# The employment status of total laryngectomized patients in japan and its association with their QOL

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## Objectives

The purpose of this study is to examine whether those who underwent total laryngectomy are working or not from before surgery to 12 months after discharge from hospital for clarifying its association with their QOL and the change of their QOL.

## Methods

64 patients who underwent total laryngectomy in 3 hospitals in the Kyushu area agreed to participate in the research. Subjects were 26 patients who completed all questionnaire items before surgery and 3, 6, 12 months after discharge from hospital. They were asked about age, sex, QOL, and employment status. Information on their diagnosis and disease stage was collected from their medical record. SF-36v2 was used in the analysis of the QOL data.

**Instrument**: SF-36v2 is a comprehensive QOL scale composed of 8 items: physical functioning (PF), role physical (RP), bodily pain (BP), social functioning (SF), general health perception (GH), vitality (VT), role emotional (RE), and mental health (MH).
We used subscales of SF-36v2 by norm-based scoring (NBS). NBS, which employs a linear T-score transformation with mean = 50 and standard deviation = 10, makes it possible to compare scores for the eight-scale profile.

We also collected descriptive statistics of basic attributes. Norm-Based Scoring (NBS) was used for calculating descriptive statistics of QOL scale scores. Analysis of covariance was conducted with QOL as a dependent variable, and a period and employment status as independent variables ($p < 0.05$). This research was approved by Research Ethics Committees in an institution to which authors belong and in those hospitals surveyed.

## Results

Subjects' average age ,sex , diagnosis and stage were shown Table 1.
Employment status was shown Table 2.

There was no statistically significant difference of QOL between the employed and the unemployed before surgery, 3 and 6 months after discharge from hospital.. There were statistically significant differences between the employed and the unemployed on following items 12 months after discharge from hospital. RP_N and SF_N were 30.8±5.3 and 34.5±4.1 (least square means ± S.E) for the employed and 41.5±3.4 and 46.0±3.1 for the unemployed. (Table3)

SF_N of the employed was 44.1±3.1 before surgery and 29.8±3.8 3 month after discharge from hospital. RP_N of the unemployed was 42.1±4.7 before surgery, 24.2±4.4 3 months after discharge from hospital, and 41.5±3.4 12 months after discharge from hospital. MH_N of the unemployed was 34.4±3.8 before surgery and 51.0±3.0 12 months after discharge from hospital.(Table4,5)

Table1.Characteristics of study participants n=26

| | | mean ± S.D (range) / n(%) |
|---|---|---|
| Age | | 67.3± 8.5（46 - 82） |
| Sex | Male | 23(88.5) |
| | Female | 3 (15.5) |
| Diagnosis | Cancer of larynx | 10 (38.5) |
| | Cancer of hypopharynx | 11 (42.3) |
| | Cancer of cervical esophagus | 5 (19.2) |
| Staging | Stage Ⅰ | 2 ( 7.7) |
| | Stage Ⅱ | 3 (11.5) |
| | Stage Ⅲ | 9 (34.6) |
| | StageⅣ | 12 (46.2) |

Table2. Employment status n=26

| | preoperation | 3months after discharge | 6months after discharge | 12months after discharge |
|---|---|---|---|---|
| | n(%) | | | |
| Employment | 15(57.7) | 9(34.6) | 10(38.5) | 8(30.8) |
| Unemployment | 10(38.5) | 11(42.3) | 16(61.5) | 17(65.4) |
| No respons | 1( 3.8) | 6(23.1) | 0 | 1( 3.8) |

Table3. QOL scores of time and employment status n=26

| | | preoperation | | | 3months after discharge | | | 6months after discharge | | | 12months after discharge | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Employment | Unemployment | p | Employment | Unemployment | p | Employment | Unemployment | p | Employment | Unemployment | p |
| | | n=15 | n=10 | | n=9 | n=11 | | n=10 | n=16 | | n=8 | n=17 | |
| | | least-squares mean ± SE | | | least-squares mean ± SE | | | least-squares mean ± SE | | | least-squares mean ± SE | | |
| QOL | PF_N | 43.9± 4.3 | 36.5± 4.3 | .30 | 36.5± 5.5 | 31.3± 4.1 | .39 | 36.2± 5.5 | 37.6± 3.4 | .83 | 31.7± 5.9 | 42.6± 3.3 | .86 |
| | RP_N | 39.7± 5.3 | 42.1± 4.7 | .75 | 26.9± 5.0 | 24.2± 4.4 | .71 | 28.4± 5.0 | 39.1± 3.5 | .06 | 30.8± 5.3 | 41.5± 3.4 | .04* |
| | BP_N | 52.5± 2.6 | 49.5± 3.3 | .53 | 44.2± 3.2 | 42.8± 3.2 | .78 | 45.8± 3.1 | 47.0± 2.6 | .71 | 48.5± 3.4 | 51.1± 2.6 | .51 |
| | GH_N | 44.3± 2.2 | 47.4± 3.0 | .47 | 44.8± 2.8 | 41.0± 2.9 | .37 | 40.8± 2.6 | 47.4± 2.4 | .07 | 46.9± 3.1 | 47.9± 2.4 | .77 |
| | VT_N | 47.5± 2.9 | 53.0± 3.2 | .30 | 45.5± 3.6 | 43.1± 3.1 | .56 | 46.0± 3.4 | 47.8± 2.6 | .67 | 47.5± 4.1 | 51.2± 2.6 | .39 |
| | SF_N | 44.1± 3.1 | 45.4± 4.0 | .80 | 29.8± 3.8 | 35.9± 3.8 | .34 | 34.5± 3.6 | 40.1± 3.2 | .26 | 34.5± 4.1 | 46.0± 3.1 | .02* |
| | RE_N | 40.3± 4.1 | 38.8± 4.8 | .85 | 31.6± 5.1 | 33.4± 4.5 | .80 | 31.1± 5.1 | 36.0± 3.6 | .38 | 32.1± 5.4 | 42.1± 3.5 | .10 |
| | MH_N | 40.3± 3.2 | 34.4± 3.8 | .36 | 41.1 ± 4.0 | 39.4± 3.6 | .70 | 42.8± 3.8 | 44.3± 3.0 | .77 | 47.6± 4.6 | 51.0± 3.0 | .44 |

