

Assessing quality of life in patients after partial laryngectomy

Hebel F¹, Mantsopoulos K², Bohr C¹

¹ Department of Phoniatics and Pediatric Audiology

² Department of Otolaryngology, Head and Neck Surgery
University of Erlangen–Nuremberg, Erlangen, Germany

Abstract

Background: In the present prospective cross-sectional clinical study, correlations between global quality of life (QoL) and coping strategies were examined in patients who had undergone partial laryngeal resection for T1-T2 laryngeal cancer.

Methods: Correlations between point scores in the “Trier Illness Coping Scales” and SF-36 were analysed in 71 patients (65 males, 6 females, mean age 62 years) at routine follow-up visits by means of linear regression and Pearson’s R.

Results: The most important coping strategy was “threat control”, followed by “search for social integration”. Greater expression of “rumination” was statistically correlated with poorer quality of life, and patients with more advanced disease were more inclined to seek social integration.

Conclusions: Coping strategies exert substantial influence on the quality of life of cancer survivors. Disease- or treatment-related day-to-day problems and anxieties about the oncological outcome have a greater influence on the quality of life of laryngeal cancer survivors than do voice changes. This finding should be taken into account in survivorship care planning. Hippokratia 2014; 18 (2):156-161.

Keywords: Laryngeal cancer, partial laryngectomy, coping behaviour, quality of life

Corresponding author: Christopher Bohr, MD, Department of Otorhinolaryngology, Head and Neck Surgery, University of Erlangen–Nuremberg, Waldstr. 1, 91054 Erlangen, Germany, tel: +4991318533896, fax: +4991318533833, e-mail: christopher.bohr@uk-erlangen.de

Introduction

With an incidence of about 4000 new cases per year in Germany at present, laryngeal carcinoma accounts for only about 1% of cancers. In medicine in general and oncology in particular, the past few decades have seen a paradigm shift in the assessment of treatment outcomes. Quality of life is now regarded as being just as important as survival time as a criterion of success. As a result, interdisciplinary care of surviving cancer patients (“survivorship care”) is now evolving into a separate subspecialty of oncology¹⁻⁵.

Operations on laryngeal carcinoma can greatly impair the patient’s quality of life in a variety of ways. Therefore, the extent of surgical excision and of radiochemotherapeutic destruction of tumour tissue in the larynx must be considered not just on the basis of oncological criteria but also from the point of view of survivorship care^{6,7}. The past few decades have seen the development of a number of specific surgical techniques that permit at least partial preservation of vocal function⁸⁻¹³, however in many cases the patient’s voice is altered and impaired, and therefore a negative impact on quality of life is to be expected^{10,14,15}.

Although a variety of specific assessment instruments including voice-related quality of life (V-RQOL)¹⁰ have been developed as methods of quantifying this impact and thereby making voice-related quality of life available as a

parameter for assessing results and progress after operations on laryngeal carcinoma, previously published studies have found only limited correlation between scores obtained with these instruments and criteria of general quality of life.

Therefore, while V-RQOL and similar instruments are certainly of value for monitoring the progress of phoniatric rehabilitation, V-RQOL results cannot simply be used as a measure of quality of life as part of the oncological outcome; instead, the use of general measuring instruments may be more informative in this regard. Along with changes in the voice, it appears that other factors such as coping strategies and the oncological prognosis are important determinants of the quality of life of affected patients.

The present study therefore looked for correlations between general quality of life as measured by means of the Short form 36 (SF-36) and various strategies for coping with illness as measured by means of the Trier Illness Coping Scales (TCS). Also examined was the question of whether such correlations are dependent on age, gender, or disease stage.

The objective of the study was to perform a detailed analysis of the factors that determine the quality of life of patients who have undergone surgery for T1-T2 laryngeal carcinoma and on that basis to draw up a set of correspondingly specific recommendations for priorities in the

rehabilitation of these patients.

Materials and methods

This prospective cross-sectional clinical study was conducted at an academic tertiary referral center (Department of Otorhinolaryngology– Head and Neck Surgery, University of Erlangen–Nuremberg, Erlangen, Germany). All patients treated with laryngeal preservation surgery for T1-2 laryngeal carcinoma in a period of 1 ½ years were evaluated. Patients with insufficient data, second primary tumors, or distant metastases at the time of diagnosis, and with histological findings other than squamous cell carcinoma, as well as patients, who received primary (chemo) radiotherapy, were excluded from the study. Follow-up visits took place between one month and 12 years (mean 2.58 ± 2.56 years) after initial therapy. Prior to the follow-up visits, the patients were provided with detailed written information about the content of the study and gave their written consent to participate. The study was performed in accordance with the Declaration of Helsinki of the World Medical Association¹⁶ and the principles of Good Clinical Practice¹⁷.

