



***Klebsiella Pneumoniae* Peritonsillar Abscess Followed by Liver Abscess in an Immunocompetent Adult**

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Pyogenic liver abscess (PLA) is a common intra-abdominal infection in immunocompromised patients. The disease is associated with a high mortality rate if not be diagnosed promptly. Fever may be the only sign of PLA and the disease is sometimes misdiagnosed because it is often asymptomatic. We report a 26-year-old male who presented with *Klebsiella pneumoniae* PLA 3 weeks after being treated for *K. pneumoniae* peritonsillar abscess. The *K. pneumoniae* PLA was diagnosed by abdominal ultrasound and treated with percutaneous drainage and an adequate period of antibiotic therapy. This case demonstrates the importance of considering *K. pneumoniae* PLA in immunocompetent patients who present with fever of unknown cause and recent *K. pneumoniae* infection.

Key words: *Klebsiella pneumoniae*, peritonsillar abscess, liver abscess

INTRODUCTION

Peritonsillar abscess (PTA) is a common disease in adolescents and young adults.¹ However, the potential complications of PTA can be life-threatening, such as airway obstruction and hemorrhage from erosion into the carotid sheath.² The most common organisms responsible for the development of PTA are *Streptococcus* and anaerobic bacteria.¹ *Klebsiella pneumoniae* is a rare cause of PTA. We present a case of *K. pneumoniae* PTA followed by pyogenic liver abscess (PLA). To the best of our knowledge, this is the first reported instance.

CASE REPORT

A 26-year-old male presented to a hospital elsewhere with PTA. He received incision and drainage, intravenous clindamycin for 3 days, and a 10 days course of oral cefitibuten. Culture of the abscess revealed *K. pneumoniae* which also grew in blood culture. There are no any symptoms of abdominal pain, gastrointestinal upset, or elevation of aspartate transaminase level during the hospitalization.

Approximately, 3 weeks later, the patient presented to the emergency department of our hospital with a 5 days history of intermittent low-grade fever and mild abdominal pain. On arrival, his blood pressure was 95/64 mm Hg, pulse rate was 108 beats/min, and body temperature was 38.4°C. On physical examination, both tonsils appeared normal and there was no neck tenderness or adenopathy. Examination of the abdomen disclosed normoactive bowel sounds without obvious tenderness or muscle guarding. Results of laboratory tests revealed the following values: White blood cell count: 16,790/mm³; C-reactive protein level, 17.9 mg/dL; aspartate transaminase level, 28 U/L; and total bilirubin level, 0.5 mg/dL. The results of urine examination and chest radiography were normal. Abdominal ultrasound revealed a heterogeneous lesion measuring approximately 5.99 cm × 4.94 cm in size over the right lobe of the liver. A 64-multidetector-row computed tomographic scan (CT) showed a poor marginal cystic mass with septa (arrow) [Figure 1] over the right lobe liver compatible with PLA. He received percutaneous drainage and intravenous administration of ceftriaxone. The abscess culture and blood culture grew *K. pneumoniae*. The drain was removed on the 6th day of hospitalization and he completed a 21 days course of intravenous ceftriaxone therapy. At 6 months follow-up, the patient was alive and well and did not present with any sequela.

DISCUSSION

Peritonsillar abscess is normally caused by Gram-positive bacteria such as *Streptococci* and anaerobic bacteria.¹ The

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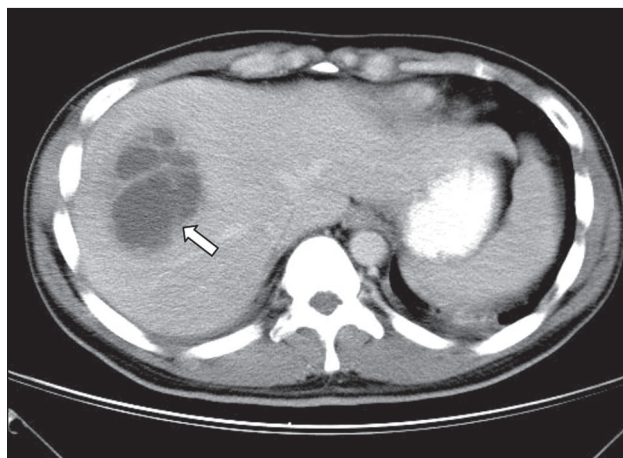


Figure 1. A 64-multiphase computed tomographic scan shows a poor marginal cystic mass with septa (arrow) over the right lobe liver

presence of Gram-negative bacteria such as *Pseudomonas*, *Enterobacterium*, *Haemophilus* and *Klebsiella* are rare, although the incidence of those species as agents of PTA has increased in recent decades.

