Voice rehabilitation and quality of life in laryngectomized patients

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BACKGROUND: *Total laryngectomy represents the surgical procedure necessary for the treatment of some advanced neoplasms of the hypopharyngeal-laryngeal district and involves strong functional, physical and emotional repercussions. This research investigated the way in which the rehabilitation methods, used to improve the communicative needs of laryngectomized patients, influence their perceived quality of life.*
METHOD: *The questionnaires "V-RQoL" and "SECEL" were administered to 45 patients divided into four groups on the basis of the type of vicarious voice: group TE (27 patients), group E (7 patients), group EL (2 patients), group NV (9 patients).*
RESULTS: *Patients using electrical or tracheo-esophageal prostheses reported a better quality of life than patients with an erythromophonic voice. Regarding postoperative satisfaction, the group with esophageal voice was the most satisfied.*
CONCLUSIONS: *The results lead us to emphasize the importance of preoperative counseling to make the patient as aware as possible of his future condition.*

KEY WORDS: Cancer, Laryngectomy, Vicarious Voice, Voice Rehabilitation, Quality of Life

Introduction

Total laryngectomy represents the necessary surgical procedure for the treatment of advanced neoplasms of the hypopharyngeal-laryngeal district.
This procedure involves the total removal of the larynx, a structure consisting of a cartilaginous and ligamentous skeleton and a complex neuromuscular network that performs a number of functions, including sphincteric/protective, respiratory, fixation and apnea blocking, phonatory and emotional functions.

The laryngectomy, with its many repercussions, has a strong impact on quality of life understood as a complex and multifaceted whole that includes well-being in the emotional, physical, functional, social, financial, and spiritual domains of patients [1-3].
Although laryngectomy involves the removal of the phonatory organ, compromising physiological vocal production, about 85-90% of patients learn vicarious phonation techniques that allow them to communicate in a clear and intelligible manner, favoring the restoration of functional communication.
The choice of the most appropriate rehabilitation method for the patient depends on a number of factors, including the type of surgery and the anatomical structures of the patient, the patient's motivation and drive to vocal recovery, the mental, visual and motor integrity necessary for good maintenance of the tracheoesophageal prosthesis; the size of the stoma; the presence of other cardio-respiratory pathologies and hypertone of the hypopharyngeal-esophageal segment.
Whatever method is chosen, the goal is to meet the communication needs of the laryngectomized patient,

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focusing the treatment on the degree of socialization. among the methods of current use should be considered:
– tracheoesophageal voice (te): considered the most widespread and effective method for phonatory recovery. Numerous studies have shown that this method allows to obtain better results than others both in terms of vocal quality and intelligibility, and in terms of effectiveness and speed of rehabilitation treatment;
– erygmophonic voice (e): it was the most widespread and effective technique for vocal rehabilitation before the development of the phonatory prosthesis. This method allows the production of a voice that is understandable but at the same time low and hoarse, requiring more effort;
– the electrolaryngeal voice (el): the laryngophon is an electronic aid of simple use that allows to produce a voice well Understandable; However, Rather "ROBOTIC" and "monotonous" for this reason several works consider the quality of the voice with electrolarynx worse than the tracheoesophageal or erygmo-phonic voice.
Where the subject does not use any of the mentioned modalities, is called a no voice (nv) patient.
The aim of this study is to evaluate how the choice of a rehabilitation method affects the quality of life perceived by patients in the postoperative period [4-13].

Materials

The patients were recruited at the department of neuroscience, reproductive sciences and odontostomatology of the university Federico II of Naples. All patients had to be able to answer the questions they were asked and subjects with clinically evident cognitive deficits or psychiatric pathologies were excluded from the sample. The research involved 45 patients between the ages of 45 and 81. The sample was divided into four groups based on the type of vicarious voice: TE group (27 patients), E group (7 patients), EL group (2 patients), NV group (9 patients).

Procedure

Patients, after being informed about the purpose of the research, signed the informed consent and then completed the Voice-Related Quality of Life (V-RQoL) and the Self-Evaluation of Communication Experience after Laryngeal Cancer questionnaires.

