Benha Journal of Applied Sciences (BJAS) **print: ISSN 2356–9751**
Vol. (6) Issue (6) Part (2) (2021), (343-350) **online: ISSN 2356–976x**
http://bjas.journals.ekb.eg

Breast related axillary masses Sonographic and color Doppler characteristics

H.E.El-Sheikh, S.Z.Abdel Aziz and R.A.Hegazy
Diagnostic Radiology, Dept., Faculty of Medicine, Benha Univ., Benha, Egypt
E-mail: rana123@gmail.com

Abstract

Breast cancer screening and assessment of symptomatic and newly diagnosed breast cancer patients often encounter axillary adenopathy in diagnostic radiology practise. Axillary adenopathy may be caused by a wide range of disorders. Doctors who are familiar with normal and aberrant nodal morphology and the many causes of adenopathy are more equipped to make an appropriate diagnosis. US is the primary imaging modality for assessing axillary lymph nodes on mammograms, computed tomography (CT), and magnetic resonance imaging. All breast associated axillary masses were studied for their Sonographic and Color Doppler features. Methods: Patients with clinically suspected axillary edoema were enrolled in this investigation, which was conducted in a prospective manner. There was a medical history form completed for each of the participants in this research (Detailed history of the complaint - Results of the clinical examination- Any previous radiological or laboratory examination). The axilla and breast are examined using clinical, ultrasound, and colour Doppler techniques. Further imaging will correlate the results of the ultrasound. Both (Clinical examinations) were used to get the final diagnosis. - MRI. After a biopsy, there is a follow up. Results: Malignant lesions accounted for 35.9% of all related breast lesions, followed by fibroadenosis (25%), and fibrodenoma (9.4%). The most prevalent breast mass was a simple cyst in 3.1 percent of cases, followed by abcess, mastitis, fibrocystic disease, and an accessory breast. Age, marital status, pregnancy and breastfeeding, as well as HTN,DM,SLE, cardiac illness, and bronchial asthma, did not have a significant connection with axillary lesion identified by US, while, HTN,DM,SLE, cardiac disease, and bronchial asthma did. There was a substantial difference in the onset, course, and duration of illness between axillary lesions diagnosed by US. Diagnosis by ultrasound revealed considerable differences in the symptoms of axillary tumours in terms of pain, redness, and heat. US diagnosis of axillary lesions was not significantly different from trauma or discharge. Differences in the location, size, and shape of axillary lesions were found when axillary lesions were analysed by US. While a non-specific lymph node is more likely to be oval or rounded, a suspicious lymph node is more likely to be globular. A considerable discrepancy in the axillary lesions' vascularity and cortical thickness was found between those diagnosed by ultrasound and those by conventional imaging methods based on radiological parameters such as hilum, consistency, and echo pattern. Normal echopattern, solid firmness, normal surrounding parynchyma, and normal cortical thickness were seen in the nonspecific lymph node. Lt and both breasts were found to have soft consistency, form, (smooth, speculated, regular uneven) margins, and substantial ascocation with axillary lesion diagnosis in terms of clinical characteristics. Axillary breast lesions were not related with fibbroglandular lesions in terms of radiologic characteristics except in the cases where the fibboglandular lesions were found to be edametous or vascular. Hypoechoic, increased vascularity, BIRD grade IV, suspicious lymph node. When it came to diagnosing axillary lesions, the results of mammography were strikingly different. Dense speculatd or hypothesised mammography was linked to suspicious lymph nodes. A normal mammogram was found in 99.2 percent of cases of abscess and 97.2 percent of cases of non-specific lymph node. Axillary lesion diagnosis had a substantial effect on the improvement of patients. An axillary Doppler and US may identify axillary breast masses and have the same accuracy rate as mammography and biobsy.

Key words: Breast, axillary masses, Sonographic characteristics, color Doppler characteristics.

