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Breast Cancer Diagnosis Stereotactic Biopsy Under Mammographic Control Bukhara State Medical Institute

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Annotation. *Data on the epidemiology of mastopathy and breast cancer, population risks of breast cancer, causes predisposing to mastopathy, and risk factors for breast cancer are presented. The concepts of mastopathy and mastalgia are discussed. The clinical symptoms and methods of physical examination of patients with non-cancerous breast diseases (MH), including palpation of the MH and regional lymph nodes, are described in detail.The issue of diagnosing aggressive small carcinomas is relevant and timely all over the world, which served as the basis for conducting this study to search for the most characteristic radiological and sonographic signs of microcarcinomas in patients with different biological subtypes of breast cancer. The possibility of performing stereotactic biopsy of mammary gland formations under X–ray control is one of the important factors for the successful operation of the outpatient clinic of a specialized oncological institution. The article presents more than 15 years of experience in performing stereotactic biopsy of mammary glands under X-ray control.*

Keywords: *stereotactic biopsy, breast cancer, mammography.*

INTRODUCTION. At the same time, the risk of malignancy in the nonproliferative form is 0.86%, with moderate proliferation 2.34%, with pronounced proliferation – 31.4% of observations. According to histological studies of the surgical material, breast cancer is combined with fibrococcosis in 46% of cases [1,2]. There is a clear link between the incidence of breast cancer and reproductive function. A woman who gave birth for the first time at the age of 18 has a three times lower risk of developing breast cancer than a woman who gave birth for the first time at the age of 35. Early first pregnancy contributes to a sharp increase in the production of one of the 3 estrogens, estriol, which is a product of estradiol and estrone metabolism and inhibits the carcinogenic effects of the latter. On the other hand, late delivery (after 30-40 years) leads to a sharp increase in estradiol levels, which can contribute to the development of breast cancer. There are sclerosing, apocrine, and microglandular types of adenosis. Among all benign breast changes, CA accounts for about 28% [3-5]. The relationship between this disease and the risk of developing breast cancer has not been established. Haagensen defined CA as a "phenomenon of the phase of the menstrual cycle of life," suggesting that estrogens induce epithelial proliferation, which predisposes to the development of adenosis and other epithelial tumors. There is also evidence that patients with verified CA have a doubled risk of developing breast cancer. Malignant neoplasms are one of the main causes of death and disability in the population, second only to cardiovascular diseases. Breast cancer (BC) is one of the most important socio–economic problems of global and domestic healthcare. In Russia and St. Petersburg, it consistently occupies the leading 1st place in terms of the incidence of breast cancer. In 2019, 2,396 primary cases of the disease were registered in St. Petersburg, 12 of them in men and 2,184 in women. The "rough" incidence rate was 85.7 per 100,000 population, the standardized rate was 47.14. In 2019, 1,132 women died of breast cancer in St. Petersburg [6,7]. Traditional methods of breast cancer diagnosis are widely known – clinical examination, mammography in women over 39 years of age, ultrasound examination in patients under this age [3]. In recent years, magnetic resonance imaging of the mammary glands with dynamic contrast enhancement has become increasingly widespread [8,9].Verification of the diagnosis

