

Features of Anatomical Parameters and Topography of the Stomach of White Rats

Nuriddinov Asliddin Mekhridinovich
Bukhara State Medical Institute

Annotation: Despite numerous experimental studies on white rats, the anatomical and topographical data and morphometric parameters of its stomach are described very little in the literature. The article examines in a comparative aspect the anatomical parameters and topography of the stomach of a white rat with the human stomach.

Keywords: Anatomical parameters, topography, stomach shape, white rat, morphometry, coefficient.

Relevance. The stomach of a white rat is a sac-like formation of the digestive tract, which is located in the upper floor, in the anterior abdominal cavity, most of this organ is located to the left of the midline. Externally, it can be divided into translucent, pale whitish mucosa - the cardiac part and the pyloric part - opaque, muscular, reddish-gray and vascularized [3,4]. It is an extremely important organ of the digestive system, involved in the digestion process. The stomach of a white rat is enveloped in a visceral sheet of peritoneum on all sides - an intraperitoneal organ, unlike the human stomach, it has 4 sections: a) esophageal (forestomach); b) small cardiac; c) the fundus is the largest part of the stomach; d) the pyloric part [3], which passes into the duodenum. In the stomach of the white rat, two curvatures are distinguished: a cranially located short, concave lesser curvature and a caudally located convex, greater curvature. The wall of the stomach consists of 3 membranes: mucous, muscular and serous.

The similarity of this organ to the human stomach in location, shape and structure does not exclude its peculiarity in the white rat. Despite numerous experimental studies of anatomical and topographical data on the white rat, the morphometric parameters of its stomach are described very little in the literature. This article examines from a comparative perspective the anatomical parameters and topography of the white rat stomach with the human stomach.

Purpose of the study: To study the normal anatomical parameters and topography of the stomach of white rats. This study is the initial stage of our scientific work on studying the morphometric parameters of the stomach.

Materials and methods of research: The work was carried out on 20 white rats of both sexes weighing about 250-300 grams, 3 months of age. The keeping of animals and the experimental studies carried out with them were carried out in accordance with regulatory documents and their requirements. Against the background of inhaled general anesthesia with isoflurane, the rats were decapitated and a wide median laparotomy was performed. The material was photographed and the topographic anatomy of the white rat stomach was studied.

The stomach was removed and morphometry was performed - measuring the length and width of this organ after emptying from food masses. The width of the stomach was measured at 3 different levels - the proventriculus, the fundus and the pyloric part of its extension and the ratio

of width to length (ratio h/l) was calculated. We have macroscopically studied the structural features of the wall of all parts of the stomach of the white rat.

Results of the study and their discussion: The stomach of white rats has two major and lesser curvatures. If you pay attention to the syntopy, the liver, the largest organ in the abdominal cavity in rats, significantly covers the lesser curvature of the stomach, the cardiac, pyloric part on the right and in front. The lesser curvature of the stomach of white rats is located behind the special caudate lobule of the liver. It is typical for rats that the esophagus enters the stomach in the middle of the lesser curvature [3,5].

The loops of the small intestine and cecum are adjacent to the pyloric part and the fundus of the stomach. Dorsal to the stomach is the pancreas and the loop of the transverse colon. To the left and dorsal to the greater curvature of the stomach is the spleen. The pyloric part of the stomach passes into the duodenum immediately to the right of the midline, forming a coal opening to the caudal side. There is a relatively small distance between the inlet and outlet openings of the white rat's stomach. The fundus of the stomach occupies most of the stomach [3,4,5,6]. The largest, variable part of the stomach is the proventriculus (esophageal part), which, as the organ fills, increases in size due to stretching of the walls, serving as a container. Outwardly, it looks transparent and whitish than the rest of the stomach. It shows a clear boundary between it and the rest of the stomach.

Features of syntopy, ligaments with neighboring organs, convex major steep and concave, short minor curvature gives it a relatively constant curved shape in the form of a "hook". In contrast, in humans it is customary to distinguish 3 shapes of the stomach: horn shape, stocking shape and hook shape [7,8].

The stomach of white rats is located almost transversely in relation to the sagittal and horizontal planes. This condition in humans occurs with the pathology of gastric prolapse with a low location of the cardiac part. Normally, the long axis of the human stomach runs from the left above and behind to the right below and forward and is located almost in the frontal plane [1,2,7,8].

Morphometry revealed the length of the stomach of a white rat to be $l=28\text{mm}$, width at the bottom level $h=14\text{mm}$, body $h=10\text{mm}$, pyloric part $h=7\text{mm}$ (Fig. 4). The width of the stomach in the caudal direction decreases, the coefficient h/l is at the level of the pregastric part the largest value of approximately 0.5. At the bottom level this figure is 0.35. At the level of the pyloric part it is about 0.25. In an adult, these dimensions are also not constant; in the empty state, length $l = 18\text{-}20\text{ cm}$, width $h = 7\text{-}8\text{ cm}$ [1,2], respectively, $h/l = 0.4$.

