Received: 04 May 2025 / Accepted: 28 October 2025 / Published online: 30 December 2025

DOI 10.34689/SH.2025.27.6.015

UDC 616.441-008.6-089

LONG-TERM RESULTS AND QUALITY OF LIFE AFTER SURGICAL TREATMENT OF DIFFUSE TOXIC GOITER

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Abstract

This study is devoted to improving the results of surgical treatment of patients with diffuse toxic goiter by justifying the choice of thyroid residue volume and predicting thyroid status in the long term. The work is based on the study of the long-term results of surgical treatment of 90 patients suffering from diffuse toxic goiter.

Aim: to study the long-term results of surgical treatment of CTD based on quality of life (QOL) and determination of the optimal amount of surgical intervention.

Materials and methods of research: From 2013 to September 2024, 90 patients with diffuse toxic goiter were operated in the surgical department of the University Hospital NCJSC «Semey Medical University».

All patients were divided into 2 groups: I — the main group, which included 63 patients who underwent subtotal subfascial resection of the thyroid gland (PCF) with the removal of thyroid tissue, II — the control group, in which 27 patients underwent thyroidectomy (TE).

There were 78 (86.6%) women and 12 (13.4%) men among the patients. The age of the patients ranged from 20 to 69 years and averaged 41.9±10.58 years. In 46 cases, accounting for 51.1% of all patients, DTT was combined with endocrine ophthalmopathy (EOP)

Results: Based on a clinical and hormonal examination conducted between 3 and 11 years after breast cancer (group I), it was found that 4 (4.7%) patients developed a recurrence of thyrotoxicosis, 65 (76.5%) patients developed hypothyroidism, and only 16 (18.8%) patients retained their euthyroid state. Hypothyroidism was achieved in all 40 patients after TE.

We did not find an effect of the age, gender of patients, average duration of the disease, severity of thyrotoxicosis, hormonal parameters (T3, T4, TSH), antibody titer to thyroid peroxidase (AT to TPO) before surgery, as well as the morphological structure of thyroid tissue on the long-term results of surgical treatment of DTP.

There were no fatal outcomes among the patients of both the main and control groups.

Conclusions: With an equal thyroid balance, different outcomes of subtotal thyroid resection are possible: hypothyroidism (76.5%), euthyroidism (18.8%) and thyrotoxicosis recurrence (4.7%). The main factors that increase the likelihood of recurrence of diffuse toxic goiter after subtotal resection of the thyroid gland are: preoperative antibody levels to the thyroid-stimulating hormone receptor of more than 30 U / l, combination of DTT with endocrine ophthalmopathy.

The quality of life of DTT patients 6 months after surgical treatment does not significantly differ in many indicators from the quality of life of healthy people.

Key words: *Diffuse toxic goiter, thyroidectomy, thyroid resection. quality of life, hypothyroidism, thyroxine, postoperative complications.*

For citation:

Omarov N.B., Aimagambetov M.Zh., Dyussupov A.A., Mukash Ye.A., Bulegenov T.A., Abdrakhmanov S.T., Auyenov M.A., Zharikov A.N. Long-term results and quality of life after surgical treatment of diffuse toxic goiter // *Nauka i Zdravookhranenie* [Science & Healthcare]. 2025. Vol.27 (6), pp. 126-134. *doi 10.34689/SH.2025.27.6.015*

Резюме

ОТДАЛЕННЫЕ РЕЗУЛЬТАТЫ И ВЛИЯНИЕ ХИРУРГИЧЕСКОГО ВМЕШАТЕЛЬСТВА НА КАЧЕСТВО ЖИЗНИ ПАЦИЕНТОВ С ДИФФУЗНЫМ ТОКСИЧЕСКИМ ЗОБОМ

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Данное исследование посвящено улучшению результатов хирургического лечения больных диффузным токсическим зобом путем обоснования выбора объема тиреоидного остатка и прогнозирования тиреоидного статуса в отдаленные сроки. В основе работы лежит изучение отдаленных результатов хирургического лечения 90 пациентов, страдающих диффузным токсическим зобом.

