



Comparison between the Efficacy of Conservative Management and Ultrasound Guided Pigtail Catheter Drainage of Uncomplicated Amoebic Liver Abscess

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Abstract

Liver abscess is the most common condition associated with right upper quadrant pain and fever. It is a common disease of the tropical region. Liver abscess is broadly classified into the amoebic and pyogenic liver abscess. Colonic amoebae are mainly responsible for the development of an abscess. The uncomplicated amoebic liver abscess has been managed conservatively with amoebicidal and antibiotics alone or in combination with ultrasound-guided pigtail catheter or pigtail catheter alone too. According to the review of literature, the smaller the amoebic liver abscess successful was the conservative management, whereas the larger sized abscess or complicated abscess (ruptured, pressure effect) required either open or closed drainage. An objective criterion for the management of uncomplicated liver abscess is established in the present study. Through this study, it is possible to know the mode of treatment to a particular patient with reference to the severity of the disease. 40 patients admitted from June 2018 to January 2020 with uncomplicated amoebic liver abscess were included in the present study. They were divided into two study groups 1) conservatively managed 2) PCD (pigtail catheter drainage). The success rate was measured in terms of clinical improvement, reduction of abscess cavity, need for the redo procedure. In the present study, it has been observed that the resolution of uncomplicated amoebic liver abscess is faster and easier with pigtail catheter drainage than who were managed conservatively. From this study, we can conclude that the pigtail catheter is a better modality of treatment for abscess measuring >6cm and conservative management for those measuring <6cm

Keywords: Uncomplicated liver abscess, antibiotic therapy, USG guided drainage –pigtail catheter.

Introduction

Liver abscess is a common condition in India and tropical regions. Liver abscess is broadly classified into pyogenic and amoebic liver abscess based on the infecting organism. Colonic amoebae have a main causative role in the development of a

liver abscess. The classic presentation of symptoms is fever, right upper quadrant pain, tender hepatomegaly with or without jaundice. Although the clinical presentation widely varies in different patients. Patients present with features of peritonitis if the abscess ruptures and gets

complicated. Ultrasound and Computed tomography are the mainstay investigations for diagnosing a liver abscess, added on are the chest X-ray to know the displacement of the right hemidiaphragm due to hepatomegaly. Modern treatment has shifted the treatment of liver abscess towards IV antibiotics, amoebicidal, imaging-guided percutaneous drainage catheters. ^(1,2). However, the review of the literature reveals that the treatment of small amoebic liver abscess (single /multiple) is mainly conservative.

In contrast, large amoebic abscess or complicated abscess is treated with either closed or open drainage methods. There are no clear cut guidelines for the management of medium-sized uncomplicated amoebic liver abscess. The present study is an effort to establish the objective criterion for the management of such abscess. This study helps to find out which mode of treatment is ideal with reference to the severity of disease and thereby reducing morbidity and mortality associated with the disease.

Aim of the Study

1. To study the therapeutic efficacy of conservative management and ultrasound-guided pigtail drainage of Amoebic liver abscess.
2. To compare the two modalities of treatment of an amoebic liver abscess.
3. To study the safety and outcome of ultrasound-guided drainage of abscess

Source of Data

The material of study comprised of 40 patients who presented to GEMS & Hospitals and diagnosed as having amoebic liver abscess from June 2018 to January 2020. The diagnosis was based on the history of, fever and pain abdomen with or without a preceding history of diarrhoea and findings of tender hepatomegaly, leucocytosis, amoebic serology and ultrasound evidence of amoebic liver abscess. Patients are randomly allocated into two groups,

GROUP I: In this Group, patients were treated

with antiamoebic (Metronidazole 500mg three times a day for 10 days) and antibiotic drugs (Piperacillin & Tazobactam 4.5gm twice a day for 10 days) - 20 Patients

GROUP II: In this group patients were treated by ultrasound-guided indwelling pigtail catheter drainage, in addition to medical management. -20 Patients

Inclusion Criteria

Patients with amoebic liver abscess with a size of abscess less than 10cms

Exclusion Criteria

Patients with complicated abscess (rupture, pressure)

Size of abscess > 10cms

Patients with abnormal INR > 1.5

Methodology

The patients in the study group were subjected to:

1. Complete history and physical examination
 - a) Complete blood picture, Liver function tests, Amoebic serology test, Prothrombin time, INR, Ultrasound abdomen, Chest Xray
 - b) Aspirated pus for culture and sensitivity
 - c) Air cavitogram was done in Group II patient
- Amoebic Serology:** Enzyme-linked immunosorbent assay (ELISA) for serum IgG antibodies against *Entamoeba histolytica* was used. were useful in detecting infection by *E. histolytica* if organism goes extra-intesti
Interpretation: Tests sample > 0.4 OD units were considered positive

Air Cavitogram: Air cavitogram was done in Group II patients at the time of removal of the pigtail catheter when the drainage has decreased, and the ultrasound findings suggest that the abscess contents were minimal.

