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Flourishing growth of Rhizopus in Diabetic serum: a Case Report

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ABSTRACT

A 60 year old male was admitted with right cheek swelling, nasal obstruction and discharge along with elevated blood sugar levels. Patient underwent FESS with ethmoidectomy and tissue was sent for microbiological diagnosis. Culture confirmed the presence of Rhizopus arrhizus. Patient was managed aggressively for control of diabetes mellitus along with iv.amphotericin B. Mucormycosis is an invasive rapidly progressive disease which involves high mortality due to cerebral invasion, the outcome of which depends on early clinical diagnosis and prompt treatment with an accurate microbiological culture report.

Keywords: Rhizopus, progressive, invasive, mucormycosis.

INTRODUCTION

Mucormycosis is an acute opportunistic infection which can lead to serious consequences when there is an underlying predisposing factor such as uncontrolled diabetes mellitus and other immunosuppressive conditions. Etiological agents include Mucor, Rhizopus, Cunninghamella, Syncephalastrum, Conidiobolus and Basidiobolus. Infection can occur by inhalation, ingestion or percutaneous injection of spores.Rhinocerebral Mucormycosis is a rapidly spreading disease, the rapid spread attributable to the angioinvasive property of the fungi. The spread occurs from the nasal mucosa to the turbinates, paranasal sinuses, orbit and palate ultimately leading to cerebral invasion. Patients present with chemosis, periorbital swelling, spreading facial cellulitis, orbital pain, visual loss and ptosis. Cerebral invasion is a consequence of fungal invasion through the cribriform plate. It is a life- threatening condition which may prove fatal if not diagnosed on time and antifungal therapy initiated [1]

Case Report

A 60 year old male was admitted to the General Hospital with C/O Right cheek swelling, Nasal discharge, Nasal obstruction, headache and right eye pain for the past 8 days. He was a known alcoholic and tobacco chewer. The poorly built and poorly nourished patient presented with a 5x4cm swelling on the right cheek extending superiorly upto the infra orbital margin, inferiorly upto the supra alveolar ridge, Medially to the lateral wall of nose and laterally upto the zygoma. The swelling was warm and tender on palpation, but was not palpable intraorally. Oral cavity and oropharynx appeared normal and no lymph nodes were palpable in the neck region. Anterior rhinoscopy showed a septal deviation to the right with pus in the right middle

meatus.Diagnostic nasal endoscopy showed a mucous discharge in the right nasal cavity. Random Blood sugar on admission was 683 mg/dl with urine positive for ketone bodies, however patient had no H/O Diabetes mellitus.Chest Xray revealed an opacity in the right upper zone with fibrosis of the left lung. A provisional diagnosis of Invasive fungal sinusitis was made in the Otorhinolaryngology department. Endoscopic debridement and Anterior Ethmoidectomy was done during Functional Endoscopic Sinus Surgery (FESS) and tissue sample sent for Fungal culture and sensitivity to the Microbiology Laboratory and for Histopathological examination.Patient was started on Inj.Ceftriaxone 1g I.V twice a day empirically.

In the Microbiology Laboratory:

Tissue sample was received for Fungal mounting and culture. The tissue sample was homogenised without much crushing using a mortar and pestle and a wet mount was put up with 10% Postassium hydroxide (KOH). Wet mount showed the presence of ribbon like broad aseptate hyphae. Specimen was inoculated onto Sabouraud Dextrose Agar (SDA) and incubated at 25°C and 37°C. Growth was observed on the 3rd day after incubation as white fluufy cotton wooly colonies with a hint of gray. A Lactophenol cotton blue mount was made after teasing the culture which showed, stolons, rhizoids arising from the nodes, long erect sporangiophores with spherical sporangia that collapse into an umbrella after liberating the spores was seen . The fungus was confirmed as Rhizopus arrhizus. Patient underwent surgical debridement and was started on Amphotericin B along with management of Diabetic ketoacidosis.

