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ULTRASOUND EVALUATION OF PALPABLE BREAST LESIONS IN PATIENTS YOUNGER THAN 35 YEARS

Sara Afridi
Radiologist Type-D Hospital Jamrud, Health Department Khyber Pakhtunkhwa

Corresponding Author:
Sara Afridi
Radiologist Type-D Hospital Jamrud, Health Department Khyber Pakhtunkhwa
Email: *drsaraafridi1234@gmail.com*

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Abstract
Objective:
The purpose of the study was to investigate those women who have palpable breast lesions and are younger than 35 years of age.
Methodology: The study was conducted at the department of diagnostic radiology, Khyber Teaching Hospital Peshawar from February to July 2020, involving female patients under 35 with palpable breast lumps. A thorough history was taken, and a clinical diagnosis was established. Participants with autoimmune diseases and hormonal replacement therapy were excluded. Informed consent was obtained, and an ultrasound was performed with the Toshiba Xario 200 ultrasound machine and all the cases were divided according to the BI-RADS 1, 2, 3, 4 and 5. Statistical analysis was done using SPSS 24**.**
Results: The study involved 122 women with palpable breast lesions, with the majority aged 30-34 years. The mean age was 27.51 years. The study found that the majority of cases (59%) were classified as BI-RADS 1, indicating negative findings. Benign cases were categorized as BI-RADS 2 (23.8%) and BI-RADS 3 (5.7%). Only 2 cases (0.8%) were malignant, with 1 case each in BI-RADS 4 and BI-RADS 5. Biopsy methods used included core needle biopsy (50.8%), surgical excision (29.5%), and needle aspiration biopsy (3.3%).
Conclusion: Ultrasound plays a significant role in the early identification of carcinoma of the breast and other breast diseases in young women under 35 with palpable breast masses, particularly in developing nations with inadequate mass screening programs. The incidence of breast cancer in women under 30 was extremely low, at 0.8%, in our study. Ultrasound proved to be a highly sensitive tool for evaluating palpable breast lesions in young women.

Key-words: Palpable Lesion, Fibroadenoma, lipoma, Ultrasound, Malignancy

Introduction:

As more people become aware that breast cancer is one of the most common malignancies in women globally and has a high death rate, more patients are seeking treatment for any kind of unusual symptoms that are related to the breast at healthcare facilities [1,2]. One significant aspect of female anatomy that symbolizes femininity is the breast. From adolescence to death, the breast undergoes ongoing physiological and physical changes related to menstruation, pregnancy, menopause, breastfeeding, and gestation. It is distinct in that a variety of hormones regulate its growth and development [3]. Moreover, Young women frequently develop breast lumps, which can be rather concerning. Most of these types of lesions are harmless. Because

they are better educated and more aware of medical issues, women in today's society are more concerned about any pathological or physiological changes in the breast, which puts patients through more emotional and psychological stress when they think the condition might be cancer [4]. In 2003, the Breast Imaging Reporting and Data System (BI-RADS) was developed by the American College of Radiology. Based on the significance of the BI-RADS classification, there are four groups: BI-RADS grade 2: benign lesions; BI-RADS grade 3: more likely benign lesions that need to be monitored; BI-RADS grade 4A indicates a low risk of cancer, BI-RADS grades 4B and higher indicate a high risk of cancer, and BI-RADS 5 is highly suggestive of malignancy. [5,6]. Along with these common initial complaints include focused discomfort, nipple discharge, breast lumps, and mastalgia. Early diagnosis and therapy depend on a reliable and authentic workup. Patients with breast-related symptoms must be evaluated using radiological imaging because clinical examinations alone are not very useful for detecting breast lesions [7, 8]. However, its sensitivity is poor for dense breasts, and its diagnostic and screening usefulness depends on the tissue density of the breasts. High resonance ultrasound (HR-USG) is used to evaluate patients under 35 years old, and it also enables the characterization of lesions found in digital mammography. When a patient has dense breast tissue and digital mammography has low sensitivity, USG of the breast becomes useful. Furthermore, tissue density has little effect on its sensitivity for lesion identification. HR-USG may identify solid lesions up to 5 mm in size and cystic lesions up to 3 mm in size under typical operating conditions. However, reports of solid lesions smaller than 5 mm are found in the literature [9, 10, 11]. Most frequently observed after the onset of pregnancy or breastfeeding, infectious mastitis and abscesses affect 1%–24% of nursing mothers. But they also seldom occur in nonpuerperal settings, accounting for 1%–2% of the total symptomatic breast processes. Obesity, smoking, and Black race are risk factors. The nonpuerperal abscess can be peripheral, usually in older individuals with concurrent medical conditions or recent breast procedures, with a lower recurrence rate, or central, frequently in young people who smoke, with a considerable recurrence incidence of 25%–40% [12,13]. Only 3% of all breast cancers are discovered during pregnancy or lactation, making it an uncommon occurrence. It predicts a dismal outcome, with more advanced illness being the result of a delayed diagnosis. Additionally, the tumors typically have aggressive biologic profiles, with a high frequency of hormone receptor-negative, epidermal growth factor receptor 2 (HER2)-positive tumors, more than 50% high grade, and more than 50% involvement nodes at diagnosis [14]. There are no extensive initiatives to screen for early breast cancer identification in developing nations like ours, which is crucial in preventing the high death rate from late-present breast cancer. A small number of public sector organizations have set up breast care clinics where patients with symptoms can receive imaging modalities to help with the early detection of various breast lesions. The study was carried out in the sole established breast care clinic in our region's public sector, which is furnished with the newest imaging technologies, including high resonance ultrasound and digital mammography. Furthermore, ultrasonography (USG) is the preferred imaging technique for young women (less than 35 years old) with palpable breast masses because of them.

