

# MEME KİTLELERİNİN TANISINDA ULTRASONOGRAFI EKLENMESİNİN DEĞERİ

## The Value of Adding Ultrasound in the Diagnosis of Breast Mass

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### ÖZET

**Amaç:** Mamografi meme kanseri taramasında yaygın olarak kullanılmasına rağmen yanlış negatiflik oranı %35 dir. Meme Ultrasonografisi en sık kullanılan ek tarama metodudur. Mamografi ile birlikte rutin meme usg'si yapılması halen tartışmalıdır. Çalışmamızda şüpheli meme kitlelerinde meme USG eklenmesinin değerini belirlemek amaçlanmıştır.

**Gereç ve Yöntemler:** Çalışmamıza 104 hastadaki toplam 121 meme lezyonu değerlendirildi. Mamografi ve ultrasonography (USG) görüntüleme yapılan hastalar çalışmaya dahil edildi. Lezyonlar Breast Imaging Reporting and Data System (BIRADS) sınıflamasına göre kategorize edildi. Hastalar 45 yaş altı ve üstü olarak iki gruba ayrılarak mamografi ve ultrasonography (USG)'nin sensitivite ve spesifite oranları karşılaştırıldı.

**Bulgular:** Malign kitlesi olan 27 hastanın mamografileri BIRADS 1,2 ve 3 olarak raporlandı. Malign kitlelerden bahsedilmedi. Meme ultrasonography (USG) 9 hastada malignite taşıyan kitleyi saptayamadı. Meme ultrasonography (USG) ile 3 hastada yanlış pozitiflik saptandı. Hastalar 45 yaş altı ve üstü olarak iki gruba ayrıldığında meme ultrasonography (USG)'sinin 45 yaş altı grupta daha duyarlı olduğu, mamografininise 45 yaş üstünde daha spesifik olduğu bulundu ( $p<0,05$ ) Tip 1 ve 2 meme paternine sahip grup ile tip 4 meme paternine sahip gruplararası mamografinin duyarlılık oranlarında istatistiksel anlamlılık saptandı ( $p<0,05$ ).

**Sonuç:** Meme ultrasonography (USG)'si memedeki malign kitleleri göstermede daha duyarlıdır. 45 yaşın üzerindeki hastalarda mamografi daha spesifiktir. Meme yoğunluğu mamografinin duyarlılığını belirlemede önemli etkindir. Ancak meme ultrasonography (USG) ve MRI ile ek görüntülemelerde duyarlılık ve spesifitede artış olacaktır.

**Anahtar kelimeler:** Mamografi; Ultrasonografi; Meme kanseri

### ABSTRACT

**Background:** Mammography has been used widely for breast cancer screening. However, the false-negative rate of mammography is 35%. Breast ultrasonography (USG) is the most common method used for additional screening. Performing routine breast ultrasonography (USG) with mammography is still a matter of debate. In our study, it has been aimed to determine the value of adding breast ultrasonography (USG) on the suspicious breast masses.

**Material and Methods:** In our study, 121 breast lesions were evaluated in 104 patients. Files and images of patients were analyzed retrospectively. Patients who underwent mammography and ultrasound imaging were included in the study. Lesions were categorized in accordance with the Breast Imaging Reporting and Data System (BIRADS) classification. Patients were divided into two groups (under and above 45 years of age), and sensitivity and specificity rates of mammography and USG were compared.

**Results:** Mammography of 27 patients with malignant masses was reported as BIRADS 1, 2 and 3, respectively and nothing was mentioned about malignant masses. Breast ultrasonography (USG) was not able to detect the malignant masses in 9 patients. Three patients were detected as false-positive in the breast ultrasonography (USG). Patients were divided into two groups as; those older than 45 and younger than 45, were divided into two groups; it has been observed that patients who are under 45 are more sensitive, and mammography is more specific for the other group, who are above 45 years old ( $p<0.05$ ). There was a significant difference between the groups that have Type 1 and 2 breast pattern and Type 4 breast pattern in terms of mammographic sensitivity rates ( $p<0.05$ ).

**Conclusion:** Breast ultrasound is more sensitive in demonstrating malignant breast masses. Mammography is more specific for patients above 45 years of age. Breast density is the most important factor in determining the sensitivity of mammography. However, sensitivity and specificity will increase with additional screening methods such as breast ultrasonography (USG) and MRI.

