

# Are Nodular Goiter Patients Likely to have a Poor Quality of Life after Thyroidectomy, if they Received Hormonal Suppressive Therapy for a Long Time before Surgery?

Emil Iskandarov<sup>1\*</sup>, Nazrin Agayeva<sup>2</sup>

<sup>1</sup>Department of Hepato-pancreato-biliary Surgery, Scientific Center of Surgery, Sharifzade str 196, Baku AZ1133, Azerbaijan;

<sup>2</sup>Department of Endocrine Surgery, Scientific Center of Surgery, Sharifzade str. 196, Baku AZ1133, Azerbaijan

## ABSTRACT

**Background:** The Quality of life of patients with benign thyroid nodules after surgical procedures is particularly important in evaluating the long-term results.

**Aim:** To compare the Quality of life of patients previously treated with L-Thyroxine and then underwent thyroidectomy, and whose surgery was introduced without hormonal suppressive therapy.

**Materials and methods:** The outcomes of 174 patients with nodular goiter who underwent thyroidectomy were comparatively analyzed. Eighty-eight patients did not receive any hormonal treatment before surgery (basic group); eighty-six patients were treated with L-thyroxin for 1 year, and when hormonal suppressive therapy was identified as ineffective, were underwent surgery (control group). The Quality of Life was calculated with the SF-36 Questionnaire, 3, 6, and 12 months after surgery, and compared among groups.

**Results:** In the basic group, 3 months after thyroidectomy only Mental Health parameters were higher than in the control group. 6 months after surgery Physical Activity ( $84.5 \pm 1.8$  points), Body Pain ( $65.1 \pm 2.5$  points), and Emotional Status ( $52.1 \pm 1.3$  points) were better compared to the control group ( $p < 0.05$ ). 12 months after the operation, all parameters of the quality of life of the main group of patients were evaluated with a higher score than the control group.

**Conclusion:** The quality of life in the control group was significantly low ( $p < 0.05$ ).

**Keywords:** Thyroid; Nodules; L-Thyroxine; Surgery; Quality of life; Outcomes

## INTRODUCTION

Benign thyroid nodules are widespread among young people and the prevalence increased with aging [1]. The northern regions of Azerbaijan are endemic zona with poor iodide concentration and so, the incidence of nodular goiter is remarkably high. Improving the outcomes of the nodular goiter treatment is a strategic issue in our country [2]. Despite introducing all justified treatment methods for nodular goiter, the surgical approach is still the method of choice in most local hospitals [3]. The quality of life of patients with nodular goiter after surgical treatment is particularly important in the evaluation of physical performance and social rehabilitation [4]. Quality of life is a

general characteristic of the patient's functional, physical, psychological, emotional, and social activity after surgery.

The physical activity and emotional condition determine the patient's satisfaction and affect the long-term outcomes of surgical treatment. The actual value of quality of life after surgeries and adequate integration of these people into social life has immense importance both for the individual and for society. During the last 10 years, the Quality of life of patients with nodular goiter after surgery was published with various aspects [5-8].

Hormonal suppressive therapy has clinical effects on nodule and gland size decreasing, also preventing the local growth of thyroid

**Correspondence to:** Emil Iskandarov, Department of Hepato-pancreato-biliary Surgery, Scientific Center of Surgery, Sharifzade str 196, Baku AZ1133, Azerbaijan, E-mail: eiskenderov@yahoo.com

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cancer and used for preventing malignancy recurrence [9,10]. L-Thyroxine has also adverse effects such as a negative influence on bone mineral density and increased cardiac arrhythmias risk [11,12]. However, the impact of L-Thyroxine suppressive treatment on the quality of life of patients with nodular goiter after surgery was not well studied. This study aimed to compare the Quality of life of patients, who were previously treated with L-Thyroxine therapy and then underwent thyroidectomy, and whose surgery was performed without hormonal suppressive therapy.

## MATERIALS AND METHODS

One hundred seventy-four patients with nodular goiter were selected as study material. We detected all predictors in the ultrasound investigation, which predict, that thyroid nodules in these patients would not respond to hormonal suppressive therapy. We call nodules with those predictors as resistant nodules. The investigation on identifying the predictor of the nodules, which are resistant to hormonal suppressive treatment, we published recently [13]. All above-noted patients were carefully informed about the existed methods of treatment. Due to the probability of the ineffectiveness of hormonal therapy, a direct surgical procedure was suggested. We explained that conservative hormonal suppressive therapy has not to effect on resistant nodules, not reducing nodule size or helping to completely resolve it. So, hormonal suppressive therapy in these cases is only a time waste, and in the future, they will choose a surgical approach.

