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MORPHOMETRIC PARAMETERS OF THE PARATHYROID GLANDS IN INTACT RATS

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Annotation. The aim of the work was investigation of morphometric parameters of parathyroid glands. The experiment was carried out on 12 matured male rats with body weight 180-200 g. The parathyroid gland were removed from the experimental rats and tissues. The histological slides of parathyroid glands were visualized by using light microscope and digital camera, then samples were examined by an original morphometric program «Morpholog». As a result of the study,morphometric parameters of the parathyroid glands of intact sexually mature rats were obtained.

Key words: parathyroid glands, rats, morphometry, morphometric parameters.

There has been a steady increase in diseases of the parathyroid glands in recent years due to environmental problems [1, p. 4]. All of this given rise to serious concerns of morphologists about studying of parathyroid glands and explore ways to enhance implementation of morphometric criteria for assessing the state of the parathyroid in medical practice [2, p. 942] The question of choosing reliable morphometric criteria for assessing the state of the parathyroid cannot yet be regarded as definitely resolved, since there are not many quantitative studies on this problem and they are often contradictory [3, p. 223].

The aim of our work was the standardization of morphometric measurements and landmarks which are necessary for the timely and correct interpretation of experimental data obtained by researchers studying the pathology of the parathyroid glands.

The presented experiment was carried out on 12 matured male rats with body weight 180-200 g. Structure of the rodents organs of the endocrine systems is not fundamentally different from those of humans, thus, they were used in the following experimental work. The maintenance of animals was carried out in compliance with the requirements of bioethics. Animals used in the study were culled by cervical dislocation of the neck and thyroid gland together with parathyroid glands were removed from the experimental rats and tissues.

The parathyroid glands were fixed in 10% neutral buffered formalin (Fisher Scientific, Fairlawn, NJ) for 48 hours and dehydrated in 70% ethanol to minimize tissue distortion that can occur during sectioning. Within 48 hours following fixation, samples were embedded in paraffin. The paraffin blokes were sectioned serially at 5μm in the longitudinal and transverse directions. The largest cross-sectional area was examined in the six fields of view; six sections were analyzed from each object. Sections were stained with hematoxylin and eosin. The histological slides were visualized by using light microscope Olympus BX41 with different magnifications (X10; X40 and X60), then the sections were photographed by using microscope and digital camera Olympus C 5050 Z and examined by an original morphometric program «Morpholog». An ocular micrometer calibrated with stage micrometer was used for histological parameters. Statistical analysis of the data was performed.

In the rat paired parathyroid glands are embedded in the lateral aspect of the thyroid glands near their anterior pole. Accessory parathyroid tissue is sometimes located adjacent to the thymus. On gross examination, in the adult rat, they are pale white, oval to elongated bodies covered by connective tissue capsule. The thickness of the parathyroid capsule is an average of 31,1±3,15 μm.

The morphometric study found that the average gross size of the parathyroid gland is 2150x940x750 μm (length, width, height).

The average number of vessels in the field of view of a microscope is 1,62±0,33. Vessels with a diameter of 45-60 μm are found 5,7 times more often than vessels with a diameter of 20-30 μm and 2,4 times more often than vessels with a diameter of 30-45 μm. The number of cell nucleus per 1000 μm^2 is 9,48±0,23.

As a result of the study, morphometric parameters of the parathyroid glands of intact sexually mature rats were obtained.

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