Patients were assessed for abdominal pain, fever, tender hepatomegaly, resolution of the abscess size ultrasonographically or air cavitogram, days of hospital stay, complications. At three to five days, patients were again reassessed, and if they have not responded to the first mode of treatment,

the patient was converted to the second modality of treatment, i.e. conservative converted to pigtail insertion and patients with pigtail insertion converted to open drainage. In case of ultrasound-guided drainage procedures, patients were advised to continue the same antibiotics until the pus culture, and sensitivity results were available ^(3,4)

Statistical Analysis

Descriptive statistics were expressed as the mean and standard deviation. Chi square test /Fischer test was employed to compare the improvement in parameters between the groups.

Observation

The study was conducted on 40 patients divided under 2 groups(Conservative management and Ultrasound-guided pigtail drainage). Interventions were done under aseptic conditions. Statistical differences were found in the following variables.

Table 1- Age distribution among the patients

Age in years	Group -I	Group -II	Total
<20	0(0.0)	3(15.0)	3(7.5)
20-30	6(30.0)	2(10.0)	8(20.0)
31-40	8(40.0)	7(35.0)	15(37.5)
41-50	2(10.0)	3(15.0)	5(12.5)
51-60	4(20.0)	3(15.0)	7(17.5)
>60	0(0.0)	2(10.0)	2(5.0)
TOTAL	20	20	40

p=0.192

Range of Group-I is 22-56 years with mean of 37.6 years, and Group –II with mean of 39.8years. There was no statistical difference between the two mean groups (p>0.05). Maximum number of cases were noted in the age group of 31-40 years.

Table 2 - Distribution according to the duration of symptoms

Duration of symptoms	GROUP-I	GROUP-II	TOTAL
<5 days	8(40.0)	2(10.0)	10(25)
6- 10 days	10(50.0)	4(20.0)	14(35.0)
11-15 days	1(5.0)	4(20.0)	5(12.5)
16-20 days	1(5.0)	2(10.0)	3(7.5)
>21 days	0(0.0)	8(40.0)	8(20.0)
TOTAL	20	20	40

p=0.003

The mean duration of symptoms at presentation in group-I (n=20) was 13.45 days and in group II (n=20) was 17.20 days. This difference between

the two groups was found to be statistically significant.

Table 3 Distribution according to amoebic serology

AMOEBIC SEROLOGY	GROUP-I	GROUP-II	TOTAL
POSITIVE	18	17	35
NEGATIVE	02	03	05
TOTAL	20	20	40

Amoebic serology was positive in 18patients in Group –I and 17 patients in Group -II

Ultrasonographic Finding

All ultrasound examination of the abdomen was routinely performed at admission to assess the site, number, size and any associated complication of the ALA.

Table 4: Distribution according to number of abscesses

	FREQUENCY	PER CENT
MULTIPLE	30	75%
SINGLE	10	25%
TOTAL	40	100%

Table 5: Distribution according to the side of abscess

MULTIPLE ABSCESS	FREQUENCY	PERCENT
LEFT	05	16%
RIGHT	25	83%
TOTAL	30	100%

Thus, it was noticed that in 30 patients, multiple abscesses were noted of which 25 were in the right lobe, and 5 were in the left lobe.

Table 6: Distribution according to Size of Amoebic liver abscess at the time of admission

DIAMETER	GROUP-I	GROUP-II	TOTAL
6CMS	02	00	02
7CMS	02	01	03
8CMS	08	04	12
9CMS	07	08	15
10CMS	01	07	08
TOTAL	20	20	40

p=0.835

The mean maximum diameter was 8.45+_0.71 in Group-I and 8.75+-0.71 in Group-II

Table 7: Distribution according to the change in the size of Amoebic liver abscess at 72 hrs after admission.

DIAMETER	GROUP-I	GROUP-II	TOTAL
6CMS	07	09	16
7CMS	06	06	12
8CMS	04	03	07
9CMS	02	02	04
10CMS	01	00	1
TOTAL	20	20	40

p=0.8459

Among the cases, the mean maximum diameter was 7.75 ± 0.71 with a range of 6.0 to 9.0 cm and among the controls mean maximum diameter was 8.00 ± 0.72 with a range of 6.0 to 10.0 cm.

The difference between the two means was 0.725, and this change in diameter from admission to 72 hours was statistically significant.

