RECONSTRUCTION OF MAXILLARY DEFECT WITH OBTURATOR PROSTHESIS IN MAXILLECTOMY USING LOST SALT TECHNIQUE: A CLINICAL REPORT

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ABSTRACT

Maxillectomy abnormalities can cause oro-antral communication issues, including difficulty in mastication, deglutition, diminished speech, and facial deformities. Prosthetic rehabilitation of such abnormalities is sometimes difficult due to the size of the defect area and the lack of proper retention induced by the prosthesis's size and weight. To create a lightweight prosthesis, an open hollow obturator or a closed hollow obturator is typically used. This case report demonstrates a one-step fabrication of a closed hollow bulb obturator utilizing the classic lost salt approach in a maxillectomy patient.

Keywords: hemi-maxillectomy, maxillofacial prosthesis, mucormycosis.

INTRODUCTION

Surgical therapy for maxillofacial malignancies can cause abnormalities both within and outside of the oral cavity. Reconstructive operations can repair minor errors, while severe deformities may need prosthetics. Prosthodontists have difficulty when restoring severe maxillofacial abnormalities due to limited retention options, high aesthetic expectations, and the necessity for optimal function.

Maxillectomy is the surgical excision of a portion or all of the maxillae, which is typically performed in acquired lesions such as squamous cell carcinoma and mucormycosis. It is frequently widespread because it preserves both hard and soft tissues in one's oral cavity. Successful rehabilitation can significantly improve the patient's quality of life.The maxilla is the most prevalent location for intraoral defects, which open into the antrum and nasopharynx. Defects in the maxilla can be congenital or acquired by surgery for oral neoplasms.

The aperture may be small or large, including the hard and soft palate, alveolar

ridges, and nasal cavity floor. Post-surgical maxillary abnormalities can lead to hyper nasal speech, fluid escaping to oral cavity, and poor masticatory function.

An obturator is defined as "a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures" in the glossary of prosthodontics.

An obturator is a disc or plate used to repair a defect or opening in the maxilla after partial or entire excision. Prosthetic rehabilitation for total and partial maxillectomy patients aims to separate the oral and nasal cavities for proper deglutition and articulation, support the orbital contents to prevent enophthalmos and diplopia, restore the midfacial contour, and achieve an acceptable aesthetic result. Obturators are categorized into three types according on their treatment phases: surgical, intermediate, and final. Obturators can be soft palate, pharyngeal, or hard palate, depending on the degree of the impairment. Definitive obturators are classified as either closed or open hollow bulb obturator

CASE REPORT

A 32-year-old male patient was referred to the Department of Prosthodontics by the Department of Ear, Nose, and Throat. With chief complaint of nasal regurgitation include difficulty swallowing, nasal tone in speech, breathing difficulties, excessive snoring, and food leaking during eating. The patient had previously been treated for mucormycosis of the palate, as evidenced by earlier reports. A 6 months ago, he underwent a partial palatectomy under general anesthesia and received a temporary obturator.

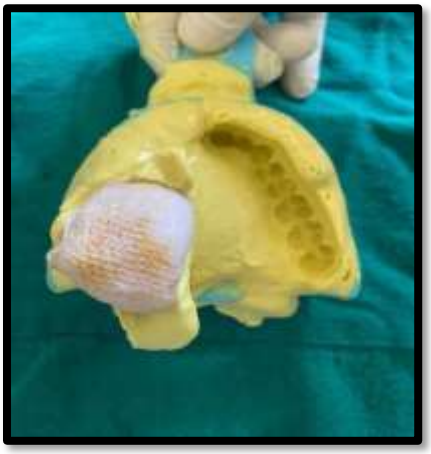
Following clinical examination, the patient had a large oro-antral communication of approximately 5 cm x 6 cm on the left side (fig. 1) extra oral image of the patient with recent ear surgery (fig.2)

Intra oral image showing the Oro antral defect (fig 1) extra oral image of the patient (fig.2)

Left maxillary alveolus was missing and teeth 21 to 26 were missing and callus seen on 27&28 respectively .Completely dentulous arch in the mandible.(fig3)

Image of the teeth present and missing intra orally (fig.3)

The patient was treated by creating an obturator. The main alginate impression was obtained by sealing the patient's nostrils with cotton rolled in gauge and dipped in betadine solution (fig.4). The impression was poured with Type III gypsum product and block out was done (fig.5). A customized tray was made with auto-polymerizing resin, bordered with green stick impression material, and the defect was recorded using an admixed compound in the ratio of 3:7sooften in a hot water bath (fig.6) followed by a secondary imprint with light-body impression material for dimensional stability (fig.7).wax bite was registered and Teeth arrangement and followed by try in was done (fig.8)



