Case report: liver abscess pyogenic after peritonitis appendix perforation

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Abstract. Two of the most common liver abscess is amoebic liver abscess and pyogenic liver abscess (PLA). PLA could be as singular or multiple abscesses. It is usually caused by Klebsiella pneumonia and Escherichia coli. Historically, PLA is usually caused by acute appendicitis, but with the development of surgical practice and microbiology, the number of events has decreased. Here we present a case of a 39-year-old woman that developed a PLA after she had an appendectomy about six months ago. An ultrasonogram and abdominal scan showed an abscess in the right lobe. We performed paracentesis, and the result from the pus culture was positive for Escherichia coli with Extended-Spectrum Beta-Lactamase (ESBL) (+) that showed the same as the culture from lesion taken from her appendix. This report emphasizes the fact that, nowadays we still found Pyogenic liver abscess after peritonitis appendix perforation.

1. Introduction

Pyogenic liver abscess (PLA) caused by a bacterial infection in the liver parenchyma consists of inflammatory cells and in the formed of a collection of pus. Historically, PLA is usually caused by acute appendicitis, but with the development of surgical practice and microbiology, the number of events has decreased. In Asian, studies have reported a high prevalence of Gram-negative organisms like Klebsiella pneumonia and Escherichia coli.

In diagnosing liver abscess we usually used abdominal ultrasonography and computerized tomography, and we confirmed it by image-guided percutaneous aspiration and drainage, and then we cultured the pus to get the appropriate therapy according to the culture and antimicrobial.

Today the combination of percutaneous drainage techniques and antimicrobial therapy is the first choice of treatment for liver abscess. If not by this treatment, it could lead to the fatal condition. Here we report a case of PLA after peritonitis appendix perforation in woman patient and review the related literature.

2. Case Report

A 39-year-old woman came to Adam Malik Hospital with right upper quadrant abdominal pain since a month ago. The pain was continuous and accompanied by the swelling on the abdomen. On further history, she reported fever, nausea, and loss of 5 kg of weight since last month. She had been admitted to other hospital and was diagnosed with liver abscess, with hepatocellular carcinoma as a differential diagnosis right after an ultrasonography examination was done. The patient had a history of...
appendicitis and appendectomy was performed six months ago. The patient had no family history of cancer.

On general physical examination, the patient was fully alert with a blood pressure of 110/70 mmHg, heart rate of 100 beats per minute, respiratory rate of 20 breaths per minute, and the temperature was 37.4°C. On abdominal physical there was hepatomegaly; the liver was palpable two fingers below the arch of the costae and three fingers below the xiphoid process, and the abdomen was soft and tender. The remaining of the physical examination was non-contributory.

Blood examination was after initial examination showing a hemoglobin of 7.3 g/dL, red blood cell count of 12.310/L and hematocrit of 22%. Aspartate aminotransferase and gamma-GT became increase (27 U/L and 84 U/L respectively), while albumin became decrease (3.2 g/dL).

The initial diagnostic test ordered was a chest radiograph, which showed a normal appearance. An ultrasound was subsequently performed and showed an HCC mass, liver abscess, and splenomegaly. The patient then underwent a computed tomography (CT) of the chest, abdomen, and pelvis to determine the extent of the pulmonary and hepatic diseases. CT scan revealed an appearance of hepatosplenic omegaly with multiple liver abscesses and minimal pleural effusion.

Paracentesis was carried out, and pus culture was performed to detect the presence of bacteria or fungus. We found 400cc reddish yellow like caseous necrosis and then the aspirate was for microbiological investigation.

![Figure 1. Paracentesis.](image1)

![Figure 2. Reddish yellow colored pus aspirated.](image2)

We performed aerobic and anaerobic culture, eosin and Lugol staining to find amoebic and both showed anegative result, but on the aerobic culture, we found Escherichia coli with ESBL (+). The patient was treated with Ampicillin sulbactam 1.5 gram/8 hours for seven days.

