

Answer to November 2014 Photo Quiz

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Answer to Photo Quiz: Acute Bacterial Meningitis Due to *Streptococcus pneumoniae*

(See page 3835 in this issue [[doi:10.1128/JCM.00853-13](https://doi.org/10.1128/JCM.00853-13)] for photo quiz case presentation.)

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The Gram-positive, lancet-shaped diplococci observed in this specimen are characteristic of *Streptococcus pneumoniae*. A cerebrospinal fluid (CSF) specimen Gram stain result such as this should be promptly relayed to the clinician who is caring for the patient and can guide initial antimicrobial therapy.

A pan-susceptible isolate of *S. pneumoniae* was recovered from CSF and blood cultures. The patient's anti-infective therapy regimen was narrowed to ceftriaxone, and her mental status markedly improved. As a result of weakness secondary to the infection, the patient was discharged to a rehabilitation facility.

Thirteen days later, the patient complained of nausea, vomiting, and shortness of breath on exertion. She was subsequently found to have a heart murmur, and an echocardiogram revealed a 1.5-cm vegetation on her aortic valve. She underwent aortic valve replacement 5 days later; the native valve was submitted for culture, but no pathogens were isolated.

Although *S. pneumoniae* is the species most commonly isolated from adults with acute bacterial meningitis (1), the incidence of acute bacterial meningitis has drastically declined since the introduction of the *Haemophilus influenzae* type b (Hib) and the 7-valent pneumococcal conjugate (PCV7) vaccines in 1985 and 2000, respectively. Between 1998 and 2001, the rates of meningitis caused by *S. pneumoniae* dropped by 32% for adults 20 to 39 years of age, 8% for adults 40 to 64 years of age, and 18% for adults 65 years of age and older (2). The overall incidence of bacterial meningitis decreased from 2.00 cases per 100,000 population in 1998-1999 to 1.38 per 100,000 population in 2006-2007 (1). Unvaccinated children, the elderly, and immunosuppressed patients remain at the highest risk for acute bacterial meningitis.

Historically, latex agglutination tests against capsular polysaccharide antigens were sometimes used to diagnose meningitis due to *S. pneumoniae*, *H. influenzae*, *Neisseria meningitidis*, and other encapsulated bacteria. However, this method suffers from both poor sensitivity and poor specificity (3, 4). Cytospin-concentrated Gram stains of CSF can increase Gram stain sensitivity. With the use of CSF supplemented with known amounts of bacteria, it has

been demonstrated that cytospin Gram stains can increase bacterial detection by up to 2 logs compared to the level for Gram stains performed on specimens that have not been cytospin concentrated or concentrated using a conventional centrifuge (5). The use of latex agglutination is now discouraged due to its lack of utility, and presently, the cytospin Gram stain appears to be the most sensitive way to detect bacterial agents causing meningitis prior to culture results (3, 6).

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