1. Introduction

The axilla includes many mesenchymal tissues such as fat , vascular , nerve , and lymph node , from which various illnesses might occur . These lesions include reactive lymphadenopathy , abscess originating in lymph node , granulomatous disease , lymphoma , lesions arising inside accessory breast (fibro adenoma , fat necrosis) (fibro adenoma , fat necrosis). [1] \sAccessory breast tissue in the axilla develops from failure of regression of primitive mammary tissue along the embryonic milk line. A palpable mass may grow with hormonal stimulation during menarche, pregnancy or nursing . Accessory breast tissue may give birth to the same issues as other breast tissue (including benign and malignant neoplasia, and infective, inflammatory illness) since it is impacted by the physiological changes. (2)\sMany additional pathologic diseases in addition to lymph node enlargement may show as axillary masses. Awarness of the range of various illness types and features Sonographic findings may assist in proper diagnostic of an axillary tumour . The use of colour Doppler sonography and correlation of Sonographic results with the characteristics of other imaging modalities , including mammography ,CT ,MRI ,may offer information about the connection between the mass and nearby structures and provide typical findings for certain malignancies. [3]

Axillary ultrasonography is more likely to identify an aberrant node if there is a metastatic nodal tumour load of at least 20 percent and morphological hallmarks of increased cortical thickness and loss of hyper echoic hilum. Axillary ultrasonography may be more effective in preoperative evaluation of big primary tumours that are stage T3 or above. Cancer breast is the most

frequent cancer in females and having one of the highest rates from cancer globally in them as well [4].

The purpose of this research was to analyse the Sonographic and colour Doppler features of distinct breast associated axillary tumours.

2. Patients and Methods

The present study was a prospective controlled study.

Population of study & disease condition:

The study included 60 patients presented with axillary swelling suspected to be related to the breast . ,

The study included 60 patients ages range from 24 years to 58 years , mean age was around thirty and all patients were female.

Inclusion criteria:

Patient with axillary mass related to breast confirmed on Sonographic examination.

Exclusion criteria:

- Patient whose ultrasound revealed mass not related to breast
- Patient unwilling to participate in the study.

Methods:

Medical history will be taken in the form of:

- Detailed history of the complaint.
- Results of the clinical examination.
- Any previous radiological or laboratory examination.

The patients undergo clinical, ultrasound, and color Doppler examination for the axilla and breast.

Ultrasound findings were correlated by further imaging. Final diagnose will be based on either:

- Clinical examination.
- Biopsy.
- Follow up.

Ultrasonography:

Transducer:

Highest frequency curved linear array probe possible. Start with 7MHz and work down to 2 or 3MHz for larger patients.Colour and Doppler capabilities.

Ultrasound machine:

logic GE P5 machine.

Doppler: color Doppler & power Doppler imaging criteria are used for evaluation and assessment.

Position of the patient:

Proper patient positioning is important to facilitate proper imaging. The patient is placed in an anterior oblique position and positioning a wedge pillow for support under the ipsilateral shoulder, with the patient's arm placed over the head. This allows the base of the pyramid, along which the US probe will slide, to be parallel to the floor. The anterior and posterior axillary folds are then identified figure (1) and are used as landmarks during imaging to demarcate the anterior and posterior walls of the axilla.

The following steps are suggested as a systematic approach to imaging the axilla and ensuring that the entire axilla is evaluated:

- Identify the inferior aspect of the anterior axillary fold and use this as the starting point for transverse image acquisition. The lateral edge of the pectoralis major muscle will make up the medial side of the image, and the axillary contents will be lateral.
- Advance the probe along the edge of the pectoralis major muscle until the humeral head is seen.
- Shift the probe toward the posterior axillary fold and again sweep from inferior to superior to reach the humeral head. Repeat this process until the entire axilla is imaged (generally two or three passes is sufficient). The final pass should be along the posterior axillary fold, with the lateral edge of the latissimus dorsi or teres major muscle making up the lateral margin of the image.
- A similar approach is taken with longitudinal images. Sweep the probe from the anterior axillary fold to the posterior axillary fold, and move the probe superiorly until the entire axilla is imaged.

