



Evaluation of upper extremity movements in patients with breast conserving treatment with the disabilities of the arm, shoulder and hand (DASH) questionnaire

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ARTICLE INFO

Keywords:

Breast cancer
Upper extremity
Radiotherapy
DASH

Received: Feb 28, 2023

Accepted: May 25, 2023

Available Online: 26.05.2023

DOI:

[10.5455/annalsmedres.2023.02.056](https://doi.org/10.5455/annalsmedres.2023.02.056)

Abstract

Aim: Surgery and radiotherapy (RT) are local treatment methods that constitute organ-preserving treatment in breast cancer. Limitations of arm movements and lymphedema are known side effects that may adversely affect quality of life. With the DASH questionnaire, the extent of the limitation and complaints by answering the questions evaluating the weakness in arm movements were used to understand the patients condition. DASH basically consists of a 30-item scale and is scored from 0 to 100. The DASH questionnaire was applied to patients who underwent breast-conserving surgery to evaluate their upper extremity functions.

Materials and Methods: 18 patients with breast cancer who underwent breast conserving surgery (BCS) and RT treatments were evaluated with at least 6 months follow-up. The DASH questionnaire was applied to the patients who are included. The test consists of two parts and the first part used on function evaluation and symptoms includes 30 questions.

Results: The median age of the patients was 45 (range: 31-67). Sentinel lymph node dissection (SLND) with BCS is the surgical method performed in all patients, but axillary lymph node dissection (ALND) was added to 13 patients with sentinel node positivity during surgery. All patients received RT. The DASH questionnaire was performed at a median postoperative 14 month (range: 6-25 months). As a result of DASH, the mean scores of the patients were found to be 23.2 (range: 1.7-59.2). Distant metastasis was detected in one of the patients, and no recurrence or metastasis was found in the other patients.

Conclusion: DASH questionnaire study was concluded as limited arm movements at the patients despite the advanced surgical and RT techniques. In terms of quality of life, recommendations are important and patients could be informed about arm movements starting from the preoperative period.



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Introduction

Breast cancer (BC) is one of the most common cancer in women worldwide with 5 year overall survival rate of 90% [1]. The number of long term survivors of BC has increased significantly over the past decades. This is largely attributable to the availability and implementation

of new treatment approaches in these patients [2,3]. RT is an indispensable discipline of multidisciplinary treatment of BC. Although the application of modern techniques has led to a significantly reduction of critical organ doses, it is still recognized as the leading causes of morbidity among BC survivors. With the growing number of long-term survivors, it is important to understand the late adverse effects related with the treatments.

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The disability of the arm, shoulder and hand (DASH) questionnaire is an upper-extremity specific outcome measure that was introduced by the American Academy of Orthopedic Surgeons in collaboration with a number of other organizations [4]. The rationale behind the use of one outcome measure for different upper extremity disorders is that the upper extremity is a functional unit [5]. Questions exist regarding the status of the motility of arm and shoulder after local treatments at BC patients. ALND, although controversial in specific situations, remains an integral part of surgical treatments in patients with invasive breast cancer and axillary lymph node metastases [6]. Especially, initially N1 or N2 patients according to the TNM staging system and patients with ongoing positivity at SLND after neoadjuvant chemotherapy considered to have ALND [7]. ALND was replaced by SLNB in patients that lack axillary lymph node involvement (N0) initially or after neoadjuvant chemotherapy [8]. The changing practice from ALND to SLND was observed as the reduction of morbidities at long survived BC patients [9-12]. ALND followed by RT is known as highest risk factors for lymphedema and movement limitations of arm. This paper aims to measure the patient's satisfactions and limitations of movements of the operated side arms at BC patients.

