

Liposuction-Assisted Short-Scar Brachioplasty: Technical Highlights

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Summary: Upper arm contouring is based on the location and amount of excess skin and fat. The short-scar brachioplasty addresses minimal to moderate skin laxity and lipodystrophy in the proximal arm in patients with appropriate skin tone and quality. This article highlights technical refinements of the senior author's (R.J.R.) approach to short-scar medial liposuction-assisted brachioplasty to maximize results and minimize incision length. To highlight this simple and safe approach with high patient/surgeon satisfaction, the authors discuss the following in this Video Plus article: patient examination, preoperative assessment, surgical pearls, and postoperative outcomes. (*Plast. Reconstr. Surg.* 138: 447e, 2016.)

To address upper arm lipodystrophy and ptosis, Rohrich et al., in 2006, proposed a classification system to differentiate the location and amount of excess arm skin and fat (Table 1).¹ Various procedures have been developed to treat these patient subtypes, but traditional brachioplasty remains the gold standard for optimal arm contouring. Despite its efficacy, this technique, first described in 1954 by Correa Iturraspe and Fernandez, is limited by visible and hypertrophic scarring, dehiscence, seroma, edema, lymphedema, and injury to nerves.^{2,3}

Over the years, various short-scar modifications have been developed to limit these complications and improve outcomes. For proximal deformities, Reed suggested a short-scar approach with only a vertical incision in the axilla.⁴ Hurwitz and Holland⁵ proposed the L brachioplasty with an inconspicuous scar across the axilla and chest wall. Strauch et al.⁶ presented a sinusoidal excision achieving appropriate contour with posterior scars. Other techniques have evolved with W or Z axillary incisions and T- or L-shaped subcutaneous resection patterns.⁷⁻¹⁶ All these approaches, typically applied to type I and IIA patients, have resulted in limited scar burden with decreased wound healing complications and reduced neurovascular injuries. However, none of these techniques is able to

address skin ptosis and lipodystrophy of the distal one-half to one-third of the arm.

To address lipodystrophy of the distal arm, Gilliland and Lyos described circumferential para-axillary superficial tumescent liposuction as an alternative to traditional brachioplasty. This technique relies on skin retraction that typically occurs with superficial liposuction and has reported successes,¹⁷ but is restricted to patients with adequate soft-tissue elasticity. Based on these outcomes, Rohrich introduced liposuction to short-scar techniques, adopting all the benefits of the short-scar brachioplasty and using liposuction for a more distal refinement. This technique has produced high patient satisfaction, with limited

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Table 1. Classification System to Differentiate the Location and Amount of Excess Arm Ptosis and Lipodystrophy

Type	Skin Excess	Fat Excess	Location of Skin Excess
I	Minimal	Moderate	N/A
IIa	Moderate	Minimal	Proximal
IIb	Moderate	Minimal	Entire arm
IIc	Moderate	Minimal	Arm and chest
IIIa	Moderate	Moderate	Proximal
IIIb	Moderate	Moderate	Entire arm
IIIc	Moderate	Moderate	Arm and chest

N/A, not applicable.

scar burden, but has typically been offered only to type IIA patients.⁷ Additional authors have reported further descriptions of liposuction-assisted brachioplasty with equivocal levels of success.^{15,18–20} The combination of liposuction with a proximal, superficial excision has led to decreased trauma of underlying nerves and lymphatics, with improved scarring and contouring while controlling postoperative edema.^{21,22}

This article highlights technical refinements of the senior author's (R.J.R.) short-scar medial brachioplasty technique; modifications include limited inner axillary undermining of fasciocutaneous flaps with circumferential liposuction to enhance contour and minimize tension on the wound closure. These updates apply type IIa principles to type IIb patients, extending the cadre of patients for which the technique is appropriate.

PATIENT SELECTION

Our short-scar medial brachioplasty offers a less invasive arm lift procedure that maximizes

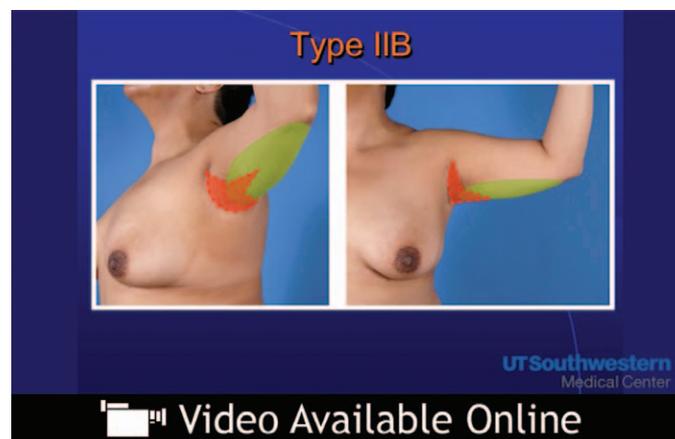
patient mobility and limits recovery. This procedure has specific applications (type IIa and IIb patients) and does not represent a replacement for a traditional brachioplasty. Ideal patients for this procedure have moderate skin excess and lipodystrophy limited to the proximal one-third to one-half of the upper extremity. Skin quality and tone should be excellent for this procedure. Massive weight loss patients typically have poor tone and are not ideal candidates for this approach.

