# MUCORMYCOSIS OF THE ORAL CAVITY: A CASE REPORT

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**ABSTRACT**
Mucormycosis is rapidly spreading fungal infection caused by mucorales, belonging to Zygomycetes which if not treated at the earliest can become fatal. Immunocompromised patients having long standing diabetes mellitus, malignancy, chronic renal failure are more affected. Mucorales invades the blood vessels causing thrombosis leading to necrosis of the tissue and bone. Infection starts from nose, paranasal sinuses, orbit by angioinvasion. Brain is affected by perineural invasion. This is a case of mucormycosis affecting the hard palate, alveolus and floor of the maxillary sinus of a patient having chronic renal failure and is immunocompromised.

**KEY WORDS**
Mucormycosis, necrosis of hard palate and alveolus.

## INTRODUCTION

Probably the first case of Zygomycosis, on the basis of histopathologywas described by Kurchenmeister in 1855. Platauf described Zygomatosis in his paper, 'Mycosis Mucorina, in 1885. A case of Zygomatosis in pediatric patient was reported by Harris in 1955. Mortality rate was very high until the discovery of Amphotericin B in 1957, which has helped to reduce the mortality rate1.

Zygomycosis is acute or chronic infection caused by several fungi belonging to phylum Zygomycota.Zygomycosis is the larger term used to describe the condition caused by many non-septate filamentous fungi classified under Order Mucorales and Entomophthorales. Condition is caused by fungi belonging to Order Mucorales and is termed as Mucormycosis. These are opportunist fungi and are generally present in the nasal cavity in humans. Mucormycosis is listed as a 'rare disease' by Ophanet, a consatorium of European partners defines a condition 'rare' when it affects 1 person per 2000. Zygomycetes have predilection for elastic lumina of large and small arteries causing thrombosis, hemorrhages and infection[2,3]. Angioinvasion, thrombosis, ischemia and tissue necrosis are primary histopathological features[4,5]

The commonest form of Mucormycosis is rhino cerebral variety which is fulminant type with rapid progress leading to fatal consequences. Generally it spreads from nasal mucosa to nasal bones, paranasal sinus, orbit and brain. Diabetes mellitus, ketoacidosis and haematologic malignancies like leukemia are predis-

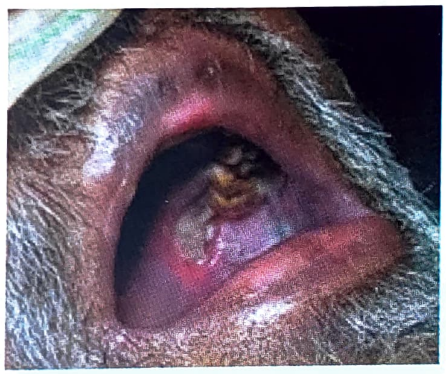

Fig 1: Fungal growth is sometimes referred to as mycetomes.Necrotic slough of yellowish brown color measuring 3.5cm x 2.5 cm was present on the palatal mucosa in left canine and premolar region.

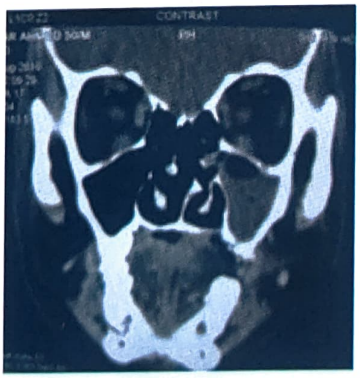

Fig 3

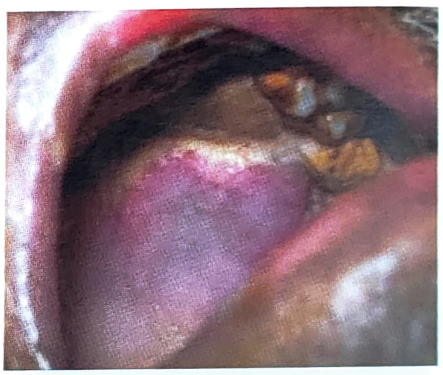

Fig 2: C T Scan was advised to know the extent of the disease.Incisional biopsy from the necrotic tissue was taken for the histopathological findings. Also small tissue and filaments from the fungal growth were taken for culture findings. Upper second molar was exfoliated after four days. Provisional diagnosis of mucormycosis was established

