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Original Article

Cytological evaluation of breast lesion and its histopathological correlation in a tertiary care center

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Abstract

Background

Breast cancer is one of the commonest cancers in female. FNAC is safe and cost affective screening test for breast lump having both high sensitivity and specificity. Our aim is evaluation of diagnostic accuracy of fine needle aspiration cytology [FNAC] in diagnosis of breast lesions.

Material and Methods

All male and female patients with breast lesion were subjected to cytological evaluation of which many were followed up with histopathological evaluation to assess the diagnostic accuracy of FNAC.

Results

Out of 1088 cases diagnosed on FNAC, 703 cases (64.61%) were benign and 232 cases (21.3%) were found to be malignant. In our study the most common benign lesion was fibroadenoma and commonest malignant lesion was Duct carcinoma. Maximum cases of breast lesions in females were in the age group of 21- 30 years followed by age group of 31- 40 years. While maximum cases in males were in the age group of 31-40 years & 61-70 years. The sensitivity and specificity of FNAC for cyto-histo correlation were found to be 97.16% and 92.83% respectively.

Conclusion

FNAC is a highly sensitive and specific test for diagnosis and categorization of breast lesions into different categories of neoplastic and non-neoplastic breast lesions.

Keywords:
Breast Lump, FNA, Histopathology.

Introduction

World over FNAC has become widely accepted tool for diagnosis of breast lesions as it is safe and simple method with high diagnostic accuracy [1]. Its success is due to its accuracy and cost effectiveness and high accuracy for a breast lump. Therefore, it holds to have many advantages for patients and surgeons [2].

There are wide varieties of breast pathologies. It is postulated that the non-proliferative and inflammatory breast lesions do not increase the risk of cancer. There is mild to moderate risk with proliferative breast disease not showing atypia and with atypia respectively and higher risk of malignancy with carcinoma in situ [3]. The success rate of FNAC for obtaining a definite diagnosis depends on whether the lesion is palpable and also its size. FNAC has approximately success rates of 75–90% for palpable and 35-55%

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for non-palpable breast lesions respectively [4]. The use of core biopsy can be considered as an alternative but the procedure is more cumbersome, expensive and time consuming as compared to FNA procedure [5-6].

The present study supported FNAC as a first line of investigation in work-up of breast lesion. In the present study our aim is to categorize the types of various breast lesions on cytology, to determine the adequacy rate, diagnostic accuracy, sensitivity, specificity, and positive and negative predictive values of FNA in the evaluation of breast lumps. Cytology–histopathology correlation was also seen for better insight of breast lesions.

Material and Methods

Various techniques for obtaining specimen for cytology are: Fine Needle Aspiration (FNA) technique, Fine Needle Capillary (FNC) sampling, Smears from nipple discharge,

Scrape smears from ulcerated lesions and Cyst fluid of the patients. The study was carried for a period of two years, from 5th June 2015 to 20thJune 2017.

Equipment required for this purpose are Needles- 23-22 gauge, Syringes and syringe holder – Cameco Syringe Pistol with 10 cc plastic syringe, Sterile containers, Slides – clean, dry and free of grease, fixatives–Coplin jar containing 95% ethanol and Stains- May Grunwald Giemsa (MGG), and Papanicolaou stains. The study was carried after getting the approval from institutional review committee. The data was analyzed by SPSS 14.0.

Results

The present study is an observational study that includes all breast lesions, observational analysis of1088patients were subjected to cytological evaluation,1061 cases were female and 27cases were male. The microscopic description of the sample and the diagnostic categories used for the smear listed below, as per recommendation with further specific sub-categorization whenever possible.

Benign: when there is no evidence of malignancy with further description and classification. e.g. Finding consistence with Abscess or Mastitis, Fat Necrosis, Non-Proliferative Breast Disease, Proliferative Disease Without Atypia, Fibroadenoma, Pregnancy Induced or Treatment Induce Changes, etc.

Atypical / Indeterminate: When the cellular findings are not diagnostic, with further description e.g. Findings suggests Proliferative Breast Disease with Atypia (Atypical Hyperplasia Versus Low Grade Carcinoma), Fibroepithelial Lesions (Fibroadenoma Vs PT), etc.

Suspicious / Probably Malignant: When the cellular findings are strongly suggestive but not definitive of malignancy. Tissue biopsy is recommended for a definitive diagnosis.

Malignant: When the cellular findings are diagnostic of malignancy, with specific sub-typing of neoplasm whenever possible.

