

A Hollow Bulb Obturator for Maxillary Resection in Partially Edentulous Patient: Case Report

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ABSTRACT

Background: Obturator is a prosthesis used to close acquired or congenital tissue openings, primarily of hard palate or contiguous alveolar structures. Palatal defect of any extent causes multiple problems in speech, mastication and esthetics. Palatal obturator is the only substitute, which covers the defect and contributes to normal speech production. It eliminates hypernasality and improves communication. In this case, the patient had Aramany Class 1V classification with 24, 25 and 26 teeth present. In this case, hollow bulb obturator was fabricated which helped in reducing extra load on the underlying tissues and remaining amount of bone.

Keywords: Obturator, palatal obturator, hollow bulb obturator, palatal defect, maxillary defect.

INTRODUCTION

In case of patients with palatal insufficiency, speech and deglutition become very difficult. Velopharyngeal insufficiency is a disorder of the structure that causes a failure of the velum (soft palate) to close against posterior pharyngeal wall during speech. It is the responsibility of the maxillofacial prosthodontist to recreate an artificial barrier.¹

General principles of the obturator design include rigid major connector, guide planes, and rests that places support along long axis of abutment teeth, direct retainers that are passive at rest and control of occlusal plane that closes the defect². Some principles need to be modified according to the defect, the condition and the position of remaining structures.

Acceptable prosthodontics care for a patient with acquired defects of maxilla should include cautious prosthesis design, combined with routine maintenance and ample care to provide comfort, function, and aesthetic. It is more difficult to treat the acquired palatal defects in edentulous patients, as no natural teeth are present to take support. As per Aramany, partially edentulous palatal defect patients are classified according to Kennedy classification and are treated successfully by taking support from the remaining natural teeth.¹ A simple technique of fabrication of hollow bulb obturator is depicted in this.

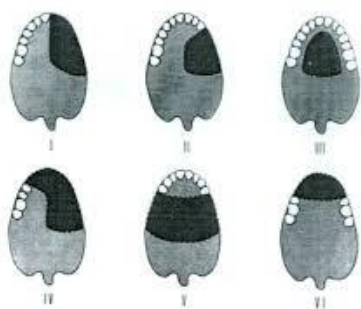


Fig a: Aramany Classification of Partially Edentulous Patients.

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A male patient aged 47 years, who had undergone surgery for the maxillary tumor on the right side of the maxilla, reported for the Department of Prosthodontics for restoration of palatal defects. The defect extended from the buccal mucosa involving the midline and only 24, 25 and 26 teeth were present. The defect extended medially and anteriorly from the canine region to posterior extent of the hard palate.

The patient presented with the obvious and typical nasal twang and he was experiencing difficulty in the speech and deglutition. Besides the patient needed a denture to restore the lost teeth and an obturator which would overcome the defect and makes things easier for him in terms of mastication and communication.³

On examination, it was found that right half of the patients' face was disfigured, thereby stretching the right labial and nasal regions. It was evident that the oral tissues, the palatal bone and the remaining residual ridge were incapable of supporting the prosthesis. Owing to unfavorable conditions, it was necessary to plan a prosthesis that would be light and easy to wear. The weight of the prosthesis could jeopardize the health of the tissues and compromise the function of the prosthesis.⁴

After taking the thorough medical and dental history, the patient was educated and prepared psychologically to undergo the procedure of obturator making. Fig 1.

Primary impression was made with the help of impression compound and the cast was poured out of it.⁵ Fig 2 The waxed up obturator was sealed with the master cast and invested in the base flask with the help of type 2 materials. Fig 3, 4, 5

The counter flasking was done and the flask was kept under the mechanical clamp for period of 24hrs. The flask clamp assembly was immersed in the de waxing unit at 92 degree Celsius for 5 minutes and dewaxing procedure was carried out in a conventional manner. Complete wax elimination was carried out. A double thickness hard base plate wax was adapted. The base plate wax was adapted on the dewaxed teeth surfaces and investing plaster surfaces Fig.6, 7. The wax sheets were adapted on areas corresponding to future



Fig 1: Partial maxillectomy. (Type IV Aramany classification Teeth present - 24,25,26,27)



Fig 2: Primary impression made with impression compound.

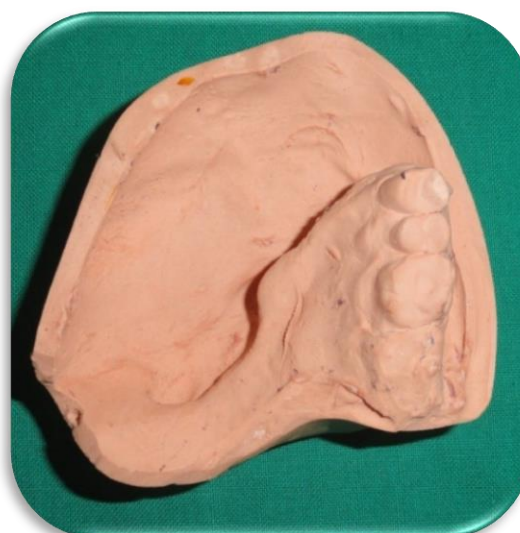


Fig 3: Primary cast.



