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Original study

A comparison of patients who made total and subtotal thyroidectomy due to benign multinodular goitre in terms of long-term quality of life results

Benign multinodüler guatr nedeni ile total ve subtotal tiroidektomi yapılan hastalarda uzun dönem hayat kalitesi sonuçları açısından karşılaştırılması

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ABSTRACT

In the literature, the subject of which of total thyroidectomy or subtotal thyroidectomy should be preferred; It is usually in the direction of complications of surgery, disease recurrence and treatment of incidental malignancies. However, there is no study in the literature comparing these two surgical methods in terms of their effects on quality of life. The aim of this study; To compare the long-term quality of life outcomes of patients who underwent total and subtotal thyroidectomy for benign multinodular goiter in our clinic.

In this study, 191 patients who underwent total and subtotal thyroidectomy for benign multinodular goiter (MNG) were analyzed cross-sectionally. Patients who developed permanent nerve damage, had an incidental malignancy, were operated for thyrotoxicosis, and had co-morbidities that would affect their quality of life were excluded from the study. 57 patients who agreed to participate in the study and met the criteria were included in the study. Total thyroidectomy was performed in 30 of 57 patients (52.6%), subtotal thyroidectomy was performed in 27 (47.4%), 51 women (89.5%), 6 men (10.5%), age their mean was 49.5±12.8. The mean follow-up period of the patients was approximately 3.5 years. The patients' quality of life was evaluated with the SF-36 form, and their anxiety and depression status was evaluated using the Hospital Anxiety and Depression Scale.

In the comparison of both groups of patients, a statistically significant difference was observed between the quality of life scale and the hospital depression scale ($p<0.05$). There was no difference in terms of hospital anxiety scale.

The significant decrease in the quality of life in patients after total thyroidectomy and the significant increase in the anxiety-depression measurement reveals the necessity of re-discussing these surgical options from these perspectives.

Keywords: Multinodular goiter; quality of life; thyroidectomy

ÖZET

Literatürde total tiroidektomi ile subtotal tiroidektomi ameliyatlarından hangisinin tercih edileceği konusu; genellikle ameliyatın komplikasyonları, hastalık nüksü ve insidental malignitelerin tedavisi yönünde olmak-

tadır. Ancak bu iki ameliyat yöntemini hayat kalitesine etkileri açısından karşılaştıran bir çalışma literatürde mevcut değildir. Bu çalışmada amaç; kliniğimizde benign Multinoduler Guatr nedeni ile total ve subtotal tiriodektomi yapılan hastaların uzun dönem hayat kalitesi sonuçlarını karşılaştırmaktır.

Bu çalışmada, benign multinoduler guatr nedeniyle total ve subtotal tiroidektomi yapılan 191 hasta, kesitsel olarak olarak incelendi. Kalıcı sinir hasarı gelişen, insedental malignite tespit edilen, tirotoksikoz nedeniyle opere edilen ve yaşam kalitesini etkileyecek yandaş hastalıkları olan hastalar çalışma dışı tutuldu. Çalışmaya katılmayı kabul eden ve kriterlere uyan 57 hasta çalışmaya dahil edildi. 57 hastanın 30'una total tiroidektomi (%52,6), 27'sine subtotal tiroidektomi (%47,4) yapıldı, 51'i kadın (%89,5), 6'sı erkek (%10,5), yaş ortalamaları 49,5±12.8 idi. Hastaların ortalama takip süreleri yaklaşık 3,5 yıl idi. Hastaların yaşam kalitesi SF-36 formu ile, anksiyete ve depresyon durumu Hastane Anksiyete ve Depresyon ölçeği kullanılarak değerlendirildi.

Her iki grup hastanın karşılaştırılmasında yaşam kalitesi ölçeği ve hastane depresyon ölçeği arasında istatistiksel olarak anlamlı fark gözlendi ($p<0,05$). Hastane anksiyete ölçeği açısından ise fark saptanmadı.

