

Role of ultrasound in the basement of the breast in women with non-cycle related pain

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Abstract

Background: The role of ultrasound in the diagnosis of breast cancer remains a matter of debate and may continue so for the incoming years. Interpretation of its value is highly variable because it needs the following variables to be taken into consideration, clinical objectives, skills of medical professionals and equipment standards. Breast pain is an important presenting symptom and needs prompt evaluation to exclude underlying malignant disorder.

The aim of the study: To evaluate the role of ultrasound in the basement of the breast in women with non-cycle related pain.

Patients and methods: The present cross-sectional study included 500 women with breast pain with no palpable mass. The pain was not cyclic. The period of study extended from November 2015 to November 2017. No patient gave a history of nipple discharge. Ultrasound examination was carried out for all women in the ultrasound unit in Al-Diwaniyah Teaching Hospital in Al-Diwaniyah province, Iraq.

Results: Ultrasound examination showed abnormal findings in (50.2%) of cases. The mean age was 37.34 ± 7.35 . Ultrasound abnormal findings were: Cyst was seen in 51 women (20.3%), Mass was seen in 97 women (38.6%) and Duct-ectasia was seen in 103 patients (41.0%); categorized into those with mass (1.2%) and those without mass (39.8%). Cystic lesions were mainly seen in women younger than 40 years of age; cystic lesions were not seen in women older than 50 years. The rate of the mass lesion was increasing with age. Duct ectasia was mainly seen under the age of 40 years. Duct ectasia accompanying mass was limited to those who are older than 50.

Conclusion: mastalgia is often associated with benign lesion; the rate of the abnormal lesion following ultrasound examination is 50% and the rate of solid mass increase with age

Keywords: Non-cycle pain, breast, ultrasound

INTRODUCTION

For a long time, the role of ultrasound in diagnosing malignant breast lesions has been labeled with many controversial issues. The interpretation of ultrasonic finding in these situations is a matter of debate because it takes into consideration a lot of variables such as skills of medical professionals with different specializations, clinical objectives, and equipment standards. The early use of ultrasound in evaluating breast mass is dated back to about 60 years; however, clinical reliability was established about three decades later. In these early reports, the aim was directed toward differentiating cystic from solid mass [1]. Modern technology nowadays permits precise detection of relatively small masses using ultrasound devices [2, 3]. The large primary study with this regard was published by Stavros *et al.* in which "modern high-resolution" ultrasound device to evaluate breast tissue was used, and authors were able to establish standardized diagnostic criteria which made different breast lesion to be differentiated with valid and reliable characteristics [4]. Meanwhile, other authors have practiced the use of ultrasound to detect breast lesions that are small to clinical and mammographic detection [5-7].

From 1960 to the 1990s, the role of early detection of malignant breast lesions by mammography has been established by a lot of screening studies that are randomized in some countries. These studies in total were carried out utilizing mammography in combination with clinical examination or mammography alone. During the last two decades, US has been utilized in addition to mammography aiming at increasing the rate of detection of malignant breast lesions and if possible to do diagnostic intervention under US guidance to improve one visit diagnostic utility. The first appearance of this trend was registered in the "first edition of the German S3 guidelines for early detection of breast cancer in 2003" [8].

From a clinical perspective, an ultrasound examination is used for both screening and diagnostic purposes. Some trusted studies have brought about the useful role of ultrasound examination in differentiating malignant from benign breast pathology [4-10]. Mammography by far proved to detect nearly three quarters of malignant lesions in the breast; however, screening programs utilizing the US as the primary tool of investigation have not been justified yet. Females with breast densities and especially at young

or menopausal age, represent a limitation when mammography is used [11, 12].

Also, the risk of malignant breast pathology is greatly increased in these patients. A study of more than 200,000 women showed that the breast cancer risk is five times increased in case of dense breasts compared to women with involutational changes [12]. There is an observation that dense breast tissue is found in about 30% of the menopausal patients [12].

Routine additional ultrasound evaluation is usually carried out to those patients in a clinical setting, but, the density of breast is not always an indication of high cancer risk and for poor mammographic detection. For that reason, density detected by mammographic examination is usually not recorded on mammographic screening tests.

PATIENTS AND METHODS

The present cross-sectional study included 500 women with breast pain with no palpable mass. The pain was not cyclic. The period of study extended from November 2015 to November 2017. No patient gave a history of nipple discharge. Ultrasound examination was carried out for all women in the ultrasound unit in Al-Diwaniyah teaching hospital in Al-Diwaniyah province, Iraq.

RESULTS

Ultrasound examination showed abnormal findings in 251 out of 500 examined women (50.2%). One proportion Z-test showed almost equal (insignificant difference) proportion of women with normal and abnormal findings ($P > 0.05$), as shown in figure 1. The mean age of women enrolled in the present study was 37.34 ± 7.35 with an age range of 21 to 63 years. Ultrasound abnormal findings were shown in table 1 and included the following: Cyst was seen in 51 women (20.3%), Mass was seen in 97 women (38.6%) and Duct-ectasia was seen in 103 patients (41.0%); categorized into those with mass (1.2%) and those without mass (39.8%). To evaluate the association between age and type of breast pathology we classified our sample into five age groups, as shown in table 2. Cystic lesions were mainly seen in women younger than 40 years of age (20% of those women < 30 years and 11.4% of those women 30-39 years of age); cystic lesions were not seen in women older than 50 years. The rate of the mass lesion was increasing with age in that order: 5.6%, 20%, 25%, 39.8%, 25% in women within age intervals of 20-29, 30-39, 40-49, 50-59 and 60

and more years, respectively. Duct ectasia was mainly seen under the age of 40 years (40 % of those younger than 30 and 26.7% of those women 30-39 years old. Duct ectasia accompanying mass was limited to those who are older than 50 (2.4% of those 50-59 years old and 8.3% of those 60 or more.

