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A Study of Outcome of Pigtail Catheterisation in Uncomplicated Liver Abscess Patients

AUTHOR

ABSTRACT:
INTRODUCTION: *liver abscess is a common condition in india . A liver abscess occurs when bacteria and protozoa destroy hepatic tissue , producing a cavity, which fills with infective organisms It .Upto 40% of patients develop complications with pyogenic liver abscess most commonly sepsis. In addition to sepsis morbidity can include pleural effusion , empyema , pneumonia . abscesses may also rupture intraperitoneally, which is fatal. liver abscess is a common condition in india . A liver abscess occurs when bacteria and protozoa destroy hepatic tissue , producing a cavity, which fills with infective organisms It ,liquefied liver cells and leukocytes. Necrotic tissue then walls of the cavity from the rest of the liver.*
Aims and Objectives
Aim : *To study the outcome of pigtail catheterisation in uncomplicated liver abscess patients.*
Objectives :
To study the time needed for total or near total resolution of abscess cavity, the progress of abscess, measure the length of hospital stay, the symptomatic improvement.
MATERIALS AND METHODS:
This study is being conducted in 100Patients of Department of general surgery SVRRGGH, Tirupati which includes both the males and females with age group of >18 years, after obtaining consent from the individual.
OBSERVATION AND RESULTS:*Of 100 patients selected 79 showed decrease in size after first time drainage to 60%and 18 showed no change and 3 increase in size.while in patients before pigtail drainage 3 showed slight decrease in size and 97 showed no change before pigtail .the chi square statistic is 116.2671. p value is <0.00001 .significant at p<0.05.*
KEY WORDS: *pigtail catheterisation*

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I. Introduction:

liver abscess is a common condition in india . A liver abscess occurs when bacteria and protozoa destroy hepatic tissue , producing a cavity, which fills with infective organisms It ,liquefied liver cells and leukocytes. Necrotic tissue then walls of the cavity from the rest of the liver.Upto 40% of patients develop complications with pyogenic liver abscess most commonly sepsis. In addition to sepsis morbidity can include pleural effusion , empyema ,pneumonia . abscesses may also rupture intraperitoneally, which is frequently fatal.Usually the abscess does not rupture but develops a controlled leakage resulting in perihepatic abscess. Pyogenic abscess also can cause hemobilia and hepatic vein thrombosis[1].

From the 1950 to 1990, mortality rates varied from as low as 11% to as high as 88%[2].Huang and associates[3] reported that 63% of patients had abscess involving the right lobe of liver .E coli, klebsiella , enterococci , and pseudomonas species are the most common aerobic cultures in recent series , whereas bacteroides species, anaerobic streptococci and fusobacterium species are the most common anaerobes[4].

It is common disease in tropical areas causing high morbidity and mortality .

The life cycle is relatively simple. Infection acquired by ingestion of the mature cysts, which is resistant to any ill effects of the acidic ph of the stomach and drying.[17,18] Excystation occurs in the ceacum or pelvic colon where ph is optimal.[17,18] The cyst wall is digested by trypsin. From each cyst four metacysticvtrophozoities are released. The trophozoites exist in two forms, a small or minuta from 10 to 20 micron in diameter and a large trophozoite 20 to 60 micron in diameter, present in patients with invasive disease. The trophozoites have a single nucleus 3-5micorn in diameter containing fine peripheral chromatin as a central nucleus. The presence of ingested erythrocytes correlates positively with presence of E. histolytica. The invasive trophozoite grows and superficial tissue invasion occurs as the organism‟s burrows through the crypts of Liberkuhn to the base of the mucosa, resulting in lytic digestion of intestinal epithelium by the proteolytic ferment of amoebae.

The trophozoites found in the feces contain erythrocytes –they are patently feeding on the tissues of host. The trophozoites move downstream to colonize the large bowel, to feed on bacteria and cellular debris. Trophozoites may then encyst, a process that is stimulated by luminal conditions that are less than ideal for the trophozoites .

Age:

. 75-90% of the total cases occurs between the age of 21 and 50.Below 20years of age, the incidence is less than 7% and above the age of 50, it is less than 21%.

