A lingual abscess caused by *Streptococcus intermedius*

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Lingual abscesses are rare. We describe a case in a healthy female with no recent history of trauma. The organism recovered by culture of drainage material collected prior to antibiotic treatment was *Streptococcus intermedius*, an organism recognized as flora of the oropharynx and associated with abscess formation. The isolate was resistant to clindamycin, which was the antibiotic therapy that the patient received.

**Introduction**

Abscess of the tongue is an extremely rare condition, and few physicians encounter it more than once in their careers. Deep infections of the tongue are rare because of the multiple layers of protection – a rich vascular network, a thick epithelium and bacteriostatic saliva (Brook, 2002; Jain & Bhatia, 1970) – and they must be recognized promptly and treated as a potential airway emergency, particularly if the abscess is at the base of tongue (Sanders et al., 1988). Most commonly, infection occurs in immunocompromised hosts or healthy individuals with foreign bodies (Hehar et al., 1996; Olsen, 2001); however, abscesses can form de novo as well (Balatsouras et al., 2004). Recommended treatment includes both drainage and administration of antibiotics.

**Case report**

A 43-year-old female presented to the emergency department with a 5-day history of odynophagia and dysphagia that started with a recent upper respiratory tract illness. She also noted that her tongue had been increasingly painful and swollen. Four months prior to this presentation, she had a tooth abscess treated with incision and drainage. She denied any drug use, and her HIV test was negative. On physical examination, the patient’s voice was muffled, and she was having difficulty handling her own secretions. She denied any respiratory difficulties. Inspection of the oral cavity revealed gross swelling of her tongue and floor of mouth. The patient was afebrile but had a white blood cell count of 21,500 $\mu l^{-1}$ and all other values were within normal limits. A CT scan with contrast demonstrated a 4 cm x 3 cm rim-enhancing fluid area of the left tongue base extending into the anterior tongue. The abscess was aspirated with an 18-gauge needle through the undersurface of the tongue along the midline. Due to a penicillin allergy, the patient was started on intravenous clindamycin. The laboratory received purulent material in a capped syringe barrel, and Gram stain showed many white blood cells and many Gram-positive cocci. Bacterial cultures grew an essentially pure isolate of *Streptococcus intermedius*, a member of the ‘*Streptococcus milleri*’ group, which was identified using standard biochemicals and media [α-haemolysis on blood agar, β-haemolysis on Gardnerella agar with human blood (PML), latex agglutination of Lancefield group F (PathoDX; Remel)], Vitek 2 GPI card (bioMérieux) and 16S rRNA gene sequencing. No anaerobes were recovered. Two sets of blood cultures were drawn but were negative for growth. Despite the initial needle aspiration and 24 h of intravenous treatment, the patient still had significant tongue pain and an elevated white blood cell count. Repeat examination showed persistent lingual oedema and inflammation of her tongue. After a second aspiration, a formal incision and drainage was performed and over 40 ml purulent material was evacuated but not sent for culture. The patient’s white blood cell count normalized the next day.
Shortly thereafter, the pain subsided and the swelling improved. The patient was discharged on hospital day 3 on oral clindamycin. Antibiotic susceptibility testing demonstrated that the isolate was susceptible to ceftriaxone (MIC 0.125 μg ml⁻¹), penicillin (MIC 0.032 μg ml⁻¹) and ampicillin (MIC 0.064 μg ml⁻¹) but resistant to clindamycin (MIC >256 μg ml⁻¹); however, the susceptibility results were available only after the patient was discharged. In outpatient follow-up, the patient had complete resolution of her tongue abscess with no residual sequelae.

Discussion

Lingu al abscesses typically involve normal flora found within the oral cavity, including Staphylococcus species and Streptococcus species and anaerobes such as Prevotella, Bacteroides and Fusobacterium. In many cases, drainage material is not sent for bacterial culture and patients are treated empirically. In this case, purulent material was sent, and bacterial culture identified Streptococcus intermedius, which was confirmed using 16S rRNA gene sequencing. S. intermedius is one of the many bacteria often called viridans group streptococci and is an organism that is characteristic ally associated with liver and brain abscesses. In case reports that have identified microbes associated with a lingual abscess, few identify viridans group streptococci beyond the genus level, and they are often recovered with other organisms associated with the oropharynx. We could only find one case report where the ‘S. milleri’ group was identified as the sole causative agent in a tongue abscess (Palme et al., 2000), making our case one of two reported. Additionally, several publications demonstrate a more diverse anatomical distribution for S. intermedius. While the predominance of infection is associated with the head and neck, a significant proportion of isolates have been recovered from infections and abscesses in skin and soft tissue, bone, abdomen, thorax and bloodstream (Claridge et al., 2001; Jacobs et al., 1995; Whiteley et al., 1992). Additionally, a collection of isolates from our laboratory confirmed by 16S rRNA gene sequencing demonstrate infections from a diverse number of skin and soft tissue sites, and several isolates were recovered from pleural fluid (data not shown). Although S. intermedius tends to be the least recovered organism of the ‘S. milleri’ group, it is most often recovered as a solitary isolate, and is most often associated with true infection (Claridge et al., 2001; Jacobs et al., 1995). An increase in pathogenicity may be due to the production of several glycosidases as well as hyaluronidase, which is an enzyme related to abscess formation (Unsworth, 1989).

Although lingual abscesses may be rare, there are two points to keep in mind with consideration to treatment. Drainage and empiric therapy, such as clindamycin, along with clinical culture and review of antibiotic susceptibilities when available from the microbiology laboratory are optimal. Resistance to clindamycin has been demonstrated in all the species of the ‘S. milleri’ group (Tracy et al., 2001), which provides a rationale for culture of the abscess and performing susceptibility testing on the isolates. Typically, lingual abscesses can be drained effectively with a more conservative needle aspiration, but the physician should be prepared to perform a formal incision and drainage if there is no resolution of the abscess (Balatsouras et al., 2004). Because the susceptibility results were not available, the patient in this case was empirically treated with clindamycin, to which this strain of S. intermedius was resistant; however, administration of clindamycin may have reduced the overall bacteriological burden of other oropharyngeal flora and prevented reinfection of the open wound. Since the abscess resolved despite the use of microbiologically ineffective antimicrobial therapy, it is unknown whether introduction of an antibiotic to which the organism was susceptible would have contributed to a more timely resolution. Even though it is not unusual for an abscess to resolve after incision and drainage alone, it is prudent to know the bacterial identification and antibiotic susceptibility were sequelae to occur. Ultimately, a subsequent drainage procedure was essential for this patient’s improvement.

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References

