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Y.S. DZHADRANOV, M.ZH. YERGAZINA, Z.N. DZHANGELDINA, A.V. KRASNOSHTANOV, V.K. KRASNOSHTANOV
KazNMU named after S.D. Asfendiarov,
subdepartment of Histology

MORPHOLOGIC FEATURES OF THE MESENTERIAL METASTASES OF EXPERIMENTAL RAT'S OVARIAN TUMOR

Transplanted organotropic strain of the ovarian tumor of rats is able to develop in different forms depending on technique of transplantation. In case of subcutaneous introduction of the tumor cells it develops in the form of solid tumor node. In case of intraperitoneal introduction of the tumor cells it develops in the form of ascites. In case of intravenous introduction of the tumor cells it develops in the form of numerous pulmonary metastases. We studied morphologic features of mesenterial metastases that develop in case of intraperitoneal ascitic form of the tumor.
Keywords: *rat, tumor, cell.*

Actuality. Transplanted organotropic strain of the ovarian tumor of rats is able to develop in different forms depending on technique of transplantation. In case of subcutaneous introduction of the tumor cells it develops in the form of solid tumor node. In case of intraperitoneal introduction of the tumor cells it develops in the form of ascites. In case of intravenous introduction of the tumor cells it develops in the form of numerous pulmonary metastases. We studied morphologic features of mesenterial metastases that develop in case of intraperitoneal ascitic form of the tumor. This investigation we carried out in comparison with structural features of metastases developed as a result of intravenous tumor cells introduction.
Methods. For our investigation we used males of laboratory rats at the age of two and a half to three months. Four groups of animals were formed (each group was made up of five rats). Group number one (control group) included intact rats. Group number two included rats that were subjected to intravenous introduction of five thousand tumor cell. Group number three included rats that were subjected to intravenous introduction of ten thousand tumor cells. Group number four included rats that were subjected to intraperitoneal introduction of five million tumor cells.
All the transplanted tumor cells were beforehand obtained from intraperitoneal ascites of a rat to which the tumor was transplanted nine days before. Concentration of the introduced tumor cells was determined with the help of Gorjaev's count chamber under microscope.
All the animals were killed on the twentieth day after beginning of the experiment. After dissection of the thoracic cavity the pieces of caudal parts of the lungs were extracted and fixed in solution of formalin. In the group number four the abdominal cavity was also dissected and the pieces of mesentery were extracted and fixed. Paraffin sections were stained with haematoxylin-eosin. Histologic specimens were observed under light microscope.
Discussion. On the outside the lungs of the control rats (rats of the group number one) are covered by serous tunic that consists of flattened mesothelium (its height is 4,13±0,19 micrometers, it contains hyperchromatic elongated nuclei) and subepithelial connective tissue layer which is penetrated by numerous capillaries. The connective tissue layer consists of a large number of cells containing oval densely stained nuclei, and of fibres directed along the surface of the organ. Thickness of the serous tunic is 19,2±1,1 micrometers.
The bulk of the pulmonary parenchyma is made up of alveoles, between which the bronchi of different size are located. The alveoles are lined by flattened epithelial cells containing elongated nuclei. There isn't any prominent difference between the diameter of alveoles situated within the peripheral parts of the lungs (21,1±1,6 micrometers) and the diameter of alveoles situates within the internal parts of the organ (23,63±1,26 micrometers). Besides, there isn't any prominent difference between the density of arrangement of alveoles situated within the peripheral parts of the lungs and of alveoles situated within the internal parts of the organ. Within the peripheral parts of the lungs the number of alveoles in one visual field of microscope (ocular 15, objective 40) is 6,73±0,26, and within the internal parts of the organ the number of alveoles in one visual field of microscope is 7,66±0,33.
Alveoles are separated from one another by thin interalveolar septa penetrated by capillaries. The interalveolar septa consist of densely arranged cells (that contain rounded and oval nuclei having well visible nucleoli and masses of chromatin) and thin connective tissue fibres. Within the peripheral parts of the lungs the thickness of the interalveolar septa is 9,75±0,49 micrometers, and within the internal parts of the organ the thickness of the interalveolar septa is 8,73±0,43 micrometers.
Bronchi of any size are followed by blood vessels. Arteries are characterized by well developed smooth muscle of media. Large veins contain valves.
Wall of those bronchi, the lumen of which is eight hundred to one thousand micrometers in diameter, contain plates of cartilage 54,05±3,06 micrometers in thickness. The cartilaginous plates contain oval and irregular-shaped cells that are densely arranged. Those cells have prominent boundaries, diameter of the cells is 15,44±0,8 micrometers. Rounded and oval nuclei of the cells (5,38±0,21 micrometers in diameter) contain well visible nucleoli and masses of chromatin.
Mucous tunic of bronchi of any size forms folds that are made up of epithelium and lamina propria. In the bronchi that are eight hundred to one thousand micrometers in diameter, the height of the folds is 62,01±3,01 micrometers. In the bronchi, that are six hundred and fifty to seven hundred and fifty micrometers in diameter, height of the folds is 103,89±5,09 micrometers. In the bronchi, that are three hundred to four hundred micrometers in diameter, the height of the folds is 60,38±3,01 micrometers. In the bronchi, that are two hundred to two hundred and fifty micrometers in diameter, the height of the folds is 64,35±3,3 micrometers. In the bronchi, that are eighty to one hundred micrometers in diameter, the height of folds is 39,25±1,9 micrometers.
Inner surfaces of the bronchi are lined by pseudostratified epithelium the cells of which contain hyperchromic nuclei that are located within middle and basal parts of the cells. Boundaries between the epithelial cells and the basal membrane are not prominent. In the bronchi, that are eight hundred to one thousand micrometers in diameter, the height of the epithelium is 27,69±1,26 micrometers. In the bronchi, that are six hundred and fifty to seven hundred and fifty micrometers in diameter, the height of the epithelium is 20,36±0,86 micrometers. In the bronchi, that are three hundred and fifty to four hundred and

