

Isolated *Pasteurella multocida* tenosynovitis following stray cat bite

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Abstract

Pasteurella multocida is a Gram negative coccobacilli that is frequently a component of the typical flora of the oral and gastrointestinal tracts of many domestic animals. In humans, following a scratch or bite from the domestic vector, cellulitis and subcutaneous abscess are common. The patient is a female with a history of chronic irritable bowel syndrome (IBS). The patient had been tending to a stray cat with the aim to have her spayed and rehomed. After weeks of feeding the cat, she attempted to pick her up, resulting in numerous scratches to both arms and a bite on the right hand proximal to the thumb. Prior to seeking admission at South Miami Hospital, the patient went to an Urgent Care twice, without improvement. At this facility she was given amoxicillin/clavulanate (875 mg/125 mg every twelve hours for seven days orally), her only medication upon admission. The patient describes swelling, redness and pain at the site of the bite. Plates inoculated with material obtained from the patient's incision and drainage procedure grew only *P. multocida* sensitive to amoxicillin. No organisms were cultured from the patient's blood samples. MRI reveals absence of septic joint, osteomyelitis. Findings are suggestive of tenosynovitis and cellulitis. *Pasteurella* is the textbook organism for cat bites. Though she did not experience relief with the treatment from the urgent care, it is likely that this is due to the complexity and depth of her infection rather than an indication of a lack of susceptibility of the organism to this medication. After incision and drainage she improved dramatically and was sent home on oral amoxicillin/clavulanate (875 mg/125 mg every twelve hours orally) for one week.

Keywords

Pasteurella multocida; tenosynovitis; animal bite

Introduction

Pasteurella multocida is a Gram negative coccobacilli that is frequently a component of the typical flora of the oral and gastrointestinal tracts of many domestic animals, visualized in Figure 1. In humans,

following a scratch or bite from the domestic vector, cellulitis and subcutaneous abscess are common. Typically patients present with swelling and tenderness within twenty-four hours of the inciting event. Regional lymphadenopathy occurs in a minority of cases [1]. Annually, it is estimated that two million Americans are bitten by domestic animals and most never seek medical attention, as animal bites account for just one percent of all emergency department visits. Infection following a bite is the most common complication of such an event, and are frequently polymicrobial [2]. In a review of forty-four cases of *P. multocida*, a majority of patients affected with this zoonotic infection are females with an average age of sixty-four, most frequently following a bite. Though serious infections and death from *P. multocida* bacteremia are rare in the United States, it is estimated that this species is isolated in seventy-five percent of all cat bites [3].

P. multocida is an LPS producing organism with a highly variable outer core. The LPS structures expressed by variants of *P. multocida* vary in genetic structure, many which resemble host glycoproteins [4]. Following animal bites, empiric antibiotic regimes covering *P. multocida*, Gram negative and Gram positives are standard of care, frequently including a combination of amoxicillin and clavulanic acid [3].

Case Presentation

The patient is a twenty-two year old female with a history of chronic IBS. The patient had been tending to a stray cat with the aim to have her spayed and rehomed. The patient works as a veterinary technician and has successfully done so several times with other animals. After weeks of feeding the cat, she attempted to pick her up, resulting in numerous scratches to both arms and a bite on the right hand proximal to the thumb. Prior to seeking admission at the hospital, the patient sought care at an Urgent Care twice, without improvement. At this facility she was given amoxicillin/clavulanate (875 mg.125 mg every twelve hours orally). This was her only medication upon admission. The patient described swelling, redness and pain at the site of the bite. She denied fever, chills, sweats, urinary changes, bowel changes or vomiting. She admitted nausea and bleeding from the site as well as headache. Range of motion (ROM) and sensation were intact in both hands. Her right elbow is non-tender, non-inflamed and had full ROM. Cranial nerves II-XII were grossly intact. She had rabies prophylaxis for work three years ago but is unsure of her susceptibility to this infection. Neighbors have been observing the animal and have described no abnormal behavioral changes. The patient had incision and drainage of animal bite. Her right hand is in sterile dressing. The left hand had numerous scratches consistent with the described encounter with a stray cat. ROM minimally limited in right hand due to wound care.

Basic metabolic panel was remarkable for high chloride (104), low lactate (0.4) and elevated CRP (12.4). CBC was remarkable for low hemoglobin (10.4), hematocrit (31.6), RBCs (3.6), increased monocytes (0.58). MRI shown in Figure 2 reveals absence of septic joint, osteomyelitis. Findings are suggestive of tenosynovitis and cellulitis. Plates inoculated with material obtained from the patient's incision and drainage procedure grew only *P. multocida* sensitive to amoxicillin. No organisms were cultured from the patient's blood samples.

The patient had surgical incision and drainage to treat her infection and her right hand was wrapped

in sterile dressing. Under general anesthesia, a one centimeter incision was made on the lateral aspect of the proximal right first digit after cleansing the skin with betadine. The hand was wrapped in sterile dressing which was changed twice daily. Her fingertips are not erythematous or swollen. She described minimal bleeding from the surgical site. Her left hand had noticeable scratches, none of which appear erythematous or are tender or warm to palpation. After incision and drainage she improved dramatically and was sent home on oral amoxicillin/clavulanate (875 mg/125 mg every twelve hours orally) for one week.

Discussion

Prior to the return of her culture results, several causative organisms were considered including *Pasteurella*, *Bartonella* and *Rabies*. In support of *Pasteurella*, the patient did not have a papule at the site of the bite nor regional lymphadenopathy, which are commonly observed in *Bartonella*. Similarly, she had no evidence of autonomic instability or neurological symptoms consistent with *Rabies*. Other infectious groups may include *Streptococcus*, *Staphylococcus*, or *Yersinia*.

Pasteurella is the textbook organism for cat bites. Though she did not experience relief with the treatment from the urgent care, it is likely that this is due to the complexity and depth of her infection rather than an indication of a lack of susceptibility of the organism to this medication. Her case is also of interest, as *P. multocida* was the only organism cultured from her surgical site.

Figures



Figure 1: Coccobacillary *P. multocida* with thick capsule visualized as chains attached to thick mesh on bentonite clay [5].



Figure 2: MRI of affected hand and finger displaying tenosynovitis and cellulitis without evidence of osteomyelitis.