Trakia Journal of Sciences, No 1, pp 31-39, 2026

Available online at:
https://trakia-uni.bg

ISSN 1313-3551 (online) doi:10.15547/tjs.2026.01.005

Original Contribution

BRACHIOPLASTIC POSITIONING OF THE SCAR TO OPTIMIZE FINAL CONTOURING RESULTS

E. Sharkov[1], D. Simeonov[2], I. Sharkova[2], A. Tsvetkova[3], S. Milhaylova[3], D. Dimitrova[3*], A. Zlatareva[4]

[1]Department of General and Operative Surgery, First Department of Surgery, St. Marina University Hospital, Medical University of Varna, Varna, Bulgaria
[2]Private Aesthetic Clinic VDERM, Sofia, Bulgaria
[3]Medical College, Medical University of Varna, Varna, Bulgaria
[4]Department of Pharmacology, Toxicology and Pharmacotherapy, Medical University of Varna, Varna, Bulgaria

ABSTRACT

Introduction: Brachioplasty is a surgical procedure aimed at removing excess skin and subcutaneous fat from the area of the upper arm. In some cases, mainly in patients after massive weight loss, the excision could also target the lateral chest area and/or to be extended further into the forearm area.

Materials and Methods: A retrospective analysis was conducted on 22 patients who underwent different types of brachioplasty. Demographic and surgical data were collected and analyzed for potential factors influencing outcome.

Results: In this group of 22 patients, 20 were female and 2 were male. In the subjective satisfaction score (1 representing the lowest satisfaction score and 5 representing the highest score) measured 12 months after surgery, 16 patients indicated the maximum value of the scale. Six patients indicated levels of satisfaction 4. The main improvement of the pinch test was calculated as 3,5cm in the 12th post-operative month. Among the 22 patients included in this subgroup analysis, 6 (27%) experienced minor complications, all of which were resolved without requiring surgical intervention. Female patients belonged to the age range of 22 to 62 years, with an average age of 42 years and an average BMI of 26.5. All female patients underwent classical type of brachioplasty or L-type brachioplasty. Ten out of twenty female patients underwent soft tissue excision on the upper arm with extension to the lateral chest area. The two male patients were aged 28 and 50 and had an average BMI of 25. One of the male patients had L-type brachioplasty with extension on the lateral chest and flank area. The most common adverse event was wound dehiscence, managed successfully with secondary intention healing.

Conclusion: Brachioplasty techniques have been used in male and female patients. In patients with predominant skin excess, excisional surgery with positioning the scar in the bicipital groove led to optimal results and "hidden scar". An additional liposuction could be needed as part of the overall procedure for patients with skin and fat excess. In the second type of patients, posterior positioning of the scar led to levels of satisfaction 5, however, the scar was still visible. Positioning the scar in between the posterior surface and the bicipital groove in combination with liposuction would have achieved optimal results with less visibility of the scar.

Keywords: Brachioplasty, L-type brachioplasty, scar, liposuction, upper body lift, massive weight loss, body contouring

INTRODUCTION

Brachioplasty is a surgical procedure aimed at removing excess soft tissue from the area of the upper arm, with or without targeting the lateral chest and/or the forearm in some rear massive weight loss cases [1]. The rationale behind the positioning of the excisional lines is to achieve optimal results in patients with skin and fat cumulation in the upper arm, and at the same time, to reduce the visibility of the scar.

Brachioplasty techniques and different ways to position the scar have been described previously.

***Correspondence to:** *Dimana Dimitrova, PhD, Medical University of Varna, Varna, Bulgaria, e-mail: dimana.dimitrova@mu-varna.bg*

Techniques with positioning the scar in the bicipital groove have been an excellent solution for patients with mainly skin excess **(Figure 1)** [2]. In that type of procedure, the pre-operative marking involves an incision line 1.5-2cm anteriorly to the bicipital groove. Posterior marking is determined by pinching the skin. During the procedure, minor undermining of the anterior flap and predominant undermining of the posterior flap would determine the final position of the scar in the bicipital groove.

