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# TO COMPARE MAMMOGRAM, FNAC , CORE NEEDLE BIOPSY AND POST OPERATIVE HPE FINDINGS IN BREAST LUMP

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## Abstract

**Background:** To compare mammogram, FNAC, core needle biopsy and post operative HPE findings in Breast lump. **Materials and Methods:** This study was conducted in the Department of General Surgery, SVRRGGH, Tirupati. The materials for the study were collected from female patients presenting to surgery outpatient department and emergency presenting with lump in breast during the period of one year were included in the study. **Result:** The diagnostic accuracy of Mammography for benign lesions compared to histopathology include Sensitivity 96.08%, Specificity 91.84%, PPV 92.45%, NPV 95.75%. The diagnostic accuracy of Mammography for malignant lesions compared to histopathology include Sensitivity 91.84%, Specificity 96.08%, PPV 95.75%, NPV 92.45%. The diagnostic accuracy of FNAC for benign lesions compared to histopathology include Sensitivity100%, Specificity 91.84 %, PPV 92.73%, NPV 100%. The diagnostic accuracy of FNAC for malignant lesions compared to histopathology include Sensitivity 91.84%, Specificity 100%, PPV 100%, NPV 92.73%. The diagnostic accuracy of Trucut for benign lesions compared to histopathology include Sensitivity 100%, Specificity 97.96 %, PPV 92.08%, NPV 100%. The diagnostic accuracy of Turcut for malignant lesions compared to histopathology include Sensitivity 97.96%, Specificity 100%, PPV 100%, NPV 98.08%. **Conclusion:** FNAC and TRU-CUT biopsy has more sensitivity compared to mammogram and TRU-CUT biopsy has more specificity when compared to mammogram and FNAC. TRU-CUT biopsy has more sensitivity compared to mammogram and FNAC and FNAC and TRU-CUT shows 100% specificity compared to mammogram [96.08%] in malignant lesions.

## INTRODUCTION

Breast lumps or masses are quite frequent in women of reproductive age. Over a quarter of all women will develop breast illness at some time in their life, and the great majority of these instances will show as a new breast lump in primary care. A range of reasons may induce breast lumps, ranging from physiological adenosis to extremely aggressive cancer.[1]

In 2020, 2.3 million women will be diagnosed with breast cancer worldwide, with 685 000 fatalities. As of the end of 2020, 7.8 million women have been diagnosed with breast cancer in the preceding five years, making it the most frequent disease in the world.[2]

A painless lump or thickening in the breast is the most prevalent sign of breast cancer. Despite the fact that the great majority of breast lumps are benign, all instances need a comprehensive and organised examination. In general, the triple- assessment method should be followed, which includes clinical examination, radiographic imaging, and pathological investigation. Mammography, ultrasound, and MRI are the most frequent radiological methods for imaging breast tissue.[3]

For women over the age of 35 who have a new breast mass, mammography is the first-line imaging. Asymptomatic women who meet their area screening requirements may also be screened with mammography. To assure imaging of all breast tissue, this approach involves getting X-ray imaging in both a craniocaudal and a mediolateral oblique plane. Mammography has greater specificity and poorer sensitivity than ultrasonography in all circumstances. In up to 15% of breast cancer patients, mammography might yield negative findings.[4]

In pathology, fine-needle aspiration cytology (FNAC) or core biopsy are both employed. The


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investigation of cells in isolation is possible with cytology, however histology of a biopsy may offer more information about the architecture of tissues. Both of these treatments are invasive and dangerous to the patient, thus they should only be done when there is a high degree of suspicion. A lot of criteria impact whether FNAC or core biopsy should be performed, including the clinician's experience, diagnostic equipment availability, and the location of the lesion. FNAC, on the other hand, is often utilised as a first-line treatment since it is less invasive.

The purpose of this research was to compare mammography, FNAC, core needle biopsy, and post-operative HPE results in breast lump patients presenting to the surgery outpatient department with clinical diagnosis of breast lump patients over 35 years of age.

## MATERIALS AND METHODS

This study was conducted in the Department of General Surgery, SVRRGGH, Tirupati. The materials for the study were collected from patients presenting to surgery outpatient department and emergency presenting with lump in breast during the period of March 2020 to April 2021 were included in the study.

**Inclusion Criteria**

Females more than 35 years age with clinical diagnosis of breast lump.

**Exclusion Criteria**

Male patients, female patients with breast lump <35 years(mammogram), ulcerative breast lump and post-operative breast lump.

