

LIVER ABSCESS CAUSED BY KLEBSIELLA PNEUMONIAE, SERIES OF CASES WITH DIFFERENT MANAGEMENT

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Abstract

We present two cases of liver abscess caused by Klebsiella pneumoniae with different management, one of them resolved under antibiotherapy without therapeutic drainage.

Klebsiella pneumoniae is a gram-negative, lactose-fermenting, rod-shaped bacterium that is part of natural intestinal flora and one of the common causes of nosocomial infections. The liver is one of the viscera in which abscesses frequently occur and is associated with intraabdominal or hepatobiliary diseases.

The first patient was admitted to „Prof. Dr. Agrippa Ionescu” Hospital with sepsis due to liver abscess. The CT examination revealed a liver lesion in segments VI-VII, limited by a hypodense margin with fluid-parafluid content (with maximal axial diameters 54/32 mm), without any other focal hepatic lesions. Laboratory workup revealed neutrophilia and lymphopenia, anemia, trombocytopenia, increased inflammatory syndrome, a high level of procalcitonin and blood cultures positives with Klebsiella pneumoniae sensitive. Based on the information presented, the diagnosis established was liver abscess caused by Klebsiella pneumoniae with favorable outcome under initial empirical antibiotherapy with Vancomycin and Meropenem, de-escalated later to I.V. Ceftriaxone, due to the result of the antibiogram. At the 14 day mark, an abdominal CT reveals a slight dimentional progression. Percutaneous ecographic guided drainage was considered but the patient denied it. The patient was released with the antibiotherapy recomandation of 14 more days of orally administered Cefixime. After 4 weeks of antibiotherapy treatment, the patient is ecographically reassessed. The liver abscess is observed to have achieved complete remission without drainage, despite the classical literature recommended protocol.

The second case, a male patient admitted with sepsis due to multiple liver abscess (the largest one 100/50 mm with negative blood cultures and unfavorable outcome, despite maximal empirical therapy. Percutaneous ecographic guided drainage was performed and Klebsiella pneumoniae was isolated from the drainage samples. Under target antibiotherapy with Ertapenem for 4 weeks the outcome was very good with complete resolution of the hepatic lesions.



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Hepatic abscess is associated with a high mortality rate and several complications, despite its low incidence. Prompt recognition is important for effective management and achieving good outcomes. Usually, the liver abscess is treated by either percutaneous drainage or surgical drainage in combination with antibiotics. The key to successful outcomes is early diagnosis, institution of appropriate therapy and attentive evolution monitoring. More prospective trials with large cohorts are needed to refine our understanding of this serious condition.

Keywords: liver, abscess, antibiotherapy, percutaneous, drainage

Rezumat

Prezentăm două cazuri de abces hepatic cauzat de Klebsiella pneumoniae, cu management diferit, unul dintre ele rezolvat sub antibioterapie fără drenaj terapeutic.

Klebsiella pneumoniae este o bacterie gram-negativă, în formă de bastonaș, care face parte din flora intestinală naturală și reprezintă una dintre cauzele comune ale infecțiilor nosocomiale. Ficatul este unul dintre viscerale în care apar frecvent abcese, asociate cu afecțiuni intraabdominale sau hepatobiliare.

Primul pacient a fost internat la Spitalul „Prof. Dr. Agrippa Ionescu” cu sepsis prin abces hepatic. Examenul CT a evidențiat o leziune hepatică în segmentele VI-VII, cu conținut lichid-parafloid, delimitată de o margine hipodensă (cu diametre axiale maxime 54/32 mm), fără alte leziuni hepatice focale. Examenele de laborator au evidențiat neutrofilie și limfopenie, anemie, trombocitopenie, sindrom inflamator t, nivel ridicat de procalcitonină și hemoculturi pozitive pentru Klebsiella pneumoniae. Pe baza informațiilor prezentate, a fost stabilit diagnosticul de abces hepatic cauzat de Klebsiella pneumoniae, cu răspuns terapeutic favorabil sub antibioterapie empirică inițială cu Vancomicină și Meropenem, ulterior Ceftriaxonă I.V., datorită rezultatului antibiogrammei. La 14 zile, un CT abdominal dezvăluie o ușoară progresie dimensională. S-a luat în considerare drenajul ecografic percutan ghidat, dar pacientul a refuzat. După 4 săptămâni de antibioterapie, pacientul este reevaluat ecografic. Se observă remisia completă a abcesului hepatic fără drenaj, în ciuda protocolului recomandat de literatura de specialitate.

