

Rehabilitation of a Palatal Defect with a Single Piece Obturator: A Case Report

Sanjeev Kumar Singh^{1*}, Pavithra K Devi², Aditi Kapur³, Ashima Goyal³

¹Assistant Professor, SMMH Govt. Medical College, Saharanpur, India

²Ex Junior Resident, Unit of Pedodontics and preventive dentistry, Oral Health Sciences Center, Postgraduate Institute of Medical Education and Research, Chandigarh, India

³Professor, Oral Health Sciences Center, Postgraduate Institute of Medical Education and Research, Chandigarh, India

DOI: [10.36348/sjodr.2023.v08i06.002](https://doi.org/10.36348/sjodr.2023.v08i06.002)

| Received: 29.04.2023 | Accepted: 10.06.2023 | Published: 14.06.2023

*Corresponding author: Sanjeev Kumar Singh

Assistant Professor, SMMH Govt. Medical College, Saharanpur, India

Abstract

The present case report describes the management of a 5-year-old male child with a palatal defect characterized by a type II cleft, which was managed with prosthetic rehabilitation using a single-piece obturator to reduce food regurgitation and improve speech.

Keywords: Children, Cleft palate, Obturator, prosthesis.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

The most common intraoral defect affects the maxilla leading to a nasopharyngeal opening. These defects can either be congenital or acquired and are usually large openings in the palate and the surrounding structures. Obturators seal these defects and restore proper mastication, speech, deglutition, and aesthetics. Maxillary obturator prosthesis is the most frequent treatment option for managing palatal defects. The obturators' heavyweight is frequently a dislocating issue. Hollowing out a prosthesis to minimize weight is a well-known fact.

The processing technique described is a single-step flasking procedure to construct a closed-hollow-obturator prosthesis as a single unit. A one-piece hollow bulb obturator can be fabricated by filling the hollow portion using materials such as sugar, salt, polyurethane foam, sponge, and gas injection using argon gas. A non-detachable screw cap can also cover the opening to pour the sugar or salt. The present case highlights the procedures for rehabilitating a palatal

deformity in a 5-year-old male with a single-piece hollow obturator. This article explains the treatment of a patient to comprehend the technique better.

CASE REPORT

A known case of group 2 cleft palate in a 5-year-old male child having difficulty feeding and speaking was referred from the plastic surgery department to the outpatient department of pediatric dentistry of our Institute. This child was scheduled for palatal defect closure at the age of seven. By then, an interim obturator was recommended for the child to perform his routine stomatognathic functions.

Intraoral examination

A 5cm x 4cm palatal cleft was present with a collapse of the anterior maxillary component. Besides the cleft, there were erupted 55 (right upper maxillary second molar) and partially erupted 65 (left upper maxillary second molar). A total component of deciduous mandibular dentition was also seen (Figure 1a, 1b).



Figure 1: (a) maxillary occlusal view (b) Frontal view

Fabrication of an obturator

Upper and lower alginate impressions were made and poured with type II dental plaster after a gauge piece was used to plug the cleft area. All the undercuts were blocked with wax, and the stress-bearing area was alleviated with wax, before a special tray was prepared (Figure 2a, 2b). The extent of the tray was checked, and a uniform depth of 2mm was assured. Following the border molding, a wash

impression was made using light body silicon, followed by a final pick-up impression using a stock tray with alginate as an impression material (Figure 2c). The master cast was retrieved after pouring the final impression with Type II dental plaster (Figure 3a). A maxillary model was made, with the two molars on either side of the arch providing the most support, stability, and retention.



Figure 2: (a) Primary cast (b) Custom plate fabricated (c) maxillary final pick up and mandibular alginate impressions



Figure 3: (a) Maxillary master cast (b) Wax Up done (c) Prepared hollow obturator

On the master cast, one layer of modeling wax was adapted on the entire defect surface. Three spaces were relieved in the wax at the roof of the defect to act as stoppers. The undercuts in the palatal deformities were sealed out with wax, and three tissue stops were created. A hollow bulb was formed using an auto-polymerizing resin.

A record base was made with auto-polymerizing acrylic resin (DPI RR Cold Cure; Dental Products of India, Mumbai, India), and the occlusion rim was fabricated with baseplate wax (Modeling wax; Deepti Dental Products, Ratnagiri, India) (Figure 3b), bite registration was performed after estimation of

vertical dimension and freeway space was calculated and articulated in an articulator.

