Immediate or Delayed Breast Reconstruction After Radical Mastectomy in Breast Cancer Patients: Does It Make a Difference in the Quality of Life

Meme Kanseri Hastalarında Radikal Mastektomi Sonrasında Hemen veya Geç Yapılan Meme Rekonstrüksiyonu: Hayat Kalitesinde Bir Fark Yaratır mı?

Sonay BALTACI GÖKTAŞ,[a]
Bahadır Mahmut GÜLLÜOĞLU, MD,[b]
Deniz ŞELİMEN[a]

[a]Department of Nursing,
Marmara University
Faculty of Health Sciences,
[b]Department of General Surgery,
Breast and Endocrine Surgery Unit,
Marmara University Faculty of Medicine,
İstanbul

Geliş Tarihi/*Received:* 28.09.2009
Kabul Tarihi/*Accepted:* 09.03.2010

This study was previously presented during 10th Turkish National Congress for Breast Diseases at Çeşme, İzmir in 30 September-4 October 2009.

Yazışma Adresi/*Correspondence:*
Sonay BALTACI GÖKTAŞ
Marmara University
Faculty of Health Sciences,
Department of Nursing, İstanbul,
TÜRKİYE/TURKEY
sonay.goktas@academichospital.com.tr

ABSTRACT Objective: Nowadays, most of the women with breast cancer are diagnosed in early stages and benefit from regional and systemic treatments with proven efficacy. Various methods of breast reconstruction can be applied to patients who undergo mastectomy at different times. The purpose of this study is to investigate how immediate or delayed breast reconstruction affected the patients' quality of life after mastectomy. **Material and Methods:** Breast cancer patients who had reconstructive surgery at any time after mastectomy were included in the study. Measures for evaluating the patients' psychopathological status (SCL-R90 Symptom checklist) and quality of life (EORTC QLQ-C 30) were used. Demographical and clinical data were obtained retrospectively from the patients and their hospital records. Demographical and clinical data were analyzed retrospectively, quality of life parameters were analyzed as descriptive statistics in a single time period. Patients who had undergo immediate (28 patients) or delayed (23 patients) breast reconstruction after mastectomy in Marmara University Hospital between January 1, 2002 and December 12, 2006 were included in the study. **Results:** When compared with the delayed reconstruction group, patients in the immediate reconstruction group were found to be at earlier stages and thus, there was less need for radiotherapy. Delayed reconstruction was mainly utilized in patients who received adjuvant therapy and axillary lymph node dissection. There was no difference between the two groups regarding their demographical characteristics. This study revealed that immediate reconstruction, when compared to delayed reconstructive surgery, improved patient's body image, self-esteem, and family/social relations. It also increased the quality of life psychologically, socially and spiritually as well as decreased somatic complaints. **Conclusion:** Immediate breast reconstruction after mastectomy in compared to delayed one, positively affects the individual's quality of life.

Key Words: Quality of life; breast neoplasms; mammaplasty

ÖZET Amaç: Günümüzde meme kanserli bir çok kadın erken dönemlerde teşhis edilmekte ve etkinliği gösterilmiş olan lokal ve sistemik tedavilerden yararlanmaktadır. Mastektomi yapılmış hastalarda çeşitli meme rekonstrüksiyon yöntemleri farklı zamanlarda uygulanabilir. Bu çalışmanın amacı mastektomi sonrasında erken veya geç yapılan meme rekonstrüksiyonunun hastaların hayat kalitesini nasıl etkilediğini araştırmaktır. **Gereç ve Yöntemler:** Mastektomi sonrasında rekonstrüktif cerrahi yapılan meme kanseri hastaları çalışmaya alındı. Hastaların psikopatolojik durumunu (SCL-R0 semptom çeklisti) ve hayat kalitesini (EORTC QLQ-C 30) değerlendiren ölçekler kullanıldı. Demografik ve klinik veriler retrospektif olarak hastane dosyalarından ve hastalardan elde edildi. Demografik ve klinik veriler retrospektif olarak, hayat kalitesi parametreleri aynı zamanda tanımlayıcı istatistikler ile analiz edildi. Marmara Üniversite hastanesinde 01.01.2002 ve 31.12.2006 tarihleri arasında mastektomiden hemen sonra (28 hasta) ve gecikmiş (23 hasta) meme rekonstrüksiyon yapılan hastalar çalışmaya alındı. **Bulgular:** Gecikmiş rekonstrüksiyon yapılan hastalar ile karşılaştırıldığında, hemen rekonstruksiyon yapılan gruptaki hastaların daha erken dönemde olduğu ve dolayısıyla radyoterapiye daha az ihtiyaç duydukları saptandı. Gecikmiş rekonstrüksiyon genellikle adjuvan tedavi alan ve aksiller lenf nodu diseksiyonu yapılan hastalarda uygulanmıştır. Demografik özelliklerine bakılınca iki grup arasında fark bulunamadı. Bu çalışma, gecikmiş rekonstrüksiyonla karşılaştırıldığında hemen rekonstrüksiyon yapılan hastanın vücut imajında, kendine saygısında ve aile/sosyal ilişkilerde ilerlemeye yol açtığını göstermiştir. Ayrıca hayat kalitesinde psikolojik, sosyal ve manevi ilerlemenin yanı sıra somatik şikayetlerinde azalmaya yol açmaktadır. **Sonuç:** Mastektomi sonrasında hemen yapılan meme rekonstrüksiyonu gecikmiş rekonstrüksiyona göre bireyin hayat kalitesini pozitif olarak etkilemektedir.