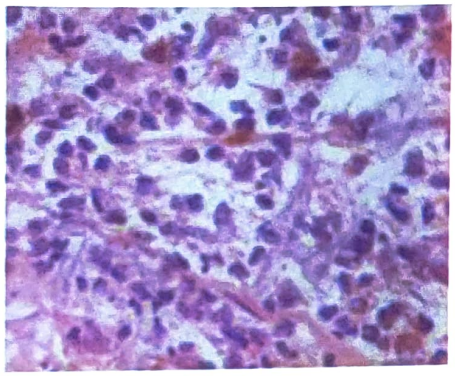

Fig 4: The tissue was stained by Periodic Acid Schiff reaction (PAS).It showed spores, mucorales bearing fungal filaments. Peripheral vessel was packed with mucorales causing thrombosis.

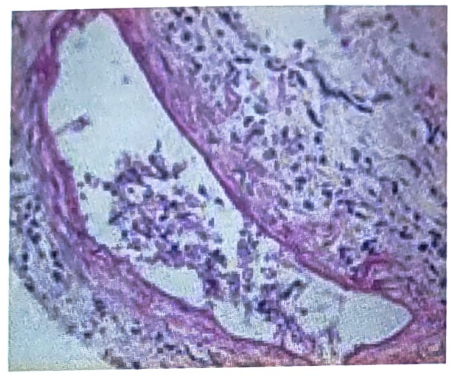

Fig 5: Thus Mucor invasion was established. It was also correlated with culture findings

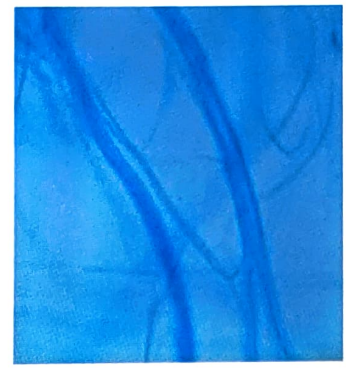

Fig 6

posing factors[4,5,6]

International Forum on Zygomycosis,in its meeting held in May-June 2008 in Athens,Greece,which was headed by Petrikkos;discussed various aspects of this disease in detail[7].

## CASE REPORT

Male patient aged 50 yrs was referred to the dental department for ulcerative lesion around the upper left third molar along with the yellowish patch of slough in the premolar and canine region on the hard palate of left side of maxilla. Patient gave history of exfoliation of upper left third molar few days back. Patient was a known case of chronic renal failure and was on kidney dialysis and immunosuppressant medication since long duration. On careful examination necrotic ulceration and slough was present around the socket of upper left third molar. Fungal growth appeared as a round ball having brownish white color in the socket.

## HRCT SCAN

Soft tissue opacification of left maxillary sinus is noted; along with an air fluid level.Ipsilateral osteomeatal complex is obliterated. Inferiorly the soft tissue is seen to extend into and cause erosion of the left alveolar margin of maxilla. Small focal erosions are also noted in lower part of anterior and lateral wall of left maxillary sinus. Foci of air seen in left pterygoid fossa.No evidence of intra orbital or intra cranial extension seen on the study. **(Fig 3)**

## HISTOPATHOLOGICAL FINDNGS

Section of the tissue was stained with Haematoxylin and Eosin (H & E). It showed ulcerated ridged squamous epithelium with clumps of colonies and moderate chronic inflammation.

## CULTURE REPORT

Small portion of necrosed tissue with filaments from fungal ball was taken.Sabouraud's Dextrose Agar (SDA) with antibiotics without cyclohexamine was used for the cultivation of fungus in a test tube. It produced white fluffy cottony growth without pigmentation at 25°C. Normally fungal growth takes place in 48 hrs, but in this case it took 5 days as the patient was already on treatment with antibiotics and anti fungal medicine, Amphotericin B.The Lacto phenol cotton Blue (LPCB) mount was prepared to examine morphological features of fungal growth.Onto the slide, small portion of the culture is picked and suspended in few drops of LPCB solution. Mycelia were teased apart and covered with a cover slip. Fungi are classified on the basis of branching, width, septae on the slide. It showed wide, aseptate sparsely branching mycelia which were suggestive of mucorales. **(Fig 6)**

## TREATMENT

Treatment was started immediately on the basis of clinical diagnosis. Amphotericin B was started. Amphotericin B is the drug of choice and it acts by damaging the walls of fungi. Dosage was 0.5 mg per kg of body weight per day. It was given intravenously by diluting it in 250 ml of normal saline every 2 hourly. In the normal patients the dosage is 1.5mg per kg, per day. In this case the dosage was reduced to 1/3rd as the patient was suffering from chronic renal failure and was on immunosuppressants. Amphotericin B was continued for 6 weeks. Surgical intervention was carried out. Partial maxillectomy was done. Left side of hard palate and alveolar bone were removed till the healthy tissues. Surgical debridement of necrotic tissues was done. Serum Creatine and blood urea levels were monitored as the drug can cause renal toxicity[5]. Obturator was advised.

