ORIGINAL ARTICLE

THE PSYCHOLOGICAL IMPACT OF BREAST-CONSERVING SURGERY VERSUS MASTECTOMY IN EGYPTIAN FEMALE PATIENTS

Ahmed Abdelatif[1,2], Galal Abounaggah[1,2], Mohamed Elmesery[1,2], Mohamed Asal[1,2], Moataz Eweda[1,2]

[1]Alexandria University of Medicine, Alexandria, Egypt
[2]Alexandria Main University Hospital, Alexandria, Egypt

Corresponding author: Moataz Eweda
E-mail: zoz30592@gmail.com

Abstract

The previous research on breast cancer's psychological impact was based on its effects on shape, with breast removal, and the subsequent effect on sexual attractiveness. Several changes that affect life behavior after breast cancer surgery including insomnia, difficulty returning to usual activities and work, nightmares and loss of appetite. These manifestations may be due to depression but they are only considered abnormal if they persist after the period of physical recovery from surgery. We conducted a study to assess the effects of the surgical decision and psychological impact of this decision on Egyptian females with breast cancer. Most patients were subjected to a questionnaire including all environmental and clinical factors affecting the surgical decision either mastectomy or breast-conserving surgery. As a conclusion we can say that breast conservative surgery is better accepted psychologically by patients than modified radical mastectomy as it did not affect sexual life, cosmetic appearance, mood, self-satisfaction, and quality of life.

Keywords*: breast cancer, quality of life, psychological impact, conservative, mastectomy*

Introduction

Treatment of breast cancer is dependent on a variety of factors including the stage of diagnosis, tumor size and location, and tumor characteristics; patients with stage II or III at diagnosis can receive more advanced cancer treatment, which can contribute to greater side effects. Breast cancer treatment is usually based on the care of the breast and the local lymph nodes with surgery either with or without radiotherapy and adjuvant systemic therapy.

Variable surgical procedures are available for treating breast cancer. The radical mastectomy introduced by Halsted in 1882 [1] was the principal treatment for breast cancer of any size or type for 80 years, regardless of the patient's age. Apart from a few modifications, such as enlarging the extent of the dissection to include the internal mammary nodes or reducing it to spare the pectoralis muscles, this operation was associated with poor cosmetics and significant impairment of shoulder movements [2]. Modified radical mastectomy (MRM) has been one of the globally accepted surgical techniques for breast cancer and in some selected patients it is the gold standard type of surgery, although excision of a breast malignancy has become recently managed with less invasive techniques as skin-sparing mastectomy (SSM); reported by Toth and Lappeort 1984 [3], nipple-sparing mastectomy (NSM); reported by Bromley S. Freeman 1962 [4] and breast conservative surgery (BCS).

The earliest research on breast cancer's psychological impact was based on its effects on femininity, with breast removal, and the

subsequent threat to sexual attractiveness. Several changes that affect life behavior are the result of breast cancer diagnosis and surgical treatment, including insomnia, recurrent nightmares, loss of appetite, difficulty returning to usual household activities and work, and inability to concentrate [5]. Although these may be manifestations of depression, they are only considered abnormal if they persist beyond the period of physical recovery from surgery (several months). The physical result of the radical mastectomy was huge, making insomnia, have sexual intimacy, and get used to clothing and body image problems. Also return to usual physical and social activities was affected in many women [5]. Fear of recurrence was expected by 50% of women despite radical surgery and feminine shape affection as a result of mastectomies. It's not surprising that such worries were common place. On the other side, breast-conserving surgery (BCS) keeps the body image of a woman intact and offers advantage concerning body image overcoming mastectomy.

While the results of emotional dysfunction of women who had breast conservation are highly variable in comparison to those who had a mastectomy as the radical surgery group of women had more psycho-emotional disruption in terms of feelings about body shape, physical attractiveness, and sexuality, in comparison with those who had lumpectomy and irradiation which may interfere temporarily with the patients' lifestyle and may cause the patients to worry more about their future [6], patients with lumpectomy report fewer feelings of unattractiveness and loss of femininity and less change in the body shape. However, anxiety and thinking of recurrence are more than in modified radical mastectomy [7].

