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Abdominoplasty

My Preferred Techniques

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Background: Abdominoplasty has been evolving since the 1960s with many technical innovations throughout the years. It has become one of the most frequent and common procedures done in aesthetic plastic surgery, with the ultimate goal of not only to remove the excess tissue in the abdominal area but also to achieve an aesthetic trunk silhouette.

Objective: The prime objective of this article was to describe our preferred approach for a full cosmetic abdominoplasty.

Methods: We summarized all the key technical aspects from our shared surgical approach for abdominoplasty. The article describes collective experiences from authors performing the surgery in South America, North America, and Asia.

Results: The key technical aspects identified were conservative muscle plication, customized excess tissue resection, and ultrasound-assisted liposuction to improve definition in the abdominal lines and body curves, combined with lipofilling. The aesthetic results are presented.

Conclusions: Abdominoplasty should be customized to every patient's anatomy and desired cosmetic outcome, taking into consideration all the anatomical areas surrounding the abdominal wall.

Key Words: abdominoplasty, liposuction, lipoabdominoplasty

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BACKGROUND

Abdominoplasty continues to be one of the most frequently performed procedures in aesthetic plastic surgery. It is a commonly requested procedure for various reasons: for the aging population that wants to maintain a youthful belly, the postpregnancy mothers to restore their previous appearance, and the bariatric patients after massive weight loss with residual excess skin. The final goals of this procedure are to remove the excess skin and fat and to tighten the abdominal muscle with the least conspicuous incision possible. Depending on the nature of the tissue excess, there is a range of procedures referred to as the abdominolipoplasty system of classification and treatment.[1–4] In certain cases, additional skin excess has to be removed from the flanks and the posterior trunk area, as seen in circumferential abdominoplasty in bariatric massive weight loss patients.[5]

Abdominoplasty and other techniques for contouring the abdomen have originated since the 1960s, with contributions from many surgeons along the way. The techniques and technologies have continuously improved to decrease complication and to enhance the overall result.[6–10]

The goal of this article is to describe our collective approach for a full cosmetic abdominoplasty.

METHODS

We included all the key technical aspects from our shared surgical techniques for abdominoplasty. This article describes the collective experiences of the authors performing the surgery in South America, North America, and Asia. The similarities and differences are discussed.

RESULTS

The main goal of our techniques is to achieve a good abdominal contour without residual skin laxity, an hour-glassed waistline, a normal-looking belly button, and an accentuated definition of the abdominal muscles according to the patient's preferences. All our abdominoplasties are combined with ultrasound-assisted liposuction.[11]

The Markings

All areas for liposuction are marked, including the back, the flanks, and the abdominal flap. In the abdominal flap, we mark the predicted areas of the future supraumbilical midline and both semilunaris lines (Figs. 1, 2). The marking begins by identifying the midline and the lower edge of the most inferior roll in the abdomen with the patient in sitting position. The marking of the incision line is made on average 6 cm superior to the vaginal introitus with the skin under moderate tension. Then 6 cm to each side of the midline, a horizontal straight line is drawn resulting in a straight line roughly 12 cm above the mons pubis. From the edge of this line, a straight line is made below the anterior superior iliac spine to the end of the flank roll with the skin under tension in a superior direction mimicking the tension that will result after surgery (Fig. 1B, arrow heads). This maneuver is done to avoid a high riding scar. The superior border of the skin resection, usually upper edge of the belly button or higher, is only estimated but not marked before surgery.

The Technique

We start the surgery in prone position with aggressive liposuction to the flanks and the waistline. If required, fat grafting to the buttocks in the subcutaneous plane is performed to enhance the hip-waistline ratio (See Video, Supplemental Digital Content 1 http://links.lww.com/SAP/A568, which shows back liposculpture). Then, we continue the surgery in the supine position. VASER-assisted liposuction (vibration amplification of sound energy at resonance; Solta Medical, Bothell, Wash) is used in all areas that will not be resected, paying special attention to the midline and the projected semilunaris lines. (See Videos, Supplemental Digital Content 2 http://links.lww.com/SAP/A569, which shows abdominal flap liposuction and, Supplemental Digital Content 3 http://links.lww.com/SAP/A570, which shows high-definition liposuction to abdominal lines). After liposuction, the abdominal flap is elevated to the xiphoid and costal margin in the center, leaving most of the perforators to the flap

