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## Liver abscess- An overview

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### Abstract

Drainage is necessary for large liver abscesses, equal to or larger than 5 cm in size, to facilitate resolution. Percutaneous drainage may help to optimize clinical condition prior to surgery. Nevertheless, in current good clinical practices, the choice of therapy needs to be individualized according to patient's clinical status and abscess factors. They are complementary in the management of liver abscesses.

**Keywords:** Pyogenic liver abscess, ultrasound-guided percutaneous drainage

### Introduction

Liver abscess is a pus-filled cyst in the liver. The liver is an organ in the digestive system that assists the digestive process and carries out many other essential functions. These functions include producing bile to help break down food into energy; creating essential substances, such as hormones; cleaning toxins from the blood, including those from medication, alcohol and drugs; and controlling fat storage and cholesterol production and release.

Anyone can get a liver abscess. The condition can be caused by infections spread directly from nearby structures, such as the bile-draining tubes, from the appendix or intestines, or carried in the bloodstream from more distant parts of the body. A liver abscess can also develop as a result of surgery or other trauma to the liver.

Liver abscess (LA) is defined as collection of purulent material in liver parenchyma which can be due to bacterial, parasitic, fungal, or mixed infection. It is a common condition across the globe. Out of total incidence of LA, approximately two-thirds of cases in developing countries are of amoebic aetiology and three-fourths of cases in developed countries are pyogenic<sup>[1]</sup>.

Amoebiasis is presently the third most common cause of death from parasitic disease<sup>[2]</sup>. The condition is endemic in tropical countries like India due to poor sanitary condition and overcrowding. Amoebic liver abscess (ALA) accounts for 3–9% of all cases of amoebiasis<sup>[3]</sup>. However, pyogenic and tubercular aetiologies should always be entertained in the differentials. The incidence of tubercular liver abscess (TLA) has increased in recent past due to increased incidence of predisposing factors like alcoholism, immunodeficiency, irrational usage of antibiotics, and emergence of drug resistant bacilli.

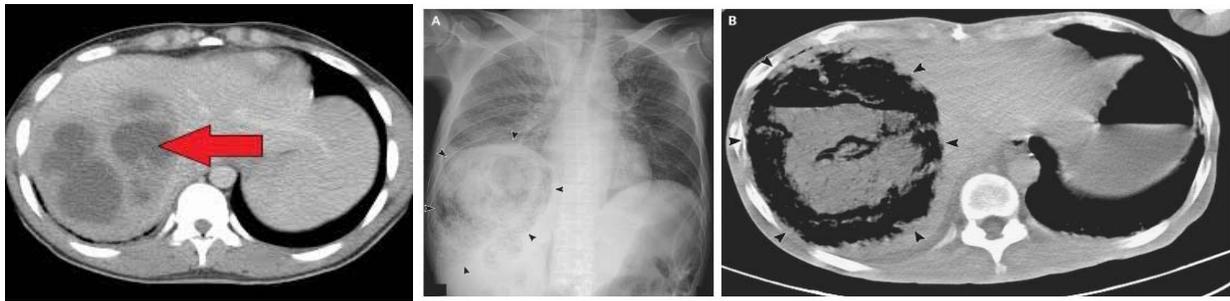
Surgical management was the mainstay for treating LA earlier<sup>[1]</sup>. However, recent evidences from percutaneous drainage procedure have shown a favorable outcome with less average length of stay in hospital compared to conservative mode of treatment<sup>[4]</sup>. In this context, precise diagnosis of the abscess aetiology is pivotal for appropriate management. The concept of the present study was to evaluate the changing trends in clinical profile, microbiological aetiology, and management outcomes of patients diagnosed with LA. Pyogenic liver abscess is a burning problem of tropical countries and remains a formidable diagnostic and therapeutic problem. If left untreated, the disease invariably runs a lethal course. The management of this disease varies considerably from surgeon to surgeon. Pyogenic liver abscess is a condition with significant mortality. The most common presenting clinical symptoms are upper abdominal pain, high-grade fever, nausea, and vomiting. Loss of appetite, jaundice, and respiratory symptoms are less frequent clinical features. These clinical features are variable depending on the size of the abscess, general health of the patient, associated diseases, and complications.

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The most common sign is right hypochondrial tenderness frequently with guarding and hepatomegaly. Some patients may present with jaundice, ascites, or pleural effusion. In majority of the cases, the underlying cause could not be identified. Biliary tract disease is reported to be the most frequent cause followed by portal circulation, arterial circulation, cryptogenic, and trauma.

