

Our sentinel lymph node experience in patients diagnosed with DCIS and microinvasive breast carcinoma

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Abstract

Aim: Along with the increased availability of radiologic imaging methods, early identification of tumor tissue, and patient surveillance programs; ductal carcinoma in situ (DCIS) and microinvasive DCIS became more commonly identified in the tru-cut biopsy specimens and resected samples of patients. Pathological examinations of the excision materials from these patients reveal invasive tumors, microinvasions or DCIS alone. Recently, it has become debatable whether to perform a sentinel lymph node biopsy (SLNB) in patients diagnosed with DCIS or microinvasive DCIS. In this present study, we evaluated the diagnosis made by examining the excision material, any presence of lymph node metastases, and the relationship of hormone profile to the presence of metastases in the patients diagnosed with DCIS or microinvasive DCIS by the examination of tru-cut biopsy specimens. Based on our study results, we discussed the requirement for SLNB in patients with a tru-cut diagnosis of DCIS or microinvasive DCIS.

Materials and Methods: The study included 172 patients, who underwent surgical excision and SLNB after receiving a tru-cut biopsy diagnosis of DCIS and microinvasive DCIS in our hospital from the year 2010 to 2018.

Results: Tru-cut biopsy diagnoses were DCIS and microinvasive DCIS in 69.8% (120 patients) and 30.2% (52 patients) respectively. SLNB metastases were identified in 35.8% (n=43) of the DCIS positive patients and 44.2% (n=23) in the microinvasive DCIS positive patients. The diagnosis of invasive ductal carcinoma after mastectomy was made at a rate of 90.0% (n=108) among the DCIS positive patients and 92.3% (n=48) among the microinvasive DCIS positive patients.

Conclusion: SLNB metastases were found in 35.8% (n=43) and 44.2% (n=23) of the DCIS positive patients and microinvasive DCIS positive patients, respectively. We conclude that SLNB should be favorably proper to perform in the patients with tru-cut diagnoses of DCIS and microinvasive DCIS because a high rate of SLNB metastases was detected in our DCIS and microinvasive DCIS patients and a high rate of invasive ductal carcinoma diagnosis was made after examining the excision material of these patients.

Keywords: Breast cancer; DCIS; microinvasive breast carcinoma; sentinel lymph node metastasis

INTRODUCTION

Breast cancer; which is an important health care issue in our country, is curable to a great extent upon early diagnosis, ensuring long term disease-free survival. As mammography and breast ultrasound imaging have become more common, the diagnosis of breast cancer is made at the earlier stages of the disease compared to the past (1). As the SLNB method reflects the condition of the axilla with a higher precision rate, it is currently performed in the patients with invasive breast carcinoma, who were diagnosed via the examination of the tru-cut biopsy material (2). As it is well known, a sentinel lymph node is the initially invaded one by the cancer cells. If no metastases are identified in this lymph node, the risk of detecting metastases in the other lymph nodes is 1-2%. Unnecessary axillary dissections and their associated morbidity are avoided by performing the SLNB technique

in patients. However; performing SLNB is debatable in patients with a tru-cut biopsy diagnosis of DCIS and microinvasive DCIS. The recent American Society of Clinical Oncology (ASCO) guideline does not recommend SLNB for the microinvasive DCIS patients, who will undergo a conservative surgery; whereas, it recommends SLNB only for the patients, who were scheduled to undergo a total mastectomy (3).

DCIS describes the neoplastic proliferation of epithelial cells limited to the basal membrane in the ductal lobular system of the breast tissue (Figure 1,2). The recent World Health Organization classification categorizes DCIS into 3 as low, moderate, and high grades, based on the characteristics of cell nuclei. A microinvasive carcinoma focus is described as a 0.1 cm-size invasion at largest around the high-grade DCIS regions (Figure 3). The cells in the microinvasive foci typically share similar cytological

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features with the DCIS cells. This single type of cell invasion at a microinvasive focus can be observed as small clusters of solid cells or glandular structures. Clinical, pathological, and molecular research data have demonstrated that DCIS is a precursor of invasive breast cancer albeit not necessarily (4). Detailed studies about the correlation between the radiological and pathological findings have shown that DCIS is usually limited to only one segment or a ductal-lobular system; however, the included segment should be extensive and it may contain skipped regions of low nuclear-grade. Tumor cells can occasionally be identified in the axillary lymph nodes of DCIS patients due to either a failure of detecting some invasive carcinoma foci in the breast or the mechanical metastases of epithelial cells of DCIS after biopsy (4). It is considered that in situ cancers only rarely deliver neoplastic cells into the circulation or they quite occasionally metastasize to the lymphatic system. On the contrary, some studies in the literature report DCIS presenting with the involvement of axillary lymph nodes at various rates, complementary to the observation of high rates of infiltration before the introduction of mammography (5-10). The involvement of lymph nodes in patients with DCIS may develop resulting from a failure to identify microscopic and invasive foci (occult microinvasions) in the pathological examination possibly due to technical limitations, which limit the proper assessment of the specimen (5-10).

