

Study of Breast Lump Using Ultrasonography

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Abstract: *This study was aimed to characterize the breast lump in ultrasound images in order to find out the most common causes of these lumps. A descriptive study was carried out in 80 patients with positive breast lumps with physical examination, the data collected contain all the features that used to diagnose the breast lump. Findings in breast ultrasound of this study consist of simple cyst, ductal carcinoma, duct ectasia, fibroadenoma, fibrocystic changes, galactocyst, hematoma, lobular carcinoma, and lipoma as follows (17.5%, 17.5%, 2.5%, 38.8%, 7.5%, 1.3%, 1.3%, 3.8%, 10%) respectively.*

Keywords: Fibroadenoma, Breast Ultrasound, Breast Cyst, Tumor

1. Introduction

The breast is a modified sweat gland that is composed of 15 to 20 lobes that are not well delineated from each other that overlap, and that vary greatly in size and distribution. Each lobe consists of parenchymal elements (lobular duct, smaller branch ducts, and lobules) and supporting stromal tissues (compact interlobular stromal fibrous tissue, loose periductal and intralobular stromal fibrous tissue, and fat). The functional unit of the breast is the terminal ductolobular unit (TDLU), which consists of a lobule and its extralobular terminal duct. Each lobule consists of the intralobular segment of the terminal duct, ductules, and loose intralobular stromal fibrous tissue. TDLUs are important because they are the site of origin of most breast pathology and of aberrations of normal development and involution (ANDIs). Most breast carcinomas are thought to arise in the terminal duct near the junction of the intralobular and extralobular segments. Lobular ducts give rise to much less pathology than do TDLUs—mainly large duct papillomas and the duct ectasia-periductal mastitis complex. However, most invasive ductal carcinomas have ductal carcinoma in situ components that can use the ductal system as conduits for growth into other parts of the breast. Each segmental duct has several rows of TDLUs arising from it. Anterior TDLUs tend to have long extralobular terminal ducts, whereas posterior TDLUs tend to have shorter extralobular terminal ducts. Some TDLUs lie at the distal end of the ductal system and are horizontally oriented. Anterior TDLUs are more numerous than posterior and terminal TDLUs, and over time, the posterior TDLUs tend to regress, leaving a progressively larger percentage of anterior TDLUs. Because anterior TDLUs greatly outnumber posterior TDLUs, most breast pathology that arises from TDLUs occurs in the superficial half of the mammary zone, just deep to the anterior mammary fascia. Rumack et al. (2011).

The vast majority of the lesions that occur in the breast are benign. Much concern is given to malignant lesions of the breast because breast cancer is the most common malignancy in women in Western countries, Caleffi, et al. (2001). The term “benign breast diseases” encompasses a heterogeneous group of lesions that may present a wide range of symptoms or may be detected as incidental microscopic findings. Vecchia and Parazzini, (1985). Fibrocystic changes (FCCs)

constitute the most frequent benign disorder of the breast. Such changes generally affect premenopausal women between 20 and 50 years of age. Although many other names have been used to describe this entity over the years, (including fibrocystic disease, cystic mastopathy, chronic cystic disease, mastoplasia, Reclus’s disease), the term “fibrocystic changes” is now preferred, because this process is observed clinically in up to 50% and histologically in 90% of women (Kinoshita, 2002). FCCs may be multifocal and bilateral. The most common presenting symptoms are breast pain and tender nodularities in breasts. Cysts are fluid-filled, round or ovoid structures that are found in as many as one third of women between 35 and 50 years old. Although most are subclinical “microcysts,” in about 20%–25% of cases, palpable (gross) cystic change, which generally presents as a simple cyst, is encountered (Houssami, 2005). Cysts cannot reliably be distinguished from solid masses by clinical breast examination or mammography; in these cases, ultrasonography and fine needle aspiration (FNA) cytology, which are highly accurate, are used. (Houssami, 2005).

2. Material and Method

A 80 patients with age range from (20-75) years were underwent successful breast ultrasound examination with Siemens ultrasound machines with high frequency linear 10 MHz probe is typically used to scan the breast, in which the main indication were Fibroadenoma, tumor and cyst where the other pathological problem was not a focus of this study. Same patient was underwent a mammographic study with diagnostic criteria that allow the diagnosis and interpretation of the images in order to find the most possible finding from the exam then these result was compared to each other using excel and SPSS program the data was then analyzed. This study was conducted in the period from January 2016 to May 2017 in Khartoum state diagnostic center.

The breast had been assessed into radial or anti/radial plane. Using a warm gel, examine the breast in a pattern in both transverse and para-sagittal plane. Overlap each scanning movement to ensure the whole breast is covered. The transducer is placed with the left margin on the nipple. The right margin is then pivoted about the nipple rotating in a clockwise direction. The right edge is moved onto the nipple and the left edge becomes the mobile part of the transducer.

