

Quality of life in laryngectomees: a post-treatment comparison of laryngectomy alone versus combined therapy

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Abstract

Patients with advanced and recurrent laryngeal and hypopharyngeal cancer often need combined therapy, which is associated with greater morbidity than single modality treatment. The aim of this study was to assess the quality of life in laryngectomees and to assess whether differences exist between the irradiated and the non-irradiated patients. The University of Michigan Head and Neck Quality of Life questionnaire, a validated instrument for assessing the head and neck cancer related functional status and well-being, was used for this purpose. Subjects for the study included patients who had undergone total laryngectomy for laryngeal or hypopharyngeal squamous cancer. No significant difference between the groups was evident in the various domain scores, although a trend towards higher scores was seen in the combined therapy group. This study suggests that long-term side effects induced by radiotherapy do not adversely affect the quality of life in laryngectomised patients.

Key words: Laryngeal Neoplasms; Pharyngeal Neoplasms; Quality of Life

Introduction

Assessment of the quality of life (QOL) after treatment for head and neck cancer is an important measure of outcome, in addition to survival. Measurement of the quality of life following different treatment regimes has important implications for the patient and the health care provider because QOL assessment attempts to quantify quality of survival after treatment.

Combined therapy (surgery and irradiation) is increasingly being used in the management of head and neck cancer. Radiation therapy given in the pre- or post-operative settings can cause long-term side effects that may have an impact on the quality of life. With modern high-energy X-rays, a higher dose is deposited in the dermis than in the superficial layers. Late changes can therefore occur, manifesting as atrophy leading to contraction. These can progress beyond one year after radiotherapy.¹ No sebaceous gland function is retained after 40–50 Gy, leading to a permanently dry skin.² A total dose of 40–60 Gy to a large volume of salivary tissue can cause permanent xerostomia in 80 per cent of cases.³ Patients undergoing combined therapy are more prone to other complications, such as pharyngeal stenosis, which can affect the QOL.

Loss of normal speech is a major loss following laryngectomy, but when patient ranking of the various QOL dimensions was studied, many laryngectomy patients did not rank loss of voice as the major QOL dimension.^{4,5} Comparing the pre-operative QOL scores with post laryngectomy scores, Deleyiannis *et al.*⁶ showed that the functional limitations caused by a laryngectomy do not translate into a worse overall QOL. Studies that have compared the quality of life between patients who were treated with radiotherapy versus salvage surgery^{5,7,8} showed no major difference between the groups. This may be because there is little impact on the QOL caused by laryngectomy on these patients.⁶ In regard to global satisfaction or psychological distress, no study has yet shown a significant QOL difference in patients treated with laryngectomy or radiotherapy.

To date there are no studies which have assessed the impact of irradiation on the quality of life in laryngectomees. This cross-sectional study aims to assess differences in quality of life between two groups of laryngectomized patients: those who have received irradiation as primary therapy or post-operatively, and those who have not had irradiation. A sensitive multi-domain validated instrument, the

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Head and Neck Quality of Life questionnaire (HNQOL), was used for this purpose (appendix 1).

Materials and methods

Details of all patients who had undergone total laryngectomy for laryngeal or hypopharyngeal squamous cancer between January 1996 and December 1998 at our hospital were obtained from the database in the department of otolaryngology and cross-checked with the records maintained in the department of speech therapy. Patient records were examined and data extracted using a form designed for this purpose. Deceased patients and those not disease-free were excluded. A total of 37 patients were available for analysis.

The HNQOL questionnaire was sent to all patients by post, this being a self-administered questionnaire. The filled-in questionnaire was received either by return post or when patients were seen at the head and neck clinic. Twenty-nine patients returned the questionnaire. A reminder was sent after a month to patients whose questionnaire was not received. One patient needed the help of a health care assistant because of visual impairment.

Patients had different stages of disease at the time of diagnosis and, as part of the treatment protocol, some had received pre- or post-operative radiotherapy (Table I). The various surgical procedures performed on the two groups of patients are mentioned in Table II. All except three patients underwent primary or secondary tracheo-esophageal puncture for a speaking valve and were regular valve users. The irradiated group had a curative dose of radiotherapy appropriate to their disease extent. All patients had completed their treatment schedule and were free of disease. The post-treatment interval ranged between six months and three years.