Anahtar Kelimeler: Yaşam kalitesi; meme tümörleri; mammoplasti

doi:10.5336/medsci.2009-15488

Turkiye Klinikleri J Med Sci 2011;31(3):664-73

Nowadays, breast cancer is the most prevalent malignant tumor in our country. In Turkey, breast cancer is seen in 19.9 per 100.000 women and forms 29 percent of all female cancers. Breast cancer is one of the most common causes of female cancer deaths. Breast cancer deaths account for 8.8 per 100.000 women in Turkey.[1]

Surgical treatment of breast cancer involves partial excision of tumor or total removal of the breast and axillary lymph nodes. Surgical procedures cause physical and psychosocial problems that diminish the patients' quality of life (QoL), and the severity of problems changes according to the surgical procedure. Beside the fear of disease relapse, depression, loss of feminity, libido, and self- confidence, these women also face the problem of readapating to social life. For all of these reasons, breast reconstruction after mastectomy is provided in order to preserve the body image, decrease psychological problems, establish social adaptation, and rebuild self confidence.[2,3]

When suitable, breast reconstruction surgery is performed on mastectomized patients with one of several different techniques. Although breast reconstruction following mastectomy is becoming more popular, it is only applied to 5% of (mastectomized) patients.[4,5]

Breast reconstruction can be done at one of two distinct times, either as an immediate (simultaneously) or a delayed reconstruction (months or years following mastectomy). Patients with early stage breast cancer are suitable candidates for immediate reconstruction. Immediate breast reconstruction has been shown to increase the QoL with its psychological benefits. In some instances, although the patient's choice is immediate reconstruction, delayed reconstruction is medically accepted as a safer and better approach.[2,6]

A number of studies have investigated the effect of breast reconstruction on QoL.[7-9] However, the data comparing the effects of immediate and delayed reconstruction on the QoL are limited in Turkey.

The aim of this retrospective study was to reveal the effect of immediate or delayed breast reconstruction after mastectomy on the QoL of patients with breast cancer.

MATERIAL AND METHODS

This study was performed between January 1, 2002 and December 12, 2006 in Marmara University Hospital, Breast Center, İstanbul.

Patients with breast cancer who had undergone immediate or delayed breast reconstruction were included in the study. Informed consents were obtained from the patients.

The outcomes of the study were determined as;

A. Primary outcomes

1. QoL levels of patients who underwent immediate reconstruction after mastectomy for early breast cancer.

2. QoL levels of patients who underwent delayed reconstruction after mastectomy for early breast cancer.

B. Secondary outcomes

1. The impact of demographic characteristics (age, marital status, education level, etc), disease features, body mass indices, presence of associated diseases, alcohol/cigarette consumption or similar habits on QoL after reconstructive surgery.

2. The impact of axillary surgery on QoL.

3. The impact of surgical method during reconstruction regardless of timing on QoL.

4. The impact of complications due to treatment on QoL.

DATA COLLECTION

A previously prepared basic questionnaire form, SCL-R-90 Symptom Checklist Form, SF-36 Health Survey Form, EORTC QLQ-C30 Quality Of Life Measures Form was filled at a face to face interview with each patient.

Questionnaire Form

The questionnaire was consisted of 33 multiple choice questions including demographical characteristics (age, height, weight, educational status, marital status, health insurance, number of chil-

dren, menarche, age of delivery, smoking, alcohol consumption); characteristics of the disease process (type of surgery, pathological stage, type of reconstruction, surgical complications, chemotherapy, hormonal therapy, radiotherapy, arm lymphedema); psychosocial characteristics related to the disease and reconstruction (sexual problems, feminine feelings, body image, self-esteem, family-social relations).

