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## IMPROVEMENT OF TACTICAL AND TECHNICAL ASPECTS OF SURGICAL TREATMENT OF DIFFUS TOXIC GOITER

**Abstract:** The authors analyze that improved surgical access to the thyroid gland and postoperative rehabilitation program will reduce the incidence of long-term complications.

The authors conclude that the use of the improved method of surgical access to the thyroid gland and the postoperative rehabilitation program made it possible to reduce the incidence of long-term complications, which, in general, provided an increase in the proportion of good and satisfactory results from 84.7% to 97.3% with a decrease in the probability of an unsatisfactory outcome from 15.3% to 2.7%.

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

**Language:** English

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### Introduction

A topical and leading issue in surgical endocrinology is the treatment of patients with diffuse toxic goiter. To date, a difficult task for this group of patients is considered to be the therapy of postoperative hypothyroidism and recurrence of thyrotoxicosis, which is caused by the development of pathological metabolic and metabolic syndromes, as well as the complexity of adequate correction of disturbed endocrine regulation of the body [7,8].

A specific complication in thyroid surgery is laryngeal paresis, which stops endocrinologists from referring a patient with thyroid disease for surgical treatment. The arsenal of modern medicine includes three main methods of treating patients with thyroid disease: treatment with thyreostatic drugs; radioactive iodine treatment; surgical treatment [2].

Despite the high level of development of pharmaceuticals, today there is no clear protocol for the treatment of patients with thyroid disease, in this regard, 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 with contraindications to other methods of treatment [6]. Currently, many works are devoted to treatment with radioactive iodine [2-5,10].

### Aim.

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

### Materials and methods.

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The analysis made it possible to determine two main directions for improving the results of surgical treatment of DTG:

tactical aspects - optimization of the choice of the method of surgery to reduce the risk of postoperative hormonal disorders and recurrence of the disease;

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

The dissertation research was carried out in the Department of Surgery No. 3 on the basis of the Department of Surgical Diseases of ASMI. The work is based on the results of treatment of diffuse toxic goiter (DTG) in 291 patients operated on for the period from 2011 to 2020.

According to the undertaken tactical and technical aspects, all patients were divided into 2

groups. The main group included 124 patients who underwent improved tactical and technical aspects of the surgical treatment of thyroid disease, treated for the period from 2016 to 2020. The comparison group included 167 patients who underwent standard operations on the thyroid gland (TG) in the volume of subtotal resection or total thyroidectomy in the period from 2011 to 2015.

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

**Table 1. Distribution of patients by sex and age**

Age (years)	Comparison group				Main group				Total			
	Wom		Man		Wom		Man		Wom		Man	
	abs.	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%
Before 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%
Older 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%

In the course of collecting the anamnesis, it was revealed that the majority of patients, 43.7% (73 of 167) in the comparison group and 43.5% (54 of 124) in the main group, had a duration of DTG disease from 3 to 5 years. More than 5-year history of DTG was registered in 25.1% (42 of 167) cases in the

comparison group and 29.8% (37 of 124) in the main group of patients. Anamnesis 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	%
Before 1 year	4	2,4%	2	1,6%	6	2,1%
1-3 years	48	28,7%	31	25,0%	79	27,1%
3-5 years	73	43,7%	54	43,5%	127	43,6%
More 5 years	42	25,1%	37	29,8%	79	27,1%
Total	167	100,0%	124	100,0%	291	100,0%

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In terms of tactical aspects, to optimize the choice of the method of surgical treatment for DTG, not only standardized indications should be taken into account, but also the following risk factors for recurrence of the disease after performing 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 the results of the operation is the improvement of the technical aspects of the surgical treatment of DTG. In this regard, we have proposed a "Method for surgical access to the thyroid gland" (Intellectual Property Agency of the Republic of Uzbekistan, patent for invention IAP No. 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 bed-days of hospital stay with good cosmetic effect.

