Surgical Management of maxillary bone Mucormycosis via modified mid-face degloving Approach: a novel technique-case report

Case Report

Safwan Salih [1], ***Sadeq Qanah*** [1]
[1]*Department of oral and maxillofacial surgery, AL Salam teaching hospital, Mosul, Iraq.*

ABSTRACT

Mucormycosis is a rapidly progressive, angioinvasive fungal infection that primarily affects immunocompromised patients, such as those with diabetes, organ transplantation, or hematological malignancies. Surgical debridement is essential in the management of this condition, but it traditionally requires extensive facial or nasal dissection. We report a case of a 58-year-old male diabetic patient with total maxillary necrosis due to mucormycosis, successfully managed using a modified midface degloving approach that avoids nasal dissection. The technique utilized an intra-oral route and a grasping bone method to remove necrotic bone along natural lines of separation created by the disease's pathophysiology. This approach not only provided a shorter operative time but also preserved the nasal anatomy, resulting in minimal morbidity and no external scarring. Additionally, the modified technique allowed for better access to the maxilla while minimizing damage to surrounding tissues. Our technique represents a safe, effective alternative for localized maxillary mucormycosis and warrants consideration in appropriate surgical cases

Key Words :Mucormycosis of the maxilla, modified degloving approach,mucormycosis surgical approach

Received: 10 April 2025**, Accepted:** 08 May 2025
Corresponding Author : Sadeq Qanah **Adresse:**Alsalam teaching hospital, mosul, iraq.
Mobile: +9647748106823, **E-mail**: sadeqkanah@gmail.com
ISSN: 2090-097X, September 2025, Vol. 16, No. 4

INTRODUCTION

Mucormycosis is one of the most common fungalinfection,which affectsmaxillaespecially in diabetes and immunocompromised patients,the predisposing factors for mucormycosis are uncontrolled diabetes [1]. Uncontrolled diabetes mellitus can alter the normal immunologic response of patients to infections. Such patients have decreased granulocyte phagocytic ability with altered polymorphonuclear leukocyte response [2]. surgery remain the most effective option in treatment for mucorrmycosis with more invasive surgery the more decreasing the mortality rate, but quality of life was questioned upon [3].different open surgical aooroaches used in surgical treatment of mucormycosis ,including Lateral Rhinotomy, Weber-Fergusson with Dieffenbach's extension facial scar and disfugrment , and Sub-labial approach and Mid-face degloving,the most drawback of these approach are time consuming and nasal complications due to extensive soft tissue dissection [4].

Case presentation

A 58-year-old male presented to the Max-illofacial Department at Al Salam Teaching Hospital, complaining of pain and fever for one month. Intraoral examination revealed multiple sinus drainages in the vestibule of the maxillary teeth and exposed alveo-lar bone of the upper jaw, accompanied by poor oral hygiene (Figure 1). The patient's medical history revealed diabetes mellitus, and he was sent for an HbA1c test, which showed uncontrolled diabetes. There was no history of radiation or medication-relat-ed osteonecrosis. The patient was also sent for a CT scan to determine the extent of the necrotic bone, which revealed that bone ne-crosis involved the entire maxilla (Figure 2).

 DOI: 10.21608/omx.2025.374251.1287

Based on clinical examination and medical history, the diagnosis of mucormycosis of the maxillary bone was concluded. The treatment plan involved,glycemic control and the removal of the maxillary bone through a modified degloving approach incision extending from the right to left molar region. Subperiosteal dissection was carried out buccally and palatally to expose the maxillary bone for adequate grasping with forceps, without nasal dissection (Figure 3).

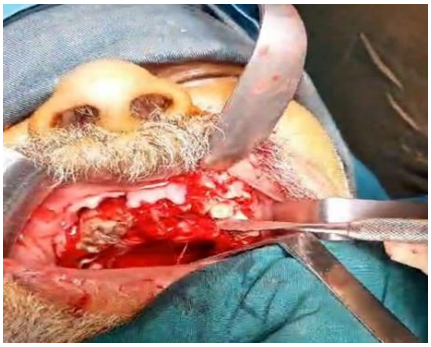

Figure 3. Incision extended from the right to left molar region.

The maxillary bone was grasped with forceps and removed en bloc. The separation was facilitated by the thrombosed vascular supply and loss of bone vitality, creating a natural cleavage plane between the necrotic and viable bone. Notably, nooscillatingsaworbone-cutting instrument was used to remove the maxilla, except for a bur used to skim the adjacent vital bones due to sharp edges (Figure 4).

Figure 4. Show the steps of the technique.

Hemostasis was confirmed, and the wound was irrigated with normal saline before closure of the incision (Figure 5).

