

Answer to ID Corner

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Answer: 5

This patient most likely has a VP shunt infection based on clinical presentation, abnormal CSF and improvement following antibiotic therapy. Although the CSF culture was negative at 72 hours, one organism to be considered in VP shunt infections is *Propionibacterium acnes*, a Gram-positive, anaerobic rod characterized by low virulence and slow growth. Diagnosis of *P. acnes* VP shunt infections can be clinically challenging because symptoms may be subtle and CSF cell counts and chemistries may be only marginally abnormal. Additionally, the Gram stain is often unreliable and the CSF culture can remain negative for several days. If suspected, one should ask the microbiology laboratory to hold the CSF culture for 10 days. Penicillin G is the antibiotic of choice with vancomycin as alternative. The Infectious Diseases Society of America (IDSA) recently released guidelines for the management of healthcare-associated ventriculitis and meningitis:

Tunkel A, Hasbun R, Bhimraj A, et al. 2017 Infectious Diseases Society of America's Clinical Practice Guidelines for Healthcare-Associated Ventriculitis and Meningitis. Clin Infect Dis. 2017;64 (6):e34–e65. DOI: <https://doi.org/10.1093/cid/ciw861>

Other clinical pearls from these guidelines are the following:

1. New headache, nausea, lethargy, and/or change in mental status are suggestive of cerebrospinal fluid (CSF) shunt infection.
2. Fever, in the absence of another clear source of infection, could be suggestive of CSF shunt infection.
3. Symptoms and signs of peritonitis or abdominal tenderness in patients with ventriculoperitoneal shunts, in the absence of another clear etiology, are indicative of CSF shunt infection.
4. Abnormalities of CSF cell count, glucose, and/or protein may not be reliable indicators for the presence of infection in patients with healthcare-associated ventriculitis and meningitis.
5. Normal CSF cell count, glucose, and protein may not reliably exclude infection in patients with healthcare-associated ventriculitis and meningitis.
6. A negative CSF Gram stain does not exclude the presence of infection, especially in patients who have received previous antimicrobial therapy.
7. CSF cultures are the most important test to establish the diagnosis of healthcare-associated ventriculitis and meningitis.

8. An elevated serum procalcitonin may be useful in differentiating between CSF abnormalities due to surgery or intracranial hemorrhage from those due to bacterial infection.
9. Magnetic resonance imaging with gadolinium enhancement and diffusion-weighted imaging is recommended for detecting abnormalities in patients with healthcare-associated ventriculitis and meningitis.
10. Vancomycin plus an anti-pseudomonal beta-lactam (such as cefepime, ceftazidime, or meropenem) is recommended as empiric therapy for healthcare-associated ventriculitis and meningitis.
11. Complete removal of an infected CSF shunt, CSF drain, intrathecal infusion pump or deep brain stimulation hardware, combined with intravenous antimicrobial therapy is recommended.