QOL instrument

The University of Michigan Head and Neck Quality of Life questionnaire (HNQOL) is a validated instrument for assessing head and neck cancer-related functional status and well-being. QOL instruments can be clinician- or patient-administered. Three other patient-rated, disease-specific instruments have been developed and validated for patients with head and neck cancer: the University of Washington Quality of Life instrument (UWQOL), the Functional Assessment of Cancer Therapy instrument (FACT), and the European Organisation for Research and Treatment of Cancer head and neck instrument (EORTC).

The HNQOL comprises 20 questions on head and neck cancer symptoms under four domains to assess the quality of life: communication, eating, pain and emotional well-being. Global symptoms, disability following treatment and response to treatment are also assessed. Each question is followed by five-choice Likert scale response options. The HNQOL was selected for this study as it has been validated to generate more specific domain scores. The ability to provide separate domain scores gives a more precise

TABLE I
PATIENT CHARACTERISTICS

	Patients Combined therapy (n = 17)	Surgery only (n = 12)
Sex		
Male	13	11
Female	4	1
Age in years (mean)	65.2	66.2
Tumour site		
Glottis	6	7
Supraglottis	6	1
Transglottis	2	4
Hypopharynx	3	–
TNM Stage		
Stage I	2	–
Stage II	1	–
Stage III	7	12
Stage IV	7	–
Post-treatment interval (months)		
6–12	6	4
13–24	4	2
>24	7	6
Speech		
Valve	14	12
Servox	3	–

picture of the patient’s functional status and allows for analysis and comparison. This is especially pertinent in the context of this study, where the differences between the two groups of patients can be subtle.

Analysis

The HNQOL Questionnaire is scored using a standardised scale. A raw score is generated from the answers. Each item is then re-scaled and transformed so that better health corresponds with higher numerical value, the scores ranging from 0 to 100.

The data were analysed using SPSS for Windows version 9.0. Mann–Whitney *U*-tests were used to compare the scores for each item between the irradiated and the non-irradiated patient groups. The transformed scores for each domain were compared as well between the groups using the Mann–Whitney *U*-tests. For categorical data, the *t*-test was used to determine statistical significance as

TABLE II
SURGICAL PROCEDURES

Procedure	Combined therapy (n = 17)	Surgery only (n = 12)
Total laryngectomy	11	11
Total laryngectomy + RND	1	1
Total laryngectomy + FND	1	–
Total laryngectomy + Bil FND	1	–
Total laryngectomy + PP + RND	2	–
Total laryngectomy + JF + RND	1	–

RND – radical neck dissection
FND – functional neck dissection
PP – partial pharyngectomy
JF – jejunal flap

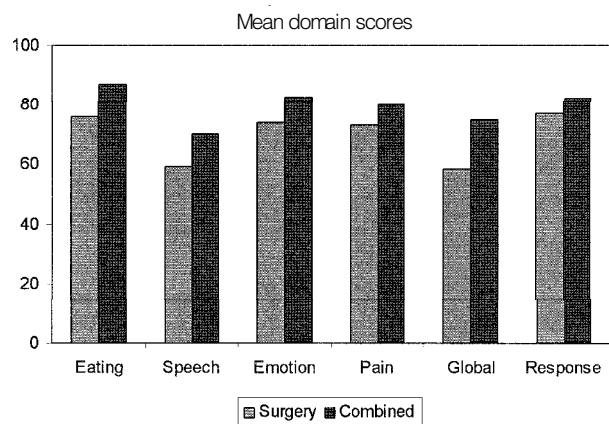


FIG. 1

Mean domain scores for the patient groups

they were seen to be normally distributed (Shapiro-Wilk test). The level of statistical significance was set at $p = 0.05$ for all tests.

Results

The clinical details of the participants of this study are shown in Table I. No significant difference in the age distribution and post-treatment interval was evident between the groups. No significant difference between the groups was evident in the communication, eating, emotion and pain domain scores. There was a consistent trend towards higher scores in the irradiated group for all domains and for the global items (Figure 1), with the emotion domain approaching significance ($p = 0.054$). Many individual items also tended to have higher (better) mean scores for the irradiated group.

Discussion

This is the first study of which we are aware that attempts to assess the impact of radiotherapy on laryngectomized patients. The post-treatment intervals of six months and three years were chosen for the following reasons: prospective studies have shown that most changes in QOL scores secondary to acute toxicity occur within the first six months of therapy,^{7,9} and psychosocial functioning has been shown to deteriorate five years after treatment in laryngeal cancer.¹⁰

Analysis reveals no significant difference in the symptom domain or global scores between the two groups. It is logical to assume that certain complications such as taste change and dry mouth would be more common among the irradiated patients. The mean scores for these specific items in the questionnaire between the groups show no significant difference. It may be that the instrument is not sensitive enough in this regard and more focused questions may be required to study the difference.

