



PROSTHODONTIC MANAGEMENT OF COMPLETELY EDENTULOUS PATIENT WITH CLEFT PALATE USING SPEECH BULB PROSTHESIS: A CLINICAL REPORT

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Article Received on 09/12/2021

Article Revised on 30/12/2021

Article Accepted on 19/01/2022

ABSTRACT

The cleft lip and palate represents the second most frequently occurring congenital deformity. Early intervention and recent improvements in surgical and orthodontic procedures ensures the closure of defect. But for those where surgical treatment is inadvisable need prosthodontic management to restore the dentition, speech rehabilitation including velopharyngeal function and to improve the esthetics. A speech appliance may prevent the hypernasality and/or nasal emission associated with Valvopharyngeal inadequacies This clinical report describes comprehensible technique for the prosthodontics rehabilitation of a completely edentulous patient with cleft palate, using a speech-aid prosthesis.

KEYWORDS: Cleft palate, speech aid prosthesis, prosthodontic rehabilitation.

INTRODUCTION

The maxillofacial prosthodontist is often involved in the habilitation and rehabilitation of speech.^[1] The cleft lip and palate represents the second most frequently occurring congenital deformity, after clubfoot deformity.^[2,3] Prosthodontic treatment of patients with orofacial clefts involves the restoration of dentition, speech rehabilitation, including velopharyngeal (VP) function; and improved esthetics. The VP valve mechanism regulates nasal resonance during speech and nonspeech oral activities such as swallowing, blowing, sucking, and whistling.^[4]

Impairment of VP function can be due to insufficiency or incompetency. VP insufficiency is distinguished by speech and nasal resonance abnormalities related to defects of the soft palate, which may be congenital as in cleft palate or acquired as in palatal tumor resection. VP incompetence describes dysfunction of an anatomically intact VP mechanism as in patients with neuromuscular disorders.

Although cleft palate patients are not regularly seen in general dental practice, the number of such patients is not negligible.^[5] Early intervention and recent improvements in surgical and orthodontic procedures

have decreased the need for prosthodontic management of patients with a cleft lip and palate.^[6,3]

But surgery may not be possible or practical for numerous clinical situations. These include: (1) advanced cardiovascular or neurologic diseases (cerebral palsy, postcerebrovascular accidents); (2) biomechanical limitations for surgery (cervical spine deformities, limitation of mandibular opening or microstomia); (3) anomalous medical deviation of the internal carotid arteries,(4) presence or risk of obstructive sleep apnea; and (5) patients refusing surgery because of psychological reasons (fear) or economic restraints.^[7,4]

In these instances, prosthetic treatment combined with speech therapy may be the treatment of choice. Prosthetic management of VP insufficiency may be accomplished using speech-aid prostheses (SAPs).^[1] A speech appliance may prevent the hypernasality and/or nasal emission associated with VP inadequacies. With a speech appliance in place, the patient can exhibit adequate airtight separation between the oral and nasal cavities during production of pressure consonants or while blowing with variable intensity.^[8,4] In addition, the appliance permits the levator veli palatini muscle to perform VP closure as well as facilitate changes in

relation to oral air pressure during blowing as in normal speakers.^[9, 4]

Patients who have not received surgical or orthodontic care early in life are the most challenging patients to manage prosthetically later in life.^[10]

This clinical report describes the prosthodontics rehabilitation of a completely edentulous patient with cleft palate, using a speech-aid prosthesis to treat the VP insufficiency.

CASE REPORT

A 53 years old female patient was referred to the department of prosthodontics with the chief complaint of missing teeth in upper and lower regions of the jaw and dysfunctional speech. On examination the patient has oronasal communication existing since birth, and this defect was not surgically treated. The cleft of soft and hard palate (Veau's classification—group II) led to velopharyngeal incompetence (**Fig.1 and 2**). Surgical treatment option was eliminated considering age, systemic health and economic status of the patient. Therefore, complete maxillary and mandibular dentures with speech bulb prosthesis was planned to meet the esthetic and functional requirements of the patient.

