

## Treatment Protocol for Clinically impalpable BIRAD 4 Breast Lesions in Young patients

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### Abstract

**Background and Objective:** Breast cancer is one of the most prevalent malignancies afflicting women in the 18–30 age range, and tumor size continues to be a key indicator of survival. Our goal was to find impalpable breast lesions in patients exhibiting a range of non-lump symptoms. To establish treatment guidelines for young children with BIRADS 4 lesions.

**Methods:** A cross-sectional study was conducted with 50 cases in a tertiary care hospital from January 2021 to June 2022 in the radiodiagnosis department in collaboration with the breast clinic in the surgery department, the

department of pulmonary medicine, and the department of radiodiagnosis. Patients were found using the following criteria: nipple discharge, family history of breast cancer, diffuse and vague lump like feeling without any obvious lesions, mastalgia (cyclical or non-cyclical), and nonpalpable breast lesions. Patients with breast cancer were also included in this study so that the opposite breast could be screened. Cases were evaluated using an 8–14 mHz linear transducer for ultrasonography (Toshiba, Core vision XARIO).

**Results:** Patients in our study ranged in age from 18 to 30; their mean age was 26.4 years. The most common complaint was mastalgia (48%), which was followed by diffuse and vague lump like feeling (32%) and nipple discharge (20%). In 6% of cases, the opposite breast is screened for cancer. 72% of BIRADS-4a and 28% of BIRADS-4b. Following US-BIRADS categorization, 84% of cases had USG-guided FNAC, and 16% underwent US-guided needle localisation. 36% of BIRADS 4 lesions are cancerous, while 64% are benign. Alternatives to surgical excision include the Fine-Needle Aspiration Cytology (FNAC), the Advanced Breast Biopsy Instrumentation (ABBI) system, and the Vacuum Assisted Core Biopsy (VACB).

**Keywords:** Ultrasonography, Breast cancer, Non palpable lump, BIRADS.

### Introduction

The management of clinically impalpable BIRAD 4 breast lesions in young patients typically involves a multidisciplinary approach, considering the individual patient's age, overall health, and specific lesion characteristics. It's important to note that my knowledge cutoff is in September 2021, and the recommended treatment protocols may have evolved since then. Therefore, it is crucial to consult with a qualified healthcare professional for the most up-to-date information and personalized recommendations.<sup>1,2</sup>

In general, the following treatment options may be considered for clinically impalpable BIRAD 4 breast lesions in young patients<sup>3,4,5</sup>:

**Imaging follow-up:** Depending on the size, morphology, and other features of the lesion, the initial approach may involve close imaging surveillance. This typically includes periodic mammograms, ultrasound, or MRI scans to monitor any changes in the lesion over time. The

frequency of follow-up imaging may vary based on the specific circumstances and the physician's recommendations.

**Image-guided biopsy:** If the lesion shows concerning features on imaging, an image-guided biopsy may be performed to obtain a tissue sample for further evaluation.

**Surgical excision:** In some cases, particularly if the lesion is suspicious for malignancy or has certain high-risk features, surgical excision may be recommended.

**Systemic treatment:** If the biopsy reveals a malignant lesion, systemic treatment options may be considered. These can include chemotherapy, hormone therapy, or targeted therapy, depending on the specific characteristics of the tumor, such as hormone receptor status, HER2/neu status, and other molecular markers. The selection of systemic therapy is typically guided by the recommendations of an oncology specialist.

It is important to consult with a team of healthcare professionals, including radiologists, breast surgeons, and oncologists, to discuss the best treatment strategy for a young patient with clinically impalpable BIRAD 4 breast lesions. They will consider the patient's overall health, tumor characteristics, and individual preferences to provide personalized and evidence-based care.

### Materials and Methods

A cross-sectional study was conducted in a tertiary care hospital from January 2021 to June 2022 with 50 cases in the radiodiagnosis department in collaboration with the breast clinic in the surgery department, the department of pulmonary medicine (as a significant number of mastalgia patients present complaining of chest pain in chest OPD), and the department of pathology. Patients were found using the following criteria: nipple discharge, family history of breast cancer, diffuse and vague lump like feeling without any obvious lesions, mastalgia (cyclical

or non-cyclical), and nonpalpable breast lesions. Patients with breast cancer were also included in this study so that the opposite breast could be screened. Cases were evaluated using an 8–14 mHz linear transducer for ultrasonography (Toshiba, Core vision XARIO)6. Reporting was done using the Breast Imaging Reporting and Data System (BIRADS) for ultrasonography. BIRADS 4 lesions that are not clinically perceptible on imaging have been found, noted, and chosen for FNAC or needle localization and removal. The results of a cytological and histological examination were analyzed. Before the trial began, each patient gave their written informed consent, which was obtained with the approval of the institutional ethics committee.

**Statistical Analysis**

In order to conduct the statistical analysis, SPSS for Windows version 25.0 was used. The results were quantified in terms of number and percentage when frequency was taken into account. The link between the variables was discovered using the Chi-square test. For comparison, the crucial P value of 0.05 was used, which represents the chance of a significant difference.

