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Results of Surgical Treated of Nodular Thyroid in Women

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Abstract

The long-term results of surgical treatment of nodular goiter and thyroid cancer were studied. Glands in 239 women under the age of 40 years. The patients were divided into two homogeneous groups: 1st - operated on for differentiated thyroid cancer; 2nd - operated on for benign neoplasms. Revealed causes and frequency the occurrence of recurrence of the disease, especially the course of postoperative hypothyroidism. The relationship of the occurrence of complications with the nosology and volume of the operation is analyzed. Evaluated the reproductive function of women after surgery. Tactics offered treatment of nodular goiter and thyroid cancer in pregnant women. We studied the long-term results in 239 women under the age of 40 years. Patients were divided into two homogeneous groups:

1. Thyroid cancer,

2. Operated for benign tumors.

The causes and frequency of recurrence of the disease and postoperative hypothyroidism were identified. The relation between the occurrence of complications with nosology and operation volume was analyzed. We evaluated the reproductive function of treatment of the goiter and thyroid cancer in pregnant women.

Keywords: Hyperthyroidism; Hypothyroidism; Nodular Thyroid; Human Chorionic Gonadotropin

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Introduction

The thyroid diseases-hyperthyroidism and hypothyroidism-are relatively common in pregnancy and important to treat. The thyroid is an organ located in the front of your neck that releases hormones that regulate your metabolism (the way your body uses energy), heart and nervous system, weight, body temperature, and many other processes in the body [1,2].

Thyroid hormones are particularly necessary to assure healthy fetal development of the brain and nervous system during the first three months of your pregnancy since the baby depends on your hormones, which are delivered through the placenta. At around 12 weeks, the thyroid gland in the fetus will begin to produce its own thyroid hormones [1-3].

There are 2 pregnancy-related hormones: estrogen and human chorionic gonadotropin (hCG) that may cause your thyroid levels to rise [1,2]. This may make it a bit harder to diagnose thyroid diseases that develop during pregnancy. However, your doctor will be on the look-out for symptoms that suggest the need for additional testing [1].

However, if you have pre-existing hyperthyroidism or hypothyroidism, you should expect more medical attention to keep these conditions in control while you are pregnant, especially for the first trimester. Occasionally, pregnancy may cause symptoms similar to hyperthyroidism should you experience any uncomfortable or new symptoms, including palpitations, weight loss, or persistent vomiting, you should, of course, contact your physician [1-3].

Untreated thyroid diseases during pregnancy may lead to premature birth, preeclampsia (a severe increase in blood pressure), miscarriage, and low birth weight among other problems. Therefore, it is important to talk to your doctor if you have had a history of hypothyroidism or hyperthyroidism so you can be monitored before and during your pregnancy, and to be sure that your medication is properly adjusted, if necessary [4,5].

Causes of thyroid disease in pregnancy hyperthyroid disease: The most common cause of maternal hyperthyroidism during pregnancy is the autoimmune disorder Grave's disease. In this disorder, the body makes an antibody (a protein produced by the body when it thinks a virus or bacteria is present) called thyroid-stimulating immunoglobulin (TSI) that causes the thyroid to overreact and make too much thyroid hormone [6].

Even if you've had radioactive iodine treatment or surgery to remove your thyroid, your body can still make the TSI antibody. If these levels rise too high, TSI will travel through your blood to the developing fetus, which may cause its thyroid to begin to produce more hormone than it needs [7,8]. So long as your doctor is checking your thyroid levels, both you and your baby will get the care needed to keep any problems in check [9].

Hypothyroid disease: The most common cause of hypothyroidism is the autoimmune disorder known as Hashimoto's thyroiditis. In this condition, the body mistakenly attacks the cells of the thyroid gland, leaving the thyroid without enough cells and enzymes to make enough thyroid hormone to meet the body's needs [10,11].

Diagnosis of thyroid disease in pregnancy hyperthyroidism and hypothyroidism in pregnancy are diagnosed based on symptoms, physical exam, and blood tests to measure levels of thyroid-stimulating hormone (TSH) and thyroid hormones T4, and for hyperthyroidism also T3 [12].

