



E-ISSN: 2616-3470

P-ISSN: 2616-3462

© Surgery Science

www.surgeryscience.com

2024; 8(1): 07-13

Received: 08-11-2023

Accepted: 11-12-2023

Dr. Fothedar Pravalika

Post-Graduate Resident,

Department of General Surgery,

Mamata Medical College,

Khammam, Telangana, India

Dr. M Rajavardhan Reddy

Senior Resident, Department of

General Surgery, Mamata Medical

College, Khammam, Telangana,

India

Dr. A Bhanu Prakash

Assistant Professor, Department of

General Surgery, Mamata Medical

College, Khammam, Telangana,

India

Comparison between FNAC and TRUCUT BIOPSY in patients with breast lump

Dr. Fothedar Pravalika, Dr. M Rajavardhan Reddy and Dr. A Bhanu Prakash

DOI: <https://doi.org/10.33545/surgery.2024.v8.i1a.1042>

Abstract

Introduction: Breast cancer is the most common cancer in women worldwide. Breast diseases include a variety of lesions including inflammatory, neoplastic and hormonal response disorders. Sometimes it is difficult to determine whether a suspicious lump in the breast is benign or malignant, simply with clinical examination and FNAC. Both FNAC and Trucut biopsy are complementary procedures. So the present study was conducted to determine the efficacy of FNAC vs Trucut biopsy in diagnosis of breast lump.

Aims and Objectives: 1. To compare the diagnostic accuracy of FNAC and Trucut biopsy in differentiating benign and malignant lesions of palpable lump in breast. 2. To analyze sensitivity, specificity, PPV and NPV and the efficacy of FNAC and Trucut biopsy. 3. How an OP procedure of FNAC can be effective in arriving at diagnosis in carcinoma breast as treatment. 4. To analyse cost-effectiveness of FNAC and Trucut biopsy.

Materials and Methods: This was a single centre, prospective, comparative study conducted from October 2022 to September 2023. It was carried out on 40 patients who were satisfying inclusion criteria.

Results: Sensitivity of FNAC was 76.92% with a specificity of 96.2% and a PPV and NPV of 90.9% and 89.65% respectively. Accuracy rate for diagnosing malignant lesions by FNAC was 90%. Sensitivity and specificity of Trucut biopsy was 85.7% and 100% with a PPV of 100% and NPV of 92.85%. Accuracy rate for diagnosing malignant lesions by Trucut biopsy is 100%.

Conclusion: It can be concluded that FNAC can be done with minimal pain and immediate report but, Trucut biopsy is superior to FNAC in diagnosis of breast lump as it can get Histopathology report, it can be performed as an outpatient surgery and can avoid unnecessary surgery in case of benign disease and early intervention in case of malignancy.

Keywords: FNAC, HPE, Trucut biopsy, breast cancer, breast lump, excisional biopsy

Introduction

Breast cancer is the most common cancer in women worldwide and it is the leading cause of cancer death for women between ages 20 to 59 years. Mortality rates due to cancer breast have increased during the past sixty years in all countries^[1].

Breast diseases include a variety of lesions including inflammatory, neoplastic and hormonal response disorders. The majority of the lesions that occur in the breast are benign. However, much concern is given to the malignant lesions of the breast, as breast malignancy is one of the commonest malignancy in women throughout the world^[2].

Lump in the breast constitute significant number of cases seen in surgical outpatient department and frequently the need arises to distinguish between benign and malignant breast lump prior to definitive treatment. The most common clinical presentation of breast disease is palpable lump in the breast, although few breast diseases can present as inflammatory lesion or with nipple discharge or incidental imaging abnormalities. Triple assessment, is a term applied for the stratified approach to a breast lump which includes clinical examination, imaging (mammography or ultra sonogram) and cytology (FNAC or Core Needle Biopsy). Triple assessment (TA) has evolved as a method of diagnosing the disease process in a breast lump.

In recent past FNAC and Trucut biopsy has replaced incisional or excisional biopsy in diagnosing a lump in the breast, because of its distinct advantages like outpatient procedure, cost effectiveness, no need general anaesthesia and less pain compared to incisional and excisional biopsy^[3].