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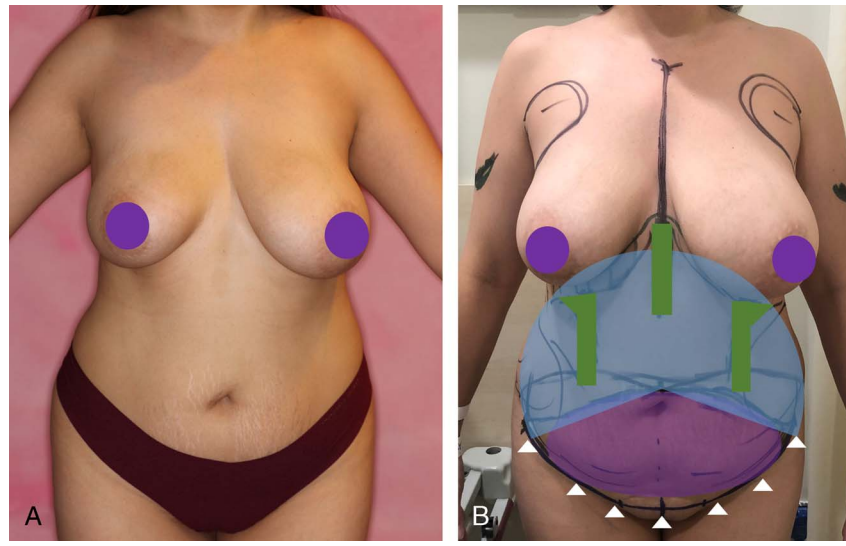

FIGURE 1. Anterior marking: the arrow head shows the initial abdominoplasty incision. The purple area corresponds to the predicted area of resection, although this will be customized, and the superior border is remarked after bending the operating table. The light blue area shows the area for deep liposuction. The green area shows the abdominal contour shadows planned for superficial liposuction. full color online

in the lateral area. During this dissection, the inferior part of the abdominal flap is divided in the midline until the umbilical opening to ease the dissection (See Video, Supplemental Digital Content 4 http://links.lww.com/SAP/A571, which shows initial abdominal flap elevation). Plication of the rectus abdominis muscle is performed in the midline to correct any diastasis (See Video, Supplemental Digital Content 5 http://links.lww.com/SAP/A572, which shows rectus abdominis muscle diastasis plication). We do not overcorrect the diastasis to preserve the rectus abdominis muscle anatomy. To enhance the waistline in some cases, we add rows of plications lateral to the semilunaris lines (Fig. 3). Because the rectus abdominal muscle position is restored and not overcorrected, high-definition liposuction to the abdominal flap can enhance the underlying muscle anatomy. After plication, the umbilicus is shortened and fixated to the aponeurosis with 4 cardinal stitches from the umbilical stalk skin edge to the fascia. This fixation provides a good sinking force for the new umbilicus, which is the key to a natural-looking umbilicus. (See Video, Supplemental Digital Content 6 http://links.lww.com/SAP/A573, which shows umbilical fixation and umbilicoplasty). The operating table is then bended to 30 degrees. A gentle tension is applied in the midline and a heavy suture is used to pull together the center of the abdominal flap to the midline of the Mons pubis. This suture is maintained and used to mark the superior border of the flap for resection. To do this, the hemi-abdominal flap on each side is tractioned with the palm of the hand in a downward and inward direction, further enhancing the waistline with the maneuver. Once the hemi-flap is in the desired position and with the desired effect on the waistline, the suture is used to mark a straight line from the midline to the lateral end of the wound. After releasing the midline suture, an elegant and smooth curved line will mark the superior border for flap resection. Symmetry of the flap resection is checked,