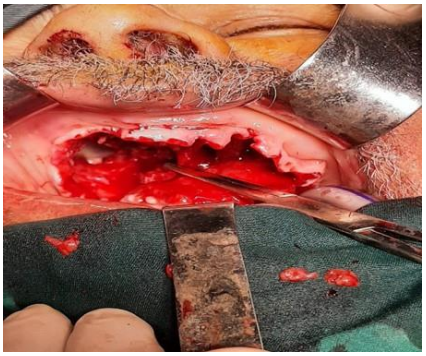

Figure 5. The surgical defect after the maxilla was removed.

The specimen (Figure 6) was sent for histopathology, which confirmed the diagnosis of mucormycosis. The patient tolerated the procedure well and was discharged the following day, on systemic antifungal therapy Amphotericin B and insulin control. Healing was uneventful with no post-operative nasal complications, except for some points of wound dehiscence, which is a normal sequel due to the loss of bone support.

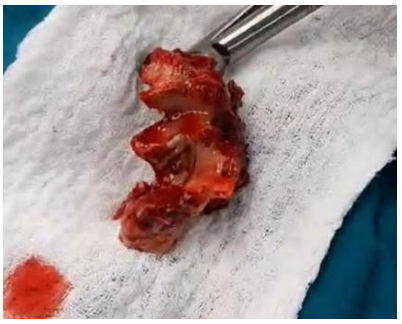

Figure 6. The necrotic maxilla specimen.

DISCUSSION:

Mucormycosis is a life threatening fungal infection that particularly affects immunocompromised individuals ,with uncontrolled diabetes mellitus being a major predisposing factor.the pathogenesis involves vascular invasion by the fungus leading to thrombosis ,tissue ischemia and subsequent necrosis of both hard and soft tissue[5]. In the maxillofacial region, although the maxilla has a rich vascular supply, it is susceptible to mucormycosis in immunocompromised patients [6].In this case, the patient exhibited classical signs of maxillary mucormycosis with extensive necrosis confirmed by imaging and histopathology. Surgical debridement remains the corner stone of treatment,as antifungal therapy alone is often insufficient due to poor drug penetration in necrotic tissue[7]. In our case, the modified midface degloving technique was used to access and remove the necrotic maxilla. Unlike traditional approaches that often involve external incision or nasal

dissection, our method was entirely intra oral and avoid manipulation of the nasal structures.this significantly reduced operative time, patient morbidity, post-operative discomfort and aesthetic complications[8]. What distinguishes our technique further is that it capitalizes on the pathogenesis of mucormycosis .the fungal invasion causes a natural separation between necrotic and viable bone due to thrombosis and lack of vascular supply.this created a bloodless surgical field and allowed the necrotic maxilla to being mobilized and removed cleanly without damaging vital structures. Thus,our approach is not only minimal invasive but also biologically compatible with the disease process, making the surgery less traumatic[5]. However,the main drawback of this technique is restricted to the maxilla without orbital or cranial extension,so should be used in selected cases of mucormycosis confined to the maxilla.

CONCLUSION:

The modified midface degloving approach provides a safe, effective, and minimally invasive method for surgically managing mucormycosis associated with the maxillary bone.

REFERENCES:

[1] Kumar JA, Babu P, Prabu K, Kumar P. Mucormycosis in maxilla: Rehabilitation of facial defects using interim removable prostheses: A clinical case report. JPharm Bioall Sci. 2013;5(Suppl 2):S163–5.

[2] Tugsel Z, Sezer B, Akalin T. Facial swelling and palatal ulceration in a diabetic patient. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2004;98(6):630–6.

[3] Chopra S, Setiya S, WaknisPP,Kale L, Tidke S. Various treatment modalities in COVID-19 associated facial mucormycosis and the need for its surgical management: A systematic review. J Maxillofac Oral Surg. 2023:1–22.

[4]C S, Y P, Bhoomannavar R, Jain R. Open surgical approach to management of rhino-orbito-cerebral mucormycosis. Int J Otorhinolaryngol Head Neck Surg. 2021;8(1):64. doi:10.18203/issn.2454-5929.ijohns20214902

[5] Ibrahim AS, Spellberg B, Walsh TJ, Kontoyiannis DP. Pathogenesis of mucormycosis. Clin Infect Dis. 2012;54(Suppl 1):S16–22.

[6] Yadav R, Parihar P, Yadav S, Yadav S, Parihar P, Yadav S. A case report on invasive mucormycosis involving the maxillary region, brain, and chest. Cureus. 2024;16(9).

[7] Goldstein EJ, Spellberg B, Walsh TJ, Kontoyiannis DP, Edwards J Jr, Ibrahim AS. Recent advances in the management of mucormycosis: from bench to bedside. Clin Infect Dis. 2009;48(12):1743–51.

[8]. Zachariah T, Neelakandan RS. Utility of the midface degloving approach for extended exposure in maxillary pathologies. J Maxillofac Oral Surg. 2020;19:217–24.