

Chapter 24

Umbilical Reconstruction with the “Heart-Shaped Incision”

Oscar M. Ramirez

24.1 Introduction

Throughout history females have enchanted males changing exposures of their erotic zones. The female abdomen, although not erotic by itself, has always been the point of attention because of the close proximity to the primary sexual zone that lies beneath. Modern female fashion has followed the so-called law of shifting erogenous zones [1]. Following this law in the late 1990s in the Western world, there was a change in fashion for exposing the abdomen by wearing low-cut jeans combined with very short tops. That has changed the focus of attention to the navel because that became available for ready inspection. Women started decorating their navels with ring piercing and tattoos. Wearers and observers became more aware of the beauty of the navel, its shape, and position. Despite that, there are scant publications dealing with the aesthetics of the navel. However there are many publications dealing with surgical techniques to reconstruct the navel during an abdominoplasty or to reconstruct a new umbilicus following an unfavorable surgical outcome from the original abdominoplasty or in the presence of large umbilical hernia. This is probably a reflection that there is not an ideal method for its reconstruction. The aim of this chapter is to describe my personal approach to reconstruct the umbilicus during abdominoplasty.

O.M. Ramirez, M.D.
Ramirez Plastic Surgery, Elite Surgical & Aesthetic Center,
2665 Executive Park Dr., Weston, FL 33331, USA
e-mail: RamirezMDPS@gmail.com

24.2 Aesthetics of the Navel

The navel is the only scar in the body that has aesthetic and sensual attractiveness. Their look is of significant concern to prospective patients and surgeons due to its visible location and exposure in the center of the abdomen. Age, weight, pregnancies, and hernias influence its shape and size. It breaks the monotony of the abdominal surface and contributes to its identity and beauty. In some cultures, it is considered philosophically speaking the center of the body. In other cultures where the woman's face is covered, the abdomen and the navel represent the face of the soul. Therefore, a summary of the available information on the navel position, distance from classic landmarks, and shape is in order.

The navel is not located in a central midline as we traditionally thought. Studies by Rohrich et al. found out that the navel rarely is in the midline [2]. The position in the longitudinal axis has been subject of many personal opinions and during surgery placement of the navel used different reference anatomical landmarks. Vernon, the pioneer of the modern abdominoplasty, suggested placing it 4 cm below the waistline [3]. Baroudi [4] and Pitanguy [5] positioned at the level of the umbilical stalk in a neutral position. Hinderer [6] advised placing it 3 cm above the anterior iliac crest. Subsequently Baroudi advised to place the umbilicus 17 cm from the anterior vulvar commissure. Dubois and Ousterhout in their study found out that the navel was located at the level of the uppermost point of the iliac crest [7]. A more mathematical approach to locate the navel were the studies of Abhyankar et al. [8]. Their studies suggested that the navel should be located in a position that is in accordance with the golden ratio: Xiphos-ternum-umbilicus distance/umbilicus-pubic symphysis distance ratio of approximately 1.6/1. Visconti et al. [9] used the abdominal crease as the lower limit of the umbilicus-pubic distance, and their findings on the location of the umbilicus were even closer to the golden ratio (i.e., 1.618).

Regardless of the shape, the most desirable navel should be small, should have a moderate hooding, and should be deep (an "innie"). The most desirable shape of the navel according to some studies is a vertical oval (1.5 cm or less vertical distance and 0.5 cm or less horizontal distance). A horizontally oriented navel with excess hooding is an aged navel and does not look athletic. Round, triangular, slit-shaped, and moderate large navels are of intermediate likeness. The less desirable is a navel with two or more of the following features: large navel, lack of hooding, horizontally oriented, and has an outie. The most beautiful navel has the following combination: small, vertical oval has an innie and a smooth skin hooding. In addition the beautiful navel should be the end of an aesthetically pleasing xiphos-umbilical depression (Fig. 24.1).

24.3 The Consultation

During consultation for abdominoplasty, I spend a good amount of time dealing with the aesthetics and surgical technique of the navel. Among the undesirable aesthetic sequelae following an abdominoplasty, problems with the navel are the most



Fig. 24.1 A beautiful abdomen has as its central piece the navel located at 1.6/1 relationship between the xiphoid and the suprapubic crease. The navel is vertically oriented, is small, has a delicate hooding, and is located at the end of a xipho-umbilical depression. Credit: KMNPhoto/Shutterstock.com

distressful to patients. Since the navel is rarely in the midline, I make a point to the patient about her navel position and how much off is from the midline. This will prevent potential medicolegal claims. I discuss the options of navel transposition on the abdominal skin vs. navel floating. This will obviously depend of the original pubis-umbilicus distance and the vertical extent of the dermolipectomy needed to obtain a good aesthetic result. If the patient is not a candidate for the “floating abdominoplasty,” I discuss the vertical extent of the abdominal skin resection, i.e., above or below the umbilicus. If the resection is going to be below the umbilicus, there will be a vertical scar from the closure of the navel defect. The patient has to be fully aware of this. Sometimes the decision of making a vertically short flap resection (with its resultant long umbilicus/suprapubic scar) will depend of the horizontal abdominal skin flap resection. This will be determined by the logistics of not having enough laxity in the upper abdomen to stretch the skin all the way down to the suprapubic/ anterior hipline of closure. Some other times may be patient’s choice, whom may elect not to have a long lower abdominoplasty scar. Basically, the length of the lower abdominoplasty scar is determined by the size of the ellipse of the skin/pannus that needs to be removed. In that context it is a patient’s decision between having a shorter lower abdominal scar and a vertical scar or having a longer lower scar and no vertical scar. In my experience most patients elect to have a longer lower abdominal scar if that entails avoiding a vertical scar and maximizing the amount of panniculectomy.