Sex:

About 85-95% of the total cases occur in males. studies reported a male preponderance in a ratio. of M:F::15:1,

Race:

the incidence of liver abscess liver was lower in the native population of tropics as compared to resident whites.

Diarrhea and dysentery:

About 40% patients with liver abscess complain of diarrhea while only 10% suffer from dysentery with trophozoites present in stool. Roughly 50% give a previous history of dysentery.

Alcohol:

Heavy alcohol consumption (>150 gm per day) is another common finding in patient population with LA.

Others predisposing factors:

According to Craig, other predisposing factors are exposure, improper diet, mental
anxiety and worry.

Systemic manifestations

fever with or without chills and rigors.weakness,anorexia, loss of weight, diarrhea, nausea and vomiting, profuse perspiration, sallowness and jaundice.

Aims and Objectives:

Aim : To study the outcome of pigtail catherisation in uncomplicated liver abscess patients.

Objectives :

1.To study the time needed for total or near total resolution of abscess cavity.
2.To study the progress of abscess
3.to measure the length of hospital stay.
4.To study the symptomatic improvement

Study Area : The Department of General surgery,
S.V. Medical College, Tirupati.

Study design: prospective study

Study Period : 1 year from the time of IEC approval

Study methods : Collection of data is from 100 patients of Department of general surgery SVRRGGH, Tirupati including both males and females with the age group of >18 years, after obtaining consent from the individual.

Inclusion Criteria :

1. Patient with liver abscess with size not more than 10cms
2.patients within age 18-60 yrs of age.

Exclusion criteria:

1.Ruptured abscess
2.Jaundice
3.Ascitis
4.Toxic patients
5.Patients with chronic medical illness like ckd, diabetes .
6. Patients with bleeding disorders.
7.Patients not giving consent

II. Method:

Materials

The various instruments; equipment's and other materials used in this study are as described below:

1. Portable ultrasound unit

All the procedures were performed with real time ultrasound guidance; Curvilinear transducer PVG-3.75 MHz; Curvilinear transducer ranges from 2.5-3.75 MHz.

2. Aspiration Needles

18 G disposable needle; 18G, 20G, 21G spinal needle

3. Pigtail catheter set (with trocar, dilators and guidewire) (6 to 14 F)

4. Trolley settings

• Towel, sponge holder
• 50 ml syringe
• Sterile gloves

• Kidney tray
• Scalpel blade with Bard Parker handle
• Iodine, spirit for cleaning local parts
• Injection lignocaine 2% (LA)

Pre-aspiration procedures
• Written consent of the patient/guardian (if the patientis a minor)
• Base line investigation like haemogram, liverfunction test
• Coagulation profile of the patient (BT, CT, PT,platelet count) Setting up of IV lines.
• Availability of emergency tray
• Premedication.
• Inj. Vitamin K i.m.,Inj. Atropine 0.02mg/kg i.m. Inj. Diazepam 0.1mg/kg i.m.Inj. Hydrocortisone 2mg/kg i.v.
• Xylocaine sensitivity test.

Techniques:
Depending upon the abscess to be drained the patient was given appropriate position.
• Intravenous line was set up. The transducer probe was covered with sterile gloves The abscess cavity was located, and appropriate route decided to avoid important structures (bowel and costophrenic recess) The shortest path that causes minimal liver parenchymal trauma was chosen .Depth of abscess from skin, appropriate angle of the approach and exact site of puncture was determined. Local anaesthesia with 2% xylocaine .The patient was asked to hold his breath and the 18Gneedle was passed .
• Presence of needle in the abscess cavity was confirmed by a giving way sensation, scanning needle tip echo and the free flow of pus
• Syringe was applied on the 18G needle and aspirated.
• local anaesthesia induced and a nick was given over marked site of skin
• Thereafter Salinger technique was used. Trocar of pigtail set was slowly inserted until it reaches in abscess cavity (confirmed by ultrasound), then a guide wire was passed through it, then over guide wire trocar was removed
• With the help of dilators (provided with pigtail catheter set), the tract was dilated by serially passing the dilators (of increasing caliber) over the guide wire and then a Pigtail catheter drain was kept in abscess cavity
• The draining catheter was properly secured in its place and connected to a collecting system.USG is done every third day until abscess cavity disappears, decreases in size or remains static compared with previous USG and catheter is removed if it was not draining for last 24 hours.

