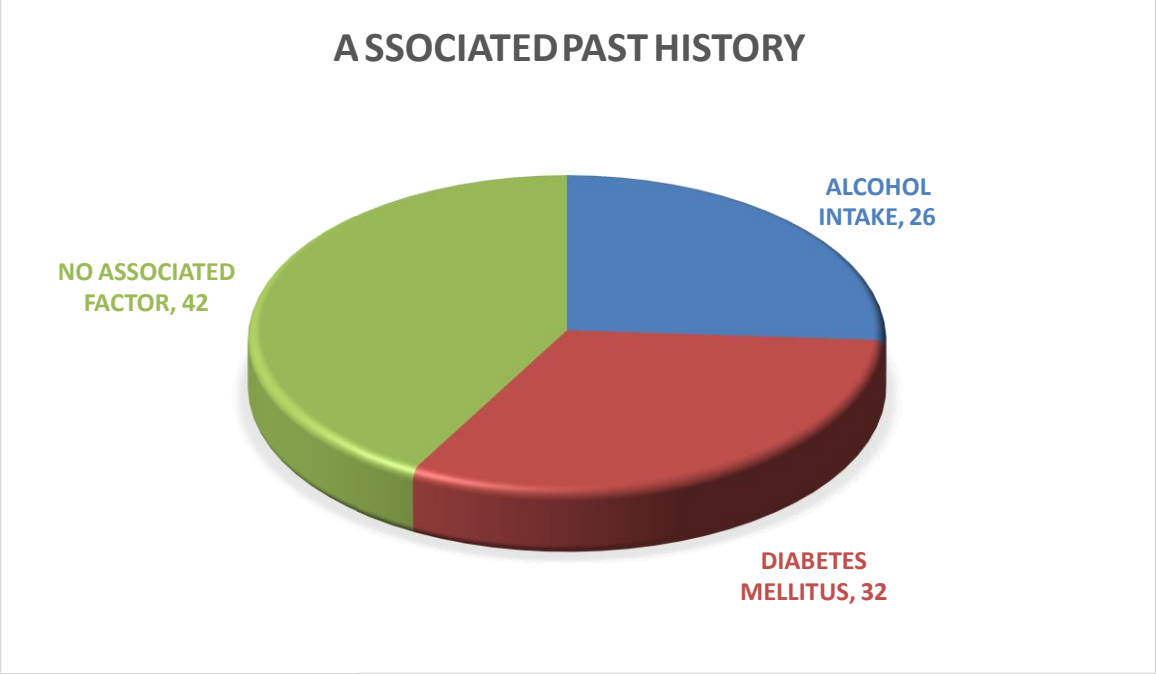
	Rajak et al [11]	**Yoo et al [36]**	**Mangukiya et al [35]**	**PRESENT STUDY**
SYMPTOMS				
ABDOMINAL PAIN	100%	85%	97%	**92%**
FEVER	96%	71%	74%	**90%**
WEIGHT LOSS	-	24%	-	**2%**
DIARRHOEA	-	23%	6%	**46%**
SIGNS				
TENDERNESS	86%	88%	95%	**84%**
FEVER	-	93%	74%	**12%**
HEPATOMEGALY	-	41%	26%	**78%**
ICTERUS	12%	7%	11%	**14%**
PALLOR	-	-	14.5%	**24%**



V. ASSOCIATED FACTORS IN PAST HISTORY

ASSOCIATED FACTOR	**NO. OF PATIENTS (n=50)**	**% OF PATIENTS**
ALCOHOL INTAKE	13	26%
DIABETES MELLITUS	16	32%

NO ASSOCIATED FACTOR	21	42%



• 13 patients (26%) had history of *alcohol* intake and another 16 (32%) gives history of uncontrolled *diabetes mellitus*.
• Other study showing associated factors was Shyam Mathur et al [16], history of alcoholism seen in 70% and diabetic history seen in another 21%.