Specific problems that need to be addressed beforehand are the presence of a large ventral or umbilical hernia. Hernia repair may require sacrifice of the blood supply to the umbilical stalk. If that is the case, the patient and surgeons should be prepared to create a new umbilicus with some of the techniques described in this book. Some patients regard their navel a highly erotic function. Sacrifice of the sensory input may be a sequel that needs to be informed. This is most likely to happen after a total amputation of the navel.

24.4 Surgical Technique

The technique about to be described has several considerations. Most navels particularly in overweight and obese patients have a long stalk. These umbilici need to be shortened, telescoped, or both. Standard rectus dehiscence repair may not tighten enough the abdominal muscles, and it will not give enough room to accommodate these long navels. Therefore the resultant reconstructed navel may not present an innie after surgery and will be located over an abdominal prominence (Fig. 24.2). It may become flat and sometimes will develop an outie (Fig. 24.3). Hooding is a difficult proposition to achieve because the abdominal flap that for necessity is placed under tension will transmit that tension to the navel, producing flattening of the navel. Absorbable braided sutures produce more inflammatory reaction than non-braided absorbable sutures. Absorbable sutures in general produce more inflammation than nonabsorbable material. On the other hand, braided materials being absorbable or permanent may harbor bacterial biofilm. Monofilament



Fig. 24.2 Poorly executed umbilicoplasty. This is located too low near the suprapubic incision, the muscle repair is incomplete with a convexity, the navel is too large and flat



Fig. 24.3 Large navel with an “outie.” Observe the redundant skin in the center of the navel

nonabsorbable sutures are the least reactive. Inflammation has a direct relationship with hypertrophic or keloid scarring (Fig. 24.4). Tension is another causation for hypertrophic scars. So to obtain the best scars, I use monofilament nonabsorbable suture material for the deep dermis and skin and avoid excessive tension during closure at the skin level.

The traditional method of coring out the umbilicus for transposition is through a circular incision. The recipient incision on the abdominal skin is also circular or a vertical or horizontal slit. Regardless of the abdominal skin incision, the circular incision on the navel upon healing will tend to produce a constricting scar usually associated with hypertrophy at the borders. The constriction may progress to a



Fig. 24.4 Hypertrophic scarring will occur due to tension, poor skin border approximation, or the use of braided absorbable sutures



Fig. 24.5 Constricting scar around the navel. This is due to a small circumferential incision to fit the navel

pinhole entrance that may complicate hygiene and in some cases may even produce infection (Figs. 24.5 and 24.6). To avoid this problem, the umbilical separation from the abdominal skin is making an incision on the navel that has a heart shape. This implies to include in the resection a triangular flap in the meridian of the navel either at 12 o'clock position (superior triangle) or at 6 o'clock position (inferior triangle). I prefer resection of the superior triangle because at the time of the transposition and inseting in its new position, I could create a hooding of the new navel with the reciprocal triangular flap of the recipient. The triangular flap that is resected has a superior base and its apex is located at the very depth of the navel. This separation



Fig. 24.6 Observe the pinhole navel with hypertrophic scarring

is done at the beginning of the surgery or when the abdominal flap elevation is about 5 cm below the umbilicus. Anterior-posterior circumferential dissection around the umbilicus is done down to the rectus fascia plane. This will isolate the navel from the abdominal flap. This is done to prevent accidental transection of the navel that may occur particularly when the panniculus is thick and the navel base attachment to the fascia is tenuous as may happen in cases of hernias or wide rectus diastasis. I have known of young plastic surgeons or trainees suddenly surprised with the presence of the navel in the elevated abdominal flap. After the skin-fat layer elevation usually up to the xiphoid process in the center and the costal margins or lower laterally the decision to plicate the rectus fascia is made at this point.

If you have a navel with a long umbilical stalk, there are two maneuvers to make it short. One is to cut the skin portion and the other is to telescope it or bury it in the muscle abdominal wall. Skin resection is limited because you need the skin component of the navel to create a natural-looking structure. You cannot cut the stalk unless you are prepared to create a neo-umbilicus. Telescoping along without pushing the stalk backwards is limited because this structure is too rigid to be compressed on itself. So the only option is to hide the stalk in the abdominal wall muscle plane. Standard rectus plication has also limited ability to hide the long stalk. I have found that the rectus partitioning and repair that I use in my abdominoplasty technique hides very well even the very long stalk [10, 11]. This technique also makes very good navel “innie.”

The rectus fascia partitioning technique is outlined as follows. The borders of the rectus diastasis are marked with ink. A large ellipse outside the previous marking from xiphoid to pubis is marked with the widest portion about 3 cm above the navel or at the level of floating ribs. This is typically at the junction of the middle with the inner third of the width of the recti muscle. It can be less if the laxity of the abdomen is not significant. It can be more if there is no rectus diastasis and patient has

