MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2023.937.942

A Comparative Study of Surgical Treatment Versus Conservative Treatment of Vocal Cord Nodules in Tertiary Care Hospital

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OPEN ACCESS

Key Words
Surgical treatment, vocal cord nodules, conservative treatment, symptoms

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Received: 4 August 2023
Accepted: 17 August 2023
Published: 18 August 2023

Citation: Indranil Khatua, Alokendu Bose, Indranth Kundu and Debarshi Jana, 2023. A Comparative Study of Surgical Treatment Versus Conservative Treatment of Vocal Cord Nodules in Tertiary Care Hospital. Res. J. Med. Sci., 18: 937-942, doi: 10.59218/ makrjms. 2023.937.942

ABSTRACT
Epiphora, or the flood of tears, is a common and irritating symptom. Lacrimation is caused by an overabundance of tears. The severity of epiphora can range from a minor annoyance to a continuously annoying overflow that can cause social embarrassment. Determine the age and gender distribution of vocal nodules in this research population. the frequency of nodules in this sample group according to profession and Post-treatment voice quality (surgical and non-surgical treatment groups), post-follow-up voice quality and recurrence of symptoms in both groups throughout the follow-up period were compared. The study was Prospective Study. It's conducted From December 2017 to December 2019 at Department of ENT and Head Neck surgery, R. G Kar Medical College. Our findings show that the patients in Group A had a mean Post Rx GRBAS of 1.3529±2.2063.The patients' average Post-Rx GRBAS in group B was 2.4545±1.4809. It was statistically significant to compare the mean Post Rx GRBAS distribution to the group (p = 0.0409). The patients' average Ch1 GRBAS in group A was 10.0588±3.5084.The patients in group-B had a mean Ch1 GRBAS of 8.7273±3.0236. The mean Ch1 GRBAS distribution was not significantly different from the group (p = 0.0648). The mean Post-F/U GRBAS for patients in group A was 1.4706±3.1448. The mean Post F/U GRBAS for the patients in group B was 2.7576±2.8508. The average Post F/U GRBAS distribution compared to the group did not reach statistical significance (p = 0.1507). The patients' average Ch2 GRBAS in group A was 9.9412±3.9126. The patients in group-B had a mean Ch2 GRBAS value of 8.4242±3.9531. It was not statistically significant (p = 0.2033) how the mean Ch2 GRBAS varied by group. One of the most common benign laryngeal lesions, vocal fold nodules, have an impact on people's quality of life, particularly their ability to sing. Although speech therapy is frequently utilized in conjunction with surgery, these problems can also be corrected successfully with speech therapy alone. As a result, otolaryngologists and speech therapists must stay up to date on the latest studies. The goal of this research was to look at the prevalence, etiology, histology, physiopathology, vocal features and treatment of vocal fold nodules that had been found in the literature.

INTRODUCTION

Vocal cord nodules are bilateral, benign, callous-like growths on the centre of the membranous vocal folds. Their size varies and histological features include epithelial thickening and different degrees of inflammation in the underlying superficial lamina propria[1]. When speaking or singing, they frequently resulted in hoarseness, discomfort and an unsteady voice. Up to 23.4% of children, 0.5-1.3% of people who visit ENT clinics and 6 percent of people who visit phoniatric clinics have nodules that cause hoarseness in the general population. They can result from "Voice abuse" (excessive shouting or singing over one's natural range) but they can also result from an infection, an allergy, or acid reflux[2]. However, the term "vocal abuse" is subjective, despite attempts to identify objective deviation[3]. Nodules are identified using a Fibre Optic Laryngoscope (FOL) and indirect laryngoscopy. Other options for treating vocal cord nodules without surgery include medical and pharmaceutical treatment for infection, allergies, gastric reflux disease and other illnesses, as well as vocal hygiene guidance including voice rest, abuse reduction and vocal retraining[4]. Exicision is a surgical procedure used to remove nodules of nodules with Micro Surgical Instruments (steel)[5].