fifty micrometers in diameter, the height of the epithelium is 15,56±0,53 micrometers. In the bronchi, that are two hundred to two hundred and fifty micrometers in diameter, the height of the epithelium is 13,33±0,64 micrometers. In the bronchi, eighty to one hundred micrometers in diameter, the height of the epithelium is 10,8±0,5 micrometers.

Lamina propria of the bronchial mucous tunic consists of numerous cells that contain densely stained nuclei of different size, and of thin connective tissue fibres.

Smooth muscle in the bronchial wall represents bundles of densely arranged smooth muscle cells. The bundles are separated by connective tissue layers. The smooth muscle cells contain poorly stained nuclei that are elongated in shape. The specific gravity of the muscle in the bronchial wall increases as the bronchi become smaller but the thickness of the smooth muscle decreases. In the bronchi, that are eight hundred to one thousand micrometers in diameter, the thickness of the smooth muscle is 73,0±3,6 micrometers. In the bronchi, that are six hundred and fifty to seven hundred and fifty micrometers in diameter, the thickness of the smooth muscle is 41,65±2,0 micrometers. In the bronchi, that are three hundred and fifty to four hundred and fifty micrometers in diameter, the thickness of the smooth muscle is 21,72,±1,08 micrometers. In the bronchi, that are two hundred to two hundred and fifty micrometers in diameter, the thickness of the smooth muscle is 17,94±0,8 micrometers. In the bronchi, that are eighty to one hundred micrometers in diameter, the thickness of the smooth muscle is 7,89±0,3 micrometers.

Bronchial adventitia cosists of numerous cells containing rounded and oval nuclei that are densely stained, and of thin fibres. Connective tissue of the bronchial adventitia is gradually continuous with the adjacent interalveolar septa, and with adventitia of the adjacent vessels, that's why boundaries of the bronchial adventitia are not prominent. The walls of the bronchi contain lymphatic nodules occupying all the thickness of the wall and even reach the subepithelial layer.

In the rats of groups number two and number three the tumor nodes are made up of clusters of densely packed cells. These clusters consist of groups of cells separated by thin layers of homogeneous substance. Within each group, the cells are structurally similar. Some of the cells possess conspicuous boundaries, and their nuclei contain large masses of chromatin, other cells show figures of mitosis. Hence we can suppose that the groups of the tumor cells represent isogenous groups, each of which is derived from one maternal cell.

In the rats of the group number two the diameter of the tumor cells is 8,73±0,41 micrometers, and diameter of their nuclei is 6,16±0,3 micrometers. In the rats of the group number three the tumor cells are 8,18±0,36 micrometers in diameter, and diameter of their nuclei is 5,14±0,2 micrometers.

The tumor nodes are penetrated by blood vessels. The walls of the blood vessels are gradually destroyed by surrounding tumor cells. Total destruction of the vascular wall

causes bleeding into the tumor tissue. Those zones of the tumor tissue, that are adjacent to the zone of the bleeding, are necrotic.

