

Breast Fibroadenoma Features Assessment by Ultrasonography

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Abstract

Background: breast cancer in women is one of the commonest cancers in world. Features assessed by ultrasound of benign lesions like fibroadenoma may be overlying with those seen in a malignant tumor. So, we evaluated breast ultrasound examination in patients with diagnosis of fibroadenoma pathologically.

Objective: To identify benign features of fibroadenomas by ultrasound and how we can make some difference between them and breast cancer.

Method: This prospective study included 202 women mean age of 28.71 SD± 7.71 (ranging between 17 and 46 years old) with proved diagnosis of fibroadenoma by pathological study which had been enrolled outpatient clinic from January 2019 to June 2020.

Result: In 202 women with 28.71 ± 7.71 years of age, all contributors were ordered as stage 4 on Breast Imaging-Reporting and Data System scale. Mean of 14.94 ± SD 7.834. Greatest no. of masses seen in upper outer quadrants of the breasts. Most masses were oval in shape with only 6.4% were rounded. The margin demarcation, 95.5 % were well defined while ill-defined masses were described in 4.5 %. About 93.6% of masses appear to be hypoechoic in the ultrasound. Masses with lobulation were in 20.8% of the masses. 6.4 % of them had calcification and 6.9% were heterogenic appearance.

Conclusion: The most common features of fibroadenoma seen by ultrasound consist of a hypoechoic mass with a well-defined margin; although , many features that have similarity to malignant masses are also seen involving ill-defined margin, lobulation, existence of a posterior shadow, heterogenicity, and presence of microcalcification.

Keywords: Breast cancer, fibroadenoma, ultrasound.

Introduction

Breast masses in women can be sharply divided into malignant and benign masses depending mainly on histopathological examination. We can reduced the number of women who perform biopsy by physical and available noninvasive radiological examination (Malur, Wurdinger et al. 2000),(Borecky and Rickard 2008). Malignant breast masses fortunately uncommon between younger age group(Pengelly, Lambert et al. 2014). Among benign masses ; fibroadenomas appear to be commoner one and it comprise of the term “fibroma,” which mean a type of tumor that composed of fibrous tissue, and “adenoma,” that of gland tissue tumor in another word they have stromal and epithelial components(Houssami, Cheung et al. 2001). fibroadenoma reported for about 95 % of all benign breast lesions (Zabolotskaya 2006). It establishes a well-defined lesion, that are simply demarcated its margin from the adjacent normal tissues. Fibroadenoma usually affects women with age ranging 20–45 years. Usually their size is altered but almost do not more than 3 cm. Fibroadenoma mostly present as a single lesion, though it may be multiple lesions in 20 % of cases also can be seen bilaterally. Fibroadenoma is one of the

causes of breast pain that is focal pain which is a common complaint in a woman that contribute to about “ 10 (7.9%) fibroadenoma causes localized pain due to lump”(Egwuonwu, Anyanwu et al. 2016) and about “19 (21.1%) with focal pain as fibroadenoma”(Al hindawi,

Alsalami et al. 2018). Transformation of fibroadenoma to a malignant lesion is rare occurrence (5 %),with lobular cancer in situ rises frequently from these lesions(Sinyukova, Korzhenkova et al. 2007). Many studies demonstrated there is increase incidence of fibroadenoma in woman with uterine fibroid “the frequency of fibroadenomas of the breast was 65% as compared to women with a normal uterus, the frequency was 35%”(Sinyukova, Korzhenkova et al. 2007), also reported with increase incidence with Presence of Uterine fibroid in the Study of “The Relationship between the Presence of Uterine Fibroid and Symptoms”(Mahmood and Abd Ali 2014). The role of mammograms are decreases in younger age groups as they have denser breast tissue so it plays limited role to differentiate between fibroadenoma from other lesions such as cysts and carcinomas. Ultrasound have an important role and a good alternative for mammography.

