

# Advanced stage laryngeal cancer in Egypt: Quality of life in the scope

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## ABSTRACT

**Background:** Laryngeal carcinoma represents 2-5% of all malignancies and 28% of cancers of the upper aero digestive tract. It has marked impact on patients' various aspects of life and its quality.

**Purpose:** The aim of this observational analytical cross-sectional study was to assess quality of life (QOL) of patients with advanced laryngeal cancer after treatment and compare between different treatment modalities.

**Patients and Methods:** This study was conducted on 86 randomly selected patients with advanced laryngeal carcinoma who received various treatment modalities. The European organization for research and treatment of cancer (EORTC) questionnaires (QLQ) (the Arabic form) were fulfilled by patients' interview.

**Results:** EORTC questionnaires were completed at a median of 18.5 months (IQR 36 months) after treatment. The overall quality of life of surgically and definitive chemo radiotherapy (CRT) treated patients was 66.7 and 83.3 respectively. Patients with a stage III had a significantly better QOL than stage IV. Patients within CRT group had statistically significant better physical function, cognitive function and social function than patients within surgery groups. On the contrary, they had statistically significant worse dry mouth, sticky saliva and cough than the surgery groups. Patients within surgery groups had statistically significant worse fatigue, financial difficulties, sense problem, speech, eating, social contact and feeling ill than patients within CRT group.

**Conclusion:** No statistical significant difference was found in the overall quality of life between the different modalities of treatment. However, various QOL aspects showed statistical significant difference between the different modalities as well as the cancer staging.

**Key Words:** Cancer larynx, chemoradiation, laryngectomy, quality of life.

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## INTRODUCTION

Laryngeal cancer represents 2 to 5% of all malignancies diagnosed each year in the whole world and represents one of the most common tumors of the upper respiratory tract<sup>[1-3]</sup>.

The most important information required for therapeutic decision making are the histologic diagnosis, site of origin and the stage of tumor (TNM classification). A number of treatment modalities are available including surgery (total or conservative laryngectomy with / without neck dissection) and radiotherapy (RT) alone or with chemotherapy (CRT)<sup>[4]</sup>.

Larynx has many functions as protective, respiratory and phonatory functions. Impairment of larynx from either disease or treatment affects the basic functions, as eating and speech. Social interactions and psychological state can

be markedly affected. Thus, quality of life following head and neck cancer is a vital issue, not only issue of survival<sup>[5]</sup>.

Quality of life (QOL) definition is "An individual's perceptions of their position in life taken in the context of the culture and value systems in which they live and in relation to their goals, standards and concerns" as defined by the WHO<sup>[5]</sup>. Because QOL is such a broad, multidimensional concept, the term health-related quality of life (HRQOL) has evolved. HRQOL is defined as "the assessment of the impact of the disease and its treatment on the physical, psychological and social aspects of quality of life"<sup>[6]</sup>. Health-related quality of life is usually measured by questionnaire. The European organization for research and treatment of cancer QLQ-C30 questionnaire has been proved to be a reliable tool to measure QOL in oncology patients<sup>[7]</sup>.

The aim of the current study was to assess QOL of patients with advanced laryngeal cancer who received different treatment modalities at a tertiary care hospital in Egypt and compare between the different modalities.

## **PATIENTS AND METHODS:**

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### ***Study Design, population and setting***

This observational analytical cross-sectional study was conducted at Faculty of Medicine, Cairo University, Egypt. Patients with advanced laryngeal carcinoma were randomly selected from Otorhinolaryngology and Oncology departments. All patients had laryngeal squamous cell carcinoma, stage III or IV disease according to the diagnostic criteria of the AJCC<sup>[8]</sup>. Patients underwent either concurrent definitive CRT (chemo-radiotherapy) or surgical treatment (total laryngectomy +/- neck dissection +/- postoperative radiation therapy). Exclusion criteria were recurrent laryngeal cancer, coincident distant metastasis or those who had not completed 12 weeks after treatment termination.

### ***Quality of life assessment tool***

Upon communication with European Organization for Research and Treatment of Cancer (EORTC), authors were approved to use both EORTC-C30 version 3.0 and the QLQ-H&N 35 module (English and Arabic forms).

The questionnaire (EORTC-QLQ-C30) includes six functional scales (physical, social, emotional, cognitive, role and general status), three symptom scales (fatigue, pain, nausea and vomiting) and six independent items (dyspnea, insomnia, appetite, constipation, diarrhea and financial difficulties). Responses were scored from 0 to 100. High functional scale scores mean that the function is better.

The specific head and neck cancer module (EORTC-QLQ-C30-H&N35) contains seven symptom scales (pain, swallowing, senses, speech, social eating, social contact and sexuality) and nine independent items (teeth, opening mouth, dry mouth, thick saliva, cough, feeling ill, pain killers, nutritional supplements, feeding tube and weight gain/loss). Responses were scored from 0 to 100, where high scores indicate more problems.