becomes a prerequisite for determining the tactics of treating a patient with a malignant breast lesion [10]. In recent years, trepan biopsy of areas suspected of malignant tumors has been preferred, which allows not only to determine the histological type of tumor structure, but also to assess its receptor status. In the case of palpable mammary gland formation, verification, as a rule, does not present any difficulties, otherwise the situation is with non-palpable mammary gland formations. For a long time, diagnostic sectoral breast resection (open biopsy) has been practically the only diagnostic method that allows obtaining material for histological examination and thus verifying the diagnosis [11,12]. Attempts to use the stereotactic Mammotest biopsy system for aspiration biopsy of non-palpable mammary glands under X-ray control have not been widely used due to a number of significant disadvantages. The obtained material was available only for cytological examination, and in 25% of cases it was not possible to obtain enough material to make a definitive diagnosis [13]. In 1988, the American radiologist S.Parker performed the first stereotactic biopsy of non-palpable mammary gland formation under X-ray control using the "needle gun" system [14]. According to various authors, the diagnostic accuracy of stereotactic biopsy of non-palpable mammary glands under X-ray control is significantly higher than that of diagnostic sectoral resection [15,16]. Indications for stereotactic biopsy under X-ray control Stereotactic biopsy under X-ray control can be performed both in the case of palpable and non-palpable changes in the mammary glands. Indications for the use of this method in the presence of a palpable seal are: a negative response obtained with a traditional trepan biopsy, edematous forms of breast cancer that do not allow for a clear localization of the area of interest, and the "deep" location of the tumor node. Non-palpable changes suspected of having a malignant neoplasm are the main indication for stereotactic biopsy under X-ray control. Non–palpable breast cancer are tumors that are on the 25th-30th cycle of cell doubling and have sizes up to 1.5 cm in diameter . In the group of preinvasive tumors, ductal carcinoma in situ (DCIS) or preinvasive ductal cancer and lobular carcinoma in situ (LCIS) or preinvasive lobular cancer are distinguished. Invasive carcinomas are divided into ductal and lobular, as well as rarer forms (mucosal, medullary, papillary, etc.) [17]. Statistical data indicate that in 21.8% of cases, non–palpable breast cancer occurs as an accumulation of microcalcinates, in 15.6% – a severe restructuring of the structure, and in 62.5% - a node. V.F.Semiglazov et al.believe that "minimal" breast cancer has the same radiological signs as large tumor nodules. At the same time, it is noted that minimal cancers are relatively more likely than larger tumors to have the appearance of rounded formations with smooth, sometimes indistinct contours[18,19]. The concept of radiological signs of non-palpable breast cancer is most fully reflected in the domestic literature in the studies of N.I.Rozhkova et al., in foreign literature these signs are summarized in the BI-RADS (Breast Imaging Reporting and Data System) systems adopted in the USA and Re.Co.R.M. (Reporting and Codifying the Results of Mammography) – in Europe. It should be noted that, according to the international descriptive systems BI-RADS and Re.Co.R.M., changes detected on mammograms and classified as categories 4 and 5 are subject to verification using stereotactic biopsy under ultrasound or X-ray control. Stereotactic puncture biopsy technique The technique of targeted biopsy on radiographic devices with stereotactic attachment or digital mammographs is described in detail in the manual "Radiation diagnostics in mammology" edited by Professor N.I.Rozhkova. When using these devices, a biopsy is performed while the patient is sitting. To perform stereotactic biopsy under X-ray control, we use the Mammotest-Mammovision device manufactured by Fisher (USA). This X–ray machine involves horizontal positioning of the patient and consists of 3 main parts: Mammotest, a breast hole and a generator, Mammovision, an electronic stereotactic system for digital image processing and visual evaluation, and AutoGuide, an automatic control and guidance system for a biopsy needle. Before performing a stereotactic biopsy, the radiologist evaluates the mammograms presented and makes a final decision on the need for a biopsy. Then, the pathological formation is marked on mammograms in a direct projection using a measuring ruler. In this case, the distance from the pathological formation to the nipple and the medial or lateral edge of the gland is measured. The measurement data is applied to the patient's skin with a marker.

Material and methods. The mammary gland is fixed with a compression plate in such a way that the previously marked area on the skin is located in the center of the compression plate hole measuring 5x5 cm. When the pathological formation is located retromammally or in the axillary process, the patient is positioned in such a way that not only the gland, but also the shoulder and arm from the appropriate side

