

# AN EVALUATION OF BENIGN LARYNGEAL PATHOLOGIES WITH THEIR MANAGEMENT AND PROGNOSIS

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## **Abstract**

**Objective** The study was undertaken to identify the benign laryngeal pathologies and their modes of clinical presentation, etiological factors, sites of involvement, demographic profile of the patients, management and prognosis.

**Study design** This is a four and half year prospective study of 50 patients with benign laryngeal lesions attending an outpatient department from September 2016 to February 2021.

**Materials and methods** A total of 50 patients with benign laryngeal lesions were included in the study based on symptoms such as change in voice, foreign body sensation, throat pain, cough and positive findings on clinical examination. The patients were in the age group of 15–60 years. All diagnostic investigations and therapeutic microlaryngoscopic procedures were done.

**Results** Male preponderance with a male:female ratio of 2.33:1 was seen. Majority of the patients were in the age group of 31–40 years. Vocal cord polyps were observed to be the commonest type of lesions (58%). Vocal Abuse was the most common predisposing factor (40%). Hoarseness was the commonest symptom (100%). In the study group, only 6% patients got complete relief with conservative management, 94% patients required microlaryngeal surgery. There was no recurrence during the follow up period.

**Conclusion** Organic disorder of larynx is the commonest cause among benign laryngeal disorder. Early diagnosis can lead to effective management and good recovery. Microlaryngeal surgery and voice rest are the treatment of choice and postoperative speech therapy should be provided to prevent recurrences.

**Keywords** Larynx, Vocal abuse, Hoarseness, Benign lesions larynx, Microscopic laryngeal surgery.

## **Introduction**

Voice is the natural medium well adapted to communicate emotional content, whereas speech is a cultural medium that is suitable to convey intellectual content. Speech may be used to express feelings but also to hide, disguise or deny them [1].

Although rarely life threatening, voice problems can cause tremendous alteration in daily living and should not be underestimated as a medical disorder [2].

Physicians particularly otolaryngologists, usually are first person approached when voice sounds abnormal. Benign neoplasms of the larynx constitute an interesting array of lesions and have been defined as “An abnormal mass of tissue in the larynx, the growth of which exceeds and is uncoordinated with that of normal tissue and persists in the same excessive manner after cessation of stimuli which evoked the change” [3].

The significance of benign lesions of the larynx lies in the importance of its function in speaking and the contribution of

the voice to one's identity. Hoarseness of voice is a common complaint in today's high-stressed life. Hoarseness may be associated with cough, foreign body sensation in throat, throat pain, difficulty in swallowing and difficulty in breathing [4].

Larynx may be adversely affected due to hyperkinetic movements of phonation, variations of the psychosomatic make up in the form of emotional instability, persistent irritation due to tobacco smoke, fumes and dust and contact with infected secretions. These factors may cause, predispose, aggravate the formation of common benign new growth of larynx e.g. vocal nodules and polyps [5]

Various authors have reported vocal cord polyps to be the commonest type of benign lesions of the larynx with a preponderance in males [4,6,7].

Failure of voice therapy to treat vocal symptoms is the most common indication for the surgical removal of the lesions. Surgical removal with microsurgical instruments remains the mainstay of the therapy for laryngeal polyps, cysts and recalcitrant nodules [8].

## Objective

The aim of the study was to determine the demographic characteristics including age, sex, occupation and the etiological factors, modes of clinical presentation, clinical site along with prognosis of the most prevalent benign lesions of the larynx over a period of two and half years.

## Materials and methods

This was a prospective study carried out at Department of Otorhinolaryngology, Apex Hospital Jaipur and CP Hospital Gangapur, Rajasthan over a period of four and half years from September 2016 to February 2021.

Patients having signs and symptoms related to laryngeal disorders were selected after provisional diagnosis of benign lesion of larynx.

The patients were selected on the basis of the following inclusion and exclusion criteria:

Inclusion criteria: Change in voice, difficulty in breathing, foreign body sensation in the throat, pain during speaking and fatigue of voice, common cold and the findings were correlated with rigid laryngoscopy;

Exclusion criteria: Patients with clinical diagnosis of malignancy of larynx, all cases with inflammatory lesions, patients with speech defect due to central nervous system lesions, patients with oropharyngeal pathology and cases with nasal and nasopharyngeal pathology.

