



A comparative study of different modalities of treatment of liver abscess

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Abstract

Objective: To compare the effectiveness of conservative medical treatment versus minimal invasive surgical techniques like percutaneous catheter drainage (PCD) and percutaneous needle aspiration (PNA) in the management of liver abscess.

Material and methods: All patients with liver abscess who were admitted in Surgery from October 2013 to June 2014 were included in this study and were exposed to four different treatment modalities. The patients were first treated with combination of medicine (Option - A). If they failed to respond to this treatment then they were subjected to ultrasound guided aspiration (Option - B). If Option - B failed they were exposed to pig tail catheter placement (Option - C). Final option was surgical drainage (Option - D) if it was rupture liver abscess and if the patient presented with co morbid conditions like septicaemia and peritonitis. PNA was repeated every third day if the cavity size had not declined to 50% of the original for up to three times. Persistence of cavity or of clinical symptoms was considered failure of treatment.

Results: Out of 51 patients, 14 patients responded to drug therapy alone. 34 patients required ultrasound guided aspiration and Pig tail catheter placement and 3 patients required open surgical drainage. A combination of drug therapy and ultrasound guided needle aspiration was effective for majority of 83% patients Duration of hospital stay was similar in the two groups.

Conclusion: Minimal surgical interventions like PCD and PNA are better than 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. Pyogenic liver abscess are less common than amoebic liver abscess. Right lobe of the liver is most commonly involved in both types of abscesses. Radio-imaging techniques like ultrasonography (US) and computerized tomography (CT) are the modalities of choice for investigation purposes. Treatment modalities of these abscesses, first emphasizes on medical treatment, but if it is unsuccessful then only the surgical intervention should be taken up. Laparotomy and Drainage or Laparoscopic Drainage remains the standard of care for ruptured liver abscess.



Key words

Amoebic liver abscess, Entamoeba Histolytica, Pyogenic abscess of liver, Percutaneous needle aspiration (PNA), Percutaneous catheter drainage (PCD).

Introduction

Amoebic liver abscess (ALA) and pyogenic liver abscess (PLA) are common clinical problems in India and other tropical countries [1, 2]. 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. Amoebic liver abscess occurs in population where Entamoeba histolytica is endemic and it affects right lobe in 80% of cases. 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, vomiting, severe abdominal pain and polymorphonucleosis. Whereas pyogenic liver abscess does not show gender difference, amoebic abscess is approximately 10 times more common in male sex as compared to females. Computed tomography (CT), and ultrasound are the imaging studies of choice [3]. Currently, these patients are treated with antibiotics along with percutaneous needle aspiration (PNA) or percutaneous catheter drainage (PCD), with surgical drainage being used only in patients who fail to respond to such treatment [4, 5].

Aim and objectives

- To study the clinico-etiological, demographic profile and management of liver abscess.
- To determine the role of ultrasonography/ other relevant radiological studies in differentiating liver abscess from other hepatobiliary conditions.

- To evaluate the outcome associated with different treatment strategies of liver abscess.

Material and methods

Patients with both pyogenic and amoebic liver abscess admitted to our institution between October 2013 and March 2014 were enrolled. Patient data was collected from all patients attending General Surgery outdoor patient department (OPD), casualty and inpatient departments, irrespective of gender/ background /socio economic status. Detailed history of patients was entered in a proforma. Complete hemogram, renal function test, liver function test (LFT), prothrombin time, clotting time, bleeding time, serum electrolytes, serum amylase, and viral markers (HIV, HbSAg) were done. Preliminary ultrasound of abdomen was done on the same day of presentation. X-ray whole abdomen erect with both domes of diaphragm, USG whole abdomen, and CT whole abdomen (optional) were also done. Patients were treated according to respective protocol. Patient on conservative line were followed up daily clinically. LFT and USG Abdomen were repeated on the 3rd day if patient was symptomatically not relieved. Repeat Ultrasound/ CT abdomen was done immediately if patient condition did not improve/ worse or after 3-4 days as a routine prognostic factor. Patient was informed about any surgical procedure and consent was taken for the same.

