"Role Of Fine Needle Aspiration Cytology In Various Breast Diseases"

[1]Dr. Akash Chandra Jain, [2]Dr. Avneesh Arya, [3]Dr. Rubina Dohare, [4]Dr. Shailendra Sharma

[1]senior Resident At Bundelkhand Medical College, Sagar, [2]department Of General Surgery Govt. Medical College , Datia (M.P.), [3]senior Resident Obstetrics And Gynaecology Department Govt. Medical College, Datia(M.P.), [4]professor, General Surgery, Rd Gardi Medical College ,Ujjain
[1]Drakashjain16@gmail.com, [2]avneesh92@gmail.com, [3]9164838934rubina@gmail.com

Keywords:
Fine Needle Aspiration Cytology (FNAC), Breast Lesions, Fibroadenoma, Breast Carcinoma, Cytological Diagnosis, Diagnostic Accuracy, Sensitivity, Specificity, Triple Assessment, Histopathology, Breast Lump, Minimally Invasive Procedure, Cytopathology, Breast Cancer Screening

Abstract

Breast lesions, with the broad spectrum of benign and malignant disorders, are commonly met in clinical practice and require timely and accurate diagnosis for appropriate therapy. Given this context, FNAC gains paramount importance due to its advantages-non-invasive nature, cost-effectiveness, and rapid diagnosis, especially when used as a part of the triple assessment that includes clinical examination, imaging, and cytology or histology. The present study was undertaken to estimate the diagnostic efficacy and utility of FNAC in different breast diseases with regard to its sensitivity, specificity, and diagnostic accuracy. A one-year hospital-based prospective observational study was carried out in the Department of General Surgery, R.D. Gardi Medical College, Ujjain, Madhya Pradesh. A total of 83 patients were included in the study who presented with breast lumps. There was clinical evaluation for every patient, imaging related to the case, and FNAC. The cytological findings were compared with histopathological findings whenever available. The data was analyzed using SPSS version 25. Among 83 patients, 98.8% were females and 1.2% consisted of males, with predominant age group being ≤30 years (59.1%). The majority of the cells as studied by FNAC were diagnosed as fibroadenoma (61.5%), abscesses (8.5%), benign breast diseases (7.2%), and carcinoma of the breast (6.0%). Other diagnoses included lactating adenoma (3.6%), proliferative breast disease (3.6%), gynecomastia (2.4%), granulomatous lymphadenitis (1.2%), and inflammatory smears (1.2%), while in 4.8%, no result was yielded. The sensitivity and specificity have been found to be 78.7% and 50.0% with FNAB. The diagnostic accuracy of 75.9% is afforded by the sensitivity of 96.1% and the specificity of 22.5%. It was proven particularly useful when performing FNAC for the evaluation of palpable breast masses, showing higher correlations with histopathological diagnoses in the benign category, hence permitting early detection of malignancy. One has to know there are some limitations: in some cases, there may be a lack of specificity; in others, there may be poor sampling techniques and inability to subtype some malignancies. Nevertheless, FNAC remains the most commonly applied technique to diagnose breast lesions Its rapid turnaround time, minimal invasiveness, low cost, and patient acceptability make it an indispensable first-line investigation for both screening and symptomatic presentations. The findings of this study reaffirm FNAC's critical role in modern breast disease management, supporting timely and accurate therapeutic decision-making while minimizing unnecessary surgical interventions.

INTRODUCTION

Some women have a variety of benign and malignant breast diseases presenting most often as pain in the breast, nipple discharge, or palpable mass. The exact causes of these symptoms vary according to the patient's age. With benign diseases predominating in young premenopausal women, malignancies increase with age. Workup of breast symptoms generally requires a thorough history and physical examination, imaging, and biopsy if indicated. A palpable breast mass is the complaint to a primary care physician in 42% of all patients presenting with breast symptoms and represents more than half of breast complaints in patients presenting to breast centres. [1,2].

The evaluation of breast lumps involves the judicious use of a detailed history, clinical breast examination, imaging modalities or labs and tissue diagnosis. The final diagnose usually rests with the histopathological examination of the excised tissue. However, it would be a poor rationale to excise all breast lumps, given that 80% turn out to be benign.[3].

So is the requirement for less invasive and cheaper means of diagnosis, thereby putting a more painful and invasive procedure like surgical biopsy out of the question. The method is to be accepted by the patients; accurate in application; easy to carry out; reproducible; and should require minimal preparation.[4]. At present, the triple assessment is the best available approach for investigation of palpable and nonpalpable lesions detected by imaging. It includes (1) clinical breast examination and eliciting relevant history; (2) imaging, including mammography or breast ultrasound; and (3) nonexcision biopsy-FNAC and/or core biopsy. The triple test is normally considered positive if any one of the three components return a positive result and negative in case all components return negative results[5]. With both the screening and diagnostic situations, the triple test approach tries to make sure that most breast lesions are diagnosed without excision biopsy while holding high accuracy in detecting cancer. If the FNAC result is malignant, it gives an opportunity for the pre-operative counselling of the lady regarding treatment options, and this may aid in planning a single stage surgery[6]. Where a benign diagnosis is reported or confirmed, and excision biopsy is ruled out, the woman should be reassured and discussed for appropriate management options. Before FNAC, a thorough clinical exam and imaging investigations must be performed whether the mass is palpable or not. The haemorrhage or haematoma associated with the sampling procedure would hamper interpretation during subsequent clinical examination or imaging studies. Advantages known over core needle biopsy are FNAC clinical: the sampling procedure is quicker, does not necessitate the use of local anaesthesia, is less traumatic and has fewer complications[7].

Some results come faster (within just a few hours) and it is cheap. Meanwhile, disadvantages of FNAC versus core biopsy include the fact it requires the expert to prepare quality smears and that considerable expertise in cytology is required to interpret the FNAC. FNAC cannot differentiate between ductal carcinoma-in-situ and invasive carcinoma[8,9].

Another definite diagnosis may prove impossible to make with FNAC for some lesions[10]. ADH, low-grade ductal carcinoma in-situ, some tubular carcinomas, and some invasive lobular carcinomas fall under these conditions. Other complications that may arise include displacing epithelium and implantation by the needle tract.

In the patients' side of comfort, no anesthesia requirement, fast analysis, and reporting, and very few false-positive results, fine needle aspiration (FNA) is the best initial diagnostic modality in breast lumps.[11]. While fine needle aspiration cytology is very commonly performed on breast groups due to its qualities or advantages of sensitivity, specificity, simplicity, economy, safety, and rapidity, in addition to being accepted by the patients [12], any lump in the breast must be cytohistologically diagnosed because even in expert hands, clinical diagnosis can only achieve 75% sensitivity[13]. It is the best way to really diagnose a lump in the breast. FNAC is popular, fast, simple and reliable diagnostic method that can be done on out-patient basis. However, it is limited by a degree of sensitivity and specificity[14].

Clinical examination, radiology, and pathology constitute the famous triple assessment diagnoses and have been adopted in most countries for breast diagnosis. As a pathological investigation, FNAC is used—the first line—in both screening and symptomatic populations, except when there are microcalcifications present[15].

FNACs done by seasoned cytopathologists boast very high diagnostic accuracy, reaching up to 98.9% in some series [16,17]. Against this backdrop, this study was conducted in a tertiary care centre of central India to study the role of fine needle aspiration cytology in various breast diseases.

MATERIAL AND METHODS:

Study Setting: This was a hospital based observational study conducted in the Department of General Surgery, R.D. Gardi Medical College, Ujjain, Madhya Pradesh.

Type of Study: Hospital Based Prospective Observational study.

Study duration: The study was conducted for a duration of 1 year.

Sample size: Based on the previous studies conducted, a sample size of 77 patients was taken into consideration. A)

Sample size: To calculate the sample size based on sensitivity and specificity with 95% confidence level, we used the following information's:

Table 1 - Sensitivity Specificity Estimation:

Sensitivity/Specificity – Estimation	
Expected Sensitivity	90.00%
Expected Specificity	95.00%
Prevalence of disease (p)	45.00% (breast malignancies percentage)
Acceptable precision (W)	10.00%
Significance level (α)	0.05
Sample size for Sensitivity	77
Sample size for Specificity	34
Final Sample size	77

The minimum calculated sample size was 77 possible cases of breast cancer. We included 83 cases for analysis.
Inclusion Criteria:
• Patients 18 years or older
• All patients who had FNAC for breast lump
• Representation is extended after proper written consent for participation. Exclusion Criteria:
• Cases where the patient refuses to participate.
• Previously diagnosed cases.
• Previously treated cases.
• Recurrence of diseases.
• Clinically obvious cases of invasive breast carcinoma, such as fungating malignant ulcers.

