Original Research Article

# Benign lesions of the vocal cords - An analysis of fifty cases

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## Abstract

**Background:** Vocal cord lesions are fairly common and easily diagnosed since the nature of disease is such that the presentation is very early. In most cases the lesions are managed with very good cure rates. Beingn non-neoplastic lesions make up majority of vocal fold lesions and are majorly associated with vibratory injury of vocal cords, but multiple factors can lead to development of these lesions. The present study was carried out to analyze the factors associated with different benign vocal fold lesions and their management via microlaryngeal surgery and speech therapy. We present common benign vocal cord lesions seen and managed over a period of one year in our institution and analyze the management strategies.
**Key Words:** Vocal cord lesions, Benign, MLS.

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## INTRODUCTION

Vocal cord lesions are a common presentation to the Laryngologist due to the nature of the disease and also the early presentation. Voice change is the common major presentation in most of the cases and this is the common reason for consultation. The presentation is more when the voice change is persistent. The origin of the vocal polyp is phonotraumatic[1, 8]. Other irritating processes, however, may contribute to the emergence of polyps, such as gastroesophageal reflux, smoking, aspiration of aggressive chemical substances, or intense respiratory activities.[2, 8]In most young age groups with no risk factor like smoking or tobacco abuse, the lesions are predominantly benign in nature and amenable to treatment successfully which makes this a very rewarding diagnosis. With the increasing use of Laryngoscope and rigid endoscope of the 70 to 90 degrees it is easier to diagnose and document these conditions. Although indirect laryngoscope remains the first mode of diagnosis which will very soon be replaced with the endoscope in the future. The management is usually surgical since most of the times the patient presents only when the voice change is persistent and chronic. Surgical excision with the aid of Microscope or Endoscope is usually successful in complete clearance of the disease.[8] Thus here we present and analyse fifty cases of Benign lesions of the vocal cord managed in our institution over the period of two years.

## MATERIALS AND METHODS

Fifty patients with Diagnosis of Benign lesions of vocal cords were taken up for the study. The mode of presentation of all the patients was voice change and altered voice or lack of voice modulation. The initial diagnosis was with the indirect laryngoscope mirror and later was confirmed by the Video laryngoscope which was aided in photo-documentation. (Figures 1 and 2)

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### Inclusion Criteria

1. Patients with complains of hoarseness or voice change later diagnosed due to vocal cord lesion
2. Vocal cord lesions diagnosed by Videolaryngoscopy
3. Lesions diagnosed as benign vocal cord lesions by pathological examination
4. Patients of any age or sex deemed fit for surgery
5. Patients amenable for follow up

### Exclusion Criteria

1. Voice change due to other causes such as vocal cord palsy and trauma
2. Lesions later diagnosed as malignant by pathological examination
3. Any contraindication to surgery either due to age or other co-morbidity
4. Patients lost to follow up after one month

All the patients were further advised pre anaesthesia evaluation and posted for surgical excision.

All the surgery was performed under General Anaesthesia after proper pre anaesthetic fitness.

After proper positioning, an Direct Laryngoscope set was placed on the patient and vocal cords are visualised. The ventilation tube normally used is the MLS tube which aids in proper positioning and identification of the vocal cords. Then either a Microscope or an endoscope is used to visualize the lesion closely and the removal is done in toto using the microlaryngeal forceps. Complete clearance is ascertained with the scopes and any bleeding is controlled with an adrenaline soaked cotton ball. The specimen is then sent for Histopathological examination in formalin. The patient is then discharged after one day and asked for follow up after five days. Routine antibiotics and analgesics are prescribed during the time period. Strict emphasis is given for the vocal hygiene before and after the surgery whatever be the post operative pathological diagnosis. After three months an repeat Videolaryngoscopy is done to ascertain the state of vocal cords and recurrence if any.

## OBSERVATIONS AND RESULTS

Fifty patients were admitted for the study and analysis whose diagnosis were confirmed to be benign.

There were 32 males and 18 females in the study.

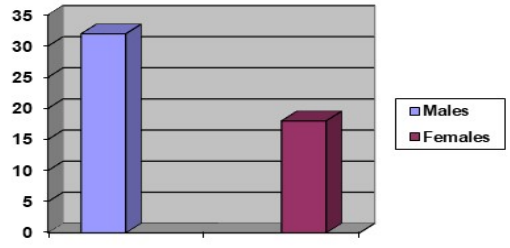


Figure 1:

The age group distribution was as follows. The youngest patient was a female of the age 22 years, while the eldest was a male of the age 62 years.

