

Maxillary Sinus Mycetoma Due To *Aspergillus Niger*

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Citation

S Zaman, D Sarma. *Maxillary Sinus Mycetoma Due To Aspergillus Niger*. The Internet Journal of Otorhinolaryngology. 2006 Volume 6 Number 1.

Abstract

Fungal infections of the paranasal sinuses are uncommon and usually occur in immunocompromised individuals. The most common pathogens are from the *Aspergillus* and *Mucor* species, and from the *Aspergillus* species, the most common are *Aspergillus fumigatus* and *Aspergillus flavus* (1). We report a case of an 83-year-old immunocompetent man afflicted with a sinus mycetoma caused by *Aspergillus niger*.

INTRODUCTION

Fungal infections of the paranasal sinuses are uncommon and usually occur in immunocompromised individuals (1). Infection is usually suspected upon reviewing the CT scan result. The most common pathogens are from *Aspergillus* and *Mucor* species, and of the *Aspergillus* species, the most common pathogens associated with fungal sinusitis and granulomatous invasive fungal sinusitis are *Aspergillus fumigatus* and *Aspergillus flavus* (1). We report the case of a patient who was not immunocompromised and presented with a mycetoma in the right maxillary sinus caused by *Aspergillus niger*.

CASE REPORT

An 83-year-old man presented with a 9-month history of chronic sinus problem and right nasal obstruction. The discomfort associated with the obstruction had progressed to a constant dull pain in the right cheek. He had been treated several times with antibiotics for his sinus infections, but experienced no resolution of his symptoms. A computed tomographic scan (Fig. 1) of his sinuses revealed extensive paranasal sinus disease with complete opacification of the right maxillary sinus abutting the nasal septum, along with dehiscence of the inferolateral and anteroinferior right maxillary sinus wall. The patient underwent a right ethmoidotomy, maxillary sinusotomy with removal of sinus contents, and left maxillary sinusotomy with removal of sinus contents. A portion of the fragmented mass from the right maxillary sinus was sent for frozen section to rule out malignancy.

Gross examination revealed multiple fragments of pink to tan tissue measuring 2.0 x 1.5 x 0.3 cm in aggregate.

Microscopically, hematoxylin and eosin staining revealed the presence of a mycelium with septate hyphae branching at 45 degrees and associated conidial (fruiting) heads (Figs. 2 and 3). Some of the hyphae showed brown-black pigment (Fig. 4). There was refractile material in the tissue that on polarization revealed numerous birefringent calcium oxalate crystals (Fig. 5). The nasal epithelial tissue was free of significant inflammation, granuloma or invading hyphae leading to a diagnosis of non-invasive sinus mycetoma.

Fungal culture did not grow any organisms. Speciation of the fungus was done by examination of the morphology of the hyphae and the conidial heads, and pigmentation noted on histologic sections stained with hematoxylin and eosin.

Figure 1

Figure 1: CT of sinuses featuring complete opacification of the right maxillary sinus

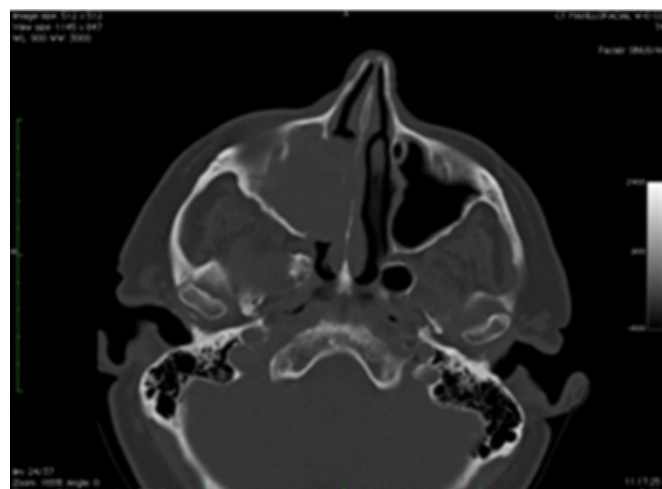


Figure 2

Figure 2: H&E 20x. Mycelium with septate hyphae branching at 45 degrees.

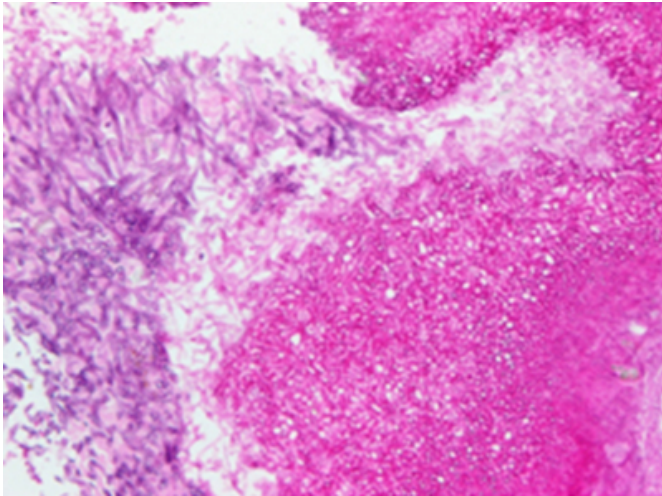


Figure 3

Figure 3: H&E 40x. Conidial (fruiting) head.

