



Change Tendency of Postoperative Symptoms in Thyroid Cancer Patients

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Abstract

Background: Tian Zhang is the correspondence author, not the first author. The correct first author is Yuan Tang. At the same time, please refer to the screenshot for the author order of the proof version we returned.

Objectives: This study aimed to detect the health-related quality of life (HRQoL) of thyroid cancer (TC) patients and analyze the change tendency of TC patients' reported symptoms after surgery.

Methods: A total of 102 TC patients who underwent thyroid surgery from September 2020 to January 2021 were included in this study and received a survey on HRQoL and disease-specific symptoms 1 month and 3 months after the surgery.

Results: Almost all the patients experienced TC-specific symptoms after the surgery. The top 5 reported complaints 1 month after surgery were throat/mouth problems, voice problems, neuromuscular problems, concentration problems, and less interest in sex. However, 3 months post-operation, less interest in sex was the top reported complaint, followed by throat/mouth problems, voice problems, psychological problems, neuromuscular problems, and concentration problems. Meanwhile, the scores of most specific symptoms decreased with an increase in postoperative time, whereas the scores of less interest in sex increased. Fatigue, insomnia, and dyspnea were the most often reported common cancer-related symptoms for TC patients 1 and 3 months after the surgery. The scores of fatigue were much lower 3 months after post-operation than 1 month after the surgery.

Conclusion: Throat/mouth problems, voice problems, neuromuscular problems, concentration problems, less interest in sex, and fatigue were the important patient-reported complaints that need more attention after the surgery.

Keywords: Complains, Health-related quality of life, Symptom, Surgery, Thyroid cancer

1. Background

The incidence of thyroid cancer (TC), as the most common endocrine malignant tumor, has been increasing all over the world (1). Surgery, including total thyroidectomy and unilateral lobectomy, is the main treatment for TC. Radioiodine is also an important treatment strategy to ablate the remaining tissues after surgery (2, 3). Furthermore, the replacement therapy of thyroxine is required for most of the patients with total thyroidectomy and a small number of patients with unilateral lobectomy to suppress the thyrotropin levels and reduce the recurrence risk (4). However, postoperative symptoms, such as nausea, vomiting, dizziness, cough, pain, and numbness of hands and feet, may occur in patients, which not only brings discomfort to the patient's body but also increases the psychological burden on the patients and seriously affects their quality of life (QoL).

Previous studies have detected the postoperative health-related quality of life (HRQoL) of TC survivors. Husson et al. compared the HRQoL of TC patients with that of age- and sex-matched normative subjects and found that TC patients experienced worse

HRQoL, compared to the normative population (3). Similarly, Goldfarb et al. estimated TC-specific QoL in female TC patients and the normal subjects (5). As expected, female TC patients had lower HRQoL and more symptoms (5). Lan et al. compared the HRQoL of patients with papillary thyroid microcarcinoma (an excellent prognosis type of TC) when undergoing total thyroidectomy and unilateral lobectomy and reported that unilateral lobectomy offered an advantage over total thyroidectomy in terms of HRQoL (4). However, to the best of our knowledge, very few studies have demonstrated the change tendency of TC patients' reporting symptoms after surgery so far.

In this study, two validated questionnaires were used to detect the HRQoL of TC survivors, through which the change tendency of TC patients' reported symptoms after surgery was analyzed.

2. Objectives

The present study aimed to improve the understanding of symptoms after TC operation and provide a reference for effective symptom management.

3. Methods

3.1. Patients

The statistical population of this study consisted of 102 TC patients undergoing thyroid surgery in our hospital from September 2020 to January 2021. The inclusion criteria were being diagnosed by TC and confirmed by postoperative pathology, having the ability to complete the questionnaires, being 18 years or older, lacking imaging evidence of extrathyroidal invasion or distant metastasis, and being voluntary to participate in the study. On the other hand, the patients who had cognitive impairment, mental illness, serious chronic diseases, or other cancers were excluded from the study.

The patients included in this study had undergone an operation by the same surgical team in our hospital. The surgeons had the experience of TC surgery for more than 20 years. Surgical procedures included total thyroidectomy and unilateral lobectomy.

