IJIMM, Volume 2, Issue 6, 2024 ISSN: 2995-5319
http://medicaljournals.eu/index.php/IJIMM/issue/view/3
INTERNATIONAL JOURNAL OF INTEGRATIVE AND MODERN MEDICINE

Normal Anatomo-Morphological Characteristics of the Spleen

Sharafiy Tamina Floridovna
Bukhara State Medical Institute

Abstract: The spleen differs from other organs in that it changes depending on the functional state of the organism and early initiation of autolytic processes in it after death. Interpretation of experimental studies of this organ is difficult because there are interspecies differences in the structure of the spleen of mammals and humans. These characteristics depend mainly on the main functions assigned to this organ in different animals. This article provides information about the standard anatomical and morphological features of the spleen.

Keywords: spleen, anatomy, morphology, white pulp, red pulp.

For centuries, many scientists have tried to unravel the mystery of the functioning of the organ in the human body called the spleen. Even modern technologies could not fully reveal all the secrets of this body. The spleen is small in size and is located in the area of the left hypochondrium, behind the stomach. This organ performs many different functions, although they are to some extent auxiliary. For example, during the intrauterine development of the fetus, the spleen takes an active part in hematopoiesis, and after the birth of the child, the spleen stops performing this task.

Spleen (spleen, lien) is a large peripheral lymphoid organ located along the course of blood vessels, an organ involved in filtration, purification, immunity, blood formation and blood clotting. In recent years, many advances have been made in cellular and molecular immunology research. At the same time, the relationship between immunological processes and the structural system of the spleen, where these events occur, has not been sufficiently studied.

The spleen differs from other organs in that it changes depending on the functional state of the organism and early initiation of autolytic processes in it after death. Interpretation of experimental studies of this organ is difficult because there are interspecies differences in the structure of the spleen of mammals and humans. These characteristics depend mainly on the main functions assigned to this organ in different animals.

In connection with the above, the morphofunctional characteristics of the human spleen, immunological aspects and its histophysiology remain very relevant in understanding the complex processes that occur in these normal and pathological conditions.

Blood passing through the spleen is cleaned by the phagocytic activity of splenic macrophages. Macrophages clean the blood from old red blood cells, as well as foreign bodies and microbes that enter the bloodstream and cause diseases. In this case, the spleen captures and processes harmful substances, while cleaning the blood of antibodies called foreign substances. Spleen cells can recognize antigens and synthesize specific antibodies. This is the most important function of this organ - immunity. Together with other organs, the spleen affects the process of forming immunity. Its function is to produce antibodies that increase the body's resistance to infectious diseases.

It is known that the mass, shape and size of the spleen can vary significantly depending on the processes of blood collection and hematopoiesis activity (Zharikova N.A., 2019). The adult spleen, according to different authors, weighs from 55 to 245 g, in men its weight is greater than in women. Compared to the size of the spleen, its artery has a large diameter. Near the gate, it branches into 6-8 branches, each of which enters the thickness of the organ, where the formation of small branches grouped in the form of brushes occurs. Arterial capillaries gradually pass into the venous sinuses, the walls of which are formed by endothelial syncytia with cracks through which certain blood elements enter the venous sinuses. Venous trunks arising from this place, unlike arteries, form a large number of

anastomoses.

The spleen is covered with peritoneum and dense fibrous connective tissue capsule. Trabeculae spread deep into the organ from the capsule and anastomose with each other.

The capsule and trabeculae of the human spleen occupy approximately 5-7% of the total volume of the organ and constitute its locomotor apparatus.

Parenchyma (pulp) includes two zones with different functions: white and red pulp.

The pulp is based on a stroma consisting of reticular cells and reticular fibers. The majority of splenic T and B cells are part of the circulating pool of lymphocytes that continuously migrate through all secondary lymphoid organs and move through other tissues.

White pulp (WP) is represented by lymphoid tissue located along the arteries. It consists of periarterial lymphoid sheaths (PALS), lymphoid follicles (LF) or lymphoid nodes, and marginal zone (MZ).

It surrounds in the form of a cylindrical compact accumulation of lymphoid tissue, which includes lymphocytes, macrophages and interdigital dendritic cells (IDC), which play the role of presenting antigen. PALS are a T-dependent zone of the spleen that serves as a site for the formation of a T-cell immune response, and their status depends on the development of the thymus. This section is dominated by lymphoid elements expressing CD4 receptors.