VI. LAB INVESTIGATIONS I. HEMOGLOBIN (Hb)

CATEGORY	Hb (G/dl)	NO. OF PATIENTS (n=50)	% OF PATIENTS
A	>10	38	76%
B	**<10**	**12**	**24%**
TOTAL		**50**	**100%**

2. LEUCOCYTE COUNT (WBC)

CATEGORY	WBC (/mm3)	NO. OF PATIENTS (n=50)	% OF PATIENTS
A	<10000	13	26%
B	**10001-15000**	**17**	**34%**
C	**15001-20000**	**12**	**24%**
D	**>20000**	**8**	**16%**
TOTAL		**50**	**100%**

3. SERUM ALKALINE PHOSPHATASE (ALP)

CATEGORY	S.ALP (U/L)	NO. OF PATIENTS (n=50)	% OF PATIENTS
A	<150	18	36%
B	**>150**	**32**	**64%**
TOTAL		**50**	**100%**

4. SGPT (ALT)

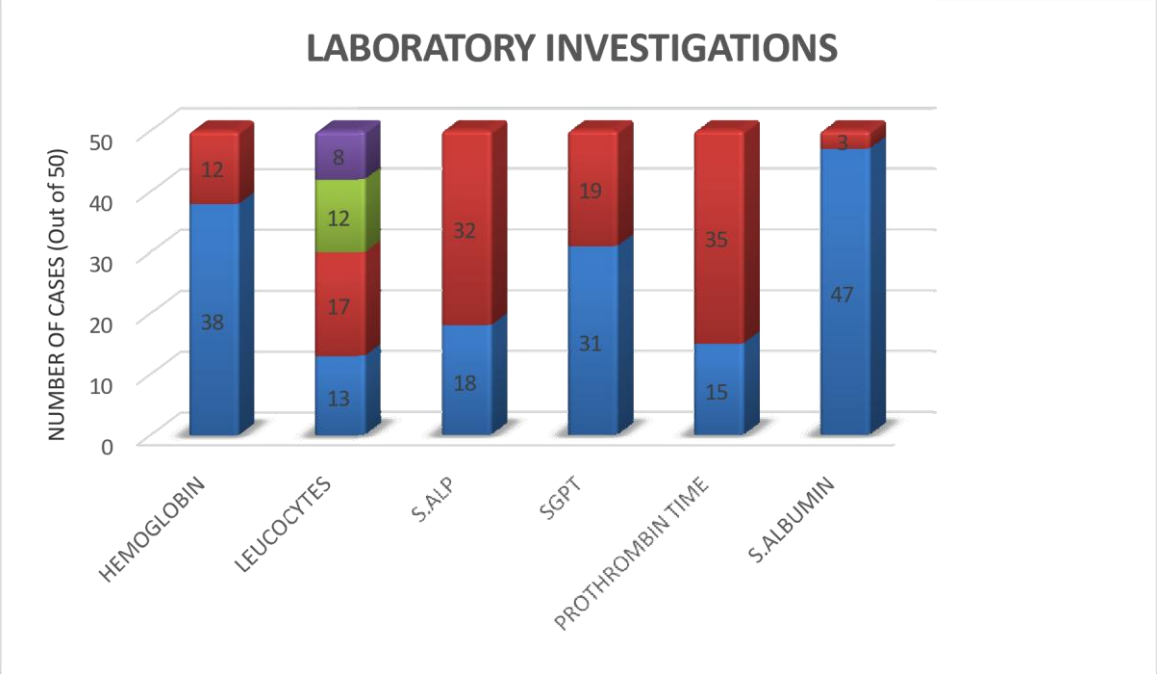
CATEGORY	SGPT (U/L)	NO. OF PATIENTS (n=50)	% OF PATIENTS
A	<49	31	62%
B	**>49**	**19**	**38%**
TOTAL		**50**	**100%**