Al doilea caz, un pacient de sex masculin internat cu sepsis din cauza abceselor hepatice multiple (cel mai mare 100/50 mm cu hemoculturi negative și evoluție nefavorabilă, în ciuda terapiei empirice maxime. S-a efectuat drenaj ecografic percutan ghidat și a fost izolată Klebsiella pneumoniae. Sub antibioterapie țintită cu Ertapenem timp de 4 săptămâni rezultatul a fost foarte bun, cu rezoluția completă a leziunilor hepatice. În ciuda incidenței scăzute, abcesul hepatic este asociat cu o rată ridicată a mortalității și apariția de complicații.

Recunoașterea promptă este importantă pentru un management eficient și pentru obținerea unor rezultate bune. De obicei, abcesul hepatic este tratat fie prin drenaj percutan, fie prin drenaj chirurgical în combinație cu antibiotice. Cheia succesului este diagnosticul precoce, instituirea terapiei adecvate și monitorizarea atentă a evoluției. Sunt necesare mai multe studii prospective cu cohorte mari pentru a ne rafina înțelegerea despre această afecțiune gravă.

Cuvinte cheie: ficat, abces, antibioterapie, percutanat, drenaj.

Introduction

A liver abscess is a localised, often encysted, purulent inflammation with parenchymal necrosis. The majority of these abscesses are classified as pyogenic or amoebic, although a minority are caused by parasites and fungi. Liver abscesses may be single or multiple; most are located in the right lobe of the liver. Although the incidence of liver abscesses is low, it is important to recognise and treat these lesions early as there is a significant risk of mortality in untreated patients. The pathogenic factor responsible for the development of abscesses can be identified by collection of the lesion contents or by culture of blood, bile, and sometimes urine or stool samples. Diagnosis is made by serological, imaging and microscopic tests^(1,2). The etiological factors of pyogenic liver abscess (PLA) are Gram-negative or positive bacteria, which are mainly the intestinal microbiota. The most common pathogens are: *Escherichia coli*, *Klebsiella pneumoniae*, *Enterococcus faecalis*, *Staphylococcus aureus* and *Streptococcus haemolyticus*. *Klebsiella pneumoniae* is often isolated in Southeast Asia in people with colorectal cancers, but its prevalence in North America and Europe is increasing. The clinical course is more severe than in other bacterial abscesses⁽³⁾. *Klebsiella pneumoniae* (K.pneumoniae) is a known cause of pyogenic

liver abscess (PLA) in the absence of hepatobiliary disease. In settings of hepatic infection, it has also been known to cause disseminated infections including meningitis and endophthalmitis. Several groups of patients are particularly susceptible to infection, including patients with diabetes mellitus, those from Southeast Asia and those with the preexisting hepatobiliary disease⁽⁴⁾.

Case reports

Case 1

We present a case of a 69 years old woman, with insulin requiring diabetes and malignant tumor of recto-sigmoid junction operated 3 months prior to the hospital admission for a liver abscess with *Klebsiella pneumoniae* isolated in blood cultures.

The patient presented to the ER of „Prof. Dr. Agrippa Ionescu” hospital with fever, shiver, nausea, emesis and malaise lasting 3 days. At the clinical exam, the patient had warm tegument, perioral cyanosis, shiver in the fever context, decreased basal bilateral vesicular murmur, SaO₂=88% with return to normal values under antitermic treatment, painless abdomen spontaneously or at palpation, meteorized, without any transit disturbances.

The CT examination reveals a liver lesion in segments VI-VII, limited by a hypodense margin with fluid-parafuid content, in size



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progression (with maximal axial diameters 54/32 mm vs. 45/29 mm one month prior), without any new focal hepatic lesions (Figure 1). Laboratory workup revealed neutrophilia and lymphopenia, anemia, thrombocytopenia, increased inflammatory syndrome, a high level of procalcitonin and hemoculture positives with *Klebsiella pneumoniae* sensitive.

Based on the information presented, the diagnosis established was liver abscess caused by *Klebsiella pneumoniae*. Empirical antibiotherapy is initiated with I.V. Vancomycin and Meropenem, which is de-escalated to I.V. Ceftriaxone, due to the result of the antibiogram. At the 14 day, an abdominal CT reveals a slight dimensional progression. Percutaneous ecographic guided drainage is considered.