In the periphery of PALS, ¬ there are LFs, which are clusters of B cells surrounded by a network of follicular dendritic cells (FDC). LF is the zone of the spleen dependent on B. FDCs are specialized to present antigens to B lymphocytes. FDCs express receptors for the Fc region of immunoglobulins and have many long thin dendritic processes that are closely associated with surrounding B cells.

During the immune response, germinal centers are formed in primary LFs. Quiescent B cells undergo blast transformation, rapid proliferation, and subsequent small B lymphocytes. In addition to B-lymphoid elements, germinal centers contain macrophages, as well as a small number of T-lymphocytes. CD4+ lymphocytes predominate among T cells, CD8+ lymphoid cells are less common. Germinal centers also contain specialized dendritic cells that present antigen to follicular T cells and may play a role in activating T cells to interact with surrounding B lymphoid elements.

The mantle zone surrounds the germinal center and consists mainly of densely packed B-lymphocytes.

The marginal zone (MZ) is the third largest splenic part of the white pulp. It contains lymphocytes, macrophages with high phagocytic activity and dendritic cells. MZ is located on the edge of PALS and LF, surrounded by marginal (marginal) sinuses with cracks in the wall and limited by red pulp (RP). This compartment contains a number of resident (non-circulating) B cells.

- memory cells and cells that can participate in the rapid primary immune response. The MZ is the initial entry point for antigens captured from the bloodstream into the white pulp of the spleen by T- and B-cells (subsequently directed to the corresponding zones) and here by macrophages. Red pulp (RP) - contains venous sinuses and splenic or pulp cords (Bilroth). Its functions include: controlling the condition and destroying old and damaged red blood cells and platelets; sedimentation of mature blood cells; phagocytosis of foreign particles; ensuring the maturation of lymphoid cells and the transformation of monocytes into macrophages.

Externally, EHs are covered with circular processes of reticular cells and reticular fibers, the basement membrane is present only in some places or not at all.

The cords of the spleen (pulp) are located between the sinuses and consist of rings of reticular tissue. They include accumulation of erythrocytes, platelets, leukocytes, as well as macrophages and plasma cells. -Blood cells constantly migrate from the pulp cords into the lumen of the sinuses. Old, ¬pathologically changed or damaged ¬blood cells (primarily erythrocytes), unable to migrate into the sinus, are completely phagocytosed and digested by macrophages formed from monocytes in threads.

Blood circulation in the spleen has a number of characteristics (Weiss L., 2014). The splenic artery

enters the entrance of the organ, its branches enter the trabeculae (trabecular arteries) and then enter the pulp ¬(pulp arteries). In the pulp, the adventitia of such an artery is replaced by a sheath of lymphoid tissue, and the artery is called the central artery. The central artery, passing to BP, gives collaterals in the form of capillaries ending with ¬MOH. The branches of the central arteries turn at right angles. Blood flows through the central artery in such a way that the blood cells move in the center of the vessel, and the plasma moves along the periphery. There is a separation of blood flow. Plasma-soluble antigens travel to the ¬BP, where they are captured by dendritic (antigen-presenting) cells. At the same time, monomeric plasma IgG can inhibit the function of reticuloendothelial system (RES) cells, separated from cellular elements. This structure increases the ability of sensitized cells to bind to Fc receptors on PC RES cells.

B-lymphoid elements (CD20; CD79a-positive cells) were detected in the B-dependent zones of the PD - LF and MZ and were also diffuse in the BL, and slightly more CD79a-positive cells were present in the splenic cords. plasma elements.

The number and functional utility of antigen-presenting cells determine the level and quality of the immune response to microbial, viral, and tumor antigens. It is known that the role of dendritic cells is reduced to capture and present antigens by T- and B-lymphocytes. It is due to these cellular elements that the antigen-antibody complex is formed, and as a result, immune reactions occur. The content of dendritic cells in the spleen was assessed using CD35 + and S-100 +. The localization of CD35-positive cells was mainly determined in the MZ, and a small number of them were scattered in the PC. Cells that react positively with S-100 were detected in the zones of the reactive centers of the LF and in the PC. Cells that react positively with S-100 were detected in the zones of the reactive centers of the LF and in the PC.