METHODOLOGY:
• Patients attending outpatient department or admitted in the ward for evaluation of lump in the breast in Department of General Surgery, during the study period were taken for study considering the inclusion and exclusion criteria.

• Data were collected through a pre-tested and structured proforma for each patient. Suitable patients underwent a detailed history and clinical examination and had investigations carried out.
• The data were collected through the pre-tested, structured proforma for each patient. Clinical history and examination findings of the patients were recorded prospectively. Patients were informed about their enrollment into the study and what it entailed.
• A detailed history of the patient concerning

Previous history of breast surgery

Family history

Here, the case of the first childbirth happening post the age of 30 is noted as an insignificant risk for malignancy of the breast.

Other factors include prolonged contraceptive use or prolonged estrogen exposure via hormone replacement therapy.
Concerning menstrual history, females experiencing early menarche and late menopause are at a slightly higher risk of malignancy. Then, you may consider lifestyle factors involving obesity, alcohol, and smoking.
- Clinical examination was done.
- General examination for patient fitness for surgery was conducted.
- Radiological investigations including mammography, USG breast and axilla or MRI breast were performed.
- FNAC/biopsy invasive methods were done.
- Study of cytopathology was carried out on the aspirate/biopsy.
An In-Tissue classification into a five-categorization of Cytopathology.
An aspirated cytological smear may suffer from inadequacy due to hypocellularity, albeit sometimes from problems of aspiration, smearing, or staining, with the former being the most frequent.
These C2 benign cells showcase all the features of a benign tumor. Duct-like architecture, myoepithelial cells, and bipolar nuclei are seen. Usually, the background is inflammatory.
Cytology C3 atypia probably benign is usually regarded as benign with a few exceptional features seldom seen in a benign cell, such as cellular crowding, pleomorphism, and discohesion.
C4 suspicious of malignancy: At times, most of the intracelular atypical features suggestive of malignancy are present, and at times, a few features such as poor preservation or hypocellularity or the presence of a benign component are there, hence a firmer diagnosis must be made of the malignant one.
Cells from this malignant aspirate in a category C5 demonstrate their malignant characteristics and more malignant features.
Outcome variable-
• The sample areate: Yes/No
• The benign from the malignant can be differentiated: Yes/No
• Need for biopsy after FNAC: Yes/No
• Improvement of prognosis of the patient on early detection of the disease: Yes/No
Statistical Analysis:
Data entry and cleaning were performed using MS-Excel, whereas SPSS 25 software was employed for data analysis. Quantitative variables were expressed as mean ± standard deviation (median ± interquartile range). Percentages (%) and proportions were used to express qualitative variables. Depending upon the interrelationship between two variables, suitable tests were used to analyze the data, and statistical significance was assigned to $p < 0.05$.
Ethical considerations:
The study protocol was submitted before the ethical committee for approval. The study was initiated only after obtaining due approval from the ethical committee. Written voluntary consent was obtained before including any patient in the study from either the patient and/or his/her legally acceptable representative

in case the patient himself did not provide the consent. Information was kept confidential and was only made available for scientific purposes, and at no stage was the identity or name of the participant divulged. No risks were introduced to the patient by perturbation for the research. Participation was purely voluntary.

Funding details:
No grants were required, as the studies were part of routine investigations.

RESULT:

A total of 83 patients presented with lump or any mass in the present study.

"Table 2 - Distribution of patients according to gender

Gender	Frequency (n)	Percentage (%)
Males	01	1.2
Females	82	98.8
Total	83	100

Figure 1 - Distribution of patients according to gender

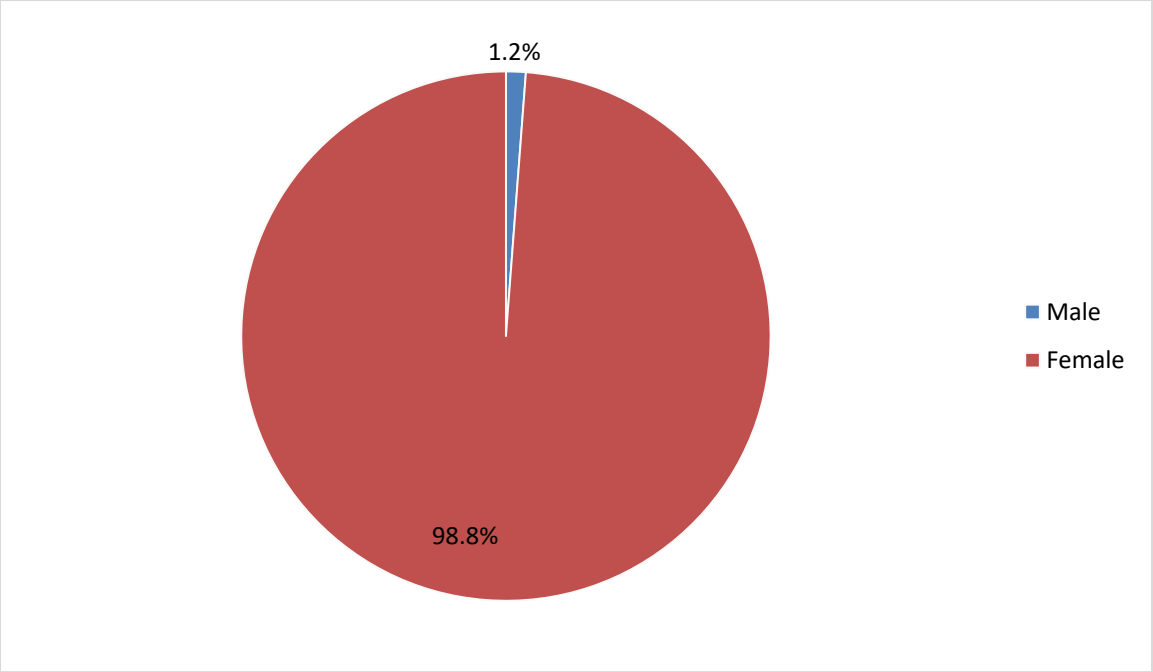


Table 2 and figure 1 show the distribution of patients according to gender in the present study. While most patients turned out to be of female, accounting for 98.8% of all, males were just 1.2% among the total patients admitted.

Table 3 - Distribution of patients according to Age

Age	Frequency (n)	Percentage (%)
18 to 30 years	49	59.1
31 to 40 years	19	22.9
41 to 50 years	09	10.8
> 50 years	06	7.2
Total	83	100

Figure 2 - Distribution of patients according to Age

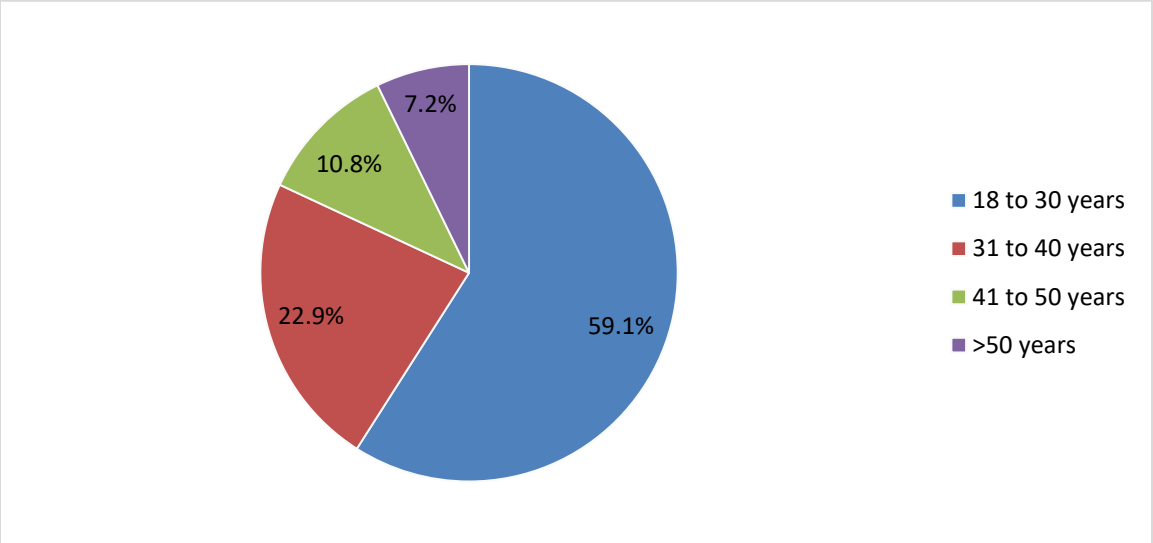


Table 3 and figure 2 depicted the age-wise distribution of patients coming before this hospital. 59.1% of them were in the age group, ≤30 years. 22.9% were between the ages of 31 and 40 years. 10.8% were in between 41 to 50 years. Only 7.2% were above 50 years.