All the patients included in the study were questioned about age, sex, occupation and area of residence. A thorough clinical workup of all the patients was done. History of all patients included in the study was taken particular consideration of the following points – (A) Symptoms and their duration-Change in voice / hoarseness of voice, inability to raise the voice, foreign body sensation in the throat, easy fatigability of the voice, discomfort in throat, breathlessness, persistent cough with or without expectoration. (B) Personal history of the patient-Vocal abuse / misuse of voice, exposure to irritant atmosphere, alcohol, Smoking and tobacco chewing, betel nut and pan chewing. (C) Past history-Tuberculosis, leprosy, syphilis, septic focus in nose and throat such as chronic tonsillitis, sinusitis etc. (D) General and systemic examination of the patient. (E) Local examination-Detailed routine ear, nose and throat examination of the patient by angled scope and examination of the neck were done.

The provisional diagnosis was made with these data. Other Investigations included routine blood investigations, urine microscopy, radiological investigations (X-ray paranasal sinuses, X-ray chest) followed by histopathological examination.

The treatment advised to the patients was either conservative medical therapy and/or surgical therapy (microlaryngeal surgery).

Postoperative management included complete voice rest for three weeks followed by gradual resumption of voice in order to resume the normal function of the vocal cords. After three weeks, when the healing appeared to be complete the patient was instructed to remain silent except for a specified period of time everyday and then to gradually increase the frequency and duration of these periods. This was continued for two weeks and then the patient was advised to be back to his normal regimen. Along with this regime all the patients were given speech therapy as and when required. The patients were also advised to avoid extremely hot and cold foods, foods with strong seasonings, exposure to air pollutants, smoking, tobacco, alcohol and hawking. A regular follow-up was done, and the final result was noted after 3 months.

## Results

During the study period (September 2016 to February 2021), a total of 10440 patients attended the E.N.T. department, out of which 50 cases were diagnosed to have benign tumor of the larynx (0.478%).

### Demographic profile:

The majority of the patients belonged to the age group of 31–40 years ( $n = 17$ ; male = 14; female = 3), the youngest patient was 15 years of age and the oldest 60 years of age. Our data reported a higher incidence of benign lesions of the larynx among males (70%) as compared to females (30%) with an M:F ratio of 2.33:1. The average age in males ( $37.91 \pm 12.17$  years) was significantly higher as compared to that of females ( $30.71 \pm 8.51$  years) ( $p = 0.04$ ). With regard to the occupation of the patients, majority were housewives followed by teachers, respectively.

The distribution of patients under the different types of tumors is shown in Table 1.

**Table 1** Patient distribution under different types of benign lesions of the larynx according to age & sex

Type of lesions	Males (age in years)					Females (age in years)					Total
	11–20	21–30	31–40	41–50	51–60	11–20	21–30	31–40	41–50	51–60	
Papilloma	0	0	1	0	0	0	0	0	1	0	2
Cyst	0	1	1	0	0	1	0	1	2	0	6
Keratosis	0	0	0	0	1	0	0	0	0	0	1
Vocal polyps	0	2	8	7	6	1	1	2	2	0	29
Vocal nodules	0	2	3	0	0	0	3	0	0	0	8
Haemangioma	0	1	0	0	0	0	0	0	0	0	1
Contact granuloma	0	0	1	1	0	0	0	0	0	0	2
No evidence of tumor	0	0	0	0	0	1	0	0	0	0	1
<b>Total</b>	<b>0</b>	<b>6</b>	<b>14</b>	<b>8</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>5</b>	<b>0</b>	<b>50</b>

**Predisposing Factors:**

Vocal overuse or vocal abuse was found to be commonest habit both in males and females i.e. total 40% cases followed by use of cigarette and bidi in 32 % cases , both smoking and voice abuse in 12% cases and alcohol consumption in 6 % cases. This was found to be predominantly in males. 10% cases were not giving any history of habits (2 male; 3 female), those constituted 2 cases of laryngeal papilloma, 1 case each of (vocal polyp, cyst and hemangioma). (Table 2)

**Table 2** Incidence of causative factors

Laryngeal pathology	Vocal abuse	Smoking	Both
Papilloma	0	1	0
Cyst	0	1	0
Keratosi	1	2	0
Vocal polyps	7	4	2
Vocal nodules	10	6	3
Haemangioma	0	1	0
Contact granuloma	2	1	1
Total, N (%)	20 (40%)	16 (32%)	6 (12%)

