Research Article

Pattern of benign lesions of larynx

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Abstract

Background: 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.

Objective: To know pattern of benign lesions of larynx.

Materials and Methods: This prospective study was conducted in 50 patients who were diagnosed with various benign lesions of larynx during a period of 1 year. After a detailed history, general physical and systemic examination, complete nasal and paranasal examination, and examination of ears, patients were subjected to examination of larynx which included external examination of larynx, indirect laryngoscopy, and microlaryngoscopy under general anesthesia.

Result: This prospective study was conducted in 50 patients who were diagnosed with various benign lesions of larynx during a period of 1 year. 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 with neoplastic benign lesions (04%) with preponderance in male patients (72%) as compared with female patients (28%). Hoarseness of voice was the most common presenting symptoms seen 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. Microlaryngoscopic examination under general anesthesia was done in 41 cases. There were 22 cases (44%) of vocal polyps, 16 cases (32%) of vocal nodules, 3 cases (6%) of Reinke's edema, 5 cases (10%) of cysts, and 1 case each of traumatic granuloma, hemangioma, 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 (6%), and endoscopic decapitation and marsupialization was done in 1 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 that is involved is 30–40 years. Vocal cord polyps and nodules are the most frequent non-neoplastic benign lesions. Microlaryngeal surgery is the treatment of choice in these lesions and postoperative speech therapy should be provided to all the patients to prevent recurrences.

KEY WORDS: 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 hemangioma. Neoplastic lesions include papilloma, adenoma, and chondroma, and other non-neoplastic lesions such as intubation granuloma and contact ulcer granuloma

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are relatively uncommon.[1] Benign laryngeal tumors include papillomas, hemangiomas, fibromas, chondromas, myxomas, neurofibromas, schwannomas, adenomas, granular cell myoblastoma, lipomas, paragangliomas, leiomyoma, and rhabdomyoma.[2] 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 patients show more predominance over the female patients with a ratio of 2.82:1 (male: female).[1] True benign tumors constitute 5% or less of all the laryngeal tumors. Of them, papilloma is the most common benign tumor, which accounts for 85% of cases.[2] The common factors responsible for the development of benign lesions are vocal abuse, misuse, overuse, speaking in unnatural tones, and exposure to various irritants such as smoke, dust, fumes, and alcohol. Allergy and infective conditions of larynx (as human papilloma virus in respiratory papillomatosis) are also responsible alone or in combination with other factors for the development of such lesions.[3–7] 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.[8,9] As such the standard treatment of choice in all the types of benign tumors 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.[10] Keeping in view the above facts, this study was undertaken to determine the clinical spectrum of the various types of benign lesions of the larynx.

Materials and Methods

This prospective study was conducted in ENT Department of SMGS Hospital, Jammu, Jammu and Kashmir, India. A total of 50 patients were diagnosed with various benign lesions of the larynx during a period of 1 year (November 2013 to November 2014). A thorough clinical workup of all the patients was done (detailed history, general physical and systemic examination, complete nasal and paranasal sinuses examination, examination of ears, examination of larynx, external examination for obvious swelling, mobility of the laryngeal framework, laryngeal crepitus, tenderness, laryngeal expansion, and indirect laryngoscopy to examine posterior one-third 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, color, surface appearance, and whether sessile or pedunculated. Investigations included routine investigations, radiological investigations, and direct microlaryngoscopy under general anesthesia. According to the lesions, the surgical procedure was performed on the patients (excision/excision with stripping of cords/stripping only/endoscopic decapitation and marsupialization).

Result

A total of 32,236 patients attended the ENT Outpatient Department of SMGS Hospital from November 2013 to November 2014. 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 1 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 with neoplastic benign lesions (04%) [Table 1].

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

Benign lesions of the larynx were found to be predominantly occurring in male patients (72%) as compared with female patients (28%) with the male: female ratio being 2.57:1. Hoarseness of voice was the most common presenting symptoms seen 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 hemoptysis in 1 patient (2%), and with irritation in throat in 1 patient (2%). Only two patients (4%) presented with foreign body sensation without hoarseness. A total of 60% of the patients were symptomatic for less than 6 months, whereas eight cases (16%) were symptomatic for less than 1 year. Six patients (12%) were symptomatic for 1 to 2 years, and six patients were symptomatic for more than 2 years, of which only two were asymptomatic for more than 4 years.