Table 4 - Distribution of patients according to marital status

Marital status	Frequency (n)	Percentage (%)
Married	57	68.7
Not married	36	31.3
Total	83	100

Figure 3 - Distribution of patients according to marital status

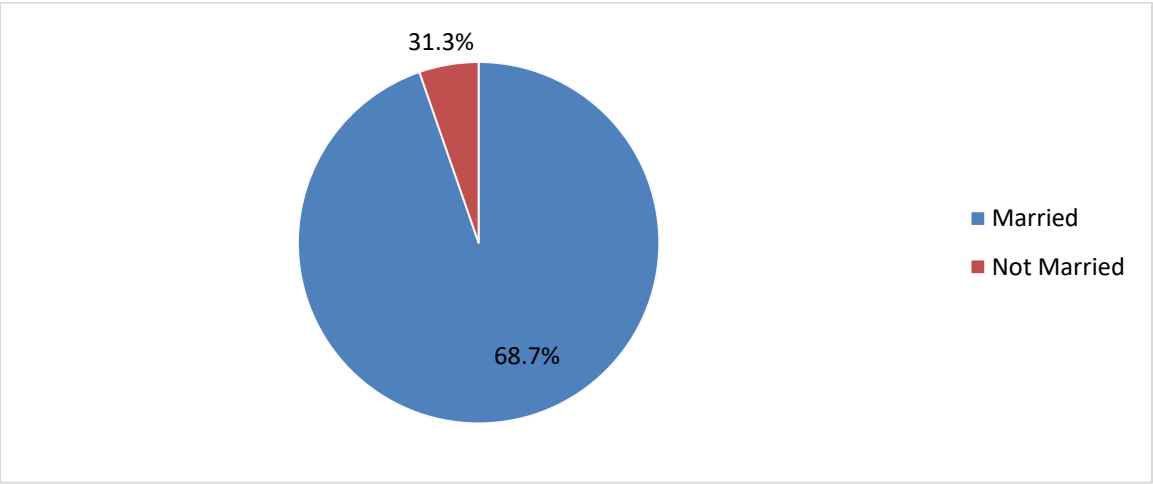


Table 4 and figure 3 show the distribution of patients according to marital status. At the time of the study, 68.7% of patients were married while 31.3% were not married.

Table 5 - Distribution of patients according to palpability of mass

Palpability	Frequency (n)	Percentage (%)
Yes	79	95.2
No	04	4.8
Total	83	100

Figure 4 - Distribution of patients according to palpability of mass

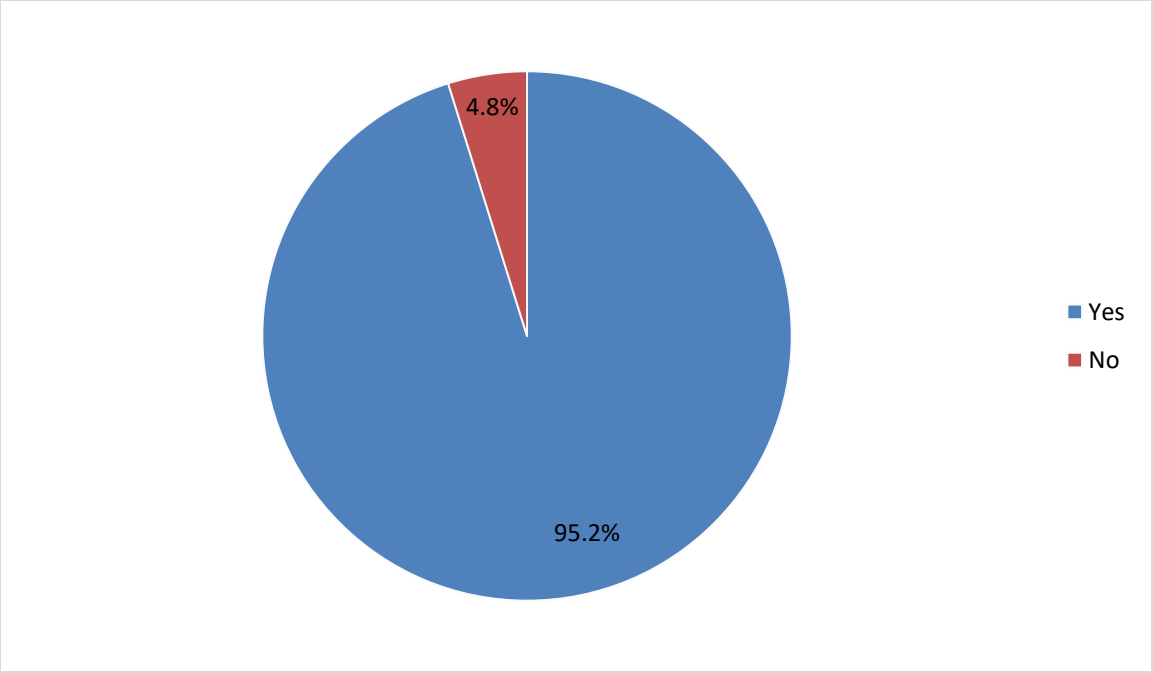


Table 5 and Figure 4 indicate that approximately 95.2% of the patients could feel the mass, and the remaining 4.8% were void of any palpable mass.

Table 6 - Distribution of patients according to sites involved*

Sites	Frequency (n)	Percentage (%)
Upper Outer Quadrant	35	42.2
Lower Outer Quadrant	19	22.9
Upper Inner Quadrant	23	27.7
Lower Inner Quadrant	28	33.7

* The sites are not mutually exclusive, implying that one patient may have multiple sites involved at a time of presentation.

