

Treatment outcomes of 213 breast cancer patients after sentinel lymph node biopsy – single center experience

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Abstract

Introduction: The article presents the results of the management of patients with breast cancer treated in the Holycross Cancer Centre during the period 2008–2012. In all the patients, invasive breast cancer clinically node negative was diagnosed and multidisciplinary treatment with sentinel node biopsy was applied.

Material and methods: The study included a group of 213 women who had previously undergone surgery, breast-conserving and/or mastectomy. In 206 patients, the sentinel lymph node was identified. Due to metastasis to the sentinel lymph node in 32 patients axillary lymphadenectomy was performed and additionally in 7 patients due to the failure of sentinel lymph node identification. Due to the higher tumor burden 10 patients were subjected to more extensive surgical treatment – mastectomy. After surgical treatment the patients were qualified for adjuvant therapy. The mean time of observation of patients after treatment was 61 months.

Results: Relapse of the disease was noted in 7 patients, 5 patients died (4 patients due to the spread of the disease, 1 due to the second carcinoma – gastric cancer). Recurrence in the axillary region was observed in 1 patient, metastases to the lungs – in 1 patient, metastases to the liver – in 1, metastases to the ovary – in 1, and in 3 patients metastases to the bones. Based on analysis of the Kaplan-Meier estimator of the survival function, it was found that the probability of survival for 5 years without symptoms of the disease was 96.2%, whereas the probability of overall 5-year survival was 96.4%.

Conclusions: The outcome of patients after sentinel lymph node biopsy was excellent. In breast cancer patients sentinel lymph node biopsy is safe and effective.

Key words: breast cancer, outcome, sentinel lymph node biopsy.

Introduction

Within recent years a paradigm shift in the extent of axillary surgery in breast cancer patients has been observed, i.e. radical excision of three levels of axillary lymph nodes and parasternal nodes (Urban mastectomy, 1952), axillary lymph node dissection (Patey, Madden mastectomy), sentinel lymph node biopsy (Giuliano AE, 1991, 1994), omission of axil-

lary dissection in the case of macro- or micrometastases (ACOSOG American College of Surgeons Oncology Group Z0011 trial, year 2011, IBCSG 32-01 International Breast Cancer Study Group year 2013), and abandonment of nodal procedures in early breast cancer (SOUND study – Sentinel node vs. Observation after axillary Ultrasound, Gentilini, Veronesi U 2012-2017, INSEMA-Inter-group-Sentinel-Mamma). The introduction of sentinel node biopsy into surgical treatment replaced routine axillary dissection. At present, this procedure is commonly used in patients with early-stage breast cancer with clinically unchanged lymph nodes. Randomized studies showed that in case of the absence of metastases to the axillary lymph node, axillary dissection is not necessary, avoiding complications [1–12]. Despite progressive decline in the extent of lymph node surgery in recent years, survival rates in breast cancer patients have improved and locoregional recurrence remains very low. In the Holycross Cancer Center (HCC) the sentinel lymph node biopsy has been performed since 2007. The current study presents HCC experience and outcome of breast cancer patients who had undergone multidisciplinary treatment with the use of sentinel lymph node biopsy.

Material and methods

The analysis included 213 patients with invasive breast cancer of no special type, stage I and II who received multidisciplinary treatment with the use of sentinel lymph node biopsy in the Holycross Cancer Center, during the period 2008–2012. Mean age of patients was 60.5 ± 9.8 years (minimum = 32.9, maximum = 85.8, median = 61.3 years). The most frequently observed tumor diameter ranged between 10 and 20 mm. The most often diagnosed histologic type was invasive ductal carcinoma of no special type (87.3%; $n = 186$). All patients had grade 1 or 2 breast cancer. Table I presents the characteristics of patients. Lumpectomy with sentinel lymph node biopsy (SLNB) was performed in 202 patients, simple mastectomy with SLNB in 11 women. Due to more extensive disease 10 patients were subjected to the radicalization of surgical treatment – mastectomy. The number of sentinel lymph nodes identified and harvested ranged from 0 to 10, with a median of 2. After histopathologic examination, in 42 macrometastases were diagnosed, and in 2 micrometastases to the axillary lymph nodes. For this reason, in 32 patients axillary dissection was performed, while in the above-mentioned 10 patients, additionally mastectomy was performed. Only in 8 patients who had lymphadenectomy performed were metastases to further axillary lymph nodes found, whereas in 24 women no metastases were observed. In the group of

patients who had undergone radical mastectomy (10 patients), in 3 women metastases to further axillary lymph nodes were diagnosed. In 7 patients, due to the failure of sentinel lymph node mapping, axillary dissection (AD) was performed. Only in 1 patient in this group were metastases to lymph nodes found, whereas in 6 patients no metastases were observed. In none of the patients who had undergone surgery were no cancer cells found within the surgical margins. After completion of the surgical treatment, the patients were subjected to adjuvant therapy. The most frequent-