Materials and Methods

The DASH questionnaire was prepared by the American Academy of Orthopedic Surgery specifically for upper extremity functions. The test consists of two parts and the main part has 30-item disability/symptom scale concerning the patient's function evaluation and symptoms [13]. Patients complete the test by evaluating at least 27 questions in this section. The items consist of questions about the degree of difficulty in performing different physical activities (21 items), the severity of pain, tingling, weakness and stiffness (5 items), the effect on social activities, work, sleep, and self-image (4 items). The second part is a separate test that evaluates upper extremity functions prepared for professional athletes and musicians. The scores for all items are used to calculate a scale score ranging from 0 (no disability) to 100 (most severe disability). The larger the score means the greater limitation of upper limb movements. A single-institution, survey study was planned to analyze the patients with BC who underwent surgery and postoperative RT. The local ethical committee approved the study (Bezmialem University, B.30.2.BAV.0.05.05/396). Thirty patients who had come to radiation oncology outpatient clinics with histologically confirmed invasive BC and had surgery followed by RT were evaluated. Exclusion criteria were defined as age below 18 years, any surgery in the upper limb ipsilateral to the BC, other malignancies except non-melanoma skin cancer, less than six months after RT or inability to complete questionnaires due to cognitive impairment or language difficulties.

Statistical analysis

For descriptive statistics, mean \pm standard deviation was used to present continuous data with normal distribution. Median with minimum-maximum values was applied for

continuous variables without normal distribution. Numbers and percentages were used for categorical variables. The Mann-Whitney U and Spearman's rank correlation test analyzed the normal distribution of the numerical variables. Data analysis was performed using the IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

Results

The median age of the patients was 45 (range: 31-67) and all of them were female. All patients had BCS with SLND and ALND was added to 13 patients with sentinel node positivity during surgery. Adjuvant chemotherapy (CT) treatment was administered to all 11 premenopausal patients and 4 of 7 postmenopausal patients, by evaluating stage and risk groups. All patients received RT. The RT fields did not include axillary regions that were dissected. The mean interval between surgery and DASH questionnaire was 14 month (range: 6-25 months). DASH scale scores were recorded and analysed as a mean score of 23.2 (range: 1.7-59.2). Regarding the type of surgery like SLND or ALND no influence on the DASH scores was observed. Distant metastasis was detected in one of the patients, and no recurrence or metastasis was found in the other patients.

Discussion

In large patients' number of trials that are included involved axillary nodes after ALND, significantly lower rates of regional and overall recurrences had been observed with RT [14]. This benefit was independent from the number of involved axillar nodes. Although, the effectiveness of treatments lead the decision of modality and sequence of therapies, quality of life studies regarding the toxicities are increasing and lead therapy mainly.

The DASH questionnaire has the capacity of detecting and distinguishing small and large changes in disability over time after surgery in patients with upper extremity musculoskeletal disorders. A 10 point difference in the mean DASH score can be considered as a minimal significant change. A mean score change of 19 was rated as "much better/worse" and a mean score change of 10 as "somewhat better/ worse". For minimal significant change, the score rated as "somewhat changed" was suggested as the limit [15]. Power calculations had to be done with this information for new prospective trials. Some trials take the score change of 15 to differentiate improved patients from unimproved patients [16]. Trials were continued to understand for DASH questionnaire efficacy on sensitivity of milder degrees of impact. And the results were showed that the DASH has the ability to detect changes corresponding to the patients' perception after surgery in a variety of upper extremity disorders. The device was shown to be able to differentiate the patients responding "much better/worse" and "somewhat better/worse" with a significant difference in DASH scores [17].

The minimum follow-up time in the present study was 6 months and the latest response was received 25 months after RT. In terms of RT late adverse effects and surgery improvements, six months follow-up was found sufficient. Based on the results of this study, mean score of 23.2

was evaluated as significant effects of therapies on upper extremity movements and patients' satisfactions. In order to evaluate the questionnaire better and understand the effect of AD and RT at regional lymphatics on upper extremity movements, a study involving a larger number of BC patients should be conducted.

Ethical approval

Ethical approval was obtained for this study from the Bezmialem Vakıf University Clinical Research Ethics Committee (Date: 11.07.2012, Decision no: 19/6).

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