The Symptom Checklist Form (SCL-R-90)

This form consisted of 90 questions in 10 groups evaluating the psychopatholical status of the patients. These groups are somatisation, obsessive-compulsive signs, fragility, depression, anxiety, hostility, phobia, paranoid ideation, psychoticism, and additional signs. High scores indicate high frequency of symptoms.[10]

SF-36 Health Survey

This measure evaluates 36 conditions. It is a multitask scale evaluating nine sub-groups of health topics under three main categories (functional health, well-being, and general health measures). It is designed in such a way that health related QoL increases with the increasing score of each health topic (positive scoring). Subgroups evaluate health using a 0-100 score, 0 represents the worst medical condition and 100 represents the best medical condition.[11]

EORTC QLQ-C30 Measure

This measure is made up of five functional scales (physical functioning, role functioning, cognitive functioning, emotional functioning, and social functioning), three symptom scales (fatigue, pain, and nausea), and a global life scale. Additionally, six conditions (dyspnea, insomnia, appetite loss, constipation, diarrhea and financial difficulties) were evaluated. This measure contains 30 questions, in 28 of which patients were asked to choose a number from 1 to 4. Evaluation of the scale is 1: not at all; 2: a little; 3: a fair amount; 4: very much. In only two of the questions patients were asked to choose their answers from 1 to 7. 1 represented very poor and 7 x where 1 represented excellent. The greater the mean of the points in the general well-being and functional scales, the better the medical condition. However in the symptom scale higher mean of points indicated a greater abundance of problems.[12]

STATISTICAL ANALYSIS

All continuous data (age, QoL measures), sequential data (stage of tumor), and nominal data (treatment groups, presence of complications, education, marital status) obtained from each of the patients were recorded using Excel database tables and analyzed with suitable statistical software programs. Data related to personal specifications were recorded as integers (%), and results of all continuous variables were recorded as mean (+/- standard deviation). When comparing immediate and delayed reconstruction groups, the Chi-square test, Fisher's Exact Chi-Square test, and the Student's t-test were used. Two-tailed significance and $p< 0.05$ were accepted as statistically significant.

RESULTS

Fifty one patients who had undergone breast reconstruction surgery at Marmara University Hospital Breast Center between January 1, 2002 and December 12, 2006 were included in the study. Breast reconstruction was performed at the same time with mastectomy in 28 patients, and after mastectomy in 23 patients. The median follow-up period for the immediate reconstruction group was 10.5 (7-15) months. The median time period from mastectomy to reconstructive surgery in the delayed reconstruction group was 14 (6-24 months), and the median follow-up period for delayed reconstruction group after reconstructive surgery (the second operation) was 12 (8-17) months.

The median age of the immediate reconstruction group was 48 (30-61) years, and of the delayed reconstruction group was 50 (34-63) years ($p= 0.40$, Table 1). There was no significant difference between the two groups regarding their marital status, education, social insurance, working condition, and number of children ($p= 0.44$, 0.25, 0.61, 0.99, and 0.83 respectively; Table 1).

In the immediate reconstruction group, 20 (71%) of the patients had undergone simple mas-

TABLE 1: Comparison of demographical data, disease and treatment characteristics.

	Immediate		Delayed		
Parameter	**(n= 28)**	**%**	**(n= 23)**	**%**	**P**
Age; mean (+/-)	46.89	(8.26)	48.7	(6.64)	0.40
Marital status					0.44
Married	25	(89)	18	(78)	
Single	3	(11)	5	(22)	
Educational status					0.25
Primary school	7	(25)	2	(8)	
Secondary school	10	(36)	8	(35)	
Graduate (higher education)	11	(39)	13	(57)	
Social insurance					0.61
Present	25	(89)	22	(96)	
Absent	3	(11)	1	(4)	
Number of children					0.83
None	8	(29)	7	(30)	
1	11	(39)	6	(26)	
2 or more	9	(32)	10	(44)	
Working condition					0.99
Working	12	(43)	9	(39)	
Not working	16	(57)	14	(61)	
Type of primary surgery					0.009
Simple mastectomy	20	(71)	8	(38)	
Modified radical mastectomy	8	(29)	15	(65)	
Reconstruction type					0.24
Prosthesis	20	(71)	12	(52)	
Autologous tissue	8	(29)	11	(48)	
Pathological stage*					0.022
Stage I	17	(61)	6	(26)	
Stage II	9	(32)	10	(44)	
Stage III	2	(7)	7	(30)	
Surgical complication					0.19
Absent	26	(93)	19	(83)	
Present	2	(7)	4	(17)	
Chemotherapy					0.80
Absent	13	(46)	12	(52)	
Present	15	(54)	11	(48)	
Hormonal therapy					0.99
Absent	5	(18)	4	(17)	
Present	23	(82)	19	(83)	
Radiotherapy					0.001
Absent	24	(86)	6	(26)	
Present	4	(14)	17	(74)	
Radiotherapy complications**					0.01
Absent	1	(25)	16	(94)	
Present	3	(75)	1	(6)	
Lymphedema					0.05
Absent	24	(86)	14	(61)	
Present	4	(14)	9	(39)	

* Staging is done according to the 6 th edition of AJCC Breast Cancer Staging Manual 2002.

