



BRAIN ABSCESS CAUSED BY PARVIMONAS MICRA: A RARE CASE REPORT

Clinical Microbiology

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ABSTRACT

Parvimonas micra are anaerobic gram-positive cocci, usually found in the human oral mucosa. We present a case of cerebral abscess caused by Parvimonas micra, an infrequent agent for this pathology, in a 03 year old male child known case of congenital heart disease (Hypoplastic right heart with critical pulmonary stenosis operated) and Left dysplastic Kidney. Initially he was conscious, irritable, febrile (102.F), had cyanosis, clubbing, cervical lymphadenopathy and raised JVP (Jugular Venous Pressure). He was evaluated with MRI Brain which showed left temporo-parietal abscess. He underwent emergency left temporo-parietal craniotomy and excision of abscess cavity along with Ommaya chamber placement. Approximately 100ml of abscess was drained sent for culture sensitivity. Postoperatively, he was managed with Intravenous fluids, anticonvulsants, cerebral decongestants and antibiotics (Ceftriaxone and Vancomycin).

KEYWORDS

INTRODUCTION

Brain abscess is a focal, intracerebral infection that begins as a localized area of cerebritis and develops into a collection of pus surrounded by a well-vascularized capsule (1). Brain abscess is one of the most serious complications of head and neck infections. Estimates reveal that, the incidence of brain abscess to be approximately 0.4 to 0.9 cases per 100,000 population, with higher rates in immunocompromised patients (2). One of the leading predisposing factors leading to hematogenously acquired brain abscess is cyanotic congenital heart disease, which accounts for 5% to 15% of all brain abscess cases, with higher percentages in some paediatric series (3). These are most commonly seen in patients with Tetralogy of Fallot or transposition of the great vessels.

SYMPTOM OR SIGN FREQUENCY	(%)
Headache	49–97
Mental status changes	28–91
Focal neurologic deficits	20–66
Fever	32–79
Triad of headache, fever and focal deficit	<50
Seizures	13–35
Nausea and vomiting	27–85
Nuchal rigidity	5–52
Papilledema	9–51

DIAGNOSIS

CT has revolutionized the diagnosis of brain abscess, the characteristic CT appearance of brain abscess is a hypodense centre with a peripheral uniform ring enhancement after the injection of contrast material; this is surrounded by a variable hypodense area of brain oedema the evaluation of a patient with suspected brain abscess. MRI is more sensitive than CT and offers significant advantages in the early detection of cerebritis, including greater contrast between cerebral oedema and adjacent brain, more conspicuous spread of inflammation into the ventricles and subarachnoid space, and earlier detection of satellite lesions.

We describe a clinical case of brain abscess caused by Parvimonas micra, a gram positive anaerobic cocci and a rare causal agent of this pathology.

Case Report

A three year old male child, a known case of congenital heart disease (Hypoplastic Right Heart with critical Pulmonary Stenosis - operated) and Left Dysplastic kidney, initially presented with complaints of multiple episodes of fever and vomiting for about a month, for which he was hospitalized and managed as a case of Dengue fever. However, he continued to have multiple episodes of fever and vomiting, for which he was admitted in a tertiary care hospital, for further evaluation and management.

On general examination, the patient was conscious, irritable, febrile (102oF), had peripheral cyanosis, clubbing of the fingers, cervical lymphadenopathy and raised JVP. Under the suspicion of a brain injury, an urgent NCCT Head was done, which showed a multifocal, hypodense nodular region measuring approximately 3.39 cm x 3.96 cm x 5.40 cm in left temporo-parietal region with midline shift of 11.5 mm. He was evaluated with CE MRI Brain which showed rim enhanced nodules consistent with abscess giving final impression left temporo-parietal abscess.

The worsening of his neurological status together with fever and vomiting, as well as CT and MRI images were data consistent with brain abscess. Patient underwent emergency left temporo-parietal craniotomy and excision of abscess cavity along with Ommaya reservoir placement. Approximately 100ml of abscess was drained and sent for microbiological investigations and culture including Gram stain, aerobic and anaerobic culture, fungal stain and culture, Ziehl-Neelsen stain and mycobacterial culture.

