Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 12, pp.63499-63501, December, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

CASE STUDY

FABRICATION OF PROVISIONAL PALATAL LIFT PROSTHESIS WITH ALTERED CAST TECHNIQUE IN A PRIMARY DENTITION

***Dr. Neha Liya Bipinchandra, Dr. Satyaprakash Shah, Dr. C. Sabarigirinathan, Dr. A. Minakshi and Dr. C. Selvamani**

Department of Prosthodontics, GDC, Ahmedabad, Gujarat

ARTICLE INFO

Article History:
Received 18th September, 2017
Received in revised form
03rd October, 2017
Accepted 14th November, 2017
Published online 31st December, 2017

Key words:
Palatal lift prosthesis, Velopharyngeal incompetency, Altered cast technique, Provisional palatal lift prosthesis, Palatal lift appliance.

ABSTRACT

Velopharyngeal inadequacies present since birth are typically associated with hypernasality in the speech, which can be dramatically affect the psychosocial life of the child. The constant connection between the oral and nasal cavities affects speech interpretation, produces hypernasality due to nasal air emission. The contact between the extended palate and tongue produces compensatory articulation. In such cases palatal lift prosthesis is recommended. This prosthesis is simple and efficient in controlling the nasal air leak. Concomitant speech therapy is necessary for patients receiving palatal lift. This paper presents a case of a child having palatal incompetency managed with the provisional palatal lift prosthesis (since there is only primary dentition for the support) and simultaneous speech therapy.

Citation: Dr. Neha Liya Bipinchandra, Dr. Satyaprakash Shah, Dr. C. Sabarigirinathan, Dr. A. Minakshi and Dr. C. Selvamani, 2017. "Fabrication of provisional palatal lift prosthesis with altered cast technique in a primary dentition", *International Journal of Current Research*, 9, (12), 63499-63501.

INTRODUCTION

Velopharyngeal deficiencies can be classified depending on the physiology and/or structural integrity of the palate. These deficits can be palatal insufficiency and palatal incompetency. Although these terms are replaced with the one another most of the time, they are actually different. Palatal insufficiency defines the patients with insufficient length of the hard and/or soft palate to achieve velopharyngeal closure, but the remaining tissues move within normal physiological limits. This kind of defect is secondary to a structural limitation. For example, patients with congenital and developmental aberrations like cleft palate and acquired soft palate defects would fall into this category. Whereas palatal incompetence defines to patients with completely normal velopharyngeal structures, but the intact mechanism is unable to achieve velopharyngeal closure. Examples are patients with neurological diseases (bulbar poliomyelitis or myasthenia gravis), or neurologic deficits secondary to cerebrovascular accidents or closed head injuries (Beumer *et al*., 1996). Gibbons and Bloomer (1958) first proposed the concept of palatal lift prosthesis, which is being used till date in case of velopharyngeal incompetence exhibiting compromised motor function of the soft palate.

Corresponding author:* **Dr. Neha Liya Bipinchandra,
Department of Prosthodontics, GDC, Chennai, Tamilnadu, India.

The main aim of this prosthesis is to gently push the soft palate in upward direction, to the level of normal palatal elevation and to produce closure by posterior and lateral pharyngeal wall action. When the soft palate is elevated the superior constrictors move medially to contract and press the lateral portion of the elevated soft palate bilaterally. Thus achieves velopharyngeal closure in case of velopharyngeal incompetency.

Case report

Parents of a 5 years old male child came to the department of prosthodontics of government dental college and hospital Chennai, with the complaint of hypernasal speech. On further evaluation it was found that the he was having hypernasality along with disarticulation since birth. The parents were worried because the child was getting teased by others. Medical history revealed that patient was also having night blindness which was found to be due to Oguchi disease, also known as congenital stationary night blindness. On intra oral examination it was found that the child was having normal anatomy of the hard and soft palate. (Figure 1) Soft palate was showing markedly reduced mobility. The patient was having velopharyngeal incompetency, causing air to leak through nasopharynx and producing hypernasality in the speech. Patient was having all deciduous teeth. So for this case sequential elevation of the palate with provisional palatal lift

prosthesis was planned. He was also planned to refer to Speech pathology centre of Madras medical college and hospital for concomitant speech therapy.

