

An Alleviating Prosthetic Approach Towards Hemimaxillectomy- A Case Report

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Abstract: Maxillectomy defects can result in oroantral communication that causes difficulty in mastication and deglutition, impaired speech, and facial disfigurement. The prosthodontist plays an important role in the rehabilitation of such defects with obturators. Goal of prosthodontics is rehabilitation of missing oral and extra oral structures with restoration of normal function of mastication, speech, swallowing, appearance etc. Malignancies are common in oral region, which are treated through surgical intervention. Surgical intervention creates anatomic defect which forms communication among the oral cavity, nasal cavity and maxillary sinus. This paper describes a clinical report of fabricating a definitive obturator with a cast metal framework for an acquired maxillary defect. Thus, this definitive prosthesis rehabilitated the patient by providing better masticatory efficiency, improving the clarity of speech and quality of life of the patient.

Key Word: Maxillectomy; Obturator; Oro antral communication

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I. Introduction

Palatal defects may result from congenital malformations, trauma, disease, pathologic changes, radiation burns, or surgical intervention¹ These defects predispose the patient to hypernasal speech, leakage of fluid into a nasal cavity, and impaired masticatory function. Such defects need special prosthesis to establish oronasal seal which can be provided by obturator prosthesis².

This an obturator is a maxillofacial prosthesis used to close, cover, or maintain the integrity of the oral and nasal compartments resulting from a congenital, acquired, or developmental disease process, such as cancer, cleft palate, osteoradionecrosis of the palate; the prosthesis facilitates speech and deglutition by replacing those tissues lost because of the disease process and can, as a result, reduce nasal regurgitation and hypernasal speech, improve articulation, deglutition, and mastication.³ The degree of obturator extension into the defect varies according to the configuration of the defect, character of its lining tissue, and functional requirements for stabilization, support, and retention of the prosthesis⁴. Prosthesis facilitates speech, and deglutition by replacing those tissues lost due to the disease process and can, as a result, reduce nasal regurgitation and hypernasal speech, improve articulation, deglutition, and mastication¹.

II. Case Report

A 45-year-old female presented to the Department of Prosthodontics and Crown- Bridge for the prosthetic rehabilitation of post maxillectomy defect resulting from adenoid cystic carcinoma of the left maxilla 18 months back. The patient complained of difficulty in mastication, nasal regurgitation of fluids, and nasal tone in her voice. She had worn surgical and interim obturator. Intraoral examination revealed well healed surgical defect in the maxilla involving part of the hard palate, alveolar ridge, and maxillary tuberosity creating an oroantral communication. All teeth in the second quadrant were missing and posterior to the second premolar were missing on the first quadrant of the maxilla. (Figure 1) Masticatory and phonetic functions of the patient

were affected. After a thorough examination, the defect was classified as Aramany's Class I maxillary defect. The treatment plan was made to rehabilitate this patient with a definitive obturator with a cast metal framework.

II.a Procedure

The primary impression was made using irreversible hydrocolloid (Zelgan2002, DENTSPLY) and was poured with dental stone (Kalstone, Kalabhai) to obtain a primary cast. The defect was blocked with a gauze piece lubricated with petroleum jelly prior to impression making.

The primary cast was then surveyed on a surveyor (MARATHON-Surveyor 103 Complete Milling Units #100769), and the framework was designed. The design included a tripod obturator design with complete palate as the major connector. Indirect retainer was planned on the right lateral incisor, and direct retention was provided by the I-bar clasp placed on the right central incisor, I-bar clasp on the second premolar, rest seat preparations on 14 and 15 were carried out to receive rest of the cast metal framework following the principles of Aramany's Class I obturator design.

Impression of preprosthetic mouth preparation was made with putty (addition silicone) (Elite Hd, Zhermack) (Figure 2), and the cast was poured with type IV dental stone (Kalstone, Kalabhai Karson)

A tripod configuration for the cast metal framework was designed (Figure 3). Designs of the cast metal framework were transferred on the cast, and a cast metal framework was fabricated (and checked intraorally for fit and retention).

Jaw relation was recorded and transferred to a semiadjustable articulator. (Hanau Wide View Articulator)

Teeth were arranged on the metal framework, and wax try-in was carried out (Figure 4 & 5). After try-in, waxed up obturator was processed conventionally with flasking, dewaxing, and packing using heat polymerizing acrylic resin. (Trevalon Denture Material, DENTSPLY India Pvt. Ltd., India) Finishing and polishing of the obturator prosthesis were done (Figure 6 & 7) It was then inserted into the patient's mouth.