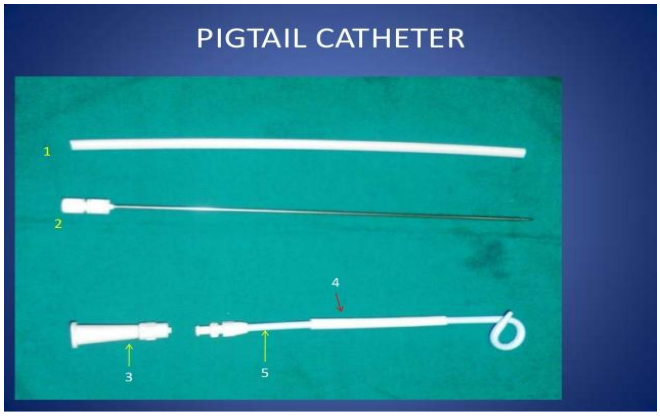
Antibiotics policy:
The antibiotics therapy was adjusted according to the results of culture and sensitivity test of pus aspirated at the time of the drainage procedure.[5,6]
Antibiotics adjustment was done immediately when the sensitivity test was available.[7] Patients with negative culture results were continuously treated with same combination.[8] The antibiotic regime was not changed for patients with poor treatment response.The patients were then put on the appropriate oral antibiotics for a total treatment period of 4 weeks.[9]

Patient follow-up and outcome measures
Patient outcomes will be recorded on the basis of:
• Duration to attain clinical relief
• Duration of hospital stay
• Treatment success and failure rates
• Death.

Criteria for discharge of the patient
The patients will be discharged from hospital:
• When the infection had subsided clinically
• Sonographic evidence of abscess resolution such as disappearance of abscess cavity or static or decrease in size of abscess cavity.

Statistical methods
Chi square test and student t test are used for statistical analysis of results wherever applicable. The statistical software named SPSS software version 21.0 is used for the analysis of the data.

PIGTAIL CATHETER:



III. Observation:

Of the total of 100 cases of liver abscess , large number(n=70; 70%) presented in patients ≤ 40 years of age and the maximum number of cases (50%) was seen between the age group of 31-40 years (50%) and the next highest number was seen between age groups of 18-30 yrs (20%).
The lowest incidence was seen in the pts between 41-50 yrs (13%).
Of the 100 cases selected , 96 affected are men and 4 are women showing higher incidence in men .
Of the total 100 patients the highest incidence is seen among the men among the age group of 31-40yrs and the number affected are (48%)and the least incidence is seen in age of 41-50 yrs and incidence is (13%) in men and 0 %in women .
Of the 100 patients selected longest duration of symptoms of 21 days is noticed in 20 % patient . and the highest number of patients are noticed to have the symptoms for 6 - 10 days and the least number of patients are noticed to face the symptoms for 16-20 days .
Of the 100 patients selected 63 percent were alcoholic and the remaining non alcoholic
Of the100 patients of the study sample 79 % were found to have amebic serology positive .
Of the 100 patients the liver abscess is most commonly noticed in right lobe that is 75%.
Of the 100 patients selected the number of patients who had the longest duration of stay after procedure are 5 % over 31-40 days , and the number of patients having the least duration of hospital stay is 60%.
After 3 weeks 99 patients showed decrease in size of the cyst cavity diameter.
Of 100 patients 90 showed symptom relief after first aspiration and 6 showed no change and after 3 weeks 98 patients showed improved symptoms .
Of 100 patients 95 were discharged home and 5 patients hospitaised more than 5 days.
Of 100 patients 88 showed decrease in TLC count after 72 hrs ,12 showed no decrease.
Of 100 patients selected 79 showed decrease in size after first time drainage to 60%and 18 showed no change and 3 increase in size.while in patients before pigtail drainage 3 showed slight decrease in size and 97 showed no change before pigtail .the chi square statistic is 116.2671. p value is <0.00001 .significant at p<0.05

TABLE NO 1:

	Size decreased	No improvement
After pigtail catheterisation	79	21
Before pigtail catheterisation	3	97

chi square statistic is 116.2671. p value is <0.00001 .significant at p<0.05

IV. Discussion:

It is common disease in tropical areas causing high morbidity and mortality . Abscess develops in liver due to various reasons broadly divided into two causes amoebic and pyogenic .
Crowding and poor sanitation contribute to its prevalence in Asia, Africa and Latin America. Entamoeba histolytica causes intestinal and extraintestinal amoebiasis.

