Brain abscess caused by *Salmonella typhi*

Case report

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The authors report a rare case of a brain abscess associated with osteomyelitis caused by *Salmonella typhi* that remained in contact with human tissues for 33 years without losing its virulence.

KEY WORDS • brain abscess • *Salmonella typhi* • typhoid abscess

ANY of the pyogenic bacteria may cause brain abscess. Staphylococci, streptococci, and pneumococci are common, but brain abscesses caused by the Salmonella group are extremely rare. We describe a brain abscess caused by *Salmonella typhi* that was successfully treated by aspiration, drainage, and injection of antibiotics into the abscess, and systemic antibiotic therapy.

Case Report

A 45-year-old woman was admitted to our clinic on May 26, 1975, because of progressive headache of 1 month's duration without nausea and vomiting, and intermittent numbness and convolution involving the angle of the left side of the mouth for 1 week. She had suffered typhoid fever at the age of 12 years, but there was no history of otitis media or high fever.

Examination. No abnormal findings were noted on the systemic physical examination. Her temperature was 97°F and the pulse 92. She was alert and well oriented but dysarthric. Examination of the cranial nerves revealed no abnormalities other than a central facial palsy on the left side. The optic fundi were normal. The patient had normal reflexes, and no sensory abnormalities were present. There was weakness of the left fingers. The white cell count was 8500/cu mm with 2% eosinophils. Blood sedimentation rate was 24 mm in the first hour. No other abnormality was found on routine hematological or biochemical examinations. Lumbar puncture revealed an opening pressure of 140 mm H₂O, protein content 60 mg%, glucose 76 mg%, and 94 white blood cells. Plain skull films and tomography showed irregular bone destruction with an island of high density in the right parietal region (Fig. 1). An electroencephalogram was normal. A brain scan showed abnormal accumulation of 99mTc in the parietal region (Fig. 2). Right carotid angiography confirmed the presence of a large mass in the same area, without hypervascularity or ring-like shadow. Within 4 days, the patient's left arm became paralyzed and weakness developed in the left leg.

Operation. On June 5, 1975, a right frontoparietotemporal craniotomy was per-
formed. When the scalp was reflected, a focus of osteomyelitis was seen in the center of the bone flap, and continuing into the brain parenchyma through the dura mater (Fig. 3). The dura mater was incised in a circular fashion. A brain cannula was inserted into the abscess cavity, which was at a depth of 3 cm and contained 10 ml of yellowish, muddy fluid. The contents were aspirated and penicillin was injected into the abscess cavity. A drain was left in the space and the bone flap was not replaced.

Pathological Examination. Purulent material from the abscess cavity was planted in cultures, which grew *Salmonella typhi* with the phage type D2 characterized biochemically by failure to ferment lactose, inability to produce indole and positive sugar fermentation without the formation of gas, and immunologically by the presence of Vi antigen. This was sensitive to a number of antibiotics.

Postoperative Course. After operation, antibiotic therapy was continued. The patient received 8 gm of cephalothin and 2 gm of chloramphenicol daily for 21 days, and penicillin was injected into the abscess for 7 days. On the fourth postoperative day, she began to move her arm. Her neurological disabilities improved steadily, and when she was discharged 44 days postoperatively, her neurological examination was normal except for residual weakness of the left side of the face. Her temperature was normal. Cultures obtained from stool, urine, blood, bile, and cerebrospinal fluid were negative on several occasions. Postoperative angiograms showed satisfactory shrinkage of the abscess cavity.

Discussion

A variety of complications of Salmonella infection may occur, such as laryngeal ulcer, gallbladder infection, or cystitis. Suppurative
Salmonella brain abscess

processes may appear in other parts of the body. Although Salmonella meningitis is not very unusual, brain abscess is not a frequent complication. Brain abscesses due to *Salmonella typhi* were reported by Melchior in 1911 and by Burrows in 1959. Since then, Paniker and George reported an otogenic brain abscess caused by *Salmonella typhimurium*, and Brzezinski, et al., reported a cerebral abscess during *Salmonella enteritidis* infection. In our case, a brain abscess was caused by *Salmonella typhi* associated with osteomyelitis of the skull. It was presumed that the typhoid bacillus remained in contact with human tissues for 33 years without losing its virulence and caused osteomyelitis.

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References


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