Thyroid Physiology in Pregnancy

Approximately 94% of thyroid hormones are secreted by the thyroid gland as thyroxine or tetraiodothyronine (T4) and 6% as triiodothyronine (T3) (Figure 1). T4 is catalytically converted to the more metabolically active T3 in peripheral tissues by deiodinases and a portion of peripherally-produced T3 returns to the circulation and it is because of this peripheral conversion that the plasma T4 to T3 ratio is approximately 4:1 [13,14]. Both T4 and T3 are mostly bound to carrier proteins in the serum, chiefly thyroxine-binding globulin (TBG). However, it is the free hormones (free T4 (fT4) and free T3 (fT3)) that are available to be actively transported into cells and exert their effects [15,16].

Changes in maternal thyroid function during pregnancy result from a combination of increased metabolic demands, increased serum TBG concentrations, stimulation of the TSH receptor by human chorionic gonadotropin (hCG) [17,18], an increased mother-to-foetus transfer of thyroxine and an increased intraplacental breakdown of T4 and T3 (resulting from the placental expression of deiodinase 3) [19].

Total T4 and T3 concentrations increase by 50% as a result of a 50% increase in circulating TBG levels by 6-8 weeks of gestation; their levels plateau at around 16 weeks of gestation [20]. Maternal TSH is usually within normal limits during pregnancy but it can be decreased in the first trimester due to the increased hCG levels and the cross-reactivity of this hormone on TSH receptors [21]; both are glycoprotein hormones with a common α subunit and a considerable homology between their β subunits. Therefore, hCG has a weak thyroid stimulating activity [22]. hCG levels increase following fertilisation and peak at 10-12 weeks of gestation, leading to a rise in the total serum T4 and T3 concentrations and subsequently reduction of thyrotropin-releasing hormone (TRH) and TSH levels as a result of negative feedback. This hormonal interplay results in a biochemical picture of subclinical hyperthyroidism, which can be considered as a physiological finding [23]. The decrease in hCG secretion later in pregnancy leads to reduction of serum fT4 and fT3 concentrations and finally the normalisation of TSH levels [24].

Thyroid hyperfunction and symptoms, if present, subside as hCG production falls, typically at 14-18 weeks of gestation. Ideally, the assay-specific TSH reference ranges for each trimester should be calculated based on the local population in iodine sufficient areas and pregnant women recruited for such calculations should be euthyroid and thyroid antibody negative. When this is not feasible, a reasonable alternative is to use the consensus ranges as per the various guidelines (Table 1) [25-27]. However, it is worth emphasizing that these guideline reference ranges are mainly drawn from Western populations [28,29]; for example, the TSH in Chinese populations has been shown to be higher than these reference values [30].

Table 1: TSH reference ranges in pregnancy.

	TSH reference ranges (mU/L)		
	First trimester	**Second trimester**	**Third trimester**
American Endocrine Society	0.1-2.5	0.2-3.0	0.3-3.0
American Thyroid Association			
European Thyroid Association	<2.5	<3.0	<3.5

Tasks:

1. Determination of risk factors recurrence of the disease after surgery.
2. Identification of the main causes of postoperative hypothyroidism and the possibility of its prevention.
3. Determine the degree of influence of these diseases and transferred operations on the state of reproductive female systems.

Materials and Methods

In the clinic of faculty surgery and oncology Saratov State Medical University theta analysed case histories of 239 women at the age of 40 years, which were operated on do nodal lesions of the thyroid gland for 15-year-old period. They were divided into 2 groups. The first group consisted of 112 women operated on differentiated thyroid cancer Shl. Isolation of various forms of thyroid cancer. PS based on the International Histological classification developed in 1974 by a group World Health Organization Experts. The ratio of various forms of tumors is given in Table 2.

The average age of patients was 29.6 ± 0.74 years (from 10 up to 40 years).

In determining the stage of the process, the class TNM certification. By the time of surgery, the disease was carried out in the following stages (Table 3).

The second group, consisting of 127 patients, were persons with benign thyroid pathology Shl. According to the results of postoperative histological remote material studies all observations were divided into groups (Table 4).

Table 2: Frequency of various forms of differentiated cancer thyroid gland.

Form of thyroid cancer	**Number of patients**	
	Abs	**%**
Papillary thyroid cancer	67	59.8
Follicular thyroid cancer	35	31.3
Follicular papillary thyroid	10	8.9
Total	112	100

Table 3: The distribution of patients with thyroid cancer in stages.

