

# A Clinical Study of Benign Lesions of Larynx

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## ABSTRACT

**Introduction.** The laryngeal lesions are significant because of the human communication through voice and contribution of voice to the identity of the person. Benign lesions of larynx are classified into the commonly occurring non-neoplastic lesions and relatively rare neoplastic lesions. **Material and methods.** This prospective study was conducted in 50 patients who were diagnosed with various benign lesions of larynx during a period of one year. After a detailed history, general physical and systemic examination, complete nasal and paranasal examination, examination of ears, patients were subjected for examination of larynx which included external examination of larynx, indirect laryngoscopy and micro-laryngoscopy under general anaesthesia. **Results.** The incidence was found to be 0.15% or 15 per 10,000 new patients with high prevalence in third, fourth and fifth decades of life. Non-neoplastic benign lesions were more common (96%) as compared to neoplastic benign lesions (04%) with preponderance in males (72%) as compared to females (28%). Hoarseness of voice was the commonest presenting symptoms being present in 48 to 50 patients. It was observed that 16 patients (32%) were smokers, 5 patients (10%) had exposure to dust, 2 patients (4%) were having incense exposure and 2 patients (4%) were farmers and had exposure to hay and pollens. Indirect laryngoscopy was done in all except one patient. The exception being a 2 year old child in whom it was not possible. Microlaryngoscopic examination under general anaesthesia was done in 41 cases. There were 22 cases (44%) of vocal polyps, 16 cases (32%) of vocal nodules, 3 cases (06%) of reinke's edema, 5 cases (10%) of cysts, and 1 case each of traumatic granuloma, haemangioma and laryngeal sporidiosis. The predominant site of involvement was the true vocal cords in 44 cases (88 %). Simple excision of the lesion was done 36 cases (72%), stripping was done in 3 cases (06%), and endoscopic decapitation and marsupialisation was done in one case (2%). **Conclusion.** Benign lesions of larynx are uncommonly occurring lesions. Non-neoplastic benign lesions are far more common than neoplastic lesions, the ratio being 24:1 and most common age group involved is 30-40 yrs. Vocal cord polyps and nodules are the most frequent non-neoplastic benign lesions. Vocal abuse either occupational or habitual is a dominant precipitating factor in the causation of common benign lesions. Hoarseness is the commonest mode of presentation. Microlaryngeal surgery is the treatment of choice in these lesions and postoperative speech therapy should be provided to all the patients to prevent recurrences.

**KEYWORDS:** Hoarseness, Indirect Laryngoscopy, Reinke's Edema, Vocal Nodule, Vocal Polyp

## INTRODUCTION

The larynx is a major component of the upper respiratory tract and lies just anterior to the upper end of the digestive tract. It is, therefore, vulnerable to inflammation and other phenomenon which lead to the formation of various lesions of the larynx.

A lesion is said to be benign when its microscopic and gross characteristics are considered relatively silent, implying that it will remain localized, will not spread to other sites, and will be amenable to local surgical removal. Benign lesions of the larynx are classified into the commonly occurring non-neoplastic lesions and relatively rare neoplastic lesions. The commonly encountered benign lesions of the larynx are: vocal cord polyps, vocal nodules, tuberculosis of larynx, laryngocele, laryngeal web, epiglottic cysts and subglottic haemangioma. Neoplastic lesions include papilloma, adenoma, chondroma and other non-neoplastic lesions like intubation granuloma, contact ulcer granuloma are

relatively uncommon.<sup>1</sup> Benign laryngeal tumours include Papillomas, Haemangiomas, Fibromas, Chondromas, Myxomas, Neurofibromas, Schwannomas, Adenomas, granular cell myoblastoma, lipomas, paragangliomas, leiomyoma, rhabdomyoma.<sup>2</sup> The common sites of occurrence of the benign lesions of larynx are vocal cords, anterior commissure, false cords, epiglottis, aryepiglottic folds and ventricle in chronological order. The incidence of benign non-neoplastic lesions is more than the benign neoplastic group. The maximum numbers of cases are seen in the age group between 31 and 40 years. Male predominance is seen over the females with a ratio of 2.82:1 (m:f).<sup>1</sup> True benign tumours constitute 5% or less of all the laryngeal tumours. Out of them papilloma is the most common benign tumour, which accounts for 85% of cases.<sup>2</sup> The common factors responsible for the development of benign lesions are vocal abuse, misuse, overuse, speaking in unnatural tones, exposure to various irritants like smoke, dust, fumes, alcohol etc. Allergy and infective conditions of