The stomach of a white rat has the following features:

1. Relatively constant "hook-shaped" stomach, with a well-developed, long, wider proventriculus and bottom than other parts. In humans, on the contrary, the largest part of the stomach is the body. The proventriculus and fundus are the most variable parts of the white rat's stomach.
2. Large steep and small short curvature. A narrow esophagus opens in the middle of the lesser curvature. In humans, the esophagus opens in the region of the cardia.
3. The smallest distance between the inlet and outlet of the stomach.

The structural features and topography of the white rat's stomach are determined by the specific characteristics of its organogenesis. In rat embryos, the dorsal parts of the liver grow more intensively than in humans. The formation of the caudate lobule of the liver along the lesser short curvature causes a displacement of the entrance of the esophagus to the middle of the lesser curvature. The stomach finds itself between the large liver, cranially, and the voluminous intestine, caudally, acquiring a transverse position. Under great pressure from the retroportal parts of the liver, the cardiac part and the fundus of the stomach are displaced caudally, and the

body and pyloric part are displaced ventrally, strongly curving and acquiring the shape of a “hook” [5,6].

Conclusions: Based on the results of macroscopic examination and morphometric parameters of the normal white rat stomach, the following conclusions can be made. The stomach of the white rat is more curved, has a relatively constant hook-shaped shape and a transverse position in relation to the horizontal and sagittal planes. The largest part of it is the bottom. As food enters and accumulates in the stomach, it increases in size due to stretching of the serous membrane. In this case, the serous and muscular layer of the stomach is torn and food masses are located under its stretched serous membrane. The distal end of the esophagus is shifted to the middle of the lesser curvature and is located very close to the outlet of the stomach. This allows easy evacuation of food into the duodenum. The stomach of a white rat has similar sections and layers of the wall as the human stomach. This allows us to carry out scientific experimental work on white rats with stomach diseases, in particular, after a simulated traumatic brain disease. Despite the similarity in structure, shape and location, there are distinctive features of the white rat’s stomach. It is recommended to take these features into account when performing scientific work.

Literature

1. Nuriddinov Asliddin Mehriddinovich MORPHOLOGICAL CHANGES OF HEART IN 3-MONTH-OLD NONBREED RATS UNDER THE INFLUENCE OF AN ENERGY DRINK // Web of Scientist: International Scientific Research 3 (10), 2022, 307-313
2. Олимова А. З., Шодиев У. М. Репродуктив Ёшдаги эркакларда бепуштлик сабаблари: Бухоро тумани эпидемиологияси //Scientific progress. – 2021. – Т. 2. – №. 7. – С. 499-502.
3. Zokirovna O. A., Abdurasulovich S. B. Ovarian Diseases in Age of Reproductive Women: Dermoid Cyst //ЎТМОИЙ ФАНЛАРДА ИННОВАСИЯ ОНЛАЙН ИЛМИЙ ЖУРНАЛИ. – 2021. – Т. 1. – №. 6. – С. 154-161.
4. Olimova A. Z. ECHINOCOCCOSIS OF LIVER OF THREE MONTHLY WHITE RAT //Scientific progress. – 2022. – Т. 3. – №. 3. – С. 462-466.
5. Олимова А. З. Морфологические и морфометрические особенности печени белых беспородных трех месячных крыс после тяжёлой черепно-мозговой травмы вызванной экспериментальным путём //BARQARORLIK VA YETAKCHI TADQIQOTLAR ОНЛАЙН ИЛМИЙ ЖУРНАЛИ. – 2021. – Т. 1. – №. 6. – С. 557-563.
6. Oglu M. Z. M., Zokirovna O. A. МОРФОЛОГИЧЕСКИЕ И МОРФОМЕТРИЧЕСКИЕ ПАРАМЕТРЫ ПЕЧЕНИ БЕЛЫХ БЕСПОРОДНЫХ КРЫС, ПЕРЕНЕСШИХ ЭКСПЕРИМЕНТАЛЬНУЮ ЧЕРЕПНО-МОЗГОВУЮ ТРАВМУ ПОСЛЕ МЕДИКАМЕНТОЗНОЙ КОРРЕКЦИИ //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2023. – Т. 8. – №. 1.
7. Олимова А. З., Турдиев М. Р. БУХОРО ШАХРИДА МЕЪДА ВА ЁН ИККИ БАРМОҚЛИ ИЧАК ЯРАСИ УЧРАШ ЭПИДЕМИОЛОГИЯСИ //Oriental renaissance: Innovative, educational, natural and social sciences. – 2022. – Т. 2. – №. 4. – С. 642-647.
8. Zokirovna O. A. Modern Concepts of Idiopathic Pulmonary Fibrosis //American Journal of Pediatric Medicine and Health Sciences. – 2023. – Т. 1. – №. 3. – С. 97-101.
9. Zokirovna O. A. Pathology of Precancerous Conditions of the Ovaries //American Journal of Pediatric Medicine and Health Sciences. – 2023. – Т. 1. – №. 3. – С. 93-96.
10. Зокировна, Олимова Азиза и Тешаев Шухрат Джумаевич. «Морфологические аспекты печени белых беспородных крыс после тяжелой черепно-мозговой травмы, вызванной экспериментально в виде дорожно-транспортного происшествия». *Scholastic: Journal of Natural and Medical Education* 2.2 (2023): 59-62.

