Pneumocephalus; A Rare Presentation of Streptococcal Meningitis

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A 66-year-old Caucasian man was admitted to the ICU for altered mental status and respiratory failure. Upon review of his symptoms, he was positive for headache and right ear stuffiness during the preceding week. Head CT obtained before lumbar puncture showed pneumocephalus (arrows) in areas overlying mastoids, petrosal bone without midline shift (Picture 1, 2) and mastoid inflammation. Cerebrospinal fluid (CSF) analysis was suggestive of bacterial meningitis and confirmed by CSF culture which grew *streptococcus pneumoniae* resistant to ceftriaxone. Ear exam showed right middle ear effusion with air bubbles and intact tympanic membrane. He was treated with vancomycin, moxifloxacin and decadron with subsequent improvement. Repeat MRI two days later showed resolution of the air pockets (Picture 3). He was discharged after completion of ten days of intravenous antibiotics.

Pneumocephalus is caused by the presence of air or gas within the cranial cavity. Pneumocephalus as a complication of otogenic meningitis is very rare and the literature is limited to only a few case reports. All of the reported cases of pneumocephalus secondary to streptococcal meningitis have had concomitant mastoiditis, as in our case (1). The patho-

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physiology is believed to be due to the invasion of mastoid air cells with bone destruction which when associated with positive pressure events such as coughing or sneezing causes forceful entry of air through the cranial defect which prevents spontaneous egress of air (ball valve mechanism) (2). Small pneumocephalus, as in our case, secondary to meningitis or trauma can be managed conservatively by treating the meningitis, monitoring the patient’s neurological status closely and repeat imaging to check for resolution. Large pneumocephalus with a midline shift requires immediate surgery in order to prevent herniation of the brain.

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References