Stage	**Number of patients**	
	Abs	**Stage -%**
T 1 N 0 M 0	16	Stage I - 14.3
T 2 N 0 M 0	58	Stage II - 77.7
T 3 N 0 M 0	26	
T 2 N 1a M 0	3	
T 4 N 0 M 0	5	Stage III - 8.0
T 3 N 1a M 0	3	
T 3 N 1b M 0	1	

Table 4: Frequency of various forms of benign nodal lesions in patients of the 2nd group.

Nosological form	**Number of patients**	
	Abs	**%**
Colloid goiter	99	78
Thyroid adenomas	13	10.2
Autoimmune thyroiditis	15	11.8
Total	127	100

The average age of patients was 30.6 ± 0.6 years (from 16 up to 40 years).

The following types of surgical procedures were performed for the patients. interventions (Table 5).

Table 5: Surgical interventions in patients of the 1st and 2nd groups.

Name of operation *	Group 1		Group 2	
	Abs	%	Abs	%
Thyroid lobe resection	0	0	18	14.2
Hemithyroidectomy	59	52.6	54	42.5
Thyroid lobe resection	1	0.9	29	22.8
Subtotal resection of the thyroid lobes	0	0	17	13.4
Subtotal resection of the thyroid gland	49	43.8	9	7.1
Thyroidectomy	3	2.7	0	0
Total	112	100	127	100

Note: * - operation names are in accordance with nomenclature [10].

Thyroidectomy were performed at stages T 4 N 0 M 0, T 3 N 0 M 0 and T 3 N 1b M 0. In the latter case, thyroidectomy supplemented by bilateral fascial-dissecting tie fiber of the neck. Unilateral lymphadenectomy was performed in 6 cases (3 in addition to the subtotal resection of the thyroid gland and hemithyroidectomy) in the presence of unilateral damage to regional lymph nodes. 4 patients with thyroid surgery combined with other goy operation (1 cholecystectomy by the traditional method, 2 laparoscopic cholecystectomy, 1 hernia repair with Mayo plastic surgery for umbilical hernia).

The early postoperative period was relatively satisfactorily in most patients. One patient (0.42%) developed bleeding, consuming battered surgical hemostasis. The phenomena of paresis of the gort not recorded in 4 patients (1.67%). In 2 cases required the imposition of a temporary tracheostoma (0.84%).

To study long-term results survey was carried out with the consent of the patient and included a tirovaniye (100%), survey (100%), ultrasonography of a thyroid gland zy (100%), reflexometry (100%), fine-needle asp biopsy (9.6%), a study of hormonal blood profile (84.9%), ECG (15%), examination by a gynecologistwith an assessment of the fertility function (4.6%). Tireoscin- tigraphy despite its importance in identifying recurrence of thyroid cancer [11], according to technical reasons could be performed only in 5% of patients.

The survey questionnaire was asked questions about health status before and after surgery, family history of thyroid disease was studied glands, oncological diseases. Special attention paid to childbearing function, quantity and course pregnancies, their connection with the operation and the method of completion.

The examination included palpation of the thyroid gland, measurement of heart rate, arterial pressure of non-brachial artery, definition of "ocular" symptoms, etc. According to the results of the directional collection complaints, anamnesis and examination determined the functional thyroid activity.

For reflexometry, ref- Lexograph "Achilles-001", developed by engineering technical cooperative "Novator" Omsk. For registration, the result of the stratum was an electrocardiograph.

If a thyroid dysfunction is suspected glands produced determination of thyroid hormones new in the blood. For this outpatient on an empty stomach in patients determined the serum concentration of the following hormones: triiodothyronine (T3), total thyroxin (T4) and thyreotropin (TSH). Blood sampling was done before 11 o'clock in the morning from the cubital vein. Serum defended, frozen lived and kept at -20°C.

Ultrasound examination of the thyroid gland all 239 women of both groups were plagued. To conduct research was used apparatus Alloca, it's often- that is 3.5 MHz.

Results and its Discussion

The frequency of recurrence of thyroid disease the gland was 2.7% for thyroid cancer and 9.4% for benign nodal thyropathies (Table 6).

Table 6: The frequency of recurrence of thyroid disease.