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Subject and Method

Two hundred and two women included in this cross-sectional study with mean age of 28.71 SD± 7.71 (ranging between 17 and 46 years old) had been enrolled outpatient clinic from January 2019 to June 2020. We registered the referred women who had done biopsy to their breast masses; i.e. with proved diagnosis of fibroadenoma we included in our study and we excluded other pathological reports or women who did not have an suitable pathologic report. Ultrasound study done for all patients by Samsung HS50 (KOREA), with LA3-14AD probe by an expert radiologist and ethically permission was taken from all women which was attended to radiology clinic for collection data for research purpose. All ultrasound reports contain a description to the mass as site, size, shape, margin, their appearance and classification of the masses according to the Breast Imaging-Reporting and Data System (BIRADS) scale.(Elverici, Zengin et al. 2013). By utilizing the SPSS software, version 24, we did the statistical study of the data collected. P value=0.000<0.05.

Result

The study included 202 women mean age of 28.71 ± SD 7.71 (ranging between 17 and 46 years old) as shown in table 1.

Table 1.

Statistics		
age of patient		
N	Valid	202
	Missing	0
Mean		28.71
Std. Deviation		7.716
Minimum		17
Maximum		46

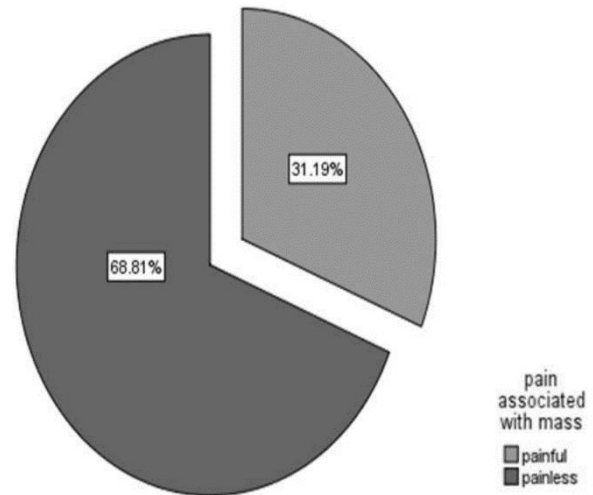
Average size of fibroadenoma masses was compared between women as measured by millimeter with mean size 14.94 ± SD 7.83 as shown in table -1.

Table 2.

Statistics		
size of fibroadenoma by millimeter		
N	Valid	202
	Missing	0
Mean		14.94
Std. Deviation		7.834
Minimum		5
Maximum		50

Fibroadenoma presented clinically as focal mass usually presented as painless focal mass or may be associated with pain as show in figure 1, painless mass 68.81%, painful mass 31.19%.

Figure 1. pain associated with fibroadenoma.



The distribution and frequency of fibroadenoma in right 43.56%, left breast 46.04% and bilaterally 10.40% are presented in figure 2.

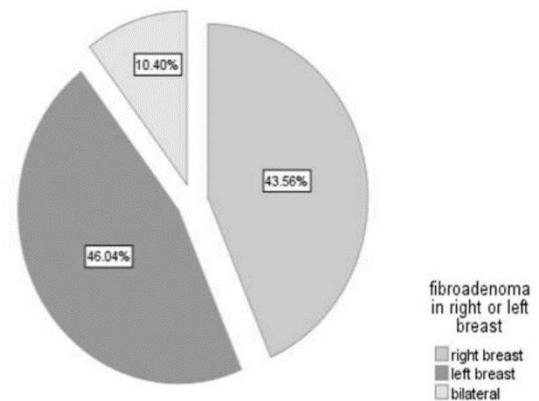


Figure 2. Distribution of fibroadenoma in right, left breast and bilaterally.

Fibroadenoma was most commonly seen in the upper outer lobe of each breast about 41.6%, second most common upper inner quarter 25.7%, in lower outer and lower inner quarters are 20.3% and 12.4% respectively as shown in figure 3.

