Descriptive Analysis of The Cytological And Histopathological Diagnosis In Malignant Breast Masses, Experience at King Hussien Medical Center.

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ABSTRACT

Objectives: To determine the usefulness of both fine needle aspiration (FNA) and the tissue core biopsy (TCBx) in diagnosis and management of breast malignancy, and to correlate their results in a certain group of patients.

Method: We reviewed the cytological and histopathological reports of malignant breast masses which were released at Princess Iman Laboratory& Research Center/ King Hussein Medical center, Amman-Jordan over a period of three years, from March 2013 till March 2016.

Results: Two hundred thirty patients with malignant breast masses were included in the study, the vast majority were females (225) with few male patients(5). The patients' age ranged from 34 to 94 years. More patients had tumours in the Right breast (119). All the cases were proved by tissue tru-cut core biopsy (TCBx) to have malignancy mostly carcinomas. One hundred fifty eight patients were diagnosed as malignant by the fine needle aspiration procedure (FNA), all of which were confirmed by tissue biopsy histopathological assessment. The rest of cases were labeled either suspicious, atypical or benign by FNA and some were inadequate samples.

Conclusion: Although the FNA is an easy, simple and cost effective procedure, the tissue core biopsy histopathological examination is the cornerstone method in diagnosing patients with breast malignancy.

Key words: Ancillary studies, Breast carcinoma, Fine needle aspiration, Tissue biopsy.

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Introduction

The importance of preoperative fine needle aspiration diagnosis in patients with breast malignancy has been under debate in recent years [1,2]; that is, although it is a less traumatic simple procedure than the tissue core biopsy, it was proved that it lacks the reliability to determine the exact nature of breast malignancy in terms of the type of malignancy, hormonal and Her2neu status and other information

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needed before giving the patients Neoadjuvant Therapy [2,3]. This is due to the recent advances in the modalities of treatment of breast cancer; in each case diagnosed as malignant by FNA , a tissue core biopsy histopathological examination should be performed , in order to assess the hormonal and the Her2neu status as well other prognostic parameters such as tumor grade and the proliferative index by applying the ancillary studies. In the current analysis, we found that there are advantages and disadvantages of both FNA and TCBx procedures. We selected a group of patients who underwent both procedures and were confirmed to have breast malignancy. FNA is an easy and simple method in which we use a 23 gauge needle into the breast mass to aspirate the tumor cells and assess them under the microscope by an experienced pathologist using Papanicolaou (PAP) and Giemsa stains. While tissue core biopsy is usually done by the surgeon using a 14 or 16 guage needle using local anesthesia, it is a relatively invasive minimally traumatic procedure. Both procedures can be done by the radiologist under ultrasound guidance in non-palpable small breast masses.

Methods

We reviewed the files of 230 patients with malignant breast masses, who had both FNA and TCBx pathological examination at Princess Iman Laboratory& Research Center /KHMC, Amman-Jordan, over a three-year period from March 2013 till March 2016. All the cases were diagnosed by an experienced histopathologists and cytologists under good technical conditions. We analyzed the cytological and histopathological reports, and then we correlated their results in all patients.

Results

Two hundreds and thirty patients who had breast malignancy were included in the study; the vast majorities were females 98% (225) with few male patients 2% (5). Our patients ranged in age from 34 years to 94 years with a mean age (64 years). (As shown in the chart bellow). More patients had right sided breast tumors (52%) while the rest had left sided tumors (48%). All our patients had undergone both fine needle aspiration (FNA) and Tissue Tru-cut Core Biopsy (TCBx). Using the fine needle aspiration procedure, 68.8% (158) of the cases were diagnosed as malignant. The rest of them were labeled as follows: suspicious (31)13.4%, atypical (27) 11.7%, benign (7) 3% or inadequate (7) 3%. (As shown in the pie chart and Table I bellow) The false negative rate is 3% according to our results. The inadequate results were followed immediately by TCBx because there were suspicious findings clinically and or radiologically and all of them were proved to be malignant on tissue specimens. Furthermore the cases reported as “Atypical” and “suspicious” were confirmed to be malignant on TCBx. All of our patients were confirmed to have malignancy by histopathological assessment of the tissue Tru-cut core biopsies, mostly carcinomas (221 cases) including: Ductal carcinoma of no special type (75.6%), Lobular carcinoma (3.9%), Medullary carcinoma (2.6%), Tubular carcinoma (1.3%), Mixed Carcinoma (4.7%) ,In situ ductal or lobular carcinoma (6%) and other types of carcinoma such as : Papillary, Mucinous, Metaplastic and Adenoid Cystic carcinoma comprising (1%) each. The rest of cases were diagnosed with other types of malignancy such as follows: Malignant Phylloides (8), Stromal Sarcoma (1) and Lymphoma (1). (As shown in the Table II bellow)