** The patients who underwent simple mastectomy for primary tumor control were the ones whose sentinel lymph node/s were tumor negative.

tectomy (SM), and eight (36%) modified radical mastectomy (MRM). In the delayed reconstruction group eight (35%) of the patients had undergone a SM, and 15 (65%) a MRM (p= 0.009). In the immediate reconstruction group, 17 (61%) patients had a stage I disease, nine (32%) patients had a stage II disease, and two (7%) patients had a stage III disease. In contrast, in the delayed reconstruction group, six (26%) patients had a stage I disease, 10 (43%) patients had a stage II disease and seven (30%) patients had a stage III disease (p= 0.02; Table 1). The number of patients who had undergone a delayed reconstruction and adjuvant radiotherapy after mastectomy (n= 17; 74%) was significantly higher than the number of patients who had undergone an immediate reconstruction and adjuvant radiotherapy (n= 4; 14%; p= 0.001). There was no statistically significant difference between the two groups for the method of reconstruction, chemotherapy or hormonotherapy received (p= 0.24, 0.80 and 0.99 respectively; Table 1).

In patients who received radiotherapy, three (75%) in the immediate reconstruction group, and one (25%) in the delayed reconstruction group had radiotherapy complications (p= 0.01; Table 1). However, there were no significant differences in arm lymphedema or surgical complications between two treatment groups (p= 0.19 and 0.05, respectively; Table 1).

In the immediate reconstruction group, 13 (46%) of the patients reported no sexual problems, whereas in the delayed reconstruction group 13 (57%) patients reported severe sexual problems (p= 0.01).

It can be seen that the delayed reconstruction group faced more problems when compared to the immediate reconstruction group with regard to loss of feminine feeling (57% vs. 21%), distortion of body image (83% vs. 39%), loss of self esteem (70% vs. 25%; p= 0.02, 0.04, and 0.13 respectively; Table 2).

It was found that the scores for somatization (4 vs. 2 points), depression (3 vs. 2 points), and anxiety (3 vs. 1 points) in the delayed reconstruction group were higher than these of immediate reconstruction group (p= 0.001, 0.008, and 0.003 respectively). Additionally, the Global Severity Index for the delayed reconstruction group (1.44 points) was significantly higher than the immediate reconstruction group (1 point; p= 0.009). However, for obsessive-compulsive, interpersonal sensitivity, hostility, phobic sensitivity, paranoid ideation, and psychoticism scores, no statistically significant dif-

TABLE 2: Comparison of the sexual and psychosocial status of the patients.

	Immediate		Delayed		
Parameter	**(n= 28)**	**%**	**(n= 23)**	**%**	**P**
Sexual problems faced					0.01
None	13	(46)	4	(17)	
Mild	10	(36)	6	(26)	
Serious	5	(18)	13	(57)	
Loss of feminine feeling					0.02
Yes	6	(21)	13	(57)	
No	22	(79)	10	(43)	
Deterioration of body image					0.04
Yes	11	(39)	19	(83)	
No	17	(61)	4	(17)	
Decrease of self esteem					0.03
Yes	7	(25)	16	(70)	
No	21	(75)	7	(30)	
Deterioration of family social relations					0.13
Yes	10	(36)	14	(61)	
No	18	(64)	9	(39)	

ferences were found between two study groups (Table 3).

The physical function scores for the delayed reconstruction group (80 points) were lower than for the immediate reconstruction group (95 points; p= 0.01). On the other hand, the immediate reconstruction group (88.9) had lower pain scores when compared to the delayed reconstruction group (77.8). Other than these parameters, physical role function, emotional role function, social functioning, mental health, vitality, and general well being scores showed no significant differences between the two treatment groups (Table 4).

The general health score of the immediate reconstruction group (33.3 points) was found to be significantly better than that of the delayed reconstruction group (16.7; p= 0.02). However, there was a significant difference in the physical functioning (73.3 vs. 9.3 points) and spiritual status scores (75 vs. 9.7 points) between the delayed reconstruction group and the immediate reconstruction group (p< 0.001 and 0.03 respectively). There was no significant difference in scores for role function, mental status, cognitive status, social status, and all sub-domains of symptom scale (fatigue, nausea-vomiting, pain, dyspnea, insomnia, appetite loss, constipation, diarrhea, financial difficulties) between the delayed and the immediate reconstruction groups (Table 5).

DISCUSSION

This study has demonstrated that immediate reconstructive surgery improves the patient's body image, self-esteem, and family/social relations con-

TABLE 3: Comparison of the mean values of SCL-90 symptom scores of the patients.

	Immediate (n= 28)		Delayed (n= 23)		
SCL-90 Parameter	**Mean**	**(+ -)**	**Mean**	**(+ -)**	**P**
Somatization	**1.93**	**(1.63)**	**3.39**	**(1.12)**	**0.001**
Obsessive-compulsive	1.68	(1.62)	2.17	(1.75)	0.28
Interpersonal sensitivity	0.50	(1.11)	0.87	(1.47)	0.51
Depression	**1.71**	**(1.08)**	2.70	(1.49)	**0.008**
Anxiety	**1.25**	**(1.38)**	2.65	(1.64)	**0.003**
Hostility	1.25	(1.40)	1.78	(1.62)	0.23
Phobic anxiety	0.86	(1.27)	0.57	(1.04)	0.42
Paranoid ideation	0.14	(0.76)	0.17	(0.83)	0.87
Psychoticism	0.25	(0.93)	0.52	(1.24)	0.27
GSI (Global Severity Index)	1.0	(1.07)	1.65	(0.80)	**0.009**

TABLE 4: Comparison of the mean values of SF 36 quality of life scores.