Цель: Оценка отдалённых результатов хирургического лечения диффузного токсического зоба на основе показателей качества жизни и обоснование оптимального объёма оперативного вмешательства.

Материалы и методы исследования: В хирургическом отделении УГ НАО «МУС» с 2013 года по сентябрь 2024 года было прооперировано 90 больных с диффузно-токсическим зобом.

Все пациенты были разделены на 2 группы: I — основную, в которую вошли 63 больных, выполнена субтотальная субфасциальная резекция щитовидной железы (СРЩЖ) с оставлением ткани щитовидной железы, II— контрольную, в которой 27 больным – тиреоидэктомия (ТЭ).

«Среди 90 пациентов, включённых в исследование, большинство составили женщины — 78 (86,6%), мужчин было 12 (13,4%). Возраст обследованных находился в диапазоне от 20 до 69 лет и в среднем составлял 41,9 ± 10,58 года. У 46 пациентов (51,1%) диффузный токсический зоб сочетался с эндокринной офтальмопатией.»

Результаты: По результатам клинико-гормонального обследования, проведённого в сроки от 3 до 11 лет после субтотальной резекции щитовидной железы (I группа), у 4 пациентов (4,7%) отмечен рецидив тиреотоксикоза, у 65 (76,5%) сформировался гипотиреоз, а у 16 (18,8%) сохранялось эутиреоидное состояние. Во всех 40 случаях после тотальной тиреоидэктомии был достигнут гипотиреоз.

Анализ показал, что такие факторы, как возраст и пол пациентов, средняя продолжительность заболевания, тяжесть тиреотоксикоза, предоперационные уровни гормонов (св. Т3, св. Т4, ТТГ), титр антител к тиреоидной пероксидазе (АТ к ТПО), а также морфологическая структура ткани щитовидной железы, не оказывали существенного влияния на отдалённые результаты хирургического лечения диффузного токсического зоба.

Летальных исходов среди больных как основной, так и контрольной групп не было.

Выводы: При одинаковом объёме оставленной ткани щитовидной железы исходы субтотальной резекции оказались неоднородными: в 76,5% случаев формировался гипотиреоз, в 18,8% — сохранялся эутиреоз, а в 4,7% развивался рецидив тиреотоксикоза. К числу факторов, ассоциированных с повышенной вероятностью рецидива диффузного токсического зоба, относились предоперационный уровень антител к рецептору тиреотропного гормона выше 30 Ед/л и сочетание заболевания с эндокринной офтальмопатией.

Оценка качества жизни показала, что через 6 месяцев после хирургического лечения у пациентов с диффузным токсическим зобом большинство показателей не имели достоверных отличий от соответствующих показателей у здоровых лиц.

Ключевые слова: *диффузно-токсический зоб, тириоидэктомия, резекция щитовидной железы. качество жизни, гипотиреоз, тироксин, послеоперационные осложнения*

Для цитирования:

Омаров Н.Б., Аймагамбетов М.Ж., Дюсупов А.А., Мұқаш Е.Ә., Булегенов Т.А., Абдрахманов С.Т., Әуенов М.Ә., Жариков А.Н. Отдаленные результаты и влияние хирургического вмешательства на качество жизни пациентов с диффузным токсическим зобом // Наука и Здравоохранение. 2025. Vol.27 (6), С.126-134. *doi 10.34689/SH.2025.27.6.015*

Түйіндеме

ДИФФУЗДЫ ТОКСИКАЛЫҚ ЖЕМСАУДЫ ХИРУРГИЯЛЫҚ ЕМДЕУДЕН КЕЙІНГІ ҰЗАҚ МЕРЗІМДІ НӘТИЖЕЛЕРІ МЕН ӨМІР САПАСЫ

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Бұл зерттеу диффузды токсикалық жемсаумен ауыратын науқастарды хирургиялық емдеу нәтижелерін қалқанша безінің қалдық көлемін таңдауды және қалқанша безінің күйін ұзақ мерзімде болжауды негіздеу арқылы жақсартуға арналған. Жұмыстың негізінде диффузды токсикалық жемсаумен ауыратын 90 науқасты хирургиялық емдеудің ұзақ мерзімді нәтижелерін зерттеу жатыр.

