

## EVALUATION OF BREAST LUMPS THROUGH FINE NEEDLE ASPIRATION CYTOLOGY IN URBAN AREA OF DISTRICT DERA ISMAIL KHAN - A STUDY OF 100 CASES

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### ABSTRACT

**Objective:** To assess the usefulness of fine needle aspiration cytology in evaluation of breast lumps before any surgical intervention and finding out the frequency and histological pattern of benign and malignant tumors of breast, diagnosed through this technique in area of District Dera Ismail Khan, Khayber Pakhtunkhwa, Pakistan.

**Study Design:** Cross-sectional study.

**Place and Duration of Study:** Rauf Medical Center, Dera Ismail Khan, from Apr 2018 to Mar 2019.

**Methodology:** The procedure was done using 23-gauge needle fitted on 10 cc disposable syringe. The air-dried smears were stained with Haemacoloour stain for Rapid on Site Evaluation (ROSE) of aspirates for checking specimen adequacy and making diagnosis. The wet smears were fixed with 95% alcohol and stained with Hematoxylin and Eosin and Papanicolaou stains.

**Results:** A total of 100 cases were analysed. As Haemacoloour stain for Rapid on Site Evaluation was done, so all the specimens were adequate. Benign tumors contributed to 50 (50%) cases and malignant tumors to 30 (30%) cases. Among benign tumor, fibroadenoma was the most common tumor which constituted 45 (90%) cases, while invasive ductal carcinoma was the most common malignant breast tumor, comprising 26 (86.6%) cases.

**Conclusion:** Fine needle aspiration cytology can be used as a useful preliminary investigation in evaluation of breast lumps and accurate results can be obtained in most of the cases. The most common benign tumor seen in our patients is fibroadenoma and the most common malignant tumor is invasive ductal carcinoma.

**Keywords:** Breast cancer, Fine needle aspiration cytology, Palpable lump.

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### INTRODUCTION

Breast cancer is the most frequently occurring cancer in women and one of the leading cause of cancer death among women all over the world. Early breast carcinomas are asymptomatic, and most of them are discovered during breast screening programs. Most of the tumors may present as a painless breast lump<sup>1</sup>. All breast lesions are not malignant and all the benign lesions do not progress to cancer. The accuracy of diagnosis of breast lumps can be increased by a combination of preoperative procedures including physical examination, radiological evaluation, fine-needle aspiration cytology and tissue biopsy<sup>2</sup>. As most of the breast masses are benign but the main concern of women with breast masses is the probability of breast cancer, hence, evaluation of the breast masses begins with investigating the symptoms and learning the general clinical history including family history of breast cancer. This is followed by clinical examination, imaging studies, and cytological examination/ biopsy, if necessary<sup>1</sup>.

Although Fine-Needle Aspiration Cytology

(FNAC) of the breast has been proved to be a safe and accurate technique, however, still many surgeons have doubts in their minds about its reliability to replace tissue biopsy. It is argued that if FNAC is followed by biopsy for confirmation, it would increase the cost of diagnostic workup. In reality, it is seen that FNAC can provide the final diagnosis in a significant number of cases, especially the benign lesions and proves is cost effective<sup>2</sup>. The clinical use of FNAC has further questioned because of the variability in results reported by different pathologists at different centres. In most of the medical institutes in the United Kingdom (UK), the United States (USA) and Canada, FNAC has been abandoned now for diagnosis of breast lesions and they straightway go for a core needle biopsy. Nevertheless, FNAC continues to be used in other institutes in these countries, as well as in other parts of the world including developed countries like Greece, Italy, Australia, Japan and in developing countries including India, Pakistan, Nigeria, Mexico and Thailand<sup>3</sup>. It can be said that FNAC bridges the gap between clinical evaluation of breast lumps and final surgical pathological diagnosis in majority of cases and helps to reduce unwanted surgeries<sup>4</sup>.

The objective of the this study is to assess the usefulness of FNAC in evaluation of breast lumps

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preoperatively and finding out the frequency of benign & malignant lesions diagnosed through this technique.

**METHODOLOGY**

It was a cross sectional study, from April 2018 to March 2019, at Rauf Medical Center, Dera Ismail (DI) Khan.

All the patients presenting with history of breast lump were examined clinically in detail. FNAC was done following the standard procedure with 23 gauge needle, attached to 10cc syringe and the material obtained by aspiration technique. From the sample obtained, at least two Air Dried (AD) and two Wet Fixed (WF) smears were prepared. Two air dried smears were stained with Haemacoloour and Rapid On Site Evaluation (ROSE) was done for checking specimen adequacy and making a rapid impression. If the specimen was found inadequate, repeat aspiration was done. In case of cystic lesions, fluid was aspirated first, followed by re-aspiration from the solid area. Out of two wet fixed smears made, one was stained with Papinoculo (PAP) stain and other with Haematoxylin & Eosin (H&E) stain. The slides were seen by Histopathologist / Cytopathologist and diagnosis was made. Findings of FNAC were correlated with clinical data from clinical examination, radiological findings & histopathology records wherever possible.

