



PROSTHETIC REHABILITATION OF MUCORMYCOSIS PATIENT WITH CAST PARTIAL DEFINITIVE OBTURATOR

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Abstract:

The COVID 19 pandemic affected people worldwide, leading to psychological, financial, educational and economic distress. In India the emergence of mucormycosis reported with an alarming rise in the number of cases. Often, mucormycosis requires surgical debridement of the infected tissues. This infection can cause blackening of skin, redness, inflammation, sores and can encroach the eyes, lungs and even the brain. This warrants for extensive surgical resection and debridement of the necrosed areas resulting in maxillary and orbital defects. The surgically removed palate has a devastating effect on the appearance and speech of the patient. Prosthetic rehabilitation is not only involved in pre treatment planning but also in the construction of temporary or permanent post treatment appliances which help the patient to live a normal life. This case report describes the novel method used for the prosthetic rehabilitation of a patient affected by mucormycosis by means of a hollow bulb obturator supported by cast partial denture framework.

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1. INTRODUCTION

Mucormycosis, an opportunistic fungal infection in humans infects intracranial structures by direct invasion in the blood stream. Oroantral communication can occur due to maxillectomy defects, affecting the integrity and function of oral cavity. It is an interdisciplinary challenge to restore these by surgery and prosthetics since many factors need to be addressed, such as speech, deglutition, mastication, aesthetics and psychological distress.(1) Surgical repair of maxillectomy defects is not always achievable due to various reasons such as poor systemic health, advanced age, financial constraints etc. Thus prosthetic rehabilitation becomes the most suitable treatment option. An obturator prosthesis, is a convenient and efficient removable prosthetic option for edentulous or partially edentulous patients who have undergone total or subtotal resection of the maxilla.(2)It replaces the missing dentition, supporting tissues and also provides an artificial palate. It is a challenging task for the prosthodontic team to accomplish the retention

and stability for such removable partial dentures due to the huge bony defect and invariably bulky prosthesis. Conventional prosthesis is typically composed of acrylic resin with or without a cast partial framework or titanium alloy framework. (3)These function adequately within their limitations although with the advent of CAD/CAM technology newer, better alternatives can be employed. This case report describes the management of defect with a hollow bulb obturator by means of a cast partial denture.

Case Report:

A 35-year-old female was referred to the Department of Prosthodontics and Crown and Bridge at Subharti Dental College and Hospital, Meerut after a subtotal maxillectomy post Covid-19 mucormycosis for prosthetic rehabilitation. The patient's overall appearance was mesomorphic with a medical history of unregulated diabetes mellitus since past 10 years. After 6 months post-surgery, the resected area had completely healed. The patient had class VI Aramany defect.(Fig 1)



Fig 1

On cone beam computed tomography analysis, it was revealed that the defect area had a patency communicating to the nasal cavity that was approximately 0.3x0.5mm in dimension. The occasional nasal discharge into the oral cavity and ingress of fluids from the oral cavity to the nasal cavity were major

patient concerns to be addressed. Upon a thorough medical history and no evidence of active infections, the patency in maxillary arch was blocked using gauze piece and patient's diagnostic impressions were recorded with irreversible hydrocolloid impression material (Zhermack, badia Polesine, Italy). (Fig 2).



Fig 2

This cast was surveyed for evaluation of the undercuts and guide planes. Upon determining the design of the final prosthesis, the mouth preparation for removable partial denture in accordance with scientific principles was done

by preparation of rest seats and guide planes for the decided path of insertion. The abutments were not healthy and thus porcelain fused to metal crowns were fabricated. (Fig 3 and Fig 4)



Fig 3



Fig 4

This was followed by border molding of the partially edentulous area using low fusing impression compound (DPI Tracing Sticks, Dental Products of India, Mumbai, India) followed by final impression with medium

body addition silicone elastomer (Aquasil, Dentsply) by using a thin layer of universal bond over the custom tray. This final impression was poured in type IV gypsum (DPI) .(Fig 5)



Fig 5

Since the defect was massive, a cast partial framework followed by acrylization would add to the weight of the obturator and may cause

retentive failure and difficulty to chew. Thus, a hollow obturator was planned to significantly reduce the bulk . (Fig 6)

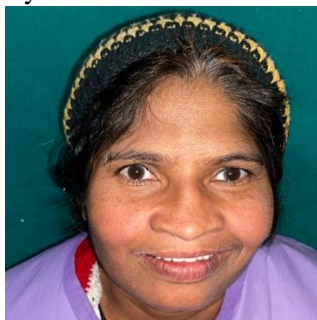


Fig 6

2. Discussion

Prosthetic rehabilitation is the treatment of choice for patients who have a large facial defect of the maxillary-orbital complex following tumour resection. Many successful techniques are available to the practitioner when treating a patient who require obturator prosthesis.(4)

The fabrication of a customised definitive hollow-bulb obturator prosthesis for a patient with maxillary defect was described in this case report. According to the standard treatment , a surgical obturator is placed, 5-10 days later, this obturator is removed, and a removable interim obturator is constructed and placed for the duration of the wound healing period; finally, the definitive obturator is constructed and placed about 3-6 months after surgery, when major changes in tissue conformation are no longer expected. In this case, the patient reported to the department one year after the surgery.(5) The patient was accustomed to an interim obturator when she visited the department. When rehabilitating a patient with a maxillary defect, the goal is to seal the defect with the prosthesis's bulb to provide retention and resonance during speech. An obturator can be solid or hollow. An interim hollow bulb obturator has the advantage of being lighter in weight, which allows for better retention and comfort for the patient .(6)The different techniques for fabricating the hollow bulb by using alum, sugar, salt during packing the defect area have been described by various authors. El Mahdy et al.(1969) described the two-flask technique to process the obturator and the tooth portion separately Matalon and LaFuente(1976)used sugar during the processing of the obturator, which was removed by drilling a hole and then flushed out. Mc Andrew et al.(1998) fabricated the prosthesis in two halves and sealed them using autopolymerizing resin.(7) With the recent advancements, customized patient specific implants may be designed for the patient with large defects and with non availability of retentive undercuts anatomically. (8) Bone grafts and intra osseous anchorage with dental implants for reconstruction of alveolar ridge can also be a treatment of choice, but due to patient concerns for surgery and financial constraints, it might not be always possible. (9,10)

3. Conclusion

Fabrication of hollow bulb obturator is an economic and advantageous method which helps the patient in improving his/her quality of life. The hollow bulb obturator not only reduces the weight of the prosthesis but also aids in achieving retentive seal around the defect. It also helps to improve the resonance during speech. It is an easy and conventional method of prosthodontic rehabilitation of a patient with acquired maxillofacial defect by which the prosthodontist can help improve the quality of life for the patient.

An obturator prosthesis for maxillectomy defects conceals the oro-nasal and/or oropharyngeal communications to enhance deglutition, mastication, phonetics, and esthetics of patient. When the defect is huge, fabrication of solid prosthesis poses a threat due to its heaviness against gravitational forces. To overcome these challenges, dentures were made hollow . Advantages of better retention, greater comfort, less stress transmission to adjacent tissues, and improved physiologic functions, was appreciated when the prosthesis was made hollow and as two piece. Closed bulb obturator was provided, to prevent accumulation of fluid or food debris thereby enhancing phonetics.

4. References

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