15th World Congress of the International Confederation for Plastic Reconstructive and Aesthetic Surgery

IPRAS

New Delhi (India), November 29-December 3, 2009
Anchor lipoabdominoplasty: A Three-layer Technique

Novaes Matos W.1 Jr., M.D., Cavalcanti Ribeiro R.2, M.D.

1Active Member of the Brazilian Society of Plastic Surgery, Professor of Post Graduation Course in Plastic and Reconstructive Surgery of Santa Casa of Rio de Janeiro, Wilson Novaes Plastic Surgery Clinic, Santos, Brazil
2Active Member of the Brazilian Society of Plastic Surgery, Professor of Post Graduation Course in Plastic and Reconstructive Surgery of Santa Casa of Rio de Janeiro, Brazil

Summary

Conventional abdominoplasty generates trauma in anatomical structures that results in complications mainly in post-bariatric weight-loss patients. From 2000 to the present, we have used a different approach to treat the abdominal region, systemizing liposuction to enable flap undermining in a safe way.

This technique is more conservative because the anatomy is preserved through the three-layer approach. We have observed a faster post-operative recovery period and better results compared to our previous experience, enabling the performance of combined surgeries.

Introduction

Obesity is a major health issue worldwide, and the number of bariatric surgeries has risen continuously. After undergoing massive weight loss, patients present a large amount of excess skin, lipodystrophy in various regions, and a skin-fat envelope, among other alterations in physical presentation. Body reconstruction after massive weight loss represents a new challenge to plastic surgeons. Abdominal plastic surgery is required in almost every case; it is the first plastic surgery procedure that these patients search due to the large amount of excess skin in this body area.

In the conventional abdominoplasty, there is wide undermining in the aponeurotic plane over the rectus abdominis muscles to enable dissection of the abdominal flap, generating trauma in the anatomical structures (veins, perforant vessels and lymphatics) (Figure 1).1, 2

The lymphatic drainage of the hypogastrium is downward toward the inguinal nodes, and lymphatic drainage of the epigastrium is upward toward the axillary nodes. These two regions are connected through thin vessels at the level of the umbilicus. These lymphatic vessels are located between the Scarpa’s fascia and the aponeurosis
of the rectus abdominis.\textsuperscript{3, 4} The classic approach traumatizes the lymphatic system and, for this, a maneuver was reported by Baroudi. It consists in the quilting suture technique to fixate the abdominal flap in the aponeurosis aiming at dead space and flap movement reduction.\textsuperscript{5}

The skin overlying the rectus abdominis muscles is supplied by branches of the superior and inferior epigastric vessels that pierce the rectus abdominis fascia, traverse the abdominal fat, and reach the skin. The superior and inferior superficial epigastric vessels are ligated during abdominal flap elevation. The intercostal, subcostal, and lumbar vessels are a secondary blood source extremely important after abdominal flap elevation and should be maintained.\textsuperscript{6}

The distribution of perforators over the anterior rectus sheath, external oblique aponeurosis and linea alba has been mapped by Boyd et al. The external oblique aponeurosis and linea alba present fewer major perforators. The greatest amount of larger perforators is positioned over the middle and medial thirds of the muscle in the paraumbilical region. The deep inferior epigastric artery is more significant than the superior epigastric artery in supplying the skin of the anterior abdominal wall.\textsuperscript{7}

From 2000 to the present, we have used a more conservative approach to treat the abdominal region, replacing the dissection only in the aponeurotic plane, systemizing liposuction to enable flap undermining in a safe way (\textbf{Figure 2}).\textsuperscript{8}

The goal of this paper is to present a technique that uses 3 different dissection planes to preserve the vascular and lymphatic systems. Improved flap viability avoids local complications, such as seroma, hematoma and necrosis mainly in post-bariatric surgery patients.
Materials and Methods

From 2000 to 2009, we studied 105 patients who had experienced massive weight loss and underwent lipoabdominoplasty.

Anchor lipoabdominoplasty was indicated to post-bariatric patients who experienced major weight loss and presented a great amount of excess skin and flaccidity or laxity. It was also indicated to patients with previous scars in the upper abdominal region and secondary abdominal surgery. Scars and hernias did not become a contraindication for this procedure.

All patients underwent preoperative lab work; as well as cardiological and pulmonary evaluations.