Both questionnaires were administered to patients by interviewing them, during their follow up visits.

### ***Statistical analysis***

Statistical analysis was performed using Statistical Package of Social Science (SPSS) version 21.0 (SPSS Inc., U.S.A.). Chi-square test was used to compare differences in categorical clinical and demographic variables between both groups. Mann\_Whitney U test was used to compare QOL scores between both treatment modalities. Sign test was used to compare QOL scores with the reference values. Results were considered significant at  $p\text{-value} < 0.05$ .

## **RESULTS:**

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A total of 86 questionnaires were completed. Participants were stratified in agreement with their treatment modality into 5 different groups; total laryngectomy with selective neck dissection (n=6, 7%); total laryngectomy with radical neck dissection (n=11, 12.8%); total laryngectomy with selective neck dissection and postoperative radiotherapy (n=21, 24.4%); total laryngectomy with radical neck dissection group and postoperative radiotherapy (n=31, 36%) and definitive chemo radiotherapy (CRT) group (n=17, 19.8%).

The mean age ( $\pm$  SD) was  $59.7 \pm 7.51$  years old. 91.9% males versus 8.1% females shared in the study. Many of them were from inside Great Cairo (64%). 77.9% were unemployed and 86% were from low socioeconomic status. Most patients (88.4%) were ex-smoker, only 2.3 % were non-smoker and 4.7 % were still smoking. 44.2% were suffering from one or more co-morbidities as cardiac diseases (22%), hypertension (163%), diabetes mellitus (12.8%), and 2.3% had history of neurological diseases. The surgical and CRT treatment groups did not have statistically significant difference concerning their age, sex, cancer stage and average time to follow-up.

### ***Quality of life assessment***

The median overall QOL score for the surgery groups was 66.7 and interquartile range (IQR) 58.3-83.3, while overall QOL score for CRT group was 83.3. The median score of the cognitive function was 100 and IQR 83.3-100.0 for all participants.

### ***Age and quality of life***

Patients were stratified whether they were above or below the median age (59 years). No statistical significant difference was found between the 2 age groups in the overall QOL with  $p\text{-value} > 0.05$ . However, patients below median age ( $< 59$  years) had better cognitive functions (CF) score, general pain score (PA), head and neck pain (HNPA) and sense problems (HNSE) scores than the other group and the difference was statistically significant.

### ***Smoking status and quality of life***

No statistical significant differences were found between smokers, ex-smokers and non-smokers patients except for the emotional function (EF2) score that showed high statistically significant ratio regarding still smoking (lower score) and ex-smokers (higher score) with  $p\text{-value} < 0.05$ .

### ***TNM classification and cancer staging***

In the current work, 26 patients were classified as stage III and 60 patients as stage IV (59 stage IVA, 1 Stage IVB).

Using EORTC-QLQ-C30, no statistical significant differences were found between stage III and stage IV patients in overall QOL or individual QOL domains scores except that, patients with Stage III had better global quality of life than the other group and the difference was statistically significant with  $p\text{-value} < 0.05$ .

Using EORTC-QLQ-C30-H&N35, special sense (HNSE), speech problem (HNSP), social eating (HNSO), social contact (HNSC) and sexual problems (HNSX) scores were worse among stage IV patients compared with the stage III group and the difference was statistically significant with  $p\text{-value}$  with 0.002, 0.000, 0.018, 0.000 and 0.007 respectively.

Comparing quality of life with reference value scores (EORTC-QLQ-C30)

The global QOL score in the present study didn't differ significantly from the global reference score, whereas patients participated in this study, had a better physical function (PF), Fatigue (FA) and Insomnia (SL) scores than the reference value scores and the difference was statistically significant with  $p\text{-value}$  0.07, 0.025 and 0.025 respectively. But worse dyspnea (DY) and financial difficulties (FI) scores and the difference was statistically significant with  $p\text{-value} < 0.001$  and  $< 0.001$  respectively.

### **Treatment modality and quality of life**

I- EORTC-QLQ-C30: Patients within CRT group had better physical function (PF2), cognitive function (CF), social function (SF), fatigue (FA), feeling pain (PA) and financial difficulties (FI) than patients within surgery groups and the difference was statistically significant with  $p\text{-value}$  0.011, 0.003, 0.032, 0.005, 0.0004 and  $< 0.0001$  respectively.

II- EORTC-QLQ-H&N35: Patients within surgery groups had worse sense problem (HNSE), speech (HNSP), social eating (HNSO), social contact (HNSC) and feeling ill (HNFI) than in the CRT group and the difference was statistically significant with  $p\text{-value} < 0.0001$ , 0.002, 0.023, 0.004 and 0.06 respectively. Patients within CRT group had worse dry mouth (HNDR), sticky saliva (HNSS) and cough (HNCO) than in the surgery groups and the difference was statistically significant with  $p\text{-value}$  0.026, 0.012 and 0.02 respectively.