5. PROTHROMBIN TIME (PT)

CATEGORY	PT (SECONDS)	NO. OF PATIENTS (n=50)	% OF PATIENTS
A	<15	15	30%
B	**>15**	**35**	**70%**
TOTAL		**50**	**100%**

6. SERUM ALBUMIN

CATEGORY	S.ALBUMIN (G/dl)	NO. OF PATIENTS (n=50)	% OF PATIENTS
A	>2	47	94%
B	**<2**	**3**	**6%**
TOTAL		**50**	**100%**

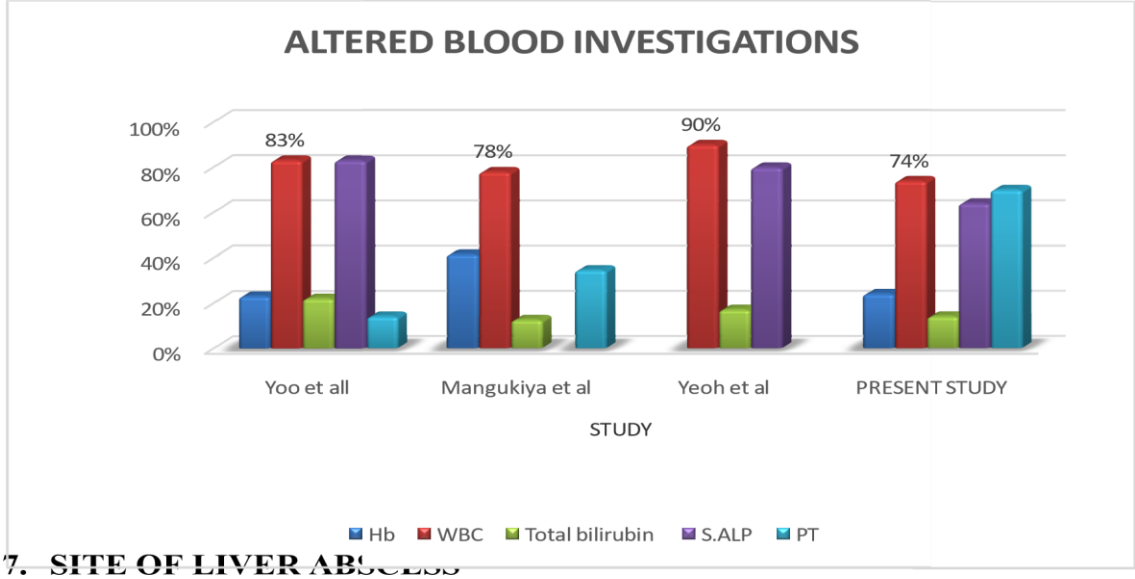


• *Anemia* (Hb <10 gm/dl) was found in 24% (12 patients) of the cases.
• *Leucocytosis* (> 10,000c/mm3) was found in 74% (37) of cases which coincides with most of other studies Yoo et al [36], Mangukiya et al [35], Yeoh et al [29].
It ranged from 6350-49,700/mm3. Eight patients showed WBC>20000/mm3

• The liver function test which was most consistently raised was *alkaline phosphatase*.
Alkaline phosphatase was found to be raised in 64% (32 patients) of cases in this study. Other studies show 83% [36] and 80% [29] patients with elevated alkaline phosphatase.

