**Pasteurella multocida** Intramuscular Chest Abscess in a Healthy Man

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**Abstract**

*Pasteurella multocida* (*P. multocida*) is the most commonly isolated pathogen in human cat bite wounds. We describe the case of a healthy 56-year-old man who presented with constitutional symptoms and a swollen right arm. He was found to have multi-focal abscesses secondary to *P. multocida*, with the portal of entry likely being a small wound on his right hand. *P. multocida* is thought to cause disease in humans either through direct inoculation or colonization of the human nasopharynx and subsequent reactivation during an immunocompromised state. Our case describes a rare presentation of invasive *P. multocida* infection in an immunocompetent host, occurring through either hematogenous or lymphatic spread.

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**Résumé**

*Pasteurella multocida* (*P. multocida*) est l’agent pathogène isolé le plus souvent dans les blessures par morsure de chat. Nous décrivons le cas d’un homme de 56 ans en bonne santé présentant des signes généraux et un œdème du bras droit. Il s’est avéré qu’il présentait des abcès multifocaux secondaires à *P. multocida*, le point de pénétration de la bactérie étant probablement une petite blessure sur sa main droite. *P. multocida* provoquerait la maladie chez l’humain soit par inoculation directe ou par colonisation du nasopharynx et une réactivation ultérieure au cours d’une immunosuppression. Notre cas décrit une présentation rare d’infection invasive à *P. multocida* chez un hôte immunocompétent, survenant par l’intermédiaire d’une dissémination par voie hématogène ou lymphatique.

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**Case Report**

A 56-year-old previously healthy man was admitted to hospital with chest discomfort, fevers, and chills. This was his second presentation to hospital in a week, and his symptoms had all worsened in that time period. On examination, he had swelling, tenderness, and erythema over his right medial arm and right pectoralis region, and a superficial right palm wound. On history, the patient was on no immunocompromising medications, did not have any risk factors for human immunodeficiency virus, did not endorse any substance use, and did not have underlying cirrhosis, end-stage renal disease, or malignancy.

Bloodwork on presentation demonstrated a white blood cell count of 30.1 × 10^9/L, with a neutrophilic predominance at 26.2 × 10^9 cells per litre. A computerized tomography (CT) scan of the
thorax revealed a 3.9 cm collection in the right pectoralis minor muscle displacing it with resulting mass effect on the pectoralis major ventrally (Figure 1). An ultrasound also showed a 10-cm collection in the medial aspect of the upper right arm. Purulent fluid was drained from both abscesses.

Blood cultures were negative. The patient was empirically initiated on meropenem for broad-spectrum coverage of abscess-forming pathogens in the context of a preexisting penicillin allergy. Pathogens causing intramuscular abscesses or bacterial myositis include *Staphylococcus Aureus* most commonly, and less frequently other gram-positive, gram-negative, and anaerobic bacteria. He subsequently developed a rash and was transitioned to levofloxacin and metronidazole.

Abscess aspirate cultures grew *Pasteurella multocida*. The patient confirmed ownership of a cat, with a history of licks; he also recently suffered a work-related injury resulting in a palmar wound which was a possible portal of entry. The local public health laboratory provided sensitivities on the isolated *P. multocida*, reporting this strain to be sensitive to penicillin, ceftriaxone, levofloxacin, and trimethoprim-sulfamethoxazole.

The patient continued on levofloxacin and metronidazole for 2 weeks, the latter used to cover for other possible slower growing anaerobes. On repeat imaging, the collections had completely resolved, and antibiotics were stopped.

**Discussion**

*P. multocida* is a nonspore forming, nonmotile, gram-negative coccobacillus and is a facultative anaerobe. It is commonly found in the nasopharynx and gastrointestinal tract of cats and dogs, but not humans, and is classically recognized as a cause of skin and soft tissue infections after an animal bite. Another mechanism by which *P. multocida* can cause disease in humans is through nasal and oropharyngeal colonization of people after frequent interactions with cats and dogs. Activation of infection may then occur during periods of suppressed immune function.

Along with simple skin and soft tissue infections, *P. multocida* and other *Pasteurella* species can rarely cause severe infections such as meningitis and endocarditis. Invasive infections most commonly occur in patients with predisposing immunocompromising conditions, such as cirrhosis, or underlying malignancy and those at extremes of age. *P. multocida* has been classically treated with penicillin; however, beta-lactamase activity has been detected in some strains, with 13% of strains found to be beta-lactamase positive in a study by Giordano et al. Therefore, initial therapy with amoxicillin/clavulanic acid, in penicillin-allergic patients with fluoroquinolones or tetracyclines is reasonable while awaiting susceptibility testing.

Our patient presented with a thoracic abscess, and while abscesses are common with *P. multocida*, a review of the literature revealed only one other report of a thoracic abscess, with Suzuki and colleagues reporting on a superficial chest wall abscess due to *P. multocida*, as compared to our deep intramuscular collection.

Our patient's presentation represents either hematogenous or lymphatic bacterial spread. Hematogenous spread is supported by the finding of abscesses in two distinct locations, but the negative blood cultures argue against it. Lymphatic spread is supported by the location of both abscesses on the same side of the body, in close proximity to each other. The definitive route of spread remains challenging to determine as the lymphatics and blood vessels in the arm travel closely together and are hard to distinguish on imaging.

Bacterial inoculation likely occurred through contact of the palmar wound with cat saliva. The invasive nature of this patient's infection is surprising, considering the patient's immunocompetent status. His excellent outcome highlights the importance of source control (abscess drainage) and susceptibility-guided antibiotic management.

**Key Points**

- *P. multocida* is a common pathogen in human animal bites and should be suspected in patients with dog and cat exposures.
- The most frequent clinical presentation is a skin and soft tissue infection, but *P. multocida* can cause invasive disease, particularly in immunocompromised hosts.
- Infections secondary to *P. multocida* are most commonly treated with penicillin but beta-lactamase production can occur; it is therefore reasonable to initiate beta-lactamase inhibitor combination antibiotics such as amoxicillin/clavulanic acid while awaiting susceptibilities.

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**Figure 1.** Pectoralis minor abscess visualized on an axial cut of a contrast-enhanced chest CT, measuring approximately 3.9 cm in diameter at its greatest dimension.
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References


