Hockey puck sign: identifying *Moraxella catarrhalis*

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DESCRIPTION

A 76-year-old male patient with diabetes mellitus presented with a 4-day history of productive cough and fever. He was a former smoker, with a history of smoking 30 packs of cigarettes per year. Physical examination revealed the following: body temperature, 38.6°C (101.5°F); heart rate, 115 beats/min; blood pressure, 136/82 mm Hg; respiratory rate, 22 breaths/min and oxygen saturation, 96% on room air. Slight crackles were detected by auscultation over the right lower zone of the lung. CT showed mixed interstitial-alveolar infiltration of the right lower lung without emphysema. A sputum Gram stain revealed abundant, Gram-negative diplococci (figure 1A), and empiric therapy with ceftriaxone was begun. On hospitalisation day 2, the culture grew round colonies on blood agar and chocolate agar which slid across the agar surface without disruption (ie, the hockey puck sign, figure 1B and video 1). Based on these clinical and microbiological findings, ceftriaxone was continued, and the symptoms quickly resolved. Subsequently, the organisms were identified as *Moraxella catarrhalis* using the VITEK 2 system (BioMérieux, France).

M. catarrhalis is a common pathogen in respiratory tract infections. In adults, *M. catarrhalis* pneumonia occurs most frequently in elderly patients with an underlying illness, such as cardiopulmonary disease, chronic kidney disease and diabetes mellitus.^{1 2} To treat *M. catarrhalis* infections, extended-spectrum cephalosporins, ampicillin/sulbactam or amoxicillin/clavulanic acid are recommended because *M. catarrhalis* often produces beta-lactamase and may be resistant to penicillin, ampicillin and amoxicillin. Prompt identification of the causative organism is essential for pneumonia management, for which the findings of the sputum Gram stains and culture can provide practical data. However, *M. catarrhalis* morphologically resembles *Neisseria* spp, which are also part of the normal,

Video 1 The colonies were able to be slid across the agar surface without disruption, a feature known as the 'hockey puck sign'.

Learning points

- ▶ *Moraxella catarrhalis* is a common, bacterial cause of pneumonia most frequently occurring in elderly patients with an underlying illness.
- ▶ A characteristic feature of *M. catarrhalis* colonies is their ability to be slid across the agar surface without disruption, known as the 'hockey puck sign'.
- ▶ A combination of sputum Gram stain examination and the hockey puck sign leads to prompt diagnosis and treatment of *M. catarrhalis* infection in patients with pneumonia.

upper airway flora. The hockey puck sign is therefore useful in distinguishing *M. catarrhalis* from *Neisseria* spp.³

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Figure 1 (A) Sputum Gram stain showed neutrophils and Gram-negative diplococci resembling *Moraxella* sp or *Neisseria* sp. (B) The colonies were able to be slid across the agar surface without disruption, a feature known as the 'hockey puck sign'.

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