Жұмыстың мақсаты: өмір сапасына (ӨС) негізделген ДТЖ хирургиялық емдеудің ұзақ мерзімді нәтижелерін зерттеу және хирургиялық араласудың оңтайлы көлемін анықтау.

Зерттеу материалдары мен әдістері: Мақалада "СМУ" КЕАҚ УГ хирургиялық бөлімшесінде 2013 жылдан бастап 2024 жылдың қыркүйегіне дейін диффузды-токсикалық жемсауы бар 90 науқасқа ота жасалды.

Барлық пациенттер 2 топқа бөлінді: I — негізгі топқа 63 науқас кірді, бұл топтағы науқастарға қалқанша безінің субтотальды субфассиялық резекциясы, яғни қалқанша безінің тінін қалдырды, жасалды, II— бақылау тобында 27 науқасқа – тиреоидэктомия жасалынды.

Науқастар арасында 78-і (86,6%) әйелдер және 12 (13,4%) ер адамдар болды. Науқастардың жасы 20-дан 69 жасқа дейін болды және орташа есеппен 41,9±10,58 жасты құрады. Ал 46 науқаста (51,1%), эндокриндік офтальмопатиямен кездесті.

Зерттеу нәтижелері: Қалқанша безінің субтотальды субфассиялық резекциясы жасалған (I топ) науқастарда 3 жылдан 11 жылға дейінгі мерзімде жүргізілген клиникалық-гормондық тексеру негізінде науқастардың 4-де (4,7%) тиреотоксикоздың қайталануы байқалды, 65- науқаста (76,5%) гипотиреоз, тек 16 -. (18,8%) эутиреоидты жағдай сақталғаны анықталды. ТЭ-ден кейінгі барлық 40 науқаста гипотиреоз анықталды.

Біз науқастардың жасына, жынысына, аурудың орташа ұзақтығына, тиреотоксикоздың ауырлығына, гормоналды көрсеткіштерге (бос.Т3, бос.Т4,ТТГ), операцияға дейін қалқанша безінің пероксидазасына (АТ к ТПО) антиденелер титріне, сондай-ақ қалқанша без тінінің морфологиялық құрылымына ДТЖ хирургиялық емдеудің ұзақ мерзімді нәтижелеріне әсерін таппадық.

Негізгі және бақылау топтары бар науқастар арасында өлім болған жоқ.

Қорытынды: Қалқанша безінің қалдықтары тең болған кезде қалқанша безінің субтотальды резекциясының әртүрлі нәтижелері болуы мүмкін: гипотиреоз (76,5%), эутиреоз (18,8%) және тиреотоксикоздың қайталануы (4,7%). Қалқанша безінің субтотальды резекциясынан кейін диффузды уытты зобтың қайталану ықтималдығын арттыратын негізгі факторлар: қалқанша безді ынталандыратын гормон рецепторына антиденелердің операцияға дейінгі деңгейі 30 бірл/л-ден асады, дтз эндокриндік офтальмопатиямен үйлесуі. 6 айдан кейін диффузды уытты зобпен ауыратын науқастардың өмір сапасы. хирургиялық емдеуден кейін көптеген көрсеткіштер бойынша Дені сау адамдардың өмір сүру сапасынан сенімді түрде ерекшеленбейді.

Түйінді сөздер: *диффузды токсикалық жемсау, тиреоидэктомия, қалқанша безінің резекциясы, өмір сүру сапасы, гипотиреоз, тироксин, операциядан кейінгі асқынулар*

Дәйексөз үшін:

Омаров Н.Б., Аймагамбетов М.Ж., Дюсупов А.А., Мұқаш Е.Ә., Булегенов Т.А., Абдрахманов С.Т., Әуенов М.Ә., Жариков А.Н. Диффузды токсикалық жемсауды хирургиялық емдеуден кейінгі ұзақ мерзімді нәтижелері мен өмір сапасы // Ғылым және Денсаулық сақтау. 2025. Vol.27 (6), Б. 126-134. *doi 10.34689/SH.2025.27.6.015*

Relevance

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Aim: to study the long-term results of surgical treatment of CTD based on quality of life (QOL) and determination of the optimal amount of surgical intervention.

