

Short Report:

An Unusual Presentation of Mucoïd Klebsiella Pneumoniae Liver Abscess

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Abstract

We present a case of a large intrahepatic abscess in a transplanted liver manifesting as dysphagia and odynophagia due to compression of the gastroesophageal junction in a Korean-born patient with a history of poorly controlled diabetes mellitus. Blood cultures and fluid cultures obtained after percutaneous abscess drainage were positive for *Klebsiella pneumoniae* that demonstrated hypermucoviscosity in culture characterized by positive string test. This case illustrates the rare but increasingly prevalent syndrome of liver abscess, bacteremia, and metastatic infection caused by the mucoïd strain of *Klebsiella pneumoniae* typically seen in Asia.

Keywords: Dysphagia; Pneumoniae; Bacteremia; Odynophagia.

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Introduction

Historically in the United States *K. pneumoniae* has been associated with urinary tract and lower respiratory tract infections. Over the past two decades the clinical syndrome of liver abscess, bacteremia, and metastatic infection has been described with a virulent mucoid strain of *K. pneumoniae* [1]. Metastatic disease can manifest as abscesses in the lung, prostate, brain, eyes, and soft tissue resulting in devastating complications including endophthalmitis, meningitis, and osteomyelitis. This disease is well described in Asia with most cases reported from Taiwan, Singapore, and Korea. In a case series from Taiwan 160 of 182 reviewed cases of liver abscesses were caused by monomicrobial *K. pneumoniae* infection; 75% of these patients had diabetes or impaired glucose tolerance as compared with 4.5% of the patients with polymicrobial liver abscesses [2].

Case Report

A 57 year old Korean-born man with a medical history notable for diabetes mellitus, HBV infection and cirrhosis, orthotopic liver transplant in 1995 complicated by biliary duct stricture requiring Roux-en-Y biliary anastomosis in 1996, who presented with progressive dysphagia and odynophagia. Three years prior to presentation, he began experiencing about one episode of dysphagia monthly. Over the past [3] months, the frequency of dysphagia increased and he also began experiencing odynophagia and a stabbing pain in his chest and epigastric region with food intake. About two weeks prior to presentation his symptoms worsened and he experienced regurgitation, anorexia, and food aversion. Additionally, over the past two months he experienced intermittent daily fevers, drenching night sweats, and an unintentional 20 pound weight loss. He denied headache, visual symptoms, neck stiffness, or bone pain.

He had immigrated from Korea in 1967 and last

traveled there 18 months prior to admission. He smokes about half a pack of cigarettes daily and has a history of heavy alcohol use but now drinks in moderation. He denies current recreational and intravenous drug use. He has no family history of gastrointestinal malignancy. His active medications include Adefovir dipivoxil, Entecavir, Tacrolimus, Insulin, Metformin, Hydrocodone-Acetaminophen, Omeprazole, Pregabalin, and Nicotine Patch.

On arrival to our emergency room he had a temperature of 101.3 F and heart rate of 105. His physical exam was notable for a well healed surgical scar across his abdomen and right upper quadrant tenderness to palpation with voluntary guarding but no rebound tenderness. His initial laboratory data was notable for mild hyponatremia, elevated blood glucose, leukocytosis with left shift, mild anemia, elevated alkaline phosphatase and gamma glutamyl transpeptidase, low albumin, normal coagulation parameters, normal lactate, and subtherapeutic tacrolimus trough. Initial blood cultures had no growth. Additional workup showed elevated hemoglobin A1c but was negative for Hepatitis B surface antigen, HIV antigen/antibody screen, Quantiferon gold, *H. pylori* antigen, Echinococcal antibody, and *Entamoeba histolytica* antibody. Computed tomography of his chest and abdomen were performed and revealed a 6.7 x 4.4 x 7.8 cm heterogeneous hypoattenuating mass in the left hepatic lobe with mass effect on the gastroesophageal junction concerning for necrotic hepatocellular carcinoma or abscess.

