

A Study of Management of Benign Lesions of the LarynxPrithvi Raj Singh¹, Amit Singhal²¹Associate Professor, Department of ENT, Krishna Mohan Medical College and Hospital, Mathura²Assistant Professor, Department of ENT, Krishna Mohan Medical College and Hospital, Mathura

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Abstract

Background: The human voice is a remarkable instrument that can transmit nuanced emotions as well as intricate ideas. Effective care of the lesion can result from an early diagnosis. A practical, safe, and economical approach to the treatment of benign laryngeal lesions is voice rest combined with micro laryngeal surgery. "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" is the definition given to them. Because of the rapid industrialization and development leading to increased environmental pollution, benign lesions of the larynx are becoming more common. In ENT, non-malignant lesions of the larynx are a quite prevalent issue.

Aim: To analyze age, sex distribution and symptomatology, site of involvement, and the prognosis of the common types of benign lesions of the larynx.

Material and Method: The Department of ENT is the site of the current prospective investigation on benign lesions of the larynx. Only those who had hoarseness for longer than three weeks were chosen. Both neoplastic and non-neoplastic lesions were considered benign lesions. Every case had a comprehensive ENT examination. When a case was suspected, it was inspected using a direct laryngoscope, a fiberoptic laryngoscope, and, if necessary, a microlaryngeal examination. Treatment options for benign non-neoplastic lesions included voice rest, laser therapy, or excision biopsy, with biopsy results validated. Regular x-rays and a direct laryngoscopic examination were performed on the benign neoplastic tumors. Patients who complained of voice hoarseness were assessed throughout this time, and 40 patients with benign laryngeal lesions were included in the current study with their agreement.

Results: It was observed that the largest prevalence occurred in individuals aged 32-45, with a preponderance of male involvement. The most frequent benign lesion of the larynx was a bilateral vocal cord nodule; other lesions included bilateral and unilateral vocal cord polyps and Reinke's edema. Vocal abuse was the most significant risk factor in each case. According to the diagnosis, patients received speech therapy, medical management, and MLS treatment; they also had a six-month follow-up period. The following patients had normal results at follow-up: 41.18% with bilateral vocal cord nodules, 50% with bilateral vocal cord polyp, 50% with right vocal cord nodules, 75% with left vocal cord polyp, 42.86% with right vocal cord polyp, and 100% with Reinke's edema.

Conclusion: In clinical practice, otorhinolaryngologists frequently meet non-malignant lesions of the larynx. Surgery won't be as necessary if the inflammatory lesions are diagnosed early and treated conservatively in the early stages. The best treatment options for non-cancerous laryngeal lesions are voice therapy, counseling, and microlaryngeal surgery. To rule out malignancy, the biopsy material needs to be sent for histology.

Keywords: Benign lesions of larynx, Micro laryngeal surgery, Speech therapy, Stroboscopy, Hoarseness and Video laryngoscopy.

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Introduction

Benign laryngeal lesions are a group of laryngeal illnesses that range in severity from stridor to pain and discomfort in the throat. In some cases, laryngeal lesions can be reversed with prompt diagnosis and treatment. The larynx's role in speaking and the voice's role in defining an individual's identity make benign lesions of the

larynx significant. [1] Benign neoplasms of the larynx have been defined by several authors. "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" is how New GB and Erich JD defined it. [2] "As any mass of tissue in the larynx which does

not present characteristics of malignancy," according to Hollinger's 1951 definition. [3]

An intriguing variety of lesions make up non-malignant laryngeal lesions. "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" is the definition given to them. [4] Because of the rapid industrialization and development leading to increased environmental pollution, benign lesions of the larynx are becoming more common. Talking loudly in a noisy environment on a regular basis has raised the occurrence. In ENT, non-malignant lesions of the larynx are a quite prevalent issue. The vocal cords play a crucial role in producing voice and enabling speech. [5]

Benign lesions of the larynx generally produce a common symptomatology known as dysphonia. [6] These lesions are significant to a laryngologist because of the symptoms they cause by interfering with the vocal cord mechanism and respiratory tract's normal functioning, as well as the need to differentiate them from malignant laryngeal lesions. The role the larynx plays in communication and the impact voice has on an individual's personality make benign lesions of the larynx significant. The quality of your voice could be affected by these lesions, and rapid growth could make breathing difficult. Cysts, polyps, and vocal nodules do not rule out cancer unless the lesion is pathologically benign or resolves with treatment. [7]

