

## WAYS TO IMPROVE THE RESULTS OF SURGICAL TREATMENT OF DIFFUSE TOXIC GOITER

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**Abstract.** *In the given article the authors analyze that an improved method of surgical access to the thyroid jelly and a postoperative rehabilitation program can reduce the incidence of long-term complications. The authors conclude that the use of an improved method of surgical treatment of thyroid jelly and a post-volitional rehabilitation program made it possible to reduce the incidence of long-term complications, which in the village ensured a clearing of the proportion of good and satisfactory results from 84.7% to 97.3% with a decrease in the likelihood of an unsatisfactory outcome with 15.3% - 2.7%.*

**Keywords:** *strumectomy, thyroid gland, hypothyroidism, hypoparathyroidism, diffuse toxic goiter.*

**Relevance.** It is important to suggest that a pressing and leading issue in surgical endocrinology is the treatment of patients with diffuse toxic goiter. Therapy of postoperative hypothyroidism and recurrent thyrotoxicosis caused by the development of pathological metabolic syndromes is considered a difficult task for this group of patients, as well as adequate correction of impaired endocrine regulation of the body [7, 8].

A specific complication in surgery for thyroid disease is laryngeal paresis, which stops endocrinologists from proceeding with thyroid disease to surgical treatment. In the arsenal of modern medicine there are three main methods of treating patients with thyrotoxicosis: treatment with thyreostatic drugs; treatment with radioactive iodine; surgical treatment [2].

Despite the high level of pharmaceutical development, today there is no clear protocol for the treatment of patients with thyroid disease; therefore, there is also no treatment method that provides 100% correction of immunological disorders and restoration of normal thyroid function [1,4,8,9]. Surgical treatment is most often recommended for patients who have contraindications to other treatment methods [6]. Currently, many works are devoted to treatment with radioactive iodine [2,3,4,5,10].

**Target.** To improve the results of surgical treatment of diffuse toxic goiter by improving the tactical and technical aspects of operations.

**Materials and methods.** The analysis made it possible to identify two main directions for improving the results of surgical treatment of DTG:

tactical aspects – optimization of the choice of surgical method to reduce the risk of postoperative hormonal disorders and disease relapse;

technical aspects – improvement of the method of surgical treatment of DTG to reduce the risk of developing specific postoperative complications.

The study was carried out in the Department of Surgery N. 3 on the basis of “Surgical Diseases” Department of Andijan State Medical Institute and in the “Surgery” Department of Andijan City Medical Association on the basis of “Faculty and Hospital Surgery” Department N. 2. The work is based on the results of treatment of diffuse toxic goiter (DTG) in 291 patients operated on from 2014 to 2023.

According to the tactical and technical aspects undertaken, all patients were divided into 2 groups. The main group included 124 patients who used improved tactical and technical aspects of surgical treatment of DTG, treated during the period from 2019 to 2023 (“Surgery” Department of Andijan City Medical Association on the basis of the Department of “Faculty and Hospital Surgery” Faculty N. 2). The comparison group included 167 patients who, during the period from 2014 to 2018 (“Surgical Diseases” Department of Andrei State Medical Institute), underwent standard operations on the thyroid gland in the amount of subtotal resection or total thyroidectomy.

The distribution of patients by gender and age showed that the vast majority were female patients (82.5%; 240 out of 291), with an approximately equal proportion in both the comparison group (82.0%; 137 out of 167) and in the main group. group (83.1%; 103 out of 124). Also, the majority of patients were of active working age – from 21 to 50 years. The average age of patients in the comparison group was 39.0±11.2 years, and in the main group – 41.27±11.79 years (Table 1).

**Table 1**

***Distribution of patients by gender and age***

Age	Comparison Group				Main Group				Total			
	Female		Male		Female		Male		Female		Male	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Till 20	2	1,2%	1	0,6%	2	1,6%	1	0,8%	4	1,4%	2	0,7%
21-30	38	22,8%	2	1,2%	17	13,7%	2	1,6%	55	18,9%	4	1,4%
31-40	46	27,5%	12	7,2%	34	27,4%	6	4,8%	80	27,5%	18	6,2%
41-50	31	18,6%	8	4,8%	28	22,6%	6	4,8%	59	20,3%	14	4,8%
51-60	13	7,8%	5	3,0%	16	12,9%	4	3,2%	29	10,0%	9	3,1%
Above 60	7	4,2%	2	1,2%	6	4,8%	2	1,6%	13	4,5%	4	1,4%
Total	137	82,0%	30	18,0%	103	83,1%	21	16,9%	240	82,5%	51	17,5%

During the history collection, it was revealed that the majority of patients, 43.7% (73 out of 167) in the comparison group and 43.5% (54 out of 124) in the main group, had a duration of DTG from 3 to 5 years. A more than 5-year history of DTG was recorded in 25.1% (42 out of 167) of cases in the comparison group and 29.8% (37 out of 124) in the main group of patients. A history of DTG up to 1 year was detected in only 4 (2.4%) patients from the comparison group and 6 (2.1%) from the main group (Table 2).

