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Diagnostic flexible fiber optic laryngoscopy and 70-degree hopkins rod lens laryngoscopic study in patient with hoarseness and dysphagia: a comparative study

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Objectives: To use Flexible Fiber Optic Laryngoscopy and 70-degree Hopkins Rod Lens Laryngoscope in diagnosis of patient with Hoarseness and Dysphagia. **Introduction:** Laryngoscopy is examination or visualization of laryngeal structures which can be Endoscopes or rigid Laryngoscopy. Endoscopic and Fiber Optic laryngoscope is usually done under local anaesthesia in adults and general anaesthesia in children. Earlier pharyngeal and laryngeal pathologies required hospitalization for examination and procedure with rigid laryngoscopy under general anaesthesia but when Endoscopic laryngoscopy and Fibre Optic laryngoscope come in use these procedures can be done under local anaesthesia in OPD basis which decrease not only patients and doctors valuable time but also economic burden. **Materials and methods:** Study was conducted in Department of ENT from August 2017 to August 2019 in Amaltas Institute of Medical Sciences, Dewas, Madhya Pradesh. Total 309patients were taken with age group of 10 to 60 who presented with symptoms of hoarseness and Dysphagia. Detailed clinical examination done for odynophagia, difficulty in breathing and cervical lymph nodes. Initially Endoscopic 70-degree Hopkins Rod Lens done under local anaesthesia and findings are compared with that of Flexible Fiberoptic laryngoscopy under local anaesthesia. **Conclusion:** Flexible Fiber Optic laryngoscopy is an important tool for detailed examination of nasopharynx and larynx. Endoscopic laryngoscopy70 degree Hopkins Rod Lens is quick & easy OPD procedure for examination of Larynx.

Keywords: Endoscope 70-degree Hopkins Rod Lens, Flexible Fiberoptic Laryngoscopy (FOL), Hoarseness, Dysphagia

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Introduction

Although Garcia was credited with first description of mirror indirect laryngoscopy [1]. Bozzini was actually the first to report on mirror visualization of the larynx and described the first indirect laryngoscope [2]. Killain in 1909 introduced the suspension laryngoscopy and in 1960 Kleinsasser developed monocular telescope and discovered the great possibilities of this magnification in detecting early pathological changes [3].

Hopkin rods have greatly enhanced the magnification and depth for detailed observation during examination of the larynx; also, they were modified to view in different angles. The invention of Hopkin rod telescope and flexible endoscope reserved direct laryngoscopy for therapeutic intentions. Laryngeal disorders are often multifactorial in etiology and to complicate matters patients may develop compensatory vocal behaviors in order to be able to communicate effectively. This may mask the true underlying or primary disorder.

Heinrich Lamm developed Fibreoptic imaging system in 1930's & later on Hirsehowitz developed functional fibreoptic scope [4] Sawashima & Hirose in 1968 introduced flexible fiberoptic system for diagnostic and therapeutic laryngoscopy on OPD basis under local anaesthesia [5].

Laryngoscopy is examination of laryngeal structures with Endoscope or rigid laryngoscope. Direct laryngoscopy means to view the larynx directly, in a straight line, all the way through a laryngoscope, under general anesthesia or local anaesthesia. Indirect laryngoscopy means visualization of the larynx with the patient comfortably sitting or supine position using a mirror, flexible fiberoptic nasopharyngoscope & angled Hopkins Rod Lens 70 Endoscope.

Endoscopic laryngoscopy proved excellent tool for doctor as well as patient because it decreased economic burden & hospital stay as it is day care procedure & also it provides great source of clinical material for learners. Charlin B et al [6] in 1989 compared endoscopic findings in 66 consecutive previously untreated cases of laryngeal cancer. Endoscopic laryngoscopy is useful for diagnosing the cause of dysphagia and hoarseness. Dysphagia is defined as difficulty in deglutition of food and hoarseness is abnormal voice production both are very common symptoms which leads to present a patient to otolaryngology clinics.

In the E.N.T. practice, flexible fibre optic has revolutionized the diagnosis of the airway tract diseases without any significant invasive intervention. With the passage of time, the horizon of its utility is broadened and is being used for many different indications. The posterior rhinoscopy and laryngoscopy with mirrors has been integral components of a thorough E.N.T. examination.

