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MORPHOMETRIC ASPECTS OF POSTNATAL ONTOGENESIS OF OVARIES OF RATS BORN DURING HYPOTEROISIS

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Abstract
The morphometric indices of ovarian dynamics in postnatal ontogenesis of ovaries of offspring born from hypothyroid rat mothers under experimental conditions were studied. According to the results of the analysis, compared with the control group, the number and size of follicles included in the ovaries of the experimental group decreased, the size was smaller, and the mesenchymal tissue components in the core and cortex layer increased, it was found that the number and size increased. This indicates that the offspring born with hypothyroidism will have a higher level of infertility in the future.

Keywords: morphometry, rat, hypothyroidism, ovarian ontogenesis, histology.

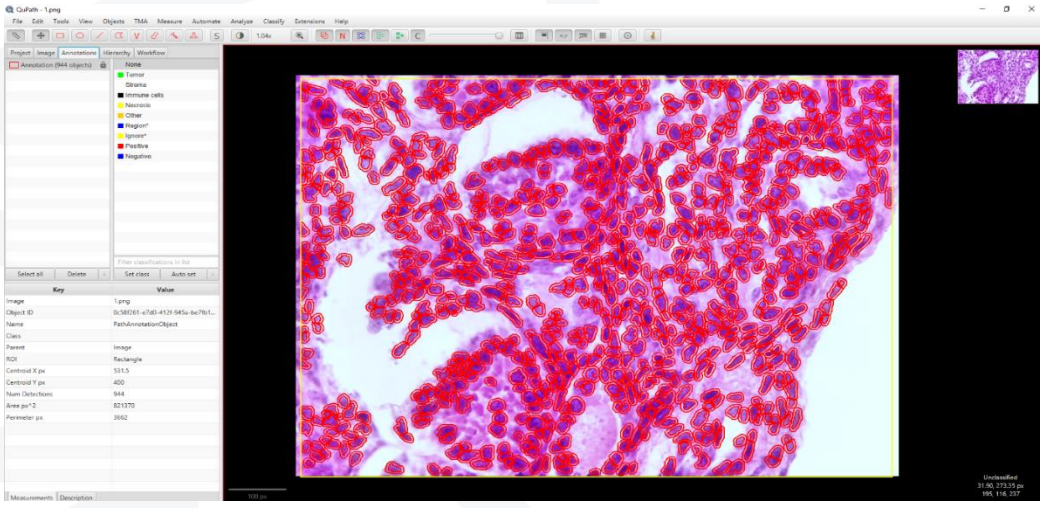
Introduction

Relevance of the topic: Currently, the problem of infertility is not only medical, socio-demographic, but also economic. The number of infertile marriages is 10-15% of married couples and does not tend to decrease. The percentage of infertility of endocrine genesis is 35-45%. Every year, 4.8-10.6% of women of reproductive age develop infertility due to a hypofunctional state of the endocrine system, which developed as a result of unknown etiological factors. This is explained by a dysfunction of the thyroid gland. In the USA and Europe, this problem is detected in an average of 7.2% of all reproductive women. The USA spends an average of 4.8 billion dollars a year from the state budget to solve this problem. In the CIS countries, this figure is an average of 10.6%, and in many cases, hormonal disorders due to chronic thyroid insufficiency remain one of the main factors in organizing the protective forces of the mother and child. In our country, on average, 980 billion soums are spent per year on the prevention of hypofunctional conditions associated with the thyroid gland function (according to the Uzbek Republic Ministry of Health, 2022).

Objective: to study the morphometric parameters of ovarian tissue and blood vessels of offspring born from rat mothers with hypothyroidism.

Material and methods: the object of the study was the ovarian tissues of 120 rats, developed against the background of hypothyroidism. The obtained material was studied by statistical, morphological hemotoxylin-eosin methods and morphometric methods.

Results and discussion. Microsamples (n=85) prepared from odin were taken for morphometric study of ovarian tissue and blood vessels of rats born under hypothyroidism conditions. During the morphometric study, ovarian tissue stained with hematoxylin and eosin and features of vascular morphology (on the section of anatomical layers of the vascular wall) were measured in the process of morphometry. The obtained data were scanned using NanoZoomer (REF C13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN) at 200x magnification to present the analysis. Cross-correlation relationships were created by software using special formulas without human intervention. In postnatal ontogenesis of the ovary, during histometry of most of the tissue, according to the data of morphometric analysis of dynamic changes in ontogenesis over time, it is determined that the size of the ovarian follicles decreases over time, the diameter of the oocyte decreases sharply, and instead of them, the cells of the granulosa theca increase. If so, then this is confirmed by the analysis of the data studied in the above morphological tests.