Figure 5 - Distribution of patients according to sites involved

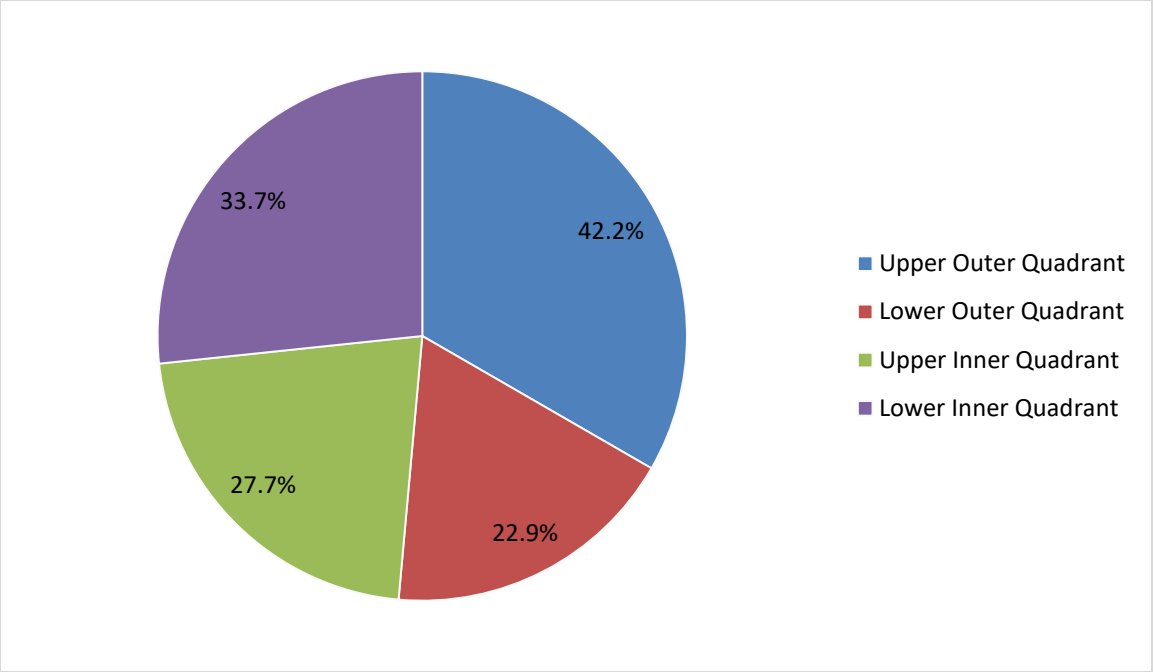


Table 6 and figure 5 show the distribution of patients according to sites involved. Thirty-five patients had upper outer quadrant involvement, whereas 28 patients had lower inner quadrant involvement. Twenty-three patients had upper inner quadrant involved, and 19 had lower outer quadrant involved.

Table 7 - Descriptive statistics for size of lump

Size	Mean	Standard deviation
Length (in cms)	2.90	1.06
Breadth (in cms)	2.25	0.82

Figure 6 - Descriptive statistics for size of lump

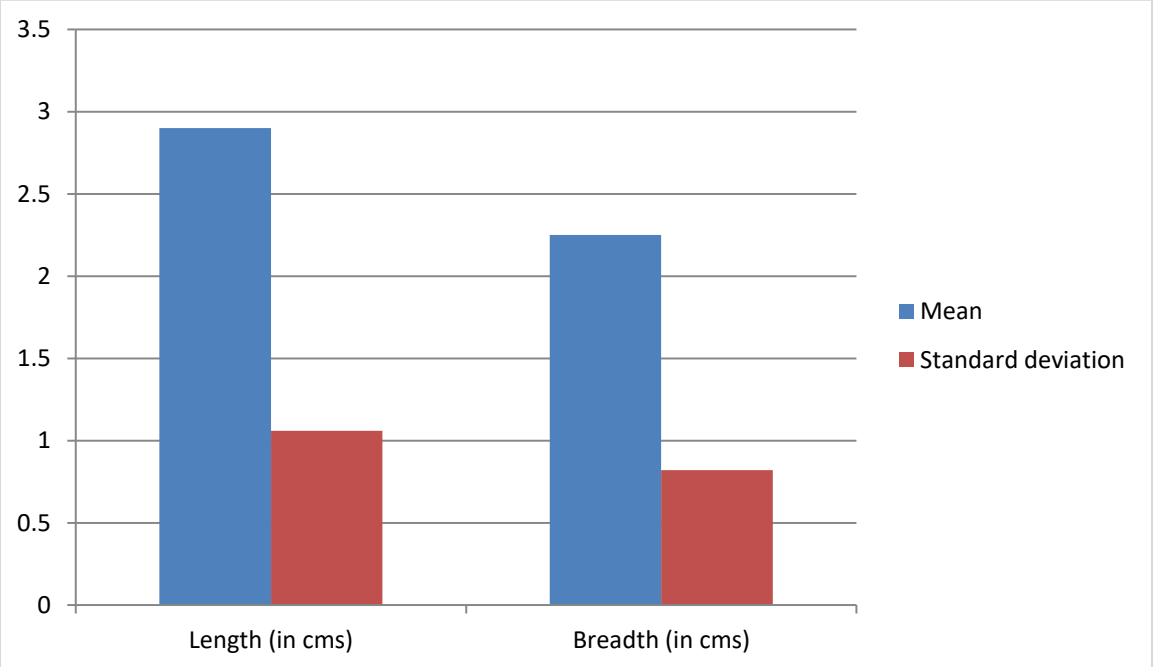


Table 7 and figure 6 provide the descriptive statistics for lump size as recorded in this study. The size of lumps was generally described by their length and breadth. The mean length of lumps was found to be 2.9 cms, with a standard deviation of 1.06 cms, while the mean breadth was 2.25 cms, with a standard deviation of 0.82 cms.

Table 8 - Distribution of patients according to consistency of lump

Consistency	Frequency (n)	Percentage (%)
Firm	71	85.6
Hard	08	9.6
Soft	04	4.8
Total	83	100

Figure 7 - Distribution of patients according to consistency of lump

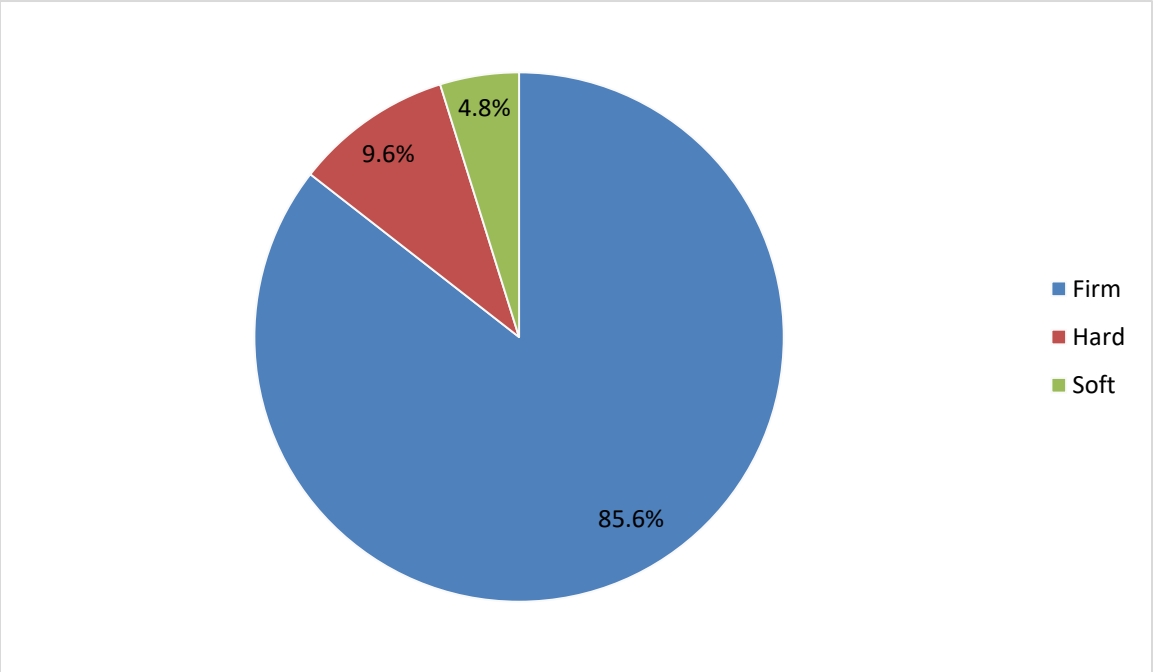
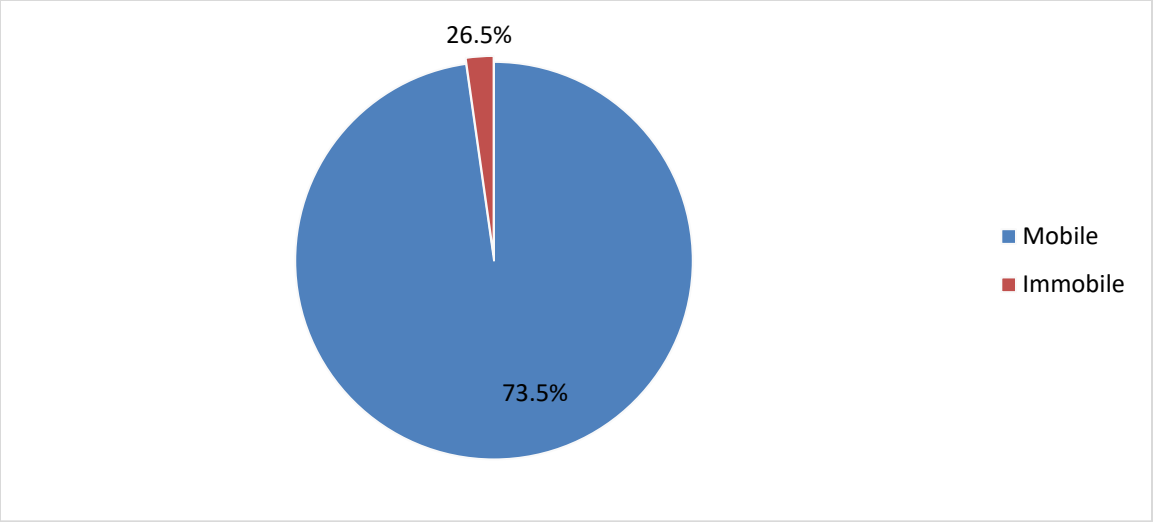


Table 8 and figure 7 show the distribution of patients based on consistency of lumps in the present study. Seventy-one patients with lumps had firm consistency, and eight (08) patients had hard consistency on palpation. Only four (04) patients were found to have soft consistency on examination.

