



## QUALITY OF LIFE FOLLOWING VOICE RESTORATION WITH TRACHEOESOPHAGEAL PROSTHESIS AFTER TOTAL LARYNGECTOMY

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### ABSTRACT

The assessment of quality of life in patients with laryngeal cancer treated by total laryngectomy, represents a highly useful tool for providing the understanding about the major difficulties of these patients and their priorities, before and after the surgical treatment, thus favouring a multidisciplinary assistance that is efficient, integral and optimized to health. The present review demonstrates that patients with tracheoesophageal prosthesis (TEP) placement after laryngectomy exhibited better quality of life compared to other rehabilitation methods.

**KEYWORDS:** tracheoesophageal prosthesis, voice restoration after total laryngectomy, quality of life in patients of total laryngectomy.

### INTRODUCTION

Laryngeal cancer is one of the most common types of cancer affecting the upper aerodigestive tract. It represents 25% of the malignancies of head and neck, mainly affecting men.<sup>[1,2]</sup> The treatments for patients with laryngeal cancer can have a major impact on physical, social and psychological function, thus altering their quality of life.<sup>[3]</sup> The World Health Organization defines quality of life as complete physical, social and mental well-being, and not just absence of disease.<sup>[4]</sup> The voice, being the major means of communication, plays a key role in the quality of life of patients, and thus should be considered as an indicator of health or disease.<sup>[5]</sup>

### QUALITY OF LIFE ASSESSMENT TOOLS

A review of literature<sup>[6]</sup> identified the presence of many scores and tools that provide subjective assessment of quality of life for patients with head and neck cancer. The EORTC-QLQ-H&N (Questionnaire of European Organization for Research and Treatment of Cancer) proved to be the most specific questionnaire for speech therapist questions; while the UW-QOL (University of Washington – QOL questionnaire) explores further physical questions; and the FACT-H&N (Functional Assessment of Cancer Therapy questionnaire) covers the emotional/psychological domain.<sup>[7]</sup> Others are used for a more detailed assessment of discourse, the ability to swallow and the sensation of pain, such as the Voice-Related Quality of Life<sup>[8]</sup> questionnaire (VR-QOL); the Voice Handicap Index<sup>[9]</sup> (VHI); and the MD Anderson Dysphagia Inventory<sup>[10]</sup> (MDADI).

The assessment of quality of life in patients with laryngeal cancer treated by total laryngectomy, represents a highly useful tool for providing the understanding about the major difficulties of these patients and their priorities, before and after the surgical treatment, thus favouring a multidisciplinary assistance that is efficient, integral and optimized to health.

### TRACHEOESOPHAGEAL PROSTHESIS (TEP) FOLLOWING TOTAL LARYNGECTOMY

When total laryngectomy is performed in cases of advanced cancer of the larynx, the patient loses his laryngeal voice, with consequent modifications in the form of communication, in personal interactions, in quality of life, as well as social, physical and emotional aspects.<sup>[11]</sup> Patients of total laryngectomy may also face loss of nasal and olfactory function, as well as poor coughing, difficulty in deglutition, changes in pulmonary function, eventual complications in the tracheostoma, and lifelong functional and psychological consequences.<sup>[12]</sup> Voice quality is the feature that exhibits the greatest change.

There are three voice rehabilitation modalities that may be chosen for a patient after total laryngectomy – the tracheoesophageal prosthesis (TEP), esophageal voice (EV) and an electronic larynx. Many authors have observed that TEP is the form of rehabilitation, that most resembles laryngeal voice, in terms of intensity, fundamental frequency and maximum phonation time.<sup>[13]</sup> Other researchers report that TEP has become the gold standard at various voice rehabilitation centers, since its introduction in 1980. The new sound source is the

pharyngoesophageal segment, which acts on vibration and sound production.<sup>[14]</sup>

The advantages of rehabilitation with a TEP are based on short learning time, good success rates, and use of the lungs as a source of air for phonation. This increases the maximum phonatory time of this process and improves vocal intensity, which has been demonstrated to be stronger than other types of rehabilitation. The disadvantages of TEP may be stated as – high cost, especially in developing countries,<sup>[15]</sup> the need of monitoring by the surgeon for maintenance and replacement of prosthesis, and the need to use one hand for occlusion of tracheostoma.<sup>[13]</sup> Also, one needs to pay attention to specific problems of TEP – such as integrity of pharyngoesophageal segment, size of the valve, leakage problems and fungal infestation.<sup>[16]</sup>

The tracheoesophageal puncture may be made at the time of surgery, when it is called primary TE puncture. When it is made during a later phase, it is called secondary procedure. The advantages of a primary placement include the avoidance of a second surgical procedure, and a more rapid and successful voice restoration. On the other hand, secondary TEP placement prevents postoperative complications such as fistulas and sequelae of radiation.

