RESEARCH PAPER

Behind the Bone: Unmasking Mandibular Mucormycosis in a Complex Medical Landscape

Dr. Atul Sharma[1], Dr. Anisha Kumari[2], Dr. Purbasha Panda[3], Dr. Damini Chopra[4], Dr. Abhishek Rai[5], Dr. Shubham Narkhede[6]

[1]Professor and Head, Department of Dentistry and Ex-HOD, Department of Oral and Maxillofacial Surgery (MMDU)
Email: maxfacesurgeon@gmail.com
[2]MDS Oral and Maxillofacial Surgery
Email: sharma.anisha17@gmail.com
[3]MDS Oral and Maxillofacial Surgery
Email: drpurbashapanda@gmail.com
[4]PG Resident, Oral and Maxillofacial Surgery, Maharishi Markandeshwar College of Dental Sciences and Research, Mullana, Ambala
Email: daminichopra1512@gmail.com
[5]PG Resident, Oral and Maxillofacial Surgery, Maharishi Markandeshwar College of Dental Sciences and Research, Mullana, Ambala
Email: raia636@gmail.com
[6]PG Resident, Oral and Maxillofacial Surgery, Maharishi Markandeshwar College of Dental Sciences and Research, Mullana, Ambala
Email: shubhnarkhede@gmail.com

Received: 25th Aug, 2026 | Revised: 1st Sep, 2026 | Accepted: 5th Sep, 2026 | Available Online: 11th Sep, 2026

ABSTRACT

A potentially fatal fungal invasion, mucormycosis is an aggressive, granulomatous, acutely contagious, and opportunistic infection that affects immunocompromised people. Baker coined the term.(1)The annual incidence of mucormycosis, a rare fungal infection, is 1.7 incidence per million in the US. (2)Due to a dearth of population-based investigations, the precise incidence of mucormycosis in India is unknown. India is thought to have a 70-fold higher prevalence of mucormycosis than the rest of the world. (3)Despite its bad prognosis, survival rates are presently believed to be above 80% with rigorous medical and surgical care.(2).There is still a dearth of research on the final care of mandibular mucormycosis amidst multiple comorbidities, which is typically deadly with a dismal survival rate.(3) we found a case of mandibular mucormycosis amidst multiple comorbidities.

How to cite this article: Atul Sharma1 Dr. Anisha Kumari2 Dr. Purbasha Panda3 Dr. Damini Chopra4 Dr. Abhishek Rai5 Dr. Shubham Narkhede6. Behind the Bone: Unmasking Mandibular Mucormycosis in a Complex Medical Landscape. Int J Drug Deliv Technol. 2026;16(82s):1397-1400. DOI: 10.25258/ijddt.16.82s.158.

INTRODUCTION

A potentially fatal and rare fungal invasion, mucormycosis is an aggressive, granulomatous, acutely contagious, and opportunistic infection that affects immunocompromised people. Baker coined the term mucormycosis.(1) The annual incidence of mandibular mucormycosis, is 1.7 per million in the US.(2) Due to a dearth of population-based investigations, the precise incidence of mandibular mucormycosis in India is unknown. India is thought to have a 70-fold higher prevalence of mucormycosis than the rest of the world.(3)Known by another name, zygomycosis is a deep saprophytic aerobic fungal infection that was initially reported by Paltauf in 1885 and is brought on by fungus belonging to the class Zygomycetes, order Mucorales.(2) An immunocompromised status is typically associated to it.(4)It manifests radiographically as the hallmark of osteomyelitis.(4) Rhizopus oryzae is the most common species, occurring in 70% of cases. Mucor, Saksenaea, Apophysomyces, Cunninghamella bertholetiae, and Lichtheimia species are other involved species.(9)Individuals with impaired immune systems, particularly those with poorly managed diabetes mellitus, hematologic cancer, organ transplants, chemotherapy, chronic renal insufficiency, malnourishment, deferoxamine medication, and severe burns, are susceptible to mucormycosis infection.(2) Its pathophysiology is primarily characterized by (i) clearly increased proinflammatory CD4 T cells and CD8 toxic granules, (ii) cytokine rush, (iii) hemoglobinopathy, (iv) hypercoagulable condition, and (v) altered iron metabolism and increased iron overload leads to hypoxia and multisystem failure in severe cases.(5)Mucormycosis can manifest in several ways, including disseminated, gastrointestinal, pulmonary, and rhinocerebral. Rhinocerebral is the most common type, affecting the orbit, brain, facial bones, jaws, and paranasal sinuses, primarily the maxillary sinus.(6) Histologic analysis reveals mucormycosis as broad, non-septate hyphae that branch obtusely or perpendicularly.(8) Although proper care is given, mortality is high and death can happen in a matter of days to weeks.(7)Though, Mandibular mucormycosis is an uncommon

occurrence but we found a case of mandibular mucormycosis amidst multiple comorbidities.[7]

