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Original Research

Breast Stereotactic Excision Results

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ABSTRACT

Objective: Suspicious microcalcifications detected in mammographic examinations may appear as early signs of breast malignancies. Microcalcifications that appear only on mammography and are not accompanied by any ultrasonographic mass should be excised after marking with a stereotactic wire, and pathological examination should be performed. In this study, we aimed to analyze the stereotactic biopsy results and share their findings.

Methods: Lesions with suspicious microcalcifications on mammography (Figure 1) and in which no mass image was detected in the ultrasonographic response were evaluated retrospectively between January 2016 and December 2022. Excision was applied to the patients after marking with mammography and stereotactic wire. Removal of the suspicious microcalcification area was confirmed by radiography of the specimen in all patients. Pathological examination results of the patients, whether re-excision was made, tumor diameter in cases with malignancy, and follow-up periods of the patients were evaluated.

Results: A total of 54 patients who underwent excision due to microcalcification were evaluated in the study. Malignancy was detected in 15 (27.7%) patients. The most common ductal carcinoma in situ (DCIS) was detected. Re-excision was performed in 4 (26.6%) patients, and mastectomy was performed in 2 (13.3%) patients with malignancy. The median tumor diameter of malignant lesions was 9 mm. The mean follow-up period of the patients was found to be 42.46+16.44 months.

Conclusion: Suspicious microcalcification areas detected in mammographic examinations, lack of ultrasonographic visibility, and biopsy with another minimally invasive method should be excised after marking with a stereotactic wire. This procedure is an effective method that allows early diagnosis of malignancies.

Keywords: Malignancy, mammography, microcalcification, stereotactic excision

INTRODUCTION

The widespread use of mammography scans facilitates the detection of nonpalpable breast lesions and early diagnosis by biopsy. Microcalcifications are frequently seen among mammography findings, and they can be detected in benign as well as malignant cases [1,2]. Excisions performed with wire localization in suspicious breast pathologies accompanied by microcalcifications, which cannot be detected ultrasonographically, contribute to diagnosing malignant cases at an early stage. The 5-year survival of these cases, which are diagnosed at an early stage, can reach 100% [3]. Ductal carcinoma in situ (DCIS) is usually diagnosed by mammography, and it can create an appearance characterized by structural distortion and asymmetrical appearance in the breast, especially

microcalcifications [2,4,5]. There has been reported a 25-30% decrease in breast cancer mortality in women aged 50 to 74 years in Europe with mammography screening programs [6].

In this study, the results of excisional biopsy performed with stereotactic wire localization in breast pathologies with suspicious microcalcifications on mammography but in which no mass image was detected in the ultrasonographic response were analyzed retrospectively.

MATERIALS AND METHODS

This study was designed retrospectively, and ethical approval was obtained (2023-222194649). Female patients who underwent mammography-guided stereotactic marking and excisional biopsy on the same day between January 2016 and December 2022 were included in the study. None of these patients had been previously treated for diagnostic purposes. There is no ultrasonographic equivalent of these lesions. Removal of the microcalcification area was confirmed by radiography of the specimen in all patients (Figure 2). The excision area was marked with clips due to the possibility of radiotherapy necessity. After excision, an x-ray examination of the specimen should be done, and then the specimen should be sent for pathological examination. The removed nonpalpable microcalcification areas were checked with X-ray after the surgical procedure.

In all of these patients, it was determined that the lesions were Breast Imaging Reporting and Data System (BI-RADS) 4 and above and had no ultrasonographic counterparts. The age of the patients, which breast the lesion was in, whether the lesion was benign or malignant as a result of histopathological examination, the diameter of the tumor in cases with malignancy, the follow-up times, and whether re-excision was performed were recorded.

In the preoperative period, 1 gram of cefazolin was administered intravascularly to all patients just before the operation. No patient developed postoperative wound infection, pulmonary complications, or seroma. DCIS patients diagnosed with ultrasonographic trucut biopsy but not palpable on examination and excised by stereotactic biopsy were not included in the study.

Main Points;

- Excision and histopathological examination of suspicious microcalcification areas detected on mammography but not corresponding with ultrasonography are recommended due to their malignant potential.

Statistical Analysis

For statistical analysis, SPSS for Windows version 22.0 package software was used. Descriptive statistics include mean and standard deviation for numerical variables and number and percentage values for categorical variables. The Pearson correlation coefficient was used to test relations between numeric variables.