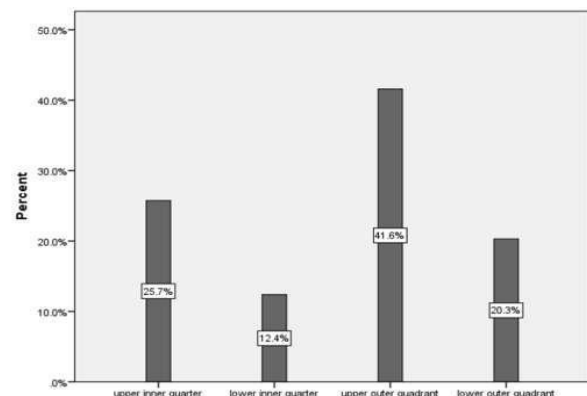


Figure 3. Distribution of fibroadenoma in the quarters of breast.

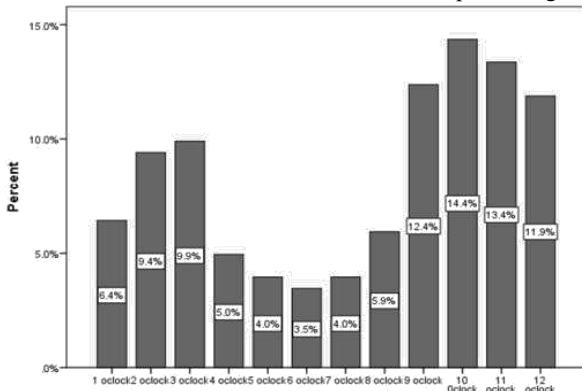
The distribution and frequency of fibroadenoma in different areas of breast as described by o'clock with common site is the 10 o'clock 14.4%, second site is 11 o'clock 13.4% and

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so on as presented in figure 4.

Figure 4. Site of fibroadenoma in o'clock position

The ultrasound features of fibroadenoma that seen in all cases we examine related to their shape, margin,



echogenicity, lobulation, calcification, posterior shadowing and BIRADIS categorization.

Regarding their shape, most of masses were oval 74.8% with 25.2 % reported rounded as seen in figure 5.

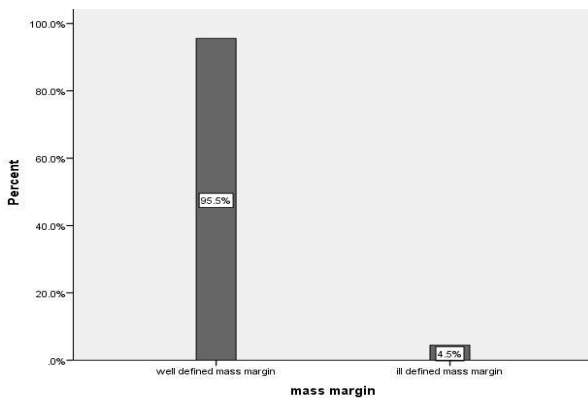


Figure 5. frequency according to fibroadenoma shape.

When assessed for the margin definition, 95.5% were reported as well-defined margin.

Ill-defined masses were reported in 4.5% of the cases.as shown in figure 6.

Figure 6. Distribution and frequency regarding margin definition.

Content assessment of the fibroadenoma show that 93.6% of cases were hypoechoic in the ultrasound assessment and 6.4% were hyperechoic in appearance as shown in figure 7.

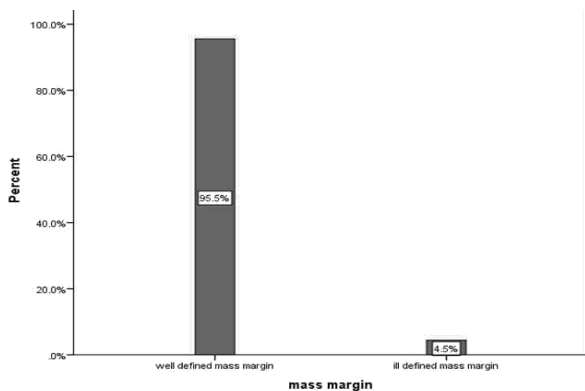


Figure 7. Distribution and frequency according to echogenicity of the masses.

