

Rehabilitation of Post-Ablation Aramany Class I Palatal Defect with Definitive Cast Partial Hollow Bulb Obturator: A Case Report

Shivangi Agarwal*, Vishwas Kharsan, Namrata Bhoyar, Elna Rose Devassy

Department of Prosthodontics, Nair Hospital Dental College, Mumbai, Maharashtra, India.

Abstract

Ambroise Pare pioneered the artificial closure of palatal defects in the 1500s. The extent of obturator extension depends on defect characteristics and functional requirements. Retention, stability, and support are vital for successful removable prostheses, including obturators. This article presents a case study of fabricating a definitive obturator for a patient with an Aramany Class I palatal defect. The treatment involved preliminary impressions, mouth preparation, final impressions, framework trial, jaw relation record, try-in, processing, and prosthesis insertion. Careful management of palatal perforations is essential to prevent complications and improve patient outcomes. Definitive obturators address anatomical and functional deficiencies, enhancing esthetics, function, and patient quality of life. Dentists should exercise caution and consider hybrid prostheses for compromised cases.

Keywords: Aramany Class I prosthesis, Definitive obturator, Post-ablation prosthesis.

INTRODUCTION

Obturators, which originate from the Latin term “obturare” meaning “to block up,” have been effectively utilized in managing defects over an extended period. In the 1500s, Ambroise Pare is credited as one of the first individuals to artificially close a palatal defect, primarily focusing on congenital rather than acquired defects.^[1] The pioneering efforts of these prosthodontists have laid the foundation for the present generation of maxillofacial prosthodontists.

The Glossary of Prosthodontic Terms defines an obturator as “a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate, and/or contiguous alveolar or soft-tissue structures.”^[2] The extent of an obturator’s extension into the defect varies depending on factors such as the defect’s form, the characteristics of its lining tissue, and the functional requirements for stabilizing, supporting, and retaining the prosthesis.^[3]

To ensure the success of a removable prosthesis, it is imperative that it possesses retention, stability, and sufficient support, principles that hold particular relevance to obturators. Standard prosthetic treatment of defects plays a critical role in enhancing the patient’s functional abilities.^[4] The present article describes a conventional method for the fabrication of a definitive obturator for a post-ablation patient with Aramany Class I palatal defect on the right side.

CASE REPORT

A 34-year-old male patient reported to the Department of Prosthodontics with the chief complaint of difficulty in speaking and eating. He gave a history of squamous cell carcinoma of the hard palate for which he was operated on 6 months back. Extraoral examination showed a depressed middle third of the face on the right side.

Intraoral examination revealed (Figure 1).

1. Aramany Class I palatal defect on right side
2. Missing teeth in 1st quadrant
3. Palatal defect extending from midline to right buccal vestibule (mediolaterally) and right side of the hard palate (anteroposteriorly)
4. Size of the defect was approximately 3.6 cm mediolaterally and 5.4 cm superoinferiorly. Anteroposteriorly, the defect was approximately 5.1 cm in length
5. Satisfactory healing was noted in the resected area.

Address for correspondence: Shivangi Agarwal,
Department of Prosthodontics, Nair Hospital Dental College,
Mumbai, Maharashtra, India.
Email: dr.shivangiagarwal@gmail.com

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Preliminary impression and surveying

For the preliminary impression, betadine-saturated gauze was placed in the undercut areas in the defect. Impression compound (Impression Composition Dental Impression Compound; 2 GM) was used to extend the tray into the defect and impression made with irreversible hydrocolloid (Algingum; Prime Dental Products Pvt. Ltd). The diagnostic cast was poured in Type 3 gypsum (Kalstone; Kalabhai). The cast was surveyed, favorable and unfavorable undercuts were marked, and cast partial denture framework designing was done (Aramany Class I tripodal design).^[5,6] I-bar retainer was planned on 21, circlet clasp on 24 with mesial rest, extending onto 23 as cingulum rest, and embrasure clasp on 26,27. The major connector was extended till the height of the contour on the palatal aspect of all remaining teeth for additional support.

Mouth preparation and final impression

The custom tray was fabricated with a 2 mm wax spacer (Modeling Wax; 2 GM) in the dentulous and palatal areas. A thin sheet of tin foil was adapted to the defect area. Self-polymerizing acrylic resin (RR Cold Cure; DPI) was used for the custom tray fabrication and extended into the defect.

Mouth preparation was done according to the cast partial framework design. Border molding was done using greenstick compound (Green Tracing Sticks; Maarc Dental), the defect area was molded last, and the final impression was made using medium body elastomer (Aquasil Ultra + Medium Regular Set; Dentsply Sirona). The final cast was poured in Type IV Gypsum (Kalrock Diestone, Kalabhai) (Figure 2).

Cast partial denture framework trial and jaw relation record

Co-Cr metal framework was fabricated using laser sintering. Try-in was done and checked for adaptation and occlusal interferences. Self-polymerizing acrylic resin (RR Cold Cure; DPI) was adapted to the metal struts in the defect area to stabilize the metal framework in the superoinferior direction. Occlusal rims were then fabricated and adjusted; facebow transfer was made, centric relation recorded and transferred to a semi-adjustable articulator (Figure 3).