Figure 1. Intra oral view of the patient with velopharyngeal incompetency

Method of fabrication

The preliminary impression was taken with the help of alginate (Vignette alginate chromatic, Dentsply, India). Cast was poured with type III dental stone (Kalstone, Kalabhai & Co., Mumbai, India). The diagnostic cast was retrieved from the impression and used for fabrication of the wire loop extension for the palatal lift prosthesis. For fabrication of the wire loop on this diagnostic cast, Adam's clasps were constructed on maxillary first molars and C clasps were constructed on the maxillary canines bilaterally. Thus self cure acrylic framework was made and tried in the patient's mouth. The wire loop was constructed to cover the anterior two-thirds of the soft palate. (Figure 2)

Figure 2. Tray with Adam's, C - clasp and wire loop

The angle of the loop was corrected to achieve the desired lift. Softened Green stick compound (DPI, Pinacle, tracing sticks) was added inside the loop and tempered. Then the tray was inserted in the mouth. Patient's head was kept such that the Frankfort horizontal plane is 30˚ below the horizontal plane. Patient was asked to turn his head alternatively towards right and left side and also to extend his or her head forward and backward to record the lateral and posterior pharyngeal muscle. Green stick compound was added on the tissue side of the wire loop until the appropriate displacement of the soft palate was achieved. The matte appearance of the green stick compound suggested tissue contact. Speech was monitored for appropriate nasal resonance during the each step as it is a good indicator of the effective lift. (Figure 3)

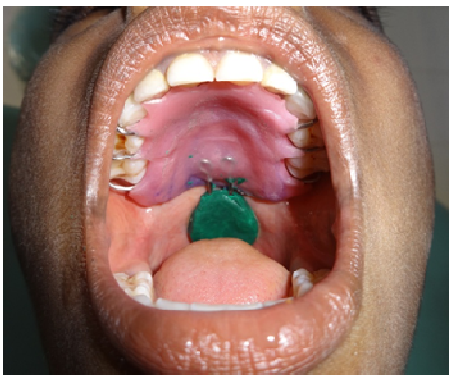

Figure 3. Moulding done with stick compound

After achieving the desired amount of lift, the appliance was kept on the cast for the fabrication of altered cast. (Figure 4a) Beading (2GM beading wax) and boxing of the loop portion was done. (Figure 4b) In that portion type 4 dental stone (Die stone, Pearl Stone, India) was poured to make an altered cast. The altered cast was retrieved. (Figure 4c and 5a) Green stick compound was removed from the loop portion and replaced with clear autopolymerizing resin (DPI Dental products of INDIA, Bombay). (Figure 5b, 5c) After finishing and polishing the prosthesis was inserted. (Figure 6a, 6b) The resin was adjusted with help of disclosing paste, to avoid contact with the lateral and posterior walls when the patient said "ah". Breathing, swallowing and speech were monitored several times. B and p are plosive sounds requiring intra-oral pressure, which are used to find out the reduction of air leakage via nasopharynx. The patient was asked close the mouth and blow air through nose. An adequate lift will stop nasal air leak completely (Premkumar, 2011). Patient was explained about the home care and was kept on follow up. Also instructed to wear the appliance during working hours and remove it while sleeping. He was also referred to Speech pathology centre of Madras medical college and hospital for concomitant speech therapy (Lang, 1967).

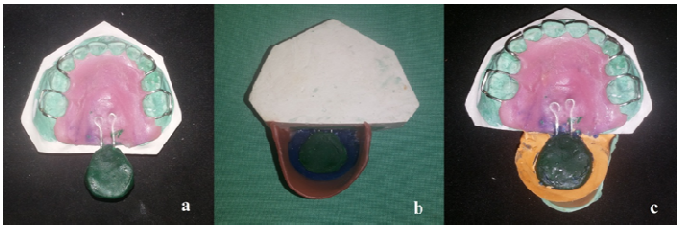

Figure 4 a. After the satisfactory lift, tray was assembled to the cast, b: beading and boxing of the loop portion was done, c: altered cast

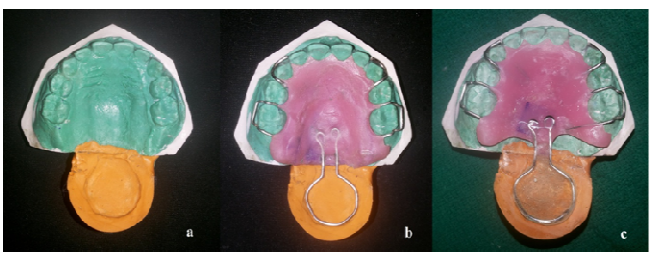

Figure 5. A altered cast, b: green stick was removed from the tray, c: loop portion was filled with clear acrylic

