

# Factors Affecting the Postsurgical Length of Hospital Stay in Patients with Breast Cancer

## Meme Kanseri Hastalarda Ameliyat Sonrası Hastanede Kalış Süresini Etkileyen Faktörler

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### ABSTRACT

**Objective:** Breast cancer is the most common malignancy and the most common cause of mortality in women worldwide. In addition to the increasing incidence of breast cancer, the length of hospital stay (LOS) after breast cancer surgery has been decreasing. Because LOS is key in determining hospital usage, the decrease in the use of hospital facilities may have implications on healthcare planning. The purpose of this study was to evaluate the factors affecting postoperative LOS in patients with breast cancer.

**Materials and Methods:** Seventy-six in patients with breast cancer, who had been treated between July 2013 and December 2014 in the General Surgery Clinic of Dicle University, were included in the study. The demographic characteristics of the patients, treatment methods, histopathological features of the tumor, concomitant diseases, whether they underwent neoadjuvant chemotherapy or not, and the length of drain remaining time were retrospectively recorded.

**Results:** There was a correlation between drain remaining time, totally removed lymph node, the number of metastatic lymph node, and LOS. LOS of patients treated with neoadjuvant chemotherapy was longer. The patients who underwent breast-conserving surgery had a shorter LOS. Linear regression analysis revealed that the drain remaining time and the number of metastatic lymph nodes were independent risk factors for LOS.

**Conclusion:** Consideration should be given to cancer screening to diagnose the patients before lymph node metastasis occurs. In addition, drains should be avoided unless required and, if used, they should be removed as early as possible for shortening LOS.

**Keywords:** Breast Cancer, Length of Hospitalization, lymph nodes, breast surgery

### ÖZ

**Amaç:** Meme kanseri en sık görülen malignite ve dünya çapında kadınlarda en sık ölüm nedenidir. Meme kanseri sıklığı giderek artmasına rağmen, meme kanseri cerrahisi sonrası hastanede kalış süresinde düşüş olmuştur. Hastane kullanımını belirlemede kalış süresi önemli olduğundan, hastane kaynaklarının kullanımında azalma sağlık planlaması için etkili olabilir. Bu çalışmanın amacı, meme kanserli hastalarda ameliyat sonrası hastanede kalış süresini etkileyen faktörleri değerlendirmektir.

**Yöntem ve Gereçler:** Dicle Üniversitesi Genel Cerrahi Kliniğinde Temmuz 2013 ile Aralık 2014 arasında tedavi görmüş meme kanserli, 76 yatan hasta çalışmaya dahil edildi. Hastaların demografik özellikleri, tedavi yöntemleri, tümörün histopatolojik özellikleri, eşlik eden hastalıklar, neoadjuvan kemoterapi alıp almadıkları ve dren kalış süresi retrospektif kaydedildi.

**Bulgular:** Dren kalış süresi, metastatik ve çıkarılan total lenf nodu sayısı ile hastanede kalış süresi arasında korelasyon vardı. Neoadjuvan kemoterapi alan hastalarda hastanede yatış süresi daha uzundu. Meme koruyucu cerrahi yapılan hastalarda ise hastanede kalış süresi mastektomi yapılanlara göre daha kısa idi. Lineer regresyon analizi değerlendirmesinde dren kalış süresi ve metastatik lenf nodu sayısı hastanede yatış süresi üzerinde etkili bağımsız prediktif faktörler olarak saptandı.

**Sonuç:** Lenf nodu metastazı ortaya çıkmadan teşhis sağlayan kanser taramasına önem verilmelidir. Hastanede kalış süresini azaltmak için dren sadece gerekli durumlarda kullanılmalı ve kullanıldığı takdirde mümkün olduğunca erken çekilmelidir.

