

**Study of non-neoplastic breast lesions with cytohistomorphological correlation**

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**Abstract**

Palpable breast lump is a common presenting complaint. Fine needle aspiration cytology (FNAC) is one of the first line investigations in diagnosis of palpable breast lesions although histopathological examination is more valuable for confirmation. FNAC is inexpensive, offers advantages like minimal invasiveness, cost-effectiveness, rapid results and accurate means of diagnosing breast lesions.

It is essential to categorize non-neoplastic breast lesions by correlating FNAC diagnosis with histopathological findings as non-neoplastic breast lesions form a significant percentage of breast lesions. This study is aimed to determine spectrum of non-neoplastic breast lesions and assessment of the same.

**Keywords:** Cytohistomorphology, non-neoplastic, breast lesion.

**Introduction**

Lump in breast is one of the most common presenting complaints for female patients. All breast lumps are not malignant and non-neoplastic breast lesions are common. Triple assessment for lesions forms as essential platform

in proper management. Present-day non-operative diagnosis of palpable breast lesions comprises “triple assessment” by physical examination, imaging (mammography and/or ultrasound), and pathology (fine needle aspiration or core needle biopsy or imprint cytology).

Fine Needle Aspiration Cytology (FNAC) is an inexpensive and highly accurate means of diagnosing breast lesions. In addition to its high diagnostic accuracy, it offers advantages such as minimal invasiveness, minimal discomfort, cost-effectiveness and rapidity of results.[1]

Results of FNAC study will be correlated and compared with histopathological diagnosis.

**Materials and methods**

This is a prospective study of breast lesions conducted in a tertiary care hospital over a period of 24 months with sample size of 100 cases. During this period the FNAC and surgically resected specimens were included in the study. Ethical clearance was obtained.

**Inclusion Criteria**

1) All patients of palpable breast lump referred for

primary diagnosis by FNAC will be included by simple random sampling.

2) Patients undergoing Ultrasound Guided FNAC for non-palpable breast lesions.

3) Patients undergoing subsequent histopathological diagnosis after FNAC.

#### Exclusion Criteria

1) Patients in whom FNAC was either acellular /inadequate.

2) Neoplastic breast lesions.

Apart from FNAC and biopsy other modalities of investigations are also being done like Ultrasonography and Mammography.

Demographic details, clinical history, past and family history physical examination of the patient, clinical diagnosis, imaging findings and other lab investigations were all recorded, wherever available and included in the study. Clinical photographs were recorded.

All these investigations thoroughly supported the clinicians as well as pathologists for final diagnosis.

Informed Consent was taken from the patient. All the patients coming in the department of Pathology for FNAC of soft tissue lesions were selected for study. Clinical history, physical examination of the swelling, site, clinical diagnosis, lab investigations, and clinical photographs were recorded wherever available.

FNAC was performed following standard procedures using 10 ml disposable plastic syringes and 23-gauge needle.

At least two aspirates were collected and smears were made on clear & dry glass slides labelled by diamond marking pencil with the FNAC number.

Few slides were kept in 95% ethyl alcohol fixative for PAP stain and H&E stains while others were kept for air drying for Giemsa.

#### Results and Observations

The present study was conducted on 100 patients who presented at our tertiary care hospital.

Of the 100 patients, 70 patients (70%) belonged to the age group of below or equal to 40 years and 30 patients (30%) belonged to the age group of above 40 years. Mean age of patients in our study was 30.4 years.

7% of the patients were male. Based on the site of lesion it was noticed that 5% of the patients had bilateral lesion, 46% was left sided and 49% was right sided. 55% of the lesions were associated with pain. 12% patients were having nipple discharge while 88% had no nipple discharge. 6% of the patients were breastfeeding at the time of presenting the lesion. 65% turned out to be mastitis.

Out of 100 cases studied, 25 to 35 years of age was the most common age group showing majority of breast diseases (67 cases).

Most prevalent lesion in our study is Mastitis which is similar to that of Sulhyan et al. According to Farkhada et al, mastitis is more common in 3rd decade of life which is similar to our studies.

FNAC had a sensitivity of 76.3% & specificity of 100% in our study. This was similar to the study conducted by Sri Lakshmi et al. [5]

False negative rate of FNAC in our study was 23%.

Table 1: Distribution of patients according to Sex

Sex	Frequency	Percentage (%)
Male	7	7
Female	93	93

Table 2 denotes the site of the lesion, whether it was on right breast 49(49%), left breast 46 (46%) or on both breasts 5 (5%).

