

A Comparative Evaluation of Fine Needle Aspiration Cytology, Trucut Needle Biopsy & Imprint Cytology and Histopathology in Breast lumps.

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ABSTRACT

Background: Carcinoma breast is the leading cause of death in female. It is difficult to access clinically whether the lump is benign or malignant. Fine needle aspiration cytology, Tru-cut needle biopsy, Imprint cytology were performed on 64 patients and their findings are compared with histopathological examination and tried to evaluate the accuracy and usefulness of these methods. **Methods:** This study was conducted at SCB Medical College, CTC in Surgery Dept. from Oct 2014 to Sept.2016 in both male and female patients. The diagnostic accuracy of the methods were accessed and compared. **Results:** Out of 64 cases studied 35 cases are benign and 29 cases are malignant. Sensitivity and specificity of FNAC is 93.33% and 97.05% respectively. Similarly sensitivity and specificity of TCNB and Imprint Cytology are 100%, 100% and 96.42%, 100% respectively. Accuracy of FNAC, TCNB, IC are 95.31%, 98.43%, 95.31% respectively. **Conclusion:** This study shows the correct diagnosis by FNAC, TCNB, IC is 93.33%, 100%, 96.42% respectively in comparison with HP study. So if FNAC gives correct diagnosis, we can go for definite surgery but if FNAC is suspicious then plan for TCNB and intraoperative IC was done to correlate the finding and definite surgery was planned.

Keywords: FNAC – Fine needle aspiration cytology, TCNB:-Tru-cut needle biopsy, IC:-Imprint cytology, Breast lump, HP: - Histopathological study.

INTRODUCTION

Breast lump whether benign or malignant is anxiety for the patient, her family as well as the treating surgeon. FNAC is a well-accepted simple method with high diagnostic accuracy which can be carried out in OPD basis.

TCNB is simple method with high diagnostic accuracy and can be carried out in OPD services with minimal trauma.

IC is a simple and rapid technique for tissue diagnosis. It is a touch preparation where the cut surface is touched with a slide during operation which leaves behind the imprints in the form of cells in the glass slide and was studied. It samples the entire surface of the specimen, less time consuming, avoids specimen loss and have proved superior to frozen section biopsy which requires specialized equipments and not always available. Histological tissue diagnosis is the gold standard and universally accepted as definite diagnosis for breast lumps.

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A prospective study of 64 female & male patients of age 10-70yrs presented with breast lumps are admitted & undergone elective breast surgery in department of surgery, SCB MCH, CTC, Odisha. This study excludes patients with acute breast abscess. A written informed consent of the patient was taken. Approval from Institutional Ethics Committee was taken for the study.

FNAC

Equipments: 23/25G needle attached with airtight 10ml syringe, Cameco aspirator, gloves, cotton, spirit, 4-6 clean grease free glass slide, 95% ethyl alcohol in coupling jar.

Procedure

Prepare the area with sterile cotton swab. Needle attached to 10ml syringe is inserted into the lesion and under constant negative pressure multiple passes were made into the lesion without taking the needle out and the aspirated material put in the glass slide and smear was prepared and fixed with 95% ethyl alcohol and stained with H&E for cytological study.

TCNB

Equipments: Disposable tru-cut needle 16G or 18G, Cotton spirit, 2ml disposable syringe, 2% xylocaine solution, 10% formalin and container.

Procedure

MATERIALS AND METHODS

Skin over the lump is cleaned and 2% xylocaine was infiltrated. The lesion is fixed by one hand and the needle is inserted. As soon as the lump is reached, the biopsy needle is advanced into the mass once the inner needle is inside the mass the outer needle is pushed and the whole trucut is taken out and the material inside the stellate is placed in 10 % formalin and sent for HPE.

Imprint Cytology

Equipment's: One pair sterilised gloves, 4-6 clean grease free glass slides, Couplin jar with 95% ethyl alcohol.