**Table 2**

***Distribution of patients by disease duration***

Period	Comparison Group		Main Group		Total	
	Abs.	%	Abs.	%	Abs.	%
Till 1 age	4	2,4%	2	1,6%	6	2,1%
1-3 age	48	28,7%	31	25,0%	79	27,1%
3-5 age	73	43,7%	54	43,5%	127	43,6%
Above 5 age	42	25,1%	37	29,8%	79	27,1%
Total	167	100,0%	124	100,0%	291	100,0%

**Results and its discussion.** In total, in the early postoperative period, 28.7% (48 of 167) cases with complications were observed in the comparison group and 11.3% (14 of 124) in the main group, which was statistically significantly lower (Table 3). In this structure, dysphonia was most often noted both in the comparison group (22.2%; 37 out of 167) and in the main group (8.9%; 11 out of 124). Hypocalcemia occurred in 12.6% (21 of 167) and 5.6% (7 of 124) of cases in the comparison group and the main group, respectively.

In terms of tactical aspects, to optimize the choice of method for surgical treatment of DTG, one should take into account not only standardized indications, but also the following risk factors for relapse of the disease after subtotal subfascial strumectomy: duration of the disease, initial thyroid volume, presence of ophthalmopathy, increased level of antibodies to TSH receptors.

One of the factors for improving surgical results is the improvement of the technical aspects of surgical treatment of DTG. In this regard, we have proposed a “Method of surgical access to the thyroid gland” (Intellectual Property Agency of the Republic of Uzbekistan, invention patent IAP N. 20200507). The problem to be solved by the claimed invention is to reduce intra- and postoperative complications (hypothyroidism, hypoparathyroidism, aphonia), reduce the number of relapses, increase the proportion of good and satisfactory treatment results in the long-term period, reduce the number of bed days of patients in the hospital with good cosmetic effect.

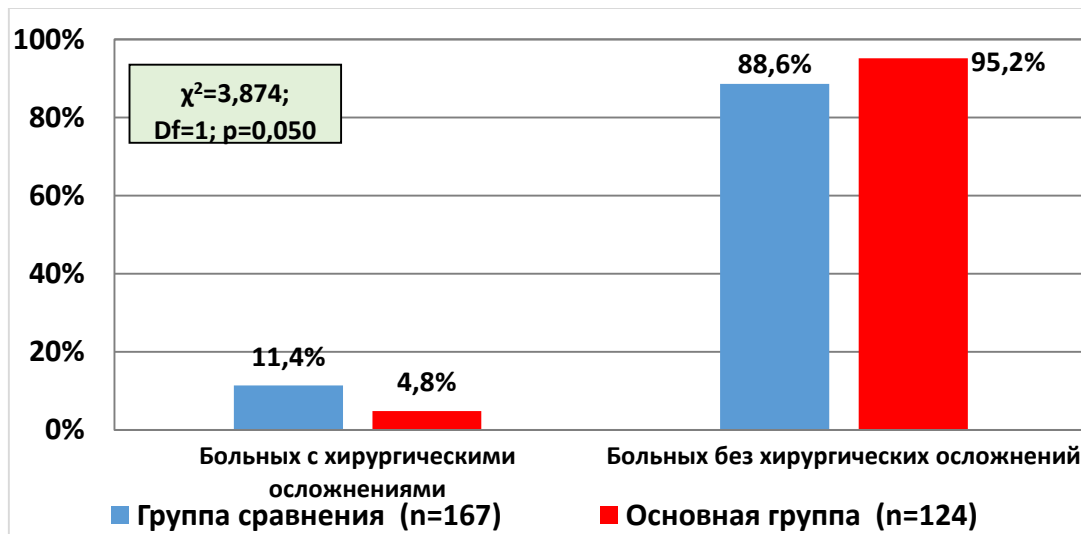
While talking about improving access to the thyroid gland, it is important to suggest that an arcuate incision is made in the skin and subcutaneous fat with detachment of the upper flap to the thyroid cartilage. The subcutaneous muscles (platysma) of the neck and saphenous veins are not crossed or ligated, but are separated longitudinally from the lower edge of the wound to the thyroid cartilage, this makes it possible to avoid postoperative swelling in the skin flaps, since this eliminates impaired lymph circulation in the subcutaneous fatty tissue and the occurrence of infiltration in a postoperative wound. Then mobilization is done along the midline of the neck of the prethyroid muscles, dissecting on both sides wedge-shaped upward and in two directions to the thyroid cartilage duplicating the fascia of the sternohyoid and sternothyroid muscles, after which the free fascia above the thyroid gland is lifted and dissected, and the prethyroid muscles with Farabeuf hooks spread in both directions. Subsequently, according to the developed method, strumectomy or subtotal resection is performed. When using the new method, a reduction in operation time by 1.5 times is achieved.

