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Post covid mucormycosis of mandible

[1]Dr. Bharati A Patil, Professor, Dept of Oral Medicine & Radiology, The Oxford Dental College, Bangalore-560068 Karnataka.

[2]Dr. Yamuna Rani, Post Graduate Student, Dept of Oral Medicine & Radiology, The Oxford Dental College, Bangalore-560068 Karnataka.

Corresponding Author: Dr. Yamuna Rani, Post Graduate Student, Dept of Oral Medicine & Radiology, The Oxford Dental College, Bangalore-560068 Karnataka.

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Abstract

Mucormycosis is a relatively uncommon opportunistic infection. It is a fulminant fungal infection that occurs most often in diabetic and immunocompromised individuals. A 57-year-old male patient who had recovered from COVID pneumonia was diagnosed with Sino nasal mucurmycosis with involvement of the mandible. The patient had a history of uncontrolled diabetes, hypertension and stroke. He was treated with sequestrectomy + saucerization of the mandible and B/L FESS + septoplasty under GA along with IV Amphotercin 1.5mg/kg and Inj Posaconazole 300mg for duration of 3weeks. The involvement of mandible sparing the maxilla was an interesting aspect of this case.

Keywords: Covid-19, Post Covid, Mandible, Mucormycosis

Introduction

Mucormycosis is a relatively uncommon opportunistic infection. It is a fulminant fungal infection that occurs most often in diabetic and immunocompromised individuals. The COVID-19 associated mucormycosis has been reported globally. By 15th July 2021, a total of 45,432 cases were reported. (Prakash and Chakrabarti, 2021) in India. The estimated prevalence of mucormycosis was at alarming rate of nearly 70 times higher than the global data.[1]

Based on anatomic localization Mucormycosis is classified as

- Rhino cerebral mucormycosis
- Pulmonary mucormycosis
- Cutaneous mucormycosis
- Gastrointestinal mucormycosis
- Disseminated mucormycosis
- Uncommon.

Mucormycosis has a high mortality rate of 54% due to its angioinvasive nature.

Rhino cerebral mucormycosis is more common involving the maxillary region and accounts for around

88% of the cases, whereas mucormycosis of mandibular region is rare and only few cases have been reported till date.[2] Here we present a rare case of mandibular mucormycosis sparing the maxilla.

Case report

A 57 yrs old male patient recovered from COVID pneumonia reported to our department with chief complaint of pain in lower right and left back tooth region since 20 days.

His past medical history included diabetes, hypertension and stroke.

During COVID treatment he was on oxygen 1lt/per minute for 15days, inj-Ptptaz (piperacillin/tazobactam) 4.5gm, inj-Remidesvir 200 on day 1 followed by 100 for 4 days, inj-Dexona (dexamethasone) 8mg, tab Dabigatran110mg twice daily for 5days, tab Predmet (methyl prednisolone) 8mg once daily for 5 days, tab Vit. C 500mg thrice daily & tab Zinc 50mg once daily for 2 weeks.

After 3months of recovery from COVID with pneumonia he developed pain in the lower jaw for about 20 days. The pain was sudden in onset, intermittent severe & throbing in nature which lasted for 2 hrs and radiated to head and neck region. Pain was relieved on medication.

On general physical examination the patient was found to be heavily built with normal gait. His random blood sugar was reported to be 157 mg/dl, his blood pressure was 120/76 mmHg.

On extraoral examination bilateral submandibular lymph nodes were palpable and tender.

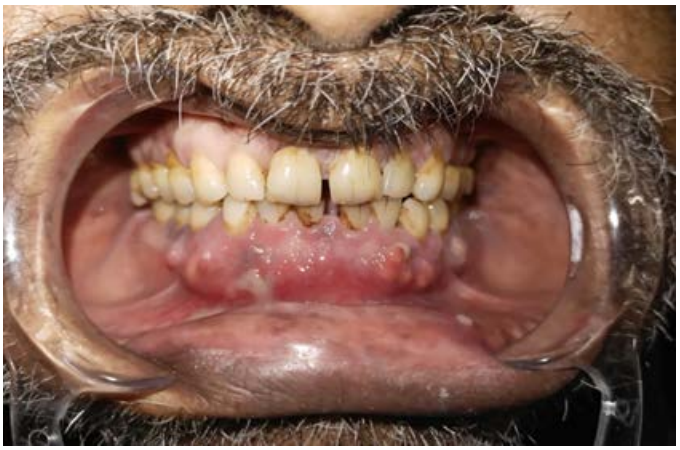

Fig 1: showing multiple sinus opening in the attached gingiva of mandible

The maxillary gingiva appeared normal on inspection & cervical abrasions were noted on the posterior teeth. In the mandibular region the attached gingiva appeared boggy with multiple sinus openings. On palpation the mandibular attached gingiva was pebbly and pus discharge was present from the multiple sinus openings. All the teeth were mobile and segmental mobility was noticed.