The common complaints recorded were hoarseness or change in voice (100%) followed by vocal fatigue in nearly 56% of the patients, irritation in nearly 24%, cold/ upper respiratory tract infection in 22% and 8% of them complained of foreign body sensation in throat. The duration of symptoms ranged from 1 month to 24 months. (Table 3)

**Table 3** Frequency of patients with respect to duration of complaints (months)

Symptoms	Duration (months)					Total	Percentage (%)
	0-6	6-12	12-18	18-24	>24		
Change of voice	25	13	4	5	3	50	100%
Voice fatigue	17	7	1	1	2	28	56%
Foreign body sensation throat	3	1	0	0	0	4	8%
Difficulty in breathing	0	0	0	0	0	0	0
Common cold	1	1	1	3	5	11	22%
Discomfort in throat	8	2	1	1	0	12	24%
Painful voice production	6	1	0	0	0	7	14%

**Type of lesions and site of origin:**

Our series showed benign lesions to be more common as compared to malignant lesions of the larynx. Most of the cases in the series were observed to have vocal cord polyp (58%), followed by vocal cord nodules (16%), cyst (12%), papilloma (4%) and keratosis (2%) respectively. Contact granuloma was seen in 4% of the patients and 2% had no evidence of tumor.

The commonest site of origin of the lesion was vocal cords with 46% on the left vocal cords, 42% on the right vocal cords, and in the remaining 12%, the site of origin was bilateral. (Table 4)

**Table 4.** Commonest site of origin of the benign laryngeal lesions

Site of involvement	No. of Cases of Benign Lesions of Larynx	
	Number	Percentage
Left vocal cord	23	46%
Right vocal cord	21	42%
Both	6	12%
Total	50	100%

One case of polypoidal mass underwent malignant change and turned out to be squamous cell carcinoma. 4% of the patients reported a past history of chronic laryngitis and tuberculosis, respectively and nearly 2% reported asthma. 22% of the patients had infection of the teeth and gums and 8% of them had sinusitis.

## Discussion

Benign lesions of larynx are significant because of the importance of spoken or sung communication and the voice's contribution to identity. It is evident from the aetiology of these common benign lesions that most of these problems are preventable. The etiological factors implicated in the causation of these benign lesions have also been evaluated and discussed. Correct diagnosis holds the key to treat the disorder [9].

In view of these facts, in the present study in addition to the demographic, clinical, pathological aspects of benign lesions of the larynx in general, the aetiological factors implicated in the causation of these benign lesions have also been evaluated and discussed. Majority of the results of our series were in concordance with the results of other similar studies. The reported average incidence of these lesions in the literature varies from 6 to 79.8 cases per year [10,11]. The finding in the present study corresponds with a study which reported an average incidence of 24 cases per year [3].

Out of the total number of patients attending the department, the incidence of benign lesions of the larynx was found to be only 0.478%. However, the incidence reported in our series is in disagreement with the incidence reported in a similar Indian study (1.4%) [12]. Various studies have reported a higher incidence of benign lesions of the larynx in the age groups between 20 and 60 years [3,4,13,14]. Our results were in concordance with the above findings as we observed maximum number of cases in the fourth decade of life (31–40 years).

The male preponderance observed in our study is in accordance with the results of various other studies [15,16] but Stewart has reported a still higher ratio (3: 2) [13].

Higher incidence (54%) of benign lesions was observed in professional voice users viz. teachers (16%), salesmen (16%), singers (2%) and bus conductors (2%); in case of non-professional voice users, the highest incidence was observed in housewives (22%). These observations are similar to those of Baitha et al [7]. This may be likely because of the misuse or abuse of voice. The importance of screaming and yelling, as a causative aetiological factors of vocal cord lesions in children has also been emphasized [16].

In our study, we found vocal abuse (40%) and smoking (32%) as the most common predisposing factors, while the incidence of vocal abuse and smoking together were seen in 12% of the cases. In the studies done by Ghosh et al. [17] and Parikh [18] vocal abuse was observed in 72% and 56% cases, respectively.

