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Prosthetic management of soft palate cleft - a case report

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Summary

The treatment of cleft in the soft palate can be achieved essentially by surgical reconstruction or prosthetic obturation. The goals of prosthetic intervention are to prevent food and liquid leakage into the nose and to improve speech intelligibility by ensuring functional velopharyngeal port closure. In this report, the prosthetic management of a 5-year-old child with soft palatal cleft is presented. The impression of the cleft was taken with tissue conditioner, Visco-gel, TM (De Trey, Amalgamated Dental London) and the pharyngeal obturator (speech bulb) was made in clear acrylic resin. Patient tolerated the appliance well and was referred to speech therapist for speech articulation.

Keywords: *Cleft, soft palate, prosthetic management, obturator, speech bulb.*

Résumé

Le traitement des tissus internes de la gorge peut être achevée essentiellement par la chirurgie reconstructive ou l'obturation prosthétique. Les objectifs de l'intervention prosthétique sont de prévenir le chute de la nourriture et e fluide ou liquide dans le nez et améliorer l'intelligibilité du parler en assurant la fermeture du port fonctionnel velopharyngeal. Ce rapport présente les soins prosthétiques chez un enfant de 5 ans ayant un cleft palpable douce. L'impression du cleft était prise à l'aide d'un tissu conditionnée de gel-viscueux (De Trey, Amalgamated Dental London) et l'obturateur pharyngal était faite à résine acrylique clair. Le patient tolérait bien l'application et était referé au personnel thérapeutique du parer pour l'articulation des mots.

Introduction

Post-maxillectomy defects and cleft in the soft palate may be treated essentially by surgical reconstruction or by an obturator sometimes called speech bulb in soft palate cleft rehabilitation [1,2,3]. Palatal training techniques using inflammable velopharyngeal prosthesis, tactile stimulation, and electrical stimulation of individual muscles have limited success rates [3].

Soft palate defects may be classified according to the anatomy and physiology of involved structures. The classification includes palatopharyngeal insufficiency, palatopharyngeal incompetence, and palatopharyngeal inadequacy [5]. Palatopharyngeal insufficiency is when some or all of the anatomic structure of the soft palate is

absent while palatopharyngeal incompetence applies when the soft palate is of adequate dimension but lacks movement because of disease or trauma affecting muscular and/or neurologic capacity. The term palatopharyngeal inadequacy includes incompetence and/or insufficiency but may also suggest a reduction or absence of pharyngeal wall function. These classifications identify the degree and type of palatopharyngeal closure and its diagnosis determines the course of treatment [5].

Surgical repair of the soft palate is obviously superior to the rehabilitation with prosthesis [4]. This is however true only if surgery can produce a functional soft palate and this will depend on the amount of muscular tissue present in the remnants of the soft palate.

Patients in which prosthetic obturator is treatment of choice can be divided into following classes [4,6].

- a) Those not suitable for surgical closure of soft palate, for example if patients are unable to undergo anesthesia for surgical repair.
- b) Those who have grown up without any surgical treatment but suffer from degradation of speech that they are quite unintelligible.
- c) Those who have had unsuccessful surgical treatment.
- d) Those who refuse surgery.

The objectives of prosthetic rehabilitation are to prevent food and liquid leakage into the nose and, to improve speech intelligibility by ensuring functional velopharyngeal port closure.

The obturator or speech bulb used in the treatment of cleft of soft palate is basically a smooth acrylic resin appliance lying in the plane of maximal pharyngeal contraction, so that when the pharynx is relaxed there is a space between it and the appliance allowing free passage of air to and from the nose and, when the pharynx is contracted it grips the acrylic producing an airtight seal of the nasopharyngeal isthmus.

Case report

A 5-year-old female patient was referred to the prosthetic unit from plastic surgery unit of the University College hospital for temporary prosthetic rehabilitation of cleft of the soft palate. Patient presented with history of cleft of soft palate from birth and hypernasal speech noticed about 2yrs after birth. The patient was clinically healthy with no sign of any neurological deficit.

Intra-orally, she had a full complement of the milk teeth with well-developed alveolus. There was a cleft involving the soft palate which extends about 10mm distal to the vibrating line (Fig. 1).



