

Preoperative steroids confuse the diagnosis of allergic fungal sinusitis

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Histologic identification of fungi, presence or absence of tissue fungal invasion, and host atopy and immune status are used to classify fungal sinusitis. Four groups of fungal sinusitis are recognized: fulminant invasive, indolent invasive, fungal ball, and allergic fungal sinusitis (AFS). It is this last group about which the least is known and the most controversy exists.

The initial description of AFS was formed on the basis of the histologic similarity of sinus contents from patients with fungal sinusitis and expectorated sputum from patients with allergic bronchopulmonary aspergillosis. The disease was initially called aspergillus sinusitis. Subsequent identification of Dematiaceae¹ as the principal etiologic agent caused its name to be changed to AFS.

No exact criteria exist for the diagnosis of AFS. Bent and Kuhn² identified five consistently seen characteristics in their series of 15 patients with the disease. They proposed the following criteria for diagnosis of AFS: (1) Type I hypersensitivity confirmed by history, skin tests, or serology; (2) nasal polyposis; (3) characteristic computed tomography (CT) scan appearance; (4) eosinophilic mucus; and (5) a positive fungal stain of sinus contents without evidence of tissue invasion.

Preoperative suspicion is crucial for efficient diagnosis of AFS. Surgery for nasal polyposis is facilitated by preoperative steroid treatment to reduce swelling and intraoperative bleeding. Increased bleeding, although seldom reaching the level of transfusion requirements, obscures the operative field. Any reduction in the sur-

Abbreviations used

AFS: Allergic fungal sinusitis

CT: Computed tomography

geon's ability to see well may result in a less thorough operation and a potentially increased likelihood of some of the catastrophic complications of endoscopic sinus surgery. We describe a case where preoperative treatment of nasal polyps with steroids confused the histologic diagnosis of AFS.

CASE REPORT

A 39-year-old man was seen in our hospital after undergoing sinus surgery elsewhere 3 months previously. At the outside facility, the patient underwent a right endoscopic ethmoidectomy, sphenoidotomy, and maxillary antrostomy performed for treatment of nasal polyposis. Cultures from the patient had grown *Aspergillus fumigatus*, but no fungi were identified on the histologic specimen. He was referred to our clinic after prompt relapse of his symptoms of congestion and rhinorrhea.

Endoscopic examination of the nose revealed right-sided polypoid changes and infection. Intradermal skin test results were positive for *Aspergillus*, *Penicillium*, *Helminthosporium*, *Alternaria*, and dust mites. He demonstrated detectable precipitins to *Aspergillus niger*. His total serum IgE level was 336 IU/ml (normal range, 10 to 100 IU/ml).

A CT scan was performed after eight weeks of conservative treatment. The CT scan revealed principally unilateral polypoid changes, multiple sinus opacification, bony expansion, and areas of hyperattenuation within the sphenoid sinus. The patient had noticed no improvement in his symptoms, and right-sided endoscopic sinus surgery was planned. The presumptive diagnosis was AFS. The patient was treated with prednisone, 60 mg/day, for 5 days immediately preoperatively.

At surgery, polypoid tissue was removed from the ethmoid sinus and middle meatus and the sphenoid was full of thick, pasty material consistent with fungus. This material was removed from the sphenoid through a wide sphenoidotomy. Histologic examination of the material (Fig. 1, A) revealed fungal hyphae in keeping with aspergillus. Notably, however,

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J Allergy Clin Immunol 1998;101:139-40.