Since the patient had history of COVID & was treated with oxygen and remidesvir a provisional diagnosis of mucormycosis was considered with differential diagnosis of mandibular osteomyelitis and multiple periodontal abscess.

On investigation his FBS was 117mg/dl, PPBS-314mg/dl, CRP- 67.96mg/l & D-Dimer- 243 and rest of the haematology report was normal.

Mycology, bacteriology culture report & Fungal culture report was negative, normal commensals & No growth respectively.

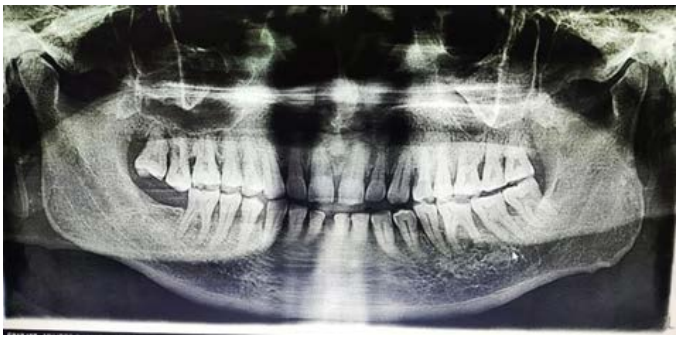

Fig 2: OPG The OPG showed normal anatomical landmarks with angular bone loss irt 18,17,16,12,11,22,23,26,27,28,36,37,38,46,47, and 48

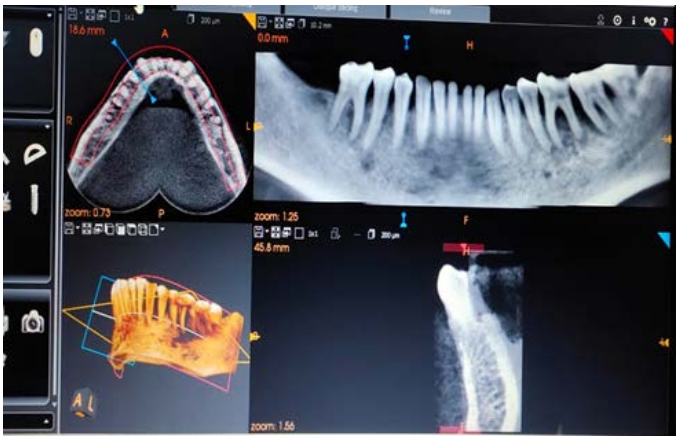

Fig 3: Showing CBCT images of mandible.

CBCT revealed irregular osteolytic lesions involving mandibular dentoalveolar region causing erosion with loss of normal architecture of the bone. Irregular outline of alveolar sockets with exaggerated disruption in the buccal & lingual cortical plates was evident around posterior teeth bilaterally with furcation bone loss.

The patient was referred to a higher centre for management, where he underwent MRI

Of Brain, Orbits & PNS which showed subtle T2 hypertense signal changes at right cavernous sinus with post contrast enhancement. PNS and Calvaria appeared normal and working diagnosis of Sino nasal Mucormycosis with involvement of mandible was given.

Patient underwent sequestrectomy + sauce ration of mandible + B/L FESS + Septoplasty's under GA.

Post operatively he was treated with IV Amphotericin 1.5Mg/kg, IV and Inj Posaconazole 300Mg for duration of 3 weeks.

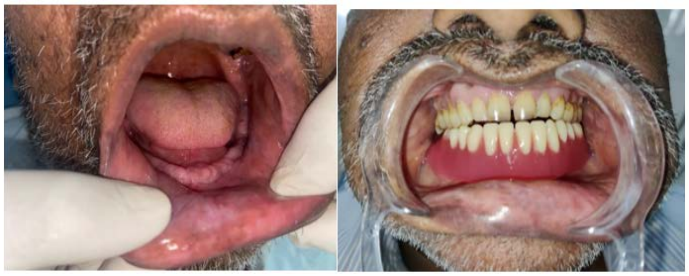

Fig 4: showing post treatment photo

Histopathology report

Histopathological report showed scattered broad, aseptate, hyaline fungal hyphae with wide angle branching resembling Mucorales against a necrotic background. Other section studied showed tissue lined by stratified squamous epithelium with underlying chronic inflammatory cell infiltrates, suppuration and haemorrhage suggestive of bone invasion with fungal elements - morphology representing mucormycosis.