Total tiroidektomi sonrası hastalarda hayat kalitesindeki anlamlı düşüş ve anksiyete depresyon ölçümündeki anlamlı yükseliş bu ameliyat seçeneklerinin bu açılardan tekrar tartışılma gereğini ortaya koymaktadır.

Anahtar kelimeler: Multinoduler guatr; hayat kalitesi; tiroidektomi

INTRODUCTION

Thyroidectomy, the surgical removal of the thyroid for malignant or benign reasons, is one of the most common operations performed in general surgery wards. Since the beginning of thyroid surgery, complication rates have reached their lowest level, thanks to the great contributions of the only Nobel Prize-winning General Surgeon Teodor Kocher. Although thyroidectomy complications are low in percentage, when complications occur, they can reduce the quality of life of postoperative patients (1).

There are various operation depending on the existing thyroid disease and indication. Bilateral subtotal thyroidectomy is performed in the absence of malignancy in patients with benign MNG. However, the current approach is total thyroidectomy due to the high recurrence rate after bilateral subtotal thyroidectomy, unpredictable carcinoma detection rate of 3-16% and more complications in recurrence operations. The tendency towards total thyroidectomy has increased in clinics over time (2-5).

In the literature, the issue of which of these two surgical methods should be preferred is; It is generally related to complications of surgery, disease recurrence and treatment of incidental malignancies. However, there is no study in the literature comparing these two surgical methods in terms of their effects on quality of life. The aim of this study is; To compare the long-term anxiety depression scores and quality of life results of patients who underwent total and subtotal thyroidectomy due to benign MNG in our clinic.

MATERIAL and METHOD

In this study, 191 patients who underwent total and subtotal thyroidectomy due to benign diseases in the 3rd General Surgery Service of Haydarpaşa Numune Training and Research Hospital between 2002 and 2008 were retrospectively examined.

Preoperatively, the blood calcium, phosphorus, free T3 (FT3), free T4 (FT4), thyroid stimulating hormone (TSH) and biochemistry values of these patients were measured. Thyroid ultrasound (USG) was performed and thyroid nodules were evaluated by fine needle aspiration biopsy (FNAB). Recurrent laryngeal nerve functions of all our patients were evaluated before surgery.

Patients with thyroid malignancy, parathyroid disease, and renal failure were excluded from the study during preoperative evaluation. Patients who were detected to be hyperthyroid were made euthyroid with antithyroid drugs.

The operation was performed with a Kocher necklace incision under general anesthesia following preoperative preparation. Calcium levels of the patients were checked on the first postoperative day, the presence of hypocalcemia symptoms was evaluated, in the presence of hoarseness, Otolaryngology–Head and Neck Surgery was consulted. The patients were evaluated with outpatient clinic controls in the postoperative period, FT3, FT4, TSH and calcium levels were checked. Patients with persistent hypocalcemia for more than 6 months-1 year were considered to have permanent hypoparathyroidism.

In the study, patients who underwent total and subtotal thyroidectomy were evaluated as two groups. These patients were evaluated in terms of permanent and temporary hypoparathyroidism, recurrent laryngeal nerve (RLN) damage, necessity of thyroid drug replacement in the postoperative period, postoperative hematoma development, and incidental malignancy detection.

People who developed permanent nerve damage, were incidentally diagnosed with malignancy, were operated on due to thyrotoxicosis, and had comorbid diseases that would affect their quality of life were excluded from the study. 57 people who agreed to participate in the study and met the criteria were included in the study. The patients' quality of life was evaluated using the SF-36 form, and their anxiety and depression status was evaluated using the Hospital Anxiety and Depression scale.

Statistical analysis

SPSS 16.0 package program was used for statistical analysis of the data. While evaluating the

study data, Pearson chi-square test was used to compare qualitative data as well as descriptive statistical methods (frequency, percentage, mean, standard deviation). In pairwise group comparisons, if it passed the homogeneity test, the Student-t test, one of the parametric tests, was used, and if it did not pass, the Mann-Whitney U test, one of the nonparametric tests, was used. It was considered statistically significant if $p<0.05$.