RESULTS

A total of 54 patients were included in this study. The mean age of the patients was 51.77+7.96 years. It was determined that 25 (46.2%) of the lesions were in the right breast, and 29 (53.7%) were in the left breast. It was determined that specimen radiographs confirmed microcalcification areas in all patients. While benign lesions were detected in 39 (72.2%) patients, malignancy was detected in 15 (27.7%) patients. Only DCIS was detected in 11 (73.3%) malignant cases, invasive breast carcinoma, and DCIS coexistence in 2 (13.3%), and only invasive breast cancer was detected in 2 of them. It was determined that re-excision was performed in 4 (26.6%) of the patients with malignancy due to the proximity of the surgical margin or the continuation of the malignant lesion at the surgical margin. It was determined that all patients who underwent this re-excision were only cases with DCIS. It was determined that 2 of these four patients underwent re-excision because of the presence of DCIS at the surgical margin, and 2 of them due to the presence of DCIS close to the surgical margin.

In 2 of the patients who underwent re-excision, reconstruction was performed with an intraglandular flap. No deformity developed in these patients after radiotherapy (Figure 3).

Subcutaneous mastectomy was performed, and a prosthesis was placed in 2 patients (13.3%) due to extensive DCIS. DCIS could not be detected in the resection specimens of 4 patients who underwent re-excision. In 2 patients who underwent a mastectomy, residual DCIS was seen in several foci around the pouch. The median of malignant lesions was 9 mm (5-45 mm). The mean follow-up period of the patients was 42.46+16.44 months (Table 1).

Figure 1. Wire-marked view of the microcalcification area.

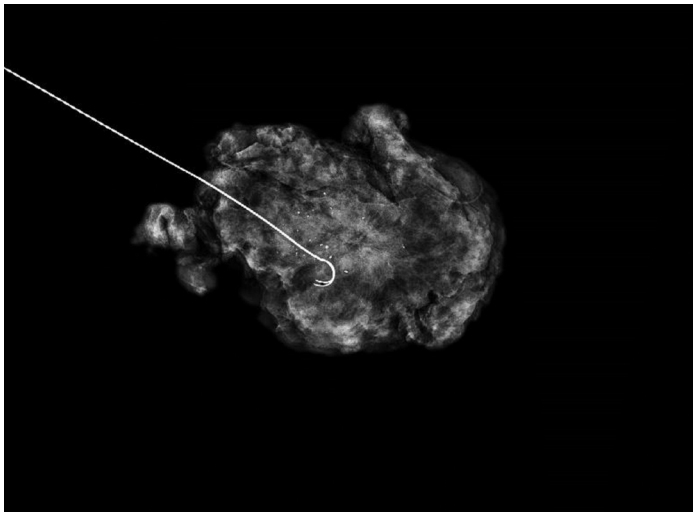

Figure 2. Graph of the specimen. Removed area of microcalcification.

Table 1. Malignant lesion distribution

Histopathology	n	%	Re-excision(n)	Mastectomy(n)
DCIS	11	73.3	4	2
DCIS+Invasive tumor	2	13.3	0	0
Invasive tumor	2	13.3	0	0

Figure 3. Post-RT image of a patient with a diagnosis of pure dcis who underwent reexcision + intraglandular flap due to proximity to the surgical margin.

Patients with invasive carcinoma were reoperated, and sentinel lymph node biopsy was performed. In one of these patients, axillary dissection was performed after the sentinel lymph node biopsy was positive. Of 54 patients, 25 were defined as BIRADS 4A, 8 as BIRADS 4B, 7 as BIRADS 4C, one as BIRADS 5, and 13 as BIRADS 4, and its subgroups were not specified. DCIS was detected in 3 (12%) of 25 patients with BIRADS 4A. Among eight patients with BIRADS 4B, DCIS was seen in 3 patients, invasive ductal carcinoma in one patient, tubular carcinoma+DCIS in one patient, and the malignancy rate was 62.5% in the BIRADS 4B category. DCIS was detected in 5 (71.4%) 7 patients with BIRADS 4C. Invasive ductal carcinoma was seen in a patient with BIRADS 5. Invasive ductal carcinoma+DCIS was detected in one (7.6%) of 13 patients specified only as BIRADS 4 without identifying the subgroup. Malignancy was detected in 15 (27.7%) of these 54 patients. Considering the BIRADS categories of these 15 patients, it was seen that 20% of BIRADS 4A, 33.3% of BIRADS 4B, 33.3% of BIRADS 4C, 6.6% of BIRADS 5, and 1 patient (6.6%) were in the BIRADS 4 category without a subgroup.

