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Development of a questionnaire evaluating satisfaction after medial versus posteromedial scar brachioplasty.

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Abstract

To compare the degree of patient satisfaction after medial versus posteromedial scar brachioplasty and to highlight the impact of Brachioplasty scar placement on patient satisfaction. The recent increase in demand for brachioplasty surgery has urged researchers to find the most suitable scar placement to enhance patient satisfaction. This study was applied to 34 patients divided into two equal groups; each group consisted of 17 patients. The study compared the patients' satisfaction through a custom-made questionnaire. The patient's satisfaction was in favor of the posteromedial group and the difference was statistically significant (p=0.010). our data suggests that in brachioplasty using the posteromedial scar placement approach would be the optimal choice for the patients in terms of patient satisfaction.

Keywords: Aesthetic surgery, Arm lift, Brachioplasty, Post-bariatric surgery, Scar placement.

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1. Introduction

Over the past two decades, there has been an increase in bariatric surgeries due to growing awareness of the hazards associated with obesity and growing attention to body shape. As a result, there are now more patients with severe post-bariatric deformity [1]. Based on available statistics, over an eight-year period, the number of brachioplasties performed annually in the US increased by 4191%, from 338 to 14,505. This contrasts with the 36% rise in breast augmentation surgeries that were carried out in the same time frame, indicating the procedure's widespread acceptance and great popularity [2]. Following significant massive weight loss, patients typically present with varying degrees of extra skin with diminished elastic qualities, residual lipodystrophy, and ptosis in various anatomical areas, such as the arms, thighs, trunk, and breasts [3]. Although the process has been much improved over the years, most Brachioplasty expert surgeons think that patients' primary concern is still postoperative scarring [4]. Most of the trials had a complication rate between 36% and 53% and a revision rate between 4% and 22.9%. [5,6]. Pathologic scarring, seroma, dehiscence, infection, and hematoma are the most common consequences [7]. Brachioplasty incisions are usually made in three primary locations: the posteromedial incision, the posterior incision (also called the posterior straight incision or brachial sulcus incision), and the medial incision (sometimes called the bicipital incision) [2]. The majority of the research had determined that, in terms of patient satisfaction, the posteromedial technique was better than the others [8,2]. This work aimed to highlight the impact of Brachioplasty scar placement on patient satisfaction by comparing the patients` satisfaction with medial scar Brachioplasty versus posteromedial scar Brachioplasty through a custom-made postoperative questionnaire.

2. Methods

This is a prospective comparison research that was carried out between January 2020 and February 2023 on 34 patients who were split into two equal groups at the Department of Plastic Surgery at Menoufia University Hospital and the private sector in Kuwait. Each group had seventeen patients. Following bariatric surgery, all of the patients experienced varying degrees of skin excess and laxity on their arms, with or without extra fat. The medial scar approach was used for the brachioplasty surgery of the first group of patients, whereas the posteromedial scar approach was used for the second group. The trial protocol stated that participants had to be between the ages of 18 and 60, have a Body Mass Index (BMI) of less than 35, and have had bariatric surgery to lose weight. The study excluded people with diabetes mellitus and uncontrolled hypertension. Power Analysis and Sample Size Software (PASS 2020) (NCSS, LLC. Kaysville, Utah, USA) was used to determine the sample size. To compare the posteromedial scar technique and the medial scar technique in post-bariatric Brachioplasty in terms of patient satisfaction, a minimum total hypothesized sample size of 30 eligible patients (15 per

