

## Osteomyelitis of the Mandible

Yadranko Ducic, MD, FRCS(C), FACS

Osteomyelitis may manifest itself in acute, subacute, or chronic forms. Chronic osteomyelitis will result in variable sclerosis and deformity of the affected bone. After the age of 50, the majority of the blood supply to the mandible comes from the overlying periosteum and attached musculature, due to age and atherosclerosis-related involution of the inferior alveolar artery. With an infection of the bone, the subsequent inflammatory response will elevate this overlying periosteum, leading to a loss of the nourishing vasculature, vascular thrombosis, and bone necrosis, resulting occasionally in formation of sequestra. These become areas that are more resistant to systemic antibiotic therapy due to lack of the normal Haversian canals that are blocked by scar tissue, inflammatory exudate, and necrotic bone. At this point, not only systemic antibiotic therapy, but also surgical debridement maybe required to remove the affected bone and prevent disease propagation to adjacent areas. The relative hypoxia seen in infected bone will impair leukocyte bacterial killing, and impede fibroblastic collagen production that is required to support angiogenesis. Thus, it is not surprising that the concomitant use of hyperbaric oxygen therapy maybe beneficial in cases refractory to medical management alone or in patients with a severely compromised immune response. Generally, 20 dives (2.8–3.0 at 100% oxygen for 90 minutes) are administered preoperatively, followed by 20 dives after the debridement of necrotic tissue.

Radiographic imaging may be deceptively unremarkable in acute osteomyelitis, particularly with plain x-rays. Computed tomography (CT) scanning is the standard for evaluating the bone for sequestrum formation.<sup>1</sup> Generally, one sees areas of lytic destruction and overlying periosteal reaction. It is much more common to find cortical plate disruption in the buccal plate than in the lingual plate. Technetium<sup>99</sup> bone scanning is often positive within 24 hours of an acute infection. Unfortunately, persistent uptake maybe present for 2 years after eradication of osteomyelitis. Gallium<sup>-67</sup> scanning normalizes after successful treatment of mandibular osteomyelitis.<sup>2</sup>

In acute osteomyelitis, or in chronic forms without evidence of formation of sequestra, culture-driven antibiotic therapy is important to allow for disease eradication and decrease the likelihood of formation of antibiotic resistant strains re-



Yadranko Ducic, MD, FRCS(C), FACS

sulting from inadequate subtherapeutic antibiotic therapy. Occasionally, repeated cultures may be required to allow for pathogen isolation, especially in cases of chronic osteomyelitis. Open biopsy of the bone allows for the most accurate culture results.<sup>3</sup> Alpha hemolytic streptococcus, often in conjunction with oral anaerobes, is the most commonly isolated organism noted today. Although acute osteomyelitis is often adequately treated with a culture-driven 6- to 8-week course of antibiotic therapy, chronic osteomyelitis generally requires surgical debridement as well. Antibiotic therapy should be continued for 4 to 6 weeks from the date of last debridement, from resolution of the patient's symptom complex and/or normalization of the gallium scan (if performed). Refractory osteomyelitis may benefit from the addition of hyperbaric oxygen therapy. Vancomycin or clindamycin are generally effective in the treatment of group A or B streptococci. However, as stated, culture-driven antibiotic therapy is required. With the propagation of multidrug-resistant varieties, treatment with nontraditional antibiotic regimens, such as fluroquinolones, may be required. Attention to optimal management of any underlying systemic immunocompromising conditions, such as diabetes mellitus, steroid usage, and HIV infection is important in all cases.

### References

1. Taori KB, Mahajan SM, Rangankar V, et al. CT evaluation of mandibular osteomyelitis. *Ind J Radiol Imag* 2005;15:447–451.
2. Alazraki NP. Radionuclide imaging in the evaluation of infections and inflammatory disease. *Radiol Clin North Am* 1993;31:783–794.
3. Montonen M, Iizuka T, Hallikainen D, et al. Decortication in the treatment of diffuse sclerosing osteomyelitis of the mandible: retrospective analysis of 41 cases between 1969 and 1990. *Oral Surg Oral Med Oral Pathol* 1993;75:5–11.

From the Otolaryngology and Facial Plastic Surgery Associates, Fort Worth, TX.

Reprint requests to Yadranko Ducic, MD, FRCS(C), FACS, Otolaryngology and Facial Plastic Surgery Associates, 923 Pennsylvania Ave, Ste 100, Fort Worth, TX 76104. Email: www.drducic.com, yducic@sbcglobal.net

Accepted August 20, 2007.

Copyright © 2008 by The Southern Medical Association  
0038-4348/0–2000/10100-0465

Please see "Multidrug-Resistant Viridans Streptococcus (MDRVS) Osteomyelitis of the Mandible Successfully Treated with Moxifloxacin" on page 539 of this issue.