



A STUDY OF CONVENTIONAL METHOD AND MICROFLAP BASED TECHNIQUE FOR EXCISION OF NON MALIGNANT VOCAL FOLD NODULAR LESIONS

ENT

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ABSTRACT

Introduction: Management of benign vocal fold nodular lesion provides a particularly good window into the revolution of voice surgery. The changes in approach to surgical management have resulted largely because of advancement in knowledge of anatomy and physiology of the vocal fold layered structures & technological developments that have improved our ability to examine and quantify voice function and the availability of better surgical instruments. **Aims:** Comparison of Microflap technique with conventional method for benign vocal fold nodular lesion and Comparison of Intropertive and post-operative parameters like operative time, primary bleeding, operative procedures, residual tissue, collateral damage, postoperative complication, recovery time and so on between two methods. **Materials and Methods:** This study was Prospective Randomised single blind trial study. This study was conducted at Patna Medical College & Hospital, Department of ENT from Feb 2020-August 2022. **Result:** We found in Conventional Group, the mean Total Score of Pre-op Video Stroboscopy (Individual) (mean± s.d.) of patients was 9.2632± 1.9268. In Micro Flap Group, the mean Total Score of Pre-op Video Stroboscopy (Individual) (mean± s.d.) of patients was 8.7857± 1.6898. Difference of mean Total Score of Pre-op Video Stroboscopy (Individual) with both Group was not statistically significant (p=0.2413). In Conventional Group, the mean Total Score of Post-op Video Stroboscopy (mean± s.d.) of patients was 2.2895 ± 3.3684. **Conclusion:** We found that Mean Total Score of Post-op Video Stroboscopy was higher in Conventional compared to Micro Flap group which was statistically significant. It was showed that Mean Video Stroboscopy Outcome Difference (Pre-Post) was less in Conventional compared to Micro Flap group which was statistically significant.

KEYWORDS

vocal fold nodular, Micro Flap, Conventional and physiology.

INTRODUCTION

Management of benign vocal fold nodular lesion provides a particularly good window into the revolution of voice surgery. The changes in approach to surgical management have resulted largely because of advancement in knowledge of anatomy and physiology of the vocal fold layered structures & technological developments that have improved our ability to examine and quantify voice function and the availability of better surgical instruments. It has been recommended by various other authors since that time. It was based on the notion that surgery should be designed to remove pathology without promoting scar formation, i.e. without stimulating fibroblast in the intermediate layer of the lamina propria or deeper. Its seemed reasonable to protect the intermediate layer of lamina propria by preserving mucosa along the vibratory margin.

The management of patients presenting with voice disorders is complex and often controversial. An expert knowledge of diagnostic and therapeutic possibilities¹ is clearly required, but often good quality evidence is lacking as to the best treatment for the individual patient. Voice disorders present in a wide spectrum of patients, across all ages, gender and social status. The causes are often multi-factorial and cannot always be fully described in anatomical or functional terms. Furthermore, voice disorders are much more varied than mere hoarseness. Indeed, a voice disorder may only have a limited affect on vocal ability, and yet strongly affect the patient's quality of life, whether at work or at home. Dysphonia only loosely describes the variety of possible voice disorders and their severity².

Furthermore, voice disorders cannot always be produced to anatomical and functional disorders of the larynx and vocal folds. The perceived voice is much more than simple vocal fold vibration at the laryngeal level. Breath control, vocal tract and articulatory movements are integral to the production and character of a voice and influence, in their respective ways, the perceived voice.

The ENT surgeon is often the first specialist consulted by a patient with a voice disorder. More than half of these patients will have benign vocal fold changes and their treatment is often a combination of conservative and interventional measures. To this end, ENT surgeons with an interest in voice disorders rarely work alone, and a multidisciplinary team consisting of, amongst others, speech and language therapists allows for the best possible patient care.

Benign lesions of the larynx constitute an interesting array of lesions. These lesions are defined as an abnormal mass of tissue in the larynx, the growth of which exceeds and is uncoordinated with that of the

normal tissue and persist in the same excessive manner after cessation of stimuli which evoke the change³.

Benign lesions of the larynx generally produce a common symptomatology known as dysphonia/hoarseness. The symptoms which they produce by interference with the routine functioning of the vocal cord mechanism and respiratory tract, along with the necessity to distinguish them from malignant laryngeal lesions, makes these lesions important to a laryngologist.