	Immediate (n= 28)		Delayed (n= 23)		
Parameter	**Mean**	**(+ -)**	**Mean**	**(+ -)**	**P**
SF-36					
Physical functioning	87.39	(12.14)	77.32	(15.60)	**0.01**
Role physical	73.21	(37.84)	78.26	(33.12)	0.78
Social functioning	78.57	(12.44)	76.81	(17.70)	0.85
Role-emotional	85.71	(35.63)	86.96	(34.44)	0.89
Mental health	71.71	(21.47)	70.26	(19.18)	0.80
Vitality	66.96	(20.52)	71.96	(17.50)	0.34
Bodyy pain	83.57	(21.15)	72.22	(21.70)	**0.04**
General health	63.21	(14.86)	68.91	(15.07)	0.18

TABLE 5: Comparison of the mean values of the scores of quality of life scale (EORTC QLQ-30).

	Immediate (n= 28)		Delayed (n= 23)		
Parameter	**Mean**	**(+ -)**	**Mean**	**(+ -)**	**P**
Global Health status					
Global Health status	29.16	(15.30)	15.94	(17.57)	**0.02**
Functional Scales					
Physical functioning	88.70	(8.15)	80.95	(9.02)	**0.001**
Role functioning	89.13	(16.37)	90.48	(15.33)	0.76
Emotional functioning	88.68	(19.44)	79.46	(15.13)	**0.03**
Cognitive functioning	84.78	(15.82)	84.52	(20.75)	0.80
Social functioning	91.07	(18.47)	85.51	(20.90)	0.30
Symptom scale					
Fatigue	84.13	(18.05)	89.85	(12.03)	0.21
Nausea and vomiting	95.83	(14.07)	99.28	(3.47)	0.26
Pain	85.71	(19.62)	86.23	(17.15)	0.9
Dyspnea	92.85	(16.62)	100	(0)	**
Insomnia	79.76	(30.54)	79.71	(29.71)	0.99
Appettite loss	97.62	(8.74)	97.10	(9.6)	0.84
Constipation	80.95	(31.98)	79.71	(35.87)	0.90
Diarrhea	100	(0)	100	(0)	**
Financial difficulties	91.66	(19.51)	92.75	(17.28)	0.93

siderably in comparision to delayed reconstructive surgery. It also increases QoL of the patients psychologically, socially and spiritually and decreases somatic (physical) complaints.

Although there are a number of studies evaluating the QoL after mastectomy, no studies have compared the effects of immediate and delayed mastectomy on quality of life.

Three QoL scales were used in the present study. These scales provided a broad perspective view of the effect of the time of reconstruction on the QoL.The questionnaires that were used for determining the QoL were answered subjectively, and this may partially affect the objectivity of the study. However, it must be considered that using objective scales is impossible in such a study. In addition, it has to be noted that there were 698 patients who underwent mastectomy in the Marmara University Hospital Breast Center between 2002 and 2006. Only 8% of these patients had immediate or delayed reconstruction, and these proportions were interpreted as similar to the general population studies in Turkey. Our sample size is relatively small, since there were only a few reconstruction operations and it was difficult to find cases fulfilling the study criteria.

There were statistically significant differences in the pathological stagines of the immediate and the delayed reconstruction groups. This shows that the patients in the delayed reconstruction group tend to be in stages II or III. Thus, the delayed reconstruction group is more likely to undergo MRM and to receive radiotherapy. Adjuvant radiotherapy following mastectomy has been shown to affect the cosmetic outcomes adversely and to increase complication rates.[13-19]

The present study reveals that immediate reconstructive surgery improves the patient's body image, self-esteem, and social relations when compared to delayed reconstructive surgery. It also increases QoL psychologically, socially and spiritually, and decreases somatic (physical) complaints. These findings correlate with the results of similar studies.[3,20-22]

Another finding in the present study is that five (18%) patients in the immediate reconstruction group, and 13 (57%) patients in the delayed re-

construction group faced major sexual problems, suggesting loss of libido and feminine feelings as the causative factors.