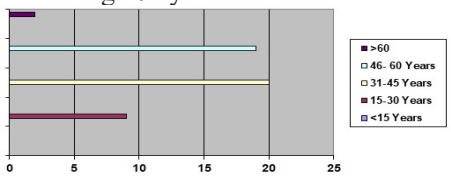


Figure 2:

Most of the patients gave a history of intense acute and chronic vocal abuse. The professions ranged from Shopkeepers to Homemakers and mostly involved vocal use and abuse of varying degree.

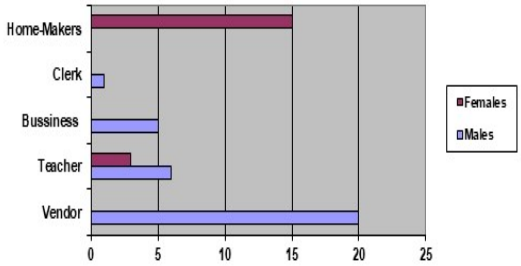


Figure 3:

All the patients were posted for MLS in GA and the lesions were sent for Histopathological diagnosis. The diagnosis were as follows. The most common diagnosis was Vocal Cord Polyp.

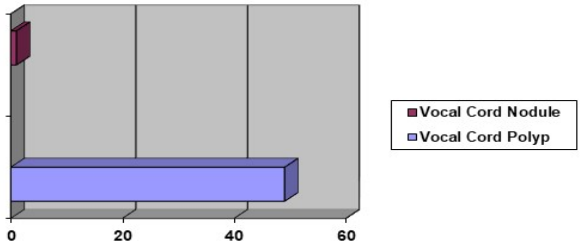


Figure 4:

The lesions were mostly unilateral since the diagnosis in most cases were Polyp while one case of Polyp was bilateral and one case of Vocal Cord Nodule was bilateral as expected.


Figure 5:

All patients were followed up for three to six months and there was no recurrence or residual lesion in all the

patients. A voice analysis questionnaire was given to the follow up patients during the first and second visit which was after one week and one month after surgery, which ascertained a self assessment of the improvement of voice after surgery. Most patients had immediate improvement in the first week and immediately after surgery (90%) while the value reached hundred percent after one month or second follow up.

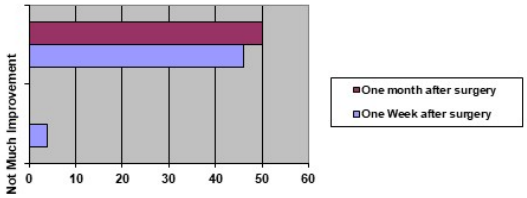


**Figure 6:**

**Figures 1 and 2:** Showing the vocal Cord polyp and removal

## DISCUSSION

Innovative otolaryngologists, speech language pathologists, and voice scientists have continued to advance our understanding of the etiology, diagnosis, and treatment of vocal fold nodules, polyps, and cysts. An article by Johns MM reviewed the recent publications over the past years with respect to these advances.

The article stated that support for the notion that benign vocal fold lesions arise from phonatory trauma and vocal misuse continues to become evident. Changes in the molecular characteristics of the lamina propria in these lesions are beginning to be understood. For diagnostic purposes, the use of innovative technology such as Ultrasonography and virtual laryngoscope is being explored. Continued support for behaviour modification as a primary treatment modality for benign vocal fold lesions has been published, and refinements in technical aspects of laryngeal microsurgery persist. Finally, outcomes studies have demonstrated improvements in vocal disability with both behavioural and surgical interventions. Our study also revealed an association with vocal abuse since more than 80 percent of the patients gave a history of vocal abuse of one form or the other. The quantification and study of the type and extent of vocal abuse has to be studied and analysed further.[1] Martins *et al.*. conducted a study to study the clinical, morphological, and immunohistochemical characteristics of vocal polyps. In the study, 76 medical charts from patients with polyps were reviewed. Histology study: in 42 slides from surgical specimens, the following were analyzed: epithelium, basal membrane, and lamina propria. In the transmission and scanning electron microscopy (TEM and SEM) studies, eight new cases of polyps were included. An immunohistochemical study was carried out in the 42 specimens, using antibody antifibronectin, antilaminin, and anticollagen IV.

