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RARE COMPLICATION FOLLOWING ADENOTONSILLECTOMY: A CASE OF NASOPHARYNGEAL STENOSIS CONTRIBUTING TO DEBILITATING MORBIDITY

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INTRODUCTION

Nasopharyngeal stenosis (NPS) is a rare condition characterised by partial or complete obstruction of the nasopharyngeal diameter. It can be classified into either primary (as a result of inflammation and scarring from a disease process or secondary/acquired which has a higher incidence and is understood to be iatrogenic. Extremely rare cases of undetermined eitiology have also been described.

Infectious diseases causing primary NPS include syphilis, TB, Diptheria, Rhinoscleroma and Sarcoidosis. Acquired causes of NPS include any oropharyngeal surgery in which the surgical technique is particularly aggressive or poor and radiotherapy to the nasopharynx in cases of nasopharyngeal malignancies. Of the oropharyngeal surgeries resulting in NPS adenotonsillectomy accounts for 67% of the incidence of this complication whilst uvuloplasty and pharyngoplasty account for 17% and 16% respectively.

This condition is the result of a large amount of postoperative fibrotic tissue which leads to scar contraction and thus fusion of the soft palate and posterior tonsillar pillars to the posterior pharyngeal wall.

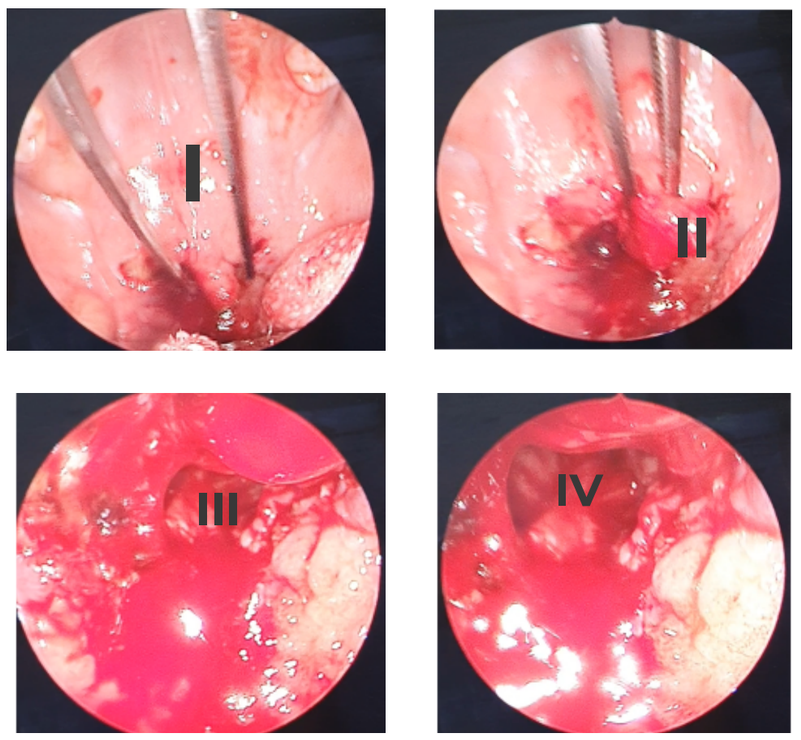
Figure 1: *Iatrogenic NPS. This image shows fibrosis and severe narrowing of the nasopharyngeal lumen following surgical intervention.*

NPS may appear months to years following surgery giving rise to signs and symptoms such as dyspnoea, hyponasal speech, velopharyngeal insufficiency, anosmia, otitis media, obstructive sleep apnoea (OSA), daytime somnolence, rhinorrhoea and dysphagia. The severity of the symptoms is directly proportional to the degree of stenosis. There is no male to female predilection that has been described for this condition.

CASE REPORT

.A 6 year old male presented to the otolaryngology outpatient department at CMHAJ in March 2022 with a history of previous OSA secondary to adenotonsillar hypertrophy. He had undergone an adenotonsillectomy 4 years prior in 2018 at a neighbouring secondary level hospital. He had now developed NPS and was referred for management thereof. His presenting symptoms as relayed by his guardian included a recurrence of snoring that had gotten progressively worse but no aponoeic episodes, shortness of breath on exertion, noisy mouth breathing, nasal obstruction and dysphagia. Clinical examination demonstrated a child who was stertorous at rest but not in respiratory distress with no features of cardiac affectation from the NPS. Oral examination showed evidence of previous tonsillectomy as well as thickened mucosal folds of the posterior tonsillar pillars with an evident stenosis.