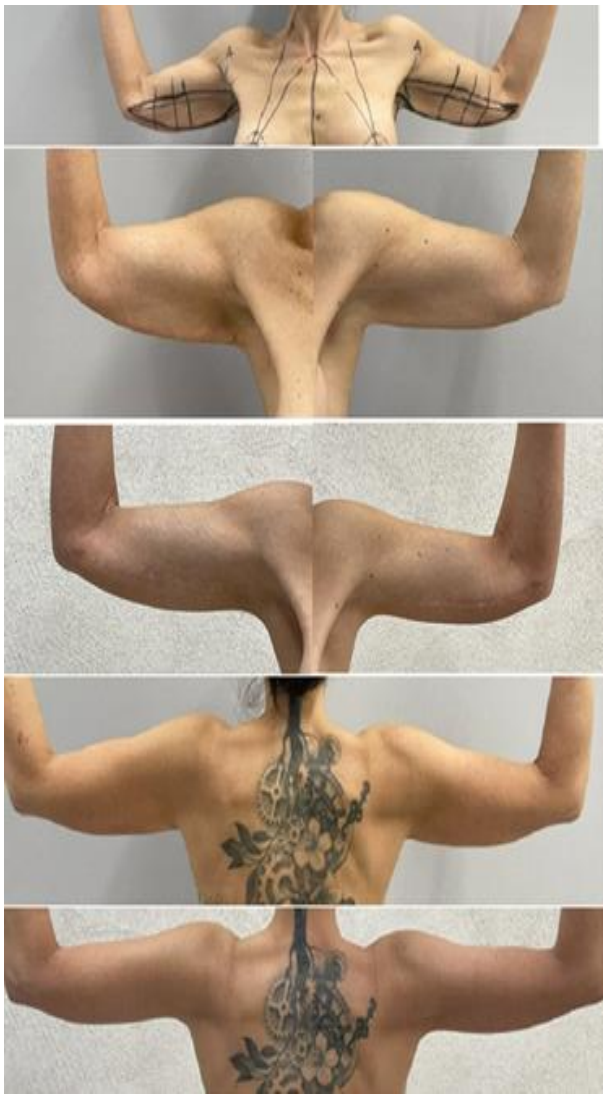

Figure 1. Pre-operative marking on a massive weight loss patient. Before and six months after a classical type of brachioplasty with skin excision.

Brachioplasty with posterior positioning of the scar in the upper arm area has been an excellent solution for both massive weight loss patients and patients with skin and fat excess **(Figure 2)** [3]. This could also be combined with liposuction in the same procedure. In those cases, the pre-op marking includes curved ellipse with the same distance anteriorly and posteriorly to the mid-posterior surface of the arm. The excision volume is determined by a pinch test and double ellipse is drawn [3]. After the excision, with or without liposuction, both posterior and anterior flaps are undermined to position the final scar on the posterior surface.

Figure 2. Pre-operative marking of brachioplasty with posterior positioning of the scar. Before and 2 years after the procedure. Early post-op result, with the scar still healing, shows the visibility of the scar from behind.

When the soft tissue excess is also apparent on the lateral chest surface – the procedure is called L-type brachioplasty. In those cases, the drawing proceeds on the lateral chest area. In the area of the armpit Z-pasty could be performed, although advancement flap is considered as sufficient **(Figure 3, 4)[**3-7]

Figure 3. Single-stage L- type Brachioplasty, with a scar positioned on the posterior surface of the upper arm, combined with an Inverted-T Mastopexy with mobilization of the subcutaneous soft tissues from the lateral surface of the chest. Before and 1 year after the procedure.

Figure 4. Pre-operative markings with positioning of the scar in the bicipital groove. In the specified case, an L-type brachioplasty was performed, as the „arm" on the lateral surface was marked in such a way that the anterior incision is 1.5 cm posterior to the lateral edge of pectoralis major sulcus, which makes this part of scar also „invisible" when viewed in neutral arm position

METHODS

Brachioplasty was performed on 22 patients.

In cases with skin excess, the author opted to position the final scar in the bicipital groove. Marking was done in the classical manner described above. Excision of the segmental-closure resection was performed on a patient in supine position and under general anaesthesia. After thorough hemostasis, undermining of the posterior flap and minimal undermining of the anterior flap was performed.

In cases with skin and subcutaneous fat excess, the author positioned the scar on the posterior surface of the arm. Simultaneous liposuction was performed. Marking was done in the classical manner described above. General anesthesia was introduced in supine position with arm lifted and fixated above the level of the operating table. After infiltration of standard Klein solution, vibrational type of liposuction with 3mm Mercedes type cannula was executed in the area of the excision. When positioning the scar posteriorly, the author trimmed the flaps where needed, rather than performing aggressive liposuction on them. Excision of the segmental-closure resection type was performed. After thorough hemostasis, undermining of the posterior and anterior flap was conducted.