Table I:(FNA and TCBx results)

No. of patients	FNA result	TCBx result
158(68.8%)	Malignant	Malignant
31(13.4%)	Suspicious	Malignant
27(11.7%)	Atypical	Malignant
7(3%)	Benign	Malignant

7(3%)	Inadequate	Malignant

Table II: Tumor Subtypes by tissue biopsy

Tumor type	No. of cases	Percentage
Invasive ductal carcinoma(NST)	174	75.65%
Lobular ca	9	3.9%
Medullary ca	6	2.6%
Papillary ca	1	0.4%
Mucinous ca	1	0.4%
Metaplastic ca	1	0.4%
Adenoid cystic ca	1	0.4%
Tubular ca	3	1.3%
Mixed carcinoma	11	4.7%
In situ carcinoma	14	6%
Malignant phyllodes	8	3.5%
Stromal sarcoma	1	0.4%
Lymphoma	1	0.4%
	230 case	100%

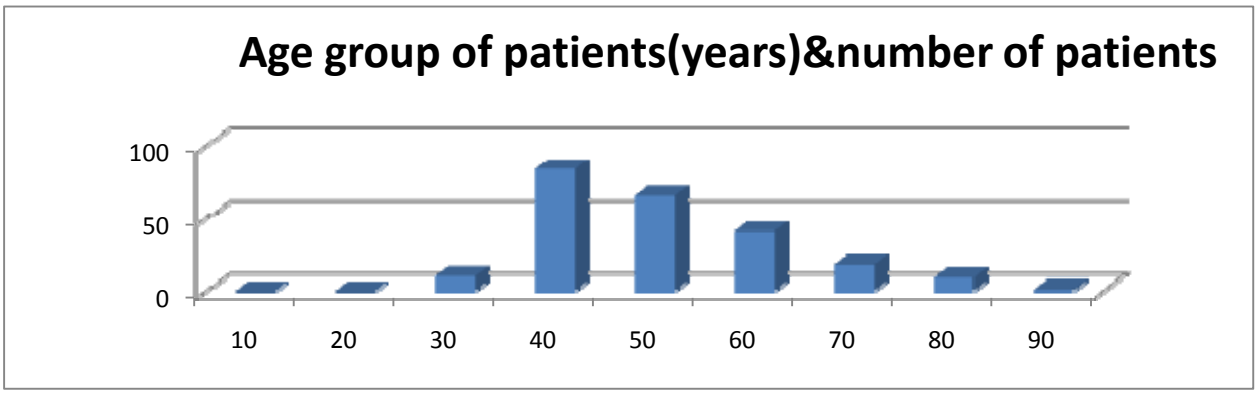

Fig 1: Age group of patients years and Numbers r of patints.