**Table 3**

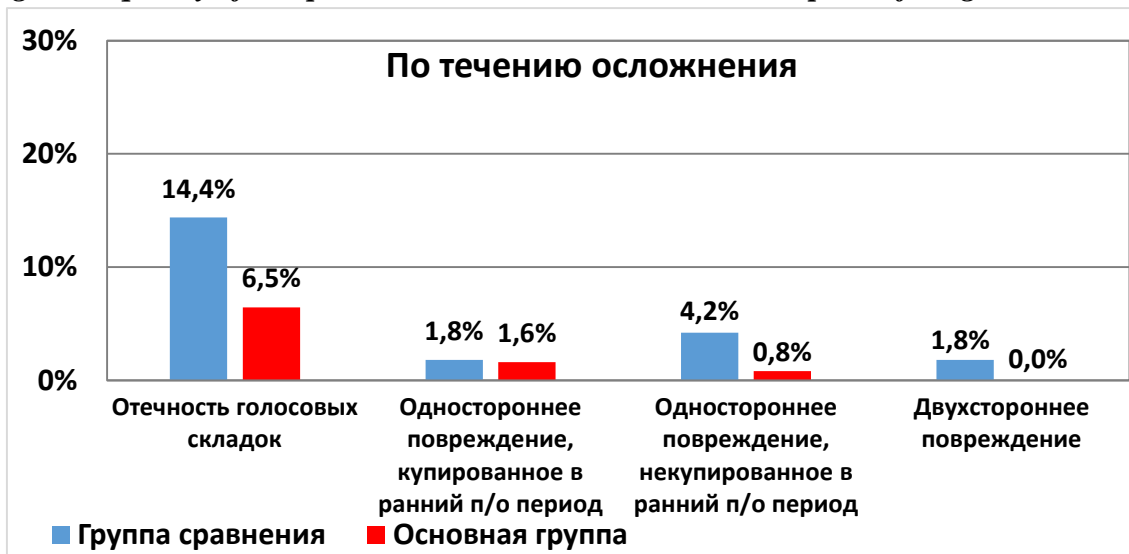
**Comparative incidence of major early postoperative complications**

Complications	Comparison group (n=167)		Main group (n=124)	
	КОЛ-БО	%	КОЛ-БО	%
Hypocalcemia	21	12,6%	7	5,6%
Bleeding	6	3,6%	2	1,6%
Tracheomalacia	1	0,6%	0	0,0%
Dysphonia	37	22,2%	11	8,9%
Wound suppuration	4	2,4%	1	0,8%
Patients with complications	48	28,7%	14	11,3%
$\chi^2$	12,192; Df=1; p<0,001			

There were no cases of tracheomalacia in the main group; wound suppuration was observed in only 1 case (0.8%) and bleeding was observed in 2 (1.6%) cases. Complications associated with the technical aspects of DTG surgery were significantly higher in the comparison group – 11.4% (19 out of 167) versus 4.8% (6 out of 124) in the main group (Fig. 1).

