ROLE OF FLEXIBLE FIBER OPTIC LARYNGOSCOPY IN PHARYNGEAL AND LARYNGEAL DISEASES

Vibhuti

ENT Department, DDU hospital, New Delhi

ABSTRACT

Purpose: To study the changes in pharynx and larynx in patients presenting with laryngopharyngeal symptoms using flexible fiberoptic laryngoscopy and compare the findings with that of indirect laryngoscopy, evaluate the incidence of complications and thereby assess the Efficacy of flexible laryngoscopy as a diagnostic tool.

Study Design: A Primary study of 1 year duration

Methodology: 100 patients presenting with suspected laryngopharyngeal pathology were evaluated. Relevant history and clinical examination including Indirect laryngoscopy and Fibreoptic Laryngoscopy was done in these patients and the results analysed.

Results: Indirect laryngoscopy could identify 11% lesions in oropharyngeal pathology compared to 13% by fibreoptic laryngoscopy. Detection rate was 26% in supraglottis by I/L in contrast to 43% by FOL, 42% by I/L while 55% by FOL in glottis, 1% by I/L in comparison to 5% by FOL in subglottis, and 2% on I/L examination against 10% on FOL examination in hypopharynx. Thus in each of these regions, the detection rate was higher by fibreoptic laryngoscopy. Only 2% patients had foreign body sensation post FOL and only 1% patient had an episode of minor epistaxis.

Conclusion: Suspected laryngopharyngeal pathology may present with a variety of symptoms. A detailed history and examination is required. Indirect laryngoscopy is a simple OPD procedure but it is difficult to perform in uncooperative or anxious patients or those with excessive gag reflex, who cannot sit and are bed ridden. Also, visualisation of few pharyngeal and laryngeal structures is obscured in indirect laryngoscopic examination. Whereas, FOL can be performed in all the patients, bedside or in OPD, and provides a clear vision of most of the structures of pharynx and larynx including the hidden areas of larynx and in cases with anatomical variations. FOL is a well tolerated, cost effective procedure with minimal patient discomfort and rare, mild, transient complications.

INTRODUCTION

The functions of the larynx include protection of the lower airway during deglutition, regulation of respiratory mechanics, phonation, coughing, and effort closure. Conditions affecting pharynx or larynx may present as voice changes, features of upper airway obstruction, dysphagia, or globus. A detailed assessment helps formulate diagnosis and determine the impact on quality of life, treatment options and prognosis. Laryngoscopy, flexible nasoendoscopy, microlaryngoscopy, Hopkins rods lens telescopes can be used for examination.

Indirect laryngoscopy has been recognized as an integral part of examination of larynx, but may be associated with failure to visualize the lesion in few patients. Rigid direct laryngoscopy is usually done under general anaesthesia therapeutically.

Endoscopic Laryngeal assessment with 70- or 90-degree rigid endoscopes provides better optical resolution and higher sensitivity, but with a 70-degree endoscope, the size of a glottic gap might appear exaggerated. The phonation is also limited to sustained vowels, and disorders evident in connected speech are not well documented.

Fiberoptic nasopharyngolaryngoscopy, however, is performed in OPD under local anaesthesia and allows visualization of the nasal cavity, nasopharynx, posterior surface of the uvula and palate, base of the tongue, pharyngeal and lingual tonsils, vallecula, pyriform spaces, supraglottis, glottis with mobility or immobility of the vocal folds and arytenoids, and the subglottis. It can view the larynx dynamically during phonation with better assessment of arytenoid mobility and glottic gap. The nasal cavity and velopharyngeal port can also be assessed.
simultaneously. It is thus useful to diagnose spasmodic dysphonia, muscle tension dysphonia and vocal fold motion impairment.

**MATERIAL AND METHODS**

This study was conducted over a period of 1 year. 100 patients presenting with various laryngopharyngeal symptoms, were evaluated on the basis of detailed history and exhaustive ENT examination. The patients were explained in detail about the procedures and a written consent was obtained.

**Inclusion criteria:** Age group of above 15 years with complaints of voice changes, voice fatigue, cough, difficulty in swallowing, foreign body sensation or feeling of lump in throat, difficulty in breathing or noisy breathing, with associated neck swelling or pain in throat, presence of blood in sputum, weight loss or regurgitation. Such patients with abnormal findings on Indirect laryngoscopy and those with overhanging epiglottis and uncooperative patients were taken up for this study.