## DISCUSSION

Studies dealing with quality of life in relation to patients of total laryngectomy are available in the literature. The present review is focussed on cross-sectional and longitudinal studies based on quality of life in patients with TEP.

Gerwin et al<sup>[17]</sup> (2005) presented a study of 16 subjects who were TEP users. The patients were evaluated using the UW-QOL scale, FACT-H&N scores, as well as questionnaire containing demographic information. The results showed that these patients were able to communicate with other people and that they judged their postoperative voice to be closely or almost similar to their postoperative voice. Of these 16 patients, two-thirds considered their speech to be intelligible, with occasional need for repetition, while the remaining third stated that their speech was always intelligible. All of the 16 patients confessed that they were understood on the telephone and 87% of them stated that they were highly satisfied with their form of communication. The authors concluded on this basis, that the restoration of communication with a TEP satisfied expectations and provided a good quality of life as measured with parameters such as functional, physical, social and emotional well being.

Lundstrom et al<sup>[18]</sup> (2011) analysed the relationship between perceptive-auditory assessment, visual analogue scale, and extraction of acoustic and self-assessment measures in 35 male patients who had TEP placement following total laryngectomy. There was a marked

change in general voice impression, pitch intonation, speech slowness and rate. Evaluation was done with the protocol of Voice Handicap Index (VHI). A mean score of 46.9 was observed. The authors concluded that the level of tracheoesophageal speech deviation showed a relationship between vocal quality and temporal aspects of speech.

In another investigation, Attieh et al<sup>[19]</sup> (2008) assessed the changes in quality of life and the degree of vocal disadvantage in total laryngectomy patients, before and after placement of a TEP. Twelve male patients were evaluated using the University of Michigan Head and Neck Quality of Life (HNQOL) questionnaire and the Vocal Disadvantage Index (VDI). In relation to HNQOL evaluation, the “communication”, “emotional” and “total” domains revealed a better quality of life after placement of TEP. The “pain” and “eating” domains did not show significant difference before and after placement of TEP, although the scores of pain domain were increased. The participants reported less vocal disadvantage for each VDI subscale after voice restoration. No significant difference was found for the correlation of time after laryngectomy, which ranged from 1 month to 16 years, with time of questionnaire application after TEP placement.

In another study, Chaves et al<sup>[20]</sup> (2012), reported that individuals with EV (esophageal voice) after laryngectomy exhibited great difficulty in verbal interaction with their family and with strangers, while their friends turned away. The communication was still worse over the telephone. The patients were upset when they were not understood. They reported physical discomfort when speaking and being unable to express their ideas. TEP users confessed satisfaction with their acquired voice since they were able to communicate well with others. Also, good speech intelligibility was reported, even on the telephone. The subjects reported the new form of communication to be similar to laryngeal voice.<sup>[17, 21]</sup> For comparison of the time before and after TEP placement, Attieh et al<sup>[19]</sup> reported improved communication and emotional aspects, with the perceived vocal disadvantage also being reduced after placement of TEP. A comparison of the different types of voice rehabilitation after laryngectomy revealed that TEP users obtained better results in the socio-emotional and physical domains, as well as in relation to communication, when compared to EV users. The main complaint of esophageal speakers concerned the difficulty in speaking and being heard in noisy environments.<sup>[22]</sup>

Another aspect to be considered is swallowing. Blanco et al<sup>[23]</sup> (2011) showed that there is gradual improvement in deglutition after total laryngectomy due to the surgical elimination of tumour and therapy for alaryngeal rehabilitation. The most important aspects reported in relation to swallowing were – a longer time to eat, coughing in the effort of removing fluid or food, and the

fear of asphyxia and pneumonia. The function of swallowing has been increasingly investigated in patients of total laryngectomy, over the past few years, with the results demonstrating that 40% to 64% of this population exhibit varying degrees of dysphagia.<sup>[24]</sup>

## CONCLUSION

The present review demonstrates that patients with TEP placement after laryngectomy exhibited better quality of life compared to other rehabilitation methods. TEP has proven to be more efficient in solving difficulties in emotional, physical and psychological domains. Apart from that, TEP provides a more acceptable voice quality.

## Conflict of interests

The author declares that there is no conflict of interests that could influence this work.

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