3.2. Ethical considerations

The study was approved by the Institutional Review Board of Cancer Hospital affiliated with the Medical College of University of Electronic Science and Technology, Sichuan Cancer Control Center, China, in accordance with the provisions of the Declaration of Helsinki. Informed consent was obtained from all patients included in the study.

3.3. Questionnaires

3.3.1. Thyroid cancer-specific quality of life questionnaire

The thyroid cancer-specific quality of life questionnaire (THYCA-QOL) is a TC-specific HRQoL developed by Husson et al. (6). This 24-item instrument measure seven symptom domains and six single scales. The time frame determined for the sexual interest item is the last 4 weeks. For other items, the time frame is the last week. The items are scored on a 4-point Likert scale (from 1=not at all to 4=very much). Using the linear transformation, the scores of all items are obtained at the range of 0-100, with a higher score representing more thyroid-specific symptoms (6).

3.3.2. EORTC QLQ-C30

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30) is a questionnaire to measure cancer-specific HRQoL (7). This 30-item questionnaire includes a global quality of life scale, five functional scales, three symptom scales, five single items to assess common symptoms, and an item to measure the financial impact of the disease. Items 1-28 are rated on a 4-point Likert scale (from 1=not at all to 4=very much). The last two items are scored on a 7-point Likert scale (from 1=very poor to 7=excellent). The scores of all items are linear-

transformed to a 0-100 scale. For the functional scale, higher scores mean better QoL; however, for the symptom scales, higher scores mean lower QoL (8).

3.4. Data collection

All TC patients enrolled in this study completed the above two questionnaires 1 and 3 months after the surgery. Our study team arranged for the researchers to help the patients fill in the questionnaires and ensure that the questionnaires were completed at the correct time. Furthermore, demographic information, such as age, gender, educational level, occupational status, marital status, and surgical method, was also collected.

3.5. Statistical analysis

The data were analyzed in SPSS 23.0 software in this study. The continuous data were expressed as the mean and standard deviation (SD). The categorical data were presented as numbers and percentages. The scores of symptoms measured 1 month and 3 months after the surgery were compared by Wilcoxon signed-rank test. The p-values of < 0.05 were considered statistically significant.

4. Results

4.1. Participants' characteristics

All included 102 patients completed this study, among whom, 73 (71.57%) and 29 (28.43%) cases were female and male, respectively. The mean age of these patients was estimated at 41.76 ± 11.96 years. Regarding the educational level, 29 (28.43%), 19 (18.63%), and 54 (52.94%) subjects had an education background of middle school or lower, graduated from high school, and graduated from junior college or above, respectively. Considering surgery methods, 75 (73.53%) patients had undergone total thyroidectomy, while 27 (26.47%) cases had undergone unilateral lobectomy. Furthermore, most of the patients (96.08%) received levothyroxine supplementation after surgery. The general data of the 102 patients are presented in [Table 1](#).

4.2. Thyroid cancer-specific symptoms

The TC-specific symptoms were measured by THYCA-QOL. As shown in [Table 2](#), all the patients experienced TC-specific symptoms 1 month after the surgery. The top 5 reported complaints were throat/mouth problems (70.59%), voice problems (70.59%), neuromuscular problems (57.84%), concentration problems (52.94%), and less interest in sex (47.06%). After 3 months of surgery, 101 out of 102 (99.02%) patients experienced different degrees of TC-specific symptoms. Less interest in sex (69.61%), throat/mouth problems (67.65%), voice problems (65.69%), psychological problems (54.90%), neuromuscular problems (37.25%), and

Table 1. Demographic information of participants (n=102)