Patient were asked to produce the following types of speech samples like phrases and sentences loaded with pressure-sensitive phonemes Eg: she sells shells in the sea side, Choose the cheese etc, Counting from 60 to 69, Spontaneous speech, storytelling, narration etc. The patient was happy and satisfied with her improved function, speech, and esthetics. The patient was instructed about the maintenance of the prosthesis and periodic recall check-up.

III. Discussion

Obturator prosthesis plays a crucial role in the recovery of oral function in postsurgical maxillectomy patients.¹ Framework designs for obturators may vary based on the classification system of the defect. All removable obturator prosthesis should be dictated by basic prosthodontic principles which include broad stress distribution, cross arch stabilization with the use of a rigid major connector, and stabilizing and retaining components at locations within the arch to best minimize dislodging functional forces⁴.

A tripod design was selected for this case. Support of the prosthesis was provided by the remaining teeth, palate and rest. Rest was prepared on the right first and second premolar. Complete palate was designed to ensure maximum distribution of the functional load to the tissue. Indirect retainer was planned on the right lateral incisor. Direct retention was provided by the I-bar clasp placed on the right central incisor, right first and second premolar⁶⁻⁸.

In dentate patients, the remaining teeth play an important role in providing retention, support, and stability to the obturator. Retention can be achieved from the remaining teeth or ridge, lateral part of the defect, soft tissue undercut, and scar band. Stabilization and indirect retention components must be positioned effectively to retard the movement of the defect extension portion away from its terminal position⁹.

Different types of retentive aids such as magnets, snap-on (friction-type) attachments, acrylic buttons, retentive clips, and implants are used for the conventional obturator prosthesis. The use of implant is a new advancement in maxillofacial prosthodontics. They effectively improve the retention of prosthesis without the help of other appliance. However, cost, health of the patient, and bone qualities are some of the factors which limit the use of implants¹⁰.

The advantages of metal framework obturator prosthesis are the longevity of the prosthesis and thermal conductivity of metal which made it sensitive to temperature change⁴.

IV. Conclusion

The great challenge in rehabilitating hemimaxillectomy patient is to obtain adequate retention, stability, and support.

Thorough knowledge and skills coupled with a better understanding of the needs of the patients enable the successful rehabilitation of such patients. Definitive obturator prosthesis fabricated with maximum extension and proper design rehabilitates the patient by improving masticatory efficiency, increasing the clarity of speech and quality of life.

References

- [1]. F. Keyf, "Obturator prostheses for hemimaxillectomy patients," *Journal of Oral Rehabilitation*, 2001, vol. 28, no. 9, pp. 821–829.
- [2]. J. Rieger, J. Wolfaardt, H. Seikaly, and N. Jha, "Speech outcomes in patients rehabilitated with maxillary obturator prostheses after maxillectomy: a prospective study," *International Journal of Prosthodontics*, 2002 vol. 15, no. 2, pp. 139–144.
- [3]. K. J. Ferro, S. M. Morgano, C. F. Driscoll et al., "The glossary of prosthodontic terms," *Journal of Prosthetic Dentistry*, 2005, vol. 94, no. 1, pp. 10–92.
- [4]. J. Kumar, M. B. Kandarphale, V. Aanand, J. Mohan, and P. Kalaigan, "Definitive obturator for a maxillary defect," *Journal of Integrated Dentistry*, 2017 vol. 2, no. 3, pp. 1–4.
- [5]. Chalian VA, Drane JB, Standish SM. *Maxillofacial Prosthetics*. Baltimore: The Williams and Wilkins Co.; 1971.
- [6]. M. A. Aramany, "Basic principles of obturator design for partially edentulous patients. Part I: classification," *Journal of Prosthetic Dentistry*, 1978, vol. 40, no. 5, pp. 554–557.
- [7]. M. A. Aramany, "Basic principles of obturator design for partially edentulous patients. Part II: design principles. 1978 [classical article]," *Journal of Prosthetic Dentistry*, 2001, vol. 86, no. 6, pp. 562–568.
- [8]. G. R. Parr, G. E. Tharp, and A. O. Rahn, "Prosthodontic principles in the framework design of maxillary obturator prostheses," *Journal of Prosthetic Dentistry*, 2005, vol. 93, no. 5, pp. 405–411.
- [9]. M. E. Gowda, M. S. Mohan, K. Verma, and I. D. Roy, "Implant rehabilitation of partial maxillectomy edentulous patient," *Contemporary Clinical Dentistry*, 2013, vol. 4, no. 3, pp. 393–396.
- [10]. R. Gurjar, S. Kumar, H. Rao, A. Sharma, and S. Bhansali, "Retentive aids in maxillofacial prosthodontics—a review," *International Journal of Contemporary Dentistry*, 2011, vol. 2, no. 3, pp. 84–88.