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larynx (as Human papilloma virus in respiratory papillomatosis) are also responsible alone or in combination with other factors for the development of such lesions.<sup>3,4,5,6,7</sup>

First line treatment for benign lesions is behavioral intervention with speaking and singing therapy. When maximal behavior intervention does not achieve satisfactory improvements in voice, surgical treatment may be considered.<sup>8,9</sup> As such the standard treatment of choice in all the types of benign tumours of the larynx should consist of a triad of approach by microlaryngeal surgery (either microscopic or endoscopic, with or without use of lasers), voice rest and vocal rehabilitation.<sup>10</sup>

Keeping in view the above facts the present study was undertaken to determine the clinical spectrum of the various types of benign lesions of the larynx. Moreover, relation of benign lesions to age, sex and occupation has also been discussed.

## MATERIAL AND METHODS

This prospective study was conducted in ENT Department of SMGS Hospital, Jammu. 50 patients were diagnosed with various benign lesions of the larynx during a period of one year. A thorough clinical workup of all the patients was done -:

- A. A detailed history.
- B. General physical and systemic examination.
- C. Complete nasal and paranasal sinuses examination.
- D. Examination of both ears.
- E. Examination of larynx
  - a.) External examination for obvious swelling, mobility of the laryngeal framework, laryngeal crepitus, tenderness, laryngeal expansion.
  - b.) Indirect laryngoscopy to see posterior 1/3<sup>rd</sup> of the tongue, Valleculae, Epiglottis, Aryepiglottic folds, Vestibular folds, Vocal cords, Pyriform fossae and movements of the vocal cords. The different types of lesions were noted in respect of their site, side, size, extent, colour, surface appearance, whether sessile or pedunculated.
- F. Investigations
  - a.) Routine investigations
  - b.) Radiological investigations
  - c.) Direct micro-laryngoscopy under general anaesthesia.

According to the lesions, the surgical procedure was performed on the patients (Excision/ Excision with stripping of cords/ Stripping only/ Endoscopic decapitation and marsupialization).

## OBSERVATIONS

A total of 32236 patients attended the E.N.T O.P.D of SMGS hospital from November 2008 to December 2009. Out of these 50 cases which were clinically diagnosed as having benign lesions of the larynx were taken up for the study. The incidence (number of new cases presenting in one year) was thus found to be 0.15% or 15 per 10,000

new patients. The relative frequency of occurrence of neoplastic and non-neoplastic lesions was determined which depicted the common occurrence of non-neoplastic benign lesions (96%) as compared to neoplastic benign lesions (04%). [Table 1]

| NON-NEOPLASTIC TYPES OF LESIONS |                        |              |                |
|---------------------------------|------------------------|--------------|----------------|
| S.No                            | Type of lesion         | No. of cases | Percentage (%) |
| 1                               | Vocal polyps           | 22           | 44             |
| 2                               | Vocal nodules          | 16           | 33             |
| 3                               | Reinke's edema         | 03           | 06             |
| 4                               | Cysts                  | 01           | 02             |
| 5                               | Epithelial hyperplasia | 02           | 04             |
| 6                               | Traumatic granuloma    | 01           | 02             |
| 7                               | Laryngeal sporidiosis  | 01           | 02             |
| 8                               | Malakoplakia           | 01           | 02             |
| 9                               | Laryngopyocele         | 01           | 02             |
| <b>TOTAL</b>                    |                        | <b>48</b>    | <b>96</b>      |
| NEOPLASTIC TYPES OF LESIONS     |                        |              |                |
| S.no                            | Type of lesion         | No. of cases | Percentage (%) |
| 1                               | Papilloma              | 01           | 02             |
| 2                               | Haemangioma            | 01           | 02             |
| <b>TOTAL</b>                    |                        | <b>02</b>    | <b>04</b>      |

Table1. Relative frequency of occurrence of different types of benign lesions of larynx.

**Age Distribution:** As regards the age distribution of patients in the study group third, fourth and fifth decades of life were found to be the most frequently involved groups. [Table 2]

| S.NO | Age group(year) | No. of patients | Percentage (%) |
|------|-----------------|-----------------|----------------|
| 1    | Upto 10         | 01              | 02             |
| 2    | 11 -20          | 04              | 08             |
| 3    | 21 -30          | 08              | 16             |
| 4    | 31 -40          | 21              | 42             |
| 5    | 41 -50          | 08              | 16             |
| 6    | Above 50        | 08              | 16             |

Table 2. Table depicting age distribution of 50 patients.

