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MIXED FUNGAL INFECTION IN A PATIENT WITH DIABETES MELLITUS - A CASE REPORT

Dentistry

Dr. Shruthy. R Professor, Department of Oral Pathology and Microbiology, College of Dental Sciences, Davanagere 577004, Karnataka, India.

Dr. Madhu Shankari G. S Professor and Head, Department of Oral Pathology and Microbiology, College of Dental Sciences, Davanagere 577004, Karnataka, India.

Dr. Kiran H. Y Professor, Department of Oral and Maxillofacial Surgery, College of Dental Sciences, Davanagere 577004, Karnataka, India.

Dr. Tejaswini N. G Reader, Department of Oral Medicine and Radiology, College of Dental Sciences, Davanagere 577004, Karnataka, India.

ABSTRACT

Mucormycosis is a potentially lethal, rare but emerging opportunistic fungal infection caused by the order Mucorales. Spores in air would be inhaled by the human host. Especially common in patients with diabetes mellitus.Oral Aspergillosis is an uncommon condition caused by aspergillus species, which most frequently occurs in an immunocompromised patient which enables the spread of invasive aspergillosis to cross the anatomical barriers. These fungal infections due to their invasive potential are a major cause of morbidity, mortality in an immunocompromised or uncontrolled diabetes mellitus patients.

KEYWORDS

Mucormycosis, Aspergillosis, Diabetes Mellitus

INTRODUCTION:

Mucormycosis is a rare fungal infection. Mucormyvetes belong to the order Mucorales, subphylum Mucoromycotina. It is a life threatening infection which has high mortality and morbidity [1] Aspergillus is a fumgal genus with a great diversity of species found saprophyte in soil, water and decomposing organic materials. Few species are able to develop at room temperature causing an opportunistic infection in humans known as aspergillosis.[2] Mucormycosis and aspergillosis are the most frequent fungal infection caused by ubiquitous filamentous fungi. Coinfection in the same host is scarce and has a poor prognosis .it commonly affects immunocompromised patients [3] Here we reported a case of concomitant mucormycosis with aspergillosis in patient with uncontrolled diabetes mellitus.

Case Report:

A 50 years old female patient, complained of pain and swelling over the right side of face and pain in the upper and lower right back tooth region since 1 week. There was a H/O application of papaya milk intraorally over the area of the pain. After the application, patient claims of mild pain over the palate.

After the application of zandu balm (extraorally) and papaya milk, there was increase in the size of the swelling. Patient visited private clinic and got extraction of 14 and 15 tooth. Extraction was uneventful, however swelling and pain exacerbated 3 to 4 hrs after extraction.

Following the above complaint, patient was referred to our hospital. On Physical examination there was facial asymmetry and gross swelling on the right side of the face.

Periorbital edema noted over right side with closure of right eye. Obliteration of nasolabial fold on right side. [Figure 1]

On intraoral examination, 14,15 were missing. There was greyish white necrotic patch over the hard palate and non healing socket with pus discharge (dry socket). Obliterated vestibule wrt 14,15 area was tender and erythematous. Lesion was irregular in shape, yellowish white color and soft in consistency. [Figure 2]

Patient had given the medical history of hypertension since 2 years and was under treatment. Patient was recently diagnosed with diabetes mellitus.

On Hematological investigations Glycosylated hemoglobin (Hb A1C) was more than 13.5% and Mean blood sugar - 340 mg/dl at admission.

On Radiographic examination, OPG was non relevant.

CECT (Contrast enhanced computed tomography)

CECT shows right premaxillary abnormal enhancing soft tissue with inflammatory mucosal thickening of right maxillarysinus.

Communication /breach noted between the right maxillary alveolus and sinus (Oro antral communication)

Histopathology: H and E stained and PAS stained tissue sections showed connective tissue with nonseptate branching fungal hyphae and few areas showing septate hyphae and numerous sporangia. [Figure 3]

By Histopathological features in correlation with obtained clinical details we come to the final diagnosis of Mucormycosis intermixed with Aspergillosis. [Figure 4]

DISCUSSION:

Mucormycosis is a rare and dreaded clinical entity caused by the fungus of the order Mucorales. It is a life threatening infection which has high morbidity and mortality. It is also known as Zygomycosis harmless to a healthy person but fatal in immunocompromised patients.[1] These opportunistic pathogens are existing in the environment, soil, air, food, compost piles, animal excreta and play a major role in the cycle of decomposition. [4] They are angioinvasive in nature.

