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BRIEF COMMUNICATION

Aggregatibacter aphrophilus brain abscess secondary to primary tooth extraction: Case report and literature review

Sofia Maraki [a,*], Ioannis S. Papadakis [a], Efkleidis Chronakis [b], Dimitrios Panagopoulos [b], Antonis Vakis [b]

[a] *Department of Clinical Microbiology, Parasitology, Zoonoses and Geographical Medicine, University Hospital of Heraklion, Heraklion, Crete, Greece*
[b] *Department of Neurosurgery, University Hospital of Heraklion, Heraklion, Crete, Greece*

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Odontogenic origin

We report on a rare case of *Aggregatibacter aphrophilus* brain abscess of odontogenic origin in a 6-year-old previously healthy boy, who had close contact with a pet dog. The poodle was the most likely source of the infecting organism, which subsequently colonized the patient's oral cavity. The abscess was surgically removed and he recovered completely after prolonged antibiotic treatment with meropenem. We also review the relevant medical literature on *A. aphrophilus* pediatric brain abscesses.

Introduction

Aggregatibacter aphrophilus (formerly *Haemophilus aphrophilus* and *Haemophilus paraphrophilus*) is a Gram-negative, nonmotile, capnophilic, fermentative, oxidase- and catalase-negative, and X and V independent on primary isolation coccobacillus that is part of the normal oropharyngeal flora.[1,2] It has been isolated from dental plaque, interdental material, and gingival pockets.[1,2] This microorganism was first described by Khairat[3] in 1940, when it was recovered from a patient with endocarditis. Other infections due to *A. aphrophilus* such as brain abscess, empyema, meningitis, sinusitis, otitis media, bacteremia, pneumonia, osteomyelitis, peritonitis, and wound infections have also been described.[4]

We report a case of brain abscess due to *A. aphrophilus*, discuss the potential sources of infection, and review the English medical literature on pediatric cases of brain abscesses due to this rare pathogen.

Case report

A 6-year-old boy was brought by his parents to the Emergency Department of the University Hospital of Heraklion due to symptoms of worsening drowsiness and repeated

* Corresponding author. Department of Clinical Microbiology, Parasitology, Zoonoses and Geographical Medicine, University Hospital of Heraklion, 71 110 Heraklion, Crete, Greece.
E-mail address: sofiamaraki@yahoo.gr (S. Maraki).

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episodes of vomiting. His past medical history was unremarkable except for a recent extraction of a central upper incisor, approximately 2 weeks prior to the onset of his symptoms. The boy was changing his primary teeth, and although he had no signs of periodontitis, he had poor dental hygiene. The parents also reported that he had frequent and close contact with the family's pet dog.

On admission the boy was afebrile, with a heart rate of 110 beats/minute, blood pressure 110/85 mmHg, and oxygen saturation 97%. He was pale, with supple neck, dry mucous membranes, and had a slightly decreased level of consciousness (Glasgow coma scale 12). The remaining of the physical examination was normal. Laboratory investigations showed leukocytes 10.9 $\times$ 10^9/L with 9.4 $\times$ 10^9/L neutrophils and 0.1 $\times$ 10^9/L bands, hemoglobin 131 g/L, glucose 7.4 mM (normal range, 3.8–6.3 mM), blood urea nitrogen 8.9 mM (normal range, 8–16.4 mM), creatinine 52 μM (normal range, 50–110 μM), sodium 140 mM (normal range, 135–145 mM), potassium 4.2 mM (normal range, 3.5–5.0 mM), fibrinogen 14.5 μM (normal range, 5.1–11.8 μM), and C-reactive protein 3.3 mg/L (normal range, 0.8–8 mg/L). Hormonal examinations, tumor markers, virology tests, and a chest radiograph were normal. A computed tomography scan of the head after administration of intravenous contrast revealed a sizable ring-enhancing lesion in the left frontal lobe, along with surrounding brain edema that caused a slight midline shift.

A magnetic resonance imaging scan of the head confirmed the computed tomography findings (Fig. 1). The boy was immediately subjected to a frontoparietal (pterional) craniotomy, which revealed a sizable abscess containing purulent and bloody material that was appropriately drained. Then, the lesion was totally removed with its capsule. Empiric antibiotic therapy was initiated pending culture results with intravenous metronidazole (10 mg/kg every 8 hours), and high-dose meropenem (40 mg/kg every 8 hours), while dexamethasone (0.5 mg/kg/day) was added as an adjunct therapy.

Cultures of the purulent material revealed an oxidase negative, catalase negative, and X and V factor independent Gram-negative coccobacillus. The isolate was identified with the use of the Vitek 2 automated system and by individual biochemical tests as *A. aphrophilus*. Using E-test, the isolate was found to be susceptible to ampicillin, amoxicillin plus clavulanic acid, cefuroxime, ceftriaxone, cefotaxime, imipenem, meropenem, clarithromycin, azithromycin, ciprofloxacin, levofloxacin, cotrimoxazole, tetracycline, and chloramphenicol. Metronidazole was discontinued and intravenous high-dose meropenem was administered as monotherapy for a total of 8 weeks. The patient underwent thorough screening for other possible sources of infection, such as congenital heart diseases, but none was found. The boy's symptoms resolved and he was discharged home in good clinical condition. A magnetic resonance imaging scan of the head conducted just prior to discharge showed remarkable improvement (Fig. 2).

Figure 1. Coronal T2 flair magnetic resonance imaging showing the abscess in the left frontal lobe.

Discussion

Brain abscess is an uncommon pathologic entity in children. Overall, about 25% of brain abscesses in some series occur in children, mostly in the age group 4–7 years.[5] The microorganisms can reach the brain by several different mechanisms. The most common is spread from a contiguous focus of infection, most often the middle ear, mastoid cells, or paranasal sinuses.[5] Other mechanisms include

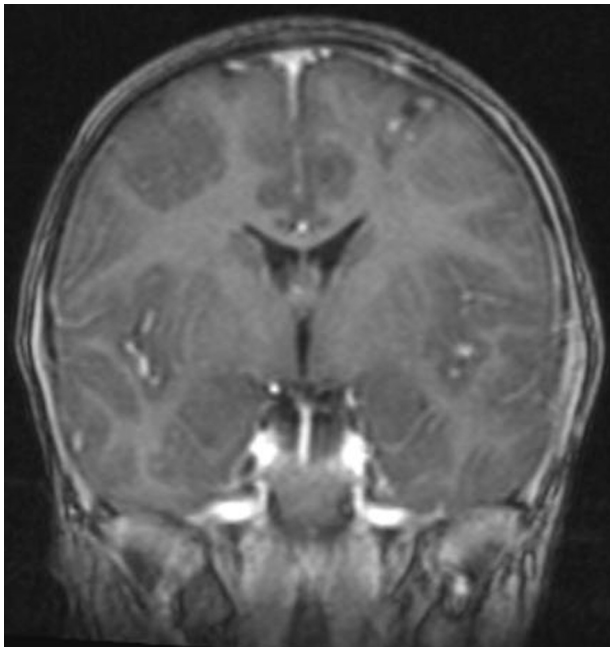

Figure 2. Coronal T1 flair image 3 months after the abscess removal.