Rhino-orbital-Cerebral Mucormycosis Presenting As Stroke

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ABSTRACT

Rhino-orbital-cerebral mucormycosis is a well established complication in diabetic patients with ketoacidosis. We report a case of rhino-orbital-cerebral mucormycosis who presented as thrombotic stroke. A 60 year old lady, a known diabetic, presented with ketoacidosis. She had unilateral facial and orbital cellulitis on the left along with ophthalmoplegia on the same side; and stroke with hemiparesis on the right. MRI brain revealed thrombosis of left internal carotid artery with hyper acute infarct of left frontal and high parietal regions. There was destruction of left inferior and middle turbinate, medial wall of left maxillary sinus and floor of left orbit upto orbital apex. Microbiological studies of specimens from nasal mucosa, turbinates and eschar on the hard palate grew Mucor species. Combined with the clinical, radiological and microbiological findings, stroke in this patient might be due to fungal vasculopathy.

INTRODUCTION

Mucormycosis or Zygomycosis is an invasive deep fungal infection with high mortality (1). The clinical spectrum includes rhino-orbital-cerebral form which is by far the commonest, followed by cutaneous, disseminated, gastro-intestinal, pulmonary and renal forms in decreasing order of frequency(2). Cerebral mucormycosis may present as stroke due to arterial thrombosis ('mucor thrombosis'), cavernous sinus syndrome; or intracerebral hemorrhage from ruptured mycotic aneurysm (1, 3, 4,). In a diabetic patient, stroke can occur due to diabetic vasculopathy and fungal vasculitis (5). We report a case of rhino-orbital-cerebral mucormycosis in a diabetic patient who presented as fatal stroke.

CASE REPORT

A 60 year old female, a diagnosed case of Systemic Hypertension and Diabetes mellitus on irregular treatment came with history of low grade fever, headache, vomiting and pain in abdomen since 8 days. There was history of swelling and blackening around the left eye since 4 days followed by ptosis since 2 days. On examination she was drowsy, responding sluggishly to verbal commands. She was Febrile (100F); pulse was 100/min, BP-110/80mmHg and dehydrated.

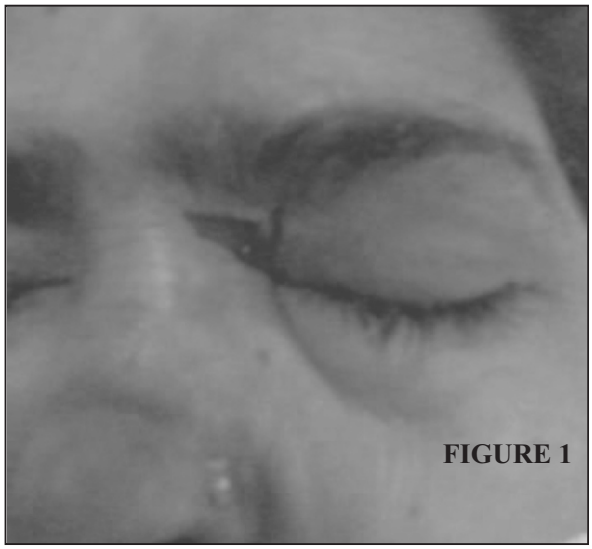

FIGURE 1

On examination there was ptosis and chemosis of left eye along with periorbital blackish discoloration (Figure 1). Nasal cavities showed black dried crustations with white ball in both nasal cavities-more on the left. The pathognomonic black eschar could be seen over the left palate. She had 3rd, 4th and 6th cranial nerve palsy on the left and hemiparesis on the right. Other system examination was within normal limits.

On investigating the patient, RBS was 537mg/dl, urine ketones were positive. Blood investigations showed

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Hb- 12gm%, TLC-15,000 with 90% polymorphs, urea-60, creatinine0.87, Na+ was137 and K+ was 4.7. X-Ray Skull showed widening of the left nasal cavity with destruction of middle and inferior turbinates. Nasal endoscopy revealed white fungal ball and black crustations coating the nasal mucosa all over and blocking the osteomeatal complex. Scrapings from nasal mass showed fungal elements on KOH mount. Biopsy samples from the nasal and palatal mass showed the picture of mucormycosis with some foci of non-septate fungal hyphae, and hyphal branches typically at right angles (Figure 2). MRI Brain and orbit showed thrombosis of left internal carotid artery with hyperacute infarct of left frontal and high parietal regions. There was evidence of maxillary sinusitis along with destruction of left inferior and middle turbinate, medial wall of left maxillary sinus and floor of left orbit upto the orbital apex. Orbital cellulitis and soft tissue edema could be seen on the left. Patient's ketosis was treated within next the 12 hours according to routine protocol; however the patient's condition deteriorated and she became stuporous, developed hypotension and respiratory distress. She was put on vasopressors and given ventilatory support. IV Amphotericin B (1.5mg/kg) was started. However the patient expired the next day before any surgical intervention could be carried out.

