



## Original Research Article

# EFFICACY OF CONVENTIONAL MICROLARYNGOSCOPIC EXCISION VERSUS COBLATION IN THE MANAGEMENT OF BENIGN VOCAL CORD LESIONS – A COMPARATIVE STUDY

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### ABSTRACT

**Background:** Benign vocal cord lesions are frequently observed. Addressing these lesions is crucial for the restoration of vocal function and the enhancement of the quality of life for patients dealing with vocal cord complications. Traditional excision methods often result in unintended thermal injury to surrounding tissues. Coblation asserts that it reduces injury to surrounding tissues because of its non-thermal approach. This study aimed to evaluate the effectiveness of traditional microlaryngeal excision using Coblation for benign vocal cord lesions.

**Materials and Methods:** Fifty-two cases with dysphonia and VLS suggestive of benign vocal cord lesion attending department of ENT were recruited. Participants were randomly divided in to two groups Group A cases were managed with conventional microlaryngoscopy excision and group B were managed with coblation. Preoperative checkup and Postoperative assessment were conducted by using videolaryngoscopic findings, GRBA score and voice handicap index by follow up at one week, one month and at three months was conducted.

**Results:** Both study groups consistently identified polyps, with group A reporting 46.15% and group B reporting 42.30%. 34.61% of Group A and 30.76% of Group B exhibited vocal nodules. 19.23% of cases in group A and 26.92% of cases in group B exhibited cysts. The average voice handicap index levels and GRBAS scores at 1 month and 3 months were statistically significant ( $p < 0.05$ ).

**Conclusion:** The overall Voice Handicap Index showed improvement after surgery in both groups, with the conventional technique yielding a more favourable response and statistically significant results. The GRBAS score additionally reinforces traditional approaches. Coblation demonstrates improved surgical ease, reduced blood loss, and shorter operation duration; nonetheless, the estimation of blood loss remains inadequate.

**Keywords:** Benign vocal cord lesions, Coblation, Conventional microlaryngeal excision, Efficacy.

## INTRODUCTION

Benign lesions of the vocal folds frequently appear in laryngeal examinations, and there has been a rising trend in vocal cord disorders attributed to vocal misuse.<sup>[1,2]</sup> The alterations in vocal cord structure associated with vocal trauma to the

laryngeal mucosa arise through mechanisms including excessive talking or coughing, the use of inappropriate pitch, and throat clearing. Vocal edema and nodules arise as a result of increased capillary pressure caused by vibrations.<sup>[3]</sup> The prevalence of vocal cord disorders has been on the rise due to vocal misuse. Minimally invasive

dissection procedures are utilized to address these vocal cord disorders, ensuring an effective outcome. Typically, traditional laryngeal microsurgery and laryngeal laser micro-surgery demonstrate efficacy in addressing vocal cord disorders.<sup>[4]</sup>

The primary approach for addressing benign and precancerous lesions of the vocal cord involves surgical excision. The introduction of advanced cold steel surgical instruments has led to the evolution of microsurgical techniques, including microdissection and mucosal flap procedures. The increasing acknowledgment of the distinct ultrastructure of the vocal fold has led to heightened awareness regarding the preservation of the deep layers of the lamina propria during microsurgical procedures for benign laryngeal lesions.<sup>[5]</sup>

Coblation technology represents a minimally invasive approach that facilitates less invasive treatment, resulting in quicker recovery times and shorter hospital stays. This technique can be effectively employed for the surgical excision or debulking of laryngeal and tracheal pathologies, including sessile polyps or tumors.<sup>[6,7]</sup> Coblation technology serves as a remarkable instrument that facilitates ablation, resection, coagulation of soft tissue, and haemostasis of vessels, all within a single surgical device. This approach contributes to minimizing postoperative laryngeal edema and lowering the risk of intra-operative metastasis in instances of malignant lesions.<sup>[8]</sup>

This study aims to evaluate the effectiveness of traditional microlaryngeal excision using Coblation for the treatment of benign vocal cord lesions, as discussed in the aforementioned literature.