**Sex Distribution:** Benign lesions of the larynx were found to be predominantly occurring in males (72%) as compared to females (28%) with the male: female ratio being 2.57:1.

**Symptoms:** Hoarseness of voice was the commonest presenting symptoms being present in 48 to 50 patients. Hoarseness was the only symptom in 23 patients (46%). Hoarseness was associated with vocal fatigue in 19 patients (38%), with dysphagia/odynophagia in 1 patient (2%), with breathlessness in 3 patients (6%), with haemoptysis in 1 patient (2%) and with irritation in throat in 1 patient (2%). Only 2 patients (4%) presented with foreign body sensation without hoarseness.

**Duration Of Symptoms:** 60% of the patients were symptomatic for less than 6 months, while 8 cases (16%) were symptomatic for less than 1 year.6 patients (12%)

were symptomatic for 1 to 2 years, and 6 patients were symptomatic for more than 2 years, out of which only 2 were asymptomatic for more than 4 years.

**Occupation:** The patients were mostly involved in occupations demanding an excessive use of voice. 10 teachers (20%) and 7 housewives (14%) constituted a major group of patients. Among the 3 students two were madrasa students and one of them was a college student cum private tuition teacher. Three patients were labourers doing heavy work. Other occupations commonly observed were farmers (2 cases), clerks (2 cases) and singers (2 cases). Among rest included 1 case each from different occupations i.e., Chemist, radio announcer, doctor, lawyer, businessman, Fireman, peon, salesman, bank manager, driver, M.E.S employee, army man, waiter, sweeper, policeman, shopkeeper, public speaker. [Table 3]

| S. no | Type of occupation | No. of cases | Percentage (%) |
|-------|--------------------|--------------|----------------|
| 1     | Teachers           | 10           | 20             |
| 2     | Housewives         | 07           | 14             |
| 3     | Labourers          | 03           | 06             |
| 4     | Students           | 03           | 06             |
| 5     | Farmers            | 02           | 04             |
| 6     | Clerk              | 02           | 04             |
| 7     | Singers            | 02           | 04             |
| 8     | Others             | 19           | 38             |

Table 3. Occupation of patients

**Exposure To Various Irritants:** The role of exposure to various irritants and ‘microclimate’ at working place in the causation of common benign lesions of larynx was assessed and it was observed that 16 patients (32%) were smokers, 5 patients (10%) had exposure to dust, 2 patients (4%) were having incense exposure and 2 patients (4%) were farmers and had exposure to hay and pollens. So, it was observed that almost 50% of patients had exposure to one or the other type of irritant. Out of the 16 smokers 10 (62%) smoked less than 10 cigarettes a day, while 2 patients smoked 10-20 cigarettes per day and were regarded as ‘moderate’ smokers and 4 patients (25%) were heavy smokers (smoking more than 20 cigarettes a day).

**Probable Synergistic Aetiological Factors In The Study Group:** Regarding the relative preponderance of certain aetiological factors acting synergistically it was seen that in 22 patients (44%) vocal abuse was associated with one or the other aetiological factors. Vocal abuse, associated with smoking was present in 13 patients (26%), vocal abuse with smoking, tobacco chewing and pan chewing was observed in 4 patients (8%) and the association of vocal abuse with exposure to other forms of irritants such as dust, incense, hay, etc. was present in 6 patients (12%). 13 patients (26%) either had no history of vocal abuse or had no association of vocal abuse with any of the irritants. Thus 23 patients (46%) had an

association of vocal abuse with exposure to one or the other form of the irritant. [Table 4]

| S.no | Aetiological factors                                  | No of cases | %age |
|------|---|-------------|------|
| 1    | Vocal abuse only                                      | 14          | 28   |
| 2    | Vocal abuse and smoking                               | 13          | 26   |
| 3    | Vocal abuse, smoking, tobacco chewing and pan chewing | 04          | 08   |
| 4    | Vocal abuse and other irritants                       | 06          | 12   |
| 5    | No vocal abuse  | 13          | 26   |

Table 4. Probable synergistic aetiological factors in the study group

**Associated Nasal Findings In The Study Group:** The nose was examined for any associated findings, and 13 patients (26%) were found to have some degree of deviation of the nasal septum, which in most of the cases was asymptomatic. Signs of nasal allergy were found in 8 patients (16%), and signs of chronic sinusitis were observed in 4 patients (8%). One of the patient had rhinosporidiosis. The remaining 24 patients (48%) did not have any clinical apparent nasal abnormality.

