

Case in Point

A Case of *Streptococcus pyogenes* Sepsis of Possible Oral Origin

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The importance of integrating the dental service in overall case management is highlighted in this case of infection.

Sepsis can be the result of single or multiple factors and sources of infection. Oral sources of sepsis and systemic infection are not commonly considered as the first potential source of infection when evaluating a septic patient. Oral infections of odontogenic or periodontal origin are frequently associated with localized or diffuse cellulitis of the head and neck region.¹ The patient's health status and complicating problems, such as an immunocompromising condition, can further reduce the immune response for controlling chronic sources of infection. This in turn, can lead to acute manifestations such as cellulitis, sepsis, or necrotizing fasciitis. Necrotizing fasciitis is caused by a polymicrobial or mixed aerobic-anaerobic infection from a variety of sources, including *Streptococcus pyogenes* (*S pyogenes*).

CASE PRESENTATION

A 57-year-old female with a history of major depressive disorder, paroxysmal atrial fibrillation, and opioid dependence that was in remission for more than 3 years was

brought to the emergency department (ED) by a family member after the patient developed confusion and lethargy. She was primarily experiencing right breast pain and swelling. The breast pain was associated with high fevers, nausea, vomiting, and chills. On examination the patient was noted to have a fever of 104° F, heart rate of 160 bpm, respirations of 22 breaths per minute, blood pressure (BP) 109/58, and a white blood cell count (WBC) of 8.7 X 10³. There was a noted skin abrasion on her right hand. She was lethargic and confused. Blood cultures were positive for *S pyogenes*, and a swab of the right breast was negative for bacterial growth.

The patient was admitted to the medical intensive care unit (MICU) and placed on 2 vasopressors for control of low BP and assistance with low urine output. After a 6 L fluid resuscitation, the patient was started on vancomycin and piperacillin/tazobactam for possible cellulitis causing sepsis. An echocardiogram was negative for endocarditis. The patient continued to decline the following day with continuing tachycardia and tachypnea with hypotension and was intubated. Pulmonology was con-

sulted for possible acute respiratory distress syndrome secondary to sepsis. General surgery was consulted for possible necrotizing fasciitis of the chest wall, and cardiology was consulted for low cardiac output.

On day 4 of her hospitalization, the patient was taken to surgery for exploration, drainage, and debridement of the right axilla and breast; cultures with lack of organism growth was noted. While in the MICU, she was followed by the Infectious Disease service as her WBC remained elevated and peaking at 32.6 X 10³, while blood cultures were negative for bacterial growth. The dental service was consulted on day 5 to evaluate for other possible sources of infection.

The patient's oral condition was noted as having advanced chronic periodontal disease that required full mouth extraction. The patient remained hemodynamically unstable with platelet counts below 50,000 until day 7, at which time she was taken for surgery for full mouth extraction and associated alveoloplasty. On extraction the patient continued to improve and was extubated on day 11 with platelets and WBC returning to normal levels by day 13 of her hospital stay. The patient remained hospitalized for a

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total MICU stay of 20 days and rehabilitation stay of more than 2 weeks.

DISCUSSION

Oral infections most often present with acute onset and noted oral-facial cellulitis or abscess. Oral source of septicemia often are considered after ruling out most other potential sources. Although it is not certain that this case is directly related to the advanced chronic periodontal disease, *S pyogenes* has been noted to be a pathogen in periodontal disease progression.

According to the American Dental Association in 2012, dental visits to the ED cost the U.S. health care system \$1.6 billion and an average cost of \$749 per visit. There are more than 2 million ED visits each year for dental pain and infection, and 39% return due to nonresolution of the dental problem. Patients return to the ED due to lack of access and resources to routine and emergent dental care.² The average daily cost

of an MICU stay with mechanical ventilation was \$2,193 in 2002. This particular case consisted of 11 days of mechanical ventilation, 20 MICU days, and an additional 20 days of inpatient rehabilitation which resulted in costs that exceeded \$50,000.³

CONCLUSION

This case demonstrates the successful collaboration of dentistry for the overall medical management of the patient. An integrated approach highlights the need for and the value of integrating dental programs within large tertiary hospital systems. Such integration will likely improve earlier recognition and better management of oral infections resulting in systemic illness and improve patient outcomes, reduced length of hospital stay, and reduction of overall costs. ●

Author disclosures

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