

# Lung Abscess Due To *Pasteurella Multocida*: Report of a Diabetic Case With No Underlying Lung Disease

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## Abstract

We reported a case of lung abscess due to *P. multocida* in a 56 years old diabetic man who had a dog but no bites or scratches. He was a current smoker with no underlying lung disease. This report suggests that *P. multocida* may cause lung abscess in diabetic patients and smoking might be considered as a predisposing factor in pet owners.

**Keywords:** *Pasteurella multocida*, lung abscess, smoking

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## INTRODUCTION

*Pasteurella multocida* is part of the normal flora of many animals and mostly causes local wound infections in humans following animal bites or scratches [1]. Respiratory tract infections also were reported especially in patients with underlying pulmonary disease [2]. The most common respiratory infection is bronchitis; and serious infections including lung abscess are rare [3]. We presented a case of lung abscess due to *P. multocida* in a diabetic man without underlying lung disease.

## CASE

A 56 year old man was admitted to emergency room with symptoms of fever, productive cough and hemoptysis for two days. The amount of hemoptysis was approximately 200-220cc/day. His respiratory rate was 28 breath/min, heart rate 96 beats/min, blood pressure 160/80mmHg and temperature 38.2°C. On the chest auscultation, breath sounds decreased in the lower zone of the right hemithorax and expiratory time prolonged. The white blood cell count was 12 300/mm<sup>3</sup>, sedimentation rate was 50mm/hour and C-reactive protein was positive. Serum biochemistry analysis revealed high fasting glucose level (329mg/dl). Arterial blood gases (at sea level and breathing room air) were PO<sub>2</sub>: 62mmHg, PCO<sub>2</sub>: 39.7mmHg, pH: 7.5, bicarbonate: 31.3mmol/l, SaO<sub>2</sub>: 93%. On examination of chest x-ray there was an infiltration in the paracardiac area of the right lower zone. Computed

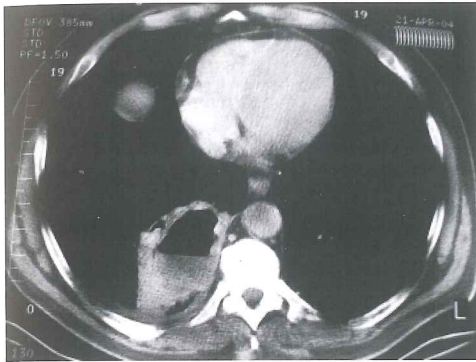
tomography showed an abscess formation, 3x5x7cm in size in the posterobasal segment of the right lower lobe and right-sided minimal pleural fluid (Figure).

He was a current smoker without underlying lung disease. Pulmonary function test was in normal range (FVC: 4.09 l (87% predicted), FEV<sub>1</sub>: 2.96 l (80% predicted), FEV<sub>1</sub>/FVC: 72%). His history was unremarkable except hypertension for 10 years. He had a dog but no bites or scratches. He had no history of alcohol or drug abuse. Based on fasting glucose levels, he was newly diagnosed as diabetes mellitus (DM) and subcutaneous insulin was given. Empiric antibiotherapy was also started with intravenous levofloxacin (400mg/day) after microbiological sampling (urine, blood and sputum cultures). Urine and blood cultures were sterile while sputum culture yielded ampicillin-sensitive *Pasteurella multocida*. No other microorganisms including *Mycobacterium tuberculosis* were isolated. Bronchoscopic examination was performed for microbiological and cytological studies. No atypical cell was found in cytological specimen obtained from the right lower lobe bronchi. Bacteriological studies of bronchial lavage fluid, including cultures for mycobacteria and fungi were negative. As fever was still high in spite of four days levofloxacin therapy, ampicillin/sulbactam combination (4g/day) was started in place of levofloxacin. A favorable outcome was achieved and patient was discharged from the hospital after 10 days of IV and 10 days of oral treatment with ampicillin/sulbactam. Control radiographic evaluation was performed after 30 days from the discharge and revealed significant reduction in the size of the abscess and resolution of the pleural fluid.

## DISCUSSION

*P. multocida*, a small, gram-negative coccobacillus, is a commensal of the upper respiratory tract of various animals including cat and dog. This microorganism mostly causes cutaneous infections in humans following animal bites and scratches [1]. The respiratory tract is the second most common site of *Pasteurella* infection. The spectrum of disease includes pneumonia, tracheobronchitis, lung abscess, and empyema [1-4]. It is thought that lower respiratory infection

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**Figure:** Computed tomography of the chest revealed abscess formation with air fluid level and minimal pleural fluid collection in the right lower lobe.

develops after direct inhalation of contaminated aerosolized particles or microaspiration of secretions from infected nasopharynx [5].

Majority of patients with pulmonary infections are pet owners with underlying lung disease, either COPD, bronchiectasis or malignancy. Infection was reported in patients with predisposing factors other than underlying lung disease such as alcohol consumption, diabetes and AIDS which are quite rare [6, 7]. Recently Tattevin et al. reported 20 cases with pasteurellosis of whom 3 had pneumonia. Underlying diseases were COPD and diabetes in two cases and no predisposing factor was determined in the remaining one [8]. Our case had no underlying lung disease however he has newly diagnosed diabetes mellitus.

Previous reports indicate that the most common respiratory infection related to *Pasteurella* is bronchitis [3]. Besides infection in cavitated lung area, *P. multocida* also causes abscess formation which is thought to be explained by dermonecrotic toxin and proteases production by the microorganism [6, 9]. According to our knowledge there are 9 case reports of lung abscess due to *P. multocida*, most of them reported in a patient with underlying lung disease. Although our case had no diagnosis of chronic lung disease, he was a smoker like most of the other cases in the literature with lung abscess due to *P. multocida* [2, 5, 6, 10-15]. This finding suggests that besides underlying lung diseases such as COPD, bronchiectasis or malignancy; diabetes and smoke consumption might be considered as predisposing factors for respiratory *P. multocida* infection in pet owners. However it was reported 33% of *P. multocida* septicemia could be occurred in healthy individuals with no underlying disease and no animal exposure could be identified in 17% of the cases [16].

In previous studies, *P. multocida* is generally isolated from bronchoalveolar lavage specimen [6, 17]. There was a report consisted of 10 patients whose sputum cultures were positive for *P. multocida* [18]. Positive blood culture was rare and observed in septic patients [1]. Since sputum and blood cultures could be sterile in most cases, it is important to consider *Pasteurella* infection and apply further investigation techniques including bronchoscopy and bronchoalveolar lavage in susceptible cases. On the other hand, *P. multocida*

is generally sensitive to penicillin and cost-effectiveness of these further investigation techniques could be a problem. However, it is important to isolate the microorganism in penicillin-resistant cases. Besides, bronchoscopic examination may be necessary for differential diagnosis since clinical and radiological findings of lung abscess due to *P. multocida* are not different from those of common bacterial abscess or malignancy [2, 12].

Our case suggests that lung abscess with excessive hemoptysis might occur due to *P. multocida* in patients who has not underlying lung disease and if microorganism is sensitive to penicillin, medical treatment might be sufficient without surgical procedures such as resection or drainage of abscess material.

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