**Diagnosis:** Indirect laryngoscopy was done in all except one patient. The exception being a 2 year old child in whom it was not possible. There were 22 cases (44%) of vocal polyps, 16 cases (32%) of vocal nodules, 3 cases (06%) of reinke’s edema, 5 cases (10%) of cysts, and 1 case each of traumatic granuloma, hemangioma and laryngeal sporidiosis. [Table 5]

| S.no | Type of lesion        | No of cases | %age |
|------|-----------------------|-------------|------|
| 1    | Vocal polyp           | 22          | 44   |
| 2    | Vocal nodule          | 16          | 32   |
| 3    | Reinke’s edema        | 03          | 06   |
| 4    | Cysts                 | 05          | 10   |
| 5    | Traumatic granuloma   | 01          | 02   |
| 6    | Hemangioma            | 01          | 02   |
| 7    | Laryngeal sporidiosis | 01          | 02   |

Table 4. Showing types of benign lesions seen on indirect laryngoscopy

**Microlaryngoscopic Examination:** Microlaryngoscopic examination under general anaesthesia was done in 41 cases. This procedure was not done in 9 cases. Out of 9 cases, 7 patients with vocal nodules responded to conservative treatment of vocal rest and speech therapy while 1 case was of disseminated rhinosporidiosis with the involvement of tracheobronchial tree which did not respond to treatment. There were 22 cases (44%) of polypoid lesions, 16 cases (32%) of vocal nodules, single case (2%) of true cyst of vocal cord, 3 cases (6%) of reinke’s edema, 4 cases of cysts and a single case each of post traumatic granuloma, laryngopyocele, papilloma, haemangioma and laryngeal sporidiosis. It is to be noted that one case, which on indirect laryngoscopy was diagnosed as a case of supraglottic cyst was diagnosed as a case of laryngopyocele on direct microlaryngoscopic examination. [Table 6]

| S.No | Type of lesion           | No of cases | %age |
|------|--------------------------|-------------|------|
| 1    | Vocal polyps             | 22          | 44   |
| 2    | Vocal nodules            | 16          | 32   |
| 3    | Reinke's edema           | 03          | 06   |
| 4    | Cysts                    | 04          | 08   |
| 5    | Post traumatic granuloma | 01          | 02   |
| 6    | Laryngopyocele           | 01          | 02   |
| 7    | Papilloma                | 01          | 02   |
| 8    | Hemangioma               | 01          | 02   |
| 9    | Laryngeal sporidiosis    | 01          | 02   |

Table 6. Types of lesions seen on microlaryngoscopic examination

**Sites of Involvement:** The predominant site of involvement was the vocal cords in 44 cases (88 %), while the other regions of the larynx were found to be less frequently involved. True vocal cords are found to be the most common site involved (86%). Right cord (26%) involvement being more common than the left (20%), while 20 (40%) cases had both cords involved. Vocal polyps are seen to occur unilaterally, while vocal nodules and reinke's edema involved both vocal cords. False cord lesions (vestibular folds) were seen to occur in 4 cases (8%). In 2 cases (4%) epiglottis was involved, out of which one case also had involvement of aryepiglottic fold on the right side. One case had involvement of anterior commissure along with some portion of the left vocal cord. Regarding the precise site of vocal cord polyps and nodules it was observed that vocal cord polyps occur mostly at the anterior 1/3 rd or at the junction of anterior 1/3<sup>rd</sup> with middle 1/3<sup>rd</sup> of the true vocal cords, while vocal nodules occurred exclusively at the junction of anterior 1/3<sup>rd</sup> of vocal cord with middle 1/3<sup>rd</sup>. The cases of reinke's edema were found to be involving the whole length of true vocal cords. [Table 7]

| S.no | Site                    | Right side | Left side | Both sides |
|------|-------------------------|------------|-----------|------------|
| 1    | True cords              | 13(26%)    | 10(20%)   | 20(40%)    |
| 2    | False cords             |            |           | 03(06%)    |
| 3    | Epiglottis              | 02(04%)    |           |            |
| 4    | False cords, subglottis | 01(02%)    |           |            |
| 5    | Anterior commissure     |            |           | 01(02%)    |

Table 7. Sites of benign lesions of larynx

**Operative Procedure:** Different types of operative procedure were done in 40 cases. Simple excision of the lesion was done 36 cases (72%), stripping was done in 3 cases (06%), and endoscopic decapitation and marsupialization was done in one case (2%). Ten cases (20%) were not operated out of which one case was of haemangioma. Haemangioma was not operated upon because facility of electrical cauterization was not available in our institute, and thus the patient was put on conservative treatment of steroids and other symptomatic measures. Rests of the cases were of vocal nodules, and

they responded to conservative treatment of vocal rest and speech therapy.