Peritonsillar abscess is an infection of the Weber's gland resulting in tissue necrosis and pus formation.³ It usually involves the soft palate and the anterior tonsillar pillar with contralateral deviation of the uvula. Potential complications of PTA can be life-threatening, such as airway obstruction, hemorrhage from erosion or septic necrosis into the carotid sheath. To avoid life-threatening complications, incision and drainage of PTA and appropriate antimicrobial therapy are important. Penicillin plus metronidazole, ampicillin plus sulbactam or clindamycin are usually used as empirical antibiotic therapy followed by 10 days regimen of oral antibiotics. The clinician should adjust the antimicrobial therapy closely if empirical antibiotic therapy fails to improve the clinical condition.⁴ We hypothesize that the period of antibiotic therapy for *K. pneumoniae* PTA should be longer than usual to prevent hematogenous spread, as occurred in our patient.

Pyogenic liver abscess is a common intra-abdominal infection in diabetic patients.⁵ The infection is usually caused by direct extension from nearby structures as the biliary tract or hematogenous spread from remote infectious sites such as an appendix or diverticulum. Fever is the most common symptom and may be the only sign of PLA in the elderly. Diagnostic studies of the right upper quadrant of the abdomen, such as abdominal ultrasound or contrast-enhanced CT, should be a part of the examination for detecting PLA. Percutaneous drainage combined with intravenous antibiotic treatment is the cornerstone of successful treatment.

Klebsiella pneumoniae, a Gram-negative rod with a large antiphagocytic capsule, accounts for most septic metastatic

infections in PLA patients, especially in Taiwan.⁶ The mechanism by which *K. pneumoniae* translocates to the bloodstream and liver is unclear. The *Klebsiella bacteremia* is associated with capsular serotype K1/K2 strain.⁵ On the other hand, mucoviscosity-associated gene A or regulator of mucoid phenotype A gene may play an important role of virulence factor of invasive characteristics of *K. pneumoniae*. However, the pathogenicity of *K. pneumoniae* has not been disclosed thoroughly.⁷ Extrahepatic abscesses have been reported in many areas, including the eye, lung, pleura, kidney, prostate, meninges, epidura, brain, bone, skin, soft tissue and spleen. *K. pneumoniae* liver abscess results in *bacteremia* in 95% of cases and distant metastasis via hematogenous spread in 7-12% of cases.^{5,6,8} Blood is supplied to the liver from the hepatic artery and portal vein, which act as natural filters of bacterium. The tonsils venous drainage is by the peritonsillar plexus, which drain into the lingual and pharyngeal veins, which in turn drain into the internal jugular vein, then into the arterial system. In our case, the patient was no fever or any other discomfort during the interval of hospital visiting after the first antibiotics therapy for PTA. We considered that *K. pneumoniae* from PTA was hematogenous spread through arterial system to the liver in our patient.

CONCLUSION

Our case highlights the importance of *K. pneumoniae* PLA in patients with a recent history of *K. pneumoniae* PTA who present with fever of unknown origin. Abdominal ultrasound should be performed early to detect PLA in such patients, even if they are immunocompetent.

CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest. The authors have no commercial associations or sources of support that might pose a conflict of interest.

REFERENCES

1. Galio NJ. Peritonsillar abscess. *Am Fam Physician* 2008;77:199-202.
2. Huang KJ, Kuo WR, Wang LF, Wang LF, Lee KW, Chiang FY, *et al.* Head and neck space infection – An analysis of 154 cases. *J Taiwan Otolaryngol Head Neck Surg* 2003;38:109-14.
3. Herzon FS, Martin AD. Medical and surgical treatment of peritonsillar, retropharyngeal, and parapharyngeal abscesses. *Curr Infect Dis Rep* 2006;8:196-202.
4. Brook I. Microbiology and management of peritonsillar, retropharyngeal, and parapharyngeal abscesses. *J Oral*

- Maxillofac Surg 2004;62:1545-50.
5. Ma LC, Fang CT, Lee CZ, Shun CT, Wang JT. Genomic heterogeneity in *Klebsiella pneumoniae* strains is associated with primary pyogenic liver abscess and metastatic infection. J Infect Dis 2005;192:117-28.
 6. Wang JH, Liu YC, Lee SS, Yen MY, Chen YS, Wang JH, *et al.* Primary liver abscess due to *Klebsiella pneumoniae* in Taiwan. Clin Infect Dis 1998;26:1434-8.
 7. Pourcine F, Baudel JL, Decré D, Dahoumane R, Bigé N, Alves M, *et al.* *Klebsiella pneumoniae* liver abscesses. Lancet Infect Dis 2013;13:392-3.
 8. Lederman ER, Crum NF. Pyogenic liver abscess with a focus on *Klebsiella pneumoniae* as a primary pathogen: An emerging disease with unique clinical characteristics. Am J Gastroenterol 2005;100:322-31.