**Anahtar sözcükler:** Meme kanseri, yatış süresi, lenf nodları, meme cerrahisi

### Introduction

Breast cancer is the most common malignancy and the most common cause of mortality in women worldwide (1-3). Breast cancer surgery on an inpatient basis is a burden on the healthcare budget (4). Of the total costs of breast cancer treatment, 35%–50% is spent on surgical treatment, of which the largest part is because of the length of hospital stay (LOS) (5). Because LOS is key in determining hospital use, the decrease in the use of hospital facilities, which coincided with an apparent increase in the demand for treatment for breast cancer, may have implications for healthcare planning (6).

In addition to the increasing incidence of breast cancer, LOS after breast cancer surgery has been decreasing (7). Since the 1990s, LOS has decreased from 10–14 days to 5–7 days (8-12).

Various factors influencing postoperative LOS have been studied for surgical admissions. LOS may be affected by patient factors such as older age, gender, comorbidities and socio-demographics (13, 14), and intraoperative and postoperative adverse events and complica-

tions (14, 15). Specifically, in breast surgery, there are only a few LOS studies and those that exist have studied trends of LOS for breast cancer surgery over several decades (16-18). The trend towards an increasing number of patients undergoing breast-conserving surgery (BCS) than mastectomy has been universally noted as one of the major factors for the decrease in LOS over the last two decades. The adoption of newer techniques such as axillary sampling and sentinel node biopsy and the decision to discharge patients early has also been shown to be important factors in decreasing LOS (17).

The purpose of this study was to evaluate the factors affecting postoperative LOS in patients with breast cancer.

## Materials and Methods

Seventy-six inpatients with breast cancer, who had been treated between July 2013 and December 2014 in the General Surgery Clinic of Dicle University, were included in the study. The study was conducted after approval by the Dicle University School of Medicine Ethics Committee. Informed consent of the patient was not required for this retrospective study. To determine the factors affecting LOS, the demographic characteristics of the patients, treatment methods, histopathological features of the tumor, and the length of drain remaining time were retrospectively recorded from the hospital database.

### Statistical analysis

Statistical analyses were performed by the Statistical Package for the Social Sciences (SPSS) version 18.0 (SPSS, Inc., Chicago, IL, USA). Data are presented as the mean  $\pm$  standard deviation or n (%). One-sample Kolmogorov-Smirnov test was used to evaluate the distribution of data. The factors affecting LOS were analyzed by linear regression tests. The correlations between variables were performed by Pearson's (r) or Spearman's rank correlation analyses based on the distribution of data. A  $p < 0.05$  was considered to be significant.

## Results

All of the patients were female. The mean age was 48.55 years (range, 26–76 years), and the mean LOS was 6.18 days (range, 1–18 days). The general characteristics of the patients are summarized in Table 1.

Multivariate regression analysis was performed to identify independent predictors for LOS. In a univariate analysis, although there was no correlation between age (years), tumor size, and LOS, there was a correlation between totally removed lymph node, drain remaining time and the number of metastatic lymph nodes, and LOS. The patients who underwent BCS accounted for 27 (35.5%) of the procedures and had shorter LOS (4.78 $\pm$ 3.45) than the patients who underwent mastectomy (6.96 $\pm$ 2.59) ( $p=0.003$ ). LOS of the patients who underwent neoadjuvant chemotherapy was 8.33 $\pm$ 3.65, and LOS of the other patients was 5.52 $\pm$ 2.58; therefore, the patients who underwent neoadjuvant chemotherapy had statistically significant longer LOS ( $p < 0.001$ ). Statistically significant parameters in univariate analysis were entered into a linear regression model. The drain remaining time and the number of metastatic lymph nodes were found to be an independent predictive factor for LOS (Table 2).

