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Results of Differentiated Surgical Treatment of Benign Origin Thyroid Nodules

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ABSTRACT

Relevance. According to WHO data, nodular goiter is present in 7% of the world's population, while the frequency of nodular forms of goiter in the structure of thyroid diseases varies between 65-80%.

Objective: to improve the results of surgical treatment of patients with benign thyroid nodules by developing a differentiated approach to the choice of the volume of surgery.

Material and methods. Surgical treatment of 368 patients with thyroid nodules operated on in the period 2005-2018 were analyzed in the 1st clinic of the Samarkand Medical Institute. The age of patients at the time of the operation was from 18 to 77 years (average age 49.4+11.8 years), women-291 (79.1%), men – 77 (20.9%).

Results. Retrospective analysis of results of operations depending on the data histological studies showed that the main cause of relapse of NFGT was nodular cystic colloid goiter with the centers of the adenomatosis (63,6%) and a combination of different types of adenomas with multinodular colloid goiter with different degree of proliferation (22,3%) which made conservative operations.

Conclusions. The developed algorithm for selecting the volume of surgical intervention in NFGT, taking into account the data of the conclusion of NPAB and intraoperative express-biopsy, allowed to improve the results of treatment by reducing the frequency of immediate postoperative complications from 21.2% to 2.9% and unsatisfactory results in the long-term postoperative period from 24.1% to 4.7%.

KEY WORDS:nodular formations of the thyroid gland, recurrent goiter, postoperative hypothyroidism.

INTRODUCTION

In recent decades, there has been an increase in the number of patients with thyroid diseases worldwide, so according to WHO data, nodular goiter is present in 7% of the world's population, while the frequency of nodular forms of goiter in the structure of thyroid diseases varies between 65-80%, and the proportion of malignant lesions is 3-15%. The Republic of Uzbekistan, particularly Samarkand region is an endemic region for goiter, despite ongoing measures to prevent iodine deficiency. [5, 7, 8, 10, 11, 12].

The treatment of NFTG is a complex surgical problem. A sufficiently high frequency of postoperative complications and numerous cases of postoperative relapses of the disease (15-44%), the development of thyroid cancer (7-16%), postoperative hypothyroidism (25-63%) indicate a lack of effectiveness and reliability of common surgical tactics [1, 3, 6, 9, 13].

According to a number of authors, the main factor provoking complications is an

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inadequately performed surgical manual, other authors point to the morphological structure of the nodular formation and goiter changes in the perinodular tissue. The lack of a common point of view on the factors that determine the risk of postoperative complications in NFTG served as the basis for this study. [1, 2, 4, 9].

Objective of the research was to improve the results of surgical treatment of patients with benign thyroid nodules by developing a differentiated approach to the choice of the volume of surgery.

MATERIAL AND METHODS

The material of the study was the results of surgical treatment of 368 patients with NFTG operated in the period of 2005-2018 in the 1st clinic of the Samarkand Medical Institute. The age of patients at the time of the operation was from 18 to 77 years (average age 49.4+11.8 years), women-291 (79.1%), men – 77 (20.9%) (table 1).

Table 1. Distribution of patients by age and sex in the study groups (n=368)

patients		**Study groups**			**Total**
Gender	**Age**	**Main group**	**Comparison group**		
			1st subgroup	**2nd subgroup**	
Male	16-20	1	2	1	4
	21-40	5	9	7	21
	41-60	12	17	15	44
	61-75	2	4	1	7
	76 and older	1	-	-	1
Female	16-20	3	2	4	9
	21-40	38	27	21	86
	41-60	62	51	49	162
	61-75	12	14	3	29
	76 and older	2	1	2	5
Overall		138	127	103	368

The patients were conditionally divided into 2 groups: the comparison group - 230 patients operated on in the period from 2005 to 2013 and the main group – 138 patients operated on in the years of 2014-2018. The patients of the comparison group were also divided into 2 subgroups: 1st subgroup consisted of patients operated on in 2005-2009, 2nd subgroup-operated on in 2010-2013 (table 2).

