



Is there any role of reduction mammoplasty in decreasing breast cancer risk in gigantomastia?

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Abstract

Aim: Large breasts create psychological and physical problems in women, all of whom must also keep in mind the common problem of breast cancer. In the present study we examine the effect of breast reduction surgery on breast cancer risk.

Materials and Methods: Our retrospective study is based on the records (between June 1, 2014, and June 30, 2019) of patients who underwent breast reduction surgery in the Plastic, Reconstructive and Aesthetical Surgery clinic of a training and research hospital. Statistical analyses were conducted using IBM SPSS Statistics (Version 25.0. Armonk, NY: IBM Corp.). Normal distribution of the data was analyzed with Kolmogorov-Smirnov. The data assessment included descriptive statistical methods and Kruskal-Wallis test. The results were evaluated at a 95% confidence interval and a significance level of $p < 0.05$.

Results: Of the 134 patients included in the study, 47% were aged 36–50 years and 60.4% had a body mass index of ≥ 40 . The shortest follow-up was 4 years, the longest follow-up was 9 years and the mean follow-up was 5.5 years. The mean amount of tissue removed from the right breast was 1050.54 ± 484.90 , the mean amount of tissue removed from the left breast was 1059.54 ± 522.28 , and the mean length of hospital stay was 1.15 ± 0.74 days. The pedicle of choice was superomedial in 55.2% and the inverted-T scar technique was used in 66.4%. Definitive findings of neither in-situ nor invasive cancer were identified in any of the cases.

Conclusion: Despite major sequelae such as external permanent scarring and decrease in breastfeeding and nipple sensation, breast reduction surgery is the operation that records the highest patient satisfaction in plastic, reconstructive and aesthetica surgery, as it provides physical and psychological relief by eliminating the heavy weight that affects the shoulders, back and neck. It is also known that the risk of breast cancer is decreased due to the removal of a considerable amount of breast tissue with cancer potential from the body, as well as the early diagnosis and treatment of incidentally detected cancer cases, albeit at a low rate. This is also supported by our findings.



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Introduction

Gigantomastia or breast hypertrophy leads to physical limitations and emotional problems in women [1, 2], and breast reduction is a common treatment method of choice to reduce the extra physical weight associated with breast hypertrophy [3–5]. Even though the primary solution for women diagnosed with obesity (body mass index > 30) and morbid obesity (body mass index > 40) is first to try to lose weight, breast reduction surgery is a good treatment option for breast hypertrophy (1). If the weight loss recommendations of the physician for obese patients result in successful outcomes, the postoperative risks may be reduced, and the reduction of large breasts attributable to

obesity following weight loss may make surgical treatment unnecessary [6, 7].

Having an ideal breast size is known to improve the mental and physical health of women [8, 9], enhance their quality of life [10, 11], boost self-confidence [12, 13], support positive body image and ensure social life adaptation [14–17]. Patient satisfaction in the postoperative period is associated with complication development [18, 19], decreased BMI [20] and a more aesthetical appearance [11].

Breasts are indispensable for a woman's ability to become a mother and feed her baby. Breast and nipple sensitivity also have a role in sexual functions. Deformities, non-optimal size or functional problems of the breast may put femininity and motherhood at risk, and can lead to significant problems for the baby and spouse. Although a direct relationship with large breasts has not been estab-

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lished, studies have reported a correlation between obesity and breast cancer [21, 22], although aside from obesity, it has been emphasized that breast cancer is also triggered by the post-menopausal decline in hormones [23, 24]. Various studies have been conducted into breast reconstruction surgery rates, although a review of literature revealed no studies reporting the findings of breast reduction surgery rates either for the world as a whole or for Turkey, patient characteristics and the subsequent follow-up for breast cancer. The present study examines the effect of breast reduction surgery on breast cancer risk.

Materials and Methods

For this retrospective and descriptive study, the records of patients who had undergone breast reduction surgery between June 1, 2014, and June 30, 2019 were reviewed at a training and research hospital, making use of a data entry form that included sections on the sociodemographic characteristics of the patients, breast hypertrophy details, the operation process, the procedure performed, pathology and ultrasonography/mammography results, pedicle choice and length of hospital stay.

Inclusion criteria

1. Over 18 years
2. Suffering from Gigantomastia
3. Not diagnosed with any malignancy before breast reduction surgery
4. Patients without language or speech disability were included in the study.

Exclusion criteria

1. Under 18 years old
2. Non-gigantomastia and applied for other breast surgeries
3. Diagnosed with malignancy before breast reduction surgery
4. Patients with language and speech disabilities were excluded.