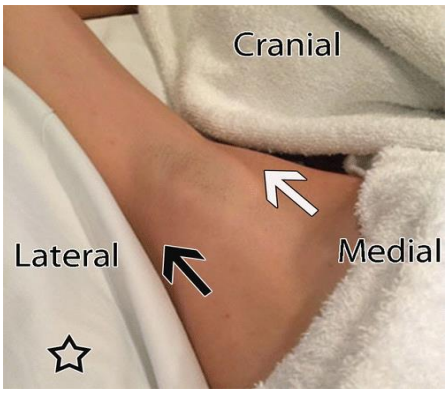

Fig. (1) Photograph shows suggested patient positioning for axillary US.

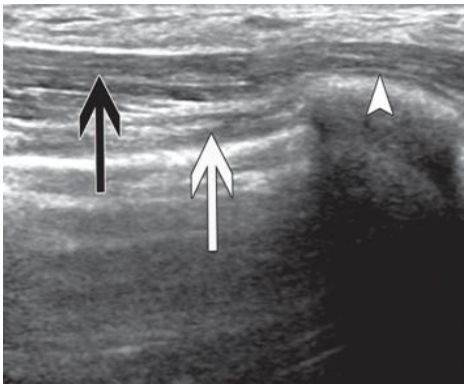

Fig 2: Photograph **(a)** and gray-scale US image **(b)** show the suggested starting position for long-axis

axillary US. Note that the probe lies against the anterior axillary fold in **a**. In **b**, the pectoralis major muscle (black arrow) and underlying rib (arrowhead) and intercostal muscles (white arrow) are seen.
Finally, identify the axillary neurovascular structures, specifically the axillary vein and artery, which will be visible at the apex of the axilla as they pass by the humeral head. The axillary vein can be distinguished from the axillary artery by its more superficial location and its compressibility with manual pressure; furthermore, Doppler imaging will demonstrate blood flowing toward (vein) or away from (artery) the thorax. Branches of the brachial plexus run adjacent to the axillary vessels.

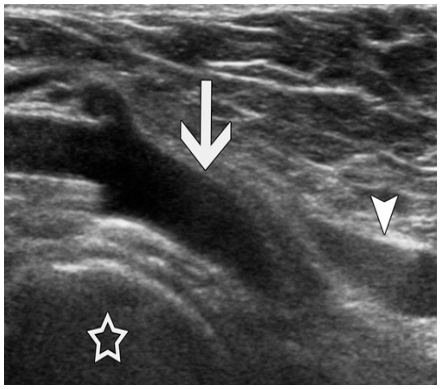

Fig. (3) Gray-scale US image shows the axillary artery (arrow) and vein (arrowhead) as they travel over the humeral head (☆). The accompanying nerves are not well seen but travel adjacent to the axillary vessels. Identification of these structures during procedural planning may help avoid neurovascular injury.

3. Results

Table (1) Diagnosis of axillary lesions by US.

			Cases N=93	
Non specific	**Non specific**	**N, %**	6	6.5%
	reactive LN	**N, %**	31	33.3%
	inflammatory LN	**N, %**	3	3.2%
Suspicious LN	**suspicious LN**	**N, %**	18	19.4%
	intermediate	**N, %**	6	6.5%
	atypical LN	**N, %**	4	4.3%
lipoma		**N, %**	4	4.3%
Abscess		**N, %**	4	4.3%
Accessory breast		**N, %**	16	17.2%
fibroadenoma		**N, %**	1	1.1%

The most common axillay lesion was non specific LN mostly reactive 33.3% followed by suspicious lymph node. And axillary breast occur in 17.2% of cases. Lipoma, abcess and fibroadenoma were the least axillary lesion 4.3-4.3-1.1 respectively.

Table (2) Comparison of clinical features of axillary lesions according to axillary lesions diagnosis by US.

