



PROSTHETIC REHABILITATION OF A PATIENT WITH NEAR TOTAL MAXILLECTOMY USING A HOLLOW BULB OBTURATOR: A CASE REPORT

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ABSTRACT

Aim: To prosthetically rehabilitate maxillary defect in a patient with near total maxillectomy using hollow bulb obturator.

Case description: Authors report a case of 64-year-old male patient with near total maxillectomy with respect to the left side who was referred for the prosthetic rehabilitation.

Conclusions: The hollow bulb definitive obturator prosthesis rehabilitated the patient in terms of masticatory function, phonetics and esthetics. The hollow bulb design ensured patient comfort due to its decreased weight.

KEYWORDS: hollow bulb obturator, maxillectomy, prosthetic rehabilitation

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INTRODUCTION

Surgical intervention for the eradication of maxillary neoplasm and the consequent defect results in an abnormal oro-antral communication^{1,2}. This leads to esthetic, functional and psychological disabilities. Prosthetic rehabilitation of such patients aims at fabricating obturators which create partition between nasal and oral cavities and improve deglutition, speech, mastication and esthetics³. Maxillary obturator prosthesis, a frequent treatment modality, functions to the

closure of the maxillectomy defect and re-creates separation between oro and naso-pharynx¹. It also facilitates improvement in mastication, deglutition and speech intelligibility⁴. However, the undesirable weight of the prosthesis is often a dislocating force and affects its retention, stability and support⁵. Hollowing the obturator bulb to decrease the prosthesis weight is an effective method. Various techniques of reducing the load of definitive obturator bulb have been proposed. As most of these techniques are complicated, time-

consuming and expensive, this article explains a simple method of fabricating a light-weight hollow bulb obturator for a partially edentulous hemi-maxillectomy patient.

CASE REPORT

A 64 year old male patient was surgically operated for the squamous cell carcinoma of left maxilla and was referred for the prosthetic rehabilitation. Medical and dental history revealed surgical resection of the anterior and left posterior maxillary alveolar bone due to

T₄N₀M₀SCC one and a half year ago. The patient had used an interim obturator for the past one year. Intraoral examination revealed well healed surgical defect (Aramany Class II)⁶ in the maxillary left palatal area creating an oro-antral communication (Fig. 1). All the remaining dentition of maxilla and mandible (Fig. 2) was examined clinically as well as radiographically. It was caries-free, without involving any significant periodontal problems. Masticatory and phonetic functions were deranged due to missing maxillary structure. The patient had a restricted mouth opening of 13mm due to post-operative scar formation. Prosthetic rehabilitation was planned with an acrylic closed hollow-bulb definitive obturator.

Figure 1. Aramany Class II defect in left maxilla.



Figure 2. Mandibular arch.



Primary impression of maxilla and mandible were made using alginate (Zelgan 2002; DentsplyIndia Pvt. Ltd., Gurgaon, India) (Fig. 3). A cotton pack coated with petroleum jelly was placed in the defect to prevent entry of the impression material into the nasal cavity. After obtaining the cast (Fig. 4), defect was blocked out with base plate wax (Fig. 5) and special tray was fabricated with self-cure resin (DPI-RR Cold Cure; Dentsply India Pvt. Ltd., Gurgaon, India) (Fig. 6). Border molding with green stick compound (DPI Pinnacle Tracing Sticks; Bombay Burmah Trading Corporation Ltd.) of the defect and the remaining edentulous area was performed using functional movements.

Figure 3. Maxillary & mandibular primary alginate impressions.

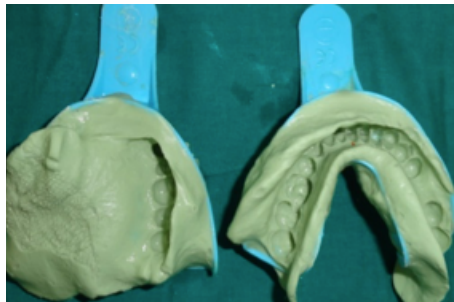
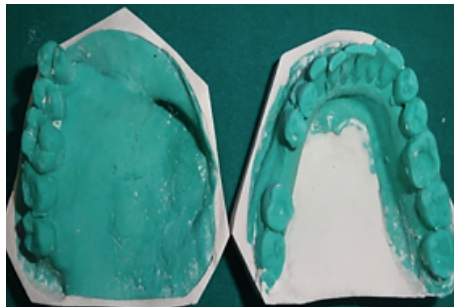


Figure 4. Maxillary & mandibular primary casts.