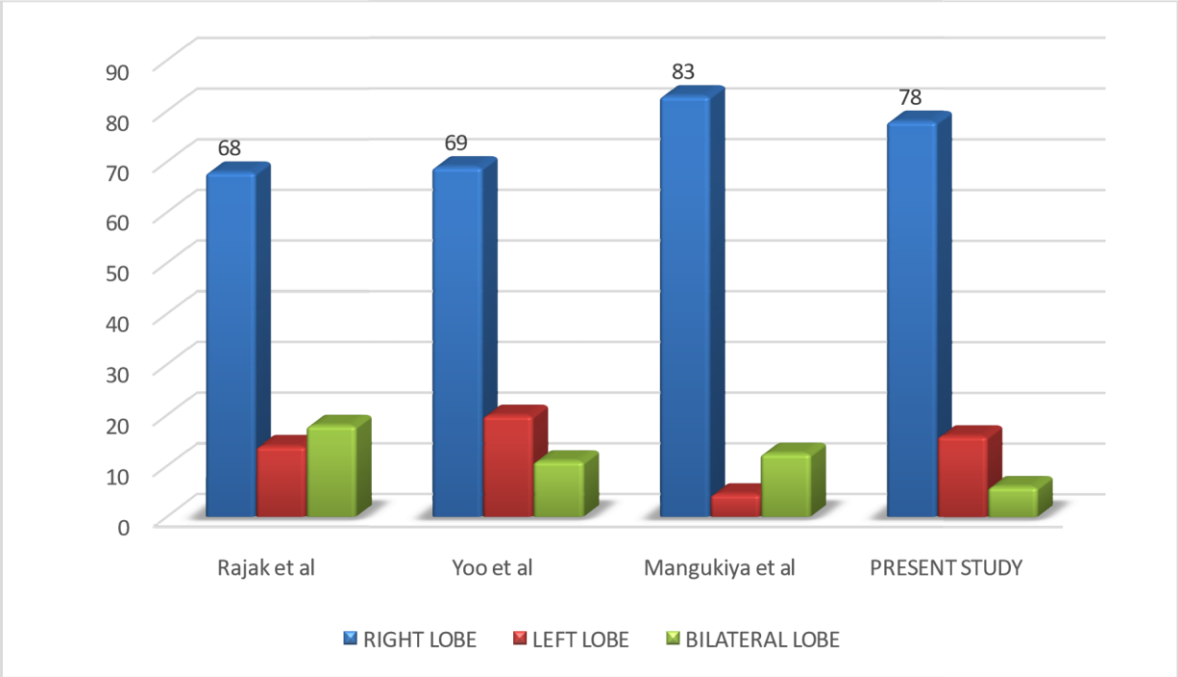
• Elevated *prothrombin time* was seen in 70% (35 patients) of cases higher than other studies

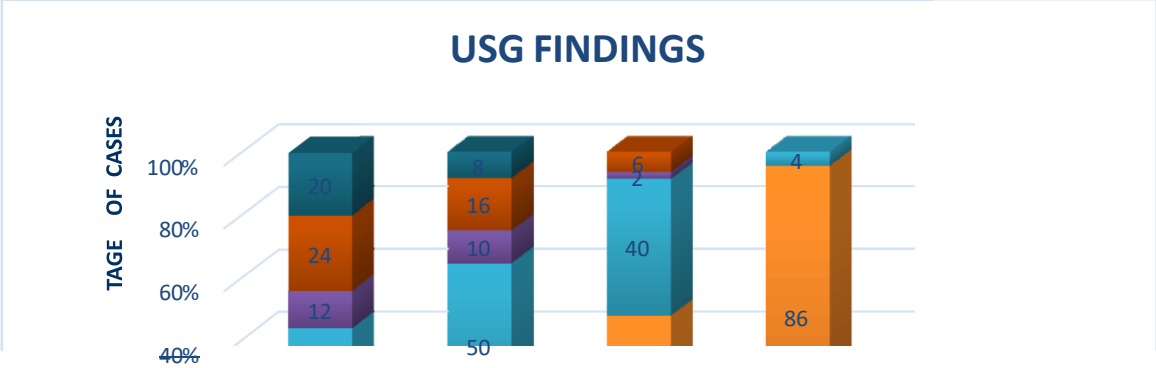
Altered Investigation	Yoo et al [36]	Mangukiya et al [35]	Yeoh et al [29]	PRESENT STUDY
Haemoglobin (<10)	23%	41.5%	-	**24%**
Leucocytosis (>10000)	83%	78%	90%	**74%**
Total Bilirubin (>2)	22%	12.5%	17%	**14%**
S. ALP (>150)	83%	-	80%	**64%**
PT (>15)	14%	34.5%	-	**70%**



7. SITE OF LIVER ABSCESS

LOBE INVOLVED	NO. OF PATIENTS (n=50)	% OF PATIENTS
RIGHT LOBE	39	78%
LEFT LOBE	8	16%
BILATERAL LOBE	3	6%
TOTAL	**50**	**100%**





• 39 patients (78%) had abscess over the *Right lobe* of liver whereas 8 patients (16%) had over the *left lobe* and 3 patients (6%) had abscess in *bilateral lobes.* Findings from study done by Yoo et al [36] were near similar to this study

Lobe involved	**Rajak et al[11]**	**Yoo et al[36]**	**Mangukiya et al [35]**	**PRESENT STUDY**
Right Lobe	68%	69%	83%	**78%**
Left Lobe	14%	20%	4.5%	**16%**
Bilatreral Lobe	18%	11%	12.5%	**6%**

8. USG FINDINGS

• On Ultrasonography, the size of liver abscess on presentation ranged from 90 to 1780 cc.