Front room flexible endoscopy showed a narrowing of the nasopharynx distal to the post nasal space. There were no features of inflamed/infectious mucosal changes of the sinonasal cavity. The flexible scope was unable to pass into the oropharynx due to the degree of nasopharyngeal narrowing noted. The patient went on to have a chest xray that was normal. He also had and echocardiogram that had no features of pulmonary hypertension with a structurally normal heart.



.***Figure 2:*** *Shows a series of intraoperative images for the above-mentioned patient. A transoral approach was used to examine the stenosis.*
I: soft palate
II: uvula elevated towards the soft palate
III: nasopharyngeal stenosis (NPS)
IV: NPS post initial surgical intervention

This patient underwent direct laryngoscopy where the operative findings demonstrated a circumferential narrowing of the nasopharynx between the soft palate and the posterior pharyngeal wall which were bound by thick fibrotic tissue thought to be scarring from the patient's previous surgical intervention. An incision was made horizontally through the lateral fibrous bands with laser to widen the nasopharyngeal lumen, intraluminal steroids where then injected to reduce the inflammatory process that initially resulted in the scarring and stenosis.

This patient has required long-term follow up and surgical intervention on a 2 to 4 weekly basis to release any recurring stenosis that presents causing symptom aggravation.

DISCUSSION

NPS is typically very challenging to manage due to its recurring nature. The diagnosis is made with rigid or flexible nasoendoscopy. Computerised Tomography (CT) scan can be used to further assess the thickness and location of the stenosed portion and its relation to important surrounding structures.

Non-surgical intervention can be considered but is not favoured. These include the use of stenting with a Foley tube under monitored conditions for 7 day intervals and front room triamcinolone acetonide injections locally around the stenosis to promote collagen dissolution and reduce inflammation thus reducing the scarring and potential for keloid tissue formation.

A variety of different surgical approaches to NPS exist and have been described by otolaryngologists and plastic surgeons alike. There is no standard surgical approach that works effectively in isolation at present and therefore several described treatments are used in combination or sequentially to achieve symptom relief over time. The most common complications from NPS surgery include re-stenosis, velopharyngeal insufficiency with nasal reflux, voice alteration and palatal fistulas.

Surgical approaches range from scar resection with cold steel or coablation/carbon dioxide laser, horizontal to vertical pharyngoplasty, local pharyngeal flaps/mucosal advancement flaps to free split skin grafts. Pharyngeal flaps are used in cases of severe stenosis and success often depends on the use of healthy pharyngeal tissue in the area of the stenosis to create the flap.

DISCUSSION CONTINUED

Toh et al. have described the transposition of a bi-valved palatal flap to increase the volume of the upper aerodigestive tract in the region of the stenosis. The soft palate is split into 2 flaps and sutured to the muscle layers anteriorly and laterally. (Looking for an image to accompany this)

Surgical intervention is often more effective when combined with balloon dilatation, a prosthesis such as a nasopharyngeal stent or patient specific obturator which is kept insitu anywhere between 7 days and 6 months postoperatively. Additionally surgical intervention can reap more advantageous results when combined with injectables such as local corticosteroids, mitomycin C and triamcinolone acetonide.

CONCLUSION

NPS is a rare but debilitating condition that can result from oropharyngeal surgery. Patients who present following oropharyngeal surgery with symptoms of OSA, mouth breathing, nasal obstruction and rhinorrhoea should raise suspicion for having developed NPS as a complication of their prior surgery. It is best to prevent NPS with adequate equipment and good surgical technique as once it has developed this condition requires long-term follow up and may even require several surgical procedures to relieve symptoms.

Some surgical techniques described in the literature are not replicable and produce only partially satisfactory results. Further studies are required to compare the surgical interventions and adjunct combinations available for NPS but this has proven difficult due to the rarity of the complication resulting in very small sample sizes available to analyse any results currently.

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ETHICS STATEMENT

. All procedures performed were in accordance with the ethical standards of the institution (CMJAH). Ethical approval of the above case study has been sought from the CMJAH Ethics Committee and a result is pending.