

An Obturator Following Partial Maxillectomy Secondary to Central Giant Cell Granuloma: A Functional and Esthetic Approach

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ABSTRACT

The hard and soft palates are essential for speech and deglutition. There is compromised function due to congenital anomalies, disease, or trauma. Large palatal openings necessitate the use of obturators to re-establish oral function and aesthetics. Maxillectomy following surgery leading to oronasal or oroantral communication leads to decreased quality of life and hampers one's psychological and social well-being. Obturators are a critical component of post-surgical care, promoting healing and offering temporary functional replacement. This case report illustrates how managing these types of defects can significantly improve a patient's quality of life, giving them back some control and hope as they navigate their recovery journey.

KEY WORDS

Central giant cell granuloma, Interim obturator, Maxillectomy, Oronasal communication, Palatal defect, Surgical obturator

Citation

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INTRODUCTION

Surgical resection of the maxilla for tumor management creates oronasal and oroantral defects that severely impair speech, swallowing, and mastication, significantly reducing quality of life.^{1,2} As an essential member of the team, the maxillofacial prosthodontist addresses this by providing immediate prosthetic rehabilitation.² The placement of surgical obturator at surgery followed by interim obturator is a viable and cost-effective treatment restores oronasal separation, thereby rapidly re-establishing critical functions, minimizing complications like nasal regurgitation, reducing hospitalization time, and expediting recovery.²⁻⁴ This prosthesis is specifically designed to close the defect and maintain the integrity between oral and nasal cavities. Although periodic adjustments are necessary, it helps in significantly improving the patient's quality of life during the crucial healing and rehabilitation period.⁵⁻⁷ This case report describes the management of a partially edentulous

patient with a palatal defect using surgical followed by interim obturator as a vital provisional measure in a staged treatment plan prior to definitive prosthesis.

CASE REPORT

A 36 years old male patient diagnosed with central giant cell granuloma of upper right region of jaw since 11 months, planned to have partial maxillectomy done reported to Department Of Prosthodontics, Kathmandu University School of Medical Sciences (KUSMS), Dhulikhel. On clinical examination 12, 13, 14 were missing. There was swelling in the alveolar gingiva extending buccally and palatally (Fig. 1). Treatment plan was made to fabricate surgical obturator. Preoperative primary impression was made in perforated metallic stock tray (Samit, New Delhi,



Figure 1. Preoperative
Occlusal view



Figure 2. Modified cast with
retentive components



Figure 3. Wax pattern



Figure 4. Finished and
polished surgical obturator

India) with irreversible hydrocolloid (Plastalglin, India) and working cast was made with type 3 dental stone (Kalstone, Kalabhai, India). The resection line was marked in the maxillary cast (Fig. 2), which was reviewed by oral and maxillofacial surgeon to design the extent of resection. The cast was modified to obtain the normal anatomical contour by comparing to the extent of lesion in CT scan. The resection included the wide excision including 15, 16, 11, 21, 22. The design was adapted buccally. Retentive component included wrap around hard, round stainless-steel 21 gauge orthodontic wire clasp over unresected side including 23, 24, 26, 27 and C-clasp over 17 (Fig. 2). Wax pattern was made with modelling wax ((Samit, India) over cast extending palatally and buccally incorporating the defect and clasp (Fig. 3). Heat-polymerizing acrylic resin (DPI, Mumbai) was used for processing, the obturator was finished and polished (Fig. 4). After the resection on the day of surgery, the palatal plate served as a temporary surgical obturator (Fig. 5).



Figure 5. Surgical obturator

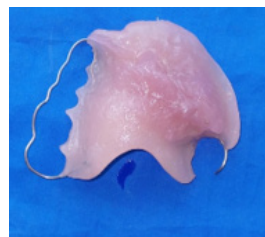


Figure 6. Relining done

The patient reported after 1 month with the complaint of loosening of prosthesis. Clinical evaluation was done. So relining was done with addition silicone-based chair side relining material (Mollosil, Germany) (Fig. 6). The functional evaluation was done by allowing the patient to take sip of water and rinse. Speech evaluation was done. Patient reported with marked comfort.

Patient was recalled after 1 month for the clinical evaluation. Soft tissue healing was found to be satisfactory. Intraorally defect was present extending from 22 to 16. This was classified as Class 4 defect according to Aramany's classification (Fig. 7).⁹ Vestibular obliteration and loss of fullness of lip was seen. Patient was having difficulty in

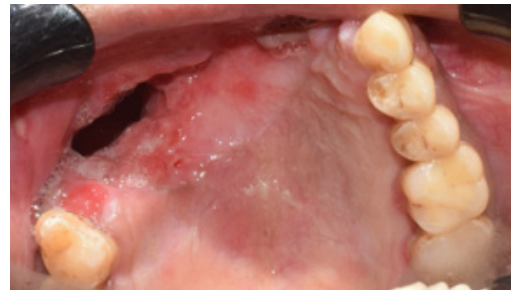


Figure 7. Aramany's class 4 defect

speech. Nasal regurgitation was present due to oroantral communication. Treatment plan was made to fabricate interim obturator.

