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The first results of remote mammographic breast cancer screening in Surkhandarya region

M. S. Salomov, Sh. Sh. Khursandova, A. A. Kenzhaev
Tashkent Medical Academy branch of Termiz
Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology of Surkhandarya branch

Abstract
The widespread introduction of mammographic screening for early detection of breast cancer in the world has reduced the mortality rate of women from this disease in the general population by 20-30%. For many years, different standard mammographic screening methods have been used in the United States and many European countries, the principles of which are the same. It is common practice to standardize the X-ray mammography process and mammography characteristics in order to divide all healthy screened women into groups requiring different monitoring recommendations after the first mammogram. Viewing mammograms by two radiologists is considered recognized in the world to reduce the number of erroneous conclusions. In connection with the adoption of the law on medical examination of the population of the Republic of Uzbekistan, which provides for mammography for women after 45 years of age once a year, the question arises of standardizing this process in order to reduce breast cancer mortality in the regions of the Republic of Uzbekistan.

Key words: breast cancer; screening; mammography.

Breast cancer (BC) among the female population is a serious problem due to the increasing incidence in many countries of the world. In 2022 Breast cancer has been diagnosed in 2.3 million women and has caused 670,000 deaths worldwide (WHO 2023). In Russia, breast cancer ranks 3rd among all causes of death in the female population after diseases of the circulatory system and accidents in all age groups, averaging 2.2%, and at the age of 35-54 years - 7.7%. In recent years, there has been a sharp increase in the number of patients going to medical institutions for benign breast diseases. The most common among them are various forms of mastopathy, which affect 20-60% of women, more often at the age of 30-50 years. In the general population of women, the widespread introduction of mammographic screening makes it possible to reduce mortality from this common disease by 15-30% with an organized process. [3, 4]. In Russia, breast cancer mortality continues to increase in absolute and standardized terms and accounts for 1/2 of the incidence, while in most European countries and the United States it is 1/3 of the incidence rate. This is explained by the fact that with mammographic screening alone, breast cancer can be detected at the preclinical stage with a tumor size of less than 1 cm3, when the probability of a metastatic process is low, and therefore the chance of recovery increases. Currently, the United States and many European countries apply different standards for mammographic screening, the principles of which are the same. It is well known that screening is the active detection of a disease among a healthy population. Mammographic screening, which is widely implemented in Europe and the USA, covers at least 70% of the population. In Russia, in 80% of cases, breast cancer is detected by the sickest, in 10% — by medical examination, and only in 10% — by mammography [2]. In May 2021, after the completion of preparatory work, mammographic screening started in Uzbekistan for the first time. From 2021 to 2022, 66,859 women were examined (70.2% coverage of the target group). In this group, 3,135 (0.46%) new cases of breast cancer, 50,708 (7.5%) benign growths and 12,812 (1.91%) precancerous diseases. Of the identified cases of breast cancer at stages 1-2, 1964 (62.6%) women had it, and the remaining 37.4% had it at stages 3-4. [breast-cancer info.uz A.V.Ososkov

It is generally accepted to standardize the X-ray mammography process and the description of mammograms in order to divide the entire stream of healthy women included in the screening process into groups requiring different monitoring recommendations after the first screening round. Viewing mammograms by two radiologists is considered recognized in the world to reduce the number of erroneous conclusions. Mammographic screening indicators have been developed to assess the quality of the screening process [3, 4]. It has been proven that the effectiveness of preventive mammographic examination depends on

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compliance with the quality standards of the mammographic process, the training of doctors and the experience of conducting such mass examinations [2]. The pilot project proved the importance of mammographic examinations and the organization of a comprehensive cancer control program for women. Early detection of cancer is a state priority and is reflected in section 2.1 of the Uzbekistan 2030 Strategy [gazeta.uz/ru/2024/01/31/breast-cancer 5]. It is important that digital or digitized images, unlike analog images, can be interpreted remotely. This has become especially relevant in connection with the adoption of the law on medical examination of the population of the Republic of Uzbekistan, which provides for X-ray mammography for women after 45 years of age once a year. To date, there are 31 mammographs in public clinics in the country (15 of them are mobile, 16 are stationary). It is necessary to train personnel so that X-ray technicians in the regions take pictures correctly, so that the specialist correctly reads mammograms using the BI-RADS system (a standardized scale for evaluating mammography, ultrasound and MRI results according to the risk of breast malignancy). This work should be paid, providing a double review of the results of preventive mammography by two independent radiologists.

Follow-up examination also requires expenses for a biopsy or the services of a histological laboratory. Polyclinics will have to conduct educational work with women, explaining the importance of mammography with subsequent verification of the diagnosis and provide communication with cancer centers.