The study results were analyzed statistically using IBM SPSS Statistics (Version 25.0. Armonk, NY: IBM Corp.). Descriptive statistical methods (frequency, standard deviation, mean) were used for the data assessment, with the statistical significance of the differences between the means determined by a Kruskal-Wallis test. Kolmogorov-Smirnov was conducted to test the assumptions of normal distribution, revealing that the data were not normally distributed. The results were evaluated at a 95% confidence interval and a significance level of $p < 0.05$.

Before starting the study, the necessary legal permissions were obtained from the Clinical Research Ethics Committee of Adiyaman University. Following the Ethics Committee Report, the patient records were accessed, and to ensure patient confidentiality only the health records were accessed, without examining any identity information.

Results

The descriptive characteristics of the patients who underwent breast reduction surgery are presented in Table 1.

According to Table 1, 34.3% of the patients undergoing breast reduction were aged 18–35 years, 47% 36–50 years and 18.7% ≥ 51 years. The BMI was 25–29 in 14.9%, 30–39 in 24.6%, and ≥ 40 in 60.4% of the patients. The amount of tissue removed from the right breast was 100–500 g in 17.9%, 501–1000 g in 25.4%, 1001–1500 g in 38.8%, ≥ 1501 g in 16.4%, and ≥ 2001 g in 1.5%. The amount of tissue removed from the left breast was 100–500 g in 17.2%, 501–1000 g in 30.6%, 1001–1500 g in 33.6%, ≥ 1501 g in 14.9%, and ≥ 2001 g in 3.7%.

The pedicle of choice was inferior in 14.9%, superomedial in 55.2%, superolateral in 24.6% and other (vertical bipedicle, central) in 5.2% of the patients. The scar pattern was inverted-T in 66.4%, vertical in 18.7% and verticolateral in 14.9%. The mean age of the patients was 40.24 ± 11.62 years (min 18; max 73), the mean amount of tissue removed from the right breast was 1050.54 ± 484.90 g (min 144; max 2950), the mean amount of tissue removed from the left breast was 1059.54 ± 522.28 g (min 142; max 3600), and the mean length of hospital stay was 1.15 ± 0.74 (min 1; max 3) days.

The mammography/ultrasonography (USG) and pathology results of the patients are presented in Table 2. According to the pathology results, 40.29% of the patients had fibrocystic changes of the right breast, 38.8% had fibrocystic changes of the left breast and 16.41% had reduction material in left breast with ductalectasis. The proportion of patients with right breast tissue removal and left breast tissue removal was 28.35% and 26.86%, respectively. Right breast adipose tissue was removed in 26.11% and left breast adipose tissue was removed in 31.34%.

According to the mammography/USG results, the proportion of patients classified as BIRADS (Breast Imaging Reporting and Data System) 0, 1, 2, 3 and 4 was 18.66%, 4.48%, 29.85%, 5.97% and 2.24%, respectively. The proportion of patients with bilateral glandular tissue dominance and bilateral retroareolar duct ectasia was 8.96% separately. The proportion of patients with cystic lesions was 13.43%.

The Kruskal-Wallis analysis revealed a statistically significant difference between scar pattern and BMI, and BMI and pedicle choice ($p = .001$) (Table 3). In this regard, as can be seen in Figures 1 and 2, the choice was verticolateral scar and inferior pedicle in patients with a BMI of 25–29. The pattern was mostly a vertical scar in the patients with a BMI of 30–39 and an inverted-T scar in those with a BMI of ≥ 40 . The pedicle of choice was mostly superolateral pedicle in vertical scars and superomedial in inverted-T scars.

Table 4 presents the reasons for hospital admissions of patients within two years of their breast reduction surgery. Accordingly, 3% of the patients presented to the hospital with scar site or breast pain, 4.5% with numbness and/or reduced nipple sensitivity, 1.5% with aesthetic concerns, 3.7% with breastfeeding problems and 8.2% with breast stiffness.

Discussion

The positive effects of breast reduction surgery include the relief of physical weight, a better frame of mind and

Table 1. Table 1. Descriptive Characteristics of Patients Who Underwent Breast Reduction (n=134)