EXAMINATION

As demonstrated in the video, patients should be evaluated in the upright position with the arms at 90 degrees; lipodystrophy and skin ptosis can be assessed with a pinch test. Patients should have excess limited to the proximal upper arm, and the excision should not exceed 4 to 5 cm from the axilla. (See Video, Supplemental Digital Content 1, which shows technical highlights of a liposuction-assisted short-scar brachioplasty, available in the "Related Videos" section of the full-text article on PRSJJournal.com or, for Ovid users, available at <http://links.lww.com/PRS/B793>.)

MARKINGS

In the upright position, with the arms at rest, the anterior and posterior boundaries of the axilla are identified in the axillary skin crease. These landmarks define the limits of the anteroposterior incision, hiding the scar within the axilla. The arm is then abducted to 90 degrees and the two points are connected in the axillary fold, delineating the most medial aspect of the incision. Using medial traction on the upper arm skin, the amount of skin excess is



Video. Supplemental Digital Content 1 shows technical highlights of a liposuction-assisted short-scar brachioplasty, available in the "Related Videos" section of the full-text article on PRSJJournal.com or, for Ovid users, available at <http://links.lww.com/PRS/B793>.

marked in an elliptical fashion. This area of excision is usually 3 to 5 cm in a transverse distance at the most central point. Two parallel lines are marked perpendicular to the excision to facilitate proper closure.

The areas of liposuction are marked with the arm in the abducted position; liposuction is circumferential, but the medial-posterior arm, elbow, and axilla must be addressed. Liposuction can be continued onto the upper lateral chest wall if indicated.

PROCEDURE

The procedure is performed with the patient in the supine position under general anesthesia. The arms are prepared in the operative field with peripheral intravenous lines preferably in the lower extremity; the forearms and hands are covered with surgical stockinettes. The arm is supported by an assistant while the areas for liposuction are infiltrated using a superwet technique: 1 liter of lactated Ringer solution, one ampule of 1:1000 epinephrine, and 30 ml of 1% lidocaine. The arm is accessed by means of a 1-cm radial incision in the elbow. A separate incision in the lateral chest may be required if axillary liposuction is performed. Ultrasound-assisted liposuction is used in the arm and axilla using long radial strokes. The ultrasound-assisted liposuction settings are 50 percent in a nonpulsed mode. The middle fat layer is targeted with a 3.7- to 4.6-mm liposuction cannula. The endpoints for ultrasound-assisted liposuction in all areas are time and decreased stroke resistance. Even though our group prefers ultrasound-assisted therapy,⁷ other liposuction modalities are interchangeable.

After completion of liposuction, the proximal incision is made in the axillary crease. The ellipse is then completed with sharp dissection. Next, using electrocautery, the incision is carried down to the subcutaneous level only. In the proximal anterior two-thirds of the ellipse, a superficial resection is performed with no visualization of vital structures; a deeper dissection into the fatty layers is performed in only the posterior one-third because of absence of these structures. The medial and lateral skin flaps are undermined approximately 1 cm circumferentially to decrease tension on the closure. The closure is then performed in a layered fashion with 3-0 Vicryl (Ethicon, Inc., Somerville, N.J.) interrupted sutures in the deep dermis, a 4-0 polydioxanone running subcuticular suture, and Dermabond (Ethicon) for the skin. The liposuction ports are closed with a single 5-0 fast absorbing suture. Of note, some type IIB patients require a 1- to 2-cm transverse extension at the midpoint of the incision to remove a dog-ear.

POSTOPERATIVE CARE

The short-scar brachioplasty can be performed in conjunction with other body contouring procedures and can be performed as an outpatient procedure. The patient is dressed in a long arm compression garment with Topifoam (Byron Medical, Inc., Tucson, Ariz.) in place. No drains are used. The Topifoam is removed on postoperative day 2, and the patient is allowed to shower. The patient is able to resume activities of daily living at 1 week postoperatively. The patient should keep the arms elevated at 90 degrees for 3 weeks.

RESULTS

The senior author (R.J.R.) has used this technique on 165 patients (type IIA and type IIB) with a range of follow-up of 3 to 58 months. Complications included two patients with superficial dehiscence, which resolved in 7 to 10 days with local wound care; one patient with lymphocele; and three instances of scar widening, two of which required revision. Both subgroups have high patient and surgeon satisfaction.

Sample patient images of type IIA and type IIB are demonstrated in the video, which shows technical highlights of a liposuction-assisted short-scar brachioplasty (see Video, Supplemental Digital Content 1, <http://links.lww.com/PRS/B793>). All postoperative images have a minimum of 1-year follow-up.

CONCLUSIONS

Short-scar liposuction-assisted brachioplasty optimally addresses minimal to moderate skin laxity and lipodystrophy in the proximal arm in patients with appropriate skin tone and quality. Circumferential liposuction with a short-scar brachioplasty is simple and safe, with high patient and surgeon satisfaction. This approach maximizes results and minimizes incision length.

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