Characteristics	Results
Age, years, mean	41.76±11.96
Gender n (%)	
Male	29 (28.43)
Female	73 (71.57)
BMI, kg/m², mean	23.70±5.75
Education level, n (%)	
Middle school or lower	29 (28.43)
High school	19 (18.63)
Junior college or above	54 (52.94)
Marital status, n (%)	
Married/partner	83 (81.37)
Living alone	19 (18.63)
Employment status, n (%)	
Employed	77 (75.49)
Unemployed	25 (24.51)
Place to live, n (%)	
Urban	71 (69.61)
Rural	31 (30.39)
Comorbidity (self-report), n (%)	
None	74 (72.55)
1	20 (19.61)
≥2	8 (7.84)
Surgical method, n (%)	
Total thyroidectomy	75 (73.53)
Unilateral lobectomy	27 (26.47)
Type of thyroid cancer, n (%)	
Papillar	92 (90.20)
Follicular	9 (8.82)
Medullary	1 (0.98)
Levothyroxine supplementation, n (%)	
No	4 (3.92)
Yes	98 (96.08)

BMI: Body mass index

concentration problems (37.25%) were the most often reported complaints. The number of patients with symptom scores of ≥ 50 is depicted in Figure 1. Whether the TC-specific symptoms were measured 1 month or 3 months after the surgery, voice problems were the TC-specific symptoms that affected most of the patients with scores of ≥ 50 (Figure 1).

A decrease was observed in the scores of neuromuscular problems (P=0.001), voice problems (P=0.018), concentration problems (P<0.001), sympathetic problems (P=0.041), throat/mouth problems (P=0.005), sensory problems (P=0.001), chilly feeling (P=0.033), tingling hands/feet (P=0.005), and headaches (P=0.040) 3 months after the surgery, while the scores of less interest in sex (P<0.001) increased, compared to the scores measures 1 month after the surgery. The scores of psychological problems, weight gain, and scar problems were not significantly different between the two time periods.

4.3. Cancer-related symptoms and Health-related quality of life

The EORTC QLQ-C30 was used to measure cancer-related symptoms among the 102 patients. The physical, role, emotional, cognitive, and social functional scores measured 1 month after the surgery were not significantly different from those measured 3 months post-operation (P>0.05). No differences

Table 2. Mean scores of thyroid cancer patients on THYCA-QoL scales 1 and 3 months after surgery

THYCA-QoL scales	1 month after surgery	3 months after surgery	P-value
Neuromuscular	8.47±8.62	5.50±8.11	0.001
Voice	24.75±22.43	21.29±20.83	0.018
Concentration	13.86±14.35	7.92±11.20	<0.001
Sympathetic	8.42±14.64	5.61±11.12	0.041
Throat/mouth	13.86±12.00	11.44±10.82	0.005
Psychological	8.33±11.36	7.67±9.18	0.348
Sensory	9.41±15.17	5.61±11.37	0.001
Problems with scar	12.54±25.32	10.56±24.00	0.075
Chilly feeling	10.89±22.66	6.93±15.14	0.033
Tingling hands/feet	5.61±12.53	3.30±10.00	0.005
Weight gain	10.26±16.06	10.89±17.07	0.621
Headaches	2.97±9.54	1.32±6.53	0.040
Less interest in sex	17.82±20.31	26.40±19.62	<0.001