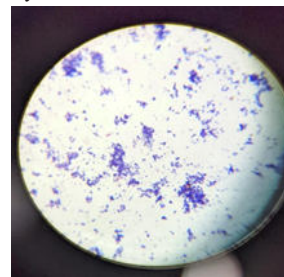


Figure 1: Gram Positive Cocci

Direct gram stain showed Gram positive cocci with numerous inflammatory cells. No acid fast bacilli and no fungal elements seen on

their respective staining methods. After 48 hours of incubation in aerobic media, no bacterial growth was observed. Interestingly, cultures in anaerobic media (Blood agar enriched with vitamin K) shown growth after 48 hours of incubation in anaerobic Gaspak. On Gram stain of the colony, Gram positive cocci were identified as shown in Figure 1.

Further, the colony was identified by VITEK® MS MALDI-TOF (Mass Spectrometry Matrix Assisted Light Desorption Ionisation-Time Of Flight) as *Parvimonas micra* with 99.9% confidence value (Figure 2). Antibiotic Susceptibility testing was done on anaerobic blood agar and was incubated in anaerobic Gaspak for 48 hours, according to Clinical Laboratory Standard Institute M-100, 31st Ed 2020. Organism was found susceptible to Ampicillin, Ampicillin-Sulbactam, Amoxicillin-Clavulanic acid, Piperacillin-Tazobactam, Metronidazole and resistant to Ertapenem, Meropenem and Clindamycin (Figure 3).



Figure 2 : Identification by VITEK® MS MALDI-TOF

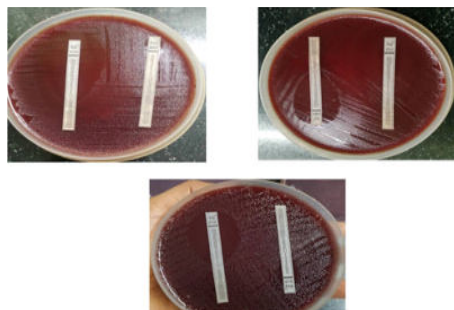


Figure 3 Antibacterial Susceptibility Test

During transfer to Paediatric ICU, patient developed bradycardia and hypoxia, for which he was resuscitated and placed on ventilator support and inotropes. Postoperatively, he was managed with intravenous fluids, anticonvulsants, cerebral decongestants and antibiotics (Ceftriaxone and Vancomycin). However, his hemodynamic condition continued to be critical, despite inotrope and ventilator support. On post-operative day 01, patient underwent a cardiac arrest wherein CPR was initiated immediately. However, the child could not be revived and was declared dead.

Discussion

Due to severity and grave prognosis of brain abscesses, it requires prompt joint action by neurosurgeons and infectious-disease specialists. Merely focusing on the focal suppurative process of the brain parenchyma is not enough for a successful treatment. It is paramount to identify and eradicate the primary source of infection.

Parvimonas micra is a non-spore forming anaerobic gram-positive coccus, which is usually and widely present in normal human oral and gastrointestinal flora and also a common finding in brain abscesses, suggesting an oral source. Predisposing factor leading to haematogenously acquired brain abscess is cyanotic congenital heart disease. Abscess location in the Temporo-parietal lobe supports that haematogenous dissemination is the major pathophysiological mechanism of brain abscess. Our report supports the diagnostic value of (MALDI-TOF) to detect anaerobes in patients with brain abscesses (5-7). However the turnaround time of MALDI-TOF may lead to delay in diagnosis. Hence the use of 16S rRNA may be a better choice in case of anaerobic/ culture negative brain abscess diagnosis. Mostly the anaerobes can be treated empirically but in this case we can appreciate that knowledge of antimicrobial resistance is essential for successful outcomes.

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