

Prosthetic Management Of Velopharyngeal Defect – A Case Report

Abstract

Pharyngeal obturator prostheses restore the congenital or acquired defects of the soft palate and allow adequate closure of palatopharyngeal sphincter. A patient with soft palate defect and subsequent velopharyngeal insufficiency was rehabilitated using pharyngeal obturator prosthesis. Since it is necessary for swallowing and intelligible speech, the patients were examined in terms of adequate velopharyngeal closure after prosthetic treatment. The results were satisfying for the patients and physicians.

Key Words

Velopharyngeal Defect, Speech Aid Prosthesis, Speech Bulb

Introduction

The soft palate establishes separation between oral and nasal cavities.^[1] It moves in response to physiologic demand of speech, deglutition and respiration. The soft palate, lateral and posterior pharyngeal walls forms the velopharyngeal (VP) closure so that all of them create a three dimensional muscular valve which is known as VP sphincter.^[2] The VP closure pattern depends on the contraction degree of the sphincter components. Adequate VP closure is required during swallowing and production of all consonants except for the nasal ones.^[3] Impairment of VP function can be due to insufficiency or incompetency.^{[3],[4],[5],[6],[7],[8]} When some or all of the anatomic structure of the soft palate is absent, the term palatopharyngeal insufficiency applies.^[9] Whereas when the soft palate is of adequate dimensions but lacks muscular and/or neurologic capacity, the term palatopharyngeal incompetence applies.^[9] The term palatopharyngeal inadequacy includes incompetency and or in sufficiency but may also suggest a reduction or absence of pharyngeal wall function.^[9]

The primary effects of the VP insufficiency are air-flow escape and hypernasality.^{[10],[11]} VP insufficiency causes communication problems because of distortion in speech, resonance and articulation apart from swallowing disturbance.^{[11],[12]} In this regard, patients usually have psychological problems together with physical difficulties.

Surgery in combination with speech therapy is a common approach to the treatment of VP dysfunction.^{[6],[11]} There are several surgical procedures that can be performed to correct the physical malfunction. However, when surgical treatment is not considered as an option, prosthetic management of VP insufficiency is carried out by means of a pharyngeal obturator, whereas VP incompetence is traditionally managed by palatal lift prosthesis.^{[7],[8]}

A pharyngeal obturator is a removable maxillary prosthesis which has a posterior extension to separate oropharynx and nasopharynx.^[10] This obturator prosthesis restores the congenital or acquired defects of the soft palate and allows adequate closure of palatopharyngeal sphincter. The objectives of obturator are to provide the capability for the control of nasal emission and inappropriate nasal resonance during speech and to prevent the leakage of material into the nasal passage during deglutition.^[9]

Case Report

A seventeen year old girl reported to our clinic with chief complaint of speech difficulty and communication problems. She had a history of cleft of hard and soft palate. In her medical history, she had undergone surgical correction of cleft palate two years back. (Fig. 1) She was speaking with soft intensity to decrease hypernasalance. Speech evaluation was performed by speech pathologists that assessed resonance, the occurrence of

¹ Neha Mall

² Amit Garg

³ Aparna IN

¹ Senior Lecturer, Dept. of Prosthodontic
JCD Dental College, Sirsa

² Reader, Dept. of Periodontics
JCD Dental College, Sirsa

³ Professor & Head, Dept. of Prosthodontics
MCODS Manipal

Address For Correspondence:

Dr. Neha Mall (Senior Lecturer)
Department of Prosthodontics
Jan Nayak Choudhary Devlal Denatl College
Barnala Road, Sirsa- 125055 Haryana

Submission : 10th August 2013

Accepted : 7th January 2015

Quick Response Code



inappropriate nasal air emission, and articulation. (Fig. 2a, 2b)

The patient refused to undergo second surgery, therefore a pharyngeal obturator with clasp retention was planned for the patient. The impression of pharyngeal



Fig 1 : Velopharyngeal Defect



Fig 2 (a) : Speech Analysis



Fig 2 (b) : Speech Analysis



Fig 3 : Impression of the defect



Fig 4 : Wax Trial



Fig 5 : Final Prosthesis

bulb was made using putty elastomeric impression material (3M ESPE, St. Paul, USA) during the functional movements. The patient was instructed to flex the neck such that chin touches the chest. This movement will establish contacts of posterior aspect of obturator with the soft tissue covering the anterior tubercle of the atlas.^[9] Lateral aspects of obturator are formed by rotation and flexion of

neck. Patient is also asked to swallow. When border molding is complete patient's speech should sound normal and there should be no escape of water between oropharynx and nasopharynx. Then the final impression is made with light body elastomeric impression material. (Fig 3)

The framework with direct retainers on molar and premolar was fabricated. It consists of an extension on the pharyngeal part to support the acrylic bulb. The acrylic bulb was formed in wax, (Rolex, Ashoo Sons, Delhi, India) trial was done (Fig 4) and then it was fabricated with heat cure acrylic resin (Trevalon, dentsply, Gurgaon, India). The prosthesis was delivered to the patient with specific instruction for maintenance of the prosthesis. Speech pathologist assessed improvement in patient's speech after wearing the prosthesis. (Fig 5).

Discussion

Prosthetic rehabilitation of the patients suffering from VP deficits with obturator prostheses varies according to the location and nature of the defect or deficiency.^{[4],[5],[7],[8]} Pharyngeal obturator prosthesis may prevent the hypernasality and/or nasal emission associated with VP inadequacies.^{[5],[10]} In order to obtain adequate VP closure during speech and swallowing a posterior extension is added to prosthesis. An acrylic resin extension must be formed functionally. This extension must be in static contact with the soft tissues and must not affect the stability of the prosthesis.^{[11],[10]}

The success of the soft palate defect prosthesis depends on the functional adaptation of the impression material.^[13] In this case elastomeric material was used to record the impression of the defect. High fusing compound, intra oral waxes can also be used for making impression.

Since the patient had complete maxillary dentition, direct and indirect retainers were used for retention. In case of partial or completely edentulous arches, the acrylic bulb can be a part of the partial or complete denture, however obtaining retention and stability can be difficult due to the weight of the prosthesis.^[10] Dental implants have great importance for these patients.

The treatment of VP insufficiency

requires multidisciplinary approach. Accordingly, a speech pathologist should participate in treatment of these cases to test articulation errors and inappropriate oro-nasal resonance balance.^[7] Perceptual and instrumental measures of hypernasality and nasal escape along with a profile of the patient's articulation provide the diagnostician information about the frequency and consistency of VP insufficiency. These measures, however, provide only limited information about the functioning of the VP mechanism. The use of multiview videofluoroscopy (MVF) and/or nasendoscopy (NE) may contribute to the diagnostic confirmation of the assessment of velar mobility, pattern of velar elevation, size of residual VP gap and lateral pharyngeal wall displacement while the patient is producing a standardized sample of connected speech. It may also contribute to the assessment of treated patients with VP insufficiency.^[14] In present cases, no nasopharyngoscopic evaluations were made. However instrumental measures showed improvement in hypernasality of the patient.

Conclusion

In this report patient with soft palate defect was successfully treated by pharyngeal obturator. Success of such treatment largely depends on patient's motivation and cooperation and ability to adapt with the prosthesis.

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Source of Support : Nil, Conflict of Interest : None declared