

Radiologic Findings in Allergic Fungal Rhinosinusitis



Jonathan J. Lusardi, MD, and Robert M. Naclerio, MD *Chicago, Ill*

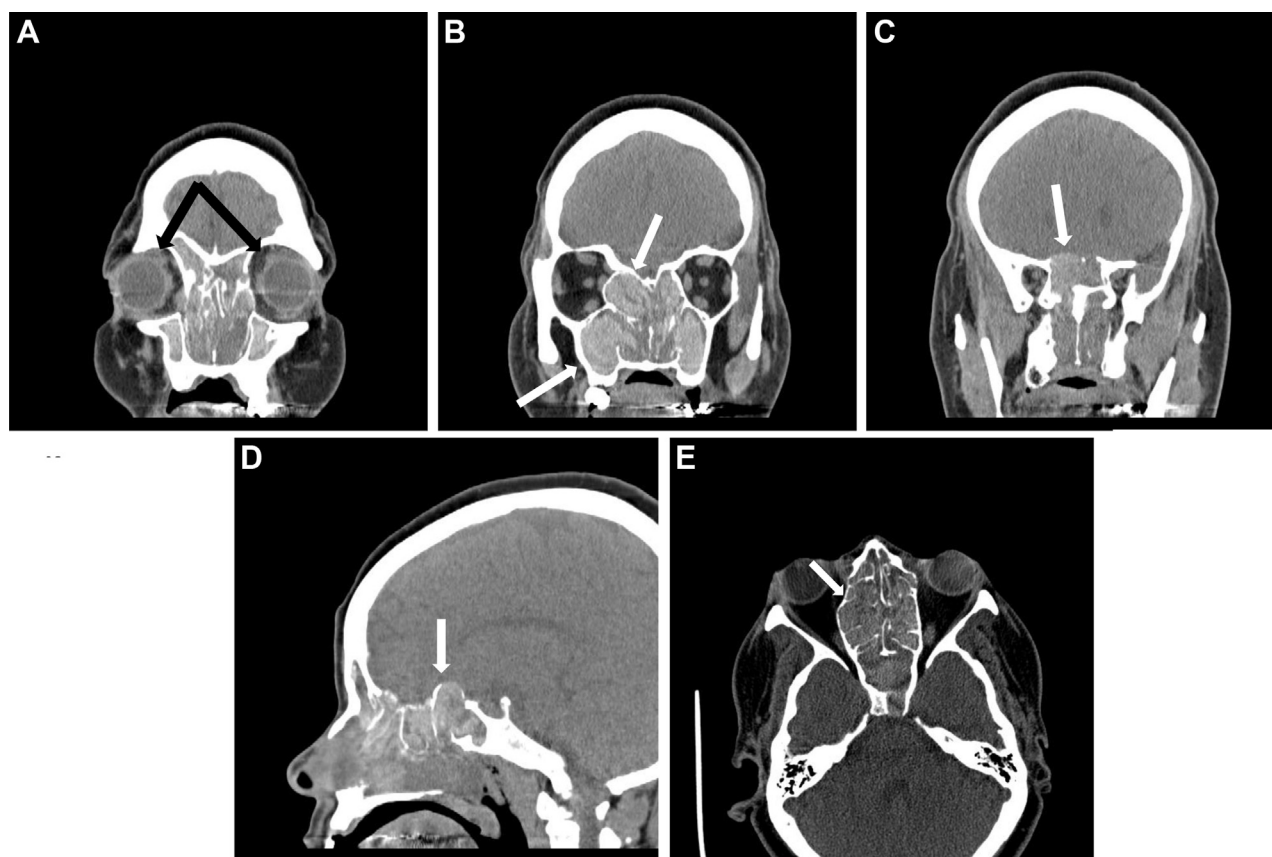


FIGURE 1. Fine cut coronal views computed tomography (CT) of sinuses. **A**, Demonstration of hypertelorism from expansion of nasal cavity. Black arrows point to orbits. **B**, Scattered areas of higher attenuation suggestive of fungal debris. White arrows point to right ethmoid and right maxillary sinuses with fungal debris. **C**, Dehiscence along the planum sphenoidale (roof of sphenoid sinus). White arrow points to bone dehiscence. **D**, Sagittal view of attenuated bone pushed into the intracranial space. White arrow points to intracranial extension of sinus. **E**, Axial view of the lamina papyracea (lateral nasal wall) being pushed into the orbit. White arrow points to lamina papyracea.