Previous studies have revealed that deterioration of the body image, loss of libido, and ongoing sexual problems still persist even two years after mastectomy. In the present study, the delayed reconstruction group had more sexual problems when compared to the immediate reconstruction group. Our findings correlate well with the previous studies.[9,20-25]

In our study, when we evaluated the data obtained from the SCL-R-90 psychopathological symptom checklist, the scores for anxiety, depression, somatization, and the global severity indeces of the delayed reconstruction group were significantly higher than these of the immediate reconstruction group. Additionally, obsessive compulsive scores were higher in the delayed reconstruction group, although these differences did not reach significance. It may be suggested that the increasing number of obsessive-compulsive signs led to the increasing levels of anxiety and depression.

Roth et al.[26] stated that the high prevalence of anxiety and somatic complaints in the delayed reconstruction patients might be the consequence of the deterioration of the body image and the fear of a relapse of the cancer. In our study, high somatization rates in the delayed reconstruction group suggest that the higher rates of anxiety and depression following mastectomy may be the reason. In breast cancer patients, psychological problems emerging with the diagnosis increase after mastectomy. In a number of studies it has been concluded that immediate reconstruction following mastectomy provided better results both psychologically and cosmetically.[27-29] Less anxiety and depression, and better adaptation to cancer diagnosis have been reported in patients undergoing immediate rather than delayed breast reconstruction following mastectomy,[20,30-32] Several studies reported that the QoL was adversely affected both in the perspective of the body image and psychosexually. However it has been stated that the patients who underwent immediate reconstruction had lower anxiety and depression rates and better feelings of the body image, self-esteem, feminine feelings, sexual activity, and satisfaction.[9,20,25]

In our study, among the parameters of SF-36, limitations in physical functions and pain scores were significantly higher in the delayed reconstruction group when compared to the immediate reconstruction group. The frequency of upper extremity problems due to axillary dissection in the surgical procedures for breast cancer has been reported as 50-70%. These complaints are pain, numbness, limitations of shoulder movements, tingling sensations, weakness, and development of arm lymphedema.[33,34] In a study by Beaulac et al., it was reported that the physical functional limitations of the patients were associated with the axillary dissection, and the functional insufficiency of the upper extremities in women with axillary dissection was reported to be three times more severe than in women without axillary dissection.[33] Long term arm and shoulder problems emerging after axillary dissection were associated with negative effects on functionality.[33] In several studies, women with breast cancer were shown to have some physical problems related to the treatment of the disease. These problems were reported to affect the QoL significantly causing severe anxiety and depression.[33-35] In our study, the delayed reconstruction group had more limitations in physical functions when compared to the immediate reconstruction group, probably since the complications of axillary dissection were more prevalent in this group. Additionally, it should be recognized that anxiety, depression, and psychological disorders in the delayed reconstruction group might also reduce the physical functions.

In our study, the pain score, which is one of the factors negatively affecting the QoL, were significantly higher in the delayed reconstruction group. It was mentioned that anxiety caused incread felt level of the pain. The chronic pain sequelae seen after breast surgery were reported to be more frequent in the patients undergoing axillary dissection.[36] The incidence of pain is shown to be smaller in the cases that undergo breast reconstruction af-

ter mastectomy in the same operating session.[37] There are several studies advocating immediate breast reconstruction because of the technical ease, smaller operation scars, and less pain, all making it the preferred choice.[38] In our study the delayed breast reconstruction group had higher pain scores than the immediate group. We suppose that higher anxiety and depression levels, and more prevalent axillary dissection among this group may be the causes.

In the EORTC QLQ C30 quality of life scale, the immediate reconstruction group showed significantly higher scores for general well being, physical and psychological functions when compared to the delayed reconstruction group. These results suggest that physical, social and psychological function scores affect the general well being scores positively. Additionally, the physical and psychological benefits of immediate reconstruction suggest that it may also have positive effects on patients in terms of social relations.

In a study which used the EORTC QLQ C30 quality of life scale, it has been reported that the patients with arm edema tend to have more physical, psychological, and social problems, and feel pain and tiredness more often than the others.[39] We suppose that the higher prevalence of arm lymphedema in the delayed reconstruction group may be the cause of the higher proportion of psychological problems in our study.

In the symptom scale, there were no significant differences in fatigue, nausea-vomiting, insomnia, dyspnea, appetite loss, constipation, diarrhea, or financial dificulties between the study groups.

Since the study was undertaken long after the administaration of adjuvant treatments, this finding should not be interpreted as unexpected.

Preservation of body integrity by reconstructive surgery can enhance the psychological and spiritual state of the patient, and reduce the devastating effects of mastectomy. Most women have a strong desire to the return to their previous lifestyle as soon as possible, thus preferring immediate reconstruction. Immediate reconstruction provides a re-establishment of the feeling of the body as a whole for the patients, increasing their self esteem, developing a sense of trust, and improving social relations and the QoL.[23,30,40]

In conclusion, the findings of this study which investigated the effect of timing of breast reconstruction on QoL in post-mastectomy patients, suggest that many factors alter the QoL of patients undergoing delayed reconstruction, and that immediate reconstruction provides psychological benefits. Breast reconstruction is becoming an integral part of the breast cancer treatment in order to give psychological support, preserve body integrity, and improve QoL of women undergoing mastectomy. However, breast reconstruction is far from being a cure-all, and does not compensate for the entire psychological and emotional trauma that the patient experiences during the diagnosis and treatment stages.[2,8,9,30,35,41]

Acknowledgements

We thank Mr. Birol Durukan and Prof. Ray Guillery for their valuable contribution in revising our manuscript. We also kindly appreciate Prof. Mehmet Bayramicli's help for providing patients' consent and operative details.

