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Original Research

Utilization and Findings of Flexible Naso-Pharyngo-Laryngoscopy in Upper Airway Disorders: A Clinic Audit

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Abstract

Background: Flexible naso-pharyngo-laryngoscopy (NPL) has become an essential clinic tool for evaluating patients with upper airway disorders in otorhinolaryngology. It has been established to be a simple, cost-effective, and minimally invasive technique with good diagnostic yields. This study aimed to audit the procedure of flexible NPL done in our clinic over 2 years and analyse the technique, indications, and findings of the procedure.
Methodology: A retrospective cross-sectional study among all the patients who presented to our ENT clinic in ABUTH Zaria, from July 2021 to June 2023 with upper airway symptoms or neck swelling who had flexible NPL done in the clinic. The records of these patients were reviewed, and information extracted including age, sex, use of anaesthesia, indications and findings of the procedure were entered in SPSS and analysed.
Results: Flexible NPL was done in 266 patients aged 4 months to 85 years. Only 3% of the patients required local anaesthesia. The commonest indications were for preoperative evaluation of goitre (26.7%), suspected adenoid hypertrophy (18.4%), complaints of hoarseness (18.8%), and foreign body sensation (12%). The commonest diagnoses made were adenoid hypertrophy (19.9%), laryngeal tumour (5.3%), nasopharyngeal tumour (4.9%), vocal cord palsy (4.9%), rhinitis (4.5%) and pharyngitis (4.1%), laryngitis (3.0%), laryngopharyngeal reflux disease (3.0%) and vocal cord nodule (2.3%).
Conclusions: Office flexible NPL was done commonly for preoperative evaluation of goitre, suspected adenoid hypertrophy, hoarseness, and foreign body sensation. The commonest pathologies were adenoid hypertrophy, laryngeal tumour, nasopharyngeal tumour, vocal cord palsy, rhinitis, pharyngitis, and laryngitis.

Keywords: Flexible Naso-Pharyngo-Laryngoscopy; Upper Airway Disorders; Indications.

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Introduction

Evaluation of patients with upper airway disorders has evolved with the introduction of flexible fiberoptic endoscopes.[1] Flexible Naso-pharyngo-laryngoscopy (NPL) is the use of a flexible endoscope to examine the nose, pharynx and larynx for diagnostic or therapeutic purposes. The nose, pharynx and larynx are hidden areas which are not easily accessible to the clinician for a routine examination. Flexible NPL was introduced in 1975 and has since overtaken the traditional posterior rhinoscopy and indirect laryngoscopy which usually require unequivocal expertise on the part of the examiner, favourable anatomy and full cooperation on the part of the patient.[2]The flexible NPL has advantages over the traditional methods in that it has better visibility, gives static and dynamic images, helps in monitoring of disease and treatment, and can be used in patient education.[3]Another inherent advantages are that the result is immediately available, recordable and the endoscopist can review the results with the patient after the procedure.[4]

The flexible naso-pharyngo-laryngoscope has evolved with a reduction in diameter, an increase in length, flexibility of the tip, and the introduction of ports for biopsy and suctioning. Now paediatric endoscopes can be used even in infants and neonates. The procedure can be used in an office setting with good cooperation and tolerability even in children. Although the use of this instrument has become routine in paediatric, it is not used in every child in the clinic setting.[5]

Common indications of the procedure include nasal blockage, epistaxis, postnasal drip, hoarseness, noisy breathing, difficulty breathing, sleep apnea, choking episodes, dysphagia, chronic cough, hawking, chronic sore throat, foreign body sensation and neck swelling.[6,7] Direct vision of the nose and throat is necessary to define the exact cause. Also, patients who have blunt or penetrating neck trauma would require this procedure to ascertain internal injuries and define the line of management.

The use of local anaesthesia in adult patients or light sedation in children for the procedure has been debated, however, the procedure can be performed even without local anaesthesia, but those who find it uncomfortable or have an overactive gag reflex can be given lidocaine and phenylephrine topical solution sprayed into the nose and pharynx.[8,9]

Although NPL is being performed in most otorhinolaryngology clinics, there is a paucity of literature on the technique, indications, and findings of the procedure. Hence, this study aims to audit our local experience with flexible NPL and analyse the indications and findings of the procedure.