In addition to the symptoms they cause, the research is crucial for laryngologists since it is necessary to differentiate them from malignant lesions. Certain tumors have the potential to develop into malignant transformations, such as granular cell tumors (2%), and papillomas (4%). [8,9] Vibratory trauma, or excessive voice abuse, appears to be the primary cause of non-neoplastic lesions. Cofactors include infection, allergies, stomach reflex, and cigarette smoking. Endoscopic removal of small lesions can be achieved by the use of CO₂ lasers or microlaryngeal devices. Pharyngotomy or laryngo-fissure are frequently necessary for larger lesions that extend past the laryngeal structure.

As "laryngeal dysfunction caused by abnormal vocal cord vibration," hoarseness is the most typical presentation of a laryngeal lesion. [10] These lesions are characterized by an atypical mass of tissue in the larynx, whose growth outpaces and is not synchronized with that of normal tissue, and which continues to expand excessively even after the stimuli causing the change have stopped. [11] Benign lesions of the larynx generally produce a common symptomatology known as dysphonia.

[12] For lesions resulting from vocal abuse, conservative care is recommended. This includes voice therapy and voice rest. Laryngeal polyps, cysts, and stubborn nodules are still treated mostly with surgery using tiny surgical instruments. [13] The development of video laryngoscopy and stroboscopy has made it feasible to diagnose and treat patients earlier. Microscopic laryngeal devices or CO₂ lasers can be used for endoscopic removal of small lesions. Pharyngotomy or laryngo-fissure are frequently necessary for larger lesions that extend past the laryngeal structure.

Material and Methods

The present study prospective study of Benign Lesions of the Larynx has been carried out in the Department of ENT. Only cases with persistent hoarseness for more than three weeks were selected. Benign lesions included neoplastic and non-neoplastic lesions. All cases underwent a thorough ENT examination. Once suspected the cases were examined under direct laryngoscope, and fiberoptic laryngoscope, and if they were needed micro-laryngeal examination was also done. Benign non-neoplastic lesions were treated by voice rest, laser, or excision biopsy, and the biopsy results were confirmed. The benign neoplastic lesions underwent direct laryngoscopic examination and routine x-rays. If needed CT scan was done. The deserving cases underwent open surgical procedures and management results were analyzed. During this period patients who presented with hoarseness of voice were evaluated and 40 patients with benign lesions of the larynx were included in the present study after taking their consent. Informed written consent was taken from the patients or their guardians willing to participate in the study.

Inclusion Criteria

1. All patients attending ENT OPD with hoarseness of voice, foreign body sensation in the throat, vocal fatigue, and difficulty in breathing.
2. Age 5- 65 years.
3. Both males and females.

Exclusion Criteria

1. Age below 5 years and above 65 years.
2. Patients with the clinical diagnosis of malignancy of the larynx.
3. Patients with speech defects due to central nervous system lesions.
4. Patients with oral and pharyngeal pathology leading to a change in voice.
5. Patients with nasal and nasopharyngeal pathology leading to a change in voice.

Laryngoscopic Examination: After obtaining the Institutional Ethical Clearance the patients with hoarseness of voice were analyzed by age, sex,

incidence, clinical features, and risk factors. All patients were examined with flexible video laryngoscopy. Besides Indirect laryngoscopic examination in the Outpatient department, all the patients were examined with video laryngoscopy after spraying with 4% xylocaine. The entire anatomy of the larynx including the movement of the vocal cords could be studied after asking the patient to phonate. It is an office procedure, causing minimum discomfort to the patient. The next important and useful investigation is stroboscopy. But it is not available in our institution and hence was not done. It was not considered cost-effective to send the patient to another center for this procedure alone. Relevant clinical history, physical findings, and video laryngoscopic and stroboscopic findings were recorded by the principal investigator using the study proforma. With all this information, the analysis was done to obtain the aim of the study.

Biopsy: The biopsy was done only in cases where the diagnosis has to be confirmed. In other cases, where the presentation and appearance were classical, it was avoided to save costs.