Table 9 - Distribution of patients according to mobility of lump

Mobility	Frequency (n)	Percentage (%)
Mobile	61	73.5
Immobile	22	26.5
Total	83	100

Figure 8 - Distribution of patients according to mobility of lump

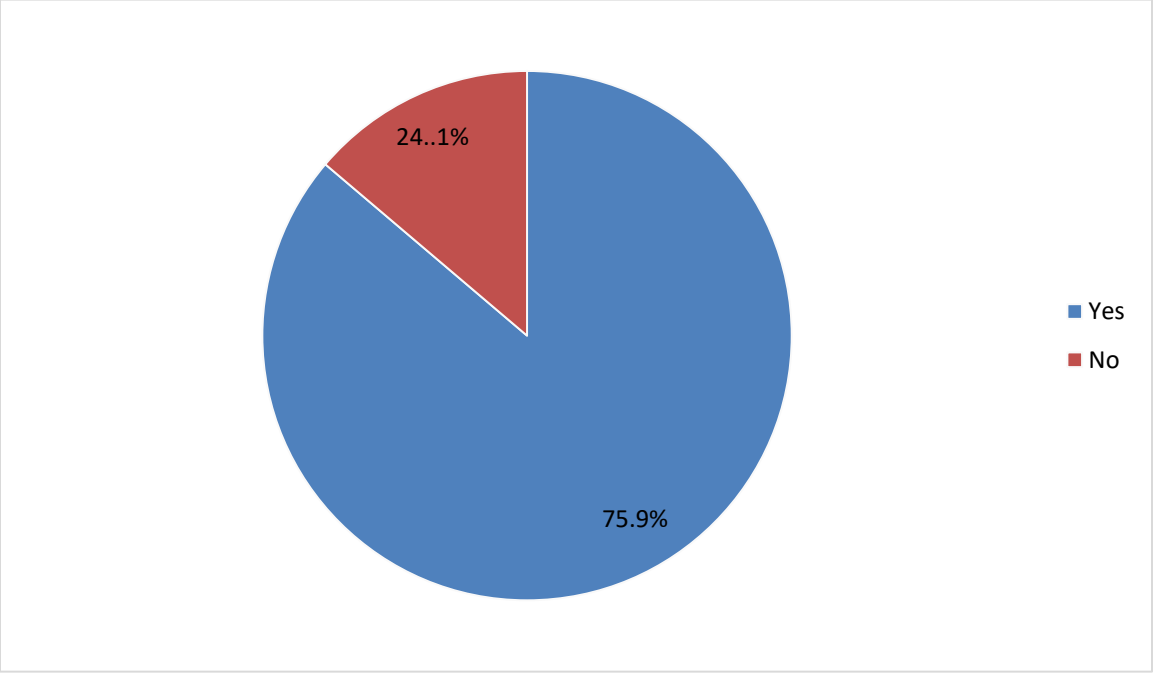


The distribution of patients according to mobility is highlighted in Table 9 and figure 8. Out of the total, in 73.5% of the patients, it was found to be mobile; in 26.5% of the patients, it was immobile.

Table 10 - Distribution of patients according to fixation to chest wall/Pectoralis major

Fixation to chest wall/ Pectoralis major	Frequency (n)	Percentage (%)
Yes	20	24.1
No	63	75.9
Total	83	100

Figure 9 - Distribution of patients according to fixation to chest wall/ Pectoralis major

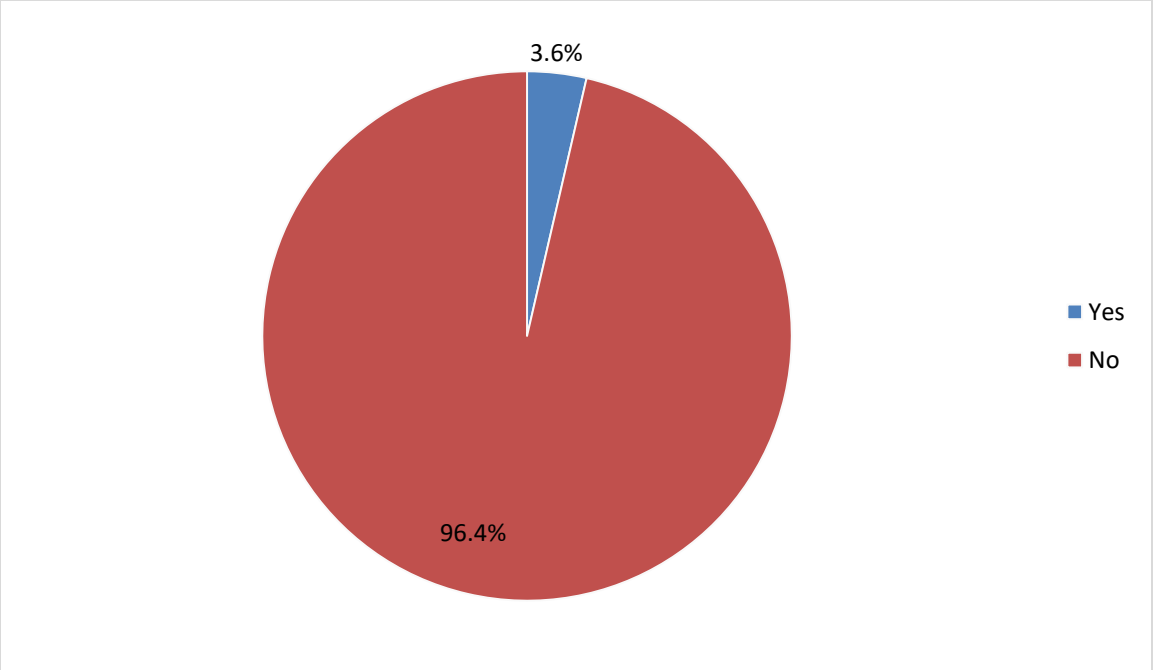


From Table 10 and figure 9, one can observe the distribution of patients along lump/mass fixation to chest wall/pectoralis major. It was found that in 24.1% of cases, fixation to chest wall/pectoralis major was present, while in 75.9% of cases, it was not.

Table 11 - Distribution of patients according to fixity to overlying skin

Fixity to overlying skin	Frequency (n)	Percentage (%)
Yes	03	3.6
No	80	96.4
Total	83	100

Figure 10 - Distribution of patients according to fixity to overlying skin



The distribution of patients who revealed fixation to the overlying skin has been shown in Table-11 and Figure-10. It was present in three (03) patients and absent in 80 patients.