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Using kvp range from 25-30kv and mAs range (12.5-18) the mammogram was performed with compression band to increase the sensitivity of lesion detection, both Craniocoudal and mediolateral oblique was performed for breast, breast tail, and axilla in continuity.

3. Results Presentation

Table 1: Showed the Cross Tabulation between the texture and posterior enhancement in US

	Posterior enhancement			Total
	enhancement	no	shadow	
Heterogeneous	0	7	13	24
Homogenous	42	14	0	56
Total	42	21	17	80

Table 2: Showed the frequency distribution of the echogenicity noted during US scan

Echogenicity	Frequency	Percent
anechoic	14	17.5
Hyperechoic	9	11.6
Hypoechoic	49	61.3
hypo/anechogenic	6	7.6
Hypo/hyper	2	2.5
Total	80	100.0

Table 3: Demostrate the presenace of psterior enhancement of the detected lesion

	Frequency	Percent
enhancement	42	52.5
no	21	26.3
shadow	17	21.3
Total	80	100.0

Table 4: Showed the lesion outlines

outline	Frequency	Percent
ill-defined	17	21.3
well	63	78.8
Total	80	100.0

Table 5: Showed the ultrasound finding of the breast

Diagnosis	Frequency	Percent
cyst	14	17.5
D. carcinoma	14	17.5
D. ecstasies	2	2.5
Fibro adenoma	31	38.8
F. cystic	6	7.5
glactocyle	1	1.3
hematoma	1	1.3
L. carcinoma	3	3.8
lipoma	8	10.0
Total	80	100.0

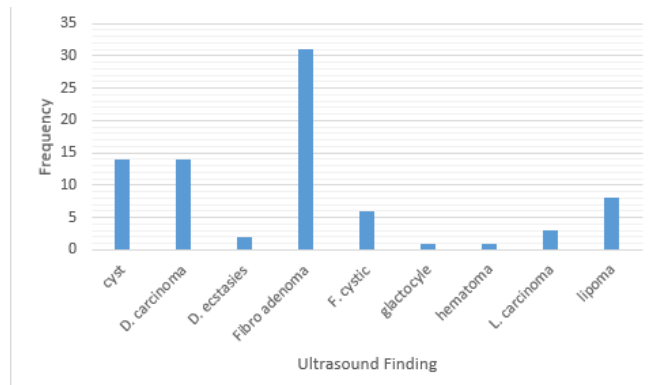


Figure 1: Showed the frequency distribution of the most common causes of breast lump according to US result

4. Discussion

This was descriptive study aimed to findout the distribution of the breast findning in ultrasound of breast in order to detect the most causes of breast lump and then another study was compare these finding to the mammography done for the same population. In which conducted in 80 patient with postative breast lump, in period from January 2016 to May 2017. In ultrasound on the important digontic criteria that used to differentiate the cytic lesion from the other was the precance of the acousic shadwing or enhancement posterior to the dtected lesion in which the cyst apper to have no enhancement but its associated with edge shadw in other hand the mass aper to have stornng hetrogenous posterior enhancement. Here 24 patient having hertrogenous apperance 7 with normal posteior ppearance and the rest was show shadowing in the back of the lesion. As in table (1). Table (3) The pattern of echotecture is one of the most important parameter in ultrasound to conferim the lesion daignosis here we present anechoic, hyperechogenic, hypoechogenic, and the rest was hertrogenous echogenicity as (17.5%, 11.6%, 61.3% respectively).

The cystic lesion tend to have an echoic echoetexture with some hemogenity due to fibrocystic changes and the mass in otherhand having hetrogenous illdefined texture. With posteroi enhancement. According to the result presented in table (5) il defined lesion noted in 21.3% of population, and 78.8% was well defined lesion a majoritty was begnin in nature.

Finding in breast ultrasound of this study was consist of simple cyst, ductal carcinoma, d. ectesia, fibroadenoma, Fibrocystic changes, glactocyle, hematoma, L.carcinoma, and lipoma as follow (17.5%, 17.5%, 2.5%, 38.8%, 7.5%, 1.3%, 1.3%, 3.8%, 10%) respectively. As in table (5).

Compared to the study done by mamon et al. 2017 the most affected quadrend was RUQ as stated that (Right breast quadrant there were 83 with no lesion (63.8%) 19 patient with RUOQ (14.6%) 3 patients with breast RUIQ percentage (2.3%) 13 patients(10%) patients with RLOQ and 12 patients (9.2%) in RLIQ (table 4- 14); Left breast quadrant there were 76 with no lesion (58.5%) 26 patient with LUOQ (20%) 5 patients with breast LUIQ percentage (3.8%) ,12 patients(9.2%) patients with LLOQ and 11 patients (8.5%)

in LLIQ.)

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