Vocal fold nodules (VFNs) are small, superficial growths on the medial surface of the actual vocal folds (TVFs) that are thought to be the result of phonotrauma. Nodules are most typically seen near the membranous vocal fold's midpoint, where the anterior and middle thirds of the vocal fold meet. Women between the ages of 20 and 50 are the most likely to get nodules., although they can also be detected in youngsters, more commonly in males than in girls, because boys are more inclined to yell or scream loudly[6]. Laryngeal lesions can be detected via ideostrobolaryngoscopy. Invasive and noninvasive treatments are available for vocal fold polyps (VFPs) and vocal fold neuromas (VFNs)[7]. Even though less than 5% of VFN patients get surgery.

When compared to other indirect laryngoscopy methods, videostrobolaryngoscopy is significantly more sensitive for identifying laryngeal lesions. For proper pretreatment and posttreatment documentation of VFNs and VFPs, voice laboratory measurements such as aerodynamic, acoustic and videostroboscopic baselines (as well as a high-quality audio recording of the patient's voice) are all beneficial. Also frequently used to more subjectively assess the impact of the voice impairment and progress are clinician and patient perception tests.

Voice therapy to address vocal usage difficulties may be sufficient for the vast majority of VFNs and select modest VFPs.

Although, surgical excision of VFNs is infrequent, surgical standards advocate for little disruption of normal tissue and a straight medial TVF edge at the conclusion with no divots or superfluous tissue.

MATERIALS AND METHODS

Study area: Outpatient department and Indoor wards of Head and Neck Surgery Department, R.G. Kar Medical College.

Time lines: From December 2017 to December 2019.

Study population: Patient attending ENT OPD of R.G. Kar Medical College during the Study period.

Sample size: At least 50 Patients.

Study type: Prospective Study.

Sampling method: Simple Random Sampling.

Case: Control not required

Inclusion criteria:

- Clinically evident bilateral vocal nodules in the patient, as determined by rigid endoscopy and FOL examination
- Patients of both sexes who are over the pediatric age range (≤12 years)
- patients who have never had laryngeal surgery before

Exclution criteria:

- Patients younger than 12 years age
- Patient with other associated laryngeal lesion/tumors
- Patients with evidence of nasopharyngtis, oropharyngitis, hypopharyngitis

RESULTS

We discovered that 6 patients (35.3%) in group A were under the age of 30, 8 patients (47.1%) were between the ages of 31 and 40 and 3 patients (17.6%) were between the ages of 41 and 50. Eight patients (24.2%), 18 patients (54.5%) and seven patients (21.2%) in group B were between the ages of 30 and 50. The age-group connection was not statistically significant. (p=0.7112). In group-A, 15 people (88.2%) were female, whereas 2 people (11.8%) were male. In group B, 14 (42.4%) of the patients were men, while 19 (57.6%) were girls. The gender-group connection was statistically significant (p = 0.02769) (Table 1).

In group A, 413 patients (76.5%) resolved, compared to 23.5% who relapsed. In group B, 29 (87.3%) patients regressed, whereas 4 (12.1%) patients

