

Chronic Rhinosinusitis of Odontogenic Origin



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Chronic rhinosinusitis (CRS) is a heterogeneous disease process primarily considered to be of nasal origin. Highlighted in this case, CRS may result from an odontogenic infection.

An 82-year-old man presented with a 6-month history of nasal malodor and purulent nasal drainage. He endorsed recurrent frontal headaches, anosmia, and dysgeusia, but denied odontalgia. He had been treated with 2 courses of oral antibiotics without durable benefit. Physical examination showed poor dentition, purulent left-sided rhinorrhea, and the absence of an oronasal fistula (OAF). The mucopurulence was found to be emanating from the left osteomeatal complex (OC) on nasal endoscopy. Cultures of the drainage grew coagulase-negative staphylococcus as part of mixed respiratory flora. On computed tomography imaging, a periapical abscess with associated opacification of his left maxillary sinus was demonstrated (Figure 1, A). The infection was seen extending to and resulting in opacification of the left frontal and anterior ethmoid sinus (Figure 1, B and C).

The etiology of odontogenic chronic rhinosinusitis (O CRS) is primarily attributed to direct infiltration of bacteria from a dental infection, but can also be secondary to dental interventions including tooth extraction (complicated by OAF), sinus floor elevations, or implant displacement.¹ Owing to the anatomical proximity between the maxillary sinus and the tooth root(s), 10% to 30% of cases of maxillary sinusitis are believed caused by an underlying odontogenic infection.¹ Odontogenic chronic rhinosinusitis frequently shows extension beyond the maxillary sinus via direct spread through the OC. At time of presentation, as in our cases, it is common to see the anterior ethmoid and frontal sinuses involved. The posterior ethmoid and sphenoid sinuses are often spared because these sinuses drain posterior and independently of the OC.

Wuokko-Landén et al² compared the microbiology of O CRS with that of acute rhinosinusitis (ARS), finding significant flora

differences. Odontogenic chronic rhinosinusitis maxillary sinus samples typically grew bacteria consistent with dental-alveolar abscess, with anaerobic gram-negative rods and viridans group streptococci most commonly identified. The pathogens typically associated with ARS (*S. pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis*) were not found in O CRS. *Staphylococcus aureus* was only discovered in 5.5% of O CRS cases.² These organisms are important to consider when initiating antibiotic treatment for suspected O CRS.

Management of O CRS depends on the severity of the disease. For mild maxillary sinus disease, dental treatment of the teeth can be sufficient to cure the problem with or without antibiotics. For severe disease characterized by opacification of the maxillary sinus with or without spread to the ipsilateral ethmoid and frontal sinuses, a combination of endoscopic sinus surgery, dental extraction, antibiotics, and systemic steroid treatment may be necessary. Molteni et al¹ report a low rate of postoperative complications (<1%). Of the complications, 62.5% were recurrent sinusitis, 25% OAF, and 12.5% bleeding.¹

When evaluating patients with rhinosinusitis complaints, rhinological and nonrhinological etiologies should be considered. In cases of unilateral sinus disease, the diagnostic differential includes neoplastic, fungal, and odontogenic disease processes. The demonstration of a dental abscess with infectious spread consistent with anatomical sinus drainage pathways is a hallmark of O CRS.

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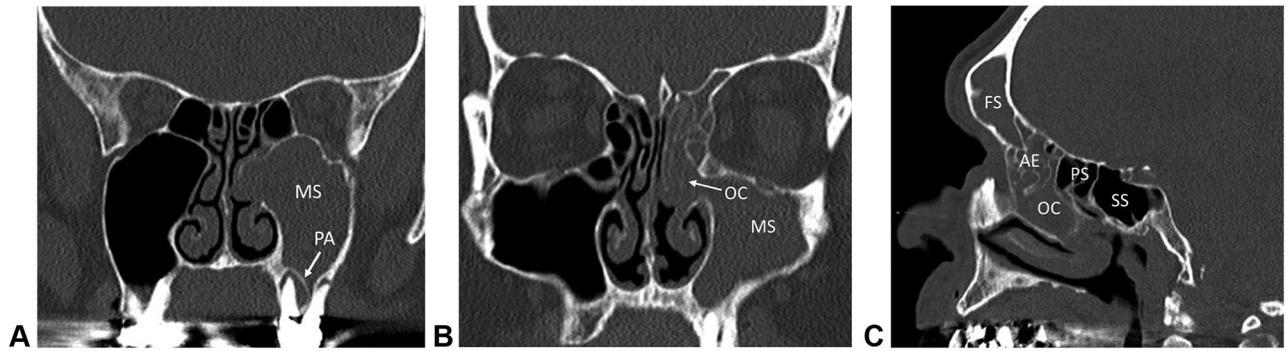


FIGURE 1. (A) Periapical abscess (AA) with complete opacification of the left maxillary sinus (MS). (B) Spread of infection through the osteomeatal complex (OC). (C) Complete opacification of the anterior ethmoid (AE) and frontal sinus (FS) with sparing of the posterior ethmoid (PS) and sphenoid (SS) sinuses due to their posterior drainage pathway.