

Factors influencing quality of life after total laryngectomy: a study of 92 patients

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Abstract. – Background and Objectives: Total laryngectomy is a radical surgery for advanced laryngeal cancer. In the present study we evaluate the influencing factors for long term quality of life of 92 laryngectomees.

Patients and Methods: 92 patients who underwent laryngectomy for laryngeal cancer in the University Hospital of Patras, Greece were evaluated using a modified version of the EORTC-QOL-C30 questionnaire. The patients were distributed into 6 groups based on time elapsed between surgical treatment and completion of the questionnaire, ranging from 2 years for group 1 to 9-10 years for group 6.

Results: The mean value of psychological status ($p=0.01$), smelling disorders ($p=0.032$), mood change ($p=0.003$) were statistically significant in regard to the patient's overall view of their life postsurgically. Coexisting illness (defined as diabetes, hypertension or prostate disease which required medication on daily basis or hospitalization more than two times a year) was also significantly affecting ($p=0.021$) the patient's oral communication skills.

Conclusion: Quality of life is affected by functional disabilities and the psychological state of the patients. No statistically significant improvement over time was noted in our series.

Key Words:

Laryngectomy, Quality of life.

Introduction

Total laryngectomy is a radical surgery often performed for advanced laryngeal cancer. Although this type of radical surgery can be life-saving, the repercussions in the patients psychol-

ogy due to loss of normal speech as well as other functional difficulties can severely affect the patients' quality of life.

In the present study we evaluate the long term quality of life of 92 patients who have undergone laryngectomy in the past 2 to 10 years.

Patients and Methods

Study Population

The study group is comprised of 92 patients who underwent laryngectomy for laryngeal cancer in the University Hospital of Patras, Greece. There participants were in their majority males ($n=88$) and between 47 to 88 years age (mean age 60.4 years, SD 9.3 years). Occupational distribution of the patients was dominated by agricultural (85%) and construction (9%) occupations. All patients had advanced stage disease (Stages III and IV), with a minority of the population presenting with positive lymph nodes ($n=18$, 20%). None of the patients had metastases on presentation or developed metastases during the follow-up period.

The patients were distributed into 6 groups based on time elapsed between surgical treatment and completion of the questionnaire. The time span between laryngeal cancer surgery and questionnaire was completion was 2 years for group 1, 3 years for group 2, 4-5 years for group 3, 6-7 years for group 4, 8 years for group 5 and 9-10 years for group 6.

Patients who underwent laryngectomy less than two years previously were not included in the study so as to avoid false results that are more likely due to patients' adjustment period.

All participating patients have been thoroughly informed and consented to the proceedings of the

study. The questionnaire was given to each patient in a follow up visit and completed on spot with no interference from the attending surgeon or other members of the faculty, or patient's family.

Questionnaire

The low educational level of the patients in our area who originate from rural and agricultural areas, alongside their reluctance to complete lengthy questionnaires prohibited us from using one of the available internationally standardized questionnaires for the evaluation of the quality of life in head and neck cancer patients.

Therefore, we opted to use a modified version of the EORTC-QOL-C30, originally conceived and adjusted to the needs of laryngectomized patients in Greece by Nalbadian et al¹ (Table I). The questionnaire is used in the present study with the full consent of the original writers.

The questionnaire evaluates 6 main areas of interests as follows; functional disabilities (questions 1-10), oral communication skills (questions

11-13), family problems (questions 14, 15), social interactions (questions 16, 17) as well as psychological (questions 18-22) and occupational (questions 23-25) status. A final question (question 26) is included in the questionnaire as an indicator of the patients' estimation of their life changes since surgery.

Statistical Analysis

Statistical analysis was performed with the SPSS program version 15.0 (SPSS Inc., Chicago, IL, USA). Kendall's non-parametric method was used to evaluate possible correlations between different areas of interest of the questionnaire. It was also used to evaluate the relationship between the items of the questionnaire and the mean values of the examined areas to time elapsed from surgery till completion of the questionnaire. Furthermore, logistic regression was used to identify the factors that influenced the patient's subjective view of their life. Further population comparisons were conducted with the Mann-Whitney non-parametric test.