DVT prophylaxis preoperative measures included heparin administration at appropriate doses, hormone therapy interruption, the intermittent wearing of compression stockings. Intraoperative prophylaxis included massaging boots and compression stockings. Immediate postoperative measures included motor physiotherapy and early ambulation. Post-operative measures should also include D-dimer analysis on the first post-operative day, venous Doppler ultrasound 4 to 5 days after surgery, and the intermittent wearing of compression stockings.9

Preoperative Evaluation

During the physical examination of the abdominal region, we took note of the following:
Skin: quality; vertical, horizontal, and total excess (pinch test); stretch marks; elasticity; laxity; and irregularities
- Adipose tissue (excess, amount, and disposition)
- Scarring (hypertrophy, position, and deep-layer adherence)
- Rectoabdominal diastasis (presence, degree, and localization)
- Hernias (dimension, location, and content)
- Pubis (size, skin, and fat excess)

Body-contouring lipodystrophies and skin excesses in other areas, such as the flanks, gluteus, sacrum, and pubis, were also evaluated. All patients underwent preoperative abdominal ultrasound test that allowed for a precise evaluation and diagnosis, detecting hernias, adherences and other alterations that may not have been noticed during the physical examination.10, 11, 12

Techniques

A saline solution with epinephrine (1:1,000.000 UI) is infiltrated in the entire abdominal region and flanks, except from the areas where hernias, scars or adherences have been detected by the preoperative ultrasound test. Liposuction is performed with 3-, 3.5- and maximum 4-mm diameter cannulae (lipoundermining) in Zone I (1st plane) to undermine and remove the remaining fat. Either power-assisted lipoplasty (PAL) or conventional liposuction is then performed, reaching both the medial and superficial portions of the lamellar layer, and the medial and deep portions of the areolar layer of the abdominal flap.

Through 3 different dissection planes, it is possible to preserve the perforators that supply the abdominal flap and the lymphatic system:

1. **Superficial and deep fat plane**: Lateral abdomen and abdominal flap dissection through liposuction, termed by us “Lipoundermining”. (Zone 1)
2. **Scarpa’s fascia plane**: Aggressive superficial liposuction of the lower lateral abdomen under the Scarpa’s fascia. (Zone 2)
3. **Aponeurotic plane**: Vertical Dermolipectomy at xiphoid-pubic line for diastasis plication and excess skin resection. (Zone 3) (Figure 3)
In the lower lateral abdominal region, the superficial fat layer is completely removed through aggressive superficial liposuction with 5, 6- and 7-mm cannulae. The Scarpa’s fascia is kept, as well as part of the deep fat, which can be reduced through open-sky lipoplasty (Zone II – 2nd plane).

The excess skin vertical resection is performed at the medium line on the aponeurotic plane from the xiphoid to the suprapubic region, exposing the diastasis region for muscular plication. There is no need for liposuction in the vertical region. Moderate liposuction is performed in the internal transition of the vertical excision (Zone III – 3rd plane).

The excess skin horizontal resection is performed overlying the Scarpa’s fascia in the lower lateral abdominal region. The Scarpa’s fascia is closed over the plication in the lower abdomen.

After this procedure, the navel is fixated on the aponeurosis, transpositioned and omphaloplasty is performed. Pubis liposuction and lifting with fixation are combined in the same surgical period (Figure 4).

Results/Complications

Patients ranged in age from 23 to 69 years, and 81% were female. Ninety percent were patients who had undergone bariatric surgery, and 10% had lost weight without surgical procedures. The weight loss ranged from 40 to 80 kg, and lipoabdominoplasty was performed approximately 18 months after the bariatric surgery. The average BMI was 27, the average weight loss was 58.2 kilograms and the average amount liposuctioned was 1 to 4 liters. Nineteen percent of patients underwent lipoabdominoplasty alone and 81% underwent lipoabdominoplasty combined with other procedures. The most frequent combined procedures were: mammoplasty (mastopexy and breast implants), brachioplasty, thighplasty, lipotorsoplasty and herniorrhaphy.

The adipose tissue modeled by the lipoplasty procedure is one of the main differences from the conventional technique, reducing the flap thickness and improving the waist contour (Figures 5 and 6).

When compared to other published series, we observed a very low rate of com-
Conclusions

Three-layer anchor lipoabdominoplasty is a more conservative technique in which we state the importance of anatomy preservation aiming at reducing the complication rate and producing better aesthetic results. Lipoundermining is less traumatic than scalpel undermining, because it does not cut the perforant vessels and does not reach the aponeurotic plane, thereby preserving the lymphatic vessels.

The anatomical understanding of the abdominal region brought us to change the treatment approach. These principles and concepts have been used for the treatment of post-weight loss patients as well as all other types of abdomen. Post-bariatric surgery patients may have post-operative complications due to countless reasons. Treating the abdomen in three planes targets the preservation of lymphatic, arterial, and venous systems to reduce the rate of complications, therefore this approach is responsible for a faster post-operative recovery period.

References