## DISCUSSION

Basic science and clinical research over past decades has led to advances in our understanding of benign laryngeal lesions. Innovative laryngologists, speech language pathologists, and voice scientists have continued to push this frontier over the past several years. The etiology of vocal fold nodules, polyps and cysts is becoming clearer, and advances in diagnostic techniques and therapeutic interventions are leading to improved outcomes for the patients with dysphonia from these lesions. The physiological role of the larynx in the acoustic expression of human thought and behavioral variation, carrying out certain vocational pursuits and protection of lower airways is second to none in the body. In carrying out these physiological functions the larynx may be adversely affected due to hyperkinetic movements of phonation, variations of the psychosomatic make up in the form of emotional instability aggressive nature of frustration, persistent irritation due to tobacco smoke, fumes and dust and contact with infected secretions. These factors may cause, predispose, precipitate or aggravate the formation of common benign new growth of larynx viz; vocal nodules and polyps.<sup>11</sup>

It is evident from the aetiogenesis of these common benign lesions that most of these problems are preventable if proper attention is given towards the correction of basic aetiological factors rather than the simple treatment alone. In view of these facts, in the present study in addition to the clinical and 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.

Out of the 32236 patients seen in the E.N.T, Out Patient Department of S.M.G.S hospital GMC Jammu from November 2008 to December 2009, 50 cases were clinically diagnosed as having benign lesions of the larynx. Thus, the incidence of benign lesions of larynx found in this was 0.15% or 15 per 10,000 new patients seen. The reported average incidence of these lesions in the literature varies from 6 to 79.8 cases per year.<sup>10,12</sup> The finding in the present study corresponds with a study which reported an average incidence of 24 cases per year.<sup>13</sup> The apparent increase in the incidence of benign lesions may be due to better awareness and concern on the part of patients regarding a change in their voice and better diagnostic facilities available. With increasing stress in day to day life, rising level of pollution and changing habits and lifestyles, hoarseness and voice disorders per se are becoming more and more prevalent.<sup>14</sup>

**Age and Sex Distribution:** The age of patients under study ranged from 2 years to 68 years. The most common age group affected was the 3<sup>rd</sup> decade of life (42%) followed by 2<sup>nd</sup> decade (16%) and 4<sup>th</sup> decade (16%) of life. Similar findings are reported earlier.<sup>1,10</sup> The benign

lesions were more common in the males (72%) than in females (28%) with a male: female ratio of 2.57:1. As reported earlier, males are common victims of benign lesions.<sup>11,10</sup> Higher incidence of these lesions in males may be because of them being involved more in occupations demanding excessive use of voice, however our findings regarding sex distribution are not consistent with a previous study who reported female preponderance which they attributed to increased employment of women.<sup>3</sup>

**Symptoms:** Hoarseness was the most common presenting feature (90%). Hoarseness was associated with voice fatigue in 38%, odynophagia in 2%, breathlessness in 6% and with hemoptysis in 2% cases. The patients presented with all the grades of hoarseness of voice as per the severity. 2 patients presented with foreign body sensation and 1 patient with irritation in the throat.

The findings in our study was comparable with a similar study in which they noted that patients presented with hoarseness of voice (100%), cough (23.81%), foreign body sensation in throat (19.05%), throat pain (9.52%), difficulty in swallowing (4.76%) and difficulty in breathing (2.38%).<sup>1</sup>

**Duration of Symptoms:** The patients presented with duration of symptoms ranging from a minimum of 3 days to a maximum of 10 years, 76% being symptomatic for less than 1 year. It was seen that patients with non-neoplastic lesions presented somewhat earlier whereas patients with neoplastic lesions had a longer history of their symptoms. In this regard, our findings were not consistent with a study performed earlier, as in their study duration of symptoms ranged from 1 month to 24 months.<sup>10</sup>

**Aetiology:** Much has been talked about the literature and a great number of theories proposed to explain the cause of common benign lesions like vocal nodules, vocal polyps and almost all the workers in the field seem to be unanimous in this view that these pathological new benign lesions are the mechanical result of faulty or excessive vocal use. They may be likened to callosities on the hands and foot which are caused by the mechanical pressure. The second point in which a number of authors are in agreement with is the direct mechanical trauma caused by the "hyperkinetic movements of phonation". Laryngeal benign lesions are more common in professional voice users viz. teachers (16%), salesmen (16%), politicians (4%) and bus conductors (6%) etc. In cases of non professional voice users, the highest incidence occurs in housewives (24%).<sup>10</sup> Our study are similar to a study done earlier.<sup>15</sup> This may be likely because of the misuse or abuse of voice.

