

Standard information from patients: the usefulness of self-evaluation (measured with the French version of the VHI)

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Abstract

Voice Handicap Index is a scale designed to measure the voice disability in daily life. Two groups of patients were evaluated. One group was represented by glottic carcinoma treated by cordectomy Type I & II (13 patients), type III (5 patients), type V (5 patients). Evaluation was done pre and postoperatively for 12 months. The other group was represented by patients with unilateral vocal fold paralysis treated by thyroplasty (17 patients). Evaluation was done before and 3 months postoperatively. Total VHI, emotional and physical subscales improved significantly for type I&II cordectomy and for thyroplasty. VHI can provide an insight into patient's handicap.

Index Terms: self-evaluation, Voice Handicap Index (VHI), Vocal Fold Paralysis, Thyroplasty, Endoscopic Laser Cordectomy

1. Introduction

The effect of voice problems differs greatly from one person to another depending on their needs and demands. Therefore, voice pathology management has to take into account its consequences on quality of life to ensure the best possible rehabilitation. Outcome measures are related to voice care and participate in determining treatment options for voice pathology. Health is a multidimensional concept that incorporates physical, mental and social states [1]. Traditionally, assessment of physical function was the only means of determining the impact of health or disease. The organic dimension of a disease used to be measured via changes in the physical examination, an improvement or change in symptoms and functions, or changes in laboratory tests or X-ray examination. Nowadays, in addition to the measurement of an outcome of treatment, represented by the presence or the absence of the disease, there has to be a way of measuring the outcomes of the functional and emotional impact of disease or treatment on general life. This assessment of outcomes is necessary for the patient to improve his/her quality of life as well as to evaluate the efficiency of a treatment. Different questionnaires exist on general health status but the challenge was to elaborate quality of life assessment instruments to try to measure the multidimensional nature of communication and health. But general tools may not measure specific factors the patient is most concerned about. In order to focus on the patient's self-perception of their voice disorders and its consequences on daily life, the Voice Handicap Index (VHI) was developed and validated [2]. It can serve as an independent and objective measure of voice dysfunction on the quality of life [3-6].

In the scope of oncology treatment of head and neck cancer, the first aim is to eradicate the illness but a second aim is voice preservation. Therefore, post-treatment voice quality is a relevant factor to take into account. Quantitative acoustic measurements, aerodynamics, and perceptual evaluation are important parameters in defining voice quality, but they fail to provide information on the patient's perception of voice quality. For this, there is the use of VHI to describe the subjective impact that a vocal problem produces in a specific individual and situation.

In this paper, we will concentrate only on the self-evaluation of voice. We present two studies exemplifying the use of VHI to measure how the voice disorder affects function and quality of life. The medical background of the patients in each study was cancer pathology. The first group of patients had an early stage glottic carcinoma (T1) and the treatment was endoscopic laser cordectomy. The second group of patients had a unilateral vocal fold paralysis (UVFP) resulting from the surgical management of lung or thyroid malignant tumor.

The aim of these two longitudinal and prospective studies was two fold: i) to evaluate the degree of improvement of the Voice Handicap Index (VHI) measured before and for 12 months after surgery (at 3, 6 and 12 months), among a group of 23 patients with early glottic carcinoma that underwent endoscopic laser cordectomy. The functional vocal results after surgery depended on the type and extension of the cordectomy and therefore was unknown; ii) to evaluate the degree of improvement of the VHI measured before and at 3 months after medialisation procedure by type I thyroplasty in a group of 16 patients with unilateral vocal fold paralysis (UVFP). The functional vocal result after thyroplasty was known to bring an improvement.

2. Materials and Methods

2.1. Population

We studied two groups of male patients: one group of patients with glottic carcinoma who underwent surgical treatment with endoscopic laser surgery and the other group of patients with UVFP who underwent a medialisation procedure with type I thyroplasty. All patients signed an informed consent before the initiation of the studies.

2.1.1. Endoscopic Laser Cordectomy

Patients with early glottic carcinoma can benefit from either surgery or radiotherapy with the same cure rate of approximately 90% [7]. We evaluated 23 patients, suffering from early glottic carcinoma that underwent endoscopic laser

cordectomy. All lesions corresponded to stage T1 of the TNM classification. At the time of the surgery no metastases in the neck or distant were detected. The patients were pooled in three groups corresponding to the type of cordectomy (eg extension of the surgical resection) : 13 patients were in group 1 representing Type I & II cordectomy, 5 patients were in group 2 representing cordectomy Type III, and 5 patients were in group 3 representing cordectomy Type V. They were evaluated with the VHI scale before surgery and during a 1 year follow up (3, 6 and 12 months). The ages were in the range 47 – 77, with an average age of 61 and a mean follow-up of 12 months.