3. Discussion
Historically, PLA is usually caused by acute appendicitis, but with the development of surgical practice and microbiology, the number of events has decreased, because of that, nowadays PLA is a rare complication in patients who have had an appendectomy.\(^{1,3,5,6,10}\) The organism can enter into the liver via vessels of the bile ducts or even directly by contiguity.\(^{5,7}\) In Asia, studies have reported a high prevalence of Gram-negative organisms like Klebsiella pneumonia and Escherichia coli. It is similar to our case, in which we found Escherichia coli as the result of the culture. Patients who had E coli as the result of the pus culture are more likely to be older and female, have pleural effusion, malignancy or a biliary abnormality with multi-drug resistant organism\(^{1}\) Our patient was a 39-year-old woman, had no family history of cancer, and got appendectomy six months ago. To our knowledge, this delayed presentation has not been explained, and this complication nowadays is very infrequent, but it is important for us to remember that cases of post-appendectomy-PLA do exist.
It could be difficult to diagnose liver abscess at the right time because most of the symptoms which caused by infection are similar and non-specific. Most of the signs and symptoms reported are fever, abdominal pain, hypotension, weight loss, jaundice, ascites, right pleural effusion, hepatomegaly, diarrhea, and anorexia. Similar to our case, the patient was with abdominal pain, hepatomegaly, ascites, subfebrile, nausea, loss of weight, pleural effusion and tachycardia.

Based on the laboratory tests result, about 70% of patients with liver abscess showed an elevated level of alkaline phosphatase, 50% of patients showed an increasing level of bilirubin, and 48% of patients showed the increasing concentration of aspartate aminotransferase. In other laboratory tests, leukocytosis, anemia (normochromic normocytic), and hypoalbuminemia were observed. We also found bacteremia in one-third to half of the patients. Our patient presented with anemia, leucocytosis, hypoalbuminemia, and increased level of AST.

Indiagnosing liver abscess, we usually use abdominal ultrasonography and computerized tomography, and confirmed the diagnosis with image-guided percutaneous aspiration and drainage and then we culture the pus to achieve the correct treatment according to the culture and antibiotic susceptibility test. On ultrasonography findings, PLA showed a hypoechogenic lesion, and the lesion which located at the top of the right bus is usually difficult to identify. On abdominal scanning, PLA showed low-density lesion. On abdominal scanning with contrast showed peripheral enhancement. If we find multiple abscesses, we could suspect it as a PLA. In our case, CT scan of the patient revealed an appearance of multiple abscesses.

Today the combination of percutaneous drainage techniques and antimicrobial therapy is the first choice of treatment for liver abscess. If not by this treatment, it could lead to the fatal condition. In case of unavailability of culture result, one of the recommended regimens with the source of infection from the intestine is the combination of Beta-lactam and inhibitor-activity of beta-lactamase, therefore this combination can also treat the anaerobic infection. Percutaneous drainage is done if the abscess larger than 5 cm. The other criteria in which we do percutaneous drainage include: continuous pyrexia after 48 – 72 hours of adequate therapy and clinical or ultrasonographic showed impending perforation. Surgical drainage could be considered if percutaneous drainage failed, unimproved jaundice, decreased renal function, and multiocular abscess. Nowadays surgical drainage is being done laparoscopically.

In our case, we got Escherichia coli ESBL (+) from the culture, and the patient was treated with ampicillin-sulbactam 1.5 gram/8 hours and the patient improved after 7 days of therapy.

4. Conclusion
Nowadays PLA is a rare complication in patients who have had appendectomy with the development of surgical practice and microbiology. In Asian, studies have reported a high prevalence of Gram-negative organisms like Klebsiella pneumonia and Escherichia coli. Today the combination of percutaneous drainage techniques and antimicrobial therapy is the first choice of treatment. It needsto perform amicrobial culture to confirm the diagnosis in a case of non-resolving liver abscess in order to treat the patientas soon as possible.

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