

SURGICAL TREATMENT OF VELOPHARINGEAL INSUFFICIENCY WITH SUPERIORLY BASED PHARYNGEAL FLAP: A CASE REPORT

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Abstract

Background: Cleft lip and palate (CLP) are the most common serious congenital abnormalities that affect the orofacial region. Patients with CLP and with isolated clefts of the palate have a malformation that involves critical anatomic components of the velopharyngeal mechanism.

Case report: We present a surgical treatment and correction of velopharyngeal insufficiency (VPI) with superiorly based pharyngeal flap. A 23 year old female patient previously was treated for the cleft of soft palate. The lack of soft tissues in posterior leads to lack of velopharyngeal deficiency and difficulties of speech, eating and breathing.

Discussion: Normal speech and hypernasality associated with abnormal compensatory articulation problems is a result of a insufficient velopharyngeal valving mechanism. Superiorly based pharyngeal flap is a very effective for improving hypernasality

Key words: Cleft lip and palate, hypernasality, pharyngeal flap

1 Introduction

A cleft is congenital abnormal space or gap in the upper lip, alveolus or palate. CLP are the most common serious congenital abnormalities that affect the orofacial region.

Problems of the cleft affected patients include dental problems (missing or supernumerary), malocclusion, nasal deformity, feeding problems, problems with ear and speech difficulties which includes retardation of consonants (p, b, t, d, k, g). As a result we have lack of good sound discrimination and hypernasality [1].

For a clear speech it is necessary for the individual to have complete control of the passage of the air from oropharynx to nasopharynx. The soft palate functions as an important valve to control the

distribution of escaping air between the oropharynx to nasopharynx.

This is called the **velopharyngeal mechanism**. The 2 main components of this mechanism are: a. The soft palate and b. Pharyngeal wall.

In patients with cleft soft palate, the velopharyngeal mechanism cannot function because of the discontinuity of the musculature from one side to another.

The result of this consistent escape of the air into the nasal cavity is called **hypernasal speech** which develops at 20% of patients [2],[3].

The patients develop compensatory velopharyngeal, tongue and nasal mechanism in order to produce illegible speech. The posterior and lateral pharyngeal walls develop great mobility and attempt to narrow the space, the

tongue postures and positions and superficial muscles around the nose, which normally are involved in facial expressions and grimacing, try to compensate missing velopharyngeal mechanism.

In this instance the valving is at the other end of the nose.

2 Case Report

A 23 year old female patient had complaint of hypernasality, difficulties in pronouncing consonant and unclear speech. The history of the patients revealed a cleft soft palate repair when she was about 4 years of age. Clinical examination showed short soft palate that could not move all the way back and fulfill its function as a valve for the air during speech.

A mucosal flap was planned in order to close the gap. A midline incision is made over the soft palate and both flaps were retracted to enhance visualisation. On the nasal surface of the flaps a book – flap incisions were made. Pharyngeal flap was raised from posterior pharyngeal wall and the inferior edge of the flap was sutured to posterior edge of the soft palate. The surface arising from pharyngeal flap were closed by approximation of the tissue.

Two flaps from soft palate are used to cover the raw surface of the pharyngeal flap. At the end the oral side of the soft palate is sutured. Fig.1-5.

3 Discussion

Timing of closure of soft palate in literature is to be recommended around 6 -9 months in order to provide normal fonation, swallowing and tongue position, because this has a positive effect of the narrowing of the gap of the hard palate also and on 18 mo., only a conservative surgery is necessary for hard palate repair [4].

Velopharyngeal muscles involved are:

- M. levator veli palatini: pulls the soft palate during swallowing and yawn, elevates the palate to the posterior pharynx, workhorse of the v.mechanism [5].

- M. tensor veli palatini: stretches the soft palate and during the swallowing and yawning, opens the orifice of the Eustachian tube
- Palatoglossus: elevates the posterior portion of the tongue and pulls soft palate towards the tongue
- Palatopharyngeus: stretches the soft palate and pulls the pharyngeal walls to sup., ant., and medially during swallowing
- M. uvulae: shortens the uvula and pulls it superiorly
- Constrictor pharyngeus superior: moves medially and narrows the space.