Table 12 - Distribution of patients according to presence or absence of dimpling/ retraction

Dimpling/ Retraction	Frequency (n)	Percentage (%)
Present	03	3.6
Absent	80	96.4
Total	83	100

Figure 11 - Distribution of patients according to presence or absence of dimpling/ retraction

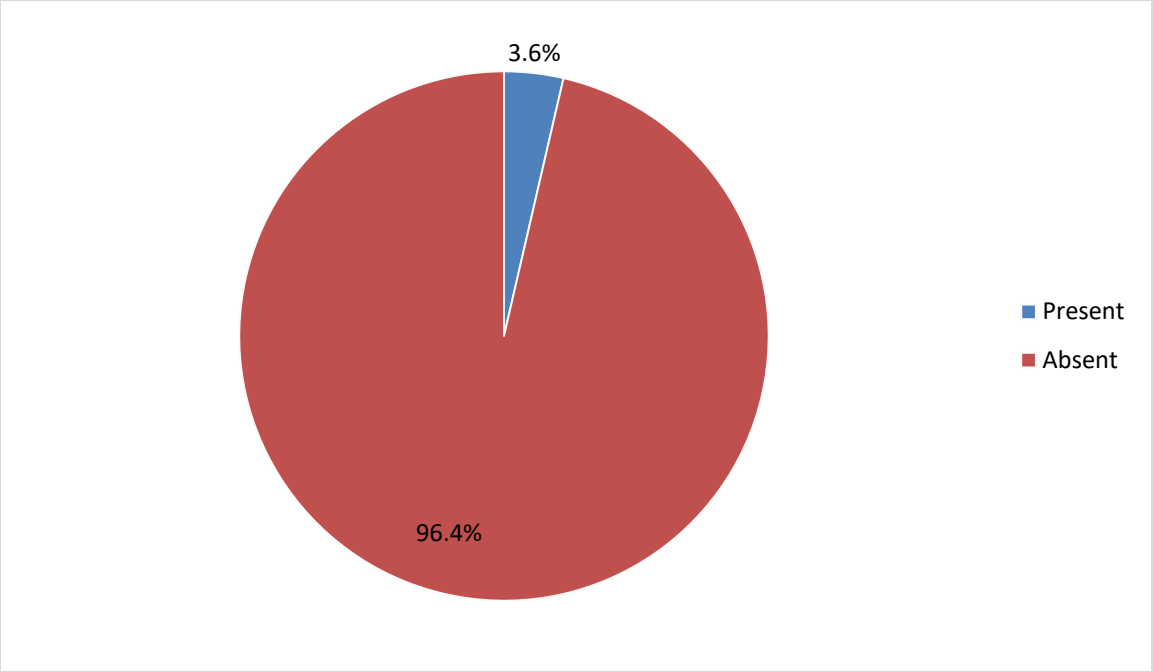
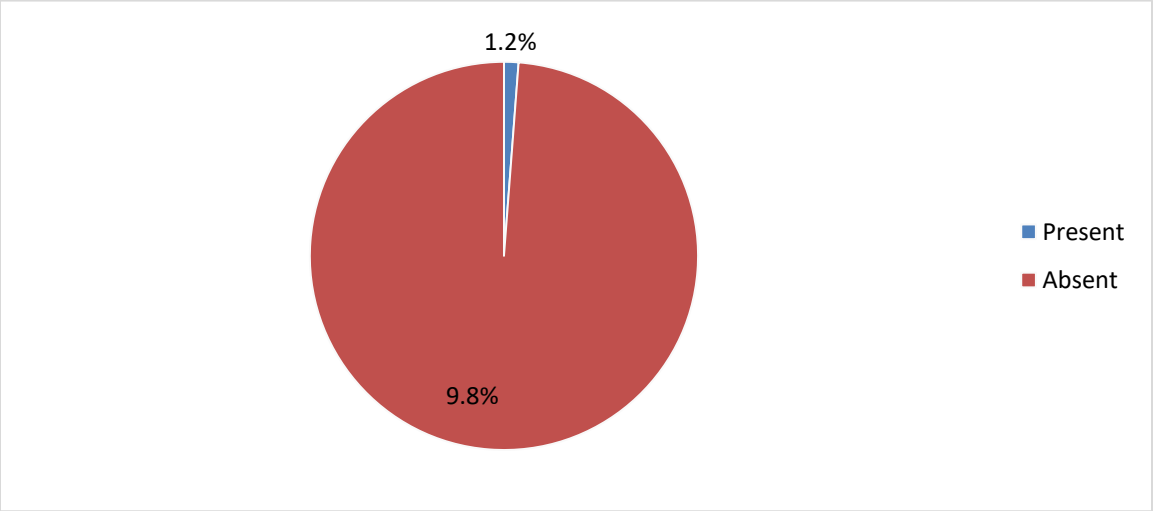


Table 12 and Figure 11 show patients distributed by presence or absence of dimpling or retraction. Dimpling or retraction was present in 3.6 percent of patients, whereas 96.4 percent did not show either of the two.

Table 13 - Distribution of patients according to discharge

Discharge	Frequency (n)	Percentage (%)
Present	01	1.2
Absent	82	98.8
Total	83	100

Figure 12 - Distribution of patients according to discharge



In the present study, the distribution of patients according to discharge has been shown in table 13 and figure 12. About 98.8% of patients did not give history or complaints of discharge, while not more than 1.2% had discharge present.

Table 14 - Distribution of patients according to axillary lymph node involvement

Axillary lymph node involvement	Frequency (n)	Percentage (%)
Present	09	10.8
Absent	74	89.2
Total	83	100

Figure 13 - Distribution of patients according to axillary lymph node involvement

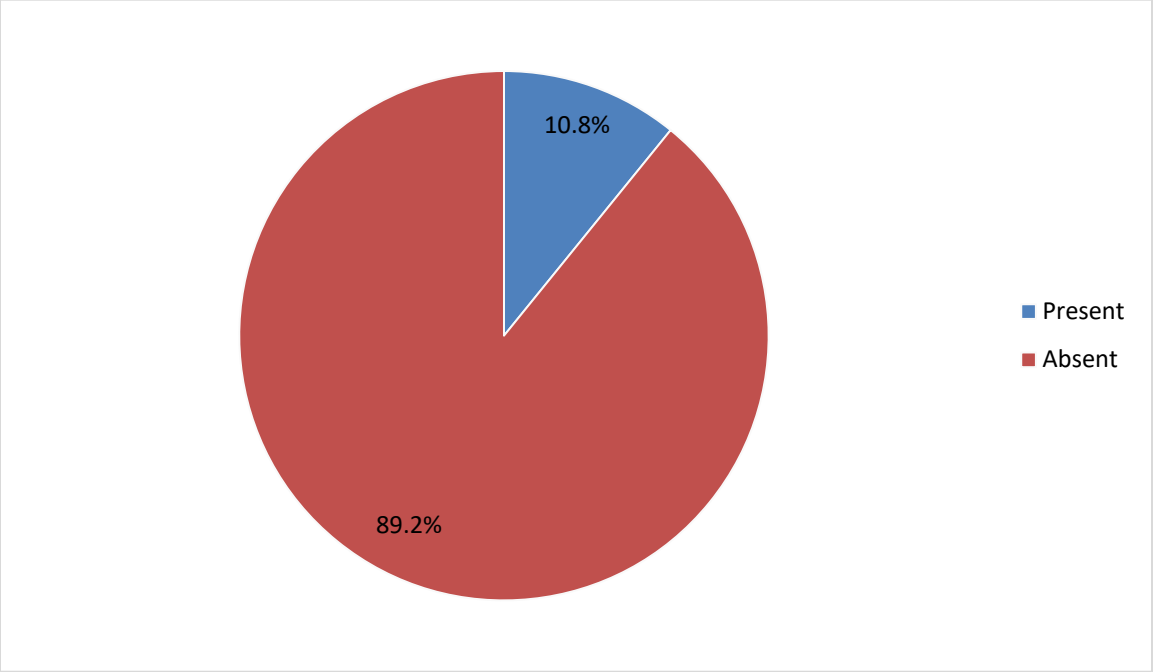


Table 14 and figure 13 present the distribution of patients concerning axillary lymph node involvement. In our study, we had only 10.8% of patients with axillary lymph node involvement, while 89.2% had no axillary lymph node involvement.

