

Precision Attachment Retained Palatal Obturator in cleft palate Patient

Dr. Syed Javad Saleem¹, Dr. Thejaswini Lakshmipathi², Dr. Padmavati Durgannavar³, Dr. Nasiha Fathima⁴

¹Associate Professor, Department of Prosthodontics, The Oxford Dental College

²Oral and Maxillofacial Prosthodontist, Private practitioner, Bangalore, India

³Oral and Maxillofacial Prosthodontist, Private practitioner, Jaisinghpur, India

⁴Periodontist, Private practitioner, Bangalore, India

Received: 12-04-2023 / Revised: 28-05-2023 / Accepted: 30-06-2023

Corresponding author: Dr. Syed Javad Saleem

Conflict of interest: Nil

Abstract

Fatality of maxillofacial structures brings about an inconsolable physical and psychological agony to a person. To plan and execute rehabilitation of such forlorn patients is the most challenging task of a prosthodontist since it demands both intellectual as well as derwent technical knowledge. Prosthodontic management involves the use of a prosthesis known as obturator prosthesis.

The use of precision attachments in a dentate maxillectomy patient can yield significant functional improvement while maintaining the obturator's aesthetic advantages. Hence, the design of the obturator should create an artificial barrier between the oral and nasal cavities and thereby restore the functional capabilities of speech, mastication and swallowing.

This article describes prosthetic rehabilitation of a maxillary defect with obturator using precision attachment as an aid in the retention of the obturator in a partially edentulous

Keyword: Obturator, Precision attachment, Cleft palate

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

In sixteenth century Ambroise Pare the word obturator is derived from Latin word 'Obturare' which means 'to stop'.⁹ Defects in the maxillary jaw can be congenital, developmental, acquired, traumatic or surgical involving the oral cavity and related anatomic structure and these defects can cause disruption of articulation and airflow during speech production and nasal reflux during

deglutition.¹¹ Retention is affected by a variety of factors, including the level of direct/indirect retention promoted by the remaining teeth; defect size; available tissue surrounding the cavity; and muscular control.³ The use of attachments as an adjunct to maxillary obturators is indicated for (1) improved aesthetics and (2) improved retention in comparison to conventional

clasping on incisors as terminal abutment adjacent to a large defect.⁷

This clinical report describes the prosthetic rehabilitation of maxillary defects using an obturator with extra-coronal resilient attachments used in place of retentive clasps. A 34-year-old female patient presented to the Department of Prosthodontics, The Oxford Dental College for the prosthetic rehabilitation of congenital palatal defect. The patient complained of difficulty in mastication, and nasal tone in her voice. Intraoral examination

revealed defect in the maxilla involving part of the hard palate creating an oroantral communication. Lateral incisor was missing on the right quadrant of the maxilla.

Masticatory and phonetic functions of the patient were affected. After a thorough examination, the defect was classified as Aramany's Class III maxillary defect (Figure:1). The treatment plan was made to rehabilitate this patient with a definitive obturator with a Fixed prosthesis



Figure 1:

Patient had no relevant medical history. And the patient required a comprehensive rehabilitation procedure to close the defect as well as a prosthesis to replace her missing teeth. It was decided to take the abutment tooth for fabrication of a fixed partial denture (FPD) along with the palatal obturator.

It was also planned to fabricate the prosthesis as a two-piece device with the obturator being attached to the FPD through precision attachments. This design was selected as it would be easier to ensure a good attachment to the FPD. The obturator portion would have good retention from the undercuts in the defect.

The precision attachment selected was Hader bar attachment. Usually, anchors or Hader bar attachments are indicated in removable partial dentures as a means of providing additional retention.¹⁰

This design was adapted in the obturator designed for the patient. The denture base had the matrix part while the obturator portion housed the matrix components.

Procedure:

The primary impression was made using irreversible hydrocolloid (Zelgan 2002, DENTSPLY) (Figure:2) and was poured with dental stone (Pearlstone) to obtain a primary cast.



Figure 2:

The defect was blocked with a gauze piece lubricated with petroleum jelly prior to impression making (Figure:2). The primary cast was then surveyed on a surveyor (Jelenko

-Surveyor), and the tooth preparation was modified and the final impression was made (Figure:3)



Figure 3:

Prior making the final impression in order to record the defect area, border moulding of the defect area was done using green stick impression compound (Figure:4). (DPI

pinnacle tracing sticks), and Impression of defect was made with light viscosity addition silicone impression material (Reprosil, DENTSPLY).