The complex structure of different parts of the spleen allows to perform mainly interrelated functions. Recognition, transport, and processing of antigens by phagocytes and other stromal cells are important for triggering T- and B-cell immune responses, as well as for the secretion of specific immunoglobulins. On the contrary, the filtering function of the spleen increases significantly under the influence of specific immune response products, both cytokines and immunoglobulins.

Endothelial cells of the venous sinuses give rise to blood cells, and they undergo a period of formation on their way to the splenic vein. This physiological barrier is a springboard for intercellular interactions, in which macrophages interact with intact cells and ¬look for defects and particles on their surface and inside them in order to phagocytose them ¬(Kay MMB , 2015). Macrophages not only swallow bacteria, but also present their processed antigens directly to lymphocytes in the spleen, stimulating the production of specific antibodies. In fact, macrophage phagocytosis significantly reduces the bacterial load in the bloodstream.

As mentioned above, the spleen is an organ well supplied with blood vessels. The splenic artery primarily supplies the organ with arterial blood, entering the top of the spleen near the middle of the visceral surface. The splenic artery separates from the aortic trunk artery and passes within the splenic ligament, along the lateral and superior pancreas. Approaching the spleen, the splenic artery divides into 5 branches that supply blood to different parts of the organ. The splenic vein provides venous drainage of the spleen. It also passes through the entire center, passes posteriorly to the pancreas, and then joins with the superior mesenteric vein to form the portal vein. The spleen is the main organ of the lymphatic system, and accordingly, the lymphatic vessels are not necessarily located in the spleen tissue itself, but some that arise from the capsule region. However, the lymphatic vessels of the spleen are only efferent lymphatic vessels, and the spleen acts like a large lymph node, supplying lymph material to neighboring nodes such as the pancreaticosplenic lymph nodes. Sympathetic innervation of the spleen comes from the solar plexus. Parasympathetic innervation originates from the vagus nerve (pair X nerve).

Thus, the spleen is a kind of filter designed to clean the bloodstream. All its components have their own functional tasks aimed at capturing pathological particles, identifying them, destroying them by phagocytosis and forming an immune response.

Literature

1. Хайдарова Н. А. Морфологическая И Морфометрическая Характеристика Щитовидной Железы При Полипрагмазии Противовоспалительными Препаратами //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2022. – Т. 1. – №. 7. – С. 151-155.
2. Akhtamovna K. N., Muyitdinovna K. S. Ischemic Heart Disease in Path Anatomic Practice: Cardio Sclerosis //European Multidisciplinary Journal of Modern Science. – 2022. – Т. 5. – С. 402-406.
3. Muyitdinovna X. S. The role of hyperhomocyteinemia in the development of cognitive disorders in chronic brain ischemia //Web of scientist: international scientific research journal. – 2022. – Т. 3. – №. 8. – С. 442-453.
4. Muyitdinovna X. S. The role of hyperhomocysteinemia in the development of cognitive impairment in chronic cerebral ischemia //Web Sci. Int. Sci. Res. J. – 2022. – Т. 3. – С. 421-428.
5. Muyitdinovna X. S. Analysis of maternal mortality in the practice of pathological anatomy //Web of scientist: international scientific research journal. – 2022. – Т. 3. – №. 8.
6. Kadirovna K. D., Muyitdinovna X. S. ELEVATED HOMOCYSTEIN LEVELS AS A RISK FACTOR FOR THE DISEASE IN CEREBRAL ISCHEMIA //World Bulletin of Public Health. – 2023. – Т. 21. – С. 117-120.
7. Муйитдиновна Х. С. СУД ТИББИЙ АМАЛИЁТИДА ЖИГАР ЦИРРОЗИ УЧРАШИ ВА СТАТИСТИК ТАҲЛИЛИ //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2023. – Т. 2. – №. 5. – С. 355-361.
8. Muyitdinovna K. S. Ovarian Cysts in Women of Reproductive Age //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2022. – Т. 1. – №. 7. – С. 225-228.
9. Muyitdinovna K. S. Pathogenetic Types and Principles of Treatment of Dyscirculatory Encephalopathy //Research Journal of Trauma and Disability Studies. – 2023. – Т. 2. – №. 9. – С. 72-79.
10. Muyitdinovna, X. S. (2023). Modern Aspects of the Etiology of Acute Intestinal Infections. *American Journal of Pediatric Medicine and Health Sciences (2993-2149)*, *1*(3), 102–105. Retrieved from https://grnjournal.us/index.php/AJPMHS/article/view/197
11. Muyitdinovna K. S. Prevalence and Epidemiology of Brain Cancer in Bukhara Region //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2022. – Т. 1. – №. 7. – С. 220-224.
12. Kadirovna K. D., Muyitdinovna X. S. The role of hypergomocysteinemia in chronic ischemic stroke : дис. – Antalya, Turkey, 2022.
13. Akhtamovna K. N. Modern View on the Influence of Antitumor Therapy on the Activity of the Thyroid Gland //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 5. – С. 50-54.
14. Muyitdinovna K. S. Prevalence and Epidemiology of Brain Cancer in Bukhara Region //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2022. – Т. 1. – №. 7. – С. 220-224.
15. Axtamovna H. N. Study of the Influence of Stress Factors on Animals //American Journal of Pediatric Medicine and Health Sciences. – 2023. – Т. 1. – №. 3. – С. 106-111.
16. Хайдарова Н. А. Морфологические Изменения Сердца У 6-Месячных Белых Беспородных Крыс Под Влиянием Энергетического Напитка //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2022. – Т. 1. – №. 7. – С. 142-146.
17. Khaidarova N. MODULAR TECHNOLOGY FOR TEACHING STUDENTS IN THE SCIENCE OF FORENSIC MEDICINE //Естественные науки в современном мире: теоретические и практические исследования. – 2022. – Т. 1. – №. 24. – С. 103-106.