This study aim is to assess the effects of the surgical choice and psychological impact of this choice on Egyptian females who had breast cancer.

Materials and Methods

Patients

The study was conducted retrospectively on 400 female patients with certain inclusion criteria. They underwent either breast-conserving surgery or mastectomy and had attended the Surgical Oncology Unit at Alexandria Main University Hospital during the period from June 2018 to January 2020. Patients were classified into two groups:

Group A: patients who underwent breast-conserving surgery (BCS) including 120 patients.

Group B: patients who underwent modified radical mastectomy (MRM) including 280 patients.

Informed written consent was obtained from each patient participating in this study.

Methods

Most patients were subjected to a questionnaire including all environmental and clinical factors affecting the surgical decision either mastectomy or breast-conserving surgery. Assessment of psychological aspects of all females was performed using:

Diagnostic and Statistical Manual of Mental Disorders [8] (text revision 4th edition) that could detect the presence or absence of depression.

Hamilton Rating Scale for depression [9] that would be used to grade the depression in patients already diagnosed with an affective disorder. There was some consensus for interpretation of total scores:

- Very severe >23,
- Severe: 19 -22,
- Moderate: 14 – 18,
- Mild: 8 – 14, and
- No depression: 0 – 7.

After the patients had answered the questions, responses were scored to detect psychological morbidities in these categories.

The two groups were compared with regard to demographic data, clinical data, patients' preference, patients' satisfaction, the total score of depression, and according to the diagnostic and statistical manual of mental disorder.

We analyzed the data using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp), and qualitative data were described using numbers and percentages. The Kolmogorov-Smirnov test was also used to verify the normality of distribution. Quantitative data were analyzed using (minimum and

maximum) range, mean, SD, and median. The significance of the obtained results was judged at the 5% level [10].

Many tests were used including: 1 – Chi-square test, 2 – Fisher's Exact or Monte Carlo correction, 3 – Student t-test, 4 – Mann Whitney test.

Results

The study included 400 female patients with breast cancer. Patients were categorized into two groups:

Group A: patients who underwent breast-conserving surgery (BCS); 120 patients.

Group B: patients who underwent modified radical mastectomy (MRM); 280 patients (Table 1).

Regarding the pathological types, all the patients in group A had invasive ductal carcinoma (100%), while for those in group B most of the patients had also invasive ductal carcinoma (86.4%) p= <0.001.

Regarding the site of the lesion; most of the patients in group A had upper outer quadrant lesion (55%) and for those in group B had also upper outer quadrant lesion (42.5%) p-value <0.001.

Demographic data	Group A - BCS (n =120)		Group B - MRM (n =280)		Test of sig.	P
	No.	%	No.	%		
Marital state						
Single	14	11.7	33	11.8	χ^2=0.001	0.973
Married	106	88.3	247	88.2		
Age (years)						
<40;	32	26.7	46	16.4	χ^2= 10.027*	0.007*
40 – 49	40	33.3	76	27.1		
50+	48	40.0	158	56.4		
Min. – Max.	25.0 – 71.0		26.0 – 75.0			
Mean ± SD.	46.82 ± 10.47		51.20 ± 10.93		t=3.721*	<0.001*
Median	47.0		51.50			
Patient education						
Illiterate	20	16.7	160	57.1	χ^2= 83.011*	<0.001*
Primary school	14	11.7	50	17.9		
Secondary school	12	10.0	10	3.6		
High school	26	21.7	14	5.0		
College	48	40.0	46	16.4		
Patient occupation						
Housewife	50	41.7	138	49.3	χ^2= 3.177	0.204
Medium professional	56	46.7	104	37.1		
High professional	14	11.7	38	13.6		
Husband job	(n = 106)		(n = 247)			
Manual worker	24	22.6	86	34.8		
low professional	38	35.8	82	33.2	χ^2= 5.614	0.060
high professional	44	41.5	79	32.0		
Family residence						
low class	34	28.3	100	35.7		
medium class	66	55.0	152	54.3	χ^2=4.485	0.106
high class	20	16.7	28	10.0		