Discussion

Mucormycosis is an opportunistic fungal infection that manifest as six clinical types, such as Rhinocerebral, Pulmonary, Cutaneous, Gastrointestinal, Isolated renal and Disseminated Mucormycosis. The rapidly progressive nature of the disease is attributable to its angioinvasive property which causes tissue necrosis and dissemination [2]

It is found to be associated predominantly in patients with poorly controlled diabetes mellitus and diabetic ketoacidosis apart from immunocompromised states due to chronic steroid treatment, organ transplantation and haematological malignancies.In a study by Hosseini et al it was reported that the pterygopalatine fossa served as a reservoir of the disease through which it spreads to the neighbouring structures such as the retro-orbital space and infratemporal fossa [3].

Tissue for culture should not be homogenised or minced as it may damage the hyphae and culture should be made on media free of cycloheximide. A negative culture does not rule out Mucormycosis and the diagnosis is to be made by the combined expertise of the clinician and microbiologist[4]. Early diagnosis and prompt treatment play a very important role and treatment should be initiated as soon as possible with clinical evidence, taking appropriate steps simultaneously towards confirmation of the diagnosis [2].

Therapeutic approach involves a combination of surgical debridement, antifungal therapy and rapid correction of underlying predisposing factors. Drugs available for effective treatment of Mucormycosis include intravenous amphotericin B, posaconazole and isavuconazole[1].

Conclusion

Rhinocerebral Mucormycosis is a life threatening condition which is rapidly progressive and angioinvasive. Diagnosis and management should go hand in hand for a better outcome. Treatment should be initiated with clinical suspicion with simultaneous confirmation of Microbiological diagnosis.

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Volume 2, Issue 2; March-April 2019; Page No. 40-42
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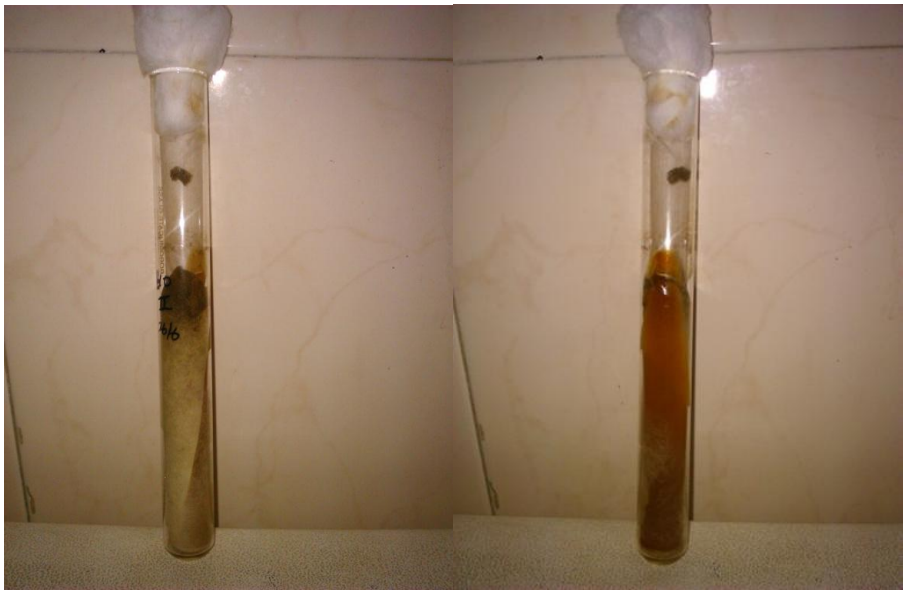

Figure1: white to gray cottony growth of colonies on SDA- obverse and reverse.

Figure 2: KOH wet mount showing broad aseptate ribbon like hyphae

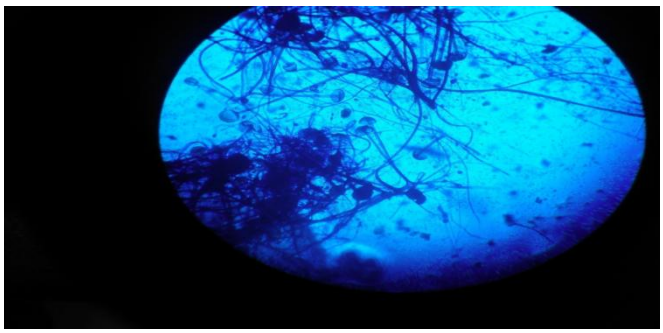

Figure 3: LPCB mount showing broad aseptate hyphae with erect long sporangiophores arising opposite the rhizoids.

Volume 2, Issue 2; March-April 2019; Page No. 40-42

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