

The Quality of Life of Patients After Total *Laryngectomy*

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Laryngeal cancer surgery often includes a total laryngectomy that has many anatomical and functional consequences such as changes in voice quality, and communication and speech intelligibility of patients. The larynx not only affects all aspects of life of patients, but also it is effective in family and friends around the patient, as well. This study aimed to assess quality of life after surgery using common methods. In this descriptive cross-sectional study 186 patients diagnosed as having laryngeal cancer and undergone laryngectomy surgery during 1995 to 2007 in two hospitals in Ahvaz: Imam Khomeini and Apadana, were studied in terms of quality of life after surgery. Data collection tools were the EORTC Scale QL-C30 and the QLH&NC-35 Scale version 3. The questionnaire was given to the patient in four stages. The first stage at the time of diagnosis of cancer of the larynx, the second stage in the midst of postoperative radiotherapy treatment, the third stage, three months after the completion of the process of treatment and the fourth stage six months after completion of treatment. The desired variables in evaluating the quality of life after the total laryngectomy included age, sex, eating, speaking, and happiness. Data were analyzed using SPSS16; furthermore, qualitative assessment and quantitative evaluation were conducted using Chi square test and t-test, respectively. Out of the 186 patients 169 (90.86%) and 17 people (9.14%) were male and women, respectively. The age range of the patients was from 28 to 90 years and with a mean age of 63 years. Of the 186 cases 91 (48.9%), 48 (25.8%), 39 (20.9%), and eight people (4.4%) were with transglottic cancer, supraglottic cancer, glottis involvement, and subglottic cancer, respectively. Also had 81% of patients were in the third stage and 19% of the patients were in the fourth stage. The completion of treatment causes to patient backs to a normal situation. In patients with advanced laryngeal cancer the total laryngectomy surgery affects the patients' quality of life and their family and friends. Regarding the status of the eating and speaking and happiness the process of returning the patient to a normal situation can be better by completing the treatment.

Key words: Laryngeal cancer; Total laryngectomy; Quality of life, QLH&NC-35 Scale.

The head and neck cancers in the United States include about 4% of the neoplasm that can be detected annually. While the most common risk factors for these cancers are tobacco and alcohol

consumption, each individual may be at risk for the disease¹.

Laryngeal cancer is the most common malignant tumor of upper digestive and respiratory system². During recent years, the ratio of male to female in the incidence of laryngeal cancer has been dropped from 15:1 to 5:1 ratio due to the increase in tobacco use and environmental carcinogenic exposures among women.

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Furthermore, laryngeal cancer has been seen in the black race twice the white race while the disease in the black race is often diagnosed in the later stages^{2, 3}.

Advanced laryngeal cancer surgery often includes a total laryngectomy that has a lot of functional and anatomical consequences including changes in sound quality, speech and communication intelligibility of the patients^{3,4}.

In addition, the postoperative total laryngectomy in advanced stage laryngeal disease, upper airway can no longer do the physiological and functional task because the upper and lower airways can be separated and this can lead to the changes in the clinical, cytological and histological features of the nasal mucosa; thus, the nasal mucosa is gradually thinner and its color will change⁴. If patients, who undergo surgery due to laryngeal cancer, have no cervical lymph node metastasis, will have a good prognosis. The studies that have been conducted in the field of the laryngeal cancer often focused on the survival of patients and their talking, in particular, variables related to speaking such as speech intelligibility, quality and volume of sound. The emphasis on the voice of patients as a factor in their quality of life is understandable. In addition to the sound other factors also are notable in quality of life of patients. The probability of survival of the patient is considered the most important factor in the health plan^{4,12}. The idea is noted that the quantity of sound is more important than the sound quality in these cases. It is known that change or removal of the larynx not only affects all aspects of life of patients, but also affects the lives of those around them⁵. The objective of this study was to assess the quality of life of patients after surgery with the help of the common procedures.