Table I. Characteristics of patients

Characteristics	Number	Percentage
Age [years]:		
≤ 45 years	17	8.0
46–55	43	20.2
56–65	75	35.2
> 65	78	36.6
Stage:		
T1a	5	2.5
T1b	39	18
T1c	104	49
T2	64	30
T3	1	0.5
Histopathologic type:		
Ductal carcinoma, no special type	186	87.5
Lobular carcinoma	16	7.5
Other	11	2
Estrogen receptor:		
Positive	190	89
Negative	23	11
Progesterone receptor:		
Positive	172	80
Negative	41	10
HER2 receptor:		
Positive	21	10
Negative	192	90
Grade (G):		
I	81	38
II	99	46
III	16	7
Unknown	17	7

Table II. Adjuvant therapy

Adjuvant therapy	Number	Percentage
Chemotherapy	2	0.9
Radiotherapy	3	1.4
Hormone therapy	5	2.3
Chemotherapy and radiotherapy	14	6.6
Chemotherapy and hormone therapy	5	2.4
Chemotherapy and immunotherapy	1	0.5
Radiotherapy and hormone therapy	113	53.1
Chemotherapy, radiotherapy, and hormone therapy	51	23.9
Chemotherapy, radiotherapy, and immunotherapy	7	3.3
Chemotherapy, radiotherapy, hormone therapy, and immunotherapy	12	5.6

ly applied chemotherapy regimens were: Adriamycin and cyclophosphamide (AC – 55 patients); in 36 patients, apart from the AC regimen, taxanes were additionally used; and in 1 patient the CMF regimen (cyclophosphamide, methotrexate, and 5-fluorouracil) was applied. Immunotherapy, in case of indications, was started after the completion of chemotherapy and continued during radiotherapy. Trastuzumab was administered to 20 patients (Table II). After treatment, the patients were subjected to check-up examinations which were performed and documented by the physicians from the Specialist Outpatient Departments at the Holycross Cancer Center.

Statistical analysis

Statistical analysis and graphic interpretation of the results was performed using the package MS Office 2010 with the license of the authors of this article, and the software Medical Bundle for Statistica 12, and SAS Enterprise Guide with the license from the HCC in Kielce. Basic statistics were calculated: arithmetic mean, standard deviation, median, and extreme values. The frequency of occurrence of individual categories of the variables analyzed was presented in absolute numbers and percentages. In the case of characteristics of the sentinel lymph nodes the median value and lower and upper quartiles were used. The probability of surviving without symptoms of the disease and the probability of overall survival were estimated using the Kaplan-Meier method.

Results

The mean follow-up of patients in our study was 61 months (min. 29, max. 89 months). During this time, recurrence of the disease was noted in 7 patients; 5 patients died (4 patients due to the spread of the disease, 1 due to a second carcinoma – gastric cancer) (Table III). The mean disease-free survival was 60.8 ± 24.7 months (minimum: 1 month, maximum: 89 months, median: 54 months). Based on the Kaplan-Meier estimator of the survival function it was found that the probability of 1-year disease-free survival was 99.5%, 24 months – 98.6%, 36 months – 97.2%, 60 and 120 months – 96.2% (Figure 1). The mean overall survival was 61.6 ± 23.8 months (minimum: 29 months, maximum: 89 months, median: 54 months). Based on the Kaplan-Meier estimator of the survival function it was confirmed that the probability of overall survival for 60 and 120 months was 96.4% (Figure 2). Based on individual medical observations, no complications were observed in patients who had undergone sentinel lymph node biopsy, nor such complications as edema of the upper extremity at the surgical site, mobility and sensation disorders which, to a considerable extent, affected the quality of life.

Discussion

In the last decade, there has been major debate on the value and extent of axillary surgery. The data from the NSABP B-32 study proved that overall survival and disease-free survival were the same in patients subjected to sentinel lymph node biopsy and those who had undergone axillary dissection [13]. Also, the number of recurrences in the axillary region occurred in a low percentage of patients treated with the use of this procedure [13, 14]. In the analyzed group, a recurrence in the axilla was observed in 1 patient. Even when excluding patients who had undergone axillary dissection or mastectomy (42 women), the percentage of recurrences in the axilla was 0.5%. In the study by Veronesi, after 10 years of follow-up a recurrence in the axillary region occurred in 0.8% of patients [15]. At present, this is a well-elaborated and commonly applied procedure, especially in patients with early breast cancer with clinically unchanged lymph nodes. After microscopic examination of sentinel lymph nodes in 162 (75%) patients no metastases were diagnosed, in 2 micrometastases were diagnosed, while in 42 (21%) patients macrometastases were diagnosed. Axillary dissection was performed in case of metastases in sentinel nodes. However, in only 11 out of 42 patients qualified for further surgical treatment, metastases were found in the axillary region. In only 2 patients, in whom AD was