• USG was done on the day of admission and then repeated on day 3, 7, 30 Between day 7 and day 30, weekly follow-ups were scheduled.

• Volume of the abscess was calculated after measuring the abscess cavity in three dimensions and applying the formula used by Rajak et al [11] in their study. Volume = 0.523 *A*B*C where A, B, C, are the three dimensions.

• Based on the graph above, it clearly shows the response on treatment as the size of abscess cavity reduces gradually. On day 1 caviYes greater than 65cc predominate (49 cases) whereas on day 30 cavity smaller than 65cc are more (43 cases).

• One patient was lost to follow-up after day 7, while at day 30 two patients didn't show up.
• Two residual cavities left behind on Day 30 requiring aspiration were of pyogenic liver abscess

9. PERCUTANEOUS TREATMENT

• Rajak et al [11] compared percutaneous needle aspiration (PNA) and Percutaneous catheter drainage (PCD) in a randomized study involving 50 patients with liver abscess. Those investigators concluded that PCD was more effective than percutaneous needle aspiration. In that study, lack of response to a second attempt at percutaneous needle aspiration was considered failure of treatment.
• Yu and colleagues [37] performed a randomized trial involving 64 patients with pyogenic liver abscess. Those investigators concluded that percutaneous needle aspiration was probably as effective as continuous PCD. They recommended percutaneous needle aspiration as a first-line approach because of procedure simplicity, patient comfort, and reduced price and suggested a multicenter study to provide a definitive answer.
• In our study, we considered a third unsuccessful attempt at percutaneous needle aspiration failure of treatment. That only one of 35 aspirations required more than three attempts confirmed that further needle aspiration is rarely successful. This result supported the design of the study by Rajak et al [11]. The results of our study confirmed that repeated percutaneous needle aspiration and PCD are equally efficient in the management of liver abscesses.
• On the day of admission almost all the patients had abscess size >65cc for which intervention in the form of needle aspiration or catheter drainage was needed.
The abscess shows gradual decline in size.
• Aspiration was carried out in all patients with aspirable abscess of size >65cc or size >5cm. Only one patient required aspiration >3 times.
• Aspiration was carried out on days 1, 3, 7, 30, as and when required.

1. NUMBER OF ATTEMPTS OF ASPIRATION

NUMBER OF ATTEMPTS	NO. OF PATIENTS (n=35)	% OF TOTAL PATIENTS
1	6	12%
2	13	26%
3	15	30%
>3	1	2%
TOTAL	**35**	**70%**

No. of aspirations	Rajak et al [11]	Yu et al [37]	Baek et al [24]	Mangukiya et al [35]	PRESENT STUDY
1	88%	41%	72%	59.46%	**12%**
2	10%	41%	16%	36.93%	**26%**
3	2%	18%	8%	2.7%	**30%**
>3	-	-	4%	0.90%	**2%**

- Thick viscous pus was the main reason for repeat aspirations.

2. NUMBER OF CASES OF CATHETER DRAINAGE

CATHETER DRAINAGE	NO. OF PATIENTS (n=14)	% OF TOTAL PATIENTS
TOTAL	**14**	**28%**

• Catheter drainage using Pigtail catheter was done in patients presenting with cavity size >10cm. Pigtail was inserted in three patients after one attempt at aspiration due to rapid re-accumulation of pus in abscess cavity.
• Pigtail catheter was kept in situ for an average of 13.6 days with range of 5 to 30 days.
• Catheter drainage for abscess drainage gives 37.97% residual cavity on day 7 in comparison to abscess size at presentation. Similarly, residual cavity size for needle aspiration stands at 40.54%.
• Daily catheter output is monitored and catheter is removed when drain output is <10cc

10. ASPIRATE CHARACTER

CHARACTER	**NO. OF PATIENTS (n=49)**	**% OF TOTAL PATIENTS**
ANCHOVY SAUCE LIKE	28	56%
YELLOW PUS	21	42%
PUS+ BILE	0	0
TOTAL	**49**	**98%**

• Anchovy sauce pus was aspirated in 56% (28 patients) while Frank yellow pus was aspirated in 21 patients (42%).

