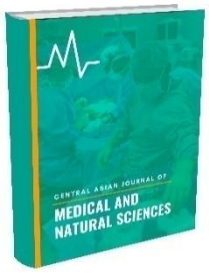
CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES



Volume: 04 Issue: 05 | Sep-Oct 2023 ISSN: 2660-4159

http://cajmns.centralasianstudies.org

Morphometric Changes of Thyroid Cancer in the Regions Along the Aral Sea

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Received 2nd Aug 2023,
Accepted 19th Sep 2023,
Online 30th Oct 2023

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Abstract: Morphometric indicators of thyroid tumors depend on quantitative and qualitative changes in pathological changes prevailing in the process and are expressed by different indicators in different histotopographic types of benign tumors. Precisely, the morphometric changes through these indicators are the basis for developing a software system for pre-prognostication and the development of a software system for predicting the risk level of tumors through specific numbers and a mathematical algorithm. At the same time, it serves to apply the parametric precision points required for modern inspections through software indicators. In PET (positron emission tomography), which is one of the modern examination methods, the values indicating the pre-risk level of the tumor are shown through the morphometric points of the organ when determining the level of saturation with glucose isotopes of the tissue and are necessary for further improvement of diagnosis.

Key words: thyroid tumor, morphometric method, morphology, metastasis, oncomarker.

Relevance of the topic: Thyroid cancer accounts for 0.4-2% of all malignant tumors in the world. According to these indicators, the same picture is 1.9% in Europe and the USA. (Grant C, 1999; Kuijpens J. et al., 1998; Vanderpump M. et al., 1998; Schlumberger M. et al., 1999). The percentage of thyroid cancer in the Russian Federation is 1-2%. In the neighboring country of Russia, the rate of thyroid cancer increased from 3.35% to 5.99% in the period from 1995 to 2005 (Rumyantsev P.O., Ilin A.A., 2009). Khmelnytskyi et al. (2010) on the etiology of thyroid diseases: "None of the types of endocrine pathology are related to the environment like thyroid diseases, because the structure and function of the thyroid gland are closely related to the intake of iodine and other trace elements from the outside, and it varies under the influence of regional factors. Persistent thyroid pathologies in endemic and sporadic foci are explained by the chronic nature of the process, which in turn leads to the development of hyperregenerative neoplastic processes. It is considered as a sign of problems that the ground for these pathologies is created in ecologically dangerous regions." There is very little information in the literature about thyroid cancer in the Aral Bay region. The lack of information about the dynamics of the development of thyroid cancer is still an actual and understudied disease, and the

medical community is widely concerned about it. the scope remains unknown (Romanchishen A.F. et al., 2003).The level of study of the problem is urgent due to the fact that a strict algorithm has not been developed that defines the treatment tactics explained by specific criteria based on morphological characteristics of thyroid tumors, pathological anatomy and changes in immunohistochemical examination. and is on time.

Purpose: It consists of morphometric examination of various forms of thyroid tumors by means of expression indicators of a number of immunohistochemical markers and analysis of the obtained results.

Materials and methods: 58 micropreparations from intraoperative biopsy materials submitted to the Bureau of Pathological Anatomy of the Khorezm Region over a period of 5 years are examined.

Research results and their discussion: For morphometric examination, thyroid gland tumor tissue was taken from 58 patients who were surgically removed and histologically diagnosed as malignant tumor. It was determined that the age of the patients was from 18 to 68 years.

As a result of histological examination of the biopsy material, 6 types of thyroid cancers were identified: 1) follicular carcinoma (FC), 2) papillary carcinoma (PC), 3) papillary variant of follicular carcinoma, 4) follicular variant of papillary carcinoma, 5) undifferentiated carcinoma (DC).) and 6) medullary carcinoma (MC).

From the total number of thyroid cancers, according to histological staining for morphometric examination (except for one, because it was lymphoma), 58 were distinguished, all structural units of which can be clearly distinguished: 1) follicular carcinoma (16), 2) papillary carcinoma (18), 3) papillary variant of follicular carcinoma (8), 3) follicular variant of papillary carcinoma (11), 5) undifferentiated (2) and 6) medullary carcinoma (3).

Hematoxylin-eosin-stained histological sections were scanned and morphometric examination was performed based on the program. The length and width of the epithelial cells, the length and width of the nuclei, the longitudinal and width diameter of the follicles and the colloid were measured. Based on the obtained quantitative indicators, the area of colloid and follicles was calculated using the following formula: $S=\pi ab/4$, where S is the area; a – longitudinal diameter; b – transverse diameter.

The size of the core was calculated based on the spheroid size using this formula: $V=4\pi ha2/3$, where V is the volume; h – core length; a is the width of the core.

The volume of the cell was calculated based on the volume of the cylinder in the following formula: $V=\pi hd2/4$, where V is the volume; h – cell length; d is cell width.

The size of the cytoplasm was calculated based on the difference between the size of the cell and the size of the nucleus. As a result of them, "The difference of the nuclear-cytoplasmic ratio was determined.

