

A Rare Case of *Aerococcus viridans* Meningitis in a Patient with Trigeminal Nerve Schwannoma

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ABSTRACT

The genus *Aerococcus* spp. comprise microaerophilic, catalase-negative, Gram-positive cocci that show alpha-haemolytic growth on blood agar. They have a tendency to divide on two planes at a 90° angle, and rapid multiplication leads to the formation of Gram-positive cocci in tetrads and irregular clusters. *Aerococcus* spp. are capable of causing invasive and fatal systemic illnesses, such as endocarditis, bacteraemia, arthritis, and meningitis. Due to evolving diagnostic tools, it is now identified as a pathogen in a variety of disorders instead of being considered a contaminant. Most isolates are susceptible to penicillins, but there is increasing resistance to cephalosporins, ciprofloxacin, cotrimoxazole, clindamycin, vancomycin, and tetracycline. Here, authors present a rare case of *Aerococcus viridans* meningitis in a patient who underwent surgical excision of a left trigeminal Schwannoma, along with the drug susceptibility pattern resistant to most first-line antibiotics used against isolates from *Streptococci* spp., except doxycycline.

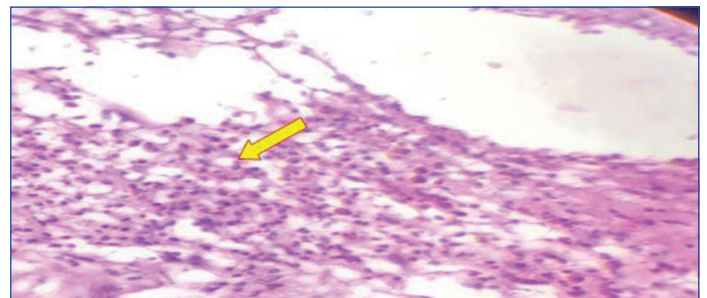
Keywords: Bacteraemia, Drug susceptibility pattern, Endocarditis, Gram-positive cocci, Penicillins

CASE REPORT

A 26-year-old woman presented to the Emergency Department with the chief complaint of holocranial headache for the past two years, vomiting with a headache, and loss of sensation over the left half of the face for the past three months. She was sent for contrast-enhanced Magnetic Resonance Imaging (MRI), which suggested a single well-defined lesion present at the left Meckel's cave measuring 4x2 cm. The lesion appeared hypointense on T1 and hyperintense on T2 (as shown in [Table/Fig-1]), extending into the middle cranial fossa from the posterior cranial fossa and causing mild compression of the midbrain. This was suggestive of a left trigeminal nerve Schwannoma, which was confirmed by histopathological examination [Table/Fig-2]. The examination showed haemosiderin-laden macrophages called Verocay bodies, which are pathognomonic of Schwannomas. She was referred to the Department of Neurosurgery at Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, and advised to undergo resection of the trigeminal nerve lesion. The surgical procedure involved a left temporal craniotomy, zygoma lowering, middle cranial fossa extradural approach, and gross total excision of the tumour under general anaesthesia. After the surgery, a subcutaneous drain was placed and closed with sutures and dressing due to a cerebrospinal fluid (CSF) leak. Two days following the surgery, she developed a high-grade fever of 103°F and experienced two episodes of seizures. Meningitis was suspected, and a CSF sample was sent for body fluid analysis.

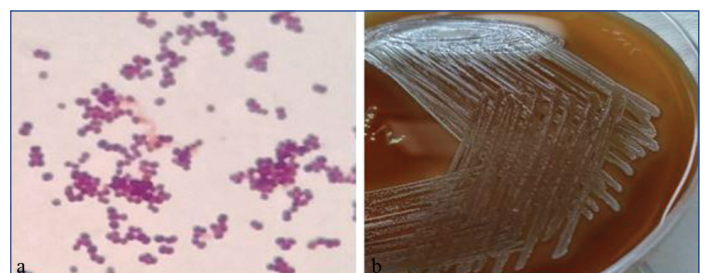


[Table/Fig-1]: Image showing Contrast enhanced- MRI suggestive of a single well defined lesion (yellow arrow) present at the left Meckel's cave of size 4x2 cm extending into middle cranial fossa from posterior cranial fossa causing mild compression of midbrain.



[Table/Fig-2]: Histopathological examination of an excised tissue stained by H&E stain showing haemosiderin laden macrophages which are pathognomonic of Schwannomas on 40X magnification.