In patients with combined soft tissue excess – skin and subcutaneous fat, excision with liposuction and final in the bicipital grove could be performed. The excision volume was determined by means of a pinch test, marking an ellipse on the inner surface of the upper arm. The anterior incision should be marked 1,5-2cm anteriorly to the bicipital groove. Posterior marking was determined by a pinch test, but did not proceed as far as the marking when the final scar reached the back surface of the arm. Markings of liposuction on the posterior surface were made. Under general anesthesia in supine position, after infiltration of standard Klein solution, vibrational type of liposuction with 3mm Mercedes type cannula was executed in the deep layer on the posterior surface. The area of the excision was completely "voided" with the liposuction. Liposuction should be gentle, not aggressive, with respect to the

vascularization of the flaps. After liposuction, single stitches on cross-sections of the ellipse were applied. It is recommended to approximate those temporarily, in order to appreciate possible adjustment in the width of the excision. Following an informed decision, excision of the segmental-closure resection type was performed. After thorough hemostasis, undermining of the posterior flap and minimal undermining of the anterior flap was carried out **(Figure 5, 6)**

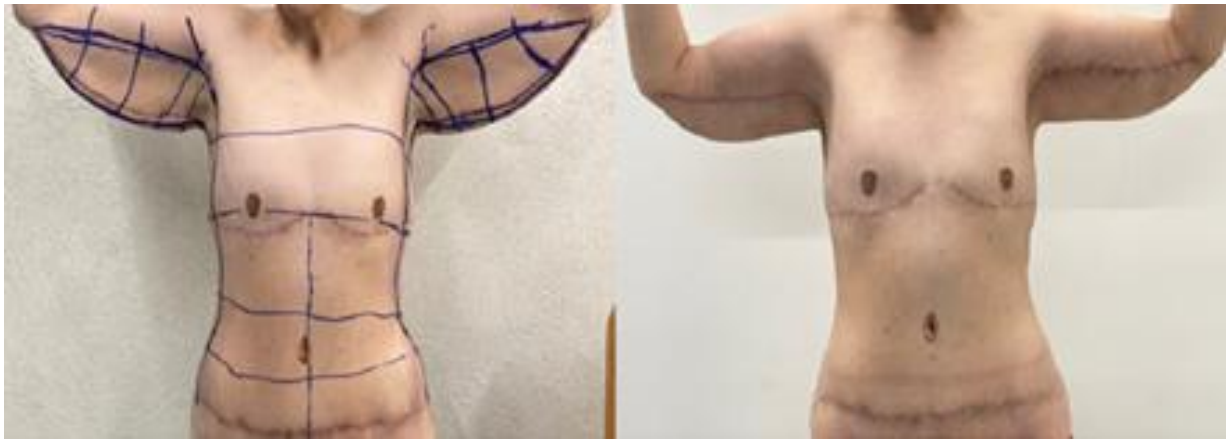

Figure 5. Lateral body lift with L-type brachioplasty 12 months later. The procedure was performed 6 months after the extended abdominoplasty with upper body lift. In a patient with massive weight loss and skin and fat excess, liposuction was performed with traditional positioning of the scar in the bicipital groove with insufficient contouring and lifting in the arm.

