

THE CLINICAL PICTURE

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Pyogenic liver abscess



FIGURE 1. Computed tomography shows a large mass on the right hepatic lobe (arrow).

A 58-YEAR-OLD WOMAN presents with fever, chills, vomiting, and right-upper-quadrant abdominal pain. She has had diarrhea for several days and has lost 15 lb over the last 6 weeks. Six months ago, she took a cruise through the Panama Canal to Nicaragua, Costa Rica, Mexico, and El Salvador.

Laboratory studies show an elevated white blood cell count at $22.73 \times 10^9/L$ (reference

range 3.70–11.00), a slightly elevated aspartate aminotransferase level, and an elevated alkaline phosphatase level at 254 U/L (reference range 40–150). These values prompt an ultrasonographic evaluation of the right upper quadrant, which reveals a 14-cm mass in the right hepatic lobe. Computed tomography (CT) of the abdomen and pelvis confirms a multiloculated mass measuring 14 cm \times 12 cm \times 11 cm on the right lobe of the liver (**FIGURE 1**).

The patient undergoes CT-guided liver biopsy with drain placement. Cultures grow *Klebsiella pneumoniae*, and she is started on intravenous piperacillin-tazobactam for 4 weeks, followed by 4 weeks of oral ciprofloxacin.

Follow-up evaluation at 4 weeks and at 8 weeks shows improvement in the patient's condition, with CT of the abdomen and pelvis showing a gradual decrease in the size of the abscess.

■ INCREASING PREVALENCE

K pneumoniae has emerged as the most common organism seen in pyogenic liver abscess.¹ Initially seen in Taiwan in the 1980s, *K pneumoniae* liver abscess is becoming more common in the United States.² Diabetes and impaired fasting glucose have both been implicated as potential risk factors, but the condition is also seen in nondiabetic patients.³ Although pyogenic liver abscess is commonly a sequela of biliary disease, *K pneumoniae* liver abscess is more often cryptogenic.¹ Clinical manifestations usually include fever, abdominal pain in the right upper quadrant, nausea, and vomiting.

In this patient, no clear relationship was established between her travel and her illness.

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GREATER RISK OF SPREAD

K pneumoniae liver abscess is more likely to spread than polymicrobial liver abscess.³ It is associated with endophthalmitis, meningitis, brain abscess, and septic pulmonary embolism.³ Diabetic patients are particularly susceptible to metastatic foci.³ The reason is not well understood, but poor glycemic control leading to impaired neutrophil phagocytosis is thought to play a role.⁴

DIAGNOSIS AND TREATMENT

Liver abscesses are associated with elevated alkaline phosphatase levels, hyperbilirubinemia, leukocytosis, hypoalbuminemia, and anemia. As bacteremia is often seen with *K pneumoniae* liver abscess, blood cultures should be obtained.¹ Imaging studies should include right-upper-quadrant ultrasonography if suspicion is high for concomitant biliary disease, and also CT with intravenous contrast to better quantify the dimensions of the abscess.⁵

Treatment includes empiric parenteral antibiotics and percutaneous drainage. In addition, culture of purulent material for aerobic and anaerobic organisms helps guide antibiotic treatment.

REFERENCES

1. Pope JV, Teich DL, Clardy P, McGillicuddy DC. *Klebsiella pneumoniae* liver abscess: an emerging problem in North America. J Emerg Med 2008; Epub ahead of print.
2. Frazee BW, Hansen S, Lambert L. Invasive infection with hypermucoviscous *Klebsiella pneumoniae*: multiple cases presenting to a single emergency department in the United States. Ann Emerg Med 2009; 53:639–642.
3. Lee SS, Chen YS, Tsai HC, et al. Predictors of septic metastatic infection and mortality among patients with *Klebsiella pneumoniae* liver abscess. Clin Infect Dis 2008; 47:642–650.

The antibiotic regimen should consist of a first- or third-generation beta-lactamase inhibitor, with or without an aminoglycoside.³ Patients unable to tolerate beta-lactam antibiotics can be given a fluoroquinolone.

The results of cultures and determination of antibiotic sensitivities help to further modify antibiotic therapy. Antibiotic therapy may be needed for 4 to 6 weeks. Parenteral antibiotics are recommended initially, and if a patient responds to therapy, treatment can be switched to oral antibiotics to complete the course of treatment.

Although antibiotics with percutaneous drainage are the recommended course of therapy, surgical drainage is sometimes necessary and is best done with the input of a hepatobiliary surgeon. Patients with abscesses larger than 5 cm who had surgical drainage had better clinical outcomes than those who had percutaneous drainage,⁶ but monitoring the response to antibiotics and the patient's clinical course is very important when determining the need for emergency surgical intervention vs percutaneous drainage.⁶

Follow-up imaging is necessary to evaluate the response to therapy, to determine the continued need for antibiotics, and to assess for any further need for drainage.

***K pneumoniae* liver abscess is becoming more common in the United States**

4. Lin JC, Siu LK, Fung CP, et al. Impaired phagocytosis of capsular serotypes K1 or K2 *Klebsiella pneumoniae* in type 2 diabetes mellitus patients with poor glycemic control. J Clin Endocrinol Metab 2006; 91:3084–3087.
5. Golia P, Sadler M. Pyogenic liver abscess: *Klebsiella* as an emerging pathogen. Emerg Radiol 2006; 13:87–88.
6. Tan YM, Chung AY, Chow PK, et al. An appraisal of surgical and percutaneous drainage for pyogenic liver abscesses larger than 5 cm. Ann Surg 2005; 241:485–490.

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