Corresponding Author:

Dr. Fothedar Pravalika

Post-Graduate Resident,

Department of General Surgery,

Mamata Medical College,

Khammam, Telangana, India

Sometimes it is difficult to determine whether a suspicious lump in the breast is benign or malignant, simply with clinical examination and FNAC. Both FNAC and Trucut biopsy are complementary procedures^[4, 5]. There is insufficient evidence to decide if one method is better than another.

Aim and Objectives

1. To compare the diagnostic accuracy of fine needle aspiration cytology and Trucut biopsy in differentiating benign and malignant lesions of palpable lump in breast cytological and histopathological correlation.
2. To analyze sensitivity, specificity, positive and negative predictive values and the efficacy of fine needle aspiration cytology and Trucut biopsy.
3. How an OP procedure of FNAC can be effective in arriving at diagnosis in carcinoma breast as treatment.
4. To recognise early breast cancers where there is scope for breast conservation surgery.
5. To analyse the cost-effectiveness of FNAC.

Patients and Methods

- **Study Design:** Comparative Observational Study.
- **Study Period:** From October 2021 to September 2023.
- **Study Place:** Department of General Surgery, Mamata General Hospital, Khammam.
- **Sample Size:** Minimum of 30 patients.

Methods of data collection

- This study will comprise of 30 patients presenting with history of lump in the breast to outpatient department (OPD) of Mamata General Hospital with following inclusion and exclusion criteria.
- Informed written consent will be taken from the patients after full explanation of the study.
- Ethical committee clearance will be taken prior to the study.

Inclusion criteria

1. Female patients of age group more than 20 years presenting with breast lump.
2. Patients willing for the study.

Exclusion criteria

1. Age group less than 20 years.
2. Past or current chemotherapy/radiotherapy/surgery.
3. Patient not willing for the study.

Methodology

A patient presenting to the outpatient department with palpable breast lump is subjected to detailed clinical history with physical examination and the information is entered in proforma. After obtained an informed and valid consent from the patient, fine needle aspiration cytology or Trucut biopsy from the breast lump is performed.

The procedure for obtaining the specimen is explained to the patient. A 10ml syringe bearing a 23-gauge needle (external

diameter of 0.6mm) is used. The lump is firmly but gently fixed by the locating hand with slight stretching of the overlying skin. Using an alcohol impregnated swab, the site to be aspirated is cleaned. Then with syringe firmly fixed and plunger closed to remove air from barrel, the needle is made ready for inserting. Patient is informed prior to puncturing the skin. The needle is introduced into skin with no air in the syringe barrel. With the needle at the anterior edge of the lump, negative pressure is applied using the thumb or with help of a syringe holder. Multiple passes are made through the lesion, at varying angle of entry into the lump, slowly rotating the syringe without withdrawing the needle from skin. This is continued till a small droplet of fluid is visualized at the hub of the needle. The negative pressure is released and then the needle is withdrawn from the skin. The needle is separated from the syringe, and reattached to the syringe filled with air. The specimen is then expressed on a glass slide. In case of excess bleed from the aspirated site, it is best to interrupt the procedure and apply pressure to avoid hematoma formation. The procedure may be repeated in the same sitting from another angle or after 1 week. Breast lesions are often deeper than they appear. If there is doubt about whether the lesion has been sampled, then re-aspiration using a longer needle may be necessary. If there is no resistance to the needle from a lump that appears clinically not to be a lipoma, then it is likely the lesion has been missed by the needle. Re-aspiration is advised, especially if the spread slide shows oily droplets throughout. Similarly, heavily blood stained aspirates may not be representative of the lesion.

The smear was fixed with 95% alcohol and later stained with haematoxylin and eosin stain. The slides were then observed under microscope and graded accordingly.

The patients were subsequently subjected to Trucut biopsy using a Trucut biopsy “gun” of 14-gauge needle. After administering Local Anaesthesia, small incision was made over the breast lump and cannula introduced. The inner trocar is thrust forward approximately 2 cm and at almost the same time the outer cutting cannula is thrust over the inner trocar filling the inside notch with the breast tissue specimen. The specimen is then placed in a container of 10% neutral formalin.

Results

Age Distribution

Maximum number of patients i.e. 14 (35%) patients belonged to age group of 20-30 years. Youngest patient was 20 years of age and oldest patient was of 85 years old. Mean age was 42.8 years.

