

# Importance of Fibreoptic laryngoscopy in the diagnosis of voice disorders

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## Abstract

**Objective:** To find out the importance of fibreoptic laryngoscopy in diagnosis of voice disorders.

**Design:** Prospective observational study.

**Methods:** In this study, we included 61 patients presenting with a primary symptom of persistent change of voice for at least 4 weeks. Of these 29 patients were female and 32 were male. Following detailed examination with a 70 degree rigid fibreoptic laryngoscope, we had come to a diagnosis.

**Result:** Among these patients we found vocal fold nodules (50.8%), laryngopharyngeal reflux disease (LPRD), vocal fold polyp, keratotic mass of vocal folds, vocal fold paralysis, Reinke's oedema and sulcus vocalis also found.

**Conclusion:** Fibreoptic laryngoscopy is a very useful examination for diagnosing various types of voice disorders.

**Key Words:** Fibreoptic laryngoscope, hoarseness.

## Introduction :

Fibreoptic laryngoscopy is a most useful and effective method of evaluation and documentation of physiological and pathological conditions of the larynx. It is of great value for making accurate diagnosis and further management. It provides instant and simultaneous voice and video recording and thereafter, analysis.

It is often not possible to differentiate between vocal fold nodules and polyps. Fibreoptic laryngoscopy can clearly differentiate between the two conditions. It is important to differentiate as vocal fold nodules arise from epithelium, basement membrane zone and superficial lamina propria, whereas polyps may involve deeper layer of lamina propria.

Vocal fold polyps involve superficial lamina propria. These lesions thought to be involved deep within lamina propria or to consist of different permanent histopathological changes unless removed surgically. Vocal polyps are usually unilateral.

Laryngopharyngeal reflux disease is a retrograde flow of gastric contents to the upper aero-digestive tract. Proton pump inhibitors are empirically used to treat laryngopharyngeal reflux disease.

Vocal fold paralysis is weakness of one or both vocal folds. Symptoms of vocal fold paralysis includes hoarseness, vocal fatigue, mild to severe reduction in vocal volume, pain in the throat when speaking, shortness of breath,

aspiration with frequent resultant coughing, and in extreme cases may cause death.

Sulcus vocalis is used specifically to describe a groove or infolding of mucosa along the surface of the vocal folds. The incidence of sulcus vocalis is very hard to determine due to variation in presentation and diagnosis. In a study by Nakayama et al, sulci were identified in 20% of autopsy specimens.

Keratoses of vocal folds are abnormal growths on one or both vocal folds. It is seen in 40-80 years age group and predominantly seen in male. Patients presents with hoarseness.

Reinke's oedema is named after Friedrich B. Reinke. It is the swelling of the vocal folds due to accumulation of fluid in superficial lamina propria. Histopathological examination of vocal folds shows swelling of Reinke's space.

Pseudosulcus vocalis is a pattern of oedema on the ventral surface of the vocal fold. It was first described in 1995. It is an infraglottic edema and extends from the anterior commissure to the posterior larynx. It is associated with LPRD.

## Materials and Methods:

This prospective study was carried out on a group of 61 patients who presented to the "Voice Clinic" run and managed by the Department of ENT & Head Neck Surgery, Ramakrishna Mission Seva Pratishthan, Vivekananda Institute of Medical Sciences, Kolkata with a primary symptom of persistent hoarseness for at least 4 weeks. The study was conducted from September, 2011 to August, 2012. Total number of 14,652 patients attended to the ENT clinic during this study and out of them 61 patients were advised to attend : "Voice Clinic".

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We used following instruments to conduct our study:

- i. 70 degree 8 mm rigid telescope
- ii. Single chip camera with TV monitoring

Examination done jointly by Otolaryngologists and voice pathologists.

At first, a detailed history was taken of all selected patients, using a specially designed pro forma. Then a thorough examination was undertaken and objective evaluation performed by 70 degree rigid fiberoptic laryngoscope.

Patients were followed up in 4 weeks and 3 months since first visit.

### Results:

In our study total number of 61 patients attended 'Voice Clinic' from September, 2011 to August, 2012. 32 (52.5%) patients were male and 29 (47.5%) were female. Duration of presenting symptoms varied from 3 weeks to 10 years with an average of 19 months.

Total no. of patients	61	100%
Male	32	52.5%
Female	29	47.5%

Table 1- showing male : female ratio of all patients

Out of 61 patients 45 presented with hoarseness. Amongst them, 5 patients suffering from hypothyroidism and were on medication (Thyroxin sodium tablets).

Indirect laryngoscopy could not be done either due to too much gag or because of anatomical reasons in 8 (13.1%) out of 61 (100%) patients. Fiberoptic laryngoscopy was done in all patients.

Investigations	Done	Percentage	Could not be done	Percentage
Indirect laryngoscopy	53	86.9%	8	13.1%
Fiberoptic laryngoscopy	61	100%	0	0%

Table 2: showing number of patients where indirect laryngoscopy was not possible.