11. Zokirovna O. A. Comparative characteristics of the morphological parameters of the liver at different periods of traumatic brain injury //Euro-Asia Conferences. – 2021. – С. 139-142.
12. Zokirovna O. A. Macroand microscopic structure of the liver of threemonthly white rats //Academic research in educational sciences. – 2021. – Т. 2. – №. 9. – С. 309-312.
13. Олимова А. З. Частота Встречаемости Миомы Матки У Женщин В Репродуктивном Возрасте //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI. – 2021. – Т. 1. – №. 6. – С. 551-556.
14. Zokirovna O. A., Abdurasulovich S. B. Ovarian Diseases in Age of Reproductive Women: Dermoid Cyst //IJTIMOIY FANLARDA INNOVASIYA ONLAYN ILMIY JURNALI. – 2021. – Т. 1. – №. 6. – С. 154-161.
15. Zokirovna O. A. Cytological screening of cervical diseases: pap test research in the bukhara regional diagnostic center for the period 2015-2019. – 2022.
16. Zokirovna O. A., PREVALENCE R. M. M. EPIDEMIOLOGY OF CANCER OF THE ORAL CAVITY AND THROAT IN THE BUKHARA REGION //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 11. – С. 545-550.
17. Olimova A. Z. The frequency of occurrence of my uterus In women of reproductive age //JOURNAL OF ADVANCED RESEARCH AND STABILITY (JARS). – 2021. – Т. 1. – №. 06. – С. 551-556.
18. Olimova Aziza Zokirovna. (2023). MODERN PRINCIPLES OF THE EFFECT OF HEMODIALYSIS THERAPY ON HEART RATE. *International Journal of Integrative and Modern Medicine*, 1(1), 80–85. Retrieved from <http://medicaljournals.eu/index.php/IJIMM/article/view/28>
19. Olimova Aziza Zokirovna. (2023). PATHOMORPHOLOGICAL CHARACTERISTICS OF THE EPIDIDYMISS UNDER IRRADIATION. *International Journal of Integrative and Modern Medicine*, 1(1), 96–100. Retrieved from <http://medicaljournals.eu/index.php/IJIMM/article/view/31>
20. Olimova Aziza Zokirovna. (2023). THE INCIDENCE OF CANCER OF THE ORAL CAVITY AND PHARYNX IN THE BUKHARA REGION. *International Journal of Integrative and Modern Medicine*, 1(1), 86–89. Retrieved from <http://medicaljournals.eu/index.php/IJIMM/article/view/29>
21. Olimova Aziza Zokirovna. (2023). INFLUENCE OF ALCOHOL INTOXICATION ON THE HEART TISSUE OF RATS IN THE EXPERIMENT. *International Journal of Integrative and Modern Medicine*, 1(1), 90–95. Retrieved from <http://medicaljournals.eu/index.php/IJIMM/article/view/30>
22. Olimova Aziza Zokirovna. (2023). Modern Aspects of the Etiology of Gastric Ulcer and Its Complications. *American Journal of Pediatric Medicine and Health Sciences (2993-2149)*, 1(3), 163–166. Retrieved from <http://grnjournal.us/index.php/AJPMHS/article/view/208>
23. Zokirovna O. A., Jumaevich T. S. Morphological Aspects of the Liver of White Outbred Rats After Severe Traumatic Brain Injury Caused Experimentally in the Form of a Road Accident //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 2. – С. 59-62.
24. Aziza Zokirovna Olimova GASTRIC ULCER AND ITS COMPLICATIONS // Scientific progress. 2022. №3. URL: <https://cyberleninka.ru/article/n/gastric-ulcer-and-its-complications> (дата обращения: 28.09.2023).
25. Olimova Aziza Zokirovna. (2022). TECHNIQUE FOR CUTTING BIOPSY AND SURGICAL MATERIAL IN THE PRACTICE OF PATHOLOGICAL ANATOMY AND

FORENSIC MEDICINE. *Web of Scientist: International Scientific Research Journal*, 3(7), 116–120. <https://doi.org/10.17605/OSF.IO/PSQ59>

26. Zhumayevich N. F., Zokirovna O. A. PATHOMORPHOLOGY OF GASTRIC CANCER //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI. – 2022. – C. 330-333.
27. Zokirovna O. A. Epidemiological and Etiological Data of Morphogenesis and Pathomorphology of Congenital Heart Diseases in Children //American Journal of Pediatric Medicine and Health Sciences. – 2023. – T. 1. – №. 4. – C. 88-91.