Computed Tomography was not done routinely for the patient. Only for two patients of schwannoma and hemangiopericytoma where the appearance was deceptive, a Computed Tomography of the neck was done.

X-ray neck soft tissue lateral view is needed for certain cases where any obstruction to the air

passage is suspected. In our study, a large number of cases were small nodules or small polyps. Exposure to radiation was avoided, where ever it was felt that no extra information would be available.

All the details were filled up by the principal investigator in a structured study proforma. This proforma contains data regarding essential demographic details, clinical features, ENT examination, flexible video laryngoscopy findings, stroboscopy findings, voice handicap index, diagnosis, and management. Therapy was based on the diagnosis. Vocal cord nodule and vocal cord polyp patients were advised micro-laryngeal surgery to excise the lesion followed by voice rest. Those who refused were put on the medical line of management including antibiotics, antacids, steam inhalation, and speech therapy. Reinke's edema patients were given a medical line of management and voice rest. Patients were followed up for 6 months to assess the persistence or regression of the lesion. Those patients with persistent lesions were advised of surgical excision.

Statistical Analysis: All data were entered into MS excel and analyzed using the statistical software SPSS. The statistical method and data analysis in this study tried to describe the analysis process with appropriate methods and principles of statistics, using the data collected from the patients, who participated in this study.

Result

Table 1: Predisposing Factor

Predisposing Factors	Numbers of cases(n = 40)	Percentage
Upper Respiratory Tract Infection	10	24
Vocal Abuse	40	100
Smoking	20	50
Alcohol Consumption	1	4

Vocal abuse was the main predisposing factor noticed in 100% of patients, others being smoking, upper respiratory tract infection and alcohol consumption.

Table 2: Duration of Hoarseness of voice.

Duration	Cases	Percentage
< 1 month	8	20
1 - 3 months	10	24
3 - 6 months	16	38
6 - 9 months	5	14
9 - 12 months	1	4
≥ 12 months	0	0
Total	40	100

The maximum number of patients i.e., 16 cases (38%) presented during 3 – 6 months.

Table 3: Clinical Presentation

Symptoms	Number of Cases(n = 40)	Percentage
Hoarseness of Voice	40	100
FB Sensation in throat	18	42
Vocal Fatigue	40	100
Difficulty in breathing	2	6

In our study the commonest clinical presentation noticed was hoarseness of voice and vocal fatigue (100%), few patients also presented with foreign body sensation in the throat and difficulty in breathing.

Table 4: Diagnosis

Findings	Number of Cases(n = 40)	Percentage
B/L Vocal cord nodule	15	34
B/L Vocal cord polyp	1	4
Right Vocal cord nodule	1	4
Left Vocal cord polyp	5	16
Right Vocal cord polyp	5	14
Reinke's edema	13	28

In our study bilateral Vocal cord nodule was the most common condition (34%). Other lesions diagnosed include Reinke's edema and vocal cord polyp.

Discussion

The larynx can develop a variety of benign lesions, with vibratory damage appearing to be the etiological factor for diseases such as vocal nodules, vocal polyps, mucosal bleeding, and intracordal cysts. In addition to smoking, infections, allergies, and acid reflux, secondary effects can also make the mucosa more susceptible to the kinds of damage that might happen during mucosal oscillation. [14]

The symmetric bilateral mass lesions known as vocal cord nodules are firm, white to opaque, and located at the intersection of the anterior and middle thirds of the vocal folds. They cause the glottal configuration to close in an hourglass shape and have an impact on the mucosal wave and vibration of the vocal fold. Vocal cord polyps originate in the free border of the anterior third of the vocal fold and are often unilateral, transparent, and red-pedunculated. [15] Polypoidal degeneration, another name for Reinke's edema, is a prolonged build-up of gelatinous mucoid material in Reinke's space. [16] Reactive lesions made of granulation tissue, laryngeal granulomas are typically found in the posterior part of the vocal folds. On a macroscopic level, they might be bilateral, 2–15 mm in diameter, pale gray to dark red, polypoidal, nodular, fungating, or ulcerated. [17] Vocal fold cysts are benign pathologic entities that tend to occur at a slightly deeper plane of lamina propria and are usually unilateral. [18]

