EVALUATION OF ENDOSCOPIC SURGERY OUTCOMES FOR BENIGN VOCAL FOLD LESIONS AT MILITARY HOSPITAL 103

Quan Thanh Nam[1], Nghiem Duc Thuan[1], Nguyen Quyet Thang[1]*

Abstract

Objectives: To evaluate the endoscopic surgery outcomes for benign vocal fold lesions at Military Hospital 103. ***Methods*:** A prospective, case-by-case descriptive, clinical interventional study was conducted on 45 patients with benign vocal fold lesions who underwent endoscopic surgery at Military Hospital 103 from July 2022 to August 2023. ***Results:*** The disease is common among working-age adults whose ages range from 18 - 60 (77.8%); 100% of patients had hoarseness before surgery at all levels, of which moderate hoarseness accounted for 66.7%; 60.0% of patients had vocal fold nodules; the basic histopathological diagnosis was consistent with the clinical diagnosis. After the surgery, 82.2% of patients had no hoarseness. The average scores of voice handicap index (VHI) and VHI-10 decreased with statistical significance, $p < 0.001$; 80.0% of patients achieved very good results one month after surgery. ***Conclusion:*** Research results show the effectiveness of endoscopic surgery to treat benign vocal fold lesions. Both the VHI and VHI-10 scales are used to evaluate voice disorders, but in clinical practice, the VHI-10 scale may be used instead of the VHI scale.

Keywords: Benign vocal fold lesions; Endoscopic surgery for treatment of benign vocal fold lesions; Endoscopic surgery with suspension laryngoscopy.

INTRODUCTION

Voice is an important means of daily communication, and voice disorders significantly affect a patient's quality of life. Benign vocal fold lesions are the most common cause of chronic hoarseness [1], which can affect work performance, especially in people whose occupation relies on voice use. This group of lesions is very common and

[1]**Military Hospital 103, Vietnam Military Medical University**

[*]**Corresponding author: Quan Thanh Nam (dr.namb6@gmail.com)**

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applied at a fairly high rate in the professional departments of otorhinolaryngology. It can be found in everyone, including men and women.

Endoscopic surgery to treat benign vocal fold lesions is a complex surgery. The purpose of the surgery is to remove lesions while still ensuring the pronunciation function without causing damage in the future. Traditionally, voice disorders and their treatment assessment protocols have focused on "objective voice measurements" [2]. These objective measures assess only a small component of voice production and do not encompass global vocal function from the patient's perspective. Moreover, neither objective voice nor video perceptual measures can assess the level of handicap that a person experiences as a result of a voice disorder [3]. Therefore, patient-based, voice-specific outcome measures can potentially provide more information than the biological and physiological variables associated with voice and its production.

In 1997, Jacobson et al. [4] proposed a measure of voice handicap known as VHI. This patient-based self-assessment tool consists of a 30-item questionnaire covering the three domains of a voice disorder: Functional, physical, and emotional (*Table 1*). The overall aim of the VHI is to quantify the patient's perception of his handicap due to the alteration in his or her vocal functions. The VHI-10 (*Table 2*) consists of a shortened version of the original VHI, including ten selected questions that were found to be the most clinically robust [5]. Together, they allow both the assessment of the initial voice handicap index and responsiveness to treatment.

Therefore, we conducted this study: *To describe some clinical features of benign vocal cord lesions and evaluate the results of endoscopic surgery to treat benign vocal fold lesions*.

MATERIALS AND METHODS

1. Subjects

45 patients diagnosed with benign vocal fold lesions underwent endoscopic surgery at Military Hospital 103 from July 2022 to August 2023.

* *Inclusion criteria:* Age ≥ 18; diagnosed with benign vocal fold lesions, endoscopic surgery with suspension laryngoscopy was performed.

* *Exclusion criteria:* There are accompanying internal and surgical lesions that contraindicate surgery; benign vocal fold lesions with no indication for surgery; patients did not have a follow-up examination after surgery.

* *Research location and time:* The study was conducted at Military Hospital 103 from July 2022 to August 2023.

2. Methods

* *Research design:* A prospective, case-by-case descriptive, clinical interventional study.

* *Assessment of voice before and after treatment:* The evaluation is based on subjective and objective criteria.

- Subjective criteria:

Patients self-perceived the level of voice disorder before surgery. This was performed between the physician and the patient to evaluate the level of hoarseness after listening to the patient's pronunciation before surgery [6].

Mild hoarseness: Slightly hoarse voice.