are lowered into the opening of the table. The main stages of stereotactic biopsy include a digital targeted mammogram with an increase in the area of interest and direct sampling of the material by the needle gun system. For accurate localization of the pathological site, the first approximate 8-fold magnified image is performed without displacement of the X-ray tube. Then the X-ray tube is shifted at an angle of +15° and -15°° and two stereotactic mammograms measuring 5x5 cm with a magnification of 3.5 times are obtained. The digital images obtained are subjected to postprocessing, which makes it possible to confirm or deny the presence of a radiologically reliable suspicion of breast cancer. In the absence of pathology, the study is completed by making an individual decision on the frequency of observation. In all other cases, a biopsy is performed. To calculate the coordinates of the pathological site on the stereotactic mammogram at an angle of -15 ° °, the cursor marks the area of interest, then moves the cursor to the stereotactic mammogram at an angle of +15 ° ° and also marks the area of interest. Both marked sections should be on the same straight line. On a stereotactic mammogram at an angle of +15°, the places of planned tissue sampling are additionally marked. You can simultaneously mark 9 points, which should be no further than 1 cm from the area of interest. The coordinates of all marked targets in horizontal, vertical and depth are automatically displayed on the monitor screen. The AutoGuide system confirms that the calculated coordinates allow a biopsy to be performed. To perform the biopsy, we use a Magnum automatic biopsy gun, Bard needles with an internal diameter of 14G (2.1 mm), a length of 16 cm, and a special spoon for tissue sampling. A sterile needle is inserted into the gun immediately before the biopsy. With an adequate level of compression, the procedure does not require an anesthetic aid. The prepared pistol-needle system is installed in a positioner with a guide and a needle holder. After the first target is set on the remote control, the pistol-needle system is automatically positioned to the designated coordinates. The depth of the needle passage is recorded manually on the ruler of the depth limiter. After preparing the "pistol-needle" system, a scalpel incision is made into the skin and subcutaneous tissue in the projection of the needle location, about 5 mm in size. The needle is inserted into the incision of the skin up to the limiter. Two preliminary stereotactic mammograms are then performed to ensure that the needle is positioned correctly. Then a "shot" is fired from a biopsy pistol. After that, the X-ray tube is again installed at an angle of +15°, and then -15°, and two additional stereotactic mammograms are obtained, which allow us to confirm the sampling of material from the area of interest. After the "shot" from the gun, the needle is removed and the tissue sample is placed in a container with a 10% formalin solution. During one procedure, an average of 7-9 biopsies are obtained for histological examination. The number of biopsy samples is determined by the size and shape of the pathological site. At the end of the biopsy, the X-ray tube is placed in its original position and a control digital targeted mammogram is performed with an image magnification of 8 times to assess the condition of the pathological site and determine the size of the internal hematoma. After the procedure is completed, the skin around the incision is treated with a ball soaked in an alcohol solution and covered with a bactericidal patch. Then, a rubber heating pad with ice is applied to the biopsy site for 30 minutes. The obtained tissue samples are sent to the histological laboratory for verification. In most women, subcutaneous hematomas form after stereotactic biopsy under X-ray control, which regress independently after a few days. To do this, use a special mandrel made of wire with curved tips – a harpoon (Hook) – with a length of 13.7 and 10.7 cm, and a diameter of 20G (0.9 mm). The technique of interstitial marking differs from the method of stereotactic biopsy in that for the installation of a marker on stereotactic mammograms, one goal is noted at the center for pathological education. The coordinates are calculated automatically. After installing a localization repositioning needle – a guide in the area of interest – control stereotactic mammograms are performed. Surgical intervention is performed on the same day or the next day after the installation of the mandrel. Contraindications to stereotactic biopsy under X-ray control on Mammothest-Mammovision devices are disorders of the blood coagulation system, the inability to maintain a horizontal position in patients with musculoskeletal disorders, artificial immobilization of the shoulder girdle from the side of interest, recent acute cerebral circulatory disorders and acute myocardial infarction. Breast cancer was verified in 73% of cases, and in 27% there were no signs of a malignant process during histological examination. In the vast majority of cases, according to the results of biopsy, infiltrating ductal cancer was morphologically diagnosed, which was detected in 89% of patients with malignant lesions of the mammary glands. Radiologically, breast cancer manifested itself in the form of nodular formations with

heavy contours without associated calcinates – 62.9%; in the form of local asymmetry – 10.9%; clusters of pleomorphic microcalcinates with a high density per unit area (more than 10 pcs. by 0.5 cm2) – 9.3%; rounded formation – 7%; in the form of a severe restructuring – 6.6%; nodular formation with calcifications – 3.3%. In 9.1% of cases, the detected changes were accompanied by breast edema. A retrospective analysis of the conducted studies revealed the X-ray signs that are most common in a certain histological picture of the tumor. Thus, infiltrating ductal cancer most often manifested itself in the form of nodular formations with radiant contours, non–infiltrating ductal cancer - clusters of microcalcinates. Lobular cancer, regardless of its shape, was more characterized by radiologically detectable areas of severe structural rearrangement and local asymmetry. Accumulations of microcalcinates in our study with approximately equal frequency were a morphological reflection of the malignant process and sclerosing adenosis. The probability of cancer detection, regardless of the variant of the X-ray picture, increased in patients with a mastectomy or a family history of cancer. When analyzing false negative results, it was found that the accuracy of stereotactic biopsy directly depends on the correct target on digital targeted mammograms with magnification of the image and a sufficient number of biopsy samples for each specific case. D.I.Kuplevatskaya recommends taking at least 7 biopsy samples in the case when the pathological site is less than 0.5 cm in diameter and does not less than 9 tissue samples if the pathological site contains microcalcinates. Thus, targeted stereotactic mammograms make it possible to characterize in detail the detected changes in the structure of the mammary glands, to assume their nature and to determine the need for stereotactic biopsy under X-ray control.