## Discussion and Conclusions

Over the last two decades, the number of new cases of breast cancer has risen each year (2). During these two decades, the average length of stay for all causes of hospitalization dropped as advancements in

**Table 1. General characteristics of the patients**

	Mean $\pm$ SD
Age (years)	48.55 $\pm$ 11.50
LOS (days)	6.18 $\pm$ 3.08
Drain remaining time (days)	4.95 $\pm$ 3.08
Metastatic Lymph Node	3.63 $\pm$ 3.96
Total Lymph Node	14.78 $\pm$ 6.26
LOS: Length of hospital stay; SD: Standard deviation	

**Table 2. Correlation and regression analysis results**

	LOS (Days)	
Tumor Size	r	0.194
	p	0.093
Metastatic lymph node*	r	0.623
	p	0.000
Total lymph node	r	0.626
	p	0.000
Age (years)	r	0.005
	p	0.963
Drain remaining time**	r	0.709
	p	0.000
LOS: Length of hospital stay * $p=0.003$ on linear regression analysis, ** $p < 0.001$ on linear regression analysis R square=0.626, $p < 0.001$ for model on linear regression analysis		

surgical techniques and a general move towards minimal invasive surgery reduced the need for prolonged hospital care (19). In a study, it was found that the mean hospital stay following breast cancer surgery has fallen from 9.8 days in 1990 to 5.2 days in 2005 (20). In another study, it was found to be shortened from around 11.5 days to just under 9 days (19). In our study, the average LOS was 6.18 days, which is not higher than the level observed during the 1990s and not lower than the level observed during the 2006s.

A short hospital stay following breast cancer surgery provides the opportunity to reduce the wound pain, facilitate shoulder movement, reduce healthcare costs without affecting the quality of the care process (16-18, 21), and allows recovery in the familiar home environment. Bundredet al. (22) found no negative effect of early discharge on physical and psychological illness and advised early discharge for patients who were provided with informal care at home. In addition, the advantages of a short LOS includes less workload on staff, savings on hospital charges, reduction in waiting lists, and shift from expensive hospital care to cheaper home care (23). Bonnemaet al. (16) reported major cost savings related to a shorter hospital stay.

The decline in LOS cannot be attributed to any single cause. LOS results from an interplay of a number of factors. One of these factors include a trend towards less extensive operations, (24-26) particularly a shift away from radical mastectomies toward BCS (27). The ideal LOS for breast cancer changes according to a number of indicators. Shorter hospital stays did not compromise outcomes.

Purushothamet al. (28) compared breast surgery with and without drain insertion and concluded that drains were not required, thus facilitating early discharge. Our results showed that the length of drain remaining time was an independent risk factor for long LOS.

The time that patients with breast cancer spend in the hospital is influenced by the stage of the disease, i.e., the degree to which it has spread. Although the insitu, localized, and regional breast cancer stages require the shorter periods of hospitalization, hospitalization tends to be longer if a cancer has spread (19). In our study, because of the high cancer stage, LOS did not shorten to the expected level. We found that the number of removed metastatic lymph nodes was an independent risk factor for LOS.

The time that a patient with breast cancer spends in a hospital can lengthen if she has other serious conditions such as heart disease, diabetes, and liver or kidney problems (29). The presence of such diseases has an impact on the treatment that patients with breast cancer receive, the success of that treatment, and the time required for recovery (30-33). We could not determine the effect of comorbidity on LOS.

More complicated or extensive procedures generally require more time in the hospital. Thus, a woman undergoing a mastectomy may expect to be hospitalized longer than a woman undergoing BCS (19). In our study, the patients who underwent BCS had shorter LOS, but it was not an independent predictive factor. We thought that surgical procedures of the breast did not affect LOS, but axillary procedures did. Similarly, neoadjuvant chemotherapy affects LOS, but it was not an independent predictive factor.

The drain remaining time and the number of metastatic lymph nodes are independent predictive factors for longer LOS. Consideration should be given to cancer screening to diagnose the patients before lymph node metastasis occurs. In addition, drains should be avoided unless required and, if used, they should be removed as early as possible for shortening LOS.

**Ethics Committee Approval:** Ethics committee approval was received for this study.

**Informed Consent:** Written informed consent was not obtained due to retrospective nature of the study.

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