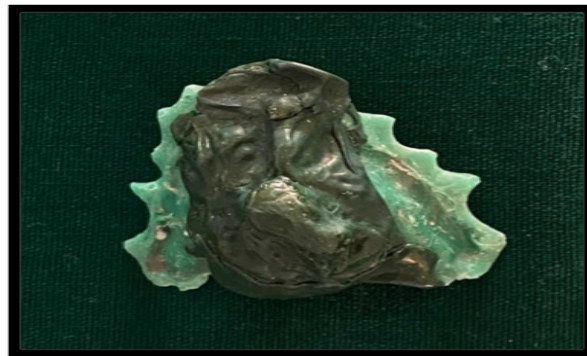


Figure 4

Pick-up impression was made over it with heavy viscosity addition silicone impression material irreversible hydrocolloid (Aquasil, DENTSPLY) and perforated stock tray

(Figure:5). Master cast was poured and jaw relation was recorded and transferred to a semi-adjustable articulator (Hanau Wide Vue Articulator).



Figure 5:



Figure 6:

Wax pattern of the copings was fabricated with blue inlay wax (Kemdent, UK). The bar was cut to the desired length and attached to the wax pattern of the copings with blue inlay wax (figure), after adjusting the length and height of the bar. The height of the bar should be

adjusted according to the availability of the vertical space. The bar should either be in passive contact with ridge or there should be 2–4 mm of space between the bar and underlying mucosa for maintaining proper oral hygiene (Figure:7)



Figure 7:

The bar and wax pattern of the copings were casted with base metal alloy (Bego Wirocast S, Bego, Germany) and the metal try in of the finished bar assembly was done in the patient's

mouth and the marginal fit of the copings and relationship of the bar with the underlying ridge was evaluated (Figure:8).

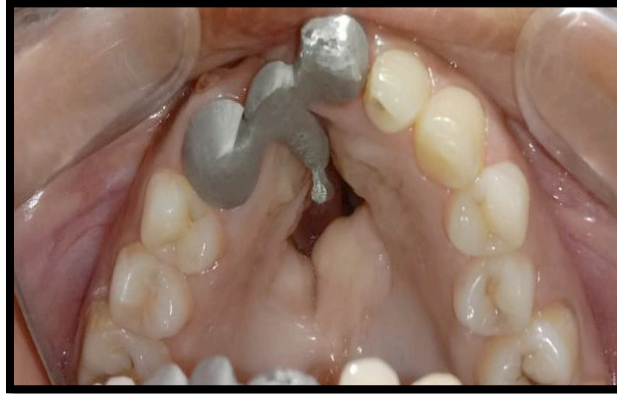


Figure 8:

After which the ceramic build-up of the metal coping was done (Figure:9&10). And the waxed-up obturator was processed conventionally with flasking, dewaxing, and

packing using heat polymerizing acrylic resin (Trevalon Denture Material, DENTSPLY India Pvt. Ltd., India) (Figure11).

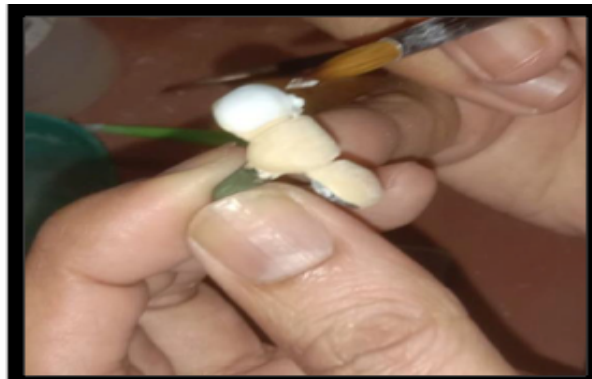


Figure 9:



Figure 10:

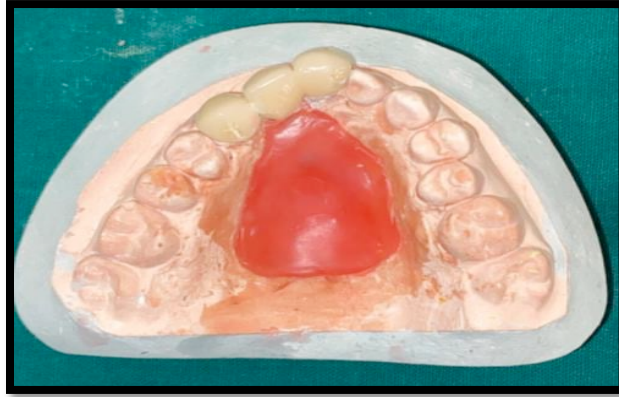


Figure 11:

Finishing and polishing of the obturator prosthesis were done. The header bar clip was picked up intra orally after the cementation of the crown(Figure:12). The obturator was then inserted into the patient's mouth after intraoral

adjustments (Figure:13). The patient was happy and satisfied with her improved function, speech, and aesthetics. The patient was instructed about the maintenance of the prosthesis and periodic recall check-up.

