

Prosthetic Approach in the Management of Cleft Palate with a Velopharyngeal Connection – A Case Report

Dr. Jithin GN*, Dr. Amalorpavam, Dr. T Sreelal, Dr. Aparna Mohan, Dr. Giri Chandramohan, Dr. Allen Jim Hines
Department of Prosthodontics and Crown and Bridge, Sree Mookambika Institute of Dental Sciences, Kulasekharam, Tamil Nadu India

*Corresponding author: Dr. Jithin GN
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Abstract

Maxillectomy is one of the most common procedures performed by oral and maxillofacial surgeon. Various classification systems exist in literature to describe the surgical defect, left behind after maxillectomy. Success in Maxillofacial defects depends on the principles of facial harmony, retention, durability, tissue compatibility & tolerance. The Velopharynx is tridimensional muscular valve located between the oral and nasal cavities, consisting of lateral and posterior pharyngeal walls and the soft palate & controls the passage of air. Cleft palate is the most common cause of velopharyngeal insufficiency. Velopharyngeal insufficiency may take place when the velopharyngeal valve is unable to perform its own closing, due to lack of tissue or lack of proper movement. Treatment options include surgical correction, prosthetic rehabilitation & speech therapy; though optimal results often require a multidisciplinary approach for the restoration of anatomical and physiological defects. This article is a case report of the treatment procedure done for a young patient with cleft palate and velopharyngeal insufficiency.

Keywords: Cleft palate, Velopharyngeal defect, Prosthetic rehabilitation, Titanium CPD with obturator.

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INTRODUCTION

Maxillofacial prosthetics is the art and science of anatomic, functional or cosmetic reconstruction carried out by means of nonliving substitutes of those regions in the maxilla, mandible, face & even other body parts that are missing or defective because of surgical interventions, trauma, pathology or developmental or congenital malformations [1]. The Maxillofacial Prosthodontist normally provides appliances and devices to restore aesthetics and function to the patients, who cannot be regain normal appearances or functions by means of plastic reconstructions. Movements of the posterior pharyngeal wall would blend with the movements of lateral pharyngeal walls and elevation of the soft palate. A complete or nearly complete velopharyngeal closure would be required for normal deglutition and the production of some speech sounds [5].

Aramany's Classification for Maxillectomy Defects

Aramany presented a classification system for maxillectomy defects in 1987. He divided these defects into 6 categories, based upon the relationship of the defect with the abutment teeth.

Class I: The resection is performed in the anterior midline of the maxilla, with abutment teeth present on one side of the arch.

Class II: The defect in this group is unilateral, retaining the anterior teeth on the contralateral side.

Class III: The palatal defect occurs in the central portion of the hard palate and may involve part of the soft palate.

Class IV: The defect crosses the midline and involves both sides of the maxilla, with abutment teeth present on one side.

Class V: The surgical defect is bilateral and lies posterior to the abutment teeth. Labial stabilization may be needed.

Class VI: Anterior maxillary defect anterior with abutment teeth with abutment teeth present bilaterally in the posterior segment.⁴

Case Report

A 35 year old female patient reported to the Post graduate clinic of Department of Prosthodontics, Sree Mookambika Institute of Dental Sciences, Kulasekharam, Kanyakumari District, with the complaint that while having food it enters her nose, she has nasal sound while speaking and that she has missing teeth. She also complained of mobile teeth in lower front tooth region since 5years. Nothing relevant was reported in Medical & Personal history. On examination of Dental history, she told she had cleft lip surgery in

her childhood (Fig-10). On extra oral examination, there were no gross facial asymmetry, on TMJ examination there was no clicking but there was mandibular deviation to the right side. On palpation, lymph nodes were non-tender but both submandibular lymph nodes were palpable. Intra oral examination revealed cleft palate in the central portion of the hard palate involving the soft palate and extending to the uvula suggestive of Aramany's class III maxillary defect. On soft tissue examination, gingiva was soft & edematous and no abnormalities were detected on the labial mucosa, buccal mucosa, tongue and floor of the mouth. On hard tissue examination grade III mobility of 12,16,17,24,25,26,31,32,34,35,42,43,44,45 & 46 grade II mobility of 14,18,22,27,28,33,36 & 37 grade I mobility of 13 & 38 were present (Fig-1). There was missing 11, 21 & 41. Dental caries was present on 16, 27, 28, 37 & 46. Patient was asked to obtain opg before treatment planning. Opg revealed generalized bone loss. Patient was advised:-

- To get periodontal opinion of all remaining teeth in the oral cavity.
- Oral Prophylaxis.
- Extraction of all periodontally compromised teeth with poor prognosis.
- Restoration of Carious teeth.
- Prosthetic rehabilitation of missing teeth and cleft palate (involving central portion of hard palate including soft palate and uvula).

