

Large unilateral pleural effusion secondary to *Moraxella catarrhalis* infection

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CASE REPORT

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Abstract

A 43-year-old male with chronic kidney disease on maintenance hemodialysis presented with breathlessness, cough and right-sided abdominal pain. Examination revealed a large right-sided pleural effusion and subsequent thoracentesis yielded an exudate. Although the fluid culture was sterile, sputum culture produced *Moraxella catarrhalis*. Tuberculosis was ruled out by pleural fluid analysis and pleural biopsy. Antibiotics were administered and subsequent radiograms indicated resolution of the effusion. This is a rare case of a large unilateral pleural effusion secondary to *M. catarrhalis* infection in a non-smoker with no pre-existing pulmonary pathology.

Key Words

Kidney disease; pleural effusion; *Moraxella catarrhalis*

Background

Moraxella catarrhalis is a relatively uncommon cause of community-acquired pneumonia. At one time considered to be merely an oral commensal and a contaminant of sputum cultures, *Moraxella* is now a proven pathogen.¹ It is largely restricted to patients with pre-existing lung disease, especially COPD, chronic smokers,² and the paediatric population.³ Carriage rates among children can reach rates of 100%, and *M. catarrhalis* is the third commonest cause of

respiratory infections after *Streptococcus pneumoniae* and *Haemophilus influenzae* in the United States;⁴ unfortunately similar epidemiological data from South-East Asia is not available.

Case details

A 43-year-old male, a diagnosed case of chronic kidney disease on maintenance haemodialysis for five months, presented with breathlessness, cough, and fever with chills that appeared soon after a session of haemodialysis three days previously. He denied any history of blood in his sputum or any history of substance abuse.

On examination the patient was anxious, tachypneic and orthopneic. His blood pressure was 170/100 mm Hg; moderate pallor was noted and accessory muscles of respiration were active. Pedal oedema was absent. Respiratory examination revealed absent breath sounds over the right side of the chest with a stony dull note on percussion. Abdominal examination showed no evidence of free fluid. Emergent chest radiography (Figure 1) confirmed the presence of a large right-sided pleural effusion.

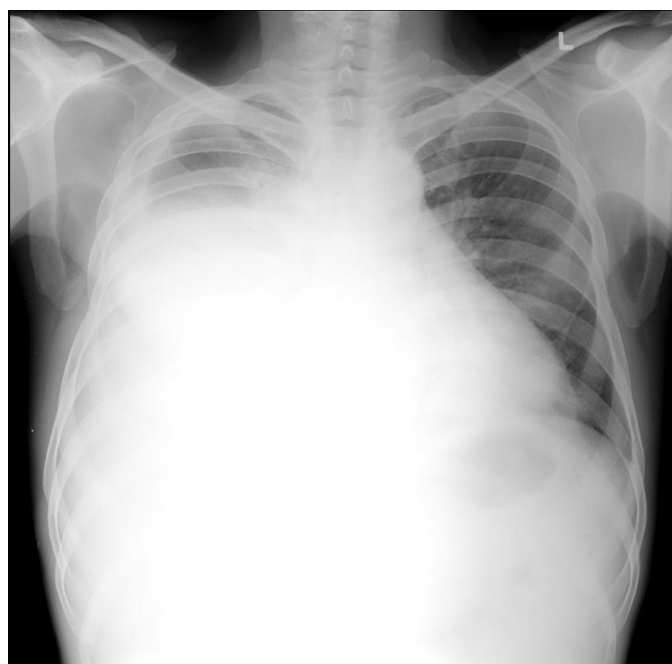


Figure 1: Thoracic radiogram showing large right-sided pleural effusion

Although neither clinical nor radiological findings were unequivocally suggestive of coexisting pulmonary oedema, emergency haemodialysis with ultrafiltration was undertaken because of the possibility of a fluid overload state. Relief of breathlessness was minimal, and thoracentesis was performed that yielded an exudate (protein 5.7 gm/dL, LDH 288 U/L, leucocytes 225/mm³, 98% lymphocytes) with a low adenosine deaminase level (30 U/L). Although gram-stain of the fluid showed occasional gram negative coccobacilli, culture of the fluid was sterile and Ziehl-Neelsen preparation was negative for acid fast bacilli. Tuberculosis PCR was also negative.