Fig. 1: Cleft involving the soft palate

Treatment

Technical Consideration in Fixed Pharyngeal Obturator Prosthesis [5,6,7]

A primary impression using an impression compound material was taken in stock tray, which extended just to the posterior border of the hard palate. An acrylic custom tray was fabricated from the primary cast obtained from the compound impression

A secondary impression using an elastomeric impression material was taken with this custom tray, and a working cast obtained from the secondary/master impression in dental stone (fig 2).

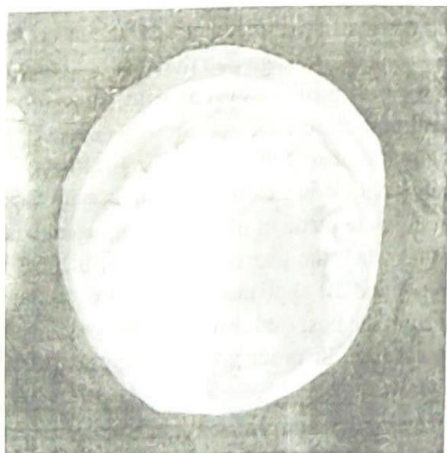


Fig. 2: Working cast obtained from the elastometric impression

An orthodontic plate fitted with Adams's clasps was fabricated on the working cast. The clasps are to enhance retention of the plate on the palate. During the construction of the plate, a semi-rigid bar was embedded at one end into the orthodontic base plate. The bar lies at the centre of the cleft completely out of contact with soft palate tissue remnants and the posterior pharyngeal wall and the plane is slightly above the level at which the soft palate remnants rise during function.

The orthodontic base plate with the bar was tried in the patient's mouth and was found satisfactory. A ball of tissue conditioner, Visco-gel, TM (De Trey Amalgamated Dental London) was appropriately mixed and adapted to the other free end of bar earlier embedded into the orthodontic base plate. The plate was placed into position in the mouth and the tissue conditioner gently moulded with the finger upwards and backwards into the pharynx.

The patient was instructed to flex the neck fully to achieve contact of the chin to the chest. This movement will establish contact of the posterior aspect of the obturator with the soft tissue covering the anterior tubercle of the atlas. Lateral aspects of the obturator were formed by rotation and flexion of the neck to achieve chin contact with the right and left shoulder respectively.

Further functional moulding of the tissue conditioner was enhanced by asking patient to swallow small quantity of water. Excess material was trimmed off with sharp scapel blade and more material added to correct area of deficit (fig 3). Swallowing and speech tests were carried out.



Fig. 3: Orthodontic base plate with speech bulb made from visco-gel.

At 24 hours review appointment, she was questioned regarding the feel of the speech bulb and on examination it was found that the bulb had undergone further moulding especially on the lateral side. More tissue conditioner was added to deficient areas and the above procedure for moulding the tissue conditioner was repeated. Speech sound was normal, with the patient able to articulate sounds such as "b" and "p" and to form nasal consonants "m", "n" and "ng".

The patient was reviewed again after 48hrs. At this visit, the speech bulb was invested in Dental Plaster of Paris Matrix (fig 4), the tissue conditioner was removed and the resulting cavity/mould filled and processed in acrylic resin. The inferior and superior surfaces of the speech bulb was polished while the tissue-contacting area

are only lightly pumiced and then buffed. The finished prosthesis was delivered to the patient (fig 5) and post insertion instructions were given.



Fig. 4: Working cast (Plaster of Paris) from the functional impression of the cleft.



Fig. 5: Finished speech bulb in patient's mouth

The patient was advised to wear the obturator all the time except at night and was encouraged to learn to grip the bulb when speaking as in the act of swallowing. She was also referred to speech therapist for speech articulation.

Conclusion

Rehabilitation of patients with cleft of soft palate with obturator presents a significant challenge in Prosthodontic, especially in child patient. In this report, impression of the cleft was taken using tissue conditioner Visco-gel, TM (De Trey, Amalgamated Dental London) on a semi rigid bar and speech bulb constructed using the technique described.

The speech bulb was well tolerated by the patient.

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