2.1.2. Vocal Fold Paralysis and thyroplasty

Unilateral vocal fold paralysis (UVFP) can cause severe glottic incompetence, resulting in various degrees of impairment, such as altered voice quality, social and professional communication disability, inefficient cough and aspiration, the latter possibly jeopardizing the vital prognosis. Type I medialization thyroplasty is the most widely used laryngeal framework phonosurgical procedure for managing glottic incompetence secondary to UVFP, and appears to be an easy, effective and safe procedure [8]

In our study, all patients had UVFP after surgical treatment of carcinoma tumors of the lung or thyroid. 17 patients suffering from UVFP underwent a type 1 thyroplasty. They were evaluated with the VHI scale before and 3 months after thyroplasty. The ages were in the range 50 – 79, with an average age of 65.

2.2. Patients' self-evaluation (VHI)

All patients were referred to our voice clinic and evaluated by a team of speech therapist and the laryngologist phoniatrician. For all patients the same procedure was applied: they had a thorough medical history and examination. At the end of the consultation a VHI form was administered to the patient. We used the French translation of the VHI that has been validated [9]. It shows to be a proper translation and instrument to evaluate quality of life related to voice disorders.

The patients completed the VHI scale comprising 30 questions covering three domains [2] represented by three subscales measuring functional, physical and emotional impacts of the voice disorder. Each question was assigned a score from 0 (no complaints) to 4 (maximum disability). Each subscale could be scored up to 40 points and the maximum for the total self-evaluation score was 120. Vocal disability was classified as mild (less than 30), moderate (31-60), severe (61-90) and very severe (91-120).

2.3. Statistical analysis

The Wilcoxon-signed Ranks test for Thyroplasty group (because the groups are strictly paired) and the Mann-Whitney test for the cordectomy group (because groups are not strictly paired) which are nonparametric statistical tests, were used for evaluation of the VHI score before and after treatment. A level of $p < 0.05$ was used as being significant.

3. Results

Tables below show the averages obtained from the VHI questionnaire with the total scores and the 3 sub-scales: functional, emotional and physical as well as the scores obtained before and after surgery. Our population has a limited number of patients and therefore, the statistical results have to be taken cautiously.

Mean total VHI scores of the different cordectomy and thyroplasty patient group is listed in table 1. We found a statistically significant improvement in total VHI score after thyroplasty as well as for the cordectomy Type I & II. On the contrary, we found no significant difference before and after cordectomy type III and type V with lower scores after cordectomy type III and higher after cordectomy type V.

Preop/Postop 3m	Total-VHI		
	Preop	Postop	p
Cordectomy Type I&II	39.1 (SD=29.5) n=13	16 (SD=16.2) n=11	<0.05 *
Cordectomy Type III	53 (SD=20) n=5	37 (SD=26.9) n=5	>0.05 N.S
Cordectomy Type V	25.8 (SD=14.3) n=5	31.3 (SD=17.9) n=4	>0.05 N.S
Thyroplasty (UVFP)	66.9 (SD=22) n=17	19.8 (SD=16.5) n=17	<0.0005 ***

Table 1: Total VHI. Before and 3 months after surgery

Mean subscales VHI scores are listed in table 2, 3, and 4. Mean functional subscale showed values significantly lower only after thyroplasty. Mean emotional VHI subscale after cordectomy type I and after thyroplasty was significantly lower after surgery. We found no significant difference before and after cordectomy type III and type V although the scores were lower after cordectomy type III and higher after cordectomy type V. When we consider the VHI subscales, we see that the physical subscale before treatment shows the highest scores of all subscales.

Preop/Postop(3m)	Functional-VHI		
	Preop	Postop	p
Cordectomy Type I&II	10.5 (SD=10.3) n=13	4.6 (SD=5.4) n=11	>0.05 N.S
Cordectomy Type III	13.6 (SD=5.1) n=5	12.4 SD=8.6) n=5	>0.05 N.S
Cordectomy Type V	6.2 (SD=5.1) n=5	9.8 (SD=6.7) n=4	>0.05 N.S
Thyroplasty (UVFP)	25.8 (SD=7.6) n=17	6.6 (SD=5.7) n=17	<0.0005 ***

