

CASE REPORT

Esthetic and Functional Rehabilitation of Maxilla with Multiple Palatal Defects using Speech Aid Prosthesis

¹Abhay Kant, ²Sudhakara G Bhat, ³Shivamurthy Shadakshari, ⁴Sanjayagouda B Patil, ⁵HS Kiran Kumar
⁶Blessy Joseph, ⁷A Tejaswini, ⁸Nivea T Francis

ABSTRACT

Introduction: The soft palate acts as a dynamic separator between the oral and nasal cavity. The soft palate, lateral and posterior pharyngeal walls form the velopharyngeal closure so that all of them create a three-dimensional muscular valve, which is known as velopharyngeal sphincter. When some or all of the anatomic structure of the soft palate is congenitally missing or developmentally defective, it is called as palatopharyngeal insufficiency. The palatopharyngeal obturator obturates the defect of the soft palate and maintains the contact of the prosthesis with the posterior and lateral walls of the pharynx. This in turn restores the function of the palatopharyngeal obturation.

Aim: The aim of this article is to describe a simple and convenient method to rehabilitate a patient with multiple palatal openings and defects using speech aid prosthesis.

Case report: A 45-year-old male patient reported to the Department of Prosthodontics, Sri Hasanamba Dental College & Hospital Hassan, Karnataka, India with complaint of difficulty in swallowing and speech. On intraoral examination, a large soft palate defect was evident extending up to hard palate and maxillary anterior vestibular defect and a fissure connecting them. Maxillary arch was completely edentulous except two teeth in the posterior region. A hollow bulb speech aid prosthesis was fabricated to rehabilitate the defect.

Conclusion: This palatopharyngeal obturator improved the speech intelligence and corrected nasal regurgitation. It also improved the masticatory efficacy and appearance of the patient. This in turn resulted in psychological improvement of the patient.

Clinical significance: A hollow bulb speech aid prosthesis is a good option for patients who are not willing to undergo surgery. It rehabilitates nasal regurgitation and speech intelligency.

Keywords: Anterior maxillary vestibular defect, Palatopharyngeal defect, Palatopharyngeal obturation, Speech aid prosthesis.

How to cite this article: Kant A, Bhat SG, Shadakshari S, Patil SB, Kumar HSK, Joseph B, Tejaswini A, Francis NT. Esthetic and Functional Rehabilitation of Maxilla with Multiple

Palatal Defects using Speech Aid Prosthesis. *Int J Oral Care Res* 2017;5(3):388-391.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

The soft palate acts as a dynamic separator between the oral and nasal cavity. The soft palate, lateral and posterior pharyngeal walls form the velopharyngeal closure so that all of them create a three-dimensional muscular valve, which is known as velopharyngeal sphincter. The closure pattern depends upon muscular activity and degree of contraction of sphincter muscles. Adequate velopharyngeal closure is required during swallowing and production of all consonants except for the nasal one.^{1,2}

When some or all of the anatomic structure of the soft palate is congenitally missing or developmentally defective, it is called as palatopharyngeal insufficiency. When the soft palate is of adequate dimension but lacks movement because of the disease, surgical intervention, trauma affecting the muscular and neurological capacity, the term "palatopharyngeal incompetence" applies.³

Normally palatopharyngeal sphincter remains open for normal nasal breathing but it closes during mouth breathing, swallowing, and speech articulation except the M and N words. It prevents nasal regurgitation during swallowing. Palatopharyngeal insufficiency (velopharyngeal insufficiency) leads to loss of speech intelligence, regurgitation of food into nasal cavity, difficulty to blow, whistle, suck, etc. Speech intelligence which is a very important factor for communication is also altered or defective when palatopharyngeal sphincter is defective, which leads to psychological trauma in the patients affecting social behavior and acceptance of patient.

Palatopharyngeal insufficiency can be managed by surgical intervention or prosthetic rehabilitation. In the early age group patients, it is managed by multispecialty approach, repeated surgeries may be required depending upon the quantitative defect. Surgical procedures like palatal pushback with pharyngeal flap and furrow palatoplasty can be performed.² However, when surgical procedure does not yield desired benefit, the prosthetic management of velopharyngeal insufficiency is carried

¹Private Practitioner, ²Professor and Head, ^{3,4}Professor, ^{5,6}Senior Lecturer, ^{7,8}Student

¹⁻⁸Department of Prosthodontics, Crown and Bridge and Implantology, Sri Hasanamba Dental College & Hospital, Hassan Karnataka, India

Corresponding Author: Abhay Kant, Private Practitioner Department of Prosthodontics, Crown and Bridge and Implantology, Sri Hasanamba Dental College & Hospital Hassan, Karnataka, India, Phone: +917406438348, e-mail: abhaykant289@gmail.com



Fig. 1: Anterior maxillary vestibular defect



Fig. 2: Posterior soft palate defect

out by means of a palatopharyngeal obturator (speech aid prosthesis).

