Spontaneous sphenoid meningoencephalocele with sepsis

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ABSTRACT

Streptococci bacteremia is an unusual source of sepsis from spontaneous cerebrospinal fluid (CSF) rhinorrhea due to sphenoid meningoencephalocele. A spontaneous cause of CSF rhinorrhea should be on the differential along with trauma and congenital and neoplastic lesions. Moxifloxacin 400 mg daily for 2 weeks has a satisfactory CSF penetration to treat *Streptococcus viridans* bacteremia due to CSF rhinorrhea.

KEYWORDS Bacteremia; chronic sinusitis; moxifloxacin; sepsis; sphenoid meningoencephalocele; spontaneous CSF rhinorrhea

Sepsis due to spontaneous sphenoid encephalocele is an uncommon presentation, as well as an uncommon source of bacteremia. Patients with spontaneous sphenoid encephalocele classically present with cerebrospinal fluid (CSF) rhinorrhea, chronic sinusitis, seizures, headache, nasal fullness, and infraorbital nerve symptoms. Common bacteria associated with CSF leaks are *Streptococcus*, *Haemophilus*, and *Staphylococcus*.¹ We present a case of streptococci bacteremia from spontaneous CSF leak due to sphenoid meningoencephalocele.

CASE DESCRIPTION

A 34-year-old man with a history of hypothyroidism and hyperlipidemia presented with recurrent and persistent CSF rhinorrhea, left-sided headache, neck stiffness, fever, and nausea. In prior health care visits, he was diagnosed with and treated for upper respiratory infections. Computed tomography of the brain revealed herniation of the temporal lobe thought to be secondary to dehiscence of the roof of the lateral access of the left sphenoid sinus, findings compatible with encephalocele (*Figure 1a*). Subsequent magnetic resonance imaging confirmed these findings (*Figure 1b*). The patient was treated empirically with vancomycin, ceftriaxone, and metronidazole. Blood cultures grew *Streptococcus viridans*, which was pan-susceptible, compatible with findings of sepsis secondary to bacteremia of *S. viridans* bacteria. Lumbar puncture attempts were unsuccessful due to his body habitus. The patient underwent a septoplasty and

endoscopic repair of a left lateral recess of the sphenoid CSF leak with fulguration of an encephalocele. Antibiotic therapy was de-escalated to moxifloxacin once he showed clearance of bacteremia along with resolution of his symptoms.

DISCUSSION

CSF rhinorrhea is a symptom caused by leakage of CSF into the nasal sinus, resulting from a defect in the skull base. The most frequent cause is head trauma, followed by idiopathic, congenital, and neoplastic lesions.² This case is unique because it led to streptococci bacteremia from spontaneous CSF leak due to sphenoid meningoencephalocele. The patient denied any history of trauma that could lead to such an insult. The common sites of origin for CSF rhinorrhea after anterior skull base trauma include the cribriform plate, the roof of the sphenoid sinus, and the posterior wall of the frontal sinus.^{3,4} In this case, it was the left sphenoid sinus likely herniating the temporal lobe, causing CSF leakage. The patient also had positive beta-2-transferrin, which exists exclusively in the CSF. His transesophageal echocardiogram was negative for any vegetation.

A single 400 mg moxifloxacin pill can achieve good penetration through healthy meninges within 2 to 6 h and reaches adequately high levels in human CSF to have bactericidal activity against penicillin-resistant *S. pneumoniae*.⁵ Our patient achieved source control of the CSF leakage after surgical repair of the encephalocele. Our goal was to target the

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Figure 1. (a) Computed tomography of the sinus showing dehiscence of the roof of the lateral recess of left sphenoid sinus, findings compatible with meningoencephalocele. (b) Magnetic resonance imaging of the brain showing a left lateral sphenoid meningoencephalocele with associated gliosis in the portion of the left temporal lobe that extends into the left sphenoid sinus.

bacteremia that developed as a result of CSF leakage. Because his *S. viridians* bacteremia was pan-sensitive, we transitioned him to moxifloxacin for 14 days after surgery with resolution of his symptoms.

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