### They had the following results

Genders--43% males and 57% females; age range--between 21 and 40 years (36.85%); and between 41 and 60 years of age (51.31%); smoking and drinking-reported by 39 and 15 patients, respectively; associated symptoms-vocal abuse (61%), gastroesophageal (47%), and nasosinusal symptoms (32%); occupation--teachers (24.0%) and maids (18.0%). Histology--epithelial hyperplasia (31.71%), hyperkeratosis, (14.28%), edema (100%), vessel proliferation (92.86%), and congestion (83.33%). SEM--reduction in mucous lacing and increase in desquamating cells. TEM--hyperplastic epithelium, enlargement of the intercellular junctions, dense subepithelial network of collagen and basal membrane with adhesion loss. Immunohistochemistry--greater immunoexpression of fibronectin, laminin, and collagen IV around the vessels. They concluded that in vocal polyps, the morphological analyses show lamina propria with edema, vessel proliferation and inflammation, basement membrane with adhesion loss in some areas and dense network of subepithelial collagen. Immunohistochemistry techniques identify pigmentation of the antibodies anti-fibronectin, anti-laminin, and anti-collagen IV in the endothelium of blood vessels. Our study had a gender majority of males and associated vocal abuse in more than 80 percent of cases. Majority of age group was in the 30 to 45 range which was similar to the above study indicating younger and vocally active generation or working professionals or housewives. The Histopathological report was of polyp in almost all the cases and one case of Nodule.[2] According to Toran K C *et*

*al.*., vocal polyps are the products of voice overuse, misuse and abuse. Treatment generally advised for them are voice therapy and Microlaryngeal Phonosurgery (MLPS). The improved or changed quality of voice is generally assessed perceptually and can cause intra rater variability. In a study they compared and analysed the acoustic characteristics before and after MLPS. The purpose of the study was to acoustically determine the changes in voice quality of a group of patients before and after the surgery. The following patients group were studied prior to and in between 3 and 4 weeks of surgery. Altogether there were 23 patients with either unilateral or bilateral vocal polyps. Voice recording and analysis were performed with Dr. Speech acoustic software (Tiger electronics, USA). The parameters analyzed were in terms of perturbation (Jitter and shimmer), harmonic-to-noise ratio (HNR) and fundamental frequency (F0). The results showed that shimmer, HNR and F0 decreased significantly ($p<0.05$) following MLPS, but jitter though reduced, was not statistically significant ($p = 0.694$). The acoustic output generally improved after MLPS as evidenced by decreased values of all the four acoustic parameters. The study also stress that voice quality can be improved through the phonosurgical procedures. This multidimensional voice analysis can be very helpful in our ability to provide objective clinical analysis of voices with vocal polyps, and following their surgical treatment. Our study also demonstrated an association with vocal abuse in more than 80 percent of patients. We also advised Microlaryngeal Surgery for all the patients with persistent symptoms. A definitive voice improvement was demonstrated by all the patients though a voice analysis was not carried out in our study. A patient questionnaire was used to ask the patient subjectively how he or she feels about his or her voice after surgery and all the patients had improvement in voice after surgery till at least the period of follow up.[3] Empirical data are often not available to guide clinical practices in the treatment of benign mucosal lesions of the vocal folds. The purpose of a report by Sulica L, was to describe opinions and practices in order to identify areas of consensus and discrepancy and thus guide future inquiry. A 16-item survey mailed to all active US members of the American Academy of Otolaryngology-Head and Neck Surgery (n = 7,321) included questions on the use of voice therapy; diagnostic testing; perioperative use of steroids, antibiotics, and antireflux medications; and use of lasers. Responses used a Likert 5-point scale with end anchors of 1 equaling "never" and 5 equaling "always" and were stratified according to lesion (nodules, polyps, cysts). A 16.5% response rate (n = 1,208) was obtained. A lack of consensus was most evident in the use of voice therapy for lesions other than nodules; antireflux medication; and intravenous steroids. Disagreement was also noted regarding the use of lasers, oral steroids, and antibiotics. Other than voice therapy as initial intervention for nodules, no statistically significant differences by lesion type exist regarding use of voice therapy, laser, or any medication. Prospective clinical trials addressing voice therapy, antireflux medications, steroids, and antibiotics are needed to inform clinical practice. Furthermore, treatment practices appear to be largely independent of lesion type. Therefore, traditional diagnostic categories do not seem to be useful guides to treatment, and may need to be reevaluated in light of improvements in diagnostic technology and surgical technique.