Symptoms of liver abscess vary among individuals but most commonly include a combination of the symptoms listed below. In itself, a liver abscess is not life threatening, but it can become dangerous if it opens and spreads the infection. This can happen suddenly, so you should consult your health care provider if you have any of the following symptoms.

- Abdominal pain (especially in the upper right portion of the abdomen)
- Clay-colored stools
- Cough
- Dark urine



### Review Works

Liver is an important and vital organ of the body. This organ is subjected to numerous systemic infections viral, bacterial and parasitic and lies at the distal end of the portal circulation; it is therefore bathed with portal blood containing viruses, bacteria parasites, ova, products of digestion and other antigens [1].

Hepatic or liver abscesses are infectious, space-occupying lesions in the liver; the two most common abscesses being pyogenic and amoebic. Pyogenic liver abscess (PLA) is a rare but potentially lethal condition, with a reported incidence of 20 per 1, 00, 000 hospital admissions in a western population [2].

Amoebic liver abscesses (ALA) are common in tropical regions mainly where 'Entamoeba histolytica' is endemic and is more prevalent in individuals (mostly young males) with suppressed cell mediated immunity [3].

The etiology of biliary obstruction has some geographic differences: in Western countries this scenario is common in patients with malignant disease,4 while in Asia, gall stone disease and hepatolithiasis are more common.5 Between 15 to 55% patients in different series, no identifiable cause or source for PLA was found (hence called cryptogenic) [4-6]. There is an increase in the median age of patients with PLA in recent years that is mostly responsible for increased severity and mortality in spite of advancement in antibiotic therapy [6-7].

Ultrasound (USG) is the imaging modality used in the initial evaluation. The appearance on USG varies according to the stage of evolution of the abscess [8]. Initially the abscess is hyperechoic and indistinct, but with maturation and pus formation, it becomes hypoechoic with a distinct margin. When the pus is very thick, a fluid-containing lesion may be

- Diarrhea
- Fever or chills
- Joint pain
- Loss of appetite
- Malaise or lethargy
- Nausea with or without vomiting
- Pleuritis chest pain (hurts to breathe)
- Sweating
- Unexplained weight loss
- Yellowing of the skin and whites of the eyes (jaundice)

An x-ray, ultrasound, CT, or MRI may show the liver abscess. You may be given contrast dye to help the abscess show up better in the pictures. Tell the healthcare provider if you have ever had an allergic reaction to contrast dye. Do not enter the MRI room with anything metal. Metal can cause serious injury. Tell the healthcare provider if you have any metal in or on your body. The images is shown below:

confused with a solid lesion on USG. USG has a sensitivity of 75% to 95%, but has difficulty in detecting an abscess high in the dome of the right hemiliver and especially multiple small PLAs. By showing gallstones, dilated bile ducts, and hepatolithiasis, USG has the advantage of imaging underlying biliary tract pathology. A computed tomography (CT) scan is more accurate than USG in the differentiation of PLA from other liver lesions and is reported to have a sensitivity of approximately 95%.8 The portal venous phase using intravenous contrast material gives the best differentiation between the liver and the abscess, with the periphery of the PLA having contrast enhancement as opposed to non-enhancement of the central portion. The advances in USG and CT that provide earlier and more accurate diagnosis also have enabled these modalities to facilitate treatment through guided aspiration and drainage, shifting management away from open surgery to minimally invasive techniques. Percutaneous drainage combined with antibiotics has become the first line and mainstay of treatment for most PLAs.

### Process of Treatment

Routine aspiration of liver abscess is not indicated for diagnostic or therapeutic purposes.25 A combination of USG findings with a positive serology in the appropriate clinical setting is adequate to start drug therapy. Aspiration has been indicated in the following circumstances:

- Lack of clinical improvement in 48 to 72 hours
- Left lobe abscess
- Large abscess having impending rupture / compression sign
- Thin rim of liver tissue around the abscess

Some people can be successfully treated for PLA with antibiotics alone. Most, however, need drainage of the abscess. This involves inserting a needle or tube into the abscess and removing the pus. Your doctor may also perform a liver biopsy at the same time by taking a sample of your liver. This helps your doctor determine the overall health of your liver, and it's performed with the aid of a CT scan.

Doctors try to treat PLA without surgery if possible to prevent the risk of bacteria spreading through the body. However, in more severe cases, surgery may be required to fully remove the abscess materials.

After surgery you'll be treated with antibiotics for several weeks to avoid recurring infection.

The main complication of PLA is sepsis, which is a body-wide bacterial infection that causes inflammation and a dangerous drop in blood pressure. If it's not treated promptly with antibiotics, sepsis can be fatal.

PLA drainage and surgery have a risk of spreading bacteria throughout your body. This may cause widespread infection or the formation of abscesses in other organs.

