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ORIGINAL RESEARCH

Comparative Study of Different Techniques for Vocal Cord Lesion Removal and Their Impact on Voice Quality in Head and Neck Patients

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ABSTRACT

Background: Benign vocal cord lesions are prevalent contributors to dysphonia and are frequently amenable to surgical intervention. These lesions encompass conditions such as vocal polyps, vocal cysts, vocal nodules, and Reinke's edema. This was a Comparative Study of Different Techniques for Vocal Cord Lesion Removal and Their Impact on Voice Quality in Head and Neck Patients. **Material and methods**: 100 patients scheduled for removal of vocal cord lesions were enrolled. Complete demographic and clinical details of all the patients was obtained. A Performa was made and complete clinical findings of all the patients was evaluated. All the patients were randomized into two study groups- Laser treatment group [CO2 laser was used] and conventional laryngo-microsurgery group. All the patients underwent removal of vocal cord lesions according to their respective study groups. The voices of the patients were assessed before surgery as well as at 1 week, 1 month, and 3 months post-surgery. For the subjective assessment, patient's self-assessment of voice disability Index (VHI) was used. All the results were compiled and compared. SPSS software was used for evaluation of results. **Results:** Mean VHI among patients of Laser group Before surgery, one week after surgery, one month after surgery and Three months after surgery was 35.1, 23.2, 18.9 and 8.3 respectively.Mean VHI among patients of Laser group Before surgery, one week after surgery, one month after surgery and Three months after surgery was 34.9, 24.9, 17.3 and 9.9 respectively. Non-significant results were obtained while comparing the two techniques at different time intervals. **Conclusion:** Both the study groups were comparable and had similar effect on voice quality in head and neck patients.

Keywords: Vocal Cord, Removal, Voice Quality

INTRODUCTION

Benign vocal cord lesions are prevalent contributors to dysphonia and are frequently amenable to surgical intervention. These lesions encompass conditions such as vocal polyps, vocal cysts, vocal nodules, and Reinke's edema.[1] They not only compromise the quality of pronunciation and vocal function but also precipitate various psychological and social challenges, thereby diminishing the overall quality of life for affected individuals. These laryngeal mucosal disorders are often attributed to vocal misuse, commonly referred to as 'phonotrauma.' The repetitive forces of collision and shear stress result in microvascular damage and trauma to the epithelial basement membrane.[1,2]

Here, 'voice' is defined as the sound originating from the vibrations of the vocal folds. The quality of voice is thus dependent on the myoelastic characteristics of the vocal folds, and is affected only slightly by the resonances and characteristics of other parts of the vocal tract. Speech on the other hand, as a carrier of messages, is based on the volitional coordinated movements of the articulators and can be affected severely by changes in muscle or tissue properties of e.g. the tongue or the soft palate.[3, 4]Management of benign vocal cord lesions may involve medical treatment, voice therapy conducted by speech-

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language pathologists, or surgical intervention performed by otolaryngologists. For patients who do not experience improvement through medical or voice therapy, microlaryngeal surgery (MLS) may be indicated.[5, 6]This was a Comparative Study of Different Techniques for Vocal Cord Lesion Removal and Their Impact on Voice Quality in Head and Neck Patients.

MATERIAL AND METHODS

The present study was conducted for evaluation and comparison of different Techniques for Vocal Cord Lesion Removal and Their Impact on Voice Quality in Head and Neck Patients. 100 patients scheduled for removal of vocal cord lesions were enrolled. Complete demographic and clinical details of all the patients was obtained. A Performa was made and complete clinical findings of all the patients was evaluated. All the patients were randomized into two study groups- Laser treatment group [CO2 laser was used] and conventional laryngo-microsurgery group. All the patients underwent removal of vocal cord lesions according to their respective study groups. The voices of the patients were assessed before surgery as well as at 1 week, 1 month, and 3 months post-surgery. For the subjective assessment, patient's self-assessment of voice disability Index (VHI) was used. All the results were compiled and compared. SPSS software was used for evaluation of results.

RESULTS

Mean age of the patients of the Laser group and conventional surgery group was 45.2 years and 42.9 years respectively. Majority proportion of patients of both the study groups were males and were of urban residence. Mean VHI among patients of Laser group Before surgery, one week after surgery, one month after surgery and Three months after surgery was 35.1, 23.2, 18.9 and 8.3 respectively.Mean VHI among patients of Laser group Before surgery, one week after surgery, one month after surgery and Three months after surgery was 34.9, 24.9, 17.3 and 9.9 respectively. Non-significant results were obtained while comparing the two techniques at different time intervals.

