

Introduction

Pasteurella multocida is a gram-negative coccobacillus prevalent in the oral flora of domestic animals such as cats, dogs, and some birds [1,2,3]. It usually causes cellulitis, osteomyelitis, meningitis, and endocarditis in humans but sporadically results in septic arthritis. Human transmission occurs by bites, scratches, and occasionally through contact with animal saliva [2,4]. Here we describe a case of a middle age male with successful treatment of *P. multocida* infection of the ankle.

Case presentation

A 63-year-old African-American man presented to the ED with a two-day history of nausea, vomiting, and left ankle pain after a fall. Significant past medical history included lupus arthritis, type-2 diabetes mellitus, autoimmune hemolytic anemia, systemic lupus erythematosus, and surgical repair of left ankle fracture.

On examination, he was febrile (102°F), hypotensive (BP 90/60 mm hg), and had a heart rate of 86 bpm. He had bilateral lower extremity sensory neuropathy and an ulceration of the right medial plantar surface. Labs revealed leukocytosis of 15 K/uL, acute kidney injury (creatinine of 2.1 mg/dL), lactic acidosis of 5.27 mmol/L, and procalcitonin of 86.22 ng/mL.

Sepsis protocol was initiated and the patient was given IV vancomycin and piperacillin/tazobactam. Blood and left ankle synovial fluid cultures revealed *Pasteurella multocida*. The synovial fluid analysis showed a high leukocyte count (96,400 mm³) and calcium pyrophosphate crystals, indicative of septic arthritis and pseudo-gout. X-ray of left foot showed a healed ankle fracture laterally with significant arthritis. MRI with contrast of the left ankle revealed widespread osteomyelitis involving the distal tibia, fibula, talus, and portions of the calcaneus (Figure 1). His antibiotics were switched to linezolid and meropenem and the left ankle was debrided. The patient improved with treatment and was discharged with outpatient follow-up.

Figure 1



Magnetic resonance imaging of the left ankle and foot (sagittal view) with contrast showing extensive osteomyelitis of the tibia and fibula.

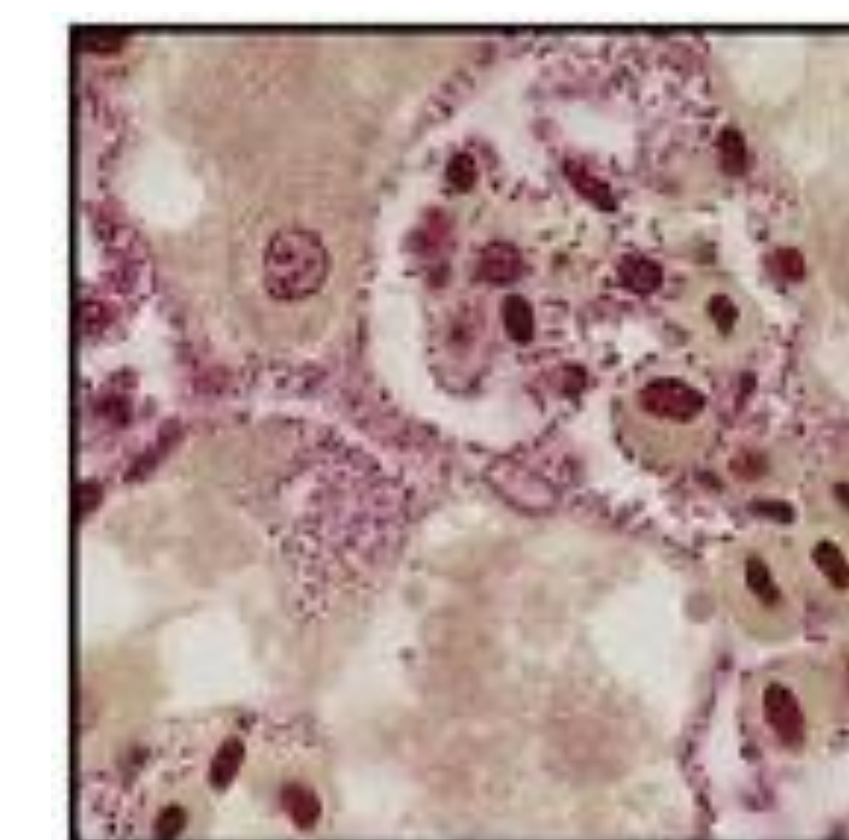
Teaching Points

- Animal bites account for about 1% (300,000) ER visits annually in the US. *Pasteurella Sp* is isolated in 50% of dog bites and 75% of cat bites [7].
- Transmission of *Pasteurella multocida* can also be transmitted through contact with animal saliva as seen in this case.
- A detailed history of animal exposure is important in guiding clinicians to identify the causative agent.
- Broad spectrum antibiotics are preferred to cover *Pasteurella Sp* and other gram-negative and gram positive organisms.
 - First-line therapy: Penicillins
 - Penicillin allergies: second and third generation cephalosporins, or quinolones.
- It is important to advise patients with chronic diseases and immunocompromised states to about the dangers of animal exposure.

Discussion

Our patient did not recall any animal scratches or bites but reported to have two cats at home. As the number of domestic pets continues to increase, the risk of *Pasteurella* infections will also increase simultaneously, especially in patients that are immunosuppressed [5].

Penicillin is the ideal treatment against *P. multocida* sepsis but in the event of resistance or allergy, intravenous second and third generation cephalosporin, tetracycline, fluoroquinolone, and amoxicillin-clavulanate, can be effective. Oral cephalosporin is not as effective because they result in low blood concentrations [1,6].



Pasteurella multocida are gram-negative coccobacilli found as part of normal microbiota oral and respiratory tract of most animals.

Source: Sheff, B. (2002). *Pasteurella multocida*. *Nursing*, 32(11), p.72.

References

- Heydemann J, Heydemann JS, Suresh A. “Acute Infection of a Total Knee Arthroplasty Caused by *Pasteurella Multocida*: a Case Report and a Comprehensive Review of the Literature in the Last 10 Years.” *International Journal of Infectious Diseases*, vol. 14, 2010.
- Martin TCS, Abdelmalek J, Yee B, Lavergne S, Ritter M. *Pasteurella multocida* line infection: a case report and review of literature. *BMC Infect Dis*. 2018;18(1):420.
- Zarlasht F, Khan M. A Case of Recurrent *Pasteurella* Bacteremia in an Immunocompetent Patient with No Animal Bite. *Am J Case Rep*. 2018;19:95–98
- Nitoslawski S, McConnell TM, Semret M, Stein MA. A Case of Polyarticular *Pasteurella multocida* Septic Arthritis. *Can J Infect Dis Med Microbiol*. 2016;2016:5025697.
- Arbefeville, S, Harris A, Dittes S, Ferrieri P. “*Pasteurella Multocida* Bacteremia with Associated Knee Arthroplasty Infection in an 80-Year-Old Caucasian Man.” *Laboratory Medicine, American Society of Clinical Pathologists*, 1 Aug. 2016.
- Giordano A, Dincman T, Benjamin CE et al. “Clinical Features and Outcomes of *Pasteurella Multocida* Infection.” *Medicine*, vol. 94, no. 36, 2015.
- Wilson BA, Ho M. *Pasteurella multocida*: from zoonosis to cellular microbiology. *Clin Microbiol Rev*. 2013;26(3):631–655. doi:10.1128/CMR.00024-13