## RESULTS

The results of 100 cases in comparison with site, size, family history re here by shown in the tables below.

In the present study, the mean age of the study population in years was 52.02 ± 11.11. majority i.e. 36% were in 35-45 years age group, 29% in 46-55 year age group, 18% in 56-65 years age group, 17% in 66-75 years age group.

58% had symptoms for <10 months, 20% had duration of symptoms for 11-20 months, 14% had duration of symptoms for 21-30 months, 8% with duration of >31 months. 18% had pain , 39% had Lump in axilla and 34% had discharge from nipple.The mean duration of symptoms in the present study in months was 12.81 ± 10.10. Mean size of the lump in our study was 5.25 ± 2.94 cm In the present study, 5% had family history of Breast lumps. [Table 2]

48% had Left sided involvement, 47% had right sided involvement and 5% had Bilateral involvement.

Central quadrant involved in 18%, Lower inner quadrant involvement seen in 15%, Lower outer quadrant involvement in 10%, Upper inner quadrant involvement in 5% and upper outer quadrant involvement in 52%.

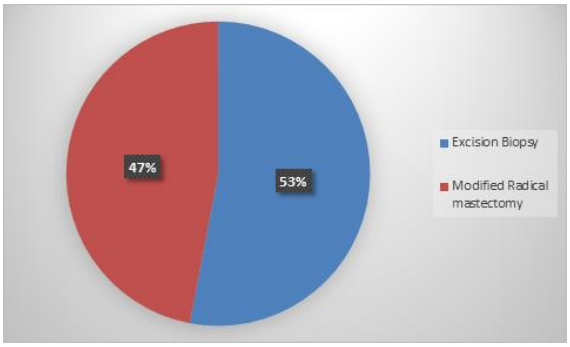


**Figure 1: Surgery performed in present study**

Distribution based on surgery performed where 53% had Excision Biopsy and 46% had Modified Radical Mastectomy done.

Based on mammography, 53% had Benign lesions and 47% had Malignant lesions.

Based on TRUCUT biopsy report, 52% had Benign lesions and 48% had malignant lesions.

Preoperatively after repeated FNAC and TRUCUT report is inconclusive; Clinically examination / Findings though of Tuberculosis; but final HPE to benign and Malignant.

**Table 1: Patients details in present study**

| Age intervals | Number | Percentage |
|---|---|---|
| 35 – 45 | 36 | 36% |
| 46 – 55 | 29 | 29% |
| 56 – 65 | 18 | 18% |
| 66 – 75 | 17 | 17% |
| Total | 100 | 100% |
| Mean ± SD | 52.02 ± 11.11 | |
| Duration of symptoms | | |
| <10 | 58 | 58% |
| 11 – 20 | 20 | 20% |
| 21 – 30 | 14 | 14% |
| >31 | 8 | 8% |
| Total | 100 | 100% |
| Mean ± SD | 12.81 ± 10.10 | |
| Symptoms | | |
| Pain | 18 | 18% |
| Lump in axilla | 39 | 39% |
| Discharge from nipple | 34 | 34% |


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|---|---|---|
| Size of Lump in cm | 5.25 ± 2.94 | |
| Family History | | |
| Yes | 5 | 5% |
| No | 95 | 95% |

**Table 2: Side and Quadrant of Breast involved**

| Side of Breast involved | Number | Percentage |
|---|---|---|
| Left | 48 | 48% |
| Right | 47 | 47% |
| Bilateral | 5 | 5% |
| Total | 100 | 100% |
| Quadrant involved | | |
| Central | 18 | 18% |
| Lower Inner quadrant | 15 | 15% |
| Lower outer quadrant | 10 | 10% |
| upper inner quadrant | 5 | 5% |
| Upper outer quadrant | 52 | 52% |
| Total | 100 | 100% |

**Table 3: Diagnostic findings in present study**

| Mammography findings | Number | Percentage |
|---|---|---|
| Benign | 53 | 53% |
| Malignant | 47 | 47% |
| FNAC report | | |
| Benign | 55 | 55% |
| Malignant | 45 | 45% |
| TRUCUT Biopsy report | | |
| Benign | 52 | 52% |
| Malignant | 48 | 48% |
| Histopathological report | | |
| Benign | 51 | 51% |
| Malignant | 49 | 49% |