Unsatisfactory: When there is scant cellularity or air drying or distortion artifact. Dense hemorrhage or inflammation has obscured the smear.

Table 1: Categorization of breast lesions on cytology

Categories	No. of cases (%)
Benign	703 (64.61)
Atypical / Indeterminate	55 (5.05)
Suspicious/ Probably malignant	16 (1.47)
Malignant	232 (21.32)
Unsatisfactory	82 (7.53)
Total	1088

Maximum cases in females were in the age group of 21- 30 years (25.11 %) followed by 24.19 % in the age group of 31- 40 years. While maximum cases in male were in the age group of 31-40 years & 61-70 years (0.45 %) followed by in the age

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group of 41-50 (0.41%). Anatomical distribution of lesion was almost equal on left and right side. Majority of breast lumps were located in upper and outer quadrant of breast the left breast. Next common site was central region and least common site was lower inner quadrant. There were 88 cases with bilateral lump.

Table below shows the Nature of specimen along with sample procured under USG – guidance.

Table 2: Distribution of Patients based on different methods of cytology.

Nature of Specimen	No. of cases (%)	USG-guidance No. (%)	Total (%)
FNA / FNC from Lump/ Nodularity	952(87.48)	49(4.50)	1001 (91.99)
Only Nipple discharge	10(0.91)	0	10 (0.91)
Lump (FNA/ FNC) & Nipple discharge	2(0.13)	0	2 (0.13)
Scrape from ulcerated lesions	1(0.09)	0	1(0.09)
Cystic lesions	53(4.92)	21 (1.93)	74(6.85%)
Total	1018(93.56)	70(6.43)	1088

Table 3: Inflammatory breast lesions.

Inflammatory:	Total =87 cases, (7.9%)
Acute mastitis	48
Chronic mastitis	16
Non – specific granulomatous mastitis	11
Tuberculosis mastitis	2
Duct ectasia	1
Fat necrosis	5
Lactiferous duct fistula	3
Periductal mastitis	1

Sub-categorization of Benign Breast Lesion In inflammatory lesions -Acute mastitis top the list followed by Chronic mastitisand nonspecific granulomatous mastitis.

Table 4: Lactational and hormonal change.

Pregnancy and Lactational and hormonal changes	Total = 34
Galactocele	14 (1.28 %)
Gynaecomastia	19
Premature Thelarche	1

In hormonal mastopathy gynaecomastia was the commonest diagnosis with 19 cases and a single case of premature thelarche.

Table 5: Benign breast lesion.

Benign neoplastic breast disease	No. of cases = 542
Fibroadenoma	270
Benign proliferative breast lesion	60
Benign breast lesion	142
Benign Fibrocystic disease	5
Benign cystic lesion	46
Benign Phylloides tumor	8
Epithelial hyperplasia	7
Miscellaneous	4

Table 6: Atypical breast lesion with mild to moderate risk of cancer.

Atypical / intermediate	Total = 55 cases (5.05%)
PBD with atypia	34
Papillary lesion	8
Gynecomastia with atypia	1
Benign breast lesion with papillomatosis	1
Borderline phylloid tumor	1
Atypical ductal hyperplasia	7
Epithelial hyperplasia with papillomatosis	1
Fibrocystic disease with atypia	2

In benign neoplastic breast disease maximum no of cases was of Fibroadenoma (270cases) followed by Benign breast lesion. In miscellaneous group,1 cases were of epidermal cyst, 2 cases of lipoma and 1 case of microfilariasis. In Atypical/ Intermediate

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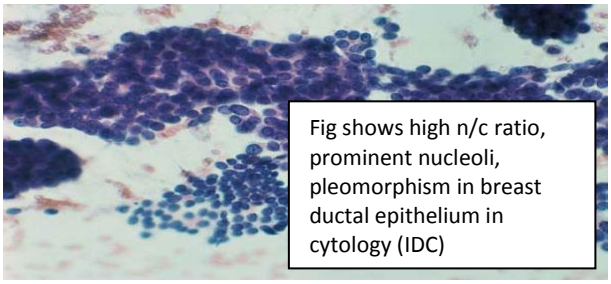
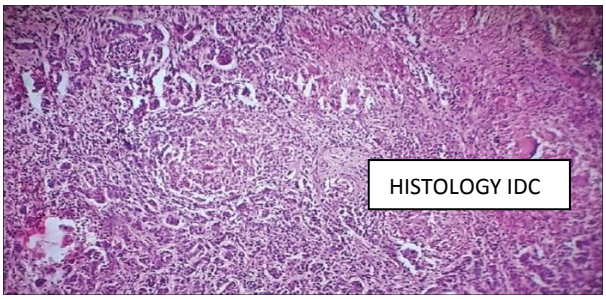
group Proliferative breast disease with atypia top the list with 34 cases followed by papillary lesion (8cases). In case of Suspicious / Probably malignant lesion, Atypical ductal hyperplasiatops the list followed by Low grade ductal malignancy.