These examinations require unequivocal expertise on the part of the examiner, coupled with favorable anatomy and full cooperation on the part of the patient. Many a times, absence of any of these components results in failure of the procedure. For such a situation examination under general anesthesia used to be performed. With the advent of flexible fibre optic, upper airway from nose up to the level of vocal cords can be visualized even in the awake patient under local anesthesia with additional advantages of simplicity and cost effectiveness.

Endoscopic 70-degree Hopkins Rod Lens and Fiberoptic Laryngoscopies usually done under local anaesthesia.

Aims and Objectives

To compare results of Endoscopic 70 degree Hopkins Rod Lens laryngoscopy with that Flexible Fiberoptic laryngoscopy in patients presented with hoarseness and dysphagia.

Materials and Methods

Site of the study: Personal clinic and Amaltas Institute of Medical Sciences, Dewas, Madhya Pradesh

Type and Duration of study: Retrospective study conducted from August 2017 to August 2019

Eligibility for the study

Age eligible for the study: 10 years and above

Genders eligible for the study: Both

Sample size: Total 309 patients were taken with age group of 10yr to 60yr who presented with symptoms of hoarseness and dysphagia.

Detailed clinical examination done for odynophagia, difficulty in breathing and cervical lymph nodes.Initially Endoscopic 70 degree Hopkins Rod Lens done under local anaesthesia and findings are compared with that of Flexible Fiberoptic laryngoscopy under local anaesthesia.

Inclusion criteria

All patients with predominant complaints of hoarseness and dysphagia.

Patients with no or with past medical history of laryngeal diseases or surgical laryngeal procedure were accepted for inclusion.

Exclusion criteria

Age less than 10 years.

Patient presented with dysphagia due to esophageal disorders

Those with acute airway obstruction and had history of allergy to local anesthesia.

Results

Table-1: Age Distribution

S. No.	Gender	No.	Percentage
1.	10-20	47	15.2%
2.	21-30	81	26.2%
3.	31-40	106	34.3%
4.	41-50	48	15.6%
5.	51-60	27	08.7%

In the present study, it was found that 34.3% patients from age group 31-40, 26.2% patients from age group 21-30, followed by 15.6% patients from age group 41-50, 15.2% patients 10-20 age group.

Table-2: Gender Distribution

In the present study, 186 were male (60%) and 123(40%) were female.

S. No.	Gender	No.	Percentage
1.	Male	186	60%
2.	Female	123	40%

Table-3: Showing comparative study between Endoscopy 70-degree Hopkins Rod Lens with that of Fiber Optic Laryngoscopy.

Diagnosis	Findings of Fiberoptic Laryngoscopy (No of patients)	Findings of 70-Degree Endoscopic Laryngoscopy	
		Matched	Unmatched
Vocal cord polyp	119	93 (78.15%)	26(21.85%)
Growth	57	57(100%)	00(0.00%)
Vocal nodules	47	33(70.22%)	14(29.78%)
Vocal cord paralysis	39	23(58.97%)	16(41.03%)
Subglottic Stenosis	17	17(100%)	00(0.00%)
Foreign body	12	12(100%)	00(0.00%)
Laryngitis	10	10(100%)	00(0.00%)
Spasmodic Dysphonia	08	08(100%)	00(0.00%)

Table-4: The comparison between successful Anesthesia, Acceptance, Complication & Time of Examination.

Parameter	70-degree Hopkins Rod Laparoscopy		70-degree Hopkins Rod Lens		P-Value
	No.	Percentage	No.	Percentage	
Successfulness	294	95	309	100	0.259
Topical Anesthesia	18	06	309	100	
Patient Acceptance	284	92	265	86	
Complication	-	-	-	-	
Average Time (Mean± SD)		488±7.1		59.5±8.1	0.0001*

* Significant using Pearson Chi Square test for difference between percentages or students T-test for difference between two independent means at 0.05 level of significance.

Discussion

Since long ago, indirect laryngoscopy has been used as a traditional method for laryngeal examination in Otorhinolaryngology clinic and during examination and difficulty was faced due overactive gag reflex and pediatric uncooperative patients. Abnormal shape of epiglottis may hamper proper visualization, so Fiber Optic laryngoscopy is investigation of choice in patient if diagnosis is unsatisfactory [7]. Endoscopic laryngoscope is used as OPD tool in patients presented with dysphagia, hoarseness and patient having strider for diagnosis and therapeutic purpose.