In a study by Hedge et al2005 [19] the youngest patient was 7 years old, the oldest being 80 years. The maximum number of cases was in the age group between 31 and 40 years (15 cases). The mean age in years was 38.74. In a study by Sharma et al2015 [20], the third, fourth, and fifth decades of life were the most frequently involved groups. In a study by Mohan et al2018 [21] vocal cord polyps were observed in 38% of the patients. In our study, the patients with nonmalignant lesions of the larynx presented with the symptoms more frequently

between 3-4 months (11 cases). In contrast to our study, in the study done by Baitha et al2004 [22] 50% of the patients presented within 1 month. Nagata et al1983 [23] and Sataloff et al1991 [24] observed a slightly decreased amplitude of the mucosal wave in cases of the vocal nodule, but the wave was generally symmetric. On the side of the cyst, mucosal waves were also seen to be absent or diminished. Larger polyps can clearly demonstrate decreased mucosal wave amplitude, but vocal folds with smaller polyps typically exhibit an unbroken mucosal wave.

In the case of vocal cord polyps, vocal abuse, and smoking were important risk factors. These findings were similar to our study. Cui et al2017 [25] in their study, found smoking and alcohol to be the most important risk factors for causing vocal cord leukoplakia. It was similar to our study in which 100% of the patients with leukoplakia were smokers and alcoholics. Zabret et al2018 [26] found no significant association of dyspepsia with benign lesions of the larynx; this was similar to our results, which showed no significant relation of dyspepsia with the non-malignant lesions of the larynx. Surgery was the predominant treatment in our study where micro laryngeal excision was done in 40 cases, similar to the study done by Singhal et al.2009 [27] In our study, bleeding during surgery was the most frequent complication that we managed using packing and cotton balls. Surgery had not been successful in treating recurrent laryngeal papillomatosis, as there were recurrences and post-operative problems such as stenosis.

We were able to include all aspect in our study, including age, occupation, risk factors, presenting symptoms, video laryngoscopy findings, and method of treatment for different lesions. In order to examine the mucosal wave pattern of vocal fold lesions, we also performed stroboscopy. Additionally, we discovered that stroboscopy is useful for diagnosing and identifying vocal fold abnormalities. Due to the small sample size, the study was unable to accurately analyze a number of parameters. Due to the study's time constraints, we were unable to monitor these instances and determine their recurrence rate.

Conclusion

Benign laryngeal lesions can cause stridor or just moderate hoarseness. An early diagnosis can result in efficient treatment and a full recovery from the illness. A better prognosis and early detection of cancer are other results of early diagnosis. Microlaryngeal surgery, with or without laser, voice rest, and speech therapy should be the standard of care. In clinical practice, otorhinolaryngologists frequently meet non-malignant lesions of the larynx. Surgery won't be as necessary if the inflammatory lesions are diagnosed early and treated conservatively in the early stages. The best treatment options for non-cancerous laryngeal lesions are voice therapy, counseling, and microlaryngeal surgery. To rule out malignancy, the biopsy material needs to be sent for histology.