			Non specific N=40		suspicious LN N=28		lipoma N=4		abscess N=4		accessory breast 16		fibroad enoma N=1	p
Site	left axilla	N, %	3	7.5%	15	53.6%	1	25%	2	50%	2	12.5%	0	<0.001
	right axilla	N, %	7	17.5%	12	42.9%	3	75%	2	50%	3	18.8%	1	0.023
	both axilla	N, %	30	75%	1	3.6%	0	0%	0	0%	11	68.8%	0	<0.001
Shape	Rounded	N, %	1	2.5%	12	42.9%	4	100%	1	25%	10	62.5%	1	<0.001
	oval	N, %	39	97.5%	2	7.1%	0	0%	3	75%	6	37.5%	0	<0.001
	Globular	N, %	0	0%	14	50%	0	0%	0	0%	0	0.0%	0	<0.001
Size (mm)		mean ±SD	10.3	3.1	16.7	4.1	22	5.4	23.5	6.3	31.8	9.9	20	<0.001

Categorical data are compared using chi square or Fisher exact tests, numerical data are compared using ANOVA. Site, size and ahape of axillary lesions showed significant association with axillary lesions diagnosis by US.

Table (3) Comparison of radiologic features of axillary LN according to axillary lesions diagnosis by US.

		Non specific 40		suspicious LN 28		lipoma 4		abscess 4		accessory breast 16		fibroadenoma 1	p
		N	%	N	%	N	%	N	%	N	%	N	
hilum	NA	0	0.0%	0	0.0%	0	0%	4	100%	16	100%	1	-
	Preserved	40	100.0%	4	14.3%	0	0%	0	0%	0	0%	0	**<0.001**
	faint	0	0.0%	15	53.6%	1	25%	0	0%	0	0%	0	**<0.001**
	Distorted	0	0.0%	9	32.1%	3	75%	0	0%	0	0%	0	**<0.001**
consistency	Soft	0	0.0%	0	0.0%	3	75%	0	0%	15	93.8%	0	**<0.001**
	firm	40	100.0%	28	100.0%	1	25%	4	100%	1	6.3%	1	**<0.001**
echo pattern	Normal	40	100.0%	4	14.3%	0	0.0%	0	0.0%	0	0%	0	**<0.001**
	hypoechoic	0	0.0%	23	82.1%	4	100.0%	0	0.0%	0	0%	1	**<0.001**
	hyperchoic	0	0.0%	0	0%	0	0%	4	100.0%	0	0%	0	**<0.001**
	disturbed echogenicity	0	0.0%	1	3.6%	0	0%	0	0.0%	0	0%	0	0.799
	Isoechoic breast	0	0.0%	0	0%	0	0%	0	0.0%	16	100%	0	**<0.001**
Surrounding	Normal	40	100%	28	100%	0	0%	4	100.0%	16	100%	1	**<0.001**
parenchyma	inflamed	0	0%	0	0%	4	100%	0	0%	0	0%	0	**<0.001**
Vascularity	Increased	1	2.5%	0	0%	4	100%	0	0%	0	0%	٠	**<0.001**
Cortical	Normal	39	97.5%	1	3.6%	0	0%	0	0%	0	0%	0	**<0.001**
thickness	increased	1	2.5%	27	96.4%	3	75.0%	0	0%	0	0%	0	**<0.001**
	NA	0	0.0%	0	0.0%	1	25.0%	4	100%	16	100%	1	**<0.001**

Categorical data are compared using chi square or Fisher exact tests.

As regard radiological features hilum, consistency, echo pattern, Surrounding parenchyma, Vascularity and Cortical thickness showed significant association with axillary lesions diagnosis by US.

Table (4) Association of radiologic features of associated breast lesions with axillary lesion diagnoses.

