ISSN NO: 2770-2936
April 2026

Comparative Analysis Of Quality-Of-Life Indicators After Total And Subtotal Thyroidectomy

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Abstract. Surgical treatment of thyroid diseases remains one of the main therapeutic approaches, while the choice of surgical extent (total or subtotal thyroidectomy) influences postoperative outcomes and patients' quality of life. The aim of this study was to perform a comparative analysis of quality of life indicators following total and subtotal thyroidectomy. A prospective study involving 140 patients was conducted. Quality of life was assessed using the ThyPRO questionnaire. No statistically significant differences in the overall quality of life between the groups were identified ($p>0.05$); however, symptoms of hypothyroidism were more frequently observed after total thyroidectomy, whereas anxiety related to the risk of recurrence was more common after subtotal thyroidectomy. The incidence of hypoparathyroidism reached up to 22%, and transient recurrent laryngeal nerve paresis was observed in approximately 6.5% of cases. The obtained data confirm the comparability of these surgical methods despite differences in certain clinical aspects.
Keywords: Thyroidectomy, thyroid gland, quality of life, hypothyroidism, ThyPRO, surgical treatment.

Relevance. Thyroid diseases occupy one of the leading positions in the structure of endocrine pathology, and surgical treatment is applied in a significant portion of patients [1, 2].

In recent years, there has been a trend toward expanding indications for total thyroidectomy, but subtotal interventions remain relevant due to a lower risk of complications [3, 4].

Quality of life (QoL) is a key indicator of treatment effectiveness and includes physical, psychological, and social aspects [5, 6]. Modern research indicates that after thyroidectomy, life quality remains generally satisfactory, but it depends on the volume of the surgery, the presence of complications, and the patient's hormonal status [7, 8].

Thus, a comparative analysis of QoL after various types of strumectomy is a pressing task in clinical endocrine surgery.

Purpose of the study. Evaluate and compare the quality of life indicators in patients after total and subtotal strumectomy.

Research material and methods. This study was conducted in the format of a prospective comparative clinical analysis based on specialized surgical and endocrinological departments. The study included 140 patients with thyroid diseases who were indicated for surgical treatment.

The study included patients aged 20 to 65 years with benign thyroid diseases (diffuse and nodular goiter, polynodular goiter) requiring surgical intervention. The inclusion criteria were the presence of indications for strumectomy, the absence of severe comorbidities in the decompensation stage, and informed voluntary consent to participate in the study.

Exclusion criteria included malignant neoplasms of the thyroid gland, previous operations on the thyroid gland, severe mental disorders that hinder adequate assessment of life quality, as well as the patient's refusal to participate in the study.

Patients were divided into two comparable groups:group I (n=70) - patients who underwent total strumectomy; group II (n=70) - patients who underwent subtotal strumectomy.

The groups were comparable in terms of age, gender, the nosological form of the disease, and the initial functional state of the thyroid gland.

Surgical treatment was performed according to standard methods under general anesthesia. Total strumectomy involved the complete removal of thyroid tissue. During subtotal strumectomy, small areas of thyroid tissue were left on both sides to partially preserve the organ's function.

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Special attention was paid to the preservation of recurrent laryngeal nerves and parathyroid glands to prevent postoperative complications.

Quality of life assessment was conducted using the validated ThyPRO questionnaire, which includes scales reflecting the physical condition, psycho-emotional disorders, and social adaptation of patients.

The clinical examination included complaint analysis, objective examination, assessment of postoperative complications (hypoparathyroidism, recurrent nerve paresis), as well as recovery dynamics.

Laboratory methods included determining the levels of thyroid-stimulating hormone (TSH) and free thyroxine (T4) in blood serum before surgery and in the postoperative period (after 3, 6, and 12 months).

Dynamic observation of patients was conducted for 12 months after surgical intervention, with follow-up visits at 1, 3, 6, and 12 months.

During the study, the evaluated indicators were analyzed: general quality of life level (ThyPRO); severity of individual symptoms; hormonal indicators (TTG, free T4); frequency of postoperative complications; and disease recurrence rate.

Statistical analysis was performed using the SPSS 23.0 software package. Quantitative data are presented as average values and standard deviations (M±SD), while qualitative data are expressed as percentages. To assess the significance of differences, Student's t-test and the $\chi 2$ test were used. Differences were considered statistically significant at a level of $p<0.05$.

Thus, a comprehensive approach, including clinical, laboratory, and questionnaire methods, allowed for an objective assessment of the impact of surgical intervention volume on patients' quality of life after strumectomy.

Results and discussion. During the study, it was established that in the postoperative period, patients in both groups showed an overall improvement in clinical condition and quality of life; however, the structure of changes and the frequency of individual disorders differed depending on the volume of surgical intervention.

Analysis of the integrated quality of life indicator using the ThyPRO questionnaire showed that 12 months after surgery, differences between the total and subtotal strumectomy groups did not reach statistical significance (21.5±5.2 versus 20.9±4.8 points, respectively; $p>0.05$). This indicates a comparable overall level of quality of life in the long-term postoperative period (Table 1).