At the follow-up examination the patients were given two self-assessment questionnaires (SF-36 and “Trier Illness Coping Scales“-TCS). SF-36 subscale point scores represent weighted sums of the questions in the respective section according to the questionnaire’s methodology. Statistical analysis was performed using the Pearson’s R test with 95% confidence intervals. The software program SPSS version 19 for Windows (SPSS, Inc., Chicago, IL), was used for the analysis. A P value of $<.05$ was considered statistically significant.

Results

A total of 71 patients were included in the study (65 males and six females; male:female ratio=10.8:1). Their mean age was 61.8 years (range, 34-83 years). 50 patients

had glottis carcinomas, 21 patients had a supraglottic localisation. Patients with glottis carcinomas were treated either by means of transoral laser surgery or transcervical vertical (frontolateral) partial laryngectomy, whereas patients with supraglottic carcinomas were treated by means of transoral laser surgery or transcervical horizontal partial supraglottic laryngectomy. Because of the lack of homogeneity in the patient groups with different procedures, unfortunately no statistical analysis of the impact of each surgical modality on the quality of life was possible.

The scores obtained on the two self-assessment scales are shown in Table 1. In the SF-36 scales mean scores were highest – i.e. the degree of impairment was least – in the “bodily pain”, “social functioning”, “emotional role functioning”, and “mental health” scales. In the rest parameters (“physical functioning”, “physical role function”, “general health” and “vitality”), mean values ranged between 58.2 and 64.1%, i.e. a greater degree of impairment was present.

The preferred coping reaction on TCS was found to be “threat control”, followed by “search for social integration”. The coping strategy “rumination” became less pronounced with increasing subjective wellbeing (Table 2). “Physical functioning”, “emotional role functioning” “physical health” and “mental health” scores on SF-36 scales showed a statistically significant correlation with the coping strategy “search for social integration” on TCS (Table 2). Interestingly, correlation between “physical health” on SF-36 and “search for social integration” on TCS was more pronounced in the women than in men ($R = 0.97$). Furthermore, women showed a pronounced negative correlation between “mental health” on SF-36 and “support in religion” ($R = 0.97$) on TCS. Older patients showed weaker correlations overall, though they did show a statistically significant positive correlation between “bodily health” and “support in religion” ($R = 0.35$; $p = 0.045$).

Table 1: Descriptive values of total scores in Short form 36 (SF-36) and Trier Illness Coping Scale (TCS).

SF-36 scale – Parameter	M ± SD	Min-max	M ± SD(%)
Physical functioning	22.8 ± 6.0	10-30	64.1 ± 30.0
Physical role functioning	6.4 ± 1.9	4-8	59.1 ± 46.4
Bodily pain	8.7 ± 2.8	2-11	74.8 ± 31.6
General health perception	16.6 ± 2.6	8-25	58.2 ± 13.2
Vitality	16.0 ± 3.8	8-24	60.2 ± 19.1
Social functioning	8.3 ± 2.0	2-10	78.2 ± 25.2
Emotional role functioning	5.1 ± 1.3	3-6	72.5 ± 42.8
Mental health	22.9 ± 4.7	12-30	71.5 ± 19.0
Total, physical health	54.9 ± 10.2	31-74	
Total, mental health	52.8 ± 10.0	31-70	

TCS scale - Parameter	M ± SD	Min-max
Rumination	3.3 ± 0.9	1.4-5.3
Search for social integration	3.8 ± 0.8	1.9-5.6
Threat control	4.8 ± 0.6	3.4-6.0
Search for information and sharing of experience	3.2 ± 1.0	1.0-5.6

M ± SD: mean ± standard deviation of raw point score, Min - max: lowest and highest raw point score in the subscale in the patient sample, M ± SD (%): mean and standard deviation of the percentage of raw point scores compared to the maximum attainable point score.

