Abstract

We report a patient with chronic lung abscess due to *Pasteurella multocida* infection that may be caused by the contact with cows in his workplace. Despite its apparent rarity, chronic abscess due to *P. multocida* should be considered in the differential diagnosis of solitary pulmonary masses. This case report suggests that *P. multocida* infection can be potentially caused from saliva of cows as well as dogs or cats.

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**Key words:** lung abscess, *Pasteurella multocida*, cow

Introduction

*Pasteurella multocida*, a pleomorphic Gram-negative bacterium, is well known as both a common commensal and pathogen in a variety of animal species. Though a much less common pathogen in humans, it is responsible for certain types of clinical disease. Cutaneous infection, secondary to dog bites or cat scratches harboring the organism, is probably the best known form in infection of humans. Although rare, respiratory tract infections including empyema, pneumonia, and lung abscess have been reported. We describe here an asymptomatic man with chronic lung abscess resulting from *P. multocida* infection possibly acquired from the saliva of a cow.

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Case Report

An asymptomatic 49-year-old Japanese man was referred to us for evaluation and treatment of a right lower lobe pulmonary nodule identified at a local hospital in March 2001. He had worked as a researcher at a prefectural stock farm center for over 25 years. He had no history of disease which suggests that he is immunocompromised. Physical examination on admission was unremarkable. Routine tests, including white blood cell count, C-reactive protein, and blood sedimentation rate were within normal limits, apart from mild anemia. Serological tests for common bacteria, viruses, and parasites were negative. A chest plain radiograph and computed tomographic (CT) scans of the chest revealed a 3-cm lesion with a central area of low attenuation and spiculated borders in the apical segment of the right lower lobe. Sputum cultures showed no bacterial growth. Lung cancer was suspected, and bronchoscopy was performed. Findings from cytologic and histologic examination of transbronchial brushing and lung biopsy showed no evidence of tumor. Smears for acid-fast bacilli also were negative. Bacterial cultures of the bronchial lavage fluid, too, were negative. Percutaneous needle biopsy under CT guidance was nondiagnostic. The patient was discharged and followed at our outpatient clinic.

Four months later, repeat CT scans of the chest revealed that the lesion had become enlarged by about 50% (Fig. 1). Because the suspicion of malignancy was increased, the patient underwent partial resection of the right lower lobe with thoracoscopic surgery. Histologic examination showed an accumulation of neutrophils surrounded by fibrous tissue without evidence of malignancy (Fig. 2). PAS, Grocott, and Ziehl staining were negative. Culture of the surgical specimen was plated on various agar and broth media and incubated both anaerobically and aerobically for 48 hours at 37 °C using BBLCRYSTALTM Identification Systems Enteric/Nonfermenter ID Kit. A strain of penicillin and tetracycline sensitive *P. multocida* was isolated at a concentration of $10^6$ colony forming units/ml. No other micro-organisms or *Mycobacterium* spp. were isolated. On questioning, the patient had no known exposure to animals including dogs and cats other than cows in his workplace. Culture of oral swabs...
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of cows under his care also yielded *P. multocida*. Postoperatively, the patient received piperacillin sodium/aztreonam (2 g) intravenously daily for 2 weeks. At present, he is alive and well without further treatment 22 months after discharge.

**Discussion**

*P. multocida* is a Gram-negative coccobacillus which frequently is recovered from the nasopharynx or gastrointestinal tract of domestic or wild mammals such as cats, dogs, cattle, swine, sheep, rats, and birds, including chickens, turkeys, and ducks (1). The organism causes epidemic fowl cholera in birds and hemorrhagic septicemia in mammals. In humans, *P. multocida* is responsible for soft tissue infections after animals bites or scratches and occasionally may be associated with arthritis or osteomyelitis. *P. multocida* infection also has been reported after non-traumatic animal exposure and 5 to 15% of affected subjects have no known exposure to animals. A variety of systemic infections including septicemia, meningitis, and peritonitis, have been reported. Lower respiratory tract infections, including pneumonia, empyema, and lung abscess, have been documented in subjects with underlying chronic pulmonary disease and, more recently, in one patient with AIDS (2). We were able to find only ten reports of lung abscess due to *P. multocida* (3–12).

The presence of *P. multocida* in sputum culture should not be ignored even though this organism is occasionally isolated from the nasopharynx of healthy individuals exposed to animals. Material from thoracoscopic biopsies should be obtained systematically for bacteriologic analysis. In the present case, isolation of pure *P. multocida* from lung specimens obtained at surgery provided definitive evidence that this organism was responsible for a chronic abscess. Although positive culture from swabs of cows suggests the cows in his workplace as the vector in this case, we could not conclude that swabs of cows was the source of the infection because DNA typing for the strains of organism isolated from the cows and the patient was not performed. However, the patient had no known exposure to animals other than cows in his workplace and a critical assessment disclosed circumstantial evidence pointing to swabs of cows as the likely cause of this disease.

Another notable point in the present case is that imaging studies including CT of the chest were strongly suggestive of primary lung cancer. To date, previous imaging studies for *P. multocida* infection have not been reported such a solitary pulmonary tumor appearance. Recognition that *P. multocida* infection can mimic primary lung cancer is important in reaching the correct diagnosis and therefore determining the correct treatment.

In conclusion, despite its apparent rarity, chronic abscess due to *P. multocida* should be considered in the differential diagnosis of solitary pulmonary masses, especially in subjects exposed to domestic pets or cattle. This case report suggests that *P. multocida* infection can be potentially caused from saliva of cows as well as dogs or cats.

**References**

1) Weber DJ, Wolfson JS, Swartz MN, Hooper DC. *Pasteurella*