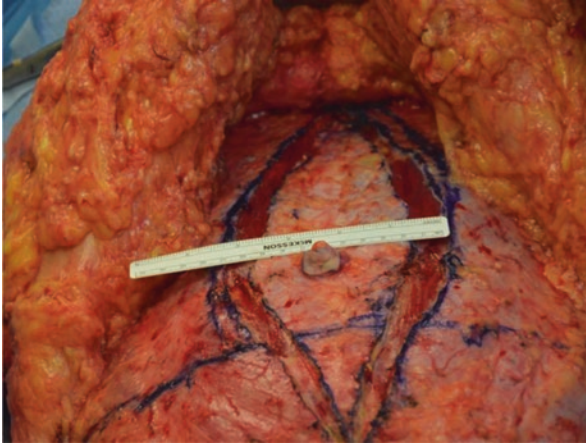


Fig. 24.7 The rectus partition has been completed. This is done well outside the recti border. The horizontal blue line indicates the projection of the iliac crests. Eleven cm of separation is very easy to correct with this technique even in the absence of rectus diastasis as in this patient. The widest portion is at the upper margins of the waistline

abdominal wall laxity. The rectus fascia splitting is done following the lines of the ellipse (Fig. 24.7). This is easily done making several perforations in the fascia with the electrocautery (every 2–3 cm) and introducing a curved hemostat underneath the fascia. The fascial bridges are cut with the electrocautery. Some musculocutaneous perforators are sometimes encountered. These are suture ligated. Prior to the fascia-muscle advancement, the navel stalk is tagged with a suture. The imbricating effect of the repair is so powerful that the navel can be lost in the depths of the advanced muscle so the navel is easily retrieved with the suture. The rectus fascia and muscle is advanced from the lateral border of the split with several interrupted sutures (Figs. 24.8 and 24.9). I prefer 1-0 monofilament nylon. The long navel stalk allows us to adjust its final position by 1–2 cm in a vertical or horizontal direction (Fig. 24.9).

This is anchored to the fascia at the line of closure with 3-0 nylon. This is done 3 mm below the navel dermis (Figs. 24.10 and 24.11).

The recipient location on the caudally advanced abdominal skin is done using the Pitanguy umbilical demarcator (Fig. 24.12). The location is checked against the aesthetic pleasing distances described in the section of aesthetics of the navel. The navel position on the abdominal wall can be changed to more superior or inferior, more to the left or to the right because the stalk is large and the space created by the muscle imbrication gives a lot of room for this. After the marking using the umbilical demarcator is done, a triangular incision on the abdominal skin is done. The triangle is superiorly based and measures about 8 mm at the base and 12 mm of length. This incision after traction of the abdominal flap for closure will have a reciprocal heart-shaped space to receive a similarly shaped navel (Fig. 24.13). From this incision in an anterior to posterior direction (vertical in the surgical position), a core of fat is removed to accommodate the navel and recreate the periumbilical valley (Fig. 24.14).

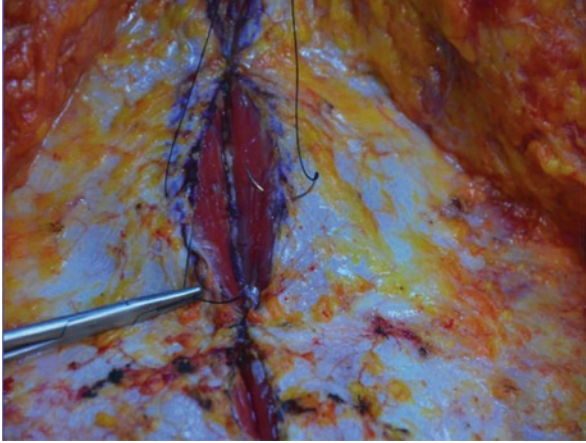


Fig. 24.8 Observe the easy approximation of the recti muscles. The medial border of the split fascia is down deep now

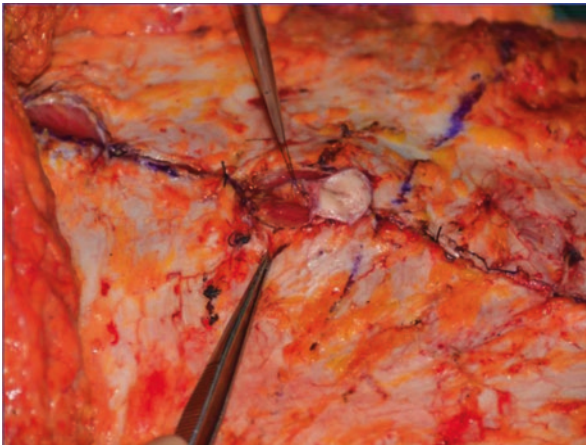


Fig. 24.9 The length of the umbilical stalk allows its repositioning in the vertical or horizontal dimension to fit the aesthetic distance guidelines

Prior to inseting of the navel, the next step is to create the xipho-umbilical depression that is an aesthetic landmark of a young and beautiful abdomen. As described in my abdominoplasty technique, this is done with a superficial liposuction toward the xiphoid starting from the recipient navel defect created.

An important addition to my umbilicoplasty technique is the recreation of the hooding. This is done by advancing the central supraumbilical portion of the abdominal flap with several quilting sutures from the xiphoid to near the umbilicus. I use 2-0 Nylon sutures for this. These sutures hold the deep dermis or the Scarpa's fascia to the muscle fascia at the midline repair. These will recruit several mm of