Table 2: Pearson's correlation coefficient and p values for evaluation of the relationship between Short form 36 (SF-36) and Trier Illness Coping Scale (TCS) scale scores.

SF-36 scales	TCS scales				
	Rumination	Search for social integration	Threat control	Search for information	Support in religion
Physical functioning	-0.2875 p=0.017	0.3661 p=0.002	-0.0105 p=0.932	0.002 p=0.987	0.0294 p=0.810
Physical role functioning	-0.3122 p=0.010	0.208 p=0.091	-0.0642 p=0.606	-0.1866 p=0.131	0.0329 p=0.792
Bodily pain	-0.3615 p=0.002	0.1957 p=0.107	0.0373 p=0.761	-0.0908 p=0.458	0.0211 p=0.864
General health	-0.1523 p=0.212	0.0097 p=0.937	0.057 p=0.642	-0.2177 p=0.072	0.0221 p=0.857
Vitality	-0.4307 p<0.001	0.2117 p=0.081	0.0547 p=0.656	-0.1118 p=0.361	-0.1137 p=0.352
Social functioning	-0.4245 p<0.001	0.2119 p=0.080	0.1335 p=0.274	-0.1321 p=0.279	-0.0855 p=0.485
Emotional role functioning	-0.296 p=0.015	0.3676 p=0.002	0.1368 p=0.270	-0.0453 p=0.716	-0.0414 p=0.739
Mental health	-0.4497 p<0.001	0.2146 p=0.077	0.0673 p=0.583	-0.1327 p=0.277	-0.1873 p=0.123
Total, physical health	-0.3242 p=0.008	0.3884 p=0.001	0.0942 p=0.456	-0.0429 p=0.734	0.1015 p=0.421
Total, mental health	-0.4821 p<0.001	0.2941 p=0.018	0.1378 p=0.278	-0.137 p=0.280	-0.1257 p=0.322

In the analysis by tumour extent the negative correlations between the SF-36 scales and "rumination" were statistically significant only in the patients with T1 tumours (Table 3). The absolute correlation coefficients of $R = 0.54$ and 0.72 , respectively found in the T1 tumour patients were significantly higher than those found in either the T2 tumour group or the overall patient population. Conversely, the positive correlations found between the SF-36 "physical health" and "mental health" scales on the one hand and the "search for social integration" scale on the other hand were statistically significant only in the T2 tumour patients ($R = 0.67$ and 0.46 , respectively). In this group statistically significant positive correlations were also found between the SF-36 grouped scales and the coping strategy "threat control".

Discussion

In the present study, results obtained with two psychometric instruments were analysed in a patient cohort that

was relatively highly selected in terms of extent of illness and thus also of treatment-related effects on mental function. The fact that all the patients underwent larynx preservation surgery made it possible to assess the possible influence of a disturbance, but not complete loss, of vocal function. This limitation seems important insofar as previously published studies on quality of life after surgery for laryngeal carcinoma were performed with cohorts that were very heterogeneous in terms of size and tumour stage¹⁸⁻²⁴. For this reason, it is extremely difficult to extrapolate results obtained in such studies to the present cohort of patients, the anatomy and morphology of whose vocal organ was preserved to a certain extent.

Seiferlein et al could detect, in a previous study, no correlation between voice-related quality of life (V-RQOL) and coping strategies (TCS)²⁵. Furthermore, patients with smaller laryngeal tumours experienced posttherapeutic vocal impairment as more severe than patients with advanced disease²⁵. The authors concluded that factors

Table 3: Pearson's correlation coefficient and p values for evaluation of the relationship between scores on the "physical health" and "mental health" grouped Short form 36 (SF-36) and Trier Illness Coping Scale (TCS) scale scores.

T1 tumours	TCS scales				
SF-36 scales	Rumination	Search for social integration	Threat control	Search for information	Support in religion
Physical health, total	-0.5394 p=0.001	0.022 p=0.899	-0.2278 p=0.181	-0.2911 p=0.085	-0.0455 p=0.792
Mental health, total	-0.7205 p=0.000	0.0694 p=0.688	-0.1088 p=0.527	-0.2647 p=0.119	-0.2989 p=0.077
T2 tumours	TCS scales				
SF-36 scales	Rumination	Search for social integration	Threat control	Search for information	Support in religion
Physical health, total	-0.2021 p=0.322	0.6675 p=0.000	0.3921 p=0.048	0.195 p=0.340	0.2577 p=0.204
Mental health, total	-0.3032 p=0.141	0.4606 p=0.021	0.4109 p=0.041	-0.0947 p=0.652	-0.0062 p=0.977