Materials and Methods

This was a retrospective study conducted in the Division of otorhinolaryngology of our facility between June 2021 to July 2023. Ethical approval was obtained from the institution and consent from the patients or caregivers for the procedure. All patients who were presented with upper aerodigestive symptoms or neck swellings and who had flexible naso-pharyngo-laryngoscopy were included in the study. Those with incomplete records or whose case folders were not found were excluded from the study. In our centre, flexible NPL is done routinely without local anaesthesia using a small-size endoscope, only those who showed apprehension or complained of pain have 10% Xylocaine topical solution sprayed into their nose and pharynx. Xylomethazoline nasal spray is used as a nasal decongestant in patients with engorged turbinates. The procedure is done by ENT consultants and/or residents. Patients or caregivers are informed that it is a minimally invasive procedure, although uncomfortable it is not usually painful. All procedures were done using a size 3.3mm PENTAX flexible fiberoptic endoscope. The endoscope is cleaned using a high-level disinfectant solution of Umonium38. Defogging of the flexible endoscope is done by wiping the tip of the scope with a piece of cotton wool soaked in Savlon (Cetrimide 3.0%w/v + Chlorhexidine Gluconate 0.3% w/v). The patient is seated on an examination chair or gently restrained in the case of a child. The examiner stands in front or slightly to the side of the patient, the scope is manipulated and steadied with one hand while the other hand rotates the tip deflector to guide insertion into the nose to view the nasal cavity, nasopharynx, hypopharynx, and larynx. The movement of the vocal cords is assessed by asking the patient to make an ‘Ee’ and ‘Aa’ sound. After the examination, the scope is retrieved gradually. Findings of the procedure are recorded. Patient information including biodata, use of anaesthesia, indications and findings was extracted, recorded in a proforma and analysed using SPSS version 25. Qualitative data were summarised as frequencies and

percentages and presented as tables. Statistical relationships were analysed using the Chi-square test. The p-value was set at <0.05.

Results:

A total of 266 patients had flexible NPL within the study period. The patients' ages ranged from 4 months to 85 years with a mean age of 32.7 years and a standard deviation of 19 years. Most patients were between the ages of 1-9 years and 30-49 years. There were 104 (39%) male and 162(61%) female with male to female ratio of 1:1.6 [see Table 1]. The procedure was well tolerated without local anaesthesia in most 258(97%) of our patients.

Table 1: Age distribution of the patients who had flexible naso-pharyngo-laryngoscopy.

Age	Frequency	Percentage
<1yr	5	1.8
1-9	50	18.8
10-19	19	7.1
20-29	35	13.2
30-39	44	16.6
40-49	49	18.4
50-59	37	13.9
60-69	19	7.1
70-79	6	2.3
80	2	0.8
Total	266	100

Preoperative evaluation of patients with thyroid diseases was the most common indication noted in 71(26.7%) patients, followed by suspected adenoid hypertrophy seen in 49 (18.4%) [see Table 2]. The diagnoses made by the examiners following flexible NPL were shown [see Table 3]. Adenoid hypertrophy was noted in 53 (19.9%) patients, laryngeal mass in keeping with a tumour in 14(5.3%) and Nasopharyngeal mass in keeping with tumour was observed in 13(4.9%) patients while many of the patients 94(35.3%) had no abnormality detected.

The laryngeal findings from the preoperative evaluation of 71 patients with goitre when analysed revealed that 66(93%) patients had normal vocal cord mobility, 3(4.2%) had reduced vocal cord mobility and 2(2.8%) had unilateral vocal cord palsy. Of the 50 patients who presented with hoarseness, 14(28%) had a laryngeal mass in keeping with tumour, 8(18.2%) had vocal fold palsy and features of laryngitis and vocal nodules were noted in 6 (13.6%) patients each respectively.

The findings identified on flexible NPL in patients who complained of foreign body sensation in the throat were analysed which revealed: Pharyngitis 7(21.9%), Allergic rhinitis 5(15.6%), and Elongated Uvula 2(6.3%), while many of the patients 14(43.8%) have no abnormality seen. The laryngeal findings

in the patients who had neck trauma were laryngeal edema 2(28.6%) and 1(14.3%) each had reduced vocal cord mobility, vocal cord web and Laryngeal stenosis.

Table 2: Indications for flexible naso-pharyngo-laryngoscopy

Age	Frequency	Percentage
Goitre	71	26.7
Suspected adenoid hypertrophy	49	18.4
Hoarseness/change in voice	50	18.8
Foreign body sensation	32	12
Cervical lymphadenopathy	17	6.3
Nasal blockage	11	4.2
Neck trauma	7	2.6
Post-operative examination	6	2.3
Choking episodes	3	1.1
F.B in the nose	2	0.8
Aphonia	2	0.8
Other indications	5	1.9
Total	266	100

Discussion:

Office flexible NPL is essential in the evaluation of patients with upper airway disorders. The age range of patients in our study was 4 months - 85years which shows that the procedure can be performed in all age groups including infants using a small-size endoscope. In this study, female preponderance was observed, and this is in agreement with the findings of Aremu *et al.*[10] where more than half of their study population were female. The reason for the higher female in our study is because the commonest indication of the procedure is for evaluation of goitre which is mainly seen in females. Most patients (97%) in our study tolerated the procedure well without local anaesthetic which showed that the procedure is tolerable without anaesthesia. In contrast, other similar studies employed Xylocaine spray in all patients.[4,6,10,11]

The most common indications for flexible NPL in our centre were for preoperative evaluation of goitre, suspected adenoid hypertrophy in children, complaints of hoarseness and foreign body sensation. This is similar to a study by Aremu *et al.*[10] in Southwest Nigeria where he reported the commonest indication of NPL to be for evaluation of goitre/thyroid cyst (45%) followed by hoarseness (26%). But, they didn't report adenoid hypertrophy as an indication probably because only 6% of their participants were less than 20yrs. Adeyemo *et al.*[12] also reported the commonest indication to be for the evaluation of goitre. However, Wilkins *et al.*[4] reported hoarseness (51.3%) as the commonest indication followed by Globus sensation (32.0%), chronic cough (17.1%), chronic rhinitis (13.5%), and sore throat (10.9%).

In about 35% of our patients who had flexible NPL no abnormality was noted, other findings included adenoid hypertrophy (19.9%), Laryngeal mass in keeping with tumour (5.3%) and Nasopharyngeal mass in keeping with tumour (4.8%). This is similar to a study by Aremu *et al.*[10] who also reported normal findings as the most common (59%), followed by nasal mass (15%).In sharp contrast to our findings, Regmi *et al.*[2] identified Laryngopharyngeal reflux disease (41%) as the most prevalent finding of their study followed by Vocal cord nodules and polyps.

Table 3: Diagnoses made following flexible naso-pharyngo-laryngoscopy.

Diagnosis	Frequency	Percentage
Normal (no abnormality seen)	93	35.0
Adenoid hypertrophy	53	19.9
Satisfactory postoperative	19	7.1
Laryngeal tumour	14	5.3
Vocal cord palsy	13	4.9
Nasopharyngeal tumour	13	4.9
Rhinitis	12	4.5
Pharyngitis	11	4.1
Laryngitis	8	3.0
Laryngopharyngeal reflux disease	8	3.0
Vocal cord nodule	6	2.3
Laryngeal edema	4	1.5
Hypopharyngeal/Oesophageal lesion	4	1.5
Laryngomalacia	3	1.1
Vocal cord web	2	0.8
Vocal cord stenosis	2	0.8
Foreign body in the larynx	1	0.3
Total	266	100

Preoperative evaluation of vocal cords in patients with goitre revealed abnormal vocal cord movement in 7% (impaired vocal cord mobility in 4.2% and vocal cord paralysis in 2.8%). This was in contrast to studies by Shin *et al.*[13]and Rowe-Jone[14] that revealed a lower incidence of preoperative vocal cord palsy at 2% and 1% in benign thyroid disease respectively. The high rate in our study may be because not all the cases of goitre are benign as higher incidences were reported in malignant thyroid disease. However, our study did not analyse the histological type of the goitre. The impairment/paralysis of the vocal cord is

usually a result of nerve stretching from a progressive goitre enlargement or nerve infiltration by a malignant lesion, hence, flexible NFL is important to check the vocal cord status before surgery for medico-legal reasons.

Flexible naso-pharyngoscopy was found to be useful in the initial evaluation of patients with complaints of foreign body sensation as significant aetiological findings such as pharyngitis, allergic rhinitis, laryngitis, elongated uvula, and laryngopharyngeal reflux were identified in our study. This is similar to a study by Moser *et al.*[15]which revealed significant organic causes in patients with Globus sensation.

Evaluation of patients with neck trauma after resuscitation also requires flexible NPL to ascertain internal injuries and plan for definitive management. The most common post-traumatic endoscopic findings noted in our study were: No abnormality seen, laryngeal oedema, reduced vocal cord mobility, vocal cord web and laryngeal stenosis.

Conclusion:

Flexible NPL is an essential clinic procedure in the evaluation of patients with upper airway problems. With the use of a small-sized endoscope and assurance from the examiner, the procedure was well tolerated even without local anaesthesia. Preoperative evaluation of goitres, suspected adenoid hypertrophy, hoarseness and foreign body sensation were the most common indications for the Flexible NPL. The commonest findings were adenoid hypertrophy, laryngeal tumour, nasopharyngeal tumour and vocal fold palsy. There is a need for further studies to compare the tolerability of the procedure with and without local anaesthesia.

Conflict of interest: nill

Financial support: nill

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