Table 1: Demographic details

Variable	Laser group	Conventional surgery group
Mean age	45.2 years	42.9 years
Males	33	35
Females	17	15
Rural residence	23	20
Urban residence	27	30

Table 2: Comparison of VHI

Variable	Laser group	Conventional surgery group	p-value
Before surgery	35.1	34.9	0.25
One week after surgery	23.2	24.9	0.27
One month after surgery	18.9	17.3	0.88
Three months after surgery	8.3	9.9	0.65
p-value	0.001 (Significant)	0.002 (Significant)	0.38

DISCUSSION

The escalating levels of environmental pollution, coupled with various interpersonal factors that contribute to the misuse of vocal techniques, have led to an increase in the prevalence of vocal cord disorders. Effective interventions for vocal cord disorders aim to preserve sound function and maintain a normal voice. Over time, two primary microsurgical techniques for voice treatment have emerged: conventional laryngeal microsurgery, which employs cold instruments such as throat knives, scissors, and pliers, and laryngeal laser microsurgery. The benefits of CO2 laser treatment for early laryngeal carcinoma have been acknowledged by researchers.[5, 6] However, its application for benign laryngeal conditions and precancerous lesions, including vocal cord polyps, nodules, and leukoplakia, remains a topic of debate. Some authors argued that CO2 laser treatment may cause thermal damage, leading to increased surgical trauma and adversely affecting wound healing. Conversely, other authors indicated that the appropriate mode and duration of CO2 laser application have a minimal impact on early wound healing in the treatment of benign vocal cord conditions.[6 -9]This was a Comparative Study of Different Techniques for Vocal Cord Lesion Removal and Their Impact on Voice Quality in Head and Neck Patients.

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while comparing the two techniques at different time intervals.Mobarsa V et al[9] carried out a prospective study of 30 patients at SMS medical college and hospital between April 2014 to November 2015 after institutional ethical committee clearance. The purpose of this study was to evaluate outcome of microlaryngeal surgery for benign lesions of vocal cord using videostroboscopy and voice handicap index. All cases between the age group 15–60 years with clinical evidence of benign lesions of vocal cord were included in study. Preoperative amplitude, mucosal wave, glottic closure was seen by videostroboscopy and subjective assessment of severity of handicap in voice was assessed by set of questionnaire using voice handicap index. Postoperative follow up was done at 3rd week and 10th week, and outcome of microlaryngeal surgery was assessed using videostroboscope and voice handicap index. This study observed statistically significant improvement in amplitude and mucosal wave and glottic closure. Subjective improvement in perception of severity of handicap in voice was analysed by voice handicap index which shows statistically significant data. Overall,this study concluded microlaryngeal surgery as an effective way for improvement in speech parameters, that can be assessed by use of videostroboscopy and voice handicap index.Ben Barsties v Latoszek et alidentified 31 eligible studies (VT: n = 47–194; phonosurgery: n = 404–1039; CT: n = 237–350). All treatment approaches were highly effective, with large effect sizes ($d > 0.8$) and significant improvements in almost all voice parameters (p-values < 0.05). Phonosurgery reduced roughness and NHR, and the emotional and functional subscales of the VHI-30 were the most compared to behavioral voice therapy and combined treatment (p-values < 0.001). Combined treatment improved hoarseness, jitter, shimmer, MPT, and the physical subscale of the VHI-30 more than phonosurgery and behavioral voice therapy (p-values < 0.001). All three treatment approaches were effective in eliminating vocal fold polyps or their negative sequelae, with phonosurgery and combined treatment providing the greatest improvement. These results may inform future treatment decisions for patients with vocal fold polyps.[10]

CONCLUSION

Both the study groups were comparable and had similar effect on voice quality in head and neck patients.

REFERENCES

1. Gray SD, Hammond E, Hanson DF. Benign pathologic responses of the larynx. Ann Otol Rhinol Laryngol. 1995;104(1):13–18.
2. Remacle M, Degols JC, Delos M. Exudative lesions of Reinke's space: an anatomopathological correlation. Acta Otorhinolaryngol Belg. 1996;50(4):253–256.
3. Verdolini K, Rosen C, Branski R. Classification manual for voice disorders. East Sussex: Psychology Press; 2006.
4. Scalco AN, Shipman WF, Tabb HG. Microscopic suspension laryngoscopy. Ann Otol Rhinol Laryngol. 1960;69:1134–1138.
5. Vasconcelos D., Gomes A.O.C., Araújo C.M.T. Vocal fold polyps: Literature review. Int. Arch. Otorhinolaryngol. 2019;23:116–124.
6. Cho K.J., Nam I.C., Hwang Y.S., Shim M.R., Park J.O., Cho J.H., Joo Y.H., Kim M.S., Sun D.I. Analysis of factors influencing voice quality and therapeutic approaches in vocal polyp patients. Eur. Arch. Otorhinolaryngol. 2011;268:1321–1327.
7. Hah J.H., Sim S., An S.Y., Sung M.W., Choi H.G. Evaluation of the prevalence of and factors associated with laryngeal diseases among the general population. Laryngoscope. 2015;125:2536–2542.
8. Van Houtte E., Van Lierde K., D'Haeseleer E., Claeys S. The prevalence of laryngeal pathology in a treatment-seeking population with dysphonia. Laryngoscope. 2010;120:306–312
9. Mobarsa V, Samdani SK, Gurjar VS. Outcome Analysis of Microlaryngeal Surgery for Benign Lesions of Vocal Cord Using Videostroboscopy and Voice Handicap Index. Indian J Otolaryngol Head Neck Surg. 2019 Oct;71(Suppl 1):327-332.
10. Ben Barsties v Latoszek et al. The Efficacy of Different Voice Treatments for Vocal Fold Polyps: A Systematic Review and Meta-Analysis. J Clin Med. 2023 May 13;12(10):3451. doi: 10.3390/jcm12103451