Figure 1: Pre-operative intraoral view

Try-in stage and processing

Posterior teeth selection involved the use of narrower teeth buccolingually. The teeth arrangement was done. Try-in was done to check for retention, stability, adaptation, esthetics, and phonetics. Processing was done using lost-salt technique to obtain a closed hollow-bulb obturator.

Prosthesis insertion

Prosthesis was placed in position and re-evaluated for retention, stability, adaptation, esthetics, and phonetics (Figure 4). The defect area was relined with a soft liner to aid in comfort. Patient satisfaction was noted. Post-insertion instructions were given regarding care and hygiene maintenance.

DISCUSSION

Resection of a palatal tumor results in a surgical defect which may or may not be managed by surgical closure or reconstruction. The choice of treatment modality depends largely on the extent of the defect, prognosis of the defect



Figure 2: Final impression and master cast

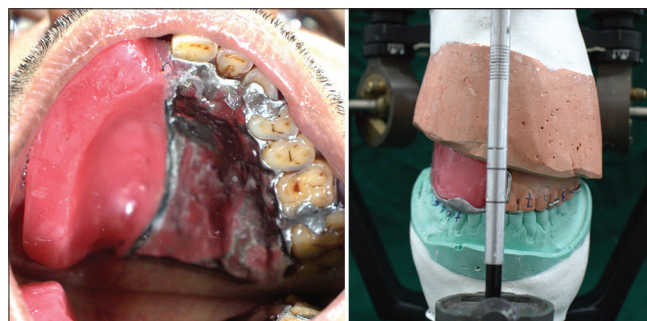


Figure 3: Metal framework try-in and jaw relation record



Figure 4: Final prosthesis *in situ*

in terms of recurrence, comorbidities, radiation status, and patient's preference, among others. When surgical management is contraindicated or not desired for any of the fore-mentioned factors, a prosthodontic approach using obturators is the treatment of choice.

A definitive obturator was planned since the surgical area was healed and sufficient time had elapsed since the surgery. The design of the prosthesis was made to include broad stress distribution, cross-arch stabilization with the use of a rigid major connector, and stabilizing and retaining components to best minimize dislodging functional forces.^[3]

Thermal conductivity and longevity of the prosthesis are the advantages of metal framework obturator prosthesis.

Aramany's tripodal configuration provides retention from buccal undercuts and reciprocation from the palatal extension of the complete palate major connector onto the cingulum of remaining teeth. Additional retention was achieved from the lateroposterior-superior walls of the defect.

The fabrication of lightweight prostheses that effectively extend into the defect is possible using both open and closed hollow obturators. Opting for an open hollow obturator offers several advantages, such as reduced weight, improved hygiene, ease of fabrication, and enhanced speech intelligibility. On the other hand, a closed hollow obturator prosthesis can prevent fluid and food accumulation, minimize air space, and enable maximum extension. Both options present benefits for both the dentist and patient.^[7]

The limitation of this particular kind of obturator arises when there is a compromise or loss of any tooth included in the framework.^[4] Such incidents directly impact the stability and retention of the prosthesis. Moreover, the broader area of tissue supports in this obturator type can lead to greater bone resorption in the edentulous region if any abutment tooth is compromised. This, in turn, can result in a misfit of the

prosthesis. In cases where the bone condition is determined to be suitable for implant placement and the patient provides informed consent, a hybrid prosthesis would be proposed as the subsequent treatment option.^[8]

CONCLUSION

Dentists need to exercise caution when dealing with palatal perforations, particularly in patients with compromised immune systems. Being vigilant in such cases can offer significant advantages to patients, including preventing the need for extensive surgical resection, minimizing post-surgical complications, and potentially avoiding fatal outcomes. Definitive prosthodontic treatment aims to address anatomical and functional deficiencies effectively. By constructing a well-designed prosthesis, dentists can restore lost functions, enhance esthetics, and improve the overall quality of life for patients. Moreover, a properly fitted prosthesis can boost the patient's confidence and facilitate their acceptance within society.

REFERENCES

1. Aramany MA. A history of prosthetic management of cleft palate: Pare to Suersen. *Cleft Palate J* 1971;8:415-30.
2. The glossary of prosthodontic terms. *J Prosthet Dent* 2005;94:10-92.
3. Kumar J, Kandarphale MB, Aanand V, Mohan J, Kalaignan P. Definitive obturator for a maxillary defect. *J Integr Dent* 2017;2:1-4.
4. Salvi RC, Chauhan M, Tembhurne J, Gangurde A, Jaiswal N, Jadhav M. Rehabilitation of post mucormycosis surgical defect using definitive obturator with cast metal framework- A case report. *Int J Oral Health Dent* 2023;9:151-5.
5. Aramany MA. Basic principles of obturator design for partially edentulous patients. Part I: classification. *J Prosthet Dent* 1978;40:554-7.
6. Aramany MA. Basic principles of obturator design for partially edentulous patients. Part II: Design principles. *J Prosthet Dent* 2001;86:562-8.
7. Habib BH, Driscoll CF. Fabrication of a closed hollow obturator. *J Prosthet Dent* 2004;91:383-5.
8. Keyf F. Obturator prostheses for hemimaxillectomy patients. *J Oral Rehabil* 2001;28:821-9.