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Mediastinal zygomycosis

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Summary: A young girl with pulmonary zygomycosis involving the mediastinum and presenting as superior vena caval obstruction is reported. Mediastinal involvement due to zygomycosis is a rare occurrence.

Introduction

Zygomycete infection in human beings is uncommon. Two distinct modes of clinical presentation have been described: (a) the invasive form which is rapidly progressive, often fatal and occurs in a seriously ill, immuno-compromised host (Lehrer *et al.*, 1980; Meyer *et al.*, 1972) and (b) the localized subcutaneous variety (Herstoff *et al.*, 1978). The subject of this communication is a young girl with pulmonary and mediastinal zygomycosis who presented with superior vena cava (SVC) obstruction. To the best of our knowledge, SVC involvement in granulomatous mediastinitis due to zygomycosis has not previously been documented.

Case report

An 8 year old girl from Central India had low to moderate grade irregular fever for 4 months and a dry, troublesome cough. A month after the onset of her illness, she had become dyspnoeic and a local practitioner had administered antitubercular therapy for 6 to 8 weeks. Clinical examination at presentation revealed an emaciated, dyspnoeic child with features of superior mediastinal compression (Figure 1). A right sided pleural effusion and soft hepatomegaly were the other salient features. A thick, whitish fluid (150 ml) was aspirated from the right pleural cavity. This fluid had 680 cells/mm^3, the majority being lymphocytes, and a protein content of 4.5 g/dl. Following the isolation of *Streptococcus pneumoniae*, appropriate antibiotic therapy was initiated. There was, however, rapid re-accumulation of fluid and the child was subjected to a thoracotomy.

A nodular tumour in the anterior mediastinum was seen surrounding the SVC, ascending aorta and pericardium. A biopsy taken from this tumorous growth consisted of a lymph node showing non-specific changes and of a separate inflammatory mass. The most striking feature of the latter was the presence

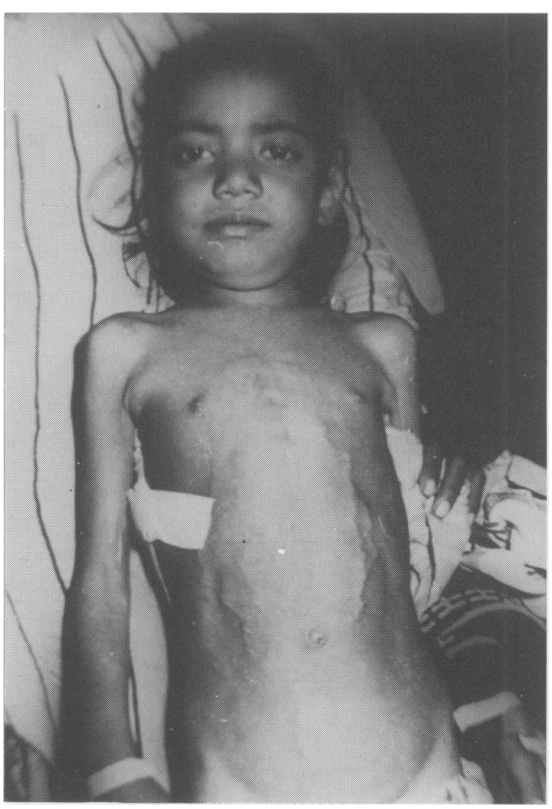

Figure 1 Showing suffused, puffy face and tortuous, dilated veins over chest and abdomen.

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granular eosinophilic material outlining the fungal hyphae which had been cut in various planes. These hyphae were broad, non-septate and infrequently branching. These were represented on the section as empty, linear or round spaces with a thin wall and a collar of granular eosinophilic material, the Splendore-Hoeppli phenomenon. The inflammatory cells consisted of neutrophils, multinucleated giant cells, lymphocytes and a prominent component of eosinophils. A variable degree of fibrosis and small foci of necrosis was also noted. Thus, morphologically, the lesion was typically that of zygomycosis (Figures 2 and 3).

She was started on specific therapy with amphotericin B once a definitive diagnosis had been established. Increasing doses were administered and appropriate laboratory monitoring of blood counts, liver and renal function tests was carried out. A total dose of 270 mg was given over 37 d. After about 2 weeks of therapy, there was significant clinical and radiological improvement. However, this period was shortlived and a month after therapy with amphotericin B had been initiated, her condition worsened. Radiologically, the right hemithorax became opaque once again and a continuous murmur at the base of the heart was noted. She died soon after.