Table III. Characteristics of patients with recurrence

No.	Age [years]	pT	pN	Tumor diameter (mm)	Type of cancer	G	ER	PR	HER	SLNB	AL	Treatment	Site	Status
1	73	pT1b	pN1	10	Ductal carcinoma NST	G2	2+ (80%)	Negative	Negative	Yes	Yes	BCT + RTH + HTH	Axillary region	Died
2	75	pT2	pN0	30	Ductal carcinoma NST	G2	3+ (80%)	3+ (90%)	Negative	Yes	No	BCT + CHTH + RTH + HTH	Lungs	Alive
3	69	pT1c	pN0	20	Ductal carcinoma NST	G1	1+ (50%)	Negative	Negative	Yes	No	BCT + RTH	Bones	Died
4	65	pT1b	pN0	8	Ductal carcinoma NST	G2	2+ (70%)	2+ (70%)	Positive	Yes	No	BCT + RTH + HTH	Bones	Died
5	56	pT1b	pN0	9	Lobular carcinoma	G1	3+ (70%)	3+ (70%)	Negative	Yes	No	BCT + RTH + HTH	Ovary	Alive
6	67	pT1c	pN1	18	Ductal carcinoma NST	G2	Negative	Negative	Negative	Yes	Yes	RM + CHTH + RTH + HTH	Bones and liver	Died
7	50	pT2	pN0	35	Ductal carcinoma NST	G1	2+ (70%)	2+ (70%)	Negative	Yes	No	BCT + RTH + HTH	Gastric cancer	Died

BCT – breast-conserving therapy, RM – radical mastectomy, AL – axillary lymphadenectomy, CHTH – chemotherapy, RTH – radiotherapy, HTH – hormone therapy.

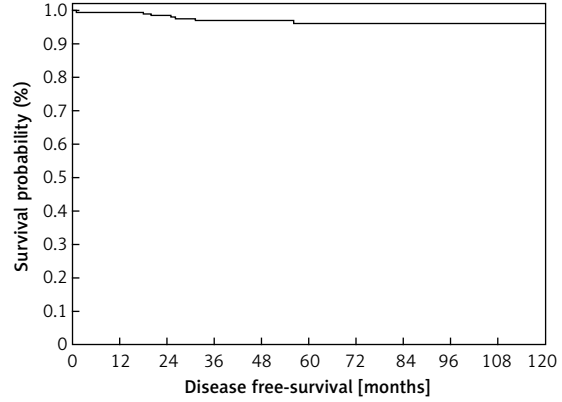


Figure 1. Probability of disease-free survival

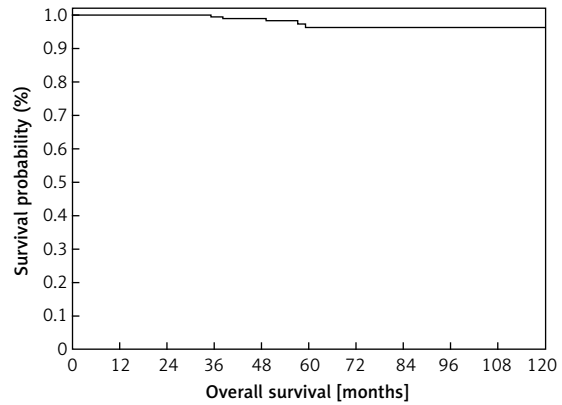


Figure 2. Probability of overall survival

performed after the SLNB, a change from pN1 to pN2 was observed. At present, it is commonly accepted that in case of metastasis to the sentinel lymph node, AD is not performed [12]. Recent international and Polish guidelines also indicate the lack of necessity for performing axillary dissection in case of macrometastases to 1–2 sentinel lymph nodes according to the Z0011 trial [13, 14, 16–22]. In the analyzed group of patients, in 7 women the sentinel lymph node was not identified, which constitutes a percentage similar to the data from the literature [23, 24]. All patients underwent axillary dissection but only in 1 patient were macrometastases diagnosed (in 11 out of 17 lymph nodes removed). Nomograms may be helpful in the identification of patients in whom axillary dissection is not necessary, which, based on logistic regression, determine the probability of occurrence of metastases to the sentinel lymph node or to non-sentinel lymph nodes for each patient [25–29].

The treatment outcome of breast cancer patients subjected to multidisciplinary therapy with the use of sentinel lymph node biopsy in the Holy-cross Cancer Center is satisfactory. Based on our experience, it was confirmed that the absence of metastases to the sentinel lymph nodes does not constitute an indication for axillary dissection. However, further studies are mandatory concerning the identification of patients in whom me-

tastases to the axillary sentinel lymph nodes are diagnosed, and who do not require axillary dissection, considering the fact that in many patients in whom the surgical procedure in the axilla was radicalized, metastases to additional non-sentinel lymph nodes were not found.

Conflict of interest

The authors declare no conflict of interest.

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