Materials and methods. To implement the tasks set according to the requirements developed by experts, the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology of Uzbekistan (RSNPMCOiR) will be included in the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology of Surkhandarya region in 2021 by the Ministry of Health of the Republic of Uzbekistan. As part of the modernization of the Republic's healthcare, a FUJIFILM digital X-ray mammograph of domestic production was put into operation, which allowed the second viewing of mammograms to be carried out remotely. Mammographic screening was performed according to the following requirements. In healthy women, screening mammography of both mammary glands was performed in two projections: direct (craniocaudal) and oblique (mediolateral). The doctor of the RSNPMTSOIR Surkhandarya branch evaluated the work of the X-ray laboratory and then described the mammograms and filled in the database according to the requirements developed by the RSNPMTSOIR experts. The quality of mammograms was assessed as excellent, good, satisfactory, and unsatisfactory. Mammograms that did not label the patient's data and the study side, as well as incomplete visualization of both mammary glands in two standard projections, were assessed as unsatisfactory and were not interpreted. Information for the right and left breast was entered into the database about each woman separately according to the SORS (System of Descriptions, recommendations and Statistics) developed by experts of the Russian National Breast Research Center. The developed system makes it possible to divide the flow of healthy women after mammographic screening into groups requiring different recommendations depending on the data obtained after viewing mammograms.

Results and discussion. In 2021-2022, mammograms were analyzed in the region of 14,855 healthy women, of which 335 studies were rejected due to violations of the technical conditions of the survey and errors of X-ray technicians made during breast placement. The reasons for the marriage turned out to be both the technical condition of the mammograph and the incorrect operation of the X-ray laboratory. Following the recommendations of the RSNPMCOiR experts, the causes of the marriage were partially eliminated. As a result, data from an independent review of mammograms by a doctor from Surkhandarya branch of RSNPMTSOIR and experts from RSNPMTSOIR 14,855 women were analyzed. A comparative analysis of groups 0-5 according to the conclusions of the branch doctor and the experts of the RSNPMTSOIR is shown in Table 1. The BIRADS I and II groups consisted of 12,727 (85.6%) women according to the conclusions of the RSNPMTSOIR experts and 12,880 (86.7%) according to the radiologist of the RSNPMTSOIR Surkhandarya branch. After further examination, the group is finally clarified. To date, no data has been received on this group of women. Group 1 consisted of 5,345 (72.5%) women with normal mammary glands according to the conclusions of the experts of the Russian Breast Cancer Center and 2020 (27.4%) according to the radiologist of the branch. They are recommended for the next round of screening. Group 2 — with benign changes (interstitial lymph nodes, macrocalcinates of a dystrophic nature, etc.) consisted of 805 (6.7%) women according to the conclusions of the RSNPMTSOIR experts and 396 (3.2%) according to the radiologist of the branch, who also recommended the next round of screening. Group 3 — with changes,

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most likely of a benign nature, consisted of 402 (2.7%) women according to the conclusions of the RSNPMCOiR experts and (2.1%) according to the radiologist of the branch. This group requires shorter follow-up mammography after 6 months (amorphous microcalcifications, etc.).Group 4 –possible breast cancer (a group of amorphous or pleomorphic microcalcifications, a node with indistinct contours, etc.), it consisted of 350 (2.33%) women according to the conclusions of the RSNPMCOiR experts and 57 (0.38%) according to the radiologist of the branch. Group 5 — breast cancer consisted of 175 (1.17%) women. The doctor of the branch of 39 patients (0.26%) noted group 5. Groups 4 and 5 require consultation with an oncologist to verify the diagnosis.

Comparative characteristics of mammographic screening results in RSNPMTSOIR and Surkhandarya branch (Table No. 1)

Group of COPC (BI-RADS)	RSNPMCOiR in Surkhandarya region (n = 19532		RSNPMCOiR (n = 1570)	
	абс.	%	абс.	%
1	2020	(27,4%)	5345	(72,5%)
2	396	(3,2%)	805	(6,7%)
3	312	(2,1%)	402	(2,7%)
4	57	(0,38%)	350	(2,33%)
5	39	(0,26%)	175	(1,17%)