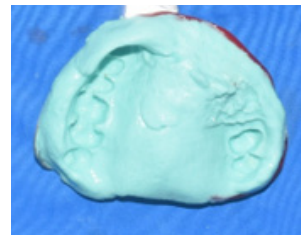


Figure 8. Primary impression



Figure 9. Primary cast



Figure 10. Custom tray



Figure 11. Final impression

Primary impression was made in metallic perforated stock tray (Samit, New Delhi, India) with irreversible hydrocolloid (Septodont, India) (Fig. 8) and type 3 dental stone (Kalstone, Kalabhai, India) was used to pour the primary cast (Fig. 9). The primary cast was surveyed for analyzing path of insertion and height of contour for placement of clasp. Rest seat were prepared. Double wax spacer with modelling wax (Samit, India) was used and custom tray was made with self-cure acrylic resin (DPI, RR Cold Cure, India) (Fig. 10). Border molding was done with low fusing green stick compound (DPI, Pinnacle Tracing Sticks, India) and final impression was made with vinyl polysiloxane (Imflex, Korea) (Fig. 11). Master cast was obtained with type IV dental stone (Kalrock, Kalabhai, India) (Fig. 12). Surveying was done to determine path of insertion and placement of retentive component (Fig. 13). Clasp were fabricated and fit was checked (Fig. 14). Bite registration was done with vinyl polysiloxane (Orange bite, United Kingdom) (Fig. 15) and mounted on mean value articulator (Fig. 16). Teeth setting was done (Prestorock, India). Try in was done (Fig. 17) and the obturator was processed with heat polymerizing resin (DPI, India). The prosthesis was finished polished and inserted (Fig. 18, 19). Speech and functional evaluation were done. Patient was recalled after 24 hours and necessary adjustment was done.



Figure 12. Master Cast



Figure 13. Surveying of cast

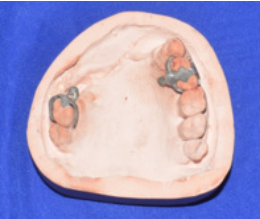


Figure 14. Clasp fitted in cast and mouth



Figure 15. Bite registration

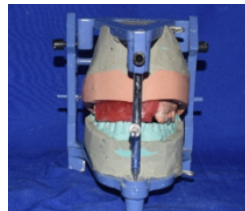


Figure 16. Mounted on articulator



Figure 17. Try in



Figure 18. Finished and polished interim obturator



Figure 19. Insertion



Figure 20. Extraoral (Pre-insertion)



Figure 21. Extraoral (Post-insertion)

DISCUSSION

The patient undergoing maxillectomy secondary to surgical procedures involving trauma and oral malignancy leads to psychological and functional distress to the patients which sharply declines the quality of life of patient.^{4,5} Obturator which helps to reestablish the partition between oronasal structure restoring the oral function and palatal integrity in reasonable level addressing the functional as well as psychological aspect of patient during initial post-operative period increasing the quality of life of patient.^{4,5} There are various classification for such defect amongst which Aramany's Classification is widely accepted which guides the prosthetic design and treatment planning.⁹

Since the fulcrum line of rotation for such defect lies to the teeth nearer to the defect movement of prosthesis occurs not in function but during mouth opening, swallowing and speech the designing of clasp terminal to disengage during function as in conventional cast partial denture is almost impossible to achieve. As in conventional approach direct retainer placed nearer to the defect prevents dislodgement of prosthesis away from tissue and indirect retainer placed as far away from fulcrum line prevents the rotational movement of prosthesis counteracting the posterior sinking of prosthesis and lifting on non-defect side maintaining the retention and stability of the prosthesis.^{4,5} The management of such defect encounters significant clinical challenge due to limited hard and soft tissue and limited mouth opening starting from the first day of impression making. Impression technique is crucial factor for long term success of the prosthesis. Several techniques are available for impression making to record anatomical structure as altered cast technique and duplicating existing dentition and palatal contours can aid in the fabrication of interim obturators, minimizing chairside time while still achieving satisfactory functional outcome enhancing proper adaptation and seal which contributes to proper stability and increased comfort to the patient.^{2,7,10} Moreover, regardless of the techniques used to capture anatomical structures and design the prosthesis, some degree of movement is unavoidable; therefore, patients should be informed about this in advance.^{4,5,10,11} Management of such defect requiring multidisciplinary approach, even after recent approaches in surgical enhancement obturator is considered as non-invasive cost and time effective approach for management of such defect considering patient comfort adaptation and oral hygiene maintenance.^{3,4}

We as a prosthodontist with the fabrication of surgical and interim obturator helps patient in restoring the form and function of oral and facial structures which is essential for enabling a patient to return to normal life. Prosthetic rehabilitation not only enhances a patient's social interactions but also renews their appearance, functionality, and self-confidence. The placement of a surgical obturator is crucial during the immediate postoperative period. An interim prosthesis aids in the adaptation of soft tissues

during healing and helps organize the wound until it is ready to accommodate a definitive prosthesis. This process

leads to significant improvements in the patient's speech, appearance, and oral function, positively affecting both her personal and professional life

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