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0091-6749/98 \$5.00 + 0 1/54/86351

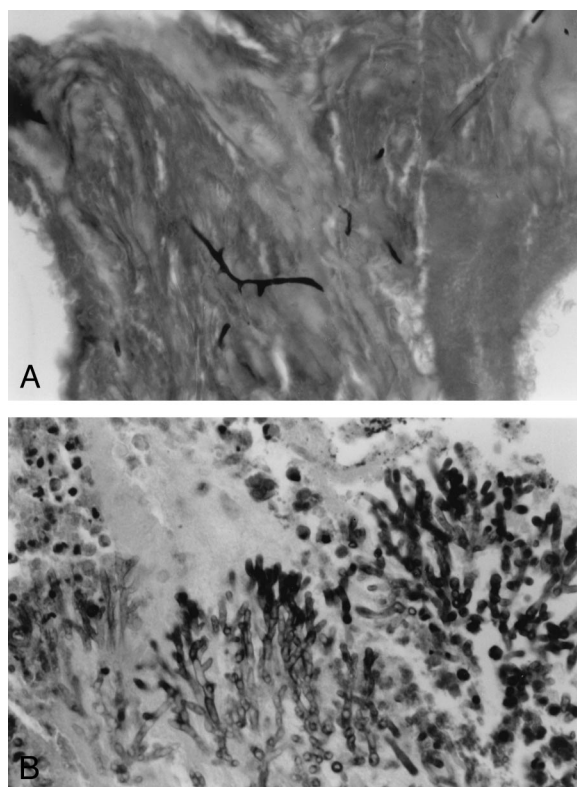


FIG. 1. **A**, Histologic changes seen in first biopsy specimen (note minimal hyphae and minimal cellular infiltrate). **B**, Histologic changes seen in second biopsy specimen after steroid therapy was ended.

there were neither eosinophils nor allergic mucin present. On this basis, a diagnosis of sphenoid fungus ball was made, and no further treatment was planned.

Two weeks after surgery, the patient noticed a rapid recurrence of his symptoms. Endoscopic examination revealed polypoid recurrence with the sphenoid sinus full of inspissated material, which was suctioned with some difficulty from the sinus. This material underwent pathologic evaluation. On this biopsy specimen there were fungal forms consistent with aspergillus, neutrophils, many eosinophils, and Charcot-Leyden crystals (Fig. 1, *B*). A diagnosis of AFS was made. The patient responded promptly to subsequent steroid treatment.

DISCUSSION

A presumptive diagnosis of AFS can be entertained in patients first seen with a typical clinical picture. The patient is most often relatively young with unilateral polyposis and opacification involving multiple sinuses. The imaging studies are characteristic. Serpiginous areas of hyperattenuation are seen on the CT scan, whereas their appearance on magnetic resonance imaging are hypodense, particularly on the T₂ image. A common

surgical practice is to preoperatively treat patients with nasal polyposis with oral steroids when there is no medical contraindication.³ This facilitates subsequent sinus surgery, reducing tissue edema and bleeding.

The role of steroids in the extended management of AFS is yet to be fully examined. Their use, while widespread, is based on extension of treatment guidelines from allergic bronchopulmonary aspergillosis. In some studies of AFS, steroids have been reserved for only those patients with recurrent disease.⁴ At the other extreme, Roth⁵ questioned whether steroids should be employed as the primary treatment for AFS, with endoscopic sinus surgery playing a secondary role. The side effects of long-term systemic steroid use are well known, and it is our practice to limit the prescription of oral steroids to patients with a histologic diagnosis of AFS.

This ensures both that patients are not needlessly exposed to the risk of steroid use and, more particularly, that steroids are not used in a situation where their use could be detrimental. Avoidance of oral steroids in a sphenoid fungal sinusitis adjacent to the central nervous system is prudent until a diagnosis is properly established. Our own practice is to wait for a histologic diagnosis of AFS before placing patients on a steroid regimen after their endoscopic sinus surgery. We generally prescribe topical nasal spray and systemic steroids; oral steroids are given in a declining-dose regimen. The dose is titrated for symptomatic response and endoscopic appearance. Prompt treatment of concomitant nonfungal sinus infections seems important in reducing recurrence of AFS.

We report a case where preoperative steroid treatment of nasal polyposis confused the subsequent histologic diagnosis of AFS. This produced a prompt return of the patient's polyps and symptoms in the postoperative period when the steroids were stopped. In cases of clinically suspected AFS, surgeons may have to weigh the benefits of preoperative steroid use against the diagnostic difficulties that sometimes result from such use.

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