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Study of Non-Malignant Lesions of Glottis in Teritiary-Care Hospital

Dr. S. Susmita, Dr. D. Suman Reddy, Dr. Surendra Kumar Chowdary, Dr. Bhyri Sateesh, Dr. Ponnada Sarath Chandra
Great Eastern Medical School and Hospital, Srikakulam, Andhra Pradesh, India.

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ABSTRACT
Background: Non-malignant lesions of the glottis constitute a significant proportion of laryngeal pathology and are a common cause of voice disorders. Despite their benign nature, these lesions can result in considerable morbidity due to persistent dysphonia and related symptoms. Understanding their demographic distribution, clinical presentation, and management patterns is essential for early diagnosis and appropriate intervention. Methods: A prospective cross-sectional observational study was conducted in the Department of Otorhinolaryngology of a tertiary care hospital over a period of 18 months. Fifty patients aged 15–80 years diagnosed with non-malignant glottic lesions were included. Data regarding demographic characteristics, risk factors, clinical features, diagnostic modalities, pathological findings, and treatment methods were collected and analyzed using descriptive statistics. Results: Among the 50 patients studied, males predominated (72%). The most commonly affected age group was 21–30 years. Non-neoplastic lesions accounted for 86% of cases. Vocal polyps were the most frequent lesion, followed by vocal nodules. Hoarseness of voice was the most common presenting symptom (80%). Smoking and vocal abuse were identified as important associated factors. Microlaryngeal excision was the most commonly employed treatment modality. Recurrence was observed in a small proportion of cases during follow-up. Conclusion: Non-malignant glottic lesions are more prevalent among young adult males and are commonly associated with vocal abuse and smoking. Vocal polyps and nodules constitute the majority of lesions. Early diagnosis and appropriate management, including surgical intervention when indicated, result in favorable outcomes with low recurrence rates.

INTRODUCTION:

Larynx is a vital structure of the body. It provides protection to the lower airway. It acts like a medium of communication. The larynx or the "Voicebox" contains vocal cords and various ligaments, which on vibrating, produces voice. Any condition that affects vibration will have phonatory and laryngeal dysfunction. Laryngeal inlet is the opening of the larynx into the airway. It is around 4–5 centimeters in diameter[1].

Anatomy of larynx:
The larynx, trachea, bronchi, and lungs will develop from the midline ventral respiratory diverticulum, namely the laryngo-tracheobronchial groove. Development: Supraglottis develops from buccopharyngeal primordium that is arch 3 & 4. Glottis & Supraglottis develops from arches 4 & 6. In newborn babies, the larynx is initially at the C2–C3 vertebrae level, which is higher compared to the adult body[2].The larynx descends as the child grows.[3]

There are 6 cartilages including three paired and three unpaired ones. The unpaired cartilages are thyroid, cricoid**,** and epiglottis**.** The membranes and ligaments include Thyrohyoid membrane and

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median thyrohyoid ligament, Lateral thyrohyoid ligament, Quadrangular membrane and vestibular ligament, Cricothyroid ligament complex, Posterior cricoarytenoid ligament. The main parts of the larynx include supraglottis (including the epiglottis), glottis (including the vocal cords), and subglottis.

NON MALIGNANT LESIONS OF LARYNX:

Definition:

A non-cancerous or benign tumor of the larynx is a growth that does not metastasize to other parts of the body. They are not usually life-threatening[5].

Classification:

Benign neoplastic lesions[6]:

Epidermal	Papilloma
Neural	Neurofibroma Schwannoma Paraganglioma
Glandular	Oncocytic tumor
Vascular	Haemangioma
Cartilaginous	Chondroma
Miscellaneous	Lipoma Fibroma Rhabdomyoma

AETIOLOGY of benign tumours are mainly Vocal abuse or phono trauma, smoking, gastroesophageal reflux disease, alcohol, miscellaneous factors like allergy, infection, chronic sinusitis[7,8] **.** The professional voice users, housewives and kids form a susceptible group for the development of benign glottic lesions.

SYMPTOMS:

They cause mild dysphonia[9] to complete aphonia. Other linked symptoms include vocal fatigue and reduced vocal range. Aphonia or no voice[10] is rare, as the patient usually reports earlier. Dyspnoea, cough, soreness, and hemoptysis are some of the other symptoms. Some lesions like a vocal nodule and Reinke's edema[11] are treated by voice rest alone, while in others, laser or micro laryngeal excision is needed. In our study, we assessed the incidence of benign lesions of the glottis.

MATERIALS AND METHODS:

Study Design and Setting:

This prospective cross-sectional observational study was conducted in the Department of Otorhinolaryngology of a tertiary care teaching hospital in Andhra Pradesh, India.

Study Duration:

The study was carried out over a period of 18 months, from January 2020 to June 2021.