11. PUS CULTURE

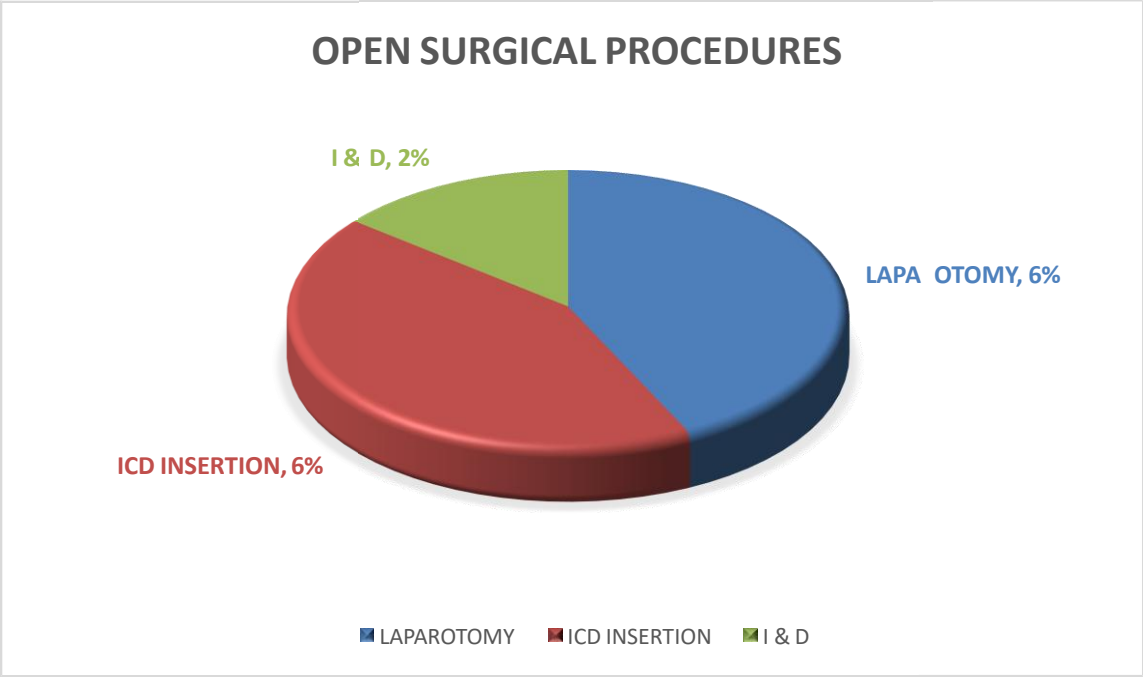
GROWTH	**NO. OF PATIENTS (n=49)**	**% OF TOTAL PATIENTS**
E.COLI	1	2%
NO GROWTH	48	96%
TOTAL	**49**	**98%**

Growth on Culture	**Present Study**	**Yoo et al[36]**
Escherichia Coli	2%	17.48%
Enterococcus	-	-
Klebsiella Pneumonia	-	2.09%
Staph. Aureus	-	4.89%
Polymicrobial	-	-
AFB	-	-
No Growth	96%	58.04%

• Aspirated pus from all patients was sent for culture and sensitivity, out of which 96% had no growth.
• The most common organism isolated in our study was *E. Coli* which was coinciding to study done by Yoo et al [36].