24 hours after admission the patient was noted to have a heart rate of 120 beats per minute, temperature of 102.9 F, diaphoresis, and rigor. The patient received acetaminophen, intravenous crystalloids and a repeat set of blood cultures were drawn prior to the administration of intravenous Vancomycin and

Ertapenem. Contrast enhanced magnetic resonance imaging of the abdomen was subsequently performed revealing an 8.1 x 4.5 cm nonenhancing lesion in hepatic segment one extending into the central aspect of the left hemiliver with internal septations and peripheral enhancement consistent with an abscess. (Figures 1-2).

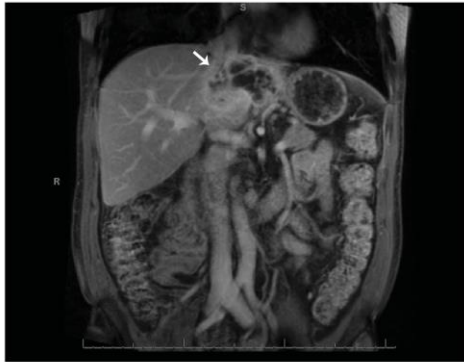


Figure 1. 8.1 x 4.5 cm lobulated, internally septated, centrally non-enhancing lesion in central left hemi-liver consistent with abscess (arrow).

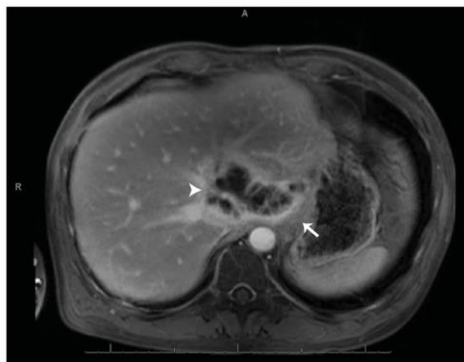


Figure 2. Mass effect of hepatic abscess (arrowhead) on esophagus at gastro-esophageal junction (arrow).

His second set of blood cultures were both positive for *K. pneumoniae*, which exhibited very mucoid colonies and a positive string test which is shown in Figure 3 for this patient. The decision was made to transfer the patient to his prior liver transplant center for surgical evaluation, where he underwent percutaneous abscess drainage with fluid cultures growing *K. pneumoniae*, and he was discharged with planned 4 weeks of ceftriaxone IV depending on serial abdominal imaging.

Discussion

In a retrospective review of 160 patients with *K. pneumoniae* abscess from Taiwan the most common clinical symptoms include fever (93%), elevated alkaline phosphatase (78%), and right upper quadrant pain in (71%).² Characteristic imaging findings include solid appearance on ultrasound³ and singular, solid, or multiloculated appearance on CT with thin wall and internal necrotic debris [4]. The virulent nature of this *K. pneumoniae* strain is related to its characteristic hyperviscous nature on culture plates referred to as hypermucoviscosity.⁵ The “string test” can be used to identify mucoid strains performed by using a loop to make contact with the colony then pulling up to form a linear string, with a positive result being greater than 5mm. The two genes most commonly associated with this phenotype are the mucoviscosity-associated gene A (*magA*), and the regulator of mucoid phenotype A (*rmpA*) [5].



Figure 3. Culture notable for greater than 10mm positive string test (arrow) and mucoid colony appearance.

Management includes maintenance of high vigilance for metastatic infection especially endophthalmitis and meningitis. Antibiotic therapy should be tailored to susceptibility empiric therapy for pyogenic liver abscess should include gram negative and anaerobic coverage. Isolates producing extended spectrum beta lactamases have been reported but are rare. Antibiotic course is generally recommended for 4-6 weeks with

parenteral therapy for at least the first 2-3 weeks. Endophthalmitis require intravitreal antibiotics and vitrectomy. Drainage of the abscess can be performed percutaneously with ultrasound or CT guidance, however, if the abscess is large (> 3cm) and multiloculated surgical treatment is superior [6]. Follow up imaging is helpful to monitor treatment response and determine length of therapy. Mortality rate with *K. pneumoniae* liver abscesses has been reported at 4.1% and 11% in two cases series with causes of death being overwhelming sepsis from failure or inadequate drainage.^{2,6} The mortality rate is lower than for polymicrobial liver abscess but can have high morbidity from metastatic infection [7].

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