



THE ROLE OF MAMMOGRAPHY AND FINE NEEDLE ASPIRATION CYTOLOGY FOR DIFFERENTIAL DIAGNOSIS OF BREAST CANCER IN YOUNG WOMEN

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Abstract

Introduction: Breast cancer is one of the most widespread malignant tumors among women. It is uncommon for the women under the age of 35 years, accounting for 5-7% of reported cases. The delay in diagnosis is due to the clinically low index of suspicion, difficulties in examination of dense and nodular breasts in younger women and failure to perform screening mammography at the proper time.

Aim: Breast cancer incidence depends on age and more frequently occurs after the age of 45. The American Cancer Society developed guidelines on screening program for breast cancer prevention and early detection. This program helps to detect breast cancer at the early stages in women after 40 years of age. Baseline mammography should be done from the age of 35 to 40. Nowadays, breast cancer is the serious problem for women under 35 as well. Thus, the reason of our investigation is to process observation tactics for women up to 35 years.

Methods: Retrospective analysis of the examination results of 125 women under 35.

Results: The ultrasound examination revealed that 19 patients had sonographic diagnosis of “cancer”, 42 cases were diagnosed as “suspicious malignancy” and 64 as “probably benign”. Among 125 patients, 112 were observed by x-Ray mammography from which 25 were evaluated as non-informative because of high X-Ray density. “Probably benign” diagnosis was set in 27 patients “suspicious malignancy» in 28, and 32 cases were diagnosed as having “cancer”. Of 125 patients, 76 underwent ultrasound-guided Fine needle aspiration with cytologic examination. The results were as follows: 17 smears were evaluated as mastitis including granulomatous mastitis; 16 cases as fibroadenomas, 18 cases as non-proliferative changes, 10 cases as hyperplasia, 4 cases as intraductal papilloma, 6 cases were cytologically documented as carcinomas, 15 cases were considered unsatisfactory for evaluation.

Conclusion: Our results indicate that after menarche (start of menstrual function) every female should monthly perform breast self-examination and if some abnormality found, she should seek a specialist’s help. These patients primarily should undergo breast ultrasound. If the breast ultrasound shows suspicious lesions, further investigation by mammography and FNA should be done. This step by step approach helps us to increase the diagnostic accuracy among women up to 35 years of age, differentiate between benign and malignant processes and choose the best way for treatment and follow-up if needed.

Keywords: breast cancer, mammography, breast ultrasound, Fine needle aspiration

Background

Breast cancer is one of the most widespread malignant tumors among women. It is a progressive disease, and small tumors are more likely to be early stage disease, have a better prognosis, and can be treated more successfully [Tabár L. et

al., 1999]. In 2003, the American Cancer Society (ACS) updated its guidelines for breast cancer screening. The previous guideline had recommended mammography every one to two years for women beginning at age 40, and annual mammography for women beginning at age 50, and the most notable change in the 1997 guideline update was that women should begin annual screening at age 40 [Dodd G.D., 1992]. The 1997 update also

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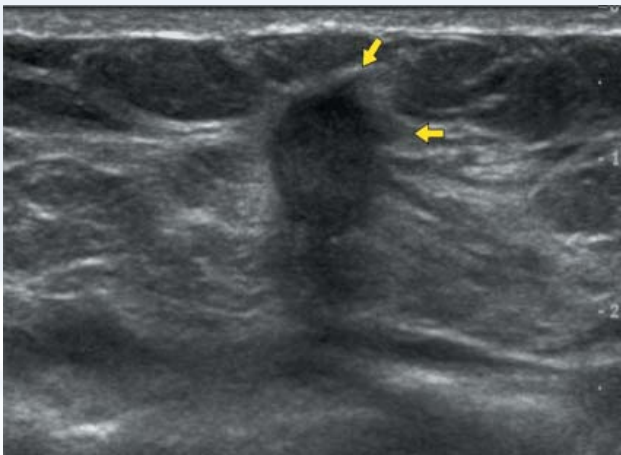


Figure 1. Angular margins are ominous signs for a mass and raise suspicion for malignancy. A 35 years old woman was referred for imaging after she felt a breast lump. Ultrasound shows a hypoechoic mass with angular margins (arrows). This was biopsied and found to be cancer