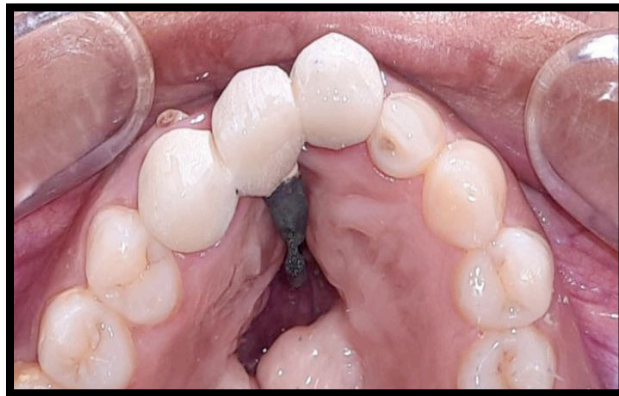


Figure 12:

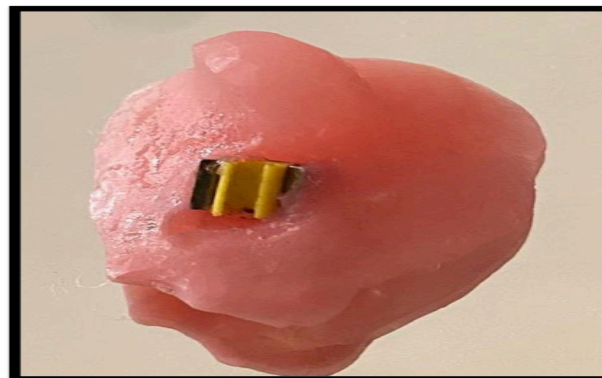


Figure 13:



Figure 14:

Discussion:

Obturator prosthesis plays a crucial role in the recovery of oral function in cleft patients.¹ The treatment of the patient in the current case report was performed with Tooth and Bar retained and supported obturator. By saving the natural teeth and fabricating a precision bar attachment retained prosthesis, there was improvement in the level of satisfaction of the patient due to increased retention (Figure:14).

The residual maxillary form (ie, amount and contour of the remaining palatal shelf, height of the residual alveolar ridge, configuration and size of the defect, availability of undercuts) affects the degree of obturator movement³. The position and periodontal status of abutment teeth are critical factors that contribute to the absorption of stress generated by functional movement of the obturator prosthesis and play an essential role in retaining and stabilizing the prosthesis⁷.

Attachments need to be resilient to accommodate obturator movement and

Conclusion:

Rehabilitating patients with a maxillofacial prosthesis require a good knowledge about material science, the anatomy of the defective area as well as skill of the prosthodontist as well as the laboratory technician. Considering

the socio-economic status and the clinical condition of the patient, it was decided to fabricate the precision attachment retained palatal obturator. The use of header bar clip further increased not only the retention of the denture but also the comfort of the patient.

References:

1. Singh M, Limbu IK, Parajuli PK, Singh RK. Definitive obturator fabrication for partial maxillectomy patient. *Case Reports in Dentistry*. 2020 Mar 21;2020:1-4.
2. Mirna G, Lokanath G, Aswini KK, Chittaranjan B. Prosthetic rehabilitation of a unilateral maxillary defect with an intermediate obturator. *Indian Journal of Dental Advancements*. 2010 Oct 1;2(4):378-83.
3. Murat S, Gurbuz A, Isayev A, Dokmez B, Cetin U. Enhanced retention of a maxillofacial prosthetic obturator using precision attachments: Two case reports. *European Journal of Dentistry*. 2012 Apr;6(02):212-7.
4. Brudvik JS, Taylor TD. Resin bonding for maxillofacial patient. In: Taylor TD, editor. *Clinical maxillofacial prosthetics*. Chicago: Quintessence; 2000.p.53-62.
5. Puryer J, Forbes-Haley C. An implant-retained obturator—a case study. *Dental Update*. 2017 May 2;44(5):415-22.

6. Srivastava N. A two-piece sectional definitive obturator: a clinical report. J Dent Health Oral Disord Ther. 2016;4:00132.
7. Grossmann Y, Madjar D. Resin bonded attachments for maxillary obturator retention: a clinical report. The Journal of prosthetic dentistry. 2004 Sep 1;92(3):229-32.
8. Aravind K, Jain AR. Precision Attachment Retained Palatal Obturator in A Completely Edentulous Patient: A Case Report. Biomedical and Pharmacology Journal. 2017 Dec 21;10(4):1925-31.
9. Trivedi MK, Guddu G, Daftary M, Devikaa TC, Chaudhary RK, Kumar P. Management of Maxillary defect via Obturator: A Case Report with Review of Literature. Turkish Journal of Physiotherapy and Rehabilitation.;32:3.
10. Singh K, Gupta N, Kapoor V, Gupta R. Hader bar and clip attachment retained mandibular complete denture. Case Reports. 2013 Oct 21;2013:bcr2013010401.
11. Bhandari AJ. Maxillary obturator. Journal of Dental and Allied Sciences. 2017 Jul 1;6(2):78.
12. Aramany MA. Basic principles of obturator design for partially edentulous patients. Part II: design principles. The Journal of prosthetic dentistry. 1978 Dec 1;40(6):656-62.