Table 1: Association between post Rx VCN, Rec symp and post F/UVCN vs group

		Groups				
	Percentage	Group A	Group B	Total	Chi-square value	p-value
Post Rx VCN	Persisting (%)	0	4	4	34.3353	<0.001
	Row	0.0	100.0	100.0		
	Col	0.0	12.1	8.0		
	Regressing (%)	4	29	33		
	Row	12.1	87.9	100.0		
	Col	23.5	87.9	66.0		
	Resolve (%)	13	0	13		
	Row	100.0	0.0	100.0		
	Col	76.5	0.0	26.0		
	Total (%)	17	33	50		
	Row	34.0	66.0	100.0		
	Col	100.0	100.0	100.0		
Rec symp	No recurrence (%)	16	21	37	5.4182	0.0199
	Row	43.2	56.8	100.0		
	Col	94.1	63.6	74.0		
	Recurrence (%)	1	12	13		
	Row	7.7	92.3	100.0		
	Col	5.9	36.4	26.0		
	Total (%)	17	33	50		
	Row	34.0	66.0	100.0		
	Col	100.0	100.0	100.0		
Post F/UVCN	Increase (%)	0	2	2	50.0000	<0.001
	Row	0.0	100.0	100.0		
	Col	0.0	6.1	4.0		
	Persisting (%)	0	4	4		
	Row	0.0	100.0	100.0		
	Col	0.0	12.1	8.0		
	Recurrent (%)	0	3	3		
	Row	0.0	100.0	100.0		
	Col	0.0	9.1	6.0		
	Regress (%)	0	24	24		
	Row	0.0	100.0	100.0		
	Col	0.0	72.7	48.0		
	Resolve (%)	17	0	17		
	Row	100.0	0.0	100.0		
	Col	100.0	0.0	34.0		
	Total (%)	17	33	50		
	Row	34.0	66.0	100.0		
	Col	100.0	100.0	100.0		

Table 2: Distribution of mean Pre and Post Rx GRBAS, Ch1 and Ch2 GRBAS and Post F/U GRBAS vs GROUP

	Groups	No.	Mean	SD	Minimum	Maximum	Median	p-value
Pre Rx GRBAS	Group A	17	11.4118	2.0018	8.0000	15.0000	11.0000	0.7499
	Group B	33	11.1818	2.5794	7.0000	15.0000	11.0000	
Post Rx GRBAS	Group A	17	1.3529	2.2063	0.0000	7.0000	1.0000	0.0409
	Group B	33	2.4545	1.4809	0.0000	7.0000	1.0000	
Ch1 GRBAS	Group A	17	10.0588	3.5084	1.0000	14.0000	11.0000	0.0648
	Group B	33	8.7273	3.0236	3.0000	13.0000	9.0000	
Ch2 GRBAS	Group A	17	9.9412	3.9126	2.0000	15.0000	10.0000	0.2033
	Group B	33	8.4242	3.9531	0.0000	15.0000	9.0000	
Post F/U GRBAS	Group A	17	1.4706	3.1448	0.0000	9.0000	0.0000	0.1507
	Group B	33	2.7576	2.8508	0.0000	9.0000	1.0000	

SD: Standard deviation

had persistent symptoms. The link between post-rx VCN and group was statistically significant (p<0.001).

In group A, 1 (5.9%) and 16 (94.1%) patients, respectively, suffered recurrence. In group B, 12 patients (36.4%) suffered recurrence, whereas 21 patients (63.6%) did not. The link between Rec Symp and group was statistically significant (p = 0.0199).

We discovered that 17 patients (100%) in group A had resolution. Two (6.1%) patients in group B saw increases, four (12.1%) experienced ongoing symptoms, three (9.1%) experienced recurrences and 24 (72.7%) experienced regressions. The association between post F/UVCN and group was statistically significant (p<0.001).

The mean pre-refill GRBAS of patients in group A was determined to be 11.4118±2.0018.The patients in Group B had a mean Pre Rx GRBAS of 11.1818±2.5794. The group's mean Pre Rx GRBAS distribution was not statistically significant (p = 0.7499) (Table 2).

We found that in group-A, The mean Post-Rx GRBAS for the patients was 1.3529±2.2063. The patients' mean Post-Rx GRBAS in group B was 2.4545±1.4809. The distribution of mean Post Rx GRBAS with group revealed statistical significance. (p = 0.0409). The patients in group-A had a mean Ch1 GRBAS of 10.0588±3.5084.The patients in group-B had a mean Ch1 GRBAS of 8.7273±3.0236. When compared to the group, the mean Ch1 GRBAS distribution was

not statistically significant (p = 0.0648). In group-A, The patients' mean Post F/U GRBAS was 1.4706±3.1448. In group-B, the mean Post F/U GRBAS of the patients was 2.7576±2.8508. It was not statistically significant to compare the mean Post F/U GRBAS distribution to the group (p = 0.1507). In group-A, the mean Ch2 GRBAS of the patients was 9.9412±3.9126. In group-B, the mean Ch2 GRBAS of the patients was 8.4242±3.9531. Distribution of mean Ch2 GRBAS with group was not statistically significant (p = 0.2033).