Table 2. Operations performed in the case of NFTG

Type of surgical intervention	**Number of operations performed**			
	Main group	**Comparison groups**		**Total**
		1st subgroup	**2nd subgroup**	
Thyroidectomy	10	4	15	29(7,9%)
Subtotal resection of the thyroid gland	54	23	62	139(37,8%)

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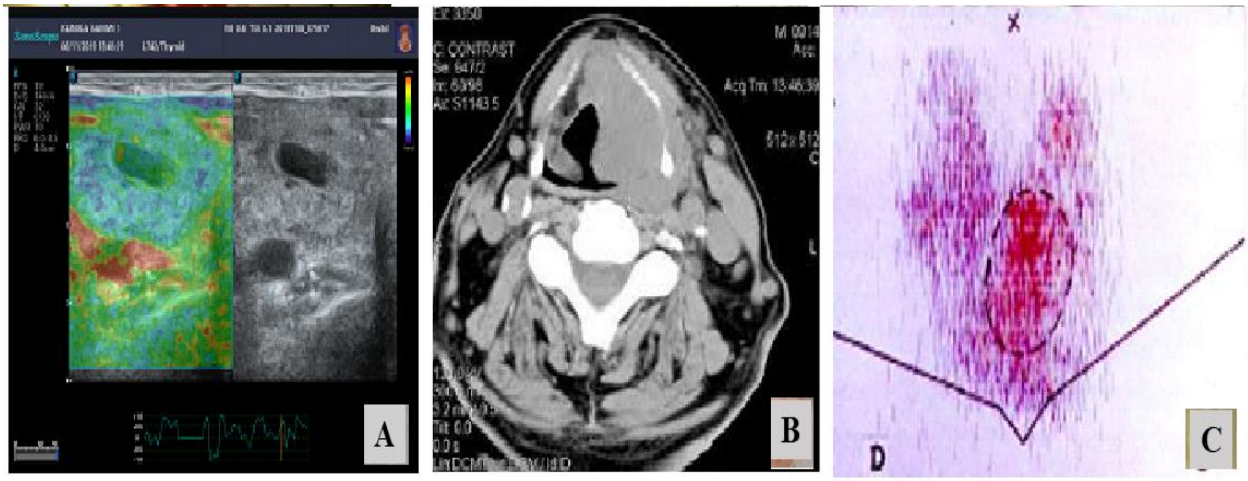
Hemithiroidectomy with partial resection of the other lobe of the thyroid gland	23	18	9	50(13,6%)
Hemithiroidectomy	37	51	12	100(27,1%)
Partial resection of the thyroid gland	14	31	5	50(13,6%)
Overall	138	127	103	368(100%)

Instrumental research methods included: - Ultrasound diagnosis of the thyroid gland and lymph nodes of the neck (performed in all 368 patients); - radiography of the thoracic cavity in the presence of clinical manifestations of compression of the neck and mediastinum, which was supplemented by tomography of the neck and mediastinum (performed according to the indications of 35 patients);- scintigraphy of the thyroid gland (according to the indications of 19 patients) (Fig. 1).

Figure 1. Instrumental methods of diagnosis of NFTG: Ultrasound diagnosis of the thyroid gland (A), Computed tomography of the neck (B), radionuclide scan of the thyroid gland (C)



The degree of enlargement of the thyroid gland was evaluated according to the classification of O. V. Nikolaev, on the basis of ultrasound and palpation of the thyroid gland. In 94 (25.5%) patients, nodular goiter of the II-III degree was diagnosed, in 274 (74.5%) nodular goiter of the IV-V degree. In accordance with the clinical and morphological form, nodular goiter was detected in 160 (43.5%) patients, multi – nodular goiter-in 196 (53.3%), and in 12 (3.3%) patients – autoimmune thyroiditis.