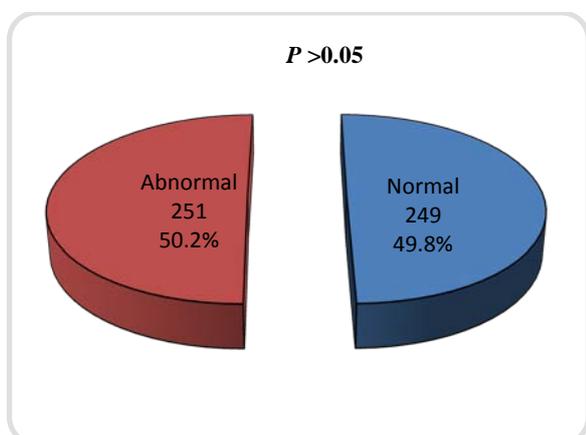


Figure 1: Pie chart showing the rate of abnormal finding based on ultrasound examination of women with non-cycle pain

Table 1: Type of breast pathology according to ultrasound examination

Abnormality	n	%
Cyst	51	20.3
Mass	97	38.6
Ductactasia	103	41.0
with mass	3	1.2
with out	100	39.8

DISCUSSION

The present study showed that pain in the absence of palpable mass carries a 50% chance of pathology than only can be detected by imaging. The most common pathology seen in the currents study was duct ectasia followed by a mass lesion and lastly by the cystic lesion. Cystic lesions and duct ectasia were mainly seen in young women (younger than 40) whereas, the rate of the mass lesion was directly proportional to the age of women. Duct ectasia was seen in 41%, cystic lesions in 38.6% and mass lesions in 20.3%. Cystic lesions of the breast are the most prevalent reasons for a breast mass in females in the age range of 35-50. From a pathophysiologic perspective, a cyst is the result of upstream occlusion of terminal ducts at the extralobular compartment that happens because of cellular proliferation or fibrosis [13]. The appearance of duct ectasia is highly variable. Indeed, the appearance of duct ectasia may be tubular containing fluid that can be single or multiple. Echogenic findings may reflect the presence of tissue debris which may be mistakenly

considered a solid mass unless the tubular pattern is recognized [13].

The finding of one study, in which ultrasound was used to assess women with mastalgia, showed cystic lesions in 4.8% and solid mass lesions in 15.4% [14]. These findings, just like our findings, suggested that mass lesion is more frequent than cystic lesions; however, rates of both lesions are less than that seen in the present study which may be due to variation in sample size and age groups. Another study reported the following findings: out of all examination, 85 (77 %) exhibit negative results. Cystic lesions were seen in fifteen cases (14%), whereas solid lesions were seen in about 3% of cases [15]. These findings contradict the findings of the present study in that cystic lesions were more frequent, and that rate of normality is far more than that of the presents study, 77.3% versus (49.8%).

The ability of ultrasound examination in establishing a diagnosis of benign versus malignant breast pathology with clear-cut is relatively high preoperatively, also, there is some evidence that ultrasound can detect early malignant breast lesions that are difficult to detect both clinically mammographically [1].

The benefit of breast ultrasound in comparison to mammography gets better with greater breast density and when women are young because at these circumstances the mammography sensitivity is low. This is an essential point because breast with dense tissue is very frequent [1]. Dense heterogeneous breast tissue and more commonly very dense glandular tissue are detected in about 50 % of women younger than 50 [16]. Moreover, dense breast tissue is detected in about 33% of women older than 50 and in those women with dense breast tissue the sensitivity of mammography is profoundly low [10, 17]. The cancer rate is relatively higher in women older than 50 [12, 17] and dense breast tissue is an indicator of higher risk of cancer in those women; dense breast tissue increases the risk by 4 to 6 folds [12, 18, 19]. Compared to mammography, implementation of ultrasound in randomized screening researches has not been tested, and there is no proof that the early cancer detection by ultrasound has reduced rate of mortality. However; tumors with small size and state of lymph nodes are the most vital indicators for the screening quality, and cancer size distribution and state of lymph nodes in the ultrasound evaluation are nearly similar to infiltrative cancers detected using mammographic screening [20]. The principal difficulty with ultrasound is that decision making needs a lot of variables to be considered together [1].

CONCLUSION

Mastalgia is often associated with benign lesion; the rate of the abnormal lesion following ultrasound examination is 50% and the rate of solid mass increase with age.

Table 2: Type of breast pathology according to age of women

Age group (years)	Subtotal number	Normal number (%)	Cyst number (%)	Mass number (%)	Ductactasia number (%)	With mass number (%)	Without mass number (%)
20-29	180	62 (34.4)	36 (20.0)	10 (5.6)	72 (40.0)	0 (0.0)	72 (40.0)
30-39	105	44 (41.9)	12 (11.4)	21 (20.0)	28 (26.7)	0 (0.0)	28 (26.7)
40-49	120	87 (72.5)	3 (2.5)	30 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
50-59	83	48 (57.8)	0 (0.0)	33 (39.8)	2 (2.4)	2 (2.4)	0 (0.0)
≥ 60	12	8 (66.7)	0 (0.0)	3 (25.0)	1 (8.3)	1 (8.3)	0 (0.0)
Total	500	249 (49.8)	51 (10.2)	97 (19.4)	103 (20.6)	3 (0.6)	100 (20.0)

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