The significance of benign lesions of larynx lies in the importance of its function in speech and the contribution of voice to one's own personality. These lesions may affect voice quality and excessive growth may cause respiratory distress. Vocal nodules, polyps or a cyst does not rule out malignancy, unless the lesion is resolved with treatment or it is pathologically benign⁴.

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. 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. Cohen in 2011, when comparing gender differences, found 11% of patients with dysphonia had benign vocal pathology listed as a diagnosis⁵.

AIMS AND OBJECTIVE

General: Comparison of Microflap technique with conventional method for benign vocal fold nodular lesion.

Specific: Assessment, Evaluation and Application of Microflap Base technique and Conventional technique.

- Comparison of Intropertive and post-operative parameters like operative time, primary bleeding, operative procedures, residual tissue, collateral damage, postoperative complication, recovery time and so on between two methods.
- Evaluation of better alternative method between this two.

MATERIALS AND METHODS

- Study setting Patna Medical College & Hospital, Department of ENT from Feb 2020-August 2022.
- Sample Technique: Samples were randomised (simple random sample) to undergo either microflap based Nodulesctomy (Group-A) or Conventional Nodulesctomy (Group-B). On proportionate sampling method patients having benign vocal fold nodular

lesions (nodule, polyp, cyst) were used as samples.

Selection Criteria

- ❖ Inclusion Criteria:
 - Age group between 10-65 yrs
 - Both Male & Female
 - Clinical symptoms – like Hoarseness of voice, husky voice, aphonia
 - Clinical signs of having Benign vocal fold nodular lesion (i.e. cyst, polyp and nodule)
- ❖ Exclusion criteria:
 - Bleeding disorder
 - Immuno compromised individual
 - Vocal cord Malignancy/ Metastasis
 - Unwilling for surgery

RESULT AND DISCUSSION

In our study, 30(37.5%) patients were Female and 50(62.5%) patient were male. In our study, 11(13.8%) patients were 10-20 years old, 19(23.8%) patients were 21-30 years old, 21(26.3%) patients were 31-40 years old, 20(25.0%) patients were 41-50 and 9(11.3%) patient were 51-60 years old. In our study, 46(57.5%) patients were Hindu and 34(42.5%) patient were Muslim. In our study, 23(28.8%) patients were Illiterate and 57(71.3%) patient were Literate. In our study, 34(42.5%) patients had Rural Residence and 46(57.5%) patient had Urban Residence. In our study, 5(6.3%) patients had Advocate, 14(17.5%) patients had Hawker, 4(5.0%) patients had House Wife, 1(1.3%) patients had Professor, 11(13.8%) patients had Shop keeper, 11(13.8%) patients had Singer, 14(17.5%) patients had Student and 20(25.0%) patient had Teacher.

Kumar VP et al ⁴(2003) found that phonomicrosurgical techniques based on Hirano 's principle of vocal fold epithelium have revolutionized results of voice surgery. Our experience in the management of benign vocal fold lesions by phonomicrosurgical techniques with pre and post-operative stroboscopic, perceptual and computerized acoustic voice analysis is described.

We found in our study, 74(92.5%) patients had Hoarseness of Voice Symptom and 6(7.5%) patient had Hoarseness of Voice & Dysphonia Symptom. In our study, 80(100.0%) patients had Gradual onset of Symptom. In our study, 80(100.0%) patients had Vocal abuse Vocal abuse. In our study, 41(51.9%) patients had Smoker. In our study, 31(39.7%) patients had Other Addiction. In our study, 3(3.8%) patients had Family History. In our study, 29(36.3%) patients had B/L Vocal chord nodule, 9(11.3%) patients had Lt Vocal cord cyst, 14(17.5%) patients had Lt. Vocal cord Pedunculated polyp, 12(15.0%) patients had Lt. Vocal cord sessile polyp, 6(7.5%) patients had Rt. Vocal cord cyst, 7(8.8%) patients had Rt. Vocal cord Pedunculated polyp and 3(3.8%) patients had Rt. Vocal cord sessile polyp.