MATERIALS AND METHODS

In this descriptive cross-sectional study 186 patients who had been diagnosed as having laryngeal cancer and undergone laryngectomy surgery during 1995 to 2007 in two hospitals in Ahvaz: Imam Khomeini and Apadana, were assessed in terms of quality of life after surgery. After surgery, patients underwent a radiation therapy of 6000 rad in 30 sessions for six weeks. Tools used for collecting data were the EORTC Scale QL-C30 and the QLH&NC-35 Scale version 3. The questionnaire was given to the patient in four stages: The first stage at the time of diagnosis of laryngeal cancer; the second stage in half of radiotherapy after the operation; the third stage three months after the completion of the process of treatment; and the fourth stage six months after completion of treatment. All patients, who have passed the above four stages, have been included in the study. The study has been approved by the Ethics Committee of the University. The desired variables in the evaluation of the quality of life after the total laryngectomy included age, sex, eating, speaking, and happiness. Statistical analysis was conducted using SPSS16; furthermore, qualitative assessment and quantitative evaluation were conducted using Chi square test and t- test, respectively.

RESULTS

In this study, out of the 186 patients studied 169 (90.86%) and 17 people (9.14%) were male and women, respectively. The age range of these patients was from 28 to 90 years and with a mean age of 63 years. Of the 186 cases investigated in our study 91 (48.9%), 48 (25.8%), 39 (20.9%),

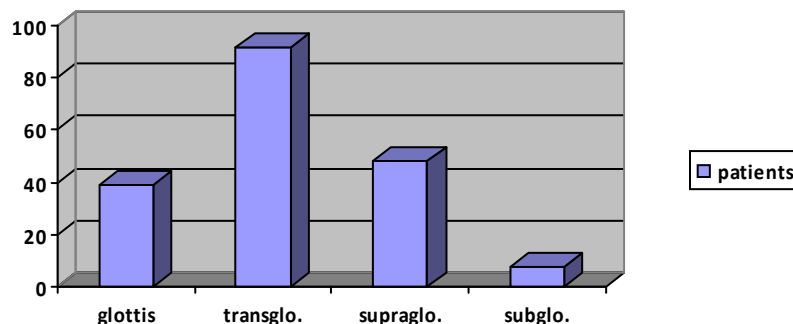


Fig. 1. Frequency distribution according to the anatomical location of laryngeal cancer in patient

and eight patients (4.4%) were with transglottic cancer, supraglottic cancer, glottis involvement, and subglottic cancer, respectively (figure 1). Also had 81% of patients were in the third stage and 19% of the patients were in the fourth stage. A total of 165 patients (88.7%) were smoker and out of which 104 cases (55.9%) reported a history of

addiction to cigarette smoking over 30 years. 126 people (67.7%) of them used more than one pack of cigarettes per day (20 cigarettes). Three patients (1.6%) had a history of alcohol abuse. In 48 cases (25.8%) the cervical lymph node metastasis were observed. With regard to the quality of life, tables 1, 2 and 3 show the state of eating, speech and

Table 1. Quality of life after total laryngectomy surgery and radiotherapy in terms of eating status

	Time of disease diagnosis Number of patients	Half of Radiation Therapy Number of patients	Three months after treatment Number of patients	Six months after treatment Number of patients
Loss of appetite	21	142	41	14
Nausea, vomiting	9	69	23	11
Eating taste sensations	174	10	38	68
Constipation	12	89	34	18
Dryness of the mouth	15	179	152	29
Swallowing solids	21	65	23	19
Swallowing liquids	2	27	18	12
Cough	25	120	74	15

Table 2. Quality of life after total laryngectomy surgery and radiotherapy in terms of eating status

Variability of speech signals	Time of disease diagnosis Number of patients	Half of Radiation Therapy Number of patients	Three months after treatment Number of patients	Six months after treatment Number of patients
Hoarseness	174	-	-	-
The lack of the ability to communicate	6	34	17	10
The lack of the ability to use the phone	11	158	101	61
Having an understandable sound	149	98	106	127
The use of hand gestures	8	96	42	32

Table 3. Quality of life after total laryngectomy surgery and radiotherapy for happiness

	Time of disease diagnosis Number of patients	Half of Radiation Therapy Number of patients	Three months after treatment Number of patients	Six months after treatment Number of patients
Communication problems with family	14	112	83	20
Communication problems with friends	13	128	53	24
Desire to leave home	175	31	87	165
The consent of the disposition of their appearance	177	86	109	161
Participation in the party	168	20	45	145
Employment	152	4	46	101

happiness. According to the tables, to return the patient to a normal state or the completion of treatment gets better.