Lobulated masses were reported in 20.8% of the cases while masses without lobulation 79.2% as shown in figure 8.

Figure 8. Distribution and frequency according to echogenicity of the masses.

Calcification seen in 6.4% while masses without calcification reported in 93.6% as shown in figure 9.

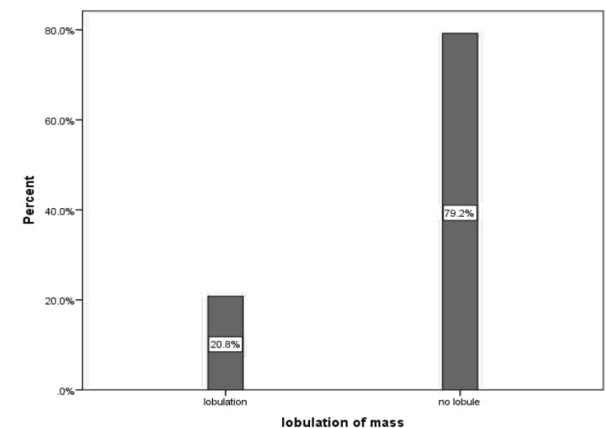
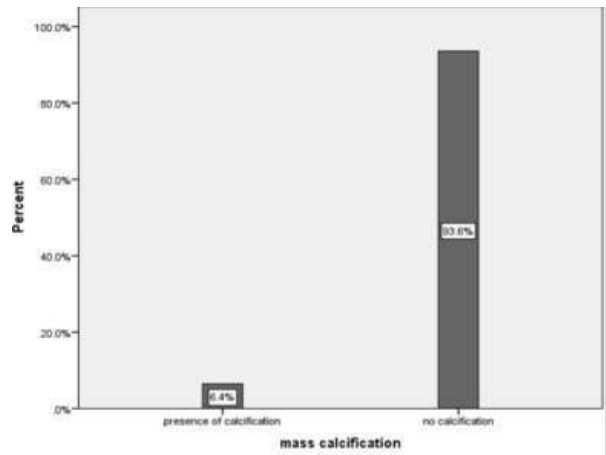


Figure 9. Distribution and frequency according to presence of calcification in the masses.

Posterior shadowing seen in 1.5% of cases while 98.5% have no shadowing as shown in figure 10.

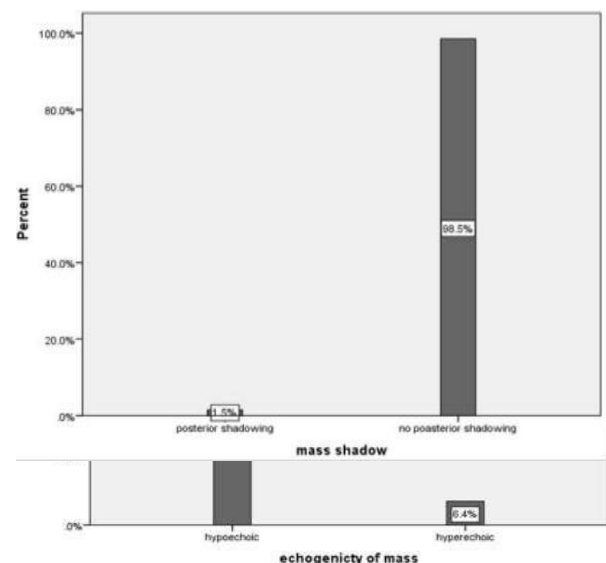


Figure 10. Distribution and frequency according to presence

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of posterior shadowing with the masses.

Homogenous appearance of masses seen in 93.1% while heterogenic appearance seen in 6.9% as shown in figure 11.