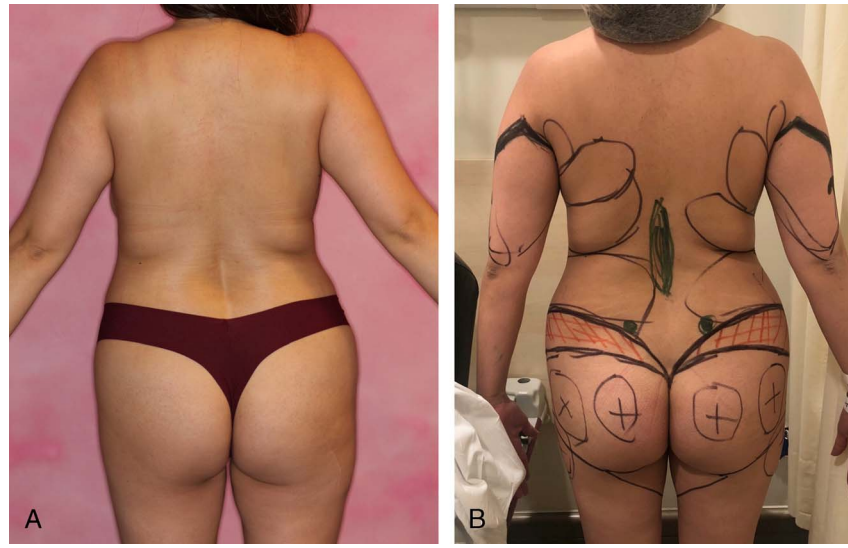

FIGURE 2. Posterior marking: all areas for deep liposuction are marked. In green are marked areas for superficial liposuction. Zones for liposuction and fat transfer are also marked in the gluteal area. full color online

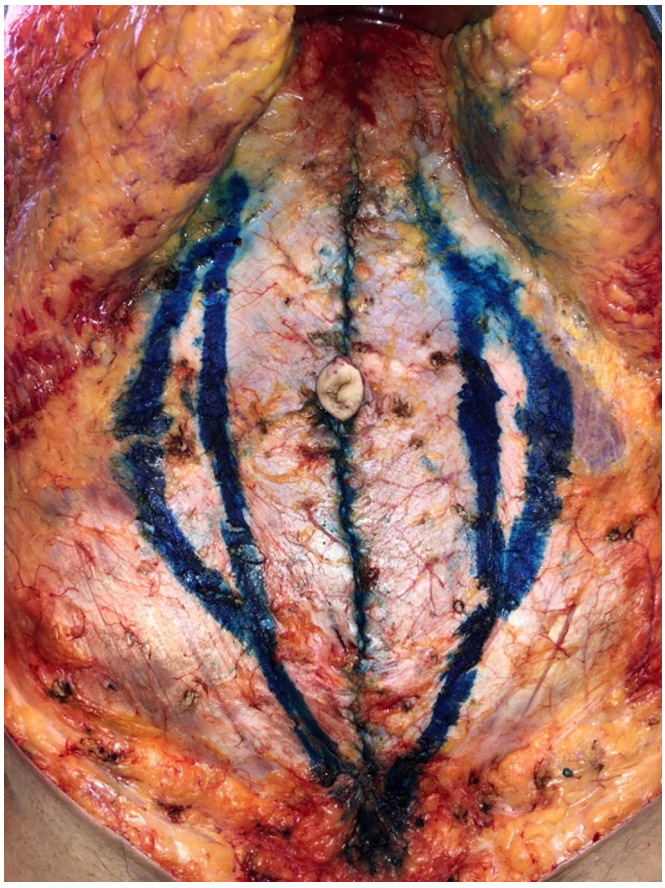

FIGURE 3. Muscle plicature shows conservative rectus abdominal muscle plicature before lateral plicature in the semilunaris lines. full color online

and the excess tissues are resected (See Video, Supplemental Digital Content 7 http://links.lww.com/SAP/A574, which shows marking and resection of the abdominal flaps).