Then the special tray was coated with tray adhesive (Caulk-Tray Adhesive; Dentsply) and a secondary impression was made using putty vinylpolysiloxane (Reprosil Hydrophilic Vinyl Polysiloxane Impression Material Heavy Body, Dentsply). The impression was relined

with light body material (Reprosil Hydrophilic Vinyl Polysiloxane Impression Material Light Body, Dentsply) to record maximum details of the defect and an alginate over-impression was made of the entire maxillary arch (Fig 7). The impression was transferred to type IV die stone (Kalrock Die Stone Type IV, KalabhaiKarson Pvt. Ltd., Mumbai) and master cast was obtained (Fig. 8).

Figure 5. Defect blocked out with wax.

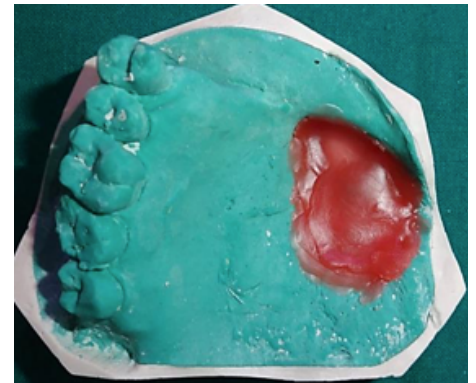


Figure 6. Special tray fabricated.



Record base was cured in a conventional method and occlusion rim was fabricated with baseplate wax (Hindustan Modeling wax No. 2; The Hindustan Dental Products). Jaw relation was recorded and transferred to semi-adjustable articulator (Fig.9). Teeth arrangement and wax-up were completed (Fig. 10) and evaluated intra-orally during try-in appointment (Fig 11).

Figure 7. Secondary impression with putty and light body.



Figure 8. Master cast obtained in die stone.



Figure 9. Articulated casts.

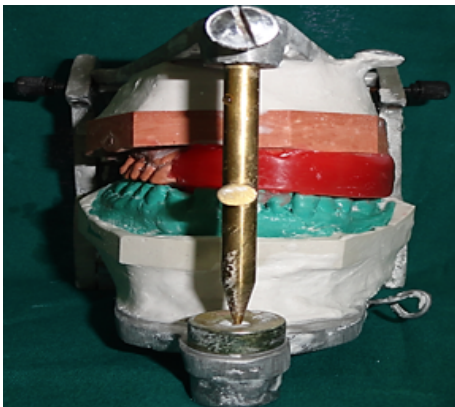


Figure 10. Teeth arrangement.

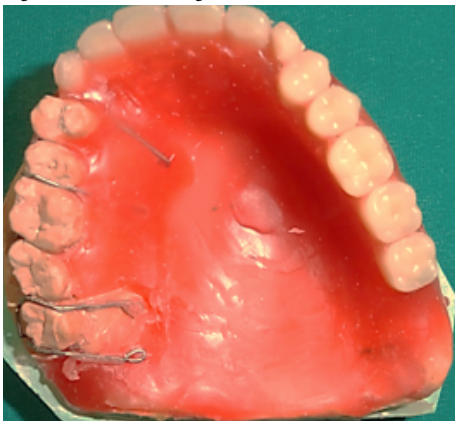


Figure 11. Intraoral try-in.



After teeth arrangement, the master cast was waxed up with retentive clasps on 1st premolar, 1st molar and 3rd molar teeth. C-clasps on 1st premolar and 1st molar and an Adams clasp on the 3rd molar were planned. The waxed-up obturator was then sealed with the master cast and invested in the drag (lower half of the flask) using type II Gypsum material (Fig 12). All the clasps and remaining natural teeth on the cast were covered with investing plaster except the teeth and waxed-up portion (Fig. 12). Flasking procedure was completed in conventional method and the flask was kept under a mechanical clamp for 24-hours. The flask-clamp assembly was immersed in a de-waxing unit at 92°C for 10 minutes and de-waxing procedure was carried out. Complete wax elimination was ensured from the cast (Fig.13).