Our study showed that, 1(1.3%) patients had Micro flap necrosis and 10(12.5%) patients had Synaechia Present. In Conventional Group, 12(31.6%) patients had B/L vocal chord nodule, 3(7.9%) patients had Lt Vocal cord cyst, 14(36.8%) patients had Lt. Vocal cord Pedunculated polyp, 2(5.3%) patients had Rt. Vocal cord cyst and 7(18.4%) patients had Rt. Vocal cord Pedunculated polyp. In Micro Flap Group, 17(40.5%) patients had B/L vocal chord nodule, 6(14.3%) patients had Lt Vocal cord cyst, 12(28.6%) patients had Lt. Vocal cord sessile polyp, 4(9.5%) patients had Rt. Vocal cord cyst and 3(7.1%) patients had Rt. Vocal cord sessile polyp. Association of I/L Finding (Types of vocal fold nodule) vs group was statistically significant ($p < 0.0001$).

We found in Conventional Group, 38(100.0%) patients had Negligible. In Micro Flap Group, 39(92.9%) patients had Negligible and 3(7.1%) patients had Primary Bleeding. Association of Primary Bleeding vs group was not statistically significant ($p = 0.0930$). In Micro Flap Group, 2(4.8%) patients had Residual Tissue. Association of Residual Tissue vs group was not statistically significant ($p = 0.1730$). In Conventional Group, 10(26.3%) patients had Scar. Association of Scar vs group was statistically significant ($p = 0.0003$). In Conventional Group, 2(5.3%) patients had Teeth Injury. In Micro Flap Group, 1(2.4%) patients had Teeth Injury. Association of Collateral damage vs group was not statistically significant ($p = 0.4980$). In Conventional Group, 10(26.3%) patients had Synaechia Present. In Micro Flap Group, 1(2.4%) patients had Micro flap necrosis. Association of Post-Op Complication vs group was statistically significant ($p = 0.0013$).

Tibbetts KM et al ⁷(2018) found that Videostroboscopy examinations were reviewed for posttreatment changes in vibratory characteristics of the vocal folds. Twenty-five patients were identified, and one was excluded for incomplete records. Mean age was 41.9 years (66.7% female), and mean follow-up time was 5.58 months. Microflap excision was pursued by 21/24 (87.5%) patients, with 14 patients (58.3%) undergoing perioperative voice therapy. One cyst recurred. Two patients elected for observation, and their cysts persisted.

In Conventional Group, the mean Duration of symptom (mean± s.d.) of patients was 7.6842± 1.9327. In Micro Flap Group, the mean Duration of symptom (mean± s.d.) of patients was 7.7500± 2.3092. Difference of mean Duration of symptom with both Group was not statistically significant ($p = 0.8911$). In Conventional Group, the mean Operation Time (Min) (mean± s.d.) of patients was 15.6842± 2.1823. In Micro Flap Group, the mean Operation Time (Min) (mean± s.d.) of patients was 24.6429± 1.6353. Difference of mean Operation Time (Min) with both Group was statistically significant ($p < 0.0001$). In Conventional Group, the mean Recovery Time (in Weeks) (mean± s.d.) of patients was 6.0263± 3.5753. In Micro Flap Group, the mean Recovery Time (in Weeks) (mean± s.d.) of patients was 4.9286± 2.5888. Difference of mean Recovery Time (in Weeks) with both Group was not statistically significant ($p = 0.1173$).

Courey MS, Gardener GM & Stonere 1995 showed 3year experience of Endoscopic vocal fold microflap technique for removal of vocal fold disorders that arose within the lamina propria must permit the preservation or restoration of vocal fold vibratory characteristics.⁸

Lim JY et al ⁹(2018) found that data regarding patient characteristics, treatment details, treatment outcomes including disease control (recurrence and progression) and the Voice Handicap Index, GRBAS scale, and acoustics were evaluated. The mean follow-up duration after initial treatment was 32± 26 months.

