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Case report

Successful treatment of giant perinephric abscess associated with decompensated cirrhosis caused by hepatitis B and alcohol consumption: A case report

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HIGHLIGHTS

- Infection is associated with high mortality in patients with cirrhosis.
- Perinephric abscess can be associated with cirrhosis.
- The giant PNA in patient with cirrhosis can be cured after drainage combined with prompt use of appropriate antibiotics.
- Timely detection and draninage combined antibiotics treatment of the abscess is a successful strategy.

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ABSTRACT

We describe the case of a 67-year-old male with decompensated liver cirrhosis caused by hepatitis B virus and alcohol consumption who presented with diarrhea and fever. Contrast CT of the abdomen revealed giant perirenal abscess. *Klebsiella pneumoniae ssp pneumoniae* was cultured from pus in perirenal abscess but not the blood. Haematogenous spread may have resulted in perirenal abscess in this case. The patient was successfully treated by percutaneous drainage, antimicrobial therapy and albumin infusion. With high mortality rates, early diagnosis and effectively treatment of perirenal abscess is required to improve the prognosis of patients.

1. Introduction

Perinephric abscess (PNA) is a collection of suppurative material located between Gerota's fascia and the renal capsule that is usually caused by urinary tract infection or hematogenous dissemination (Coelho et al., 2007; Liu et al., 2016). PNA is commonly associated with diabetes, cirrhosis, and immunosuppression (Lee et al., 2008). Most patients with PNA present with pain and fever, while a few patients had atypical symptoms, therefore the diagnosis can be challenging (Lin et al., 2008; Meng et al., 2002). Patients with liver cirrhosis have the increased infection risk due to their impaired immune function (Jalan et al., 2014). Infection can aggravate the damage of liver function and increase the mortality of patients with liver cirrhosis. Timely and effective treatment of infection in cirrhosis patients is very important for the prognosis of patients (EASL., 2017; Xie., 2018). We herein report a patient with giant PNA caused by *Klebsiella pneumoniae ssp pneumoniae* associated with decompensated cirrhosis caused by hepatitis B complicated by alcoholism., The patient was successfully treated with percutaneous drainage, antibiotic therapy and albumin infusion.

1.1. Case report

A 67-year-old male presented with ten days of diarrhea. He complained of diarrhea of yellow watery stool about ten times per day, accompanied with fatigue, poor appetite and abdominal distention. His medical history of decompensated cirrhosis caused by Hepatitis B complicated with alcoholism for 5 years. He had been taking entecavir orally against hepatitis B virus and HBV-DNA loading remained negative. On admission, he was alert and oriented with uncomfortable appearance. Physical examination revealed his body temperature was 38.6 °C, blood

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pressure at 124/75 mmHg, pulse rate at 95 beats per minute, respiratory rate at 20 breaths per minute and oxygen saturation 98%. His skin and sclera were obvious jaundice. Cardiopulmonary examination did not reveal abnormal findings. The abdomen was distended with high tension. He has edema of both lower limbs.

Laboratory test results on admission were notable for elevated C-reactive protein (59.32 mg/L), procalcitonin (0.63 ng/ml) and anemia (hemoglobin concentration, 11.6 g/dL). Although the white blood cell count was normal but the percentage of neutrophils was increased (white blood cell count, 793/mm^3 with 80.6% neutrophils, 8.4% lymphocytes, and 10.1% monocytes). Liver function test showed hypoproteinemia (albumin 24.4 g/L) and elevated serum bilirubin levels (total bilirubin, 55.6 umol/L, direct bilirubin, 25.6 umol/L). Coagulation profiles were marked abnormal, with prolonged prothrombin time (18.3 s) and active partial thromboplastin time (44.7 s), decreased prothrombin activity (54%). International normalized ratio was 1.51 and D-dimer was 7004.4 ng/ml. There were no other abnormal data (hematocrit, 33.5%; platelets, 124 000/mm^3; serum electrolytes, blood urea nitrogen, amylase, lipase, liver enzymes, urinalysis were within normal limits). Blood, stool and ascites cultures were all negative. Laboratory test results revealed severe liver dysfunction, the Child–Pugh score 11 points, Model for End-stage Liver Disease (MELD) score 16 points.

Chest CT scan revealed scattered pneumonia of both side and small amount of bilateral pleural effusion. Contrast-enhanced CT of the abdomen and pelvis revealed liver cirrhosis, splenomegaly, massive ascites (Figure 1A upper panel). CT also revealed a low-density cystic mass with peripheral rim and septal enhancement in the right posterior perinephric space (Figure 1A). The range of the largest layer was 9.2 cm * 4.8 cm in the axial sections (Figure 1A middle panel). The abscess involved the right psoas major muscle and extended downward to the iliac fossa, with an upper and lower diameter of about 15.8 cm in the coronal sections (Figure 1A lower panel).

