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PATTERN OF BREAST LUMPS AND DIAGNOSTIC ACCURACY OF FINE NEEDLE ASPIRATION CYTOLOGY IN COMPARISON TO HISTOPATHOLOGY

Pathology

Dr. Navjot Kaur Associate Professor, Dept of Pathology, Govt Medical College Amritsar.
Tejasvin Singh
Dr. Jaspreet Singh* Associate Professor, Dept of Pathology, Govt Medical College Amritsar. *Corresponding Author

ABSTRACT

Pattern of breast lumps and diagnostic accuracy of fine needle aspiration cytology in comparison to histopathology. Breast cancer is the second most common cancer in the women in India. An effective and accurate method of breast cancer diagnosis will help to reduce the patients morbidity and mortality as early diagnosis is lifesaving, cost effective and requires less aggressive therapy. Mammography represents the most used modality for breast cancer screening, with mortality reduction of 30-40% in screened population. Despite the imaging techniques, pathological characterization still plays an essential role for differential diagnosis and for avoiding surgical over treatment in case of breast lesion with suspicious features.

KEYWORDS

Carcinoma Breast, FNAC, Histopathology, Mammography

INTRODUCTION

Breast cancer is the most common malignancy in women throughout the world and it is the second most common cancer in the women in India. Global variation in cancer survival is very wide. 5-year relative survival for breast, colorectal, and prostate cancer was generally higher in western countries in comparison to low income countries. Cancer detection rates in women who had a first-degree relative with a history of breast cancer were similar to those in women a decade older without such a history. [1-3]

Fine-needle aspiration cytology is a desirable outpatient procedure for preoperative diagnosis of solid tumors. This approach is much better than that of excision biopsy and frozen section followed by mastectomy because the patient can be informed in advance about the mastectomy. Pathological characterization still plays an essential role for differential diagnosis and for avoiding surgical over treatment in case of breast lesion with suspicious features.[4-10]

Fine needle aspiration cytology is a relatively simple, reliable, atraumatic, economical and complication free technique for the evaluation of mass lesions. FNAC is now a well established technique for the investigation of mass with suspected breast carcinoma.[5-11]

The primary goal of FNAC is to separate malignant lesions that require more radical therapy from the benign lesions that may be conservatively managed. Cytology helps in identifying benign lesion, the subtypes of malignant lesions and minimal residual disease for the purpose of planning the therapeutic protocol and eventual follow up. Thus it plays a major role as an important pre operative assessment alongwith clinical and mammography examination, which together are frequently referred to as triple test.[6-8,12-14]

It has been shown that FNAC has reduced the number of open biopsies because of its high diagnostic sensitivity and specificity. However, open biopsy is still preferred in same centers due to lack of expert cytologists.[9-16] The biopsy of palpable breast lesion predicated on the histological study of the tissue specimens can provide all the reliable information to the surgeon and oncologist for modern therapeutic strategies as part of the decision making regarding patients treatment. This technique permits the eventual use of neo-adjuvant therapy. Different studies have determined the FNAC has a sensitivity ranging from 80% to 98% and a specificity of 99% to 100%.[10-17]

The present study was undertaken to evaluate various patterns of breast lumps and diagnostic accuracy of FNAC in comparison to histopathological findings. All patients who met the inclusion criteria was included in the study.

Inclusion Criteria

- Women having clinically breast lump attending the hospital
- Age between 11 to 80 years.

Exclusion Criteria

- Breast lump which wee suspected clinically and diagnosed by sonomammography or mammography as malignant
- Uncooperative patients

At every time the biopsy specimen was sent to pathology department, paraffin sections were made and stained by H & E. Histopathological examination was done. A cyto-histopathological correlation of results of cytological and histopathological studies was done to estimate the efficacy of FNAC.

OBSERVATIONS

The present prospective study comprise of 50 cases with breast lumps, which were subjected to fine needle aspiration cytology on OPD basis. Patients were referred to cytology OPD.

Number of breast lumps cases were 50, out of these maximum cases were found in 4th decade i.e. 18n cases (36%) and minimum in 8th decade i.e. 1 case (2%).

Table1:

Age	Frequency	Percentage
11-20 yrs	6	12%
21-30 yrs	7	14%
31-40 yrs	18	36%
41-50 yrs	10	20%
51-60 yrs	5	10%
61-70 yrs	3	6%
71-80yrs	1	2%
Total	50	100%

Distribution of breast cancer in relation to right or left breast.

Side of the breast involved

Table 2:

Side of breast involved	Frequency	Percentage
Right	28	56%
Left	22	44%
Total	50	100%

Amongst 50 cases, lump was observed in right breast in 28 cases and 22 cases in left breast.