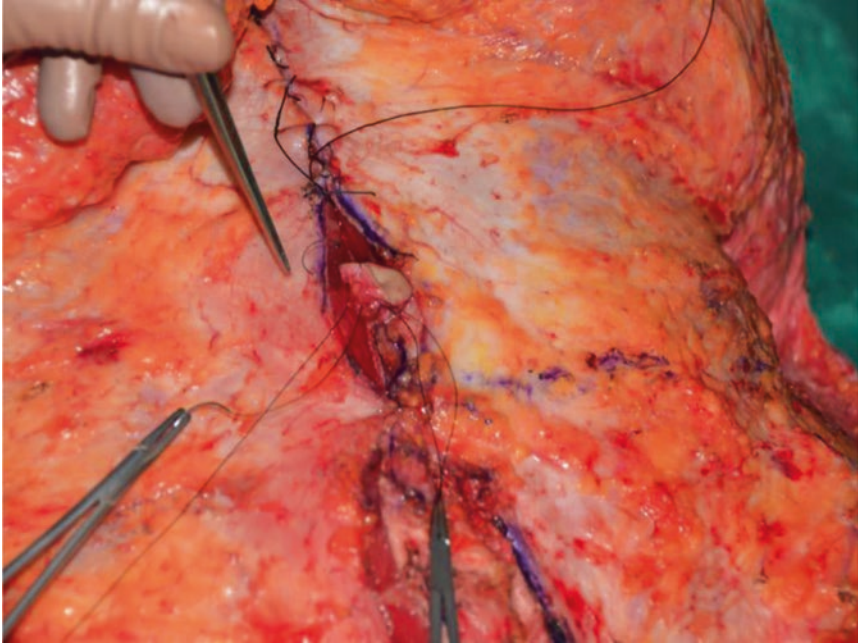


Fig. 24.10 The deep dermis of the navel is sutured to the borders of the fascia. The midline repair is almost completed, the navel stalk is down, and the navel is leveled to the fascia. The vertical position of the navel has been adjusted to the level of the iliac crests for better aesthetics

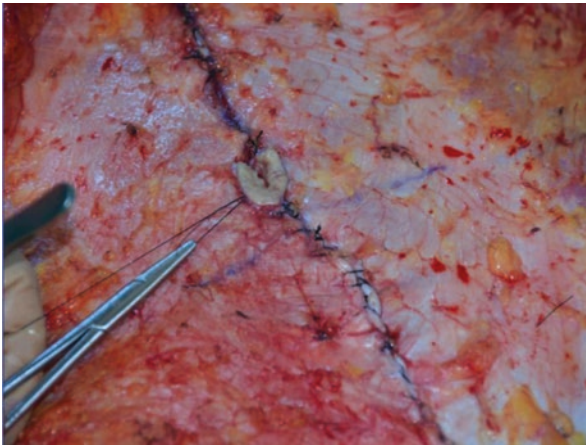


Fig. 24.11 The navel has been stabilized on the midline. It has the original heart shape. It is ready for the skin inset

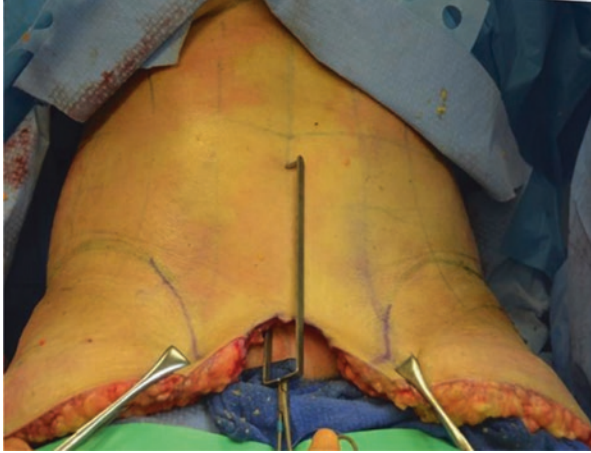


Fig. 24.12 The location of navel on the recipient skin is done with Pitanguy umbilical demarcator



Fig. 24.13 The triangular incision at the recipient site



Fig. 24.14 The triangle now has a heart shape and the core of fat removed is shown

skin to recreate the hooding. This technique has several additional purposes: defines more the xipho-umbilical depression and decreases the tension on the lower abdominal flap. This will also prevent in the short and long term postoperative tension on the navel that otherwise will flatten the navel after a well-executed abdominoplasty.

The shortened navel has a 6 mm horizontal and 8 mm vertical diameters at the skin borders and its depth is usually 6 mm. This will usually fit well into the recipient site. Insetting is done in two layers. The subdermal layer is closed with interrupted inverted 3-0 or 4-0 nylon sutures and the skin with 4-0 or 5-0 Nylon sutures. Size of sutures depends on the thickness and how delicate the navel tissues are. Insetting starts from underneath the abdominal flap with anchoring the dermis of the tip of the triangular flap to the deepest portion of the dermis of the triangular defect of the navel (12 o'clock position) (Fig. 24.15). Next sutures are at the angles of the corresponding circular borders with the triangle (about 10 and 2 o'clock positions) (Fig. 24.16). The next suture is at the six o'clock position. The additional dermal sutures are placed at nine and three o'clock positions from the outside after the abdominal flap is turned over; the skin closure is done with interrupted nylon sutures (Fig. 24.17). The rest of the abdominoplasty closure is completed (Fig. 24.18). At the end you will notice a bit of redundancy and folding of the recipient triangular

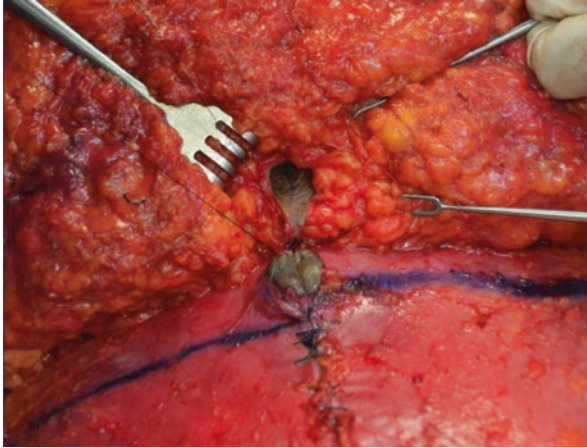


Fig. 24.15 The first inset suture is done from underneath the abdominal flap at the tip of the reciprocal triangles

