

Hollow Bulb Obturator with Cast Titanium Frame Work as a Method for Weight Reduction of Prosthesis in Rehabilitation of Acquired Maxillary Defect: A Case Report

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ABSTRACT

Background: This article describes a case report in which a patient with acquired maxillary defect is rehabilitated using a hollow closed bulb obturator with Titanium framework. A twenty eight year old female patient, reported with an acquired maxillary defect due to surgical removal of chondrosarcoma in the maxillary arch. The pre-existing acrylic obturator was heavier and uncomfortable and the patient discontinued its use. Hence weightless obturator to achieve good retention and comfort was indicated. A hollow closed bulb obturator with Titanium framework was planned and inserted. Post-insertion, the patient was very much satisfied with the esthetics, retention and comfort. The Cast Titanium framework further reduces the weight of hollow bulb obturator and increases patient satisfaction. Prosthodontists should always try to establish the best treatment plan to meet the functional and esthetic demands of the patient.

Keywords: Obturator prosthesis, Acquired Maxillary defects, Hollow bulb obturator, Titanium framework obturator.

INTRODUCTION

The rehabilitation of maxillofacial defects are always challenging to prosthodontists. The challenge varies from esthetics to retention. When a maxillary defect, either acquired or congenital in origin is rehabilitated, weight of the obturator will affect the retention of the prosthesis. Incorporation of Titanium framework instead of Co-Cr frameworks will aid in retention and further reduction of weight if used along with hollow bulb obturator. This case report describes the rehabilitation of an acquired maxillary defect due to surgical removal of neoplasm, using hollow bulb obturator with Titanium cast framework to improve the patient comfort and quality of life by providing good retention, stability, support, esthetics and weightlessness for the denture.^{1,2}

CASE REPORT

A twenty eight year old lady patient came to the department of Prosthodontics, with the chief complaint of difficulty in mastication, fluid leakage into nasal cavity and nasal tone while speaking since three years. The medical history and past dental history revealed, subtotal maxillectomy for the treatment of Chondrosarcoma four years back followed by acrylic obturator. She discontinued the obturator due to its heaviness, discomfort and pain within one year itself. On clinical examination, Aramany Class IV defect with only 24, 25, 26, 27 and 28 were present.^{3,4} 24 was periodontally weak and lingually inclined while 28 was grossly decayed. Patient was not willing for further extractions. Fig1

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Fig 1: Intraoral Preoperative view.



Fig 2: Recording the defect using admix.



Fig 3: Final impression of defect.

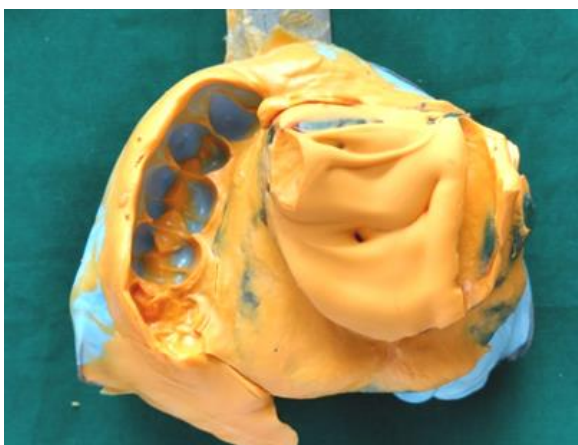


Fig 4: Pick up impression.



Fig 5: Titanium cast metal frame work with occlusal rim.



Fig 6: Acrylized try-in prosthesis.



Fig 7: Acrylized schim.



Fig 8: Finished hollow bulb obturator cameo surface.



Fig 9: Finished hollow bulb obturator intaglio surface.



Fig 10: Post insertion view- intraoral.



Fig 11: Pre insertion view- extraoral.



Fig 12: Post insertion view- extraoral.

Though, various treatment options including Co-Cr cast framework and hollow bulb obturator was possible, considering the patients difficulty in using previous obturator due to heaviness and loss of retention, following treatment plan was made after discussion with the patient. The final treatment plan included, endodontic treatment of 24, 25, 26 and 27 followed by metal coping on 24 to improve retention and splinted fixed dental prosthesis on 25, 26, 27. Subsequent to this, a definitive closed hollow bulb obturator with Titanium cast framework was planned.

Treatment procedure

Primary impression was made using irreversible hydrocolloid after blocking out the maxillary defect with petrolatum laden cotton, to prevent excess material getting entrapped into the defect. Floss was attached to the cotton for easy retrieval from defect. Cast was poured with type III gypsum.

After completion of endodontic treatment on 24, 25, 26 and 27, crown preparation was done and putty-light body 2 stage impression was made. Cast was poured with type IV gypsum product. Metal coping on 24, splinted crowns with distal occlusal rest seats on 25, 26 and mesial occlusal rest seat on 27 were fabricated and cemented using Glass Ionomer Cement (luting consistency). The crown on 25 was porcelain fused to metal with ceramic facing, while 26 and 27 were full metal crowns.

Special tray was fabricated on primary cast with self-cure acrylic resin after blocking out of defect using modeling wax. Admix of Impression compound and green stick compound in 3:7 ratios were made and loaded into the tray to record the impression of the defect. The impression was taken out and re-inserted multiple times before setting to prevent engaging into tissue undercuts. Final recording of defect was done with addition silicone impression material (light body consistency). Tray adhesive was painted on polished surface of special tray and a pick up impression was made with putty light body single stage impression technique. Cast was poured with type IV gypsum. Later the cast was duplicated and titanium framework was fabricated. (Fig 2, fig 3, fig 4, fig 5)

Titanium framework design included, complete palate major connector, mesial occlusal rest and I

bar on 25 and embrasure clasp assembly on 26 and 27. Metal try-in was done and checked for the fit, retention and stability of titanium framework. This was followed by recording of jaw relation and mounting in semi-adjustable articulator. After teeth setting, trial was done in patient's mouth to evaluate esthetics, occlusion and retention.

The acrylization of try-in prosthesis was done using heat cure acrylic. A heat cure acrylic shim was fabricated using a duplicated cast and was attached to the metal framework to get a hollow bulb obturator.^{5,6} The finished and polished hollow bulb obturator was inserted in the patient's mouth. Occlusal adjustments and other minor intraoral corrections were done for the comfortable use of obturator. Maintenance protocols were explained to the patient. Periodic recall visits to assess the patient comfort and evaluation of prosthesis were scheduled and completed. (Fig 6, 7, 8,9,10,11 and 12)

DISCUSSION

Maxillectomy patients suffer from functional as well as facial deformity. Prosthodontist plays an important role in restoring function and esthetics. The size and location of the defects influence the degree of impairment and difficulty in prosthetic rehabilitation. The ease of fabrication and maintenance makes maxillary obturator prosthesis more acceptable treatment modality than surgical reconstruction.⁷ Obturator bulb extension will improve speech by providing resonance. Bulb extension can be classified into solid, open hollow and closed hollow. Hollow bulb obturator provides weightlessness and increased retention.⁸ Closed hollow bulb obturators prevent fluid and food accumulation.⁹

Metallic framework for hollow bulb obturators will increase retention due to close adaptation and fit of the framework. The use of Titanium framework being weightless will further improve retention and patient comfort.²

CONCLUSION

The quality of life of patients with maxillectomy defects is often compromised. Poor prosthesis can further increase their psychological trauma and decrease overall health of the patient. Retention and

weightlessness of obturator prosthesis will improve the acceptance and confidence of the patients thereby improving their quality of life. The use of closed hollow bulb obturator with Titanium framework will be a good choice of treatment for these types of patients due to weightlessness and retention.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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