Procedure

It was collected intra-operatively in the OT in department of Surgery, SCB MCH. First the excised specimen of breast lump was cut through the middle part of the specimen. The slide was firmly pressed on the cut surface without any lateral sliding movement. 4 to 6 slides were taken. Two were air dried and seen immediately for specimen adequacy by Diff Quick method. Remaining slides were fixed

with 95 % alcohol and stained with H & E for cytology reporting.

RESULTS

In this study, 64nos of breast lumps are taken into consideration, of which 60 (93.75%) patients are female and 4 (6.25%) patients are male, with female to male ratio 15:1. The age range varied from 11-70yrs. In female the average age is 40.5yrs and in males the average age is 40.5yrs. They are presented with chief complaints of lump in breast 64 (100%), mastalgia 24 (37.5%), related to menstrual cycle 12 (18.75%), nipple discharge 4 (6.25%) and skin ulceration 8 (12.5%). Anatomical location wise 30nos. (46.87%) in upper outer quadrant, 12nos (18.75%) in upper inner quadrant, 11 nos (17.18%) in lower outer quadrant, 8nos (12.5%) in lower inner quadrant and 3nos (4.68%) in central region.

Table 1: Clinical Symptoms' in relation to breast lumps.

Symptoms	Lump	Relation to Menstruation	Mastalgia	Nipple Discharge	Skin Ulceration
Nos of Cases	64	12	24	4	8
%age	100	18.75	37.5	6.25	12.5

Table 2: Topographical distribution.

Author	UO	C	UI	LO	LI	T	WB
Zuk JA	42.20	31.6	6.4	5.3	4.3	5.3	0.5
Rocha PD	45.20	30.4	7.6	5.2	4.4	2.3	0.3
Michael B	60	12	12	10	6	-	-
Our Study	46.87	4.68	18.75	17.18	12.5	-	-

(UO-Upper Outer, C-Central, UI-Upper Inner, LO-Lower Outer, LI-Lower Inner, T-Tail, WB- Whole breast)

On cytological examination they are divided as inflammatory 3nos (4.68%), benign 32nos (50%) and malignant 29nos (45.3%).

FNAC gives correct diagnosis in 58nos (90.62%) cases, while in 6nos (9.37%) cases it is false positive. The sensitivity is 93.33%, specificity 97.05%, positive predictive value is 96.55%, negative predictive value 94.28% and overall accuracy is 95.31%.

TCNB gives correct diagnosis 59 (93.65%) cases, while in 4nos (6.34%) cases it is false positive. The sensitivity is 100% and specificity is 100%, PPV is 100% and NPV is 100% and overall accuracy is 98.43%.

IC gives correct diagnosis in 57 (91.93%) cases, while in 5 nos (8.06%) cases it is false positive. The sensitivity is 96.42% and specificity is 100%, PPV is 100% and NPV is 97.14% and overall accuracy is 95.31%.

Table 3: Comparative cyto-histological diagnosis of lumps after FNAC, TCNB, IC.

Lumps	FNAC		TCNB		IC	
	No.of cases	%age	No of cases	%age	No o cases	%age
INFLAMMATORY						
Granulomatous mastitis	1	2.85	1	2.94	1	2.84
Chronic non-specific mastitis	1	2.85	1	2.94	1	2.84
Galactocele	1	2.85	-	-	-	-
Benign						
Fibroadenoma	25	70.42	24	70.58	24	68.57
Fibrocystic disease	4	11.42	3	8.82	5	14.28
Benign phylloides tumour	1	2.85	3	8.82	2	5.71
Duct papilloma	1	2.85	1	2.94	1	2.85
Gynaecomastia	1	2.85	1	2.94	1	2.85
Total (100%)	35	100	34	100	35	100
Malignant						
Infiltrating duct carcinoma	26	89.65	27	90	25	86.20
Medullary carcinoma	1	3.44	1	3.33	1	3.44
Malignant phylloides tumour	1	3.44	1	3.22	1	3.44

Suspicious of malignancy	1	3.44	-	-	-	-
Inadequate/Insufficient smear/tissue	-	-	1	3.33	2	6.89
Total (100%)	29	100	30	100	29	100

Table 4: Cyto Histological correlation of breast lumps after FNAC, TCNB & IC.

