VASCULAR MALFORMATION PREDISPOSES BACTERIAL MENINGITIS

Jorge R Risco, Physician
University of Rochester Medical Center - ROCHESTER NY

Introduction

Bacterial meningitis is a deadly infectious disease of the leptomeninges. The organisms responsible for meningitis depend upon the route of acquisition and underlying host factors. Direct entry of organisms into the CNS can occur by contiguous infection from trauma, neurosurgery, CSF leak and medical devices [1-2]. I describe a patient with bacterial meningitis likely predisposed by an underlaying sigmoid sinus diverticulum (SSD).

Case Description

Ms. B is a 75yo year old woman with a PMH notable for HTN, HLD, Afib / Aflutter on warfarin, remote 30 PY smoker who presents as a stroke alert for aphasia at 8:30am.

Two days prior to presentation she developed a headache and right ear pain. One day prior to presentation she developed right serosanguinous otorrhea. She presented to the hospital for worsening headache. On arrival, aphasia was noted, activating a stroke bell. Family denies preceding fevers, chills, or neurologic symptoms.

PMH HTN, HLD, Afib / Flutter on warfarin

QxH Cholecystectomy, breast lumpectomy, appendectomy, hysterectomy, oophorectomy.

SoH Remote 30PY smoker.

Medications Warfarin, Metoprolol, Tamsulonsin, Chlorthalidone.

Exam
8:45am HR83 RR24 T37.2°
9:30am HR120 T39.3°
General: Dried right serosanguinous otorrhea
Neurologic Exam: somnolent, decreased attention, non-fluent speech + paraphasic errors, supple neck.

Workup
8:38am WBC11.5, CRP 118
4:25pm WBC 18.9
7:44pm WBC 21.7
LP (Tube 1)
Nuc Cells 10952 (97% poly), RBC 1857, Gluc <2, Protein>600
Opening pressure >55.
G+ Cocci in Pairs
Blood Culture: Streptococcus Pneumoniae.
CTA and MRI confirmed a R Sigmoid Sinus diverticulum

Therapy / Hospital Coarse
Started on Vancomycin, Cefepime, Metronidazole, Ampicillin, Dexamethasone.
Narrowed to Ceftriaxone for 3 weeks of antibiotics.
EVD Placed
Intubated 9 days
Acute Rehab 11 days
Discharged with mild executive dysfunction.

Discussion

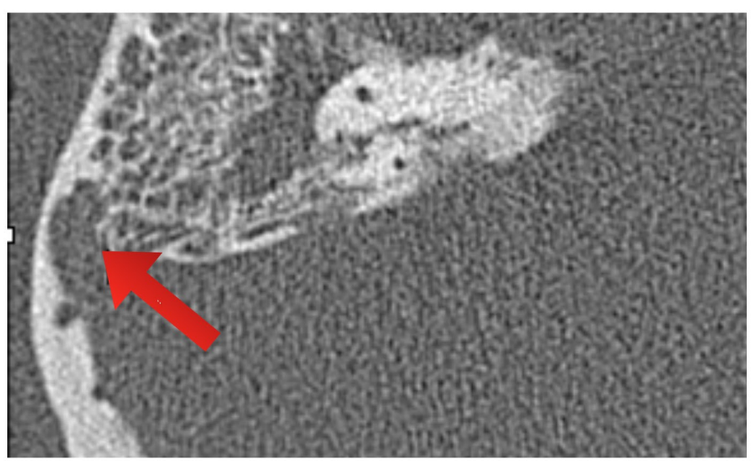
A SSD is a well-circumscribed sac in which the sigmoid sinus focally protrudes into the adjacent mastoid area. It is a cause of pulsatile tinnitus. Pulsatile tinnitus can be treated through endovascular coiling or transmastoid surgery, correcting the turbulent blood flow that reverberates against the cochlea [3]. Sigmoid sinus diverticula have not been associated with other clinical entities.

Ms B's meningitis developed quickly on the morning of admission, as suggested by her rapidly changing vitals, mental status and inflammatory markers. The infection was preceded by two days of earache and serosanguinous otorrhea, ipsilateral to the SSD and mastoid opacification seen on imaging. In the setting of anticoagulation, the SSD bled into the mastoid, then external auditory canal and likely provided a pathway for infection.

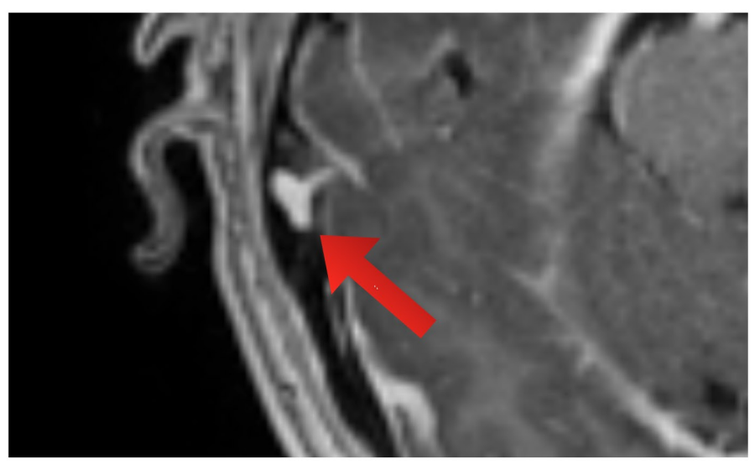
Ms B's presentation raises concern for a vascular malformation predisposing meningitis.

Bibliography
1. Durand, M. L., S. B. Calderwood, et al. "Acute Bacterial Meningitis in Adults. A Review of 493 Episodes." The New England Journal of Medicine 328, no. 1 (January 7, 1993): 21–28.
2. Reefhuis, Jennita, Margaret A. Honein, et al. "Risk of Bacterial Meningitis in Children with Cochlear Implants." The New England Journal of Medicine 349, no. 5 (July 31, 2003)
3. Wang, Guo-Peng,et al. "Surgical Treatment of Pulsatile Tinnitus Caused by the Sigmoid Sinus Diverticulum: A Preliminary Study." Medicine 94, no. 21 (May 2015): e882.

CT Angio Head. arrow demonstrates sigmoid sinus diverticulum. The diverticulum erodes into the mastoid air cells.



CT Mastoid. The mastoid air cells are opacified. The sigmoid sinus wall is dehiscent



MRI with Contrast. arrow demonstrates sigmoid sinus diverticulum