12. OPEN DRAINAGE PROCEDURES

PROCEDURE	**NO. OF PATIENTS (n=7)**	**% OF TOTAL PATIENTS**
LAPAROTOMY	3	6%
ICD INSERTION	3	6%
I & D	1	2%
TOTAL	**7**	**14%**

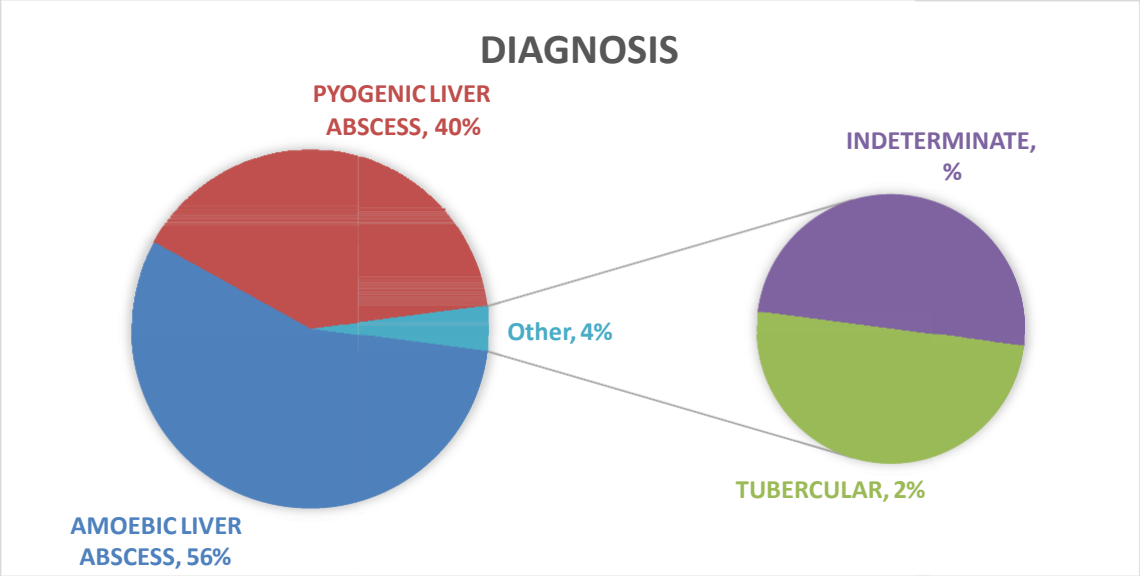


• Three of the percutaneously treated group required surgical drainage due to viscous Abscess contents and their rupture.
• I & D was done in 1 patient with subcutaneous extension of liver abscess.
• ICD insertion was done in 3 patients with intra thoracic rupture of liver abscess.

13. DIAGNOSIS

DIAGNOSIS	**NO. OF PATIENTS (n=50)**	**% OF PATIENTS**
AMOEBIC LIVER ABSCESS	28	56%
PYOGENIC LIVER ABSCESS	20	40%
TUBERCULAR ABSCESS	1	2%
INDETERMINATE ABSCESS	1	2%
TOTAL	**50**	**100%**

• Of the 50 cases included in the study, 56% (28 patients) were of *Amoebic Liver Abscess* whereas 40% (20 patients) were of *Pyogenic liver abscess*.
• One case (2%) was *tuberculous* in origin. 2% or 1 patients was considered *Indeterminate* as their diagnosis could not be made.
• The study coincides with overall study done by Rajak et al [11] and Yeoh et al[29] in most of the indices except in the overall incidence of ameobic liver abscess and pyogenic liver abscess, pointing towards the geographical location and its effect on the study



14. MORTALITY ASSOCIATED WITH LIVER ABSCESS

OUTCOME	NO. OF PATIENTS (n=50)	% OF PATIENTS
SUCCESFULLY TREATED	47	94%
MORTALITY	3	6%
TOTAL	**50**	**100%**

• Mortality Rate in the present study was 6% (3 patients). Sepsis remained the cause of death in all three cases.
• Most of the study done previously shows different mortality rates.
1. Yoo et al [36] had 11% mortality rate in their study.
2. Tan et al [38] showed mortality in their study to be 3.8%. 3. Mangukiya et al [35] had 1.5% mortality rates in their study.

SUMMARY

➢ The aim of our study was to evaluate the liver abscess and its management strategies in our clinical setup. The study was done at Rajarajeshwari medical college and hospital banglore.
➢ 50 cases of liver abscesses were studied and they were subjected to various treatment modalities based on USG size and clinical wellbeing of the patient.
• Conservative (Antibiotics only) trial was given to all as initial line of management, and continued in those where other modalities are not required or possible.