		Non specific N=36		suspicious LN N=25		abscess N=3		p
		N	%	N	%	N	%	
Fibro glandular	Normal	21	58.3%	0	0%	0	0.0%	**<0.001**
	Increased	11	30.6%	1	4%	3	100.0%	**<0.001**
	distorted	0	0.0%	17	68%	0	0.0%	**<0.001**
	edematous	4	11.1%	2	8%	0	0.0%	0.781
	infiltrated	0	0.0%	5	20%	0	0.0%	**0.014**
Echo pattern	anechoic	7	19.4%	0	0%	0	0.0%	**0.047**
	hypo	11	30.6%	24	96.0%	0	0.0%	**<0.001**
	hyper	15	41.7%	1	4.0%	3	100.0%	**<0.001**
	Same as breast	3	8.3%	0	0.0%	0	0.0%	0.294
Vascul.br	Normal	31	86.1%	1	4.0%	3	100.0%	**<0.001**

	Increased	5	13.9%	24	96.0%	0	0.0%	**<0.001**
BIRAD	**II**	24	66.7%	1	4.0%	3	100.0%	**<0.001**
	III	12	33.3%	1	4.0%	0	0.0%	**0.013**
	IV	0	0.0%	23	92.0%	0	0.0%	**<0.001**

Categorical data are compared using chi square or Fisher exact tests.

As regard radiologic features of associated breast lesions fibbroglandular except edametous, vascular, BIRD,echopattern showed significant association with axillary lesion diagnoses.

Table (5) Mammography results of associated breast lesions.

		Cases N=64	
mammography	**No**	43	67.2%
	speculated	6	9.4%
	dense speculated	15	23.4%

As regard mammography most cases had no mammography, dense speculated in 23.4% of cases and speculated in 9.4%

Table (6) Association of biopsy of breast lesions with axillary lesion diagnoses.

	Non specific N=7		**suspicious LN N=22**		**p**
	N	**%**	**N**	**%**	
fibroadenosis	4	57.1%	0	0%	**<0.001**
fibroadenoma	2	28.6%	0	0%	**0.009**
malignancy	0	0%	5	22.7%	0.166
mammary carcinoma	0	0%	3	13.6%	0.302
invasive duct caricinoma	0	0%	4	18.2%	0.224
DCIS	0	0%	10	45.5%	**0.028**
fat necrosis	1	14.3%	0	0%	0.071

Categorical data are compared using chi square or Fisher exact tests.

As regard biobsy of the breast fibroadenosis, fibroadenoma and DCIS showed significant association with axillary lesion diagnoses

Table (7) Association of features of cases with axillary lesions diagnosed by US.

		Non specific N=40		**suspicious LN N=28**		**abscess N=4**		**lipoma N=4**		**accessory breast 16**		**fibro adenoma N=1**	**p**
Age (years)	mean±SD	29.4	4.37	48	8.8	24.2	5.2	30.2	3.8	30.1	5.1	31	<0.001
Marriage	N, %	25	62.5%	28	100%	1	25%	3	75%	13	81.3%	1	<0.001
Pregnancy	N, %	24	60%	28	100%	1	25%	3	75%	13	81.3%	1	<0.001
Lactation	N, %	23	57.5%	28	100%	1	25%	3	75%	13	81.3%	1	<0.001
Hypertension	N, %	0	0%	5	17.9%	0	0%	0	0%	1	6.3%	0	0.094
DM	N, %	1	2.5%	4	14.3%	0	0%	0	0%	0	0%	0	0.249
Cardiac	N, %	0	0%	3	10.7%	0	0%	0	0%	0	0%	0	0.190
Bronchial asthma	N, %	0	0%	1	3.6%	0	0%	0	0%	1	6.3%	0	0.668
SLE	N, %	1	2.5%	0	0%	0	0%	0	0%	0	0%	0	0.889

Categorical data are compared using chi square or Fisher exact tests, numerical data are compared using ANOVA. Age , mrrital state , pregnancy and lactation showed significant association with axillary lesion diagnosed by US while , HTN,DM,SLE, cardiac disease and bronchial asthma showed no significant association with axillary lesion diagnosed by US.

Table (8) Comparison of clinical presentation according to axillary lesions diagnosis by US.