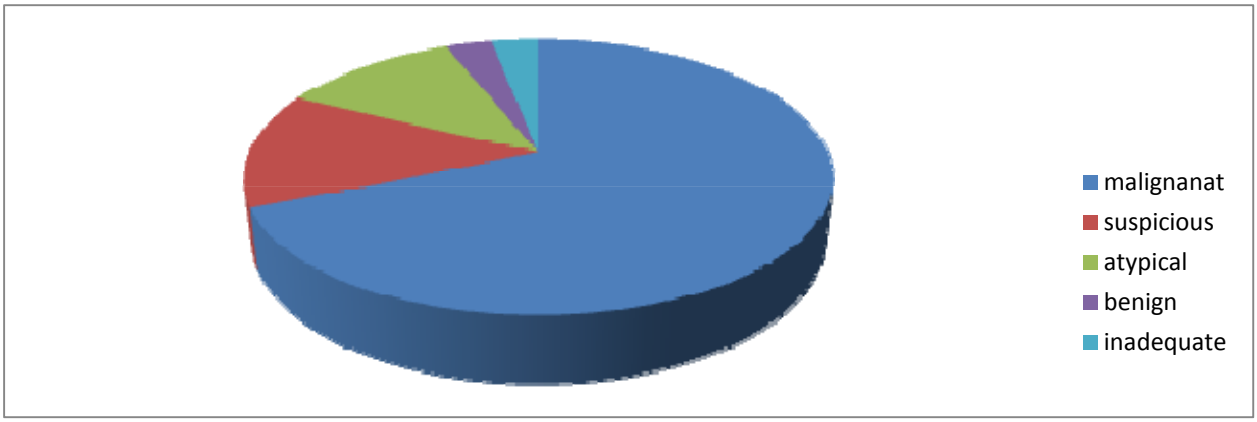

Fig 2: Fine Needle Results distribution chart

Discussion

The life time risk of developing breast cancer in women is 1:8 in United Kingdom, while in India, breast cancer comprised 22.2% of all new cancer cases (4-6). In Jordan, according to the annual report of Jordan Cancer Registry, newly diagnosed breast cancer cases in women comprised 36.8% in 2009 and increased to 37.3% in 2012 of all the newly diagnosed cancers in women. On the other hand, breast cancer comprised 0.7% and 0.6% retrospectively in men. Most countries have adopted a triple assessment approach (clinical, radiological and pathological) to breast diagnosis, with FNA as the first-line pathological investigation [7-12] in both screening and symptomatic populations; successful treatment of breast cancer requires early detection, accurate diagnosis, and effective management. [13] This fact makes it mandatory to assess any breast lump; early diagnosis of breast cancer is very important because of its great impact on further management and it gives more chance to offer cosmetic oncoplastic surgery [4]. Detecting breast malignancies at an early stage had become more frequent these days, this could be due to patients awareness about breast cancer and the recent well established screening programs at the governmental and private medical institutions [4]. In addition to that, the advancement of breast management modalities pre and postoperatively as well as the emergence of oncoplastic breast surgery had made it crucial to diagnose breast cancer as early as possible [4]. Fine needle aspiration is a simple, cost-effective method, in which a 23 gauge needle is inserted into the breast mass to obtain the material needed for diagnoses [3,14]. The aspirated cells then are stained by PAP and Giemsa stains to be examined under the light microscope by an experienced pathologist. An adequately trained and experienced cytopathologist is necessary to reduce the number of non-diagnostic FNAs. [15] Although FNA is a relatively an accurate first- line diagnostic method [3,6,7,14] ,one cannot determine if the carcinoma is in situ or invasive in nature. Also it is difficult to accurately subtype and grade the tumor. In addition to that, FNA has a limited role in assessing the papillary and atypical lesions [1], and frequently with suboptimal results especially in very small tumors.[1] It is difficult to determine whether tiny breast lesions are benign or malignant on the basis of imaging findings alone, and for such cases, the histopathological examination is needed for a definitive diagnosis, even when the cytological findings indicate malignancy. [1,16] The recent advancement of surgical and oncologic modalities in managing malignant breast tumors had made the FNA role questionable; that's because of the limitations mentioned above and more importantly because it cannot be used to accurately determine the hormonal and the Her2neu status of breast carcinomas; Neoadjuvant and Hormonal treatment are becoming a routine protocols in preoperative management of most breast cancer cases. [4] This made tissue diagnosis mandatory in any breast tumor in order to optimally treat patients with best outcome. Many surgeons are reluctant to accept the cytological report as the only criterion for performing definitive surgery; since no distinction is possible between infiltrating and non infiltrating lesions. [16] In needle core breast biopsy, the surgeon uses a 14 or 16 gauge needle (depending on the size of the mass) and insert it into the breast mass under local anesthesia, the tissue obtained is stained by Haematoxylin and Eosin (H&E) stain, then it is assessed under the light microscope by the histopathologist who gives the definite diagnosis and does the ancillary studies needed to assess the hormonal and Her2neu status(4), in addition to that TCBx provides information regarding other prognostic factors such as : tumor subtype, grade and the proliferative index . Thus the histopathological report is the corner stone in each breast malignancy as it greatly helps the clinicians to manage their patients pre and postoperatively . Furthermore, patients with atypical or suspicious results by FNA cannot be properly managed without getting tissue biopsy