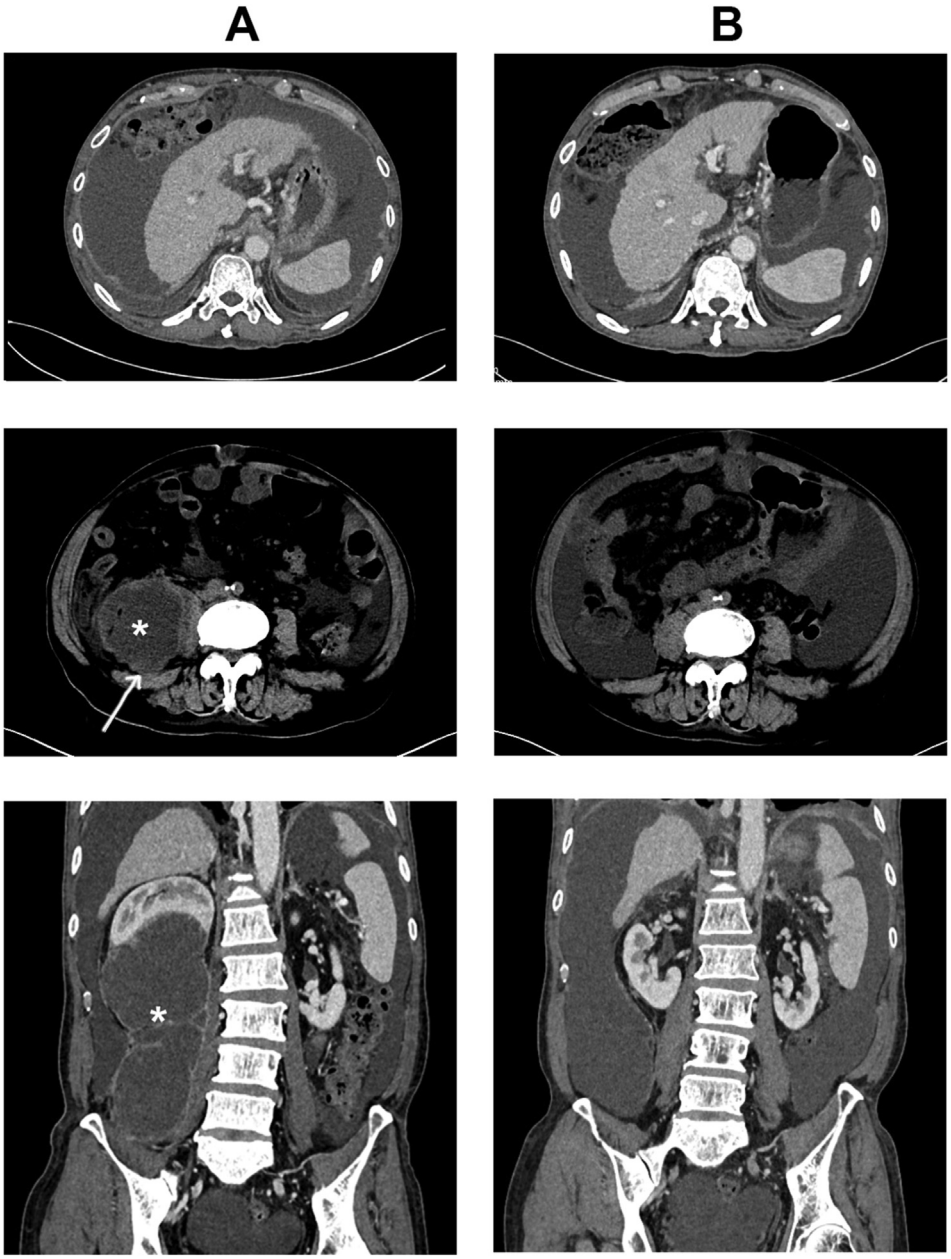

Figure 1. CT scan of the abdomen. A. Upper panel: liver cirrhosis, large amount of ascites was shown. The lesion in the area of the right kidney was shown in the axial sections (middle panel) and coronal sections (lower panel) of the CT scan. The lesion is marked by *. The arrow indicates the drainage path. B. CT follow-up of the abdomen two months after the patient was discharged.

The patient was treated empirically with 4.5 g of piperacillin tazobactam per 8 h a day from the second day after his admission. The 10 g albumin was intravenous infusion per day. Abdominal puncture was performed on the patient to extract light yellow clarified ascites. Percutaneous drainage guided by ultrasound was performed and 125 ml of grayish white pus was sucked out. The results of abscess culture showed that *Klebsiella pneumoniae ssp pneumoniae.* Antibiotic resistance testing of *Klebsiella pneumoniae ssp pneumoniae* showed that the bacteria were sensitive to most of the antibiotics except ampicillin. However, his symptoms did not improve and was accompanied with loss of appetite.

