



Original Article

Fine needle aspiration cytology in a palpable breast lesion

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ABSTRACT

Background: Breast cancer is the common malignant lesion in women. Fine needle aspiration cytology has high sensitivity and specificity and is a simple, rapid and safe method to diagnose breast lesions. The aim of the study was to categorize breast lesions and correlate the Fine needle aspiration cytology diagnosis with histopathological findings.

Materials and Methods: This was a retrospective study done in department of Pathology of Institute of medicine, Trivuvan university teaching hospital, from January 2007 to December 2010. There were 1403 FNAC cases and 469 histopathology cases. Fine needle aspiration correlation with histopathology was done in 249 cases. All the cases were categorized according to risk for cancers: Unsatisfactory sample, Inflammatory breast disease Benign proliferative breast disease without atypia, Benign proliferative breast disease with atypia, Suspicious for malignancy and Malignant lesions.

Results: Benign breast lesions were common in the age group of 21-30 years and malignant breast lesion common in the age of 41-50 years of age. In our study fibroadenoma was most common benign lesion and ductal carcinoma was the most common malignant lesion. The sensitivity and specificity of FNAC for malignancy were found to be 98.2% and 98.5% respectively.

Conclusion: Fine needle aspiration cytology is highly sensitive and specific technique for diagnosis of most of the malignant and benign breast lesions.

INTRODUCTION

Breast cancer is the leading cause of morbidity and mortality.^{1,2} There is wide variety of breast pathology. It has been postulated that inflammatory breast disease and non proliferative breast disease do not increase the risk of cancer. Proliferative breast disease without atypia and with atypia confers mild and moderate risk respectively, whereas carcinoma in situ is associated with substantial risk

if untreated.³

There are different preoperative diagnostic modalities for breast pathology. Fine needle aspiration cytology (FNAC) is sensitive, simple, cost-effective, less traumatic and rapid method. FNAC may be used for palpable or non palpable and benign or malignant breast lesions. Palpable lesions may be either solid or cystic and non palpable lesions are detected by radio imaging study.¹

The aim of this study was to find out the common causes of breast lesions and its risk categorization for development of cancer and to conduct cytohistological correlation.

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Table 1A: Benign lesions with no risk of cancer.

Diagnosis	No. of Cases
I. Unsatisfactory sample	27
II. Inflammatory breast lesion	-
Breast Abscess	53
Mastitis	68
Fat necrosis	6
Parasits: Filariasis, Cysticercosis	3
Duct ectasia	1
III. Nonproliferative breast disease	
Fibrocystic change and simple cyst	262
Epithelial hyperplasia, mild	11
IV. Miscellaneous breast lesion	
Benign mesenchymal lesion	4
Lactational change/Galactocele	44
Gynaecomastia	37
Lipoma	31
Sebaceous cyst	4
Lymphadenitis	9
Mucocele	3
Axillary breast tissue	11
No evidence of malignancy	44
Total	618

Table 2A: Lesions with no risk of cancer

I. Inflammatory breast lesions	
Breast Abscess	11
Mastitis	28
Fat necrosis	3
Duct ectasia	8
II. Miscellaneous	
Skin lesions	5
Gynaecomastia	36
Lipoma	3
Lymphadenitis	4
Fibrous mastopathy	1
Galactocele	1
Mesenchymal lesions	3
Axillary breast tissue	5
III. Nonproliferative breast disease	
Fibrocystic change	26
Total	134

Table 1B: Benign lesion with mild and moderate risk for cancer .