The inclusion of this study was to all the patients with palpable breast lump in whom adequate aspirate was obtained were included in the study. The exclusion of this study were to the previously diagnosed breast lumps and inadequate aspirates were excluded from the study. The study data was statistically analyzed by using SPSS-16 version.

**RESULTS**

A total of 100 cases were included in the study. All the 100 patients of breast lumps were female & underwent a diagnostic FNAC. Age range of patients varied from 12-65 years. The youngest patient was 12 years old and was diagnosed as fibroadenoma. The most aged patient was of 65 years, who was diagnosed with infiltrating ductal carcinoma. Maximum cases of fibroadenoma 45 (22.5%) cases were found in the second to third decade, while maximum cases of infiltrating ductal carcinoma 26 (7.8%) cases were found in the sixth decade. Age distribution of the patients with breast lump is given in table-I.

Out of all breast lumps, benign tumors were more common than the malignant tumors. Cytological

photomicrophotographs of common benign and malignant tumours which were fibroadenoma and invasive ductal carcinoma, respectively (fig-1 & 2).

On cytological examination of all these 100 cases, 50 (50%) cases were benign (C2 category) and 30 (30%) cases were malignant (C5 category). Ten (10) (10%) cases were found to be in the category of a typical lesion probably benign (C3 category) and 10 (10%) cases in category of suspicious for malignancy (C4 category).

**Table-I: Age distribution of patients with breast lumps.**

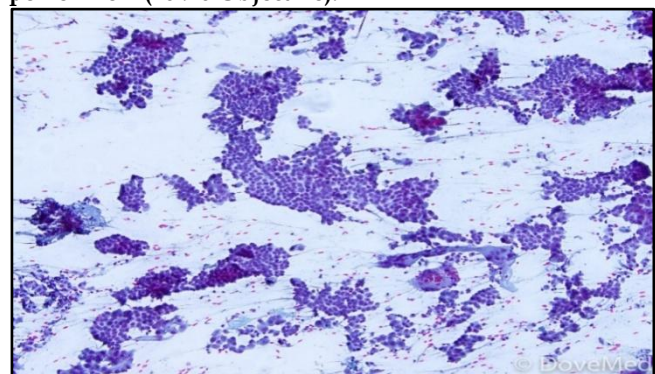
Age	n (%)
10-20 Years	12 (12)
21-30 Years	16 (16)
31-40 Years	24 (24)
41-50 Years	32 (32)
51-60 Years	12 (12)
61-70 Years	04 (04)

**Table-II: Different categories of breast lesions found on FNAC.**

Reporting Category	n (%)
Benign (C2)	50 (50)
Atypical Lesion probably benign (C3)	10 (10)
Suspicious for malignancy (C4)	10 (10)
Malignant (C5)	30 (30)



**Figure-1: Cytological features of fibroadenoma at low power view (10x10 Objective).**



**Figure-2: Cytological features of Invasive Ductal Carcinoma at low power view (10x10 Objective).**

As ROSE was done in all the cases, thus there were no inadequate specimens (C1 category). The various types of diagnoses given on FNAC along with the diagnostic categories are given in table-II.

## DISCUSSION

Most of the lesions of the breast are benign in young and middle-age females, however increased awareness about the breast cancer in patients has led to their desire for early detection and quick robust management<sup>5</sup>. The ideal assessment of palpable breast lesions is done through triple approach, which includes clinical, radiological and cytological/ histopathological evaluation<sup>6</sup>. Fine needle aspiration cytology (FNAC) is an important tool for pathological assessment of breast lumps. Open or core needle biopsy techniques are relatively more costly and traumatic causing patient discomfort such as pain and haematoma formation along with other disadvantages including long tissue processing time<sup>7</sup>. When all three assessments including clinical radiological and cytological findings are in keeping with, the final treatment of malignant lesions may proceed on the basis of FNAC. However, presently core needle biopsy is insisted for all the lesions for more confident diagnosis and to do receptor studies for further evaluation and management. In a resource limited area, the case could be made for proceeding to definite management without requesting tissue biopsies, particularly if FNAC is combined with cell block preparations, which increase its diagnostic accuracy and provides material for doing receptor studies<sup>8</sup>. In early 1960s, FNAC for breast lumps was practically started by Franzen and Zajicek at the Karolinska Hospital in Stockholm. Being an oncologist, Franzen introduced standard May-Grunwald Giemsa stains on air-dried smears to allow for rapid interpretation. However, despite its success, it was in 1980s that FNAC became widely used<sup>9</sup>. The main purpose of FNAC in breast lumps is to pick up all the suspicious breast lesions and do categorization accordingly, as in most cases definitive treatment can often be based on cytological diagnosis without the need for further histopathological examination<sup>10</sup>.