group) is required; this is assuming an effect size of 25%, a significance level of 5%, and a power of 80% using the Chi-square test. **[2, 9]**. The patients were given the opportunity to debate the two possibilities for scar placement and choose the preferred location site, and the degree of skin elasticity and extra fat were examined. Along with the possible hazards of general anesthesia, the patients were informed about the potential consequences related to the operation, which included apparent scarring, persistent or recurring skin laxity, hematoma, seroma, wound dehiscence, and asymmetry. The patients completed an informed consent form that included information about the operation, potential common and significant problems, and alternative treatments. Preoperative and follow-up photos were obtained using standardized brachioplasty techniques. During the pre-operative marking process in order to expose the medial intermuscular groove for the medial scar procedure, the patient had to stand, abduct their arms, and supinate their forearms. A horizontal line placed beneath the groove serves as the first mark. The top line is then marked once the upper skin is brought to the first line by downward traction. Pinching the extra skin is how the lower line is then calculated. The incision pattern is elliptical. While for the posteromedial scar technique, the expected scar placement is first indicated by drawing a line between the medial epicondyle and the axillary fossa's apex. The upper incision is placed 1 cm above the predicted line while the lower incision line is approximated by pinching the skin. All patients were placed under general anesthesia, with their arms abducted to around 90 degrees and their forearms flexed to 90 degrees. At the time of inducing anesthesia, pre-operative medication (1.2 gm of intravenous Amoxicillin/clavulanate and 1 gm of intravenous Tranexamic acid) was given. Liposuction was used in all the patients, and a common tumescent solution is infused into the liposuction sites before liposuction. Liposuction is performed with a 4-mm cannula. To guarantee tension-free closure and symmetry, the Intraoperative Staple Approximation Technique, also known as tailor-tacking, is utilized to replicate the ultimate final scar. To minimize bleeding and preserve the integrity of the subcutaneous arteries and lymphatics, skin excision is limited to the subcutaneous plane. Electrocautery is used to achieve hemostasis, and the skin is closed in three layers. All the patients followed up in the clinic post-operatively twice a week in the first 3 weeks then in the 2nd,3rd, and 6th month post-operative, at the last visit the patient had to fill in the custom-made questionnaire by themselves. The survey consists of ten questions with three possible answers, each with a score of 0, 1, or 2. When the questionnaire is finished, the total score is calculated by summing the results of each question. There were two languages available for the questionnaire: Arabic and English. based on the patient's preferred language. We divided the entire score into four classes after obtaining the overall score for every patient. We categorized the total score into 4 grades. From 0-5 unsatisfied patients, from 6-10 barely satisfied patients, from 11-16 moderately satisfied patients, and from 16-20 satisfied patients.

2.1 Ethical considerations

Menoufia University's Academic and Ethical Committee approved this study. To take part in the study, each patient had to fill in a signed informed consent form. The Helsinki Declaration of the World Medical Association serves as an ethical framework for research involving humans.

2.2 Statistical analysis

Using Microsoft Excel software (Microsoft, NY., USA), data from the history, basic clinical examination, laboratory studies, and outcome measures were coded, input, and examined. Version 20.0 of the SPSS software package was then used to examine the data once it was loaded into the computer. (IBM Corp., USA, Armonk, NY). Numbers and percentages were used to describe the qualitative data. To confirm that the distribution was normal, the Shapiro-Wilk test was performed. The terms range (minimum and maximum), mean, standard deviation, median, and interquartile range (IQR) were used to characterize quantitative data. At the 5% level, the results' significance was assessed. ***The Chi-square test*** was the one employed. Comparing categorical variables across several groupings.

3. Results

34 patients were included in the trial, split into two equal groups. Each group had seventeen patients. Following bariatric surgery, all of the patients experienced varying degrees of skin excess and laxity on their arms, with or without extra fat. There were 84.4% girls (n=14) and 17.6% men (n=3) in each group. In the first group, the ages ranged from 23 to 58, with a mean age of 37.24 (SD 11.49). On the other hand, the second group's age ranged from 23 to 54, with a mean age of 36.47 (SD 9,06). At the time of surgery, The BMI of the patients in the Medial group was ranged from 26 to 31 with a mean value of 29.06 (SD 1.75) while in the posteromedial group was ranged from 26 to32 with a mean value of 28.82 (SD 1.78). The degree of weight loss between the bariatric surgery and the time of Brachioplasty was recorded, in the Medial group ranged from 25 to 45 Kg with a mean value of 33.18 (SD 5.81) while in the Posteromedial group ranged from 24 to 48 Kg with a mean value of 36.41 (SD 6.55). Of the patients in the Medial group, 76.5% (n=13) had no significant medical or surgical history, and 23.5% (n=4) had a positive history that included uncontrolled hypertension 5.9%(n=1), hyperthyroidism 5.9%(n=1), and Hidradenitis 11.2% (n=2). Conversely, among the patients in the Posteromedial group, 82.4% (N=14) had neither a significant medical history nor a surgical history. Meanwhile, 17.6% (n=3) had a positive history, including hyperthyroidism 5.9% (n=1), Hidradenitis 5.9% (n=1), and uncontrolled hypertension 5.9% (n=1). Based on the patient's given medical history, 23.5% (n = 4) of the participants in both groups were smokers. (Table 1) the interpretation of the answers in the 10 questions patients` satisfaction questionnaire was as follows. The difference between the answers to each individual question was statistically insignificant between the two groups except in question number 8 in which The mean score for the medial group was 1.05 (SD 0.74) while the mean score for the posteromedial group was 1.76 (SD 0.43), with a statistically significant difference in favor of the posteromedial group(p=) (Table 2). In the Medial group, the range of the scores of the questionnaire was 7 to 20 with a mean value of 15.53 (SD 3.14) while in the Posteromedial group, the range

was 14 to 20 with a mean value of 17.47 (SD 2.10), The difference between both groups was statistically significant (p=0.042) in favor of the posteromedial group **(Table 3**

Table).