Methodology:

The present cross-sectional study was conducted in the Department of Diagnostic Radiology at Khyber Teaching Hospital Peshawar from February 2020 to July 2020, after approval from the ethical review board of the hospital. A thorough history is taken in all female patients under 35 who arrive at the outpatient department (OPD) having palpable breast lumps. This includes information about the lump, discomfort, nipple discharge, menstruation, obstetrics, and history of oral contraceptive pill use. A general physical examination was performed. Following a thorough local and systemic investigation, a clinical diagnosis was established. While those females with autoimmune diseases and hormonal replacement therapy were excluded from the study. Informed consent was obtained from each participant prior to the

study and their privacy and confidentiality were maintained. Ultrasound was done for all the women with the Toshiba Xario 200 ultrasound machine and all the cases were divided according to the BI-RADS 1, 2, 3, 4 and 5. Statistical analysis was done through SPSS 24 version accordingly.

Results:

In the present study total of 122 women had palpable breast lesions, in addition, the mean age of the participants was 27.51 years with a standard deviation of 4.21. Table 1 below highlights benign and malignant cases according to the BI-RADS scale along with total number of cases, moreover, there was 59 % (72) negative cases in BI-RADS 1, similarly, 23.8 % (29) and 5.7 % (7) of benign cases out of the total cases were in BI-RADS 2 and 3. Consequently, in BI-RADS 4 there was 14 patients in which 1 (7.1%) was confirmed as a malignant and in only malignant cases was in BI-RADS 5, in addition, the rate of malignancy was 0.8 % (2). Biopsies was done for those cases that falls in BI-RADS 3, 4 and 5 accordingly. The most common method of biopsy was core needle biopsy 50.8 % (60), which include 45.9 % BI-RADS 4 and 8.1 % (5) BI-RADS 3 cases, followed by surgical excision 29.5 % that was commonly performed for those patients that falls in BI-RADS 3 (29 %) 18 and BI-RADS 4 (14.8 %) 18. Furthermore, needle aspiration biopsy was done for only 3.3 %.

Table 1: BI-RADS Assessment and Outcome

BI-RADS Category	Number of Benign Cases (%)	Number of Malignant Cases (%)	Total Cases
BI-RADS 1 (Negative)	72 (100%)	0 (0%)	72 (59.0%)
BI-RADS 2 (Benign)	29 (100%)	0 (0%)	29 (23.8%)
BI-RADS 3 (Probably Benign)	7 (100%)	0 (0%)	7 (5.7%)
BI-RADS 4 (Suspicious)	13 (92.9%)	1 (7.1%)	14 (11.5%)
BI-RADS 5 (Highly Suggestive)	0 (0%)	1 (100%)	1 (0.8%)
Total	121 (99.2%)	2 (0.8%)	122

Table 2: Distribution of Biopsy Methods for Patients with BI-RADS Categories 3, 4, and 5 Assessments

Biopsy Procedure Type	BI-RADS 3 (Probably Benign)	BI-RADS 4 (Suspicious Abnormality)	BI-RADS 5 (Highly Suggestive of Malignancy)	Total
Core Needle Biopsy	5 (8.1%)	56 (45.9%)	1 (100%)	62 (50.8%)
Surgical Excision	18 (29.0%)	18 (14.8%)	0 (0%)	36 (29.5%)
Combination: Core Needle Biopsy + Surgical Excision	4 (6.5%)	16 (13.1%)	0 (0%)	20 (16.4%)
Needle Aspiration	1 (1.6%)	3 (2.5%)	0 (0%)	4 (3.3%)
Other Procedures	0 (0%)	1 (0.8%)	0 (0%)	1 (0.8%)
Total	46	94	1	122