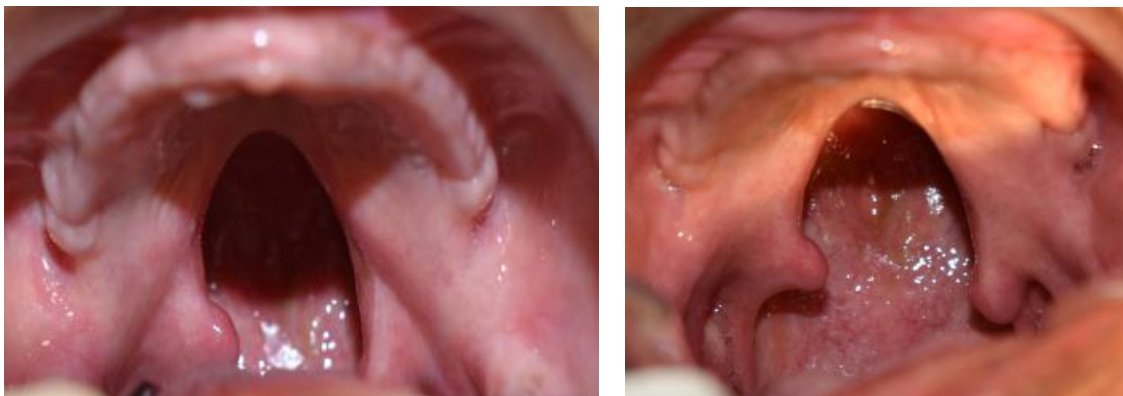


Fig. 1 and 2: Intraoral photograph of the defect.

Primary impressions were made using impression compound. The upper tray was extended using autopolymerising resin (DPI RR COLD CURE, INDIA) to record the defect area using admix material

(combination of impression compound and low fusing green stick compound in the ratio of 3:7) (**Fig 3 and 4**) and primary cast was poured. (**Fig 5**)



Fig 3

Fig 3: Modified stock tray to make preliminary impression.



Fig 4

Fig 4: Preliminary impression.



Fig 5: Primary Cast.

The special trays were fabricated with auto-polymerizing acrylic resin to make a final impression. The upper special tray was having pharyngeal extension for making the final impression of the defect area.

The tray was border molded using green stick impression material(DPI PINNACLE TRACKING STICKS)and defect area was recorded once again using admix material. 1 mm of admix material is scrapped off and the final impression of defect with light body polyvinyl

siloxane(AFFINIS LIGHT BODY- COLTENE) was made and master cast was poured.(Fig 6)

Final impression was accomplished by recording all the functional movements of the soft palate, that is, by asking the patient to tilt her head side-to-side and front-back when sitting upright and also by asking the patient to do various activities such as speech, swallowing, and nasal breathing. Nasal airflow was used as an index of success of prosthetic management of the patient.



Fig 6: Master cast and denture base were fabricated precluding the defect area.

Maxillomandibular relations were obtained and artificial teeth arrangement was done.(Fig.7) Dentures were fabricated in conventional method.

The retention and stability of the speech bulb prosthesis, its extensions, speech and occlusion were evaluated. Oral hygiene instructions were given and patient was recalled after 24 hours, first week, and first month following insertion of the prosthesis. The patient has been wearing the prosthesis for 2 years and the patient found considerable improvement in speech and esthetics.



Fig 7: Try in of the prosthesis.

DISCUSSION

Patients with unrepaired cleft defects of the hard and soft palate represent a significant psychosocial as well as technical challenge in terms of treatment, especially when they present with an edentulous maxillary arch.

Speech-aid prostheses are removable prostheses usually required to restore an acquired or congenital defect of the soft palate, with the central component extending into the pharynx to separate the oropharynx and nasopharynx, thereby allowing completion of the palatopharyngeal sphincter. Effective speech-aid prostheses must have adequate retention and stability to improve speech, deglutition, mastication, and appearance.

Prosthetic rehabilitation of soft palate disorders and defects has relied traditionally on functional contouring of prostheses using functionally adapted impression materials. For contouring the defect portion various materials are recommended by different authors, Beumer *et al* in 1996 described the use of modeling compound, Harrison in 1992 added impression wax to the modeling compound surface and Keyf *et al.*, 2003 described the use of zinc oxide–eugenol impression material to make a functional impression. Recently, elastomeric impression materials such as polysulfide by Harrison, 1992 and polyvinylsiloxane by Abreu *et al.*, 2007 have been used in final impressions of Cleft lip /palate patients. With these materials, the dimensional accuracy is usually time dependent.^[4]

In the present case, the final impression was made with polyvinylsiloxane impression material. As it undergoes the least amount of dimensional change on setting of all elastomeric materials (<0.1%), allowing it to be poured for up to 1 week after the impression is made, and it will also allow repeated pours.

The final impression should be examined for contact with the pharynx bilaterally and posteriorly. The acrylic resin extensions are functionally formed so that the soft tissues make intimate static contact but do not tend to displace the obturator.^[4,11] Basically, these prosthetic ‘aids to speech’ serve to obdurate any opening or cleft of the palate.

In the present case, no objective measurements were made, such as nasometric data and/or voice change in association with placement of the speech-aid prosthesis. Speech assessments were made subjectively. The patient demonstrated a significant improvement in speech ability and overall the esthetic outcome was satisfactory.

CONCLUSION

This clinical report described the comprehensible technique for recording the defect area and fabricating the speech bulb prosthesis to treat the valvopharyngeal insufficiency of the cleft palate patient.

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