An Adult Case of Pneumocephalus and Pneumococcal Meningitis Associated with the Sphenoid Sinusitis

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Abstract

A 60-year-old man was admitted to our hospital after being found at his home in a comatose state. Cerebrospinal fluid and blood cultures were positive for Streptococcus pneumoniae. Brain magnetic resonance imaging (MRI) revealed sinusitis in the sphenoid sinus. Computed tomography demonstrated the presence of multiple air pockets in the basilar cistern, and we diagnosed pneumococcal meningitis complicated with pneumocephalus. Multiple cerebral infarctions were found on brain MRI after admission. In this case, pneumocephalus was secondary to pneumococcal meningitis due to sinusitis on admission, and multiple cerebral infarctions after admission. We demonstrated that early diagnosis is required for the successful treatment of pneumococcal meningitis.

Key words: pneumococcal meningitis, pneumocephalus, sphenoid sinusitis

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Introduction

Pneumocephalus has been reported to result from a variety of etiologies. Most patients with pneumocephalus are children or those in an immunocompromised condition (1-6).

Pneumocephalus is a rare complication of pneumococcal meningitis (7, 8). We report an adult case of pneumococcal meningitis associated with pneumocephalus and multiple cerebral infarctions.

Case Report

A 60-year-old man was admitted to our hospital after being found at his home in a comatose state. He had no significant medical history. On admission to our center, the patient’s temperature was 40°C, his heart rate was 146 beats/min, his respiratory rate was 24 breaths/min, and his blood pressure was 220/137 mmHg. Cardiac, lung, and abdominal exams were normal. He was slow to respond to questions and commands. His Glasgow Coma Scale (GCS) score was 13. The cranial nerves were intact. His deep-tendon reflexes were brisk and symmetrical and the Babinski sign was absent bilaterally. There was neck stiffness, and Kerning’s sign was significantly positive. Laboratory data revealed a total white cell count of 5,370/μL, neutrophilia of 96.7%, and C-reactive protein of 16.5 mg/dL. Cerebrospinal fluid (CSF) obtained via lumbar puncture revealed a cell count of 678/μL (polymorphonuclear cells 402/μL, lymphocytes 276/μL), a glucose concentration of 20 mg/dL (serum glucose 241 mg/dL) and a protein concentration of 1,949 mg/dL. The CSF pressure was high (180 mmH2O). A Gram stain of the CSF sample revealed Gram-positive cocci on the first day. The cultures of CSF and blood grew Streptococcus pneumoniae five days after admission. Brain magnetic resonance imaging (MRI) revealed sinusitis in the sphenoid sinus (Fig. 1a). Computed tomography (CT) demonstrated the presence of multiple air pockets in the basilar cistern (Fig. 1b). Sagittal CT scan showed a bone defect on the clivus (Fig. 1c). Pneumocephalus was diagnosed. Medical treatment included ceftriaxone (8 g i.v./day) and ampicillin (6 g i.v./day). Two days after admission, incision and drainage surgery were performed using an endoscopic endonasal approach. After starting antibiotic treatment, his fever decreased and the inflammatory reaction improved.

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After 11 days, the patient’s GCS score decreased to 3 and quadriplegia appeared. Multiple cerebral infarctions were found in the bilateral temporal lobe and brain stem on brain MRI (Fig. 1d, e).

He was transferred to another medical center, and he was still bedridden six months after onset.

**Discussion**

Pneumocephalus is usually found after trauma (1), and other known causes include neoplasm (2), surgery (3), otitis media (4), post-radiation necrosis (5), and meningitis with gas-producing organisms (6). Pneumocephalus is a rare complication of pneumococcal meningitis. Some reports (7-10) have shown pneumococcal meningitis concomi-
The authors state that they have no Conflict of Interest (COI).

References