4. Discussion

In addition to the great advancements in both surgical and non-surgical weight loss techniques, the growing awareness of the problems associated with obesity and the growing obsession with the self-body image resulting from the widespread use of social media and self-photography all contribute to a progressive increase in the number of patients seeking for weight loss, which in turn raises the annual number of bariatric surgeries. Data gathered by the American Society of Plastic Surgeons show that the number of Brachioplasty surgeries performed increased significantly between 2000 and 2012, rising by 4392 percent [10]. Since the shape and location of incisions are among the most important aspects of surgical planning and ultimately determine wound tension and scar-hiding ability [4], The authors are constantly experimenting with changing the form of the incision, searching for the best location for the incision, and comparing various sites. Since achieving patient satisfaction is the primary objective of all cosmetic surgery, the authors have created several surveys and questionnaires to gauge patient satisfaction following the invention or modifications of cosmetic surgical techniques. This allows them to guide other surgeons through the challenging process of selecting the best technique. The custom-made questionnaire used in this study was developed using ideas from the modified BODY-Q scales [11] and some other questionnaires such as the one developed by Samara et al [10]. One of these trials was done by Simone et al in which the physical model they created to analyze the difference in the skin's response to tension in the medial and posteromedial skin regions came to the conclusion that pathologic scarring is less likely to occur in the latter location due to the lower intrinsic skin tension on the latter's aspect of the arm than in the former, and they developed a postoperative assessment questionnaire [8]. One of the study's shortcomings, in our opinion, is that the questionnaire did not contain a comparison group for patients who had medial scar surgery; as a result, the evaluation of patient satisfaction is absolute and inaccurate. On the other hand, in this study, patients were divided into two groups, one with a medial scar and the other with a posteromedial scar, and provided the questionnaire to both groups to be able to make a comparison. We came to the same conclusion that the patient's satisfaction was more after the posteromedial scar technique. In another trial of emphasizing the scar placement impact, Samra et al. used a marker pen to draw the location of the brachioplasty scar in a normal arm to simulate its position in the medial (bicipital groove) and posterior (brachial sulcus). Patients, plastic surgeons, and laypeople participated in the survey. According to how the study's results were interpreted, a medial straight Brachioplasty scar is more acceptable than a posterior straight scar. If the scar is sinusoidal in form, a posterior scar is preferable over a medial scar [10]. A limitation of this research is that a significant number of participants were laypeople, many of whom may not have previously had lengthy scars, and their perception of the scar is not well established.

Table 1: demographic data, medical history and anthropometric measurements of the patients.

Type of data	Medial (n = 17)		Posteromedial (n = 17)		Test of Sig.	p
	No.	%	No.	%		
Gender						
Male	3	17.6	3	17.6	χ^2=0.000	1.000
Female	14	82.4	14	82.4		
Age (years)						
Min. – Max.	23.0 – 58.0		23.0 – 54.0		t=0.215	0.831
Mean ± SD.	37.24 ± 11.49		36.47 ± 9.06			
Median (IQR)	35.0 (27.0 – 41.0)		36.0 (28.0 – 43.0)			
Weight lost (kg)						
Min. – Max.	25.0 – 45.0		24.0 – 48.0		t=1.524	0.137
Mean ± SD.	33.18 ± 5.81		36.41 ± 6.55			
BMI (kg/m^2)						
Min. – Max.	26.0 – 31.0		26.0 – 32.0		t=0.389	0.700
Mean ± SD.	29.06 ± 1.75		28.82 ± 1.78			
Co-morbidities						
Null	13	76.5	14	82.4	χ^2=0.934	1.000
Hidradenitis	2	11.8	1	5.9		
Hyperthyroidism	1	5.9	1	5.9		
Controlled HTN	1	5.9	1	5.9		
Smoking						
Nonsmoker	13	76.5	13	76.5	χ^2=0.000	1.000
Smoker	4	23.5	4	23.5		

Table 2 : Details of patients` satisfaction questionnaire.

