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FAMM FLAP FOR GRADE II NASOPHARYNGEAL STENOSIS RECONSTRUCTION IN A 2-YEAR-OLD: A CASE REPORT

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SUMMARY

Acquired nasopharyngeal stenosis (NPS) is a rare and heterogeneous pathology with diverse causes, often a consequence of pharyngeal surgery. Disparate approaches have been used for the treatment of nasopharyngeal stenosis but there is no consensus on a unique and standardized management, however many methods have been described.

We present a case of a 2-year-old with grade II nasopharyngeal stenosis reconstructed with an inferiorly based left unilateral facial artery myomucosal flap. The Facial artery myomucosal (FAMM) Flap is a versatile yet reliable flap for reconstruction of postsurgical nasopharyngeal stenosis, a common complication of pediatric adenotonsillectomy and other pharyngeal surgeries.

In conclusion, inferiorly based facial myomucosal (FAMM) flap is an easy, yet sufficient local option in the reconstruction of nasopharyngeal stenosis post scar release.

Key words: **FAMM flap, Facial artery myomucosal flap, Nasopharyngeal stenosis, upper airway obstruction, versatile, Case Report.**

INTRODUCTION

Acquired nasopharyngeal stenosis is a rare and heterogeneous pathological condition that has different causes, generally resulting as a complication of a pharyngeal surgery, especially in patients affected by obstructive sleep apnea (OSA)(1). With an incident of about 3 in 100,000 cases occurring following tonsillectomy(2) The common causes of NPS include uvulopalatopharyngoplasty (UPPP), adenotonsillectomy, laser-assisted uvulopalatoplasty (LAUP), or radiotherapy for nasopharyngeal carcinoma(3), Thus in the pediatric population, adenotonsillar hyperplasia is a common phenomenon and adenotonsillectomy one of the commonly performed surgical procedures and that may lead to scarring causing Nasopharyngeal stenosis (NPS). However, there have not been a standardized approach to surgical management, and with growing use of electrocautery and palatal surgery techniques, incidence of NPS is on the rise.(4).

FAMM flap refers to an axial composite flap based on the facial artery in the buccal area(5,6)

Different approaches have been proposed for the treatment of nasopharyngeal stenosis but a unique and standardized management has not yet been presented. Among described techniques is the modified palatal flaps (1). However, FAMM flap provides a versatile easy alternative in the management of postsurgical severe nasopharyngeal stenosis(2). This case report represents a versatile option of the surgical techniques, the FAMM flap and we describe the steps in a simplified manner as one of the reliable options for Nasopharyngeal stenosis reconstruction. The FAMM flap was first introduced by Pribaz and colleagues in 1992, and since then, it has been utilized for repairing various types of intraoral defects(6). The facial artery myomucosal (FAMM) flap is a versatile axial intraoral flap lined by jugal mucosa and submucosa along with a portion of buccinator muscle connected to nearby blood vessels to maintain perfusion. In the bargain moreover, the FAMM flap may be pedicled inferiorly on the facial artery or superiorly on the angular artery. We report an inferiorly based pedicled FAMM flap for the reconstruction of the pharynx, in addition the flap also finds utility in vast intraoral reconstructions such as of soft palate, nasal cavity and among others nasopharyngeal defects.

Studies have shown numerous advantages supporting the use of the FAMM flap, most of which contribute to its general low morbidity rates(7,8); avoiding any external scar, provides a great axis of rotation and range of reach allowing for reconstruction of multiple sites; it is also thin & pliable; Provides a fully functional mucosal tissue; a satisfactory reconstructive option, even in irradiated tissues and finally; its strong vasculature withstands postoperative radiotherapy(8).

Guidelines: This case report has been reported in line with the SCARE Criteria 2023(9)

CASE PRESENTATION

A 2-year-old female patient who was brought to our facility by the aunty, as a referral from a peripheral facility with a diagnosis of Velopharyngeal stenosis, she had been followed up and managed at the referring facility since first presentation at the age of 3 months and had undergone adenoidectomy, followed by adenotonsillectomy by age of 17 months due to recurrence of symptoms. However, there was still persistence of symptoms including snoring, mouth breathing and bad breath at which point submucosal diathermy of the inferior turbinate was done 2 months before time of presentation, having been found to be hypertrophic but no improvement was noted.