Regional sepsis in the form of infection of teeth and gums and sinus sepsis was observed in about 25% of the cases. The vocal cords can be exposed to the toxic effects of mucopus originating in the paranasal sinuses. This is similar to the findings of Singhal et al (30%) [10] and Epstein et al (15%) [19]. However, these findings contradict the observations of Baitha et al. (48.1%), Mehta and Parikh (43%) and that of Kaluskar (59%) [7]. All these studies revealed that associated regional sepsis may be a predisposing factor in the causation of these lesions. The decrease incidence in the present study in contrast to the other studies mentioned above indicate improved hygiene of the patient and early management of septic foci.

In our study, we observed maximum number of patients to have vocal cord polyps (58%) followed by vocal nodules (16%), cyst (12%), papilloma (4%), haemangioma and keratosis were observed in (2%) of the cases while 4% of the patients had contact granuloma. These findings indicate preponderance of non-neoplastic tumors over neoplastic tumors, confirmed by histopathological examination and have been supported by the elaborate classification given by Myerson [19] and the results of other similar studies [4,6,13,15,20,21]. However, Stewart reported the incidence of neoplastic tumors to be 24.03%; Lowenthal reported 41.9% whereas in our series, we observed only 4% cases of neoplastic tumors (papilloma). This might be because of the greater number of cases (Stewart, n = 104; Lowenthal; n = 62) studied by them as compared to our study (n = 50).

With regards to the site of origin of the benign lesions, true vocal cords were found to be the commonest site for the origin of all neoplastic and non-neoplastic lesions. These findings are in accordance with the findings

reported by Hegde et al and Baitha et al [4,7].

Relatively thinner epithelium of vibrating edge and maximum mechanical impact at the junction of anterior 1/3rd and middle 1/3rd of the vibrating cords have been postulated as the possible mechanism for the typical localization of vocal nodules and polyps [5,22].

Hoarseness of voice was found to be the most prominent and presenting feature of these tumors in the current series. All patients (100%) have this symptom. Batra et al. observed the largest number of cases of hoarseness (70%) in the age group of 21–50 years with a male:female (M:F) ratio of 2.6:1. He also suggested fiberoptic laryngoscopy to be an invaluable tool in the diagnosis of functional voice disorders primarily affecting young adults, frequently non-vocal, non-professional resulting from vocal abuse [23].

Voice fatigue was observed to be second most common symptom (56%) in our study which was comparable to the study by Singhal et al [10] and Pankaj Kumar Doloj and Swagata Khanna [24].

Surgical treatment of the benign lesions of larynx is necessary not only for the histological confirmation of the clinical diagnosis but also to re-establish the mechanism of normal phonation which is altered by the changes in the mass, flexibility, elasticity, resistance or morbidity of the true vocal cord [5,19,25].

Surgical treatment was the treatment of choice in majority of the cases studied (94%) and voice rest and rehabilitation sufficed in the remaining 6% cases. Of the different modes of management mentioned in the literature viz. medical, physical, immunological and surgical, the last one remains the standard treatment of choice in all types of tumors and in all age groups [4]. Precise microlaryngeal surgery with efforts to preserve as much normal tissue as possible remains the surgery of choice for symptomatic benign laryngeal mass lesion. Voice rest and vocal rehabilitation remains the treatment of choice applicable to early stages of vocal nodule and in preventing the recurrence of benign tumor (polyps, cysts etc.) post-operatively [8]. However, it has been advised that surgical treatment of benign tumors of the larynx must invariably be followed by post-operative voice correction therapy, otherwise recurrences are liable to occur [22].

Despite of the various viewpoints by various authors favoring one or the other forms of treatment methods, the most appropriate standard of care for treating the vocal fold polyps and cysts has not been established. So mostly, it is a combination of surgery and voice therapy that is recommended by and agreed by all [26].

In this study, all the patients were given speech therapy during the trial of conservative management and in postoperative cases. The goals of voice therapy are to maximize vocal efficiency, thereby reducing the vibratory trauma that underlies and exacerbate the masses according to Johns [27]. Following this treatment protocol in the present study showed promising results as patients under study were normal without any recurrence after single operation during the period of follow up.

## Conclusion

Non-neoplastic benign lesions are far more common than neoplastic lesions. Symptoms of which can vary from mild hoarseness to life-threatening respiratory distress. These can put a enormous financial and emotional burden in lives of patient and patient's families. Early diagnosis of the lesions is key to effective management and good recovery. Microlaryngeal surgery and voice rest offer a cost-effective and safe method for the management of benign laryngeal lesions. Vocal hygiene and de-addiction from tobacco/smoking need to be practiced, as these are the common causative factors.

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