## MATERIALS AND METHODS

This prospective interventional study was conducted in the Department of ENT at MNR Medical College

and Hospital, Sangareddy from September 2023 to August 2024. A source of 52 cases with dysphonia and VLS suggestive of benign vocal cord lesion attending department of ENT and willing to participate were included. Cases with malignant lesions, history of surgery to vocal cords, history of recurrence of symptoms, other systemic complications and not willing to participate were excluded. Written informed consent was obtained from study participants and study protocol was approved by the institutional ethics committee.

The detailed clinical history was collected from the participants. All participants were subjected to detailed physical and clinical examination and referred for necessary laboratory investigations. Further, participants were screened by video laryngoscopy under local anaesthesia to found out the organic pathology. After explanation about the condition, voice handicap index score and GRBA score to assess the severity of hoarseness. Conservative management was continued and cases were followed up for one month. Participants were randomly divided for surgery in to two groups. Group A was managed with conventional microlaryngoscopy excision and group B was managed with coblation. All the participants were subjected to detailed preoperative check-up and operated under general anaesthesia. Postoperative follow up was conducted at one week, one month and at three months. Postoperative assessment was conducted by using videolaryngoscopic findings, GRBA score and voice handicap index. Categorical data was represented in frequency and percentages. Continuous variables were reported as mean and standard deviation. Independent t test and chi-square test was used to find the significance between study variables by using SPSS version 26.0. P<0.05 was considered as statistically significant outcome.

## RESULTS

**Table 1: Sociodemographic profile of study participants**

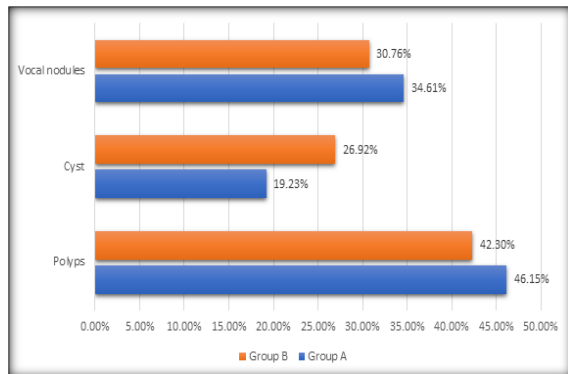
Parameters	Group A (n=26)		Group B (n=26)	
	Frequency	Percentage	Frequency	Percentage
<b>Age (In years)</b>				
< 20	03	11.53%	04	15.38%
21-30	09	34.61%	09	34.61%
31-40	05	19.23%	04	15.38%
41-50	07	26.92%	07	26.92%
> 50	02	7.70%	02	7.70%
<b>Gender</b>				
Male	19	73.07%	18	69.23%
Female	07	26.92%	08	30.76%
<b>Occupation</b>				
Professional	04	15.38%	06	23.07%
Skilled	07	26.92%	07	26.92%
Semi-skilled	05	19.23%	05	19.23%
Unemployed	10	38.46%	08	30.76%
<b>Associated comorbidities</b>				
Diabetes mellitus	12	46.15%	08	30.76%
Hypertension	04	15.38%	06	23.07%
Smoking	10	38.46%	12	46.15%

**Table 2 Comparison of voice handicap index before and after surgical procedure**

Parameters	Group A (n=26)	Group B (n=26)	t-value	p-value
	Mean±SD	Mean±SD		
Before surgery	39.78±7.14	39.18±6.98	0.328	1.036
1 <sup>st</sup> week	30.61±2.56	29.96±4.53	0.406	0.931
1 <sup>st</sup> month	25.80±2.35	26.57±3.88	1.892	0.001
3 <sup>rd</sup> month	8.86±3.24	11.99±2.06	2.748	0.001

**Table 3: Comparison of GRBAS score before and after surgical procedure**

Parameters	Group A (n=26)	Group B (n=26)	t-value	p-value
	Mean±SD	Mean±SD		
Before surgery	6.18±2.01	6.36±2.41	0.258	0.946
1 <sup>st</sup> week	3.74±1.37	3.94±1.76	0.201	1.328
1 <sup>st</sup> month	2.11±1.35	2.89±1.48	3.285	0.001
3 <sup>rd</sup> month	0.83±1.88	1.80±1.32	3.562	0.001