TEST	LUMPS	CYTO DIAGNOSIS	HISTO DIAGNOSIS	IN-CONSISTENT
FNAC	Inflammatory	3(4.68%)	2(3.44%)	1
	Benign	32(50%)	28(48.27%)	4
	Malignant	29(45.31%)	28(48.27%)	1
	Total (%)	64(100%)	58(90.62%)	6(9.37%)
TCNB	Inflammatory	2(3.17%)	2(3.17%)	-
	Benign	32(50.79%)	28(44.44%)	4
	Malignant	29(46.03%)	29(46.03%)	-
	Total (%)	63(100%)	59(93.65%)	4(6.34%)
IC	Inflammatory	2(3.22%)	2(3.22%)	-
	Benign	33(53.22%)	28(45.16%)	5
	Malignant	27(43.54%)	27(43.54%)	-
	Total (%)	62(100%)	57(91.93%)	5(8.06%)

Table 5: Comparative Diagnostic Accuracy of FNAC, TCNB, IC in breast lumps.

Diagnostic Test	Sensitivity (%)	Specificity (%)	-ve predictive value (%)	+ve Predictive value (%)	False +ve Rate (%)	False -ve rate (%)	Overall accuracy (%)
FNAC	93.33	97.05	94.28	96.55	2.95	6.67	95.31
TCNB	100	100	100	100	0	0	98.43
IC	96.42	100	97.14	100	0	3.58	95.31

DISCUSSION

The search for an early and accurate diagnosis for breast lump is a necessity for the patient and his/her family members. Though the incision or excision biopsy is a well-accepted diagnostic method, it requires OT facilities, specialized equipments and the procedures are traumatic. Hence much emphasis is given on FNAC, TCNB, IC.

FNAC is an extremely safe technique used for the diagnosis of breast lump on OPD basis. The false negative result in carcinoma breast is 0-10% and in our study it is 6.67%. The correct diagnosis in this study is 90.6%. Benefits of FNAC is it saves hospital admission, saves frozen section and the patient know beforehand the type of operation.^[1-5]

TCNB is simple and safe technique with high patient acceptance rate, though mild bruise and pain occurred. With positive TNB report a definite surgery was planned and positive results are reported. In this study TCNB is positive in 87.5% benign lesions and 100% in malignant lesions.^[6-9]

IC is also a safe one with high accuracy for malignant cases for which excision or /incision biopsies are avoided and definite surgery done .In this study IC report positive in 84.8% benign cases and 100% in malignant cases.^[10-12]

All the above techniques have their own advantages and drawbacks. FNAC is a simple technique and does not require any special instruments and results can be obtained within few hours and operation can be planned accordingly. TCNB is a histological diagnosis. However false negative results reported if the biopsy material is inadequate. IC is simple, accurate and cost effective diagnostic tool with high sensitivity and specificity. It also access the margin

status during surgery, thus avoiding a second surgery.

CONCLUSION

This study was undertaken to correlate FNAC, TCNB, IC and Histopathology. Results shows overall accuracy rate in detecting the cases correctly by FNAC (95.31%), TCNB (98.43%) and IC (95.31%) when compared with HP study. In OPD basis FNAC is the first line of diagnostic aid in detecting the breast lump along with clinical examination. On this basis definite surgery can be planned. However in clinically suspicious cases if FNAC report is negative, we can go for TCNB which is 100% specific. When TCNB is inconclusive we can go for incision biopsy and IC study and then definite surgery undertaken. Intraoperative IC improves the diagnostic accuracy of FNAC, TCNB and all have good correlation with each other and, with HP findings and their combined use is of great importance in effective management of breast lumps in hospitals without facilities for frozen section studies.

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