

Prosthodontic Management of Maxillectomy Defect -A Case Report'

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I. Introduction

Maxillo-facial Prosthodontics is a specialty of prosthetic dentistry that deals with rehabilitation of congenital and acquired defects of the head and neck. Prosthetic rehabilitation of the patients after surgeries is essential for the restoration of speech, mastication, swallowing, nutrition and facial appearance. Maxillo-facial rehabilitation is essentially a team effort comprising of general, plastic and onco-surgeons, oral & maxillofacial surgeon, prosthodontist, speech therapist, and psychologist. Maxillo facial Prosthesis can be broadly classified as intraoral prosthesis and extra oral prosthesis. The primary objective of intraoral prosthesis is to enhance function i.e. swallowing, mastication and speech, whereas that of an extraoral prosthesis is to enhance appearance and thereby the psychologic well being of the individual.

The most common type of intra oral prosthesis is the obturator, a prosthesis used to separate the oral and nasal cavities following partial or total maxillectomy. The functions of an obturator are to enhance speech, mastication, and esthetics. It keeps the defective area clean and reshapes and reconstructs the palatal contour. It also reduces the flow of exudates into the mouth. In 1560, Lusitanus was most likely the first to explain what's known today as a palatal obturator. In 1561, Pierre Franco stated that if the palatal defect plugged with cotton, the patient spoke more clearly. In 1564, Ambroise Paré known as his little obturators couverts and solely in 1575 modified the name to obturateur. Pierre Fauchard, the father of modern dentistry, attached obturator to the dental prosthesis. In 1757, Bourdet improved palatal obturators by fixing them to not the surface itself or within the nose however by suggests that of lateral clasps to the teeth. In 1820, Delabarre created a rubber prosthetic device with bands and clasps that utilised the palatal muscles to maneuver the velar section of the prosthetic device. In 1841, Stearn was the first to extend the speech aid into the pharyngeal area. In 1860, McGrath introduced fixed restoration and extended the velar section into the bodily cavity. In 1878, Passavant employed collar button obturator to maintain posterior displacement of the velum after a transverse incision. In 1880, Kingsley was the primary to advocate therapy following the development of an obturator. In 1921, C.S. Case developed the velar obturator designed with careful attention to the palatopharyngeal muscles that contacted the prosthesis. After this prosthetic era, surgical and orthodontic correction for palatal and velopharyngeal defects invaded the modern ages. (1)

Based on the timing of construction an obturator can be classified as a surgical obturator, interim obturator and definitive obturator (2). A surgical obturator is a base plate type appliance which is constructed from the preoperative cast and inserted at the time of surgical process of the upper jawbone within the hospital room. It provides a matrix on which the surgical packing can be placed. On closure of the wound, it maintains the packing within the correct relationship, so guaranteeing shut adaptation of the skin to the raw surface of the cheek flap. It reduces oral contamination of the wound during the immediate post-surgical period and thus may reduce the incidence of local infection. It enables the patient to speak more effectively postoperatively by reproducing normal palatal contours and by covering the defect. It permits deglutition, thus eliminating the need for a naso-gastric tube for some or allows its earlier removal for others. It lessens the psychological impact of surgery by making the postoperative closure easier to bear with. The patient is reassured that rehabilitation has started. It may reduce the period of hospitalization. The surgical obturator can be an immediate surgical obturator or a delayed surgical obturator. An immediate surgical obturator is fabricated from a presurgical cast and placed at the time of surgery. It is more suited for people with few teeth remaining after the surgery. If the patient is edentulous and the surgical defect is extensive, it may not be possible to place an obturator on the day of surgery. In such circumstances, an obturator can be placed 6 to 10 days after the surgery – delayed surgical

obturator.

An interim obturator is constructed from the post-surgical cast, which has a false palate, false ridge and generally has no teeth. The bulb extending into the defect area is hollow. The purpose is to maximize prosthesis adaptation to hard & soft tissues during every step of prosthesis fabrication. It serves the patient through the immediate post-surgical phase. A definitive prosthesis is not indicated until the surgical site is healed and is dimensionally stable. It "bridges the gap" between the immediate surgical obturator and the definitive obturator. It can serve as a back up prosthesis, which may be useful when the definitive prosthesis needs to be repaired, relined, or rebased.

A definitive obturator is constructed from the post-surgical master cast, three to four months after the surgery. The timing will vary depending on the size of the defect, the progress of healing, prognosis for tumor control, the use and timing of post-surgical radiation therapy and the effectiveness of the existing interim obturator. The definitive obturator must ensure adequate retention, stability, and support.

II. Case Report

A 56 year old male patient reported to the Prosthodontic Department of Tamil Nadu Government Dental College & Hospital, Chennai with complaints of a big defect in the roof of his mouth. He was also concerned for frequent passage of food into the nasal cavity, altered speech, and difficulty in swallowing. He had undergone resection of left maxilla following squamous cell carcinoma six months before. On extra-oral examination, he had a sunken appearance. His mouth opening was not restricted.

On intra-oral examination, a large defect extending from the left premaxillary region to the soft palate was noted (Fig. 1). He had teeth 1, 2, 3, 4, and 5 in the upper arch. Mandibular arch had the full component of teeth with a fair oral hygiene. The remaining teeth were in good intercuspation. As the healing of the defect was satisfactory, the case was deemed ideal for thought for a definitive prosthesis. When a close discussion, a heat-polymerizing acrylic jaw prosthesis with hollow bulb style was planned.

III. Fabrication Of Prosthesis

Step 1: Primary impression

Impression compound was softened and kept in the region of the defect. A tray loaded with alginate impression material was placed over the arch such that the set impression compound placed over the defect comes along with the alginate impression when the tray is removed from the mouth. The impression was disinfected with 2% glutaraldehyde and poured with Type III Dental stone.