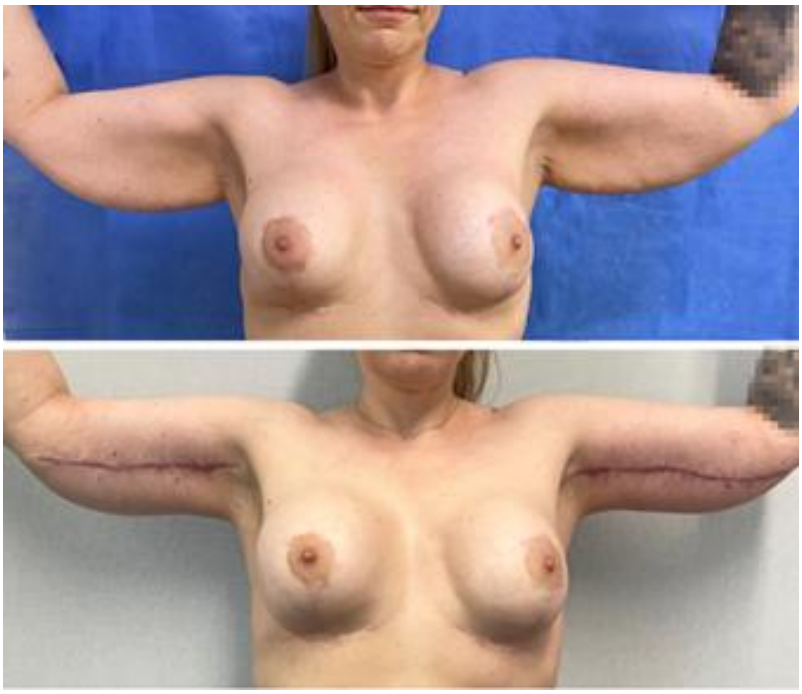

Figure 6. Classical type of brachioplasty with scar in the bicipital groove and liposuction 3 months later. The final result was noted by the author as insufficient contouring in the area of the arm.

Brachioplasty with liposuction and positioning of the scar in between the bicipital groove and the posterior surface of the arm was conducted in patients with skin and fat excess in the area. The excision volume was determined by means of a “pinch-test”, marking an ellipse on the inner surface of the upper arm. The key point was that the anterior incision should be marked on the bicipital groove or slightly anteriorly (0,5cm on the mid-portion of the drawing).

Posterior marking was determined by a pinch test but did not proceed as far as the marking when the final scar reached the back surface of the arm. Markings of liposuction on the posterior surface were made **(Figure 7, 8).** The surgical technique at this stage followed the same steps as outlined above in the description of Figures 5 and 6: vibrational liposuction with Klein solution, temporary approximation stitches, segmental-closure resection, and flap

undermining as required by closure tension. Liposuction would already contribute to the undermining, thus this should only be done if tension during closure were present. Minimal undermining of the anterior flap was needed **(Figure 9).**

In all types of brachioplasty techniques, deep fixation fascial sutures with 2/0 PDS are placed, after which the surgical defect is closed in layers, using 3/0 and 4/0 Monocryl suture. [8-10] The author uses redon drainage, which is brought out at a declivous location. All patients underwent the same postoperative protocol including drains and scar therapy. The author does not use compression garments in this area.

Figure 7. Pre-operative marking with final scar to bi positioned slightly posteriorly to the bicipital groove in a massive weight loss patient with skin and fat excess.

Figure 8. Intraoperative visualization of the defect, the wide undermining of the posterior flap, and the final outcome. Liposuction on the posterior surface was performed prior to excising.

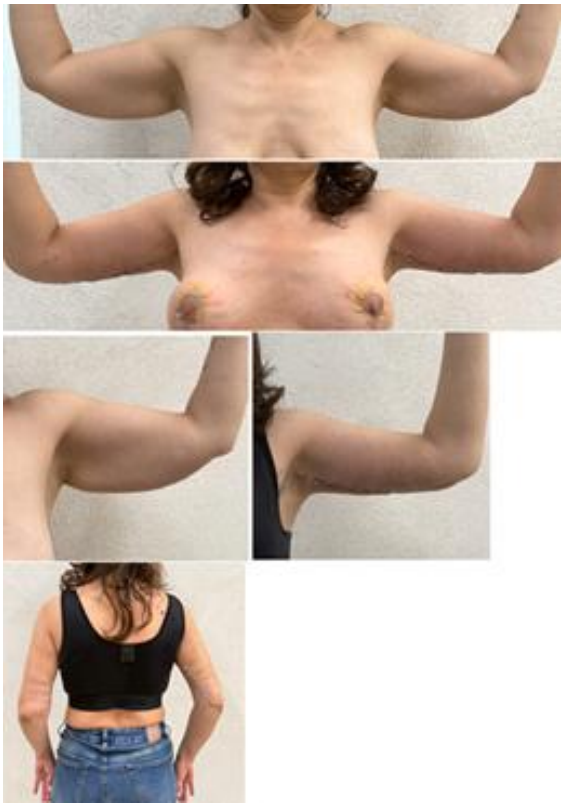

Figure 9. Before and a month later - early results with final scar to be positioned slightly posteriorly to the bicipital groove in a massive weight loss patient with skin and fat excess. Visibility of the scar from behind is lower, compared to the standard visibility with scar on the posterior surface.