	Non specific N=40		**suspicious LN N=28**		**lipoma N=4**		**abscess N=4**		**accessory breast 16**		**fibro adenoma N=1**	**p**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	
Swelling	15	37.5%	26	92.9%	4	100%	4	100%	9	56.3%	1	**<0.001**
Screening	13	32.5%	0	0%	0	0%	0	0%	7	43.8%	0	**<0.001**
Pain	12	30.0%	2	7.1%	0	0%	0	0%	0	0%	0	**<0.001**

Categorical data are compared using chi square or Fisher exact tests.

Swelling, screening and pain showed significant association with axillary lesions diagnosed by US.

Table (9) Comparison of onset, course and duration according to axillary lesions diagnosis by US.

		Non specific N=40		suspicious LN N=28		lipoma N=4		abscess N=4		accessory breast 16		fibro adenoma N=1	p
		N	%	N	%	N	%	N	%	N	%	N	
Onset	**Insidious**	20	50%	18	64.3%	0	0%	0	0%	15	93.8%	1	**<0.001**
	Progressive	20	50%	10	35.7%	4	100%	4	100%	1	6.3%	0	**<0.001**
Course	**Stationary**	26	65%	13	46.4%	0	0%	4	100%	14	87.5%	0	**<0.001**
	Progressive	14	35%	15	53.6%	4	100%	0	0%	2	12.5%	1	**<0.001**
Duration	**Days**	19	47.5%	5	17.9%	4	100%	2	50%	0	0%	0	**<0.001**
	Weeks	6	15%	20	71.4%	0	0%	1	25%	1	6.3%	1	**<0.001**
	Months	12	30%	3	10.7%	0	0%	1	25%	1	6.3%	0	**<0.001**
	Years	3	7.5%	0	0%	0	0%	0	0%	14	87.5%	0	**<0.001**

Categorical data are compared using chi square or Fisher exact tests.

Onset, course, duration of the disease showed significant association with axillary lesions diagnosis by US.

Table (10) Comparison of clinical presentation according to axillary lesions diagnosis by US.

		Non specific N=40		suspicious LN N=28		lipoma N=4		abscess N=4		accessory breast 16		fibro adenoma N=1	p
		N	%	N	%	N	%	N	%	N	%	N	
Pain		21	52.5%	10	35.7%	4	100%	0	0%	0	0%	1	**<0.001**
Redness		4	10%	1	3.6%	4	100%	0	0%	0	0%	0	**<0.001**
Hotness		4	10%	1	3.6%	4	100%	0	0%	0	0%	0	**<0.001**
Trauma		1	2.5%	0	0.0%	0	0%	0	0%	0	0%	0	0.931
Discharge	**No**	31	77.5%	24	85.7%	4	100%	4	100%	16	100%	1	0.262
	lactating	4	10%	0	0%	0	0%	0	0%	0	0%	0	0.354
	dark yellow	4	10%	0	0%	0	0%	0	0%	0	0%	0	0.354
	brownish	1	2.5%	4	14.3%	0	0%	0	0%	0	0%	0	0.266

Categorical data are compared using chi square or Fisher exact tests.

Pain, redness, hotness showed significant association with axillary lesions diagnosis by US. While trauma and discharge showed no significant association with axillary lesions diagnosis by US.

4. Discussion

The most prevalent axillary lesion in this research was a nonspecific lymph node that was largely reactive (33.3%), followed by a suspicious lymph node and an axillary breast. The least common axillary lesions were a lipoma, an abscess, and a fibroadenoma, in that order (4.3-4.3-1.1).

Reactive lymphadenitis, lipoma, and metastatic lymphadenopathy were the most prevalent cytological diagnoses, according to Dey and Sinha, [5]. Two occurrences of schwannoma, a cancer of the axillary area that is very uncommon, were found. Pilomatrixoma is uncommon in this area, as well; one instance was reported.

