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## Case Report

# Management of a case of velopharyngeal insufficiency with multidisciplinary approach



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## Introduction

Rehabilitation of a patient with resection of palate is a real prosthodontic challenge. Abnormalities of the soft palate may be due to congenital, acquired or developmental defects. Defects are classified based on the anatomy and physiology of the supporting structures.<sup>1</sup> Velopharyngeal (VP) dysfunction may occur either as insufficiency or incompetence. VP insufficiency means speech abnormalities related to a congenital or acquired anatomic defect of the soft palate whereas in VP incompetence, the palate is intact and speech aberration is related to some neuromuscular disorder.

VP insufficiency and VP incompetence usually affect the speech of the patients. The speech is characterized by nasal resonance, improper audible nasal air emission and a decrease in intra-oral air pressure during the production of oral speech sounds. The speech is only partially intelligible

and the management involves a multidisciplinary approach. The prosthodontic rehabilitation of velopharyngeal insufficiency involves obturation of the palatal defect with speech bulb prosthesis augmented with speech therapy.<sup>2,3</sup>

## Case report

A 20 year female patient reported with chief complaint of difficulty in normal speech with nasal sound in her voice. Medical and dental history revealed that she had undergone multiple surgical procedures for rehabilitation of her congenital cleft lip and palate. Extraoral examination revealed straight profile with well healed scar in the philtrum region due to surgical correction of cleft lip. Intraoral examination revealed missing 11, 12, 13, 14, 18, 22, 38 & 48 with transposition of 23 and 24. Soft palatal defect was present with missing uvula and a small incomplete cleft present in the palate [Fig. 1]. Defect was involving the premaxilla and a major portion of the soft palate. The patient was not able to speak normally and words were not recognizable. A multidisciplinary team approach was carried out with evaluation/suggestions from other specialists including otolaryngologist. Speech evaluation was performed by speech pathologists that assessed resonance, the occurrence of inappropriate nasal air emission, and articulation. Based on history, clinical findings & radiographic examination, diagnosis of velopharyngeal insufficiency was made. Prosthodontic rehabilitative treatment plan was formulated to give palatal speech bulb prosthesis for the patient with replacement of missing 11. There was no space available for the replacement of 12, 13, and 14 & 22. Treatment sequence involved making of diagnostic impressions for evaluation,

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**Fig. 1 – Pre-op intraoral view.**

surveying and treatment planning. Mouth preparation was carried out involving oral prophylaxis, restorations of carious teeth and preparation of rest sets on 16 & 17 and 26 & 27. Impression of the maxillary arch was made using elastomeric impression material (3M, Germany) and master cast retrieved in die stone (Kalabhai, India) [Fig. 2]. Surveying and designing was carried out on the master cast for cast partial denture with replacement of missing 11 and metal loop extension extending towards the soft palatal defect region [Fig. 3]. The selected design was palatal plate major connector with embrasure clasps on 16, 17, 26 & 27 with additional rests on anterior 21 & 23. Subsequently the master cast was duplicated and cast partial denture framework fabricated in Co–Cr alloy (Wironit, Bego, Germany) following manufacturers recommendations. Impression of soft palate defect was made utilising cast metal framework. The patient was made to perform various functional movements involving bending of head in various guided positions and make functional movements like swallowing, sipping of water & speaking aloud. The patient was asked to move her head in a circular manner from side to side, to extend

her head as far forward and backward as possible and to say ‘ah’ and swallow. Initial molding was done with low fusing impression compound (DPI Pinnacle tracing sticks, DPI, India) and final correction with mouth temperature wax (corrective impression wax, MP Sai Enterprise, Mumbai, India). The impression was then sent to dental laboratory for fabrication of speech bulb prosthesis with replacement of missing 11. The processed prosthesis was then inserted in patient's mouth [Fig. 4]. The patient was evaluated by otolaryngologist for the correct extensions of the prosthesis and speech evaluation. Fiber optic nasopharyngoscopy was used to visualise the back of the nose for velopharyngeal function. This also involved looking at the back of throat while patient is speaking in order to see how the muscles of the throat work during speech. To prevent discomfort during the nasopharyngoscopic examination, anesthetic drops were placed in one side of the nose. A very small, flexible telescope is gently placed in the nose in order to see the back of the throat. Patient was also asked to say a few words of sentences with the telescope in place. Modifications were made in the extensions after nasopharyngoscopy evaluation [Fig. 5]. Over extensions were rectified as per the suggestions of otolaryngologist and again verified by nasopharyngoscopy till the desired extensions were achieved. Subsequently the patient was also evaluated by the speech therapist. The patient was counseled and trained over a period of time to how to use and speak with the prosthesis in mouth. Consolidated effort of the multidisciplinary team led to a marked improvement in the speech of the patient. The speech improvement was confirmed by a speech pathologist so that the patient's facial grimaces were disappeared and articulation of the explosive consonants such as “p”, “b”, “g”, “t”, and “d” was corrected. During two years of follow-up period, patient was satisfied with the use of the prosthesis and also expressed her social and psychological satisfaction.

## Discussion

Palatopharyngeal dysfunction generally take place when palatopharyngeal port is not able to carry out its own closing action due to a lack of tissue (palatopharyngeal insufficiency) or lack of proper movement (palatopharyngeal incompetence) as associated with neuromuscular disorders. To assess the



**Fig. 2 – Final impression and master cast.**

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