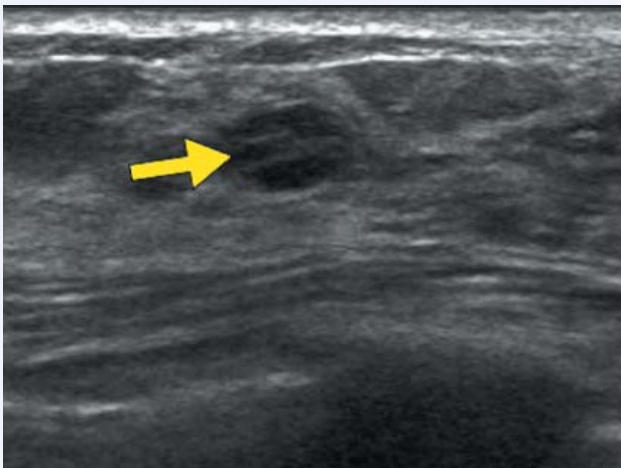
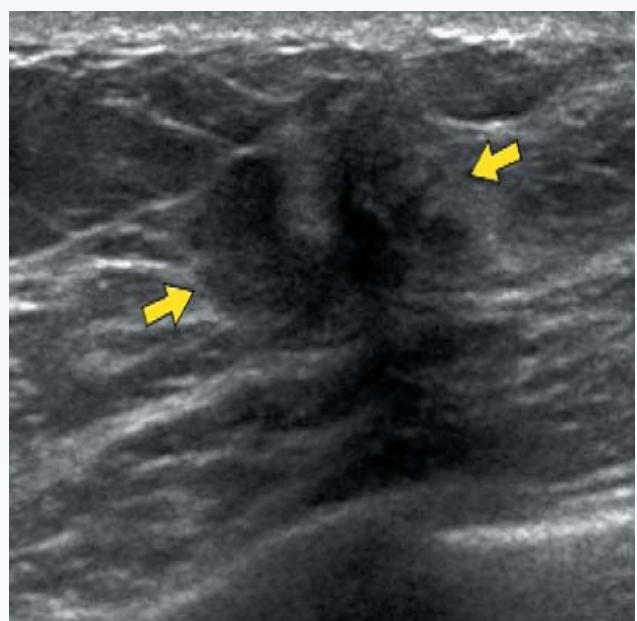


Figure 2. A 30 years old woman felt a breast lump and was referred for imaging. Ultrasound showed a hypoechoic circumscribed mass (arrow) that is essentially round. This was biopsied and found to be a fibroadenoma.

Figure 3. The shape of a mass is a very important factor to be considered when determining the likelihood of cancer. An irregular shape is a bad sign, increasing the probability of malignancy for a mass. Occasionally benign masses can be presented by an irregular shape, although this is not typical. An irregularly shaped mass should always be biopsied. The boundary of mass can be helpful in predicting if the mass is benign or malignant. Sometimes cancers show an echogenic halo on ultrasound. This malignant feature is thought to be due to microscopic speculations that are too small to be distinguished by ultrasound. In contrast, an abrupt interface as we see with simple cysts and fibroadenomas favours a benign lesion.

noted that there was no chronological age, at which screening should stop, emphasizing that as long as a woman was in good health she would likely benefit from breast cancer screening. Recommendations for clinical breast examination (CBE) were modified by adding the advice that women aged 40 and older schedule annual CBE close to the time of, and before, their annual mammograms [Leitch A. *et al.*, 1997]. The efficacy of breast cancer screening has been demonstrated in randomized controlled trials (RCTs) and observational studies; thus, most organizations recommend regular mammography as an important part of preventive care.

Breast cancer is uncommon for the women under the age of 35, accounting for 5-7% of reported cases. In Western countries this group accounts for less than 4% of the total number of breast cancer cases diagnosed [Chung M. *et al.*, 1996; Winchester D., 1996]. According to the 2002 annual report of the Korean Central Cancer Registry, breast cancers that developed before the age of 35 comprised 9.5% of all breast cancers [Winchester D. *et al.*, 1996]. Despite the disease being relatively uncommon, it has a severe negative effect on the patients and their families. It remains controversial whether young age at diagnosis is an adverse prognostic factor in primary breast cancer. While some studies have found that younger patients have worse clinical outcomes than older patients [De la Rochefordiere A. *et al.*, 1993; Albain K. *et al.*, 1994; Fowble B. *et al.*, 1994; Nixon A. *et al.*, 1994; Xiong Q. *et al.*, 2001], others report younger patients have a more favorable