Earlier all these patients were admitted for direct laryngoscopy under general anaesthesia which is invasive procedure that leads to complications, extra burden on hospital's limited resources also put extra unnecessary economic burden on patients due to more staying duration [8]. In laryngology clinics, 70^0 and 90^0 Hopkins nasal endoscope is used for laryngeal examination where flexible laryngoscope is not available or flexible laryngoscopy is not possible due to nasal deformity, deviated nasal septum, turbinate hypertrophy, nasal polyp.

In Barker and Dort's study he found 83% of larynx visualization as compared to laryngeal mirror which is 52% only [9].

In the present study, the commonest problem was hoarseness and dysphagia which is a symptom of disease. Fiber optic laryngoscopy is the commonest tool that is mostly used otolaryngologists for evaluation of the dysphonic patient [10,11].

In the present study, out of 309 patients Vocal cord polyp was seen in 119 out of them 93 were matched and 26 were unmatched. Disparity from these results Bastian reported that more than 50 % of patients with voice changes are suffering from benign vocal fold lesions [12]. Brodnitz reported that 45% in his study had a diagnosis of nodules and polyps [13]. Differences from our results are probably due to that the current study did not included evaluation of laryngeal lesions by stroboscope which may considerably change the diagnosis. Sataloff et al [14], Casiano et al [15] and Woo et al [16] reported that stroboscope may lead to changes in the diagnosis in approximately 30% of cases when compared to examination with continuous light alone.

Second probable elucidation explained by Merati that in the great majority of cases involving phonotrauma, medical attention is not sought [17]. The number of patients (39) having vocal cord paralysis in FOL &Endoscopic laryngoscopy showed only 23 patient of same finding 16 patient missed diagnosed so FOL is better here.

In the present study, both methods easily confirmed matched supraglottic and glottic growth. 57(100%) patient with growth matched. Laryngeal symptoms are more common in age group 31 to 40 year and males i.e. 186 are most commonly affected, Fiber optic laryngoscopy is important for assessment of vocal cord mobility or fixation and also staging of malignancy.

The introduction of video digital recording equipments as capture devices, camera systems, monitors and the availability of computer's software had greatly enhanced the efficacy of examination by endoscopes. This will provide documentation and confirmation for reassessment without disturbing the patient with re-examination, data are also available for medicolegal reasons and provides a better way of teaching capability. Jeannon and Macnamara mentioned that photo documentation is becoming an important part of otolaryngology practice. It improves case review between clinicians and is increasingly forming part of routine practice in the current medicolegal climate [18].

In the current study all patients underwent flexible endoscopy under topical anesthesia while almost all of them 294 patients (95%) required no anesthesia for examination with rigid Endoscope; this point is very significant in evaluating patients with allergy to local anesthetics.

In consistency with the current results Rammage et al [19], Hirano and Bless [20] and Izdebski et al [21], all were reported that examination of the larynx by rigid endoscope is simple and does not usually require topical anesthesia. Johnson et al stated that topical nasal administration of local anaesthesia is often used prior to flexible laryngoscopy in order to decongest the nose and facilitate examination [22].

Conclusion

Endoscopic laryngoscopy 70-degree Hopkins Rod Lens is significantly better regarding the average time spent and the negligible level of discomfort experienced during examination. No anaesthesia is required during Endoscopic laryngoscopy. No significant differences between both procedures regarding successfulness, acceptance and the number of trials for optimum examination. No complications recorded during both procedures.

What the study adds to the existing knowledge?

Flexible Fiber Optic laryngoscopy is an important tool for detailed examination of nasopharynx and larynx. Biopsies can be taken by flexible punch forceps guided through flexible fibre optic cable.

FOL is better tool for making accurate diagnosis of symptoms and maintaining of records and follow up in these patients and substitute of 70-degree Hopkins rod endoscope in patients with Oral submucous fibrosis and other temporomandibular joint diseases.

Endoscopic laryngoscopy 70-degree Hopkins Rod Lens is quick & easily available OPD procedure for examination of Larynx and very cost effective as compared to FOL.

Author's contributions

Dr. Kapil Meena: Concept, study design

Dr. Rakesh Maran: Data analysis, manuscript preparation

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