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Comparative study of benign vocal fold lesions in a tertiary health centre

Geetha K. Siddapur[1], Kishan R. Siddapur[2]*

[1]Department of Otorhinolaryngology, Karpaga Vinayaga Institute of Medical Sciences & Research Centre, Palayanoor, Tamil Nadu, India
[2]Department of Forensic Medicine & Toxicology, Karpaga Vinayaga Institute of Medical Sciences & Research Centre, Palayanoor, Tamil Nadu, India

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***Correspondence:**
Dr. Kishan R. Siddapur,
E-mail: kishan_rs@yahoo.co.in

ABSTRACT

Background: The present study was carried out to analyze the factors associated with different vocal fold lesions and to diagnose various benign vocal fold lesions at an early stage by their demographic profile and clinical presentations.
Methods: Patients with history of hoarseness of voice as a predominant symptom, cough, pain, foreign body sensation, dryness of throat and with a dominant history of vocal abuse, smoking or alcoholism were included in the study. Patients with acute infections, carcinomas, vocal cord palsy or other neurological diseases were excluded from the study.
Results: The males comprised 66.7% of patients in the study and the commonest age group involved was 30-40 years. Vocal abuse was the leading risk factor in 80% patients. Hoarseness of voice was the predominant symptom in 83% patients followed by vocal fatigue. Bilateral vocal fold involvement was seen in 50% of the cases. All vocal nodule cases had bilateral vocal fold involvement. The vocal nodules were the commonest lesion seen (35%). Intra-operative and post-operative use of intravenous steroids was also found beneficial. Statistical analysis was done using Chi-square test. Significance level was assessed with P value <0.05. The bilateral involvement in all the vocal nodule cases was found significant.
Conclusions: Voice therapy and cessation of smoking and alcohol can significantly reduce the incidence of these benign vocal fold lesions. It's not only surgery that's important in managing vocal fold lesions, but the post-operative care equally plays a vital role.

Keywords: Otorhinolaryngology, Benign, Vocal, Hoarseness, Dysphonia

INTRODUCTION

Benign vocal fold lesions that we otorhinolaryngologists deal in the current scenario are vocal nodules, vocal polyps, intrachordal cysts, Reinke's edema, laryngopharyngial reflux disease, contact ulcers, laryngeal webbing and papillomatosis. Benign vocal fold lesions can be broadly classified into neoplastic and non-neoplastic lesions. Benign, non-neoplastic lesions make up the majority of vocal fold lesions. Most of the lesions are associated with vibratory injury of the vocal cords. But, multiple factors can also lead to the development of these lesions. The most common ones include extroverts with a talkative personality and occupations with high voice demands.[1] Though vocal nodule, also called singer's nodule, screamer's nodule, is not only associated with singers, and screaming people, but also associated with other factors that can potentiate vibratory injury like smoking, acid reflux, uncontrolled allergies, and infections. However, singers, who tend to vary their pitch and tone while singing in order to demonstrate their capability and uniqueness, lecturers, who are accustomed

to continuous speaking for hours, and housewives especially, who, in the event of irritation, keep screaming at their young kids, especially during baby care, are the commonest affected people. Hoarseness of voice is a common presentation. It could be the initial or the only symptom of an underlying malignancy, and thus requires a detailed examination. Ideally the term "Hoarseness" refers to laryngeal dysfunction caused by abnormal vocal cord vibration.[2] Normal voice requires laryngeal function to be coordinated, efficient, and physiologically stable. Any imbalances of this delicate system can affect phonation. Benign lesions of the vocal folds can cause imbalances in this system, which can result in varying degrees of dysphonia. Bernoulli's principle explains that when air passes from one large space to another i.e. from lungs to Pharynx, a vibratory pattern is developed at the vocal cords and the resultant sound produced is appreciated as voice.[3] Cohen[4] in 2011, when comparing gender differences, found 11% of patients with dysphonia had benign vocal pathology listed as a diagnosis.

The present study, carried out mainly to analyze the factors associated with different vocal fold lesions, also aims at diagnosing various benign vocal fold lesions at an early stage by their demographic profile and clinical presentations. Findings, along with treatment modalities, were tabulated and analyzed.