histopathological result for the definite diagnosis. [1] According to our results, we found that FNA had correlated well with the malignant diagnosis of the tissue core biopsy; that the false negative cases comprised only 3% in our patients, while the malignant and suspicious results constituted 82%. This proves that FNA can be a reliable first line diagnostic method and for follow-up of cases to detect recurrence , those findings also ensure its role as a diagnostic tool and were convergent to other regional and international studies [3,5,7,14,18-22] . Other analytical studies had confirmed breast cytology as an individual risk assessment tool for women at risk of developing breast cancer and a reliable alternative to frozen sectioning during intraoperative evaluation of sentinel lymph nodes and margins of lumpectomay specimens.[4,23] On the other hand, we could also affirm its limitations in comparison to the tissue biopsy results and the lack of feasibility to perform the ancillary studies . Our results are comparable to other regional and international analytic studies. [2,14,18-20]. Ballo and Sneige [24] selected only patients in whom a malignancy ultimately had been confirmed by an excision biopsy or mastectomy. They concluded that FNA is more sensitive in detecting cancer than TCBx (sensitivity, 97.5% vs. 90%) [24]which contrasted few other studies which concluded that FNA is a useless method in diagnosing breast malignancy and that tissue biopsy should be the initial diagnostic method especially in small breast lesions [1,4,16] this could be probably related to lack of experienced cytopathologists or due to technical issues which certainly lead to high error rates at individual laboratories [4,25] Freehand TCBx detects more breast carcinomas as compared to FNA in palpable breast lumps, and correctly categorizes borderline / inadequate breast lumps on FNA into benign & malignant categories. [16] Needle core biopsy permits a preoperative knowledge of the histological type and prognostic parameters (receptorial status, proliferative activity, ploidy, and expression of oncogenes and antioncogenes such as c-erbB-2 and p53) routinely used in the planning of surgical and eventual neoadjuvant treatment. [2]The use of core biopsy has increased, especially in the evaluation of lesions that are associated with high inadequacy rates with FNA cytology . [26,27]

Conclusion

In conclusion, although FNA is a simple, relatively accurate procedure in diagnosing malignant breast masses, the tissue Tru-cut core biopsy (TCBx) histopathological result remains the mainstay of diagnosis in breast cancer especially in atypical and or suspicious findings in FNA method. In patients with malignant lesions, in addition to having diagnostic significance, TCBx also provides adequate tissue for performing the ancillary studies and for the evaluation of molecular markers which have extreme therapeutic value. FNA remains a good first-diagnostic method for breast masses and for the follow up of previously diagnosed breast cancer cases. Tissue biopsy histopathological result is the cornerstone in managing of breast malignancy and its is required by the surgeon and the oncologist to treat patients pre and post operatively as well as in the long term follow up. Nowadays, proper management of breast malignancy cannot be achieved without getting a complete histopathological report by a well experienced pathologist.

Limitations of this study:

This is a descriptive analysis of the usefulness of fine needle aspiration method in diagnosing breast malignancy; so only the truly malignant cases were included in these analyses which were confirmed to be malignant by tissue specimen histopathological diagnosis. In this type of descriptive analysis, the statistical parameters cannot be applied.

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