Eighty-six patients (control group) did not agree with the suggested surgical method and preferred conservative medical treatment-hormonal suppressive therapy with L-Thyroxine. These patients were followed up for 1 year, with regular investigations (physical, laboratory, ultrasound, fine-needle aspiration biopsy) 3, 6, and 12 months after beginning conservative treatment. Decreasing nodule size and gland volume were not observed in these patients. Moreover, in most cases, new nodules developed and symptoms of the pressing in the throat were more persistent. Surgical treatment was suggested during the last visit and disappointed patients agreed. All patients underwent thyroidectomy and after discharge received replacement therapy.

Eighty-eight patients (basic group) agreed with surgical intervention and thyroidectomy had been performed. The replacement therapy has been used according to the results of TSH concentration. All patients were invited to the hospital 3, 6, and 12 months after discharge. The physical exam, laboratory analyses, and ultrasound investigation were performed. Also, all participants fulfilled the SF-36 survey form. The SF-36 consists of 36 items grouped into eight scales: physical functioning, role-playing, bodily pain, general health, vitality, social functioning, emotional state, and mental health. The indicators of each scale are compiled in such a way that the higher the value of the indicator (from 0 to 100), the better the score on the chosen scale. Two parameters are formed from them: health's psychological and physical components.

## Statistical procedure

All numerical values were statistically analyzed considering modern recommendations. The values of the Quality of life in the groups were arranged in a variation order and the average (M), Standard error (m), Minimum (min), and Maximum (max) values were calculated for each variation order. A non-parametric method-Wilcoxon (Manna-Whitney) Criterion (U) was used to determine the difference between indicators in groups. The result was statistically significant when  $p < 0.05$ . Statistical analysis was performed using the IBM SPSS-20 program.

## RESULTS

All scales of Quality of life after thyroidectomy in both groups were noticeably impaired. The most weakened scale was the Emotional state. In the basic group, it was a little high compared to control patients ( $32.8 \pm 1.1$  basic vs.  $31.9 \pm 2.6$  controls) but the difference was not significant. Comparing the results 3 months after discharge, no statistically significant difference was determined in the basic and control group patients, except for mental health. Only the Mental health in the basic group was significantly ( $p < 0.05$ ) higher than in the control group patients ( $57.6 \pm 1.4$  basic vs.  $49.4 \pm 3.2$  control).

In the progress of time, the Quality of life increased their values. In the survey after 6 months, a tangible increase in all scales in both groups was recorded. However, compare of the values between groups showed a statistically significant difference only in the values of three scales: Physical functioning ( $84.5 \pm 1.8$  basic vs.  $73.2 \pm 1.6$  control); Bodily pain ( $65.1 \pm 2.5$  basic vs.  $52.5 \pm 3.9$  control); and Emotional state ( $52.1 \pm 1.3$  basic vs.  $41.6 \pm 1.2$  control). The values of these three scales were significantly higher in basic group patients compared to control patients ( $p < 0.05$ ).

The last survey was performed 1 year after surgery and the Quality of life significantly improved in both groups. All parameters of the quality of life of the basic group patients were higher than in the control group. Comparing the values of each 8 parameters showed a statistically significant difference ( $p < 0.05$ ). The Table 1 below shows the Quality-of-life values of both group patients 3,6, and 12 months after discharge.