Table I. Questionnaire

1	Has your coughing increased since you've begun treatment for your throat?	Yes / No
2	Do you become ill more often after treatment?	Yes / No
3	Do you use painkillers more often?	Yes / No
4	Do you have difficulty swallowing solid or liquid food?	Yes / No
5	Do you have trouble tasting?	Yes / No
6	Do you have trouble smelling?	Yes / No
7	Do you feel your throat dry?	Yes / No
8	Do you expectorate much?	Yes / No
9	Do you often cough when you swallow?	Yes / No
10	Do you have trouble eating?	Yes / No
11	Do you find it difficult using the telephone?	Yes / No
12	Do you have difficulty talking to your family/friends; do they understand you easily?	Yes / No
13	Do you have difficulty talking to strangers?	Yes / No
14	Do you have any problems with your family members after treatment?	Yes / No
15	Has your sexual life been influenced by the treatment you have undergone?	Yes / No
16	Do you have any problems with your friends after treatment?	Yes / No
17	Do you go out with company as before?	Yes / No
18	Do you feel uncomfortable with your appearance after treatment?	Yes / No
19	Are you embarrassed of your voice?	Yes / No
20	Are you embarrassed of your illness?	Yes / No
21	Do you feel more lonely after treatment?	Yes / No
22	Your mood is: The same/Better/Slightly worse/Much worse	
23	Your financial situation after your treatment is: The same/Slightly worse/Much worse/Better	
24	Your capacity/strength for work is: The same/Decreased/Increased	
25	As a result of your illness and the subsequent treatment I have: Changed my job/Not changed my job/Gone into retirement	
26	Has your life changed by your treatment? No/Little/Much/Very much	

Results

Functional Disabilities

The most common complaint in the functional disorders was olfactory disorders (69.6%) followed by taste disorders (34.8%) and throat dryness (34.8%). Swallowing and eating disorders were also reported by a significant percentage of patients –15.2% and 13% respectively – while pain was rarely reported as a problem (4.2%).

Application of Kendall's non-parametric test revealed a positive correlation between the mean value of the functional disorders and the mean value of family issues ($p=0.02$), psychological status ($p=0.016$) and occupational status (0.034).

Oral Communication Skills

The majority of patients reported difficulties communicating with strangers (56.5%) or via telephone (78.3%) while a minority of the patients also reported communication difficulties with close family members (30.4%).

Family Problems

Family issues only rarely reported by our patients (10.9%), although 23.9% reported adverse effects in their sex lives. The mean value of family issues presented a positive correlation with the mean value of psychological status ($p=0.038$).

Social Interactions

23.9% of our patients confessed to decreased participation in social events, although a minority (2.2%) reported problems with their friends. The mean value of social interactions also showed a positive correlation with the mean value of the psychological status of our patients ($p=0.04$).

Psychological Status

58.7% of our patients reported uneasiness due to their appearance while 23.9% felt embarrassed due to their voice or disease, while 30.4% mentioned a feeling of loneliness. 67.4% reported that their mood worsened after surgery in contrast to 32.6% of the patients who reported no change (28.3%) or a better mood (4.3%).

Occupational Status

80.5% of the patients reported worsened financial situation, with the majority (91.3%) of the patients also reporting decreased capacity for work in accord with the high retirement rate (65.2%).

Time Elapsed Since Surgery Versus Areas of Interest

The mean values of oral communication skills and social interactions tended to improve in our study with the time elapsed from surgery till completion of the questionnaire. However, none of the parameters of the questionnaire proved to be of statistical significance in regard to time elapsed since surgery; this was also the case with the mean values of the specific areas of interest (Figure 1).

