ANALYSIS OF CORE NEEDLE BIOPSY VERSUS FINE NEEDLE ASPIRATION CYTOLOGY IN THE DIAGNOSTIC APPROACH OF PALPABLE BREAST MASS.

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ABSTRACT

BACKGROUND: Breast cancer is one of the leading causes of death in women globally. Triple assessment was prompted worldwide which includes clinical (Palpation), radiological (Ultrasonography& Mammography) and cytological (Fine needle aspiration/ FNA/FNAC) assessment. But in recent times, there was a gradual increase in demand of core needle biopsy (CNB) instead of Fine needle aspiration as a tool for preoperative diagnosis of breast cancer. There are some major limitations of Fine needle aspiration like inability to pick up some borderline lesions such as atypical ductal hyperplasia, in situ carcinoma, and also it is quite difficult to distinguish these lesions from invasive carcinoma. In detection of such grey zone lesions of breast, Core needle biopsy has an edge over Fine needle aspiration cytology. In our study we will analyse the accuracy of FNAC and CNB in the diagnosis of breast masses preoperatively by comparing the diagnoses of respective post operative excision samples.

AIM AND OBJECTIVE:

1. To analyse primary diagnosis of breast lump by FNAC and CNB

2. To assess the diagnostic accuracy of each of the method by comparingthe resultswith respective post operative histopathology report.

PATIENTS AND METHODS: The current prospective study was conducted on the patient attending cytology section of the department of Pathology MKCG Medical college Berhampur, Odisha for evaluation of breast mass aspiration fromJanuary 2023 to June 2024(18 months). Total 92 patients were included in the study. Informed consent of patients wastaken. Then the patients were subjected to FNA using 5/10 cc syringes and 22/23 G needles under local anaesthesia. Simultaneously CNB specimens were also taken by 14gz 10 cm biopsyneedle. Cytosmear were stained with May–Grunwald Giemsa, diff Quick,haematoxylinand eosin and pap. The post operative excision biopsy (EB) specimenwas subjected to processing and microsection were studied with haematoxylin and eosin stain.

The preoperative FNACand CNB diagnoses results were compared with post –operative excisional biopsy specimens results.

INCLUSION CRITERIA

1. All patient with clinically palpable breast lump.

EXCLUSION CRITERIA

1. Patients not giving consent.

2. Patients who were under chemotherapy and radiotherapy.

3. Acute suppurative lesion or breast abscess diagnosed on cytology.

4.Patient with bleeding disorder.

RESULTS: Total of 92 cases were studied within the age group of 19-77 years. In this study FNAC was found to have, sensitivity of 95%, specificity of100%, PPV of 100%, NPV of 75% and accuracy of 95.6%. In comparison to FNAC, CNB showed a sensitivity of 97.5%, specificity of 100%, PPV of 100%, NPV of 87% and accuracy of 97.8%.

CONCLUSION: CNB has high sensitivity and specificity in detecting malignant lesion compared to FNAC. CNB always provides definitive histopathological diagnosis along with information regarding tumour type, grade, hormonal receptor status of tumour that permits the eventual use of neo-adjuvant therapy, which helps in planning the appropriate treatment for the patient and also avoids unnecessary excisional biopsy. CNB is cost effective and has minimal complications compared to excision biopsy. If the initial FNAC is inadequate, core needle biopsy (CNB) can be a useful second line method of pathological diagnosis in order to minimize the chance of missed diagnosis of breast cancer.

Therefore, it is concluded that, CNB is better than FNAC in evaluating breast lump.

Key words: FNAC, CNB, Breast lump

INTRODUCTION:

Breast cancer is one of the leading causes of death in women globally. Its early detection and treatment by surgery, chemotherapy and radiotherapy can decrease the mortality rate significantly[1]. Triple assessment   was prompted worldwide which includes clinical (Palpation), radiological (Ultrasonography& Mammography) and cytological (Fine needle aspiration/ FNA/FNAC) assessment[2]. But in recent times, there was a gradual   increase   in demand of core needle biopsy (CNB) instead of Fine needle aspiration as a tool for preoperative diagnosis of breast cancer.

Both Fine needle aspiration cytology and Core needle biopsy can be performed on palpable as well as non –palpable breast lesions. Besides the malignant lesions, the benign lesions also contribute to the morbidity especially when they mimic malignancy.