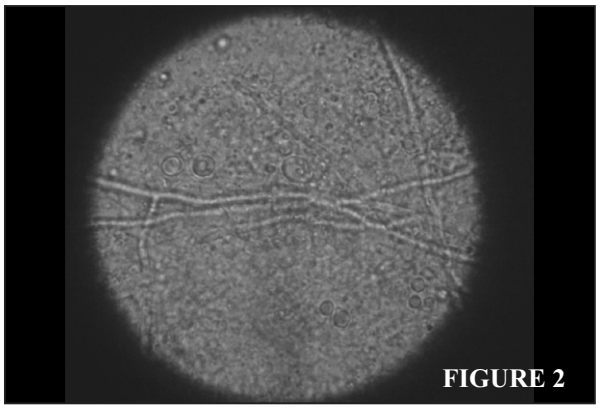

FIGURE 2

DISCUSSION

The first published case of mucormycosis was described by Paltauf in 1885 (6). Mucormycosis is caused by various fungal species in the order Mucorales; members of the family, Mucoraceae being the most pathogenic. It commonly occurs in immunologically and metabolically compromised hosts like diabetes mellitus with or without ketoacidosis, chronic renal failure, hematologic malignancies, immunosuppressive therapy or Desferrioxamine therapy (5, 7). These fungi thrive in a highly acid environment which is rich in carbohydrate. Thus a diabetic patient with ketoacidosis has a double threat of defective phagocytic function (from acidosis) and provides an environment for rapid invasion (2).

The portal of entry is commonly through the nasal mucosa from where, after initial colonization, spread occurs to the neighboring structures like the sinuses (stage1 disease), orbit (stage 2 disease) and central nervous system (stage 3 disease) (1,8). The pterygopalatine fossa appears to be the main reservoir for mucor and acts as a conduit for its further spread (9).

Mucor is an angiotropic fungus with a high affinity for the elastic membrane of the blood vessels (10). Vessels, especially arteries, are prone to invasion, producing thrombosis and infarction. Thus after initial entry and colonization in the nasal mucosa and paranasal sinuses, intracranial extension may occur via hematogenous route or more commonly by direct extension through the superior orbital vein, superior orbital fissure, or the cribriform plate (11).

Rhinocerebral involvement is the commonest mode of presentation of all invasive mucormycosis (one-third to half) (2). Cerebral mucormycosis may uncommonly present as stroke due to infarction (1, 3) or rarely as intracranial hemorrhage from ruptured mycotic aneurysm. When present, intracranial extension with focal neurological deficits is a major predictor of mortality in rhinocerebral mucormycosis (1). Presence of altered sensorium, facial necrosis, unsuspected diabetes mellitus and mucormycosis related malignant stroke at presentation are other predictors of poor outcome (12).

Our patient presented with orbital cellulitis, external ophthalmoplegia and an ischemic stroke. Combined with the clinical and neuroimaging findings, the growth of Mucor species from microbiological specimen supports the diagnosis of extensive rhino-orbital disease with cerebral infarction due to Mucormycosis. Accelerated, malignant stroke may be due to diabetic and fungal vasculopathy.

Confirmation of mucormycosis especially cerebral form is bit difficult as the initial blood work-up does not reveal any specific findings; blood cultures are

usually negative. Thus demonstration of the characteristic hyphae in the tissues and growing the fungus in culture remain the gold standard for diagnosis. Neuroimaging studies are helpful to know the extent of involvement. Treatment is with Amphotericin B and its newer formulations. New broad spectrum triazole agents, Posaconazole and Rovuconazole have been reported to be effective against zygomycetes. Early, aggressive surgical intervention, including endovascular intervention of involved internal carotid artery, hyperbaric oxygen therapy along with Amphotericin B may benefit the patient (13). Yet even with optimal treatment, the prognosis remains poor with high mortality.

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