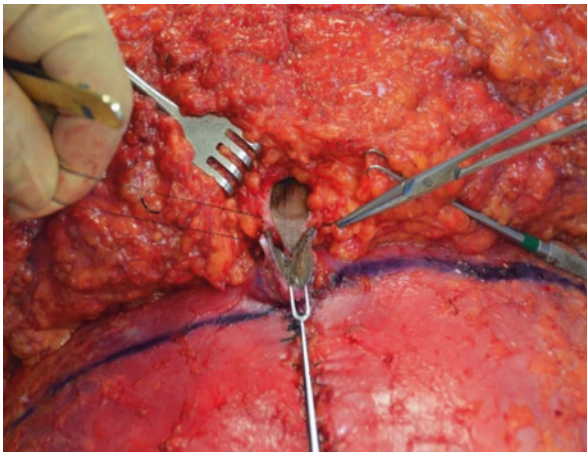


Fig. 24.16 The reciprocal angles are sutured next

flap. This is the hooding created with this technique. You will also notice the navel valley and “innie” as well as the xipho-umbilical depression (Fig. 24.19). These features are maintained over many years (Fig. 24.20). Figures 24.21 and 24.22 illustrate some aspects of the procedure.

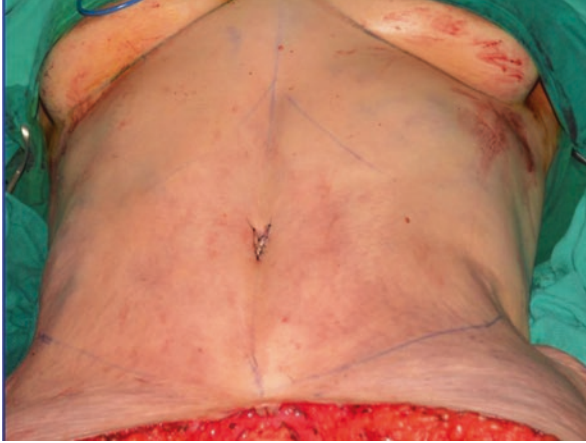


Fig. 24.17 The vertical heart-shaped reconstructed navel



Fig. 24.18 After the navel is inset, the rest of the abdominoplasty is concluded. The panniculus was resected up to above the old navel level. Observe the new navel valley and the xiphoid-umbilical depression

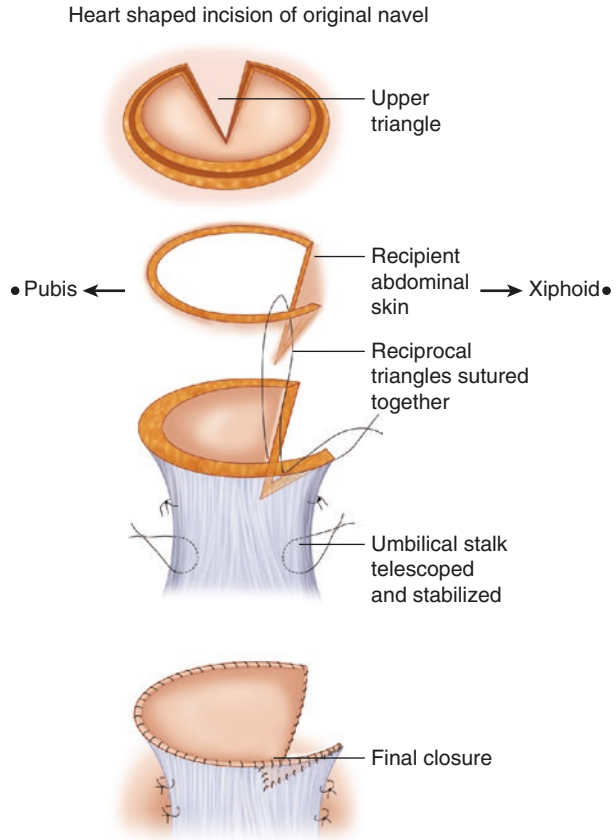


Fig. 24.19 Two days after surgery. Observe the navel position, navel valley, and xipho-umbilical depression



Fig. 24.20 Several years later the xipho-umbilical depression and navel “innie” are maintained. Also observe the navel hooding

Fig. 24.21 Steps of the umbilical reconstruction



24.5 Postoperative Care

The navel is covered with a Xeroform dressing and circular conforming dry gauze sponges of 3–4 cm diameter around the navel. This helps to define better the navel concavity at and around the navel. Sutures are removed at around 7 days and the skin border protected with ¼ inch Steri-Strips applied radially. These are changed every 4–5 days and used for several weeks.

24.6 Clinical Experience

Since my original description of the umbilicoplasty was described within a larger paper dealing with a comprehensive abdominoplasty, many changes have been made [10, 11]. I do not use anymore the inferior triangle. My preference is

