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 polymorphonuclear 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 polymorphonuclear 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.

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
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