Table 3

Site of lump. Distribution of breast lumps:

Site of lump	Frequency	Percentage
Upper outer quadrant	28	56%
Lower outer quadrant	6	12%
Upper inner quadrant	8	16%
Central quadrant	3	6%
Lower inner quadrant	4	8%

Whole quadrant	1	2%
Total	50	100%

The lesions were most common in upper outer quadrant of breast i.e. 28(56%), followed by upper inner quadrant i.e 8 cases (16%), lower outer quadrant 6 (12%), lower inner quadrant 4 (8%) and central quadrant 3 (6%). There was 1 (2%) cases where whole breast was involved.

Table 4.
Distribution of chief complaints

Chief complaints	Frequency	Percentage
Lump	46	92%
Lump, bloody discharge	2	4%
Lump, Milky discharge	1	2%
Lump, pain	1	2%
Total	50	100%

All 50 cases presented with common symptom of lump in breast. Amongst them, pain was present in 1 case and nipple discharge was present in 3 cases.

CLINICAL DIAGNOSIS:

Table 5. Distribution Of Cases According To Clinical Diagnosis

Clinical diagnosis	Frequency	Percentage
Fibroadenoma	32	64%
Carcinoma breast	14	28%
Gynecomastia	1	2%
Abscess	1	2%
Phyllodes tumour	1	2%
Galactocele	1	2%
Total	50	100%

Table 6.
Cytological features of aspirated material was creamy white in 33 cases, hemorrhagic in 13 cases, clear fluid was obtained in 2 cases, milky aspirate in 1 case and white mucus aspirated in 1 case.

FNAC	Frequency	Percentage
Benign	32	64%
Malignant	12	24%
Suspicious	2	4%
Fibrocystic	1	2%
Galactocele	1	2%
Gynecomastia	1	2%
Non specific inflammation	1	2%
Total	50	100%

Cytological Findings:

1. Benign: 32 (64%) smears were found as benign. Smears were cellular and showed large, branching monolayered sheets of uniform benign ductal epithelial cells lined by myoepithelial cells. Numerous single bare bipolar nuclei of benign type and fragments of fibromyxoid stroma were seen.
2. Malignant: 12 (24%) cases were diagnosed as malignant. Most smears were highly cellular with discohesive clusters and single atypical epithelial cells, irregular angulated clusters of atypical cells, nuclear enlargement, hyperchromatic and irregularity of variable degree. Single cells with intact cytoplasm and absence of single bare nuclei of benign type and presence of necrosis are seen in few cases.
3. Suspicious of malignancy: There were 2 (4%) smears in which aspirated material showed some but not all criteria of malignancy. Cellular smears with discohesive cluster showing subtle cellular atypia with nuclear crowding and overlapping such clusters shows presence of myoepithelial cells also.
4. Fibrocystic disease: 1 case (2%) was diagnosed as fibrocystic disease. Smears showed apocrine epithelial cells, benign ductal epithelial cells, bare oval nuclei, background of macrophages and connective tissue fibres.
5. Gynecomastia: 1 smear (2%) was diagnosed as gynecomastia, smear was moderately cellular, epithelial sheets are often large and many single bare nuclei were also seen. Fragments of fibromyxoid stroma were seen and there were some fibroblastic spindle cells with intact cytoplasm in the background.
6. Non specific inflammation: There was 1 smear (2%) which showed a benign bimodal pattern, inflammatory cells, regenerative epithelial atypia, few epithelioid histiocytes and many plasma cells.
7. Galactocele: One smear was diagnosed as galactocele, with milky fluid and resolved after aspiration. Fluid contains mainly macrophages with same regenerated acinar cells and fat miscelles.

Histopathologic Diagnosis

In the present prospective study of 50 breast cases, results on fine needle aspiration cytology were correlated with histopathology.

Table 7:

	Histopathological diagnosis	Frequency	Percentage
BENIGN	Fibroadenoma	26	52%
	Benign Phyllodes tumour	3	6%
	Sclerosing adenosis	1	2%
MALIGNANT	Infiltrating ductal ca	9	18%
	Intraductal ca	1	2%
	Mucinous ca	1	2%
	Invasive papillary ca	2	4%
	Infiltrating lobular ca	1	2%
INFLAMMATORY	Granulomatous mastitis	1	2%
	Chronic non specific inflammation	1	2%
OTHERS	Fibrocystic disease	2	4%
	Gynecomastia	1	2%
	Galactocele	1	2%
	Total	50	100%

In the present study, out of 32 smears diagnosed as benign on cytology, showed 26 as fibroadenoma, 3 as benign phyllodes, 1 as fibrocystic disease, 1 as chronic non specific inflammatory tissue and 1 as granulomatous mastitis on histopathology.

