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PEDIATRIC SEPSIS SECONDARY TO AN OCCULT DENTAL ABSCESS: A CASE REPORT

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Abstract—Background: In general, hematogenous spread of bacteria in children is uncommon. Bacteremia, however, is a known complication of dental procedures and severe caries, but is infrequently associated with primary, asymptomatic, non-procedural-related, dentoalveolar infection. **Case Report:** The patient is a 7-year-old previously healthy boy who presented to the Emergency Department (ED) with “fever, mottling, and shaking chills.” In the ED, he appeared systemically ill with fever, mottling, delayed capillary refill, and rigors. Physical examination by three different physicians failed to reveal any focus of infection. Laboratory evaluation, including blood cultures, was obtained. The patient later developed unilateral facial swelling and pain, and a dentoalveolar abscess was found. He was started on antibiotics, underwent pulpectomy and eventually, extraction, prior to improvement in symptoms. Blood cultures grew two separate anaerobic bacteria (*Veillonella* and *Lactobacillus*). This is, to our knowledge, one of the first reported cases of pediatric sepsis with two different anaerobic organisms secondary to occult dentoalveolar abscess in a pediatric patient. **Why Should an Emergency Physician Be Aware of This?:** It is imperative for emergency physicians to recognize the possibility of pediatric sepsis in the setting of acute maxillary or mandibular pain, as well as in patients for whom no clear focus of infection can be found. This is particularly important for those who appear ill at presentation or meet systemic inflammatory response syndrome criteria and would benefit from further laboratory evaluation, including blood cultures, and possibly antibiotic therapy. © 2017 Elsevier Inc. All rights reserved.

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INTRODUCTION

Odontogenic bacteria are a known cause of bacteremia in the setting of dental procedures, severe caries, and even tooth brushing (1,2). However, it is extremely rare to have symptomatic hematogenous spread of bacteria in clinically inapparent dentoalveolar infections. We present one of the first known cases of pediatric sepsis with two different anaerobic organisms secondary to an occult dentoalveolar abscess in a pediatric patient.

CASE PRESENTATION

A previously healthy, fully vaccinated, 7-year-old boy was brought into the Emergency Department (ED) by his father for evaluation of “fever, mottling and shaking chills.” On the day of evaluation, the patient had started to complain of mild, right-sided tooth and jaw pain. This was nonprogressive in nature and did not interfere with eating or other activity. However, about 3 h prior to evaluation, he developed fever at home, with progression to shaking chills and lower-extremity mottling. In the ED, he was noted to be febrile to 39.6°C (103.3°F), and on examination had lower-extremity mottling, cool feet, delayed capillary refill (4 s), and rigors. Cardiac,

lung, and abdominal examination were normal without murmurs or focal sounds on lung auscultation, and no tenderness to abdominal palpation. Lymphadenopathy was absent at this time as well. Other vitals showed mild tachycardia (heart rate 127 beats/min) and mild tachypnea (respiratory rate 24), but otherwise no hypotension (blood pressure 126/83 mm Hg). He did complain of intermittent, mild, right mandibular/tooth pain but without evidence of swelling, tenderness, trismus, or other abnormality indicative of infection despite close examination by three separate providers.

Given the child's age group, vital signs, and physical examination findings, he met the classification for systemic inflammatory response syndrome (Table 1). Given concern for systemic bacterial infection, intravenous access was obtained, laboratory studies including complete blood count (CBC), electrolytes, C-reactive protein (CRP), and two sets of blood cultures were drawn. The patient was given a 20-cc/kg bolus of normal saline and a dose of acetaminophen for defervescence. Upon re-evaluation, the patient appeared clinically improved. He remained febrile to 39.1°C (102.4°F) but had resolution of rigors and mottling, and capillary refill had normalized. Laboratory evaluation revealed normal CRP (< 3.0 mg/L), white blood count ($6.9 \times 10^9/L$), and electrolytes (Na 136; K 3.6; Cl 103; HCO₃ 20; blood urea nitrogen 8; Cr 0.4; Glu 110). Given clinical improvement after intravenous fluids and antipyretics, as well as a normal white blood cell count and CRP, he was discharged to home with a discharge impression of fever of unclear etiology. The family was provided instructions for follow-up the next day with the patient's primary care physician and with the agreement that the family would be contacted if blood cultures had any growth.

The patient awoke the following day with a markedly swollen, tender, and erythematous right mandibular area. He was taken to a dentist, where an abscess in tooth #LR6 (lower right first molar) was identified (Figure 1).

A pulpectomy was performed to release the abscess, but the tooth was not removed. The patient was started on amoxicillin and was discharged to home. Despite the antibiotics and pulpectomy, the patient continued to have fevers, as well as increasing right lower jaw swelling and tenderness.

At 29 h after blood cultures were drawn, an anaerobic blood culture bottle revealed growth of a Gram-negative bacterium. As such, the patient was contacted to return to the ED for evaluation. Given positive growth from blood cultures, he retrospectively met criteria for sepsis at his initial visit to the ED (Table 1). At presentation, the family acknowledged that he continued to have fevers, swelling, and discomfort. On examination, he had mild tachypnea (respiratory rate 22 breaths/min) but was afebrile (36.8°C) and not tachycardic (heart rate 67 beats/min). He appeared well, with normal capillary refill (2 s), but had a marked increase in swelling over his right mandible. Further examination revealed a first molar on the right side of the mandible that had been drilled and capped, with a small amount of gingival swelling surrounding the tooth. There was tenderness to percussion of the tooth as well as tenderness and swelling along the mandible inferior to the tooth. There was no significant lymphadenopathy noted and a skin examination was normal, and specifically, there was no evidence of splinter hemorrhages.

Given the growth of Gram-negative cocci in an anaerobic bottle and persistent symptoms, repeat CBC, CRP, and blood cultures were obtained. CBC still had an insignificant white count ($5.5 \times 10^9/L$) but CRP was elevated at 33.9 mg/L (39 h after initial CRP was obtained and found to be < 3.0 mg/L). The patient was started on clindamycin, in addition to the previously prescribed amoxicillin, and discharged to home from the ED after arrangements were made to have the tooth extracted as an outpatient. The tooth was extracted the following day and the patient was seen in primary care clinic for

Table 1. Definitions of Systemic Inflammatory Response Syndrome (SIRS), Sepsis, Severe Sepsis, and Septic Shock

Systemic Inflammatory Response Syndrome

At least two of the following four criteria, one of which must be abnormal temperature or leukocyte count

Core temperature of > 38.5°C or < 36°C

Tachycardia (mean HR > 2 SD above normal for age)

Tachypnea (mean RR > SD above normal for age)

Leukocyte count elevated or depressed for age or > 10% immature neutrophils

Sepsis

SIRS in the presence of, or as a result of, suspected or proven infection

Severe sepsis

Sepsis plus organ dysfunction as described in one of the following: cardiovascular organ dysfunction OR acute respiratory distress syndrome OR two or more other organ dysfunctions

Septic shock

Sepsis and cardiovascular organ dysfunction

HR = heart rate; RR = respiratory rate; SD = standard deviation.

Adapted from ref. (3): Goldstein B, Giroir B, Randolph A; International Consensus Conference on Pediatric Sepsis. International pediatric sepsis consensus conference: definitions for sepsis and organ dysfunction in pediatrics. *Pediatr Crit Care Med* 2005; 6:2–8.

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