Management strategies were as follows.

- Antibiotics alone (in uncomplicated abscess measuring more than 2 cm and less than 5 cm)



- Percutaneous aspiration + Antibiotics coverage (in non-ruptured abscess measuring > 5 cm) (53%) patients and loss of appetite in 25 (50%) patients as per **Table – 2**.
- Percutaneous catheter drainage + Antibiotics coverage (in non-ruptured abscess measuring 5-10 cm) and catheter was removed 24 hours after drain output was nil. Alcohol addiction was common in males and had an important correlation with liver abscess as per **Table – 3**.
- In ruptured liver abscess, open surgical drainage or laparoscopic surgical drainage (Extraperitoneal/ Transperitoneal) was done. Majority of liver abscesses were found in right lobe of liver (83%) and 4.5% of liver abscess was found in left lobe, and both lobes were involved in 12.5% of patients as per **Table - 4**. In more than 50% liver abscess was solitary in presentation; multiple abscesses were found in 21% cases. Majority (60%) cases were partially liquefied liver abscess, 22% case presented with liquefied liver abscess and 18% cases were predominantly solidified. The laboratory investigations revealed that 40% patients had hemoglobin levels <10 gm%, 80% patients had high leucocyte counts and 10% had hyperbilirubinemia. The Microbiological reports revealed 40% cases were positive for klebsiella, 30% were positive for E. Coli, 11% were positive for staphylococcus, 9% were positive for Bacteroides, and 5% were positive for Citrobacter as per **Table – 5**.

Follow up of patients

Patients were followed up for a period of 6 months, once in 2 weeks for first 2 months, then on a monthly basis, to detect recurrent attacks or development of complications and to monitor the efficacy of the treatment given.

Inclusion criteria

- All cases of liver abscess diagnosed clinically as well as ultrasonographically.
- All cases of diagnosed liver abscess being referred to our hospital.

Exclusion criteria

- Immunocompromised patients.

Results

During 6 months period from October 2013 to March 2014, 51 patients with the diagnosis of liver abscess fulfilled the criteria and were included in the prospective study. The age range was between 15 to 75 years with the mean age of 40 years. 39 (76.5%) of our patients were male while 12 (23.5%) were females with a male to female ratio of 3.1: 2 as per **Table – 1**.

Total 48 (90%) patients presented with upper abdominal pain, high grade fever was present in 34 (67%) patients, nausea and vomiting in 24

Intravenous antibiotics in form of cephalosporins or fluoroquinolones and metronidazole were given to all patients. About 14 patients were treated successful by this conservative management, 34 patients were required minimal surgical interventions like PNA and PCD and 3 patients required laparotomy as per **Table – 6**.

Mean abscess size in the aspiration group was 6.87 cm and that in PCD was 11.5 cm as per **Table - 7**. Rupture of abscess into pleural and peritoneal cavity was major complication occurred in 3 cases (5.7%).

**Table - 1:** Age wise distribution in years.

Age (in years)	15-25	25-35	35-45	45-55	55-65	65-75
No of patients	7	8	12	8	9	7

Table - 2: Symptomatology.

Symptoms	Pain	Fever	Nausea and vomiting	Anorexia
No of patients	48	34	24s	25

Table - 3: Alcoholism in case of liver abscess.

	Total (n=51)	%
Males	46	88
Duration <10 years	28	48
Duration >10 years	16	33

Table - 4: Anatomical location.

Lobe affected	Right lobe	Left lobe	Both lobe
Percentage	83%	4.5%	12.5%

Table - 5: Microbiology.

Organism	Klebsiella	E. coli	Staphylococcus	Bacteroides	Citrobacter
Percentage	40%	30%	11%	9%	5%

Table - 6: Modalities of treatment.

Treatment	Antibiotics alone	PNA and PCD	Laparotomy
No of patients	14	34	3

Table - 7: Size of abscess and treatment modality.