• Percutaneous Needle aspiration was done in patients with abscess size >5 cm or >65cc volume.
• Percutaneous Catheter drainage was limited to patients with abscess size >10 cm.
• Open/ laparoscopic surgical drainage of abscess was done when above all modalities fail.
➢ USG was done on Day 1, 3, 7, 30. Only patients above 18years of age who are consenting for intervention and long follow-up were included in study.
➢ Intervention was done in first 7 days with cavity size >5 cm after which serial follow-up was done.
➢ The cavity size **on day 7 was reduced to**:
• 80% of original cavity size in conservatively managed patients group
• 40.54% of original cavity size in percutaneous needle aspiration group
• 37.97% of original cavity size in percutaneous in catheter drainage group.
➢ Other findings included in the study above are summarized below:
• The present study showed the maximum incidence of the disease is in patient in their 6th decade of life (51-60 years) (36.0%) with a mean age of 55.6 years.
• Males are more commonly affected (88%).
• Abdominal pain was the most common complaint (100% of patients). It was accompanied by fever in 45 cases (90%).
• Other symptoms like Diarrhea occurring in 23 patients (46%) and 10 patients (20%) presented with respiratory symptoms like cough, breathlessness.
• Patients also gave history of **Alcohol** intake in 13 cases (26%) and history of **Diabetes Mellitus** was seen in 16 cases (32% of cases).
Ø On **examination**,
• Abdominal tenderness was elicited in 42 cases (84%).
• Fever was present in 6 cases (12%).
• Hepatomegaly was present in 39 cases (78%).
• Icterus was present in 7 cases (14%).
• Pallor was present in 12 cases (24%).
• Respiratory findings were elicited in 10 cases (20%).
➢ **Laboratory** investigations were analyzed
• Leukocytosis was found in 70% of cases.
• Anemia was found in 24% of cases.
• Alkaline phosphatase was the single most consistent liver function test to be abnormal in 64% cases.
• Prothrombin time was altered in 70% of cases.
➢ **On Radiological** examination: USG abdomen showed
• Abscess to be most common in the right lobe of liver (78%). Left lobe accounted for 16% cases, while 6% patients showed bilateral abscesses.
➢ On **Pus** examination:
• Anchovy Sauce aspirate along with history of diarrhea showed 58% cases to be Amoebic liver abscess.
• Based on the yellow aspirate 42% were diagnosed to be Pyogenic liver abscess.
Mortality rate in our study was 3/50 cases at 6%.

CONCLUSIONS

❖ Advances of interventional radiology have influenced management of liver abscess.
❖ In case of liver abscess,
➢ **Conservative (antibiotics only)** management is tried in all cases of liver abscesses as initial therapy, continued in those who are improving or are not fit for operative intervention or not giving consent for operative intervention.
➢ **Percutaneous needle aspiration** (PNA) under USG guidance is minimally invasive and readily acceptable to most of the patients and easy to perform and with very rare complications. Less medical or nursing care is required with shorter hospital stay and negligible morbidity and no mortality. Only

disadvantage is in very large abscesses (>8cm) repeated aspirations are required and in cases of thick and loculated collection it may fail. Though it can be used as initial line of management.

- **Percutaneous pigtail catheter drainage** (PCD) of abscess under USG guidance is better in larger abscesses which are partially liquefied or with thick pus. It is safe effective and minimally invasive procedure with less morbidity and no mortality. The disadvantage is that the patient had longer duration of hospital stay. This technique also requires expertise and is costlier than percutaneous aspiration.
- **Open/ laparoscopic surgical drainage** of abscess is reserved for those who are not benefitted by the above modalities.

❖ There is no significant difference in cavity resolution rate, so both percutaneous procedures could be used with equal efficacy in properly selected cases.

❖ ***Minimal surgical interventions like PCD and PNA along with conservative treatment is better than Only conservative treatment*** for the management of liver abscesses of size >5 cm, in terms of duration to attain clinical relief and duration for which parenteral antibiotics are needed.

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