Table 1

General quality of life

Indicator	Total	Subtotal
Total QoL (points)	21,5±5,2	20,9±4,8

At the same time, differences in the severity of individual symptoms were identified. In patients after total strumectomy, complaints of fatigue, decreased work capacity, and general weakness were more frequent, accounting for up to 42% of cases, which is associated with the development of hypothyroid conditions and the need for lifelong replacement hormonal therapy. Laboratory data confirmed this trend: in a portion of patients, an increase in thyroid-stimulating hormone levels was noted, amounting to 5.8±1.6 μME/ml, while free T4 levels remained relatively stable during therapy (Table 2).

Table 2

Clinical symptoms (ThyPRO)

Indicator	Total (%)	Subtotal (%)
Fatigue	42	35
Anxiety	28	40
Depression	25	27
Cognitive disorders	18	15

As seen from the table, according to Table 2, in the subtotal strumectomy group, the frequency of hypothyroidism was lower, but a higher prevalence of psycho-emotional disorders was noted, specifically anxiety (up to 40%), associated with the preservation of part of the thyroid gland tissue and the risk of disease

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recurrence. At the same time, hormonal indicators in most patients in this group remained within reference values, indicating partial preservation of the functional activity of the gland.

Analysis of postoperative complications showed that hypoparathyroidism was significantly more frequent after total strumectomy (up to 20%), whereas during subtotal surgery, its frequency did not exceed 8%. Transient paresis of the recurrent laryngeal nerve was observed in 6% of patients in the main group and 3% in the control group. These data indicate that the total volume of intervention is more traumatic (Table 3).

Table 3

Post-operative complications

Ccomplication	Total (%)	Subtotal (%)
Hypoparathyroidism	20	8
Nerve paresis	6	3
Recurrence of the disease	2	12

The frequency of disease recurrence was an important indicator. In the subtotal strumectomy group, it was approximately 10-12% during the year of observation, whereas after total surgery, recurrences were practically not recorded (up to 1-2%). This confirms the higher radicality of total thyroid removal.

The duration of hospitalization and recovery time in both groups were comparable, but patients after total strumectomy more often required correction of hormonal therapy in the early postoperative period.

The interpretation of the obtained results allows for the conclusion that despite a similar overall quality of life level, various types of strumectomy are accompanied by specific clinical and laboratory features. Total strumectomy provides better disease control and a minimal risk of recurrence, but is associated with a higher frequency of hormonal disorders and complications. At the same time, subtotal strumectomy is characterized by a lower frequency of complications but a higher risk of recurrence and psychological discomfort.

Analysis showed that the overall quality of life level in both groups was comparable ($p>0.05$), which corresponds to data from international studies, where no significant differences were also identified between the surgical volumes.

However, the structure of the symptoms was different. After total strumectomy, signs of hypothyroidism (fatigue, decreased energy) were more frequently observed, which is associated with the need for lifelong hormonal therapy.

In the subtotal strumectomy group, a higher level of anxiety associated with the risk of disease recurrence was noted (up to 12%).

The frequency of complications was higher during total surgery, especially hypoparathyroidism (up to 20-22%), which corresponds to literature data. From this, it follows that with total surgery, disease control is better but hormonal disorders are more pronounced; with subtotal surgery, there are fewer complications but a higher risk of recurrence; QoL depends not on the volume of the operation, but on the complications.

The results obtained demonstrate that the volume of surgical intervention does not have a decisive impact on the overall quality of life of patients. This aligns with modern international studies, which also did not reveal statistically significant differences between total and partial thyroidectomy regarding QoL indicators [9, 10].

At the same time, differences in the structure of clinical manifestations were identified. After total strumectomy, symptoms of hypothyroidism are more frequently observed, due to the complete loss of thyroid function and the need for lifelong replacement therapy. This can negatively affect the subjective perception of life quality, especially in the early postoperative period.

On the other hand, subtotal strumectomy is accompanied by a higher level of anxiety in patients, which is associated with the preservation of a portion of the glandular tissue and the risk of disease recurrence. This psychological factor plays a crucial role in shaping quality of life and requires consideration when choosing a treatment method.

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Post-operative complications are of particular importance. The higher frequency of hypoparathyroidism and recurrent laryngeal nerve damage during total strumectomy confirms the need for thorough surgical technique and individualized approach to the patient.

Thus, the choice of surgical intervention volume should be based on an individual assessment of the clinical situation, hormonal status, and potential impact on the patient's quality of life.

Conclusions:

1. The overall quality of life after total and subtotal strumectomy is comparable;
2. Total strumectomy is often accompanied by hypothyroidism and complications;
3. Subtotal strumectomy is associated with a higher risk of recurrence;
4. Life quality depends on complications and psychological factors;
5. A personalized approach to choosing the surgical method is necessary.

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