

# Pasturella Multocida Isolated From A Domestic Cat Bite Abscess

A A Wahab, M M Rahman

## Citation

A A Wahab, M M Rahman. *Pasturella Multocida Isolated From A Domestic Cat Bite Abscess*. The Internet Journal of Microbiology. 2013 Volume 12 Number 1.

## Abstract

A 55-year-old diabetic Malay lady was admitted to orthopaedic ward with an abscess following a domestic cat bite. On laboratory examination her C-reactive protein was elevated (17.29 mg/dL) in blood and *Pasturella multocida* bacteria was identified from pus of the abscess. The patient was treated with amoxicillin-clavulanic acid and discharged well. A cat was considered as carrier of *Pasturella multocida* and as a source of zoonotic infection.

## INTRODUCTION

*Pasteurella multocida* are small gram-negative coccobacillary bacteria present in nasopharyngeal and gastrointestinal flora of many animals<sup>1</sup>. Infection in humans is commonly acquired through zoonotic contact following animal bite or scratch. Skin and soft tissue infection is the most common clinical manifestation<sup>1</sup>. Tenosynovitis is the most frequent local complication of *Pasteurella* soft tissue infection<sup>2</sup>. *Pasteurella multocida* is a non-fastidious microorganism. The role of *Pasteurella multocida* in zoonotic infection through cat bite has further been emphasized in the presentation.

## CASE REPORT

A 55-year-old Malay lady with background medical illness of type II diabetes mellitus and hypertension was admitted to the Orthopaedic Ward of the National University of Malaysia Medical Centre with history of cat bite on her right forearm. The incidence happened four days prior to admission when her cat suddenly bite and scratched her right forearm on the extensor surface. Initially, there was just redness over the area but later progressed to localized swelling and increased in pain intensity. She also noticed pus was coming out from the wound. For the past four days occasionally she experienced fever. Apart from that, there was no other relevant complaint.

Her blood pressure was 137/77 mmHg with pulse rate of 90 beats per minute. She was febrile with body temperature 39°C. Examination of the right forearm showed presence of multiple scratch marks on the extensor surface. There was an

area of induration and erythematous. Purulent discharge was noted draining out from the wound. The wound did not extend to the elbow joint. The peripheral circulation was good.

The baseline laboratory investigations noted the presence of leukocytosis (11 x 10<sup>9</sup>/L) predominantly neutrophils. The C-reactive protein was raised (17.29 mg/dL). Her diabetic was poorly controlled with random blood sugar of 15.8 mmol/L and HbA1c of 13.5%. X-ray of the right forearm showed no evidence of osteomyelitis changes and no gas shadow.

She was treated as case of right forearm abscess secondary to domestic cat bite. Intravenous amoxicillin-clavulanic acid 1.2 grams 8-hourly was started empirically. Prompt incision and drainage of the abscess with wound debridement was done under emergency operation. Pus and tissue samples were sent for microbiological culture.

Intravenous amoxicillin-clavulanic acid was continued post operatively at the similar dose. The pus and tissue cultures grew *Pasteurella multocida*, which were susceptible to amoxicillin-clavulanic acid and ciprofloxacin. The antibiotic was continued intravenously for 10 days. She was discharged well with oral amoxicillin-clavulanic acid for one week. Upon discharged both white cell count and C-reactive protein were normalized. Repeated tissue and pus cultures were no growth.

## DISCUSSION

*Pasteurella multocida* is an inhabitant of oropharyngeal and gastrointestinal tracts of the cats and many other animals<sup>1</sup>.

Human infection is usually zoonotic in nature and in most cases occur after animal bite<sup>2,4,5</sup>. In our case cat bite was the mode of transmission of the infection. Other modes of transmission have been reported which include animal licking on the open wound and inhalation of animal aerosols<sup>6</sup>. Surprisingly there is also report on vertical transmission occurred in human<sup>7</sup>.

Clinical manifestation depends on mode of transmission. In animal biting the cat is found to be the most common mode of acquisition, thus skin and soft tissue infection becomes the most common infection in humans. In most of the cases, the infection appears as non-purulent cellulitis, lymphangitis or both<sup>8</sup>. This is followed by purulent wound with or without abscess formation<sup>8</sup>. Our case the patient presented with purulent type of infection with abscess formation. Cellulitis occurs hours to few days at the bite site<sup>2</sup>. However, in another study, respiratory tract infections were found to be the most common clinical presentation of *Pasteurella multocida* infection followed by skin and soft tissue infections<sup>9</sup>.

Human infections following cat bites are frequently polymicrobial particularly if it is associated with abscess formation<sup>8</sup>. In abscesses, mixed aerobic and anaerobic infections are common. This did not occur in our case as we managed to isolate only *Pasteurella multocida* in the pus and tissue specimens from our patient. Our anaerobic culture showed no anaerobic bacteria isolated.

*Pasteurella multocida* is a non-fastidious organism and it is not difficult to isolate them in clinical specimens. They grow well on blood agar but do not grow on MacConkey agar. They are non-motile and cytochrome oxidase positive. API 20NE commercial kit was shown and proved to be the best identification kit to identify these bacteria. API 20NE performed better than API 20E for this purpose<sup>3</sup>. Here we used API 20NE to help us identify the isolate as *Pasteurella multocida*.

Molecular technique such as polymerase chain reaction (PCR) can be used to further differentiate between *Pasteurella multocida* subspecies. *Pasteurella multocida* subsp. *septica* and *Pasteurella multocida* subsp. *multocida* are among the most common subspecies isolated in human infection. These two subspecies have been proven to be associated with specific clinical manifestations. For instance, the *Pasteurella multocida* subsp. *septica* is associated with more skin and soft tissue infections rather than respiratory tract infections<sup>1</sup>. In our opinion, in our case the identification

until to the subspecies level is not important because the management of the patient will not be changed by this factor. The molecular technique such as PCR is most likely to be helpful if further research is needed in this area to sub-identify these bacteria.

Good initial therapy results in better prognosis. Early surgical intervention (if required) and appropriate antimicrobial therapy are crucial<sup>10</sup>. In our case, the wound exploration and debridement were carried out promptly after admission. The use of amoxicillin-clavulanic acid as empirical therapy is a good choice for the treatment of animal bites because it encompasses broad coverage of microorganisms including aerobic and anaerobic bacteria<sup>10</sup>. In our case amoxicillin-clavulanic acid was continued as definitive antimicrobial treatment as the *Pasteurella multocida* is susceptible to amoxicillin-clavulanic acid.

Zoonotic infection by *Pasteurella multocida* through cat bites has been confirmed further in our hospital. The patient was treated by a combination of surgical intervention and appropriate antimicrobial therapy. She responded to the treatment and was discharged well. The public should be made aware of the danger of animal bites particularly those at risk of getting infection. *Pasteurella multocida* should be considered as one of the causative organisms in patients presenting with clinical infection due to cat bite. Antibiotics that have both aerobic and anaerobic coverage should be used as an empirical antibiotic in clinical infection due to animal bites.

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**Author Information**

**Asrul Abdul Wahab**

Department of Medical Microbiology & Immunology, Faculty of Medicine, The National University of Malaysia  
Kuala Lumpur, Malaysia  
asrulwahab@hotmail.com

**M. M. Rahman**

Department of Medical Microbiology & Immunology, Faculty of Medicine, The National University of Malaysia  
Kuala Lumpur, Malaysia