### Improved access to the thyroid gland.

An arcuate incision is made in the skin, subcutaneous fatty tissue with detachment of the upper flap to the thyroid cartilage. The subcutaneous muscles (platysma) of the neck and the saphenous veins do not intersect or ligate, but are diluted longitudinally from the lower edge of the wound to the

thyroid cartilage, this makes it possible to avoid postoperative edema in the skin flaps, since this eliminates the violation of lymphatic circulation in the subcutaneous adipose tissue and the occurrence of infiltration in the postoperative wound. Then mobilization is done along the midline of the neck of the prethyroid muscles, dissecting on both sides wedge-shaped upwards and in two directions to the thyroid cartilage duplicate of the fascia of the sternohyoid and sterno-thyroid muscles, after which the free fascia above the thyroid gland is lifted and dissected, and the prethyroid muscles with hooks bred in both directions. In the future, according to the developed method, a strumectomy or subtotal resection is performed. When using the new method, the operation time is reduced by 1.5 times.

### Results and its discussion.

In total, 28.7% (48 of 167) cases with complications in the comparison group and 11.3% (14 of 124) in the main group were observed in the early postoperative period, 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) cases in the comparison group and the main group, respectively.

**Table 3. Comparative incidence of major early postoperative complications**

Complications	Comparison group (n=167)		Main group (n=124)	
	Number	%	number	%
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%
Suppuration of the wound	4	2,4%	1	0,8%
Patients with complications	48	28,7%	14	11,3%
$\chi^2$	12,192; Df=1; p<0,001			

In the main group, there were no cases of tracheomalacia; also, in only 1 cases (0.8%), wound suppuration was observed and in 2 (1.6%) cases, bleeding was noted.

Complications associated with the technical aspects of DTZ 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).

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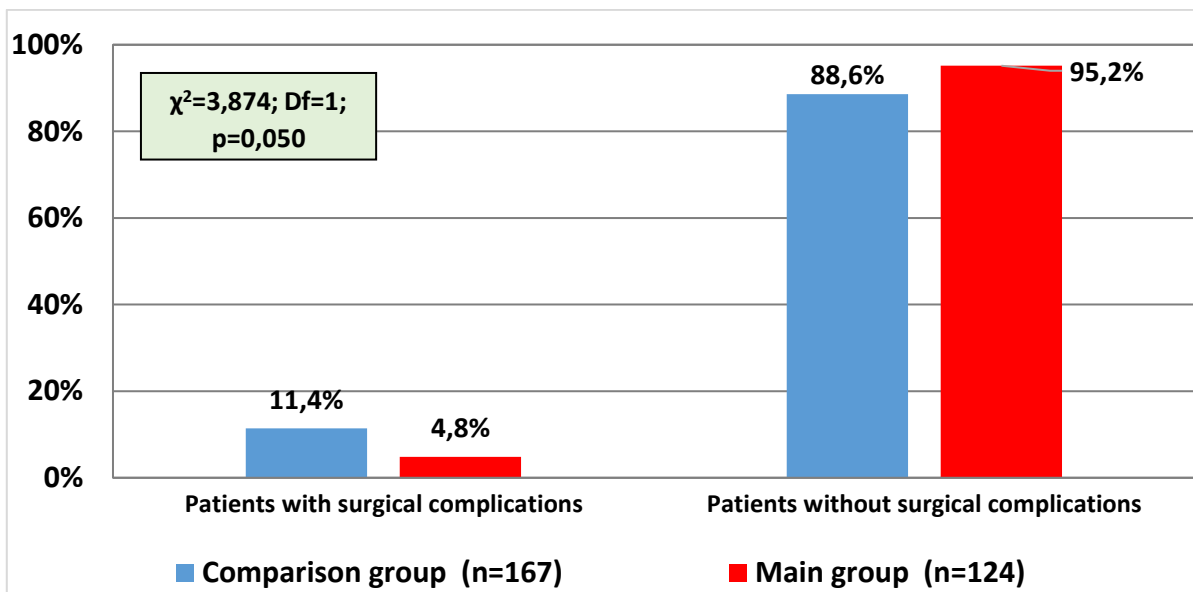