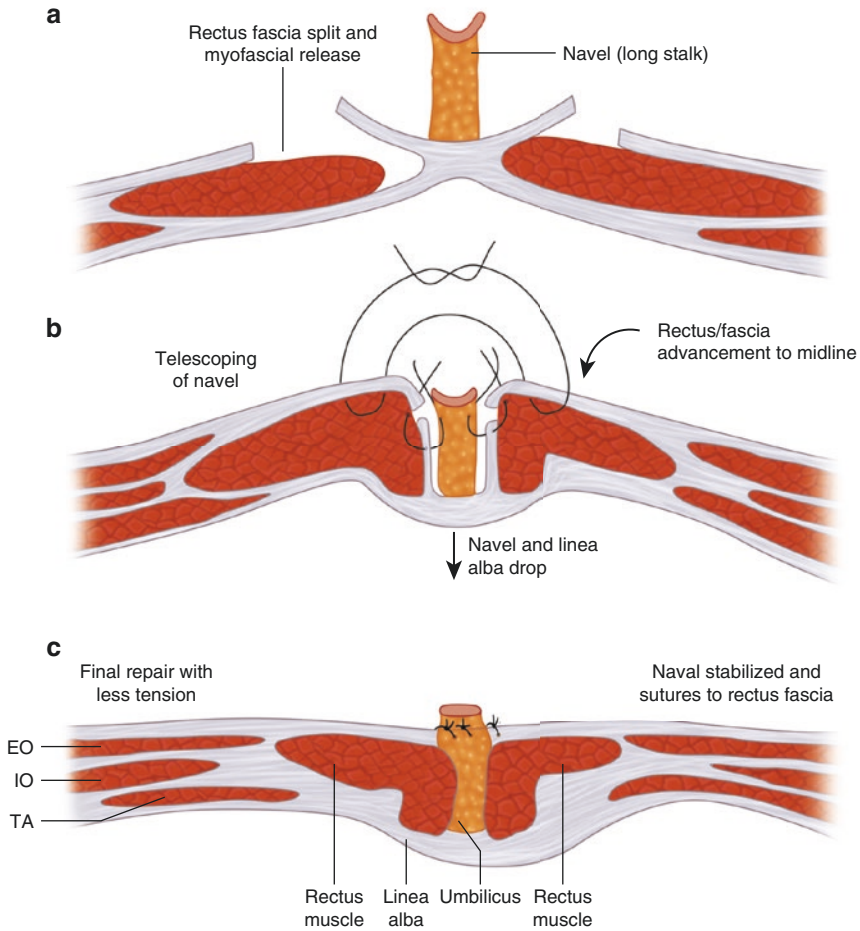


Fig. 24.22 Rectus fascia partitioning, burying of the umbilical stalk, new midline repair, and navel stabilization on the abdominal wall

for the superior triangle. The quilting sutures at the supraumbilical midline with simultaneous advancement of the flap emphasize the midline depression and recruits skin to create the hooding. The addition of this technique prevents tension and potential elongation and flattening of the navel. I still use the rectus partitioning and repair that decreases tension at the midline repair and creates a depth to accommodate the long umbilical stalk. I have applied some or all of these maneuvers to my umbilicoplasty with a high rate of success in several hundreds of abdominoplasty procedures since the early 1990s (Figs. 24.23, 24.24, 24.25, and 24.26).

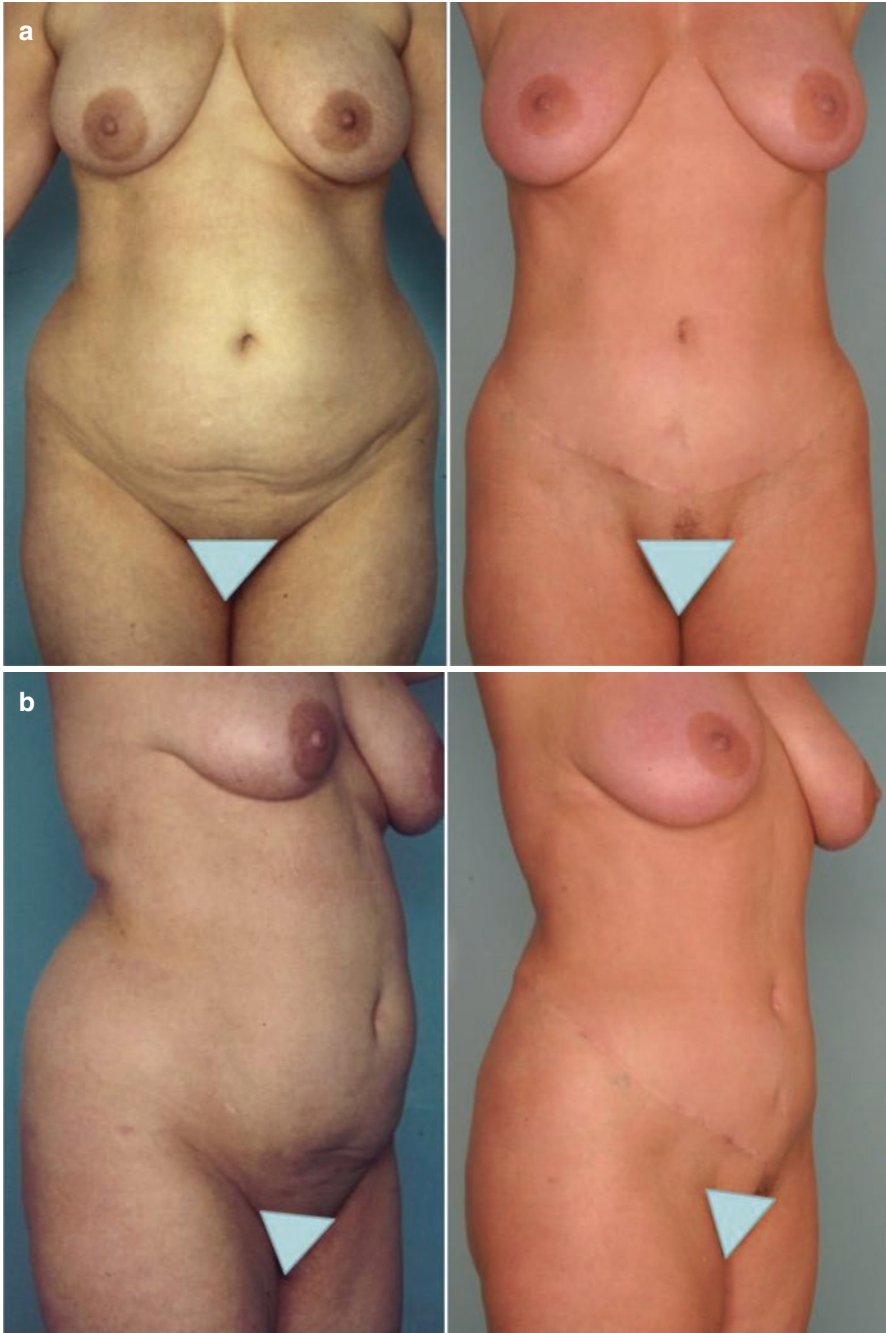


Fig. 24.23 (a) Preoperative. (b) Postoperative after using the described techniques minus recreation of the hooding with the upper flap advancement. Observe the vertical navel and the recreation of the “innie”