**Table 4: Final diagnosis on Histopathology**

| Diagnosis | Number | Percentage |
|---|---|---|
| Breast abscess | 5 | 5% |
| Benign cystocarcinoma phylloides | 4 | 4% |
| Comedo carcinoma | 1 | 1% |
| Fibrocystic disease | 10 | 10% |
| Fatty degeneration | 4 | 4% |
| Fibroadenoma | 26 | 26% |
| Intraductal carcinoma | 35 | 35% |
| Lobular carcinoma | 13 | 13% |
| Serous cystadenoma | 2 | 2% |

**Table 5: Diagnostic accuracy of Mammography compared to Histopathology**

| | | Histopathology | | Total |
|---|---|---|---|---|
| | | Benign | Malignant | |
| Mammogram | Benign | 49 | 4 | 53 |
| | Malignant | 2 | 45 | 47 |
| Total | | 51 | 49 | 100 |
| Chisquare test = 76.76 , p=<0.0001* Statistically significant | | | | |

**Table 6: Diagnostic Accuracy of Mammography for Benign and malignant Lesions compared to Histopathology**

| Diagnostic Accuracy of Mammography for Benign Lesions | Value | Range |
|---|---|---|
| Sensitivity | 96.08% | 86.541% to 99.522% |
| Specificity | 91.84% | 80.399% to 97.731% |
| Area Under the Curve (AUC) | 0.94 | 0.873 to 0.977 |
| Positive Likelihood Ratio | 11.77 | 4.594 to 30.154 |
| Negative Likelihood Ratio | 0.043 | 0.011 to 0.167 |
| Disease prevalence | 51.00% | 40.804% to 61.136% |
| Positive Predictive Value | 92.45% | 82.703% to 96.912% |
| Negative Predictive Value | 95.75% | 85.226% to 98.873% |
| Accuracy | 94.00% | 87.397% to 97.767% |
| Diagnostic accuracy of Mammography for Malignant lesions | | |
| Sensitivity | 91.84% | 80.399% to 97.731% |
| Specificity | 96.08% | 86.541% to 99.522% |
| Area Under the Curve (AUC) | 0.94 | 0.873 to 0.977 |
| Positive Likelihood Ratio | 23.418 | 6.004 to 91.338 |
| Negative Likelihood Ratio | 0.085 | 0.033 to 0.218 |


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|---|---|---|
| Disease prevalence | 49.00% | 38.864% to 59.196% |
| Positive Predictive Value | 95.75% | 85.226% to 98.873% |
| Negative Predictive Value | 92.45% | 82.703% to 96.912% |
| Accuracy | 94.00% | 87.397% to 97.767% |

**Table 7: Diagnostic accuracy of FNAC compared to Histopathology**

| | | | Histopathology | Total |
|---|---|---|---|---|
| | | Benign | Malignant | |
| FNAC | Benign | 51 | 4 | 55 |
| | Malignant | 0 | 45 | 45 |
| Total | | 51 | 49 | 100 |
| Chisquare test = 84.3 , p=<0.0001* Statistically significant | | | | |

**Table 8: Diagnostic accuracy of FNAC for Benign and malignanat Lesions compared to Histopathology**

| Diagnostic Accuracy of FNAC for Benign Lesions | Value | Range |
|---|---|---|
| Sensitivity | 100.00% | 93.022% to 100.000% |
| Specificity | 91.84% | 80.399% to 97.731% |
| Area Under the Curve (AUC) | 0.959 | 0.900 to 0.989 |
| Positive Likelihood Ratio | 12.25 | 4.789 to 31.333 |
| Negative Likelihood Ratio | 0 | |
| Disease prevalence | 51.00% | 40.804% to 61.136% |
| Positive Predictive Value | 92.73% | 83.291% to 97.025% |
| Negative Predictive Value | 100.00% | |
| Accuracy | 96.00% | 90.074% to 98.900% |
| Diagnostic accuracy of FNAC for Malignant lesions | | |
| Sensitivity | 91.84% | 80.399% to 97.731% |
| Specificity | 100.00% | 93.022% to 100.000% |
| Area Under the Curve (AUC) | 0.959 | 0.900 to 0.989 |
| Positive Likelihood Ratio | | |
| Negative Likelihood Ratio | 0.082 | 0.032 to 0.209 |
| Disease prevalence | 49.00% | 38.864% to 59.196% |
| Positive Predictive Value | 100.00% | |
| Negative Predictive Value | 92.73% | 83.291% to 97.025% |
| Accuracy | 96.00% | 90.074% to 98.900% |