Morphological studies of thyroid tissue included: - fine needle aspiration biopsy at the preoperative stage (performed in 368 patients); - urgent intraoperative express biopsy (performed according to the indications of 89 patients); - routine histological examination of the removed thyroid tissue (performed in all 368 patients operated on) (Fig. 2).

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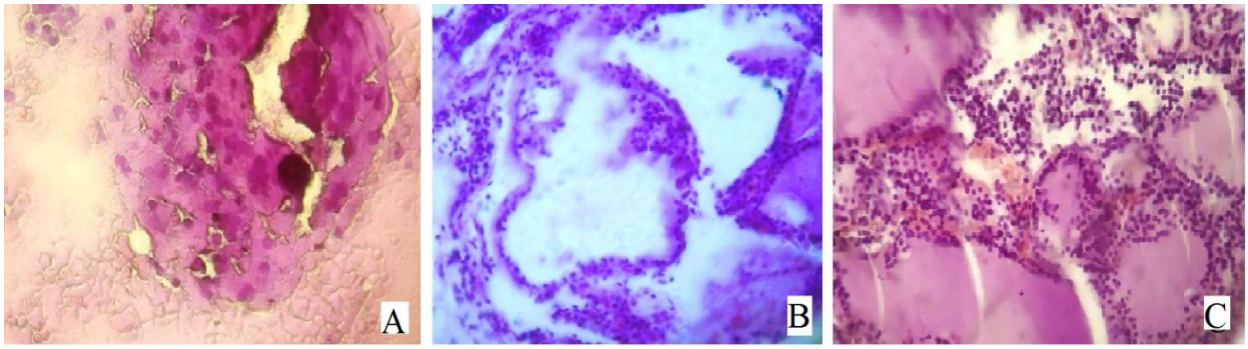
Figure 2. Morphological methods for the study of NFTG: fine needle puncture aspiration biopsy (A), intraoperative express biopsy (B), postoperative histological examination (C)



According to histological studies, nodular cystic-colloidal goiter with different degrees of proliferation was found in 95(25.8%), nodular cystic-colloidal goiter with foci of adenomatosis – 98(26.6%), a combination of different types of adenomas with multi – nodular colloidal goiter with different degrees of proliferation-100(27.2%) and various types of primary multiple adenomas in 75 (20.4%) patients with NFTG.

According to our study, in the morphological diagnosis of NFTG, the informative value of NPAB was 91.8%, express biopsy-98.1%, and the combination of these methods increased the informative value to 99.2%. The introduction into clinical practice of the above-mentioned methods of morphological diagnosis of changes in the nodular and perinodular thyroid tissue in patients with NFTG made it possible to choose the optimal volume of surgical intervention.

In our study, patients with NFTG underwent the following operations such as, - thyroidectomy 47(12.8%); - extremely subtotal resection of the thyroid gland 39(10.6%); - hemithiroidectomy with subtotal resection of the other lobe 53(14.4%); - subtotal resection of the thyroid gland 95(25.8%); - hemithiroidectomy 80(21.7%); - partial resection of the thyroid gland 54 (14.7%).

RESULTS

In choosing the scope of surgery in the surgical treatment of 127 patients with NFTG in the 1st subgroup of the comparison group (2005-2009), we followed the principle of organ preservation. Subtotal resection of the thyroid gland (44), hemithiroidectomy (29) and partial resection of the thyroid gland (36) were mainly performed. About 51.2% were organ preserving operations (hemithiroidectomy and partial resection of the thyroid gland), radical operations were performed in 14.2% of patients (thyroidectomy – 4, extremely subtotal resection of the thyroid gland (TG) – 3, hemithiroidectomy with subtotal resection of the other lobe-11.

With very favorable results of treatment in this group of patients-leveling in the immediate postoperative period - such complications as laryngeal nerve paresis, bleeding, hypoparathyroidism and hypothyroidism-the number of relapses in NFTG significantly increased, which was 26.4%. The frequency of this complication after hemithiroidectomy was 28.6%, and after partial resection 55.6%.