## DISCUSSION

The progress of Mucormycosis takes place at a very rapid pace from Paranasal sinus to orbit to cerebrum[2]. Involvement and necrosis of maxilla rarely occurs because of its rich vascularity[5]. Prognosis is poor and mortality rate varies depending on its form and severity. Mortality varies from 30% to 70%. The mortality rates have dropped due to Amphotericin B therapy. As the presence of fungus in the tissue increases, the survival rate decreases. If the angioinvasion is minimal, survival rate is 100% and with moderate to marked angio invasion the sur-

vival rate is less than 46%. The most common is Rhinocerebral, which is fulminating type[8,9]. The important role in the defense of the host from the infection caused by Zygomycetes is played by neutrophils.Breakdown of immune system leads to neutropenia and neutrophils dysfunction. Neutrophils play an important role in the defense mechanism of the patient by phagocytosis and oxidative killings of spores. The host with neutrophil defects, either qualitative or quantitative is predisposed to Zygomycetes. Immunocompromised patients, particularly uncontrolled diabetes, chronic renal failure, haematological malignancies and patients on prolonged treatment of corticosteroids, antibiotics and cytolotoxic therapy are at greater risk[3,4,6]. Patients with iron overload, treated with deferoxamine, an iron chelator, are most susceptible. Perineural invasion also occurs and have retro orbital spread affecting the brain. Ulceration and necrosis of the palate leading to perforation is common which is due to invasion of palatal blood vessels[9,10]. Hyperbaric oxygen may help as a supportive therapy as higher oxygen pressure increases the ability of neutrophils to kill the organism.Success of the treatment depends upon early clinical diagnosis and starting the treatment of Mucormycosis immediately with I.V.Amphotericin B as the histopathological and culture report takes 2 to 3 days.

ACKNOWLEDGEMENTS

*We sincerely thank Dr.P.M. Bhujang (Medical Director), Dr.A.P.Doshi (Cons. Nephrologist), Dr.(Mrs.)Tasneem.B.Doctor (Chief Pathologist), Dr.Poorva Bhave(Cons. Microbiologist), Dr.(Mrs.) A.K.Murthy (Hon. Histopathologist) from Sir H.N.Hospital & Research Centre for the help extended to us.*

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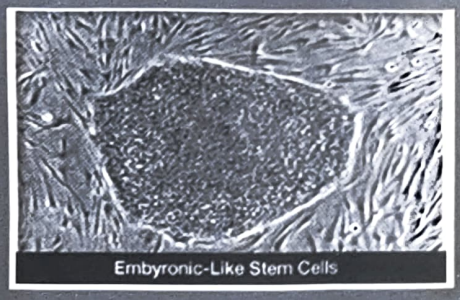
## PLANS ARE BEING MADE FOR AN INNOVATIVE STUDY

**The first known human trial using embryonic-like stem cells from adult cells to grow bone cells will be happening soon. The cell technology, referred to as VSEL stem cells, come from adult cells, not fetuses. The distinction is important because it absolves the study from any possible ethical dilemmas. The research will be conducted by the University of Michigan School of Dentistry and NeoStem, a New Yorkbased company.**

**The research team believes that these stem cells have the ability to create a minimally invasive method to speed up painful bone regeneration for dental patients and other people that have experienced bone trauma. The University of Michigan School of Dentistry's role will be in the area of patient care, while NeoStem will be provide the cells.**



Embyronic-Like Stem Cells

**Before the teeth are extracted, the researchers house the cells before NeoStem makes sure the samples aren't tainted in any way. The VSEL stem cells are then separated from the person's other cells. This ensures that the purest samples are used for the study. The people in the control group for the study receive their own cells instead of the VSEL stem cells. After the new bone grows, the research takes out a portion of it for studying. The University of Michigan has taken the necessary steps to file patent protection for the VSEL stem cells. If this study is successful, it will provide many benefits, including disease treatment, based on the embryonic-like stem cells that will be produced for each patient.**