Patients' General Sense of Life Changes

93.5% of the patients felt that their life was changed to a greater (65.2%) or lesser degree (28.3%) as opposed to 6.5% who reported no perceived changes in their lifestyle. The method of logistic regression showed that only the mean value of psychological status was of statistical significance ($p=0.01$) when the mean values of the questionnaire's areas of interest were used. Application of logistic regression method for the separate items in the questionnaire revealed that items number 6 and 22, smelling disorders ($p=0.032$) and mood change ($p=0.003$) respectively, were statistically significant.

Subgroup Comparisons

Mann-Whitney non-parametric test was applied to determine whether coexisting illnesses had an adverse effect in our study group.

Coexisting illness was defined in our series as diabetes, hypertension or prostate disease which required medication on daily basis or hospitalization more than two times a year. 38 patients covered the specified criteria. The mean value of oral communication skills differed significantly ($p=0.021$) between the 38 patients and the remaining 54 patients. None of the other parameters showed statistically significant differences.

The sex distribution of our patients (4 female patients and 88 male patients) was prohibitive for comparison purposes. However, it should be noted that all of the female patients reported a sense of embarrassment regarding their appearance, voice and illness.

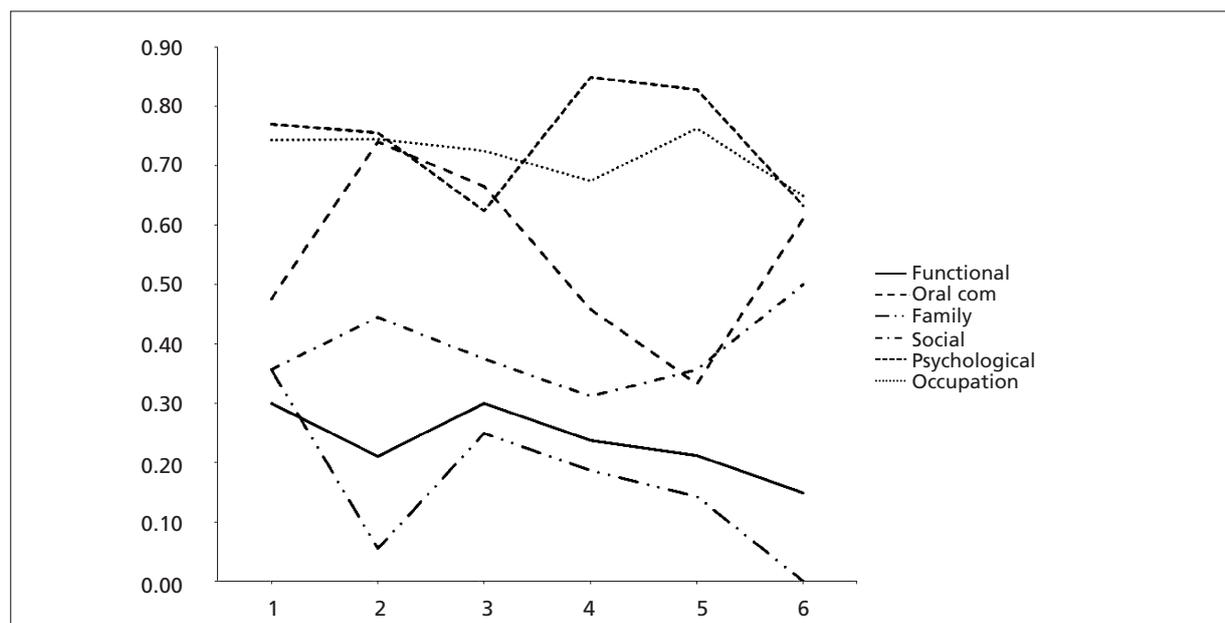


Figure 1. Mean values of the 6 areas of interest in relation to time elapsed since laryngectomy.

Evaluation of T stage, N stage and clinical stage to quality of life outcome was not possible due to the uniformity of the study population.

Discussion

Total laryngectomy constitutes a major head and neck operation with varying repercussions in the patients' quality of life and general sense of well being. The most obvious disability is of course loss of speech, however other functional difficulties may contribute significantly to the overall quality of life of these patients²⁻⁴.