Pic 1. Ovary of rats of the 3-day experimental group. The cellular content of the ovarian tissue was scanned using NanoZoomer (REF C13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN). Cellular

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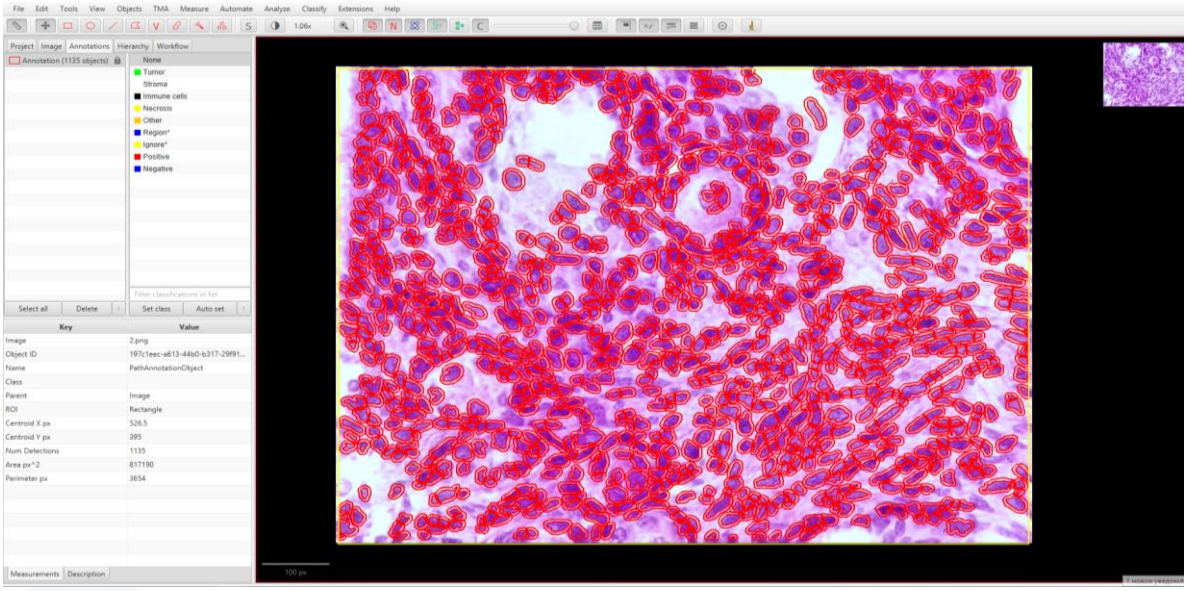
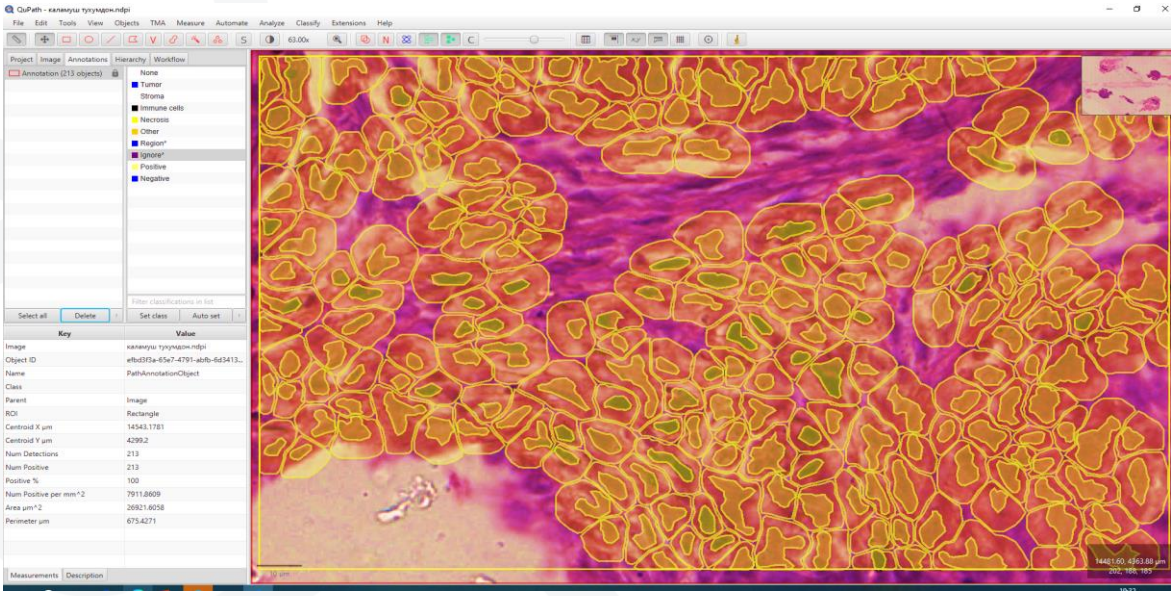
composition of ovarian tissue and walls of small-diameter blood vessels. The boundaries of fibrous structures are given in exact sizes and their perimeters along the X-Y axis in 2 dimensions were obtained. G.E. paint. Size 10x20.