Table 1 – Comparison between the two studied groups according to demographic data (χ^2: Chi-square test, p: p-value for comparing between the two groups, *: statistically significant at p≤0.05)

Clinical assessment	Group A - BCS (n =120)		Group B - MRM (n =280)		Test of sig.	P
	No.	%	No.	%		
Pathological type						
IDC (invasive ductal carcinoma)	120	100.0	242	86.4	χ^2= 17.995*	<0.001*
MIXED (invasive ductal and lobular)	0	0.0	28	10.0		
ILC	0	0.0	10	3.6		
Site of breast cancer						
UOQ	66	55.0	119	42.5	χ^2= 45.354*	<0.001*
LOQ	8	6.7	4	1.4		
LIQ	14	11.7	30	10.7		
UIQ	32	26.7	52	18.6		
Retro-areolar	0	0.0	36	12.9		
Multicentric	0	0.0	39	13.9		
Size of breast cancer						
Min. – Max.	1.0 – 5.0		2.0 – 8.50		t= 19.393*	<0.001*
Mean ± SD.	3.35 ± 0.80		4.53 ± 1.43			
Median	2.40		4.50			
Axillary LN clinical						
Not palpable	76	63.3	154	55.0	χ^2= 2.387	0.122
Palpable	44	36.7	126	45.0		
Axillary LN mammography						
No	42	35.0	76	27.1	χ^2= 2.493	0.114
Yes	78	65.0	204	72.9		
Neoadjuvant therapy						
No	96	80.0	220	78.6	χ^2= 0.103	0.748
Yes	24	20.0	60	21.4		
Adjuvant therapy						
No	10	8.3	12	4.3	χ^2= 2.648	^{MC}p= 0.104
Yes	110	91.7	268	95.7		
Stage						
I	30	25.0	8	2.9	χ^2= 98.148*	<0.001*
II	90	75.0	156	55.7		
III	0	0.0	116	41.4		
Grade						
1	2	1.7	12	4.3	χ^2= 5.108	0.078
2	100	83.3	205	73.2		
3	18	15.0	63	22.5		
Patient sharing in treatment decision						
No	10	8.3	54	19.3	χ^2= 7.497*	0.006*
Yes	110	91.7	226	80.7		

Table 2 – Comparison between the two studied groups according to clinico-pathological criteria (χ^2: Chi-square test, MC: Monte Carlo, FE: Fisher Exact, p: p-value for comparing between the two groups, *: statistically significant at p≤0.05)

	Patient satisfaction	Group A - BCS (n =120)		Group B - MRM (n =280)		χ^2	P
		No.	%	No.	%		
Patient preference	No	24	20.0	166	59.3	51.987*	<0.001*
	Yes	96	80.0	114	40.7		
Patient satisfaction	No	32	26.7	144	51.4	20.903*	<0.001*
	Yes	88	73.3	136	48.6		

Table 3 – Comparison between the two studied groups according to patient satisfaction (χ^2: Chi-square test, p: p-value for comparing between the two groups, *: statistically significant at p ≤ 0.05)

The total score of depression	Group A BCS (n =120)		Group B MRM (n =280)		Test of sig.	P
	No.	%	No.	%		
Hamilton rating scale for depression						
No depression 0 – 7	26	21.7	28	10.0		
Mild (8 – 13)	66	55.0	87	31.1	χ^2= 43.122*	<0.001*
Moderate (14 – 18)	20	16.7	115	41.1		
Sever (19 – 22)	8	6.7	50	17.9		
Min. – Max.	4.0 – 21.0		2.0- 20.0			
Mean ± SD.	10.58 ± 4.67		13.35±5.0		t=5.163*	0.001*
Median	9.0		15.0			