Table 15 - Distribution of patients according to diagnosis based on FNAC

Diagnosis	Frequency (n)	Percentage (%)
Fibroadenoma	51	61.5
Abscess	07	8.5
Benign breast disease	06	7.2
Carcinoma breast	05	6.0
No result	04	4.8
Lactating adenoma	03	3.6
Proliferative breast disease	03	3.6
Gynecomastia	02	2.4
Granulomatous lymphadenitis	01	1.2

Inflammatory smear	01	1.2
Total	83	100

Figure 14 - Distribution of patients according to diagnosis based on FNAC

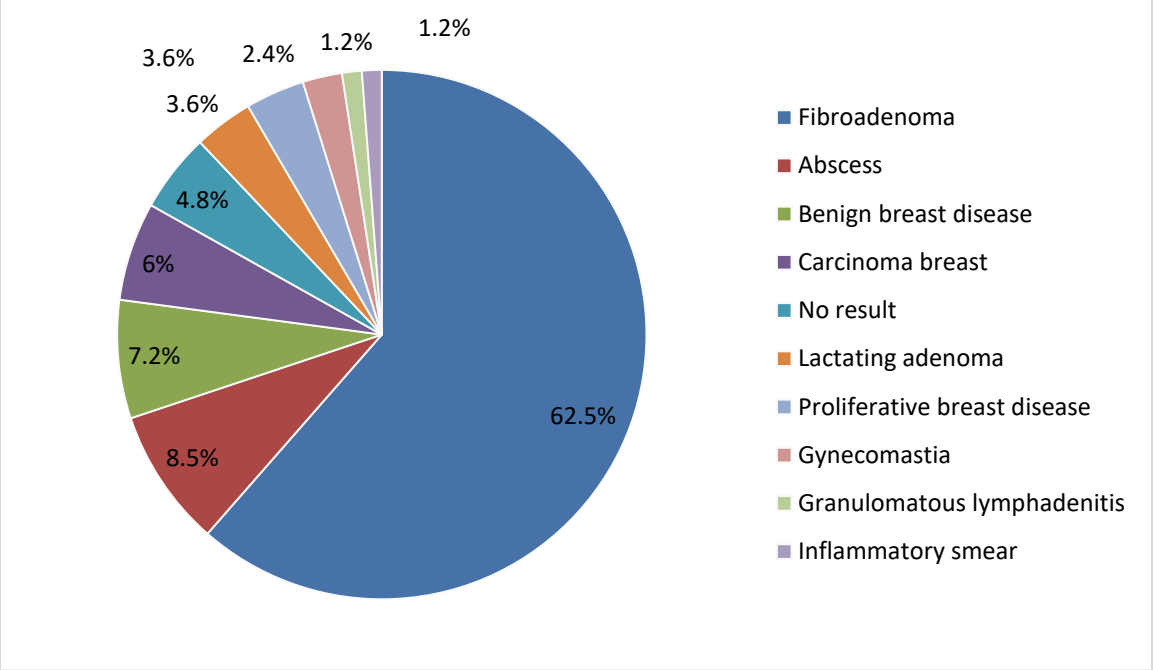


Table 15 and figure 14 show the distribution of patients according to diagnosis on the FNAC ground in the present study. Fibroadenoma was diagnosed in 51 patients, constituting the most common diagnosis. Abscess was found on FNAC in seven (07) patients, benign breast disease in six (06). Five (05) patients were found to have carcinoma breast. FNAC turned inconclusive in four (04) patients. Three (03) patients each were diagnosed with lactating adenoma and proliferative breast disease. Two (02) cases were found to have gynecomastia. Other findings on FNAC were granulomatous lymphadenitis in one (01) patient and an inflammatory smear in one (01).

Table 16 - Statistical Analysis of FNAC in comparison to Trucut/HPE

FNAC	Histopathological diagnosis		Total
	Diseased n (%)	Non-diseased n (%)	
Positive	59 (78.7)	04 (50)	63
Negative	16 (21.3)	04 (50)	20
Total	75 (100)	08 (100)	83

Table 16 represents the statistical analysis of FNAC as compared with Trucut or histopathological diagnosis. Out of total diseased, the FNAC correctly diagnosed 78.7% of patients, whereas 21.3% of patients were not correctly diagnosed. Similarly, in the case of patients with no disease, 50% were correctly identified by FNAC.

Disseminated sensitivity was 78.7% for every affliction of the mammary gland, whereas the specific action of the FNAC was only 50%. The positive predictive value of FNACs was 93.5%, and the negative was 20%. An overall diagnostic accuracy of 75.9% was established for FNACs.

DISCUSSION:

Fine Needle Aspiration Cytology has an important role to play with respect to the evaluation and diagnosis of various breast diseases. A minimally invasive procedure, it uses a thin needle to aspirate cells from a lesion for cytological examination under a microscope thereby helping clinical management decisions. Let's get into an elaborate discussion on the role of FNAC in various breast diseases:

Diagnostic Utility

1.Benign Lesions of the Breast: It is very accurate in differentiating between benign and malignant breast lesions. It also helps in diagnosing common benign conditions like fibroadenomas, cysts, and fibrocystic changes. This is pertinent because most breast lesions are benign, and FNAC helps in averting unwarranted surgical interventions by arriving at a conclusive diagnosis.

2. Malignant: In carcinoma of the breast, FNA serves as an indispensable diagnostic tool. It detects malignant cells, classifies the carcinoma type, whether ductal or lobular carcinoma, and grades the tumour. This information is necessary for staging the cancer and choosing the treatment modalities such as surgery, chemotherapy, or radiation therapy.

Role in Specific Breast Conditions

1. Palpable Breast Lumps: The first investigation of choice for palpable breast lumps is FNAC. Another way of describing it would be quick diagnosis within hours leading to immediate decisions about whether to proceed with further management or not.

2. Following the advent of imaging techniques such as mammography and ultrasound, non-palpable breast lesions are increasingly being detected. Guided-fine needle aspiration can be performed under image guidance (i.e., ultrasound-guided FNAC), thus making it possible to evaluate non-palpable lesions. It is less invasive than core needle biopsy and is capable of providing material in sufficient quantities for diagnostic purposes.

3. Evaluation of the Axillary Lymph Node: The presence of enlarged axillary lymph nodes with appearances suggestive of possible metastasis from a primary breast carcinoma warrants FNAC to stage the disease and decide treatment options.

Advantages of FNAC

• Tested through Minimal Invasiveness: FNAC stands as a simple, quick outpatient procedure-with little discomfort for the patient.

• Prompt Results: Reports would ordinarily be available within hours so that medical decisions can be taken immediately.

• Economical: Generally less expensive than a core nerve biopsy or a surgical biopsy, FNAC surely qualifies as a very inexpensive diagnostic method.

• Repeatable: FNAC can be repeated in cases of necessity without posing a significant health risk or complications. Following are the study comparisons with existing literature for generalizability of results.

Present Study
Sociodemographic Details
Presently, 83 patients with lumps in the breast were registered in the study. For females, the incidence

was 98.8%, whereas 1.2% were males. 59.1% of patients were younger than or equal to 30 years of age. The marital status showed that 68.7% of the patients were married.

Lump

Mass was palpable in 95.2% of patients as compared to 4.8% of patients with no palpable mass. Upper outer quadrant lumps were 35 in number as compared to 28 lumps in the lower inner quadrant. The upper inner quadrant had 23 lumps and the lower outer quadrant had 19 lumps. The mean length of the lump was 2.9 cms with standard deviation of 1.06 cms while the mean breadth of the lump was found out to be 2.25 cms with standard deviation of 0.82 cms. On palpation, 71 lumps were of firm consistency while 8 lumps were hard. On examination, only four (04) patients were found to have a soft consistency. The distribution of patients according to mobility of lump showed the lump to be mobile in 73.5% of patients and immobile in 26.5% of patients. Regarding fixation to chest wall/pectoralis major, 24.1% of patients had fixation to chest wall/pectoralis major present, and 75.9% of patients did not have fixation to chest wall/pectoralis major. The fixity to overlying skin was present in three patients and absent in 80 patients. Dimpling or retraction was present in 3.6% of patients while 96.4% of patients had no dimpling or retraction. All but 1.2% of the patients had no history or complaint of discharge. Only 10.8% of patients in the study had axillary lymph node involvement, while 89.2% had no axillary lymph node involvement.