Approximately 20 % of children with palates repaired appropriately develop VPI, that requires additional/secondary surgical treatment [6].

Secondary surgical procedures have the aim to improve speech, correct hypernasality, eliminate audible nasal emissions without causing complete obstruction of the velopharyngeal port, allowing for nasal breathing and resonance or correct residual defects.

Pharyngeal flap was first described by Schoenborn in 1876 [7].

It creates two lateral ports, which usually can be closed under function when lateral wall movement of pharynx is good.

The port size can vary from suturing techniques and the width of the tissue flap [8],[9].

The inferiorly based pharyngeal flap is another alternative, but most surgeons have found it to be of limited use because of its tendency to retract and thin after secondary healing and contracture. The result is a limited degree of velopharyngeal sphincter augmentation [10].

Sphincteroplasty operations recruit lateral tissue, usually from the tonsillar pillar region, to allow for easier velopharyngeal closure but have been associated with lower success rates of 40 – 60 % [11].

Some techniques of augmentation of the posterior pharyngeal wall have been described in an effort to facilitate closure of the nasal airway.

Autogenous and alloplastic implants have been used, including local tissue flaps, rib cartilage, synthetic injections of silicone, Silastic, Teflon, Proplast, and collagen [12].

Problems with migration or extrusion of the implant material and an increased incidence of infection often add to the morbidity associated with these procedures. They are no longer recommended in most cases.

The double-opposing Z-plasty is another procedure that requires a more aggressive dismantling of the palate than a conventional pharyngeal flap procedure. The result may be a slightly longer palate, but one with more extensive

scarring and less physiologic movement. Another consideration is the significantly higher rate of fistula formation associated with this type of repair [13].

When randomly applied to patients with VPI, pharyngeal flap procedure is approximately 80 % effective in improving hypernasality [14].

Shprintzen has also shown that with careful diagnosis and patient selection, this procedure is 97 % effective in treating VPI [8].

In this case patients hypernasality and good sound discrimination improved without any postoperative complications.

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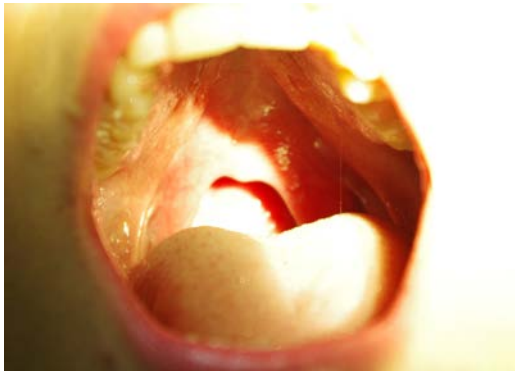


Figure 1. preoperative view of short soft palate design

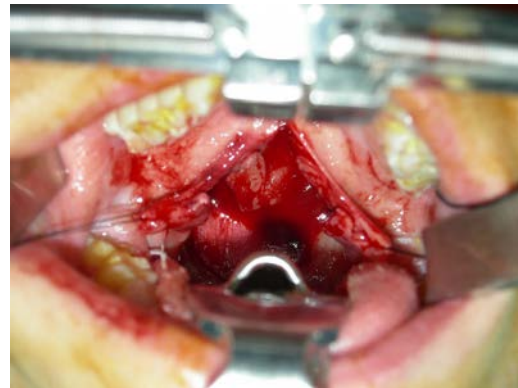


Figure 2. Dissection of soft palate and the pharyngeal flap

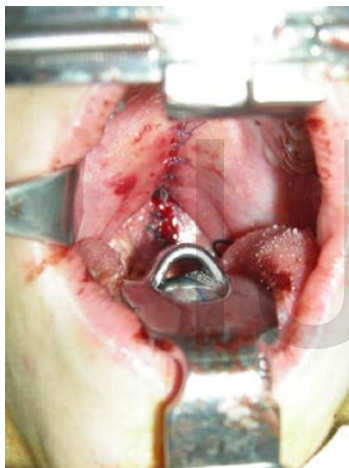


Figure 3. Closure of the flap and soft palate



Figure 4. Postoperative view after 3 months



Figure 5. Postoperative view after 6 months

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