Materials and methods: From 2019 to September 2022, 90 patients with diffuse toxic goiter were operated in the surgical department of the University Hospital NCJSC «Semey Medical University».

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There were 78 (86.6%) women and 12 (13.4%) men among the patients. The age of the patients ranged from 20 to 69 years and averaged 41.9±10.58 years. In 46 cases, accounting for 51.1% of all patients, DTT was combined with endocrine ophthalmopathy (EOP)

The duration of the disease before surgery ranged from 4 months to 36 years (median 3 years).

Patients in the study groups I and II were examined before surgery and for a period of 6 months to 11 years after surgery

The examination of patients included: clinical examination, laboratory and instrumental examination (hormonal and immunological blood tests, electrocardiography, ultrasound examination of the thyroid gland, radiography of the cervical-thoracic space with contrast of the esophagus), consultation of specialists: otolaryngologist (with mandatory indirect laryngoscopy), oculist (to determine the severity of EOP).

In order to study the quality of life in the postoperative period, a study was conducted using the methodology developed in the PHC, with the calculation of the so-called quality of life index (QIQ) PHC, which studies both the general level of quality of life (QOL) and its individual components [4]. In order to determine only the general level of QOL and as an express method, we used a linear analog scale (LASH). In the second group of patients, the study was conducted using a double test method, while the quality of life of patients before surgery and after surgical treatment was studied in a comparative aspect. Using this technique allowed us to conduct a comparative assessment of the condition of patients before surgical treatment and in the postoperative period.

Long-term results were studied from 6 months to 11 years after surgery. A control group of practically healthy individuals (n= 45) consisting of 25 women and 20 men was used to compare the indicators of QOL after various types of operations for DTP. The age range ranged from 21 to 41 years (average 31±7.03).

Two modules were included in the questionnaire: universal and specific (29 and 11 questions, respectively). The questions of the universal module covered the following aspects of QOL: physical activity; social function; sex life; economic security; intellectual activity; emotional function; perception of one's health and well-being; perception of the treatment process and its consequences. The specific module included questions about the effect of the underlying disease on the patient and the consequences of surgical treatment. In the questionnaire we used, we included questions related to a specific module and related to the effect of the underlying disease on the patient, i.e. DTP, as well as subtotal resection of the thyroid gland or thyroidectomy performed in this regard.

A universal questionnaire module was used for the control group, excluding the issue of perception of the treatment process and its consequences. In the answers to the ICJ questions, healthy people were asked to replace the phrase "after surgery" with the words "because of your well-being." The total number of questions included in the questionnaire was 40.

It is based on the standard 5–rank R. Likert scale: "never", "rarely", "often", "very often", "constantly" – which corresponds to values from 0 to 4 points. The final result was calculated by summing up all the values obtained for each question in the questionnaire. The values of the individual components of the quality of life were calculated by summing up the scores of the relevant questionnaire questions. The hypothetically possible range of total points can range from 0 to 112 points - the first part of the questionnaire (before surgery); from 0 to 160 – the second part of the questionnaire (after surgery). The level of quality of life is directly dependent on the amount of points. Questionnaires to determine the quality of life were sent by mail, which significantly increased the number and reduced the duration of the research (the time to review the questions is 20-25 minutes).

To measure the overall level of quality of life, the LASH was used, represented by a straight line 200 mm long, on the diametrical sections of which the opposite possible conditions of the patient are marked: "the happiest", "the healthiest" (the right part of the segment) and "the most unhappy", "the sickest" (the left part of the segment). than happiness and health, they are interconnected and inseparable. On a straight line segment, patients were asked to put a label (with an X or a dot) that would correspond to their self-assessment of their current condition. The test result was evaluated by measuring the distance in millimeters from the left (zero) edge of the segment to the mark made by the subjects.

The closer this marker was placed to the right edge of the segment, the greater the distance in millimeters from the left edge of the segment to it, the higher the level of quality of life. The rating range is from 0 to 200 conventional units.

