Gram-ghost cells

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DESCRIPTION

A 65-year-old Japanese man with advanced lung cancer was admitted with a 2-week history of cough and general fatigue. On physical examination, the patient appeared to be chronically ill; his blood pressure was 115/52 mm Hg, pulse rate was 97 beats/min and regular, temperature was 37.3°C, respiratory rate was 24 /min and peripheral arterial oxygen saturation was 93% on room air. Chest examination revealed decreased right breath sounds in the right chest region, and a plain chest x-ray revealed massive right pleural effusion. Thoracentesis was performed on the day of admission and Gram's staining of the pleural fluid revealed birefringent and colourless bacilli ('Gram-neutral' or 'gram-ghost') admixed with polynuclear leucocytes (figure 1). In the examination conducted using a longer focal distance, weakly stained, gram-positive rods were detected (figure 2). An additional study confirmed by Ziehl-Neelsen staining demonstrated acid-fast rods admixed with polynuclear leucocytes, which were strongly suspected to be mycobacteria (figure 3).

Mycobacterium tuberculosis: PCR was positive and pleural fluid culture grew *M tuberculosis*.

Gram-ghost appearance refers to the gram-neutral (neither positive nor negative) appearance of mycobacteria on Gram's staining.¹ In general, most internists and infectious disease specialists in Japan perform Gram's staining, especially in the setting of emergency room. Recognition of gram-ghost bacilli on the initial Gram's staining is useful, because it provides an early diagnostic clue, before the presence of mycobacteria can be confirmed by Ziehl-Neelsen's staining.

To cite: Hadano Y. *BMJ Case Reports* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-008477

Figure 1 Gram's staining of the sputum under appropriate focus (×1000).

Figure 2 Gram's staining of the sputum under a mildly longer focal distance (×1000).

Learning points

In the presence of gram-ghost cells by gram's staining is strongly suspected to be mycobacteria. Gram's staining is useful as an easy and rapid diagnostic clue to recognize infective mycobacteria.

REFERENCE

- 1 Trifiro S, Bourgault AM, Lebel F, *et al*. Ghost mycobacteria on gram stain. *J Clin Microbiol* 1990;28:146–7.

Figure 3 Ziehl-Neelsen's staining under appropriate focus (×1000).

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