Table 1: Distribution of patients according to their age

Age in years	Number of patients (N=40)	Percentage %
20-30	14	35
31-40	07	17.5
41-50	07	17.5
51-60	06	15
> 60	06	15
Total	40	100

Incidence of benign and malignant breast lump in various age groups

Table 2: Age wise distribution of patients having Benign and Malignant Breast lump

Age group (Years)	Benign		Malignant	
	No of patients (N=26)	Percentage%	No of patients (N=14)	Percentage%
20-30	14	53.8	0	0
31-40	06	23.07	01	7.14
41-50	05	19.23	02	14.28
51-60	0	0	06	42.85
>60	01	3.84	05	35.71
Total	26	100	14	100

Clinical Presentation

In the present study out of 40 patients, most of the patients presented with chief complaints of breast lump.

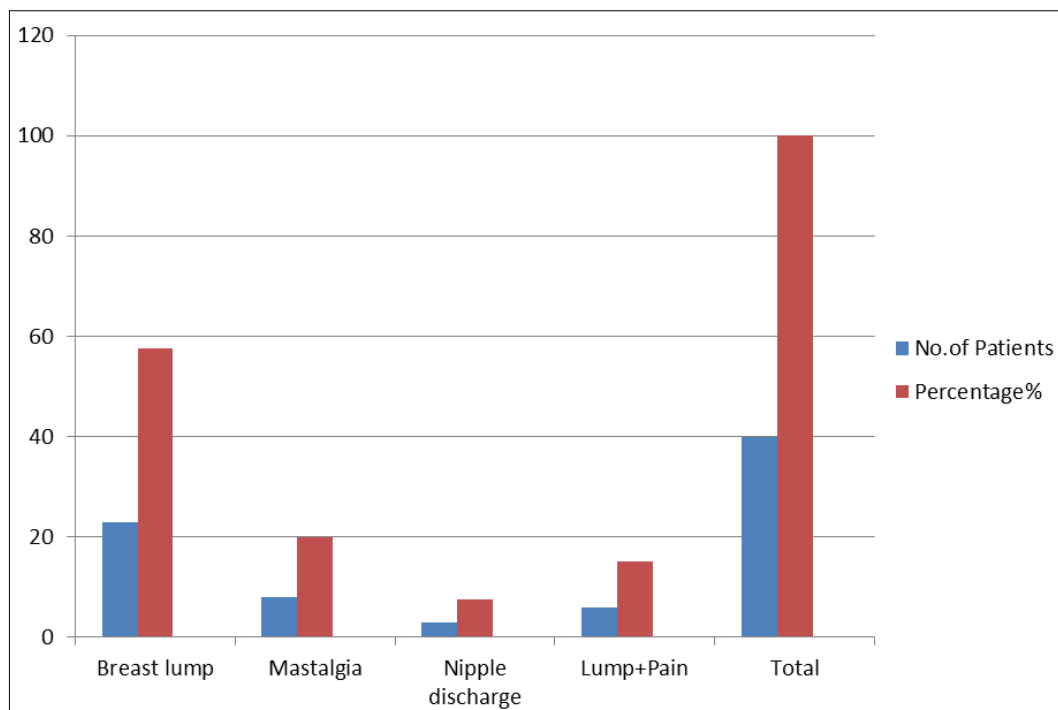


Fig 1: Incidence of presenting complaints.

Site of presentation

In the present study out of 40 patients, most common quadrant involved was upper outer quadrant.

Table 3: Quadrant presentation

Quadrant	No of Patients (N=40)	Percentage %
Upper Outer	25	62.5%
Upper Inner	05	12.5%
Lower Outer	06	15%
Lower Inner	04	10%
Total	40	100%

Menopause

In the present study out of 40 patients, 31 (77%) patients were pre-menopausal and 09(23%) patients attained menopause.

Association of malignancy with menopause

In the present study out of 40 patients, 31(77%) patients were pre-menopausal and 09(23%) patients attained menopause. Out of 14 patients with malignancy, 08 (57.14%) patients were post-menopausal and 06 (42.85%) patients were pre-menopausal. Out of 09 patients who attained menopause 08(88.89%) patients had malignancy and 01 (11.11%) patient had benign breast disease.