Descriptive Characteristics	n	%
Age Groups		
18-35 years	46	34.3
36-50 years	63	47
≥51 years	25	18.7
Marital Status		
Married	36	26.87
Single	98	73.13
Body Mass Index		
25-29	20	14.9
30-39	33	24.6
≥40	81	60.4
Amount of Tissue Removed from the Right Breast		
100-500 g	24	17.9
501-1000 g	34	25.4
1001-1500 g	52	38.8
≥1501 g	22	16.4
≥2001 g	2	1.5
Amount of Tissue Removed from the Left Breast		
100-500 g	23	17.2
501-1000 g	41	30.6
1001-1500 g	45	33.6
1501-2000 g	20	14.9
≥2001 g	5	3.7
Pedicle Choice		
Inferior pedicle	20	14.9
Superomedial pedicle	74	55.2
Superolateral pedicle	33	24.6
Other	7	5.2
Scar Pattern		
Inverted-T	89	66.4
Vertical	25	18.7
Vericolateral	20	14.9
Mean Values	Meant ± SD	Min, Max
Age	40.24 ± 11.62	(18, 73)
Amount of Tissue Removed from the Right Breast	1050.54 ± 484.90	(144, 2950)
Amount of Tissue Removed from the Left Breast	1059.54 ± 522.28	(142, 3600)
Length of Hospital Stay (days)	1.15 ± 0.74	(1, 3)

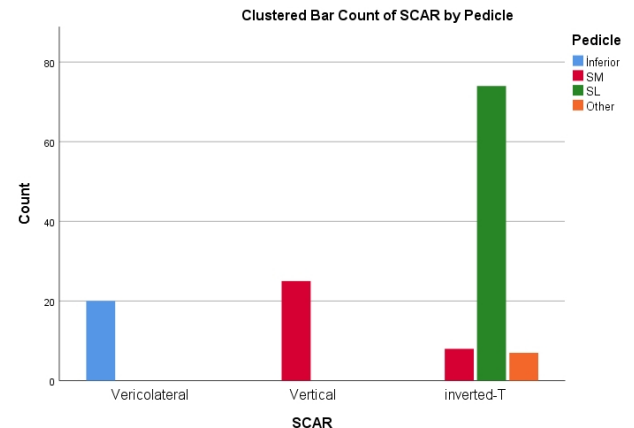
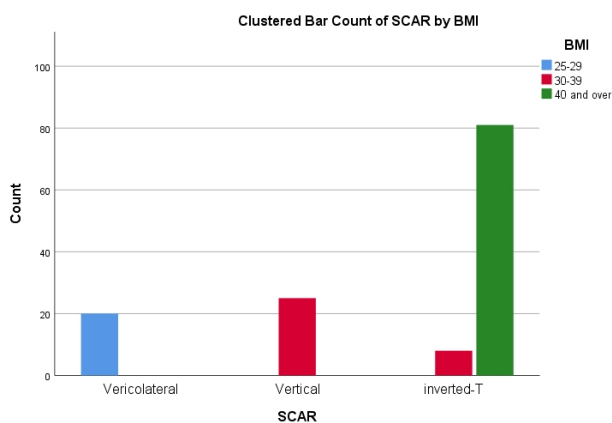


Figure 1. BMI-Scar Pattern Graph (n=134)
BMI: Body Mass Index

Figure 2. Scar Pattern-Pedicle Choice Graph (n=134)
SM; Superomedial, SL; Superolateral

Table 2. Table 2. Pathology and Mammography/Ultrasonography Results (n=134)

Test	Result*	n	%
Pathology Results	Fibrocystic change of right breast	54	40.29
	Fibrocystic change of left breast	52	38.8
	Duct ectasia right breast reduction material	14	10.44
	Ductal hyperplasia of right breast	14	10.44
	Duct ectasia left breast reduction material	22	16.41
	Adenosis	12	8.95
	Ductal hyperplasia of left breast	8	5.97
	Right breast tissue	38	28.35
	Left breast tissue	36	26.86
	Right breast adipose tissue	35	26.11
	Left breast adipose tissue	42	31.34
Mammography/Ultrasonography	BI-RADS 0	25	18.66
	BI-RADS 1	6	4.48
	BI-RADS 2	40	29.85
	BI-RADS 3	8	5.97
	BI-RADS 4	3	2.24
	Bilateral glandular tissue dominance	12	8.96
	Bilateral retroareolar duct ectasia	12	8.96
	Presence of accessory breast	5	3.73
	Cystic lesion	18	13.43
	Hematoma	5	3.73

*Each patient may have more than one result. BI-RADS: Breast Imaging Reporting and Data System

Table 3. Comparison of Scar Patterns and Pedicle Choices by BMI (n=134)

	BMI	n	Mean	Kruskal-Wallis	df	p
Scar Pattern	25–29	20	10.50	114.266	2	.001
	30–39	33	46.82			
	≥40	81	90.00			
	Total	134				
Pedicle Choice	25–29	20	10.50	124.444	2	.001
	30–39	33	37.00			
	≥40	81	94.00			
	Total	134				

improved body image [11, 19, 25]. Those who experience physical and psychological relief are better able to adapt to social life and are happier. It may also be possible for women to become more functional and assertive, both at home and in the workplace, after breast reduction surgery.