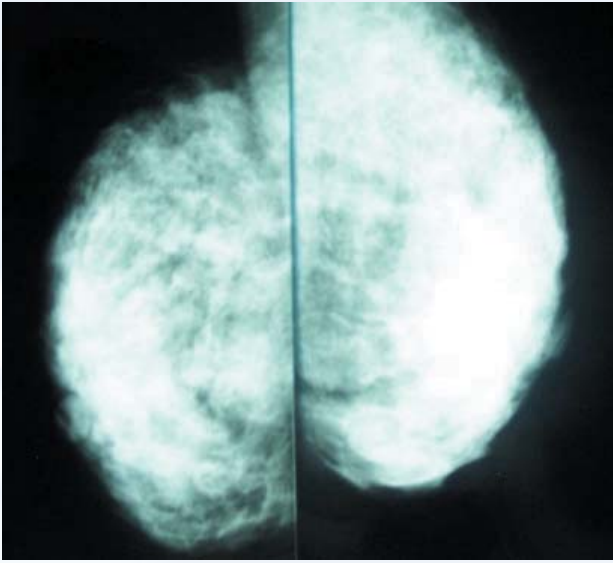


Figure 4. The sensitivity and specificity of X-ray mammography

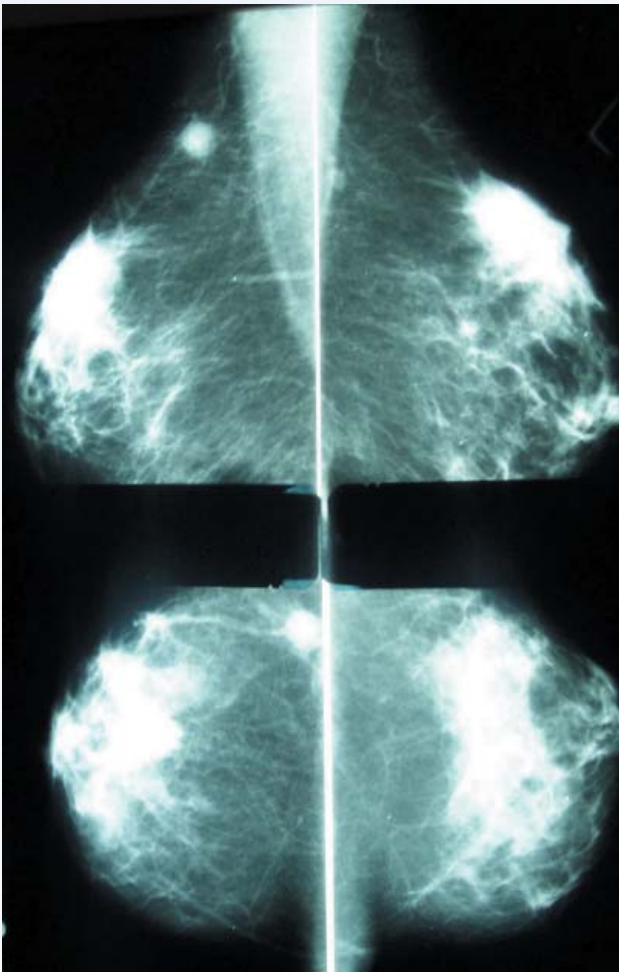


Figure 5. Malignant changes in the right breast – multicentric cancer

prognosis, or that there is no relationship between outcome and age [Muscolino G. et al., 1987; Anderson B. et al., 1995; Henderson I., Patek A., 1997]. Various explanations have been given for these conflicting results, including small numbers of patients comprising the study population, differences in patient selection criteria and differences in the age groupings used in the analyses. Moreover, it has long been debated whether breast cancer diagnosed at a young age is a clinically and etiologically distinct disease from breast cancer diagnosed later in life. Some researchers reported that tumors in younger women were of higher grade, higher proliferation fraction, with more vascular invasions, and expressed fewer estrogen and progesterone receptors compared to tumors in older women [Adami H. et al., 1986; Walker R. et al. 1996; Winchester D. et al., 1996; Colleoni M. et al., 2002]. Thus, the reason of our investigation is to process observation tactics for women up to 35 years.