RESULTS

A retrospective analysis was conducted on 22 patients who underwent different types of brachioplasty. Demographic and surgical data were collected and analyzed for potential factors influencing outcome. In this group of 22 patients, 20 were female and 2 were male. In the subjective satisfaction score (1 representing the lowest satisfaction score and 5 representing the highest score) measured 12 months post surgery, 16 patients indicated the maximum value of the scale. Six patients indicated levels of satisfaction 4. The main improvement of the pinch test was calculated as 3,5cm in the 12th post-operative month. Among the 22 patients included in this subgroup analysis, 6 (27%) experienced minor complications, all of which were resolved without requiring surgical intervention. Female patients ranged in age between 22 and 62 years, with an average age of 42 years and an average BMI of 26.5. All female patients underwent classical type of brachioplasty or L-type brachioplasty – 10 out of 20 female patients underwent soft tissue excision on the upper arm with extension to the lateral chest area. The two male patients were aged 28 and 50 and an had an average BMI of 25. One of the male patients had L-type brachioplasty with extension on the lateral chest and flank area. The most common adverse event was wound dehiscence, managed successfully with secondary intention healing **(Table 3).**

Different status of the area of treatment has been observed – 14 (13 female and 1 male) patients had predominantly skin excess, and 12 of them were patients after massive weight loss. One of those patients was a female patient having undergone Interferon therapy for Hepatitis C. In 8 patients, subcutaneous fat deposits in the area of treatment were apparent prior to the procedure, with one of them being a male patient after massive weight loss. All patients with predominant skin excess had excision with positioning the scar in the bicipital groove area. All patients with skin and fat tissue excess had skin excision with liposuction done as a single stage procedure. In this second group, one female patient had posterior positioning of the scar, and two other female patients had positioning of the scar in between the bicipital groove and the posterior surface of the arm. Those three female patients had excellent final results and indicated levels of satisfaction 5. In the second group, however, a female and one male patient with a scar in the bicipital groove

reported level of satisfaction 4 and had insufficient contouring.

Excised soft tissue ranged from 15 to 40 cm in length and 6 to 15 cm in width, with an average of 27.5cm in length and 10.5cm in width. Regarding the weight of the excised tissue, it was calculated that the average amount was approximately 150g per side.

Despite the relatively small number of individuals analysed in this article, a clear conclusion can be drawn about the improvement in skin elasticity when measured before and 12 months after the procedure **(Table 1).**

In the subjective satisfaction score (1 representing the lowest satisfaction score and 5 representing the highest score) measured 12 months after surgery, almost all indicated the maximum value of the scale **(Table 2**). Six patients indicated a level of satisfaction 4 – two patients with undertreatment in the area of the upper arm and four patients with secondary healing. This data is an indicator of a very high level of patient satisfaction.

Additional complications, such as hematomas, infection, necrosis, hypertrophic scarring have not been reported.

Table 1. *Pinch test before and 12 months after the procedure.*

Pinch test		
	Baseline measurement *	After 12 months*
N	22	22
Mean	6	2.5
Minimum	5	2
Maximum	7	3
**pinch test in centimeters*		

Table 2. *Patient satisfaction level after 12 months.*

Patient Subjective Experiences after 12 moths		
	Patient Satisfaction	
N	22	
Mean	4.833	
Median	5	
Std. Error of Mean	0.05	
Minimum	4	
Maximum	5	
**1 represents the lowest satisfaction score and 5 represents the highest score*		

Table 3. *Complication overview.*

Complication Overview	Column1	Column2	Column3	Column4	Column5
Patient	Characteristics	MWL	Liposuction or RF	Complication Type	Outcome
1	F, 47	Yes	No	Wound dehiscence in the armpit area - secondary healing	No revisional surgery needed
2	F, 46	No	No	Wound dehiscence in the armpit area - secondady healing	No revisional surgery needed
3	F,35	No	YES - liposuction	Insuficient contouring (upper arm)	Patient was satisfied with the outcome and prefered to not undergo second surgery
4	M, 28	Yes	yes - liposuction	Insufficient contouring (upper arm)	Secondary surgery would be recommended in the area of the arm as an isolated brachioplasty
5	F, 59	NO	YES - liposuction with radiofrequency microneedling	Wound dehiscence left arm in the middle third of the scar	Secondary healing - no revisional surgery needed
6	F,46	YES	NO	Wound dehiscence left arm in the middle third of the scar	Secondary healing - no revisional surgery

DISCUSSION

Brachioplasty procedures have been executed as a primary technique mainly in cases with skin and subcutaneous fat excess in the area of the arm. Determining the position of the scar is one of the key success factors.