Fig. 1. The incidence of complications associated with the technical aspects of surgical treatment

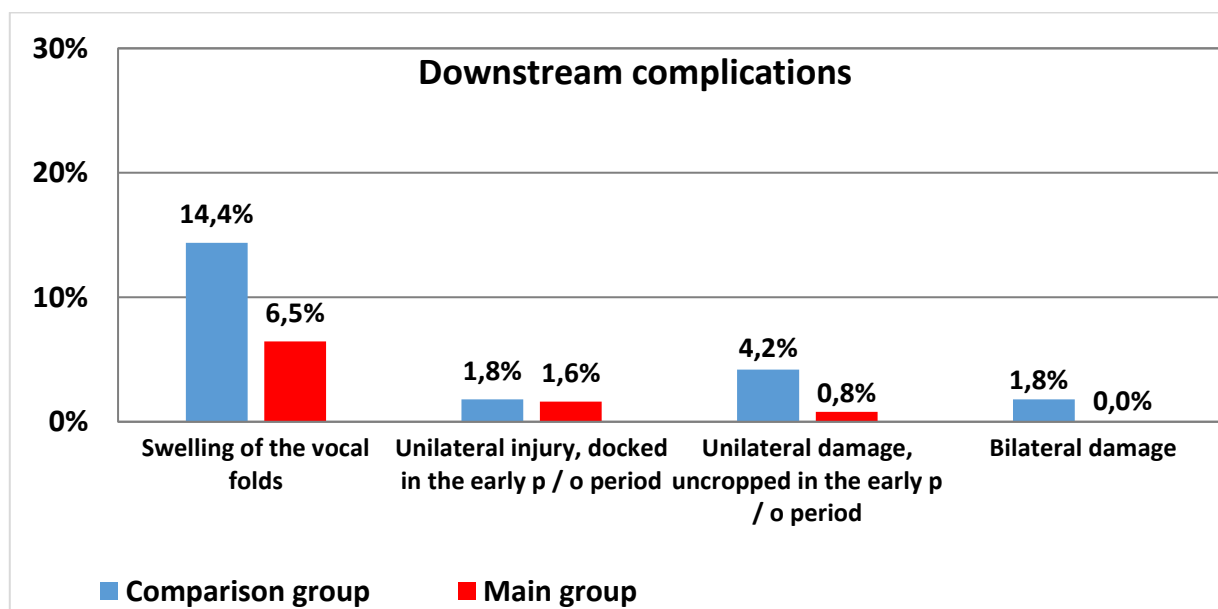


Fig. 2. Distribution of early postoperative complications from the vocal folds by the severity of the course