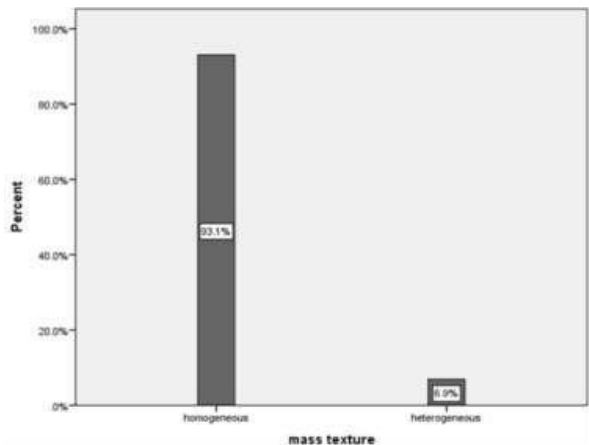


Figure 11. Distribution and frequency according to homogenous and heterogeneous appearance of the masses.

When assessed for the BIRADS categorization, 72.8% of the masses were disturbed as 4a class. 25.7% and 1.5% of the masses were categorized as 4b and 4c, respectively as shown in figure 12.

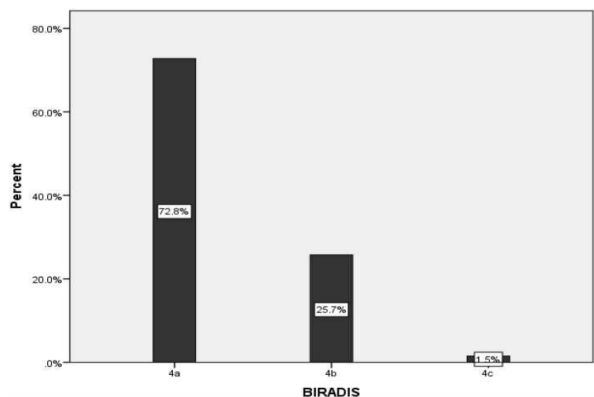


Figure 12. Distribution and frequency according to BIRADS categories.

Some example of fibroadenoma from our work see Fig 13, 14 and 15.

Figure 13. A 22-year-old female with fibroadenoma.

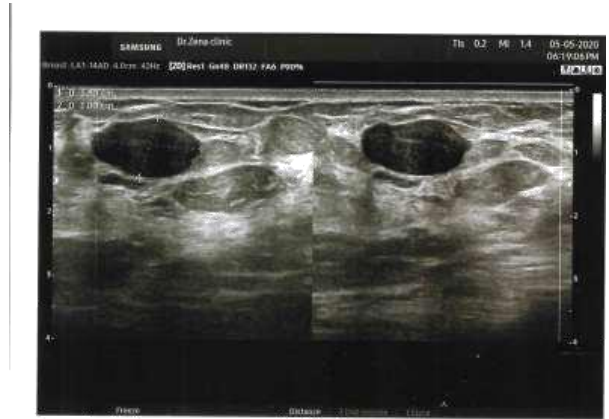
Figure 13. A 32 years old female with fibroadenoma.

Figure 14. A 20-year-old female with fibroadenoma.