METHODS

The study was retrospectively conducted to analyze benign vocal fold lesion cases examined between August 2012-2015 in Karpaga Vinayaga Institute of Medical Sciences & Research Centre, Tamil Nadu, India. A total of 57 cases were identified by the data received from medical records department of the institution. The received data was anonymised and unidentifiable in the results of the research, as names were not used when reporting individual data. Patients with history of hoarseness of voice as a predominant symptom or other complainants like cough, pain, foreign body sensation, dryness of throat etc. were included in the study. Patients with a dominant history of vocal abuse, smoking or alcoholism were also included in the study. Patients with acute infections, carcinomas, vocal cord palsy or other neurological diseases were excluded from the study. Data pertaining to general physical examination, routine investigations, indirect laryngoscopy and rigid endoscopy (70 degree, 4 mm), was noted. All the patients with structural lesions were managed with microlaryngeal surgery and specimen were sent for histopathological examinations.

Collected data included patient demographics, various benign vocal fold lesions and management modalities. Patients were separated into two cohorts. Group I included vocal nodule cases (n=20), and Group II, non-vocal nodule cases (n=37). Age, gender, side of involvement of vocal cord, and treatment strategies were statistically correlated with the two cohorts. Chi-square test was used for the purpose and significance level was assessed with P value <0.05.

RESULTS

The males comprised 66.7% of patients in the study and the commonest age group involved was 30-40 years (Table 1). Vocal abuse was the leading risk factor in 80% patients, rest were smokers and alcoholics. Hoarseness of voice was the predominant symptom in 83% patients followed by vocal fatigue (Table 2). Bilateral vocal fold involvement was seen in 50% of the cases. All vocal nodule cases had bilateral vocal fold involvement. The structural anomalies diagnosed are listed in table3. The vocal nodules were the commonest lesion seen (35%). The treatment strategies adopted have been highlighted in Table 4. Intra-operative and post-operative use of intravenous steroids was also found beneficial. The two cohorts were statistically analyzed using Chi-square test. Significance level was assessed with P value <0.05 (Table 5-8). The bilateral involvement in all the vocal nodule cases was found significant.

Table 1: Age wise distribution.

Age distribution	n	%
<10 years	0	0
10-20 years	4	7
20-30 years	13	22.8
30-40 years	35	61.4
40-50 years	4	7
>50 years	1	1.8
Total	57	100

Table 2: Predominant symptoms.

Predominant symptoms	n	%
Hoarseness	47	82.5
vocal fatigue	3	5.3
Foreign body sensation	2	3.5
Heart burn	2	3.5
dry cough	1	1.8
Throat clearing	1	1.8
Low grade pain	1	1.8
Total	57	100

Table 3: Lesions diagnosed.

Lesions	n	%
Vocal nodules	20	35.1
Vocal polyps	13	22.8
Intracordal cysts	9	15.8
Reinke's odema	5	8.8
Laryngopharyngial reflux disease	5	8.8
Contact ulcer	2	3.5
Laryngeal webbing	1	1.8
Papillomatosis	2	3.5
Total	57	100

Table 4: Treatment strategies adopted.

Lesions	Conservative (n, %)	Surgical (n, %)
Vocal nodules	5, 8.8%	15, 26.3%
Vocal polyps	1, 1.8%	12, 21.1%
Intracordal cysts	2, 3.5%	7, 12.3%
Reinke's odema	5, 8.8%	0
Laryngopharyngial reflux disease	5, 8.8%	0
Contact ulcer	2, 3.5%	0
Laryngeal webbing	0	1, 1.8%
Papillomatosis	0	2, 3.5%
Total	20, 35.1%	37, 64.9%

Table 5: Chi-square test: Groups vs. Genders.

	Group I	Group II	Total	Result	Statistical significance
Males	15	23	38	The Chi-square statistic is 0.9628 P value = 0.326473	Not significant at P <0.05
Females	5	14	19		
Total	20	37	57		

Table 6: Chi-square test: Groups vs. Age.

	Group I	Group II	Total	Result	Statistical significance
<30	5	12	17	The Chi-square statistic is 0.3427 P value = 0.5583	Not significant at P <0.05
>30	15	25	40		
Total	20	37	57		

Table 7: The Chi-square test: Groups vs. Side of involvement.