Out of 61 patients 31 (50.8%) were diagnosed with vocal nodules, 21(19.7%) with laryngopharyngeal reflux disease, 5 (8.2%) with vocal fold paralysis, 4 (6.6%) with vocal fold polyp, 4 (6.6%) with sulcus vocalis, 3 (4.9%) with vocal fold keratosis, 1 (1.6%) with pseudosulcus and 1 (1.6%) with Reinke's oedema.

Total no. of patients	61	
Vocal nodules	31	50.8%
LPRD	12	19.7%

Vocal fold paralysis	5	8.2%
Vocal fold polyp'	4	6.6%
Sulcus vocalis	4	6.6%
Keratotic mass of vocal fold	3	4.9%
Pseudosulcus	1	1.6%
Reinke's oedema	1	1.6%

Table 3: showing distribution of pathology

Total no. of patients with vocal nodules were 31. Out of them 14 were male and 17 were female. By occupation 9 patients were homemaker, 8 were student, 6 were office worker, 3 were teacher, 3 singer, 1 was shop keeper and 1 was bus conductor.

Total no. of patients with Vocal nodules	31	100%
Male	14	45.2%
Female	17	54.8%

Table 4: showing male : female ratio of vocal fold nodules

In indirect laryngoscopy, 8 (25.8%) patients with vocal nodules showed normal findings and in rest 23 (74.2%) patients showed vocal nodules. Whereas in fiberoptic laryngoscopy, vocal nodule could be clearly demonstrated in all 31 patients

Investigations	Vocal nodules appeared normal	Percentage	Vocal nodules appeared pathological	Percentage
Indirect laryngoscopy	8	25.8%	23	74.2%
Fiberoptic laryngoscopy	0	0%	31	100%

Table 5: showing indirect laryngoscopy and fiberoptic laryngoscopy findings of vocal nodule patients

Out of 21 patients with LPRD 11 (52.4%) were male and 10 (47.6%) were female.

Out of 5 patients with vocal fold paralysis 4 (80%) were with adductor paralysis and 1 (20%) was with abductor paralysis. 2 (40%) patients were with bilateral vocal fold paralysis and 3 (60%) were with unilateral paralysis. 3 (60%) patients were male and 2 (40%) were female. Two patients with bilateral vocal fold palsy has history of chronic smoking.

Out of 4 patients with sulcus vocalis 2 (50%) were with involvement of bilateral vocal folds and 2 (50%) were with unilateral vocal folds. 2 (50%) were male and 2 (50%) were female. Out of 4 patients with vocal fold polyp 2 (50%) were male and 2 (50%) were female. All of the patients had

unilateral polyp. All of 3 patients with vocal fold keratotic mass were male and had bilateral involvement.

#### Discussion:

Brent GA, Davies TF (2011) stated that hoarseness is presenting feature of patients with hypothyroidism. In our study, 5 patients with hypothyroidism presented with hoarseness. According to El Uali Abeida M et al. (2011), Cipriani NA et al. (2011) and Yamasaki R et al. (2011) vocal nodules are most often observed in women aged 20-50 years, but they are also found in children (more frequently in boys than in girls) who are prone to excessive shouting or screaming. In our study we found vocal nodules are more prone to develop in female than in male. We had a 8 years old male patient having vocal nodules. We did not have any female patient of pediatric age group having vocal nodules.

In a study in 1999, Hogikyan et al stated that the professional groups which includes including laryngologists, speech language pathologists, and singing teachers most involved with the care of the voice to gauge the prevalence of opinions regarding the specific entity of vocal nodules. Practices that constitute either abuse or misuse of the speaking and/or singing voice were felt by all groups to be of greatest importance in causing vocal fold nodules in singers. In our study we found homemakers, students and office workers are more prone to develop vocal nodules. All the patients with vocal nodules have history of vocal abuse or misuse.

Joel A Ernster et al.(2012) mentioned smoking as a etiological factor for bilateral vocal fold paralysis. Our study supports it as we found 2 patients with bilateral vocal fold paralysis were chronic smoker.

Robert A Buckmire et al. (2011) stated that vocal fold polyps are generally unilateral. Our study supports it as we had found all 4 cases of vocal fold polyp were unilateral.

G.T. Williams, I.M. Farquharson, J. Anthony et al. (1975) opined that fiberoptic laryngoscopy has revolutionized the examination of larynx and the performance of laryngeal operations and it has gained widespread acceptance.

#### Conclusion:

We conclude that fiberoptic laryngoscopy is an essential tool for diagnosis of voice disorders. Indirect laryngoscopy is inconclusive in significant number of patients owing to anatomical factors or patient's co-operations. In these patients fiberoptic laryngoscopy is mandatory. Furthermore many pathological conditions may be missed on indirect laryngoscopy. Whereas with fiberoptic laryngoscopy, a definitive diagnosis can be made in most of the cases. Therefore, we recommend fiberoptic laryngoscopy for all patients presenting with persistent hoarseness for a duration more than 4 weeks.

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