This shows that the incidence of malignancy was more in the post-menopausal women compared to pre-menopausal women.

Table 5: Association of malignancy with menopause

Menopausal Status	Benign/Malignant	No of Patients (N=40)	Percentage %
Pre-Menopausal	Benign	30	75%
	Malignant	01	2.5%
Post-Menopausal	Benign	01	2.5%
	Malignant	08	20%

Axillary lymphadenopathy

In the present study out of 40 patients axillary lymph nodes were palpable clinically in case of 08 (20%) patients, of which 07 (87.5%) patients had mobile axillary lymph nodes and 01 (12.5%) patient had fixed axillary lymph nodes.

Ultrasonography Findings

In the present study ultrasonography was the first investigation performed on all patients. Among 40 patients, 24(60%) patients had findings suggestive of benign disease on ultrasonography and 16(40%) patients had features suggestive of malignancy on ultrasonography.

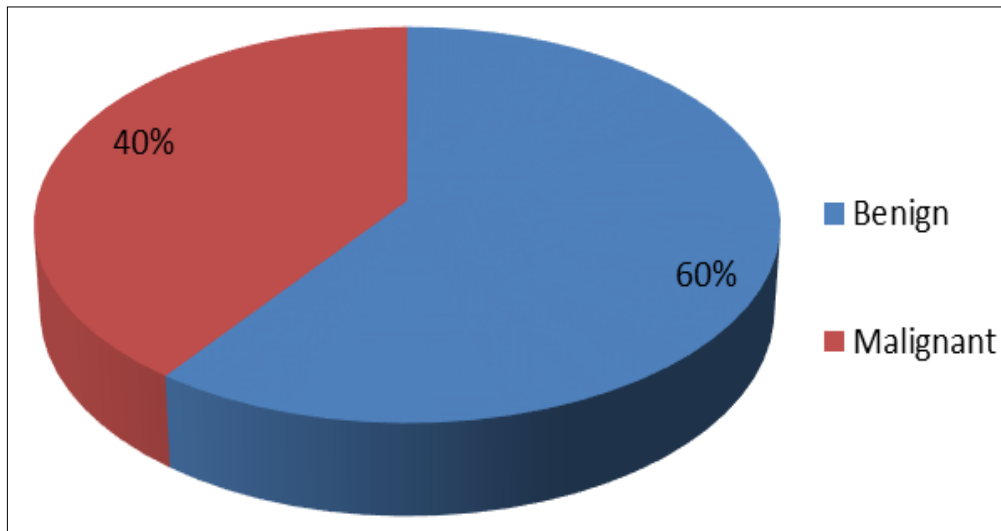


Fig 2: USG findings among patients.

Histopathological Findings

In the present study out of 40 patients, 26 (65%) patients had benign disease after HPE and 14(35%) patients had malignancy after HPE. Out of 26 patients with benign disease fibroadenoma accounted for 19(73%) patients, fibrocystic disease was seen in

03(11.5%) patients, phyllodes was seen in 02(7.6%) patients and duct ectasia was seen in 02(7.6%) patients. Out of 14 patients with malignancy, 13(92.8%) patients had invasive ductal carcinoma on HPE and 01(7.2%) patient had lobular carcinoma on HPE.