18. Khaidarova N. ATHEROSCLEROSIS OF CORONARY VESSELS WITH NORMAL MACRO AND MICROSTRUCTURE OF THE THYROID GLAND IN PRACTICALLY HEALTHY PERSONS //Инновационные исследования в современном мире: теория и практика. – 2022. – Т. 1. – №. 24. – С. 606-608.
19. Mustafoevich S. O., Akhtamovana K. N. MEETING OF KIDNEY CYSTERS IN COURT MEDICAL AUTOPSY PRACTICE //Web of Scientist: International Scientific research Journal. – 2022. – №. 3. – С. 6.
20. Mustafoevich S. O., Akhtamovana K. N. Epitelial safe tumors of bladder rate, types and causes //Web of Scientist: International Scientific research Journal. – 2022. – №. 3. – С. 6.
21. Muitdinovna, K. S., & Rakhimovich, O. K. (2023). Forensic Medical Assessment and Statistical Analysis of Mechanical Asphixia. International Journal of Integrative and Modern Medicine, 1(3), 21–24.
22. Khaidarova Nargiza Akhtamovna. (2023). Modern Aspects of Morphological Features of the Thyroid Gland in Autoimmune Thyroiditis. *International Journal of Integrative and Modern Medicine*, *1*(3), 47–51. Retrieved from https://medicaljournals.eu/index.php/IJIMM/article/view/95
23. Xaydarova Nargiza Axtamovna. (2023). HASHIMOTO TIREOIDITIDA QALQONSIMON BEZNING MORFOLOGIK XUSUSIYATLARI. *AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI*, *2*(11), 247–252. Retrieved from https://sciencebox.uz/index.php/amaltibbiyot/article/view/8514
24. Kadirovna K. D., Muyitdinovna X. S. ELEVATED HOMOCYSTEIN LEVELS AS A RISK FACTOR FOR THE DISEASE IN CEREBRAL ISCHEMIA //World Bulletin of Public Health. – 2023. – Т. 21. – С. 117-120.
25. Axtamovna H. N. Effect of Hemodialysis Therapy on Heart Rhythm //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 5. – С. 326-331.
26. Axtamovna H. N. Effect of Hemodialysis Therapy on Heart Rhythm //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 5. – С. 326-331.
27. Kadirovna K. D., Muyitdinovna X. S. The role of hypergomocysteinemia in chronic ischemic stroke : дис. – Antalya, Turkey, 2022.
28. Muyitdinovna X. S. Modern Concepts on the Effect of Alcohol Intoxication on the Activity of the Heart //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 5. – С. 332-338.
29. Муйитдиновна Х. С. Суд Тиббий Амалиётида Механик Асфиксиялардан Чўкишнинг Учраши Ва Статистик Таҳлили //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2023. – Т. 2. – №. 11. – С. 403-406.
30. Rakhimovich O. K. CHARACTERISTICS OF MORPHOMETRIC AND ULTRASTRUCTURAL STRUCTURE OF LIVER HEPATOCYTES. – 2023.
31. Очилов К.Р., Каюмов Ж.Т. Ультраструктурные изменения печени крыс при пероральном введении солей тяжёлых металлов. “Пути совершенствования судебной экспертизы. Зарубежный опыт” Материалы научно-практической конференции 15-16 ноября 2017 г. Ташкент. С. 175.
32. Очилов К. Р. Влияние ионов кадмия и кобальта на дыхание митохондрий печени крыс //Новый день в медицине. – 2020. – №. 2. – С. 710-712.
33. Очилов К. Р. Изучение Влияние Солей Тяжелых Металлов На Биохимические Процессы Митохондрий Печени Крыс //Central Asian Journal of Medical and Natural Science. – 2021. – С. 383-387.

