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Study of glottic lesions in patients undergoing microlaryngeal surgery

Vikrant Mittal¹, Manish Munjal², Rohit Verma^{2*}, Parth Chopra³, Hemant Chopra⁴

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*Correspondence: Dr. Rohit Verma,

E-mail: rohitaiims@yahoo.co.in

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ABSTRACT

Background: Vocal cords are the most common site of laryngeal pathologies. Hoarseness is the sentinel symptom for lesions affecting the glottis. The aim of this study was to categorize various types of lesions affecting the glottis in patients undergoing microlaryngeal surgery. Patients' demographic profile, gender, occupational factors were studied. Clinical, microlaryngeal and histopathological correlation of the lesions was done.

Methods: 50 patients with glottic pathologies undergoing microlaryngeal surgery were included. Patients underwent detailed examination including indirect laryngoscopy, flexible fibreoptic laryngoscopy, followed by microscopic laryngeal examination under general anaesthesia. The lesions were excised using standard microlaryngeal instruments and the specimens were subjected to histopathological examination. The data was analysed.

Results: There was male preponderance (male: female ratio of 1.27:1). Housewives formed the largest group (28%). Commonest pathologies were vocal nodules (34%), vocal polyps (22%) and carcinoma (22%). Microlaryngoscopy was found to be the best means of visualizing the lesions and reaching a clinical diagnosis. In 10 (20%) patients, the final histopathological diagnosis was different from clinical diagnosis.

Conclusions: In this study, vocal nodules were the commonest lesions to affect the glottis. Microlaryngoscopy proved to be the best method for examination. Also, there was discrepancy in the clinical and histopathological diagnosis in 20% cases.

Keywords: Fibreoptic laryngoscopy, Glottis, Hoarseness, Indirect laryngoscopy, Microlaryngeal surgery, Vocal disorders

INTRODUCTION

Larynx is a vital body organ that functions as an airway and the organ of phonation. Among the laryngeal pathologies, glottis involvement is the most common. Glottic pathologies are diagnosable in the early stage because of their effect on phonation and causation of hoarseness. There is often difficulty in ascertaining whether a lesion is inflammatory, degenerative, traumatic or neoplastic. The clinical appearance may not correlate with the final histopathology. A thorough and detailed

laryngeal examination is the heart of every evaluation when a patient complains of a voice related problem. There is no single method of laryngeal examination that is optimal for all patients. Thus it is important to recognize the advantages and limitations of the various techniques used for laryngeal examination. Classical mirror examination described by Manuel Garcia is usually the initial method of laryngeal examination in the otorhinolaryngology outpatient department. However, this is not possible in about 10% of cases due to brisk or uncontrollable gag. These patients can be examined by

¹Department of Otorhinolaryngology, Sri Guru Harkrishan hospital, Mohali, Punjab, India

²Department of Otorhinolaryngology, Dayanand medical college and hospital, Ludhiana, Punjab, India

³Chopra ENT Hospital, Ludhiana, Punjab, India

⁴Department of Otorhinolaryngology, Fortis hospital, Ludhiana, Punjab, India

using flexible fibreoptic laryngoscopy. This affords a physiological examination of the dynamics of larynx. Micro laryngoscopy is a procedure that means the laryngeal structures are visualised in greater detail under magnification along with the ability to take a biopsy.

The objective of this study was to determine the prevalence of various glottic pathologies in patients undergoing microlaryngeal surgery and their distribution across age, sex and occupation. The relative accuracy of various modalities of laryngeal examination (indirect laryngoscopy, fibreoptic laryngoscopy and micro laryngoscopy) in reaching a clinical diagnosis was studied. Discrepancy between the clinical and final histopathological diagnosis was noted.

METHODS

Fifty patients attending the otorhinolaryngology outpatient department of Dayanand Medical College and Hospital, Ludhiana, Punjab with glottic pathologies, were selected over a period of two and a half years from July 2009 to December 2011.

Inclusion criteria

All patients with glottic lesions who were planned for microlaryngeal surgery were included in the study.

Exclusion criteria

Patients with glottic lesions selected for non-surgical treatment, non-consenting patients were excluded.

Detailed history of each patient was recorded with regards to the onset, duration, progression of the symptoms. Emphasis was laid on occupational history, vocal abuse, exposure to irritants like smoking, alcohol and industrial pollutants. Thorough clinical examination including an indirect laryngoscopy was undertaken. A fibreoptic laryngoscopic examination was then carried out with an olympus fibreoptic scope (ENF P-2). The patients were admitted one day prior to surgical intervention. Microlaryngoscopic examination was performed under general anaesthesia using Zeiss GMBH 73446 microscope with video-photographic attachment. The glottic lesions were then excised/ biopsied using standard MLS instruments and the tissue was preserved in 10% formalin and sent for histopathological examination.

