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Original Research Article

CORRELATION BETWEEN FINE NEEDLE ASPIRATION CYTOLOGY AND CORRESPONDING ULTRASOUND BIRADS SCORE IN MAMMARY MALIGNANCY

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Abstract: *The aim of this study is to evaluate accuracy of ultrasound in diagnosing breast cancer and assessing correlation of radiological findings with findings of fine needle aspiration cytology (FNAC). A retrospective study was conducted at Ibne Sina Hospital& Multan Medical & Dental College Multan from July 2021 to December 2021. A study was conducted on 40 patients aged between 30 to 90 years having breast limps. Subjects underwent clinical and ultrasonic examination and BIRADS score was correlated with cytology data. The major ultrasonic finding was that irregular lesion was found in 21 (52.5%) subjects. In 10 (25%) patients ill-defined lesion was found. FNAC revealed severe atypia in 7.5% and mammary carcinoma in 92.5% cases. BIRADS score V, IV and III were assigned to 75%, 20% and 5% cases respectively. Correlation of FNAC results with ultrasonic findings showed 90.6% accuracy of ultrasound in diagnosis of breast cancer. Ultrasonography provides accurate diagnosis of breast lesions and is recommended radiographic modality for assessing underlying cause of palpable breast mass.*

Keywords: Mammary malignancy, BIRADS, Fine needle aspiration cytology

Introduction

Breast lumps are abnormal masses having different tissue consistency from normal tissues (Mohson, 2016). Every breast lump is not malignant and may have signs for different diagnosis (Ganggayah et al., 2019). Breast lumps are major presenting complain for which women seek help (Lalchan et al., 2015). Breast cancer is rapidly increasing among women worldwide (Organization, 2019).About 10% of the breast lesions are cancerous, which means these lesions require careful evaluation. It is also a major cause of cancer death among women (Organization, 2019). Incidence of breast cancer varies from country to country, it is higher in developed countries as compared to developing ones(Sood et al., 2019). In the USA, breast cancer has higher prevalence in women aged above 40 years (CO, 2015). However, in developing countries younger women are also at the risk of developing breast cancer, due to which it remains a major health concern (Tricoli and Bleyer, 2018). Best method to decrease spread and mortality due to breast cancer is to do regular self-examination and seek early medical advice and treatment (Sih, 2018).Radiological imaging techniques along with clinical examination play vital role in detection and follow up of the confirmed cases. Radiologists use Breast Imaging Reporting and Data System (BIRADS) to give final diagnosis of the breast lesion. Under this system surgeons, radiologist and pathologist work as multidisciplinary team for reducing the risk of inaccurate diagnosis(Niu et al., 2020). BIRADS category V highlights > 95% risk of breast cancer and calls for urgent intervention(Stepanek et al., 2019).The aim of this study is to evaluate accuracy of ultrasound in diagnosing breast cancer on the basis of BIRADS and correlating results with the findings of fine needle aspiration cytology (FNAC).

Methodology

The retrospective study was conducted in the Pathology Department of Ibne Sina Hospital & Multan Medical & Dental College Multan from July 2021 to December 2021. The study was conducted on 40 patients. The included subjects were aged between 30 to 90 years, they had palpable breast lesion and were referred to radiology department from surgical department for early diagnosis of breast cancer. The patients with chronic illness and having previous trauma to breast tissue were excluded. Informed consent of included patients was taken. The Ethical Board of the hospital approved the study. Breast ultrasound was performed in all subjects through GE Voluson E6 machine. 7–12-megahertz linear

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transducer was used for scanning. The patient was lying flat for ultrasound examination and breast and axilla region were fully exposed. Breast masses were assessed, their size, echogenicity, margin and location were recorded. Suspicious lymph nodes in axilla were also assessed, their cortical thickness, shape and hilum were recorded. Next, a specialist cytologist performed FNAC using 22 G needle under ultrasonic guide or palpation. A sample was aspired, and slide was prepared and immersed in alcohol jar. It was stained using Papanicolaou stain and any malignant or atypical cells were examined cytologically.

Results

The study was conducted in 40 patients having breast lumps. The mean age of the subjects was 60 years. Results of the ultrasound showed that irregular lesion was found in 21 (52.5%) subjects. In 10 (25%) patients ill-defined lesion was found. In 1 (2.5%) no mass was found, in this patient pathological lymph nodes were found. In 2 (5%) patients multifocal lesions were found in one breast. In 20 (50%) subjects pathological lymph nodes were found. According to the results of FNAC cytology mammary carcinoma was found in 37 (92.5%) patients, in 3 (7.5%) severe atypia was reported. BIRADS III, IV and V were reported in 2 (5%), 8(20%) and 30 (75%) cases respectively. Correlation of FNAC results and BIRADS score (BIRADS IV and V) shows that ultrasound has high sensitivity for detecting malignant breast lesions (Table I) Diagnostic value of ultrasound is summarized in Table II.

Table I Correlation of Ultrasound BIRADS score with FNAC results

Ultrasound	**FNAC**		**Total**
	Positive	**Negative**	
Positive	36	2	38
Negative	2	0	2
Total	38	2	40

Table II Diagnostic value of ultrasound in detecting mammary malignancy

Parameter	**Percentage**
Sensitivity	97%
Specificity	0%
Positive Predictive Value	93%
Negative Predictive Value	0%
Accuracy	90.6%

Discussion

FNAC is safe, easy, simple, cheap and quick modality for early diagnosis of breast tumors (Mutebi et al., 2020; Stepanek et al., 2019). FNAC can be used distinguish between fibrosis and chest wall recurrence and also in evaluation of suspicious lymph nodes in axilla (Moazeni Bistgani et al., 2019). FNAC is a preferable option for confirming suspicious masses detected by mammography or breast ultrasound(Al Alwan, 2015). However, FNAC has certain limitations including difficulty in distinguishing between the histopathology of invasive carcinoma or ductal carcinoma in situ, detecting poorly differentiated cases of lobular and ductal carcinoma and inability to detect level of HER2 and hormonal receptors in case of inadequate aspirated sample (Chandanwale et al., 2022). For accurate diagnosis trained cytopathologists, correctly aspirates sample, clearly recorded findings and expert technicians who prepare quality smears are important. In current study, results of FNAC and ultrasound diagnosis according to BIRADS are highly correlated. Mammary carcinoma was cytologically confirmed in 74% BIRADS V and 22% BIRADS IV lesions. Similar findings were reported by a previous study (Mustafa, 2014). In current study, malignant cell were more in irregular and poorly demarcated lesions as compared to well demarcated lesions, a previous study confirmed this finding (Machado et al., 2019). In this study, accuracy of ultrasound for diagnosing breast cancer was reported to be 90.6%. However, another study accuracy of ultrasound to be 57% (Mubuuke, 2019). In our study sensitivity of ultrasound was found to be 97%, while in a study conducted by it was reported to be 100% (Badu-Peprah and Adu-Sarkodie, 2018).

Conclusion

It is concluded that ultrasound is a cost effective and efficient modality with good resolution to detect suspicious breast masses, without use of ionizing radiation. It is a first line investigative tool for breast masses. It yields precise productive diagnosis when performed by well-trained radiologists.

Conflict of interest

The authors declared absence of conflict of interest.

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