A retrospective analysis of the results of the operations, depending on the data of histological studies, showed that the main cause of the relapse of NFTG was nodular cystic-colloidal goiter with foci of adenomatosis (63.6%) and a combination of different types of

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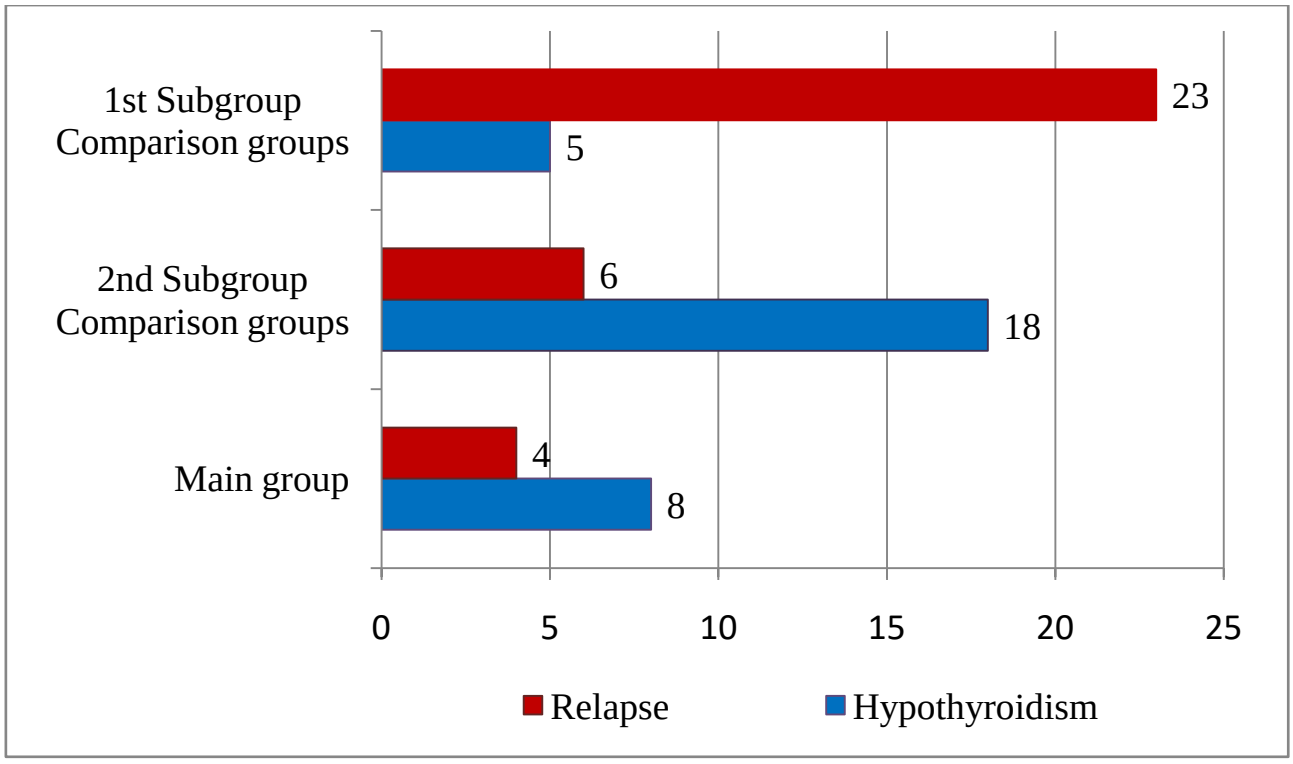
adenomas with multi-nodular colloidal goiter with different degrees of proliferation (22.3%), in which organ-preserving operations were performed.

The high frequency of relapse in NFTG was the reason for the revision of the surgical tactics for choosing the volume of surgery in 103 patients of the 2nd subgroup of the comparison group (2010-2013) in the direction of expanding the indications for performing radical operations. In 51.4% of cases, these patients underwent radical surgery: - thyroidectomy (14); - extremely subtotal resection of the thyroid gland (18); - hemithiroidectomy with subtotal resection of the other lobe (21). Organ-preserving operations were performed in 24.3% of cases: - hemithiroidectomy (19); - partial resection of the thyroid gland (6). Subtotal resection of the thyroid gland was performed in 25 patients.