Table 8: Distribution of Total Leukocyte Count (TLC) at admission

TOTAL LEUCOCYTE COUNT	GROUP-I	GROUP-II	TOTAL
<10,000	01	03	04
10,000 – 15,000	07	08	15
15,000-20,000	09	06	15
>20,000	03(15%)	03	06
TOTAL	20	20	40

p=0.6436

The mean value of TLC in study Group I patients at admission was 13700 ± 5937 cell/mm³ (range 6800 to 32300 cells/mm³), while in study Group II patients the mean value was 16812 ± 6832 cell/mm³ (range 8200 to 32300 cells/mm³).

Table 9: Distribution of Total Leukocyte Count (TLC) at 72 hrs

TOTAL LEUCOCYTE COUNT	GROUP - I	GROUP-II	TOTAL
<5,000	02	03	05
5,000 – 10,000	05	06	11
10,000 -15,000	09	08	17
15,000 – 20,000	03	03	06
>20,000	01	00	01
TOTAL	20	20	40

p=0.8528

The mean value of TLC at 72 hrs was 8645 ± 3096 cell/mm³ (95% CI: 4315- 8276) study patients. The change in TLC from admission to 72 hours was statistically significant.

Table 10: Visual Analog Scale (VAS) of pain at admission

VAS	GROUP-I	GROUP-II	TOTAL
0-3	02	03	05
4-6	06	05	11
7-8	07	08	15
9-10	05	04	09
TOTAL	20	20	40

P=0.9254

The mean VAS of pain at admission in patients was 6.02 ± 2.75 .

Table 11: Visual Analog Score (VAS) of pain in the study population at 72 hrs

VAS	GROUP-I	GROUP - II	TOTAL
0-3	08	09	17
4-6	07	06	13
7-8	03	03	06
9-10	02	02	04
TOTAL	20	20	40

p=0.9866

The mean VAS of pain at 72 hours in study patients was 1.68 ± 2.786 .

The difference between the means of VAS at admission and at 72 hours was 4.35 (95% CI: 3.39- 5.31), and this difference was found to be statistically significant .

Table 12: Distribution of duration of hospital stay

DURATION OF STAY	GROUP-I	GROUP-II	TOTAL
<10DATYS	17	05	22
11-20 DAYS	03	07	10
21-30 DAYS	00	06	06
>30 DAYS	00	02	02
TOTAL	20	20	40

p=0.011

Mean duration of hospital stay in Group I was 6.95 days and in Group II was 17.20 days. There is a statistically significant difference between Group I and Group II.

Table 13: Various types of Air cavitogram

	FREQUENCY	PER CENT
SUGGESTIVE OF NO FLUID LEVEL	09	22.5
SUGGESTIVE OF MINIMAL FLUID	04	10
SUGGESTIVE OF SMALL CAVITY WITH AIR ONLY	03	7.5
SUGGESTIVE OF SUBSTANTIAL FLUID INSIDE THE CAVITY	02	5
SUGGESTIVE OF SUBSTANTIAL FLUID LEVEL	02	5
TOTAL	20	100

In Group I, the 20 patients (3 patients were converted to Study Group II vide supra), were discharged once they became asymptomatic and the abscess cavity was found reduced in size on ultrasound. In Group II the abscess was considered resolved on the basis of ultrasound findings at the time of pigtail catheter removal when the size of the abscess was found to be markedly decreased, and the air cavitogram showed nil/minimal residual fluid.

Outcome of Management in the Study Group Conversion to Alternative Treatment

Due to persistence of fever, increase in the pain score at 72hr, failure to reduce the total leucocyte count and increase in the size of the abscess treatment modality was changed for three patients from conservative management to pigtail catheter drainage insertion. However, initial pigtail inserted patients needed no change in the treatment modality, and showed improvement.

Follow Up

Group I patients were followed up by Ultrasound examination at regular intervals to note the size of the abscess, whereas in Group II patients with catheter when stopped draining air cavitogram was done and also ultrasound examination to note the quantity of the residual fluid in the cavity

Complications of Pigtail Drainage

- i. Technical complications (n=4)-wrong placement (n=3), displacement of catheter (n=1)
- ii. The leak of contrast into the peritoneal cavity during cavitogram (n=1).
- iii. Bile leak (n=6)

Table 14: Total serum bilirubin & Serum Alkaline Phosphatase (ALP)

	GROUP-I	GROUP-II	MEAN	RANGE
S. BILIRUBIN (mg/dl)	0.55	0.94	0.91	0.4-1.4
S.ALKALINE PHOSPHATE(KA)	23.3	21.4	22.3	4-46KA

Discussion

In the present study among 40 patients, 20 each were there in Group -I &II for comparing the two modalities of treatment of uncomplicated amoebic liver abscess I .e. conservative management versus ultrasound-guided pigtail drainage of amoebic liver abscess measuring between 6.0 and 10.0cm in the maximum diameter.