other than voice-related sequelae of partial laryngectomy are of more importance for general quality of life in this group of patients. It seemed that patients with more advanced tumours are more concerned about the oncological outcome and thus regard voice changes as a matter of secondary importance. This information casts doubt on an assumption that underlies many earlier quality of life studies²⁶, namely that impairment of quality of life after partial laryngectomy are more or less inevitable consequences of the voice-related disturbances that undeniably occur in these patients^{8,9,20,27}.

According to earlier studies on laryngeal carcinoma²⁷⁻³⁰ and other tumour localisations³¹⁻³⁴, there is a need to investigate the influence of other, not voice-related factors on the general quality of life in this patients' group. In this aspect, the present study aimed to evaluate the influence of the ability of "coping with illness" to influence post-therapeutic quality of life in this patients' group by means of reliable and valid questionnaires^{15, 35-41}.

Of the various coping strategies, "threat control" - meaning the possible compliance with medical treatment and instructions - was found to be by far the most important, followed by "search for social integration". Overall, this distribution reflected the findings obtained in the reference population of the measurement instrument (TCS), though at a somewhat lower point score level⁴¹.

The present study detected a correlation between the coping strategy "rumination" and a greater degree of health impairment, which means that presence of this TCS characteristic tended to be negatively correlated with quality of life. A literature research failed to find any published data on this question. In the context of prevention and understanding of illness, rumination can exert a positive effect in terms of risk minimisation. On the other hand, once treatment has been completed the patient has no longer any means of influencing subsequent developments and intensive rumination is ineffectual, if not an emotional burden.

In our study sample, "support in religion" was found to be the least important coping strategy, though significantly more important in older and female patients. This finding agrees with earlier studies, which have consistently found a tendency for religion, or more generally spiritual coping strategies, to be more important in women and older patients^{33,42}.

"Search for social integration" was found to be the second most important coping strategy overall, being more important in patients with T2 disease. The more advanced the disease and the more immediate the threat of death and/or further treatment-related suffering, the less effective further suppression strategies will be and the more likely the patient will be to seek for help in his social environment in bearing the disease-related burden that he can no longer bear by himself. This finding comes in agreement with data reported in the relevant literature⁴³⁻⁴⁵. Possibly, the difference in respective correlations between coping strategies in patients with T1 and T2 tumours, respectively, reflects the differential impact

of early and more advanced stage disease on the patients: Whereas "rumination" has a major impact on QoL in earlier stages, patients with more advanced disease gain a more pronounced benefit from social support. However, this explanation is speculative and would need corroboration by further study.

Undoubtedly, voice-related quality of life is of undisputed importance as an instrument for monitoring the functional success of partial laryngectomy and evaluating the progress of phoniatric rehabilitation after operations on the larynx. In accordance with other relevant studies⁴³, our analysis showed that voice related parameters appear to play a relatively minor role in influencing the overall quality of life of patients with local early laryngeal carcinoma.

The observation that concerns about the outcome of oncological treatment, fear of possible recurrence, and treatment-related day-to-day problems influence the quality of life of tumour patients more than do treatment-specific effects on the diseased target organ has been made also in other oncological subspecialties^{44,46}.

In a recently published study in 76 patients with laryngeal carcinoma, Eadie et al. found that although "traditional" factors such as age, time since treatment, and alaryngeal speech techniques account for a quarter to a third of the variance of V-RQOL, they account for only 5% of global quality of life. By contrast, coping strategy determined, to an equal extent, scores of all the quality of life instruments that were used, accounting for 23-32% of variance⁴⁷. This underlines the importance of coping for the quality of life of patients who have undergone laryngeal resection and the need for development of integrative concepts of survivorship care.

Conclusion

Significant correlations were found between illness coping and overall quality of life in patients who had undergone partial laryngeal resection. The relative importance of the various coping strategies in these patients corresponded to that in the reference population of the TCS, with "threat control" in first place, the point scores, however, being somewhat lower, while the score for "rumination" was found to be negatively correlated with quality of life. Women and older patients were more likely to seek support in religion, while patients with more advanced disease were more likely to seek social integration.

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Conflict of Interest

None.

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