DISCUSSION

In a study conducted in 1995 at the University of Minnesota, Olsen *et al.* examined the quality of life in 172 patients who underwent the laryngeal cancer surgery⁶. The patients were divided into three groups: total laryngectomy (n= 111), near- total laryngectomy (n= 38), and partial laryngectomy (n= 23). Surgical success was measured by factors of working, activity, family and marital and sexual relationships, and psychological condition such as stress and anxiety. In this study, two questionnaires were used. Except in one case i.e. occupational factor, no difference was seen between three mentioned groups in terms of a state of mental balance in illness using Psychosocial Adjustment to Illness Scale (PAIS) and Mayo Clinic Post-laryngectomy Questionnaire (MCPLQ). Patients who have been undergone total laryngectomy had a status better than group, which underwent a near- total laryngectomy. In general, both total and near- total laryngectomy had a situation worse than the group that had not undergone surgery⁷. As well as the results of this study showed that the quality of life and the quality of the talking are not same together and a change in sound quality is associated with quality of life; the measurement of quality of life is not standardized and requires additional studies and also the success rate in the treatment of cancer is not specified with survival⁸. Our study had been performed only among patients who had total laryngectomy and quality of life before, during and three and six months after treatment was evaluated in terms of happiness and eating and speaking. In a study conducted in the United States in 2007 Woodard *et al.* assessed the clinical and functional outcomes and quality of life in patients who underwent total laryngectomy. Also, In this study, the role of preoperative variables, including age, sex, disabilities associated, chemotherapy or radiotherapy before laryngectomy, as well as the location and size of the tumor on long-term survival and quality of life of patients, was investigated. In this study, 143 patients, who had undergone a total laryngectomy and information related to them was

available in the hospital records, were reviewed. Out of these 91 patients had undergone surgery due to the primary cancer, and 52 patients had undergone surgery due to recurrent laryngeal cancer. In subsequent follow-up, 58 patients were still alive. In this study, the quality of life of patients was assessed using a questionnaire that had been previously validated⁹. The survival of patients was investigated using the Kaplan-Meier method. The results of this study showed that the average survival of these patients has been 23 months. The analysis of the five factors as predictors was significant: place of cancer in the larynx, stage T3, stage N0 to N1, a lack of more than two associated incapacity or absence of cardiovascular complications at the time of cancer diagnosis. The multivariate analysis showed that only stage T as a factor in predicting the survival of patients has been important, whereas tumor location was not significant. For patients who were alive at the time of the study, outcomes for the performance and quality of life in five areas (speaking, eating, social disconnection, beauty and quality of life) were in the stage rate (score of 31 to 69) to high range (score of 70 to 100), respectively. Factors related to patients who were associated with better performance and a higher quality of life for patients included the age above 65 years at the time of diagnosis, absence of more than two associated incapacity, lack of a history of previous chemo-radiation therapy and previous tracheoesophageal puncture. This study also suggests that despite popular belief, most of the patients who underwent laryngectomy are in good condition after surgery^{9,10}. Our study also demonstrated that the quality of life of happiness and eating and speech after surgery was acceptable and satisfied. The mean age of our patients was 63 years and 81% of patients were in the stage . In a study in 2008 Boscolo *et al.* compared the quality of life in patients, who underwent total laryngectomy with voice prosthesis placement and radiotherapy after surgery with quality of life in patients who have been undergone with chemo-radiation therapy for larynx preservation. In this study, Quality-of-Life questionnaire from the *European Organization for Research and Treatment of Cancer-EORTC* was used in order to check the quality of life of patients. The results of this study showed that the rates relating to the physical, social and role functioning

in the group that underwent Chemoradiation, were higher. The overall rating of quality of life in the non-surgical group was higher. The group who had undergone surgery, reported privileges related to sleep disorders, dyspnea and more pain and had more problems in terms of emotions, social relationships and talking. Also the group that underwent chemo-radiation therapy, reported more problems in conjunction with *Xerostomia* and sticky saliva^{3,11}. In our study, patients with total laryngectomy, who underwent postoperative radiotherapy, were studied and quality of life in terms of happiness, eating and speaking during radiotherapy, and three and six months after it was determined that the results showed a remitting process during the time.