As shown in the table of morphometric indicators, it was found that follicles of thyroid gland epithelium were 4-5 μm in height and 6-7 μm in thickness, while undifferentiated and medullary cancer had relatively large sizes. Accordingly, the lowest (112.5±4.56) amount of epithelial cells was found in papillary carcinoma, while the highest (171.5±4.8) was found in medullary carcinoma. It can be concluded that as atypical tumor cells become morpho-functionally activated, their size and volume naturally increase.

Table 1. Morphometric indicators of tissue structures of thyroid cancers

Indicators	Types of carcinoma					
	FK	PK	Fkp	Pkf	DK	MK
Cell height (μm)	4,56±0,2	4,64±.09	5,1±0,3	5,74±0,2	5,12±0,1	6,2±0,3
Cell thickness (μm)	6,14±0,3	5,86±0,1	6,1±0,2	6,3±0,12	6,23±0,13	7,3±0.24
Cell Volume (μm3)	146,7±5,47	112,5±4,56	164,4±5,17	155,4±3,8	165,3±3,8	171,5±4,8
Core height (μm)	3,86±0.09	3,23±0.08	3,45±0.07	4,12±0,9	4,23±0,08	4,54±0,06
Core thickness (μm)	3,12±0,09	2,89±0,08	2,78±0,07	3,15±0,06	3,43±0,08	3,78±0,07
Core volume (μm3)	58,12±3,56	62,8±4,6	71,8±4,9	123,7±5,4	132,4±5,1	142,7±4,9
Cytoplasm volume (μm3)	82,6±3,9	91,6±5,2	109,4±6,1	76,4±4,3	67,8±3,8	66,3±3,9
Nuclear-cytoplasmic index	0,64	0,54	0,76	0,81	0,94	0,98
Average follicle length (μm)	208,5±3,2	107,2±2,9	176,3±2,8	156,4±3,7	7,4±5,8	3,7±2,9
Mean follicle width (μm)	204,2±2,9	106,4±6,8	156,4±3,4	118,5±3,3	5,7±4,4	4,4±4,1
Colloidal length dimension (μm)	208,5±3,2	107,2±2,9	160,3±2,8	186,4±3,7	5,4±5,8	2,7±2,9
Colloid cross-sectional dimension (μm)	178,5±3,2	106,2±2,9	146,3±2,8	126,4±3,7	177,4±5,8	3,7±2,9

The results of morphometric calculations of follicular epithelial nuclei were also observed to change in accordance with the above changes. In follicular cancer, it was observed that the nuclei of epithelial cells are relatively small in size (3.12±0.09), and increase in size when not differentiated (3.43±0.08). It was found that the size of the nucleus increased almost 3 times.

Among the papillary carcinoma of the thyroid gland, the follicular variant is relatively common, and follicles of different sizes are distinguished in its histological structure. It is observed that suckers of different sizes appear in the large spaces of the follicles. Cancer cells in them are prismatic in shape, and it is determined that their nuclei are in a state of strong hyperchromasia. It is observed that there is a light-colored colloidal substance in the cavity of relatively small follicles.

It was observed that the result of morphometric calculations of epithelial nuclei of papillary carcinoma changes according to the above changes. It was observed that the nuclei of gland epithelial cells are relatively small in size (3.23±0.08), and become larger in medullary forms (4.54±0.06). It was found that the size of the nucleus in follicular cancer was only 58.12±3.56 μm3, while in medullary cancer it increased almost 3 times, i.e. it was 142.7±4.9 μm3. Studies have shown that if the size of the nucleus is small, the area of the cytoplasm is large, and as the size of the nucleus increases, the area of the cytoplasm decreases. As determined in any cell, the nuclear-cytoplasmic index, which shows the proliferative level of the cell, was determined in different forms of thyroid tumors. Compared to normal forms of the tumor, this index has a low index, and undifferentiated and medullary forms have high indices.

Conclusion

It was found that the size of the epithelium and nuclei of malignant tumors of the thyroid gland increased in high-risk forms, and accordingly, the cell size also increased accordingly. This, in turn, allows us to draw a conclusion that medullary cancer is more severe than follicular cancer.

Among the most malignant tumors of the thyroid gland, the high frequency of follicular type of papillary carcinoma and the fact that it is very similar to follicular tumors in terms of structure indicate a high probability of recurrence in cases ranging from 13.2% to 21% in diagnosis and treatment. This means that, compared to the data presented in the interpretation of modern literature, tumors of the thyroid gland are mainly closely related to regional pathologies, and the fact that they meet in specific proportions in each region and that the phenotypes of the most common types in diagnosis are different has not been fully explained. That is why the epidemiological distribution of thyroid gland tumors is different in different strata in the Republic of Uzbekistan, and there are no statistical data with specific numbers in the last 10 years. There is very little information on the interpretation of

modern examination methods for specific types of malignant tumors (although it is given, it is given for a specific case). This proves the relevance of the topic once again. According to the analysis of the latest data presented in the foreign literature, the classification and types of thyroid glands, comparing with the studies in our research work, requires enrichment with information about the level of occurrence and which type is most common and its specific pathomorphological structure. At the same time, it is necessary to develop important practical recommendations in determining the treatment tactics recommended by the WHO according to the modern classification, distinguishing the dangerous types of thyroid gland with specific criteria and determining the treatment tactics in the future.

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