**Table 9: Diagnostic accuracy of TRUCUT Biopsy compared to Histopathology**

| | | | Histopathology | Total |
|---|---|---|---|---|
| | | Benign | Malignant | |
| TRU CUT | Benign | 51 | 1 | 52 |
| | Malignant | 0 | 48 | 48 |
| Total | | 51 | 49 | 100 |
| Chisquare test = 95.15 , p=<0.0001* Statistically significant | | | | |

**Table 10: Diagnostic accuracy of TRUCUT Biopsy for Benign and malignanat Lesions compared to Histopathology**

| Diagnostic Accuracy of TRUCUT Biopsy for Benign Lesions | Value | Range |
|---|---|---|
| Sensitivity | 100.00% | 93.022% to 100.000% |
| Specificity | 97.96% | 89.146% to 99.948% |
| Area Under the Curve (AUC) | 0.99 | 0.945 to 1.000 |
| Positive Likelihood Ratio | 49 | 7.042 to 340.944 |
| Negative Likelihood Ratio | 0 | |
| Disease prevalence | 51.00% | 40.804% to 61.136% |
| Positive Predictive Value | 98.08% | 87.995% to 99.719% |
| Negative Predictive Value | 100.00% | |
| Accuracy | 99.00% | 94.554% to 99.975% |
| Diagnostic accuracy of TRUCUT Biopsy for Malignant lesions | | |
| Sensitivity | 97.96% | 89.146% to 99.948% |
| Specificity | 100.00% | 93.022% to 100.000% |
| Area Under the Curve (AUC) | 0.99 | 0.945 to 1.000 |
| Positive Likelihood Ratio | | |
| Negative Likelihood Ratio | 0.02 | 0.003 to 0.142 |
| Disease prevalence | 49.00% | 38.864% to 59.196% |
| Positive Predictive Value | 100.00% | |
| Negative Predictive Value | 98.08% | 87.995% to 99.719% |
| Accuracy | 99.00% | 94.554% to 99.975% |

**Table 11: Diagnostic accuracy for benign and malignant lesions in all three diagnostic methods**

| Diagnostic accuracy for benign lesions | Sensitivity | Specificity | PPV | NPV |
|---|---|---|---|---|
| Mammogram | 96.08% | 91.84% | 92.45% | 95.75% |
| FNAC | 100.00% | 91.84% | 92.73% | 100.00% |
| TRUCUT | 100.00% | 97.96% | 98.08% | 100.00% |


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| Diagnostic accuracy for Malignant lesions | | | | |
| Mammogram | 91.84% | 96.08% | 95.75% | 92.45% |
| FNAC | 91.84% | 100.00% | 100.00% | 92.73% |
| TRUCUT | 97.96% | 100.00% | 100.00% | 98.08% |

**Table 12: Diagnostic Accuracy of all diagnostic procedure in comparision with other studies**

| **Diagnostic Accuracy Mammography** | **Sensitivity** | **Specificity** |
|---|---|---|
| Saha et al,[5] | 69% | 100% |
| Giri et al,[7] | 90.32% | 100% |
| Ligaraju et al,[8] | 98.5% | 97.1% |
| Hua et al,[9] | 92.7% | 92.1% |
| Kamphausen et al,[10] | 90% | 100% |
| Present study | 96.08% | 91.8% |
| Fine Needle Aspiration Cytology's Diagnostic Accuracy | | |
| Hussain M et al,[11] | 90.9% | 100% |
| Aziz et al,[12] | 85.2% | 100% |
| Abdulrahman et al,[13] | 91.7% | 100% |
| Alema et al,[14] | 83.3% | 100% |
| Sudarat et al,[15] | 92.5% | 90.2% |
| Ahmed et al,[16] | 92.6% | 95.2% |
| Khemka et al,[17] | 96% | 100% |
| Tiwari et al,[18] | 83% | 100% |
| Nggada et al,[19] | 95.7% | 98.7% |
| Muzaffar et al,[20] | 85.2% | 100% |
| Rubin et al,[21] | 87% | 100% |
| Yeoh et al,[22] | 79% | 98% |
| Choi et al,[23] | 77.7% | 99.2% |
| Present study | 100% | 91.8% |
| Diagnostic Accuracy of TRUCUT biopsy | | |
| Saha et al,[5] | 88.3% | 100% |
| Fattahi et al,[24] | 92.6% | 100% |
| Hari et al,[25] | 46.7% | 100% |
| Present study | 100% | 97.9% |

## DISCUSSION

Breast lumps are a typical complaint among women who visit the surgical outpatient department. Breasts are a dynamic structure that changes during reproductive life, as well as the cyclical alterations that occur during menstruation. Breast cancer affects around 30% of women at some point in their lives. The aetiology involves disrupted breast physiology, which may range from extreme normalcy to well-defined disease processes. A benign breast lump is found in around 40% of all patients with breast issues, and many unneeded procedures are undertaken for benign conditions. The most prevalent lesions in the breast are benign breast lumps, which account for 60 to 80 percent of all breast illness.