The palatopharyngeal obturator obturates the defect of the soft palate and maintains the contact of the prosthesis with the posterior and lateral walls of the pharynx. This in turn restores the function of the palatopharyngeal obturation.

This case describes the management of multiple defect of completely edentulous maxillary arch except remaining two posterior most molars, one on each side of hard palate, a method by means of speech aid prosthesis.

CASE REPORT

A 45-year-old male patient reported to the Department of Prosthodontics, Sri Hasanamba Dental College & Hospital, Hassan, Karnataka, India with the complaint of difficulty in swallowing, speech, and mastication. On intraoral examination, there was a large soft palate defect extending up to posterior part of hard palate (Fig. 1). Second defect was in the right labial vestibular area extending from midline to the lateral incisor. From this defect a fissure-like deficiency extended posterior up to soft palate (Fig. 2). Maxillary arch was completely edentulous except 17 and 27 teeth, which were normal anatomical and in the mandibular arch 33, 41, 43, 45, and 48 teeth were present. History revealed congenitally multiple missing teeth in maxillary arch.

The treatment plan consisted of fabricating an intermediate palatopharyngeal obturator (speech aid prosthesis) with prosthetic replacement of missing teeth and transitional removable partial denture for the mandibular arch.

Both the anterior vestibular and posterior soft palate defects were covered with gauze piece to prevent the mushrooming of the alginate. Modeling wax was used to extend the stock tray to record the areas of soft palate and after blocking the undercut alginate impressions of both arches were made. Casts were poured with dental stone^{3,4}

and maxillary full coverage special tray was fabricated after covering teeth with sheet of wax and blocking the undercut. Mandibular special tray was fabricated with spacer in edentulous area for two-stage pickup impression. Maxillary special tray had two parts: Palatal part and pharyngeal extension.

First the special tray was checked intraorally for the extensions. Overextended areas were trimmed off. Border molding in the maxillary vestibular region was done using green stick compound. Labial vestibular defect area was recorded with the 5 to 6 mm extension of the green stick in the defect area. Initially impression compound was used to record the palatopharyngeal defect, which extended into the nasopharynx. This compound impression was refined repeatedly by softening in hot water. Borders of the defect opening were refined using green stick compound. Patient was asked to do right and left, up and down movements of the face to record soft palate movements. Patient was asked to say "ah," which caused the vibratory movement of the palatopharyngeal tissue. These movements were recorded in the impression.⁵ After recording the palatopharyngeal tissue, patient was asked to drink a sip of water to check swallowing. Patient was asked to say "mango" and "beep" to check the improvement in speech. Patient was asked to breathe through nose, keeping the mouth close to check the patency of the airway in relaxed conditions so that nasal breathing was possible. Prosthesis was molded accordingly until satisfactory results were achieved. After that reline impression was made with light body elastomeric impression material (Fig. 3).³ For the mandibular arch, border molding was done and final impression made with light body elastomeric impression material followed by pick-up impression with alginate (Fig. 4).

Jaw relations were recorded and teeth arrangement (Fig. 5) followed by try-in was done. Two clasps were placed one on each second molar. It was decided to fabricate the pharyngeal extension of the speech aid