Breast cancer patients who had ultrasound prior to surgery for preoperative staging were often used as subjects for significant research on axillary ultrasound effectiveness in nodal disease diagnosis [6]. The results of these research led to the development of numerous criteria for identifying worrisome lymph nodes and recommending a biopsy in such cases. Radial lymph node diameter, rounding of the node, hypoechogenicity of the cortex, eccentric thickness of the cortex, eccentric compression of the mediastinum, and aberrant vascularity are some of the signs to look out for [7].

The location, size, and form of axillary lesions differed significantly between axillary lesions diagnosed by US in this investigation. Non-specific lymph nodes are more often oval or rounded than suspicious ones. When comparing axillary lesions diagnosed by ultrasound using hilum, consistency, echo pattern, surrounding parenchyma, vascularity, and cortical thickness as radiological parameters, there were significant differences. This non-specific lymph node came up Normal echopattern, normal surrounding parynchyma, normal cortical thickness, and a preserved hilum are all signs of a healthy brain, according to this study. Blood vessels in the suspicious lymph node were found to be enlarged in BIRD grade IV. The majority of cases of malignant breast tumour are linked to a suspicious lymph node.

A typical axillary LN should be oval in shape with a smooth, well-defined edge, and our observation was in line with that. If the cortex is less than 3 millimetres thick, it should be mildly hypoechoic and consistently thin. Nodal metastases may be detected by suspicious US features such as focal cortical bulging or eccentric

cortical thickening, round hypoechoic LN, fatty hilum effacement, and total or partial replacement of LN with an ill-defined or irregular mass [8]. Preoperative breast cancer patients with thickened axillary lymph nodes had a higher incidence of malignancy compared to those with thinner nodes, according to a study published in the Journal of Clinical Pathology. Undefined borders, node matting and perinodal edoema on sonograms indicate the presence of extranodal extension, a risk factor for both death and recurrence [9].

Raffaele and coworkers [10] All measurements of size were considerably greater as compared to contralateral normal ALNs among the lymph nodes indicated on the clinical MRI interpretation as suspicious and eventually pathology-proven malignant.

Mammography is the imaging modality of choice for the detection of breast disease. Because the majority of the axilla is pushed out of the picture field during mammography, only the lowest portion of the axilla may be seen. Preoperative lymph node involvement may be assessed using ultrasound, a simple diagnostic that is often utilised [11].

According to the results of this research, dense speculative mamography was performed in 23.4% of instances and speculated mamography was performed in 9.4% of cases. Pathology, mammography, and axillary ultrasound all showed comparable lymph node characteristics. The diagnosis of an axillary lesion differed significantly from what was shown on mammography. There was an association between dense speculative or hypothesised mammography and a suspicious lymph node. Normal mammography was connected with 100% of abscesses and 97.2 percent of non-specific lymph nodes.

Fibroadenomas and ductal carcinoma in situ have a substantial correlation with non-specific axillary lesion diagnoses, whereas suspicious axillary lesion diagnoses have a significant correlation with fibroadenomas. The accuracy of axillary ultrasound in detecting axillary lymph node metastases was equivalent to that of breast mammography or biopsy.

With these findings, Alvarez et al. [12] concluded that ultrasound is moderately sensitive and reasonably specific in the detection of axillary metastatic involvement.

According to Hu et al., [13] combined US/FNAB had a high accuracy rate and a satisfying outcome because they were less expensive and easier to determine the status of axillary lymph nodes.

Lymph node metastases were also observed in 10 women with DCIS and invasion, according to Meijnen et al. [14]

According to the results of this study, age, marital status, pregnancy and lactation were found to be significant factors in diagnosing axillary lesions by US, while HTN, DM, SLE, cardiac disease and bronchial asthma were found to have no significant association with axillary lesions diagnosed by US.

US-diagnosed axillary lesions differed significantly in terms of swelling, screening, and discomfort.

There were substantial differences in the axillary lesions diagnosed by ultrasound in terms of their onset, course, and persistence.

There was a substantial difference in the axillary lesions diagnosed by ultrasound in terms of pain, redness, and heat. However, there was no significant difference between the axillary lesions diagnosed by ultrasound after the incident and after the patient was discharged.