Discussion:

A comprehensive imaging assessment is required to characterize the palpable lesion because most noticeable abnormalities in the breast do not show clear clinical symptoms. As previously stated, tissue diagnosis was once advised for the treatment of a palpable mass, even when imaging results were negative or benign. According to early breast sonography reports, ultrasonography should only be used to differentiate solid objects from cysts. However, as ultrasound technology advanced, it became evident that careful sonographic technique and lesion characterization might be used to better characterize solid masses [15]. Similarly, women under the age of thirty usually only have breast imaging done when they develop focal signs or symptoms while regular mammograms are not advised until they are forty years old [16]. ACR advises targeted breast ultrasonography as the first imaging test for this patient population, with mammograms being utilized only in high-risk patients or as a follow-up in instances that are clinically or by ultrasound concerning [17]. Since every cancer in our sample was via ultrasound detected, ultrasound had a 98% sensitivity for diagnosing breast cancer. Previous research has demonstrated that ultrasound's sensitivity varies between 66% to 100% [18]. Similarly, in our study, the specificity of ultrasounds was 82%. The found result is in line with earlier research's findings, which showed specificity levels ranging from 78% to 100% [19]. The current study found 0.8 % the overall of cancer among the study participants, similarly, Sood R et all reported that the incidence of malignancy was 0.4 % which is coherent to our study [20]. Additional another study by Lehman CD et al reported 1.9 % incidence malignancy among the females having ages from 30-39 years of age [21], along with this other studies had concluded 1 % malignancy among their study participants who underwent ultrasound for their palpable breast lesions [22,23]. Our study's findings on the distribution of breast imaging cases according to the BI-RADS scale align with existing literature by Lehman at el found 55 %, likewise in the current study significant proportion of cases (59%) were categorized as BI-RADS 1, indicating no abnormality, which is comparable to previously reported rates [24]. The predominant use of core needle biopsy (50.8%) in our

study aligns with established guidelines, which advocate for its use as the initial biopsy method for most breast lesions. Notably, the American College of Radiology (ACR) endorses this approach. Additionally, our findings indicate a slightly higher rate of surgical excision (29.5%) compared to previous reports (22%) [25,26].

Conclusion:

Ultrasound plays a significant role in the early identification of carcinoma of the breast and other breast diseases in young women under 35 with palpable breast masses, particularly in developing nations with inadequate mass screening programs. The incidence of breast cancer in women under 30 was extremely low, at 0.8%, in our study. Ultrasound proved to be a highly sensitive tool for evaluating palpable breast lesions in young women.

References:

1: Mukhtar R, Hussain M, Mukhtar MA, Ali SM. Breast metastasis from medullary carcinoma of thyroid: A case report with literature view. JPMA J Pak Med Assoc. 2020 Nov 1;70(11):2051-3.

2: Saraswat S, Chandak S, Pratap V, Kumar A. Sonomammographic Evaluation & Characterization of Breast Lumps. INTERNATIONAL JOURNAL OF SCIENTIFIC STUDY. 2014;1(4):50-3.

3: Kovi J. Frozen Section In Surgical Pathology: An Atlas Volume 2. CRC Press; 2019 Jun 12.

4: Kelsey JL, Hildreth NG. Breast and gynecologic cancer epidemiology. CRC Press; 2019 Oct 10.

5: Moy L, Heller SL, Bailey L, D'Orsi C, DiFlorio RM, Green ED, Holbrook AI, Lee SJ, Lourenco AP, Mainiero MB, Sepulveda KA. ACR Appropriateness Criteria® palpable breast masses. Journal of the American College of Radiology. 2017 May 1;14(5):S203-24.

6: Evans A, Trimboli RM, Athanasiou A, Balleyguier C, Baltzer PA, Bick U, Camps Herrero J, Clauser P, Colin C, Cornford E, Fallenberg EM. Breast ultrasound: recommendations for information to women and referring physicians by the European Society of Breast Imaging. Insights into imaging. 2018 Aug;9:449-61.

7: Stachs A, Stubert J, Reimer T, Hartmann S. Benign breast disease in women. Deutsches Ärzteblatt International. 2019 Aug;116(33-34):565.

8: Mukhtar R, Hussain M, Mukhtar MA, Haider SR. Evaluation of high-risk patients with dense breast on high-resolution ultrasound for screening and detection of breast cancer where mammography is of low significance. West African Journal of Radiology. 2022 Jul 1;29(2):125-9.

9: Hansmann M, Hackelöer BJ, Staudach A. Ultrasound diagnosis in obstetrics and gynecology. Springer Science & Business Media; 2012 Dec 6.