Discussion

Zygomycosis, a term now used rather than phycomycosis, is a rare fungal disease. The diagnosis is based on the histological demonstration of broad, infrequently septated organisms which have irregular branching (Chandler *et al.*, 1980). Culture of the organism from body fluids is successful in fewer than 20% of cases (Lehrer *et al.*, 1980). A positive culture helps in further differentiating the various species. In our case, the presence of eosinophilic material surrounding the characteristic hyphae suggests that the organism belongs to the order Entomophthorales in the class zygomycetes. The Entomophthorales are most frequently associated with subcutaneous and nasofacial disease though *E. conidiobolus coronatus* has been reported to cause deep pulmonary disease and mediastinitis (Herstoff *et al.*, 1978; Reich & Renzetti, 1970). In contrast, the Mucorales, a histologically distinct order, are commonly associated with the invasive, disseminated and fatal forms of zygomycosis (mucormycosis). The nature and course of the disease in this case is like Mucormycosis but the histology is more typical of Entomophthorales.

Zygomycosis characteristically afflicts immunologically compromised hosts, with the rhinocerebral form occurring most often in patients with diabetic ketoacidosis (Lehrer *et al.*, 1980) and pulmonary zygomycosis in leukaemia and lymphoma (Meyer *et al.*, 1972). However, pulmonary and cutaneous involvement has been reported in apparently healthy individuals (Record & Grider, 1976; Eckert *et al.*, 1972; Reich & Renzetti, 1970).

The case under discussion had no identifiable predisposing factor and had disease involving the lungs and mediastinum. Mediastinal zygomycosis is rare and forms the subject matter of some case reports (Eckert *et al.*, 1972; Leong, 1978; Connor *et al.*, 1979). To the best of our knowledge superior mediastinal involvement with compression of SVC due to zygomycosis has not previously been reported. Another interesting feature of this case was the appearance of a continuous murmur when her condition deteriorated while on therapy. Hyphae of

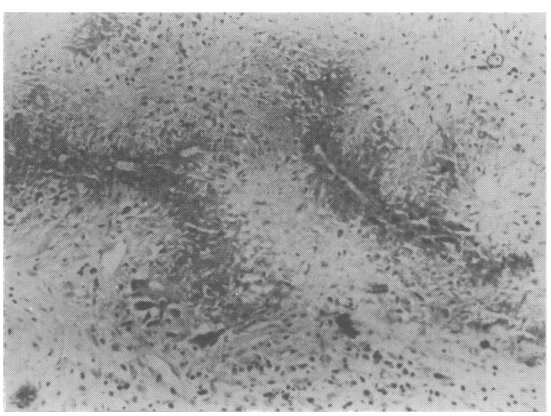

Figure 2 Showing inflammatory tissue with several fungal hyphae represented by linear empty spaces and surrounded by eosinophilic material. (H & E × 160)

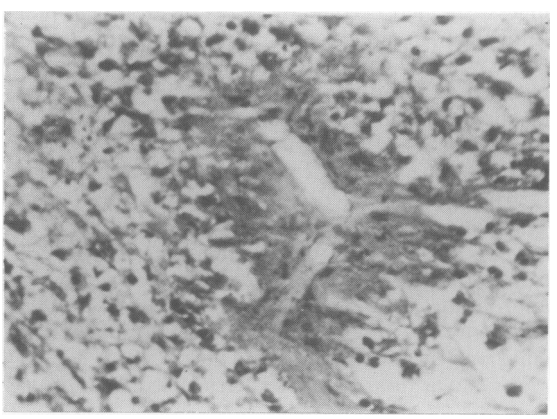

Figure 3 Higher magnifications showing details of one fungal hyphae. (PAS × 640)

zygomycete have been known to invade vessel walls. This gives rise to the speculation that the murmur observed was due to pulmonary arterial mycothrombi, a complication that has been reported earlier (Reich & Renzetti, 1970).

Treatment with amphotericin B used alone or in combination with drugs like 5-fluorocytosine and griseofulvin along with surgical debridement of diseased tissues has helped in affecting cures and in reducing mortality rates in zygomycosis to 20% (Lehrer *et al.*, 1980; Hauch, 1977; Brown *et al.*, 1977; Eden & Santos, 1979). Widely disseminated disease was the major factor which determined the poor outcome in our patient.

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