This is a relatively small cohort, and the trend for higher scores in the irradiated group might not be evident with a larger sample size. Only 76 per cent (29 out of 37) replied to the questionnaire. While two of these patients belonged to the non-irradiated

group, six patients from the radiation arm did not return the questionnaire. It has been shown that patients with a low performance status and poor QOL are less likely to take part in studies.¹¹ It is possible that these non-respondents have spuriously caused the trend for higher scores in the irradiated arm.

The combined treatment arm comprises two groups of patients: those who underwent primary radiation and had surgical salvage and those who had planned post-operative radiotherapy. The psychological impact of initial failure and subsequent successful salvage surgery should be considered in these patients. This could partly explain the trend to higher scores in the combined therapy arm. The other reason why domain scores may be higher in the combined arm may be due to the fact that three of these patients had early disease. These patients may also be more optimistic as they feel they have been more comprehensively treated with both modalities.

We estimate that the current study has, generally, only about 30 per cent power to detect a difference of 10 per cent over all the domain scores. Using the data available from this pilot, a combined sample size of about 150 patients (75 per group) would be required to detect a difference of 10 per cent between groups in all of the domain scores, should such a difference exist, with 80 per cent power.

More comparable cohorts where similar procedures have been done may help resolve the issue. More studies are needed to substantiate these results, which may influence clinicians to add radiotherapy to the treatment regime of some patients if QOL afterwards is not compromised.

Conclusion

Although combined modality treatment is known to cause more morbidity, this study suggests that long-term side effects induced by radiotherapy do not adversely affect the QOL score in laryngectomized patients.

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Appendix 1

INSTRUCTIONS: This survey is designed to assess how much you are bothered by your head and neck condition and/or treatment. Please answer every question by marking one box. If you are unsure about how to answer, please give the best answer you can.

1. As a result of your head and neck condition and or treatment, over the past FOUR WEEKS how much have you been BOTHERED by your

	Not at all	Slightly	Moderately	A lot	Extremely
A. Ability to talk to other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Ability to talk on the phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. As a result of your head and neck condition and or treatment, over the past FOUR WEEKS how much have you been BOTHERED by problems with

	Not at all	Slightly	Moderately	A lot	Extremely
A. Volume of your voice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Clarity of your voice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Difficulty opening your mouth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Dryness in your mouth while eating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Chewing food (For example, pain, difficulty opening or closing your mouth, moving food in your mouth, or teeth or denture problems)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Swallowing liquids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Swallowing soft foods and/or solids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Your ability to taste food (For example, loss of taste, and/or loss of appetite due to poor taste)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Pain, burning, and/or discomfort in your mouth, jaw, or throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J. Shoulder or neck pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Over the last FOUR WEEKS how often did you take pain medication

	Never	Rarely	Sometimes	Frequently	Always
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Over the last FOUR WEEKS how much have you been BOTHERED by

	Not at all	Slightly	Moderately	A lot	Extremely
A. Concerns or worries about your appearance related to by your head and neck condition and/or treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Emotional problems related to your head and neck condition and/or treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Embarrassment about your symptoms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Frustration about your condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Financial worries due to medical problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Worries that your condition will get worse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Physical problems related to your head and neck condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Were you employed prior to being diagnosed with cancer? Yes No If no, go to question 6.

5A. If yes, did your doctor declare you unable to work due to head and neck condition and/or treatment



6. Have there been other problems related to your head and neck condition that were not mentioned? If so, please write them in the spaces below and tell us how much this problem has bothered you. (For instance, if your treatment included surgical transfer of tissue from a donor site to the head and neck, does the donor site bother you?)

	Not at all	Slightly	Moderately	A lot	Extremely
A. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. For the past FOUR WEEKS, please rate your overall amount of disturbance or bother as a result of your head and neck condition

	Not at all	Slightly	Moderately	A lot	Extremely
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Overall how satisfied are you with your Head and Neck cancer treatment at this hospital

9. Overall how would you rate your response to treatment?

	Poor	Fair	Good	Very good	Excellent
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Approximately how long did it take you to complete this questionnaire? _____ minutes

11. How difficult was it to complete this questionnaire?

	Not at all	Slightly	Moderately	A lot	Extremely
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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