There are numerous advantages of Fine needle aspiration like rapidity of diagnosis, cost effectiveness, ability to sample multiple areas at a single go, sampling of metastatic as well as primary site, performance of ancillary technique. It is relatively safe with low rate of procedure relatedcomplications[3]. Despite these advantages there are some majorlimitations of Fine needle aspiration like inability to pick up some borderline lesions such as atypical ductal hyperplasia, in situ carcinoma, and also it is quite difficult to distinguish these lesions from invasive carcinoma[3]. In detection of such grey zone lesions of breast, Core needle biopsy has an edge over Fine needle aspiration cytology. However, its sensitivity, specificity, negative predictive value, positive predictive value, accuracy percentage are marginally similar to those of FNAC in most of the studies conducted in the past in various institutions. In our study we will analyse the accuracy of FNAC and CNB in the diagnosis of breast masses preoperatively by comparing the results of respective post operative excision biopsy samples[4].

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RESULTS AND DATA ANALYSIS:

In the present study, age ranged from 19 to 77 years, majority of the cases belonged to 41 to 50 yrs (27, 29.34%). Youngest case was of 19 years old and the oldest was 77 years old. 65 cases were above the age group of 41 years of age, which comprised nearly 70.65% of all the cases.

Table-1: Distribution of cases of breast lump according to gender wise(N=92)

Sex	No of cases	Percentage (%)
Female	90	97.82
Male	02	2.17
Total	92	100

Table-2: Distribution of cases of breast lump according to age(N=92)

Age in years	No of Patients	Percentage (%)
<20	03	3.26
21-30	06	6.25
31-40	18	19.56
41-50	27	29.34
51-60	22	23.91
>60	16	17.39
Total	92	100

A total of 80 cases in the study were malignant lesion whereas only 12 cases were found to be benign lesions. In the present study age prevalence for benign breast lesions ranged from 19 to 62 years and for malignant lesions range from 19 to 77 years. Commonest age for benign lesion was 31 to 40 years of age group and for malignant lesion it was from 41 to 50 years of age group.

Table-3: Age wise distribution of cases of breast lump based on benign and malignant nature (N=92)

Age in years	Benign	Malignant	Total
<20	01	02	03
21-30	02	04	06
31-40	04	14	18
41-50	01	26	27
51-60	03	19	22
>60	01	15	16
Total	12	80	92

Table-4: Distribution of cases of breast lump according to size of lump(N=92)

Lump Size	Frequency	Percentage (%)
< 2 cm	14	30.43
2-5 cm	60	65.21
>5 cm	18	4.34
Total	92	100

In this study, size of the breast lump was considered for distribution of patients. Cases were categorized with lump size 5 cm. Among 92 patients, 60 had lump size of 2-5 cm, followed by 14 patients with lump size of 5cm.

Table-5: Histopathological Examination report (HPE)(N=92)

Diagnosis	Benign	Malignant	Total
Frequency	12	80	92
Percentage	13.04 %	86.95 %	100 %

Out of the 92 cases, 12 (13.04%) cases were reported as benign lesions and 80 (86.95%) case reported as malignant lesion by Histopathology examination on larger specimens.

Table-6: Comparison between FNAC and HPE of larger biopsy specimen (N=92)

FNAC (N=92)	Histopathological (HPE)		Total	P Value
	Malignant	Benign		
FNAC Malignant(n=76)	76	0	76	< 0.001
FNAC Benign(n=16)	4	12	16	

Comparison Between FNAC And Histopathology of Larger Biopsy Specimens Among the 16 (17.39%) cases who were reported as benign lesions on FNAC, 12 (13.04%) were confirmed to have benign lesion on histopathology, but remaining 4 of the cases turned out to be malignant on histology. So, a total of 80 patients were found to have histologically proven malignancy, where FNAC had reported 76cases (82.60%) malignant and 4 cases as false negative cases, as mentioned in the table below. There were zero false positive cases. FNAC and histopathology tests were found to be significant with a p-Value of (< 0.001

Table-7: Comparison between CNB and HPE of larger biopsy specimen (N=92)

CNB (N=92)	Histopathological (HPE)		Total	P Value
	Malignant	Benign		
CNB Malignant(n=76)	78	0	78	< 0.001
CNB Benign(n=16)	2	12	14	

Comparison Between CNB And Histopathology of Larger Biopsy Specimens Among the 14 cases which were diagnosed as benign lesion on the CNB were later found to be malignant on the histopathological examination of larger biopsy samples. But rest (78) which were already diagnosed as a malignant in CNB were also found to be malignant on larger biopsy specimen. CNB had reported 2 cases

as false negative cases. Thus, out of 92 cases finally 80 cases were diagnosed as malignant by histopathology. There were zero false positive cases in CNB.