Diagnosis	No. of Cases
I. Proliferative breast disease without atypia	
Epithelial hyperplasia, moderate	11
Adenosis	128
Papilloma	6
Fibroadenoma	451
Phylloides tumor, benign	3
II. Proliferative breast disease with Atypia /Atypical but benign	11
Total	610

Table 1C: Suspicious and malignant lesions

Diagnosis	No. of Cases
II. Suspicious for malignancy	36
III. Malignant breast lesion	
Ductal carcinoma	124
Lobular carcinoma	3
Medullary carcinoma	4
Mucinous carcinoma	3
Adenosquamous carcinoma	3
Metaplastic carcinoma	1
Atypical carcinoid tumor	1
Total	175

Table 2B: Lesions with mild and moderate risk of cancer

I. Proliferative breast disease without atypia	No. of Cases
Epithelial hyperplasia	14
Adenosis	22
Papilloma	2
Tubular adenoma	3
Fibroadenoma	135
Phylloides Tumor, benign	4
II. Proliferative breast disease with atypia	-
Atypical ductal hyperplasia	2
Mucocele with ADH	1
III. Miscellaneous	-
Adenomyoepithelioma	1
Total	184

MATERIALS AND METHODS

This was a retrospective study done over a period of four years from January 2007 to December 2010, in the Department of Pathology, Institute of Medicine, Tribhuvan University Teaching Hospital. Fine needle aspiration (FNA) was done with a 21 or 23 gauge needle attached to a 10 cc airtight disposable syringe. The sample was obtained with aspiration and non aspiration techniques with minimum passes to minimize hemorrhage. Samples were smeared onto glass slides and fixed as necessary. In cystic lesions after aspiration of fluids the lesion was again aspirated. The fluid was centrifuged and the taken for smears. Wet-fixed

smears were stained with Papanicolaou stain, while air-dried smears were stained with Giemsa stain.

During the period of study, breast lesions were interpreted according to the risk of developing cancer. According to National cancer institute consensus conference on breast FNA, categorization of breast lesions are: Unsatisfactory, Benign, Atypical probably benign, suspicious probably malignant and Malignant. Sensitivity, specificity and test efficiency were calculated using SPSS 11 software.

RESULTS

A total of 1403 FNAC cases were collected with detail radiological and clinical findings from pathology records. Histopathology examination of breast pathology was found in total of 469 cases. The FNAC report was correlated with the final histopathology report in 249 cases. The maximum number of cases was in the age group of 21-30 years in benign breast lesion and in the age group of 41-50 years in malignant breast lesion. Among them only 0.8% cases were male while 99.2% were female. Out of 1403 cases benign lesion with no risk factor, including unsatisfactory samples and parasitic lesions like filariasis(fig.1) and cysticercosis were 618. Benign lesion with mild and moderate risk for cancer were 610 cases, suspicious for malignancy were 36 cases and malignancy were 139 cases. The details of these lesions are in Table 1A, 1B and 1C respectively.

Most common cases was fibroadenoma (32.1%) followed by fibrocystic change and adenosis in benign breast lesion. Ductal carcinoma (8.8%) was the commonest

Table 2C: Histology of Malignant breast lesion

Malignant lesions	No. of Cases
Ductal carcinoma	128
Lobular carcinoma	1
Medullary carcinoma	5
Mucinous carcinoma	3
Adenosquamous carcinoma	7
Metaplastic carcinoma	2
Infiltrating papillary carcinoma	2
Carcinosarcoma	1
Angiosarcoma	1
Squamous cell carcinoma	1
Phyllodes tumor, malignant	1
Total	152

Table 3: FNAC and Histopathology correlation.

FNAC	Histopathology													No. of cases
	Benign					Malignant								
	Mes	IBD	NPBD	BPBD No atypia	BPBD atypia	Sus	DC	LC	MC	MuC	CS	AS	MeC	
Mes	2													2
IBD	1	19												20
NPBD			13	5										18
BPBD no atypia		2	10	81										93
BPBD atypia					2	1								3
Sus					1	11								12
DC	1				1	77						2	1	82
LC						1	1							2
MC						2	1	9						12
MuC					1	1			3					5

Mes: Mesenchymal breast disease, IBD: Inflammatory breast disease, NPBD: Non proliferative breast disease, BPBD: Benign proliferative breast disease, DC: Ductal carcinoma, LC: Lobular carcinoma, MC: Medullary carcinoma, MuC: Mucinous carcinoma, AS: Adenosquamous Carcinoma, MeC: Metaplastic carcinoma.