Patient was referred to Department of Periodontics, Oral & Maxillofacial Surgery & Conservative and Endodontics for treatment. Patient reported after completing all other treatment. For obtaining impressions, the palatal portion of the stock tray should be extended with wax. Diagnostic Impression was made for planning the treatment.

Options of surgical correction of the cleft palate was discussed with patient & oral surgery department. Patient was not at all willing for surgical correction. After clinical case discussion of all the options of treatment a titanium cast partial denture with hollow bulb obturator and velopharyngeal extension in maxillary arch & cobalt chromium cast partial denture in the mandibular arch was finalized for the patient. Patient duly informed about the treatment plan and the cost of the treatment. She was very cooperative and accepted the treatment plan. Preprosthetic mouth preparation done. Impressions were taken (Fig-2). Cast fabricated. Master cast were send to dental lab for fabrication of metal framework. Metal framework try in done, occlusal rim fabricated and bite registration & teeth selection completed (Fig 3, 4 & 5). Articulation and teeth setting completed and try in done (Fig 6). After this a hollow bulb obturator with velopharyngeal extension was fabricated and attached during the lab procedures of wax up, investing dewaxing and packing of maxillary titanium cast partial denture. Along with that acrylisation, curing, finishing trimming & polishing of maxillary and mandibular cast partial denture completed (Fig 7 & 8). A titanium cast partial denture with hollow bulb obturator (Fig 9, 10 & 11) a velopharyngeal extension or speech bulb will be added in maxillary Titanium CPD at a later stage which will complete the treatment and cobalt chromium cast partial denture for mandibular arch was inserted. Patient was satisfied with her appearance & she was able to have food, as the communication created due to cleft palate was successfully closed with the obturator. Speech will be reestablished in the next phase of treatment which will be completed with the speech bulb extension. Patient was informed in detail about the treatment plan. She was very cooperative and was absolutely satisfied with the treatment plan.



Fig-1: Pre Operative intra oral view



Fig-2: Impression



Fig-3: Maxillary Titanium framework with wax bite



Fig-4: Jaw relation



Fig-5: Intra oral view



Fig-6: Try in



Fig-7: Finished Maxillary and mandibular partial denture with Maxillary hollow obturator



Fig-8: Finished Maxillary and mandibular partial denture with Maxillary hollow obturator



Fig-9: Cast partial denture in situ



Fig-10: Pre operative



Fig-11: Post operative

DISCUSSION

Velopharyngeal insufficiency or incompetency may result from:-

- Congenital malformations like Cleft palate
- Developmental aberrations
- Acquired neurological deficits
- Surgical resection of neoplastic disease [2]

This particular patient had a congenital cleft palate from the central portion of hard palate involving the soft palate and extending to the uvula, (Class III cleft). An Obturator prosthesis is a covering prosthesis, which reestablishes the oronasal partition [5]. Objectives of Obturation are:-

- To provide the capability for the control of nasal omission during speech.
- To prevent the leakage of material into the nasal passage during deglutition.
- Movement of lateral and posterior walls & movement of residual soft palate are essential for rehabilitation [3].

The obturator should be placed at or just above the level of palatal plane. If it is placed above the level of pharyngeal wall movement, it will occlude with the nasopharynx resulting in difficulty in nasal breathing and hypo nasal speech. If obturator is placed too low to the oropharynx, tongue function will be disrupted and gagging may be precipitated. Pharyngeal Obturator prosthesis restore the congenital or acquired defects of soft palate and allow adequate closure of palatopharyngeal sphincter [1].

Titanium Cast partial denture with hollow bulb obturator was chosen for this particular patient because:-

- Of the light weight of titanium
- Cast partial denture was an ideal treatment option of patient with some periodontally compromised teeth.
- Hollow bulb Obturator was chosen due to reduced weight of the prosthesis making it comfortable and efficient. The lightness of the prosthesis changes one of the fundamental

problems of retention & it increases physiological function.

CONCLUSION

In this report, a successful treatment for a patient with cleft palate & velopharyngeal insufficiency is explained. Treatment plan will be completed when a speech bulb extension will be added at a later stage of treatment which will completely reestablish the speech of the patient. Patient's aesthetics and function has been restored with the Titanium CPD with hollow bulb obturator in maxillary arch & cobalt chromium CPD in mandibular arch. Prosthetic rehabilitation of maxillofacial defects is a fast developing field, which gives excellent aesthetic & harmonial functional treatment options for both patients and maxillofacial prosthodontists. A satisfied & happy patient explains a successful Dentist.

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