Statistical data processing was performed using the SPSS for Windows 11.5 program (SPSS inc., USA). The comparison of patients with different outcomes of surgical treatment of DTP was carried out using the Kruskal-Wallis criterion for quantitative variables and the chi-square criterion for qualitative variables. Multiple comparisons of quantitative variables were carried out using the Newman-Keiles criterion. The Spearman coefficient was used as the correlation coefficient (r) between variables belonging to the ordinal scale, and the Pearson correlation coefficient was used for variables belonging to the interval scale. In order to identify predictive factors, logistic regression analysis was

applied with the calculation of regression coefficients, odds ratio, individual risk indicators and the calculation of a 95% confidence interval. The critical significance level when testing statistical hypotheses was assumed to be 0.05.

Results

Based on clinical and hormonal examinations conducted 3–11 years after subtotal thyroid resection (Group I), recurrence of thyrotoxicosis was observed in 4 patients (4.7%). Hypothyroidism developed in 65 patients (76.5%), while only 16 patients (18.8%) retained a euthyroid state. Hypothyroidism was achieved in all 40 patients after thyroidectomy.

We did not find an effect of the age, gender of patients, average duration of the disease, severity of thyrotoxicosis, hormonal parameters (T3, T4, TSH), antibody titer to thyroid peroxidase (AT to TPO) before surgery, as well as the morphological structure of thyroid tissue on the long-term results of surgical treatment of DTP.

The outcome of the operation also did not depend on the initial volume of the thyroid gland. There were no statistically significant differences between the initial volume of thyroid residue (TO) in the groups with different outcomes of surgical treatment of DTP.

According to our data, the most important prognostic factor for the development of thyrotoxicosis recurrence, as the main unfavorable outcome of DTP treatment, is the level of AT to RTG before surgery of more than 30 U/l and the combination of DTP with EOP.

When comparing the incidence of permanent recurrent laryngeal nerve (RLN) palsy and permanent hypoparathyroidism, no statistically significant differences were found between patients who underwent subtotal thyroid resection and those who underwent thyroidectomy. Permanent hypoparathyroidism developed in 3 patients (3.5%) after subtotal thyroid resection and in 1 patient (2.5%) after thyroidectomy. Permanent recurrent laryngeal nerve palsy occurred in 2 patients (2.3%) after subtotal thyroid resection and in 1 patient (2.5%) after thyroidectomy.

We conducted a study of the results of surgical treatment of CTD, in accordance with the recommendations of WHO experts, based on a study of the quality of life of operated patients.

At the preoperative stage, we interviewed DTP patients included in the prospective study group (n=40). At the same time, it was revealed that the disease had a negative effect on many aspects of QOL (Table 1). On average, the patients' IQ before surgery was only 104.8±11.6 points. The lowest values among all QOL components (less than 60% of the maximum possible value) were recorded when the patient assessed conservative treatment (45%) and his health (52.5%), as well as his economic condition (58.7%).

Table 1.

Dynamics of quality of life before surgery and at different times after surgery in patients with diffuse toxic goiter.

Indicator	Before the operation	After the operation		
		after 6 months	after 1 year	after 2 year
Quality of life index	104,8±11,6	125,3±15,07	131,1±9,7	132,3±7,7
Intelligent function	10,7±1,5	13,5±1,9	14,3±1,3	14,3±1,37
Emotional function	20,3±2,9	23,2±3,8	22,9±3,3	24,6±3,07
Physical activity	16,9±3,3	20,2±3,9	21,26±3,2	22,8±2,4
Perception of health	4,2±0,7	5,8±1,2	5,8±1,08	5,9±1,08
Symptoms of the disease	35,8±4,7	40,8±4,2	41,9±3,1	42,6±2,05
Sexual function	2,7±0,5	3±07	3,1±0,3	3,1±0,4
Social function	8,1±1,3	10±1,6	10,4±1,2	10,4±1,4
Economic condition	4,7±0,6	5,9±1,4	6,3±1,2	6,4±1,2
Perception of treatment	1,8±0,4	2,9±0,8	3,1±0,5	3,1±0,5

The values of such QOL indicators as physical condition, emotional function, intellectual function, social function, economic status, as well as the perception of one's health and well-being in patients before surgery differed statistically significantly from the values of the corresponding QOL components in healthy individuals (p0,001) (Table 2).