Table 4 – Comparison between the two groups according to the total score of depression (χ^2: Chi-square test, t and p: t and p values for Student t-test for comparing between the two groups, p: p-value for comparing between the two groups, *: statistically significant at $p \leq 0.05$)

Diagnostic and statistical manual of mental disorders	Group A BCS (n =120)		Group B MRM (n =280)		χ^2	P
	No.	%	No.	%		
Mood /feeling of the patient						
Happy	90	75.0	116	41.1	9.782*	0.002*
Unhappy	30	25.0	164	58.6		
Patient hobby before having the disease						
Continues	116	96.7	262	93.6	1.548	0.213
Not	4	3.3	18	6.4		
Weight loss						
Less than 5%	114	95.0	76	27.1	155.102*	<0.001*
More than 5%	6	5.0	204	72.9		
Sleep habit						
Increase	8	6.7	76	27.1	21.229*	<0.001*
Decrease	112	93.3	204	72.9		
Daily activity						
Unchanged	88	73.3	98	35.0	49.616*	<0.001*
Decrease	32	26.7	182	65.0		
Feeling of worthlessness						
No	120	100.0	82	29.3	168.034*	<0.001*
Yes	0	0.0	198	70.7		

Ability of concentration						
No change	88	73.3	185	66.1	2.044	0.153
Decrease	32	26.7	95	33.9		
Do you think that life is worth living						
No	0	0.0	1	0.4	0.430	0.512
Yes	120	100.0	279	99.6		

Table 5 – Comparison between the two studied groups according to the diagnostic and statistical manual of mental disorders (χ^2: Chi-square test, p: p-value for comparing between the two groups, *: statistically significant at $p \leq 0.05$)

Regarding tumor size, the mean for group A was 3.35±0.80cm and group B was 4.53±1.43cm, p-value <0.001.

Regarding the stage, most of the patients in group A had stage II (75%), most of group B had also stage II (55.7%), p-value < 0.001.

Regarding patient sharing in treatment decision, 10 patients (8.3%) in group A and 54 patients (19.3%) in group B did not share in treatment decision compared to 110 patients (91.7%) in group A and 226 patients (80.7%) in group B shared in treatment decision, P-value = 0.006 (Table 2).

A statistically big difference in patients' preferences was found between breast-conserving surgery (BCS) and modified radical mastectomy (MRM), it was noticed that 24 patients (20%) did not prefer BCS in group A whereas 166 patients (59.3%) did not prefer MRM in group B. However, 96 patients preferred BCS (80%) in group A, while 114 patients (40.7%) preferred MRM in group B, p-value < 0.001.

A statistically big difference was found in patients' satisfaction. There were 32 patients (26.7%) in group A as well as 144 patients (51.4%) in group B who were not satisfied, while 88 patients (73.3%) in group A and 136 patients (48.6%) in group B were satisfied, p-value < 0.001 (Table 3).

Table 4 shows a comparison between the two studied groups according to the total score of depression which was statistically significant. Hamilton rating scale was used to assess the severity of depression. For those in group A; 55% of the patients had mild depression while for those in group B 41.1 % of the patients had moderate depression, p-value <0.001.

Table 5 shows Comparison between the two groups according to the diagnostic and statistical manual of mental disorders which are mood of the patient, patient hobby before having the disease, weight loss, sleep habit, daily activity, feeling of worthlessness, the ability of concentration, and those who think that life is worth living.

There was a statistically big difference between the two groups regarding the mood/ feeling of the patient, weight loss, sleep habits, daily activity, and feeling of worthlessness.

Regarding mood/feeling of the patient, (75%) in group A and (41.1%) in group B were happy, while (25%) in group A and (58.6%) in group B were unhappy, p-value =0.002.