**Figure 1: Comparison of diagnosis between the study groups**

## DISCUSSIONS

The predominant age group of participants was 21 to 30 years, comprising 34.61% in each group, followed by those aged 41 to 50 years, which constituted 26.92% in each group. Male participants constituted a majority in both study groups, including 73.07% in group A and 69.23% in group B. The predominant demographic among participants in both study groups was the jobless, succeeded by skilled workers, semiskilled workers, and professional employees. In group B, smoking was frequently linked to comorbidity (46.15%), while in group A, it was connected with diabetes mellitus (46.15%). [Table 1] Both study groups consistently identified polyps, with group A reporting 46.15% and group B reporting 42.30%. 34.61% of Group A and 30.76% of Group B exhibited vocal nodules. 19.23% of cases in group A and 26.92% of cases in group B exhibited cysts (Graph 1). The voice handicap index was 39.78 prior to surgery, 30.61 at one week, 25.80 at one month, and 8.86 at three months in group A. In group B, the values were 39.18 prior to surgery, 29.96 at one week, 26.57 at one month, and 11.99 at three months. The average voice handicap index levels at 1 month and 3 months were statistically significant ( $p < 0.05$ ) (Table 2). The average GRBAS scores were 6.18 prior to surgery, 3.74 at one week, 2.11 at one month, and 0.83 at three months. In group B, the GRBAS score was 6.36 prior to surgery, 3.94 at one week, 2.89 at one month, and

1.80 at three months. The mean difference was statistically significant at both 1 month and 3 months ( $p < 0.05$ ).

Sundaram M et al. found that in cases using coblation, blood loss and surgery duration were reduced in a study involving 40 patients with benign vocal cord lesions. Lower scores and improved performance with statistically significant outcomes on the voice handicap index, voice analysis, and GRBAS score suggest a preference for conventional micro laryngeal surgery. The reduced scarring and minimal tissue manipulation compared to traditional micro laryngeal surgery are probably to blame for this. Following the procedure, both groups showed an improvement in the GRBAS score, voice analysis, and overall voice handicap index. It was found that the traditional approach yielded better results, with values that were statistically significant ( $p < 0.05$ ).<sup>[9]</sup>

Swain et al. examined 54 patients who had microlaryngeal surgery with coblation assistance for benign vocal fold lesions. The results showed that the GRBAS score significantly improved after the procedure according to the perceptual analysis of voice ( $P < 0.001$ ). ( $P < 0.001$ ),<sup>[10]</sup> the acoustic analysis showed that all parameters significantly improved after surgery. In addition to the GRBAS scale, Webb AL and colleagues also assessed the Vocal Profile Analysis Scheme (VPA). The seven speech and language therapists evaluated 65 voices, 25 of which had dysphonia of varying severity, and 5 of which were normal. With the exception of Strain, they found that the GRBAS was dependable across all parameters after rating all voices on three scales.<sup>[11]</sup>

Elkaref M et al. conducted an evaluation of the safety and effectiveness of coblation through a study comprising 30 cases of benign vocal cord lesions. Their study revealed nine instances of vocal nodules and sixteen instances of polyps. The typical duration for the procedure was fifteen minutes. Each case successfully accomplished the objective of complete removal. Conservative management was implemented to address a singular instance of immediate postoperative bleeding. No occurrences of aspiration, infection, or challenges in visualization were documented. The typical length

of hospital stay following surgery was one day. The GRBAS score demonstrated a significant decrease from 6.57 prior to the procedure to 1.83 after three months ( $p < 0.05$ ), indicating a marked improvement in voice quality. The findings indicate that coblation represents a safe and effective minimally invasive technique for the removal of benign growths from the vocal cords. This approach facilitates thorough removal while minimizing surrounding thermal injury, promoting swift recovery post-surgery, and resulting in low rates of recurrence.<sup>[12]</sup> In a similar vein, the findings from our study indicated notable enhancements in the overall voice handicap index across both study groups, with the conventional method yielding more favourable results.

## CONCLUSION

The overall Voice Handicap Index improved post-operatively in both groups, with a more favourable response to the conventional technique and statistically meaningful results. The GRBAS score also supports conventional methods. Coblation has better surgical ease, blood loss, and operation duration; however, blood loss estimation is poor. Microlaryngeal surgery can be treated using coblation, a novel procedure with advantages and reduced time. Short-term performance is inferior due to loss of precision and postoperative scarring.

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