Table 2.

Quality of life of patients with Diffuse toxic goiter in the preoperative period and 6 months after surgery in comparison with healthy individuals.

Quality of life indicators	Groups of surveyed			Reliability	
	Health	Before the operation	After the operation	P1	P2
Physical activity	23,82±2,29	16,92±3,36	20,22±3,98	< 0,001	< 0,001
Social function	10,17±1,03	8,17±1,33	10,0±1,67	< 0,001	> 0,05
Sexual function	3,15±0,48	2,72±0,55	3,0±0,71	< 0,001	> 0,05
Economic condition	6,87±0,72	4,75±0,63	5,90±1,46	< 0,001	< 0,001
Intelligent function	13,45±1,41	10,77±1,52	13,55±1,90	< 0,001	> 0,05
Emotional function	28,85±1,21	20,30±2,91	23,25±3,84	< 0,001	< 0,001
Perception of health	7,0±0,71	4,22±0,76	5,82±1,25	< 0,001	< 0,001

Note: The significance of the differences is indicated for healthy individuals.:

p1 – with patients before surgery, p2 – with patients after TE

Statistical processing of the obtained results indicates the presence of a moderate inverse correlation between the level of IQ and the duration of the disease (r = -0.687, p0.001), i.e., the longer the disease, the lower the QOL.

The hypothesis of a possible negative effect of severe thyrotoxicosis on the level of heart failure is also confirmed by mathematical calculations: a moderate inverse correlation was found (r = -0.610, p0.001).

However, the result of the study did not reveal a correlation between the age, gender of patients, the presence of EOP and the quality of life in the preoperative period.

All patients in this group underwent thyroidectomy. A repeat survey of patients 6 months after surgery showed a significantly significant improvement in quality of life (Tables 1, 2, Fig. 1)

The average IQ of patients 6 months after surgery was 125.3±15.07 points. The best results (more than 80% of the maximum possible value of QOL) were found in the following parameters: intellectual function (84.3%), social function (84.1%), severity of symptoms of DTD (85%). When examining other aspects: physical condition, emotional function, economic condition, the impact of treatment on the perception of one's health and well-being, the QOL level ranged from 70 to 80% of the maximum possible value. Differences in the average values of the above-mentioned QOL indicators in patients before surgery and 6 months after surgery are statistically significant (p<0.001). After surgical treatment of patients with DTP, such indicators of QOL as social, intellectual, and sexual function became commensurate with the corresponding indicators in the control group of healthy people (p>0.05) (Table 2).

A survey of patients one year and 2 years after surgery revealed a tendency towards a further increase in QOL (Table 1, Fig.1).

Thus, surgical treatment with DTP significantly improves the quality of life of patients. A noticeable improvement is observed already 6 months after the operation.