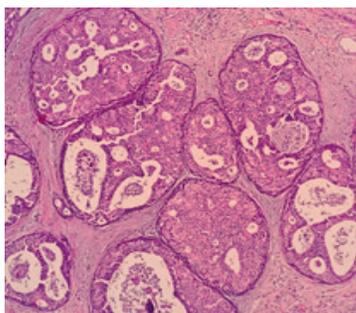


Figure 1. Ductal carcinoma in situ (H&E 100X)

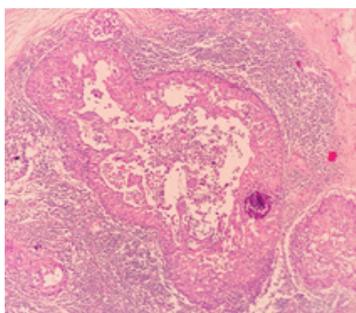


Figure 2. Ductal carcinoma in situ with intraaciner calcification (H&E 100X)

In this study; we examined our experiences with SLNB in these patients, considering the debate over the pathogenesis and the ways of management in DCIS and microinvasive carcinoma. Furthermore, we investigated the relationship of metastases found in SLNB to the immunohistochemical markers; estrogen, progesterone, and Ki-67.

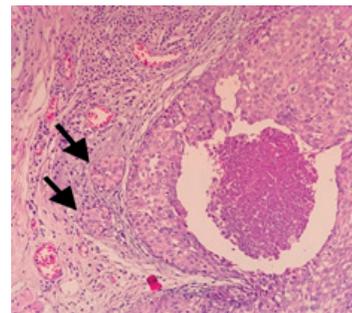


Figure 3. Microinvasive carcinoma (H&E 200X)

MATERIALS and METHODS

A total of 172 patients; who received a tru-cut biopsy diagnosis of DCIS and microinvasive DCIS and who underwent surgical excision and SLNB in our hospital from the year 2010 to 2018, were included in the study. We examined the results of SLNB and their relationship with estrogen (ER), progesterone (PR), and Ki-67 as the immunohistochemical markers.

Statistical Analysis

The statistical analyses of the study were performed, using the SPSS 22.0 program. When the data conformed to the requirements, they were described in mean, standard deviation, frequencies, and ratios. Two different groups were compared with the Student t-test. The distribution of the data was compared with the chi-square test, Yates corrected chi-square test, and the Fisher's Exact test. The results of the comparisons were considered to be significant at p-values of <0.05.

RESULTS

The examination of the tru-cut biopsy material revealed the diagnoses of DCIS and microinvasive DCIS in 69.8% (120 patients) and 30.2% (52 patients) of the patients, respectively. All of the patients included in the study were females with a mean age of 53 ± 13 years. SLNB was performed in all study patients, revealing metastases in 38.4% (n=66) of the patients.

The pathological examination of the excision material of the patients with a tru-cut biopsy diagnosis of DCIS revealed invasive ductal carcinoma in 108 (90%) patients, DCIS in 11 (9.2%) patients, and MIC in one patient. Among the patients with a tru-cut biopsy diagnosis of DCIS; invasive ductal carcinoma and microinvasive DCIS were found out to be the diagnoses in the excision material in 48 (92.3%) and 4 (7.7%) patients, respectively.

The distribution of the findings after SLNB and mastectomy has been presented in Table 1 by the positivity of DCIS and microinvasive DCIS in tru-cut biopsies. The table shows that SLNB revealed metastases in 35.8% (n=43) of the DCIS positive patients and 44.2% (n=23) of the microinvasive DCIS positive patients. After the mastectomy, the diagnoses were reported as IDC in 90.0% (n=108) of the DCIS positive patients and 92.3% (n=48) of the microinvasive DCIS positive patients. The reported findings after mastectomy were similar to those

of the tru-cut biopsies in 9.2% (n=11) of the DCIS positive patients and 7.7% (n=4) of the microinvasive DCIS positive patients.