The link between Group and Pre Rx GRBAS was not determined to be statistically significant (p=0.3283). The difference between Post Rx GRBAS and group was not statistically significant (p = 0.2106). Post F/U GRBAS 0 was higher in group-A by 13 (76.5%), while Post F/U GRBAS 1 was higher by 17 (51.5%). The post F/U GRBAS connection within the group was statistically significant when compared to the group (p = 0.0004). The average time spent by patients in Group A was 5.9559 4.6723. The average in group B is the patients' duration was 6.8818 4.0286. The mean duration distribution by group lacked statistical significance (p = 0.4695).

DISCUSSIONS

We discovered that the majority of the 50 patients [26 (52.0)] were between the ages of 31 and 40, however this was statistically significant (p = 0.02769). We discovered that female population [34 (68.0)] was statistically significantly more than male population [16(32.0)] (p = 0.02769).

Todic *et al*.[8] discovered that every patient was a woman.

Béquignon *et al*.[9] (2013) 90 patients (69%) with an average age of 33 years completed the questionnaire 9.5 years after surgery, including 60 women and 2 males. The lack of postoperative voice treatment was linked to a greater recurrence incidence. (P140.02): Without voice therapy, 56% of patients had recurrent dysphonia, whereas 22% received it. Voice therapy after surgery lessens the incidence of recurrence.

We discovered that Regressing was more common in Post Rx VCN Group-B than in Group-A, which was statistically significant (p<0.001).

In our analysis, the majority of patients (36.4%) experienced recurrence compared to Group-A (5.9%), which was statistically significant (p = 0.0199).

Our investigation found that more patients in Post F/UVCN Group-A had resolve [17 (100.0)], which was statistically significant (p<0.001).

It was found that, the mean duration was lower in-group-A (5.9559±4.6723) compared to group-B (6.8818±4.0286) it was not statistically significant (p = 0.4695).

Jeong *et al*.[10] found during resolution, 43 (46%) of the 94 VF nodules had a clinically meaningful size decrease and 36 (38%) were entirely removed without the need for surgery. According to a multivariate study, female patients had the highest likelihood of having their VF nodules disappear. At three and eight months, 44 and 81% of nodules had disappeared, respectively. Treatment of the VF nodule with caution may be advantageous, particularly for female patients and those with tiny, newly emerging polyps. The majority of polyps disappear within eight months, which can help with clinical counselling and decision-making.

Wang *et al*.[11] found the rate of lesion decrease following VFSI was higher in vocal nodules at 1 and 2 months than after VHE (p<0.01). One and two months after therapy, those with high occupational voice demands had considerably lower lesion sizes.

Lin *et al*.[12] found that Relaxation, breathing, basic pronunciation, chewing voice and tone sandhi pronunciation training were also provided to the vocal training group. The subjective and objective voice assessments of the two groups were evaluated three months after surgery and the differences were statistically significant (p<0.05). Patients suffering from vocal cord polyps may benefit substantially from voice therapy, which can also aid in their rehabilitation.

Pedersen *et al*.[13] found Non-surgical therapy or no treatment is used in conjunction with surgical surgery for vocal chord nodules. There were no suitable trials found. There were no studies that met the criteria for inclusion. High-quality randomised controlled studies are required to examine the efficacy of surgical and non-surgical therapy of vocal cord nodules.