Study Population and Sample Size:

A total of 50 patients diagnosed with non-malignant lesions of the glottis were included in the study. The sample size was calculated using a standard prevalence-based formula, considering an expected prevalence of benign glottic lesions of 90%, a 95% confidence level, and a 5% allowable error.

Inclusion Criteria:

- Patients diagnosed with benign lesions of the glottis attending the ENT outpatient department
- Age between 15 and 80 years
- Both gender
- Patients who provided written informed consent

Exclusion Criteria:

- Lesions of the glottis with malignant features
- Lesions involving the supraglottis or subglottis
- Neurological lesions affecting the glottis
- Critically ill patients

Clinical Evaluation and Diagnostic Methods:

All patients underwent detailed history taking, general physical examination, and complete ENT examination. Indirect laryngoscopy was performed in all cases to assess vocal cord morphology and mobility. Biopsy was undertaken where histopathological confirmation was required. Computed tomography was performed selectively in cases with suspected laryngocele. Advanced investigations such as videostroboscopy, MRI, and electroglottography were not available and therefore not performed.

Data Collection:

The following parameters were recorded: demographic details, risk factors (smoking, alcohol intake, vocal abuse, gastroesophageal reflux), presenting symptoms, type and pathology of lesion, diagnostic modality used, treatment administered, and complications, if any.

Treatment Protocol:

Treatment was individualized based on the type of lesion and clinical presentation. Management options included conservative treatment, microlaryngeal excision, cord stripping, endoscopic procedures, open surgery in selected cases, and medical therapy where indicated. Postoperative patients were advised voice rest and followed up for recurrence.

Ethical Considerations:

Approval was obtained from the Institutional Ethics Committee prior to commencement of the study. Written informed consent was obtained from all participants, and confidentiality of patient data was maintained.

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RESULTS:

A total of 50 patients diagnosed with non-malignant lesions of the glottis were included in the study. All patients completed the clinical evaluation and were included in the final analysis.

Demographic Characteristics:

Of the 50 patients, 36 (72%) were males and 14 (28%) were females, indicating a clear male predominance. The male-to-female ratio was approximately 2.6:1.

The age of the patients ranged from 15 to 80 years. The highest incidence of non-malignant glottic lesions was observed in the 21–30 year age group, followed by the 31–40 year age group. Fewer cases were seen at the extremes of age, with relatively lower incidence in patients below 20 years and above 60 years.

Occupational Distribution:

Analysis of occupational background revealed that labourers constituted the largest group affected by benign glottic lesions. This was followed by students, teachers, clerks, and other professions. Among female patients, housewives formed the majority, accounting for most cases in that subgroup. The occupational pattern reflects increased vocal strain and environmental exposure among certain professions, as well as the hospital's catchment population.

Duration of Symptoms:

The duration of symptoms prior to presentation varied among patients.

- 27 patients (54%) had symptoms persisting for more than one year
- 23 patients (46%) presented within one year of symptom onset

This indicates that a significant proportion of patients had chronic symptoms before seeking specialized medical care.

Clinical Presentation:

Hoarseness of voice was the most common presenting symptom and was reported by 40 patients (80%). Other voice-related complaints included vocal fatigue, reduced voice range, and intermittent voice breaks.

Aphonia was observed in 2 patients (4%), both of whom were diagnosed with respiratory papillomatosis. Voice fatigue was reported by 7 patients (14%), often in association with prolonged voice use.

Associated symptoms such as cough, sore throat, fever, and odynophagia were reported in a smaller proportion of patients. Pain while talking and pain during swallowing were the most frequently noted complications.

Type and Pathological Distribution of Lesions:

Based on clinical and histopathological evaluation:

- 43 lesions (86%) were non-neoplastic
- 7 lesions (14%) were benign neoplastic

The most common lesion identified was vocal polyp, followed by vocal nodules. Other lesions encountered included vocal cysts, Reinke's edema, respiratory papillomatosis, intubation granuloma, laryngocele, tuberculous laryngitis, and rhinosporidiosis.

Neoplastic lesions were predominantly observed in patients aged above 45 years, whereas non-neoplastic lesions were more common in younger individuals.

Risk Factors and Associated Conditions:

A history of smoking was present in 18 patients, while 10 patients reported alcohol consumption. Six patients reported both smoking and alcohol use. Vocal nodules were observed more frequently among smokers when compared to non-smokers.

A history suggestive of gastroesophageal reflux disease was present in 16 patients. Increased levels of voice usage were reported by 25 patients (50%), including professional and habitual voice users such as teachers and labourers.

Diagnostic Modalities:

Indirect laryngoscopy was performed in all patients as the primary diagnostic modality.
Biopsy for histopathological confirmation was performed in 35 patients.
Computed tomography was performed in one patient with suspected laryngocele.
Advanced diagnostic tools such as videostroboscopy and electroglottography were not available at the study center and were therefore not used.

Treatment Modalities:

Management was individualized based on lesion type and clinical severity.

