

## Emerging Infectious Liver Disease - Metastasizing *Klebsiella pneumoniae* Liver Abscess

Mahendran Jayaraj\*, Joseph Evan Villaluz, Mily Seth and James Cronin

University of Arizona, Internal Medicine, Arizona, USA

\*Corresponding author: Mahendran Jayaraj, University of Arizona, Internal Medicine, 501 N Campbell Avenue Tucson, Arizona 85724-5212, USA, Tel: 7027691616; E-mail: [Mahendran.Jayaraj@uahealth.com](mailto:Mahendran.Jayaraj@uahealth.com)

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### Abstract

*Klebsiella pneumoniae* liver abscess (KLA) is an emerging infectious liver disease in developed countries such as the United States. This is particularly common in the East Asians living in the United States who has other comorbid medical problems, especially diabetes mellitus. Metastatic infections involving non-contiguous areas originating from *Klebsiella pneumoniae* liver abscess have been documented as being the causal source for endophthalmitis, brain abscess, lung abscess, psoas abscess, splenic abscess and septic arthritis. The incidence of metastatic infection in the setting of KLA is higher than in liver abscesses of any other bacterial origin.

**Keywords** *Klebsiella pneumoniae*; Liver abscess; Metastatic abscess; Pyogenic liver abscess

### Introduction

*Klebsiella pneumoniae* liver abscess (KLA) is an emerging infectious liver disease in developed countries such as the United States [1]. This is particularly common in the East Asians living in the United States who has other comorbid medical problems, especially diabetes mellitus. Metastatic infections involving non-contiguous areas originating from *Klebsiella pneumoniae* liver abscess have been documented as being the causal source for endophthalmitis, brain abscess, lung abscess, psoas abscess, splenic abscess and septic arthritis. The incidence of metastatic infection in the setting of KLA is higher than in liver abscesses of any other bacterial origin [2].

### Case Presentation

60 year old Filipino male with PMH of uncontrolled Diabetes Mellitus on oral hypoglycemic agents was admitted with Diabetic Ketoacidosis (DKA) and left sided facial cellulitis with nasal abscess. Initially he was admitted to Intensive Care Unit (ICU) for Diabetic ketoacidosis (DKA) management. Otorhinolaryngology (ENT) was consulted and patient underwent Incision and drainage. Cultures from nasal abscess grew *Klebsiella pneumoniae*. According to Infectious Disease recommendations patient was treated with IV ceftriaxone.

During the course of the hospitalization he developed worsening right upper quadrant abdomen pain. He also had moderately elevated liver enzymes and acute on chronic renal failure. Abdominal ultrasound showed 6.5 cm solid mass in the liver. During the course of next 2 days, patient continued to have persistent leukocytosis along with hypoxia despite being on appropriate antibiotics. Infectious disease consult recommended CT of the abdomen to rule out abscess. After patient's Acute Kidney Injury was resolved, CT Abdomen with contrast was performed which showed 10.4 x 8.5 cm abscess. CT guided percutaneous drainage of the abscess was performed. Cultures from the abscess again showed *Klebsiella pneumoniae*.

After drainage and continuation of IV ceftriaxone, patient improved clinically and leukocytosis was resolved. Patient was discharged home with the drain in place until his follow up visit with surgery in 2 weeks and on oral ciprofloxacin.

### Discussion

This case illustrates an unusual presentation of *Klebsiella pneumoniae* liver abscess both anatomically and geographically. To our knowledge, facial abscess as a presenting complaint in patients with *Klebsiella* Liver Abscess has not been previously reported in the United States. Like that of previous reports, the case presented here demonstrates the propensity of this condition to manifest itself with metastatic complications. Conversely, unlike most hepatic abscesses, our patient did not present with symptoms typical of liver abscess such as abdominal pain but rather initially endorsed minimal to no symptoms, though these symptoms eventually became more prominent during hospitalization.

KLA strains known to disseminate are commonly associated with the K1 capsular serotype and mucoid phenotype. It has been proposed that the presence of the MagA gene, which may confer phagocytosis resistance, as well as the RmpA gene which is associated with hypermucoviscous phenotype and resistance to complement mediated killing, potentiates the ability of the bacteria to seed vasculature and establish distal sites of metastatic infection [3]. Also diabetes mellitus interferes with the chemotaxis and phagocytosis of the neutrophils [4]. Radiographic findings are instrumental in identifying the anatomical sites of hepatic infection. Ultrasound (US) of KLA predominantly present as solid mass like enhancements [5]. On Computed tomography (CT), KLA are likely to appear as a single abscess cavity up to involving as much as a single lobe of the liver [6].

Thus, clinical findings of soft tissue abscesses in unusual places secondary to *Klebsiella pneumoniae* should prompt urgent consideration of underlying liver abscess in certain patients, particularly diabetics or those of East Asian descent [7]. Moreover, overt clinical hepatic abscess findings may not always be present so it is imperative that liver etiology be considered as a source for infection

regardless of clinical presentation when *Klebsiella pneumoniae* infection is found elsewhere.

## Conclusion

Although cases with *Klebsiella pneumoniae* liver abscess causing endophthalmitis, brain abscess, lung abscess and psoas abscess have been documented, spreading to the face and causing nasal abscess is possible as described above. This case illustrates the importance of looking for an underlying liver abscess in patients coming in with nasal abscess, skin and soft tissue infection positive for *Klebsiella pneumoniae*. Even though skin and soft tissue infections are common in diabetics, *Klebsiella pneumoniae* skin infections which are not responding to treatment should prompt work up of underlying liver abscess in people of East Asian origin.

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