Observations in the present study support the view that these lesions may also be caused by some sort of non occupational abuse of voice. This group constituted 38% of cases in this study. Among these included patients from different occupations like chemist, radio announcer, doctor, lawyer, businessman, fireman, peon, salesman, bank manager, driver, M.E.S employee, army man,

waiter, sweeper, policeman, shopkeeper, public speaker besides the housewives. The importance of screaming and yelling, as a causative aetiological factors of vocal cord lesions in children has also been emphasized.<sup>11,16</sup>

In addition to the abuse and misuse of voice, prolonged use of improper vocal habits during talking may cause the vocal folds to adapt to the strain by forming nodules, edema and various forms of hyperplasia.<sup>17</sup> This view is supported in the present study by the observations regarding the manner of voice production, as the most of the patients were found to exert a considerable strain on the vocal cords even during normal conversation.

The above mentioned facts strongly support the views regarding the dominant role played by vocal abuse and poor vocal hygiene in precipitating the formation of benign vocal cord lesions in the form of polyps and nodules but the fact remains that a vast majority of people with vocal abuse do not develop these lesions and these lesions develop in only a small number. This suggests that there certainly exists some other local or systemic predisposing factors in addition to vocal abuse.

In the present study, an attempt was made to study the role of these contributory factors in the causation of common benign lesions of the larynx. The role of tobacco smoke and alcohol as the contributory factors in the aetiopathogenesis of benign lesions has been highlighted by many workers.<sup>18,19</sup> A significant number (46%) of the patients in the present study were having exposure to one or the other form of an irritant. This observation further lends support to the generally held view that tobacco smoke and alcohol act as aggravating factors in the causation of most benign lesions particularly the diffuse polypoid laryngitis (reinke's edema).<sup>20,21</sup>

The role of other irritants per se in the causation of benign lesions of larynx seem to be small as very few number of patients had a history of exposure to irritants in the form of dust and fumes but achieved more importance if associated with vocal abuse. The incidence of these factors acting in combination is higher than either vocal abuse any of other irritant alone. The unfavorable 'microclimate' at work, and consequent inhalation of irritants has been incriminated in the aetiopathogenesis of these lesions.<sup>3,19</sup>

A surprising observation in the present study is the occurrence of exposure to the incense smoke which was present in 4% of the cases. The exposure to this form of smoke in local religious practice is common especially among ladies and preachers. Though inhalation of incense smoke has been incriminated in the causation of nasopharyngeal malignancy but in the survey of literature, we could not find this form of irritant being implicated in the etiology of benign laryngeal lesions. To know whether the occurrence is coincidental or incense smoke acts as an irritant or allergen, a further large sample survey is required.

Nasal obstruction and sepsis may be acting as adjuvant aetiological factors and it has been suggested that in nasal

obstruction the inspired air is deviated from the humidifying action of nasal mucosa and may exert a negative influence on the epithelium of the true vocal cords. Similarly, the cords can be exposed to the toxic effects of mucopus originating in the paranasal sinuses.<sup>22</sup> Regional sepsis in the form of infection of teeth and gums and sinus sepsis was observed in 30% of the cases.<sup>10</sup>

In our study, we found 26 cases (52%) having the associated pathology of deviated nasal septum or allergy. So our findings correlate with some earlier observations which reveal the association of regional sepsis as a predisposing factor in the causation of these lesions.<sup>15,23</sup>

**Diagnosis:** Simple inspection of the larynx with a laryngeal mirror (indirect laryngoscopy) continues to be the mainstay of initial diagnosis of the laryngeal disease. But it is well recognized fact that in young children and certain adults despite reassurance, local anesthesia and deftness of the examiner's hands it is sometimes impossible to obtain adequate information from indirect laryngoscopy and in such cases direct laryngoscopy under GA is mandatory to establish the diagnosis.<sup>24</sup> Conventional direct laryngoscopy, however, has always been less than satisfactory due to its inadequate illumination, limited monocular vision devoid of depth perception and difficulties in fine manipulations required for endolaryngeal surgery. It is in the interest of greater accuracy of observation and surgical precision especially in small lesions, the technique of microlaryngoscopy and microlaryngeal surgery has been evolved. Microlaryngoscopy has following advantages over direct laryngoscopy: ability to use bimanual instrumentations, binocular vision, magnifying action, illumination and ability to use the laser. Microlaryngoscopy concentrates mainly on the glottic area in cases where the diagnosis is already established and, unlike direct laryngoscopy, is not primarily concerned with other areas of the larynx which should have been assessed preoperatively. In the present study, indirect laryngoscopy was done as a part of the clinical examination in all except one patient. The exception being a two year old child it was obviously not possible. Direct microlaryngoscopy was done under GA in 41 cases.