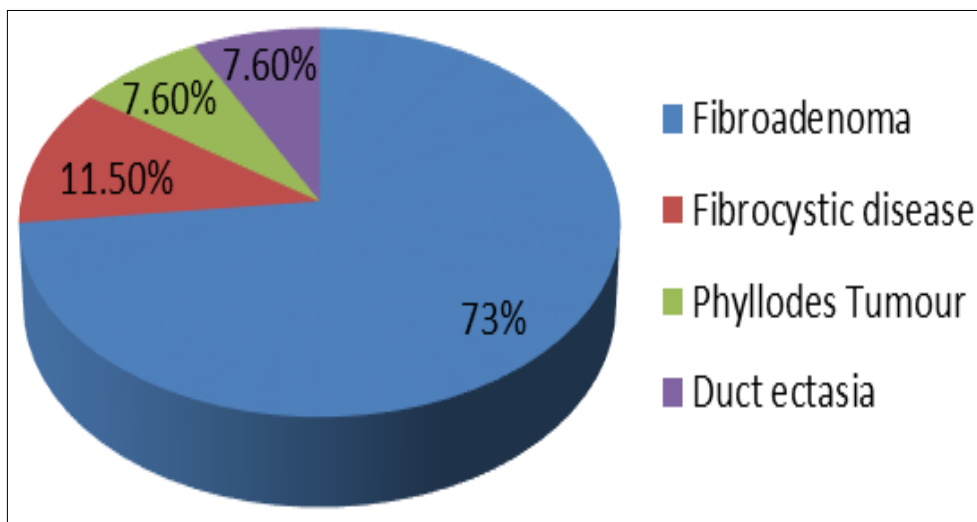


Fig 3: Incidence of various benign lesions

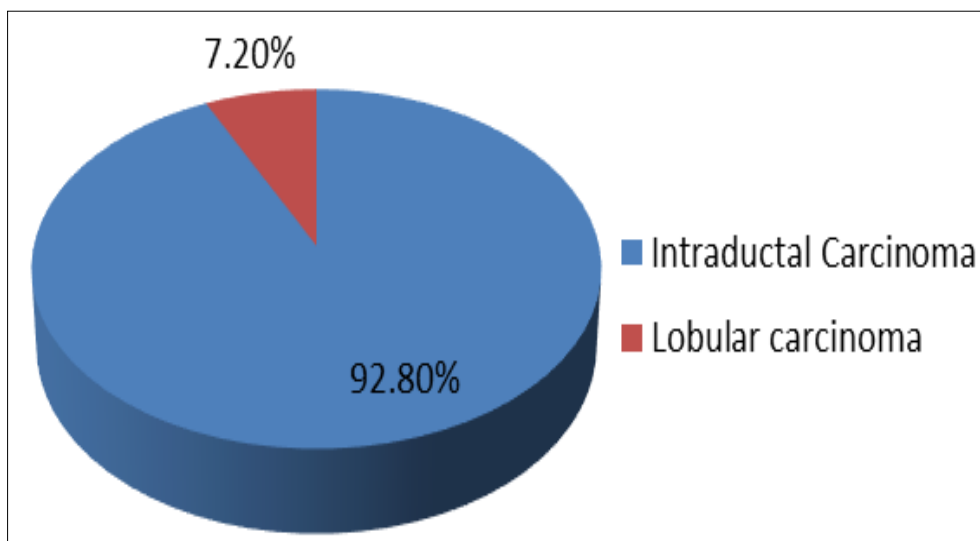


Fig 4: Incidence of various Malignant lesions

Correlation of USG with HPE report

In the present study out of 40 patients, 24(60%) patient features suggestive of benign breast disease on USG of which all patients had benign disease after Histopathological examination. 16 (40%) patients had features suggestive of 92.8, 7.2 Invasive ductal carcinoma Lobular carcinoma 46 malignancy on USG of which 14(35%) patients had proven malignancy after histopathological examination and 02 (5%) patients had benign disease after HPE.

Table 6: Correlation of USG with HPE.

		No of Patients (N=40)	Percentage %
USG	Benign	24	60%
	Malignant	16	40%
HPE	Benign	26	65%
	Malignant	14	35%
Total		40	100%

Mammography Findings

In the present study out of 40 patients mammography was done on all patients greater than 35 years of age which accounted for 21 (52.5%) patients. Out of 21 patients 04(19.04%) patients had BIRADS-II, 05 (23.8%) patients had BIRADS-III, 05(23.8%) patients had BIRADS-IV and 07(33.33%) patients had BIRADS-V on mammography.

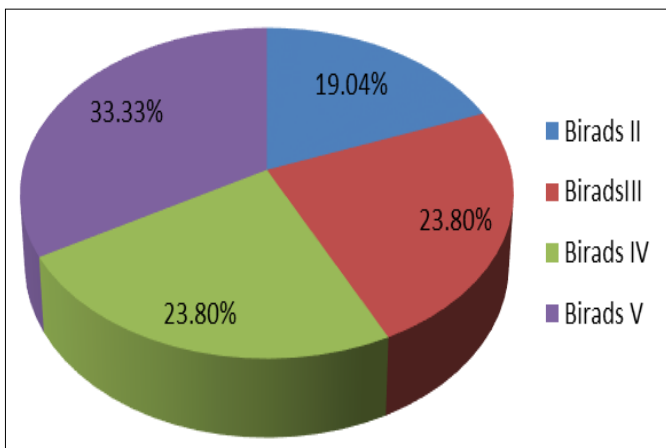


Fig 5: Mammography findings among patients.