Step 2: Master impression

A special tray was fabricated with self cure resin. A master impression of the region was made with low fusing compound, and a pickup impression was made with alginate. The impression was disinfected with 2% glutaraldehyde and poured with Type III Dental stone. (Fig.3 &4).

Step 3: Fabrication of the hollow bulb

The hollow bulb part of the obturator was fabricated in the conventional way. The hollow bulb was tried in the patient's mouth to relieve any pressure area. (Fig. 5) (3,4)

Step 4:

Modeling clay was adapted over the outer surface of the bulb such that the area was made flat with it. An acrylic plate was adapted over the region covered previously by the clay. (Fig. 6)

Step 5:

With the prosthesis placed inside the patient's mouth, an impression was again taken with alginate. The cast was poured after disinfection of the impression.

Step 6:

Bite registration and wax try-in were done using the acrylic plate. (Fig. 8 & 9)

Step 7:

The partial denture was fabricated by the regular method of processing with heat cure acrylic resin. The denture was finished and polished. The partial denture was fitted into the patient's mouth; occlusion and esthetics were checked. (Fig. 10)

Later, the hollow bulb was attached to the partial denture by means of self cure acrylic resin. What appeared to be 2 separate prostheses were made into a single piece obturator. This was inserted into the patient's mouth, and proper home care regime was emphasized.

IV. Discussion

According to World Health Organisation statistics, Indian subcontinent has a high prevalence of (≥ 6.9 per 100,000 world population) orofacial cancer. Restoring of acquired maxillary defects are always a challenging task since the defects are usually presented with varying degrees of morphological forms which are

highly individual in nature and the patients seek rehabilitation at different stages of treatment for the primary disease. Though, surgical management of the defect with an autogenous bone graft was the ideal treatment for this patient, it was not considered because of the patient's unwillingness for the second surgery and the large size of the defect.

A definitive obturator can be constructed as a single piece or two-piece prosthesis. In this case a one piece obturator consisting of a hollow bulb and a maxillary denture was fabricated using heat polymerized denture base resin. According to Desjardins (5) there are 5 intrinsic areas inside and round the defect that may offer retention for the prosthesis. These areas embrace the residual palate, the residual surface, the anterior nasal aperture, the lateral scar band and also the height of the lateral wall. The hollow bulb engaged the defect undercut by adapting fine to the walls of the defect. This enlarged the retention and stability of the prosthetic device. The patient was glad with treatment since there was no fluid discharge into the bodily cavity. throughout the follow-up appointment the patient expressed remarkable improvement in speech with the prosthesis. The hollow bulb design minimized the weight of the prosthesis thereby by increasing retention.

Most of the procedures followed were very much similar to conventional denture fabrication and hence can be fabricated at any routine clinical settings. Also resin prosthesis is economical and hence can be used for a greater population harmed by maxillary resection.

V. Conclusion

The rehabilitation of maxillary defects is a significant challenge in terms of achieving stability and retention. Though, it is difficult to exactly replicate what has been lost sincere efforts to rehabilitate the patient through meticulous planning and execution is essential. The ultimate success lies in patient's satisfaction.

References

- [1]. FilizKeyf Obturator prostheses for hemimaxillectomy patients *Journal of Oral Rehabilitation* 2001 28; 821-829
- [2]. Beumer J, Curtis T, Marunick M. Maxillofacial rehabilitation: Prosthodontic and surgical considerations. St Louis: IshiyakuEuroAmerica, Inc.; 1996:240-285.
- [3]. Chalian, V.A. & Barnett, M.O. (1972) A new technique for Constructing a one-piece hollow obturator after partial maxillectomy. *Journal of Prosthetic Dentistry*, 28, 448.
- [4]. Chalian, V.A., Drane, J.B. & Standish, S.M. (1971) Maxillofacial Prosthetics. Multidisciplinary practice, pp. 133±148. The Williams & Wilkins Co., Baltimore.
- [5]. Desjardins, R.P. (1978) Obturator prosthesis design for acquired maxillary defects. *Journal of Prosthetic Dentistry*, 39, 424.
- [6]. Tirelli G, Rizzo R, Biasotto M, Di Lenarda R, Argenti B, Gatto A, Bullo F. Obturator prostheses following palatal resection: clinical cases. *Acta Otorhinolaryngol Ital*. 2010 Feb;30(1):33-39
- [7]. Brown Ke, Clinical considerations in improving obturator treatment. *J Prosthet Dent*, 1970;24: 461-466.
- [8]. Wood, Rh, Carl W, Hollow silicone obturator for patients after total maxillectomy. *J. Prosthet Dent*, 1977;47: 643-651
- [9]. B. Rilo, J. L. Dasilva, I .Ferros, M. J. Mora & U. Santana. A hollow-bulb interim obturator for maxillary resection. A case report . *Journal of Oral Rehabilitation* 2005 32; 234-236.
- [10]. Tanaka Y, Gold Ho, Pruzansky S. A simplified technique for fabricating a lightweight obturator. *J Prosthet Dent*. 1977;38:638-642.

Fig. 1: Intra-oral view of the defect



Fig. 2: Primary cast



Fig. 3: Special tray



Fig. 4: Master impression



Fig. 5: Hollow bulb



Fig. 6: Clay adapted over the bulb



Fig. 7: Impression with the obturator in place



Fig. 8: Bite registration



Fig. 9: Wax try-in



Fig. 10: Partial denture



Fig. 11: After insertion of PD



Fig. 12: Single piece obturator



Fig. 13: Before treatment



Fig. 15: After treatment



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