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Weber-Ferguson Approach with Surgical Obturator for Mucormycosis of Maxilla: A Classic Case

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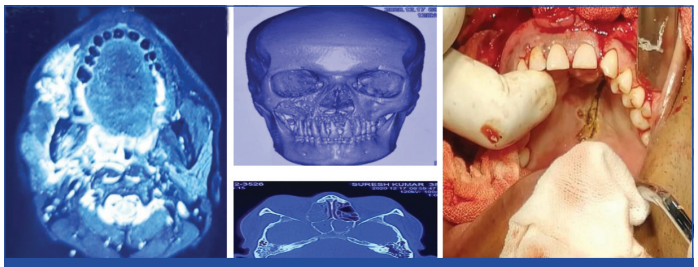
A 35-year-old male patient came with complaints of swelling in right-side of the face and headache in right-side for past two months. History of present illness showed that patient was apparently normal before two months after which he gradually developed swelling in right-side of face with dull aching pain. Headache in right-side for past two months relieved on medication and the pain in upper back tooth region for past two months was insidious in onset and dull aching type. Mucopurulent nasal discharge was present in right-side for past one month [Table/Fig-1]. Past medical history revealed that patient was diagnosed with diabetes mellitus Type II and was on insulin for past one month. The patient was treated for Coronavirus Disease 2019 (COVID-19) infection one month back. Patient had given the history of Functional Endoscopic Sinus Surgery (FESS) done one month back in private hospital.

Extraoral inspection and palpation showed diffuse swelling over right maxillary and infraorbital region which was firm in consistency, tender on palpation, proptosis of right eye, mucopurulent discharge in right nasal cavity, extraoccular movement-restriction in elevation more in right eye compared to left eye.

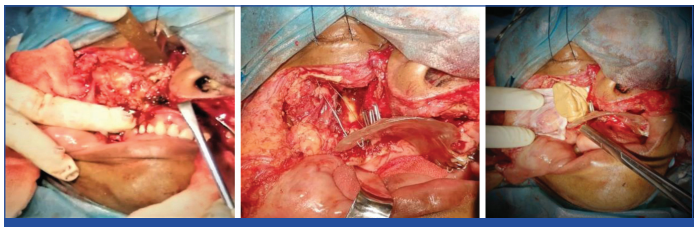
Intraoral examination showed Grade II mobility of 14,15,16,17 and mobility of right maxilla during palpation, tenderness on percussion present in 11,12,13,21,22 [Table/Fig-2]. Computed Tomography (CT), Magnetic Resonance Imaging (MRI) was taken to identify the extent of the lesion [Table/Fig-3-5]. Patient gave nasal swab specimen from middle meatus on Potassium Hydroxide (KOH) mount which showed few aseptate hyphae and fungal infection of mucormycosis was confirmed. Medical management was started with Inj. amphotericin B 50 mg, Inj. 100 mL of 5% dextrose, Intravenous fluid normal saline one unit before and after amphotericin B, Tablet rantac 150 mg twice a day, Tablet paracetamol 500 mg thrice a day, Tablet zinc once a day, Tablet multivitamin once a day, insulin was administered according to diabetologist opinion. Surgical management of subtotal maxillectomy under general anaesthesia was planned.

[Table/Fig-1]: Preoperative picture showed swelling on the right-side of the face. **[Table/Fig-2]:** Preoperative picture swelling on the right-side palate with mobility of 14,15,16,17 teeth. **[Table/Fig-3]:** Magnetic Resonance Imaging (MRI) coronal section showed involvement of right maxillary sinus, orbital floor, ethmoid sinuses. (Images from left to right)

Weber-Ferguson incision was placed in right-side and subtotal maxillectomy was planned. Layer-wise dissection was done. Flap was elevated and osteotomy cut was made with 703 bur in nasal process, zygomatic process and palatine process. Bony disjunction was made with osteotome, pterygoid chisel, septal chisel [Table/Fig-6-8]. The lesion was removed and peripheral osteotomy was done using vulcanite bur and adequate irrigation was done with betadine and saline and collagen sheet was placed with impression compound over the surgical site and stabilised with surgical obturator which was secured with SS wire to the zygoma [Table/Fig-9,10]. Flap was closed layerwise with 3-0 vicryl. Skin closure was done with 3-0 proline and pressure dressing was placed [Table/Fig-11]. Complete excision of the lesion is shown in [Table/Fig-12]. Postoperatively one month later patient developed wound dehiscence at medial canthus of eye [Table/Fig-13] but by thorough wound care infection was over come. Patient was followed for six months [Table/Fig-14-18]. Histopathological examination confirmed the presence of fungal hyphae [Table/Fig-19].



