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STUDY TO DETERMINE THE EFFICACY OF ULTRASOUND-GUIDED CORE NEEDLE BIOPSY FOR DIAGNOSIS OF BREAST CANCER

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Abstract:

Aim: *To evaluate the effectiveness of USG guided core needle biopsy (US-CNB) as a preoperative diagnostic method of breast cancer.*

Study Design and duration: *This prospective cross-sectional study was held on 93 patients with ultrasound detection of breast lumps at the Department of Pathology and Surgery department of Bahawal Victoria Hospital (BVH) Bahawalpur for one-year duration from June 2019 to June 2020.*

Patients:

Methods: *A total of 93 women with solid and / or indirect changes in the breasts visualized on ultrasound were included. Apart from clinical treatment, all the above-mentioned patients underwent US-guided core-needle biopsy and excision of the lesions in the breasts. Then, the histopathological diagnosis of US guided core needle biopsy was compared with the results of excision biopsy.*

Results: *Of all 93 cases, 47 (50.5%) had mild ultrasound changes; In US-CNB, 24 were found as fibroadenoma, four with chronic inflammatory mastitis, five with chronic purulent mastitis, one tuberculosis, four fat necroses, two mammary adenomas, and seven cases with benign ductal hyperplasia without atypia. Nine (9.7%) cases showed suspected abnormalities in ultrasound examination; US-CNB revealed five cases with atypical ductal hyperplasia, one ductal carcinoma in situ, and three invasive ductal carcinomas. Thirty-seven (39.8%) cases were highly indicative of malignancy on ultrasound; US-CNB showed 34 invasive ductal carcinomas, two invasive lobular and one medullary. Excision biopsy confirmed the diagnosis of US guided core needle biopsy in all but four cases; one case of chronic purulent mastitis was diagnosed as tuberculosis, and three cases of ductal hyperplasia as invasive ductal carcinoma. Consequently, there was no false positive but four (4.3%) false negatives. Thus, the sensitivity of the US-CNB was 100% and the specificity was 91.1%.*

Conclusion: *USG guided core needle biopsy is a satisfactory method of histopathological diagnosis of breast changes. An open biopsy should be performed after any unsatisfactory, suspicious, or unusual change in the US-CNB.*

Keywords: *breast ultrasound, core biopsy, breast cancer.*

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INTRODUCTION:

The breast biopsy should be handled and processed in such a way as to maximize the chances of an accurate diagnosis and to provide useful information about the patient's treatment [1-2]. A diagnosis of breast cancer is not a medical emergency; most of the crayfish had been present for many years before their discovery [3-4]. Survival time, even for advanced cancer, is usually measured in years. Histopathological diagnosis of breast cancer is mandatory prior to surgery, although mammography and / or ultrasound can provide a sufficiently accurate diagnosis. Stereotactic procedures significantly improved the localization of breast lesions. Core needle biopsies correctly identified 85-90% of the cancers. Percutaneous core needle biopsy (CNB) has become standard practice in the pathological evaluation of clinically latent breast lesions [5-6]. This minimally invasive method of diagnosis is the basis for further surgical treatment and planning, in addition to identifying benign lesions for which management is less clear. Multiple studies have shown that needle biopsy prevents unwanted surgery in patients with benign lesions, allows better treatment planning, and a greater likelihood of obtaining margins for people with cancer, and lower costs. This procedure allows you to completely remove some minor changes [7-8]. While core biopsy is of significant value in accurately identifying and diagnosing a lesion, it reflects the sampling of a larger lesion in general. The diagnosis of any breast lump cannot be based on a single method as none of the currently available tests are sensitive and specific enough to make a definitive diagnosis. Therefore, it is important to have a multidisciplinary (triple) assessment based on clinical, imaging (mammography / ultrasound) and histocytological (fine needle aspiration cytology / core biopsy) examination [9]. When the results of all three methods are similar, the cumulative level of diagnostic accuracy exceeds 99%. Bearing in mind all the above facts, we performed a core needle biopsy under ultrasound to assess its usefulness as a preoperative diagnostic method of breast cancer.