Regarding weight loss; (95%) of group A lost less than 5%, while in group B (27.1%), and for those who lost more than 5 % in group B (72.9%) while for group A (5%), p-value <0.001.

Regarding sleep habit, (27.1%) in group B had an increase in sleep habit and (6.7%) in group A, and for those who had a decrease in their sleep habit in group A (93.3%) while in group B (72.9%), p-value <0.001.

Regarding daily activity, in group A (73.3%) did not change their daily activity while (35%) in group B, while those who had a decrease in their daily activity (65%) in group B and (26.7%) in group A, p-value <0.001.

Regarding feeling of worthlessness, (100%) in group A and (29.3%) in group B did not feel worthless, while those who had a feeling of worthlessness (70.7%) in group B, p-value <0.001.

Discussions

At present, there is a consensus on BCS as choice for patients with early-stage breast cancer [11], however, no comparative study is done to investigate the psychological influence of surgical procedures on Egyptian patients with breast cancer. Here, we provided a comparison between BCS and modified radical mastectomy (MRM) as regards to its psychological and mental impact.

Our first observation was that 80% of patients in the BCS group preferred their procedure while only 40.7% of patients in the MRM group preferred their procedure. The percentage of satisfied patients in the BCS was 73.3% while the percentage in the MRM group was only 48.6%.

This was consistent with M. Lagendijk [12] report in which outcome were compared for different surgeries and stated that MRM was associated with lower ‘’satisfaction with breast’’ scores than BCS. Soufiane Berhili [13] reported similar results.

However, Jagsi et al [14] reported a similar rate of satisfaction between the patients who underwent the two techniques. It was a huge study that was conducted on 1450 patients who responded to surveys and experienced no recurrence, 963 underwent breast-conserving surgery, 263 mastectomies without reconstruction, and 222 mastectomies with reconstruction. Cosmetic satisfaction was similar between those receiving breast conservation therapies and those receiving mastectomy with reconstruction.

The results of Hsin-Yun Tsai [15] were in accordance with Jagsi et al [14] and in contrary to our results as they reported no significant difference at any of QOL domains except body image as women who underwent BCT reported better body image than those who received mastectomy.

Nevertheless, Sun et al [16] reported two different stages of satisfaction. They found that the short-term psychological effect on patients receiving BCS is worse than that with MRM on the other hand BCS effect was better than MRM 6 months postoperatively and also BCS left less effect on long term psychological state of breast cancer patients in comparison with MRM.

Our most important result was that patients suffering from MRM had significantly more depression scores than patients who underwent BCS. The percentage of patients with no depression, mild, moderate, and severe depression in patients undergoing BCS was 21.7%, 55.0%, 16.7%, and 6.7% respectively. While in patients undergoing MRM the percentage was 10.0%, 31.1%, 41.1%, and 17.9% respectively.

The explanation of that high prevalence of depression among patients with mastectomy is that loss of a breast, which is important to female sexual performance and pleasure, body shape, and reproduction, disrupts the biological and psychological and social balance, causes related problems so affects the quality of life of the patients with breast cancer [17]. Ana Olivia Corte´s-Flores found a lower prevalence of female sexual [18] dysfunction in patients treated with conservative mastectomy Alternatively, radical mastectomy was offered to older patients, a condition that could contribute together with a loss of female perception to a higher prevalence of sexual dysfunction.

Shoshana M Rosenberg [19] reported that young breast cancer survivors who undergo more extensive surgery have worse body image, sexual health, and anxiety compared with women undergoing less extensive surgery. In another study, body image, future perspective, arm symptoms, depression symptoms, and hair loss was better in patients who received BCS while there was no difference in systemic therapy, side effects, and breast symptoms between BCS and MRM groups [20]. Kement et al. [21] reported that quality of life was better both physically and mentally in patients who received BCS. In other studies, comparing BCS and MRM, Acil and Cavdar [22] showed less physical and mental status in MRM patients while Trinh et al. [23] reported better social and physical quality of life.