2 Pic. 7-day-old ovary of the experimental group of rats. The cellular content of the ovarian tissue was scanned using NanoZoomer (REF C13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN). Cellular composition of ovarian tissue and walls of small-diameter blood vessels. The boundaries of fibrous structures are given in exact sizes and their perimeters along the X-Y axis in 2 dimensions were obtained. GE paint. Size 10x20.



3 Pic. 14-day-old ovary of the experimental group of rats. The cellular content of the ovarian tissue was scanned using NanoZoomer (REF C13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN). Cellular composition of ovarian tissue and walls of small-diameter blood vessels.

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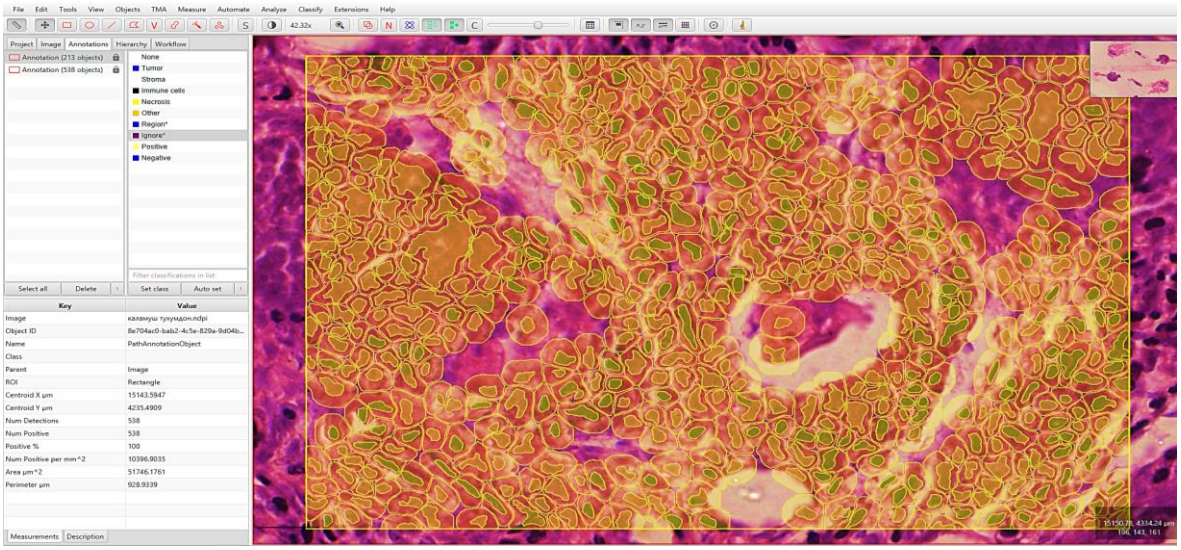
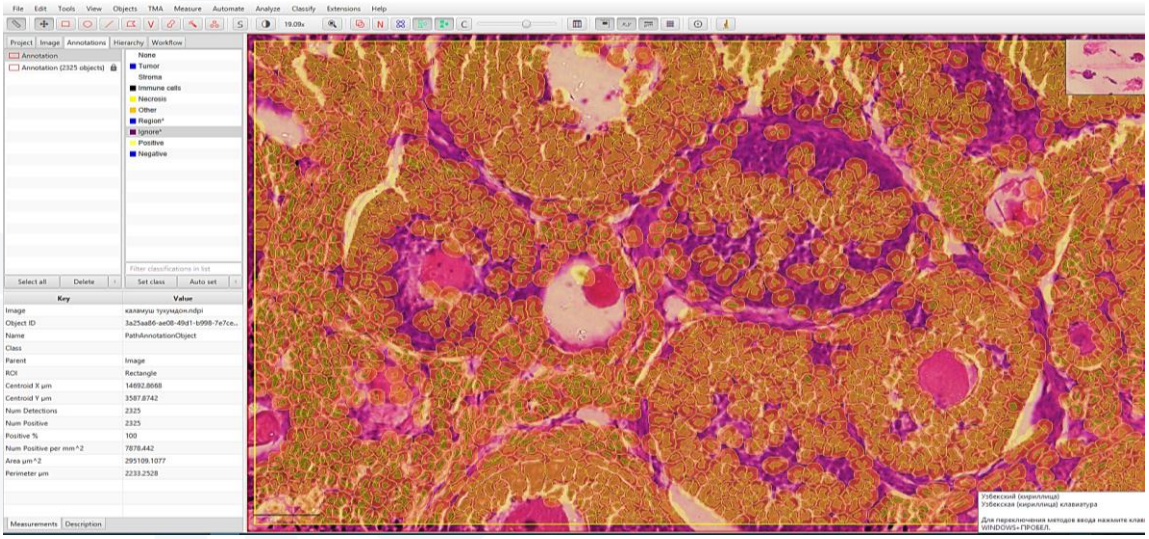
The boundaries of fibrous structures are indicated in exact sizes, and the perimeters along the X-Y axis were obtained in two dimensions. GE paint. Size 10x20.