[Table/Fig-4]: Magnetic Resonance Imaging (MRI) axial section showed right cheek involvement. **[Table/Fig-5]:** CT coronal , axial section showed right maxilla, sphenoid sinuses involvement. **[Table/Fig-6]:** Intraoral incision beyond the midline of the palate to cover medial extention of the lesion. (Images from left to right)

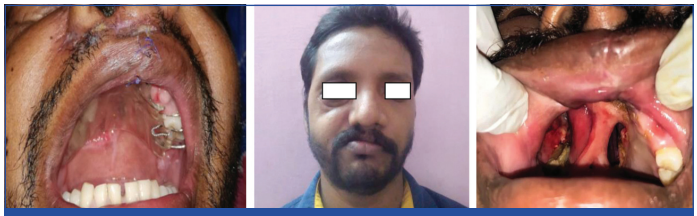


[Table/Fig-7]: Extraoral right Weber-Ferguson incision with infra orbital extention and exposure of lesion. **[Table/Fig-8]:** After complete excision of the lesion, temporary obturator with the spike seated with 24 gauge wiring from zygomatic complex. **[Table/Fig-9]:** Impression compound placed on the collagen membrane and kept in the defect. (Images from left to right)

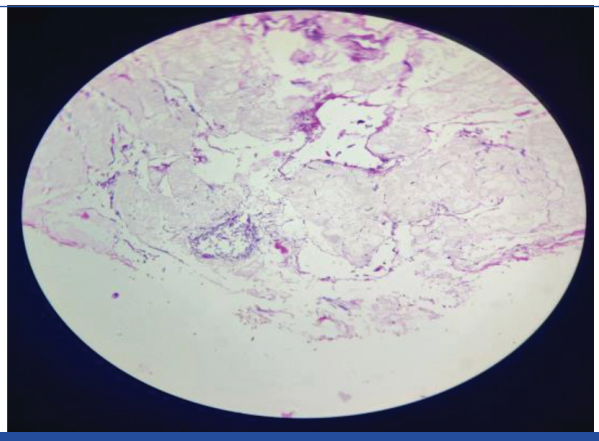
[Table/Fig-10]: Collagen membrane covered impression compound and sutured to sub cutenous tissue of the skin. **[Table/Fig-11]:** Wound sutured with 5-0 proline. **[Table/Fig-12]:** Complete excision of the lesion by subtotal right maxillectomy. (Images from left to right)

Nose is the primary mode of entry of the infection followed by mucosa and skin. Invasive mucormycosisis identified by first development of tissue necrosis due to vascular invasion and subsequent thrombosis. In most cases, the infection become serious which results in death

[Table/Fig-13]: Wound dehiscence at medial canthus of eye occurred 1st month postop. **[Table/Fig-14]:** Postoperative picture at two months. **[Table/Fig-15]:** Complete healing of intraoral wound after two months. (Images from left to right)



[Table/Fig-16]: Interim obturator placed helped for swallowing and to prevent nasal regurgitation. **[Table/Fig-17]:** Postoperative picture at six months. **[Table/Fig-18]:** Postoperative picture at six months intraoral view with complete healing. (Images from left to right)



[Table/Fig-19]: Histopathological view of mucormycosis, fungal hyphe seen.

unless treatment such as surgical debridement and anti fungal therapy is started early [1]. The fungal hyphae produces a fibrin reaction and production of mucor thrombi which occludes the arteries leads to reduced blood flow and necrosis producing black colored necrotic crusts. The infection spreads quickly to adjacent sinuses, orbit and cranium via ethmoid bone, orbital vessels [2]. The extent of the disease is clearly demonstrated by water's view X-ray such as mucosal thickening, sinus opacification without fluid levels. CT, MRI demonstrates spotty destruction of bony wall of para nasal sinuses and erosion of bone [3]. COVID-19 infection predispose to developing fungal infection during the course or post COVID-19 stage of the diseases especially in severly ill patients who stayed long days in the hospital. The main cause of immune suppression is decreased response of CD4+ T-cells and CD 8+T-cells [4]. Patient with severe infection of COVID-19 disease and those admitted in intensive care unit who required mechanical ventilation or patient who stays longer duration for example 50 days or more are likely to develop fungal infection such as mucormycosis, so it is very important to be aware about mucormycosis during middle and later stage of diseases [5].

Authors selected Weber-Ferguson incision for easy access and easy closure of the lesion after excision under general anaesthesia. The type of approach such as intraoral or extraoral is based on the extent of the lesion in CT, MRI scan and involvement of soft tissues and hard tissues. In this case the lesion was extended posteriorly upto pterygoid plates, involving sphenoid sinuses and superiorly upto superior ethmoid sinus, cresta galli anteriorly upto zygoma, anterior wall of maxilla. Surgical obturator construction is mandatory after excision of the lesion helped to take soft diet and nutrients via oral cavity and also helped the wound to heal without complications. Impression compound surrounded by collagen membrane technique really helped to avoid unwanted complications from the flap, the collagen membrane covers the inner part of the flap, so that there was no contact between impression compound and inner part of the flap. In conclusion multidisciplanary approach and addition of impression compound with collagen membrane in surgical obturator and extensive exposure with Weber-Ferguson incision will give best clinical outcome in mucormycosis cases of maxilla.

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