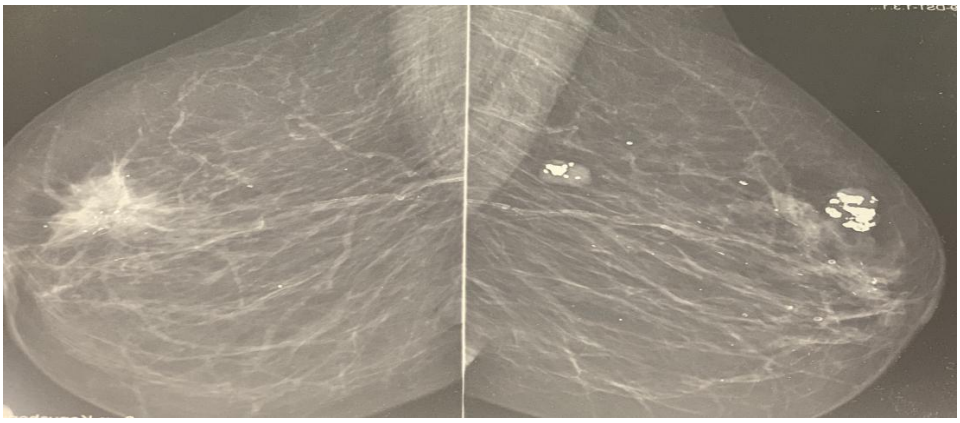

Fig. 1. A 55-year-old woman. Screening mammography. Mammograms of both mammary glands in two projections: craniocaudal (direct) and mediolateral (oblique) of good quality. In the upper outer quadrant of the left breast, there is an isodense formation with hidden contours and multiple pleomorphic microcalcinates. Group 4. No changes were found in the right mammary gland. Group 1. Conclusion: cancer? the left breast. Additional examination is required: an aiming image and ultrasound followed by a cor biopsy. Histological conclusion:infiltrating ductal cancer.

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Fig. 2. A 66-year-old woman. Screening mammography. Mammograms of both mammary glands in two projections: craniocaudal (direct) and mediolateral (oblique) of good quality. The skin of the upper outer quadrant of the left breast is thickened and stretched. In the upper right quadrant of the left breast, a lumpy node with cords into the surrounding tissue and skin measuring 2.2×1.6 cm is revealed. Group 5. No changes were detected in the right breast. Group 1. Conclusion: cancer of the left breast. A cor biopsy is recommended.

In the Surkhandarya regional branch, data on 28 (0.19%) women, 4 breast cancer was verified in one woman (Fig.1). One woman (with a group of amorphous microcalcifications) is under observation with a definitive diagnosis of fibrocystic mastopathy, i.e. 1 false positive result was obtained in group 4. In group 5, 25 (0.16%) women had a verified diagnosis of breast cancer. They are treated at the branch. There is no data on 3 (7.6%) women from this group. In 6 women with proven breast cancer, edematous form was detected on mammograms in one case, and cancer with screening into breast tissue and lymph nodes in one case. In all women, the maximum tumor sizes exceeded 2 cm (Fig. 2). Our results were compared with the extensive material from 12 regions of Uzbekistan and mammographic screening data from the staff of the RSNPMTSOIR, systematized in the dissertation work. Comparative characteristics of our data, systematized by experts after double-viewing screening mammograms of women. As shown in Table 1, the largest group 1 (49.5%) consists of women with no changes in the mammary glands. Benign processes are detected significantly less frequently (9.9%) in group 2, which, like group 1, is recommended for the next round of screening. The percentage difference is explained by the fact that there is no clear definition of the changes that are designated as benign processes. Next in frequency is group 3 (4.8%). The smallest number of cases is observed in the branch, the largest — in the regions of Surkhandarya region. Group 3 consists mainly of women who have microcalcifications detected on mammograms. In our study, there were a slightly smaller number of observations in group 4. We also compared the results of further examination of women from groups 4 and 5 who need to consult an oncologist to verify the diagnosis. A comparative characteristic of our data with the results shows that the RSPMCOID exceeds the indicator. Of the 9 women who applied to the region, the diagnosis of breast cancer was verified in 6 cases, 21 women are in the process of being examined.

Conclusion. At the first stages of the organization of mammographic screening in Surkhandarya region, the help of experts is required. The SORS developed for mammographic screening helped to standardize the work and evaluate the quality of the work of the team carrying out this process. Conducting a double independent review of screening mammograms using remote technology and with the participation of experts accelerates and improves the learning process. The primary analysis of remote mammographic breast cancer screening with the participation of the Society of Mammologists of Uzbekistan and radiologists showed the following results. Since the basic skills of mammographic screening quality assessment and BIRADS assessment have not been achieved, mammograms must be double-checked by the center's experts. All women with proven breast cancer have formations with a maximum size of more than 2 cm. According to international standards, the detection of breast cancer up to 1 cm3 in the first round of mammographic screening should be 20%, and in subsequent rounds — 25%. In none of the cases was a noninvasive form of ductal cancer (DCIS) detected, which should be 20-30%. Additional organizational measures are required in the branch for additional examination of women from group 0. It is necessary to analyze the reasons for the lack of information about women in groups 4 and 5, who need to consult an oncologist to verify the diagnosis.

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