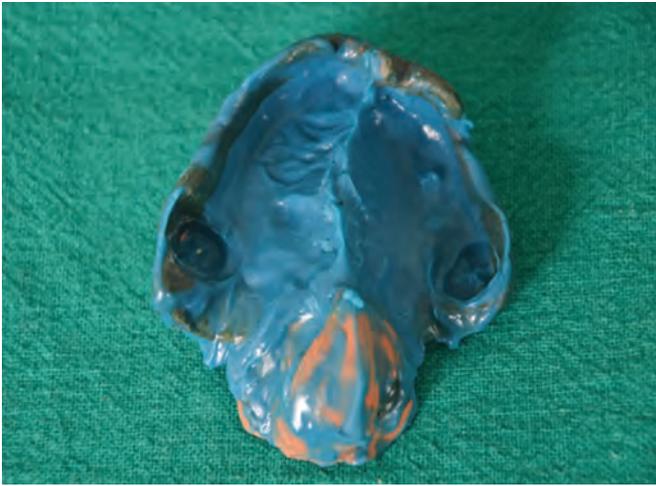


Fig. 3: Final maxillary impression

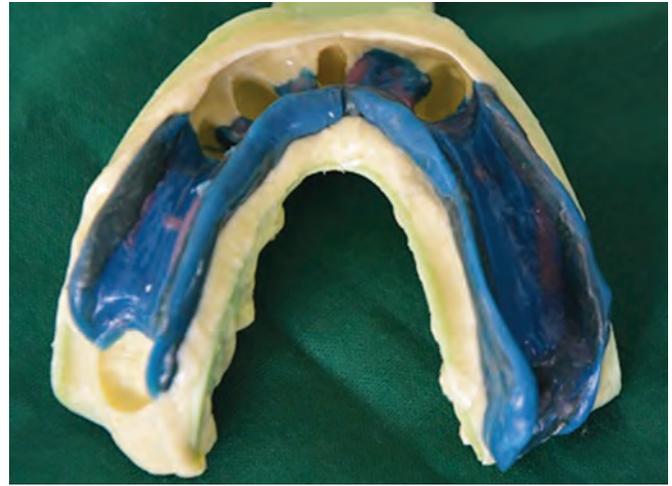


Fig. 4: Final mandibular impression



Fig. 5: Teeth arrangement



Fig. 6: Final prosthesis



Fig. 7: Obturation of anterior defect



Fig. 8: Obturation of posterior defect

prosthesis hollow to reduce the weight of prosthesis. For that purpose during waxing procedure, a step was made so that separate fabricated lid could be easily positioned on a predetermined position.

Prosthesis was fabricated using heat cure acrylic resin (Fig. 6) and was delivered to the patient and it was

confirmed that the anterior and posterior defects were obturated (Figs 7 and 8) and instructions regarding the maintenance of the prosthesis were given to patient. Follow-up was done after 24 hours and 3 days. Corrections in the prosthesis were done accordingly. After 1 week when the patient got adjusted with the prosthesis,



Fig. 9: Closed bulb using heat cure lid



Fig. 10: Postoperative view

a lid was attached over the pharyngeal extension of the prosthesis using self-cure acrylic resin (Fig. 9). The speech bulb prosthesis helped in great improvement of esthetics and confidence of the patient (Fig. 10).

DISCUSSION

Palatopharyngeal insufficiency causes major problems like nasal regurgitation and hypernasality. These problems require multidisciplinary approach including speech therapist and psychiatrist.

Implant retained overdenture and fixed partial denture options were given to patient but patient was not willing to undergo any surgical procedure or any modification of teeth. So we decided to fabricate interim/transitional partial denture prosthesis including obturation of maxillary defects.

Retention is always a matter of concern for the palatopharyngeal prosthesis especially in the case of completely edentulous maxillary arch. Proper adaptation of the prosthesis to the tissue, clasps encircling the maxillary second molar, and utilization of the undercut in the maxillary anterior vestibular region provided the required retention. Pharyngeal extension of the prosthesis could add extra weight to the prosthesis, which could cause downward movement of the prosthesis. To reduce the weight of the prosthesis, it was decided to fabricate a hollow bulb speech aid prosthesis.

A properly constructed speech bulb prosthesis not only replaced all the missing teeth, corrected the hypernasality and nasal regurgitation but also improved masticatory efficacy, speech, and appearance. Prosthesis improved the psychology and confidence of the patient for better social acceptability.^{4,5}

CONCLUSION

This palatopharyngeal obturator improved the speech intelligence and corrected the nasal regurgitation. It also improved the masticatory efficacy and appearance of the patient. This in turn resulted in psychological improvement of the patient.

REFERENCES

1. Ram HK, Shah RJ. A novel approach for velopharyngeal prosthetic rehabilitation: case series. *Int J Healthcare Biomed Res* 2013 Jan;1(2):70-76.
2. Tuna SH, Pekkan G, Gumus HO, Aktas A. Prosthetic rehabilitation of velopharyngeal insufficiency: pharyngeal obturator prosthesis with different retention mechanisms. *Eur J Dent* 2010 Jan;4(1):81-87.
3. Uphadhyay M, Jain D, Kumar S, Uppal S. Speech aid prosthesis. *BMJ Case Rep* 2013 Jul;2013:bcr2013010102.
4. Kahlon SS, Kahlon M, Gupta S, Dhingra PS. The soft palate friendly speech bulb for velopharyngeal insufficiency. *J Clin Diagn Res* 2016 Sep;10(9):ZD01-ZD02.
5. Varghese K. Prosthetic rehabilitation of a congenital soft palate defect. *J Indian Prosthodont Soc* 2014 Dec;14(Suppl 1):181-186.