Moderate hoarseness: The voice is hoarse, rough, and shrill.

Severe hoarseness: Hoarse voice, unclear pronunciation, like no breath.

Assessed by the VHI and the VHI-10 [4, 5].

Table 1. Voice handicap index.

	Statements	**Scores**				
		0	**1**	**2**	**3**	**4**
	Functional					
F1	My voice makes it difficult for people to hear me.					
F2	People have difficulty understanding me in a noisy room.					
F3	My family has difficulty hearing me when I call them throughout the house.					
F4	I use the phone less often than I would like to.					
F5	I tend to avoid groups of people because of my voice.					
F6	I speak with friends, neighbors, or relatives less often because of my voice.					
F7	People ask me to repeat myself when speaking face-to-face.					
F8	My voice difficulties restrict personal and social life.					
F9	I feel left out of conversations because of my voice.					
F10	My voice problem causes me to lose income.					

	Statements	Scores				
		0	1	2	3	4
	Physical					
P1	I run out of air when I talk					
P2	The sound of my voice varies throughout the day.					
P3	People ask, “What’s wrong with your voice?”					
P4	My voice sounds creaky and dry.					
P5	I feel as though I have to strain to produce a voice.					
P6	The clarity of my voice is unpredictable.					
P7	I try to change my voice to sound different.					
P8	I use a great deal of effort to speak.					
P9	My voice is worse in the evening.					
P10	My voice “gives out” on me in the middle of speaking.					
	Emotional					
E1	I am tense when talking to others because of my voice.					
E2	People seem irritated with my voice.					
E3	I find other people do not understand my voice problem.					
E4	My voice problem upsets me.					
E5	I am less outgoing because of my voice problem.					
E6	My voice makes me feel handicapped.					
E7	I feel annoyed when people ask me to repeat.					
E8	I feel embarrassed when people ask me to repeat.					
E9	My voice makes me feel incompetent.					
E10	I am ashamed of my voice problem.					

Table 2. Voice handicap index-10.

	Statements	Scores				
		0	1	2	3	4
F1	My voice makes it difficult for people to hear me.					
F2	People have difficulty understanding me in a noisy room.					
F8	My voice difficulties restrict my personal and social life.					
F9	I feel left out of conversations because of my voice.					
F10	My voice problem causes me to lose income.					
P5	I feel as though I have to strain to produce a voice.					
P6	The clarity of my voice is unpredictable.					
E4	My voice problem upsets me.					
E6	My voice makes me feel handicapped.					
P3	People ask: “What’s wrong with your voice?”					

The previous statements can be used to describe one’s voice and its impact on his/her life. For each statement, a number (0 - 4) is given corresponding to its frequency. VHI is the mean of all values. Answers: 0 = never, 1 = almost never, 2 = sometimes, 3 = almost always, and 4 = always.

All patients were asked to complete the VHI and VHI-10 questionnaires both before and after endoscopic surgery. The VHI questionnaire includes 30 questions (10 questions each for physical, functional, and emotional items) that patients must answer depending on the frequency of each question. Each question has a score from 0 - 4 in order of increasing frequency. The score of VHI is obtained by adding the values of each question and ranges from 0 - 120 (maximum 4 x 30). According to Giorgio Peretti (0 points: Normal level; 1 - 30 points: Mild level; 31 - 60 points: Moderate level; 61 - 90 points: Severe level; 91 - 120 points: Very severe level) [4].

- Objective criteria: Endoscopic evaluation one month after surgery.

A very good result: All lesions have been removed, there has been no recurrence, the vocal folds are flat, there have been no scarring, no atrophy, no depressions, no tears or mucosal edema, the glottis is closed when pronouncing, the vibration waves of the mucosa of the two vocal folds are regular, and they touch each other when pronouncing.

A good result: Meets the above standards, but there are still a few points that are not perfect.

A not-good result: remaining damage or recurrence, scarring, glottis not closing tightly, and mucous membrane vibrations are few.

* *Data processing and analysis methods:* Data processing by using SPSS 22.0 medical statistical software.

3. Ethics

The procedure of operation was approved by the Institutional Review Board of Military Hospital 103. All participants confirmed their participation in the study by signing the informed consent form before enrollment. The principles of medical ethics are guaranteed to be strictly implemented.

RESULTS

1. Age and gender

Table 3. Distribution age and sex of patients (n = 45).