Scales	Basic group			Control group		
	3 months	6 months	12 months	3 months	6 months	12 months
Physical functioning	68,5 ± 2,1	84,5 ± 1,8*	91,1 ± 2,3*	67,8 ± 2,2	73,2 ± 1,6	78,7 ± 1,6
Role-physical functioning	45,5 ± 2,3	71,3 ± 2,2	83,5 ± 2,1*	45,2 ± 3,1	65,7 ± 4,1	69,2 ± 3,1

Bodily pain	44,2 ± 3,1	65,1 ± 2,5*	74,6 ± 3,1*	43,6 ± 2,9	52,5 ± 3,9	67,5 ± 3,2
General health	52,1 ± 2,1	74,1 ± 1,8	82,1 ± 2,4*	51,8 ± 2,7	60,8 ± 3,8	67,1 ± 2,1
Vitality	42,1 ± 1,1	64,9 ± 3,5	79,5 ± 2,7*	42,2 ± 2,6	52,3 ± 3,76	58,7 ± 4,2
Social functioning	59,1 ± 2,8	81,1 ± 1,3	87,8 ± 2,5*	60,2 ± 1,1	71,8 ± 3,2	74,8 ± 3,2
Emotional state	32,8 ± 1,1	52,1 ± 1,3*	67,5 ± 3,1*	31,9 ± 2,6	41,6 ± 1,2	56,1 ± 3,5
Mental health	57,6 ± 1,4*	65,6 ± 3,1	80,1 ± 3,5*	49,4 ± 3,2	61,7 ± 2,1	64,3 ± 2,4

Note: \*p<0.05. The difference between variables is significant.

**Table 1:** The values of quality of life of patients.

## DISCUSSION

Improving surgical treatment outcomes of the nodular goiter is still one of the important issues concerning the high complication rates, such as laryngeal nerve injury, parathyroid gland iatrogenic extraction, nodule recurrence, and malignancy, etc. [14]. However, the importance of the Quality of life after surgical procedures was limited studied and published mainly about the outcomes of patients with thyroid carcinoma [15]. We studied the Quality of life of patients with nodular goiter after thyroidectomy 3, 6, and 12 months after discharge from the hospital. Our results show that the Quality of life was generally affected in patients after surgery in both groups. Emotional state and mental health scales were especially low in the survey 3 months after surgery. We tried to analyze these weak aspects and performed detailed conversations with control group patients. The reasons for the decreased mental health were different. Some patients explain that after diagnostic and suggestion of surgery from doctors, they preferred hormonal suppressive therapy due to fear of surgery. The dominated believe that L-Thyroxine is helpful in the nodular goiter played its role. However, despite receiving hormonal treatment for a long time, the nodules' size did not decrease; on the contrary, additional nodules developed. This aspect was one of the reasons for the emotional stress and the development of extreme nervous conditions. Other patients regretted that they continuously visited the medical institutions for examinations and had to check their TSH blood with regular blood tests and all of these procedures took a lot of time. Moreover, regularly fine needle biopsies for excluding malignancy negatively influenced the mental health of patients with labile psychology. In another small group of patients, re-hormonal replacement therapy in the period after the surgical operation has caused certain dissatisfaction.

In the progress of time, the quality-of-life scales tried to restore their expected values. However, the rehabilitation speed was low

in the control group, who previously received L-Thyroxine therapy and then underwent surgery. During statistical procedures, it was identified that after 6 months in control patients the Physical functionality, Bodily pain, and Emotional state values were significantly low. The low Physical functionality was mostly reflected when patients tried to do some activities like taking heavy or working in the garden, etc. Another important indicator with low values was bodily pain, which indicates the presence of pain in the body during daily work. Most common complaints came especially from women and were about the pain and fatigue during doing housework. Patients explained their complaints with pain in the musculoskeletal system and getting tired easily. These complaints with a great probability related to adverse effects of L-Thyroxine on bone mineral concentration and forthcoming osteoporosis. The temp of the rehabilitation process required a long time in the control group of patients. So, despite the progress over time, the values of Quality of life after 12 months were significantly lower in the control group. However, the patients in the basic group demonstrated better mental and physical performance.

## CONCLUSION

Among all scales of the SF-36 questionnaire, Mental Health is most susceptible to long-term L-Thyroxine treatment in the short-term follow-up period after surgery. Surgical procedure especially affects patients with nodular goiter when they before surgery received hormonal suppressive therapy with L-Thyroxine for at least 1 year. The restoration of physical and mental health is slow in patients with L-Thyroxin therapy. The surgical procedure is suggested in patients with benign thyroid nodules, which have predictors of resistance to hormonal therapy. For the improvement of the mental health of patients after thyroidectomy multidisciplinary approach is required. New clinical studies should be performed for applying the methods which are reliable for the acceleration of restoring Quality of life.

## CONFLICT OF INTEREST

Authors declare no conflict of interest.

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