In our study, the mean age of the patients was 37.19 years (range 36-50years) with the maximum number (n=16) of patients were in the age group of 36-50 years (40%). In the present study, the mean duration of symptoms at presentation in the Group I was 13.45 days (range 1-60 days). While the mean duration of symptoms at presentation in Group II was 17.20 days. Studies by Ochsner et al. reported the duration of symptoms as 1 day with an average of 10days to 2 weeks in acute Group whereas, in chronic Group, it was 3 years with an average of 3-6 months ⁽⁵⁾. Salles et al. reported in his study that the duration of symptoms to varying from 4 days to 12 weeks but most of the patients presented within two weeks of the onset of symptoms.⁽⁶⁾ The average duration of symptoms has also been reported to be 2 ½ months according to a study by Shabot et al.⁽⁷⁾ The amoebic serology was positive in 18/20 cases of Group (90%). It was positive in 85% of cases in Group II. Studies by Gandhi et al. and Lodhi et al. had reported 79.1% positive amoebic serology in cases of amoebic liver abscess patients.^(9,10) A study was done by Mathur et al., 79 out of 82 patients (96.3%) of amoebic liver abscess were reported to be positive for amoebic serology. In endemic areas, serological tests are helpful in evaluating the risk of invasive amoebas in asymptomatic cyst passer as they also develop antibodies.⁽¹¹⁾ The mean value of total serum bilirubin in Group -I was 0.55mg/dl, Group II was 0.94mg/dl. The mean value of 1.9mg/dl for total bilirubin had been reported in studies done by Lodhi et al. and Khanna et al.^(10,12) Another study by Sharma et al. had reported the Bilirubin level of >3.5mg/dl was associated with a worse prognosis.⁽¹³⁾ Serum Alkaline Phosphatase has the

mean value of 23.30 KA in group-I, whereas, in Group II, it is 21.4KA. Earlier reports by Khanna et al. showed raised ALP in 76% of cases of Amoebic liver abscess. ⁽¹²⁾ Thus, ALP is the most reliable and consistent biochemical indicator of Amoebic liver abscess. Mean TLC value at admission in Group. I was 13,700 cells/mm³ (range 6800-32,300 cells/mm³) and in Group II was 16812 cells/mm³ (range 8200 to 32,300 cells/mm³). A TLC of above 20000 cells/mm³ indicates secondary infection of amoebic liver abscess or a pyogenic abscess was given by Lamont⁽¹⁴⁾ In the present study, right lobe is involved in 25 cases (83%) and left lobe in 5 cases (16%) of 30 cases of multiple abscesses. In the study of Gandhi et al., amoebic liver abscess 73% of cases involve right lobe, 17% involve left lobe and both lobe involvement in 10% cases.⁹ Solitary ALA had been reported in 77% cases and multiple in 23% cases.⁽⁹⁾ Thus, the reported involvement of different lobes in our study correlates well with earlier studies. The mean abscess diameter was 7.4cm.⁽¹⁷⁾ Other studies by Gandhi et al. had reported the mean largest abscess diameter as 7.0cm.⁽⁹⁾ Clinical, biochemical and ultrasound parameters were observed at the time of admission and 72 hours later to check for the progress of particular modality of treatment. Medical management for uncomplicated ALA is indicated if the size of the abscess is 5cm or less^(17,18,19) while therapeutic aspiration is indicated if the volume of abscess exceeds 200ml.⁽²⁰⁾ The present study is comparing the efficacy of medical treatment versus pigtail insertion for amoebic liver abscess measuring 6.0 to 10.0 cm, which in literature have been treated subjectively without clearly identifying the treatment parameters. In our study, there was not much difference in the size of amoebic liver abscess in the two groups under study. Further, our study showed that the abscesses of size between 6.0 to 10.0 cm could be taken for pigtail catheter drainage initially at presentation as the time of resolution was more rapid in Group II as compared to Group I. Mean duration of hospital stay in Group I was 6.95 days

and in Group II was 17.2 days. Thus our study clearly proves that the resolution of uncomplicated solitary right lobe liver abscess measuring between 6.0 to 10.0 cm was faster and earlier if the ALA was drained with a pigtail catheter than in patients who were managed conservatively. The study clearly indicates that uncomplicated abscesses measuring 6.0 to 10.0 cm are better treated with pigtail insertion under Sonographic control. Other indications for pigtail insertion are abscesses measuring more than 10.0 cm and those ALA associated with complications. Abscesses less than 6.0 cm can be managed with medical treatment alone.

Conclusion

Our study clearly proves that the resolution of uncomplicated solitary right lobe liver abscess measuring between 6.0 to 10.0cm was faster and easier if the Amoebic liver abscess was drained with a pigtail catheter than in patients who were managed conservatively. Abscess less than 6 cm can be managed with medical treatment alone.

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