Characterization of Breast Fibroadenoma using Ultrasonography

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Background: Fibroadenoma is the most common benign tumor of the female breast. It is a new growth composed of both fibrous and glandular tissue occurring commonly in young women before the age of 30, and probably caused by hormonal imbalance. Detailed characterizations of their sonographic appearances are necessary for differential diagnosis from other benign lesions or breast cancer. The main objective of this study was to characterize breast fibroadenomas using ultrasonography.

Materials and Methods:A cross sectional descriptive study was conducted at Mohammed Aldossary Hospital K.S.A within 3 months (October-December 2019) through evaluation of 82 breast fibroadenoma female patient who were scanned by ultrasound machines (ACUSONX300 and Vuluson E6) with high frequency transducer7-18MHZ.

Results:The study revealed that the most affected age by fibroadnoma were between 21-40 years old.The predominant sonographic feature of fibroadenoma were; hypoechoic lesion (97.6%), homogenousecho texture (98.8%) and avascular (53.7%).

Ultrasound is the modality of choice for the characterization of simple breast fibroadenoma with the typical sonographic criteria include different presentation that most frequently consistent with presentation seen in a benign mass. In addition ultrasound could eliminate the need for further invasive procedures including biopsy.

Key words: Fibroadenoma; echogenicity;echotechure; BIRADS.

I. Introduction

A breast fibroadenoma is a benign (non-cancerous) breast tumor that arises from an overgrowth of fibrous and glandular tissues from the breast (Hartmann, Sellers et al. 2005).. Fibroadenoma is the most common breast tumor in adolescent girls and women younger than 25 years. Although the peak incidence is between the second and third decades of life, it is not uncommon in postmenopausal women, with an increased incidence after hormone replacement therapy (Rosen, Johnstone et al. 2012).A fibroadenoma usually has a rubbery texture, is smooth to the touch and moves easily under the skin. It is possible to have more than one fibroadenoma in the same breast and also to find them in the other breast, they can vary in size from 1-5 cm, but occasionally some can grow to more than 5 cm and are called "giant"fibroadenomas(O'Malley, Pinder et al. 2011).Ultrasound has an important abilities of enabling determination of the internal matrix of masses. In the breast most palpable masses in young women are caused by fibroadenomas(Hooley, Scoutt et al. 2013).The ultrasound images criteria that support the diagnosis of a fibroadenoma are a round or oval solid mass with a smooth contour. This imaging technique is very useful for differentiating between solid and cystic lesions (Faguy 2017). This study aimed to characterize breast fibroadenomas using ultrasonography.

II. Materials and Methods

Descriptive cross sectional study has been applied on 82 female patients pathologically confirmed fibroadenoma with age range from 15 to 60 years old were underwent successful breast ultrasound examination with ACUSONX300 and Vuluson E6 ultrasound machine with high frequency linear array probe 7-18 MHZ which are typically used.Only female patient underwent ultrasound procedure and weren't affected by hormonal changes over the age of 15 and under the age of 60 were included in this study.

This study was conducted from October to December 2019 in Mohammed Aldossary Hospital K.S.A.The area for evaluation was fixed and skin was adequately lubricated to facilitate ultrasound transmission. The transducer was gently applied and both longitudinal and transverse scans were taken after taking a Medical history of all study subjects directly from participants themselves. Whereas the patient with the patient supine, the ipsilateral arm wasabducted and the elbow flexed to bring the hand below the head for assessing theinner quadrants, as well as to assess the outer quadrants a contralateral posterior oblique posture in this the breast to be scanned was elevated relative to the opposite breast (30-45) degree.The scans included sonographic information regarding the margins, distribution, width antero-posterior, echogenicity, internal echo

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texture, posterior acoustic phenomena, calcifications, BIRADS classification, and vascularity of the breast fibroadenomas. Data was symbolized, classified, and analysed using excel and statistical package for the social sciences (SPSS).

III. Results

Table 1: showed frequency of sample population according to age

Age groups	Frequency	Percent %
"15-20Y"	2	2.4
"21-30 Y"	25	30.5
"31-40 Y"	25	30.5
"41-50Y"	23	28.0
"51-60 Y"	7	8.5
Total	82	100.0

Table 2: showed mass echogenicity in sample population

Echogenicity	Frequency	Percent %
Hypoechoic	80	97.6
Isoechoic	2	2.4
Total	82	100.0

Table 3: showed mass echotexture in sample population

Texture	Frequency	Percent %
Homogenous	81	98.8
Heterogenous	1	1.2
Total	82	100.0

Table 4: Showed mass vascularity and vascularity speed in sample population

Vascularity	Frequency	Percent %
Avascular	44	53.7
High vascularity	1	1.2
Low vascularity	37	45.1
Total	82	100.0

Table 5: Showed cross-tabulation between mass site and mass quadrant in sample population

Mass site	Mass quadrant				
	UOQ	LOQ	LIQ	UIQ	Total
Right Breast	10	7	7	7	31
Left Breast	6	3	3	9	21
Bilateral	11	5	3	11	30
Total	27	15	13	27	82

Table 6: Showed mass BIRADS classifications in sample population

BIRADS Classifications	Frequency	Percent %
IIBIRAD	14	17.1
IIIBIRAD	64	78.0
IVBIRAD	4	4.9
Total	82	100.0

Table 7: showed correlation between BIRADS classification and mass echogenicity

		BIRAD CLASSIFICATION	Echogenicity
BIRAD CLASSIFICATION	Pearson Correlation	1	-.307-**
	Sig. (2-tailed)		.005
	N	82	82
Echogenicity	Pearson Correlation	-.307-**	1
	Sig. (2-tailed)	.005	
	N	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

IV. Discussion

A total of 82 breast fibro adenoma patient were conducted in this study; 25 patient (30.5) was in age range between (31-40Yrs) beside 7 patients(8.5%) was in age range (51-60Yrs) (table.1);according to echogenicity 80(97.6%) had hypoechoicfibro adenoma while 2 (2.4%) had isoechoicfibro adenoma (table.2): According to echo texture 81(98.8%) had homogenous echo texture, instate of only 1 (1.2%) had heterogeneous echo texture(table.3);According to mass vascularity and vascularity speed 44(53.7%) had avascular mass while 37(45%) had low vascularity (table.4); According to mass site and mass quadrant the most affected sitewas the right breast(31) on the upper outer quadrant (10)(table.5); According to BIRAD classification 64 (78%) had BIRAD III classification which is probably benign (table.6); A Pearson correlation was run to determine a relationship between BIRADS classification and mass echogenicity and the result was that a strong correlation between them was shown in P-value relation (v: -0.307), n= 82. P < 0.01(table.7).

V. Conclusion

The study reveals that ultrasound can provide an alternative noninvasive method for assessing and evaluation of breast fibroadenoma using high frequency probe.Ultrasound is the modality of choice for the characterization of simple breast fibroadenoma with the typical sonographic criteria include different presentation that most frequently consistent with presentation seen in a benign mass. In addition ultrasound could eliminate the need for further invasive procedures including biopsy.

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