To make hollow bulb obturator, a layer of heat-cure acrylic (Trevalon High Impact Denture Base Material, Dentsply, Gurgaon) was mixed according to manufacturer's instructions and adapted in the defect area (in dough stage) and table salt was packed over it sufficient enough to allow hollow space between two layers of heat-cured resin (Fig. 14). Then second layer of heat polymerizing acrylic was placed over it

and the remaining palatal contour (in dough stage).

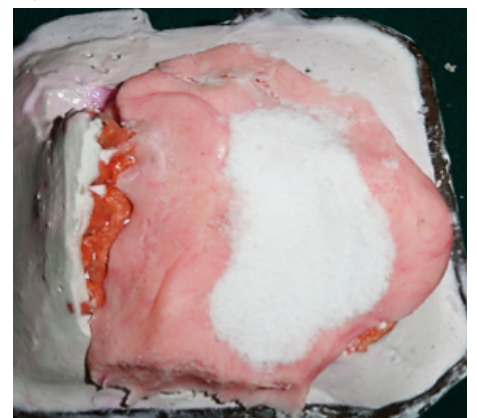
Figure 12. Invested master cast in the drag.



Figure 13. After de-waxing procedure.



Figure 14. Salt packed in the defect.



Then the drag was closed with the cope (upper half of the flask) in close approximation under the mechanical clamp. Bench curing was performed in conventional manner by keeping the

flask-clamp assembly at room temperature (25°C) for 24 hours. Then this assembly was subjected to regular long curing cycle. Following this bench cooling was performed by keeping the flask-clamp assembly at room temperature for 24 hours. The processed resin-obturator was obtained and a hole was created in the bulb for the salt particles to escape. All the residual salt crystals were eliminated by jet of water under high pressure through the hole. Thus hollowness was automatically created in the space previously occupied by salt crystals. The hole was sealed with autopolymerizing acrylic resin. For ensuring the hollow cavity seal, the denture was immersed in water and no evidence of air bubbles verified it. The processed hollow bulb obturator was finished and polished conventionally (Fig 15, 16). The prosthesis was made to fit intraorally after making necessary adjustments (Fig 17). It was delivered to the patient with the emphasis of post-insertion care and hygiene maintenance (Fig. 18, 19).

Patient was satisfied with his obturator. There was a marked improvement in the patient's phonetics, masticatory efficiency and esthetics which was noticed at initial visit (Fig. 20, 21).

DISCUSSION

This article described a technique which is simple to execute and less time-consuming. Several techniques of fabricating a light-weight hollow bulb obturator have been reported in the literature. But they are not without limitations. The time and cost of the treatment cannot be met with by all standards of patients.

Figure 15. Finished and polished obturator.



Figure 16. Finished and polished obturator.

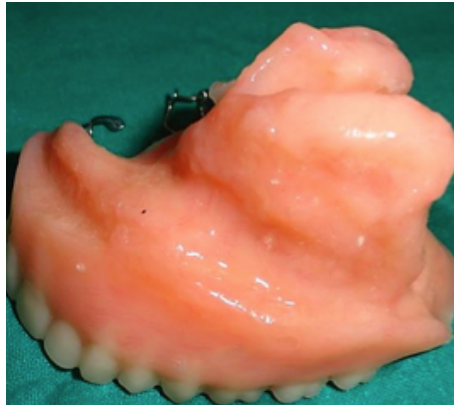


Figure 17. Prosthesis fits.



Figure 18. Obturator insertion.



Figure 19. Obturator insertion.



Figure 20. Preoperative view.



Figure 21. Postoperative view.



The method described in the article uses lost salt technique which is relatively simple and a very cheap and readily available spacer material is utilized. The salt crystals being heat labile

melt during curing procedure and thorough flushing after processing results in their complete removal thereby maintaining denture integrity. Thearduous taskof removing the spacer material from the obturator prosthesis is also avoided.

CONCLUSIONS

Two-thirds of neoplasms which involve oral cavity are SCC. The procedures of choice for removal are partial/total maxillectomy. Rehabilitation via palatal obturators is often preferred⁷. The present case report showed the prosthetic rehabilitation of an Aramany class II maxillary defect using hollow bulb definitive obturator. The prosthesis rehabilitated the patient in terms of masticatory function, phonetics and esthetics. The hollow bulb design of the obturator prosthesis ensured patient comfort due to its decreased weight.

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