ANDI (abnormalities of normal development and involution) is a benign breast condition that is characterised by a distinct lump in the breast that may be bilateral but is more usually observed in the upper outer quadrant. Cyclic nodularity and mastalgia, cysts, fibroadenoma, duct ectasia, and periductal mastitis are all part of this category.

Although their sensitivity varies, high-resolution ultrasonography (HRUSG), mammography, fine needle aspiration cytology (FNAC), and core needle biopsy are all alternatives for examining a breast tumour. Clinical examination, followed by HRUSG and mammography, are affordable and non-invasive methods for detecting causes. In resource-poor places, these strategies are very successful. Like other carcinogenic disorders, malignant neoplasm is more common in elderly women.

Failure to diagnose makes management more difficult, since the majority of them appear at an advanced stage. Mammography is also a highly important examination for detecting breast cancer. HRUSG leaves the possibility of missing cancer in a minority of patients. In most resource-poor locations, there are no systematic breast screening programmes. Traditional beliefs, a lack of understanding, and low socioeconomic circumstances all play a role in late case discovery. As a result, a test should have a high degree of diagnostic accuracy to avoid needless biopsies. Breast cancer may be detected through a comprehensive clinical examination as well as diagnostic tools including HRUSG, Mammography, and Core needle biopsy.

The first step in treating a breast lump is determining if it is a typical variation or an abnormality. If an abnormal mass is discovered, it must be determined if it is cancerous or not. Clinical examination, high-resolution ultrasonography, mammography, and either biopsy (large bore needle) or aspiration cytology are used to make a preoperative diagnosis (using a tiny hypodermic needle in resource-poor settings).

The goal of this research was to compare the diagnostic accuracy of Mammography, FNAC, and TRUCUT biopsy results with Histopathology findings in patients with breast masses. attending a tertiary care hospital's OP and IP


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In the present study, the mean age of the study population in years was 52.02 ± 11.11. majority i.e. 36% were in 35-45 years age group, 29% in 46-55 year age group, 18% in 56-65 years age group, 17% in 66-75 years age group. The mean duration of symptoms in the present study in months was 12.81 ± 10.10. Based on side of involvement, where 48% had Left sided involvement, 47% had right sided involvement and 5% had Bilateral involvement. Central quadrant involved in 18%, Lower inner quadrant involvement seen in 15%, Lower outer quadrant involvement in 10%, Upper inner quadrant involvement in 5% and upper outer quadrant involvement in 52%.Based on Symptoms 18% had pain , 39% had Lump in axilla and 34% had discharge from nipple. The mean size of the lump in our study was 5.25 ± 2.94 cm. 5% had family history of Breast lumps. 53% had Excision Biopsy and 46% had Modified Radical Mastectomy done.

Breast lumps were found in 36 percent of the 35-45 year old, 29 percent of the 46-55 year old, 18 percent of the 56-65 year old, and 17 percent of the 66-75 year old in the current research. The highest incidence of breast lumps in this research were in the age category of 21-30 years, according to Mandal et al62. The age range 11-20 years had the lowest rate of breast lesions. The age range 21-40 years has the highest number of benign breast lesions, whereas the age group beyond 50 years has the highest number of malignant lesions (50 percent ). An rising percentage of patients are between the ages of 20 and 40, which is a highly concerning trend. Over the past several decades, the average age at which a woman in India develops breast cancer has shifted dramatically.

In our study, The mean duration of symptoms in the present study in months was 12.81 ± 10.10. In our study, Based on side of involvement, where 48% had Left sided involvement, 47% had right sided involvement and 5% had Bilateral involvement. Saha et al [5]found that 52 percent of the 50 patients had their lesions in the right breast. In instances of carcinoma, the right breast was somewhat more affected (52.4 percent) than the left. Breast cancer develops roughly equally in the right and left breasts, according to Aljarrah et al.[6]

In our research, the central quadrant was involved in 18% of the time, the lower inner quadrant in 15% of the time, the lower outer quadrant in 10% of the time, the upper inner quadrant in 5% of the time, and the upper outer quadrant in 5% of the time.

