Leptotrichia buccalis: a novel cause of chorioamnionitis

Marcela C. Smid,1 Sarah K. Dotters-Katz,1 Rongpong Plongfa,2,3 Kim A. Boggess1
1Department of Obstetrics and Gynecology, Division of Maternal Fetal Medicine, 2Department of Pathology and Laboratory Medicine, University of North Carolina, Chapel Hill, NC, USA; 3Department of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Abstract

Intra-amniotic Leptotrichia buccalis has not been previously associated with adverse pregnancy outcome. We report a case of chorioamnionitis and pregnancy loss associated with this primarily oral commensal. We review Leptotrichia buccalis and other oral commensals that have been identified in cases of intra-amniotic infection.

Case Report

A 35-year-old multigravida woman with a history of loop electrosurgery excision procedure (LEEP) six months prior to index pregnancy, presented at 19 weeks and 1 day for an anatomy ultrasound. At that time, her cervical length was noted to be 9 mm. She was counseled on management options including vaginal progesterone, cerclage, a purse-string suture, and other oral commensals. That day following her cerclage placement, the preliminary culture from her amniocentesis returned 1+ filamentous Gram-negative rods, growing only on the chocolate agar plate (Figure 1). The organism was identified as Leptotrichia buccalis with confidence value of 99.7% using matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS; bioMérieux Vitek MS, Durham, NC, USA) using the v2.0 Knowledge Base database. Then, 16S rRNA gene sequencing was performed to confirm the identification as L. buccalis, which matched 98.5% identity by the method described previously. The patient was called, and she complained of back pain. She was evaluated and had no clinical signs or symptoms consistent with chorioamnionitis. Given her clinically stable picture, she was discharged with precautions and a plan for follow up in four days. Two days later, the patient developed abdominal pain and bleeding. She presented to her local hospital in labor, the cerclage was removed, and she delivered a non-viable infant. She was treated with antibiotics for twenty-four hours and recovered without complication. Placenta pathology was consistent with acute chorioamnionitis.

Discussion

There is increasing evidence that the gravid uterus is not a sterile environment. Gibbs et al. identified organisms in the amniotic fluid of 31% of term patients without any evidence of clinical infection. More recently, Bearfield et al. reported that 34 (71%) of 48 women delivering at term via cesarean section had evidence of bacterial contamination in amniotic fluid by DNA testing, while 21 (44%) had bacteria present on microscopy. These women had no clinical signs of infection at time of delivery, although 21 (44%) of 48 reported infections in the index pregnancy including urinary tract infection, bacterial vaginosis, periodontal disease and respiratory infection. The debate over the significance of identifying bacterial DNA in the amniotic fluid of asymptomatic pregnant women continues. The challenge for the clinicians arises in determining when the presence of bacteria, particularly oral commensals such as L. buccalis, is benign and when it poses a risk to the mother, the fetus, and the pregnancy.

Leptotrichia species are slow-growing, anaerobic gram negative bacteria that are found as part of the endogenous oral, intestinal and genital microbiome. Only recently have Leptotrichia species been appreciated as cause of human disease. Eribe et al. have described a myriad of pathological conditions associated with Leptotrichia, including appendicitis, pneumonitis, mucositis and sepsis. L. buccalis is primarily an oral commensal and has been associated with infections in immunocompromised individuals. Both Leptotrichia amnionii and L. sanguinegens have been associated with adverse pregnancy outcomes including miscarriage, chorioamnionitis, preterm labor, neonatal infection and postpartum infection. This case, to our knowledge, is the first reported case of L. buccalis associating with clinical infection. More recently, Bearfield et al. reported that 34 (71%) of 48 women delivering at term via cesarean section had evidence of bacterial contamination in amniotic fluid by DNA testing, while 21 (44%) had bacteria present on microscopy. These women had no clinical signs of infection at time of delivery, although 21 (44%) of 48 reported infections in the index pregnancy including urinary tract infection, bacterial vaginosis, periodontal disease and respiratory infection. The debate over the significance of identifying bacterial DNA in the amniotic fluid of asymptomatic pregnant women continues. The challenge for the clinicians arises in determining when the presence of bacteria, particularly oral commensals such as L. buccalis, is benign and when it poses a risk to the mother, the fetus, and the pregnancy.

Correspondence: Marcela Smid, Department of Obstetrics and Gynecology, Division of Maternal Fetal Medicine, University of North Carolina – Chapel Hill 3010 Old Clinic Building, CB 7516, Chapel Hill, NC 27599-7516, USA. Tel.: +1.919.966.4163 - Fax: +1.919.966.6377. E-mail: marcela_smid@med.unc.edu

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ated with chorioamnionitis and pregnancy loss. We hypothesize that the LEEP procedure six months prior to pregnancy may have increased risk for cervical incompetence.15 Exposed amniotic membranes may have increased the risk of ascending infection from vaginal colonization leading to chorioamnionitis, however, L. buccalis, unlike other Leptotrichia species, is not typically found in the vagina. An alternative explanation for the development of chorioamnionitis is hematogenous spread from the oral cavity.

A wide variety of organisms, both pathologic and benign, have been identified in the intramniotic environment, including oral flora. Eikenella corrodens have been described as causative agents in intra-amniotic infection, though these are also known to exist as part of the vaginal flora as well.17 Capnocytophaga sp., Capnocytophaga leadbetteri, and Fusobacterium nucleatum, are all members of the oral microbiome that are not typically found as part of the vaginal flora, and have been isolated in cases of chorioamnionitis.18

Bacterial infection causing adverse pregnancy outcomes may be related to cytokine-mediated inflammatory reaction. Bacteria incite inflammation of decidua and/or chorioamnion leading to activation of macrophages. Activated macrophages then release cytokines, most notably IL-6, which initiate prostaglandin secretion, initiating cervical dilation and eventual delivery.19 However, the exact pathway by which normal commensals including oral flora, is associated with clinical infections and adverse pregnancy outcomes has yet to be elucidated. When clinicians incidentally encounter evidence of bacterial intra-amniotic infection in the setting of normal pregnancy, clinical judgment and patient preferences should be used to balance the risks and benefits of continuing pregnancy with maternal and fetal well-being. There is some evidence that antibiotic treatment may improve pregnancy outcomes for asymptomatic women even with highly pathogenic bacteria, including Ureaplasma urealyticum, Eikenella corrodens, Leptotrichia buccalis, and Capnocytophaga species.20 Use of chemotaxonomy as an aid to differentiation of Leptotrichia species, CDC group DF-3, and aerotolerant strains of Leptotrichia buccalis. J Clin Microbiol 1991;29:2263-5.

In summary, clinicians encountering pregnancies complicated by the presence of intrauterine commensals, not previously associated with intra-amniotic infection, should report their findings and pregnancy outcome. Disseminating this information may help guide management and counseling for other patients in the future. With regard to counseling patients on follow-up of asymptomatic cervical dilation treated with exam-confirmed cerclage, clinicians should consider any evidence of intra-amniotic bacterial contamination, including oral flora such as Leptotrichia buccalis, an ominous sign.

References