All statistical calculations were done using Statistical Package of Social Sciences (SPSS) 17 version statistical program for Microsoft Windows (SPSS Inc. Released 2008. SPSS statistic for windows, version 17.0, Chicago).

RESULTS

The overall male to female ratio was 1.27:1 (28 males and 22 females). The age of the patients ranged from 8

months to 75 years with 84% of the patients in the age group of 21 to 60 years.

Table 1: Distribution of patients according to occupation.

Occupation	No. of patients	Percentage (%)
House wives	14	28
Office employee	9	18
Shopkeeper	6	12
Teacher	5	10
Farmer	5	10
Businessman	2	4
Student	2	4
Retired servicemen	2	4
Labourer	2	4
Doctor	2	4
Tailor	1	2

Table 2: Distribution of lesions in patients with vocal abuse.

Glottic pathology	Number of cases (%)
Vocal nodule	13 (35.14)
Carcinoma	7 (18.92)
Vocal polyp	5 (13.51)
Hematoma	3 (8.11)
Chronic hyperplastic laryngitis	2 (5.41)
Reinke's oedema	2 (5.41)
Carcinoma in situ	2 (5.41)
Amyloidosis	1 (2.70)
Cyst	1 (2.70)
Papilloma	1 (2.70)

Table 1 shows the distribution of the patients according to their occupation. The largest group comprised of housewives (28%). There were 37 (74%) patients with history of vocal abuse or misuse or excessive talkativeness. The distribution of glottic pathologies in patients with history of vocal abuse (n=37) is shown in the Table 2. Most common among these was vocal nodule.

Table 3: Lesions in smokers.

Glottic lesion	Number of cases (%)
Carcinoma	6 (40)
Vocal nodule	2 (13.3)
Vocal polyp	2 (6.67)
Amyloidosis	1 (6.67)
Chronic hyperplastic laryngitis	1 (6.67)
Reinke's oedema	1 (6.67)
Leukoplakia	1 (6.67)
Tubercular laryngitis	1 (6.67)

Table 4: Lesions in alcoholics.

Glottic lesion	Number of cases (%)
Carcinoma	5 (55.6)
Hematoma	2 (22.2)
Reinke's oedema	1 (11.1)
Amyloidosis	1 (11.1)

15 (30%) patients in this study were smokers, 9 (18%) were chronic alcoholics and 5 (10%) were both smokers as well as alcoholics. The most common pathology found in both smokers and alcoholics was squamous cell carcinoma (Table 3 and 4).

Table 5: Lesions diagnosed on microlaryngoscopy.

Type of lesion	Number of cases (%)
Vocal nodule	17 (34)
Vocal polyp	11 (22)
Carcinoma	11 (22)
Reinke's oedema	3 (6)
Leukoplakia	2 (4)
Vocal cyst	2 (4)
Chronic hyperplastic laryngitis	2 (4)
Papilloma	2 (4)

The various types of pathological lesions visualized on microlaryngoscopy are shown in Table 5. The largest group was that of vocal nodules (34%), followed by vocal polyps and carcinoma in 22% each. In this study, microlaryngoscopy was found to be the best means of visualizing the lesions and reaching a clinical diagnosis. It was possible to reach a clinical diagnosis with microlaryngoscopic examination in all the 50 (100%) cases, while indirect laryngoscopy and fibreoptic laryngoscopy could yield a clinical diagnosis in 44 (88%) and 46 (92%) cases respectively.

Table 6: Lesions diagnosed on histopathological examination.

Type of lesion	Number of cases (%)
Vocal nodule	15 (30)
Carcinoma	9 (18)
Vocal polyp	6 (12)
Hematoma	3 (6)
Carcinoma in situ	3 (6)
Chronic hyperplastic laryngitis	2 (4)
Tubercular laryngitis	2 (4)
Reinke's oedema	2 (4)
Vocal cyst	2 (4)
Leukoplakia	2 (4)
Papilloma	2 (4)
Amyloidosis	1 (2)
Intubation granuloma	1 (2)

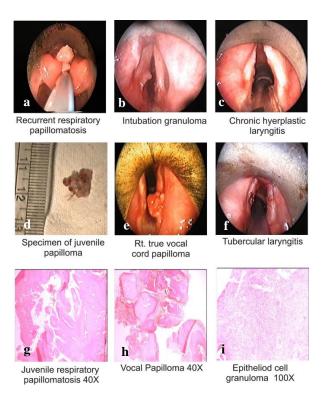


Figure 1 (a-i): Microlaryngoscopy and histopathological view of glottic papilloma, intubation granuloma, hyperplastic laryngitis, and laryngeal tuberculosis.