REFERENCES

1. Eser SY. Cancer incidence in Turkey. In: Tuncer M, ed. Cancer Control in Turkey. 1st ed. Ankara: Onur Typography; 2008. p.14-43.
2. McCraw JB, Papp C, Cramer A, Huang V, Bandak AZ, McMellin A, et al. Breast reconstruction following mastectomy. In: Bland KI, Copeland EM, eds. The Breast, Comprehensive Management of Benign and Malignant Disorders. 3rd ed. St. Louis: Ill. Saunders; 2004. p.899-940.
3. Alicikus ZA, Gorken IB, Sen RC, Kentli S, Kinay M, Alanyali H, et al. Psychosexual and body image aspects of quality of life in Turkish breast cancer patients: a comparison of breast conserving treatment and mastectomy. Tumori 2009;95(2):212-8.
4. Hu E, Alderman AK. Breast reconstruction. Surg Clin North Am 2007;87(2):453-67.
5. Caprice K, Niland J, Edge B, Ottesen RA, Hughes ME, Theriault R, et al. A multi-institutional analysis of the socioeconomic determinants of breast reconstruction. Ann Surg 2006;243(2):241-9.

6. Watson M. Psychological issues in breast reconstruction. In: della Rovere GQ, Benson JR, Breach N, Nava M, eds. Oncoplastic and Reconstructive Surgery of the Breast. 1sted. London: Taylor and Francis; 2004. p.131-4.
7. Irwig L, Bennets A. Quality of life after breast conservation or mastectomy; a systemic review. Aust NZ Surg 1997;67(11):750-4.
8. Cruickshank S, Kennedy C, Lockhart K, Dosser I, Dallas L. Specialist breast care nurses for supportive care of women with breast cancer. Cochrane Database Syst Rev 2008;(1): CD005634.
9. Montazeri A. Health-related quality of life in breast cancer patients: a bibliographic review of the literature from 1974 to 2007. J Exp Clin Cancer Res 2008;27-32.
10. Dag I. [The reliability and validity of SCL-90-R for university students]. Turk Psikiyatri Dergisi 1991;2(1):5-12.
11. Pinar R. Reliability and construct validity of the SF-36 in Turkish cancer patients. Qual Life Res 2005;14(1):259-64.
12. Guzelant A, Goksel T, Ozkok S, Tasbakan S, Aysan T, Bottomley A. The European Organization for Research and Treatment of Cancer C-30: an examination into the cultural validity and reliability of Turkish version of the EORTC QLQ-C30. Eur J Cancer Care 2004;13(2): 135-44.
13. Chung CS, Harris JR. Post-mastectomy radiation therapy; translating local benefits into-improved survival. Breast 2007;16(Suppl 2):S78-83.
14. Wapnir IL, Anderson SJ, Mamounas EP, Geyer CE Jr, Jeong JH, Tan-Chiu E, et al. Prognosis after ipsilateral breast tumor recurrence and locoregional recurrences in five National Surgical Adjuvant Breast and Bowel Project node-positive adjuvant breast cancer trials. J Clin Oncol 2006;24(13):2028-37.
15. Pomahac B, Recht A, May JW, Hergrueter CA, Slavin SA. New trends in breast cancer management, is the era of immediate breast reconstruction changing? Ann Surg 2006; 244(2):282-8.
16. Ananthakrishnan P, Lucas A. Options and considerations in the timing of breast reconstruction after mastectomy. Clev Clin J Med 2008;75(1):30-3.
17. Ragaz J, Olivotto IA, Spinelli JJ, Phillips N, Jackson SM, Wilson KS, et al. Locoregional radiation therapy in patients with high-risk breast cancer receiving adjuvant chemotherapy: 20-year results of the British Columbia randomized trial. J Natl Cancer Inst 2005;97(2):116-26.
18. Dickson MG, Sharpe DT. The complications of tissue expansion in breast reconstruction. A review of 75 cases. Br J Plast Surg 1987; 40(6):629-35.
19. Barreau L, Le MG, Rietjiens M. Risk factors for failure of immediate breast reconstruction with prosthesis after mastectomy for breast cancer. Cancer 1992;70(5):1145-51.
20. Al-Ghazal SK, Sully L, Fallowfield L, Blamey RW. The psychological impact of immediate rather than delayed breast reconstruction. Eur J Surg Oncol 2000;26(1):17-9.
21. Wolf L. Breast reconstruction from a woman's point of view: the experience of a female clinical nurse specialist-breast care. In: della Rovere GQ, Benson JR, Breach N, Nava M, eds. Oncoplastic and Reconstructive Surgery of the Breast. 1st ed. London: Taylor and Francis; 2004. p.175-80.