	Question and choices	Medial (n = 17) No.	%	Posteromedial (n = 17) No.	%	χ^2	p
	With the presence of scars on your arm, do you wear light clothes like a swimsuit in public or a sleeping gown that reveals your arms at home with family members?						
	No Never		.0	2	11.8		
	Yes, but uncomfortable		7.6	2	11.8	.933	0.660
	Yes, comfortable	4	2.4	13	76.5		
	Do you feel that you are more comfortable with exposing your arms than before the surgery?						
	No		.0	2	11.8		
	The same		9.4	2	11.8	2.889	0.239
	Yes	2	0.6	13	76.5		
	Do you think of your arm scar and concentrate on hiding it?						
	Always		7.6	1	5.9		
	Sometimes		7.6	2	11.8	1.552	0.560
	Never	1	4.7	14	82.4		
	Does the presence of the scar affect your social life?						
	Yes, severely affected		.9	1	5.9		
	Yes, moderately affected		5.3	3	17.6	1.591	0.707
	No	0	8.8	13	76.5		
	Does the presence of the scar affect your sexual life?						
	Yes, severely affected		3.5	2	11.8		
	Yes, moderately affected		9.4	3	17.6	1.943	0.444
	No		7.1	12	70.6		
	Does the presence of the scar affect your confidence to participate in sports activity?						
	Yes, severely affected		1.8	1	5.9		
	Yes, moderately affected		7.6	3	17.6	0.538	1.000
	No	2	0.6	13	76.5		
	Do you feel that the look of your arms with						

	Question and choices	Medial (n = 17) No.	%	Posteromedial (n = 17) No.	%	χ^2	p
	the scar is much better than the look of your arms with skin redundancy?						
	No		.0	0	0.0	2.125	0.485
	The same		1.8	0	0.0		
	Yes	5	8.2	17	100.0		
	After drawing the other modality of scar placement in the arm lift surgery, do you feel that the other modality is better than what you had?						
	Yes		3.5	0	0.0	8.482*	0.010*
	The same		7.1	4	23.5		
	No		9.4	13	76.5		
	Do you recommend the surgery for friends or relatives to git ride of excess skin and/or fat?						
	No never		.0	0	0.0	0.000	1.000
	Not strongly recommended		1.8	2	11.8		
	Yes strongly recommended	5	8.2	15	88.2		
0	**After the passing of 6 months or more, what is your overall rating of the results of the surgery?**						
	Bad		7.6	0	0.0	3.471	0.244
	Good		9.4	4	23.5		
	Excellent		2.9	13	76.5		

*: significant

Table 3: interpretation of the patients` satisfaction questionnaire.

Patients` Satisfaction questionnaire	Medial (n = 17)		Posteromedial (n = 17)		Test of Sig.	p
	No.	%	No.	%		
Unsatisfied (0 to 5)	0	0.0	0	0.0	χ^2= 3.524	0.139
Barely satisfied (6 to 10)	1	5.9	0	0.0		
Moderately satisfied (11 to 15)	7	41.2	3	17.6		
Satisfied (16 to 20)	9	52.9	14	82.4		
Total Score						
Min. – Max.	7.0 – 20.0		14.0 – 20.0		t=2.118*	0.042*
Mean ± SD.	15.53 ± 3.14		17.47 ± 2.10			

*:significant

In this study, the concept of the target participants of the questionnaire was modified. Patients only were involved. In question number 8, the site of the medial scar in the posteromedial group was marked by a marker and vice versa, and patients were asked if they felt that the drawn site of the scar was better, the same, or worse than their scar, their answers had given a score of (0,1,2) respectively. The difference between both groups in favor of the posteromedial group was statistically significant. A research that comparing the scar's posteromedial and posterior locations was published by Elnaggaey and Aziz. Even though our study's comparison group is different, their conclusion on the posteromedial scar's superiority in terms of patient satisfaction is consistent with our findings. [2]. The limitations of this study are a relatively small sample of patients, and selection bias as this study was done partially in the private sector and the choice of scar placement was completely for the patient. Another limitation of the questionnaire was the conservative nature of the patients` style of clothing. As this study was done in the Middle East, a big percentage of the patients are covering their arms in public which renders the answer to some questions inaccurate.

5. Conclusion

In conclusion, the placement of the scar has a significant impact on the overall patients' satisfaction which was in favor of posteromedial scar placement.

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