Content		Quantity (n)	Percentage (%)
Gender	Male	18	40.0
	Female	27	60.0
Age	18 - 39	19	42.2
	40 - 60	16	35.6
	> 60	10	22.2

Male patients accounted for 40% and female patients accounted for 60%. The working age group, from 18 - 60 years old, is the most common (77.8%).

2. Clinical symptoms

Table 4. Clinical symptoms (n = 45).

Symptoms	Quantity (n)	Percentage (%)
Hoarseness	45	100.0
Shortness of breath	7	6.7
Cough	15	33.3
Speak out of breath	40	88.9

The symptom of hoarseness accounted for 100.0%, followed by the symptom of shortness of breath at 88.9%. Other common symptoms, such as coughing and difficulty breathing, were 33.3% and 6.7%, respectively.

Table 5. Classification of benign pathologies (n = 45).

Classification	Clinic		Histopathology	
	n	%	n	%
Vocal fold nodules	27	60.0	27	60
Polyp	8	17.8	4	8.9
Vocal fold cyst	4	8.9	4	8.9
Papillomas	2	0.4	3	6.7
Chronic inflammation	3	6.7	5	11.1
Specific disease	1	0.2	2	4.4
Total	45	100.0	45	100.0

Vocal fold nodules were most common clinically and histopathologically in 27/45 cases (60.0%), vocal fold polyps in 8/45 cases upon clinical assessment, and histopathological results in 4/45 cases. Vocal fold cysts were the same in both clinical and histopathological diagnoses (8.9%), papillomas and specific lesions increased in 1 patient, and chronic inflammation increased in 2 patients compared to the clinical diagnosis.

3. Evaluation of surgical results

Table 6. The level of hoarseness post-operative.

Hoarseness	Pre-operative	%	Post-operative	%
Mild	4	8.9	5	11.1
Moderate	30	66.7	3	6.7
Severe	11	24.4	0	0.0
Not hoarse	45	100.0	37	82.2

Symptoms of hoarseness significantly reduced. Before surgery, 100.0% had hoarseness. After surgery, 82.2% had no hoarseness.

Table 7. Evaluate by VHI and VHI-10 at pre- and post-operation.

VHI	Pre-operative	Post-operative	p
Functional	17.5	1.5	$p < 0.001$
Physical	24.2	1.8	$p < 0.001$
Emotional	17.4	1.3	$p < 0.001$
Average	59.1	4.6	$p < 0.001$
VHI-10	20.5	1.05	$p < 0.001$

The average score on all aspects as well as the overall average score of the VHI and VHI-10 changed after surgery. The difference was statistically significant ($p < 0.001$).

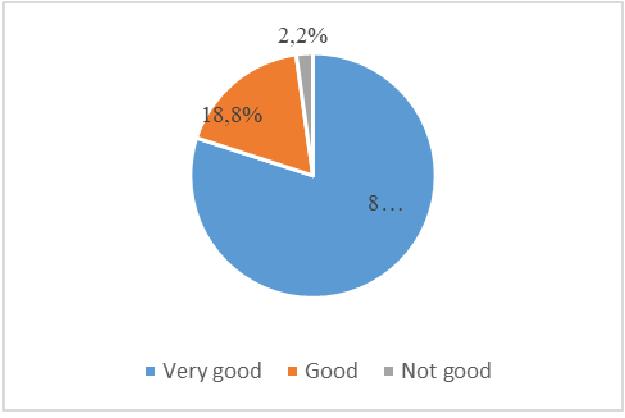

Chart 1. Evaluate the outcomes of endoscopic surgery.

Post-operatively, 80.0% of patients had a very good result, 18.8% had a good result, and 2.2% had a not-good result.

DISCUSSION

1. Age and gender

Our study was conducted on 45 patients; female patients accounted for 60.0%, and male patients accounted for 40.0%. The most common age group was the working age, ranging from 18 - 60 years old (77.8%). This result is consistent with the study by Le Van Diep et al. [7]. The author identifies that this is the age group where communication activities require the most use of voice, and women often do jobs that require more speaking.

2. Clinical symptoms

Symptoms of hoarseness accounted for 100.0%, followed by symptoms of shortness of breath at 88.9%. This is the main symptom that causes patients to go for examination and treatment. The patient's voice is often hoarse and becomes more hoarse when speaking a lot; patients have to work hard to pronounce, so they often feel tired and short of breath. This result is similar to the study by Le Van Diep and Nguyen Van Truong [7, 8]. Patients with accompanying difficulty breathing are those with polyps or large papillomas that partially cover the glottis or who have accompanying inflammation and edema. In addition, coughing is also common in patients with lesions in the larynx due to irritation of the lesions and inflammatory fluid leading to a cough reflex. In our study, this symptom accounted for 33.3%.

