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An Overview of Pyogenic Liver Abscess

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Abstract

Pyogenic liver abscesses are uncommon conditions that present diagnostic and therapeutic challenges to physicians. If left untreated, these lesions are invariably fatal. Liver abscesses have been recognized since the age of Hippocrates. In 1883, Koch described amebae as a cause of liver abscess. In 1938, Ochsner and Debakey published the largest series of pyogenic and amebic liver abscesses in the literature. Since the late 20th century, percutaneous drainage has become a useful therapeutic option.

Keywords: Pyogenic Liver abscess; Causes, Diagnosis; Treatment

Introduction

A Pyogenic Liver Abscess (PLA) is a pocket of pus that forms in the liver due to a bacterial infection. Pus is a fluid composed of white blood cells and dead cells that typically forms when your body fights off infection. In the case of PLA, instead of draining from the infection site, the pus collects in a pocket inside the liver. An abscess is usually accompanied by swelling and inflammation in the surrounding area. It can cause pain and swelling in the abdomen.

When pyogenic liver abscesses develop, it is most commonly following peritonitis due to leakage of intraabdominal bowel contents with subsequent spread to liver via the portal circulation or in the setting of biliary infection via direct spread. They may also result from arterial hematogenous seeding in the setting of systemic infection. A pyogenic liver abscess can be fatal if it's not treated promptly [1-3].

Pathophysiology

Pyogenic bacteria can gain access to the liver through direct extension from contiguous organs or via the portal vein or hepatic artery. Hepatic clearance of bacteria via the portal system appears to be a normal phenomenon in healthy individuals; however, organism proliferation, tissue invasion, and abscess formation can occur with biliary obstruction, poor perfusion, or micro-embolization [4].

Microbiology

The organisms isolated most often are included below [4]. Most abscesses contain more than one organism and frequently are of biliary or enteric origin. Blood culture results are positive in 33-65% of cases, with positive results from abscess cultures reported in 73- 100% of series. *Escherichia coli* is the most commonly isolated organism in Western series, whereas *Klebsiella pneumoniae* has emerged as a common isolate in patients with diabetes in Taiwan. The microorganisms most commonly isolated from blood and abscess cultures are as follows

- *E. coli* - 33%
- *K. pneumoniae* - 18%
- *Bacteroides* species - 24%
- Streptococcal species - 37%
- *Microaerophilic streptococci* - 12%

Causes

The most common cause of PLA is biliary disease. This is a broad term for conditions in the biliary tree affecting the liver, pancreas, and gallbladder. According to Johns Hopkins Medicine an infected, inflamed common bile duct is associated with up to 50% of liver abscesses [4]. According to research published in Clinical Infectious Diseases, people with diabetes mellitus are at 3.6 times the risk for this condition because they're often more susceptible to infection.

There are many possible causes of liver abscesses, including:

- Abdominal infection, such as appendicitis, diverticulitis, or a perforated bowel;
- Infection in the blood;
- Infection of the bile draining tubes;
- Recent endoscopy of the bile draining tubes;
- Trauma that damages the liver;
- Colon cancer;
- Pancreatic cancer.

A number of common bacteria may cause liver abscesses. In most cases, more than one type of bacteria is found.

Symptoms

PLA symptoms resemble those of gallbladder inflammation or massive infection. They may include [4]:

- Chest pain (lower right);
- Pain in the right upper abdomen (more common) or throughout the abdomen (less common);
- Clay-colored stools;
- Dark urine;
- Fever, chills, night sweats;
- Loss of appetite;
- Nausea, vomiting;
- Unintentional weight loss;
- Weakness;
- Yellow skin (jaundice).

Diagnosis

Tests may include [4]:

- A CT scan with intravenous contrast, or injected dye, to find and measure the abscess.
- MRI of the abdomen.
- An abdominal ultrasound to locate an abscess.
- Blood cultures for bacterial growth to determine which antibiotic(s) you need
- Complete Blood Count (CBC)/ blood tests to look for signs of infectious inflammation, such as an increased serum white blood count and neutrophil level.
- Liver biopsy.
- Liver Function Tests [LFT].

Treatment

Treatment usually consists of placing a tube through the skin to drain the abscess. Less often, surgery is needed. You will also receive antibiotics for about 4 to 6 weeks. Sometimes, antibiotics alone can cure the infection.

Some people can be successfully treated for PLA with antibiotics alone. Most, however, need drainage of the abscess, which is considered to be the ideal therapy for PLA. This involves inserting a needle and possibly placing a drainage catheter into the abscess to remove the infection-containing pus. Your doctor may also perform a liver biopsy at the same time by taking a sample of your liver tissue. This helps your doctor determine the overall health of your liver. These invasive diagnostic and interventional procedures are performed with CT scan or ultrasound guidance.

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 material.

After surgery you'll be treated with antibiotics for several weeks to help fully remove the infection. According to a review article in Clinical Liver Disease, parenteral (intravenous) antibiotics followed by oral antibiotics are used to treat and manage PLA. The initial course of intravenous antibiotics aids in the initial healing process. Several weeks of taking strong antibiotics by mouth can help you heal after you've had a good clinical response to surgical and parenteral antibiotic therapies [5].

Prognosis

This condition can be life threatening. The risk for death is higher in people who have many liver abscesses.

Complications

The main complication of PLA is sepsis, which is a severe infection that causes severe systemic inflammation. This can lead to a dangerous drop in blood pressure. If it's not treated promptly with antibiotics and intravenous fluid, sepsis can be fatal. PLA drainage and surgery have a risk of spreading bacteria throughout the 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, which occurs when a bacterium stimulates a clot in one or more arteries in the lungs.
- Brain abscess, which can cause permanent neurological damage.
- Endophthalmitis, which is an infection in the inner part of the eye that may lead to vision loss.

Conclusion

Pyogenic liver abscess is a challenging disease with high rate of postoperative morbidity. Most of the abscesses are unique and situated in the right lobe of the liver. The imaging techniques, especially ultrasound exam and CT-scan, are essential for the diagnosis and the treatment of liver abscesses. The treatment is usually surgical, by open or laparoscopic approach; in selected patients the percutaneous approach can be performed.

The pyogenic liver abscess has subacute evolution which makes the diagnosis more difficult. Image exams have high sensitivity, particularly computed tomography. Percutaneous drainage associated with antibiotic therapy is safe and effective therapeutic resource.

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