**Key words:** Mammography; Ultrasonography; Breast cancer

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## INTRODUCTION

Number of women diagnosed with breast cancer is increasing every day. The mortality rate gets lower by early diagnosis and treatment. It is important to prepare regular screening programs for early diagnosis. Mammography has been used widely, for breast cancer screening. According to the data from Turkish Health Ministry, only 20% of the targeted breast cancer screening can be performed in Turkey. However, the false-negative rate of mammography is 35 % (1). Additional imaging method is needed because of the lower sensitivity of mammography in dense breasts. Breast ultrasonography and Magnetic Resonance Imaging are used for assistive and advanced imaging. Breast MRI is capable of providing more sensitive and specific imaging compared with breast ultrasonography (USG) and mammography (2-4). MRI is not used as a screening tool because of the higher costs and false-positive rate.

Breast USG is the most common method used for additional screening. Since it doesn't have any side effects, it can be implemented easily and it provides detailed evaluation of axilla at the same time. Performing routine breast USG with mammography is still a matter of debate (5-7).

In a study, breast USG that is performed in addition to mammography for the screening of breast cancer in dense breast has been found useful in detection of primary invasive tumor (5). The combination of breast USG with mammography has been shown to improve diagnosis of breast cancer at all ages (6). In another study, no evidence has been found for the usefulness breast USG as routine screening method (7).

In our study, we aimed to determine whether mammography is sufficient alone in detecting malignant breast masses.

## MATERYAL METOD

In our study, 121 breast lesions were evaluated in 104 patients between the years of 2010 and 2014. Files and images of patients were analyzed retrospectively. Patients who underwent mammography and ultrasound imaging were included in the study. 101 female and 3 male patients were included in the study. All ultraso-

nography examinations were carried out with Siemens Acuson Antares device (Medical Solutions, Siemens, Erlangen, Germany) using a superficial linear probe of 8-11 MHz's. All mammography examinations were carried out by Siemens Mammomat 300 device (Medical Solutions, Siemens, Erlangen, Germany) for both breasts in the craniocaudal and mediolateral oblique positions. Images were interpreted by an experienced radiologist after sending them to the medical image archive and transfer system. Lesions were categorized in accordance with the Breast Imaging Reporting and Data System (BIRADS) classification (Table 1).

**Table 1:** BIRADS Classification

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- 0: need additional review
  - 1: negative mammogram
  - 2: Benign findings
  - 3: possible benign findings; short-term track
  - 4: Suspicious findings; Biopsy recommended
  - 5: Malignant; Biopsy and diagnosis is required
  - 6: Known malignant lesions

BIRADS: Breast Imaging Reporting and Data System classification

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Categories 2 and 3 were considered as benign, while categories 4 and 5 were considered as malignant lesions, respectively. Microcalcification and speculated irregular lesions were noted. Breast patterns (Type 1, 2, 3 and 4) were identified according to the breast density (Table 2). Patients were divided into two groups (under and above 45 years of age), Group 1 was under 45 years of age group. Group 2 was above 45 years of age group. Between the two groups, sensitivity and specificity rates of mammography and USG were compared.

Statistical Package for the Social Sciences (SPSS) 13.0 software was used to analyze the data. Average data was given as mean  $\pm$  standard deviation.  $P < 0.05$  was considered statistically significant.

**Table 2.** Type of breast

Type 1 breast: almost entirely consists of adipose tissue breast  
 Type 2 breast: more adipose breast  
 Type 3 breast: more glandular and fibrosis tissue in breast  
 Type 4 breast: almost entirely consists of glandular and fibrous tissue breast

**RESULT**

The average age of patients was 52.6 ± 11.6 years (range: 27-82). The measured average size of breast masses suspected with malignant was 33.4±24.5 mm (range; 9-150 mm). Mammography of 27 patients with malignant masses was reported as BIRADS 1, 2 and 3, respectively. In the mammography screening of BIRADS 4 and higher lesions, biopsies of four lesions with malignant criteria were reported as benign. Despite having malignant masses, no mass with malignancy criteria was found in the USG of 9 patients. Three patients were detected as false-positive in the breast USG. When patients, who are older than and younger than 45, were divided into two groups; it has been seen that patients who are under 45 are more sensitive, and mammography is more specific for the other group, who are above 45 years old (p<0.05) (Table 3).

**Table 3.** Mammography and breast ultrasonography sensitivity and specificity comparison of values of patients

	<45 years-old		>45 years-old	
	sensitivity	specificity	sensitivity	specificity
Mammography	74.5%	82.2%	81.3%	92.4%
Breast ultrasonography	91.8%	90.4%	88.6%	84.3%

There was a significant difference between the groups that have Type 1 and 2 breast pattern and Type 4 breast pattern in terms of mammographic sensitivity rates (p<0.05). The sensitivity and specificity rates of mammography and breast USG are given in (Table 4.)