Previous studies have reported that if obese or morbidly women who want to have breast reduction surgery first try to lose weight, breast reduction can be achieved through low-cost and non-invasive methods [1]. It should also be considered, however, that weight loss can take a long time and can be difficult; the women suffering from large breasts may fail to lose weight and may experience depression due to social disconnection and social isolation. In the present study it was found that 34.3% of patients were aged 18–35 years, 47% 36–50 years and 18.7% ≥51 years. The BMI was 25–29 in 14.9%, 30–39 in 24.6% and ≥40 in 60.4% of the patients. As can be understood from these findings, a considerable proportion of the study group was of normal weight (14.9%), and 34.2% of the patients were aged 18–35

years – which is a period of life with potential for considerable productivity, both at home and in the workplace. In such cases, it would appear to be appropriate to perform breast reduction surgery as soon as possible to allow their rapid return to a life with maximum functionality.

Patients undergoing breast reduction surgery may experience hematoma, delayed wound healing, wound dehiscence and reduced nipple sensitivity as postoperative complications, although it has been established that the satisfaction of patients undergoing breast reduction is generally high, despite such complications [26]. In the present study, the mean amount of tissue removed from the right breast and the left breast were 1050.54 ± 484.90 (min 144; max 2950) and 1059.54 ± 522.28 (min 142; max 3600), respectively, while a similar study from Turkey reported the mean amount of tissue removed from the breast to be 839.7 g.

The scar of choice for patients scheduled for breast reduction varies according to the preference of the patient,

Table 4. Reasons for Hospital Admissions of Patients within Two Years of Breast Reduction (n=134)

Reasons for Hospital Admissions	n	%
Scar site and/or breast pain	4	3
Numbness and/or reduced nipple sensitivity	6	4.5
Aesthetical concerns (scars, asymmetry, etc.)	2	1.5
Breastfeeding problems	5	3.7
Breast stiffness	11	8.2

* Each patient may have more than one result.

as well as the physician's experience and the manipulation areas of the breast tissue. That said, the optimum choice should, where possible, be the one that will not need/need fewer multiple scar revisions in the future. In the present study the inverted-T scar technique was performed in 66.4% of the patients, while a verticolateral scar was opted for in those with a body mass index of 25–29. The inverted-T technique was most commonly preferred by the patients as it falls within the bikini area. Techniques that prevent limited clothing choices and that reduce the need for multiple scar revisions in the future tend to be more preferred by patients [27].

Today, prophylactic bilateral mastectomy procedures are performed due to the increasing prevalence of breast cancer, and it is one of the leading solutions, especially for patients with a family history of breast cancer. A systematic review identified the preventive effect of especially subcutaneous mastectomy on breast cancer, and suggested that large breasts increased the risk of cancer development [28]. Furthermore, there are reports in literature that obesity increases postmenopausal breast cancer [29]. The reasons for the hospital admission of patients within two years of breast reduction surgery were scar site or breast pain in 3%, numbness and/or reduced nipple sensitivity in 4.5%, aesthetical concerns in 1.5%, breastfeeding problems in 3.7% and breast stiffness in 8.2%. None of the patients presented to the hospital with tumors or masses, and none were diagnosed with malignancy.

Breast reduction surgery aims to increase the body image of women, to be more self-confident, and to eliminate the burdens of Gigantomastia. A review of literature identified no previous study on the incidence or prevalence of women in need of or likely to need breast reduction surgery associated with obesity, genetic factors, healthcare opportunities and patient preferences. The fact that none of the patients who underwent breast reduction surgery in the present study later presented with malignancy may be a promising finding, suggesting that breast reduction may reduce the risk of breast cancer. The single-center design of our study was considered a positive limitation.

Conclusion

Excessive breast size called gigantomastia relative to the musculoskeletal structure can be a stressful and painful condition for women, and is seen not only in obese and morbidly obese women, but also in those of normal weight. Accordingly, weight loss may not always be an appropriate solution to breast reduction, and the sagging or deformities that may develop in women with breast hypertrophy

after weight loss may require breast reconstruction surgery anyway. While breast reduction procedures are associated with high patient satisfaction, several complications may occur after such procedures, as is the case with many surgical interventions. Accordingly, the physical and psychological well-being of women after breast reduction should not be ignored, and a successful breast reduction should be planned and performed for such cases considering patient expectations. The fact that none of the patients underwent breast reduction presented later with malignancy suggests a negative relationship between breast reduction and malignancy.

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