Bronchovascular Mucormycosis in the Diabetic: An Urgent Surgical Problem

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This report reviews the successful surgical experience with a diabetic patient with bronchial obstruction due to Mucorales infection. A review of the reported medical and surgical experience is included. The danger of a lethal pulmonary hemorrhage makes early surgical intervention mandatory.


The combination of mucormycosis and diabetes mellitus causes a well-defined clinical disorder of the bronchus and pulmonary vessels that if unrecognized can result in a fatal hemorrhage. This report contains a review of the experience with the medical and surgical treatment of bronchovascular mucormycosis in the diabetic, illustrated by the successful surgical management of a patient with this rare but potentially lethal disease.

Case Summary

A 50-year-old diabetic man was admitted because of a cough and fever of 5 days' duration. The diabetes mellitus was easy to control with insulin. Five months before he coughed up a small amount of blood.

Physical examination showed his temperature to be 38.9°C. Rales were present posteriorly in the left lower chest. He had hypesthesia in a stockinglike distribution over both legs. Laboratory values revealed a blood sugar level of 6.9 mmol/L (124 mg/dL), but levels up to 22.2 mmol/L (400 mg/dL) were recorded at various times. The blood level of potassium was 4.2 mmol/L (4.2 mEq/mL), the chloride level was 108 mmol/L (108 mEq/mL), and the creatinine level was 79.6 μmol/L (0.9 mg/dL). The urine was negative for ketone bodies and glucose. The chest film showed an area of consolidation in the basilar segments of the left lower lobe.

A bronchoscopic examination revealed the left lower lobe bronchus to be obstructed with a plug of yellowish cheesy material. A portion of the plug was removed. It showed a network of branching pleomorphic nonseptate hyphae typical of Mucorales. After 2 days of treatment with amphotericin, 0.3 mg/kg per day, the patient's left lower lobe was removed without difficulty. After operation, he was given amphotericin daily at the same dosage over the next 14 days. The patient was discharged on the 14th postoperative day.

The left lower lobe bronchus was partially necrotic and contained a 1×1-cm cavity with a large pulmonary artery adjacent to it, partially necrotic and occluded by a thrombus. Interspersed within the thrombus, the vessel wall, and bronchus were many organisms similar to those noted in the specimen removed at bronchoscopy. Cultures were negative.

A year later his chest film did not show signs of recurrence.

Comment

When the patient's problem of bronchial obstruction from mucormycosis was recognized, and after only a short 2-day period of amphotericin therapy, the left lower lobe

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Table 1. Surgical Treatment by Excision

<table>
<thead>
<tr>
<th>Reference</th>
<th>Age (y)</th>
<th>Sex</th>
<th>Biopsy</th>
<th>Amphotericin</th>
<th>Acidosis</th>
<th>Bled</th>
<th>Operation</th>
<th>Results</th>
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<tr>
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</table>

* Diabetes developed in this patient 1 year postoperatively.
was removed because of the fear of an impending serious pulmonary hemorrhage.

The diagnosis of mucormycosis was established in our patient by the nonseptate appearance of the Mucorales on sections obtained from the fungus mass in the bronchus. It is unusual to be able to culture the fungus from either sputum or the surgical specimen.

Table 1 summarizes the experience of several observers with resection in the diabetic for bronchovascular mucormycosis. All patients survived. Three of the patients received amphotericin. Spread or recurrence of the infection after operation has not been reported.

The first diabetic patient cured of mucormycosis was a child with the rhinocerebral form treated by Harris [9] using only careful management of the severe diabetes. With bronchovascular mucormycosis in the diabetic treated medically, control was attempted in 4 of 11 patients with amphotericin (Table 2). Two of the 4 died as did all the other medically treated patients. Five of 8 who bled had a bronchial biopsy a few days before death. In view of this experience, care should be taken to only remove a part of the fungus ball and not include the bronchial wall.

In conclusion, bronchovascular mucormycosis and diabetes makes a potentially lethal combination because of the likelihood of hemorrhage due to the vascular involvement. Although the presenting symptoms may be due to bronchial obstruction, the danger of bleeding precludes the consideration of conservative treatment. Pulmonary resection performed almost as an emergency procedure is the proper treatment.

References