The patients were mostly involved in occupations demanding an excessive use of voice. Ten teachers (20%) and seven housewives (14%) constituted a major group of patients. Among the three students, two were madrassa students and one of them was a college student-cum-private tuition teacher. Three patients were laborers doing heavy work. Other occupations commonly observed were farmers (two cases), clerks (two cases), and singers (two cases). Among the rest included one case each from different occupations, that is, chemist, radio announcer, doctor, lawyer, businessman, fireman, peon, salesman, bank manager, driver, MES employee, army man, waiter, sweeper, policeman, shopkeeper, and public speaker [Table 3].

The role of exposure to various irritants and "microclimate" at the 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 irritants. Of the 16 smokers, 10 (62%) smoked less than 10 cigarettes a day, whereas 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).

Regarding the relative preponderance of certain etiological factors acting synergistically, it was seen that in 22 patients (44%) vocal abuse was associated with one or the other etiological 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, and hay was present in 6 patients (12%). A total of 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 irritants [Table 4]. 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 eight patients (16%), and signs of chronic sinusitis were observed in four patients (8%). One of the patients had rhinosporidiosis. The remaining 24 patients (48%) did not have any apparent nasal clinical abnormality.

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 (6%) of Reinke's edema, 5 cases (10%) of cysts, and 1 case each of traumatic granuloma, hemangioma, and laryngeal sporidiosis [Table 5].

Microlaryngoscopic examination under general anesthesia was done in 41 cases. This procedure was not done in nine cases. Of the nine cases, seven patients with vocal nodules responded to conservative treatment of vocal rest and speech therapy whereas one case was of disseminated rhinosporidiosis with the involvement of tracheobronchial tree, which did not respond to this 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 posttraumatic granuloma, laryngopyocele, papilloma, hemangioma, 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].

The predominant site of involvement was the vocal cords in 44 cases (88%). True vocal cords were found to be the most common site to be involved (86%) with right cord (26%) involvement being more common than the left (20%) [Table 7].

Different types of operative procedures were done in 40 cases. 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 1 case (2%). Ten cases (20%) were not operated of which one case was of hemangioma. Hemangioma was not operated on 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. Rest of the cases were of vocal nodules, and they responded to conservative treatment of vocal rest and speech therapy.

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

Non-neoplastic types of lesions	
Type of lesion	**Frequency (percentage [%]) (*n* = 48)**
Vocal polyps	22 (44)
Vocal nodules	16 (33)
Reinke's edema	03 (06)
Cysts	01 (02)
Epithelial hyperplasia	02 (04)
Traumatic granuloma	01 (02)
Laryngeal sporidiosis	01 (02)
Malakoplakia	01 (02)
Laryngopyocele	01 (02)
Neoplastic types of lesions	
Papilloma	01 (02)
Hemangioma	01 (02)

Table 2: Table depicting age distribution of 50 patients

Age group (years)	**Frequency (percentage [%]) (*n* = 50)**
Up to 10	01 (02)
11–20	04 (08)
21–30	08 (16)
31–40	21 (42)
41–50	08 (16)
Above 50	08 (16)

Table 3: Occupation of patients

Type of occupation	**Frequency (percentage [%]) (*n* = 50)**
Teachers	10 (20)
Housewives	07 (14)
Laborers	03 (06)
Students	03 (06)
Farmers	02 (04)
Clerk	02 (04)
Singers	02 (04)
Others	21 (42)

Table 4: Probable synergistic etiological factors in the study group

Etiological factors	**Frequency (percentage [%]) (*n* = 50)**
Vocal abuse only	14 (28)
Vocal abuse and smoking	13 (26)
Vocal abuse, smoking, tobacco chewing, and pan chewing	04 (08)
Vocal abuse and other irritants	06 (12)
No vocal abuse	13 (26)

Table 5: Types of benign lesions seen on indirect laryngoscopy

Type of lesion	Frequency (percentage [%]) (*n* = 49)
Vocal polyp	22 (44)
Vocal nodule	16 (32)
Reinke's edema	03 (06)
Cysts	05 (10)
Traumatic granuloma	01 (02)
Hemangioma	01 (02)
Laryngeal sporidiosis	01 (02)

Table 6: Types of lesions seen on microlaryngoscopic examination

Type of lesion	Frequency (percentage [%]) (*n* = 50)
Vocal polyps	22 (44)
Vocal nodules	16 (32)
Reinke's edema	03 (06)
Cysts	04 (08)
Post traumatic granuloma	01 (02)
Laryngopyocele	01 (02)
Papilloma	01 (02)
Hemangioma	01 (02)
Laryngeal sporidiosis	01 (02)