Hemodynamically and respiratory stable, the patient is released with the antibiotherapy recommendation of 14 more days of orally administered Ceftriaxone. After 4 weeks of antibiotherapy treatment, the patient is ecographically reassessed. The liver abscess is observed to have achieved complete remission (Figure 2) without drainage, despite the classical literature recommended protocol.

Case 2

We present a case of a 55 years old man, without any known comorbidities admitted to our hospital for sepsis with unknown origin. The patient presented to the ER of „Prof. Dr. Agrippa Ionescu” hospital with fever, shiver,

and malaise lasting 7 days. At the clinical exam, the patient was febrile, tachypneic with low blood pressure ~100 mmHg the systolic value, with abdominal pain spontaneously and at palpation, meteorized, without any transit disturbances. Laboratory workup revealed leucocytosis with neutrophilia, slightly anemia, increased inflammatory syndrome, a high level of procalcitonin and negative blood culture. The CT examination revealed multiple lesions in the liver, the largest one of 100/50 mm (Figure 3). Based on the information presented, the diagnosis established was sepsis due to liver abscess with negative blood cultures. Despite maximal empirical therapy with Meropenem and Vancomycin, the outcome was unfavorable with increasing the dimensions of the lesions and increasing inflammatory syndrome. Percutaneous ecographic guided drainage was performed and *Klebsiella pneumoniae* was isolated from the drainage samples. Under target antibiotherapy with Ertapenem for 4 weeks the outcome was very good with complete resolution of the hepatic lesions (Figure 4).

Discussion

A liver abscess is a potentially life-threatening infection. Common causes predisposing to occurrence of liver abscess include biliary disease, malignancies of gastrointestinal tract, and pylephlebitis. It is commonly a polymicrobial infection and the common causative



Figure 1. CT examination: liver lesion in segments VI-VII, limited by a hypodense margin with fluid-parafluid content



Figure 2. Complete remission of the liver abscess



Figure 3. a) CT at admission



b) CT after percutaneous drainage

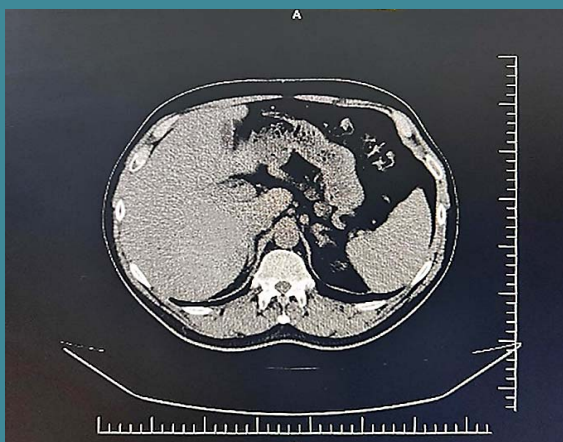


Figure 4. Complete resolution of the hepatic lesions



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organisms well documented in the literature include *Escherichia coli*, streptococci, Enterobacteriaceae, and anaerobes. But currently there is an emerging trend of primary liver abscess caused by *Klebsiella pneumoniae*. Patients with diabetes are more prone to develop KLA and related septicemic complications. Also, regardless of etiology, they have longer periods of fever after treatment and prolonged hospital stay. Thus poorly controlled diabetes increases the susceptibility to K1/K2 *Klebsiella pneumoniae* infections and related liver abscess and complicated endophthalmitis⁽⁵⁾.

Percutaneous transhepatic drainage of the pus collection can be helpful in determining the causative organisms and can shorten the duration of treatment⁽⁶⁾. In the first case, the liver abscess achieved complete remission without drainage, despite the recommended protocol found in classical literature. However, in the second case, antibiotics alone were not sufficient to control the infection. Additionally, identifying the etiology would not have been possible without cultures from secretions collected during drainage. Therefore, percutaneous transhepatic drainage serves as a useful tool for both diagnosis and treatment.

Conclusion

Hepatic abscesses are associated with a high mortality rate and can lead to several

complications despite their low incidence. Prompt recognition is crucial for effective management and optimal outcomes. Typically, treatment options for liver abscesses involve percutaneous or surgical drainage in combination with antibiotics. Early diagnosis, proper treatment, and diligent monitoring are essential for achieving favorable outcomes. Further prospective studies with significant sample sizes are necessary to enhance our understanding of this severe ailment.

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