References

- Hegde MC, Kamath PM, Bhojwani K, Peter R, Babu PR Benign lesions of the larynx – a clinical study. *IJLO*. 2005;57(1):35–8.
- New GB and Erich JB Benign tumors of the larynx: a study of 722 cases. *Arch Otolaryngol*. 1938;28:841–910.
- Hollinger PH, Johnston KC. Benign tumors of the larynx. *Ann Otol*. 1951;60:496-509.
- New GB, Erich JB. Benign tumors of the larynx- a Study of 722 cases. *Archives Otolaryngol*. 1938;28(6):841-910.
- Chopra H, Kapoor M. Study of benign glottic lesions undergoing micro-laryngeal surgery. *Indian J Otolaryngol Head Neck Surg*. 1997;49(3):276-9.
- Saudi, S. Benign lesions of the Vocal Cords in different ages: Prospective Study of 60 Cases. *Journal of Medical Science and Technology*, 2013;2(3),130-134.
- Ahmed, S. U., Kabir, M., Alam, A. K., Hasan, D. M., Ahmed, K. U., & Khan, H. S. Benign vocal cord lesions-a study of 25 cases. *Bangladesh Journal of Otorhinolaryngology*. 2006.
- Winston P, Epstein SS. Papilloma of the larynx: A clinic-pathological study. *J Laryngol Otol*. 1958;72:452-64.
- Sataloff RT, Ressue JC, Portell M, Harris RM, Ossoff R, Merati AL, et al. Granular cell tumors of the larynx. *J Voice*. 2000;14(1):119-34.
- Thomas C, Mona A. The Hoarseness patient. *ENT Secrets*. 2005;3:179.
- Singhal, P., Bhandari, A., Chouhan, M., Sharma, M. P., & Sharma, S. Benign tumors of the larynx: a clinical study of 50 cases. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 2009;61(1), 26-30.
- Saudi, S. Benign lesions of the Vocal Cords in different ages: Prospective Study of 60 Cases. *Journal of Medical Science and Technology*, 2013;2(3),130-134
- Chagnon F, Stone RE Jr. Nodules and polyps. In: Brown WS, Vinson DP, Carry MA, eds. *Organic voice disorders: assessment and treatment*. Singular Pub. Group, San Diego. 1996.
- Bastian, R. W. Benign mucosal and saccular disorders: benign laryngeal tumors. *Otolaryngology-Head and Neck Surgery*. St Louis, Mo. Mosby Year Book Inc, 1993; 2:1897-1924.
- Johns MM. Update on the etiology, diagnosis, and treatment of vocal fold nodules, polyps, and cysts. *Curr Opin Otolaryngol Head Neck Surg*. 2003;11(6): 456-61.
- Zeitels SM, Hillman RE, Bunting GW, Vaughn T. Reinke's edema: phonatory mechanisms and management strategies. *Ann Otol Rhinol Laryngol*. 1997;106 (7):533-43.
- Bostijan Luzar, Nina Gale, Ulrika Klopčič Janez Fishinger. Laryngeal granuloma; Characteristic of covering epithelium. *The journal of laryngology and otology*. 2000; 114: 264-267.
- Charles W. Cummings. John M. Febrickson, Lee A. Harker, Charles J. Krause. David E. Schuller. *Otolaryngology. Head and Neck surgery*. Mosby- Year Book. 1993; 2:2020-2051.
- Hegde MC, Kamath MP, Bhojwani K, Peter R, Babu PR. Benign lesions of the larynx-A clinical study. *Indian J Otolaryngol Head Neck Surg*. 2005;57(1):35-8.
- Sharma M, Kumar S, Goel M, Angral S, Kapoor M. A Clinical Study of Benign Lesions of Larynx. 2015;2(2):7
- Bharathi MM, Selvam DK, Vikram VJ. A study on the non-malignant lesion of the larynx. *Int J Otorhinolaryngol Head Neck Surg*. 2018;4:655-8.
- Baitha S, Raizada RM, Singh AK, Puttewar MP, Chaturvedi VN. Predisposing factors and etiology of Hoarseness of voice. *Indian J Otolaryngol Head Neck Surg*. 2004;56(3):186-90.
- Nagata K, Kurita S, Yasumoto S, Maeda T, Kawasaki H, Hirano M. Vocal fold polyps and nodules. A 10- year review of 1,156 patients. *Auris Nasus Larynx*. 1983;10:27-35.
- Sataloff RT, Spiegel JR, Hawkshaw MJ. Stroboscoped laryngoscopy: results and clinical value. *Ann Otol Rhinol Laryngol*. 1991;100 (9):725-7.
- Cui W, Xu W, Yang Q, Hu R. Clinicopathological parameters associated with histological background and recurrence after surgical intervention of vocal cord leukoplakia. *Medicine*. 2017;96(22):7033.

26. Zabret M, Hočevár BI, Šereg BM. The Importance of The Occupational Vocal Load for The Occurrence and Treatment of Organic Voice Disorders. *Zdr Varst.* 2018;57(1):17-24.
27. Singhal P, Bhandari A, Chouhan M, Sharma MP, Sharma S. Benign tumors of the larynx: a clinical study of 50 cases. *Indian J Otolaryngol Head Neck Surg.* 2009;61(1):26–30.