Figure 1: Fine needle aspiration smear showing microfilaria (Papanicolaou stain, X10)

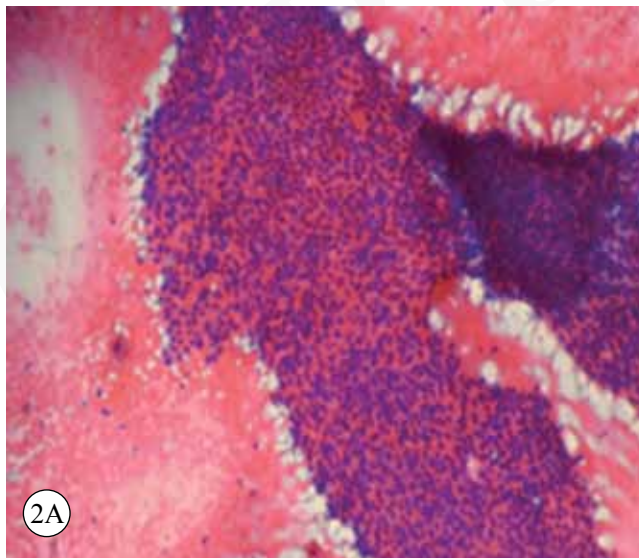


Figure 2A: Smears showing monolayered sheets of epithelial cells in branching pattern. (Wright stain, X10)

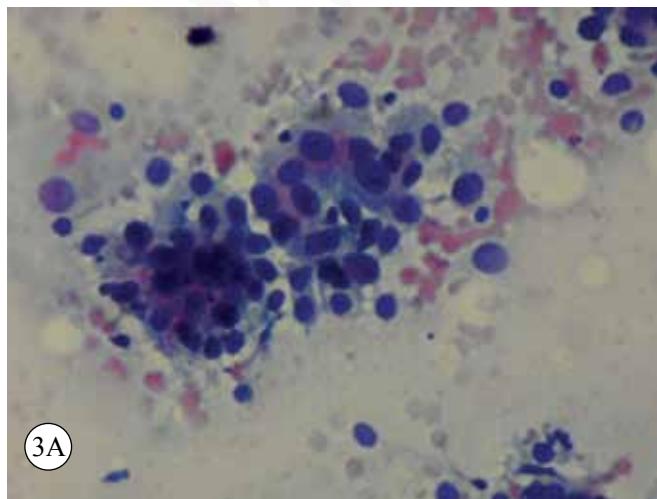


Figure 3A: Smears showing loosely arranged pleomorphic tumor cells (Papanicolaou stain, X200)

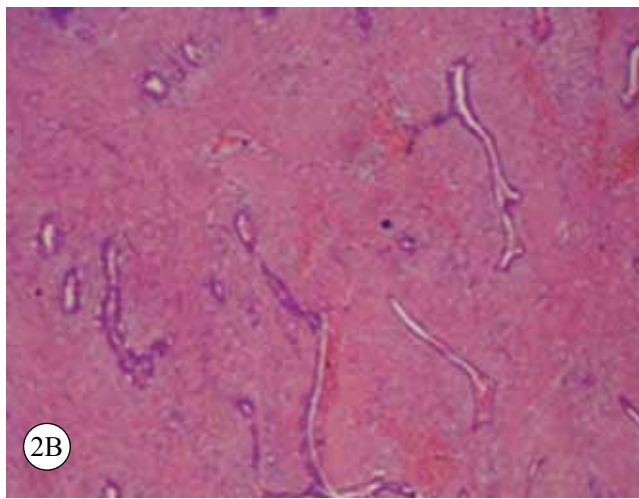


Figure 2B: Section showing proliferating ducts and stromal component. (HE stain, X20)