At the time of presentation at our facility, she aunty reported persistence of symptoms of upper airway obstruction, which included mouth breathing, mucoid rhinorrhea, persistent grunting, intermittent night difficulty in breathing also dubbed Obstructive sleep apnea (OSA), she had no difficulty with feeding, and no symptoms or signs of cardiovascular compromise, no known comorbidities reported and as were the findings by our Multidisciplinary team which for this case was comprised of the plastics surgeons, and Otolaryngologist (ENT).

Examination: Good general clinical condition, with no pallor, no jaundice, no edema. Nasal examination revealed normal nares, no discharge, normal mucosal lining, Central septum, no inferior turbinates hypertrophy. Oral examination findings showed a normal lip, tongue and oral mucosa, normal dentition, healed tonsillar bed with scar tissue involving the soft palate and tonsillar pillars bilaterally (right worse than left) with narrowing of pharyngeal airway (nasopharyngeal stenosis) with about 2cm residual aperture. Ear examination did not reveal any abnormalities of the tympanic membranes.

Examination under anesthesia (EUA): Rigid nasal endoscopy using size 4mm endoscopes, 0^0 and 45^0 to further evaluate the nasopharynx was done. Nasopharyngeal stenosis was noted, with scar bands between the pillars and velum, right side affected more than left side with narrowing of nasopharyngeal airway (Figure 1). Grade II adenoid tissue bilaterally, patent choanae bilaterally.

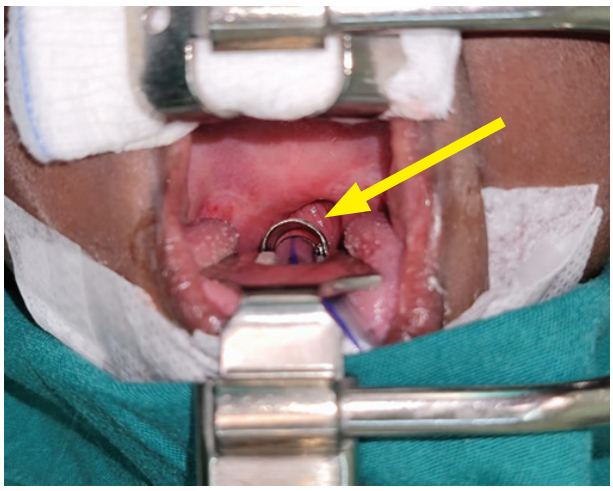

Figure 1: Showing the extent of NPS, note the severity of the right compared to the left, The remnant opening < 2cm diameter (Orange arrow)

The Plastic surgery team subsequent proceeded with release of scarred tissue (Figure 2) and reconstruction with an inferiorly based FAMM flap.

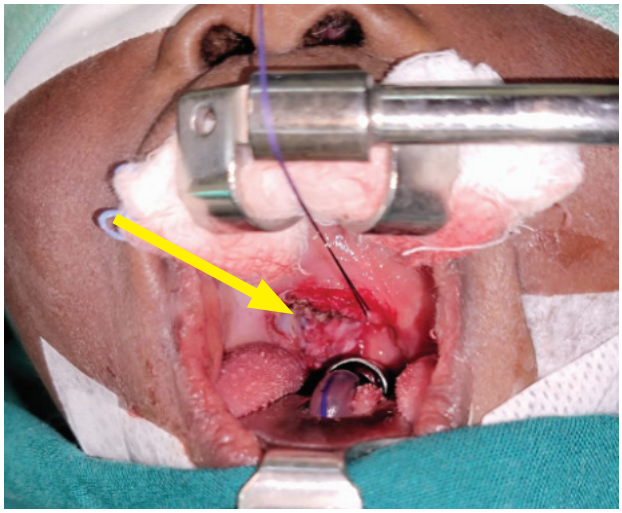

Figure 2: Extensive scarring released from the right side to free the soft palate from the pillars, (note the purple retraction stitch at the tip of the soft palate)

SURGICAL TECHNIQUE:

We started the surgery by releasing the fibrosis/ adhesion (Figure 2). To perform the procedure, we identified the position of the facial artery (Figure 3a) (10) by palpation of pulse and a hand-held Doppler and mapped its position in the myomucosal pedicle flap, we also identify the os of the Stensen duct and marked(Figure 3b).