Alginate impression (fig.4) primary cast with wax block out (fig5)

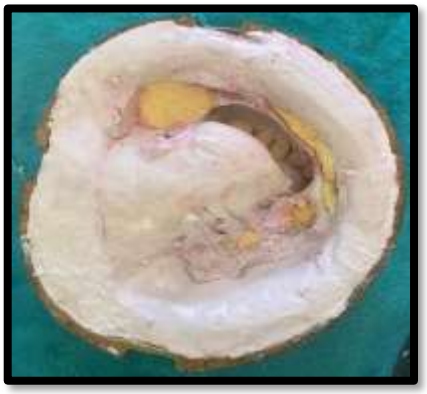
Secondary impression (fig.6) master cast with dental stone (fig.7)

Wax bite registration, teeth arrangement and try in done (fig.8)

The next processes of maxilla mandibular attachment, articulation, and try-in were completed in the conventional manner.

Following de-waxing (fig.9), the following steps were taken to create a hollow bulb obturator. Undercuts were blocked out first, then separating media was applied to the depth of the defect, followed by auto-polymerizing heat cure acrylic to the depth of the master cast defect and the salt was packed in the cellophane sheet (fig 10,11), and packed completely using the same acrylic.

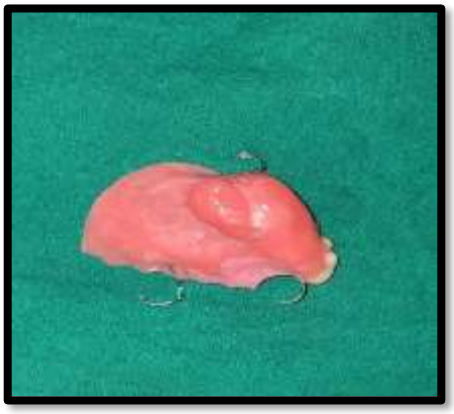
After processing, three small apertures were produced on the prosthesis's walls with an acrylic removing bur, and the salt inside the prosthesis was removed via the openings generated by injecting water into one hole and extracting dissolved salt from the other. The holes were subsequently sealed with an auto-polymerizing resin. Followed by floating test and weighing of the prosthesis was done to confirm the lightness of the obturator prosthesis (fig12). After setting, the material was carefully removed from the cast, trimmed to a thickness of 2 mm, and restored to the problem region (fig.13). The hollow part of the denture was made using the prosthesis's bulb. The final prosthesis was completed, polished, and presented to the patient (fig14). The patient received post-insertion maintenance instructions and was followed up on at 24 hours, 3 months, and 6 months later.



De-waxing done (fig.9)

Auto polymerising heat cure acrylic was packed using the lost salt technique (fig.10, 11)

Salt removal, Floating test and weighing of the prosthesis before delivery (fig 12)



Final maxillary obturator prosthesis (fig.13)

Final insertion of the orbital prosthesis (fig.14)

DISCUSSION

Hollowing down the bulb section of the maxillary obturator reduces its weight greatly. The bulb component of the obturator may be solid, open hollow, or

closed hollow. Both of open hollow and closed bulb obturators are lightweight, offering the benefits of decreased weight and enhanced speech. Open hollow bulb obturators gather mucous and fluid, resulting in a foul odour. Closed hollow bulb obturators, on the contrary, do not collect moisture or other accumulations while yet reaching sufficiently into the defect and giving better retention and support. A hollow maxillary obturator can decrease the weight of the prosthesis by, depending on the extent of the maxillary defect.

In this setup, we used salt, which is widely available and inexpensive. Separate lid manufacturing and subsequent luting of the lid to the prosthesis were omitted, resulting in reduced laboratory time. Thus, convenience, time, and cost savings are the benefits of the one-time processing approach used in this paper.

CONCLUSION

In order to prevent widespread surgical resection, post-operative complications, and the loss of physiological functions, prosthodontist should be vigilant and suspicious in cases of palatal perforation, particularly in elderly patients who are immune-compromised. Maxillary obturators are still regarded as a less intrusive and more cost-effective alternative to surgical reconstruction for the majority of patients. Prosthodontists play an important part in the effective rehabilitation of patients treated with maxillectomy. Effective rehabilitation in such circumstances requires a deep awareness of the patient's demands as well as substantial experience.

The obturator is the optimal treatment option due to its fast rebuilding, low risk of complications such osteoradionecrosis, patient acceptability, low cost, and ability to restore physiological functions.

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