Positioning of the scar has been previously accepted as a factor only influencing its visibility.

In contrast, the author introduces the theory that this position could influence the level and the direction of undermining the post-excisional flaps surrounding the soft tissue defect, thus affecting the final result.

The author has reported optimal level of patient satisfaction when positioning the scar in the bicipital grove in predominant skin excess. Minimal undermining anteriorly with mostly undermining posteriorly is sufficient for achieving excellent results.

Similar optimal results have been reported when positioning the scar on the posterior surface of the arm in cases with added subcutaneous fat excess. Undermining in both directions, with liposuction and trimming on the flaps if needed, is sufficient for optimal results. The author has reported two cases of insufficient contouring of the treated area. Both of them have been described as cases with skin and fat excess. One of those cases has been a massive weight loss patient. In both of those cases, liposuction in combination with skin excision has been performed. Pre-operative marking has been done identically to the cases with mainly skin excess. The author's belief is that the suboptimal results in those cases are due to the level and direction of undermining the flaps, determined by the position of the excisional lines.

In two female patients who had skin and subcutaneous fat excess, the excision was directed in a manner to position the scar in between the bicipital groove and the posterior surface. One of those patients was reported as a massive weight loss patient. By positioning the scar slightly behind the bicipital groove and maintaining the same level of undermining – minor anteriorly (1-1,5cm) and major posteriorly (2.5-3cm) optimal results were achieved without placing the scar as visible as previously described on the posterior surface of the arm.

The advantages of this type of scar positioning could be described as a combination of a less visible scar, compared to the posterior surface one, and optimal results at the same time.

CONCLUSION

Brachioplasty procedures achieve contouring in the area of the arm, and in some cases include excisional surgical treatment of the forearm and/or the lateral chest side.

Previously described procedures have focused mainly on positioning the scar on the posterior surface of the arm or onto the bicipital groove. This type of procedures can achieve excellent results in patients with mainly skin excess by positioning the post-operative scar in the bicipital groove. In those cases, the undermining of the posterior flap is priority and gentle minimal undermining of the anterior flap is advisable.

In cases with additional fat cumulation in the area, liposuction could be performed additionally, and posterior positioning with anterior and posterior undermining would suggest optimal results. Nonetheless, visibility of the scar, could have a negative impact on the patient.

In cases with fat cumulation, a possible solution could be to position the scar in the bicipital groove and then perform liposuction. Due to the minimal undermining of the anterior flap, this could lead to suboptimal results.

In conclusion, when the skin excess is combined with fat excess, liposuction with positioning the scar in between the posterior surface of the arm and the bicipital groove, with minor undermining anteriorly and major undermining posteriorly, could be a reasonable solution to achieve optimal results.

The author declares that they have no conflicts of interest to disclose

REFERENCES

1. Sharkov, E., Body contouring surgery– the role of non-invasive, minimal invasive and surgical technologies. Heidelberg, New York, Dordrecht, London, *Springer*, 166-170, 2023.
2. Rubin, P., Jellew, ML., Richter, DF. and Uebel, CO., Body Contouring and Liposuction. *Saunders Elsevier*, P 19-24, 2013.

3.Aly, AS. Body Contouring After massive weight loss. St Louis, *Quality Medical Publishing*, 59-83, 2006.
4. Rubin, P., Jellew, ML., Richter, DF. and Uebel, CO. Body Contouring and Liposuction. *Saunders Elsevier*, P 159-165, 2013.
5. Rubin, P., Jellew, ML., Richter, DF. and Uebel, CO. Body Contouring and Liposuction, *Saunders Elsevier*, P 166-177, 2013.
6. Hurwitz, DJ. and Holland, SW. The L Brachioplasty: An innovative approach to correct excess tissue of the upper arm, axilla and lateral chest. *Plast Reconstr Surg*, 117:403-11, 2006.
7. Pitanguy, I. Correction of lipodystrophy of the lateral thoracic aspect and inner side of the arm and elbow. *Clin Plast Surg*, 2:477-83, 1975.
8. Correa-Iturraspe, M. and Fernandez, JC. Dermolipectomia braquial. *Prensa Med Argent*,41-2432,1954.
9. Baroudi, R. Body sculpturing. *Clin Plast Surg*, 11(3):419-43,1984.
10. Lockwood, TE. Superficial fascial system (SFS) of the trunk and extremities: a new concept. *Plast Reconstr Surg*, 87(6):1009-18, 1991.