The wound is approximated momentarily with skin staples. The level of the umbilicus is marked on the abdominal wall. The wound is closed with absorbable sutures. The incision for the umbilicus in the abdominal flap is marked in the midline at its original level in a vertical oval shape. The skin and fat are resected to make space for the new umbilicus. Liposuction is done to the midline and semilunaris lines to the desired degree of definition trying to produce a shadow more than a line. The umbilical stalk is fixed to the flap. One or 2 drains are always left in place.

Aesthetic Outcomes

Figures 4 and 5 shows the result 1 month after abdominoplasty and ultrasound-assisted liposuction. (Same case from the Supplemental Digital Content). Improvement in the overall abdominal and body contour can be seen in this single-stage surgery. Figure 4 shows a natural-looking umbilicus and moderate abdominal shadows with enhanced waist-hip relationship.

Figure 6 shows the result 3 months after surgery with a good waist definition, natural umbilicus, and mild definition of the abdominal shadows.

Figure 7 shows the result 5 years after surgery. The result is maintained over time, with a good waist definition, improved waist-hip ratio, natural and still sunken umbilicus, and mild abdominal shadows.

Figure 8 shows the result 6 months after surgery with a smooth abdominal wall, with no residual skin laxity and a natural-looking umbilicus.

Figure 9 shows the result 1 year after surgery with a good waist-hip ratio and a normal-looking umbilicus.

DISCUSSION

Abdominoplasty should be customized to every patient's anatomy and desired cosmetic outcome. The main unique aspect of our surgical technique is to take into consideration all the anatomical

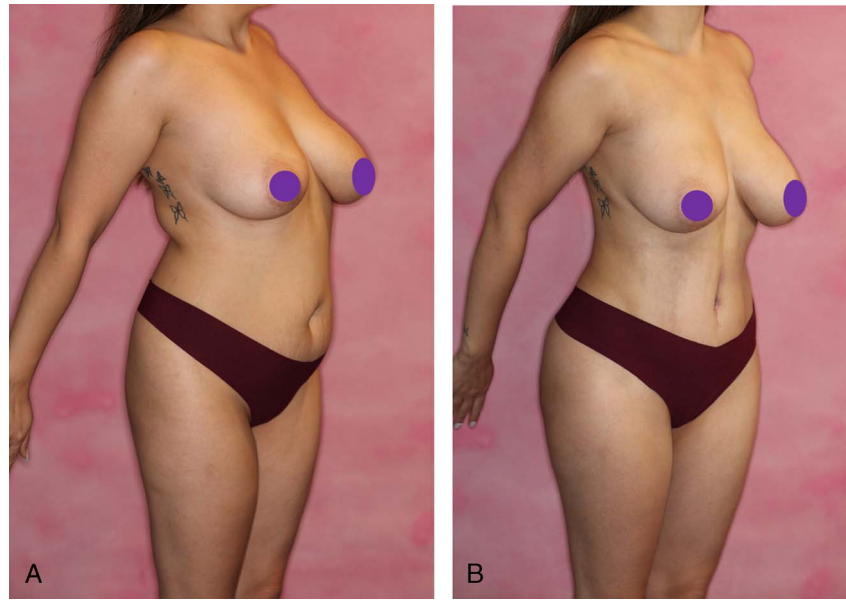

FIGURE 4. Result 1 month after surgery. (Case from Supplemental Digital Content). A, Anterior oblique view preoperative. B, Anterior oblique view postoperative. full color online