Table 2: Site of the Lesion

Site	Frequency	Percentage (%)
Bilateral	5	5
Total	100	100

Left	46	46
Right	49	49

Table 3: Parameters with distribution

		Mastitis (n=65)		Non-mastitis (n=35)		Total (n=100)	
		No.	%	No.	%	No.	%
Age Group	<=40 yrs.	42	64.6%	28	80.0%	70	70.0%
	>40 yrs.	23	35.4%	7	20.0%	30	30.0%
Sex	Male	0	0.0%	7	20.0%	7	7.0%
	Female	65	100.0%	28	80.0%	93	93.0%
Site	Bilateral	2	3.1%	3	8.6%	5	5.0%
	Left	28	43.1%	18	51.4%	46	46.0%
	Right	35	53.8%	14	40.0%	49	49.0%
Pain	Present	52	80.0%	3	8.6%	55	55.0%
	Absent	13	20.0%	32	91.4%	45	45.0%
Nipple discharge	Present	6	9.2%	6	17.1%	12	12.0%
	Absent	59	90.8%	29	82.9%	88	88.0%
Breast feeding	Present	3	4.6%	3	8.6%	6	6.0%
	Absent	62	95.4%	32	91.4%	94	94.0%

Table 4: Correlation of cytology findings with histopathology

	N	Agreement	Non- agreement	Partial agreement
Accessory breast	13	13	0	0
Acute on chronic mastitis	29	29	0	0
Chronic mastitis	11	10	1	0
Cn granulomatous mastitis	6	0	0	6
Duct ectasia	5	5	0	0
Fat necrosis	6	6	0	0
Fungal granulomatous mastitis	2	0	0	2
Galactocele	4	4	0	0



Gynaecomastia	7	7	0	0
Idiopathic granulomatous mastitis	14	0	1	13
Tb granulomatous mastitis	3	0	0	3
Total agreement	100	74	2	24

Fig 1: Cystic Neutrophilic Granulomatous Mastitis (H&E section 100x)

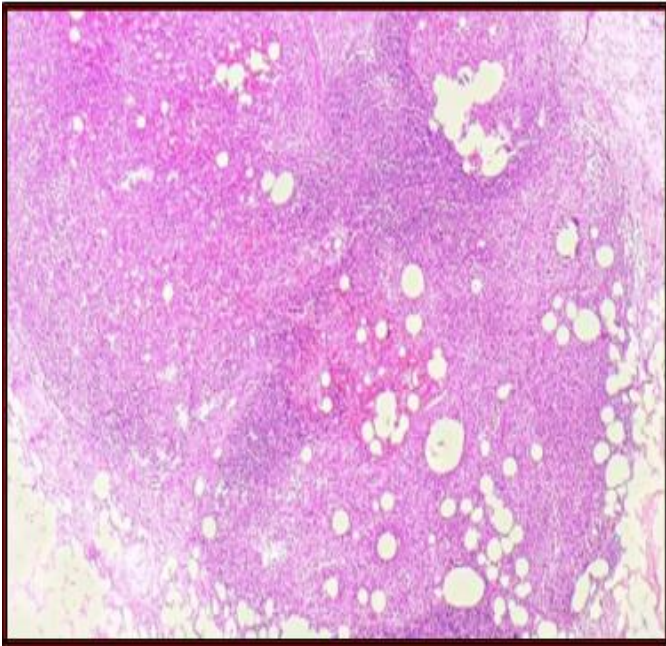


Fig 2: Cystic spaces surrounded by rim of neutrophil. These spaces are formed secondary to central lipid vacuole. (H&E section 400x)

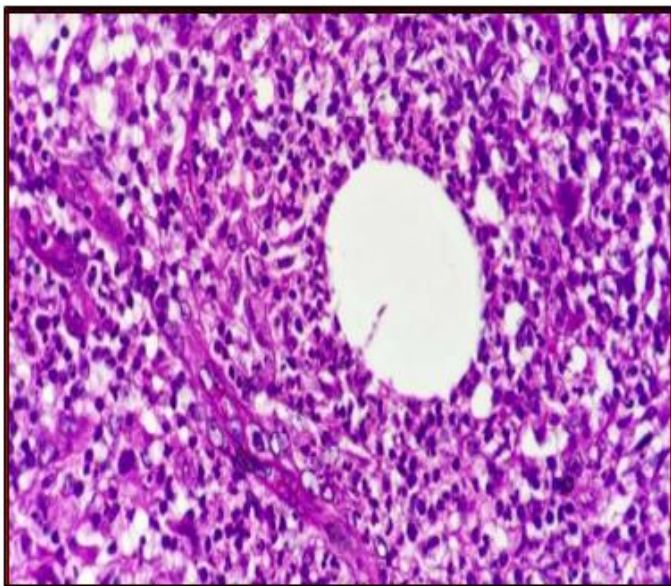


Fig 3 : TDLU with scattered lymphocytic inflammatory cells in the surrounding stroma (H&E section 100x)