DISCUSSION

In our study, no recurrence was observed, which is the mean follow-up period of 42.46+16.44 months. While breast pathologies manifest as a palpable mass in patients who do not have routine follow-ups in the late period, they can be detected by radiological examinations in the early stages in patients with periodic follow-ups. With the widespread use of mammographic

tests in women, the advantage of early diagnosis of breast lesions and initiation of treatment in the early period has been achieved. The BIRADS classification defines the level of suspicion of mammographic lesions [7]. The results of the BIRADS classification of lesions affect the clinician's decision about the patient, especially in nonpalpable lesions. In this study, patients who did not undergo any diagnostic intervention before were diagnosed with BIRADS 4 and above nonpalpable lesion in their mammography for the first time and underwent excisional biopsy after stereotactic marking were included in the group.

While calcification is detected in 75% of breast cancers in histopathological examinations, calcification can be seen in 35-40% of them radiologically [8]. Excision of calcifications with radiological suspicion of malignancy is an important treatment modality in the early diagnosis of malignancies. In DCIS cases, which are usually accompanied by pathological microcalcifications, a clean surgical margin, and a good cosmetic result are achieved by excision of microcalcification areas after stereotactic wire marking in the early period [9, 10]. Mortality and morbidity are significantly reduced in these cases removed with a clean surgical margin. Nonpalpable breast lesions can be removed at 90-100% with the excision method after marking with a stereotactic wire [11]. After excision, an x-ray examination of the specimen should be done, and then the specimen should be sent for pathological examination. In this study, the removed nonpalpable microcalcification areas were checked with X-ray after the surgical procedure, and it was confirmed that the microcalcification areas were removed. During the marking process with the stereotactic wire, wire breakage, migration, and infection can be seen. A single prophylactic dose of 1 gram of cefazolin sodium was administered to all patients. No surgical site infection was observed in the patients. These patients did not observe complications such as migration or breakage of the wire inserted with stereotactic marking. The short duration of the surgical procedure after stereotactic marking may also be effective in this.

This study determined that four patients with DCIS underwent re-excision (30.7%), and 2 patients underwent mastectomy (15.3%). It was observed that the rate of re-excision was consistent with the literature, but the rate of mastectomy was lower than the literature [12]. Langhans et al. reported that they found a 3-fold higher re-operation rate in DCIS than in invasive breast cancers [12]. They emphasized that this was because the borders of DCIS were not well defined and could be widespread in the breast. In this study, re-excision was performed in patients with close proximity to the surgical margin and the presence of DCIS at the surgical margin. Still, DCIS could not be detected in the re-excision specimens. In 2 patients who underwent mastectomy for widespread DCIS, DCIS was seen in several foci around the pouch. In surgical margin positivity, mastectomy can be planned by considering the extent of the disease, high grade, and presence of comedo necrosis. In one of the patients who were diagnosed with invasive breast cancer and had sentinel lymph node biopsy, the sentinel lymph node was positive, indicating the importance of studying the sentinel lymph node in invasive breast cancers.

Most DCIS cases are detected due to mammographic examinations, and the standard treatment is surgical procedures [13]. Wapnir et al. reported that local recurrence rates in DCIS cases who underwent breast-conserving surgery were as high as 25%-35% in 13-17 years of follow-up, and half of these recurrences were seen as invasive cancer and expressed by. The same study demonstrates the importance of long-term follow-up of DCIS cases in terms of local recurrence after surgery [14]. In our study, no recurrence was observed, which is the mean follow-up period of 42.46+16.44 months. The mean follow-up period in malignant patients was found to be 42.73+17.58 months. DCIS, which is seen in approximately one in 33 women throughout life, peaks around the age of 50, and its incidence decreases rapidly after the 7th decade [15].

Microcalcifications are generally one of the earliest signs of breast cancer that mammography can detect. Malignant microcalcifications have a clustered pleomorphic appearance and vary in size and density. They can be segmental, linear, and branched structures and show interval changes [1]. Accurate interpretation of microcalcifications observed in mammography is critical. In this way, appropriate action plans such as advanced diagnostic tests and biopsies will be determined. By detecting microcalcifications at an early stage, the chance of early diagnosis of breast cancer will be achieved. Stereotactic excision is a surgical procedure that enables the effective removal of breast microcalcifications. Extensive resection to obtain a clean surgical margin may result in the loss of intact breast tissue and adverse cosmetic results.

CONCLUSIONS

In suspicious microcalcifications that only show mammographic findings, a biopsy can be performed by excision method after

marking with stereotactic wire. Excision of the pathological microcalcification area should be confirmed by x-ray after the surgical procedure. It should be remembered that re-excision may be required due to histopathological examination, especially in DCIS cases. Microcalcifications observed on mammography should be carefully examined because of their importance in early breast cancer diagnosis.

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