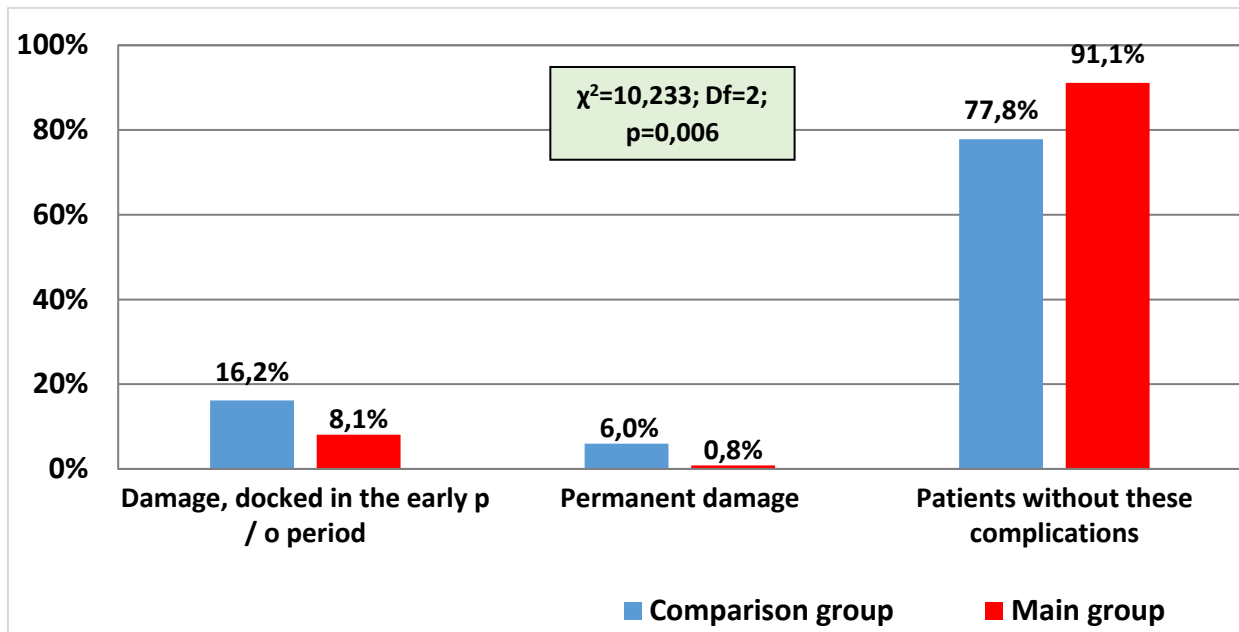
According to the severity of the course of early postoperative complications associated with lesions of the vocal cords, fold edema was registered most of all, both in the comparison group (14.4%) and in the main group (6.5%). At the same time, unilateral injury with relief in the early period after 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 of 124) cases in the main group, which was statistically significantly lower than in the comparison group, where this indicator was 6.0% (10 of 167) (Fig. .3).

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

An analysis of the incidence 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 reduced the incidence of vocal fold edema from 11.4% (13 of 114 patients in the comparison group after SSS) to

4.5% (3 of 66 patients in the main group after SSS). There was also a decrease in cases with 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 and bilateral damage (Table 4).

**Table 4. Complications from the vocal folds in the early period after SSS**

Complications	Comparison group (n=114)		Main group (n=66)	
	Number	%	Number	%
Swelling of the vocal folds	13	11,4%	3	4,5%
Laryngeal paresis	6	5,3%	1	1,5%
<i>Left vocal fold</i>	2	1,8%	0	0,0%
<i>Right vocal fold</i>	3	2,6%	1	1,5%
<i>Both vocal folds</i>	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			

In the course of this group of complications, patients after SSS 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 that were arrested in the early period were also observed with a greater frequency in the comparison group ( 1.8% versus 1.5%). At the same time, in the main group of patients, there were

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no cases of bilateral damage to the vocal folds and uncropped cases of complications in the early period after SSS. According to the outcome, it was also possible to note better results and a higher incidence

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)