Methods

Retrospective analysis of the examination results was performed for 125 women under 35 years of age who underwent examinations in the Radiology Department of Armenian-American Wellness Center – Mammography Center, between January 2000 and July 2009.

Results

All 125 patients were examined by ultrasound and here are the results:

19 patients were diagnosed as having “cancer” (Figure 1); 42 were diagnosed as having “suspicious malignancy” (Figure 2) and 64 as having “probably benign” lesions (Figure 3).

Among 125 cases: 112 were observed by x-Ray mammography, of which 25 were evaluated as non-informative because of high X-Ray density (Figure 4); 27 patients received “probably benign” diagnosis; 28 “suspicious malignancy” and 32 were diagnosed as having “cancer” (Figure 5).

Of 125 patients, 76 passed ultrasound-guided Fine needle aspiration with cytologic examination. The following results were obtained: 17 smears were evaluated as mastitis, including granulomatous mastitis. Sixteen cases were diagnosed as fibroadenomas (Figure 6), 18 cases as non-proliferative changes (Figure 7), 10 cases as hyperplasia, 4 cases as intraductal papilloma; 6 cases were cytologically documented as carcinomas (Figure 8), while 15 cases as unsatisfactory for evaluation.

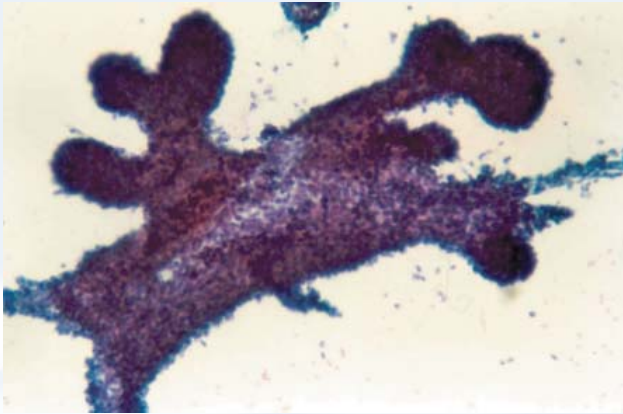


Figure 6. *Fibroadenoma - cytology - antler-like sheets*

Conclusion

Our results indicate that every female after menarche (start of menstrual function) should perform monthly breast self-examination and if some abnormality is found, she should seek a specialist's help. These patient should s primarily undergo breast ultrasound. If the breast ultrasound shows suspicious lesions, further investigation by mammography and FNA should be performed. This step-by-step approach helps us to increase the diagnostic accuracy among women up to 35 age, to differentiate benign from malignant processes and to choose appropriate treatment methods (Scheme).

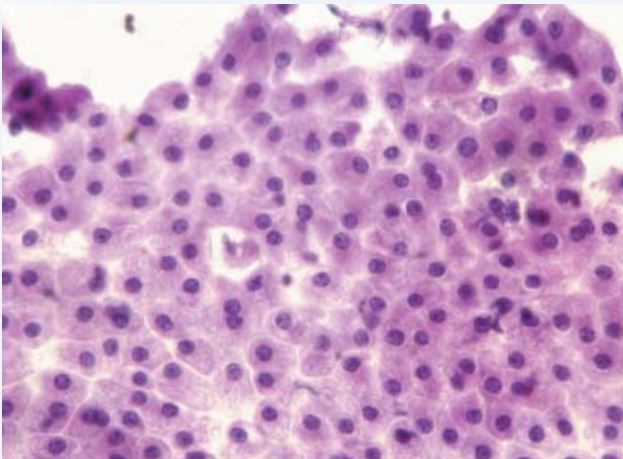


Figure 7. *Fibrocystic changes cytology-apocrine cells - non-proliferative changes*