### **Neck dissection and quality of life**

No statistically significant differences were recorded between patients who had undergone radical neck dissection and those who had not, except that patients without radical neck dissection had a better general QOL (QL2) score than the others and the difference was statistically significant ( $p\text{-value}$  0.048).

## **DISCUSSION**

The laryngeal cancer represents 0.9% of all tumors and 18.7% of head and neck cancers in Egypt<sup>[9]</sup>.

In this study, no statistical significant difference was found between patients above or below the median age (59 years) in overall QOL. However, patients below median age (<59 y) had better cognitive functions (CF) score, general pain score (PA), head and neck pain (HNPA) and sense problems (HNSE) scores than the other group and the difference was statistically significant. Khafif *et al.* (2007)<sup>[10]</sup> and Williamson *et al.* (2011)<sup>[11]</sup> in their study showed a high degree of agreement with these results.

Most of patients were ex-smoker; this is accordance with the known fact that smoking is the highest risk factor for cancer larynx<sup>[12]</sup>.

In this study, most patients were from a low socioeconomic class. Edwards & Jones (1999), Conway *et al.* (2010) and Williamson *et al.* (2011) showed similar social distribution<sup>[11,13,14]</sup>. Vartanian and his coworkers in 2006 stated that a high proportion of Brazilian patients with head and neck cancer belonged to low socioeconomic classes due to low educational level, increased use of tobacco and alcohol with limited income<sup>[15]</sup>.

In the current work, most of patients were unemployed. Previous research done in Egypt on laryngeal cancer patients agreed with these results, as cancer larynx treatment is usually associated with work losses due to affection of the patient's communication<sup>[16]</sup>.

In this research, stage III patients had statistically significant better global quality of life than stage IV. Hammerlid *et al.* (1999), Morton (2003), Terrell *et al.* (2004), El-Deiry *et al.* (2009), and Williamson *et al.* (2011) showed that stage IV patients had poor QOL in several aspects<sup>[11,17-20]</sup>. However, de Graeff *et al.* (2000) and Aarstad *et al.* (2003) showed no significant relationship between tumour stage and QOL<sup>[21,22]</sup>.

Moreover, patients who did not undergo radical neck dissection had a better general QOL (QL2) score than patient who underwent radical neck dissection as they had not been exposed to a major morbidity or shoulder dysfunction.

### **Quality of life assessment**

#### **I-EORTC-QLQ-C30**

#### **Global health status QL2**

In this study, there are slightly higher global health status scores for patients treated by CRT than for

patients who were treated surgically. This difference was not statistically significant (83.3 for CRT group and 66.7 for the surgery group).

Similar results using the EORTC questionnaire were reported by different researchers<sup>[19,23–26]</sup>. In contrast to these results, Williamson *et al.* in 2011 reported slightly better scores for patients treated surgically compared to those who received CRT, however not statistically significant<sup>[11]</sup>.

### Other domains

In this study, patients within CRT group had better physical function, cognitive function and social function. These results coincided with the results of Terrel *et al.* in 2004 and Boscolo-Rizzo *et al.* in 2008<sup>[19,26]</sup>.

Also, patients within surgery groups had worse fatigue and financial difficulties than patients within CRT group. On the contrary, Hamid *et al.* in 2011, showed that, the financial impact score was worse for radiotherapy treated patients (whether in the CRT or the postoperative group), compared with the surgery alone. Cancer and its treatment are associated with work losses and the patients are usually away at home during follow-up. Nevertheless, transportation and accommodation costs are added for the patient and his family during the period of radiotherapy sessions<sup>[16]</sup>.

In this study, role of function was better for the CRT group while dyspnea, nausea and vomiting scores were worse. However these differences were not statistically significant. Same results were reported by Boscolo-Rizzo *et al.* (2008)<sup>[26]</sup>.

### II-EORTC-QLQ-H&N35

Patients within surgery groups had worse sense problem, speech, social eating, social contact and feeling ill than in the CRT group. Similar results were reported by Hanna *et al.* (2004) and LoTempio *et al.* (2005)<sup>[24,25]</sup>.

While, patients within CRT group had worse dry mouth, sticky saliva and cough than the surgery groups. Similar results reported by Williamson *et al.* in 2011 and Boscolo-Rizzo *et al.* in 2008<sup>[11,26]</sup>.

### CONCLUSION

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No statistical significant difference was found in the overall quality of life between the different modalities of treatment. However, various QOL aspects showed statistical significant difference between the different modalities as well as the cancer staging.

Standardized questionnaires of QOL are easy tools for data collection from the patients and can reveal unexpected treatment impacts and non-medical problems facing the

patients. Many patients may be embarrassed to discuss emotional, physical or financial problems with their physician. These questionnaires are useful in exploring the different aspects of utmost patients' concerns.

### CONFLICT OF INTEREST

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There are no conflicts of interest.

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