4 Pic. 21-day-old ovary of the experimental group of rats. The cellular content of the ovarian tissue was scanned using NanoZoomer (REF C13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN). Cellular composition of ovarian tissue and walls of small-diameter blood vessels. The boundaries of fibrous structures are indicated in exact sizes, and the perimeters along the X-Y axis were obtained in two dimensions. GE paint. Size 10x20.



5 Pic. 21-day-old ovary of the experimental group of rats. The cellular content of the ovarian tissue was scanned using NanoZoomer (REF C13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN). Cellular composition of ovarian tissue and walls of small-diameter blood vessels. The boundaries of fibrous structures are indicated in exact sizes, and the perimeters along the X-Y axis were obtained in two dimensions. GE paint. Size 10x20.

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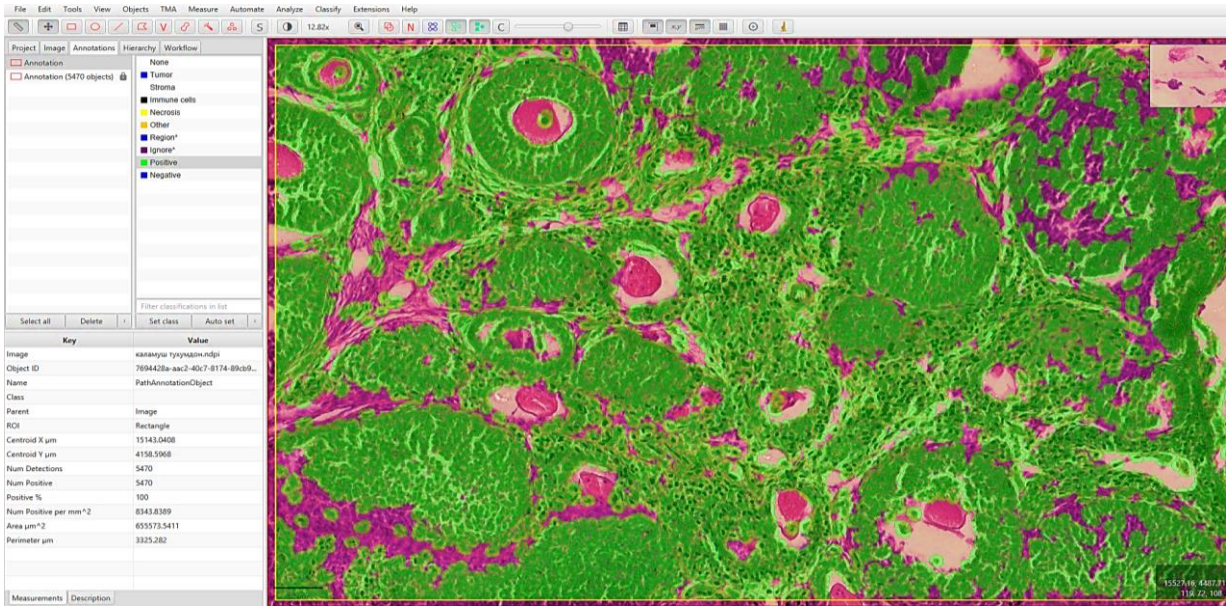