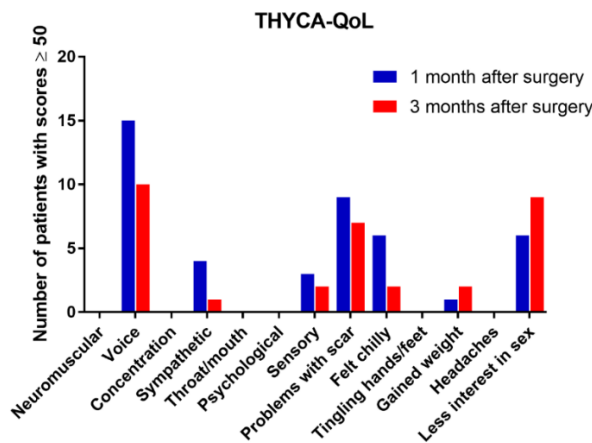


Figure 1. Number of patients with THYCA-QoL symptom scores of ≥ 50

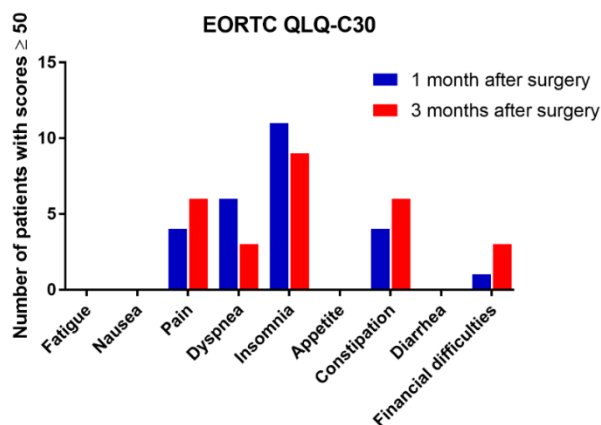


Figure 2. Number of patients with EORTC QLQ-C30 symptom scores of ≥ 50

Table 3. Mean scores of thyroid cancer patients on EORTC QLQ-C30 scales 1 and 3 months after surgery

EORTC QLQ-C30 scales	1 month after surgery	3 months after surgery	P-value
Functioning*			
Global health	76.30±14.65	76.73±13.74	0.850
Physical functioning	97.40±6.04	97.83±6.16	0.601
Role functioning	96.10±11.44	95.45±10.34	0.381
Emotional functioning	92.31±9.82	91.67±11.31	0.513
Cognitive functioning	91.77±13.59	90.39±15.03	0.320
Social functioning	97.19±9.90	97.19±10.20	0.964
Symptoms**			
Fatigue	9.81±11.67	7.50±11.02	0.017
Nausea	0.87±4.60	1.95±6.60	0.248
Pain	6.06±14.54	6.93±15.38	0.523
Dyspnea	10.82±19.07	11.69±17.74	0.850
Insomnia	16.45±23.95	18.18±21.99	0.907
Appetite	2.16±8.26	3.03±9.64	0.655
Constipation	6.93±16.52	8.23±18.06	0.248
Diarrhea	2.60±8.99	3.03±9.64	0.655
Financial difficulties	6.06±14.02	6.93±15.01	0.180

*Higher scores indicate better functioning; **Higher scores indicate more symptoms.

were observed in general health scores ($P>0.05$). Regarding the symptom scores, TC patients had significantly lower fatigue scores 3 months after the surgery than 1 month post-operation ($P=0.017$). The other symptoms, including nausea, pain, dyspnea, insomnia, appetite, constipation, diarrhea, and financial difficulties, showed no differences between the two time periods. After 1 month of the surgery, the top 3 reported cancer-related symptoms were fatigue (48.14%), insomnia (40.20%), and dyspnea (29.41%). The top 3 reported symptoms were also fatigue (43.88%), insomnia (41.06%), and dyspnea (35.29%) after 3 months of surgery. Nevertheless, the number of patients with fatigue seemingly decreased 3 months post-operation. For each symptom, the proportion of patients with symptom scores of ≥ 50 was highly low (Figure 2). Insomnia was the symptom that affected most patients with scores of ≥ 50 after 1 month or 3 months of the surgery as is shown in Table 3 and Figure 2.

5. Discussion

To the best of our knowledge, this was the first

study to assess postoperative symptoms and HRQoL in TC patients using the EORTC QLQ-C30 and THYCA-QOL questionnaires. The EORTC QLQ-C30 is one of the most widely used tools for quality of life assessment that was first developed in Europe and has been used in approximately 3,000 studies worldwide since its development (9), but there are few studies on the application of TC (10). In the present study, the EORTC QLQ-C30 was employed to measure the cancer-related symptoms and HRQoL of TC patients after the surgery. It was revealed that fatigue, insomnia, and dyspnea were the most often reported symptoms 1 and 3 months post-operation. Nonetheless, the degrees of these symptoms were not severe; accordingly, the proportion of patients with symptom scores of ≥ 50 was highly low. It was also found that the fatigue scores were much lower 3 months after the surgery than 1 month post-operation. In this study, fatigue was the most common postoperative symptom of TC patients, which had a significant impact on their quality of life. Fatigue has been reported as one of the long-term side-effects of cancer treatment (11). High levels of fatigue have been reported to be associated