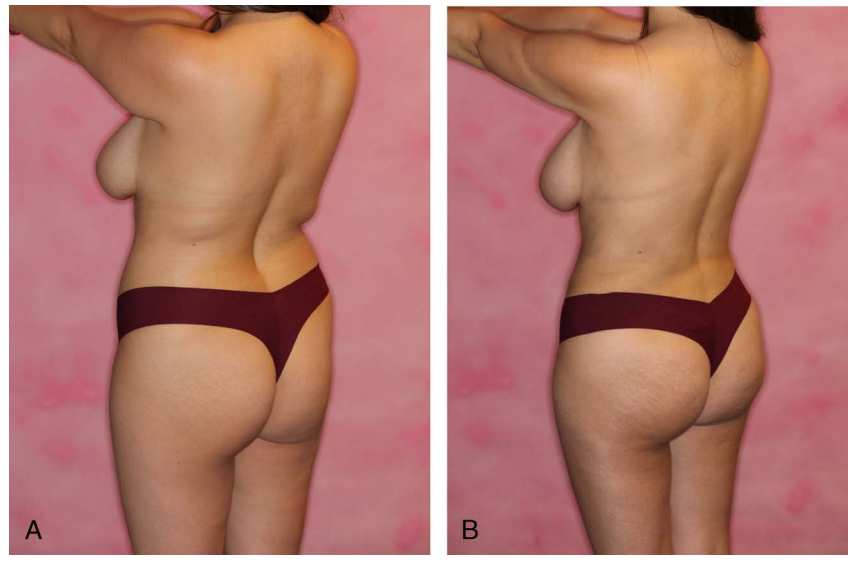

FIGURE 5. Result 1 month after surgery. (Case from Supplemental Digital Content). A, Posterior oblique view preoperative. B, Posterior oblique view postoperative. full color online

details of the abdominal wall, including the aesthetics of the surrounding areas. We now seldom perform a full abdominoplasty without suction-assisted lipectomy. Liposuction enhances the waist line and improves the overall abdominal contour. Ultrasound-assisted liposuction is used to improve definition, especially in the abdominal lines.[12] One often forgotten technical point in every abdominoplasty is the careful intraoperative marking of the superior border of the flap to be resected. Because the superior border of resection is not marked before surgery, it can be customized intraoperatively to the patient skin laxity and flank skin and roll excess. This step is of paramount importance to achieve a good cosmetic result that is well maintained over time (Fig. 1). This superior border marking maneuver helps handle the flank rolls and the excess skin on the flanks and further define the waistline. For a natural result, we always make the new umbilicus at the same level of the original umbilicus, usually at the level of iliac crest. The shape of the umbilicus is always longer in its vertical dimension than its width to achieve a young-looking umbilicus. There have been many different umbilical excision shapes suggested in the literatures; after trying all of them, we found that the shape is not the most important factor to a natural-appearing umbilicus and being deep is actually the key. The

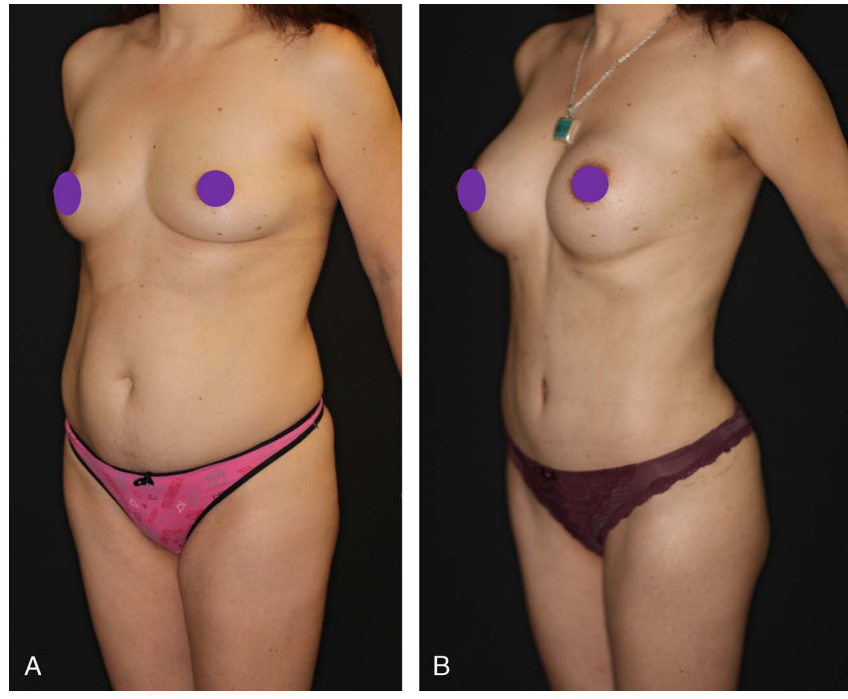

FIGURE 6. Result 3 months after surgery. A, Anterior oblique view preoperative. B, Anterior oblique view postoperative. full color online