Correlation of Mammography with HPE

Table 7: Correlation of mammography with HPE

Mammography	HPE	No. of Patients (N=40)	Percentage%
Birads-II	Benign	04	100%
	Malignant	00	00
Birads-III	Benign	03	60%
	Malignant	02	40%
Birads-IV	Benign	00	00
	Malignant	05	100%
Birads-V	Benign	00	00
	Malignant	07	100%

Fine needle aspiration cytology

In the present study out of 40 cases fine needle aspiration was performed on all patients. Among 40 patients 29(72.5%) patients had benign findings after cytology, 10(25%) patients had findings in favour of malignancy and 01(2.5%) patient had suspicious finding on cytology.

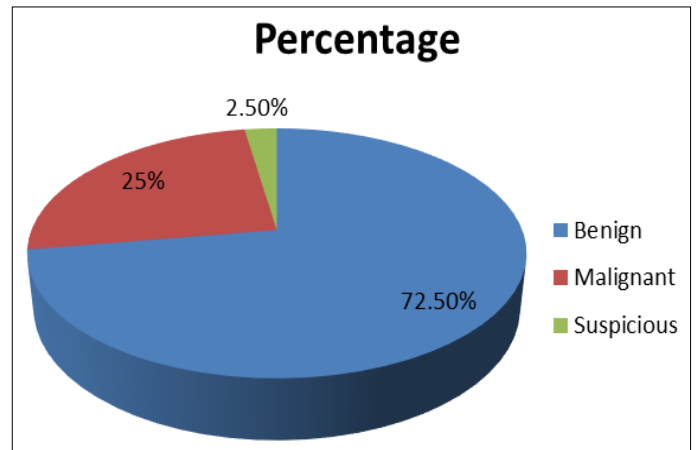


Fig 6: FNAC findings among Patients

Correlation of FNAC and HPE

In the present study out of 40 patients, 29(72.5%) patients had benign findings on cytology of which 26 (96.3%) patients had benign findings after HPE and 03(10.3%) patient had malignancy after HPE of the total 14 cases of malignant lesions, FNAC had reported 10(71.42%) patients malignant, 3(21.42%) patient benign and 1(8.33%) patient having suspicious lesion. There were 03 false negative cases and 01 false positive case. Accuracy rate for diagnosing malignant lesions by FNAC was 90%.

Table 8: Correlation of FNAC and HPE

FNAC	HPE	No of Patients (N=40)	Percentage %
Benign (29)	Benign	26	96.3%
	Malignant	03	10.3%
Malignant (10)	Benign	00	00
	Malignant	10	100%
Suspicious (01)	Benign	00	00
	Malignant	01	100%

Trucut biopsy findings and correlation with HPE

In the present study out of 40 patients, 28 (70%) patients had benign disease on Trucut biopsy and 12 (30%) patients had malignancy on Trucut biopsy. Out of 28 patients, 26 patients had benign disease after HPE and out of 12 patients all patients had malignancy after HPE. There were 02 false negative cases and zero false positive cases. Accuracy rate for diagnosing malignant lesions by Trucut biopsy is 95%.

Table 9: Correlation of Trucut biopsy and HPE

Trucut Biopsy	HPE	No. of Patients (N=40)	Percentage %
Benign	Benign	26	65%
	Malignant	02	05%
Malignant	Benign	00	00
	Malignant	12	30%
Total		40	100%

Correlation of FNAC vs Trucut biopsy vs HPE

In the present study of 40 patients correlation was done between FNAC, Trucut biopsy and HPE and following statistical values were obtained.

Table 10: 2x2 table of diseased and non-diseased on FNAC.

Total Results (FNAC)	Diseased (Malignant)	Non-Diseased (Benign)
Positive	10	01
Negative	03	26
Total	13	27

Sensitivity of FNAC was 76.92% with a specificity of 96.2% and a PPV and NPV of 90.9% and 89.65% respectively. Accuracy rate for diagnosing malignant lesions by FNAC is 90%.