	Group I	Group II	Total	Result	Statistical significance
Unilateral	0	29	29	The Chi-square statistic is 31.9112 P value = 0	Significant at P <0.05
Bilateral	20	8	28		
Total	20	37	57		

Table 8: Chi-square test: Groups vs. Treatment modality.

	Group I	Group II	Total	Result	Statistical significance
Conservative	5	15	20	The Chi-square statistic is 1.3766 P value = 0.240682	Not significant at P <0.05
Surgery	15	22	37		
Total	20	37	57		

DISCUSSION

Most patients (more than half) with voice complaints are known to have benign vocal fold lesions.[5] Brodnitz[6] reported 45% of nodules, polyps or polypoidal thickenings. Kleinsasser[7] also reported similar findings. In the present study, the commonest pathology was the presence of vocal nodules in 35% patients. Mahesh Chandra et al.[8] reported an incidence of 28.57% and 24%, on vocal nodules and vocal polyps respectively, in their study. Kotby et al.[9] reported similar results. In studies by Kambic et al.[10] and Chopra et al.,[11] the incidence varied from 68.3 to 16%. In the present study, 9% patients were diagnosed as having features of laryngopharyngeal reflux. These patients were diagnosed with associated symptoms like excessive cough (especially at night), frequent attempts of clearing throat, difficulty in swallowing food or liquids, sensation of foreign body in throat and presence of heart burn, chest pain or indigestion. Otorhinolaryngologists encountering reflux related disease cases in the present scenario is no more considered rare. Moreover, patients with oesophagitis are found to be at double risk of getting laryngitis than those who do not have it.[12] Harding and Richter[13] estimated the prevalence of GERD (Gastroesophagial reflux disease) associated cough and found it to be 10-40%. Classical symptoms of GERD are rarely presented these days by patients with GERD induced Otolarynologic manifestations making diagnosis of such cases more challenging in the present scenario. Going by the quote 'prevention is better than cure', life style modification is

required to prevent GERD related lesions. Modifications like quitting smoking and alcohol, keeping BMI (body mass index) <30, exercises, maintaining latent period between meal intake and sleep.

In the present study, hoarseness of voice, vocal fatigue and foreign body sensation were the commonest presenting symptoms. Reinke's edema was seen in 9% patients. It is often seen in patients who are chronically exposed to irritants such as tobacco smoke. Intracordal cysts were seen in 16% patients in the present study. The history of patients with vocal cysts was similar to that of patients with vocal nodules or polyps. Shohet et al.[14] compared stroboscopic findings between cysts and polyps, and found that mucosal wave was the most important parameter in differentiating such cysts from polyps. During the present study, we, the authors had to rely on histopathological examination to confirm findings since stroboscopy was unavailable. In the present study contact ulcers were seen in 3.5% patients. These were mostly bilateral and symmetrical. With regard to management modalities, smaller nodules were managed conservatively by voice therapy. But, larger ones required surgical approach (microlaryngeal surgery). However, post-operative voice therapy was recommended and found beneficial. Thus, surgical approach too required conservative management concurrently for better prognosis. Steroid administration (tablet prednisolone, 1 mg/kg bodyweight, followed by tapering of dose over 3 weeks) was an effective way of conservative management. However, as quoted earlier during this discussion, life style modification like cessation of smoking, avoidance of alcohol and spicy food, and going to sleep not less than two hours after food is equally important conservative management.

Chi-square test on the cohorts with various factors revealed the significance of bilateral involvement of vocal fold in vocal nodule cases. Thus, it can be inferred that, with the presence of bilateral vocal fold involvement, the probability of vocal nodule diagnosis goes high. However, one query is still unanswered, which is, how come vocal nodules are the only lesions that involve the vocal folds bilaterally when the risk factors, for the entire group of benign vocal fold lesions, are more or less the same? Maybe more research is required in this aspect.

CONCLUSIONS

We, the authors, conclude by quoting that bilateral vocal fold involvement in association with vocal nodule cases is significantly high. Vocal abuse is a dominant risk factor, and hoarseness of voice is the predominant symptom of benign vocal fold lesions. Voice therapy and cessation of smoking and alcohol can significantly reduce the incidence of these benign vocal fold lesions. It's not only surgery that's important in managing vocal fold lesions, but the post-operative care equally plays a vital role. More research is required to know the reason behind bilateral vocal fold involvement by the vocal nodules.

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