Table 7: Malignant breast lesions.

Malignant lesion	Total = 232 cases
Ductal carcinoma (NOS)	163
Ductal malignancy with metastasis	51
Medullary carcinoma	1
Mucinous carcinoma	2
Lobular carcinoma	11
Invasive papillary carcinoma	1
Malignant phylloid tumor	1
Paget's disease	1
Primary lymphoid malignancy	1

In malignant lesion maximum no. of cases was from ductal carcinoma (214 cases, including ductal malignancy with lymph node metastasis) followed by lobular carcinoma (11 cases).





In present study follow up biopsies with cyto-histopathology correlation was available in 215 cases.

Table 8: Correlation of cyto& histological diagnosis.

Cytology		Histology	
Diagnosis	Number with follow-up biopsies	Benign	Malignant
Unsatisfactory	1	1	0
Inflammatory/Benign	152	151	1
Atypical/Indeterminate	18	15	3
Suspicious of Malignancy	11	4	7
Malignant	33	1	32
Total	215	172	43

In the present study, sensitivity was 97.16%, specificity was 92.83%, Positivity predictive value 91.15%, Negative predictive value was 97.74%, diagnostic accuracy was 94.70%, Adequacy rate was 92.36% and inadequacy rate was 7.63%.

Discussion

The objective of this study was to categorize and type the various breast lesions on cytology, statistically analyze the findings and correlate the cytology findings with histopathology for better insight of breast lesions on cytology.

The most common cancer in Nepal is cervix carcinoma followed by breast carcinoma. [7,8,9]. Different studies have shown that most commonly the lesions are benign for which only assurance is needed [8.9]. In order to prevent the cancer and for accurate approach to treatment, it is important to screen and diagnose the breast lesions early and categorization them into different groups of breast pathology [10,11]. Majority of breast lumps (55.05%) were located in the upper and outer quadrant of breast [12]. The commonest benign breast lesion is Fibroadenoma. Ferguson also reported that

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the commonest benign breast lump as fibroadenoma which most commonly occurs in the younger age group [13]. Singh A et al reported commonest malignant neoplasm of breast was Invasive duct carcinoma occurring most commonly in the age group of 41-60 years of age. In our present study we have similar findings.

FNA samples were categorized in to five categories (benign, Atypical, suspicious, malignant and insufficient). On cytological evaluation maximum cases were of benign breast lesions (64.61%) followed by malignant lesion (21.32%).7.53% cases were inadequate/insufficient for interpretation, while 5.05% cases were diagnosed as intermediate/Atypical breast lesions and 1.47% cases were categorized as suspicious /probably malignant breast lesions. Maximum breast lesions that occurred in the first 3 decades were benign, while malignant breast lesion was more common in the later decades (6^{th} decade onwards). Of the benign breast lesions, majority cases were of fibroadenoma (24.8%).

The Suspicious / probably malignant category included 16 cases in which the cellular findings were highly suggestive of, but not diagnostic of malignancy. In all these cases biopsy was advised. In malignant lesions, maximum cases were of Ductal carcinoma (NOS).

Histopathology correlation was available in 215 cases (19.76%). Maximum cases of histopathology correlation were found in the benign and malignant category, and lower cyto-histo correlation in suspicious lesions. The commonest cause of inadequate for interpretation on cytology could be attributed to marked sclerosis, hyalinized and collagenized stroma.

In the present study, sensitivity was 97.16%, specificity was 92.83%, positivity predictive value 91.15%, negative predictive value was 97.74%, diagnostic accuracy was 94.70%, adequacy rate was 92.36% and inadequacy rate was 7.63%. FNAC of breast lesions is highly sensitive, specific, and accurate screening test for palpable breast lesions in a tertiary hospital setting [14].

Conclusion

The FNAC of breast is cheap, safe and highly accurate investigation for diagnosis of breast lesions. The correlation between cytology and histology showed that FNAC is an accurate test in diagnosing and managing benign breast lesions.

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