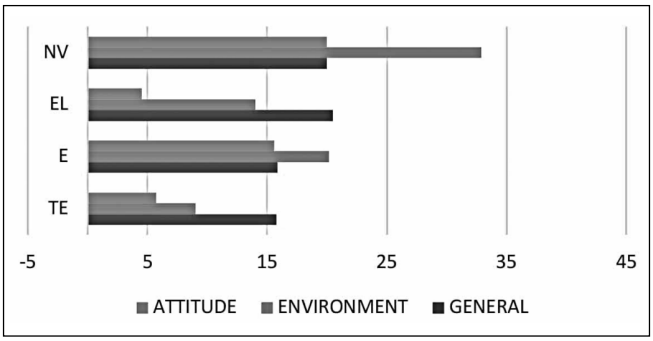
Tools

The Self-Evaluation of Communication Experience after Laryngeal Cancer (I-SECEL) is an instrument that measures communication dysfunction in laryngectomy patients and the effects of voice therapy and rehabilitation on daily activities. The scale is divided into three subscales: the "General" subscale, which describes general attitudes and examines the patient's behavioral; the "Environment" subscale, which investigates how the patient experiences his voice in different settings; and the "Attitude" subscale, which highlights the patient's emotional state. Items are rated on a Likert scale from 0 to 4 and scores range from 0-15 for the "General" scale, 0-42 for the "Environment" scale, 0-45 for the "Attitude" scale. A higher score indicates greater perceived communication dysfunction [14-16].
The Voice-Related Quality of Life (V-RQoL) scale is a self-assessment tool to assess patients' social-emotional and physical-functional aspects of voice disorders. The first section includes 10 items that assess the difficulties encountered by the laryngectomized patient in daily life after surgery. Each question can be given a score from 1 to 5 (no problem-slight difficulty); the total score thus ranges from 10 to 50 (10-15 excellent. 16-20 very good, 21-25 good, 26-30 fair, more than 30 low). The higher the score, the worse the perceived quality of life.
The second section includes 5 items that investigate the vocal outcomes of patients, the way in which they judge their own voice, the extent to which the voice limits the ability to be understood, the interference of the voice in social activities, problems in swallowing and the effort they feel during the act of phonation [17-19].

Results

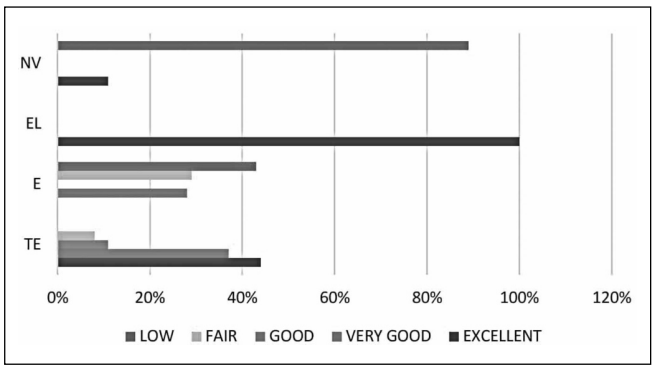
The results of the SECEL scale highlight the need to establish a specific counseling to direct the patient to a logopedic rehabilitation program. In particular, as shown in Table I, among patients with a phonatory prosthesis, only 4% scored below the cut-off, while another 4% were at the limits of the average. Of the sample with esophageal voice, 43% of the cases would be potential candidates to start a rehabilitation treatment specifically addressed to the vicarious voice acceptance process. 78% of NV patients require specific treatment. Greater impairment appears to affect the "environment" domain, especially for the NV and E sample. The subscales "general"

Table I - *Trend of SECEL scale results for the different phonatory methods, obtained from the averages of the subscales.*



NV: no voice, EL: electrolaryngeal voice; E: Erygmophonic voice; TE: Tracheoesophageal voice.

TABLE II - *Trend results V-RQoL scale*



NV: no voice, EL: electrolaryngeal voice; E: Erygmophonic voice; TE: Tracheoesophageal voice

TABLE III - *Correlations between SECEL scale and V-RQoL.*

	SECEL-G	SECEL-E	SECEL-A	SECEL-TOT
V-RQOL F	0,4	0,9	0,8	0,9
V-RQOL M	0,4	0,8	0,9	0,9
V_RQOL TOT	0,4	0,9	0,8	0,9

and "attitude" also report modestly high values for the four categories of speakers.
The results obtained from the V-RQol scale, as shown in (Table II), provide us with a good overview of the impact that voice disability has on the patient's quality of life. The total score, reports that patients who use electrical and tracheo-esophageal prostheses, claim to have a better quality of life than patients who use erythromophonic voice or other communicative modalities. Nevertheless, among phonatory valve patients, 8% scored a total score greater than 30. There are also enrolled no-voice speakers who are not strongly affected by voice impairment (approximately 11%). Esophageal speakers uniformly achieved values ranging from "low" (43%) to "very good" (28%). Each of the administered scales was analyzed using SPSS 18.0 statistical software. The mean, standard deviation, and range within which the minimum and maximum scores assigned fluctuated were calculated. Subsequently, the Pearson product-moment correlation test was used to compare the results of the two scales in order to highlight how much the patient's perception of his voice could impact on quality of life. Pearson's coefficient highlights how there are significant positive correlations between the two different self-assessment scales, ranging from 0.4 to 0.9. The lowest values are observed between the general subscale of the SECEL and the V-RQoL (Table III).