Table 2: Functional subscale. Before and 3 months after surgery

Preop/Postop (3m)	Emotional-VHI		
	Preop	Postop	p
Cordectomy Type I&II	10.4 (SD=9.8) n=13	3.1 (SD=4.3) N=11	<0.05 *
Cordectomy Type III	15.8 (SD=12.2) n=5	8.6 (SD=9.1) N=5	>0.05 N.S
Cordectomy Type V	9.2 (SD=7.2) n=5	7.3 (SD=8) N=4	>0.05 N.S
Thyroplasty (UVFP)	20.1 (SD=9.9) n=17	3.4 (SD=4.9) N=17	<0.0005 ***

Table 3: Emotional subscale. Before and 3 months after surgery

Preop/Postop (3 m)	Physical-VHI		
	Preop	Postop	p
Cordectomy Type I&II	18.2 (SD=10.1) N=13	8.3 (SD=7.1) n=11	<0.05 *
Cordectomy Type III	23.6 (SD=5.9) N=5	16 (SD=10.1) n=5	>0.05 N.S
Cordectomy Type V	10.8 (SD=5.7) n=5	14.3 (SD=4.6) n=4	>0.05 N.S
Thyroplasty (UVFP)	21.1 (SD=6.7) n=17	9.8 (SD=7.2) N=17	<0.0005 **

Table 4: Physical subscale. Before and 3 months after surgery

3.1. Endoscopic Laser Cordectomy

The results are summarized in figure 1 to 4 for the longitudinal study at 3, 6 and 12 months

Total VHI as well as subscales of patients in the three groups of cordectomies, have a non significant improvement in the post operative period. There again physical subscale remains with the highest values.

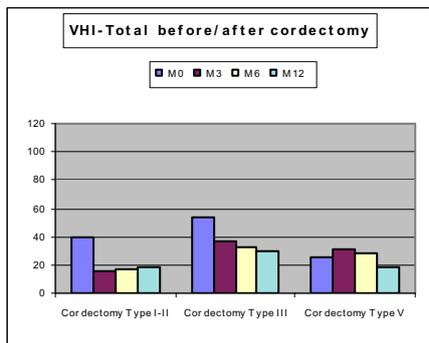


Figure 1: VHI-total before and at 3, 6 and 12 months after cordectomy Before cordectomy: n=23, 3m after, n=20, 6m after n=21, 12 months after n=13

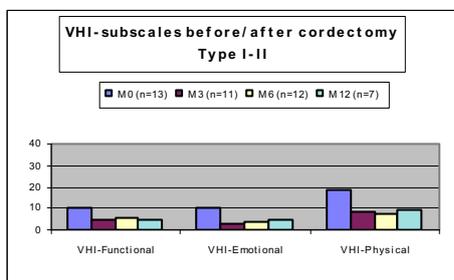


Figure 2: VHI-subscores before and at 3, 6 and 12 months after type I-II cordectomy. Before cordectomy: n=13, 3m after, n=11, 6m after n=12, 12 months after n=7

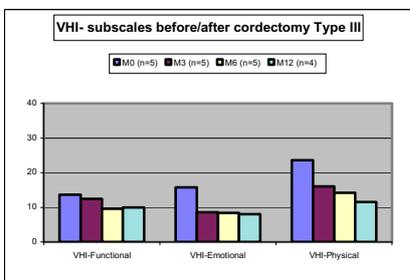


Figure 3: VHI-subscores before and at 3, 6 and 12 months after type III cordectomy Before cordectomy: n=5, 3m after, n=5, 6m after n=5, 12 months after n=4

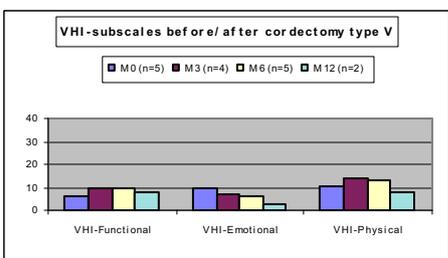


Figure 4: VHI-subscores before and at 3, 6 and 12 months after type V cordectomy Before cordectomy: n=5, 3m after, n=4, 6m after n=5, 12 months after n=2

3.2. Vocal Fold Paralysis and Thyroplasty

The results are summarized in figures 5 & 6

Three months after type I thyroplasty for UVFP, there was a statistically significant improvement for the total VHI score as well as for the three subscales