Department of Surgery, University of Chicago, Chicago, Ill

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Corresponding author: Robert M. Naclerio, MD, Department of Surgery, University of Chicago, 5841 S. Maryland Ave., MC 1035, Chicago, IL 60637. E-mail: rnacleri@surgery.bsd.uchicago.edu.

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A 58-year-old African American woman with a history of diabetes and previous sinus surgery presented with worsening nasal congestion and decreasing sense of smell over the last several years. She denied recurrent sinus infections but had constant clear rhinorrhea that did not respond to nasal steroid sprays or antihistamines. She had been treated with antibiotics and oral steroids in the past with temporary improvement of her symptoms. She has not had previous allergy testing. She does have a remote history of asthma. No immunologic testing was done because the results did not affect the clinical management of the patient.

On physical examination, the patient was in no acute distress. She had polyps extruding from both nasal cavities. Her vision was grossly intact, and she had full extra ocular movements and no evidence of facial numbness. She underwent a preoperative

CT scan shown in [Figure 1](#). The CT scan demonstrated hypertelorism from expansion of nasal cavity, scattered areas of higher attenuation suggestive of fungal debris, dehiscence along the *planum sphenoidale* (roof of sphenoid sinus), attenuated bone pushed into the intracranial space, and the *lamina papyracea* being pushed into the orbit.

Given her extensive disease with areas of bony attenuation and dehiscence along her skull base, the patient was recommended to undergo bilateral endoscopic sinus surgery for removal of polypoid disease and fungal material from her sinuses. The patient underwent surgery, and the radiologic findings suggestive of fungal debris and the bony erosion along the roof of the ethmoid and sphenoid sinuses were confirmed. The patient tolerated the procedure well. On her last postoperative debridement, her sinus cavities were healing well and the patient's nasal symptoms had improved. The cultures collected from the material in her sinuses grew *Aspergillus flavus*. The pathology showed extensive eosinophils and stained positive for hyphae. The patient was recommended to use intranasal steroids and large volume saline irrigations.

Allergic fungal rhinosinusitis has been described as a subtype of chronic rhinosinusitis with characteristic clinical and radiologic findings in addition to patient hypersensitivity to fungi. These characteristics include CT findings of bony remodeling and expansion of the paranasal sinuses, dense accumulations of eosinophilic mucin that stain positive for fungus or positive cultures, and nasal polyposis.^{1,2} Patients who develop allergic fungal rhinosinusitis are often atopic with high prevalence of allergic rhinitis and asthma. There is also noted to be an increased incidence of this condition in the southeastern United States, within African Americans, and patients of lower socioeconomic status.² The disease appears to be the result of an overzealous inflammatory response to eliminating the fungus

from the sinus cavities, which results in bone remodeling. In contrast, other forms of fungal rhinosinusitis, such as invasive fungal sinusitis, occur in immunocompromised patients and are diagnosed by evidence of microscopic invasion of nasal mucosa or bone with fungal hyphae. Fungal balls are much less common than allergic fungal rhinosinusitis. While medical therapy can be pursued, ultimately surgery is often necessary to alleviate nasal symptoms, debride the fungus, provide openings for topical drug delivery, and prevent sequelae of bony compression of cranial nerves, or extension into the orbit or intracranial space.^{3,4} To prevent recurrent disease, oral and intranasal corticosteroids are the mainstay therapeutic options.⁵ Oral antifungal agents have been studied, though there is conflicting evidence for their ability to prevent recurrent disease. Topical amphotericin has been shown not to work, though large volume saline irrigations appear useful.⁶ Evidence for the effectiveness of fungal immunotherapy is limited.¹

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