12 cases diagnosed as malignant on cytology, which on histology showed IDC in 8 cases, invasive papillary carcinoma in 2 cases, I as infiltrating lobular carcinoma, 1 as mucinous carcinoma and 1 as DCIS.

Suspicious of malignancy was made in 2 smears, which on histopathology were diagnosed as IDC and DCIS.

In remaining cases, gynecomastia was diagnosed in 1 case on cytology and galactocele in 1 case were confirmed on histology. 1 case diagnosed as fibrocystic disease on cytology and 1 as chronic non specific inflammatory pathology were confirmed and diagnosed as granulomatous mastitis on histology.

So considering the categories of cytological and histopathological diagnosis, the table is as follows:

Table 8: Comparison Of Cytological Diagnosis And Histopathological Diagnosis

Cytological diagnosis	No. of cases	Histopathological Diagnosis		Total
		Consistent	Inconsistent	
Benign	32	32(100%)	0	32
Malignant	12	12(100%)	0	12
Suspicious of malignancy	2	1(50%)	1(50%)	2
Others	4	3(75%)	1(25%)	4
Total	50	48(96%)	2(4%)	50

Thus in the present study, cytological findings were consistent with histopathological findings in 48 out of 50 cases (96%) and inconsistent in 2 (4%) cases.

DISCUSSION

Present study was conducted on 50 patients with a palpable lump in the breast, each of whom underwent a FNAC of the lump followed by excisional surgery either in the form of a lumpectomy or a definitive surgical procedure like mastectomy depending on the diagnosis at aspiration cytology. The aspiration cytology findings were then matched with the final histology reports to see as to how accurate FNAC was, as compared to open biopsy i.e. cytohistological correlation.

As per the age wise distribution of 50 cases of breast lump, maximum cases were found in 3rd decade i.e. 18 cases (36%) and minimum in 8th decade i.e. 1 case (2%). The present study is comparable to Dutta et al (2009)[76] where in most cases were in the age group of 31-40 yrs.

In distribution of breast lump, most common site was the upper outer quadrant of breast i.e. 28 (56%) followed by upper inner quadrant 8

cases (16%). Lower outer quadrant 6 (12%), lower inner quadrant 4 (8%) and central quadrant 3 (6%). The present study findings correlate with Reddy and Reddy et al[85], R K Gang and Ishita Pant study[88].

Clinical diagnosis: The commonest pathology found in our patients was fibroadenoma in 32 patients. This was followed by malignancy in 14 patients.

Table 9. Findings Of FNAC In Different Studies:

Author	Benign	Suspicious/ Inconclusive	Malignant	Total cases
Present study	64%	4%	24%	50
George et al[89]	68.10%	3.3%	12.3%	1472
Ishita et al[88]	68%	1.6%	20%	125
Pradher[90]	81.92%	2.58%	14%	1297
Bhagat et al[92]	71.5%	10%	8.5%	200
Yusuf et al[71]	54.5%	13.5%	22%	200

This %age of benign lesions in this study correlates with that of George et al and Ishita et al. %age of malignant lesions correlates with Ishita et al and Yusuf et al and %age of suspicious lesions correlates with George et al.

HISTOPATHOLOGICAL DIAGNOSIS

Author	Benign	Malignant	Total cases
Present study	60%	28%	50
Chauhan et al[68]	44.5%	52%	200
Wolfgramm et al[94]	59.06%	40.42%	4349
Moschatta et al[93]	56%	43.5%	400

Findings of the present study correlates with the findings of wolfgramm et al 2013 and Moschatta et al 2014 in which malignant cases are around 40.42% and 43.5% respectively.

SUMMARY and CONCLUSION:

FNAC is a simple, rapid, cost effective procedure to diagnose breast lesions. It is not associated with any drawbacks of harm to patient or any complications of the procedure. It is valuable in diagnosing pure benign lesions and avoids surgical intervention in benign lesions, also reduces the anxiety on the part of the patient. Diagnostic accuracy of the procedure for malignant lesions is well established.

Thus in the present study, cytological findings were consisitent with histopathological findings in 48 out of 50 cases (96%) and inconsistent in 2 (4%) cases.

Findings of FNAC were compared with that of histopathological findings. Sensitivity, specificity, positive predictive value and negative predictive value of FNAC were found to be 97.30%, 100%, 100% and 92.86% respectively.

The results of this study were comparable with other published data.

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