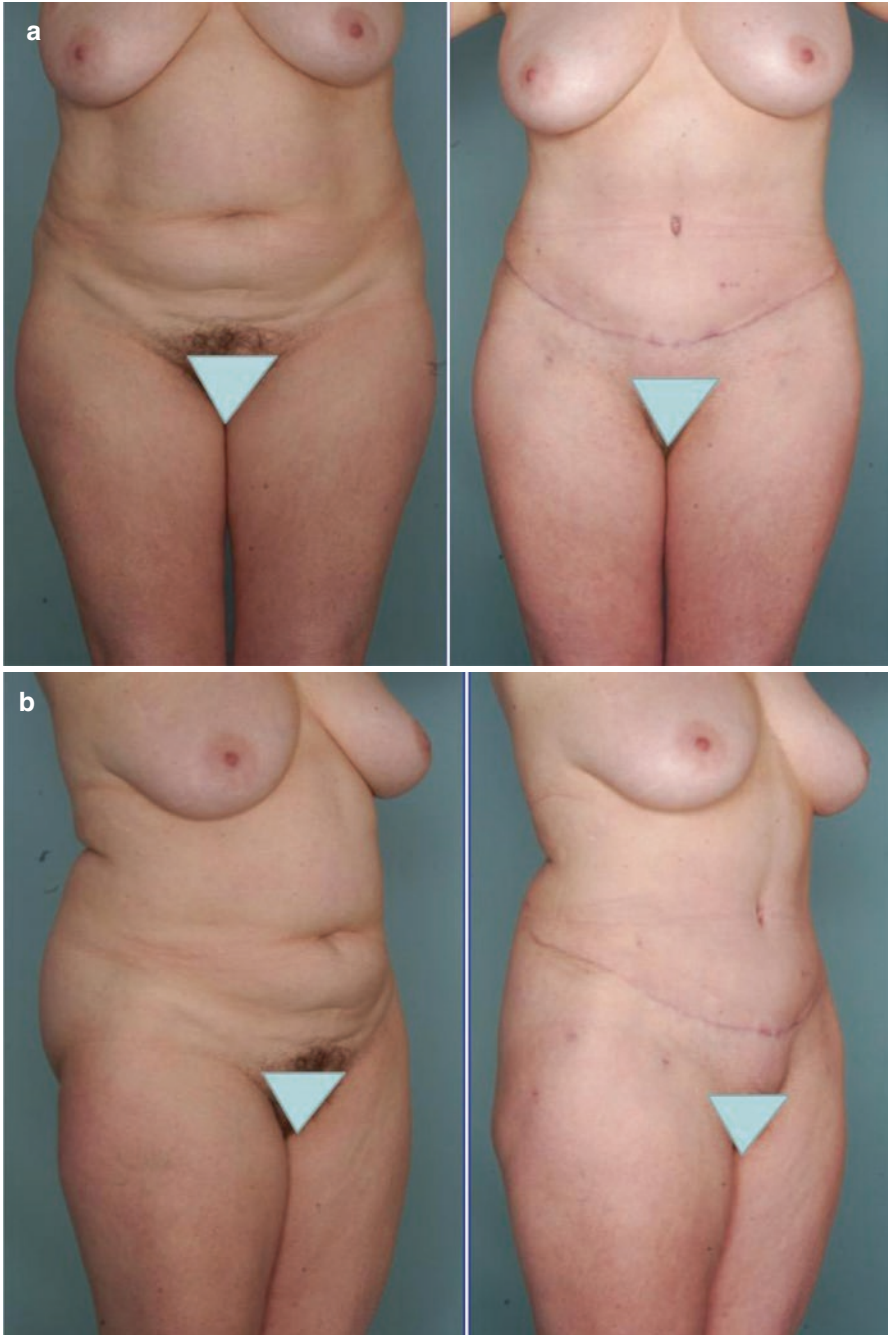


Fig. 24.24 (a, b) (Left) preoperative. (b) Postoperative after using the described techniques minus recreation of the hooding with the upper flap advancement. Observe the vertical navel and the recreation of the “innie”