Loss of speech seemed to be the main concern in our series of patients with over 50% reporting difficulties in everyday communication activities. Similar results have been published by Evans et al⁵ who also report that their post-laryngectomy group belonged in large to the moderately severe range of the voice handicap index, while Boscolo-Rizzo et al⁶ in their comparative study of laryngectomy and organ preserving therapies report significant differences in the patient's subjective opinion of their speech capacity.

Considering the high percentage of patients (56.5%) complaining about their oral communication potential, we expected prominent correlation between the aforementioned areas as has al-

so been reported by Babin et al⁷. Notable in our series, however, is the lack of statistically significant correlation between communication issues and other areas investigated, most prominent being the lack of correlation between speech disabilities and the social parameters studied.

This seemingly ambiguous observation could be attributed to the social and cultural background of the participating patients who originate mostly from agricultural areas where phenomena of social isolation are only sporadically reported. The same view on this issue is shared by Nalbadian et al¹ whose study is based on a patient population with social and occupational distribution highly similar to our own.

Furthermore, application of logistic regression to identify the parameters affecting the patients' general view of their life was not significant for any of the communication parameters or their average in agreement with reports by Nalbadian et al¹. The exclusion of the oral communication from the final model, bring to the forefront views by Stewart et al⁸ who report that oral communication issues need not be the main concern regarding the quality of life of laryngectomized patients. Studies showing no statistical significance regarding speech between patients undergoing laryngectomy or organ preserving therapy⁹, or high overall quality of life scores despite speech impairment^{10,11} provide further support to this notion.

The functional disabilities studied in our series proved to be most interesting, with more than two thirds of our patients reporting olfactory disorders, which also proved to be statistically significant in the final logistic regression model. The issue of olfactory disorders in laryngectomees has been thoroughly discussed by a number of researchers^{12,13} and is a frequent complaint in quality of life studies^{3,14}.

The average score of the functional disorders group was also related to family problems, psychological and occupational status, in agreement with early works by DeSanto et al¹⁵.

Social interactions and family relationship issues were also reported in our series by roughly 25% of the patients in each case and were also related to the psychological status of our patients. In our experience the low educational level and misconceptions inherent to small communities such as those of agricultural Greece may lead to varying behavior towards the laryngeal cancer patient with deleterious effect to the patient's already vulnerable psychological state. Vilaseca et al also address this issue in their relevant study¹⁶, while reports by Eadie et al¹⁷ are supportive of the role educational status may have in the quality of life of these patients.

The psychological status of the patients in our series proved to be a significant factor determining the overall evaluation of their life, with mood change also being statistically significant as a separate parameter. The high number of patients reporting worsened mood change in our series lies in agreement with the results published by Terrell et al¹⁸ who reported a considerably higher percentage of signs of depression (30% compared to 8%) in patients undergoing laryngectomy compared to conservative treatment modalities. The reported percentage of mood changes also lies in agreement with the high retirement rate (65.2%) although this relationship did not reach statistical significance.

Comparison analysis to evaluate the effect of coexisting diseases on the quality of life of the study group proved to be significant only for the development of oral communication skills. Patients with no other diseases also had higher mean values in psychological status and social interactions areas of the questionnaire although these differences did not reach statistical significance.

Comparing our results to those of Nalbadian et al¹ who evaluated their patients with the same questionnaire certain conclusions can be reached.

The most notable difference is the lack of improvement of oral communication skills in our series which could be attributed to the influence of the coexisting diseases group of patients in our study. Furthermore, although functional disabilities as a whole weren't significant for the patients' general perception of their life, a specific item (olfactory disorders) was significant and was also noted on the study by Nalbadian et al¹ although it did not reach statistical significance in their series.

Lastly, laryngectomees in Greece seem to share an occupational and societal background and their quality of life is affected by functional disorders more than loss of speech although the latter may be their main complaint in our experience.

Conclusion

Quality of life is affected by functional disabilities and the psychological state of the patients and does not seem to improve with time. Prospective studies with a greater number of patients could provide further insight to factors influencing the quality of life of laryngectomees.

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