Elvin T. Ng`s [24] meta-analysis on six studies found that breast-conserving surgery was preferred over mastectomy because BCS leads to better outcomes in body image. Hadi et al. [25] found better global health and role functioning in patients receiving BCS and more dyspnea, lack of sleep, fatigue, nausea, vomiting, pain, depression symptoms, and arm symptoms in patients who underwent MRM. Akca [20] reported that patients who received BCS or simple mastectomy for breast cancer had a better

quality of life. Although, they reported significantly better social functioning in patients who received BCS while there was no difference in physical and emotional status between the two groups [26].

Another recent study that completely agreed to our results was conducted by Akça and his colleagues [27]. They found that BCS had a better impact on patient satisfaction, psychological, physical role, cognitive, and social functions, and symptom scale scores. When the identical parameters were taken into consideration, better outcomes of BCS on the patients were observed in comparison with mastectomy patients. Although not statistically significant, BCS had more patient satisfaction on sexual performance compared to mastectomy. Patients with advanced-stage disease and elder patients had more unfavorable health-related quality of life (HRQoL) scores than younger patients and patients with early stages of breast cancer.

Han Qiu [28] revealed that the postoperative SCL (symptoms checklist)-90 score in the observation group was better than that before the operation, and better that in the control group, further suggesting that breast-conserving surgery has a promoting effect on the psychological state of patients with breast cancer.

Nevertheless, many studies found no significant differences between psychological outcomes of the two techniques regarding depression symptoms. Steinberg et al [29] showed that BCS patients as well as mastectomy patients reported analogous negative alterations in self- image during the first 6 months after surgery, but in the BCS patients these were less found than in the mastectomy patients. However, by the second year BCS patients showed virtually no impairment of self-image due to their cancer treatment, whereas the negative changes in self-image persisted in mastectomy patients. The absence of differences between BCS and MRM patients on depression measurements, as found by Chengjiao Zhang1`s systematic review [30] agrees with the findings in other studies.

Sanger and Reznikoff [31] did not observe any differences in the psychological adjustment of the two groups after testing three aspects of body image and two general adjustment variables. Their conclusion was that general psychological adjustment might not be greatly affected by a (modified) radical mastectomy, provided that the patient was well adjusted before surgery.

A surgical procedure as mutilating as mastectomy is expected to have important consequences. The female breast with its feeding and sexual functions has such a symbolic meaning that its amputation is supposed to have consequences for the woman's self-image, her feelings of femininity and her social functioning [32], Nevertheless, our findings suggest that at least in the initial phase after surgery, mutilation is not the main cause of depressive symptoms. Alagaratnam and Kung [33] found that post-mastectomy patients are at no greater risk of developing psychosocial morbidity than patients with other malignancies. Although they studied oriental women (with perhaps a different sexual symbolism of the breast) in a long-term follow-up, their conclusions might also apply to the immediate post-surgery period: the diagnosis of malignancy is a more powerful factor in causing depressive symptoms than the mutilation itself. The preparatory aspect of depression is more important than the reactive aspect. The confrontation with a potentially lethal disease has a stronger impact than the change in body image. Both groups of women have to cope equally with the diagnosis of malignancy. Mastectomy may even carry a greater reassurance than BCS in the sense that the patient may believe that all malignant tissue has been removed. In time the BCS patients will probably be reassured that all malignancy was removed. A difference between the groups might then emerge in analogy with the differences that Steinberg et al. [29] found for the evolution of the body image in the two groups.

Conclusion

Brest conservative surgery is better accepted psychologically by patients than modified radical mastectomy as it did not affect sexual life, cosmetic appearance, mood, self-satisfaction, and quality of life.

The level of depression is higher in patients with modified radical mastectomy comparing to those with breast conservative surgery.

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