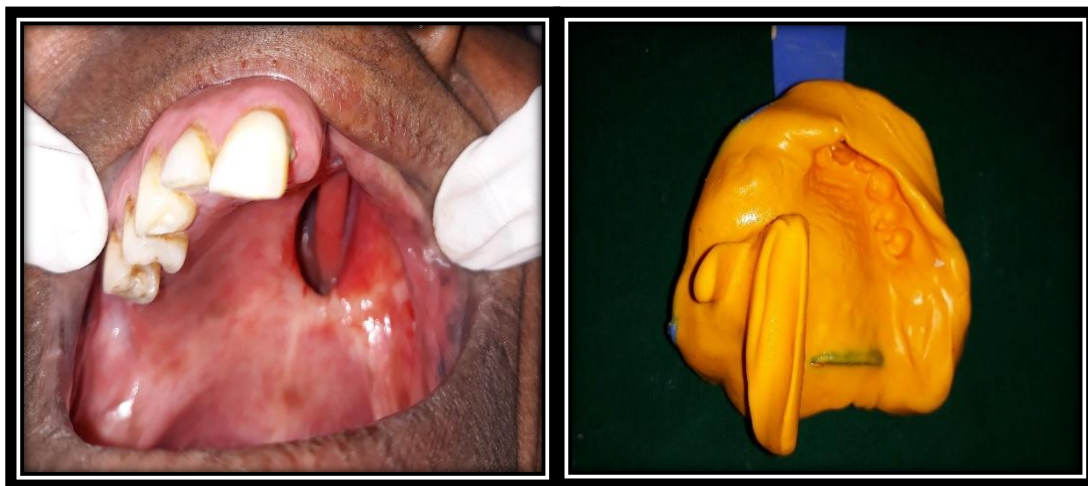


Figure 1: Intraoral defect of the palate **Figure 2:** Final impression.

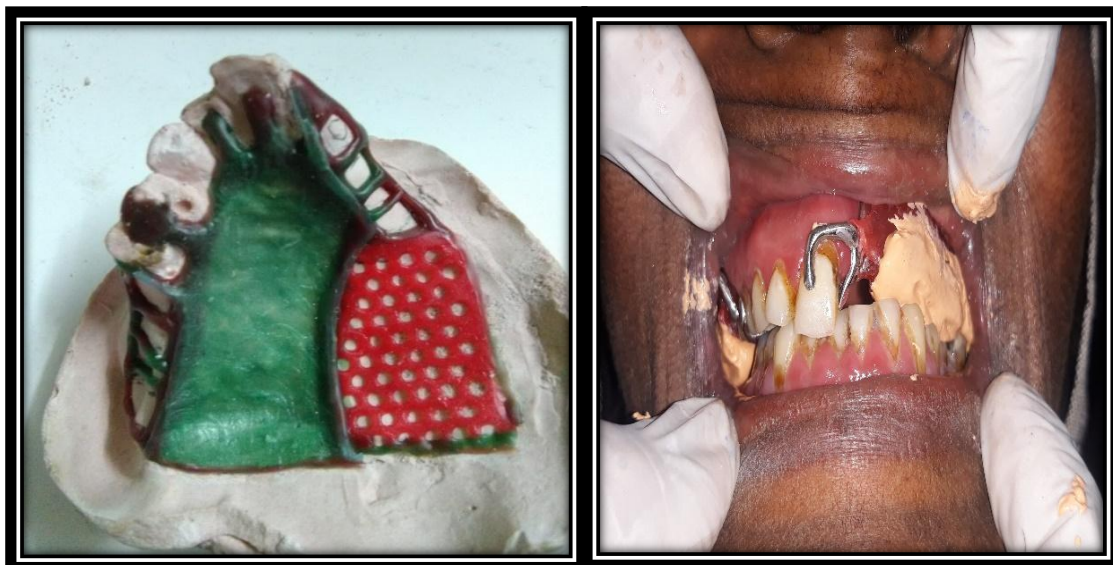


Figure 3: Wax pattern of the metal framework of the obturator.

Figure 4: Bite Registration



Figure 5: Try In **Figure 6:** Occlusal view of prosthesis.



Figure 7: Impression view of prosthesis.

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