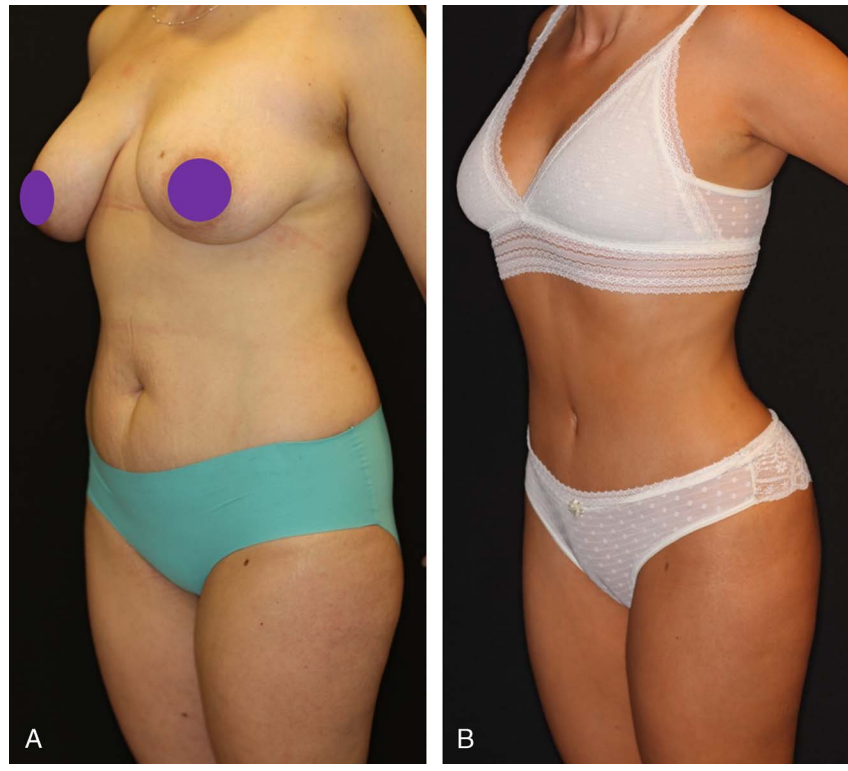

FIGURE 7. Result 5 years after surgery. A, Preoperative photo. B, Result 5 years after surgery. full color online

sinking force of the remaining umbilical stalk from being sutured to the aponeurosis is of paramount importance to achieve that depressed umbilicus look. With the umbilicus deep, the scar around the umbilicus is usually not a problem, as it will be hidden inside close to the aponeurosis. Besides tissue resection customization, we also customized the liposuction to the abdominal wall. One key technical point to achieve this is to momentarily and partially close the umbilicus. This allowed us to assess the sinking force and the new shape of the abdominal wall. Many of the enhancements to the abdominal shape, lines, and shadows can be done through the navel.

Although the aesthetic objectives of the patients have evolved over time, nowadays, looking for a more athletic result, one of the aspects we pay most attention to is achieving a feminine outcome in women. We believe that the overuse of high-definition liposuction in some cases can masculinize the abdomen. To avoid this, we carefully measure the degree of definition of the lines and shadows in every patient.

Because we perform ultrasound-assisted liposuction in conjunction with abdominoplasty, we always use drains to avoid seroma. We do not use progressive tension sutures to the abdominal flap, because we consider the use of drains necessary because of the liposuction portion