Fig 4: Wax bite recorded.



Fig 8: Indexing for wax insert.



Fig 5: Articulation and teeth arrangement done.



Fig 9: Wax insert corresponding to hollow space.



Fig 6: Waxed denture.



Fig 10: Hollow obturator.

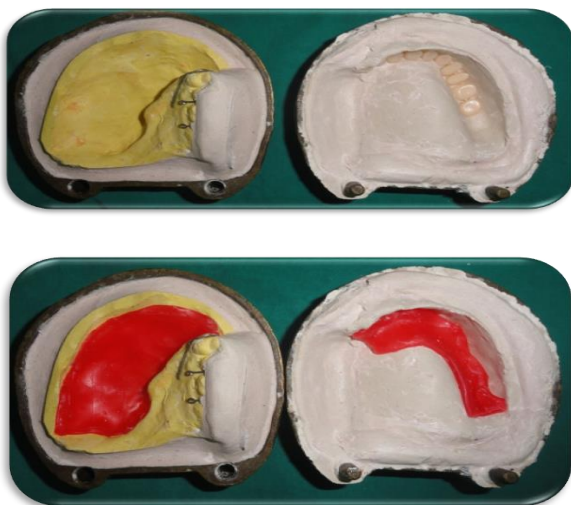


Fig 7: Flasking, dewaxing and wax insert to create the desired hollow space in the obturator.



Fig 11: Obturator in Function.



Fig 12: Post-operative Frontal and lateral view.

hollow space of obturator prosthesis. Wax sheet adapted on the denture plaster surface (in counter flasking) was cut to create 3-5 widely located windows (3mmx3mm) depending on the surface area. Fig 8. Vaseline petroleum jelly was applied to both the adapted wax sheets as a separating media. A wax bolus was formed by softening the hard base plate wax in hot water (60 degree) sufficient enough to accommodate the free hollow space between two adapted wax sheets after closing the flask. Fig 9. The softened wax bolus placed on the adapted wax sheet in either flask and both flasks were closed in close approximation under the mechanical clamp. The flask- clamp assembly was kept under the cold water (20 degree) for 10 minutes. The base and the counter flask were separated excess wax flash was removed and the flasks were closed again to ensure complete closure.

The softened wax bolus completely occupies the hollow space between the two adapted wax sheets. The wax bolus was removed. The wax bolus was kept under the cold water for 10 minutes to acquire the hardness. The adapted wax sheet was removed from both the flask Fig 9. The hardened wax bolus was positioned on the counter flask. The wax bolus was pressed on the packed acrylic resin. The flask – clamp assembly was kept at the room temperature (25 degree Celsius for 24 hrs.) for early bench polymerization of heat-polymerized acrylic resin before any temperature rise occurs.

Curing cycle was carried out as per manufacturer's instructions (165degreeF for 12 hrs.). The flask-

clamp assembly was again kept at the room temperature for 24 hrs. (bench cooling) after completion of the curing cycle. The flasks were separated after bench cooling. The wax bolus, completely enclosed by acrylic resin, partially got melted and came out of the resin-obturator through the opening during cycle.

Remaining portion of the wax- bolus was removed by immersing the obturator in hot water (60 degree) just to melt the wax inside the resin hollow-bulb followed by forceful cleaning with steam cleaner. Care was taken not to immerse the obturator in hot water (to melt the wax) for longer period to prevent any distortion of the prosthesis. The processed hollow obturator was finished and polished conventionally. Fig 10

Necessary adjustments were made to fit the prosthesis intraorally. The prosthesis was delivered to the patient with reinforcement of post –insertion care and recalled at 3 months interval for one year followed by every 6 months. Fig 11, 12

DISCUSSION

This article describes a new, relatively simple and less time-consuming technique to fabricate a closed hollow obturator. Several techniques and methods have been employed to fabricate closed hollow bulb obturator. Material such as sugar and ice were used to create the hollow space inside the processed acrylic resin. Processing the two halves of the obturator separately and then joining it with the help of auto polymerizing resin. The acrylic shim and polyurethane foam were incorporated into the defect area during packing to create hollow space⁶. The technique described in this article is superior to all other techniques in 2 ways:

- It gives the complete prosthesis as a single unit in a heat cured acrylic resin.
- Size and shape of hollow space achieved allow uniform wall thickness for closed hollow obturator.

This technique is a variation of some previously described techniques which comprises the use of pre shaped wax-bolus to maintain a predictable internal dimension of a hollow space⁷. The ability of this technique to provide a predictable internal dimension of hollow space to achieve uniform wall

thickness for closed hollow obturator in one step processing procedure justifies its novelty^{8,9}.

Some issues regarding the technique should be carefully handled to achieve best possible results as discussed:

- a. The difficulty of reliably seating the wax bolus in polymerizing resin during packing procedure to maintain the uniformity of the resin thickness is one of the concerns with this technique.
- b. Chances for the dimensional change in the wax-bolus resulting from the curing temperature to adversely influence the uniformity of resin thickness.
- c. There may be risk of displacing wax bolus during final closure of flask.

Thus, this article describes the simple technique of fabricating the hollow bulb obturator.

CONFLICTS OF INTEREST

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

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