These observations in the study reveal that direct microlaryngoscopy under GA by virtue of it providing better exposure, adequate time for unhurried completion of the procedure and other advantages enumerated above provide a better accuracy of observation and thus complementing the indirect laryngoscopy in the diagnosis of benign lesions of the larynx which is already cited in a previous study.<sup>25</sup> The commonest site of involvement observed in the present study was the true vocal cords (86%), the lesions being located in the either right vocal cord or the left vocal cord in 46% of cases and on both vocal cord in 40% of cases. There was slight a preponderance of the lesions on the right cord. The frequency of involvement of the other sites in the larynx is for less (08%). The commonest site of origin of benign tumors was vocal cords with 44% on the left vocal cords, 40% on the right vocal cords and in the remaining 16%

bilateral involvement was seen.<sup>10</sup> These observations regarding the predilection of the site in the benign lesions also support the almost unanimous view of many authors that the functional pathophysiology and changes in these lesions are caused by faulty or excessive use of voice in the all important subepithelial (reinke's) space of vocal cords. Relatively thinner epithelium of vibrating edge and maximum mechanical impact at the junction of anterior 1/3<sup>rd</sup> and middle 1/3<sup>rd</sup> of the vibrating cords have been postulated as the possible mechanism for the typical localization of vocal nodules and polyps.<sup>11,26</sup>

**Treatment:** 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.<sup>22,11,19</sup> Surgical treatment was the treatment of choice in the majority of the cases studied (94%), and voice rest and rehabilitation sufficed in the remaining 6% cases of benign lesions of the larynx.<sup>10</sup>

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 the types of benign tumors and in all age groups.<sup>1</sup> In our study simple excision of the lesion was done in 36 cases (72%), stripping was done in 3 cases (06%), and endoscopic decapitation and marsupialization was done in one case (2%). The case of haemangioma was not operated upon. Ten cases (20%) were not operated as they responded to conservative treatment of vocal rest and speech therapy. Postoperative vocal rest and speech therapy was advised to the patients to prevent recurrence. At the present time, surgery remains the mainstay of the treatment for recurrent respiratory papillomatosis (RRP). We had one case of 2 yr old child with laryngeal papilloma in which excision was done under general anesthesia.

In spite 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.<sup>9</sup>

## CONCLUSION

1. Benign lesions of the larynx are uncommonly occurring lesions accounting for the 15 per 10,000 new patients attending ENT OPD.
2. Non-neoplastic benign lesions are far more common than neoplastic lesions, the ratio being 24:1 and most common age group involved is 30-40 yrs.
3. Vocal cord polyps and nodules are the most frequent non-neoplastic benign lesions. Lesions like haemangiomas, laryngopycele, malakoplakia, laryngeal sporidiosis, occur very rarely.
4. No single factor can be pinpointed as the causative mechanism for the formation of vocal polyps and nodules.

5. Vocal abuse either occupational or habitual is a dominant precipitating factor in the causation of common benign lesions, whereas poor vocal hygiene, exposure to irritants and primary nasal pathology also play a significant role in the aetiopathogenesis of these lesions.
6. Hoarseness is the commonest mode of presentation. However in many cases it may be associated with vocal fatigue.
7. Microlaryngeal surgery is the treatment of choice in these lesions, and postoperative speech therapy should be provided to all the patients to prevent recurrences.