Table 11: 2x2 table of diseased and non-diseased on trucut biopsy.

Total Results (Trucut)	Diseased (Malignant)	Non-Diseased (Benign)
Positive	12	00
Negative	02	26
Total	14	26

Sensitivity and specificity of Trucut biopsy was 85.7% and 100% with a PPV of 100% and NPV of 92.85%. Accuracy rate for diagnosing malignant lesions by Trucut biopsy was 95%.

Table 12: Correlation of FNAV vs Trucut biopsy vs HPE.

Diagnosis	FNAC	Trucut	HPE
Benign	29	28	26
Malignant	10	12	14
Suspicious	01	0	0

Discussion

Breast lump is a common complaint presented by patients at the surgical outpatient department in all major hospitals, with an anxiety of possible malignancy being extremely common. Accurate diagnosis of carcinoma has been a diagnostic dilemma since long. Breast malignancy is the leading cause of organ specific cancer in prevalence today.

Enormous and tremendous success has been attained with the expansion of fine needle aspiration and cytology as the primary diagnostic tool in cancer for the past 30 years. Its use in diagnosing the presence of carcinoma prior to the surgical procedure and to direct the appropriate treatment has been well recognized. Moreover many studies have established the value of methodical use of Trucut biopsy for the detection of carcinoma breast despite of the presence of good quality clinical, radiological, and cytological examinations.

Age distribution

In a similar study done by Evith M. Pereira *et al.* [6] done on 105 cases, the patients age ranged from 17-76 years with a mean age of 40.17 years. In their study the maximum number of cases of breast lesions were seen in the age group of 31-40 years (27 cases) followed by 21-30 years (22 cases), 41-50 years (21 cases).

Incidence of benign and malignant breast lump in various age groups

In a study done by Evith M. Pereira *et al.* [6] the mean age of presentation of benign breast disease was 34 years and of malignancy was 57 years. The results are comparable to the present study.

In a study done by Jagdish B. Karia *et al.* [7] the mean age of presentation of benign breast disease was 27±9.7 years and malignancy was 47±11.28 years.

Histopathological findings

In a study done by Evith M. Pereira *et al.* [6] on 105 patients, 52 (49.52%) patients had benign disease and 53 (50.48%) patients had malignancy of 52 patients with benign disease fibroadenoma accounted for 44 (41.91%) patients followed by fibrocystic disease in 06 (5.71%) patients, duct ectasia in 01 (0.95%) patient and phyllodes tumor in 01 (0.95%) patient.

In a study done by Himabindu Bangaru *et al.* [8] on 202 patients, 197 (97.5%) patients had benign disease and 05 (2.5%) patients had malignancy of 197 patients with benign disease fibroadenoma accounted for 167 (82.67%) patients followed by fibrocystic disease in 21 (10.39%) patients, phyllodes tumor in 06 (2.97%) patients and duct ectasia in 03 (1.48%) patients.

The most common benign pathology in breast was fibroadenoma in majority of studies which is similar to the present study.

Correlation of USG with HPE report

In a study done by Himabindu Bangaru *et al.* [8] sensitivity and specificity of USG in diagnosis of breast lump were 97% and 94% respectively with a PPV and NPV of 79% and 98% respectively.

In a study done by Lod Khoda *et al.* [10] sensitivity and specificity of USG in diagnosis of breast lump were 91.6% and 100% respectively with a PPV and NPV of 100% and 97.3% respectively.

Correlation of FNAC and HPE

In a study done by Evith M. Pereira *et al.* [6] it revealed a sensitivity of 91.89% and specificity of 100% for FNAC.

In a study done by Hussain Gadelkarim Ahmed *et al.* [9] FNAC revealed a 92.6% sensitivity of 92.6% with a specificity of 95.2%. In a similar study done by Mahajan NA, *et al.* [11] positive predictive value and negative predictive value or FNAC were 96.77% and 98.66% respectively.

Correlation of Trucut biopsy and HPE

In a study done by Eman MS Muhammad *et al.* [12] the success rate for diagnosing benign lesions was 100% while the success rate for diagnosis of malignant lesions was 86.1%. The sensitivity and specificity of TCNB were 86.1% and 100% respectively.