CASE REPORT

A 39-year old male patient with no previous history of COVID-19 presented with pain and diffuses swelling on lower left side of the jaw since 1 month. On extraoral examination, swelling was extending anteroposteriorly from corner of mouth to angle of mandible and superoinferiorly from ala-tragus line to lower border of the mandible.

On palpation, swelling was soft in consistency and it was tender in nature. No local rise in temperature was present..

Intraorally, swelling was present on left mandibular buccal vestibuler region extending from 33 to 38 region obliterating the vestibule. Denuded bone was appreciable in 37 and 38 region. Grade 2 mobility of teeth were present in 33,36,37,38. On manipulation, there was no bleeding or pus discharge. Paresthesia was present in left lower lip region

The patient had been suffering from diabetes with Hb1Ac 14.8% for that patient was on medical prescription of insulin (injection basalog) and metformin 500mg to control elevated blood sugar levels. He was HCV positive. He had a history of pleural TB since 2 months for which he was on Anti-tubercular treatment (ATT).

He had been undergone for biopsy 2 months back which was suggestive of mucormycosis and inj Amphotericin B (50mg) was started already.

CECT face revealed soft tissue thickening in buccal mucosa on left side along gingivobuccal sulcus.

Surgical Intervention:

The patient was painted and draped under all aseptic condition. Local anaesthesia with epinephrine (1:200000) was administered via left inferior alveolar nerve block. Extraction was done of 33,36,37 and 38. A crevicular incision was placed from left 33 region till 37 region on the buccal side and mucoperiosteal flap was raised to expose both buccal and lingual cortices. Intraoperatively, buccal and lingual cortices were found intact. During surgery, a clear plane between necrotic medullary bone and both bleeding buccal & lingual cortices were seen. Hence, the previous plan for the resection of the mandible was changed to debridement of necrotic part of bone to preserve both buccal and lingual cortices. Meticulous curettage of the osteolytic medullary region of the mandible was done to remove complete necrotic bone for preserving both the cortices. The wound bed was irrigated with the diluted hydrogen peroxide solution and the closure was done with primary intention. The wound got dehiscence at some regions in follow-up, which was managed via continuous irrigation with diluted hydrogen peroxide. After two months of follow-up, the wound was completely recovered. Initially liposomal amphotericin B with loading dose of 2.9 gm was started, lateron patient was started with posaconazole tablet 100 mg three times a day with a loading dose of 600 mg to avoid hepatotoxicity. After 10-month follow-up, the CBCT showed regeneration of the medullary bone. Now the patient is further planned for patient specific implant placement for mandibular rehabilitation.

FIG 1,2 : PRE OPERATIVE INTRAORAL PICTURES

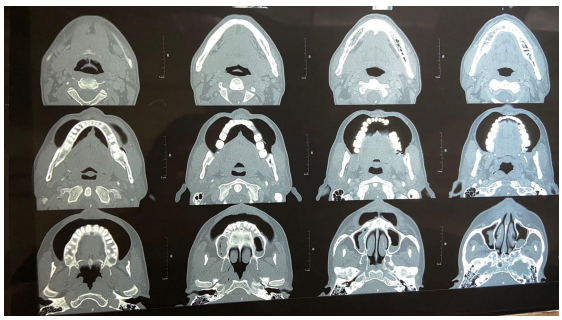
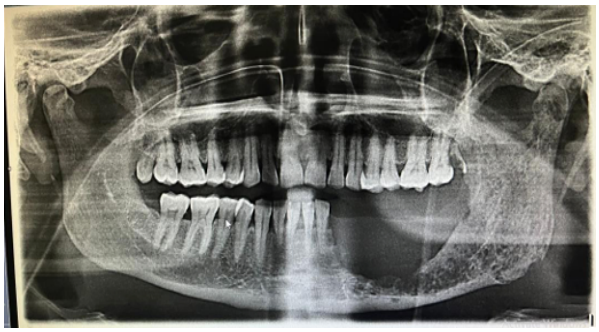