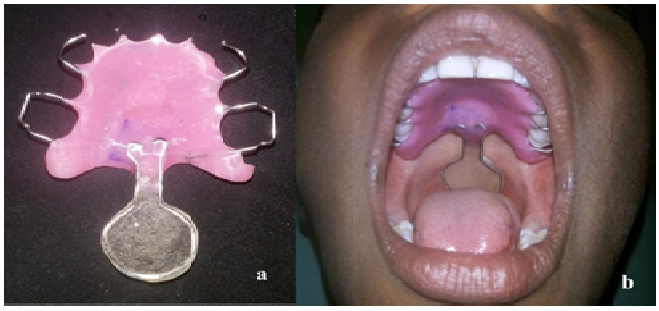

Figure 6a. Provisional palatal lift prosthesis, b prosthesis in situ

DISCUSSION

The palatal lift prosthesis was discovered by Gibbons and Bloomer (1958), which is especially useful for patients with velopharyngeal incompetence having compromised motor control of the soft palate and related musculature e.g. myasthenia gravis, cerebrovascular accidents, traumatic brain injuries, bulbar poliomyelitis, cerebral palsy, or injury to the soft palate (as post operative complication due to adenoidectomy, tonsillectomy, or maxillary tumor resections), or with cleft palate patients with palatal insufficiency and submucous cleft palate. The idea behind this prosthesis is to reposition the soft palate superiorly to the level of normal elevation of the palate to achieve near normal velopharyngeal closure, which is absent otherwise. For the prosthesis to be effectual sufficient lateral pharyngeal wall movement is must. At rest a space for breathing must be present bilaterally between the elevated soft palate and the pharyngeal walls. In cases where the amount of improvement may be difficult to anticipate, it may be advisable to fabricate provisional palatal lift prosthesis first. Then the prosthodontist may proceed with definitive prosthesis if consequential improvement in speech can be gained. Here extension with a wire loop was preferred to facilitate future adjustments as well as reline procedures. If the amount of displaceability of the soft palate is uncertain, then wire loop form of retention is suggested as it is more adjustable. If adaptation to the prosthesis is difficult for the patient then lift may be extended posteriorly gradually, by sequential additions over several appointments. Patients with palatal lift prostheses should be observed closely to assure that the lifting force does not create tenderness or breathing, swallowing or speech problems. The force of the displaced soft palate does not have an adverse effect on the supporting dentition. To avoid interference with tongue, it was kept as thin as practicable. The extension across the intact palate should not be wide laterally. To achieve appropriate displacement of the soft palate, these prostheses should be wide posteriorly, like a beaver tail. Lang emphasized the use of lift prostheses with concomitant speech therapy is required for best results (Lang, 1967; Kipfmueller and Lang, 1972). The advantages of a palatal lift prosthesis are: (1) gags are reduced because of the superior position and the continuous pressure of the lift portion against the soft palate, (2) function of the tongue is not compromised (3) Access to the nasopharynx is derived (4) lift portion can be sequentially modified for convince of the patient (5) it is very useful treatment modality for the patient which cannot be treated surgically. Lifted portion along with the residual pharyngeal muscle activity will produce a reduce size of the palatopharyngeal opening, which help to reduce nasality (Kipfmueller and Lang, 1972). The contraindications are: (1) optimum retention is not available, (2) where the displaceability of the soft palate is questionable (The displaceability of the soft palate can be checked by elevating the soft palate with a mouth mirror), or (3) patient's disagreement

Conclusion

In case of velopharyngeal incompetency, palatal lift prosthesis can give good results. It improves speech and helps the patient to gain confidence. Once the patient adapts, the provisional prosthesis can be replaced by definitive prosthesis.

REFERENCES

Beumer, J., Curtis, T.A. and Marunick, M.T. 1996. Maxillofacial Rehabilitation: Prosthodontic and Surgical Considerations. St.Louis, MO, Ishiyaku Euroamerica.

Gibbons, P. and Bloomer, H. 1958 A supportive-type prosthetic speech aid. *J Prosthet Dent*., 8:362.

Kipfmueller, L. and Lang, B. 1972. Treating velopharyngeal inadequacies with a palatal lift prosthesis. *J Prosthet Dent*., 27:63.

Lang, B. 1967. Modification of the palatal lift speech aid. *J Prosthet Dent*., 7:216.

Premkumar, S. 2011. Clinical application of palatal lift appliance in velopharyngeal incompetence. *J Indian Soc Pedod Prev Dent*., 29:70-3.

Schaefer, K.S. and Taylor, T.D. 2000. Clinical application of palatal lift. In: Thomas D, editor. Maxillofacial prosthetics. Chicago: Taylor Quintessence Publishing Co, Inc; p. 133-42.

****