6 Pic. 30-day-old ovary of rats of the experimental group. The cellular content of the ovarian tissue was scanned using NanoZoomer (REF C13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN). Cellular composition of ovarian tissue and walls of small-diameter blood vessels. The boundaries of fibrous structures are indicated in exact sizes, and the perimeters along the X-Y axis were obtained in two dimensions. GE paint. Size 10x20.

Morphometric parameters of structural structures of the control group in postnatal ontogenesis of ovarian tissue

1 Table

№	Structural components of the ovarian cortex	3 days	7 days	14 days	21 days	30 days
	Control					
1	Primordial follicle	18,6±1,02*	17,2±1,12*	17,3±0,97*	16,1±1,37*	15,36±1,87*
2	follicle	67,22±0,63*	69,89±1,14*	78,01±0,87*	82,45±1,67*	86,36±1,42*
3	Secondary follicle	-	-	112,4±1,47*	114,85±2,27*	145,01±1,87*
4	Tertiary follicle	-	-	248,27±3,45*	337,39±4,35*	348,12±3,75*
5	Atretic follicle	-	-	29,86±1,27*	26,1±2,34*	20,89±1,72*
6	Corpus luteum			28,16±2,27*	31,25±1,37*	32,35±2,21*
7	Area occupied by blood vessels (200x area), µm2	16,21±2,27**	18,01±2,01**	19,08±0,93**	19,71±0,08**	20,16±1,33**

Reminder: P<0,05*, P<0,01**

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Experimental group morphometric indicators of structural structures in the postnatal ontogeny of ovarian tissue

2 Table.

№	Structural components of the ovarian cortex	3 days	7 days	14 days	21 days	30 days
	Experimental group					
1	Primordial follicle	14,5±1,02*	15,1±1,08*	17,1±0,65*	17,80±1,05*	16,22±1,31*
2	follicle	41,06±0,74 *	49,51±1,05*	65,01±0,81*	72,52±1,11*	78,12±1,42*
3	Secondary follicle	-	-	92,3±1,37	99,15±1,23	139,01±1,65
4	Tertiary follicle	-	-	221,05±1,34*	269,47±2,01*	301,11±1,35*
5	Atretic follicle	-	-	40,06±1,07*	32,12м1,34*	27,32±1,42*
6	Corpus luteum			36,11м2,05*	35,35±1,87*	36,05±1,28*
7	Area occupied by blood vessels (200x area), μm2	17,22±1,85* *	20,01±1,01 **	23,01±1,02**	22,03±1,08**	24,02 ± 1,31**

Reminder: P<0,05*, P<0,01**

Quantitative and qualitative changes in the morphometric aspects of postnatal ontogenesis of rats developed from maternal rats under hypothyroidism conditions are presented in the table above. One of the main morphometric substrates is the egg cell with parenchymatous elements of the ovary and shrinkage. cells around it cortex compared to the control group, it was found that the number of primordial follicles in the stratum corneum was less, the period of complete formation was delayed by 2.5 times compared to the control group (see Table 1.2). the area occupied by blood vessels increased by 1.15 times compared to the control group, in dynamics it was morphologically branched, and the diameter increased by 1.22 times compared to the control group, and by 21-30 days persistent other changes were preserved compared to the control group, mesenchymal in postnatal ontogenesis of the ovaries, mesenchymal layer and perimeter of the cortex layers morphometric studies confirmed that tissue elements are preserved in most irreversible aspects. This confirms that from the clinical and morphological point of view, among rats born under hypothyroidism, on average 40% of the offspring will be sterile in the future. In many cases, a large number of formed components of mesenchymal tissue, corpora lutea and leukocytes in the ovaries of rats was observed in the experimental group, which increased up to 2.25 times compared to the control group on average by 14-21 days. It was found that in the experimental group at the age of 21-30 days, embryonic

cells were preserved in large quantities, and the average size of the corpus luteum was 36.11±2.05 μm, which indicates underdevelopment of the main morphological parenchymatous elements of the ovary. pstage This confirms that, although the size of the ovaries is not small, an increase in corpora lutea and white bodies is observed in the stroma.

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