Table 1. Distribution of the findings in SLNB and mastectomy by the positivity of DCIS and microinvasive DCIS in tru-cut biopsies (n=172)

Variables	DCIS (+) (n=120)		Microinvasive DCIS (+) (n=52)	
	Number	Percent*	Number	Percent*
Metastasis (+) in SLNB	43	35.8	23	44.2
Mastectomy Result				
IDC	108	90.0	48	92.3
MIC	1	0.8	4	7.7
DCIS	11	9.2	0	0

DCIS: Ductal carcinoma in situ, SLNB: Sentinel lymph node biopsy, IDC: Intraductal carcinoma, MIC: Microinvasive carcinoma

The comparison of SLNB positivity for metastasis by ER, PR, and Ki-67 findings of the patients has been presented in Table 2. No statistically significant differences were observed in the number of SLNB positive metastasis patients by a positive result with ER and PR or a low or high Ki-67 proliferation index.

Table 2. Comparison of SLNB positivity for metastasis by the levels of ER, PR, Ki-67 (n=172)

Variables	METASTASIS IN SLNB				X ²	p**
	Absent		Present			
	n	%*	n	%*		
ER						
Positive	84	60.4	55	39.6	0.4	0.51
Negative	22	66.7	11	33.3		
PR						
Positive	64	59.8	43	40.2	0.4	0.53
Negative	42	64.6	23	35.4		
Ki-67						
Low	63	62.4	38	37.6	0.1	0.81
High	43	60.6	28	39.4		

SLNB: Sentinel lymph node biopsy, ER: estrogen, PR: progesterone

DISCUSSION

It is debatable whether to perform an SLNB when DCIS or microinvasive DCIS is identified in tru-cut biopsy material. The advantages of SLNB include revealing the invasive disease in the lumpectomy and mastectomy sample of the mass, enabling to make an axillary staging of the disease, and allowing for the identification of the patients; who will benefit from systemic adjuvant therapy. A SLNB diagnosis of metastasis occurs at a low frequency in patients with a postoperative pathological diagnosis of DCIS and this diagnosis rarely leads to changes in the treatment regimen; however, our study patients with a tru-cut biopsy diagnosis of DCIS were diagnosed with invasive carcinoma at a higher rate compared to the reports in the literature (11-12). For this reason, in our study, patients

with SLNB showed a higher rate of metastasis than the literature.

Even though SLNB is a mildly invasive procedure, its disadvantages include the potential to develop lymphedema in the arm, impairments in the shoulder functions, pain, decreased muscle strength, and high costs and time-consuming characteristics of the procedure both for the patients and physicians (13-15).

In a recent study on microinvasive DCIS patients, the authors concluded at the end of the study that avoiding extra surgical procedures would be more appropriate in the management of this type of patients (16). Studies conducted about this issue have not reached a consensus yet on the metastasis rates in DCIS or microinvasive DCIS. While some studies report low rates of metastases in SLNB, others report high rates similar to the results of our study (16-20). Another important point about SLNB in these patients is that SLNB will not be possible to perform technically anymore once it is not performed during the mastectomy procedure. Furthermore, a diagnosis of invasive carcinoma in the mastectomy material will require axillary lymph node dissection because performing SLNB will not be an option at this point anymore. Therefore, there is a need for standardization for these conditions.

In the patients with invasive DCIS, we examined the relationship of the levels of immunohistochemical markers ER, PR, and Ki-67 proliferation index with the identified metastases in SLNB in our study. Although ER and PR are conventionally known as poor prognostic parameters of breast cancers; these receptors are the most robust factors to predict the treatment response in endocrinological treatments (21).

CONCLUSION

In our study, it was observed that a high number of patients with a tru-cut biopsy diagnosis of DCIS or microinvasive DCIS received the diagnosis of an invasive tumor after the postoperative pathological examination. For this reason, in our study, patients with SLNB showed a higher rate of metastasis than the literature. Furthermore, a significant number of patients had a metastasis in the SLNB. Therefore, SLNB appears to be a suitable approach to perform in patients with a tru-cut biopsy diagnosis of DCIS and microinvasive DCIS.

Competing Interests: The authors declare that they have no competing interest.

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Ethical Approval: Medical Specialization and Education Board report and approval was obtained from Health Sciences University Konya Training and Research Hospital (Decision number: 48929119/774).

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