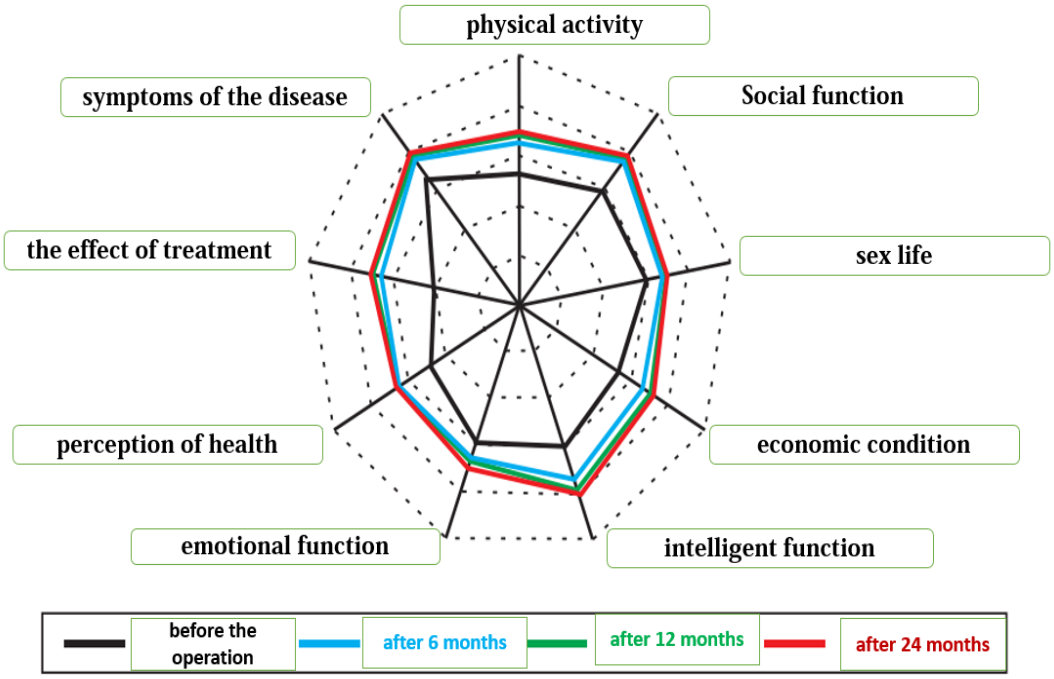

Figure 1. Dynamics of quality of life parameters before and at different times after surgery in patients with DTG.

Table 3.

Parameters of quality of life (ICG, LAS) before and after surgery in patients with diffuse toxic goiter.

Indicator	Before the operation	After the operation		
		after 6 months	after 1 year	after 2 year
Quality of life index	123,6 ± 15,5	127,1 ± 14,3	129,6 ± 13,05	131,05 ± 13,06
linear analog scale	30,95 ± 14,59	156,42 ± 18,80	162,70 ± 12,31	165,32 ± 9,72

The results obtained when patients answered the questions of the ICG FCC and LASH questionnaire correlate and allow us to conclude that these methods are highly reliable and sensitive in studying the quality of life of DTZ patients (Table 3). The correlation of the ICG and LASH questionnaire was r=0.85 (p=0.0001).

When studying the long-term results of surgical treatment of CTD, it was determined that there were no significantly significant differences in the group of patients who underwent prostate cancer (group I) and in the group of patients who underwent TE (group II): the total number of points in group I averaged 119.41±18.73, in group II 121.52±19.17 (p>0.05). There were also no significant differences when considering individual QOL indicators (Table 4)

The results closest to the maximum possible value of QOL (more than 70%) were in patients of groups I and II according to the following indicators: intellectual function, physical activity, severity of symptoms, sexual function, social function, economic well-being. In the second group of patients, the indicators of their perception of health and well-being and the impact of treatment were also brought closer to the maximum possible results (Table 4).

Table 4.

Quality of life and changes in its individual indicators depending on the volume of thyroid resection.

Indicator	Volume of thyroid resection		The validity of the differences P
	Subtotal Resection Of The Thyroid Gland	Thyroidectomy	
PHC Quality of Life Index *	119,41±18,73	121,52±19,17	p >0,05
Intelligent function **	80,6	78,7	p>0,05
Emotional function **	68,1	67,5	p>0,05
Physical activity **	71,07	69,6	p>0,05
Perception of health **	66,2	71,2	p>0,05
Symptoms of the disease **	80,4	83,7	p>0,05
Sexual function **	72,5	75	p>0,05
Social function **	78,3	79,1	p>0,05
Economic condition **	70,1	70	p>0,05
Perception of treatment **	67,5	72,5	p>0,05

***** as a unit

****** in % of the maximum possible value.

Primary hypothyroidism was achieved in 109 of the studied patients (87.2%) as a result of DTP treatment. To determine the possible effect of hormone replacement therapy on the level of QOL, a comparison was made between the IQ of patients taking L-thyroxine preparations and the IQ of patients who do not receive replacement therapy. At the same time, there were no significant differences in the results obtained: the IQ was 120.46±17.90 cont.units and 114.44±24.31 conl.units, respectively (p>0.05).