*:p<.05, ANCOVA

Table5. QOL scores of unemployed participants

| | | preopertion | 3months after discharge | 6months after discharge | 12months after discharge | p |
|---|---|---|---|---|---|---|
| | | n=10 | n=11 | n=16 | n=17 | |
| | | least-squares mean ± SE | | | | |
| QOL | PF_N | 36.5± 4.3 | 31.3± 4.1 | 37.6± 3.4 | 42.6± 3.3 | .20 |
| | RP_N | 42.1± 4.7 | 24.2± 4.4 | 39.1± 3.5 | 41.5± 3.4 | .01* |
| | BP_N | 49.5± 3.3 | 42.8± 3.2 | 47.0± 2.6 | 51.1± 2.6 | .23 |
| | GH_N | 47.4± 3.0 | 41.0± 2.9 | 47.4± 2.4 | 47.9± 2.4 | .25 |
| | VT_N | 53.0± 3.2 | 43.1± 3.1 | 47.8± 2.6 | 51.2± 2.6 | .12 |
| | SF_N | 45.4± 4.0 | 35.9± 3.8 | 40.1± 3.2 | 46.0± 3.1 | .16 |
| | RE_N | 38.8± 4.8 | 33.4± 4.5 | 36.0± 3.6 | 42.1± 3.5 | .43 |
| | MH_N | 34.4± 3.8 | 39.4± 3.6 | 44.3± 3.0 | 51.0± 3.0 | .01* |

*:p<.05, ANCOVA

Table4. QOL scores of employed participants

| | | preoperation | 3months after discharge | 6months after discharge | 12months after discharge | p |
|---|---|---|---|---|---|---|
| | | n=15 | n=9 | n=10 | n=8 | |
| | | least-squares mean ± SE | | | | |
| QOL | PF_N | 43.9± 4.3 | 36.5± 5.5 | 36.2± 5.5 | 31.7± 5.9 | .37 |
| | RP_N | 39.7± 5.3 | 26.9± 5.0 | 28.4± 5.0 | 30.8± 5.3 | .17 |
| | BP_N | 52.5± 2.6 | 44.2± 3.2 | 45.8± 3.1 | 48.5± 3.4 | .21 |
| | GH_N | 44.3± 2.2 | 44.8± 2.8 | 40.8± 2.6 | 46.9± 3.1 | .49 |
| | VT_N | 47.5± 2.9 | 45.5± 3.6 | 46.0± 3.4 | 47.5± 4.1 | .97 |
| | SF_N | 44.1± 3.1 | 29.8± 3.8 | 34.5± 3.6 | 34.5± 4.1 | .03* |
| | RE_N | 40.3± 4.1 | 31.6± 5.1 | 31.1± 5.1 | 32.1± 5.4 | .40 |
| | MH_N | 40.3± 3.2 | 41.1 ± 4.0 | 42.8± 3.8 | 47.6± 4.6 | .61 |

*:p<.05, ANCOVA

## Conclusions

Total laryngectomy surgery brings about a variety of physical problems such as the loss of vocal function, the change of breathing route by the placement of tracheostomy tubes, the increase of accompanying cough and phlegm, and the changes of swallowing function and physical appearance (Armstrong et al., 2001). It is considered that these physical problems lead to unemployment by causing the loss or restriction of human relations and social contribution. Kotake and others (2006) revealed the problems of the breakdown of social life such as the staying at home without getting in touch with family members which laryngectomized patients face. It is also clarified that the breakdown of social life causes psychological trauma and mental disorder with high frequency (Bussian et al., 2010). These physical, psychological, and social problems lead to the impairment of QOL among those who underwent laryngectomy in a significant way.
This research also showed that RP_N and SF_N among the unemployed were statistically significantly high 12 months after discharge from hospital. This research also showed that RP_N and SF_N among the unemployed were statistically significantly high 12 months after discharge from hospital.
There was a significant difference between SF_N of the employed before surgery and 3 months after discharge from hospital, a period soon after the return to work after surgery. It has been clarified that writing and electrolarynx speech were most used as a communication method during this period (Kotake et al., 2012). Yet, these communication tools are not considered to be effective in creating working relationship with other workers.
There was a significant difference between RP_N of the unemployed before surgery and 3 months after discharge from hospital, and between 3 months and 12 months after discharge from hospital. Around 3 months after discharge from hospital they start to reconstruct their lives without support from medical professionals. This lack of support is considered to lead to a drop of RP among patients who continue to stay home without working outside. MH_N was the lowest before surgery and improved gradually. It is expected that the unemployed tend to be housebound, therefore, medical professionals must provide sustained support since before surgery. There are few longitudinal data on this subject, therefore, we need to continue to study the process in a sustained research project.

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