Our current study has highlighted that FNAC is cost effective method as first line investigation for assessment of breast lumps, specifically in low resource areas. Furthermore the study shows that if rapid on site evaluation is done to see the adequacy of the smears, the procedure becomes more rewarding for diagnostic purpose as the factor of inadequacy is ruled out. The study also highlighted that benign lesions are

two times more common than the malignant ones, thus enhancing the practicability of FNAC & its importance to be recognized by the clinicians. In straight forward benign cases (C2 category), no further evaluation like receptor studies etc are required, so management can be planned taking the diagnosis as final verdict. In other categories, like atypical probably benign (C3), lumpectomy can be done, while in suspicious for malignancy (C4) and out rightly malignant (C5), core needle biopsy and receptor studies can be performed.

It is seen that our study goes in accordance with statistics of many national and international studies. The percentage of benign lesions in present study, which comprises about 50% of the total outcome is similar to a study by Mulazim *et al*<sup>2</sup>, Poudel *et al*<sup>4</sup> and Badge *et al*<sup>5</sup>. In present study, out of all benign lesion, fibroadenoma turned out to be the most common benign lesion, which comprised about 90% of the benign lesions, which is concordant with another study done by Gupta *et al*<sup>10</sup>, showing almost similar figures.

The malignant lesions in our study comprised 30% of total cases, which is less in frequency than benign lesions. These findings are similar to the study by Gupta *et al*<sup>10</sup> showing similar out come. The most common malignant lesion in current study was infiltrating ductal carcinoma, comprising about 87% of all malignant lesions. This finding goes in concordance with many other studies like Mulazim *et al*, Badge *et al* & Gupta *et al*<sup>2,5,10</sup>, showing invasive ductal carcinoma as the most common malignant lesion with the percentage more or less similar to that noted in our current study.

Another study by Ashwin Pattanshetty Khageshan *et al*<sup>11</sup> revealed almost the similar ratio of benign and malignant lesions and as seen in our study. In another study by Singh *et al*<sup>12</sup> the ratio of benign lesions was similar to our study, however, the ratio of malignant lesion was relatively less as compared to this study.

Regarding age groups, in our present study, the most common benign lesion fibroadenoma was seen in younger age group, and most common malignant lesion invasive ductal carcinoma was seen in elderly age group. Nirmala *et al*<sup>13</sup> conducted a study revealing fibroadenoma being the most common benign breast lesion, occurring in younger age group. Sankaye *et al*<sup>14</sup> performed a study showing wide age range of cytological spectrum of benign lesions, fibroadenoma being the most common, occurring in younger age group

and out of malignant lesions, invasive ductal carcinoma being the most common, occurring in middle to elderly age group, the findings more or less similar to the age group findings in our study.

Another study by Schandanwale *et al*<sup>15</sup> showing benign breast lesions occurring in younger age group, while malignant lesions occurring in middle to elderly age group, the findings almost similar to the data of our present study.

Reddy *et al*<sup>16</sup> observed in their study that the most common benign lesion, fibroadenoma was seen not in teen age group, but between 20-30 year of age, which is similar to our study, while breast carcinoma was seen in relatively younger age group, the finding which slightly differs from our study. Jain *et al*<sup>17</sup> presented data in their study as fibroadenoma being the most common benign lesion in age group between 15-25 years, which is also compatible with our findings and invasive ductal carcinoma, being the most common malignant lesion, occurring in early forties, the age group relatively less as compared to our study. Naz *et al*<sup>18</sup> showed malignant breast lesion in third and fourth decade, which is again comparatively younger age group than our present study.

## CONCLUSION

It is concluded that FNAC is safe and reasonably accurate method for evaluation and diagnosis of breast lump preoperatively. This technique can avoid inconvenience during biopsy and undue surgery, especially in low resource areas. FNAC of breast lumps can be used as a preliminary investigation in outdoor patients. The lesions which are unequivocally benign can be managed without biopsy, while in malignant lesions, cell block preparation or biopsy can be performed for further confirmation of diagnosis and doing receptor studies.

The most common benign tumor diagnosed on FNAC is fibroadenoma and the most common malignant tumor is invasive ductal carcinoma.

## CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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