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# Palatal eversion for the treatment of combined nasopharyngeal stenosis and tonsillar pillars adhesion☆

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ABSTRACT

*Objective:* Rarely the tonsillar pillars and the soft palate became adherent to the posterior nasopharyngeal wall by strong fibrous tissue due to excessive dissection and cauterization during surgery leading to nasopharyngeal stenosis. Therefore, many treatment modalities are being tried to cure this problem. The aim of this study is to explore our results of modifying the basic technique to accommodate those patients with combined nasopharyngeal stenosis and tonsillar pillars adhesions in one stage. Study Design: Case series.

*Methods:* This study was conducted on 10 patients with combined nasopharyngeal stenosis and tonsillar pillars adhesions after adenotonsillectomy. They were subjected to treatment by palatal eversion through dividing the soft palate in the midline to separate each pillar from the pharyngeal wall in continuation with each half of soft palate and removal of the fibrous tissue causing stenosis. This was followed by eversion and fixation of the two palatal divisions on either side to allow complete epithelialization of the stenotic area. Postoperative follow-up was done for one year by the flexible nasopharyngoscopy, perceptual speech analysis, and polysomnography.

*Results:* The flexible nasopharyngosopic examination of the 10 patients at the end of post-operative period revealed a freely mobile soft palate with no nasopharyngeal stenosis or palatal fistula. Velopharyngeal function and speech assessment by perceptual speech analysis was normal in all 10 cases. No obstructive episodes were recorded in polysomnograms.

*Conclusions:* Palatal eversion is a promising technique in the treatment of post-adenotonsillectomy of combined nasopharyngeal stenosis and tonsillar pillars adhesion. It is recommended to be used on a wider scale of patients and other indications as nasopharyngeal stenosis following uvulopalatoplasty and post nasopharyngeal radiotherapy. The level of evidence: 4 (case series).



## 1. Introduction

Rarely after adenotonsillectomy, may the patient develop adhesion of the soft palate to the posterior nasopharyngeal wall by strong fibrous tissue. This may be due to excessive dissection and cauterization during surgery leading to nasopharyngeal stenosis. Sometimes the tonsillar pillars became adherent also to the lateral part of the posterior oropharyngeal wall due to severe fibrosis. The main predisposing factor is excessive scarring in keloid-forming patients [1,2]. The patient develops nasal obstruction, accumulation of nasal secretion, hyponasal speech, anosmia, rhinorrhea, sleep apnea, dysphagia, which may complicate to acute otitis media and sinusitis secondary to nasopharyngeal stenosis [3,4].

The optimum treatment of nasopharyngeal stenosis is mainly prevention by careful operative technique, judicious use of electrocautery and adequate preoperative evaluation for adenoidectomy or uvulopalatoplasty during the primary surgery are essential to prevent nasopharyngeal stenosis. The definitive treatment of nasopharyngeal stenosis is very difficult due to the recurrence and restenosis and many patients require repeated operations to obtain a satisfactory result. Therefore, many treatment modalities are being tried to cure this problem. The trial of Triamcinolone acetonide injections [5] and local injection of corticosteroids [6] has been shown to reduce the secretion of collagen as well as leading to its solubilization, significantly reducing the occurrence of keloids.

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Palatopharyngoplasty with bilateral buccal mucosal graft repair to alleviate oropharyngeal stenosis after tonsillectomy showed success in one case report [7]. Bilateral Z-pharyngoplasty for Amelioration of acquired nasopharyngeal stenosis has been described [8] with satisfied results. The author published in (2012) the new technique of palatal eversion for the treatment of nasopharyngeal stenosis [9]. The basic technique was prescribed in 2 stages mainly for those patients with nasopharyngeal stenosis due to plastered soft palate to the posterior pharyngeal wall in 12 patients after adenotonsillectomy without dealing with the tonsillar pillars. In some patients, the tonsillar pillars are also plastered to the lateral part of the posterior wall of oropharynx due to excessive fibrosis. The aim of this study is to explore our results of modifying the basic technique to accommodate those patients with combined nasopharyngeal stenosis and tonsillar pillars adhesions in one stage technique.