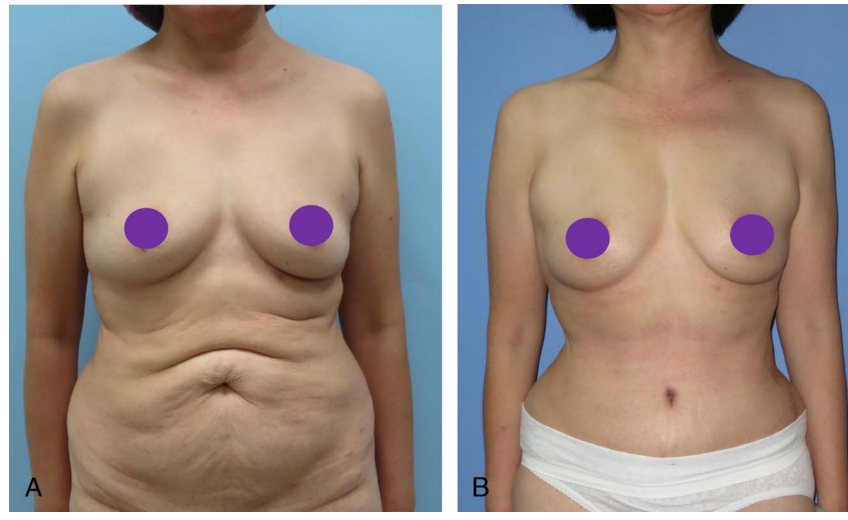

FIGURE 8. Result 6 months after surgery. A, Preoperative photo. B, Result, 6 months after surgery. full color online

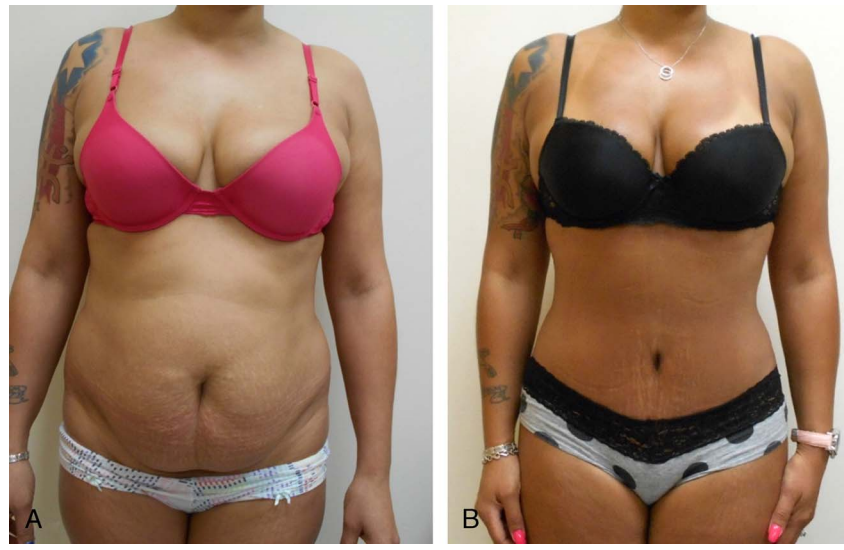

FIGURE 9. Result 1 year after surgery. A, Preoperative photo. B, Result, 1 year after surgery. full color online

of our procedure and is less time-consuming than putting multiple rows of progressive tension sutures.

Regarding high-definition liposuction, we should always be mindful of the patient's desire but also try not to overdo it to avoid masculinize the female abdomen. In abdominoplasty in men, we are in general more aggressive with the marking and definition liposuction.

Abdominoplasty, like most body contouring procedures, the aesthetics, and techniques are very similar across cultures and races. From our collective experiences, the main difference lies in the scar formation. Asian and Black patients are more prone to form hypertrophic scars and keloids in the lower abdominal incision. Especially, the incision is usually under tension at the time of closure. To optimize scar in the Asian and Black population, we recommend routine 3 layers closure of the Scarpa fascia, deep dermis, and the superficial dermis. Silicone scar tape is also routinely recommended for 3 to 6 months use after surgery.

CONCLUSIONS

In summary, we consider that abdominoplasty is no longer an isolated procedure but a component of mixed techniques for body contouring. Abdominoplasty surgical techniques combined with ultrasound-assisted technologies should be considered in every patient. A deep sunken umbilicus, conservative rectus abdominal muscle plicature, customized abdominal flap resection, customized liposuction, and reproduction of abdominal line shadows are of paramount importance to achieve a natural and aesthetic result that maintains over time.

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