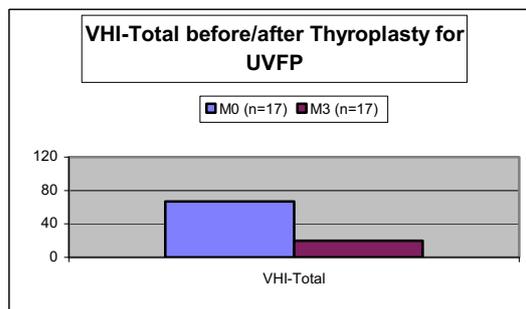


Figure 5: VHI-Total before/after thyroplasty (n=17)

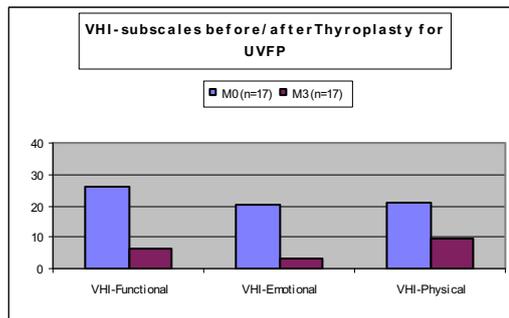


Figure 6: VHI-subscores before/after thyroplasty (n=17)

4. Discussion

Malignancy in the head and neck region or its surgical treatment can be responsible for voice disorders. In this context, patient's opinion about their voice following treatment is very important. The impact of voice on quality of life should be a constant concern in the treatment of laryngeal disease. This concept however is recent [10]. Classical assessment of health treatment valued only the presence or absence of disease following treatment, which is important but insufficient to assess the impact on life in general. Therefore, vocal fold paralysis as well as glottic carcinoma has been shown to have a strong impact on quality of life [11-12]. Early glottic carcinoma can be treated using endoscopic surgery, radiotherapy or partial laryngectomy. In choosing one treatment or another, one should contemplate the cure rate, larynx preservation rate, post-treatment voice quality, morbidity and treatment cost [13]. Various studies have been published comparing voice quality after surgical treatment or radiotherapy [14-16]. However there are fewer published studies that include patient's opinions with regard to the impact the illness and the treatment have had on their quality of life [17-19]. Hence it is important to include this information in the choice of treatment and in the evaluation of therapeutic results.

Before any treatment, in this study, the vocal disability measured with the average total VHI before cordectomy was considered as mild to moderate (ranging from less than 30 to 60). These results showed that although most patients had some degree of dysphonia, their daily life was moderately altered because of their voice disorder. On the contrary, patients with UVFP were severely vocally disabled.

After cordectomy type I, II and III, we observed improvement in patient's perception of severity of their voice disorder. This improvement was quoted at 3 months after

surgery and was maintained during the 12 months study. This result confirms data published in literature [8,18]. Only type V cordectomy had no statistically significant improvement after surgery but rather a worsening of total VHI. [20]. As a matter of fact, voice quality and communication handicap is linked to the glottic efficiency. After type V cordectomy, there is a gap in the glottic closure responsible for a whispery voice [21,22].

After medialisation with thyroplasty there was an expected immediate positive result on the quality and efficiency of voice. Our results confirm the improvement in the total VHI with the largest decrease in the emotional subscale. The thyroplasty treatment improved significantly their vocal handicap.

VHI is an instrument developed to help to take into account the patient's subjective sensation with respect to their problem. It is a pre treatment evaluation by giving a glance of the patient's expectation and actual handicap. It is also a post treatment evaluation of the patient's global well being. It can provide valuable data as to the reason why, in the same therapeutic management, two patients will differ in their perceived handicap severity [4]. The VHI proves to be a very important tool in the therapeutic decision-making process and the follow up assessment.

5. Conclusions

In our series the self-evaluation of the quality of voice, quantified by the VHI, showed on the one hand for limited glottic carcinoma a moderate impact before surgery and a mild disability after surgery except after Type V cordectomy, on the other hand for UVFP a severe handicap before medialisation surgery and a significant improvement after.

These evaluations stressed the relative importance of each subscale as a reflection of social life and physical handicap. The physical domain that was always slightly higher than the other two subscales could be influenced by the underlying physical and anatomical condition. These data can provide an insight into the patient's handicap without unrealistic expectations on voice quality after thyroplasty or cordectomy.

Outcome researches in voice quality and efficiency are dependant on scales that are able to identify patient's limits and needs. These evaluations will guide the therapeutic decisions and help to conduct the rehabilitation. Measuring voice handicap should be included in the general assessment of voice at the same level as acoustic and perceptual evaluation as voice is multidimensional. The application of objective outcomes tools such as VHI should ensure the assessment of global impact on quality of life.

6. References

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