The tumor nodes are surrounded by connective tissue infiltrated by the tumor cells. Those zones of the lungs which are situated between the tumor nodes are destroyed.

In the rats of the group number four (ascetic tumor) singly arranged pulmonary metastases are rounded in shape, they are about five hundred micrometers in diameter. Those tumor nodes consist of densely packed oval and polygonal tumor cells arranged in groups separated by thin layers of homogeneous substance. Diameter of the tumor cells is 11,5 ±0,29 micrometers, and diameter of their nuclei is 5,58±0,26 micrometers. Central zones of such tumor nodes are necrotic. Pulmonary tissue situated outside the tumor nodes remains intact.

We also investigated the mesentery of the animals of group number four. Microscopically it was determined that those mesenterial zones that are situated between the tumor nodes are well vascularized: arterial vessels in it have well developed tunica media, venous vessels are thin-walled. Those mesenterial zones consist of thin connective tissue fibres that may be arranged in small wavy bundles, and may interlace in the form of network. Between the fibres there are cells the oval nuclei of which have distinct karyolemma, nucleoli, and masses of chromatin. Next to the metastases the structural elements of the mesentery are directed along the surface of the tumor nodes. Between tumor nodes there is a large amount of adipose tissue. Mesenterial tissue is infiltrated by the tumor cells.

Tumor nodes are made up of cells the boundaries of which are not visible. Within some parts of the nodes the cytoplasm of the tumor cells is granular, the rounded and oval nuclei are characterized by distinct karyolemma and nucleoli. Diameter of the nuclei is 7,36±0,26 micrometers. Many of such cells are at some stages of mitotic division. Within other parts of the nodes the cytoplasm of the tumor cells is densely stained, hyperchromatic nuclei are rounded, oval, bean-shaped and irregular in shape. Some zones of the tumor tissue are made up of unstructured substance containing fragments of nuclei.

Tumor nodes are penetrated by blood vessels. The walls of the vessels are gradually destroyed by the tumor cells. In case of entire destruction of vessels the hemorrhages occur.

There are some tumor cells outside the mesenterial tissue. Such cells may be present singly or in groups. Some of those cells contain granular cytoplasm and rounded or oval hyperchromatic nuclei. Diameter of the cells is 9,36±0,25 micrometers, diameter of their nuclei is 5,89±0,2 micrometers. There are cells that show prominent degenerative changes.

Conclusions. Intraperitoneal growth of the experimental rat's ascitic ovarian tumor causes development of numerous mesenteric metastases. Those metastases consists of malignant cells; in different zones of each metastasis the cells are characterized by special features.

