ABSTRACT Background: Fine Needle Aspiration Cytology (FNAC) is a simple, minimally invasive, cost-effective, and outpatient-based method for diagnosing various palpable lesions. Breast cancer is the commonest malignancy in women worldwide, and adequate preoperative evaluation is the most essential part of managing breast lumps. Although core needle biopsy has evolved as the diagnostic tool of choice for breast lumps, Fine Needle Aspiration Cytology remains an important diagnostic tool. Material & Method: We have conducted a retrospective study of FNAC of palpable breast lumps for one year (June 2020 to May 2021) in the Pathology department at Shantabaa Medical College and General Hospital, Amreli. All patients were outpatient based on surgical OPD. A total of 46 FNACs from palpable breast lesions were studied. Results: Out of 46 FNACs, 25 were benign, including infective aetiology, 12 were suspicious for malignancy, and 9 were malignant. Conclusion: FNAC serves as a rapid, economic and reliable tool for diagnosing palpable breast lesions. Cytopathological examination of lesions before operation or treatment is an important diagnostic modality.

KEYWORDS Breast lump, Cytopathology, Fine Needle Aspiration Cytology

Introduction
Fine Needle Aspiration Cytology is one of the important components of ‘the triple approach, which has been widely accepted for the preoperative diagnosis of breast lesions[1]. It is a multidisciplinary approach that includes analysis of clinical and radiological findings in conjunction with FNAC features to diagnose breast lesions and to determine the best management plans for the patient.

Most cases of breast lumps are benign[2]. Still, sometimes it is difficult to determine whether a suspicious lump is benign or malignant simply by doing a clinical examination. In these circumstances, as a widely accepted and established outpatient-based procedure, FNAC plays an important role in determining the nature of the lump. In addition, FNAC can reduce the number of open breast biopsies[3]. Thus FNAC is accepted as reliable, rapid, cost-effective, complication-free, and an accurate diagnostic modality for the evaluation or management of breast lumps.

Aims & Objectives
• Fine Needle Aspiration Cytology can provide information about the type of lesion, which helps in planning treatment modalities.
• Early detection of the malignant or suspicious malignant lesion by Fine Needle Aspiration Cytology helps clinicians plan management at an early stage and thus reduce complications in patients.
Material & Method

This retrospective study was carried out on female patients visiting Shantabaa Medical College and General Hospital, Amreli, from June 2020 to May 2021 (one year) to examine suspected palpable breast lesions through FNAC. Most patients with surgical OPD are referred to the cytopathology laboratory of the Pathology department of Shantabaa Medical College and General Hospital, Amreli. All the study subjects had written informed consent before inclusion in the study. 46 patients presenting with palpable breast lumps were included in this study. After informed consent and performing FNAC, a detailed history and general physical and clinical examination were carried out. FNAC was performed by injecting the needle into the palpable lesion of the breast mass using a 22-23 G disposable syringe. The procedure was repeated twice or thrice in some cases depending upon the size and gross appearance of the palpable mass or nodule. The cellular component was aspirated into a syringe and spread onto the glass slides for smear preparation. For each patient, 6–12 smears on slides were prepared. Each slide was positioned on the table, and on its end, a small- or medium-sized drop of aspirated material was placed and spread with the help of a glass spreader to prepare the smear of the aspirate. The prepared smears were fixed in methanol and stained with the Hematoxyline & Eosin (H&E) staining technique. The stained slides were observed under the microscope using a high-power objective lens.

Results

The present study was conducted to know the utility of Fine Needle Aspiration Cytology in patients presenting with palpable breast lumps at the outpatient department. The present study was carried out at the Department of Pathology, Shantabaa Medical College & General Hospital, Amreli, for the period of one year, from June 2020 to May 2021. A total of 46 cases of palpable breast lumps were diagnosed cytomorphologically in the study. In addition, data were analyzed and tabulated to know age distribution, nature of aspirate and cytomorphological features of breast lesions.