Nosology	1st group	2nd group
Colloid goiter	-	9
Thyroiditis	-	3
Crayfish	3	-
Total	3 (2.7%)	12 (9.4%)

In this case, the re-formation of nodes was fixed 54 cases (22.6%), but their histological the structure differed from that established on the first operation (psevdoretsidivy). Repeated operation was 21 patients were infected (8.8%). Higher percentage true recurrence in benign pathology was due to involvement in the pathological process a process of greater thyroid tissue and inadequate surgical intervention.

The relationship of the transaction volume with the frequency the recurrence of the disease. The following laws have been identified dimensionality:

- In case of benign pathology, relapse after subtotal resection of the thyroid glands are significantly lower than after hemithyroidectomy ($p = 0.05$);
- Recurrence rate after hemithyroidectomy significantly higher in benign thyroid patty than in thyroid cancer ($p = 0.05$).

Another important indicator for assessing long-term results of surgical treatment, is the presence of postoperative hypothyroidism. So, according to leading Russian endocrine surgeons, the frequency the occurrence of postoperative hypothyroidism after surgeries for multinodular goiter reaches 50% [12]. The frequency of this complication was investigated in each doy of the groups (Figure 1).

Significant differences in postoperative frequency hypothyroidism between the 1st and 2nd groups was not identified ($p = 0.1$). However, in the 1st group, due to the presence of cancer, more extensive operations were carried out. When using the standardization method is established that if the patients of the 1st and 2nd groups were performed alone naive in terms of surgery, the frequency of hypothyroidism in the 2nd the group would be significantly higher ($p = 0.05$). When calculating "Forces" and the direction of the relationship between the volume of thyroid residual and number of cases of postoperative hypothyroidism

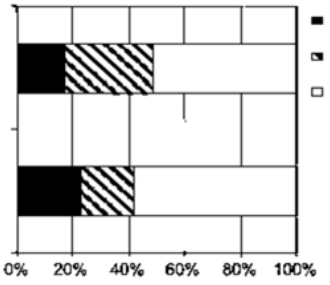

Figure 1: Frequency of postoperative hypothyroidism.

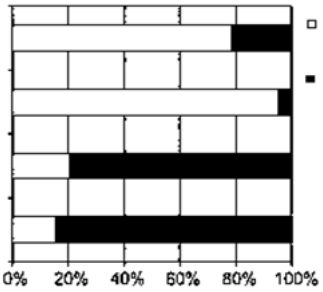

Figure 2: The ratio of hypothyroidism and miscarriage.

a strong feedback was obtained (ρ = -0.77 ± 0.18). The presence of hypothyroidism has a great effect on state of reproductive function of women. To study connection of postoperative hypothyroidism with pregnancy we studied the functional state thyroid gland in women who have had aborted pregnancy after surgery in each group.

Of the 34 women of the 1st group, hypothyroidism had 15 (44.1%), out of 30 of the 2nd group - 14 (46.7%). With a statistical treatment (Figure 2) revealed that in the presence of hypothyroidism premature abortion rate significantly higher than that in the total populations, and in women without hypothyroidism (p = 0.01). It also draws attention to the fact that pregnancy is significantly less common absence of hypothyroidism than in the general population oscillations (p = 0.001). This fact is indirectly about the high role of thyroid hormones in providing the normal course of pregnancy. Miscarriage of pregnancy with manifest hypothyroidism is more common than subclinical however, statistically this difference turned out to be true (p = 0.3).

Hypothyroidism, present in 29 women during the menstruation and confirmed at that time level data TSH and T4, was subsequently compensated by the reception L-thyroxine in 17 patients. 12 women when receiving more than 200 mcg of L-thyroxine per day to achieve normalization of nya thyroid hormone fails. They were all previously surgical interventions were made in the amount of hemi- thyroidectomy and more.

Conclusion

Hemithyroidectomy provides a low risk of rediva only with differentiated thyroid cancer glands. With benign thyroid disease glands to reduce the likelihood of recurrence can perform subtotal resection of the thyroid gland PS or thyroidectomy. The likelihood of postoperative hypothyroidism it depends not only on nosology and to a significant extent fines (ρ = -0.77±0.18) is associated with the volume of the remaining tissue thyroid gland. Violation of the reproductive function of women operated on for nodular lesions of the thyroid gland, is associated with the presence of postoperative hypothyroidism and does not depend on the morphological structure node tours.

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