**Exclusion criteria:** Less than 15 years of age, patients with speech defects due to CNS lesion, patients with infective pathologies of pharynx or larynx, or with severe coagulopathies or cardiac disorders

**Statistical Significance:** We make the null hypothesis that there is no difference in the efficacy of I/L and FOL method. To check this hypothesis we run the data in SPSS. We run one sample test on the summative scale of I/L and FOL for the 100 patients. The Mean difference of FOL (1.26) was higher than that of I/L (.76). Higher mean value of FOL shows that as compared to I/L, FOL is a better method of study.

**RESULTS**

The mean age was 42.8 years with male to female ratio of 2.85:1. Most of the patients were in the age group of 35-44 years. The most common presenting symptoms were change in voice (61%), foreign body sensation in throat (28%), difficulty in swallowing (16%), followed by other symptoms. Maximum patients (27%) presented after 4-5 months duration of chief symptom.

Indirect laryngoscopy could identify 11% of lesions in oropharynx compared to 13% detection rate by fiberoptic laryngoscopy. Detection rate was 26% in supraglottis by I/L in contrast to 43% by FOL, 42% by I/L while 55% by FOL in glottis, in subglottis 1% by I/L in comparison to 5% by FOL, and 2% on I/L examination against 10% on FOL examination in hypopharynx. Thus in each of these subsites, the lesions detected by fibreoptic laryngoscopy was higher than that of indirect laryngoscopy.

About 44 findings could not be detected on Indirect laryngoscopy compared to Nil by Fibreoptic laryngoscopy. Indirect laryngoscopy was difficult to perform in few, uncooperative or anxious patients (34.09%), those with excessive gag reflex (6.81%), those who cannot sit and are bed ridden. Visualization of few structures were obscured due to pathological lesions or the hidden areas (31.82%) or in those with normal anatomical variations (22.73%). Whereas FOL could be performed in all the patients and all the structures were visualized adequately.

The difficulties faced during fiberoptic laryngoscopy procedure were minimal and seen only in 15 patients. In 2 patients we faced difficulty in passage of the laryngoscope, 5 had excessive secretions, 3 had excessive cough and 4 patients were overanxious. However, the procedure could be carried out successfully in all these patients. The complications of this procedure are minimal. 2% patients had foreign body sensation post FOL for some time and only 1% patient had an episode of epistaxis which stopped spontaneously after a few minutes.

**DISCUSSION**

Most of the studies in past have been mainly to study the etiology or the clinical profile of hoarseness. However, apart from hoarseness, many authors, Parikh (1991)\(^1\), also found association of various other symptoms. Sambhav et al in their study on Clinical profile of hoarseness found change in voice as the most common symptom of presentation followed by cough, fever, voice fatigue, foreign body sensation. Kadambari et al assessed the efficacy of FOL as a diagnostic tool in 100 patients with hoarseness, in which I/L could not be performed in 38 patients. Epiglottic overhang was the most common cause (20 patients) followed by hypersensitive gag reflex (7), anxious uncooperative patients (7), others. FOL was successful in diagnosing 61 cases of which 35 had functional voice disorder. 42 patients were saved from direct laryngoscopy. Difficulties encountered with FOL were fogging of scope, difficulty during passage, bleeding, excessive secretion, anxiety, cough. In a study by Welch et al (1982)\(^2\), 37 patients were spared of direct laryngoscopy and could be diagnosed by FOL alone. Silbermann et al (1976)\(^3\) used 10% cocaine as topical nasal anaesthesia and stated that FOL is reassuring in patients with unsatisfactory laryngeal mirror examination and it avoids unnecessary exposure of patients to general anaesthesia. Specific uses of FOL included observing larynx while swallowing, coughing, as bedside laryngoscopy in elderly, comatose patients; those with inability to open mouth, swollen tongue, post radiotherapy; for photography, paediatric uses, sinuscopy, tracheoscopy and to check the position of the endotracheal tube.