According to Saha et al,[5] 50% of the 50 patients in their study exhibited lumps in the upper outer quadrant, followed by the centre quadrant (14 percent). The upper outer quadrant of the breast was the most often involved by cancer in our study (18 patients out of 42, or 42.9 percent), followed by the centre quadrant (7 patients, or 16.7%), and finally the other quadrants of the breast.

The upper outer quadrant was linked in 58 percent of those with breast lumps in Hussain's research. According to a study by A Aljajarrah et al,[6] breast cancer mainly affects the upper outer quadrant (UOQ) of the breast. Early breast cancers in the central/internal quadrants have a worse prognosis than those in the lateral quadrants, which is why tumour site is so important for distant metastases and survival. When compared to lateral implantation, medial position was connected with a 50 percent greater risk of systemic recurrence and breast cancer death in another analysis. In our research, the average lump size in our study was 5.25 ± 2.94 cm.

According to Saha et al,[8] the tumours varied in size from 3 cm to 12 cm among 50 participants in their research. 27 (64.3%) of the 42 patients with cancer had breast lesions measuring more than 5cm in diameter. The measured size of a breast carcinoma, as reflected by its greatest dimension, is one of the most significant prognostic indicators. Numerous studies have shown that when tumour size grows, the number of axillary nodal metastases increases as well.

Atypical epithelial hyperplasia, papillary lesions, and atypia of the ductal epithelium in a cyst are all examples of lesions that might result in a false positive result. In low-grade malignancy, convoluted proliferative lesions, and tumours with central necrosis, such as small cell carcinoma, a false negative result is conceivable. The major benefit of FNAC in the context of breast disorders is that it has a minimal risk of false positives when it comes to identifying benign from malignant tumours.

According to Silverman et al,[26] fine needle aspiration cytology showed a greater positive predictive value than tru-cut biopsy in identifying cancer and locally recurring disease.

For breast lump diagnosis, FNAC is a reliable, rapid, cost-effective, and uncomplicated technique. Although it is an important operation, it lacks the sensitivity of true-cut biopsy. When used in concert with other diagnostic modalities (clinical and radiological = triple test), FNAC is highly predictive and accurate for breast lesions. On the other hand, preferred FNAC to tru-cut biopsy since it caused less complications, allowed for multidirectional sampling, and avoided the technical challenge of immobilising the tumour with a tru-cut needle. The histologic type of tissue and important information on prognostic indicators such as expression of oncogenes and anti-oncogenes (c-erbB2 & p53), receptor status, proliferative activity, and ploidy were among the benefits of tru-cut biopsy. The oncologist and surgeon will be able to choose the optimum treatment plan, which may include neoadjuvant chemotherapy.

The advantage of tru-cut biopsy of palpable breast lesions based on histological examination of tissue specimens is that it provides information on prognostic parameters (receptor status, proliferative activity, ploidy, and expression of oncogenes and antioncogenes such as c-erbB-2 and p53) that can help surgeons and oncologists make surgical decisions. It also makes neoadjuvant treatment possible in the future.


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True-cut biopsy of palpable breast lesions combined with histological examination of tissue specimens may provide all of the information needed. Core biopsy informs surgeons and oncologists about the histological type and prognostic parameters (receptor status, proliferative activity, ploidy, and expression of oncogenes and anti- oncogenes such as c-erbB-2 and p53) before surgery, allowing them to make the best surgical decision for the best modern therapeutic strategy. It also provides for the future use of neoadjuvant therapy. Trucut biopsy has substituted FNAC for small non-palpable lesions in breast masses since sample insufficiency is uncommon with technique, especially for tiny lesions. When compared to open surgery, trucut biopsy is much less intrusive.

## CONCLUSION

Detection and management of breast lump requires an optimal environment for interpretation, relevant use of clinical information, technically excellent imaging procedures. A fine collaboration between experienced, radiologist, cytologist and the clinician is required. Core needle biopsy is a suitable alternative when FNA is inconclusive and may offer additional information. FNAC and TRU-CUT biopsy has more sensitivity compared to mammogram and TRU-CUT biopsy has more specificity when compared to mammogram and FNAC.TRU-CUT biopsy has more sensitivity compared to mammogram and FNAC and FNAC and TRU-CUT shows 100% specificity compared to mammogram 96.08% in malignant lesions.

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