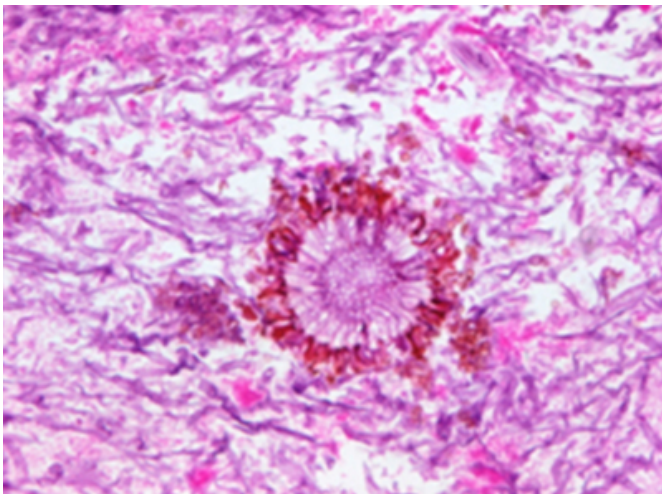


Figure 4

Figure 4: H&E 40x. Mycelia with brown-black pigment.

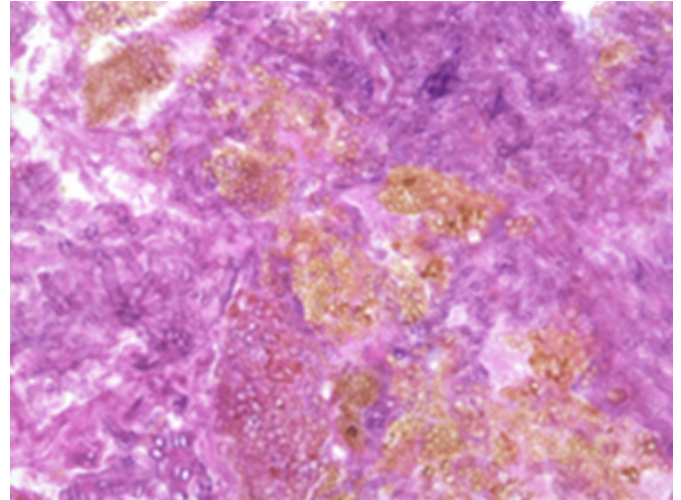
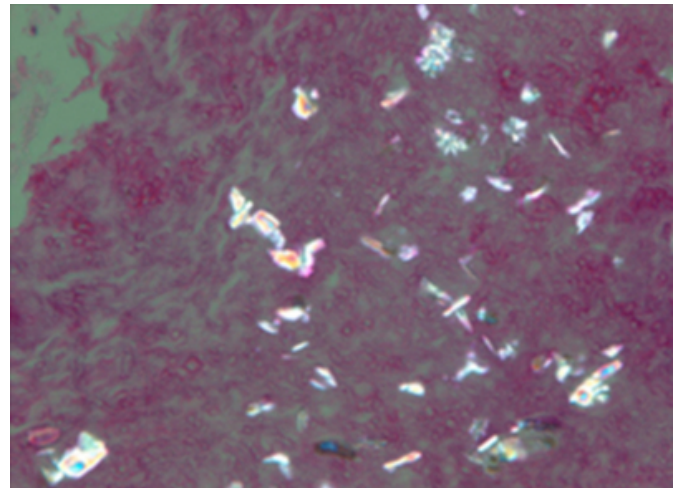


Figure 5

Figure 5: H&E 20x. Polarizing calcium oxalate crystals.



COMMENT

This patient presented with findings on computed tomography scan of complete opacification of the right maxillary sinus abutting the nasal septum, raising the possibility of a neoplasm. Pathologic evaluation of the resected sample revealed a mycetoma with no evidence of invasion.

Fungal culture did not grow any organisms. The culture yield of an *Aspergillus* or another septate mold from infected tissue has been shown to be generally low, ranging from 30% to 50% (2). Speciation of the organism was performed by assessing the morphology of the hyphae, conidial heads, and presence of pigments on hematoxylin and eosin and PAS staining. The morphology of the organism suggested that of the species *Aspergillus niger*. The association of

oxalate crystal deposition in tissue in *Aspergillus niger* infection is documented, mostly as a pulmonary aspergilloma. In the reported cases of sinus mycetoma the causative organisms have been either *Aspergillus fumigatus* or *Aspergillus flavus*. Sinus mycetoma caused by *Aspergillus niger*, as reported in this case, seems to be very rare.

The association of aspergillosis and oxalosis was first reported by Nime and Hutchins in 1973 (3). Oxalic acid is a mycotoxin produced by *Aspergillus niger* and occasionally by other *Aspergillus* species. It reacts with tissue and blood calcium to precipitate as calcium oxalate. Oxalate crystals are strongly birefringent, they appear in various shapes (e.g., rosette, needle, dumbbell, and ellipsoid), and they exhibit sheaf-like groupings (4). Most of the cases of *Aspergillus niger* infection with oxalosis in tissue have occurred in the lung (5). Our case of sinus mycetoma due to *Aspergillus niger* associated with oxalosis in tissue is a rare finding.

Surgical removal and establishment of sinus aeration resolves this condition without further treatment in most individuals. When invasion occurs in a mycetoma, the syndrome of chronic invasive fungal sinusitis occurs (6). Our patient had no evidence of invasion, and five months after

surgical treatment, he remains free of recurrence.

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