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Case Report

A Child with Brain Abscess Due to *Gemella haemolysans*

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Abstract

Gemella Haemolysans, are Grampositive cocci that are considered to be normal inhabitants of the mucous membranes of the oropharynx,but are consideredrare pathogens in case of bacterial brain abscess. We report, to our knowledge, the second pediatric case of *Gemella Haemolysansbrain* abscess in an 8-year-old child, with no previous medical problems. Because of its similarity with Streptococcus viridans group, *Gemella Haemolysansoften* remains underdiagnosed in the laboratory, constituting a great challenge for many microbiologists in its correct identification.

Keywords: *Gemella Haemolysans; Brain abscess*

Introduction

In the pediatric population, brain abscesses are seen most often in children between 4 and 7 years of age, and occur infrequently, with an incidence of 4 cases per million. Brain abscesses in children are mainly caused by Gram-positive cocci such as Staphylococci, Streptococci, and Peptostreptococcispp. which are the most common causative agents found in pediatric brain abscesses, followed by gram-negative bacilli, including Klebsiella, Escherichia coli, Salmonella, Bacteroides, Haemophilus, and Proteus spp. Here we report a case of Gemella Haemolysans,as a rare cause of brain abscess[1].

Case Study

An 8-year-old male with unremarkable past medical history, presented with one-month history of headache mainly over the frontal and occipital areas. The headache wasrelieved with ibuprofen, till one week prior to his presentation, when the headache started to increase inintensity and became unresponsive to ibuprofen. In addition, the patient started to complain of phonophobia, photophobia and hypoactivity. In the day of presentation, the patient developed left sided tonic clonic movements and presented to our institution. Upon admission, he was afebrile. His blood pressure was 110/60 mmHg; respiration rate of 24 breaths per min, heart rate of 110 beats per min, and body temperature of 36.6°C. He was conscious and alert. Neurologic examination revealed no evidence of neck stiffness, Kernig's sign, or Brudzinski's sign were negative, with good muscle power and positive deep tendon reflexes. Laboratory data included a peripheral white blood cell count of 19.3x103/µl with 56% segment neutrophils, a hemoglobin level of 10.5 g/dl, a platelet count of 417 × 103/µl, an erythrocyte sedimentation rate of 50 mm/h, and a C-reactive protein level of 0.5mg/liter.

An urgent CT scan for the brain showed 3.5x3.2 cm right parietal thick walled formation with adjacent edema and gliosis. There was minimal midline shift to the right and mass effect on the right ventricle (Figure1). We proceeded with MRI of the brain. It showed an intracerebral right parieto occipital expansil processes measuring 4.3x3.6 cm with heterogeneous high signal on T2 and flair, and diffusion and low on T1, with peripheric thick capsule with enhancement after IV gadolinium, surrounded by a huge edema,exerting a mass effect on the right ventricle, and 5 mm deviation of the midline to the left (Figure2). The findings were suggestive of brain abscess. The patient started IV dexamethazone and an urgent craniotomy was done. Biopsy and aspiration of the encapsulated massrevealedwhite yellowish pus. Directly the patient was started on Ceftriaxone,Vancomycin and Metronidazole, while waiting for the culture result.

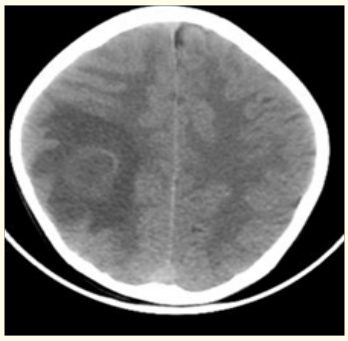

Figure1: *CT scan of brain showed right parietal thick walled formation with adjacent edema.*

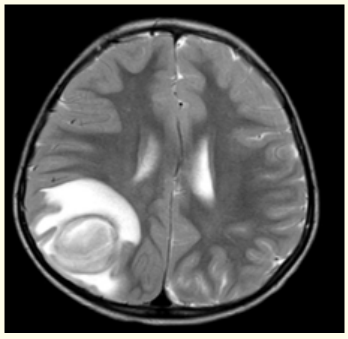

Figure2: *Brain MRI showed intracranial right parietooccipital mass of 4.3 x 3.6 cm, with peripheral thick capsule.*

The pathology revealed an abscess of infectious or inflammatory origin, with no evidence of malignancy. The gram stain showed gram positive cocci and the pus culture revealed *Gemella Haemolysans*. Unfortunately we couldnot determine the sensitivity of the organism, as our lab follows the CLSI Guidelines(Clinical & Laboratory Standards Institute) in which there is no sensitivity level for this organism, so we decided to treat the patient with IV penicillin with vancomycinfor a period of 6 weeks.

Discussion

Gemella species are facultative anaerobic Gram-positive *cocci*, and commensal organisms of the upper respiratory, gastrointestinal, and genitourinary tracts of humans [2,3].

The membersof this genus have been classified as *G. haemolysans, G.morbillorum, G. bergeri, G. sanguinis, G. palaticanis*, and *G.cuniculi* on the basis of DNA hybridization and comparative16S rRNA gene sequencing [4].

In 1938 *G. haemolysans* was first described by Thjotta and Boe as *Neisseria haemolysans*. However, unlike Neisseriae, Berger showed that it was catalase and oxidase negative and attacked carbohydrates fermentatively, thus it was consideredas a new genus, *Gemella* (little twin), with in the family *Neisseriaceae*, with a single species, *G. haemolysans*. Later, the genus *Gemella* was transferred to the family of *Streptococcaceae*, as thenucleic acid hybridization studies showed no relation to members of the family *Neisseriaceae* [2-5].

During gram staining, cells are easily decolorized and thus may appear gram variable or even gram negative. Besides, the identification of the organism may be delayed owing to its fastidious requirements and slow growth. It is likely that gram staining abnormality and morphological polymorphism are responsible for the misidentification of *Gemella* spp. They may be alpha-hemolytic on blood agar and catalase negative and appear as gram-positive cocci. Therefore, it can be initially misidentified as a viridans group streptococcus and reported as a part of the normal flora [5-8].

G. haemolysans occasionally causes severe localizedand generalized infections. Endocarditis [2], the most common infection caused by this organism, in addition to central nervous system infections [9], eye infections [10], spondylodiscitis [11], thorax empyema [12], and bacteremia [13]. Central nervous system infection due to *G. haemolysans* is very rare. *Gemella* species infections are associated with underlying conditions, such as immuno deficiency, cardiac diseases, malignancy, sinusitis, or poor dental health. In our case, the patient was immunocompetent, with no underlying chronic disease, and his physical exam was unremarkable except for dental caries.

Gemella is generally sensitive to β-lactam antibiotics [14], although resistance has been reported to vancomycin, teicoplanin, erythromycin and tetracycline [15].

Infections caused by G. haemolysans in the pediatric agegroup are rare. Upon reviewing the literature, we found one case of brain abscess due to G.Haemolysans in an 11-year-old child with complex congenital heart disease.

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