Nakagawa *et al*.[14] found 29 people had lesion reduction after 4.1 months on average and 55 people had complete resolution after 5.1 months on average after receiving conservative treatment. Conservatively treated nodules were more likely to be female, smaller and had shorter symptom durations than unmodified or growing nodules. They were unable to demonstrate the superiority of voice therapy. Conservative treatment is appropriate for at least 9.7% of vocal fold nodules. Conservative therapy should be an option for some people who have recently developed smaller polyps.

It was found that, mean Pre Rx GRBAS was slightly higher in in group-A (11.4118±2.0018) compared to group-B (11.1818±2.5794) but this was not statistically significant (p = 0.7499). We found that, mean Post Rx GRBAS was significantly higher group-B (2.4545±1.4809) compared to group-A (1.3529±2.2063) (p = 0.0409).

In our study, mean Ch1 GRBAS and Ch2 GRBAS were lower in group B than in group A, although the difference was not statistically significant.

Our investigation found that the mean post F/U GRBAS in group A was greater than in group B, however this was not statistically significant (p = 0.1507).

Hosoya *et al*.[15] found Conservative treatment resulted in lesion shrinkage after 4.1 months on average and complete resolution after 5.1 months on average. Conservatively treated nodules were more likely to be female, smaller and had shorter symptom durations than unmodified or growing nodules. They were unable to demonstrate the superiority of voice therapy. Conservative treatment is appropriate for at least 9.7% of vocal fold nodules. Conservative therapy should be an option for some people who have recently developed smaller polyps.

We discovered that the relationship between Pre Rx GRBAS and Post Rx GRBAS vs. group was not statistically significant. Post F/U GRBAS 0 was greater in group-A by 13 (76.5%), while Post F/U GRBAS 1 was higher in group-B by 17 (51.5%). The association of Post F/U GRBAS vs. group was statistically significant (p = 0.0004).

Vasconcelos *et al*.[16] found A vocal fold nodule is one of the most common benign laryngeal lesions and it affects people's quality of life, particularly their ability to sing. Although speech therapy is frequently utilized in conjunction with surgery, these problems can also be corrected successfully with speech therapy alone. As a result, otolaryngologists and speech therapists must stay up to date on the latest studies.

Speech therapy was shown to be successful in 30-100% of studies for the treatment of vocal fold polyps, with superior results in microscopic and recent lesions[17].

Şahin *et al*.[18] found In contrast to the intraepithelial group, patients with vocal cord nodules who received voice training and those with polyps who had surgery had better voice parameters with improved GRBAS and SHE scores. During the first examination, voice therapy should be employed as the first line of treatment for individuals with prediagnosed vocal cord nodules and the therapy's effectiveness should be reviewed.

Niebudek-Bogusz *et al*.[19] observed that in their pursuit of professional success, instructors usually forget their most crucial instrument: Their voice. Due to the high vocal demands of teaching, teachers are at a higher risk of acquiring voice disorders over their careers. Teachers (11% vs. 6.2%) had a substantially higher present incidence of voice disorders and teachers (11% vs. 28.8%) had a larger history prevalence of voice disorders. Dyphonic teachers are evaluated using objective data and voice analysis.

CONCLUSION

Conservative management of VF nodule may assist female patients and those with tiny, newly emerging nodules in particular. The fact that most nodules vanish after 8 months can aid in clinical decision-making and counselling. Vocal cord nodule patients may benefit greatly from voice training, which can also aid in their recovery. Vocal fold nodules, one of the most prevalent benign laryngeal lesions, have an influence on people's quality of life, notably their ability to sing. Although speech therapy is commonly used in combination with surgery, these defects may also be successfully addressed with speech therapy alone. As a result, otolaryngologists and speech therapists must maintain current knowledge of the relevant research. The goal of this research was to look at the prevalence, etiology, histology, physiopathology, vocal features and treatment of vocal fold nodules that had been found in the literature. Last but not least, patient adherence, particularly voice quality, is critical for the outcome.

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