Summarizing the above, we can conclude that, despite the absence of significant differences in quality of life and frequency of postoperative complications in patients of the two study groups, subtotal surgery 1. Aristarkhov V.G., Kirillov Yu.B., Panteleev I.V., Voronina T.A., in contrast to thyroidectomy, led to different results: rare preservation of stable euthyroid postoperative hypothyroidism and recurrence of thyrotoxicosis, which required repeated surgical intervention and radioiodine therapy. At the same time, postoperative hypothyroidism was easily compensated by L-thyroxine preparations and did not lead to a decrease in the quality of life of patients. In this regard, thyroidectomy should be recognized as the most optimal and pathogenetically justified volume of surgical intervention for DTT.

Discussion

Long-term clinical and hormonal assessment conducted 3–11 years following subtotal thyroid resection (Group I) demonstrated thyrotoxicosis recurrence in 4 patients (4.7%). Hypothyroidism was identified in 65 patients (76.5%), whereas only 16 patients (18.8%) maintained euthyroid function. In contrast, hypothyroidism was observed in all 40 patients after thyroidectomy.

Comparative analysis of the rates of permanent recurrent laryngeal nerve (RLN) palsy and permanent hypoparathyroidism revealed no statistically significant differences between patients undergoing subtotal thyroid resection and those undergoing thyroidectomy. Permanent hypoparathyroidism was observed in 3 patients (3.5%) following subtotal thyroid resection and in 1 patient (2.5%) after thyroidectomy. Permanent RLN palsy developed in 2 patients (2.3%) after subtotal thyroid resection and in 1 patient (2.5%) after thyroidectomy.

The responses obtained from patients on the ICG FCC and LASH questionnaires were highly correlated, indicating that both instruments are reliable and sensitive for assessing quality of life in DTZ patients (Table 3). The correlation between the ICG and LASH questionnaires was r = 0.85 (p = 0.0001).

At the preoperative stage, patients with DTP included in the prospective study group (n = 40) were interviewed. The results demonstrated that the disease adversely affected multiple domains of quality of life (QOL) (Table 1). The mean preoperative IQ score was 104.8 ± 11.6. The lowest scores across all QOL domains (below 60% of the maximum possible value) were observed in patients' evaluations of conservative treatment effectiveness (45%), perceived health status (52.5%), and economic well-being (58.7%).

As a result of DTP treatment, primary hypothyroidism was induced in 109 patients (87.2%). To assess the potential impact of hormone replacement therapy on quality of life (QOL), IQ scores were compared between patients receiving L-thyroxine therapy and those not undergoing replacement treatment. No statistically significant differences were identified between the groups: mean IQ values were 120.46 ± 17.90 conventional units in patients receiving L-thyroxine and 114.44 ± 24.31 conventional units in those not receiving replacement therapy (p > 0.05).

Conclusions: With an equal thyroid balance, different outcomes of subtotal resection of the thyroid gland are possible.:hypothyroidism (76.5%), euthyroidism (18.8%) and recurrent thyrotoxicosis (4.7%). The main factors that increase the likelihood of a recurrence of diffuse toxic effects after subtotal thyroid surgery are: preoperative levels of antibodies to the thyroid-stimulating hormone receptor of more than 30 U/l, combination of DTT with endocrine ophthalmopathy.

The quality of life of DTP patients 6 months after surgical treatment in many respects does not significantly differ from the quality of life of healthy people.

The volume of DTP surgery does not have a significantly significant effect on the quality of life of patients. However, given that thyroidectomy is the most pathogenetically justified operation that eliminates the recurrence of thyrotoxicosis and does not lead to an

increase in the frequency of postoperative complications, this intervention should be considered the operation of choice for DTT.

Postoperative hypothyroidism, provided adequate hormone replacement therapy, does not lead to a deterioration in the quality of life of patients.

Acknowledgments: *None.*

Conflict of Interest: *The authors declare no conflicts of interest.*

Author Contributions: *All authors contributed equally to the preparation of this material.*

Publication Information: *This material has not previously been submitted for publication elsewhere and is not under consideration by other publishers.*

Funding: *This study was not funded.*

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