Table 8: Distribution of cases – SCRAFF BLOOM RICHARDSON histological grading (SBR) method

Grade	No of cases	Percentage (%)
I	10	12.82
II	47	60.25
III	21	26.92
Total	78	100

Grade of tumour in CNB In this study shows frequency distribution of patient taking into consideration the grade of tumour on TCB, the grading is categorised as Grade-I, Grade-II, Grade-III, TCB report Grade-I is seen in 10(12.82%) cases, Grade-II seen in 47 (60.26%.) cases, Grade-III seen in 21 (26.92%) cases. Higher incidence of patients falls under Grade-II followed by Grade-III.

Table 9: Comparison of results of FNAC and CNB with large biopsy specimen (HPE)

Type of Breast lesion	FNAC result in numbers	CNB result in numbers	HPE results in numbers
Fibroadenoma	9	7	6
Phyllodes Tumour	4	4	3
Fibrocystic disease	2	2	2
Atypicalepithelial hyperplasia	1	1	1
IDC-NST/S/o Ductal Carcinoma	76	72	74
Tubular Carcinoma	0	3	3
Medullary Carcinoma	0	2	2
Secretory Carcinoma	0	1	1
Total	92	92	92

DISSCUSSION:

Comparison of FNAC With Final Histopathology Report

In this present study, out of 92 cases FNAC reports 16 cases (17.39%) cases are benign and (82.6%) cases as malignant compared to final histopathology in which 80 (86.95%) cases are malignant and 12 (13.04%) cases are benign. In this present study of 92 patients, the sensitivity of FNAC found to be 95% in detecting malignant lesions, specificity is 100%, PPV is 100%, NPV is 75% and overall accuracy in detecting malignant lesions is 95.6%[5,6].

Comparison Of CNB With Final Histopathology Report

CNB reports in this present study of 92 cases were found to be benign in 15.2% cases and 84.7% cases were malignant compared to final histopathology in which 80 (86.95%) cases are malignant and 12 (13.04%) cases are benign. The sensitivity of CNB in detecting malignant lesion in this present study was found to be 97.5%, with a specificity of 100%, PPV of 100%, NPV of 87% and overall accuracy in detecting malignant lesions is 97.8%. Hence it can be concluded that CNB detects benign breast lesion

correctly (100%). The sensitivity, specificity, and accuracy in detecting malignant lesion is higher than FNAC and almost similar to final HPE[7,8].

Sensitivity and Specificity of FNAC and CNB.

In the present study we evaluated the agreement between two modalities for broad diagnosis of malignant and benign lesions and used histopathological outcome as the gold standard for evaluation[9]. The present study aligns with other studies in that it found CNB to have both higher sensitivity as well as specificity as compared to FNAC. Thus, the findings of the present study have shown that CNB has a slight edge over FNAC[10].

CONCLUSION:

One of the most common complaints by the patients in the surgical outdoor is of palpable breast lump and associated mastalgia. And these cases are referred for various diagnostics modalities such as, ultrasonography, mammography and other pathological tests including FNAC and CNB. These tests are required for mainly differentiating benign causes from the malignant ones. FNAC is a rapid, less complicated, economical, reliable and relevant method for the preoperative pathological diagnosis of breast lump in a developing nation like ours. FNAC stands as an active and reliable method in the pre-operative diagnosis of benign and malignant lesions as the first line diagnostic modality. Moreover, the Robinson cytological grading system correlates precisely with the grade of histology. But in few cases where there is slight difference or overlapping features of benign and malignant causes, as in ductal carcinoma in-situ, FNAC fails to provide necessary relevant details. Given the failure of FNAC to provide additional details on important and therapy related issues such as invasive nature of tumour, tumour grade, hormonal receptor status and lymphovascular invasion, CNB proves to be better in diagnosing malignant cases. In doubtful cases, if CNB report is inconclusive, patient should be subjected for excisional (lumpectomy) or incisional biopsy for proper histopathological examination and further treatment. As the whole reason behind these investigations is that these are rapid, reliable, cost effective and foremost outdoor based procedures where patients need not be admitted to hospital and planning further better treatment options.

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