RESULTS

125 patients out of 191 were reached. People who developed permanent nerve damage, were incidentally diagnosed with malignancy, were operated on due to thyrotoxicosis, and had comorbid diseases that would affect their quality of life were excluded from the study. 57 patients who accepted to participate in the study and fulfilled the criteria were included in the study.

Total thyroidectomy (52.6%) was performed in 30 of 57 patients, and subtotal thyroidectomy (47.4%) was performed in 27 patients. Of the patients participating in the study, 51 were women (89.5%) and 6 were men (10.5%). The average age of the patients was 49.5±12.8 years. 2 of the patients were high school graduates (3.5%), 18 were secondary school graduates (31.57%), and 37 were primary school graduates (64.9%). The average follow-up period of the patients was approximately 3.5 years. Gender, age, education level and follow-up periods of the patients were compared, it was observed that there was no statistically significant difference between both groups ($p>0.05$) (Table 1).

The groups were compared using the SF-36 form and the Hospital Anxiety and Depression scale. There was no statistically significant difference between the groups in 5 of the 8 parameters in the SF-36 form ($p>0.05$) (Table-2), and a statistically significant difference was detected in 3 of them ($p<0.05$) (Table 3).

There was no statistically significant difference in hospital anxiety scores between the groups ($p>0.05$). However, there was a statistically significant difference between the groups in the Hospital depression scale ($p<0.05$) (Table 4).

DISCUSSION

Benign multinodular goiter (BMNG) is the most common endocrine disease requiring surgical intervention. The appropriate surgery option for BMNG is controversial (3,6,7). Subtotal thyroidectomy has been the most preferred surgical option since Theodore Kocher. Subtotal thyroidectomy was performed to avoid pressure symptoms, cosmetic concerns, and hypothyroidism. However, in long-term follow-up, BMNG recurrence has been found to increase up to 50% (8,9). In addition, it has been determined that a significant portion of patients who underwent subtotal thyroidectomy need thyroid hormone support. In addition, recurrent nerve damage and hypoparathyroidism are common complications after this surgery (6).

Table 1: Demographic characteristics of the patients and postoperative follow-up periods.

	Total n=30	**Subtotal n=27**	**Total**	***p***
Gender (F/M)	28/2	23/4	51/6	*0,317*
Age	50,1±11,6	48,9±14,2	49,5±12,8	*0,724*
Educational status (primary/secondary/ higher education)	22/8/0	15/10/2	37/18/2	*0,183*
Postoperative follow-up period (year)	3,46±0,18	3,25±0,27	3,36±0,21	*0,433*

Table 2: Data analysis of factors that were not statistically significant according to the SF 36 form.

Groups	**Bilateral Total Thyroidectomy (n=30)**	**Bilateral Subtotal Thyroidectomy (n=27)**	*p*
	Mean Median (min-max)	Mean Median (min-max)	
Physical Function	81,666±15,992 85 (45-100)	86,481±21,204 95 (5-100)	*0,063*
Role-Physical	54,166±46,462 62,5 (0-100)	76,851±38,559 100 (0-100)	*0,077*
Social Functioning	71,250±33,339 87,5 (12,5-100)	82,407±28,432 100 (25-100)	*0,129*
Role-Emotional	52,233±46,902 67 (0-100)	67,037±45,326 100 (0-100)	*0,238*
Mental Health	51,766±25,467 50 (8-100)	59,777±22,395 68 (24-96)	*0,214*

Table 3: Data analysis of statistically significant factors according to the SF 36 form.			
Groups	**Bilateral Total Thyroidectomy (n=30)**	**Bilateral Subtotal Thyroidectomy (n=27)**	***p***
	Mean Median (min-max)	**Mean Median (min-max)**	
Bodily Pain	58,466±2,942 61,5 (0-100)	73,222±2,493 74 (31-100)	*0,047*
General Health	35,453±27,227 26,3 (0-92)	52,829±27,077 52 (5-97)	*0,019*
Vitality	44,500±2,620 40 (5-85)	59,629±2,134 65 (5-85)	*0,021*