Performing radical operations in this subgroup of patients with NFTG significantly reduced the rate of relapse (8%) in the long-term period, but the number of specific intraoperative complications and complications in the immediate postoperative period, such as bleeding, paresis and damage to the laryngeal nerves, hypoparathyroidism, significantly increased. In the long-term period, hypothyroidism was detected in 24% of operated patients, and in 90% after thyroidectomy, in 46.1% - subtotal resection of the thyroid gland (fig. 3).

Figure 3. The frequency of unsatisfactory results in the long-term postoperative period



The high percentage of unsatisfactory treatment results in the comparison group is associated with the fact that the factors determining the choice of the operation volume depending on the histological structure of the thyroid gland were not sufficiently taken into account. Based on this, in the main group of patients with NFTG (138 operated in the period 2014-2018), the choice of surgical tactics was differentiated depending on the results of pre-and intraoperative morphological examination of the thyroid tissues (NPAB and express biopsy). In accordance with the developed point system for choosing the method of surgery, it is recommended to: - up to 9 points - perform a hemityroidectomy or partial resection of the

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thyroid gland (small nodular formations of the thyroid gland without proliferative cells were detected during puncture and express biopsy); - from 10 to 12 points with NFTG -subtotal resection of the thyroid gland; - more than 12 points total thyroidectomy, extremely subtotal resection of the thyroid gland or hemithiroidectomy with subtotal resection of the other lobe (with puncture and express biopsy, there were foci of adenomatosis or different degrees of proliferation of the thyroid tissue) (table 3).

Table 3. Point system for choosing the method of treatment of thyroid nodules

№	Factors influencing the choice of treatment	Characteristics of factors	Points
1	The degree of enlargement of the thyroid gland according to O. V. Nikolayev.	I	0
		II	1
		III	2
		IV	3
		V	4
2	Cytological conclusion	Different types of primary multiple adenomas	1
		Nodular cystic-colloidal goiter with varying degrees of proliferation	2
		Combination of different types of adenomas with multi-node colloidal goiter with different degrees of proliferation	3
		Nodular cystic-colloidal goiter with foci of adenomatosis	4
3	Localization of the thyroid gland node	In one share	0
		In both shares	1
4	Thyroid status of the thyroid gland	Hypothyroid	0
		Euthyroid	1
		Hyperthyroid	2
5	Inflammation of the thyroid gland	Yes	0
		No	1
6	Concomitant pathology of vital organs	Yes	0
		No	1

In accordance with the proposed program, radical operations were performed with the possible maximum removal of the thyroid gland (thyroidectomy – 29, maximum subtotal resection of the thyroid gland – 18, hemityroidectomy with subtotal resection of the other lobe – 21), which was 49.3%. Organ-preserving operations (hemityroidectomy-32, partial resection of the thyroid gland-12) were performed in 31.9% of patients. Subtotal resection of the thyroid gland was performed in 26 patients (Fig. 4).

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Figure 4. Hemithiroidectomy: macropreparation of the removed node together with the left lobe of the thyroid gland (A), cosmetic suture on the skin after the operation (B)

CONCLUSION

The developed algorithm for selecting the volume of surgical intervention in NFTG, taking into account the data of the conclusion of NPAB or express biopsy, allowed to improve the results of treatment by reducing the frequency of immediate postoperative complications from 22.3% to 2.9% and unsatisfactory results in the long-term postoperative period from 24.1% to 4.7%. Thus, the relapse in the main group of patients was 1.9%, while postoperative hypothyroidism was 3.8%, and the frequency of specific complications such as intraoperative bleeding was 1.4%, in the immediate postoperative period, transient paresis of the recurrent laryngeal nerve and transient hypoparathyroidism were observed in 2.9% and 0.7%, respectively.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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