INTESTINAL AMOEBIASIS

After incubation period of 1-4 weeks, amoebae invade the colonic mucosa, producing characteristic ulcerative lesions and a profuse bloody diarrhea(amoebic dysentery). The ulcers either are generalized involving the whole of the large intestine or localized in the ileo-caecal or sigmoido-rectal region .Ulcers are discrete with intervening normal mucosa. They vary in size from pin –head size to more than 2.5cm in diameter.

EXTRAINTESTINAL AMOEBIASIS

Amoebic liver abscess may occur in any part of the liver but is generally confined to the postero-superior surface of the right lobe . In development of amoebic hepatitis and hepatic abscess the two factors which play important roles are:

1) The production of intrahepatic portal thrombosis and Infarction.
2) The cytolytic activity of the amoeba.

Causative factors for amoebic liver abscess:

1. Low socioeconomic status.
2. Poor sanitation.
3. Poor immunity.
4. Homosexual.
5. Emigration to endemic areas.
6. Alcohol intake.

An outbreak of amoebiasis in Republic of Georgia demonstrates the importance of sanitizing human water sources and underscores the vulnerability of any community to infection by E histolytica.[8] Decreased immunity due to conditions like pregnancy, peptic ulcer disease , hepatitis, malaria, and HIV predisposes to amoebic liver abscess and are known to worsen existing abscess lesions.[9]Drugs like steroids also appears to predispose patients to development of systemic amoebiasis, or to worsen existing lesions of amoebic liver abscess.[10] In United States , immigrants and travelers to developing countries are most likely to develop amoebiasis. A total of 2970 cases of amoebiasis were reported in 1993: 33% of the patients were Hispanic immigrants and 17% immigrants from Asia or Pacific Islands.[11]Men having sex with men were in past predominantly infected with nonpathogenic amoeba E. dispar, but recently invasive amoebiasis has been in this group (with and without HIV infection).[12,13] Residents of institutions for the mentally retarded are also at increased risk for amebic colitis and liver abscess.[14]

INVESTIGATION :

Apart from routine investigations like cbp , liver function tests , ultrasound cect scan are helpful .

ULTRASOUND :

Ralls and his associates described a constellation of findings highly suggestive of liver infection.44 These include :

1.No significant wall echoes
2.Round or oval shape
3.Less echogenecity than parenchyma with fine homogenous low level echoes throughout at high gain,
4.Location contiguous to liver capsule,
5.Distal sonic enhancement

The more acute presentation with Symptoms of less than 10 days duration have multiple abscesses .[15] Under ultrasound guidance pigtail catheter drainage is easy resulting in minimal trauma, rapid clinical relief, short hospital stay, little morbidity, and early and Complete resolution of cavity. Patient acceptance is high and the cost of treatment is low.[16]

TABLE 2: **Ultrasound characteristics of liver abscesses**

Ultrasound characteristics	Duration
Echo – poor wall with hetrogenous echoPattern	2 to 3 weeks
Fine echogenic rim with homogenous hypoechoic pattern	4 to 8 weeks
Echogenic nodules	4 to 12 weeks
Thick echogenic wall with anechoic areas	8 to 16 weeks
Complete healing	3 to 6 months

Contrast enhanced tomography scan

It has an advantage over ultrasonography in being able to detect intrahepatic collections as small as 0.5cm.

MANAGEMENT OF LIVER ABSCESS:

Principles of treatment .