Gram-staining of sputum smear also revealed gram-negative coccobacilli morphologically indistinguishable from those seen in the pleural fluid (Figure 2), fewer than five epithelial cells and more than 25 neutrophils per low power field, suggesting a good quality sample of sputum. Culture on chocolate agar also produced a heavy growth of the same organism, which was subsequently identified by biochemical tests including oxidase, catalase and deoxyribonuclease positivity, and resistance to colistin as *M. catarrhalis*. The possibility of contamination by oral commensals was considered and the microbiologists were consulted. They concurred that the presence of intracytoplasmic cocci and the heavy growth of *Moraxella* in the absence of other common oral commensals made such a possibility remote. A diagnosis of *M. catarrhalis* pneumonia with associated pleural effusion was made. As the patient had already been initiated on empirical therapy with parenteral cefepime, the same was continued. The patient responded with a reduction in fever. Although anaerobic culture of the fluid and sputum had not been performed due to lack of appropriate facilities, the prompt clinical response of the patient to monotherapy with cefepime virtually ruled out any likelihood of anaerobic infection.

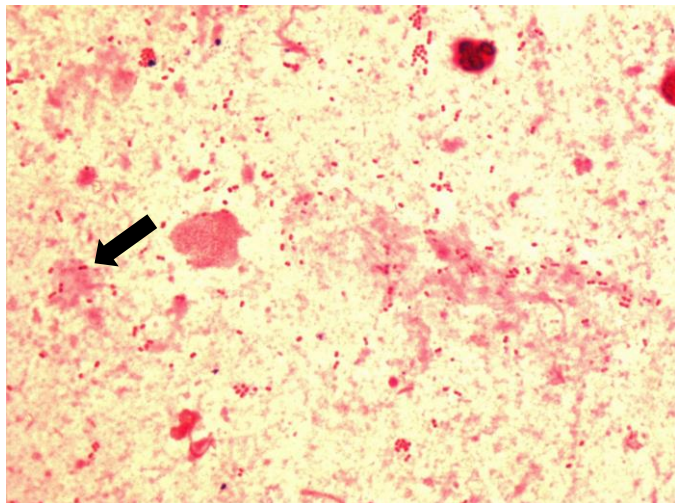


Figure 2: Sputum smears showing intracytoplasmic gram negative cocci in pairs (black arrow). Magnification X1000

Blood cultures by Bactec method were sterile. Despite this, the clinical microbiologist involved concurred with us that the presence of numerous pus cells and the absence of epithelial cells in the sample of sputum made it an acceptable sample.

We also investigated this patient for tuberculosis since chronic kidney disease is a known risk factor, however pleural biopsy was negative for granulomas or acid-fast bacilli. Thoracentesis was repeated but again showed no evidence of tuberculosis.

The patient was discharged after completion of an antibiotic course. At follow-up after one month he was symptom free, with clinical examination unremarkable and serial chest radiograms demonstrating progressive resolution of the effusion.

Patient consent

Signed informed consent was given by the patient for publication of material pertaining to this case.

Discussion

M. catarrhalis rarely produces pneumonia in individuals without risk factors. Our patient had no such history. In addition, respiratory examination and routine thoracic radiograms performed a year prior to this episode were normal. Arguably, the principal risk factor in this instance was chronic kidney disease, known to be an immunocompromised state, although reports of opportunistic infection by *Moraxella* in patients with chronic kidney disease are rare.^{5,6}

A possibility of the pleural effusion principally being a manifestation of fluid overload with *Moraxella* infection playing only a minor role in its pathogenesis was considered. However, we believe that the exudative nature of the fluid, the heavy growth of *Moraxella* from the sputum sample, the lack of evidence of fluid overload such as dependant oedema and ascites, the poor response to the emergency session of haemodialysis and the unilateral and large nature of the effusion all point towards *M. catarrhalis* infection as the principal aetiology. The presence of gram negative coccobacilli in the fluid further supports this assertion although culture of the fluid was sterile. Admittedly a fluid overload state cannot be completely ignored, and certainly the effusion produced by the infection was exacerbated and prolonged by it.

Although the patient's symptoms had started soon after a session of haemodialysis, the session itself had been completely uneventful. Furthermore a detailed cardiac



evaluation including serial electrocardiograms and an echocardiogram performed soon after admission showed no evidence of ischemic heart disease. Although the protocol of the prior session of haemodialysis could not be obtained, it was unlikely to have had any bearing on the patient's symptoms at presentation.

Conclusion

Pleural effusions are rare with *Moraxella*, and restricted to minor parapneumonic effusions.⁷ Large effusions are unprecedented and a thorough review of current scientific literature failed to reveal any reports of similar cases.

Our patient is therefore a unique case of unilateral large pleural effusion secondary to *M. catarrhalis* in the absence of classical risk factors.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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CONSENT

The authors declare that

1. They have obtained informed consent for the publication of the details relating to the patient in this report.
2. All possible steps have been taken to safeguard the identity of the patient.
3. This submission is compliant with the requirements of local research ethics committees.