To compare quality of life in patients with laryngeal cancer treated with chemo-radiation therapy in Patients treated with total laryngectomy, in this study 42 patients with laryngeal cancer, who were in the stages of three or four of the diseases or underwent chemo-radiation therapy or total laryngectomy, were reviewed and compared according to the information contained in the records. For entry into this study, the patients must be without evidence of relapse and also before entering the study must have been treated at least for three months. A Quality of Life Questionnaire from the EORTC was used to check the quality of life of patients. According to the results of the study, as a whole no significant differences were observed in terms of the overall score of quality of life between the two groups of patients. In terms of the subscales of functional status, not surgery patients were in a situation better than surgical group; moreover, in terms of sensory problems (smell and taste), use of analgesics and cough the surgical patients were in a worse situation. On the other hand, non-surgical patients were in a worse situation in terms of dry mouth^{7,8}

CONCLUSION

In this study laryngeal cancer as the most common malignant tumor of the upper respiratory and digestive systems was investigated. Advanced laryngeal cancer surgery often include a total laryngectomy that includes a lot of anatomical and functional consequences such as changes in voice quality, intelligibility of speech

and of communications of patients. It has been determined that the change or removal of the larynx not only on all aspects of life affect patients, but also affects the lives of people around them. In this study the quality of life of patients after surgery were investigated.

Most of our patients were male with a mean age of 63 years and a history of high cigarette smoking. The locations of prevalence of involvement were transglottic, supraglottic, glottis and subglottic, respectively. Most patients were in stage . Cervical lymph node metastasis was observed in 25.8% of cases. About the quality of life, eating status, and speaking and happiness, we can say that back to the normal situation of the patient can be better by completing the treatment.

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REFERENCES

1. Deleyiannis FW, Weymuller EA Jr, Coltrera MD, Futran N. Quality of life after laryngectomy: are functional dis- abilities important? *Head Neck* 1999; **21**: 319-324.
2. Scott Major M, Bumpous JM, Flynn MB, Schill K. Quality of life after treatment for advanced laryngeal and hypopharyngeal cancer. *Laryngoscope* 2001; **111**: 1379-1382.
3. Palmer AD, Graham MS. The relationship between communication and quality of life in alaryngeal speakers. *J Speech Language Pathol Audiol* 2004; **28**: 6-24.
4. Armstrong E, Isman K, Dooley P, *et al.* An investigation into the quality of life of individuals after laryngectomy. *Head Neck* 2001; **23**: 16-24.
5. Schuster M, Lohscheller J, Kummer P, Hoppe U, Eysholdt U, Rosanowski F. Quality of life in laryngectomees after prosthetic voice restoration. *Folia Phoniater Logop* 2003; **55**: 211-219.
6. Fung K, Lyden TH, Lee J, *et al.* Voice and swallowing outcomes of an organ-preservation trial for advanced laryngeal cancer. *Int J Radiat Oncol Biol Phys* 2005; **63**: 1395-1399.
7. Zotti P, Lugli D, Vaccher E, Vidotto G, Franchin G, Barzan L. The EORTC quality of life questionnaire-head and neck 35 in Italian

- laryngectomized patients. European organization for research and treatment of cancer. *Qual Life Res* 2000; **9**:1147–1153.
8. Makitie AA, Niemensivu R, Juvas A, Aaltonen LM, Back L, Lehtonen H. Postlaryngectomy voice restoration using a voice prosthesis: a single institution's ten-year experience. *Ann Otol Rhinol Laryngol* 2003; **112**:1007–1010.
 9. DeSanto, L. W., Olsen, K. D., Perry, W. C., Rohe, D. E., & Keith, R. L., Quality of life after surgical treatment of cancer of the larynx. *The Annals of otology, rhinology, and laryngology*, 1995; **104**(10 Pt 1), 763-769
 10. Woodard, T. D., Oplatek, A., & Petruzzelli, G. J., Life after total laryngectomy: a measure of long-term survival, function, and quality of life. *Archives of Otolaryngology–Head & Neck Surgery*, 2007; **133**(6), 526-532
 11. Boscolo–Rizzo, P., Maronato, F., Marchiori, C., Gava, A., Mosto, D., & Cristina, M., Long Term Quality of Life After Total Laryngectomy and Postoperative Radiotherapy Versus Concurrent Chemoradiotherapy for Laryngeal Preservation. *The Laryngoscope*, 2008; **118**(2), 300-306.
 12. Nikakhlagh S, Fakher Rahim, Hatam Boostani , Seyed Taghi Beheshti Shirazi , Saki N. The effect of Adenotonsillectomy on quality of life in adults and pediatric patients . *Research Journal of Biological Sciences*. 2009; **4**(12):1259-1261.