## REFERENCES

1. Hegde MC, Kamath MP, Bhojwani K, Peter R, Babu PR et al. Benign lesions of Larynx – a clinical study. *Ind J Otolaryngol and Head Neck Surg* 2005;57(1):35-38.
2. Maran AGD and Stell PM. Tumours of the larynx. In: Watkinson JC, Gaze MN and Wilson JA (editors), *Stell and Maran's Head and Neck Surgery*, 4<sup>th</sup> edition. Butterworth Heinemann, 2000:235-237.
3. Kambic V, Radsel Z, Zargi M, Acko M et al. Incidence of vocal polyps. *The journal Laryngol Otol* 1981;95:609-618.
4. Ghosh S K, Chattopadhyay, Bora H, Mukherjee P B et al. Microlaryngoscopic study of 100 cases of hoarseness of voice. *Ind J Otolaryngol and Head and Neck Surg* 2001;53:270-272.
5. Mackenzie K. Chronic laryngitis. In: *Scott-Brown's Otorhino-laryngology, Head and Neck Surgery*, 7<sup>th</sup> edn. Edited by Gleeson M, Browning G G, Burton M J, Clarke R, Hibbert J, Jones N S, Lund V J, Luxon L M, Watkinson J C. Hodder Arnold, 2008a:p.2258.
6. Glashan. Disorders of voice. In : *Scott – Brown's Otorhinolaryngology, Head and Neck Surgery*, 7<sup>th</sup> edn. Edited by Gleeson M, Browning G.G., Burton M J, Clarke R, Hibbert J, Jones N S, Lund V J, Luxon L M, Watkinson J C. Hodder Arnold, 2008a:p.2198.
7. Dabholkar J P, Chhabria S, Mishra M, Chirmade S, Sikdar A et al. Benign laryngopharyngeal lesions: a case series. *Ind J Otolaryngol* 2008;60:7-10.
8. Michael M Johns. Update on etiology, diagnosis and treatment of vocal fold nodules, polyps and cysts. *American Academy of Otolaryngology – Head and Neck Surgery foundation*, Elsevier, 2007.
9. Cohen SM, MPH, Garrett C G et al. Utility of voice therapy in the management of vocal fold polyps and cysts. *Otolaryngol Head and Neck Surg* 2007;136(5):742-746.
10. Singhal P, Bhandari A, Chouhan M, Sharma MP, Sharma S et al. Benign tumours of larynx: A clinical study of 50 cases. *Ind J Otolaryngol Head Neck Surg* 2009,(suppl 1);26-30.
11. Arnold GE. Vocal nodules and polyps: Laryngeal reaction to the habitual hyperkinetic dysphonia. *J Speech Hear Disord* 1961;27:205-217.
12. Hollinger PH and Johnston KC. Benign tumours of the larynx. *Ann Otol Rhinol Laryngol* 1951;60:496-509.
13. New GB and Erich JB. Benign tumours of larynx: A study of 722 cases. *Arch otolaryngol* 1938;28:841-910.
14. Batra K, Motwani G, Sagar PC. Functional voice disorders and their occurrence in 100 patients of hoarseness as seen on fiberoptic laryngoscopy. *Ind J Otol Head Neck SURG* 2004;56(2):91-95.
15. Baitha S, Raizada RM, Singh AKK, Puttewar MP, Chaturvedi VN. Predisposing factors and hoarseness of voice. *Ind J Otolaryngol Head Neck Surg* 2004;56(3):186-190.
16. Benjamin B and Croxson G. Vocal nodules in children. *Ann Otol Rhinol and Laryngol* 1987;96:530-533.
17. Damaste PH. Disorders of voice. In: *Scott-Brown's Otolaryngology* 1987;5(5):119-143. London Butterworths.
18. Lowenthal G. The treatment of polypoid laryngitis. *Laryngoscope* 1958;1095-1104.
19. Snow James B. Surgical therapy for vocal dysfunction. *Otolaryngol. Clinics North America* 1984;17:91-100.
20. Nielsen VM et al. Surgical treatment of Reinke's Edema. *J Laryngol Otol* 1986;100:187-190.
21. Lumpkin SMM et al. Comparison of surgical techniques in the treatment of laryngeal polypoid degeneration. *Ann Otol Rhinol and Laryngol* 1987;96:254-257.
22. Epstein SS et al. The vocal cord polyp. *J laryngol otol* 1957;71:673-688.
23. Kaluskar. Study on hoarseness of voice: A thesis submitted by master of surgery (otorhinolaryngology) Gujarat University 1971.
24. Mc Cormick MS. Methods of examination of the pharynx and larynx. In *Scott-Brown's Otolaryngology* 1987;5(5):1-6. London Butterworths.
25. Kleinsasser O. Microlaryngoscopy and Endolaryngeal microsurgery 1968. W.B. Saunders company.
26. Kleinsasser O. Pathogenesis of vocal cord polyps. *Ann Otol Rhinol and Laryngol* 1982;91(4):378-81.

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