CONCLUSIONS. Volumetric mammary gland formations detected by palpation, as a rule, do not pose difficulties for verification by fine needle aspiration biopsy or trepan biopsy followed by histological examination of the obtained material. Non–palpable volumetric formations, areas of local asymmetry or severe restructuring, clusters of pleomorphic calcinates are the spectrum of pathology that is available only during diagnostic studies and cannot be verified without the participation of a radiologist. Surgical interventions in the presence of non-palpable benign changes (except for proliferative forms of diffuse fibroadenomatosis) are not justified in terms of consequences for the patient and economic costs. That is why it is especially important to equip specialized oncological institutions with stereotactic biopsy devices under X-ray control. Puncture biopsy using Mammotest devices is economically more profitable than diagnostic sectoral resection. Stereotactic biopsy under X-ray control is performed on an outpatient basis, does not require hospitalization of the patient and special anesthetic aid. The cost of the procedure under compulsory medical insurance is almost 7 times lower than the cost of diagnostic sectoral resection. Secondary prevention of breast cancer involves the widespread use of X-ray mammography for the purpose of early detection of a malignant tumor. The establishment of minimal changes on mammograms and verification of the diagnosis using stereotactic biopsy make it possible to carry out the required range of therapeutic and diagnostic measures at the earliest stages of the development of the tumor process. Early diagnosis of the neoplasm, combined with well–chosen therapy tactics, makes it possible to achieve stable clinical remission, reduce the economic costs of therapy and, in the long run, reduce mortality rates from breast cancer.

LITERATURE

1. Семиглазов В.Ф., Нургазиев К.Ш. Семиглазов В.В. Руководства: Общие рекомендации St. Gallen-2015 по лечению раннего рака молочной железы /(адаптированные экспертами российского общества онкомаммологов [РООМ] // Издательство Алматы. 2015; 71с. 2.
2. Mashrab Rustamovich T, Guljamol Fazliddinovna M, Uyg'unovich NA, Ziyoda Rakhmonovna S. Hystological Changes Of The Spleen In Experimental Rheumatoid Arthritis And Morphological Alteration After Pathogenic Treatment. J Neonatal Surg [Internet]. 2025Mar.28 [cited 2025Mar.28];14(9S):697-704Axmadova M.A. - COMPARATIVE DESCRIPTION OF RADIOLOGICAL AND MORPHOLOGICAL CHARACTERISTICS IN BREAST CANCER//New Day in Medicine 12(74)2024 933-938 https://https://newdayworldmedicine.com/en/new_day_medicine/12-74-2024
3. Axmadova Maftuna Amin qizi, Role of Mammography in Early Detection of Breast Cancer , International Journal of Integrative and Modern Medicine: Vol. 2 No. 6 (2024): International Journal of Integrative and Modern Medicine https://medicaljournals.eu/index.php/IJIMM/article/view/588

