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Case Report

Invasive *Klebsiella pneumoniae* Liver Abscess. A Worldwide Emerging Disease

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Case Report

A 61-year-old Hispanic female presented with a 3 week history of right upper quadrant abdominal pain and persistent fever. The pain was constant, dull, steadily worsening, not related to food intake, and was associated with fevers, chills and weight loss. She denied cough, shortness of breath, chest pain, nausea, vomiting or diarrhea. Her past medical history was pertinent for type II diabetes on insulin treatment for the past 12 years. She had no surgical history. Her family history was significant for father having diabetes and myocardial infarction. She denied smoking, drinking alcohol or history of illicit or intravenous drug use, tattoos or transfusions. She had recently travelled from Honduras.

All vitals were within normal limits except a heart rate of 111 per min. Physical examination was remarkable for right upper quadrant abdominal tenderness, with no murphy sign or rigidity or rebound tenderness.

A complete blood count revealed a white count of 14,600 (normal 4,500-11,000 cells/mcL) with no bandemia, with normal hemoglobin, normal hematocrit and normal platelet count. The basal metabolic panel was normal. A hepatic panel was remarkable for an alkaline phosphatase 190 (normal 25-100 U/L), and gamma-glutamyl transferase 125 (normal 6-37 U/L). Patient's HbA1C was 10.8%. A urinalysis was negative.

An abdominal ultrasound showed an 11 x 6 x 7 cm heterogeneous, well defined intrahepatic mass with minimal flow. A subsequent MRI of the abdomen with and without contrast confirmed a sub-capsular enhancing 11.7 x 6.8 x 7.5 cm lesion within the right hepatic lobe consistent with an abscess. Chest x-ray revealed a small right pleural effusion and right middle lobe atelectasis.

Based on the clinical scenario a diagnosis of amoebic liver abscess was made, antibodies for *Entamoeba histolytica* were sent and the patient was started on Metronidazole and Paromomycin. No invasive procedures were attempted at this time. After 3 days of hospitalization her abdominal pain significantly improved, no fevers were documented and she was eventually discharged home on oral amoebicides.

A week following discharge the patient presented back to the hospital with persistent symptoms with associated with shortness of breath. Clinically the patient looked ill and in acute distress. Vitals signs significant for a blood pressure 92/61 mmHg, heart rate 114 per minute, temperature 96.4°F, respiration rate 32 per minute, and O2 saturation 91% on room air. Skin was clammy but anicteric; decreased breath sounds were heard at the right lung base up to the mid lung field; abdominal examination once again was positive for right upper quadrant tenderness, and the liver was found to be enlarged with a total span of 18 cm.

A complete blood count revealed a white blood count of 15,200 (normal 4,500-11,000 cells/mcL) without bandemia

or eosinophilia. The liver function was remarkable for an alkaline phosphatase of 335 u/l, total bilirubin 1.2 mg/dl, with normal aminotransferases. The serology for *Entamoeba histolytica* sent during the prior admission returned negative.

A repeat abdominal ultrasound showed a complex subcapsular collection in the right lobe of the liver unchanged in size but now associated with a larger right pleural effusion. A CT thorax revealed the previously noticed hepatic collection now extending into the right thorax causing a large right pleural effusion.

Patient underwent a right-sided ultrasound guided thoracentesis with chest tube placement and ultrasound guided liver abscess drainage, obtaining initially 700 cc of pleural fluid and 100 cc purulent fluid respectively. Specimens were sent for culture and patient was started empirically on Metronidazole, Piperacillin/Tazobactam and Vancomycin. Cultures grew *Klebsiella pneumoniae* and based on the sensitivity antibiotics were deescalated to Ciprofloxacin.

During her hospitalization, the patient underwent right lung decortication for her empyema. The patient's clinical condition improved significantly following the procedures and was finally discharge home to complete a total of three weeks treatment with ciprofloxacin. Patient was followed up in the clinic one week after discharge with substantial recovery of her illness.

Discussion

Liver abscesses are the most common type of visceral abscess; the incidence is estimated at 3.6 cases per 100,000 populations for pyogenic liver abscess (PLA) [1] and 1.38 per million populations for amoebic liver abscess [2]. Abscesses can develop from hematogenous seeding, direct spread from biliary infection, penetrating wounds or without a definitive source. In absence of an underlying disease or evident etiology the most likely causes of liver abscess are pyogenic and amoebic. The most common pathogens isolated from pyogenic liver abscesses are *Klebsiella pneumoniae* and *Escherichia coli* [3]. A solitary liver abscess in patients residing in or visiting areas in which amoebae are endemic should arouse the suspicion of an amoebic etiology. Amoebic and pyogenic abscesses often share the same clinical presentation (right upper quadrant abdominal pain, fever and chills) but their management greatly differs [4,5].

Radiographic determination of their number and features help to narrow down the most likely causative-agent. A solitary right lobe subcapsular cystic lesion is most seen in amoebic liver abscesses whereas multiple fluid collections suggest a pyogenic liver abscess; never the less, these findings cannot reliably distinguished both and the isolation of the organism ultimately establishes the definitive diagnosis [4,5].

Liver abscess due to *Klebsiella* infection arises in the absence of hepatobiliary disease, are almost monomicrobial and frequently occurs in patients with uncontrolled diabetes. Clinical manifestations are non-specific and mainly include fever, right upper quadrant abdominal tenderness, leukocytosis, and abnormal liver enzymes [6,7]. In contrast to other pyogenic abscesses, liver abscess due to *Klebsiella* infection tend to be solid and focal [7]. Lately a highly invasive community-acquired *Klebsiella pneumoniae* resulting in complicated pyogenic liver abscesses have been reported specially in East Asia but new cases are rising in Europe and North America [8,9]. These infections are caused by hypervirulent *K. pneumoniae*; two specific bacterial capsular types (K1 and K2) and diabetes mellitus predispose a patient to the development of liver abscess and potential metastatic complications like: bacteremia, meningitis endophthalmitis, and necrotizing fasciitis [8]. Treatment of liver abscess due to *Klebsiella* infection, unlike amoebic liver abscess, includes appropriate antibiotic therapy combined with percutaneous drainage of liver abscesses. The length of antimicrobial treatment is four to six weeks, having an overall good prognosis in patients with appropriate prompt diagnosis and treatment [6,8,9].

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