Size in cm	Treatment modality
<5	Antibiotics alone
5-10	Antibiotics + PNA
>10	Antibiotics + PCD

Discussion

Liver abscesses are life-threatening with mortality rate as high as 80 to 90% if left

untreated [6]. In earlier times when antibiotics were not available open surgical drainage was the treatment of choice. Treatment by



aspiration followed by antibiotics was described by 6 and recently in last few years percutaneous drainage under USG has largely replaced surgical drainage [3].

Pyogenic liver abscess

In half of the cases, no identifiable cause of pyogenic liver abscess was ascertained. With USG, initially the abscess is hyperechoic but with maturation it becomes hypoechoic. Computed tomography is more specific and sensitive than USG [3]. Klebsiella and E. Coli being the commonest organism [6]. Treatment of PLA should individualize. The choice of antibiotic should cover most of common microorganisms cultured from liver abscess. This therapy should consist of a combination of aminoglycosides either with metronidazole or beta-lactam antibiotic. Antibiotic therapy should alone be reserved only for patients in good clinical condition and those who have solitary abscess lesser than 2 cm in diameter, patients must receive antibiotic for 4-6 weeks. "Source control" is essential in surgical treatment of PLA. Although there are various reports comparing these modalities in the treatment of liver abscess, there are no prospective randomized studies comparing different treatment modalities. Gerzof, et al., 1985 compared the medical treatment, percutaneous and surgical drainage in the retrospective study reporting better result with surgical drainage in total of 26 patients [7].

Amoebic liver abscess

USG findings are good for radiological evaluation of amoebic liver abscess which shows peripheral rim with homogeneity [3]. The first line of treatment in amoebic liver abscesses is metronidazole. The size of abscesses is important factor in determining the response of drug. PCD and catheter drainage offer other modalities of treatment as in pyogenic abscesses. Metronidazole is given 750 mg 3

times a day for 7-10 days. Surgical open drainage is indicated only in those patients with complicated amoebic abscesses e.g. secondary infection or peritonitis with large pyogenic and amoebic liver abscesses.

Percutaneous drainage (either needle aspiration or catheter drainage) with systemic antibiotics has become the preferred treatment for the management of pyogenic liver abscesses. In contrast, for amoebic abscesses, the primary mode of treatment is medical. Although, PCD is a preferred method most widely used to drain liver abscesses, recent studies have shown PNA to be simpler, less costly, and equally effective. Usually needle aspiration is preferred for smaller abscesses and catheter drainage is done in larger ones. But no clear cut guidelines have been laid [7, 8, 9].

Both these techniques have certain disadvantages. Multiple attempts of PNA needed for large abscesses may be uncomfortable and perceived as more traumatic by patients. Also, during the period between two aspirations pus may get re-accumulated. For smaller abscesses, daily production of pus may be small, but a larger abscess cavity may produce larger quantity of pus, which needs to be drained continuously [10, 11, 12]. PCD has this obvious advantage over PNA, which may have accounted for quicker clinical recovery, lesser duration of parenteral antibiotics and lesser failure rate among patients treated with PCD. On the other hand, placing a catheter needs more expertise followed by nursing care. Percutaneous needle aspiration and percutaneous catheter drainage are more effective than conservative medical management in treatment of liver abscess; however co-morbid conditions of patients and size of liver abscess also influence the outcome [11, 12, 13, 14].



Conclusion

Liver abscess is a very common condition in India. India has 2nd highest incidence of liver abscess in world. Liver abscesses occurred most commonly between 30-60 years. Most of the cases had an acute presentation, and right lobe is most commonly affected. Males were affected more than females. Pain in abdomen was the most common symptom present in all 100 cases. Alcohol consumption was the single most important etiological factor for causation of liver abscesses. Alkaline phosphatase is the most consistently elevated among all liver function. Raised WBC count, Alkaline phosphatase level, Diabetes, Hypoalbuminemia, Prolonged Prothrombin time were considered as the predictive factors of complicated (ruptured) liver abscess in this study. Diabetes mellitus was more frequently associated condition in cases of liver abscess and especially Pyogenic liver abscess cases. Percutaneous needle aspiration and percutaneous catheter drainage are more effective than conservative medical management in treatment of liver abscess; however co-morbid conditions of patients and size of liver abscess also influence the outcome.

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