Aspergillosis is the clinical condition caused by the Aspergillus species most often A. fumigatus. It is a second most prevalent opportunistic fungal infection. Rowe Jones in 1994 classified aspergillosis into three variants – Invasive, Non invasive and Non invasive destructive type.[5] Aspergillus species is acquired by inhalation of airborne infective spores and can cause lower respiratory tract infection- bronchopulmonary aspergillosis. Paranasal sinuses, larynx, eyes, ears and oral cavity may be involved in primary apergillosis. [5,6]

Predisposing factors for invasive fungal infections are uncontrolled diabetes mellitus particularly in having ketoacidosis, underlying malignancies, renal failure, organ transplant, long term immunosuppressive therapy and cirrhosis.[7,8]

Mucormycosis and aspergillosis are two invasive fungal infections that have clinical and paraclinical similarities. These infections could be disseminated invading multiple organs and are frequently fatal in immunocompromised patients.[3]

The normal body physiology inhibits growth by controlling pH and

glucose. Aspergillus and mucormycosis invade tissues and spread both locally and systemically in uncontrolled diabetic patients. Uncontrolled diabetes mellitus with ketoacidosis is the most common predisposing factor.in these patients there will be decreased granulocyte phagocytic activity with altered polymorphonuclear leukocyte response.

Mucor grow in an acidic PH and glucose rich medium. Hyperglycemia enhances fungal growth and impairs neutrpophil chemotaxis, while lactic acidosis decreases phagocytosis.[9,3] Co infection usually occurs in orofacial region and sinus.[3]

Mucorales have the ability to invade and damage endothelial lining of blood vessels. Angio invasion results in thrombosis and tissue necrosis. This is the most characteristic feature of mucormycosis. [5]

Computed tomography (CT) and magnetic resonance imaging (MRI) is useful to find out intracranial and sinus spread of infection. The diagnosis needs proper identification of the fungus. Fungal culture and histopathological examination will help in the diagnosis.[1]

Diagnosis of Aspergillosis usually confirmed by a positive culture.[6] The common culture media to grow fungi are Sabouraud Dextrose agar, Inhibitory mold agar or Potato agar at a wide range of temperature of 25 C to 55.c. Other microscopic techniques such as 20% potassium Hydroxide, Gomori's Methenamine silver staining, periodic Acid Schiff , and Hematoxyline and Eosin staining are very useful in the diagnosis of Mucormycosis and aspergillosis.

Histopathological features of mucorales are broad ribbon like nonseptate hyphaewith right angled branching. Histologically Aspergillus species exhibits septate hyphae with branching at acute angles [Figure 3, Figure 4].

Treatment of these invasive fungal infections are surgical resection affected tissues in association with intravenous antifungal agents. Surgical debridement of infected tissue is essential and should be performed to limit the aggressive spread of infection and massive tissue destruction. Amphotericine B is active against most agents of mucprmycosis and also against aspergillosis.[3]

Voriconazole is tne drug of chice for the treatment of invasive aspergillosis. As it has better tolerance, increased efficacy, increased survivalrate and lower toxicity when compared to liposomal amphotericine B.[2] Control the diabetes by medication.

CONCLUSION:

An increase in opportunistic fungal infection and coinfection with the occurrence of more than one infection, leading to the poorer prognosis is observed now a days. There are many predisposing factors such as dental treatment or trauma and immunocompromised state of an individual may have coinfection.

In our case extraction in uncontrolled diabetes could be considered as one of the cause. Early and prompt diagnosis is crucial for its subsequent successful treatment. Proper history of the underlying systemic disease associated with this disease reduces the mortality and morbidity rate.

Acknowledgement And Disclosure Statement

Nil

Figure 1 Periorbital edema noted over right side with closure of right eye. Obliteration of nasolabial fold on right side.

Figure 2 Non healing socket with pus discharge

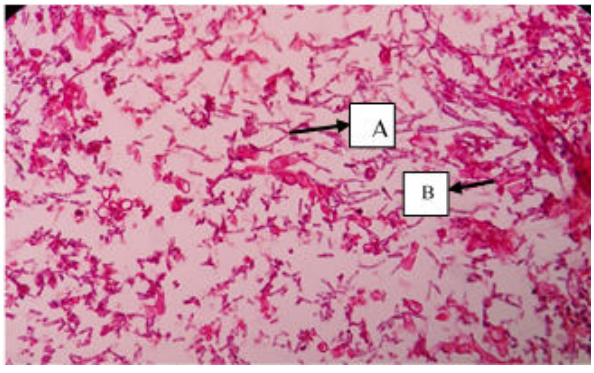

Figure 3: H&E stain A- Septate hyphae (Aspergillosis) B – Non septate hyphae (Mucormycosis)

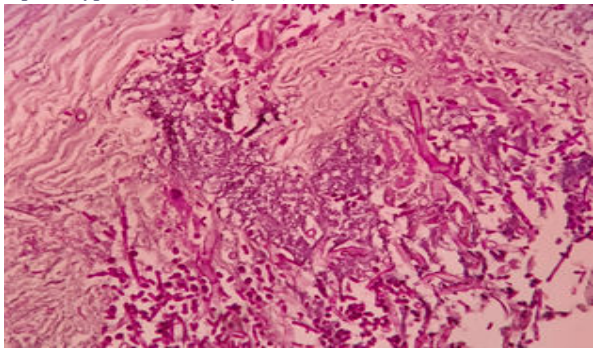

Figure 4: PAS stain showing Mucormycosis

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