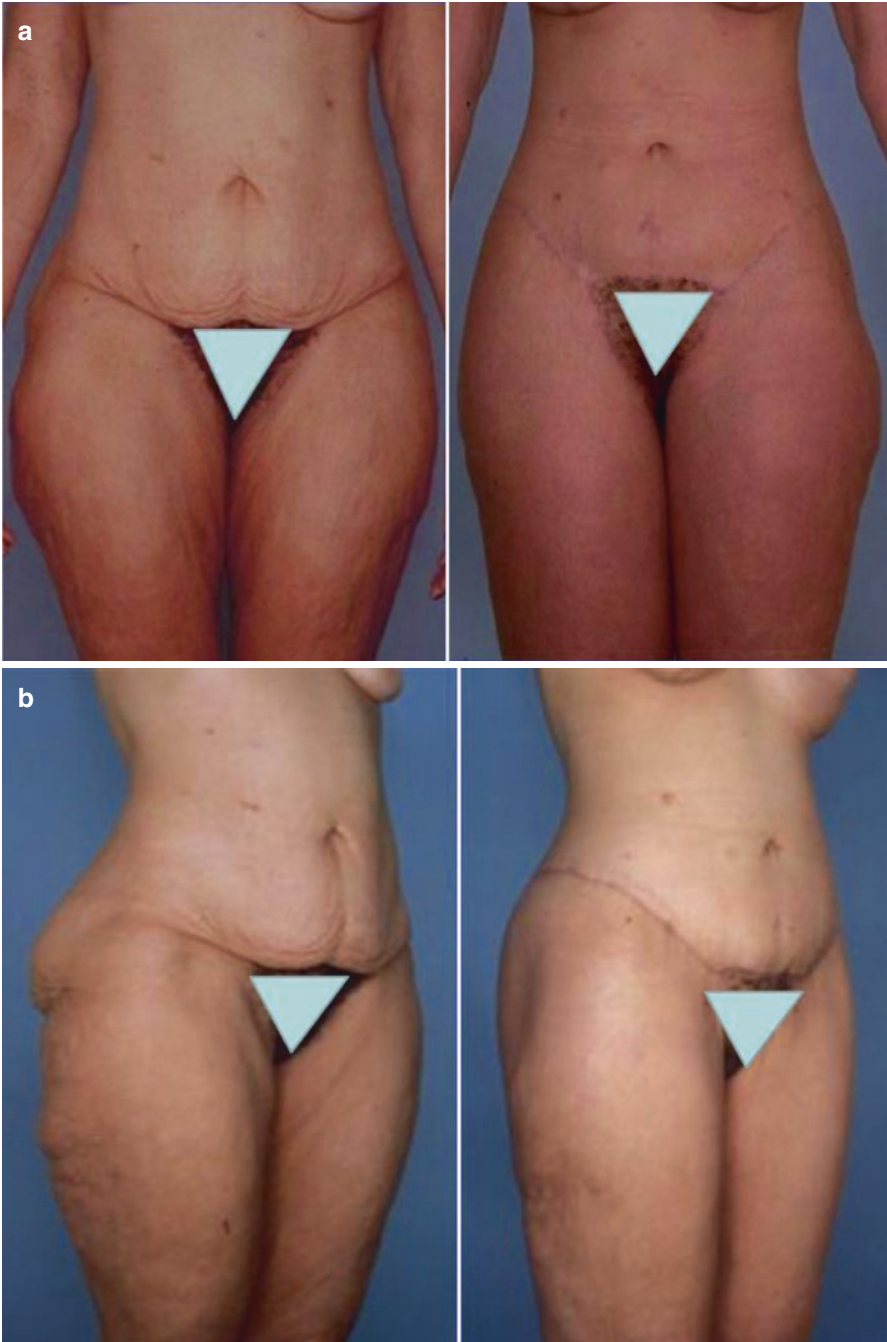


Fig. 24.25 (a, b) (Left) preoperative. (b) Postoperative where patient had in addition recreation of hooding



Fig. 24.26 (a, b) (Left) preoperative. (b) Postoperative where patient had in addition recreation of hooding. Observe the xypho-umbilical depression, vertically shaped navel and the periumbilical valley

24.7 Conclusions

Navel reconstruction after an abdominoplasty is not as simple as may be perceived. It does not simply entail to make a hole on the recipient skin to fit a similar circularly amputated navel. It requires a more careful assessment of the preoperative condition to determine horizontal midline and vertical position and where it will be the final placement on the abdomen. The rest of the planned abdominoplasty has direct impact on the navel aesthetics. The umbilicoplasty is integrated in the abdominoplasty technique taking into consideration the length of the umbilical stalk, thickness of the abdominal pannus, and laxity of the abdominal wall, and careful navel recreation to fit the aesthetic guidelines described at the beginning of this chapter is paramount. If the patient qualifies for a “floating” abdominoplasty or has a large umbilical hernia, the surgical and aesthetic strategy will be completely different. For the umbilical transposition in an overweight or obese patient or for those with abdominal deformities post childbearing, the technique described here provides a comprehensive approach to an aesthetically pleasing umbilicoplasty.

References

1. James L. Modesty in dress. London: Heinemann; 1969.
2. Rohrich RJ, Sorokin ES, Brown SA, Gibby DL. Is the umbilicus truly midline? Clinical and medicolegal implications. *Plast Reconstr Surg.* 2003;112(1):259–63.
3. Vernon S. Umbilical transplantation upward and abdominal contouring in lipectomy. *Am J Surg.* 1957;94(3):490–2.
4. Baroudi R. Umbilicoplasty. *Clin Plast Surg.* 1975;2:431.
5. Pitanguy I. Abdominal lipectomy. *Clin Plast Surg.* 1975;2(3):401–10.
6. Hinderer UT. The dermolipectomy approach for augmentation mammoplasty. *Clin Plast Surg.* 1975;2(3):359–69.
7. Dubou R, Ousterhout DK. Placement of the umbilicus in an abdominoplasty. *Plast Reconstr Surg.* 1978;61(2):291–3.
8. Abhyankar SV, Rajguru AG, Patel PA. Anatomical localization of the umbilicus: an Indian study. *Plast Reconstr Surg.* 2006;117(4):1153–7.
9. Visconti G, Visconti E, Bonomo L, Salparello M. Concepts in navel aesthetics: a comprehensive surface anatomy analysis. *Aesthetic Plast Surg.* 2015;39:43–50.
10. Ramirez OM. Abdominoplasty and abdominal wall rehabilitation: a comprehensive approach. *Plast Reconstr Surg.* 2000;105:425–35.
11. Ramirez OM. The U-M Dermolipectomy and Myofascial Release in Abdominoplasty. *Oper Tech Plast Reconstr Surg.* 2002;8(1):40–52.