Table 7: Sites of benign lesions of larynx

Site	Right side	Left side	Both sides
True cords	13 (26%)	10 (20%)	20 (40%)
False cords			03 (06%)
Epiglottis	02 (04%)		
False cords, subglottis	01 (02%)		
Anterior commissure	01 (02%)		

Discussion

Basic science and clinical research over the past decades have led to advances in our understanding of benign laryngeal 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 because of hyperkinetic movements of phonation, variations of the psychosomatic makeup in the form of emotional instability aggressive nature of frustration, persistent irritation because of 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, that is, vocal nodules and polyps.[11] It is evident from the etiology of these common benign lesions that most of these problems are preventable if proper attention is given toward the correction of basic etiological factors rather than the simple treatment alone. In view of these facts, in addition to the clinical and pathological aspects of benign lesions of the larynx in general, the etiological factors implicated in the causation of these benign lesions have also been evaluated and discussed in this study.

A total of 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.[10,12] The finding in this study corresponds with a study that reported an average incidence of 24 cases per year.[13] 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.[14]

The age of patients under study ranged from 2 to 68 years. The most common age group affected was the third decade of life (42%) followed by second decade (16%) and fourth decade (16%) of life. The benign lesions were more common in the male patients (72%) than in female patients (28%) with a male: female ratio of 2.57:1. As reported earlier, male patients are common victims of benign lesions.[1,11,10] Higher incidence of these lesions in male patients may be due to them being involved more in occupations demanding excessive use of voice; however, our findings regarding sex distribution are not consistent with a previous study that reported female preponderance which they attributed to increased employment of women.[3] 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 findings in our study were 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%).[1] 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.

Much has been talked about the literature and a great number of theories proposed to explain the cause of common benign lesions such as 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. 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, that is, teachers (16%), salesmen (16%), politicians (4%), bus conductors (6%), etc. In cases of nonprofessional voice users, the highest incidence occurs in housewives (24%).[10] Our study is similar to a study done earlier.[15] Observations in this study support the view that these lesions may also be caused by some sort of nonoccupational abuse of voice. This group constituted 38% of cases in this study. The importance of screaming and yelling,

as a causative etiological factor of vocal cord lesions in children has also been emphasized.[11,16] 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.[17] The abovementioned 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 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 exist some other local or systemic predisposing factors in addition to vocal abuse. In this 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 etiopathogenesis of benign lesions has been highlighted by many workers.[18,19] A significant number (46%) of the patients in this 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).[20,21] Nasal obstruction and sepsis may be acting as adjuvant etiological 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.[22] Regional sepsis in the form of infection of teeth and gums and sinus sepsis was observed in 30% of the cases.[10] 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.[15,23] 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 General anaesthesia (GA) is mandatory to establish the diagnosis.[24] Observations in our 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, complement the indirect laryngoscopy in the diagnosis of benign lesions of the larynx which is already cited in a previous study.[25] The most common site of involvement observed in this study was the true vocal cords (86%), the lesions being located in either the right vocal cord or the left vocal cord in 46% of cases and on both vocal cords in 40% of cases. There was a slight preponderance of the lesions on the right cord.

Surgical treatment of the benign lesions of larynx is necessary not only for the histological confirmation of the clinical diagnosis but also for reestablishing the mechanism of normal phonation, which is altered by the changes in the mass, flexibility, elasticity, resistance, or morbidity of the true vocal cord.[22,11,19] 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.[10] 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 and agreed by all.[9]

Conclusion

Benign lesions of the larynx are uncommonly occurring lesions accounting for 15 per 10,000 new patients attending ENT OPD. Non-neoplastic benign lesions are far more common than neoplastic lesions, the ratio being 24:1 and the most common age group involved is 30–40 years. Vocal cord polyps and nodules are the most frequent non-neoplastic benign lesions. Lesions such as hemangiomas, laryngopyocele, malakoplakia, and laryngeal sporidiosis occur very rarely. No single factor can be pinpointed as the causative mechanism for the formation of vocal polyps and nodules. 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 etiopathogenesis of these lesions. Hoarseness is the most common mode of presentation. However, in many cases it may be associated with vocal fatigue. Microlaryngeal surgery is the treatment of choice in these lesions, and postoperative speech therapy should be provided to all the patients to prevent recurrences.

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