5. Conclusion

Mammograms and biopsies have a high probability of false positives, however Axillary Doppler and US may be utilised to identify axillary-related breast masses.

References

[1] J. K.An, K. K.Oh, and W. H. Jung, "Soft-tissue axillary masses (excluding metastases from breast cancer): Sonographic appearances and correlative imaging." Journal of Clinical Ultrasound.vol.33(6),pp.288-297,2005.

[2] Y.Song, J.Zhang, Z.Liu. Periclitoral accessory breast tissue in a lactating woman: A case report. *Medicine (Baltimore)*.vol.97(43),pp.129-136,2018.

[3] S. J. Kim, and Y. M.Park."Clinical importance and sonographic features of nonpalpable axillary lymphadenopathy identified on breast sonography in patients without malignancy." Journal of Ultrasound in Medicine.vol.34(12),pp.2193-2202,2015.

[4] Y.Lee, S. E.Song, E.-S.Yoon. "Extensive silicone lymphadenopathy after breast implant insertion mimicking malignant lymphadenopathy." Annals of surgical treatment and research .vol.93(6),pp.331-335,2017.

[5] A.Dey, RTK.Sinha Clinicopathological correlation of axillary masses – Importance of fine needle aspiration cytology as a diagnostic modality. J Med Sci Health.vol.3(1),pp.30-40, 2017.

[6] J.Jung, H.Park, J.Park, and H.Kim. "Accuracy of preoperative ultrasound and ultrasound-guided fine needle aspiration cytology for axillary staging in breast cancer." ANZ journal of surgery.vol.80(4),pp.271-275,2010.

[7] A. T. Stavros. Breast ultrasound, Lippincott Williams & Wilkins.vol.15,pp.155-160,2004.

[8] J. S.Ecanow, H.Abe, G. M.Newstead, D. B.Ecanow, and J. M.Jeske. "Axillary staging of breast cancer: what the radiologist should know." Radiographics.vol.33(6),pp.1589-1612, 2013.

[9] A.Nottegar, N.Veronese, M.Senthil, R. M.Roumen, B.Stubbs, A. H.Choi. "Extra-nodal extension of sentinel lymph node metastasis is a marker of poor prognosis in breast cancer

patients: a systematic review and an exploratory meta-analysis." European Journal of Surgical Oncology (EJSO).vol.42(7),pp.919-925,2016.

[10] H.Rahbar, J. L.Conlin, S.Parsian, W. B.DeMartini, S.Peacock, C. D.Lehman ."Suspicious axillary lymph nodes identified on clinical breast MRI in patients newly diagnosed with breast cancer: can quantitative features improve discrimination of malignant from benign?" Academic radiology.vol22(4),pp.430-438,2015.

[11] A.Khan, I.Masroor, K.Khandwala, S.-U.-N. Abbasi, and M. U. Tariq . "Utility of Ultrasound and Mammography in Detection of Negative Axillary Nodal Metastasis in Breast Cancer." Cureus.vol.12(1),pp.6691-6691,2020.

[12] S.Alvarez, E.Añorbe, P.Alcorta, F.López, I.Alonso, and J.Cortés . "Role of Sonography in the Diagnosis of Axillary Lymph Node Metastases in Breast Cancer: A Systematic Review." American Journal of Roentgenology.vol.186(5),pp.1342-1348,2006.

[13] X.Hu, X.Zhou, H.Yang, W.Wei, Y.Jiang, and J.Liu . "Axillary ultrasound and fine needle aspiration biopsy in the preoperative diagnosis of axillary metastases in early-stage breast cancer." Oncol Lett.vol.15(6),pp.8477-8483,2018.

[14] P.Meijnen, H. S.Oldenburg, C. E.Loo, O. E.Nieweg, J. L. Peterse, and E. J. Rutgers. "Risk of invasion and axillary lymph node metastasis in ductal carcinoma in situ diagnosed by core-needle biopsy." Br J Surg.vol.94(8),pp.952-956,2007.