Graph 1 age distribution of cases

In the present study, the age of the patients ranged from 11 years to 80 years. The maximum numbers of patients were between the age group of 41 to 50 years (13 cases, i.e. 28.2%).

All FNAC smears were studied and examined under a microscope for cytomorphology. The results were tabulated and analyzed.

Graph 2 Cytological diagnosis of cases (% of cases)

The nature of aspirate was studied in all 46 patients. The most common finding was blood mixed (26 cases, i.e.56.5%), then fluidic in cystic lesions of the breast (17.3%), and pus-like (13%) in inflammatory conditions.

Cytological diagnosis in all patients was correlated with the age group. It was found that benign lesions and inflammatory conditions occur at a younger age. In contrast, the malignant condition is more common in the older age group.

Graph 3 Comparison of cytological diagnosis with age group

Image 1 Fibroadenoma on cytopathology smear(H&E stain, 100x)
### Table 1 Age distribution of patients with a breast lump

| Age range (years) | Cases | Percentage (%) |
|-------------------|-------|----------------|
| 11 – 20 years     | 1     | 2.1%           |
| 21 – 30 years     | 9     | 19.5%          |
| 31 – 40 years     | 12    | 26%            |
| 41 – 50 years     | 13    | 28.2%          |
| 51 – 60 years     | 6     | 13%            |
| 61 – 70 years     | 4     | 9%             |
| 71 – 80 years     | 1     | 2.1%           |
| >80 years         | 0     | 0%             |
| Total             | 46    | 100%           |

### Table 2 Cytological diagnosis of cases

| Cytological diagnosis                                      | No. of cases | % of cases |
|------------------------------------------------------------|--------------|------------|
| Inflammatory lesion – acute mastitis                       | 3            | 6.5%       |
| Chronic granulomatous mastitis / chronic mastitis          | 3            | 6.5%       |
| Fibroadenoma                                               | 2            | 4.3%       |
| Fibrocystic breast lesion                                  | 8            | 17.3%      |
| Proliferative breast lesion                                | 8            | 17.3%      |
| Benign Phyllodes tumor                                     | 1            | 2.1%       |
| Suspicious for malignant                                   | 12           | 26%        |
| Malignant breast lesion                                    | 9            | 19.5%      |
| Total                                                      | 46           | 100%       |

### Table 3 Nature of aspirate of studied cases

| Nature of aspirate   | No. of cases |
|----------------------|--------------|
| Pus-like/sticky      | 06           |
| Fluidic              | 08           |
| Blood mixed          | 26           |
| Scanty               | 06           |
| Total                | 46           |

### Table 4 Comparison of cytological diagnosis with the age group of patients

| Cytological diagnosis         | Age group (years) | Total cases |
|-------------------------------|-------------------|-------------|
|                               | 11-20  | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | >80 |
| Inflammatory mastitis         | 3      | 2     | 1     |       |       |       |       |     |
| Fibroadenoma                  | 2      |       |       |       |       |       |       |     |
| Fibrocystic disease           | 2      | 5     | 1     |       |       |       |       |     |
| Proliferative breast lesion   | 1      | 2     | 4     | 1     |       |       |       |     |
| Benign Phyllodes              | 1      |       |       |       |       |       |       |     |
| Suspicious for malignant      | 2      | 2     | 5     | 1     | 2     |       |       |     |
| Malignant lesion              | 2      | 4     | 2     | 1     |       |       |       |     |
| Total                         | 1      | 9     | 12    | 13    | 06    | 04    | 01    | 00  | 46  |
Table 5  Cytological comparison of the study with literature reports