FIG 3 – CECT FACE SCANS– REVEALING SOFT TISSUE THICKENING IN BUCCAL MUCOSA ON LEFT SIDE ALONG INFERIOR GINGIVOBUCCAL SULCUS

FIG 4,5,6 : INTRA-OPERATIVE PICTURES ; EXPOSURE ; BONE REMOVAL ; CLOSURE



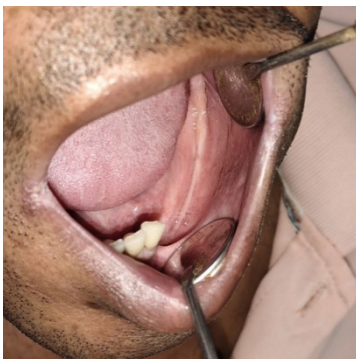


FIG 7,8 : HEALED OPERATED SITE AND OPG (POST 10 MONTHS)

DISCUSSION:

Mandibular mucormycosis represents an uncommon but severe form of mucormycosis, a rapidly progressive opportunistic fungal infection caused by Mucorales. While sinonasal and rhino-orbito-cerebral forms are more frequently encountered, mandibular involvement is rare and may be associated with dental extractions, trauma, or profound systemic immunosuppression.

Here too the patient was suffering from Mandibular Mucormycosis with multiple comorbidities,

particularly diabetes mellitus, tuberculosis, and chronic hepatitis C, thereby the disease followed a more aggressive course and posed significant therapeutic challenges.

Diabetes impairs the body's immune response, enabling the rapid proliferation of Mucorales species and increasing morbidity and mortality. Hyperglycemia reduces neutrophil chemotaxis and phagocytic efficiency, weakening host defense and encouraging fungal growth.[10]

Tuberculosis is a chronic bacterial infection caused by Mycobacterium tuberculosis that primarily affects the lungs but can involve other organs.[11] Coinfections of pulmonary mucormycosis and tuberculosis is a rare and challenging condition, particularly in immunocompromised patients.[12] Tuberculosis adds to this susceptibility by causing chronic immune activation, systemic debilitation, and malnutrition, which compromise host defense.[13]

The coexistence of hepatitis C further complicates the clinical scenario, as chronic hepatic dysfunction can impair metabolism of antifungal and antitubercular drugs, increasing the risk of toxicity and limiting therapeutic options.

Clinically, mandibular mucormycosis manifested as painful swelling, non-healing extraction sockets, loosening of teeth, exposed necrotic bone, and paresthesia of the inferior alveolar nerve distribution of the affected side.

The pathognomonic feature is tissue necrosis secondary to vascular invasion by broad, aseptate fungal hyphae leading to thrombosis and ischemia, which further necessitated heparin therapy. Diagnosis relied on clinical findings, imaging modalities such as deep nasal swab for KOH smear, CECT or MRI to delineate bone and soft tissue involvement, and definitive confirmation was by histopathology demonstrating characteristic fungal morphology.

Management required a prompt, multimodal strategy. Surgical curettage or debridement is gold coin over extensive resection in many cases, especially when cortical bone is intact, as the thicker cortex resists fungal spread.[4]. The following surgical steps should be followed for conservative management.

- The medullary bone affected by mucormycosis appeared necrotic and should be debrided while preserving the viable cortical bone.
- Debridement including extraction of affected teeth and thorough curettage until found bleeding healthy bone margins.
- Wound irrigation with betadine or diluted hydrogen peroxide and primary closure should be part of the procedure, along with regular follow-up irrigation for wound healing.