Table 4: Comparison of hospital anxiety and depression scores of the groups.			
Groups	**Bilateral Total Thyroidectomy**	**Bilateral Subtotal Thyroidectomy**	***p***
	Mean (n=30)	Mean (n=27)	
Hospital Anxiety Scale (HAS)	8,23 ± 1,13	6,25 ± 0,91	***0,297***
Hospital Depression Scale (HDS)	9,04 ± 1,18	5,79 ± 1,05	***0,03***

Subtotal thyroidectomy is also preferred in BMNG. Total thyroidectomy eliminates the risk of recurrence, relieves pressure symptoms and cosmetic concerns as in subtotal thyroidectomy, also treats well-differentiated malignancies that may occur incidentally. However, for a benign disease, total thyroidectomy has been found by some authors to be an unnecessary treatment option due to its more frequent accompanying complications. Due to the advantages of total thyroidectomy, comparative studies with bilateral subtotal thyroidectomy in benign MNG have started to appear in the literature since 1980, and a large number of studies have been conducted on this subject (10).

There are many studies including BMNG recurrence results of surgeries which are less invasive than total thyroidectomy (6). The recurrence frequency increases with the follow-up period. Studies have reported a high recurrence rate in subtotal thyroidectomy (11-14).

When recurrence occurs in patients who underwent subtotal thyroidectomy due to BMNG, completion thyroidectomy is required, which has more complications. One study compared completion thyroidectomy with total thyroidectomy and reported that the frequency of complications was significantly higher in completion thyroidectomy (15).

The incidental cancer rate in specimen examination after thyroidectomy is between 3-16.6% in the literature. The majority of these incidental cancers are micropapillary or microinvasive follicular cancers. While total thyroidectomy is a sufficient treatment in these patients, subtotal thyroidectomy is a condition that requires re-surgical intervention. In addition, pathologies such as Hurthle cell carcinoma, lymphoma or even anaplastic thyroid carcinoma may be encountered in these patients. In this study, it was observed that 4.5% of the patients who underwent total thyroidectomy did not need reoperation due to incidental malignancy, but 3.5% of the patients who underwent subtotal thyroidectomy required reoperation (1,16-19).

In our study, the incidental cancer rate was found to be 7.2%. In the patient group who underwent subtotal thyroidectomy, 2 patients required reoperation for this reason. Long-term voice changes and hypoparathyroidism can cause a serious decrease in quality of life. The acceptable rate of nerve and parathyroid complications in total thyroidectomy has been reported to be 1-2% (20).

There are many studies comparing complications in total thyroidectomy and subtotal thyroidectomy. In some of these studies, it was reported that there was no vocal cord paralysis, and in others, the rate of paralysis was reported to be below 2%. The rate of permanent hypoparathyroidism has been reported to be between 0-10.5% (11,21-24). In a multicenter German study, permanent hypoparathyroidism was reported to be 10.5% (25). Temporary hypocalcemia is considered a sequela rather than a complication, and its rate is between 1.8-45% (6).

Although postoperative levothyroxine support does not seem to be needed in subtotal thyroidectomy, Koyuncu et al. study reported that hormone replacement was needed in 52.1% of patients with subtotal thyroidectomy (23).

The reasons why surgical treatment is recommended in BMNG are suspicion of tumor, compression symptoms, and cosmetic problems. These surgeries aim to improve the patient's symptoms. In 1948, the World Health Organization defined recovery from a disease. In this definition,

complete recovery after treatment is defined as the disappearance of disease symptoms as well as patient's mental well-being. In the 1980s, quantitative measurements of mental recovery of patients came to the fore and for this purpose, post-treatment quality of life measurements came into use. Many quality of life studies have been conducted regarding thyroid diseases. Among these, it is now accepted that thyroid dysfunction negatively affects the quality of life. Quality of life in thyroid diseases was mostly evaluated with the SF-36 form, which contains 36 questions. Assessment of quality of life in patients who have undergone thyroid surgery is considered an important tool to evaluate recovery (26).