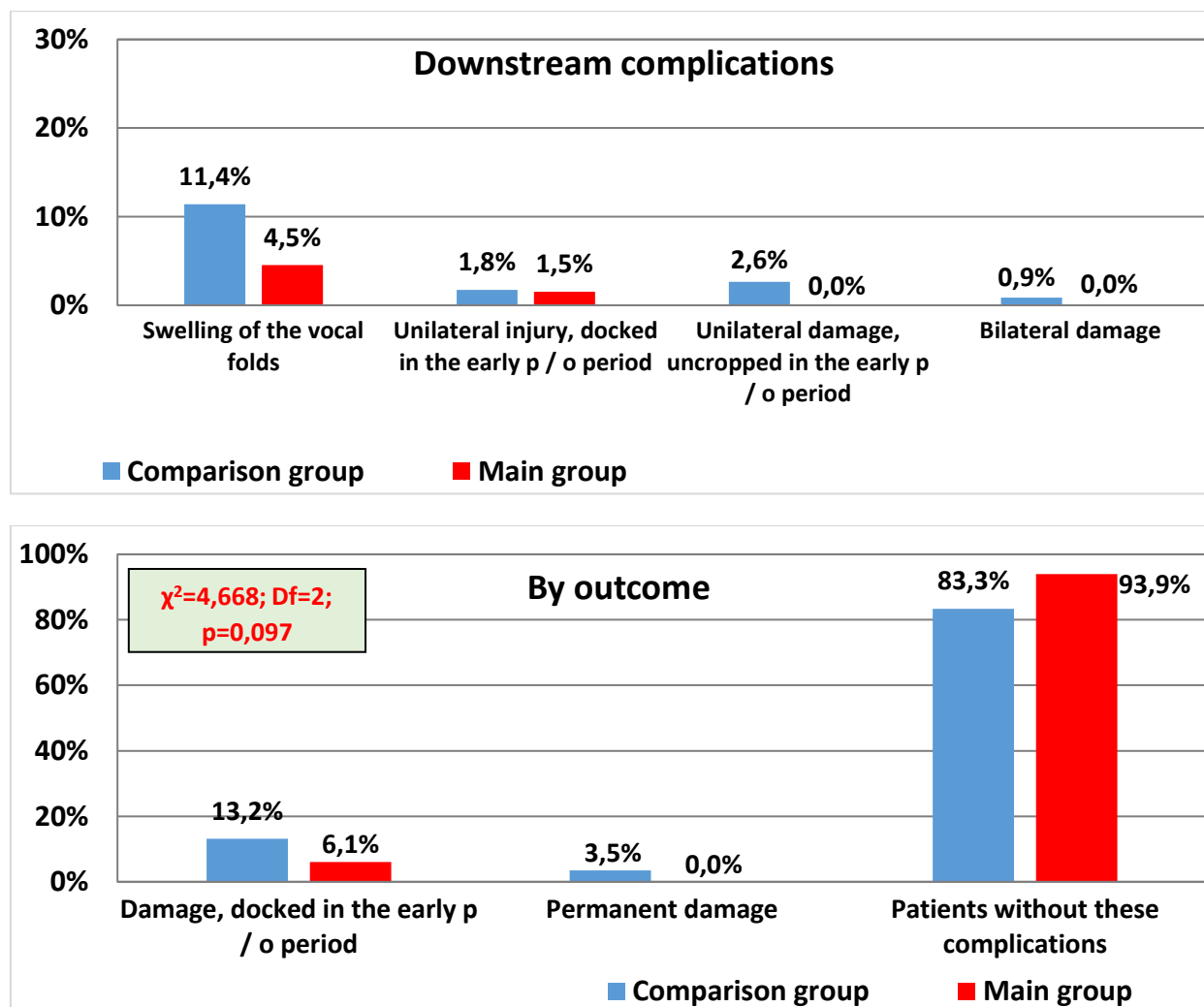


Fig. 4. Distribution of early complications after SSS from the vocal folds according to the severity of the course

Table 5. Duration of hospital treatment period in comparison groups

Index	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, Table 5 shows that this indicator in the comparison group was statistically significantly worse ( $8.59 \pm 2.09$  bed-days versus  $6.9 \pm 1.68$  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 a longer rehabilitation of patients.

**Conclusion.**

Thus, the improved method of surgical access to the thyroid gland provides adequate visualization of the organ with minimization of the likelihood of trauma to the surrounding tissues, which made it possible to reduce the incidence of complications associated with the technical aspects of the operation from 11.4% in 19 out of 167 patients in the

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comparison group to 4.8%. and in 6 of 124 patients in the study group (bleeding, tracheomalacia, dysphonia, wound suppuration). At the same time, the frequency of complications from the vocal folds in the nearest period decreased by 22.2% in 37 out of 167 patients in the comparison group to 8.9% and in 11 of 124 patients in the main group, in whose structure the

proportion of folds edema 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 traced patients, and in the comparison group and 0.9% in 1 out of 112 in the main group.

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