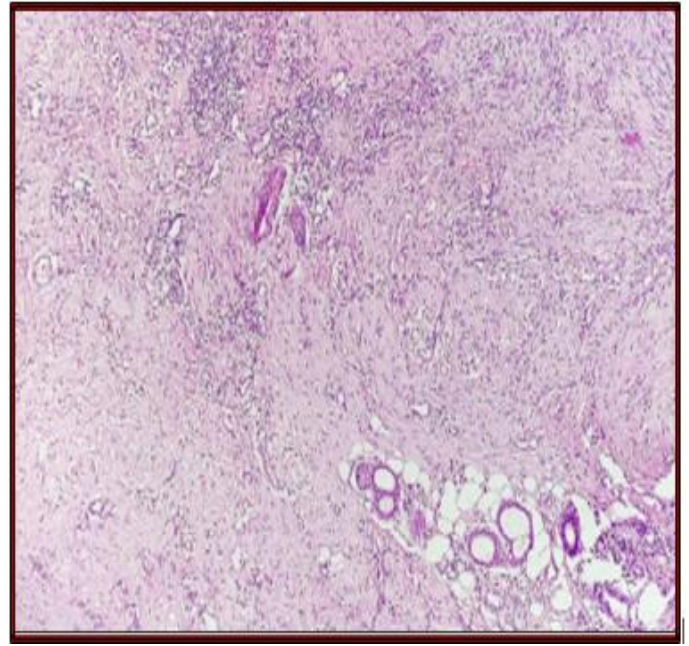


Fig 4 : a duct and lymphocytic inflammatory cells in the stroma (H&E section 400x)

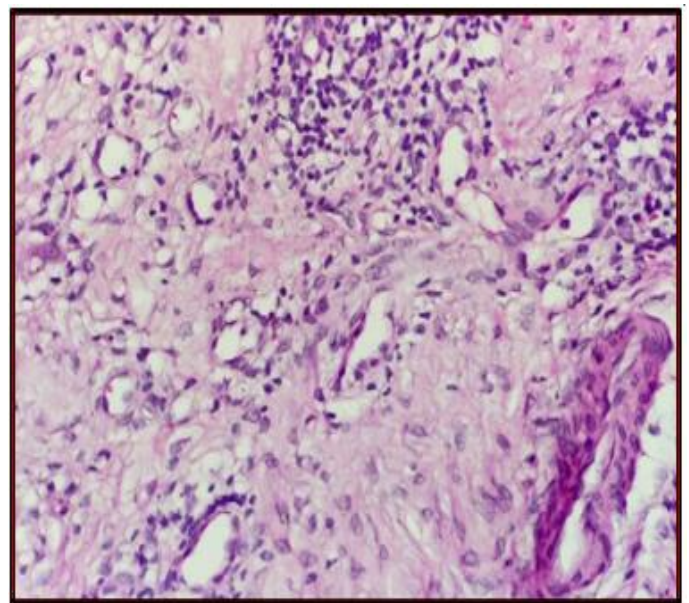




Fig 5: Galactocele- duct which is cystically dilated lined by flattened cuboidal epithelium that contain pink, eosinophilic amorphous secretion. (H&E section 100x)



Fig 6: Fungal mastitis- showing the broad aseptate fungal hyphae (H&E 400x)

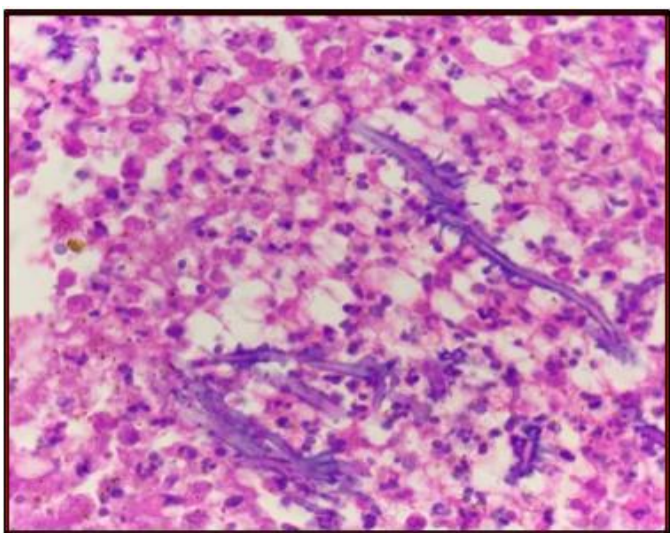


Fig 7: H&E 400x Cytological image of Mastitis.