1. Every case of suspected liver abscess should be given a course of amoebicidal drug therapy before any procedure is used, unless rupture of the abscess appears imminent.
2. If evacuation of pus is necessary, aspiration and preliminary administration of amoebicidal drugs is the procedure of choice.
3. Open drainage of the abscess should be reserved for the relatively few cases of secondarily infected abscess

Earlier surgical drainage was indicated in the following conditions:
1. Patients not responding to medical treatment in spite of repeated needle aspiration or drugs.
2. Presence of more than one abscess cavity.
3. Doubt in diagnosis or of the presence of a coexisting carcinoma or cirrhosis.
4. Lesions pointing below the costal margin, for fear of complications that may Result from needling of neighboring viscera, and abscesses of the left lobe liver presenting as epigastria masses.
5. Patients presenting with complications such as peritonitis, empyema thoraces, abscess bulging through the abdominal wall, pericarditis, hemobilia, obstructive jaundice, and metastatic abscess.
6. Thrombosis of portal vein or inferior vena cava or fistulous connection with Hepatic ducts; and
7. Recurrent or refractory abscess Medical management for uncomplicated liver abscess is indicated if size of abscess is 5 cm or less.

Table 3: Medical treatment of amoebic liver abscesses

Drug	**Adult Dosage**	**Side effect**
Metronidazole	**750mg tid x 7-10 days**	**~ 10% headache, dizinesss, nausea, anorexia.<1%ataxia, seizures, paraesthesias, peripheral reaction with alcohol, metical taste**
Or		
Tinidazole Followed Bylodoquinol	**2gm/d divided tid x 3 days 650mg tid x 20 days**	**Similar to metronidazole, but typically better. Optic neuritis with long term use.**
Or		
Paromomycin	**25-35 mgkg/d divided tid x 7 days**	**1-10%; diarrhea, nausea, vomiting, abdominal.<1%; headache, vertigo, eosinophilia, rash.**
Or		
Diloxanide Furoate	**500 mg tid x 10 days**	**Flatuelence, nausea, vomiting, pruritis,urticaria**

TABLE NO 4: SYMPTOMS

SYMPTOM	**% of Amebic Abscesses**
Pain	**55**
Fever	**83**
Nausea and vomiting	**50**
Anorexia	**37**
Weight loss	**55**
Malaise	**34**
Diarrhea	**12**
Cough or pleurisy	**30**
Pruritus	**17**

TABLE NO 5: SIGNS

Hepatomegaly	40
Right upper quadrant tenderness	52
Pleural effusion or rub	20
Right upper quadrant mass	25
Ascites	25
Jaundice	31
LABORATORY DATA	
Increased alkaline phosphatase	87
WBC count >10,000/mm3	71
Hematocrit <36%	55
Albumin <3 g/dL	53
Bilirubin >2 mg/dL	21

TABLE NO 6 :DIFFERENCES BETWEEN AMOEBIC AND PYOGENIC LIVER ABSCCESS

Amebic	**Pyogenic**
Age <50 years	Age >50 years
Male:female ratio 10:1	Male:female ratio 1:1
Hispanic descent	No ethnic predisposition
Recent travel to endemic area	Malignancy
Pulmonary dysfunction	High fevers
Abdominal pain	Pruritus
Diarrhea	Jaundice

Abdominal tenderness	Septic shock
Hepatomegaly	Palpable mass

The review of literature reveals that the smaller a liver abscesses, (multiple or single) can be treated conservatively. Larger liver abscesses or abscesses with complications (prerupture, rupture, pressure effects) require intervention in the form of either closed or open drainage. However, there is no clear cut consensus for the management of uncomplicated symptomatic medium sized liver abscesses with treatment modalities ranging from drugs alone to needle aspiration to pigtail catheter drainage. The present study is an effort to establish an objective criterion for management of such abscesses. Our study is designed to find out which mode is helpful and ideal for particular patient with reference to severity of the disease and safety of the patient. Effective management of the disease would help in decreasing morbidity and mortality associated with the disease.

Of the total of 100 cases of liver abscess , large number(n=70; 70%) presented in patients ≤ 40 years of age and the maximum number of cases (50%) was seen between the age group of 31-40 years (50%) and the next highest number was seen between age groups of 18-30 yrs (20%).

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V. Conclusion:

In the study most common age group affected is 31-40 yrs of age .
2)Male to female predominance is seen.
3)There was symptomatic improvement after intervention.
4)One of the main factor associated with this disease is alcoholism .
5)Most of the cases are of amoebic etiology.
6)There is improvement noted in the form of decrease in the size of the abscess cavity , decrease in pain , decrease in duration of hospital stay , decrease in TLC counts .
7)Thus pigtail catheterization had significant effet on well being of liver abscess patients .

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