Teeth arrangement and wax carving were completed, and wax try-in was done intraorally. The master cast was used to seal the waxed-up maxillary obturator, which was then placed in a base flask with type I gypsum plaster. By pouring type I gypsum material into a counter flask, the flasking procedure was completed in the usual manner. For 24 hours, the flask was held in place by a mechanical clamp. The flask clamp assembly was immersed in a de-waxing unit for 5 minutes at 920°C, and the dewaxing technique was performed conventionally. All the clasps were covered

in investing plaster except for the teeth and waxed-up part. Complete wax elimination was ensured from the cast and investing plaster surface.

After dewaxing, a hollow bulb fabricated with auto polymerizing was placed in the defect using stoppers as a guide, followed by heat cure acrylic resin was mixed and packed into the flask. The acrylic resin was processed, finished, and polished (Figure 3c).

DISCUSSION

The prosthetic rehabilitation of children with major palatal deformities is a significant challenge for a pediatric dentist. Retention is significantly impaired insignificant defects, resulting in speech and mastication issues. The hollow bulb obturator was described in the literature by Chalian and Drane, which bids many advantages of being light and minimizing the excessive atrophy of muscles [1]. The hollow bulb obturator can be fabricated using a variety of approaches.

LaFuente, in 1976, explained the technique where sugar was added during the processing of the obturator, which was later removed by drilling a hole, and the hole was filled with auto-polymerizing resin or by using a non-detachable screw cap [2]. In 1969, El Mahdy *et al.* explained the two-flask technique for fabricating a hollow bulb obturator where the obturator and tooth portion are cured separately [3]. It can be prepared in two halves and further sealed using self-cure or auto-polymerizing resin [4]. The other technique where argon gas was injected in the hollow bulb [5], use of a rigid thermoforming splint [6], use of plaster index as a matrix to fabricate the hollow bulb obturator.

Among the various techniques discussed above, the method given by Chalian *et al.* is being followed to date [1]. The two-piece obturator controls the obturator's thickness and weight and decreases the clinical time, whereas additional processing time and fluid seepage. These two-piece obturators are mainly used in significant defects with severe undercuts or reduced mouth opening.

Considering the advantages and disadvantages of two-piece obturators, it was decided to go for a

single-piece obturator. In the present case, fabrication was completed in one piece, which offers various advantages over other techniques, including being more hygienic, aesthetic, simple, and accurate, avoiding lines of demarcation between two types of resin, and improving speech by adding resonance.

The downsides of a one-piece obturator include more excellent processing time and increased prosthesis weight due to the use of a shim or polyurethane foam.

CONCLUSIONS

- Palatal defect closure with a hollow bulb obturator is a viable treatment option to restore form and function.
- Assists in improving the patient's facial profile, appearance, and speech.
- Patient can chew and swallow without regurgitation.

REFERENCES

1. Chalian, V. A., Drane, J. B., & Standish, S. M. (1972). *Maxillofacial prosthetics: multidisciplinary practice*. Williams & Wilkins Company.
2. Matalon, V., & LaFuente, H. (1976). A simplified method for making a hollow obturator. *The Journal of prosthetic dentistry*, 36(5), 580-582.
3. El Mahdy, A. S. (1969). Processing a hollow obturator. *The Journal of prosthetic dentistry*, 22(6), 682-686.
4. McAndrew, K. S., Rothenberger, S., & Minsley, G. E. (1998). An innovative investment method for the fabrication of a closed hollow obturator prosthesis. *The Journal of prosthetic dentistry*, 80(1), 129-132.
5. Iramaneerat, W., Seki, F., Watanabe, A., Mukohyama, H., Iwasaki, Y., Akiyoshi, K., & Taniguchi, H. (2004). Innovative Gas Injection Technique for Closed-Hollow Obturator. *International Journal of Prosthodontics*, 17(3).
6. Asher, E. S., Psillakis, J. J., Piro, J. D., & Wright, R. F. (2001). Technique for quick conversion of an obturator into a hollow bulb. *Journal of Prosthetic Dentistry*, 85(4), 419-420.