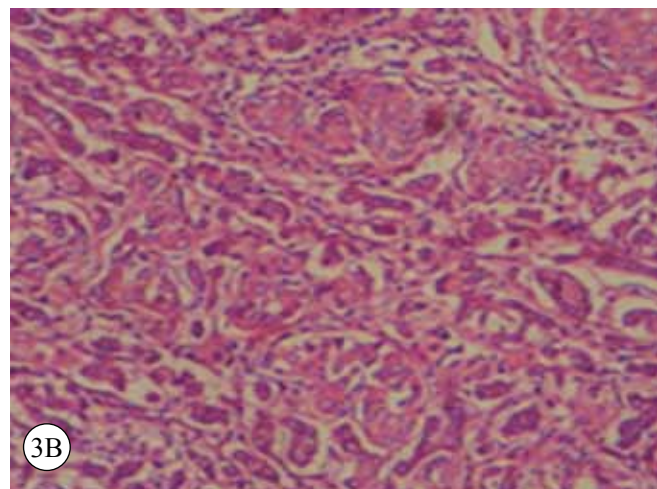


Figure 3B: Section showing Invasive ductal carcinoma arranged in glandular patterns and in cords (HE stain, X50)

malignant breast lesion. There were chronic nonspecific, granulomatous and necrotizing granulomatous mastitis.

Out of 469 histological samples, 317 cases were benign breast disease and 152 cases were malignant lesions. Skin lesions were seborrheic keratosis, Fibroadenoma was the commonest benign breast lesion and ductal carcinoma was the most common malignant lesions (Table 2A, 2B & 2C). FNAC correlation with histopathology is significant (P value=0.01). The cytohistological correlation is shown in Table 3.

DISCUSSION

Breast carcinoma is common cancer among females in Nepal preceded by cervical cancer.^{4,5} Different studies have shown that the most common lesions are benign and needs

only reassurance.^{5,6} Early screening and diagnosis of breast lesions and categorization into different groups of breast pathology is important. This can be helpful in prevention of cancer and in accurate management of the patients. Early diagnosis helps to prevent patients discomfort and anxiety.^{7,8}

Fibroadenoma (fig. 2A and B) is the commonest lesion in the category of proliferative breast disease without atypia that has minimal risk for cancer development. Ferguson also reported most common benign breast lesion as fibroadenoma occurring before the age of 25 years of age.⁹

Singh A et al⁵ reported that invasive ductal carcinoma is the commonest breast malignancy and found in the age group of 41-60 years of age. The present study shows similar findings, the ductal carcinoma being the most common breast malignancy in the age group of 41-60 year of age (fig. 3A & 3B).

In this study 1.7% cases were unsatisfactory. Sudarat et al¹⁰ found 4.2% of unsatisfactory smear i.e. fewer than five epithelial cell groups, which needs further repeat aspiration or needs core/incisional biopsy for analysis. Unsatisfactory sample can be due to insufficient experience of the pathologist, radiologist or clinician who perform FNA or due to nature of lesion itself. FNA sampling technique is equally important as sample interpretation in reaching the correct diagnosis. Provision of adequate sample and experienced pathologist can prove FNAC as highly reliable diagnostic tool.¹

In comparative analysis of FNAC and histopathology diagnosis, we observed 5 cases of cytologically interpreted errors which were 3 cases of false positive and 2 case of false negative cases. Two false negative cases diagnosed as BPBD with atypia turn out to be malignant cases. In 3 false positive cases 2 were BPBD with atypia and 1 case was benign fibrous histiocytoma. Twelve cases diagnosed as suspicious for malignancy in FNA were considered as malignant in this study. In which one case was diagnosed as BPBD with atypia. FNAC of breast lesions is sensitive, specific, and highly accurate as the initial investigation of palpable breast lesions in tertiary hospital.¹¹

Thus the FNAC smears have very high accuracy in diagnosis of breast lump.^{12,13}

CONCLUSION

The FNAC of breast is cheap, safe and highly accurate preoperative method for diagnosis of breast lesions. Preoperative categorization of breast lesions is utmost important for management of the patient.

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