An Unusual Case of Renal Abscess Caused by Streptococcus pneumoniae

The most common manifestation of pneumococcal disease is pneumonia, which has been associated with local complications (empyema, pericarditis, lung abscess), extrapulmonary infections (otitis media, sinusitis, meningitis), or less-common extrapulmonary infections (endocarditis, septic arthritis, and peritonitis) [1]. Streplococcus pneumoniae has also been associated with soft-tissue infections (cellulitis, fasciitis, and abscess), especially in patients with connective tissue disease [2, 3]. Scott and Schmidt [4] described psosas muscle abscess caused by S. pneumoniae. Pyogenic abscess of the gluteal muscle due to S. pneumoniae has been also been reported [5]. Patients infected with HIV have an increased frequency of invasive pneumococcal disease, although Janoff et al. [6] found that HIV-infected patients had symptoms and signs that were similar to those in healthy hosts.

A 50-year-old man with an unusual type of S. pneumoniae infection was treated at our facility. He had a history of type II diabetes that had been treated with oral medication. He complained of abdominal distention, nausea, vomiting, and fever that had begun 6 weeks before admission to the hospital; night sweats and chills also developed sometime before admission. At each of several visits to the clinic, low-grade fever was noted, but the patient did not have any respiratory complaints.

Chest examination did not reveal any abnormalities, and findings on a chest roentgenogram were normal. The WBC count was 11,900 × 10^9/L, and the hemoglobin level and the hematocrit were normal. He lost 40 lb over a 3-week period because of decreased appetite. Because of persistent fever and poorly controlled diabetes, he was admitted to the hospital for further evaluation.

On physical examination, the patient was not in acute distress. Some shivering was noted. His temperature was 100.3°F, his pulse was 118 beats/min, and his blood pressure was 130/94 mm Hg. Examination of the head, eyes, and throat did not reveal any abnormalities, and the neck was supple. His chest was clear on auscultation. His heart sounds were normal, and no murmur was noted. The abdomen was obese and soft without tenderness, and no hepatosplenomegaly, guarding, or rebound was noted. Examination of the extremities did not reveal any clinically significant findings. Findings of neurological examination were normal.

Laboratory tests at admission showed a normal WBC count, hemoglobin level, and creatinine level; the results of liver function tests were normal, as were findings on a chest roentgenogram. Cultures of blood and urine specimens obtained in the emergency department at admission were negative.

In the hospital, the patient was initially treated with ceftazidime and clindamycin phosphate; 1 day later, treatment was changed to cefazolin sodium (1 g every 8 hours). His temperature decreased except for an occasional elevation. On hospital day 2, an abdominal CT showed an abscess affecting the lower pole of the right kidney (figure 1). A percutaneous drainage tube was placed into the abscess on hospital day 4. Cultures of the abscess and concomitant blood cultures yielded oxacillin-susceptible S. pneumoniae. Because of incomplete drainage, a second percutaneous tube was placed on hospital day 11.

The patient became afebrile on hospital day 6. An echocardiogram did not reveal any clinically significant findings or any evidence of definite valvular vegetation. He was treated first with iv cefazolin for 12 days, and he then received oral cephalaxin alone for 4 weeks. He recovered fully without long-term complications. When last seen 1 year after treatment, the patient was doing well.

This case was unusual because the primary disease process was probably a renal abscess (no other foci of infection were noted), whereas extrapulmonary pneumococcal infection most often metastasizes from the lung. Moreover, the patient had no evidence of respiratory disease or pneumonia and instead had fever, abdominal discomfort, and weight loss.

A review of the English-language literature found only one case in which S. pneumoniae was the pathogen in renal abscess [7]. Organisms usually found in renal abscesses include Staphylococcus aureus (in renal carbuncles); Escherichia coli, Klebsiella species, and Proteus mirabilis (in renal corticomedullary abscesses)
apy was started were negative. On the eleventh hospital day, ampicillin/sulbactam therapy was substituted for penicillin therapy; thereafter, ampicillin/sulbactam therapy was continued for 31 additional days. Coincident with this therapy, the patient returned to her prior state of health; she remained well over the next 22 months.

This is the only case of *P. multocida* infective endocarditis among 459 (representing 0.2%) cases of infective endocarditis in the Duke Endocarditis Service database. We were unable to find any case of *P. multocida* prosthetic valve endocarditis in the world literature. We are aware of 19 previous cases of infective endocarditis caused by *Pasteurella* species that were reviewed below [2, 3]. The species of *Pasteurella* responsible for these 16 cases were diverse and included *P. multocida*, *P. ureae*, *P. pneumotropica*, *P. haemolytica*, *P. gallinarum*, and *P. dagmatis*.