with decreased HRQoL in cancer survivors (12). For TC patients, post-treatment fatigue is also one of the most frequent complaints (13, 14). The results of a study conducted on 2,584 patients after TC in the United States showed that 38.2% of the patients felt decreased energy and 50.7% of them felt moderate to severe fatigue (13). The malignancy and its treatment may result in the occurrence of fatigue. In addition, psychological distress may also contribute to the severity of fatigue (15). However, the etiology of post-treatment fatigue is not clear currently. In this study, our results indicated that the symptoms of fatigue might be relieved with the increase of postoperative time. In addition to cancer-related symptoms, TC also has its specific symptoms (6). Although TC-specific symptoms can be diminished over time, they remain long after treatment (3). In the study conducted by Husson et al., neuromuscular, concentration, sympathetic, and sensory problems were the most often reported postoperative TC-specific complaints that were related to thyroid dysregulation (3). These specific problems were strongly associated with the symptom of fatigue (12). Goldfarb et al. showed that young TC patients complained more about symptoms related to psychological issues. Headaches, chilliness, and scar problems were also common complaints (16). Based on the findings of a study carried out by Choi et al., the problem with scar affected HRQoL of TC patients negatively in the first year after the surgery (17).

In this study, the THYCA-QoL questionnaire was used to evaluate TC-specific complaints after the surgery. Our results showed that almost all 102 patients experienced TC-specific symptoms post-operation. The top 5 reported complaints after 1 month of surgery were throat/mouth problems, voice problems, neuromuscular problems, concentration problems, and less interest in sex. However, 3 months after surgery, the top 5 complaints had some changes; regarding, less interest in sex was the top reported complaint, followed by throat/mouth problems, voice problems, psychological problems, neuromuscular problems, and concentration problems. Meanwhile, the scores of most specific symptoms decreased with an increase in postoperative time, while the scores of less interest in sex increased. To be less interested in sex is a reflection of psychological problems. It has been reported that increased scores of less interest in sex were related to the fear of cancer recurrence or metastasis (6). Therefore, it is also necessary to carry out psychological interventions for TC patients after surgery.

The innovation of this study was that the EORTC QLQ-C30 scale was used to analyze the trend of postoperative symptoms of TC patients and the analysis of TC-specific symptoms after the surgery. The present study had several limitations. First, the follow-up time was short. The long-term analysis of the change tendency of TC patients' reported

symptoms after surgery warrants further investigation. Second, the number of patients entered into our study was not enough and all patients in this study were from one hospital in China, which might have led to selection bias. Finally, only two questionnaires were used to evaluate the HRQoL of patients; therefore, it is recommended to use more tools in this field in further studies.

6. Conclusion

In this study, EORTC QLQ-C30 and THYCA-QoL questionnaires were employed to evaluate the symptoms and HRQoL of TC patients 1 and 3 months after the surgery. Fatigue was the most often reported common cancer-related symptom. Throat/mouth problems, voice problems, neuromuscular problems, concentration problems, and less interest in sex were the most often reported TC-specific symptoms. The above symptoms are important patient-reported complaints that need more attention after the surgery.

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Footnotes

Ethics approval and consent to participate: This study was conducted in accordance with the declaration of Helsinki and was performed with the approval of the Ethics Committee of Cancer Hospital affiliated to the Medical College of University of Electronic Science and Technology/Sichuan Cancer Control Center (NO.: SCCHE-02-2021-044). Written informed consent was obtained from all participants.

Authors' contributions: (I) Conception and design: Tang Y.

(II) Administrative support: Zhang Y. and Que Y.W.

(III) Provision of study materials or patients: Lin D. and Qiao D.

(IV) Collection and assembly of data: Zhang T., Yang X.T., and Zhao J.F.

(V) Data analysis and interpretation: Zhang Y.J., Wang G.R., and Wang Z.H.

(VI) Manuscript writing: All authors

(VII) Final approval of manuscript: All authors

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