Bacteria released and spread throughout the body can cause:

- septic pulmonary embolism when a bacteria stimulates a clot in one or more arteries in the lungs
- brain abscess, which causes permanent neurological damage
- endophthalmitis, which is an infection in the inner part of the eye that may lead to vision loss

Treatment for liver abscess may cause unpleasant effects. Draining the abscess may spill the pus into your abdomen (stomach) and may cause a severe infection. Medicines may cause side effects, such as itching, nausea, vomiting, or seizures (convulsions). If left untreated, your problems could get worse and may be life-threatening. Fluid could gather between the lungs and the ribs causing breathing problems. The abscess may burst and spread the infection throughout the body.

Patient may be given the following medicines:

- **Antibiotics:** This medicine is given to help treat or prevent an infection caused by bacteria.
- **Antifungal medicine:** This medicine helps kill fungus that can cause illness.
- **Antinausea medicine:** This medicine may be given to calm your stomach and prevent vomiting.
- **Antiparasitic medicine:** This medicine may be given to kill parasites. Parasites are living things that feed or eat off of other living things.
- **Pain medicine:** Caregivers may give you medicine to take away or decrease your pain.
- Do not wait until the pain is severe to ask for your medicine. Tell caregivers if your pain does not decrease. The medicine may not work as well at controlling your pain if you wait too long to take it.
- Pain medicine can make you dizzy or sleepy. Prevent falls by calling a caregiver when you want to get out of bed or if you need help.

#### You may need any of the following tests

- **Blood tests:** You may need blood taken to give caregivers information about how your body is working. The blood may be taken from your hand, arm, or IV.

- **Computerized tomography scan:** This is also called a CT scan. A special x-ray machine uses a computer to take pictures of your abdomen, including your liver. You may be given dye through an IV before the pictures are taken so that your organs show clearly. People who are allergic to iodine or shellfish (lobster, crab, or shrimp) may be allergic to some dyes. Tell your caregiver if you are allergic to shellfish or have other allergies or health problems.
- **Liver scan:** This is a test to look at your liver. You are given a small amount of dye in your IV. Pictures are then taken by a special scanner that can see the dye in your body. The dye soaks up more in abnormal areas of the liver.
- **Magnetic resonance imaging test:** This test is also called an MRI. It uses magnetic waves to look at the liver. You will need to lie still during an MRI. Never enter the MRI room with an oxygen tank, watch, or any other metal objects. This can cause serious injury.

#### Ultrasound

- **Abdominal ultrasound:** This test is done so caregivers can see the tissues and organs of your abdomen. Gel will be put on your abdomen and a small sensor will be moved across your abdomen. The sensor uses sound waves to send pictures of your abdomen to a TV-like screen.
- **Doppler ultrasound:** This is a test that uses sound waves to see your veins on a TV-like screen. A doppler ultrasound study may also be called a duplex scan. Caregivers look for clots in the veins near the area of your pain and redness. You also may be able to hear your blood flow during this test.

#### X-rays

- **Abdominal x-rays:** Abdominal x-rays are pictures of the organs inside your abdomen. Caregivers use these pictures to look for problems such as blocked or ruptured intestines, kidney stones, or solid masses (tumors) in your organs.
- **Chest x-ray:** This is a picture of your lungs and heart. Caregivers use it to see how your lungs and heart are doing. Caregivers may use the x-ray to look for signs of infection like pneumonia, or to look for collapsed lungs. Chest x-rays may show tumors, broken ribs, or fluid around the heart and lungs.

#### Treatment

- **Catheter drainage:** Caregivers make an incision (cut) into your abdomen, over your liver. With an ultrasound or CT as guide, a catheter (tube) is inserted in the cut and into the abscess. Draining the abscess may clean out any pus in your abdomen. The incision will be closed with thread or staples. The catheter may be sutured (sewn) to the skin to prevent it from moving. The catheter may need to be flushed with a saline (salt-water) solution once in a while.
- **Needle aspiration:** Caregivers may do a needle aspiration to suck the fluid out of the abscess. With an ultrasound or CT as guide, a needle is put through your skin over your liver and into the abscess. The fluid is removed and sent to the lab for tests.
- **Surgery:** Surgery to open your abdomen may be done if other forms of treatment have failed. It may also be

done if the abscess is very large or if there are multiple lesions. Caregivers may do surgery to look for and correct problems inside your abdomen. This may include removing bile duct stones or cleaning pus if the abscess bursts.

### Conclusions

This paper presents an overview of liver abscesses. Initially it discusses the symptoms of the diseases and explains the reason for the disease. Finally the process of treatment was explained.

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