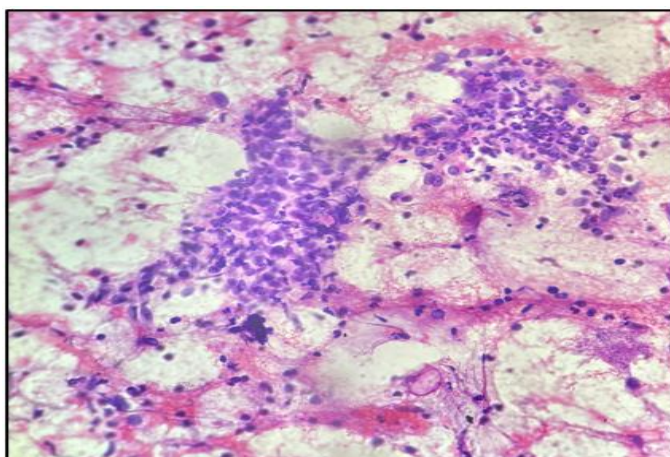
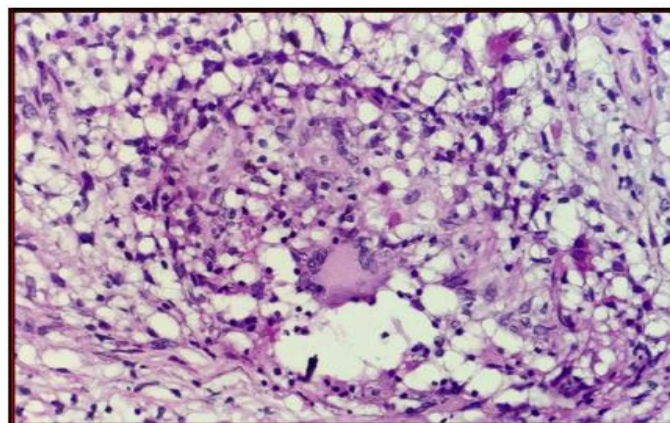


Fig 8: H&E section 400x showing granuloma and Langhans giant cell.



**Discussion**

FNAC had a sensitivity of 76.3% & specificity of 100% in our study. This was similar to the study conducted by Sri Lakshmi et al. False negative rate of FNAC in our study was 23%. Below is comparison with various other studies.

Authors	False negative FNA (%)
Present study (n = 100)	23
Park and Ham (n = 699)	10
Feicher et al (n = 150)	9

False positive rate of FNAC in our study was 0%.

Authors	False positive FNA (%)
Present study (n = 100)	0
Park and Ham (n = 699)	1
Feicher et al (n = 150)	0.5

Of the 100 patients, 70 patients (70 %) belonged to the age group of below or of 40 years, 30 patients (30 %) belonged to the age group above 40 years. Mean age of patients in our study was 30.4 years.

**Comparison of mean age (in years) with other studies.**

Authors	Mean age (in years)
Present study (n = 100)	30.4
Reddy et al (n = 168)	32
Yadav et al (n = 150)	34.7

Out of 100 cases studied, 25 to 35 years of age was the most common age group showing majority of breast diseases (67 cases).

Most prevalent lesion in our study is Mastitis which is similar to that of Sulhyan et al [8]. According to Farkhada et al, mastitis is more common in 3rd decade of life which is similar to our studies.

#### **Conclusion:**

A prospective study of 100 cases during a period of two years of palpable breast lesions were conducted. From the present study we conclude that non-neoplastic breast lesions are more common in 3<sup>rd</sup> decade of life. Most common condition being mastitis followed by accessory breast.

FNAC being 76% sensitive and 100% specific should be used specific diagnostic modality to classify whether we are dealing with neoplastic or non-neoplastic lesions. Hence it is a rapid and reliable method to reach to a probable diagnosis.

All granulomatous mastitis cases are not tuberculous and the etiological diagnosis must be based on multidisciplinary approach. Treating tuberculosis with steroids would aggravate the infection, whereas giving unnecessary anti-tuberculosis drugs in cases of idiopathic granulomatous mastitis causes side effects.

Cystic neutrophilic granulomatous mastitis is an entity that is difficult to distinguish from breast carcinoma without pathological examination for which careful histological examination, especially in the cystic spaces, is critical for both single and mixed organism identification.

Fungal granulomatous mastitis is an emerging invasive fungal disease that require high level of clinical and histopathological skills.

Fat necrosis is an entity which has high BIRADS score on mammography creating agony in the patient and

treating physician although it's a non- neoplastic lesion.

The important feature to differentiate fat necrosis from carcinoma is preponderance of inflammatory cells as compared to ductal cells and typical background with foamy histiocytes and giant cells. In conclusion, the simplicity, rapidity, lack of morbidity, high sensitivity, high specificity and cost effectiveness of FNAC makes it the most valuable tool in the evaluation of the breast lesions.

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