## 2. Patients

Ten patients with combined nasopharyngeal stenosis and tonsillar pillars adhesions after adenotonsillectomy were included in this study (Fig. 1). The patients were collected from the outpatients clinic of pediatric otolaryngology unit in Cairo University Hospitals from March 2013 to March 2015. They were seven males and 3 females, their age ranged between 3 and 10 years with a mean age of 6 years and 8 months. They complained of complete bilateral nasal obstruction 6–18 months after adenotonsillectomy with hyponasal speech, snoring and sleep apnea. There was no history of surgical correction of nasopharyngeal stenosis in all the patients. Informed consent was obtained from parents of the patients and the principles outlined in the Declaration of Helsinki were followed.

## 3. Methods

All patients were subjected to the following:

### 3.1. Pre-operative assessment

* Full ENT examination and history taking.
* Flexible nasopharyngoscopy: to see the degree of stenosis, and mobility of the different velopharyngeal walls. Five points scale regarding stenosis of the nasopharynx was used for assessment (Table 1). Patients with complete nasopharyngeal stenosis were selected to be participants in this study.
* CT scan of the paranasal sinuses to exclude chronic sinusitis.

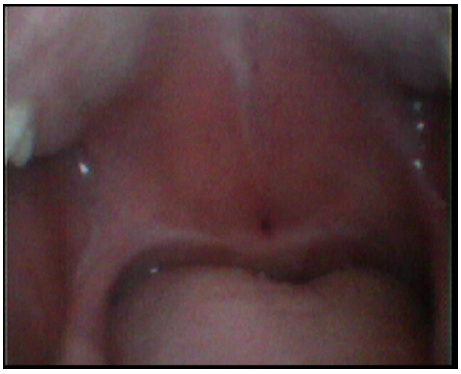

**Fig. 1.** Preoperative nasopharyngeal stenosis showing complete soft palate and tonsillar pillars adhesions to the posterior pharyngeal wall, and the dimple represents the site of the base of the uvula.

**Table 1**
The degree of preoperative and postoperative nasopharyngeal stenosis by flexible nasopharyngeal examination.

| Point scale | Preoperative | Postoperative |
|---|---|---|
| Normal | 0 | 6 |
| Mild (25% stenosed) | 0 | 3 |
| Moderate (50% stenosed) | 0 | 1 |
| Severe (75% stenosed) | 0 | 0 |
| Complete obstruction | 10 | 0 |

* Tympanometry to exclude middle ear effusion.
* Preoperative perceptual speech analysis for velopharyngeal function and speech assessment with 4 points scale of hyponasality (normal, mild, moderate and severe) was done by a speech pathologist (Table 2).
* Overnight polysomnography to detect any obstructive episode.

### 3.2. Operative technique

Under general anesthesia with oral endotracheal intubation, a Dingman mouth gag is introduced. The posterior tonsillar pillar and lateral part of the posterior pharyngeal wall and the soft palate are injected with saline in adrenaline (1: 200,000). A midline incision was done by dividing the full thickness of the soft palate into two halves right and left. Separation of each half of the soft palate from the posterior pharyngeal wall was done using sharp dissection which was extended downwards to separate each pillar from the pharyngeal wall (Fig. 2). The stenotic scar tissue plastering the soft palate to the posterior pharyngeal wall was excised. Eversion and fixation of each half of the soft palate by two absorbable stitches (Vicryl 0) laterally at the oral side was done (Fig. 3). The uvula was fixed in the midline followed by hemostasis using bipolar electrocautery.

### 3.3. Post-operative follow-up

The nasal regurgitation more to fluids and rhinolalia aperta were developed postoperatively, which were improved by increased mobility of soft palate and decreased pain within few days. Releases of the two palatal divisions were done by lysis of the lateral stitches, with complete healing of the pharyngeal wound and complete epithelialization of the site of stenosis (Fig. 4). Follow-up of the patients was done for one year by the flexible nasopharyngoscopy. Velopharyngeal function and speech assessment by perceptual speech analysis were done after one month. Sleep studies were done for all patients at the end of the follow-up period using overnight polysomnography to detect any obstructive episode.

## 4. Results

The study was conducted on 10 patients who complained of post-adenotonsillectomy combined nasopharyngeal stenosis and

**Table 2**
The degree of preoperative and postoperative hyponasality by speech analysis test.

| Point scale | Preoperative | Postoperative |
|---|---|---|
| Normal | 0 | 7 |
| Mild | 0 | 2 |
| Moderate | 2 | 1 |
| Severe | 8 | 0 |