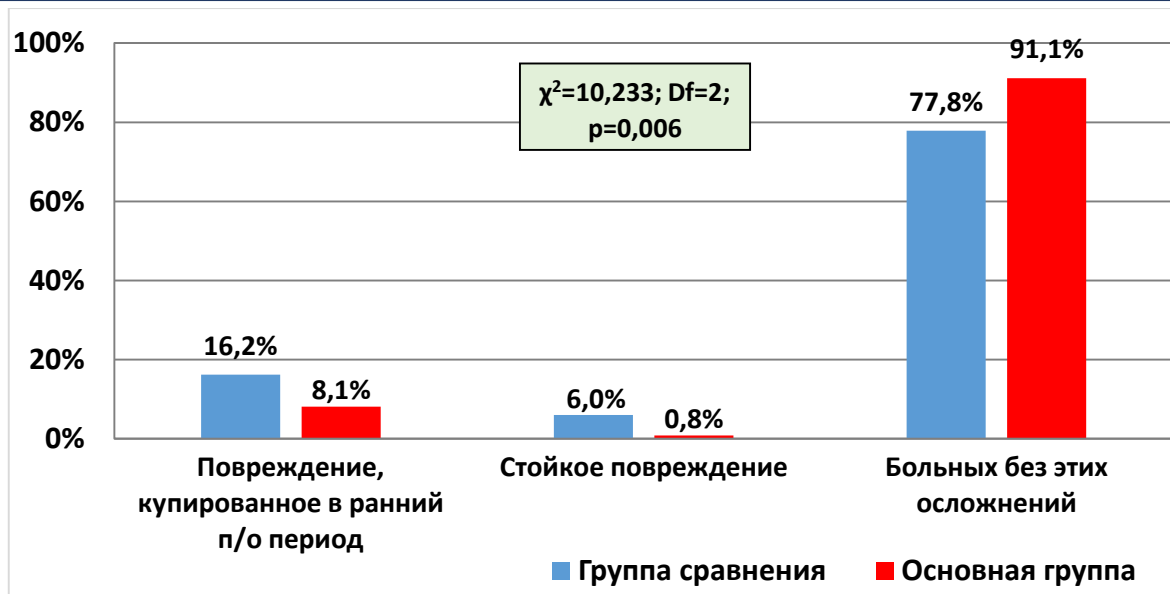


**Fig.1. Frequency of complications associated with technical aspects of surgical treatment**



**Fig.2. Distribution of early postoperative complications from the vocal folds by severity**

In terms of the severity of early postoperative complications associated with damage to the vocal cords, swelling of the folds was most recorded, both in the comparison group (14.4%) and in the main group (6.5%). At the same time, unilateral damage with relief in the early period after surgery was observed with a frequency of 1.8% (3 out of 167) in the comparison group and 1.6% (2 out of 124) in the main group (Fig. 2). At the time of discharge, persistent damage to the vocal cords was noted in only 0.8% (1 out of 124) of cases in the main group, which was statistically significantly lower than in the comparison group, where this figure was 6.0% (10 out of 167) (Fig. 3).



**Fig.3. Distribution of early postoperative complications of the vocal folds by outcome at the time of discharge**

An analysis of the frequency of complications noted in the early period from the vocal folds in a cohort of patients after SSS showed that the optimized tactical and technical aspects of surgical treatment of DTG undertaken in the main group of patients made it possible to reduce the incidence of vocal fold swelling from 11.4% (13 of 114 patients in the comparison group after CVS) to 4.5% (3 out of 66 patients in the main group after CVS). There was also a decrease in cases of laryngeal paresis (1.5% versus 5.3% in the comparison group) and damage to the right vocal fold (1.5% versus 2.6% in the comparison group). There were no cases of damage to the left vocal fold or bilateral damage (Table 4).

**Table 4**

**Complications from the vocal folds in the early period after CVS**

Complications	Comparison Group (n=114)		Main group (n=66)	
	КОЛ-ВО	%	КОЛ-ВО	%
Comparison group	13	11,4%	3	4,5%
Swelling of the vocal folds	6	5,3%	1	1,5%
Left vocal fold	2	1,8%	0	0,0%
Right vocal fold	3	2,6%	1	1,5%
Both vocal folds	1	0,9%	0	0,0%
Patients with these complications	19	16,7%	4	6,1%
Patients without these complications	95	83,3%	62	93,9%
$\chi^2$	4,219; Df=1; p=0,040			

According to the course of this group of complications, patients after CVS were distributed as follows: swelling of the vocal folds was noted in 11.4% of cases in the comparison group and 4.5% in the main group; unilateral injuries stopped in the early period were also observed with greater frequency in the comparison group (1.8% versus 1.5%). At the same time, in the main group of patients there were no cases of bilateral damage to the vocal folds and no cases of

untreated complications in the early period after CVS. In terms of outcome, it was also possible to note better results and a higher frequency of cases without complications in the main group of patients (93.9%; 62 out of 66) than in the comparison group (83.3%; 95 out of 114) (Fig. 4)