For now the chief treatment is surgical excision since it has an excellent cure rate. The same has been demonstrated in our study.[4] Vocal fold polyp is generally thought to require surgical removal. However, a certain proportion of polyps resolve with conservative treatment. A study was performed to clarify the frequency of spontaneous resolution of vocal fold polyp and identify features associated with polyps that are likely to resolve without surgery. A review of the medical records of patients diagnosed with vocal fold polyps in Tokyo Voice Center from January 2001 to December 2008 was done in this study. Of 644 patients with the diagnosis of vocal fold polyp, 132 received conservative treatment, 433 were treated surgically, and 79 dropped out without attending for further consultation after the initial visit. Of those treated conservatively, 55 experienced complete resolution after a mean of 5.1 months of follow-up from the outset, and 29 showed lesion shrinkage after a mean of 4.1 months of follow-up. Polyps that resolved with conservative therapy were more likely than those that remained unchanged or enlarged to occur in women, be smaller, and have a shorter duration of symptoms. They could not determine the superiority of voice therapy. The authors concluded that at least 9.7% of vocal fold polyps might resolve without surgery. Conservative treatment should be considered as an option for selected patients with smaller and more recent-onset polyps. In our experience and as demonstrated in our study, since surgery had a cent percent cure rate, it is the treatment of choice provided the lesion is identified properly and removed in toto. Conservative treatment is however even otherwise offered initially and to patients with contraindication to surgery due to any cause. Vocal cord and voice hygiene is anyway the corner stone of treatment both before and after the surgery.[5] The aim of a study by Gökcan KM *et al.*. was to present symptoms, laryngological findings, clinical course, management modalities, and consequences of vascular lesions of vocal fold. This study examined 162 patients, the majority professional voice users, with vascular lesions regarding their presenting symptoms, laryngological findings, clinical courses and treatment results. The most

common complaint was sudden hoarseness with hemorrhagic polyp. Microlaryngoscopic surgery was performed in 108 cases and the main indication of surgery was the presence of vocal fold mass or development of vocal polyp during clinical course. Cold microsurgery was utilized for removal of vocal fold masses and feeding vessels cauterized using low power, pulsed CO(2) laser. Acoustic analysis of patients revealed a significant improvement of jitter, shimmer and harmonics/noise ratio values after treatment. Depending on our clinical findings, the authors proposed treatment algorithm where voice rest and vocal therapy is the integral part and indications of surgery are individualized for each patient.[6, 8]

According to Schindler A *et al..*, benign vocal fold lesions are common in the general population, and have important public health implications and impact on patient quality of life. Nowadays, phonomicrosurgery is the most common treatment of these lesions. Voice therapy is generally associated in order to minimize detrimental vocal behaviours that increase the stress at the mid-membranous vocal folds. Nonetheless, the most appropriate standard of care for treating benign vocal fold lesion has not been established. The aim of their study was to analyze voice changes in a group of dysphonic patients affected by benign vocal fold lesions, evaluated with a multidimensional protocol before and after voice therapy. Sixteen consecutive patients, 12 females and 4 males, with a mean age of 49.7 years were enrolled. Each subject had 10 voice therapy sessions with an experienced speech/language pathologist for a period of 1-2 months, and was evaluated before and at the end of voice therapy with a multidimensional protocol that included self-assessment measures and videostroboscopic, perceptual, aerodynamic and acoustic ratings. Videostroboscopic examination did not reveal resolution of the initial pathology in any case. No improvement was observed in aerodynamic and perceptual ratings. A clear and significant improvement was visible on Wilcoxon signed-rank test for the mean values of Jitt%, Noise to Harmonic Ratio (NHR) and Voice Handicap Index (VHI) scores. Even if it is possible that, for benign vocal fold lesions, only a minor improvement of voice quality can be achieved after voice therapy, rehabilitation treatment still seems useful as demonstrated by improvement in self-assessment measures. If voice therapy is provided as an initial treatment to the patients with benign vocal fold lesions, this may lead to an improvement in the perceived voice quality, making surgical intervention unnecessary. They concluded that this was one of the first reports on the efficacy of voice therapy in the management of benign vocal fold lesions; further studies were needed to confirm these preliminary data.[7, 8] We have also opined that vocal cord hygiene is paramount for the treatment and prevention of vocal cord lesions.

## CONCLUSION

Vocal cord lesions are common causes of voice change or Hoarseness of voice. Vocal abuse is a chief cause of vocal cord lesion. Benign lesions are commoner than malignant especially in the younger age groups. MLS or Microlaryngeal surgery is the treatment of choice. If properly done under good visualisation using either a Microscope or Endoscope, the recurrence or residual rates are low. Vocal and voice hygiene before and after the surgery is the cornerstone of management.

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