4. Axmadova, M. (2024). NON-PALPABLE BREAST FORMATIONS WITH HIGH TISSUE DENSITY ROLE OF MAMMOGRAPHY. В CENTRAL ASIAN JOURNAL OF ACADEMIC RESEARCH (Т. 2, Выпуск 6, сс. 152–157). https://doi.org/10.5281/zenodo.11634543
5. Axmadova Maftuna Amin qizi. (2024). Role of Mammography in Early Detection of Breast Cancer. International Journal of Integrative and Modern Medicine, 2(6), 47–51. Retrieved from https://medicaljournals.eu/index.php/IJIMM/article/view/504
6. Axmadova Maftuna Amin qizi. Modern and Clinico-Morfological Diagnosis of Breast Cancer. (2023). American Journal of Pediatric Medicine and Health Sciences (2993-2149), 1(6),1-6. https://grnjournal.us/index.php/AJPMHS/article/view/475
7. Soxibova Z.R., Turdiev M.R. Some features of laboratory indicators of micro- and macroelementary condition of the organism of female age women innormality and iron deficiency. //The American Journal of Medical Sciences and Pharmaceutical Research. 2021, № 3(04)., – P. 200-205.
8. Soxibova Z.R.Fertil yoshdagi ayollarda normal va temir tanqisligi xolatida mikro va makro elementlar laboratoriya ko'rsatkichlarining ayrim xususiyatlari // Oriental renaissance :Innovative,educatsional natural and social sciences scientific journal. – Volume 1. №8. 2021. – CP 406–414.
9. Ахмадова Мафтуна Амин кизи Маммография И Ультразвуковое Исследование В Диагностике Местных Рецидив Рака Молочной Железы.CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCE./https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/102
10. Rakhmanov, K.E.; Radjabov, J.P.; Davlatov, S.S.; Khamdamov, B.Z.; Yanchenko, S.V.; Navruzov, R.R. ASPECTS OF LIVER ECHINOCOCCOSIS SURGERY,АСПЕКТИ ХІРУРГІЧНОГО ЛІКУВАННЯ ЕХІНОКОКОЗУ ПЕЧІНКИ Neonatology, Surgery and Perinatal Medicine2024 | Journal articleDOI: 10.24061/2413-4260.XIV.3.53.2024.10 EID: 2-s2.0-85210350836 Part of ISSN: 24134260 22261230 http://www.scopus.com/inward/record.url?eid=2-s2.0-85210350836&partnerID=MN8TOARS
11. Davlatov, S.; Navruzov, R.; Sanoyeva, M.; Xudoykulov, D.; Gaziev, K. Case of laparoscopic treatment recurrent obturator hernia BIO Web of Conferences 2024 | Conference paper DOI: 10.1051/bioconf/202412104003 EID: 2-s2.0-85200220988 Part of ISSN: 21174458 22731709 http://www.scopus.com/inward/record.url?eid=2-s2.0-85200220988&partnerID=MN8TOARS
12. Davlatov, S.; Navruzov, R.; Sanoyeva, M.; Xudoykulov, D.; Gaziev, K. Morphometric changes in the walls and lymphoid structures of the colon in radiation sickness BIO Web of Conferences 2024 | Conference paper DOI: 10.1051/bioconf/202412103003 EID: 2-s2.0-85200251026 Part of ISSN: 21174458 22731709 http://www.scopus.com/inward/record.url?eid=2-s2.0-85200251026&partnerID=MN8TOARS
13. Rustam Navruzov; Жасур Исмоилов; Mukhammadshokir Bahadirkhanov; Umida Almatova; Jamolbek Djuraev; Alisher Mikhiddinov; Надира Мираметова Analysis and prediction of different stages of brain tumor from mri using ai models Health Leadership and Quality of Life 2024-12-30 | Journal article | AuthoR DOI: 10.56294/hl2024.188 Part of ISSN: 3008-8488 http://dx.doi.org/10.56294/hl2024.188
14. Makhmudova Guljamol FazliddinovnaAkhmadova Maftuna Amin kizi, Khalikova Feruza Sharofovna Age-related comparative morphological and morphometric indicators of the spleen of healthy rats and its lymphoid structures | Journal of Advanced Zoology (jazindia.com) http://www.jazindia.com/index.php/jaz/article/view/1341
15. Ахмадова М.А. СРАВНИТЕЛЬНЫЙ АНАЛИЗ РАДИОЛОГИЧЕСКИХ И МОРФОЛОГИЧЕСКИХ ХАРАКТЕРИСТИК ПРИ РАКЕ МОЛОЧНОЙ ЖЕЛЕЗЫ.Ахмадова М.А. https://drive.google.com/file/d/1MVUj5ydqQ80zCgDvbWrKP16RsAOVd_oj/view?usp=sharing
16. NasriddinovB.Z.SARATON KASALLIKLARIDA JIGAR SIRROZINI TASHXISLASHDA ULTRATOVUSH DIAGNOSTIKASI VA ELASTOGRAFIYANING AHAMIYATI. https://drive.google.com/file/d/1MVUj5ydqQ80zCgDvbWrKP16RsAOVd_oj/view?usp=sharing
17. Turdiyev M.R, Makhmudova G.F, Nurboboev A. U, Sokhibova Z. R. Hystological Changes Of The Spleen In Experimental Rheumatoid Arthritis And Morphological Alteration After Pathogenic Treatment // Journal of Neonatal Surgery ISSN(Online): 2226-0439 Vol. 14, Issue 9s (2025). P. 697-704
18. Nasriddinov B. Z., Soxibova Z.R. Ultrasound Examination as an Important Part of Clinical Diagnostics// International Journal of Health Systems and Medical Sciences ISSN: 2833-7433 Volume 2 | No 9 | Sep -2023 75-78p. https://inter-publishing.com/index.php/IJHSMS/article/view/2527
19. Sokhibova Ziyoda Rakhmonovna, Turdiyev Mashrab Rustamovich , Ibodova Dilnoza Fazliddinovna , Toirova Dilafro'z Ravshanovna Morphological Indicators Of The Lymphoid Structures Of The Spleen Of White Rats In Postnatal Ontogenesis In The Dynamics Of Age https://www.jneonatalsurg.com/index.php/jns/article/view/5040