The fungal elements were identified on routine H and E sections. The tissue sections were subjected to additional histochemical stains - PAS to highlight the fungal elements.

Final diagnosis was given as Sino nasal and Mandibular Mucormycosis.

Discussion

Mucormycosis is a rare life threatening black fungal infection in patients recovered from COVID-19.[3] A complex interplay of factors, including pre-existing diseases, such as diabetes mellitus, previous respiratory pathology, use of immunosuppressive therapy, the risk of hospital-acquired infections, and systemic immune alterations of

COVID-19 infection itself may lead to secondary infections, which are increasingly being recognized in view of their impact on morbidity and mortality.[3]

Given the mortality rate of both COVID-19 and mucormycosis we must pay heed to diagnose this fungal infection at initial stage. It is recommended that post COVID-19 patients are enquired about having any dental problems and any patients with symptoms must be treated on urgent basis.[4]

There are specific pathophysiologic features of COVID-19 that may permit secondary fungal infections, including a propensity to cause extensive pulmonary disease & the subsequent alveolo-interstitial pathology that may enhance the risk of invasive fungal infections, second the immune dysregulation associated with C0VID-19 with reduced numbers of T lymphocytes, CD4 +T & CD8+T cells may alter innate immunity.[3]

Hyperglycaemia stimulates fungal proliferation and the diabetic reduction in chemotaxis and phagocytic efficiency permit these otherwise innocuous organisms to thrive in acid-rich environment.[1] Diabetic patients have impaired defence mechanism along with increased level of iron in tissues. Iron free environment is essential for proper innate and acquired immune response. Any excess of iron (iron overload) would lead to direct damage to natural Défense system & an increase in fungal virulence.[5]

The National Institute of health recommended the use of dexamethasone (6mg/day for a maximum of 10 days) in patients who are ventilated or require supplemental oxygen but not in milder cases. The guidelines specifically mention the risk of developing a secondary infection.[3]

There are several hypotheses as to what else may contribute to mucormycosis infections. Some are unlikely, such as the use of industrial oxygen or ventilation systems, age-related immune complications and non-sterile water, whilst others believe that steam inhalation may play a role by impacting the mucosa, in addition to zinc supplementation being a fungal growth promoter.[6]

For any patient who received oxygen support during their hospital stay, it becomes essential to observe any black pigmentation in their nostrils or mouth. Even the slightest colour change or pigmentation should be reported immediately without neglect. Sanitization of the oxygen supply system in hospitals is also an area of concern.[7]

The health ministry in its advisory has instructed the hospitals to provide a pamphlet of mucormycosis related symptoms, cure and preventive measures along with the discharge papers (ICMR,2021).[7]

In the case of hospitalised COVID-19 patients, especially aging people and those with severe symptoms who require a ventilator, corticosteroids are given in an attempt to alleviate some of the symptoms. However, steroids are known to lower immunity and raise blood sugar levels, and they tend to increase clotting factors and fibrinogen concentrations in patients.

This situation provides an opportunity for pathogens to evade the human immune system and infect the host. According to a recent study, the number of cases of mucormycosis (also known as zygomycosis, black fungus) have increased in COVID-19 patients who are either hospitalised or have recovered.

It is a potentially lethal infection occurring primarily in immunocompromised patients particularly in those with diabetes mellitus.[6]

Timely intervention and recognising the fatal infection at an early stage will potentially reduce the mortality and morbidity rate in mucormycosis cases.

Conclusion

It is imperative for health professionals to be on the lookout for mucormycosis in COVID-19 patients, particularly those with diabetes, aging people, and those

with multiple sinus drainage. India has contributed to almost 70% of the global cases of mucormycosis since the emergence of COVID-19. The rise in mucormycosis in India reflects the triumvirate of diabetes, widespread corticosteroid and oxygen use. All steps should be taken cautiously in order to maintain optimal blood glucose levels, and with sensible assessment-based corticosteroid usage.[6] Successful management of mucormycosis largely depends on early diagnosis, reversal of underlying predisposing factors, prompt and ideally broad surgical debridement of infected tissue and rapid administration of systemic antifungal therapy.[5]

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