Haidry et al. have successfully managed a case of Mandibular Mucormycosis, which had developed after COVID-19 infection, in a 59-year-old man by surgical debridement. Similarly,

Cohen et al. compared conservative and radical treatment of mucormycosis. He has managed three cases of mandibular mucormycosis by debridement and curettage of the area[4]and did radical surgical debridement of necrotic mandibular bone was combined with systemic antifungal therapy, with liposomal amphotericin B in one case, which was the cornerstone of treatment, followed by oral azoles group of drugs such as posaconazole or isavuconazole for consolidation. Delayed-release posaconazole tablet was preferred over oral suspension because it displayed more reliable plasma concentration, less interaction with other drugs, and no added side effects, and it is cheaper than amphotericin B. Prophylaxis with parconazole tablet is initiated with a loading dose of 300 mg twice daily on the first day and then continued at a dose of 300 mg once daily.[4]. In our case we performed debridement followed by Initially liposomal amphotericin B with loading dose of 2.9 gm was started, lateron patient was started with posaconazole tablet 100 mg three times a day with a loading dose of 600 mg to avoid hepatotoxicity.

Optimal glycemic control, tailored antitubercular therapy(ATT) and vigilant monitoring of hepatic function are critical adjuncts in preventing further deterioration. The complexity of drug–drug interactions between antifungal, anti tubercular agents, and antivirals underscores the need for multidisciplinary care involving oral and maxillofacial surgeons, gastroenterologist and endocrinologists.

Care for such complex cases is best delivered by an integrated multidisciplinary team, ensuring aggressive infection control, thorough management of comorbidities, and surgical plus prosthetic rehabilitation for optimal outcomes

Despite aggressive intervention, prognosis remains guarded due to cumulative immunosuppression, high rates of recurrence, and potential for dissemination. Early diagnosis and coordinated medical & surgical management, however, can significantly cure mucormycosis, improve survival rate and reduce morbidity.[4]

REFERENCES

1. Dewan H, Patel H, Pandya H, Bhavsar B, Shah U, Singh S. Mucormycosis of jaws – literature review and current treatment protocols. Natl J Maxillofac Surg 2022;13:180-9.

2. Shah KM, Badhan TS, Landge JS, Goyal P. Mucormycosis of mandible – A rare case series [Internet]. J Oral Med Oral Surg Oral Pathol Oral Radiol. 2023 [cited 2026 Jun 23];9(1):47-50. Available from: https://doi.org/10.18231/j.jooo.2023.010

3. Prakash H, Chakrabarti A. Epidemiology of mucormycosis in India. Microorganisms. 2021 Mar 4;9(3):523

4. Oswal NP, Gadre PK, Sathe P, Gadre KS. Mucormycosis of mandible with unfavorable outcome. Case reports in dentistry. 2012;2012(1):257940
5. Mokhtar E A, Haidry N, . K, et al. (October 14, 2022) Mandibular Mucormycosis: A Report of Four Cases and a Discussion on Their Management. Cureus 14(10): e30301. DOI 10.7759/cureus.30301
6. Sharma A, Goel A. Mucormycosis: risk factors, diagnosis, treatments, and challenges during COVID-19 pandemic. Folia microbiologica. 2022 Jun;67(3):363-87.
7. Oswal NP, Gadre PK, Sathe P, Gadre KS. Mucormycosis of mandible with unfavorable outcome. Case reports in dentistry. 2012;2012(1):257940
8. Netal Rathi, Bhairavi Kale, Anjali Borle, Mucormycosis in Head, Neck and Face Region, J Res Med Dent Sci, 2022, 10 (12): 100-103.
9. Brunet K, Rammaert B, Mucormycosis treatment: recommendations, latest advances, and perspectives, Journal de Mycologie M´edicale (2020), doi: https://doi.org/10.1016/j.mycmed.2020.101007
10.Cohen A, Shoukair FL, Korem M, Shaulov A, Casap N. Successful mandibular mucormycosis treatment in the severely neutropenic patient. Journal of Oral and Maxillofacial Surgery. 2019 Jun 1;77(6):1209-e1.
11. Ravishankar C, Hemalatha BR, Pruthvi Raj S, Architha Menon P. Post Covid-19 Mandibular Mucormycosis: A Rare and Deviant site of Presentation. Bengal Journal of Otolaryngology and Head Neck Surgery. 2022;30(3):332-6.
12. Haidry N, Bhavana K, Shivhare P, et al. (August 20, 2022) A Rare Case of Mandibular Mucormycosis in a Post-COVID-19 Patient. Cureus 14(8): e28216. DOI 10.7759/cureus.28216
13. Aras MH, Kara MI, Erkiliç S, Ay S. Mandibular mucormycosis in immunocompromised patients: report of 2 cases and review of the literature. Journal of oral and maxillofacial surgery. 2012 Jun 1;70(6):1362-8.