34. Очилов К. Р. СТРУКТУРНОЕ СТРОЕНИЕ КЛЕТОК ТКАНИ ПЕЧЕНИ ПРИ ВОЗДЕЙСТВИИ КАДМИЯ //Новости образования: исследование в XXI веке. – 2023. – Т. 1. – №. 7. – С. 372-377.
35. Очилов К. Р. ВЛИЯНИЕ СВИНЦА НА ОРГАНИЗМ ЧЕЛОВЕКА И ЖИВОТНЫХ //ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ. – 2023. – Т. 18. – №. 7. – С. 89-93.
36. ОЧИЛОВ К. Р. и др. ДЕЙСТВИЕ БУТИФОСА НА ТРАНСПОРТ Ca2+ В МИТОХОНДРИЯХ ПЕЧЕНИ КРЫС //Доклады Академии наук УзССР. – 1985. – Т. 45.
37. Наврузов Р. Р., Очилов К. Р. МОРФОФУНКЦИОНАЛЬНЫЕ ОСОБЕННОСТИ ЛИМФОИДНЫХ СТРУКТУР ТОЛСТОЙ КИШКИ ПРИ ЛУЧЕВОЙ БОЛЕЗНИ //Scientific progress. – 2022. – Т. 3. – №. 1. – С. 728-733.
38. Тешаев Ш. Ж., Очилов К. Р. МОРФОФУНКЦИОНАЛЬНЫЕ ОСОБЕННОСТИ МИТОХОНДРИЙ ПЕЧЕНИ КРЫС ПРИ ОТРАВЛЕНИИ БУТИЛКАПТАКСОМ //Новый день в медицине. – 2020. – №. 2. – С. 715-717.
39. Ochilov Kamil Rakhimovich Issues of Physical Health of Young People
40. Intersections of Faith and Culture: AMERICAN Journal of Religious and Cultural Studies *Volume 01, Issue 02, 2023 ISSN (E): XXX-XXX*
41. Ochilov Komil Rahimovich Khaidarova Nargiza Akhtamovna Morphological and Morphometric Characteristics of the Thyroid Gland Polypharmacy Anti-inflammatory Sensors SCHOLASTIC: Journal of Natural and Medical Education *Volume 2, Issue 5, Year 2023 ISSN: 2835-303X https://univerpubl.com/index.php/scholastic*
42. *Ochilov Komil Rakhimovich Khatamova Sarvinoz Muitdinovna,* Forensic Medical Assessment and Statistical Analysis of Mechanical Asphixia IJIMM, Volume 1, Issue 3, 2023 ISSN: XXXX-XXXX http://medicaljournals.eu/index.php/IJIMM/issue/view/3 Kamil Rakhimovich Ochilov Studying The Effect Of Heavy Metal Salts On Biochemical Processes Of Rat Liver Mitochondria DOI: 10.47750/pnr.2022.13.S07.230
43. Ochilov Kamil Rakhimovich Effects of Heavy Metal Salts in Biochemical Processes, Rat Liver Mitochondria .American Journal of Science and Learning for Development ISSN 2835-2157 Volume 2 | No 1 | January -2023 Published by inter-publishing.com | All rights reserved. © 2023 Journal Homepage: https://inter-publishing.com/index.php/ AJSLD Page 109