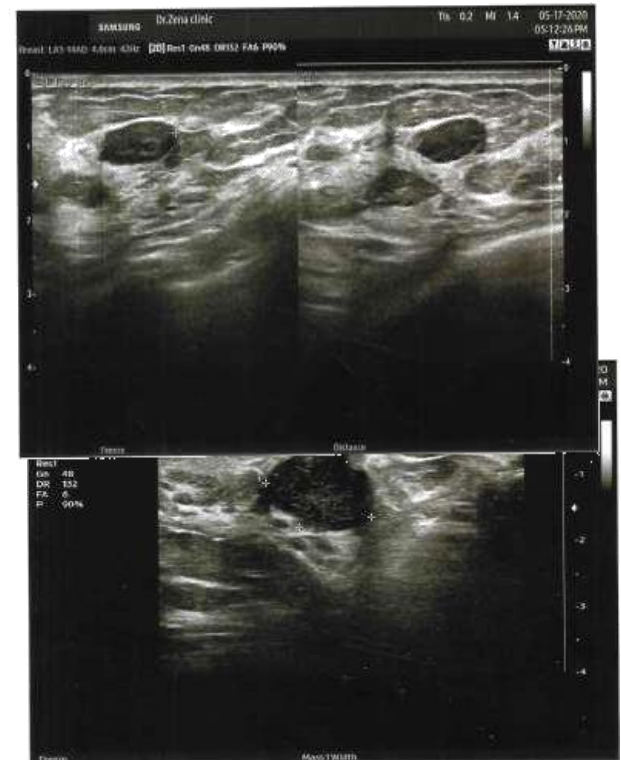
Discussion

Breast masses are frequent presentation of possible breast cancers, mainly in women, many researches are concern with this aspect and trying to apply a new estimation for screening to achieve fast and safe finding of underlying cause.(Malur, Wurdinger et al. 2000)So, we assessed the ultrasound features of fibroadenoma for description the most common findings of these masses. Fibroadenoma diagnosis clinically does not rule out malignancies.(Houssami, Cheung et al. 2001) In young patients diagnosis by ultrasound and in older patient using both ultrasound and mammogram gives additional suggestion for a more accurate diagnosis; though, there are some reports that show features overlap with other diagnosis.(Malur, Wurdinger et al. 2000),(Devolli-Disha, Manxhuka-Kërliu et al. 2009)Fibroadenoma is commonly

seen as oval or rounded mass with regular well define



margins ,appear either hypoechoic or hyperechoic or isoechoic masses. Fibroadenoma mostly surrounded by a thin layer of echogenicity which present because of compression on normal breast tissue; so any thickening of this region surrounded it may rise the possibility of a malignant pathology.(Fornage, Lorigan et al. 1989),(Jackson, Rothschild et al. 1986). “Smith and Burrows” show in their work that there was no differences in the diagnosis between ultrasound and histopathological study for fibroadenoma; so, it is not recommended to study all cases through biopsy except if they have any extra changes in the patients’ history or in the physical examination .(Fornage, Lorigan et al.1989),(Smith and Burrows 2008). As we know that fibroadenoma most commonly seen in young female, their occurrence is still expected to the menopausal years. Most cases of fibroadenoma are benign, but there are many aspects should rise the possibility of other diagnosis, like older age, positive familial history for breast cancer, micro calcifications, multiple masses and heterogenicity. The most common differential diagnosis for these cases are complicated cyst, fibromyxoid , cystosarcoma, phyllodes



tumors, and breast malignancies.(Wirtzfeld, Nam et al. 2013),(Gatta, Iaselli et al. 2011). In our work, all of the 202 patients involved had pathological report of benign lesion and

were grouped as a variants of category 4 on the BIRADS scale. These result are similar to study done by Adibi et al.2017 (Namazi, Adibi et al. 2017)This is reinforced by the works that only a few percent of the females with proved diagnosis of fibroadenoma may show some appearances of a malignant tumor. In our study as in other works the usual site of masses in the upper outer quadrant of the breasts as shown in Figure 3, and as seen in previous studies and in our study that the size of fibroadenoma less likely exceeds 3 cm. Regarding the ultrasound features we see in our study that are similar to the literature results . The shape of the most cases was oval, with majority have well-defined margin, most of them are hypoechoic, no regional lymphadenopathy seen in all cases and no recurrence seen in the follow-up.

Conclusion

Fibroadenoma show a wide range of ultrasound features that are reliable with benign mass. Most commonly seen features involved an oval shape hypo echoic mass with a well-defined border; but complex features that have similarity with malignant masses like calcification and heterogeneous appearance are also visible.

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