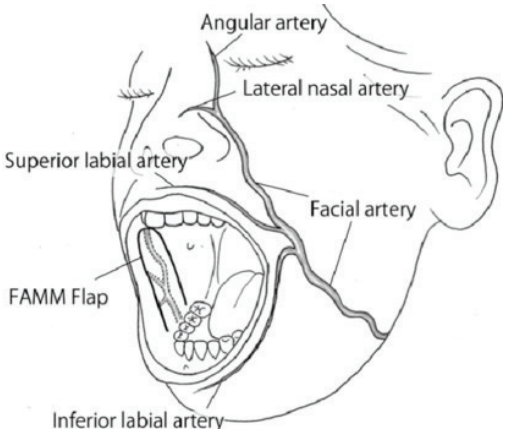

Figure 3-a: Schematic representation of the right inferiorly based FAMM flap

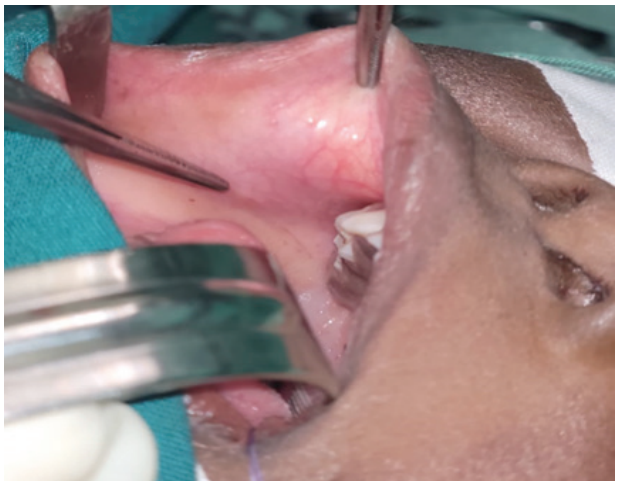

Figure 3-b: Buccal mucosa, Note the forceps pointing at the Ostium of the Stensen's duct at tip of forceps/ Orange arrow

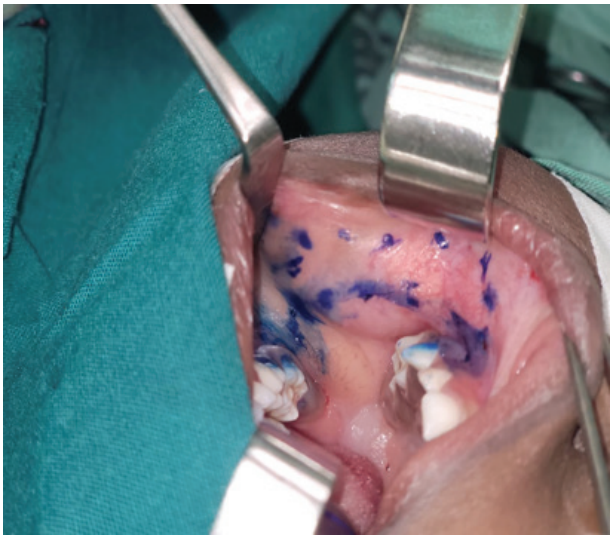

Figure 3-C: Flap Marked using methylene blue dye; posterior border 1-2mm anterior to the Os of Stensen duct and the anterior boundary 1. - 1.5cm from oral commissure, the flap tip was 1.7cm from the superior labial frenulum

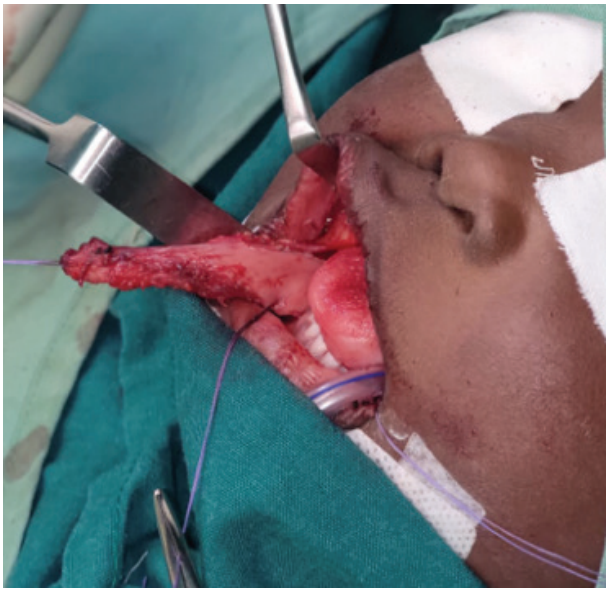

Figure 3-D: Right side inferiorly based FAMM Flap completely dissected out and freed ready for inset.