PATIENTS AND METHODS:

This study was carried out on 93 patients with ultrasound detection of breast lumps at the Department of Pathology and Surgery department of Bahawal Victoria Hospital (BVH) Bahawalpur for one-year duration from June 2019 to June 2020. Their age ranged from 15 to 76 years, mean age 46.2 years. Clinical trials, including studies, were conducted in all cases. In all these cases, US guided core-needle biopsy was performed, showing solid and / or indirect breast changes; the study excluded cases with cystic lesions. The procedure was performed under local anesthesia. After cleaning the site, the skin above the lump was cut with a small disposable scalpel about 2-3 mm to accommodate the needle tip. The needle was then inserted under ultrasound guidance and a sample was obtained; in all cases one maneuver was enough. The sample was then placed in 10% formalin, embedded in paraffin, sectioned into 4 µm sections, stained with hematoxylin and eosin, observed under a microscope, and histopathological diagnosis made. The results were tabulated and finally compared with the results obtained on excisional biopsy in all cases.

RESULTS:

Out of 93 patients, an ultrasound examination revealed benign lesions in 47 (50.5%) and suspicious lesions in 9 (9.7%) cases, while 37 (39.8%) cases were diagnosed as highly suggestive of malignancy. The histopathological results of these changes in US guided core needle biopsy and excision biopsy are presented in Table I.

Table I. Comparison of Histopathology on Core Needle Biopsy and Excisional Biopsy (n-93)

Ultrasound Diagnosis	Histopathology	Ultrasound Guided Core Needle Biopsy	Excisional Biopsy	False -ve
Benign Lesion	Fibroadenoma	24	24	--
47 (50.5%)	Chronic Mastitis	04	04	--
	Ch. Suppur. Mastitis	05	04	01
	Tuberculosis	01	02	--
	Fat Necrosis	04	04	--
	Lactational Adenoma	02	02	--
	Ductal Hyperplasia	07	07	--
Suspicious Lesion	Atypical " "	05	02	03
9 (9.7%)	Ductal Ca. In-situ	01	01	--
	Invasive Ductal Ca.	03	06	--
Highly Suggestive of	Invasive Ductal Ca.	34	34	--
Malignancy 37 (39.8%)	Invasive Lobular Ca.	02	02	--
	Medullary Ca.	01	01	--

The excision biopsy confirmed the diagnosis of US guided core needle biopsy in all but four cases; one case of chronic purulent mastitis was diagnosed as tuberculosis, and three cases of atypical ductal hyperplasia as invasive ductal carcinoma. Consequently, there was no false positive but four (4.3%) false negatives. Thus, the sensitivity of the US-CNB was 100% and the specificity was 91.1%. The US-guided core needle biopsy procedure was completed within 4-6 minutes. Without serious complications, only three patients developed a small hematoma that resolved spontaneously.

DISCUSSION:

The advantages of the US-CNB include simplicity, low cost, low morbidity, and speed of getting an accurate diagnosis. US-CNB has the advantage that it can be performed externally, can undergo routine histopathological techniques, can distinguish in-situ from invasive disease, and can rule out the possibility of false positives in benign lesions [10-11]. It is also helpful in tumor assessment and various immunohistochemical analyzes prior to surgery [12]. US-CNB is not helpful for cystic lesions. Fine-needle aspiration, core biopsy, and placement of locating wires introduce an interfering element into the breast that disrupts the tissue and translates cells into the breast stroma. For in situ cancer, this can cause diagnostic difficulties as it can mimic micro-invasive or truly invasive cancer cells [13-14]. Crushing artifact can make accurate lesion assessment difficult.16 Another rare complication of core biopsy is pseudoaneurysm formation. In the current study, 4 (4.3%) cases were misdiagnosed in the US-CNB, but no false + ve [15]. The accuracy of the lesions, which were highly suggestive of malignancy, was 100%. Cancer sensitivity was 100% and specificity 91.1%, which is consistent with other studies in different parts of the world.

CONCLUSION:

The data contained in the present study show that the US-CNB is a useful method of histopathological diagnosis of breast lesions, and an open biopsy should be performed after each unsatisfactory, suboptimal, suspicious or unusual change in the US-CNB.

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