We found in Conventional Group, the mean Total Score of Pre-op Video Stroboscopy (Individual) (mean± s.d.) of patients was 9.2632± 1.9268. In Micro Flap Group, the mean Total Score of Pre-op Video Stroboscopy (Individual) (mean± s.d.) of patients was 8.7857± 1.6898. Difference of mean Total Score of Pre-op Video Stroboscopy (Individual) with both Group was not statistically significant ($p = 0.2413$). In Conventional Group, the mean Total Score of Post-op Video Stroboscopy (mean± s.d.) of patients was 2.2895 ± 3.3684. In Micro Flap Group, the mean Total Score of Post-op Video Stroboscopy (mean± s.d.) of patients was .7143 ± 2.1672. Difference of mean Total Score of Post-op Video Stroboscopy with both Group was statistically significant ($p = 0.0141$). In Conventional Group, the mean Video Stroboscopy Outcome Difference (Pre-Post) (mean± s.d.) of patients was 6.9737 ± 2.9084. In Micro Flap Group, the mean Video Stroboscopy Outcome Difference (Pre-Post) (mean± s.d.) of patients was 8.0714 ± 2.1114. Difference of mean Video Stroboscopy Outcome Difference (Pre-Post) with both Group was statistically significant ($p = 0.0454$).

Dutta A et al ¹⁰ (2020) found the groups were assessed through vocal cord morphological observation by videostroboscopy and subjective voice assessment parameters GRBAS score and VHI10 index preoperatively and 2 weeks and 3 months postoperatively by a panel of blinded viewers and listeners. Surgical and recovery times were compared between the two groups. Intraoperative blood loss was compared by gauze visual analogue. Patients recovered remarkably well following both the techniques as denoted by the voice parameters. Preoperative bleeding was observed to be significantly reduced.

CONCLUSION

- In our study, 74(92.5%) patients had Hoarseness of Voice Symptom and 6(7.5%) patient had Hoarseness of Voice & Dysphonia Symptom.
- We found that 41(51.9%) patients had Smoker and 3(3.8%) patients had Family History. Vocal chord nodule and pedunculated polyp were higher in all patients though pedunculated polyps were higher in conventional which were statistically significant.
- Primary Bleeding was not statistically significant in two groups.
- Scar was higher in Conventional compared to Micro Flap group which was statistically significant.
- It was found that 10(12.5%) patients had Synaechia Present in Conventional compared to Micro Flap group which was statistically significant.

- Mean Operation Time was less in Conventional compared to Micro Flap group which was statistically significant.
- We found that Mean Total Score of Post-op Video Stroboscopy was higher in Conventional compared to Micro Flap group which was statistically significant.
- It was showed that Mean Video Stroboscopy Outcome Difference (Pre-Post) was less in Conventional compared to Micro Flap group which was statistically significant.

Table: Distribution between I/L Finding (Types of vocal fold nodule) vs group

OPERATIVE PROCEDURE			
I/L Finding(Types of vocal fold nodule)	Conventional	Micro Flap	TOTAL
B/L vocal chord nodule	12	17	29
Row %	41.4	58.6	100.0
Col %	31.6	40.5	36.3
Lt Vocal cord cyst	3	6	9
Row %	33.3	66.7	100.0
Col %	7.9	14.3	11.3

Lt. Vocal cord Pedunculated polyp	14	0	14
Row %	100.0	0.0	100.0
Col %	36.8	0.0	17.5
Lt. Vocal cord sessile polyp	0	12	12
Row %	0.0	100.0	100.0
Col %	0.0	28.6	15.0
Rt. Vocal cord cyst	2	4	6
Row %	33.3	66.7	100.0
Col %	5.3	9.5	7.5
Rt. Vocal cord Pedunculated polyp	7	0	7
Row %	100.0	0.0	100.0
Col %	18.4	0.0	8.8
Rt. Vocal cord sessile polyp	0	3	3
Row %	0.0	100.0	100.0
Col %	0.0	7.1	3.8
TOTAL	38	42	80
Row %	47.5	52.5	100.0
Col %	100.0	100.0	100.0

Chi-square value: 38.4248; p-value: <0.0001

Table: Distribution of mean Total Score of Pre-op Video Stroboscopy (Individual), Total Score of Post-op Video Stroboscopy (Individual): Operative procedure

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Total Score of Pre-op Video Stroboscopy (Individual)	Conventional	38	9.2632	1.9268	5.0000	13.0000	9.0000	0.2413
	Micro Flap	42	8.7857	1.6898	4.0000	13.0000	9.0000	
Total Score of Post-op Video Stroboscopy (Individual)	Conventional	38	2.2895	3.3684	0.0000	13.0000	0.0000	0.0141
	Micro Flap	42	.7143	2.1672	0.0000	12.0000	0.0000	

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