- Microlaryngeal excision was performed in 18 patients and constituted the most common surgical intervention
- Open surgical procedure was performed in one patient with laryngocele
- Antitubercular therapy was administered to two patients diagnosed with tuberculous laryngitis
- Conservative or medical management was employed in selected cases

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Postoperative patients were advised voice rest for approximately 15 days.

Complications and Follow-up:
The most commonly observed complications were pain while talking and pain during swallowing. No major perioperative complications were recorded.

Patients were followed up post-treatment, and recurrence was noted in approximately 2% of cases, indicating favorable outcomes with appropriate management.

DISCUSSION:

Most of the tumors of glottis constitute benign or non-malignant lesions, and its prevalence in the general population is around 1%. Considering this high prevalence, we have undertaken the current study.

Though there are studies previously done on the incidence, prevalence, pattern of benign tumors of the glottis, the current study would add more details to the research on the Indian population.

Similarities and differences with Hemant's study:
In the study by Hemant Chopra[23], Minisha Kapoor, et al., 67 patients were included who complained of hoarseness voice. Patients with benign laryngeal lesions were selected, and micro laryngeal examination was done. In our study, we included 50 patients. Hemant's study excluded any patient showing evidence of malignancy was not included like our study. Results showed that 73.14% patients presented between the age group of 20-25 years, which is in contrast to our study, in which 56% of patients belonged to 21-30 years age group. 69% presented within 1 year of the symptoms of hoarseness. The highest incidence was seen in housewives among females, similar to our study. Other people are shopkeepers, businessmen, students and teachers. In our study, there are no shopkeepers or businessmen. In Hemant's study vocal nodules were found to be most common, followed by vocal cysts and vocal polyps. In our study, the most common lesion was vocal polyp followed by vocal nodules. Vocal polyps, chronic Hypertrophic laryngitis, leukoplakia were found to be common among smokers. In our study also, smokers had more vocal polyps compared to nonsmokers.

Males predominated in every category of benign laryngeal lesions except in cases of vocal nodules. In our study, vocal nodules are seen in 12 males among 13 total subjects.

Findings of the Paul'[24]s study:
In the study conducted in Chicago on 1197 patients by Paul H. Holinger and K. C. Johnston (1951), 70%of cases were males and 30% females. Females had more vocal nodules and hematomas.

Other studies:
In the study by A. Sinha, S. K. Kacker and K. N. Pramanik[25], 73% of cases were males and 27% were females. As per the M. S. Strong[26]'s study, done in 1971, nodules are commonly more common in young women and children.

In the study by Chathopadyayin 1972, it was around 65% of the benign lesions are non-neoplastic. In our study, 86% are non neoplastic
In the study by Kleinsasser in 1982[27], the male: female ration is 3:1 for benign lesions of glottis. In our study it is 25:7
In 1988 Lancer[28] study found that women were most commonly affected by nodules. In our study also, vocal nodules are found to be common among females.

As per Jones SR[29]Vocal cord polyps show highest incidence in 30-50years. 75% patients being males and 85% being smokers. In our study also, vocal polyps are more common among males compared to females. Hemant's study vocal granuloma was seen in 1.42% of cases. In our study, there were 2 cases of intubation granuloma.

Limitations of the current study:
In this study, the sample size was 50, indicating that the study sample was small, and the primary limitation was the interpretation of results. Results for small studies were less reliable compared to larger studies. Larger studies with more subjects produce narrow confidence intervals (95% to 99%) and produce more accurate results. The study was done on patients aged 15-80 years of age only.

CONCLUSION:

Non-malignant lesions of the glottis are common causes of voice disorders, particularly among young adult males. Vocal polyps and vocal nodules constituted the majority of lesions in the present study, with hoarseness of voice being the most frequent presenting symptom. Smoking and vocal abuse were commonly associated factors, highlighting the role of behavioral and occupational influences in the development of these lesions. Most patients presented after a prolonged duration of symptoms, underscoring the need for early recognition and evaluation.

Timely diagnosis using routine laryngeal examination and appropriate management resulted in favorable outcomes with minimal complications

and low recurrence rates. Microlaryngeal surgery, when indicated, proved to be an effective treatment modality. Early intervention, combined with adequate voice rest and patient counseling, can significantly improve voice outcomes and quality of life in affected individuals.

RECOMMENDATIONS:

Patients with persistent voice changes should be encouraged to seek early otolaryngological evaluation to allow prompt identification and management of non-malignant glottic lesions. Education regarding voice hygiene, avoidance of vocal abuse, and smoking cessation should form an integral part of patient care, particularly among individuals with high vocal demands.

Conservative management may be considered in selected cases, while surgical intervention should be reserved for patients with persistent or structural lesions not responding to non-surgical measures. Future studies involving larger sample sizes, multi-center participation, and the use of advanced diagnostic modalities are recommended to further refine diagnostic and management strategies for non-malignant glottic lesions.

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