One of the goals of treatment in patients planned to undergo surgery due to BMNG is to treat tumors that may occur incidentally. In this study, incidental malignancy was detected in 7.2% of the patients who underwent surgery for BMNG. In the remaining patients, it is aimed to optimize the quality of life by relieving pressure and cosmetic symptoms. For these treatment purposes, total thyroidectomy was performed in some of the patients, and bilateral subtotal or unilateral lobectomy and isthmectomy was performed in some of the patients. In this study, subtotal thyroidectomy and total thyroidectomy results were compared with quality of life criteria. While making this comparison, the long-term postoperative quality of life results of patients with temporary postoperative complications (temporary hypoparathyroidism, temporary recurrent nerve paralysis) were examined, taking into account their duration. In addition, in order to homogenize both groups as much as possible, patients with incidental malignancies, permanent complications, and patients with additional diseases that could impair quality of life were excluded from the study.

In studies conducted for quality of life, it has been suggested that quality of life alone may not be sufficient to evaluate patients' feelings of health, and therefore patients should be evaluated together with anxiety and depression examinations (26). For this reason, anxiety and depression scores of the patients in the study group were also measured and compared. The average follow-up period of the patients was 3.5 years. In the comparison, a significant decrease in quality of life parameters was detected in favor of Total thyroidectomy. Additionally, the depression score increased significantly in favor of total thyroidectomy. These findings suggest that the option of total thyroidectomy for BMNG should be reconsidered. The advantage of total thyroidectomy in the patient groups in this study is that it eliminated the need for reoperation in only 5.6% of incidentally occurring tumors. In patients who underwent subtotal thyroidectomy, reoperation was required in 2 of the patients. In this study, recurrences after subtotal thyroidectomy could not be evaluated because there was not enough follow-up time for recurrence. Although the decrease in the frequency of reoperation provided by total thyroidectomy is seen as an advantage, the morbidity caused by reoperation in approximately 2 patients who underwent reoperation due to malignancy is at an acceptable level compared to total thyroidectomy.

In patients with BMNG, more care should be taken in patient selection for surgery indication. There are studies that recommend known algorithms for patient selection, such as detailed examination of the nodules with USG, Doppler examination of the thyroid, FNA from the nodule with high suspicion, if necessary, leaving the lobe of the thyroid with low suspicion for malignancy and clinical follow-up of that side (27).

The patient who underwent total thyroidectomy requires lifelong thyroid hormone replacement. Although biochemical replacement can be achieved with medication, this form of replacement is different from physiological hormone secretion. Additionally, patients who have undergone total thyroidectomy are likely to experience subclinical hypothyroidism at certain periods of their lives. When the demographics of the patients were examined in this study, it was observed that the education level and socioeconomic status of the patients were relatively low in both groups. This is a factor that may reduce patients' compliance with the medication they need to use throughout their lives (28).

Recent publications state that osteoporosis and cardiac complications may be more common in the long-term follow-up of patients with total thyroidectomy. It has been suggested that more sensitivity should be exercised in the selection of patients who will undergo total thyroidectomy for BMNG. Compression symptoms and the symptoms of patients who will undergo surgery due to cosmetic concerns are subjective complaints related to thyroid pathology. For this reason, patient interrogation should be done more meticulously and the extent to which the improvement that can be achieved due to surgery will affect the quality of life criteria should be taken into consideration.

There was a significant difference in hospital depression scores and quality of life in subtotal thyroidectomy. Although total thyroidectomy is the current approach, subtotal thyroidectomy may be an alternative to total thyroidectomy in appropriate patients.

Quality of life questioning is a simple, short questioning method that patients can apply on their own. Quality of life after pre-operative questioning and psychiatrist evaluation for patients with low depression-anxiety scores can be considered as a factor in patient selection for surgery. In this study, patients with comorbidities that could impair quality of life and patients receiving psychiatric treatment were also excluded from the study. In this study, preoperative quality of life measurement was not performed, as in some studies. This is the shortcoming of this study because it is not prospective. Although

there are many studies in the literature comparing both surgeries, there are no studies on quality of life. Prospective randomized studies on quality of life to compare both surgery options play an important role in determining the surgery option and are a factor that can increase the quality of clinical evaluation.

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