In a study done by Abhijit Saha *et al.* [13] TCNB had sensitivity and specificity of 88.3% and 100% respectively.

In a study done by Mohammed Bdour *et al.* [14] Trucut biopsy was reported to have a sensitivity of 90% and a specificity of 100%.

Summary and Conclusion

This comparative study was done on 40 cases of breast lump presenting to Mamata general hospital from October 2022 to September 2023.

Hence it can be concluded that FNAC can be done with minimal pain and immediate report but, Trucut biopsy is superior to FNAC in diagnosis of breast lump as it can get Histopathology report, it can be performed as an outpatient surgery and can avoid unnecessary surgery in case of benign disease and early intervention in case of malignancy.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Park K. Textbook of Preventive and Social Medicine. 23rd Ed. Jabalpur, Bhanot, Epidemiology of Chronic Non-Communicable Diseases and Condition; 2015. p. 389. Chapter 6.
2. Brancato B. Accuracy of needle biopsy of breast lesions visible on ultrasound: Audit of fine needle versus core

- needle biopsy in 3233 consecutive samplings with ascertained outcomes. *Breast*. 2012 Aug;21(4):449-54.
3. Chaurasia BD. Textbook of Human Anatomy: Regional and applied, dissection and clinical. Volume 1, Upper limb and thorax. 6th Ed. New Delhi: CBS Publisher; 2013. p. 37-43.
 4. Arunraja KK. A Comparative study between FNAC, Trucut Biopsy and Histopathological Examination in Breast Lumps in Tirunelveli Medical College Hospital, Tirunelveli [Doctoral dissertation]. Tirunelveli Medical College; c2021.
 5. Hunt KK, Mittendoeff EA. Sabiston text book of surgery. 20th Ed. New Delhi: Elsevier; 2017. p. 820-824.
 6. Pereira EM, Tambekar MY, Sahu S, Dhar R. Diagnostic efficacy of fine needle aspiration cytology in breast lesions. 2017.
 7. Karia JB, Kothari MD, Palekar HD, Patel UA, Patel J. Clinical features and pattern of presentation of breast diseases in surgical outpatient clinic of a tertiary hospital. *Pain*. 2014;28:23-1.
 8. Bangaru H, Chandra AS, Gaiki VV. Clinical radiological and pathological assessment of benign breast lumps: Our institutional experience. *International Surgery Journal*. 2017 Oct 27;4(11):3627-32.
 9. Khema A, Chakrabarti N, Shah V, Patel S. Palpable breast lumps: Fine needle aspiration cytology versus Histopathology: A Correlation of Diagnostic Accuracy. *The Internet Journal of Surgery*. 2009;18(1).
 10. Khoda L, Kapa B, Singh KG, Gojendra T, Singh LR, Sharma KL. Evaluation of modified triple test (clinical breast examination, ultrasonography, and fine-needle aspiration cytology) in the diagnosis of palpable breast lumps. *Journal of Medical Society*. 2015 Jan 1;29(1):26.
 11. Pedersen L, Guldhammer B, Kamby C, Aasted M, Rose C. Fine needle aspiration and Trucut biopsy in the diagnosis of soft tissue metastases in breast cancer. *European Journal of Cancer and Clinical Oncology*. 1986;22(9):1045-1052.
 12. Muhammad EM, Ahmed AR, Osman SM. Comparative study between FNAC and TCNB for diagnosis of breast masses. *New Egyptian Journal of Medicine*. 2010 Mar 1;42(3 Supplement):38.
 13. Saha A, Mukhopadhyay M, Das C, Sarkar K, Saha AK, Sarkar DK. FNAC versus core needle biopsy: A comparative study in evaluation of palpable breast lump. *Journal of Clinical and Diagnostic Research: J CDR*. 2016 Feb;10(2):EC05.
 14. Bdour M, Hourani S, Mefleh W, Shabatat A, Karadsheh S, Nawaiseh O, Ebous A. *Journal of Surgery Pakistan*, 2008 Jan-Mar, 13(1).

How to Cite This Article

Pravalika F, Reddy MR, Prakash AB. Comparison between FNAC and TRU cut biopsy in patients with breast lump. *International Journal of Surgery Science*. 2024;8(1):07-13.

Creative Commons (CC) License

This is an open-access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.