

## Bacterial Superinfection in Amoebic Liver Abscess in a Tertiary Care Institute-A Case Series

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### Abstract

Amoebic liver abscess is more common in India. Alcoholics are more prone to get liver abscess. Both pyogenic and amoebic liver abscess have unique set of predisposing factors and clinical features. Here we witnessed 3 cases of secondary bacterial infection in amoebic liver abscess in our hospital.

**Keywords:** Amoebic liver abscess, pyogenic liver abscess, secondary bacterial infection

### 1. Introduction

Infection due to the protozoan, *Entamoeba histolytica*, can result in amoebic colitis. The most common extra intestinal manifestation of amoebiasis is liver abscess. Men between the ages of 18 and 50 are most commonly affected. Areas endemic for amoebiasis include India, Africa, Mexico, and Central and South America. The most common symptoms are fever and right upper quadrant pain with one third of patients presents with concomitant amoebic colitis. The diagnosis is based on clinical symptoms and relevant epidemiology coupled with radiographic studies and serologic tests.

Pyogenic liver abscess is distinct entity caused by bacterial infection. The routes of entry of bacteria in to liver are biliary, portal vein, hepatic artery, hepatic vein and local spread from contiguous sites.

The exact incidence of bacterial super-infection in amoebic liver abscess is not known. Very few case reports have been reported. The risk factors are immune-compromised states like HIV, malignancy, patients on steroids, diabetes, chronic alcoholics and tuberculosis infection.

Here we present three cases of amoebic liver abscess with bacterial super infection managed in our hospital.

#### Case 1

A 48 year old gentleman, chronic alcoholic presented with fever, abdominal pain with loss of appetite. There was no history of recent colitis. On examination, he was febrile, tender hepatomegaly, distended abdomen with guarding. Haemogram showed leucocytosis with neutrophil shift.

Liver function showed mild elevation of liver enzymes with elevated alkaline phosphatase. Chest x-ray revealed elevated right hemidiaphragm. Ultrasound abdomen showed 10\*8cm hyper echoic lesion in right lobe with echogenic ascites noted. Contrast CT showed 9.4\*9cm well defined lesion in right lobe of liver extending to caudate lobe with ascites and reactive cholecystitis. He was diagnosed to have ruptured liver abscess. Intraoperative finding revealed ruptured liver abscess in right lobe with pyoperitoneum. The abscess cavity showed anchovy paste like slough. Thorough drainage of abscess with copious peritoneal lavage was done. Amoebic serology by Indirect hemagglutination(IHA) test was positive. Pus culture showed *E.Coli*. He was given ceftriaxone 1g iv 12<sup>th</sup> hourly, metronidazole 500mg in 8<sup>th</sup> hourly for 8days. He recovered uneventfully and was discharged with oral antibiotics for 2 weeks.

#### Case 2

A 42 year old male chronic smoker and alcoholic attended to surgical casualty with severe right upper abdominal pain, intermittent high grade fever and vomiting. He gave history of colitis 20 days back. Abdominal finding witnessed tender hepatomegaly. X-ray showed elevated right hemi-diaphragm. Blood investigation showed leucocytosis, hyper-bilirubinemia, hypoalbuminemia, mild elevation of liver enzymes and elevated prothrombin time. Ultrasound showed 10\*8cm echogenic lesion with moving internal echoes noted in right lobe of liver. CT abdomen showed 10\*9cm hypodense lesion in right lobe with peripheral enhancement suggestive of liver abscess. He was started vitamin k injection and intravenous third generation cephalosporin and metronidazole. There was no significant improvement in the size of the abscess.

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Around 100ml of thick purulent abscess was drained under ultrasound guidance and sent for bacteriological culture and sensitivity. Culture grown *Klebsiella pneumoniae*. Amoebic serology showed 1:512 titres by IHA test. He was discharged with oral antibiotic for 2 weeks.

**Case 3**

60year old gentleman alcoholic presented with abdominal pain, low grade fever and anorexia. He had history of jaundice which was treated by native medication 2months back. He was known diabetic and on insulin for 3 years. On presentation, he was pale, oedematous lower extremities, not icteric. Abdominal examination revealed tender hepatomegaly. Vitals were stable. Chest x-ray shows elevated right hemidiaphragm. Ultrasound of abdomen witnessed huge 7.3\*7.2cm irregular heteroechoic lesion with echogenic rim and internal moving echoes in right lobe segment 5/8.. He was started on intravenous ceftriaxone 1g and metronidazole 750mg. owing to huge size of abscess with moving echoes, abscess was drained with pigtail drainage under ultrasound guidance. Around 100ml blood mixed pus was drained. Bacteriology of pus revealed E.coli sensitive to ciprofloxacin and amikacin. We changed the antibiotic to ciprofloxacin. Amoebic serology using IHA showed 1:1054 titre. He was sent home with oral antibiotics for 2 weeks.