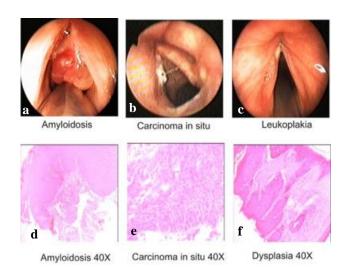


Figure 2 (a-f): Microlaryngoscopy and histopathological view of laryngeal amyloid, carcinoma in situ and leukoplakia.

The distribution of pathologies based on final histopathological diagnosis is listed in Table 6. Out of 50 cases studied, there was a discrepancy in the clinical and histopathological diagnosis in 10 (20%) cases, while in the remaining 40 (80%) cases, the clinical and histopathological diagnosis were in accordance. The lesions which could not be diagnosed correctly on clinical examination were carcinoma in situ, tubercular laryngitis, amyloidosis, intubation granuloma and vocal cord

hematoma. Microlaryngoscopic and histopathological photographs of a few of these patients are represented in Figures 1 and 2.

DISCUSSION

This study was conducted to determine the distribution of various glottic pathologies amongst patients undergoing microlaryngeal surgery. In accordance with the published literature, the most common age group affected in this study was 21-60 years.³⁻⁶ It is known that individuals in younger age group are more ambitious, active, use their vocal functions to the maximum and demonstrate risk taking behaviour such as smoking and alcohol addiction. This clearly suggests the use of excessive voice and addictions as the main causes of glottic pathologies.

The overall sex ratio in our study was 1.27:1 (56% males and 44% females). The published literature also shows male preponderance with regards to glottic pathologies.^{3,4,6-8} Males outnumber females in almost every category of benign laryngeal lesions except in cases of vocal nodules and vocal cysts, where females outnumber males. The female larynx may be more susceptible to nodules because of hormone mediated effects.

In this study, the maximum incidence of laryngeal lesions was found among housewives (28%), followed by office workers (18%), shopkeepers (12%), teachers and farmers (10% each). These professions were also noted to be the most common amongst patients with laryngeal pathologies in various other studies. Herrington et al reported top five occupations associated with laryngeal pathologies were homemakers, retired persons, factory workers, unemployed and executives or managers. As expected the most common lesion noted in smokers and alcoholics was squamous cell carcinoma.

Overall, the most common glottic lesion found in this study was vocal nodules (30%), followed by carcinoma (18%) and vocal polyps (12%). Strong et al also found vocal nodules and polyps to be the most common glottic lesions. Similarly, Ono et al found vocal nodule and polyps to be the most common lesions among 911 cases of laryngeal conditions in which endoscopic microsurgery was performed.

Microlaryngoscopy was found in this study to be the best means of assessing the lesions and reaching a clinical diagnosis in contrast to fibreoptic and indirect laryngoscopy. This was because of superior magnification, better resolution and the fact that examination is possible under complete relaxation. This overcame the drawbacks of fibreoptic laryngoscopy in terms of narrow field and indirect laryngoscopy in terms of gag and lack of patient co-operation.

Another important observation which was noted in this study was the variations in the clinical and

histopathological diagnosis. The lesions that were incorrectly diagnosed clinically were-tuberculosis, intubation granuloma, amyloidosis, hematoma and carcinoma in situ. The correct diagnosis was made on histopathological examination. Laryngeal tuberculosis, although not a very common diagnosis, still remains an important differential in laryngeal pathologies. This is especially true in a developing country like India. The earliest symptom is usually hoarseness and the lesions may involve any part of the larynx. The lesions can be classical granulomas or may present as ulcers or oedema. In this study laryngeal amyloidosis was diagnosed in one case. The patient presented with a polypoidal mass on vocal cord. Larynx is the most common site of upper aerodigestive tract amyloidosis. 12 Hoarseness is the usual symptom in these cases.

CONCLUSION

Vocal disorders are a common problem among general population and have significant effect on the quality of life. In accordance with the published literature, we found a male preponderance in patients with glottic pathologies. The commonest to be affected were patients in the age group of 20 to 60 years. House wives formed the largest group to be affected (28%). Almost 75% of the patients had history suggestive of some form of vocal abuse. Vocal nodules remain the commonest lesions to affect glottis. The differentiation of benign from malignant lesions is vital. Microlaryngoscopic examination has proved to be the best modality for visualizing these lesions and arriving at a clinical diagnosis. However, there can be a discrepancy in clinical and histopathological diagnosis. This emphasizes the need for a thorough histopathological examination of all such lesions.

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Institutional Ethics Committee

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