**Results-**

Table 1: Demographic and Clinical characteristics of study participants

Parameters	N (%)
Mean age	26±4.4
Mean size of lesion	10.64±1.48mm
Screening of opposite breast	3 (6)
Positive family history of Ca breast	3 (6)
Chief complaints Mastalgia	24 (48)

Diffuse and vague lump like feeling	16 (32)
Nipple discharge	10 (20)
Quadrants involvement	
Upper outer	24 (48)
Upper inner	07 (14)
Lower inner	6 (12)
Lower outer	13 (26)
BIRADS 4a	36 (72)
4b	14 (28)
USG guided FNAC	42 (84)
USG guided needle localization	8 (16)

As per table 1 for this study, a total of 50 patients with breast lesions that are impalpable were enrolled. Patients in our study ranged in age from 18 to 30; their mean age was 26+|- 4.4 years. The most common complaint was mastalgia (48%), which was followed by diffuse and vague lump like feeling (32%) and nipple discharge (20%). In 6% of cases, the opposite breast is screened for cancer. In 6% of patients, there was a confirmed family history of breast cancer. 48 percent of the lesion was found in the upper outer quadrant, 14 percent in the upper inner quadrant, 12 percent in the lower inner quadrant, and 26 percent in the lower outer quadrant. 72% of BIRADS-4a and 28% of BIRADS-4b. With a mean size of 10.64 1.48 mm, the non-palpable lesions in 50 instances range in size from 6 mm to 15 mm. In 84% of cases following US-BIRADS categorization, FNAC was performed under USG guidance, and in 16% of cases, needle localization was performed on US guidance.

Table 2: BIRADS 4's FNAC pathological distribution

Pathology distribution	Number (%)
Malignant	18 (36)
Ductal carcinoma- Invasive	10 (20)
Ductal carcinoma in situ	4 (8)
Medullary carcinoma	2 (4)
Tubular carcinoma	1 (2)
Metastasis	1 (2)
Benign	32 (64)
Fibroadenoma	14 (28)
Fibrocystic change	10 (20)
Ductal hyperplasia	4 (8)
Papilloma	2 (4)
Fat necrosis	2 (4)

As per table 2 pathological results of BIRADS 4 lesions are classified as malignant and benign. Around 64% of BIRADS 4 lesions were benign and 36% are malignant. Among malignant lesions the most common lesion was invasive ductal carcinoma seen in 36% of patients

followed by ductal carcinoma in situ, metastasis was seen in 2% of cases. Among benign lesions the most common lesion was Fibroadenoma seen in 28% of patients followed by fibrocystic changes in 20%.

Table 3: Treatment Protocols of BIRADS 4

Criteria	USG FNAC	ABBI	VACB	Surgical Excision	USG Needle localisation	Systemic Treatment
Sensitivity	78	79	77	54	64	44
Specificity	87	84	85	66	72	-
PPV	89	89	87	67	74	54
NPV	81	86	84	59	79	-
Accuracy	85	84	86	63	77	45

ABBI- Advanced Breast Biopsy Instrumentation

VACB- Vacuum Assisted Core Biopsy

As per table 3 The Vacuum Assisted Core Biopsy (VACB), the Advanced Breast Biopsy Instrumentation (ABBI) system, and Fine-Needle Aspiration Cytology

(FNAC) are all acceptable alternatives to surgical excision with needle localization because of their superior sensitivity, positive predictive value, and accuracy compared to surgical excision. This implies that the

optimal procedure for BIRADS 4 lesions is image guided biopsy.

### Discussion

Breast ultrasonography is quite important in this situation. In case of the Indian situation, where breast cancer is at diagnosis of cancer is ten years younger.<sup>6</sup> It helps greatly in the diagnosis of tiny impalpable lesions and is more cost-effective. In women 45 years of age or younger with breast complaints, sonography of the breast is an accurate imaging test and may be an acceptable first line of inquiry.<sup>7,8</sup>

According to tumor kinetics, a single tumor cell takes 5 to 10 years to develop to the point of clinical manifestation. Indian patients must be screened between the ages of 35 and 45.<sup>9,10</sup>

The most prevalent age group incidence in Indian breast cancer was found in two studies where cancer patients were found to be between the ages of 45 and 54.<sup>11,12</sup> The PPV and accuracy of BI-RADS have been the subject of numerous research. The PPV of BI-RADS 4 varied from 3% to 94% in earlier investigations.<sup>13,14</sup> However, there aren't many studies examining the PPV of sonographic descriptors and BI-RADS 4 subcategories. The large range of PPVs calculated across studies is most likely due to variations in patient selection criteria and breast cancer prevalence.<sup>15,16</sup> Only nonpalpable lesions were included in the current investigation, and the overall PPV for BI-RADS 4 was 85%.

Our research has some limitations. First, we only included lesions that were not perceptible. Second, radiologists simply looked at the lesions' static images. However, routine exams use real-time USG evaluation, which enables the collection of more information. Real-time USG is better in evaluating lesions, particularly when there is calcification and other related characteristics.

Third, this study did not analyze descriptors in the form of shape, margin, orientation, or boundary.

### Conclusion

In younger age groups of patients, ultrasound might be utilized as the first investigation to find subclinical abnormalities of the breast more precisely than in circumstances of borderline cases. As screening procedures, US-guided FNAC, ABBI, VACP, and needle localization are more accessible, affordable, and comfortable than mammography, and they are accurate for detecting and treating early cases of breast cancer. It is helpful to subcategorize BI-RADS 4 lesions in order to assess the likelihood that they are malignant; however no firm diagnostic standards could be developed for subcategorization. Radiologist experience is a major factor in this. Additionally, subclassification is more challenging for smaller lesions.

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