СПИСОК ЛИТЕРАТУРЫ

1 Акимов О.В. Злокачественная мезотелиома корня брыжейки тонкой кишки. // Архив патологии.- 1989.- Т. 51.- В. 8.- С. 65 - 67.
2 Блинов Н.Н., Рукавишникова В.Г. Клинико-морфологическая характеристика овсяноклеточного рака лёгкого.// Вопросы онкологии.- 1973.- Т. 19.- №6.- С. 25-31.
3 Васин В.А., Мнихович М.В., Васин И.В., Снегур С.В. Клинико-морфологическое наблюдение бронхоальвеолярного рака лёгкого.// Архив патологии.- 2008.- Т. 70.- №2.- С. 43-45.
4 Деревянко И.М., Степанова В.К., Гуденко Ю.А. Гигантские множественные кисты лимфатических сосудов брыжейки тонкого кишечника. // Клиническая хирургия - 1972.- №10.- С. 65 - 66.
5 Дмитракова Л.Г., Бушик В.Я., Махлин А.М. Гемангиоматоз брыжейки тонкой кишки. // Здравоохранение Белоруссии.- 1987.- №4.- С. 60.
6 Зыбина А.А., Левковская Л.Ю., Евтушенко А.В. О мезенхимомах брыжейки тонкой кишки. // Клиническая хирургия.- 1975.- №9.- С. 43 - 46.
7 Куликов А.Г., Зелёнов Г.Г. Ангиолейомиома брыжейки тонкой кишки. // Хирургия.- 1976.- №4.- С. 128 - 129.
8 Косуха А.Ф., Шатько А.М. Кистовидная опухоль брыжейки тонкой кишки. // Здравоохранение Белоруссии.- 1975.- №4.- С. 74 - 75.
9 Лебедев В.И. Сочетание диффузного полипоза толстой кишки и десмоида брыжейки толстой кишки. // Труды Ленинградского научного общества патологоанатомов.- 1973.- В. 14.- С. 162 - 164.
10 Лийвранд В.Э., Кулдева Д.Я., Силласту В.А. Случай громадной инвазивной фибромы брыжейки тонкого кишечника. // Учёные записки Тартуского государственного университета.- Тарту.- 1968.- Т. 17.- В. 214.- С. 250 - 252.
11 Немировская Н.А. Лимфангиома брыжейки тонкой кишки. // Архив патологии.- 1973.- Т. 35.- В. 8.- С. 74 - 77.
12 Ольховская И.Г., Соколова И.Н., Патютко Ю.И. Невринома с диссеминацией по брюшине. // Архив патологии.- 1975.- Т. 47.- В. 9.- С. 82 - 85.
13 Пашкова В.С. О ранних стадиях приживления опухолевых клеток в лёгких крыс.// Вопросы онкологии.- 1969.- Т. 14.- №10.- С. 60-64.
14 Саркисов Д.С., Воропаев М.М., Никулин В.И., Музыкант Л.И. Морфологические изменения лёгких на относительно ранних стадиях развития рака.// Грудная хирургия.- 1964.- №3.- С. 58-63.
15 Харченко В.П., Галил-Оглы Г.А., Коган Е.А., Берщанская А.М., Палкина О.В. Бронхоальвеолярный рак.// Архив патологии.- 2000.- Т. 62.- №3.- С. 10-16.
16 Ягубов А.С. Морфологические формы рака лёгкого и их прогностическая оценка.- Автореф. … канд. мед наук.- М.- 1969.- 15 с.
17 Якубов А.С. О некоторых гистоструктурных особенностях рака лёгкого. // Архив патологии.- 1970.- Т. 32.- № 12.- С. 18-24.

Е.С. ДЖАДРАНОВ, М.Ж. ЕРГАЗИНА, З.Н. ДЖАНГЕЛЬДИНА, А.В. КРАСНОШТАНОВ, В.К. КРАСНОШТАНОВ
Гистология кафедрасы,
С.Ж. АсфендияроватындағыҚаз¥МУ

ЕГЕУҚҰЙРЫҚТАРДА АНАЛЫҚ ЖЫНЫС БЕЗІНІҢ АФФИНИТИВТІ ЭКСПЕРИМЕНТАЛЬДІ ІСІГІНІҢ ШАЖЫРҚАЙЛЫҚ МЕТАСТАЗЫ КЕЗІНДЕ БАЙҚАЛАТЫН МОРФОЛОГИЯЛЫҚ ЕРЕКШЕЛІКТЕРІ

Түйін: Егеуқұйрықтардың аналық жыныс безіндегі аффинитивті экспериментальді ісігінің шажырқайлық метастазының құрсақішілік асцитті түрінде байқалатын морфологиялық ерекшеліктеріне сипаттама берілді. Ісіктің тінін құрайтын көптеген жасушаларда митоз көріністері анықталады. Жасушалардың шекаралары анық емес. Ядросының пішіні дөңгелек келген, онда кариолеммасы мен ядрошығы айқын білінеді. Шажырқай тіні ісік жасушаларымен инфильтрацияланған..
Түйінді сөздер: егеуқұйрық, ісік, жасуша.

Е.С. ДЖАДРАНОВ, М.Ж. ЕРГАЗИНА, З.Н. ДЖАНГЕЛЬДИНА, А.В. КРАСНОШТАНОВ, В.К. КРАСНОШТАНОВ
Каф. гистологии,
КазНМУ им. С.Д. Асфендиарова

МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ БРЫЖЕЕЧНЫХ МЕТАСТАЗОВ ЭКСПЕРИМЕНТАЛЬНОЙ ОПУХОЛИ КРЫС АФОЯ

Резюме: Описаны морфологические особенности брыжеечных метастазов у крыс при внутрибрюшинном развитии асцитной формы экспериментальной перевивной опухоли АфОЯ. Ткань опухоли образована многочисленными клетками среди которых обнаруживаются фигуры митоза. Границы клеток неразличимы. Их округлые и овальные ядра имеют отчётливую кариолемму и ядрышки. Ткань брыжейки инфильтрирована опухолевыми клетками.
Ключевые слова: крыса, опухоль, клетка.