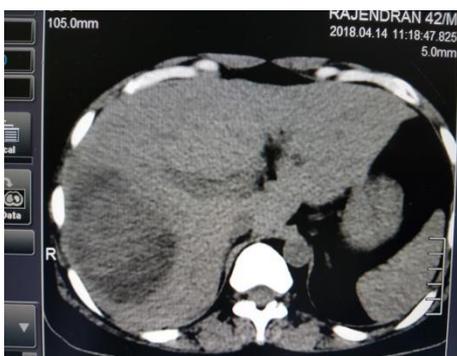
**Figure: 3** Ultrasound of abdomen shows liver abscess in right lobe (case 3)

**Table1** Case details of the patients

Patient characteristics	Case 1	Case 2	Case 3
Age	48	42	60
Sex	Male	Male	Male
Alcoholic status	+	+	+
Diabetes mellitus	-	-	+
H/o jaundice	-	-	+
H/o colitis	-	+	-
Icteric	-	-	-
Size of abscess	9.4*9cm	10*9cm	7.3*7.2cm
Management	Laparotomy	Percutaneous drainage	Percutaneous drainage
Bacteriology	<i>E.Coli</i>	<i>Klebsiella</i>	<i>E.Coli</i>
Amoebic serology	1:1054	1:512	1:1054



**Figure 1:** CT Abdomen shows liver abscess in right lobe with impending rupture (case1)



**Figure 2:** CT Abdomen shows liver abscess in right lobe

**Discussion**

It has been suggested that the male hormone testosterone could be a host factor that favours the development of ALA based on animal models (hamster) [1].The middle-aged men were mostly affected owing to the positive role of testosterone; the incidence declines after 50years with the reduction of testosterone levels [1].

Further, it is a well-known fact that iron is a vital growth factor for *E. histolytica* [2] and a crucial component of *E.histolytica* enzymes [3]. In vitro experimental studies have showed that females of reproductive age are protective for invasive amoebiasis owing to regular menstrual blood loss which may lead to lower iron stores[2] mainly in the liver [4]

Apart from age and sex, the other associated risk factor was consumption of alcohol. Makkar et al. [2] have suggested that high carbohydrate and iron intake in habitual consumers of alcohol may predispose to invasive amoebiasis. Further, age predilection and gender bias in

the formation of ALA is also based on the high alcohol intake [5].

Ghosh et al. [5] have reported that alcohol ameliorate the function of Kupffer cells in the liver which has its role in clearing the amoeba. Furthermore the invasive capacity of *E. histolytica* is facilitated by alcohol and nutritional deficiencies in alcoholics as suggested by Raja and Karthik et al [6], thus leading to a higher incidence of ALA in alcoholics. The duration and quality of alcohol consumed also play an important role in the higher incidence of liver abscess.

The ALA is most common in men and usually presents in the right lobe of the liver. The stool examination is negative for parasites in all three cases. ALA with concurrent amoebic colitis is present in one third of cases. The detection of the parasite in the abscess aspirate is uncommon owing to the necrotic nature of the abscess [7]. The Diagnostic percutaneous aspiration is rarely needed. In the cases that we report the percutaneous aspiration was required because of large size and lack of adequate response to medical management.

Serological test are usually very helpful in the diagnosis of the disease. Indirect hemagglutination assay (IHA) is the most sensitive test (90-100%), but it can be false negative in the first week. The sensitivity increases during the second to third week of the infection.

In the present 3 cases, IHA test showed positive titres as all these cases presented during second and third week of infection.

The symptoms of ALA are epigastric pain and high fever. Blood investigation often showed leukocytosis and abnormal liver profile. The radiological findings are those of a liver abscess and consist of a hypodense collection on CT or a hypoechoic lesion on ultrasonography, with posterior acoustic shadowing and moving internal echoes. Although Radionuclide studies with gallium-67 lacks specificity, it reveals "cold" spot with peripheral rim enhancement, unlike in the case of a pyogenic abscess that appear as a hot spot [8].

With early diagnosis and treatment, mortality from uncomplicated liver abscess is less than 1%, ranging from 1-34%, and prevents surgery. The complications of ALA are secondary bacterial infection, free rupture into the peritoneal cavity causing pyoperitoneum, rupture in to pleural space causing empyema thoracis and rupture in to pericardium.

The risk factors for secondary bacterial infection are immunocompromised states like diabetes, malignancy, HIV infection, alcoholism and immunosuppressive drugs. The risk factor for rupture is location in left-lobe abscesses, owing to the smaller size of this lobe and the lack of adequate space for a growing mass [9].

In the first case we report, presented with ruptured ALA. All three patients were alcoholics.

The management strategy in ALA is to treat invasive liver abscess and eradicate colonic colonization. Metronidazole is the drug of choice for the treatment of ALA and amoebic colitis (adult dosage of 750 mg orally

three times a day for 7-10 days). This regimen should be followed by a luminal agent like paramomycin or diloxanide furoate for a period of seven days [2]. Most ALA respond to metronidazole therapy. The percutaneous aspiration and drainage of ALA is controversial. Indications for aspiration of liver abscesses are the need to rule out a pyogenic abscess; bacterial coinfection of ALA, large abscesses with a diameter of more than 5 cm, the prevention of rupture of left-lobe abscesses, the failure to respond clinically to drug therapy within 5 to 7 days and the threat of imminent rupture [9,11,12]. The percutaneous aspiration can cause the super-infection of the ALA, so it should be avoided in those cases with no indication.

Surgical treatment should be reserved for instances of rupture of the abscess as occurred in the first case or coinfection that is not solved with medical treatment [9,12]. In the second and third case we present, percutaneous drainage was done due to large size of the abscess and failed medical management. The possibility of ALA should be considered even the absence of history of exposure, and serological test should be repeated in suspected cases with an initially negative result. An early and accurate diagnosis avoids a higher morbidity and mortality, as the treatment for ALA differs from that of the pyogenic abscess.

Bacteriology of the abscess should be considered to rule out pyogenic superinfection in suspected cases of ALA. Owing to increased alcoholism and growing prevalence of immune compromised states, it is worthwhile to study the aetiology, epidemiological factors and prevalence of bacterial superinfection in ALA. Meticulous aseptic precaution should be followed for aspirating liver abscess to prevent iatrogenic bacterial contamination of ALA.

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