Five (31%) of 16 cases of infective endocarditis due to *Pasteurella* species resulted in death, which is surprising in light of the fact that all *Pasteurella* species are highly susceptible to penicillin. The favorable outcome in our patient’s case may have been related to prompt diagnosis and treatment; she started receiving antibiotic therapy within 5 days after the onset of symptoms. She had definite endocarditis according to the Duke criteria (i.e., she had two major criteria and three minor criteria) [4].

We retrospectively applied the Duke criteria to the remaining 15 cases of endocarditis due to *Pasteurella* species that were reported by other investigators (table 1). With use of the Duke classification, 8 (50%) of 16 cases were definite, 7 (44%) of 16 were possible, and none were rejected. One of four pathologically confirmed cases was categorized as definite; three were classified as possible using the Duke criteria even without the aid of an echocardiogram.

Many patients with *P. multocida* infection have a history of contact with dogs and cats. However, of the cases of infective endocarditis that we reviewed, only 7 (44%) of 16 had a history of animal contact (three of seven had contact with dogs, three of seven with cats, one of seven with sheep, and one of seven with unspecified household pets). Since over 100,000 prosthetic heart valves are inserted annually in patients in the United States and since there are over 180 million pet dogs and cats in this country, we were surprised that *P. multocida* prosthetic valve endocarditis has not been previously reported [5, 6].

References

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**Pasteurella multocida Prosthetic Valve Endocarditis: Case Report and Review**

*Pasteurella* species are gram-negative nonmotile cocobacilli that are distributed worldwide. They can be recovered from the nasopharynx or gastrointestinal tract from wild animals and from 50%–90% of cats and 50%–66% of dogs, and they are rarely present in the respiratory tract of healthy humans [1]. *Pasteurella* species are a rare cause of infective endocarditis; only 19 cases have been previously reported. We describe what we believe to be the first case of *Pasteurella multocida* prosthetic valve endocarditis and review the literature on cases of infective endocarditis caused by *Pasteurella* species.

A 72-year-old woman underwent aortic valve replacement with a Carpentier-Edwards bioprosthesis for aortic stenosis 3 years before she presented to the Duke University emergency department with a 2-day history of hip pain, fever, chills, and diarrhea. The patient owned a cat but denied a recent bite or scratch. Her physical examination revealed fever (temperature of 41°C), orthostatic hypotension, a grade 2/6 holosystolic murmur, and tenderness in the left lateral buttock. A chest roentgenogram did not reveal any abnormalities. An electrocardiogram revealed first-degree atrioventricular block.

Laboratory studies revealed anemia (hematocrit of 30%), leukocytosis (WBC count, 15 × 10^9/L), and an elevated erythrocyte sedimentation rate (140 mm/h). All of four blood cultures performed during the first 36 hours of hospitalization yielded *P. multocida*. A transthoracic echocardiogram demonstrated an oscillating mass on the inferior aspect of the aortic prosthetic valve. A CT scan revealed a minute abscess of the left psoas muscle.

Therapy with ciprofloxacin was started, and this therapy was changed to penicillin G on the third hospital day. The patient continued to have fever until 48 hours after penicillin therapy was started. The results of blood cultures performed 8 days after therapy were negative. On the eleventh hospital day, ampicillin/sulbactam therapy was substituted for penicillin therapy; thereafter, ampicillin/sulbactam therapy was continued for 31 additional days. Coincident with this therapy, the patient returned to her prior state of health; she remained well over the next 22 months.

This is the only case of *P. multocida* infective endocarditis among 459 (representing 0.2%) cases of infective endocarditis in the Duke Endocarditis Service database. We were unable to find any case of *P. multocida* prosthetic valve endocarditis in the world literature. We are aware of 19 previous cases of infective endocarditis caused by *Pasteurella* species during 1947–1996. The 15 cases of infective endocarditis due to *Pasteurella* species that were reported in the English-language literature and our case are reviewed below [2, 3]. The species of *Pasteurella* responsible for these 16 cases were diverse and included *P. multocida*, *P. ureae*, *P. pneumotropica*, *P. haemolytica*, *P. dagmatis*, and *P. gallinarum*.

Five (31%) of 16 cases of infective endocarditis due to *Pasteurella* species resulted in death, which is surprising in light of the fact that all *Pasteurella* species are highly susceptible to penicillin. The favorable outcome in our patient’s case may have been related to prompt diagnosis and treatment; she started receiving antibiotic therapy within 5 days after the onset of symptoms. She had definite endocarditis according to the Duke criteria (i.e., she had two major criteria and three minor criteria) [4].

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Clinical Infectious Diseases 1997;25:920–1
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