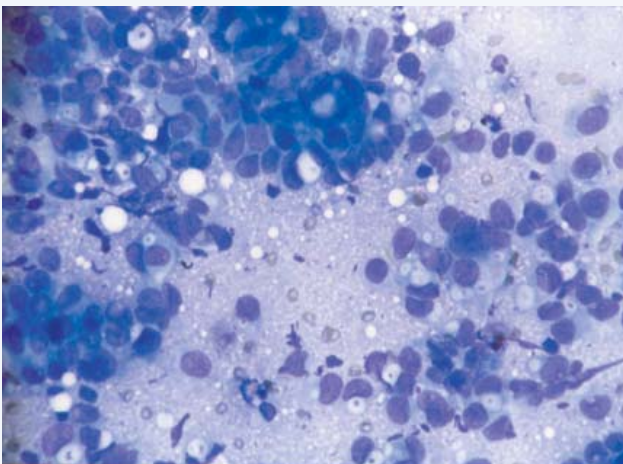
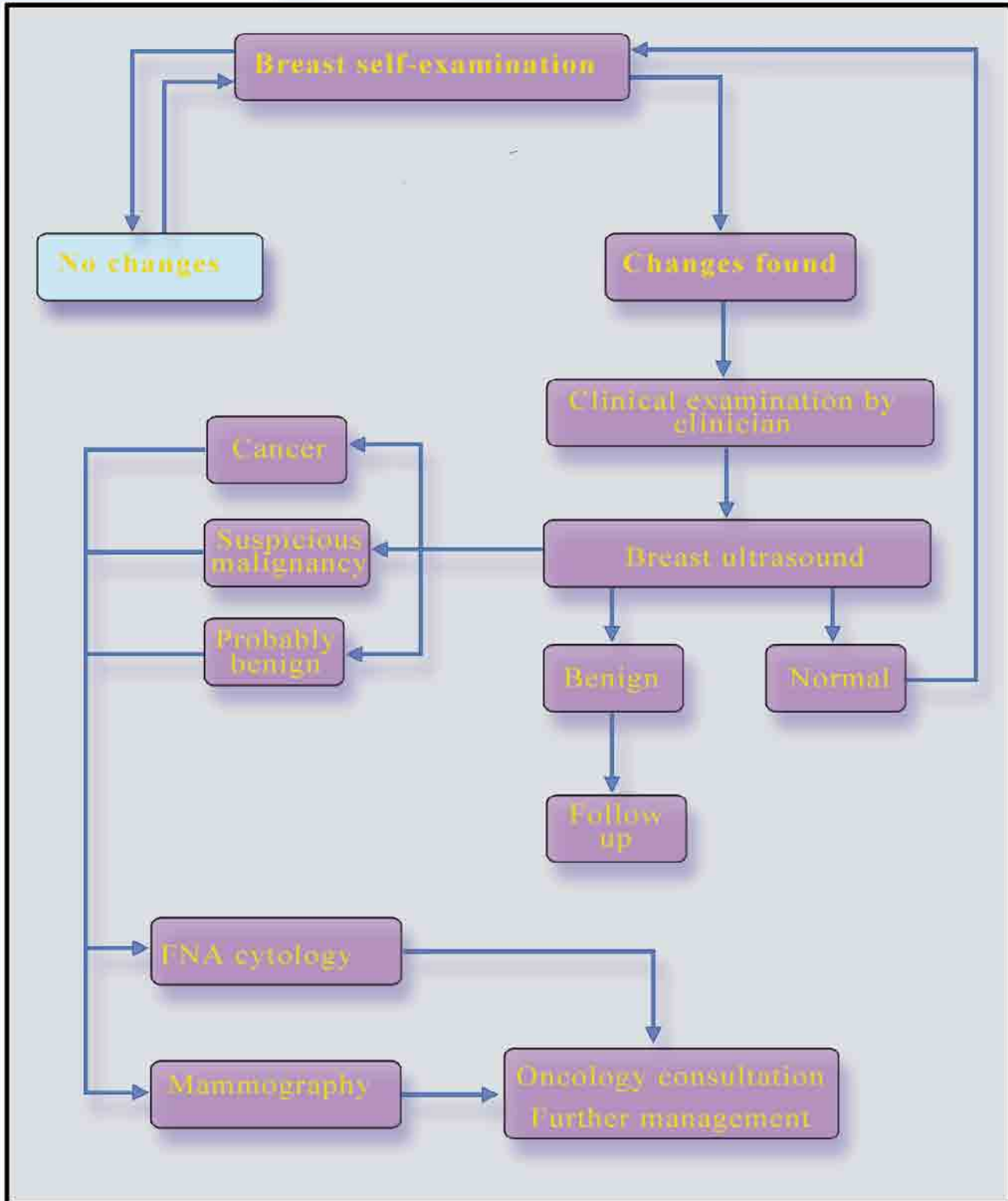


Figure 8. *Intraductal carcinoma - cytology*

Scheme.

**Systematic approach to breast examination
for the women up to 35 years of age**



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