Discussion

The results lead us to emphasize the importance of preoperative counseling to make the patient as aware as possible of his future anatomic-functional condition, especially by organizing repeated meetings with laryngectomized patients, possibly of similar age, sex, and sociocultural sphere, in order to exchange experiences and feelings. The standardization of protocols for approaching patients undergoing total laryngectomy, both in the preoperative phase and during the course of their stay in the healthcare facility, could also lead to more patients deciding to undergo phonatory rehabilitation, if adequately informed about the various rehabilitation techniques and therefore motivated.

Conclusion

From the present work, it has been shown that, although logopedic rehabilitation and the learning of a clinically appreciable vicarious voice may allow the patient to communicate effectively, the satisfaction of the laryngectomized patients is closely related both to the perception that they have of their own voice and to the impression and judgment that others attribute to it. This aspect is particularly evident in the group of patients rehabilitated with tracheo-esophageal prostheses, in which about 40% do not feel that their voice corresponds to their expectations, so that it becomes a limiting factor in interpersonal relationships and in work activity. On the other hand, the lowest number of dissatisfied patients can be observed in laryngectomized patients re-educated with esophageal voice.

Riassunto

BACKGROUND: La laringectomia totale rappresenta l'intervento chirurgico necessario per il trattamento di alcune neoplasie avanzate del distretto ipofaringeo-laringeo e comporta forti ripercussioni funzionali, fisiche ed emotive. Questa ricerca ha indagato il modo in cui i metodi riabilitativi, utilizzati per migliorare i bisogni comunicativi dei pazienti laringectomizzati, influenzano la loro qualità di vita percepita.
METODO: I questionari "V-RQoL" e "SECEL" sono stati somministrati a 45 pazienti suddivisi in quattro gruppi in base al tipo di voce vicaria: gruppo TE (27 pazienti), gruppo E (7 pazienti), gruppo EL (2 pazienti), gruppo NV (9 pazienti).
RISULTATI: I pazienti che utilizzano protesi elettriche o tracheo-esofagee hanno riportato una migliore qualità della vita rispetto ai pazienti con voce eritromofonica. Per quanto riguarda la soddisfazione postoperatoria, il gruppo con voce esofagea è stato il più soddisfatto.
CONCLUSIONI: I risultati ci portano a sottolineare l'importanza della consulenza preoperatoria per rendere il paziente il più consapevole possibile della sua condizione futura.

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Commento e Commentary

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Innanzitutto bisogna dire che in letteratura le problematiche post-operatorie che i pazienti devono affrontare sono ancora poco studiate. Pertanto questo articolo aggiunge informazioni utili su questo argomento.
Questo studio ha una buona raccolta di dati e un'analisi completa dei dati al fine di indagare a fondo un problema di impatto sulla riabilitazione dei pazienti.
L'unica critica in questo lavoro riguarda la sproporzione tra il gruppo che ha subito il posizionamento della protesi fonatoria e quelli con voce elettro-laringea.
Inoltre, per quanto riguarda i questionari, viene approvata la selezione operata tra l'ampia gamma di questionari in materia, in particolare la VR-QoL, con l'obiettivo di esplorare l'impatto della riabilitazione logopedica sulla vita quotidiana del paziente.

* * *

Firstly, in literature the post-operative issues that patients have to cope with is still scarcely investigated. Therefore this article adds useful information concerning this topic.
This study has a good data collection and a complete data analysis in order to investigate thoroughly an impacting issue on patients' rehabilitation.
The only criticity in this paper is about the disproportion between the group that underwent the positioning of the voice prosthesis and the ones with electro-laryngeal voice.
Moreover, concerning the questionnaires, it is approved the selection made among the wide range of questionnaires regarding this matter, especially the VR-QoL, with the aim to explore the impact of the logopaedic rehabilitation on patient's daily life.