![Figure 1](image_url)  
**Figure 1** Rate of Detection of Lesions By I/L AND FOL.  
\( \text{Rate of Detection of Lesions By I/L AND FOL} \)
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Difficulties in Visualization of Larynx by Indirect Laryngoscopy

- Anxious/Uncooperative Patient: 15 (34.09%)
- Epiglottic Overhang: 11 (25%)
- Excessive gag reflex: 3 (6.81%)
- Inability to open mouth: 2 (4.55%)
- Arytenoid edema: 3 (6.81%)
- Others: 10 (22.73%)

**Figure 2** Difficulties Faced In Visualization of Larynx By Indirect Laryngoscopy

Difficulties with Fol

- Difficulty in passage: 27%
- Excessive Secretions: 33%
- Fogging: 7%
- Others: 20%

**Figure 3** Difficulties Faced During Fiberoptic Laryngoscopy Procedure

Complications of Fiberoptic Laryngoscopy

- Epistaxis: 0
- Residual FBS: 1
- Cough: 2
- Tachycardia: 0
- Arrhythmia: 1

**Figure 4** Complications of Fiberoptic Laryngoscopy

Indirect laryngoscopy has been the first line of laryngeal examination. It is widely available and easy, simple procedure but the image visualized by I/L mirror, is a reverse image, with antero-posterior inversion. The disadvantages include inability to visualize endolarynx in all the patients due to patient discomfort and thus non-cooperation despite repeated reassurances, or due to excessive gag reflex or in those who cannot sit or are bed ridden. Also, it cannot visualize the ‘hidden areas’ of larynx, viz. laryngeal surface of epiglottis, ventricle, the anterior commissure, subglottis, and apex of pyriform fossa, post cricoid region. In some patients, normal anatomical variations such as overhanging or tubular epiglottis and certain pathological lesions obscure the view of other adjacent structures. In other patients, the view is not satisfactory and requires further assessment. Other difficulties while performing I/L include involuntary contraction or raising of dorsum of tongue by the patient, fogging of mirror, beam reflection, limited mirror-objective size, lack of magnification and difficulty in obtaining photographic documentation.

Fiberoptic Laryngoscopy, on the other hand, can be performed in almost all the patients, bedside or in OPD, with minimal patient discomort. It provides a brighter image, easily perceived and facilitates detailed observation of the laryngopharynx including the ‘hidden areas’ compared to I/L. Local anaesthesia of nose and posterior pharyngeal wall is sufficient to supress hypersensitive gag reflex. FOL can be done via transnasal or transoral route. The small tip of the scope is easily maneuvered in cases with anatomical variations of nasal septum or epiglottis, or pathological lesions to allow adequate vision. The major advantage is the visualization of dynamic larynx. Thus, FOL holds significant advantages. It is as informative as Direct Laryngoscopy procedure and avoids unnecessary hospital admission or need of general anaesthesia. It is the only reliable method of clinical examination in patients unfit for general anaesthesia. FOL enables photographic documentation of the findings and also allows for frequent or repeated examinations for follow up.

No significant discussion of complications of flexible laryngoscopy exists in the literature. But a few patients may present with discomfort of variable degree, occasional epistaxis during difficult insertion, excessive gag reflex in the absence of local anaesthesia, coughing, transient laryngospasm, tachycardia, arrhythmia post procedure. Very few may present with gluteraldehyde allergy and infection due to laryngoscope contamination. Psychogenic pain and other symptoms may be experienced by some patients rarely which may last for prolonged periods. The incidence of complications of FOL is minimal and FOL is a safe efficacious diagnostic tool for laryngopharyngeal diseases.

**CONCLUSION**

FOL is a simple, well tolerated procedure, performed bedside or in OPD and provides accurate diagnosis. It is a cost effective procedure, associated with minimal patient discomfort and rarely, mild transient complications. Despite I/L being the simplest procedure for examination of laryngopharynx, Fibreoptic laryngoscopy has a higher efficacy. The rate of detection is higher by fibreoptic laryngoscopy compared to indirect laryngoscopy in each of the regions of pharynx or larynx.

In light of these findings, it is concluded that FOL has a definite and unchallengeable role in assessment and diagnosis of Laryngopharyngeal disorders and is an indispensable armamentarium of present ENT surgeon.

**References**


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