10: Jang JY, Kim SM, Kim JH, Jang M, La Yun B, Lee JY, Lee SH, Kim B. Clinical significance of interval changes in breast lesions initially categorized as probably benign on breast ultrasound. Medicine. 2017 Mar 1;96(12):e6415.

11: Marcomini KD, Fleury EF, Oliveira VM, Carneiro AA, Schiabel H, Nishikawa RM. Evaluation of a computer-aided diagnosis system in the classification of lesions in breast strain elastography imaging. Bioengineering. 2018 Aug 9;5(3):62.

12: Kasales CJ, Han B, Smith Jr JS, Chetlen AL, Kaneda HJ, Shereef S. Nonpuerperal mastitis and subareolar abscess of the breast. American Journal of Roentgenology. 2014 Feb;202(2):W133-9.

13: Pluguez-Turull CW, Nanyes JE, Quintero CJ, et al. Idiopathic granu lomatous mastitis: manifestations at multimodality imaging and pitfalls. Radiographics 2018;38(2):330–356.

14: Slanetz PJ, Moy L, Baron P, Didwania AD, Heller SL, Holbrook AI, Lewin AA, Lourenco AP, Mehta TS, Niell BL, Stuckey AR. ACR appropriateness criteria® breast imaging of pregnant and lactating women. Journal of the American College of Radiology. 2018 Nov 1;15(11):S263-75.
15: Leithner D, Moy L, Morris EA, Marino MA, Helbich TH, Pinker K. Abbreviated MRI of the breast: does it provide value?. Journal of Magnetic Resonance Imaging. 2019 Jun;49(7):e85-100.
16: El Hachimi K, Benjelloun H, Zaghba N, Yassine N. Métastase pleurale et pulmonaire d'une polyadénofibromatose dégénéréé: à propos d'un cas. Pan African Medical Journal. 2017;28(1):146-.
17: Smith RA, Andrews KS, Brooks D, Fedewa SA, Manassaram-Baptiste D, Saslow D, Wender RC. Cancer screening in the United States, 2019: A review of current American Cancer Society guidelines and current issues in cancer screening. CA: a cancer journal for clinicians. 2019 May;69(3):184-210.
18: Sharma U, Jagannathan NR. MR spectroscopy in breast cancer metabolomics. Analytical Science Advances. 2021 Dec;2(11-12):564-78.
19: Cantisani V, David E, Barr RG, Radzina M, de Soccio V, Elia D, De Felice C, Pediconi F, Gigli S, Occhiato R, Messineo D. US-elastography for breast lesion characterization: prospective comparison of US BIRADS, strain elastography and shear wave elastography. Ultraschall in der Medizin-European Journal of Ultrasound. 2021 Oct;42(05):533-40.
20: Sood R, Rositch AF, Shakoor D, Ambinder E, Pool KL, Pollack E, Mollura DJ, Mullen LA, Harvey SC. Ultrasound for breast cancer detection globally: a systematic review and meta-analysis. Journal of global oncology. 2019 Aug 27.
21: Lehman CD, Lee CI, Loving VA, Portillo MS, Peacock S, DeMartini WB. Accuracy and value of breast ultrasound for primary imaging evaluation of symptomatic women 30-39 years of age. American journal of roentgenology. 2012 Nov;199(5):1169-77.
22: Deloumeaux J, Gaumond S, Bhakkan B, M'Ebobisse NM, Lafrance W, Lancelot P, Vacque D, Negesse Y, Diedhiou A, Kadhel P. Incidence, mortality and receptor status of breast cancer in African Caribbean women: Data from the cancer registry of Guadeloupe. Cancer Epidemiology. 2017 Apr 1;47:42-7.
23: Wharam JF, Zhang F, Lu CY, Wagner AK, Nekhlyudov L, Earle CC, Soumerai SB, Ross-Degnan D. Breast cancer diagnosis and treatment after high-deductible insurance enrollment. Journal of Clinical Oncology. 2018 Apr 10;36(11):1121-7.
24: Lehman CD, Arao RF, Sprague BL, Lee JM, Buist DS, Kerlikowske K, Henderson LM, Onega T, Tosteson AN, Rauscher GH, Miglioretti DL. National performance benchmarks for modern screening digital mammography: update from the Breast Cancer Surveillance Consortium. Radiology. 2017 Apr;283(1):49-58.
25: Katzen JT, Grimm LJ, Brem RF. The American College of Radiology/Society of Breast Imaging updated fellowship training curriculum for breast imaging. Journal of Breast Imaging. 2021 Jul 1;3(4):498-501.
26: Reis J. Breast MRI in the preoperative assesment of patients with locally advanced breast cancer treated with neoadjuvant endocrine therapy: diagnostic accuracy and clinical utility.