| Studies             | Inadequate/Insufficient (%) | Benign/Inflammatory (%) | Suspicious for malignant (%) | Malignant lesion (%) | Total cases (No) |
|---------------------|-----------------------------|-------------------------|------------------------------|----------------------|-----------------|
| Panjvani et al. [13]| 0                           | 68.18                   | 1.35                         | 31.08                | 222             |
| Khan et al. [14]    | 0                           | 32.4                    | 12.2                         | 55.4                 | 74              |
| Chauhan et al. [17] | 4.9                         | 73.07                   | 3.85                         | 18.16                | 468             |
| Yusuf and Atand A [18] | 0                       | 54.5                    | 23.5                         | 22                   | 200             |
| Singh et al. [19]   | 0                           | 31                      | 5                            | 39                   | 100             |
| Rehan et al. [20]   | 11.1                        | 64.5                    | 14                           | 10.5                 | 287             |
| Montezuma et al. [21]| 5.77                       | 73.38                   | 15.31                        | 5.54                 | 3625            |
| Gorasiya and Jhaveri [22] | 0                          | 9.38                    | 60                           | 30.62                | 160             |
| Rioki and Ronena [23]| 15.2                       | 78.1                    | 5.9                          | 0.8                  | 768             |
| Khattak et al. [24] | 0                           | 72.7                    | 7.94                         | 19.31                | 88              |
| Present study       | 0                           | 54                      | 26                           | 19.5                 | 46              |

Image 2 Benign Phyllodes tumour (H&E stain, 100x)

Image 3 Malignant aspirate (H&E stain, 100x)

Discussion

FNAC is extensively recognized as a reliable procedure for the initial examination of palpable breast masses. It is minimally invasive, cost-effective, safe, simple, rapid and sensitive compared to biopsy [4,5]. Applying Fine Needle Aspiration (FNA) for diagnosing palpable breast masses was first introduced by Martin and Ellis in 1930. Since then, it has been established as an essential tool in evaluating breast lesions. Most patients with breast lumps are in a state of anxiety. So, in them reducing anxiety and unnecessary surgical procedures as well as in minimization of delay in the diagnosis, FNAC proves very fruitful. FNA procedure is a safe method with only a few reported complications. In our study, the most common age group of patients who presented with palpable breast lumps was 41 to 50 years (28.2%). The age range of the studied population ranges from 19 to 80 years; similar findings were reported by Goyal et al. [6]. Who conducted a study in India and found most breast lump patients belong to 15–70 years of age. Age is the strongest risk factor for breast cancer. It is proportional to risk; the older the age, the higher the risk, but chances are increased markedly in postmenopausal years, that is, age >50 years [7].

Cytological diagnoses of all cases were studied and analyzed; the most common diagnosis based on cytological features is suspicious for malignant lesion (12 cases, i.e. 26%), followed by the malignant lesion (9 cases, i.e. 19.5%), Proliferative breast lesion (8 cases, i.e. 17.3%), Fibrocystic breast lesion (8 cases, i.e. 17.3%), Inflammatory lesions (6 cases, i.e. 13%), Fibroadenoma (2 cases, i.e. 4.3%) and Benign Phyllodes tumour (1 case, i.e. 2.1%). Bukhari et al. [8] also reported 31% malignant cases in their study, which agrees with our findings. In Nigeria, similar findings were found by Egwuonwu et al. [9] and Mayun et al. [10]. They reported 47.3% and 40% malignant lesions in their study patients, respectively. Ahmed et al. [11] reported 30.5% cases of malignancy in their study conducted in Sudan. These study results are also consistent with Siddiqui et al. [12] and Lakhana and Khalid [13]. They found breast cancer as the most commonly encountered lesion. Previous studies reported fibroadenoma as the commonest finding in breast lesions, followed by breast cancer and fibrocystic disease [14]. A comparison of the cytomorphological conclusions of this study to various literature reports is given in Table 1.5. These differences might be attributed to geographical, socioeconomic, cultural, and religious variations.

Conclusion

Fine needle aspiration cytology is a simple, cost-effective, highly accurate, quick and relatively less painful procedure that can be used to diagnose breast lumps. In addition, FNAC can provide information about the type of lesion, which helps in planning the treatment modalities and further management at an early stage. Thus helping the clinician to plan early management and reduce patient complications.
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Conflict of Interest
There are no conflicts of interest to declare by any of the authors of this study.

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