Pneumocephalus: A Rare Complication of Mastoiditis and Cerebral Venous Sinus Thrombosis

The Neurohospitalist
2020, Vol. 10(4) 324-325
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1941874420923530
journals.sagepub.com/home/NHO

Aman Deep, MD¹ and Andrew N. Wilner, MD¹

Keywords

mastoiditis, pneumocephalus, cerebral venous sinus thrombosis

Case Report

A 19-year-old African American female who was 16 weeks' pregnant (gravida 2, para 1) received oral antibiotics and pain medications from her obstetrician and primary care physicians for chronic otitis media. She presented to our emergency department with dizziness, fever and chills, nausea and vomiting, and 3 weeks of severe right frontal headache. Vital signs were temperature 38.5 °C, heart rate 144 beats per minute, blood pressure 110/83, and respiratory rate 44. Physical and neurological examinations were unremarkable except for right ear drainage.

Computerized brain venography revealed right mastoiditis with bony erosion (Figure 1) as well as cerebral venous sinus thrombosis (CVST) of the right jugular vein that extended intracranially into the sigmoid and transverse sinus. The thrombosed sinuses contained multiple air pockets (Figure 2). Magnetic resonance venogram confirmed

absence of flow in the right transverse and sigmoid sinuses (Figures 3). Blood cultures grew *Peptoniphilus indolicus* and *Bacteroides fragilis*, both notorious gas-producing anaerobic bacteria. Emergent surgical debridement and intravenous meropenem and vancomycin resolved the patient's symptoms.¹ Because of the infectious etiology of her CVST, she was not anticoagulated. She is currently 25 weeks' pregnant.

Figure 1. Computerized tomography of the right mastoid revealing bony erosion associated with abscess.

Figure 2. Computerized tomographic venography showing air pockets within the thrombosed cerebral venous sinus.

¹ Department of Neurology, University of Tennessee Health Science Center, Memphis, TN, USA

Corresponding Author:

Aman Deep, Department of Neurology, University of Tennessee Health Science Center, Memphis, TN 38163, USA.
Email: adeep1@uthsc.edu

Figure 3. Magnetic resonance venogram showing flow void in the right transverse and sigmoid sinus indicating venous sinus thrombosis.

Discussion

Transverse or lateral CVST secondary to otitis media is an uncommon complication in children^{2,3} and rarer in adults.⁴ This case of chronic otitis media in a pregnant adolescent evolved to mastoiditis and septic CVST. Air pockets in the venous sinuses may have been due to bone erosion of the mastoid air cells or in situ gas formation by anaerobic *Bacteroides* or *Peptoniphilus* bacteria.⁵⁻⁷

To the best of our knowledge, this is the first reported case of pneumocephalus associated with mastoiditis and CVST.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Aman Deep, MD <https://orcid.org/0000-0002-1103-4228>

References

1. Hedberg M, Nord CE. *Anaerobic Bacteria. Antimicrobial Therapy and Vaccines*. 2nd ed. Apple Tree productions; 2002:55-62.
2. Bianchini C, Aimoni C, Ceruti S, Grasso DL, Martini A. Lateral sinus thrombosis as a complication of acute mastoiditis. *Acta Otorhinolaryngol Ital*. 2008;28(1):30-33.
3. Singh GB, Arora R, Garg S, Kumar D, Ranjan S. Septic lateral sinus thrombosis: sinus exploration is unnecessary. *Case Rep Otolaryngol*. 2016;2016:4349538. doi:10.1155/2016/4349538
4. Kethireddy N, Sama S. Cerebral sinus venous thrombosis in the setting of acute mastoiditis. *Cureus*. 2019;11(2):e4023.
5. Murphy EC, Frick IM. Gram-positive anaerobic cocci—commensals and opportunistic pathogens. *FEMS Microbiol Rev*. 2013;37(4):520-553.
6. Parmar MS. Pneumocephalus associated with *Bacteroides fragilis* meningitis. *J Postgrad Med*. 2004;50(4):272-273.
7. Riggio MP, Lennon A. Development of a PCR assay specific for *Peptostreptococcus anaerobius*. *J Med Microbiol*. 2002;12(2):1097-1101.