3. Pathological classification compared with histopathology

Vocal fold nodules are most common clinically and histopathologically, accounting for 27/45 patients (60.0%), and there is an agreement between endoscopic and histopathological images. This result is consistent with the study by Nguyen Thi Phuong Lam et al. [9] and is also consistent with the characteristics of a higher proportion of female patients and those whose occupations often require the use of voice. There were 8 patients (17.8%) with endoscopy diagnosed with vocal fold polyps, but histopathology results showed only 4 patients (8.9%). 4 patients had histopathology results that were different from the clinical diagnosis. Clinical symptoms include vocal fold papilloma, chronic inflammation, and 1 case of laryngeal tuberculosis. This explains the increased number of patients in this group after surgery. Therefore, in diagnosing benign vocal fold tumors, although endoscopic images give quite accurate results, the definitive diagnosis must be based on histopathological results, which are considered the gold standard for diagnosing tumors.

4. Evaluation of surgical results

** Evaluate the symptoms of hoarseness:*

Pre-operatively, 100.0% of patients had hoarseness to varying degrees. Moderate hoarseness accounts for the highest rate (66.7%), followed by severe hoarseness (24.4%) and mild hoarseness (8.9%). Post-operatively, 82.2% of patients had no hoarseness, the rest had mild and moderate hoarseness, and no patients had severe hoarseness. This result is consistent with Le Van Diep's research [7] when evaluating 105 patients with benign tumors using suspension laryngoscopy, with the result that 100% of patients had hoarseness before surgery, of which the majority was moderate and severe hoarse, accounting for 93.3%. All patients had reduced hoarseness post-operatively, there was no case of increased hoarseness, and 89.5% of patients had voices returned to normal. Author Nguyen Van Truong also had similar results [8].

** Evaluate the VHI and VHI-10 at pre- and post-operation:*

The study evaluated the voice pre-operatively using the VHI showed an average score of 59.1/120, and post-operatively, during a 1-month follow-up period, it showed an average score of 4.6. The research results also show a correspondence between the average score of the two scales and the patient's level of hoarseness (mainly moderate hoarseness); this result is consistent with the observations of Hallak B et al., whose study of voice disorders in patients with Reinke's edema was evaluated before and after surgery. The author believes that the impact of voice disorders on a patient's quality of life is more serious the higher the VHI score [10]. The pre-operative analysis of the different sub-scales showed that the average score for the physical aspect was 24.2/40, the functional aspect was 17.5/40, and the emotional aspect was 17.4/40. Post-operative 1 month for three aspects: Physical, functional, and emotional were 1.8, 1.5, and 1, respectively. According to these results, the physical aspect has the greatest impact on the patient's quality of life before treatment. Using the VHI-10, pre-operative assessment showed an average score of 20.5/40, and post-operatively, at 1 month, it was 1.05/40 (*Table 5*). Analyzing further, we also found that there is also a greater influence from the physical aspect.

In this study, we used the patient-based VHI and VHI-10 self-assessment

questionnaires to provide a subjective assessment of the impact of voice disorders before and after surgery. The results showed a clear difference in both the VHI and VHI-10 obtained before and after surgery and the results were similar in both indexes; both indexes showed great improvement in a clinically significant impact on the quality of life of all patients. However, assessment according to the VHI needs to be more detailed and time-consuming, while the VHI-10 can be used to quickly assess voice disorders, and results can be achieved as quickly and reliably as the VHI questionnaire and have good effectiveness in clinical practice.

** Evaluation of the outcomes of endoscopic surgery:*

Post-operatively, 80% of patients achieved a very good result, 18.8% achieved a good result, and 2.2% achieved a not-good result. Patients with a not-good result were cases of laryngeal papilloma, with one case of early recurrence and one case of scarring. Our research results are similar to Trinh Viet Hong's research, with a very good result reaching 83.71% [6], which is lower than Nguyen Thi Phuong Lam's research, with a very good result reaching 96.2% [9].

CONCLUSION

Endoscopic surgery to treat benign vocal fold lesions had a good result, with 82.2% of patients no longer hoarse and 80% of patients achieving a very good result at one month post-operative. In clinical practice, it can be assessed using the VHI-10 instead of the VHI.

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