The analysis revealed a lymphocyte count of 60% and a polymorph count of 40%. CSF glucose was low (32 mg/dL), total cell count was 103 cells/cubic mm, and CSF protein was 256 mg/dL. These findings indicated bacterial meningitis [1]. A CSF sample was then sent for routine aerobic bacterial culture and microscopy to the Bacteriology section in the Department of Microbiology at Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow. On wet mount, the sample showed plenty of red blood cells, a few pus cells, and a few non-motile cocci. Gram's stained smear revealed a few pus cells and a few Gram-positive cocci [Table/Fig-3]. The CSF sample was subcultured on MacConkey's agar and blood agar, and incubated at 37°C. After 16 to 18 hours of incubation, pinpoint colonies with alpha-haemolysis were observed on blood agar [Table/Fig-3]. We advised a repeat sample after changing the external drain and collecting bag to confirm the pathogenic nature



[Table/Fig-3]: Image: a) Shows Grams stained smear showing few Gram-positive cocci in pairs and chains on 100X magnification; b) Blood Agar showing alpha-haemolytic growth after overnight incubation at 37°C.

of the microorganism and exclude the presence of colonising flora in the drain [2]. On the repeat sample after changing the drain, the same isolate was confirmed using Matrix Assisted Laser Desorption/Ionisation-Time Of Flight-Mass Spectrometry Assay (MALDI-TOF-MS) [3]. Further antibiotic sensitivity testing was performed using the Kirby Bauer disc-diffusion method following CLSI 2019 guidelines [4]. The tested antibiotics against the isolate were ampicillin, doxycycline, gentamicin, levofloxacin, linezolid, minocycline, ampicillin-sulbactam, teicoplanin, and vancomycin. The isolate was found susceptible to doxycycline, minocycline, and linezolid. Although amoxicillin/clavulanic acid had been started after the blood sample was sent, it failed to alleviate the patient's symptoms of the patient. The patient was shifted from amoxicillin/clavulanic acid to doxycycline. After three days of antimicrobial treatment, the patient became afebrile, and no seizure episodes were noted. The drain was removed a week after the procedure, and the further hospital stay was uneventful. She was maintained on doxycycline and asked to follow-up after two weeks. Unfortunately, as she was lost to follow-up, her progress could not be traced further.

DISCUSSION

The *Aerococcus* genus comprises microaerophilic, catalase-negative, Gram-positive cocci that show alpha haemolytic colonies on blood agar. They have a tendency to divide on two planes at a 90° angle, and rapid multiplication leads to the formation of Gram-positive cocci in tetrads and irregular clusters [5]. The most common species of *Aerococcus* identified is *Aerococcus urinae*, followed by *Aerococcus sanguinocola*, *Aerococcus viridans*, *Aerococcus christensenii*, *Aerococcus suis*, and others [6-10]. It is capable of causing invasive and fatal systemic illnesses such as endocarditis, bacteraemia, arthritis, and meningitis. With the use of evolving diagnostic tools like MALDI-TOF-MS and Vitek-2, *Aerococcus viridans* is now recognised as a pathogen in a variety of disorders instead of being considered a contaminant [11]. We present a rare case of *Aerococcus viridans* meningitis in a patient who underwent surgical excision of a left trigeminal Schwannoma.

Due to the scarcity of reported cases of *Aerococcus viridans* meningitis in the literature, we report the fourth case of *Aerococcus viridans* meningitis from India. A rare case of urinary tract infection caused by *Aerococcus viridans* has been previously reported from India [12]. Nathavitharana KA et al. reported a series of cases of acute meningitis caused by *Aerococcus viridans* in three children in 1983, with a reported mortality rate of 33.33% (1/3, 33.33%) [13]. Another study by Chandran S et al., reported a case of aseptic meningitis caused by *Aerococcus viridans* when CSF fluid samples were assessed using FilmArray Meningitis [14].

Most *Aerococcus* isolates were found to be susceptible to penicillins, with increased Minimum Inhibitory Concentration (MIC) to cephalosporins, ciprofloxacin, cotrimoxazole, clindamycin, vancomycin, and tetracycline [12]. Interestingly, the isolate in this case was found to be susceptible to doxycycline, minocycline, and

linezolid. A similar susceptibility to tetracyclines was observed in our study, as reported by Mohan B et al. [12]. The use of MALDI-TOF-MS brought this underreported microorganism to light in duplicate samples from the same patient, along with identical drug susceptibility in our case. This study emphasises the significance of MALDI TOF-MS in identifying of rare and underreported isolates from the CSF, and the need for specific CLSI/EUCAST antimicrobial susceptibility guidelines for these isolates.

CONCLUSION(S)

This study emphasises the importance of MALDI-TOF-MS in the identification of this isolate, which can easily be misidentified as alpha-haemolytic streptococci. We identified the fourth case of *Aerococcus viridans* meningitis in India in a postoperative case of trigeminal Schwannoma and it represents the sixth case of *Aerococcus viridans* meningitis worldwide. Present study also provides clinicians with insight into the drug susceptibility pattern of this rarely isolated bacterium.

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