22. Montebarocci O, Lo Dato F, Baldaro B, Morselli P, Rossi NC. Anxiety and body satisfaction before and six months after mastectomy and breast reconstruction surgery. Psychol Rep 2007;101(1):100-6.
23. Burstein HJ, Winer EP. Primary care for survivors of breast cancer. N Engl J Med 2000; 343(15):1086-94.
24. Burwell SR, Case LD, Kaelin C, Avis NE. Sexual problems in younger women after breast cancer surgery. J Clin Oncol 2006;24(18): 2815-21.
25. Cella D, Wagner L, Cashy J, Yount S, Lilenbaum RC. Should health-realted quality of life be measured in cancer symptom management clinical trials? Lessons learned using the functional assessment of cancer therapy. J Natl Cancer Inst Monogr 2007;(37):53-60.
26. Roth RS, Lowery JC, Davis J, Wilkins EG. Quality of life and affective distress in women seeking immediate versus delayed breast reconstruction after mastectomy for breast cancer. Plast Reconstr Surg 2005;116(4):993-1002.
27. Rowland JH, Desmond KA, Meyerowitz BE, Belin TR, Wyatt GE, Ganz PA. Role of breast reconstructive surgery in physical and emotional outcomes among breast cancer survivors. J Natl Cancer Inst 2000;92(17): 1422-9.
28. Salhab M, Al Sarakbi W, Joseph A, Sheards S, Travers J, Mokbel K. Skin-sparing mastectomy and immediate breast reconstruction: patient satisfaction and clinical outcome. Int J Clin Oncol 2006;11(1):51-4.
29. Naidu N, Preminger A, Rogers K, Messina P, Gayle LB. Determinants of aesthetic satisfaction following TRAM and implant breast reconstruction. Ann Plast Surg 2004;52(5):464-70.
30. Pluchinotta AM. Breast reconstruction from a woman's point of view: the experience of a male breast surgeon. In: della Rovere GQ, Benson JR, Breach N, Nava M, eds. Oncoplastic and Reconstructive Surgery of the Breast. 1st ed. London: Taylor & Francis; 2004. p.167-74.
31. Harcourt DM, Rumsey NJ, Ambler NR, Cawthorn SJ, Reid CD, Maddox PR, et al. The psychological effect of breast reconstruction: a prospective multicenter study. Plast Reconstr Surg 2003;111(3):1060-8.
32. Elder EE, Brandberg Y, Björklund T, Rylander R, Lagergren J, Jurell G, et al. Quality of life and patient satisfaction in breast cancer patient after immediate breast reconstruction. Plast Reconstr Surg 2005;14(3):201-8.
33. Beaulac SM, McNair LA, Scott TE, LaMorte WW, Kavanah MT. Lymphedema and quality of life in survivors of early-stage breast cancer. Arch Surg 2002;137(11): 1253-57.
34. Sakorafas GH, Peros G, Cataliotti L, Vlastos G. Lymphedema following axillary lymph node dissection for breast cancer. Surg Oncol 2006;15(3):153-65.
35. Holland J. Psychosocial care of patients: psyco-oncology's contribution. J Oncol 2003; 21(23 Suppl):253-65.
36. Williams J, Filshie J. Chronic pain after reconstructive surgery for breast cancer. In: della Rovere GQ, Benson JR, Breach N, Nava M, eds. Oncoplastic and Reconstructive Surgery of the Breast. 1st ed. London: Taylor and Francis; 2004. p.145-56.
37. Cohen L, Hack TF, de Moor C, Katz J, Goss PE. The effects of type of surgery and time on psychological adjusment in women after cancer treatment. Ann Surg Oncol 2000;7(6):427-34.
38. Mehrara BJ, Disa JJ. The TRAM flep. In: King T, Borgen P, eds. Atlas of Procedures in Breast Cancer Surgery. 1st ed. London: Francis and Taylor; 2005. p.183-94.
39. Pyszel A, Malyszczak K, Pyszel K, Andrzejak R, Szuba A. Disability, psychological distress and quality of life in breast cancer survivors with arm lymphedema. Lymphology 2006; 39(4):185-92.
40. Gil-Fernandez J, Ramos C, Tamayo T, Tomas F, Figuera A, Arranz R, et al. Quality of life and psychological well-being in Spanish long-term survivors of Hodgkin's disease: results of a controlled pilot study. Ann Hematol 2003; 82(1):14-8.
41. Longman AJ, Braden CJ, Mishel MH. Side-effects burden, psychological adjustment and life quality in women with breast cancer: pattern of association over time. Oncol Nurs Forum 1999;26(5):909-15.