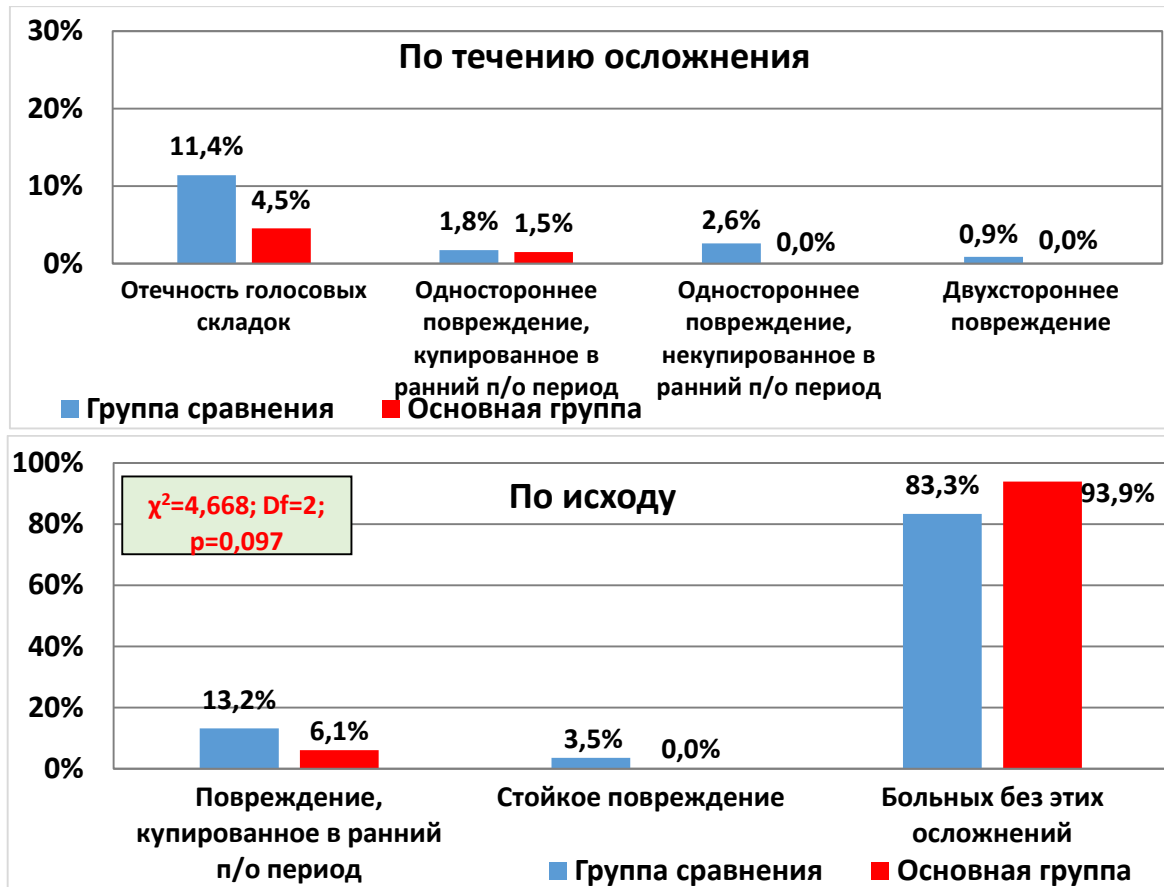


Fig.4. Distribution of early complications after CVS from the vocal folds according to severity

Table 5

**Incidence of hypoparathyroidism in comparison groups**

Indicator	Comparison Group		Main Group		T	p
	M	δ	M	δ		
Bed- days	8,59	2,09	6,90	1,68	- 7,64	<0,001

Thus, from Table 5 it is clear that this indicator in the comparison group was statistically significantly worse (8.59±2.09 bed days versus 6.9±1.68 in the main group; t=-7.64; p< 0.001) than in the main group of patients, which was associated with higher specific complications that required longer rehabilitation of patients.

**Conclusion.** Thus, the improved method of surgical access to the thyroid gland provides adequate visualization of the organ while minimizing the likelihood of trauma to surrounding tissues, which reduced the incidence of complications associated with the technical aspects of the operation from 11.4% in 19 of 167 patients in the comparison group to 4.8% and in 6 out of 124 patients in the main group (bleeding, tracheomalacia, dysphonia, wound suppuration). At the same time, the frequency of complications from the vocal folds in the immediate period decreased from 22.2% in 37 out of 167 patients in the comparison group to 8.9% and in 11 out of 124 patients in the main group, in whose structure the proportion of swelling of the folds decreased from 14.4 % (24) to 6.5% (8), and laryngeal paresis from 7.8% (13) to 2.4% (3). In turn, in the long-term period,

persistent damage to the recurrent nerve was noted in 6.0% in 9 out of 150 patients followed, and in the comparison group and 0.9% in 1 out of 112 in the main group.

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