Diagnosis
There were 51 patients with fibroadenomas, which was the most common diagnosis. Seven (07) patients had abscesses in FNAC while six (06) were diagnosed with benign breast disease. Five (05) patients were found to have carcinoma breast. The results of FNAC were inconclusive in four (04) patients. In three cases, lactating adenoma and proliferative breast disease made their appearances. Two were cases of gynecomastia. Other findings by FNAC include granulomatous lymphadenitis and an inflammatory smear in one case each.

Validity of FNAC

78.70% of those with a pathological condition were correctly diagnosed by FNAC, and 21.30% were missed. Likewise, amongst those having no disease, 50% of the subjects were detected correctly by FNAC. The sensitivity of FNAC for various breast diseases was found to be 78.70%, while its specificity was 50%. The positive predictive value of FNAC was found to be 93.50%, whereas the negative predictive value was 20%. The accuracy of FNAC was 75.90%.
FNAC slides from 420 females presenting with a palpable breast lump were evaluated by Mohanty SS et al. [103] The relationship of the tumours with the quadrants of the breast was: upper outer 57.14%, upper inner 13.33%, lower outer 11.9%, lower inner 6.67%, and central quadrant 10.95%. With respect to sensitivity, specificity, disease prevalence, positive predictive value, negative predictive value, and diagnostic accuracy, the study reported 93.42%, 100%, 57.8%, 100%, 91.17%, and 96.19%, respectively, for FNAC.

In a similar series of studies by de Cursi JA and colleagues, lesions 1.0 cm or smaller (≤1.0 cm) (n = 8334) were included for evaluation, classified according to the recommendation of the International Academy of Cytology Yokohama System for Reporting Breast Fine Needle Aspiration Biopsy Cytopathology into these categories: (1) insufficient/inadequate; (2) benign; (3) atypical, probably benign; (4) suspicious of malignancy; and (5) malignant.

Subsequently, a comparison developmental phase emerged between FNAC results and histopathological examination results (n = 785). FNAC had specificity, 99.6%; sensitivity, 97.4%; positive predictive value, 99.6%; negative predictive value, 97.6%; and accuracy, 98.5%. FNAC is a reliable procedure for diagnosing these small breast lesions (≤1.0 cm).

Thus, by way of contrast, a study by Ogbuanya AU et al [105] was undertaken as a descriptive prospective study of patients with palpable breast lumps over a period of 18 months. The patients were basically subjected to FNAC followed by an open biopsy. Patients with malignant lumps were then further evaluated. There were 88 (44.9%) biopsy confirmed breast cancers and 108 (55.1%) benign lumps. There were 12 (6.1%) unsatisfactory smears (C1), 96 (49%) benign (C2), 8 (4.1%) atypical (C3), 10 (5.1%) suspicious of malignancy and 70 (35.7%) unequivocally malignant (C5) smears from the cytological point of view. FNAC was found to score better than clinical examination in tests of validity for breast malignancy. The diagnostic results for malignancies of breast were 97.2% (sensitivity), 98.9% (specificity), 1.4% (false positive rate []), 2.1% (false negative rate), 98.6% (positive predictive value), 97.9% (negative predictive value), with 98.2% as the overall diagnostic accuracy. Therefore, with the high diagnostic performance of cytology stated above, FNAC proved practically useful and remarkably accurate for diagnosis of breast cancers.

CONCLUSION:

In conclusion, FNAC becomes one of the chief diagnostic techniques in the broader management of breast diseases. FNACs cover the diagnostic spectrum of clinical scenarios from palpable breast lumps to non-palpable lesions detected by high-end imaging techniques. FNACs render fast and reliable diagnoses that can differentiate benign breast lesions from malignant ones. With this information at hand, the surgeon can refrain from operating unnecessarily on benign conditions. The treatment of breast cancer can then be started immediately as the patient is staged.

Besides, FNAC stands to be very important in the evaluation of axillary lymph nodes for metastases and helps stage breast cancer and decide on neoadjuvant therapy and surgical procedure. Being essentially a minimally invasive procedure provides for yet another slight margin of anxiety to be alleviated in the patient and clinches the swift decision-making pathway offered to the clinician.
Yet, FNAC has certain limitations: the potential of sampling errors and the inability to subtype some varieties of breast cancers on cytological characteristics alone. Thus, these limitations stress the need for an expert hand, backed by a combined assessment involving clinical findings and the interpretation of imaging results all within a multidisciplinary setting.

In essence, FNAC goes to stand as one of the anchor diagnostic aids for breast diseases and thus has implications on management protocols of patient-centered care and eventual clinical outcomes. Given the constant evolution of technology and methodologies in cytology, FNAC continues to stand as a relevant investigative procedure in the ongoing quest to extend care to individuals suffering from breast ailments worldwide.

REFRENCES:

1. Salzman B, Fleegle S, Tully AS. Common breast problems. Am Fam Physician. 2012;86(4):343-349.
2. Bleicher RJ. Management of the palpable breast mass. In: Harris JR, Lippman ME, Morrow M, Osborne CK, editors. Diseases of the breast. Fifth. Philadelphia: Wolters Kluwer Health; 2014. pp. 29-37.
3. Pruthi S. Detection and evaluation of a palpable breast mass. Mayo Clin Proc. 2001;76(6):641-647; quiz 647-648.
4. Tiwari M. Role of fine needle aspiration cytology in diagnosis of breast lumps. Kathmandu Univ Med J (KUMJ). 2007;5(2):215-217. Nigam M,
5. Nigam B. Tripple Assessment of Breast – Gold standard in Mass Screening for Breast Cancer Diagnosis. Journal of Dental and Medical Sciences 2013;7(3): 01 – 07
6. Ahmed ME, Ahmad I, Akhtar S. Ultrasound guided fine needle aspiration cytology versus core needle biopsy in the preoperative assessment of non-palpable breast lesions. J Ayub Med Coll Abbottabad 2010; 22(2): 138 – 142.
7. Madubogwu CI, Ukah CO, Onyiaorah IV, anyiam DCD, Anyanwu SNC, Chianakwana GU. Cost effectiveness of fine needle aspiration cytology for breast masses. Orient Journal of Medicine 2015; 27 (1-2): 22- 27.

8. Challa VR, Guru BGY, Rangappa P, Deshmane V, Gayathri M. Cythological and pathological correlation of FNAC in assessing breast lumps and axillary lymph node swellings in a public sectoe hospital in India. Pathology Research International 2013. Article ID 695024.
9. Tse GM, Tan PH. Diagnosing breast lesions by fine needle aspiration cytology or core biopsy: which is better? Breast Cancer Res Treat 2010: 123:1
10. Sneige N, Staerkel GA. Fine needle aspiration cytology of ductal hyperplasia with and without atypia and ductal carcinoma in situ. Hum Pathol 1994; 25(5): 485 – 92
11. Khemka A, Chakrabarti N, Shah S, Patel V. Palpable breast lumps: fine-needle aspiration cytology versus histopathology: a correlation of diagnostic accuracy. The Internet Journal of Surgery. 2009;18.
12. Pradhan M, Dhakal HP. Study of breast lump of 2246 cases by fine needle aspiration. JNMA J Nepal Med Assoc. 2008;47(172):205 209.
13. Wilkinson S. Cytohistological diagnosis in breast lump. Acta Cytologica. 1989;33(5):613-619.
14. Dixon JM, Anderson TJ, Lamb J, Nixon SJ, Forrest AP. Fine needle aspiration cytology, in relationships to clinical examination and mammography in the diagnosis of a solid breast mass. Br J Surg. 1984;71(8):593-596.
15. Kocjan G, Bourgain C, Fassina A, Hagmar B, Herbert A, Kapila K, Kardum-Skelin I, et al. The role of breast FNAC in diagnosis and clinical management: a survey of current practice. Cytopathology. 2008;19(5):271-278.
16. Bukhari MH, Arshad M, Jamal S, Niazi S, Bashir S, Bakhshi IM, Shaharyar. Use of fine-needle aspiration in the evaluation of breast lumps. Patholog Res Int. 2011;2011:689521.
17. Panjvani SI, Parikh BJ, Parikh SB, Chaudhari BR, Patel KK, Gupta GS, Kodnani AH, et al. Utility of fine needle aspiration cytology in the evaluation of breast lesions. J Clin Diagn Res. 2013;7(12):2777 2779.