The follow-up CT showed a persistent PNA along the posteroinferior aspect of the right kidney and the size of the PNA was not decreased. A 12-French pigtail drainage catheter was inserted. On the first day after catheterization, 100 ml pus was pumped from the catheter, and the amount of pus pumped once a day gradually decreased. The drainage catheter was kept in the PNA for 18 days until there was no pus that could be sucked out. At the same time, the patient was treated with same dose of piperacillin tazobactam as previous and albumin. Antimicrobial treatment was prolonged to more four weeks and then the patient was making satisfactory progress and was discharged on day 46. Two months later, abdominal CT showed that although liver cirrhosis and ascites still existed (Figure 1B upper panel), the perinephric abscess had been completely absorbed (Figure 1B middle and lower panel).

2. Discussion

Bacterial infections are very common in patients with liver cirrhosis, especially in decompensated cirrhosis, which might be associated with immune dysfunction, altered gut microflora, bacterial translocation and genetic factors. Infections accelerate the progression of liver failure, developing liver-related complications. Infection is also associated with high mortality in patients with cirrhosis (Zaccherini et al., 2020; Gustot et al., 2017). Spontaneous bacterial peritonitis, urinary tract infections and pneumonia are the most frequent infections in patients with decompensated cirrhosis (Fernández et al., 2019). Bacterial translocation to the systemic circulation could cause the infection of other organs, even deep abscesses, which are characterized by high mortality rate and complications (Bartoletti et al., 2016). Early diagnosis and timely and appropriate antibiotic treatment are the key to the management of bacterial infection in liver cirrhosis, while delayed and inappropriate treatment is related to increased mortality.

PNA often show diversity of clinical manifestation. It is reported that in most cases, PNA result from rupture of renal abscess, most of which occur secondary to renal tract calculi with ascending UTIs, while approximately 30% of PNAs come from hematogenous dissemination (Shu et al., 2004). Diagnosis of PNA remains challenging because the symptoms can be variable or insidious. The patients can show fever, anorexia, nausea and vomiting, flank pain, signs of sepsis, weight loss, and urinary tract complaints. Ultrasonic or CT examination help finding perinephric occupying lesions. Antimicrobial therapy alone might not effectively cure PNA with large size. The combination of antimicrobial therapy and drainage, including open surgical drainage, percutaneous and laparoscopic-assisted drainage have been most frequently used (Ko et al., 2011; El-Nahas et al., 2010). Drainage is also helpful for identifying the pathogenic microorganism since urine and blood cultures show positive growth in less than half the cases.

In our case, the patient has the history of decompensated cirrhosis for five years. This time, he showed diarrhea and mild-type of fever, and rapidly growing ascites in the short term with high abdominal tension. The Child–Pugh score and MELD score both showed that the patient was in the late stage of liver disease. The CT scan showed liver deformation and shrinkage, ascites, pneumonia and giant PNA. PNA of the patient probably came from hematogenous dissemination after intestinal infection or pneumonia. The large abscess size, decompensated cirrhosis with severe liver functional lesion, and old age had been associated with poor response to antibiotic treatment. The patient also could not bear open surgical drainage. Percutaneous drainage combined with antibiotic therapy worked well on him. The choice of initial empirical antibiotics should be based on the type, severity and origin of infection and on the local epidemiological data about antibiotic resistance. About 20% of the isolates from gram-negative bacterial bloodstream infection in liver cirrhosis patients were *Klebsiella pneumoniae* (Xie et al., 2018). It is also worth noting that the incidence of multidrug-resistant (MDR) gram-negative bacteria has been increasing in recent years, leading to antibacterial therapy failures and poor outcomes. Fortunately, although the pus culture showed *Klebsiella pneumoniae ssp pneumoniae*. Antibiotic resistance testing showed that *K. pneumoniae pneumonia subspecies* in this case were sensitive to most of the antibiotics. In spite of this, considering severe liver function and poor immunity of this patient, we insisted on using piperacillin tazobactam on him for 45 days.

Patients with decompensated liver cirrhosis have low serum albumin, resulting in ascites which could lead to the translocation of enteric gram-negative bacilli. Severe infection aggravated liver injury and further decreased albumin. Daily albumin infusion also plays a great role in the therapy of this case. Albumin might improve hemodynamics by its permeability, immunomodulation, antioxidation and endothelium stabilization capacity (Garcia-Martinez et al., 2013).

In conclusion, we present the complicated case of a 67-year-old male patient with decompensated cirrhosis history with giant PNA caused by *Klebsiella pneumoniae ssp pneumoniae*, successfully treated by drainage, antibiotics and albumin infusion. Clinicians should be aware of the formation of deep abscess in patients with liver cirrhosis who have signs of infection.

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Declarations

Author contribution statement

All authors listed have significantly contributed to the investigation, development and writing of this article.

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Data availability statement

Data included in article/supp. material/referenced in article.

Declaration of interest's statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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