

Brain abscess due to *Haemophilus aphrophilus*

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Haemophilus aphrophilus (*H. aphrophilus*) is a member of normal oral cavity flora. The organism can be isolated from gingival scrapings, interdental material, and dental plaque.¹ Although rare, brain abscesses are one of the most serious infections of the CNS. Dental pathologies and therapeutic interventions may have a role in the pathogenesis of brain abscesses. The rationale for this paper is to report a rare case of brain abscess caused by *H. aphrophilus* with a possible odontogenic origin.

A 28-year-old male patient with an unremarkable previous medical history was admitted to the emergency service of our hospital. He had been well until 10 days before, when headache and vomiting developed consecutively. He noticed weakness on the right side 3 days ago. On admission the patient was conscious, had no fever and neck stiffness. Neurological examination revealed right hemiparesis. Cardiovascular, respiratory, and abdominal examinations were found to be normal. White blood cell count was 9800/mm³ with 80% neutrophils. The erythrocyte sedimentation rate was 10 mm/h, and C-reactive protein level was 3.02 mg/l. Biochemical parameters were within normal limits. A CT of the brain showed a hypodense lesion in the left temporoparietal area. An MRI of the head revealed a left sided lesion with contrast ring enhancement, peripheral edema, and mass effect to the left ventricle (Figure 1). Intracranial mass or abscess was suspected as the likely diagnosis. Craniotomy was performed and the lesion was

identified as an abscess with aspiration and was totally removed with its capsule. Abscess material was cultured, and empirical antibiotic therapy was started with ceftriaxone (2 gr every 12 hours IV) and metronidazole (500 mg every 6 hours IV). Culture of the abscess material grew gram negative, catalase negative, and oxidase positive coccobacillus. The organism fermented glucose, fructose, and sucrose. It did not require X and V factors and was identified as *Haemophilus aphrophilus* by the API NH System (bioMerieux, Marcy l'Etoile, France). The isolate was susceptible to penicillin, ampicillin, amoxicillin-clavulanic acid, ceftazidime, ceftriaxone, and trimethoprim-sulfamethoxazole by the disk diffusion method. To find out the source of this infection transesophageal echocardiography was performed, and infective endocarditis or any valvular heart disease were excluded. Otorhinolaryngologic examination did not reveal any pathology. Dental examination showed multiple missing teeth, caries, chronic periodontitis, and root rest infection of bilateral maxillary first molar teeth. Following the surgery the patient's headache resolved rapidly. Neurologic symptoms improved within a week, and the patient recovered promptly. Dental treatment was initiated in the hospital. After 3 weeks of antibiotic therapy, he was discharged without any neurologic deficit.

Haemophilus aphrophilus is a small, pleomorphic, nonmotile, facultatively anaerobic, slow growing gram negative coccobacillus. It is oxidase positive; catalase, urease, and indole negative and can ferment glucose, sucrose, lactose, and maltose. Unlike the other members of the genus *Haemophilus*, it does not have a strict requirement for X factor (hemin) or V factor (nicotinamide-adenine dinucleotide).¹ *Haemophilus aphrophilus* has been reported to be the causative agent of different clinical manifestations. It is a well-known cause of infective endocarditis, and it has also been identified as the etiological agent in a number of cases with brain abscess, meningitis, spondylodiscitis, paravertebral abscess, osteomyelitis, arthritis, bacteremia, endophthalmitis, lymphadenitis, and soft tissue infections. Brain abscess due to *H. aphrophilus* is infrequent. Huang et al² reported that osteoarticular infection was the major clinical entity in their series. Only one out of 28 patients had brain abscess in the mentioned study. Certain predisposing and associated conditions for *H. aphrophilus* infections are described in the literature such as dental procedures or diseases, poor oral hygiene, underlying heart diseases, immune compromise, local trauma, and cirrhosis.¹⁻³ Although it is difficult to define the primary infectious site, brain abscesses frequently result from a contiguous focus of infection, mostly in the middle ear or sinuses. It has been reported that dental procedures and diseases may have

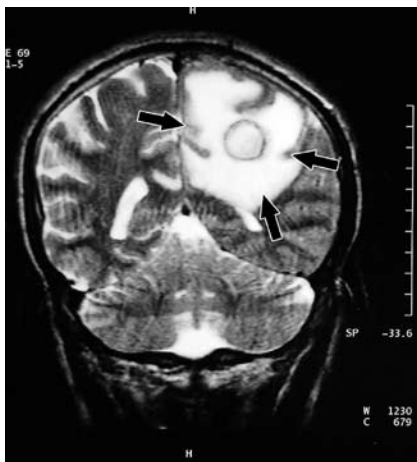


Figure 1 - Excessive peripheral edema around the left sided lesion and mass effect to the left ventricle.

an association with brain abscesses. Periodontal therapy, operative dentistry, periodontal diseases, and dental infections have been reported to be linked with brain abscesses.⁴ Our patient had no signs of otitis or sinusitis. Also, his cardiologic examination and echocardiography did not reveal any pathology. He was immunocompetent and previously healthy. Chronic periodontitis and root rest infection of bilateral maxillary first molar teeth were detected on his dental examination. Establishing a link between pathogens isolated from brain abscesses and oral origin is difficult. Since *H. aphrophilus* is a member of oral flora and considering that there was no any other source of infection, it is supposed that brain abscess in this patient originated from an odontogenic source. Cornerstones of therapy in patients with brain abscess are prompt drainage of the abscess either by surgery or stereotactically and adequate antibiotic therapy. Third generation cephalosporins are drugs of choice in empirical therapy of brain abscesses. As soon as the patient's diagnosis was certain, ceftriaxone therapy began and was continued for 3 weeks. As brain abscesses are known to be polymicrobial infections, metronidazole was added to cover possible anaerobe microorganisms. Clinical isolates of *H. aphrophilus* have been described as being susceptible to penicillin, ampicillin, and cephalosporins, with the use of disc diffusion susceptibility testing.⁵ The isolated bacteria in our case was also susceptible to ceftriaxone. Our patient had an operation without any complications and responded very well to antibiotic therapy. He recovered in days and was discharged without any neurologic deficit.

In conclusion, we report a patient with brain abscess caused by *H. aphrophilus* possibly linked to an

odontogenic origin. In light of the available literature, *H. aphrophilus* is a rare cause of brain abscesses. This life threatening condition can develop even in otherwise, healthy individuals with dental problems. Appropriate antibiotic therapy along with early surgical intervention can lead to favorable clinical outcomes. It should be borne in mind that an odontogenic focus should be considered in the evaluation of brain abscesses.

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