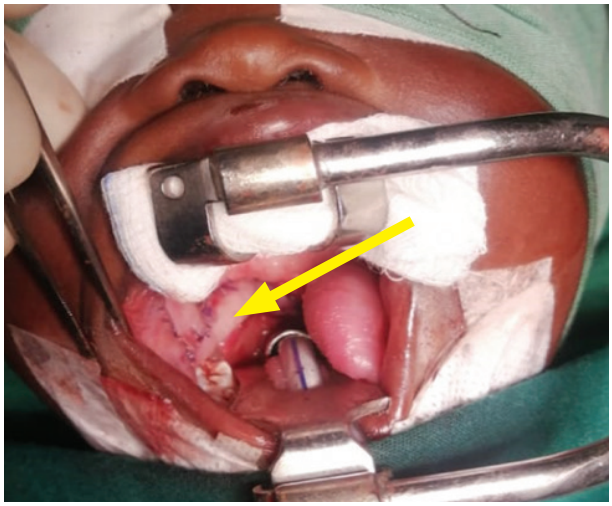

Figure 4: FAMM Flap inset (Orange arrow) onto the raw area over the site of released fibrosis and the donor site closed primarily.

We then marked the flap with pedicle inferiorly based (Figure 3c) using methylene blue, the anterior border at 0.8cm from the oral commissure, and the posterior border 2mm anterior to the os of Stensen duct. The distal reach of the flap was 17mm shy of the ipsilateral superior labial frenulum, the flap was then raised with part of the buccinator muscle in the plane of the buccal fat pad until inferiorly as far as the mandibular vestibule opposite second mandibular premolar and first molar and advanced to the defect, via the retromolar trigone without needing a bite protector, the flap had good reach crossing the midline. The narrow tip (excess) was amputated after inset (Figure 4), we did not use stents or obturators, since the epithelial surface of the flap already established the lining.

RESULTS

After flap inset to establish the mucosal lining of the resultant raw area from release of fibrosis, there was a significant immediate flexibility of the velum, and patency of the nasopharynx. The patient was admitted to the ward after recovery and on first post operative day, reported pain at the operative site with refusal to take fluid diet, and there was also drooling of saliva.

With good pain management however, the symptoms subsided and was able to feed.

Upon review at the clinic after one week, the aunty reported the child still had symptoms but was much better,

At three weeks review, the symptoms were reported to have resolved, save for the intermittent snoring that was reported by the aunty.

The flap was divided four weeks later and the child was discharged stable.

DISCUSSION

Nasopharyngeal stenosis (NPS) is a rare condition characterized by obstruction of the communication between the oropharynx and nasopharynx owing to scar contracture of the soft palate, tonsillar pillars, and posterior pharyngeal wall. NPS can be primary (attributed to disease process such as rhinoscleroma) or secondary, if caused by prior surgery (postoperative NPS), it usually manifests with nasal obstruction, dysphagia, snoring, and obstructive sleep apnea (OSA) It represents one of the challenging problems that can complicate surgeries in the pharyngeal region. Being a rare condition, it has not been described in literature. At the same time, not much has been written about this severe complication(3).

NPS is classically classified based on severity as follows:

Type I (Mild): The lateral aspects of the soft palate adhere to the posterior pharyngeal wall without velar lengthening.

Type II (Moderate): Circumferential scarring with a small central opening (1–2 cm in diameter) of soft palate.

Type III (Severe) Complete fusion of the soft palate with the posterior and lateral pharyngeal walls, leaving a remaining opening < 1 cm(4).

Considering our findings, we grade our case to have had Type II NPS

Considering absence of standardized definitive treatment for NPS, most suggested methods that require reestablishment of epithelium may lead to more scarring and restenosis.

CONCLUSIONS

Nasopharyngeal stenosis is a rare, yet a potentially severe complication of pharyngeal surgeries, especially in the pediatric population. The increasing number of cases attributed to increase in the utility of electrocautery(4) presents a challenge in the management, convoluted by the absence of standardized protocolized management of nasopharyngeal stenosis, The facial artery myomucosal flap represents a versatile yet reliable technique for reconstruction of nasopharyngeal stenosis that provides stable mucosal lining, limiting recurrence of fibrosis.

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