**Table 4.** Mammography and breast USG sensitivity and specificity values

	sensitivity	specificity	-PV	+PV
Mammography	80.3 %	87%	50 %	95,9%
Breast ultrasonography	90.4 %	90%	75 %	96%

PV: predictivevalue

After imaging, biopsy was performed for 101 lesions that were suspected to be malignant. Tru-cut biopsy was applied in 65 patients, 12 patients underwent excisional biopsy, and 22 patients underwent fine needle aspiration biopsy (FNAB), respectively. No atypical cell was detected in 7 patients who underwent fine needle aspiration biopsy. The pathologic diagnosis failed in 6 patients who underwent for tru-cut biopsy. Two of these patients were diagnosed by wire marking and other four patients were diagnosed by excisional biopsy. Invasive ductal carcinoma was observed in 71 patients, whereas invasive lobular carcinoma was seen in 17 patients; and they were both observed in 8 patients together. In 5 patients, other lesions were observed. Biopsy was carried out in benign 20 lesions, tru-cut biopsy was applied in 8 patients, 5 patients underwent excisional biopsy, and 3 patients underwent FNAB (Table 5).

**Table 5.** The pathological diagnosis of the lesions

MalignantLesions	n
Invasive ductal carcinoma	71
Invasive Lobular carcinoma	17
Invasive lobular + ductal carcinoma	8
Medullary carcinoma	1
Metaplastic carcinoma	1
Intracystic papillary carcinoma	1
Malignant phyllodes tumor	2
BenignLesionsFibroadenoma	9
Cystic lesion	4
Granulomatous mastitis	3
Fat necrosis	1
The other	3

65 (62.5%) of the patients, who were diagnosed with malignant breast masses, underwent modified radical mastectomy and 25 (24%) patients underwent breast-conserving surgery. Eleven of the patients were transferred to oncology service to receive neoadjuvant therapy.

## DISCUSSION

Breast carcinoma is a disease with quite high rates of mortality and morbidity among women throughout the world. Therefore, differentiation and treatment of the malignant and benign masses in the breast is very important. Thus, the use of suitable imaging procedures will improve the efficiency of a correct diagnosis. In the imaging method selection, the characteristics of the mass in the breast is important as well as the age of the patient and structure of the breast.

The most important factor determining the sensitivity of mammography is breast density (1). False-negative rate may be higher in dense breasts due to the lower sensitivity of mammography. Therefore, clinicians are directed to ask both examinations at a time. MRI can only be used in selected cases because of the cost and availability of MRI biopsy.

In several studies, it has been determined that breast USG is more sensitive than mammography in youth and some people who have dense breasts (8-10). In our study, breast USG was found more sensitive compared with mammography in both groups above and below the age of 45. However, specificity of mammography was found significantly higher in the group above 45 years of age. The reason for this may be more involved breast, less density and increase in the fat tissue of the breast.

In our clinic, the request rate for both mammography and breast USG is increasing. In this, the high rate of false-negative mammography and high sensitivity of the breast USG play an important role. According to a prospective randomized and multicenter study conducted by Berg et al., a single screening breast USG increased the detection of breast cancer rate from 1.1 to 7.2 in 1000 women, who have higher cancer risk.

This work has brought a new perspective on breast ultrasonography, which can be used as a standard screening tool (11).

However, there is still a need for studies of population screening programs in asymptomatic women. Even though mammography is negative in women who have dense breast tissue, additional breast ultrasonography examination increases the success rate in detecting invasive cancer. Performing breast USG in addition to mammography results in 3 times more breast biopsies in women compared with performing only mammography (5). Only 10-40% of occult lesions visible on mammograms can be displayed by breast ultrasound (1, 12). In our study, 66.6% of the occult lesions seen on mammography were displayed by breast ultrasound. Therefore, it will be useful to perform breast USG along with mammography for the cases, in which clinician is suspicious about (6, 13).

Breast ultrasound is very useful for imaging of occult breast lesions (14). Performing mammography, breast ultrasound, MRI and physical examination will increase the sensitivity (3).

However, according to another study, there is no evidence to use breast USG as a routine examination method for women, who have average risk of breast cancer (7). In our study, it has been observed that performing both mammography and breast USG increased the sensitivity and specificity. In addition, the sensitivity of breast USG has been found higher regardless of the age. However, mammography plays an important role to show pathological microcalcifications that are early harbinger of breast cancer (9). Therefore, breast USG is not used as a screening tool like mammography. Breast ultrasound is not an alternative and equivalent of mammography.

## CONCLUSION

Breast ultrasound is more sensitive in demonstrating malignant breast masses. Mammography is more specific for patients above 45 years of age. Breast density is the most important factor in determining the sensitivity of mammography.

In the presence of clinical suspicion and mammography, breast USG should be performed to display lesions that seem occult. Mammography is not sufficient by itself for the evaluation of all malignant masses. However, sensitivity and specificity will increase with additional screening methods such as breast USG.

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