

9 Personal Approach to Aesthetic Abdominal Deformities

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9.1 Introduction

The abdomen plays a leading role in the aesthetic image of the upright human body, and is of prime importance in defining the overall contour of the individual. Slimmer forms have substituted the voluptuous figures that were idealized by artists in the past. Today's fashion trends and outdoor activities promote body-revealing attire as never before, and this is especially true in countries with a warmer climate and an aesthetically aware society [1].

Plastic aesthetic surgeons must strive to understand the motivation of patients who present themselves wanting contour alterations of the abdomen. Opposing factors such as sedentary lifestyle, weight gain, pregnancy and the inevitable aging process contrast with the lean and athletic model, and this becomes the source of personal frustration and lower self-esteem. The abdomen is usually seen as central to defining the younger and more vital physique. The desire for surgical treatment of these deformities should be evaluated within the context of what surgery may achieve to bestow a physical form that approximates the individual with his or her ideal self-image [2].

The form of the abdomen is defined by the skeletal structure, as well as the quantity and distribution of fat, the appearance and condition of the skin, the tonus of the aponeurotic and muscular system, and the protrusion of the intra-abdominal organs. Each of these components constitutes an independent variable within the diagnosis of deformity of the abdominal wall, and will determine the type of treatment indicated for the patient.

Three large muscles (the external oblique, the internal oblique and the transversus abdominis) are found on each side of the abdominal wall, which is reinforced at the mid-line by the rectus and pyramidalis muscles. This muscular "shield" is vital for maintaining posture, locomotion and intestinal functions, constituting the primary elements in establishing the tone of the abdominal wall.

Abdominal alterations may be summarized as: cutaneous (redundancies, stretch marks, scars, flaccidity

and retractions); accumulation of subcutaneous tissue (lipodystrophy); and those affecting the muscular-aponeurotic system (diastasis, hernia, eventration and convexity). Procedures have, therefore, been described to correct the integument (skin and loose subcutaneous cellular tissue), the aponeurosis and the muscle structure. The ultimate goal of surgery is to achieve an aesthetic contour, with acceptable scars, and the return of full function of the abdominal girdle [3, 4].

A personal approach to abdominal deformities was described in 1967, where attention to both function and aesthetics was emphasized [5]. The functional aspect of abdominoplasties was deemed to be especially pertinent in the older, overweight, multiparous woman. The reinforcement of the abdominal wall, as proposed, was done by the plication of the aponeurosis from top to bottom, without opening of the fascia. A pleasing curvature was given to the waist, not by pulling on the skin, but by tension on the aponeurosis and the muscles.

9.2 Classification

In general terms, the human form may be classified into different somatotypes: mesomorphic, ectomorphic and endomorphic, representing the various body shapes. Mesomorphic individuals have a more solid, stronger appearance. Ectomorphs are characterized by their length and fragility, with minimal development of muscular and fatty tissue. Endomorphs feature excessive fat, a protuberant abdomen and short limbs. There is naturally a high level of variability among the three types.

On the other hand, the patient that presents with an aesthetic complaint regarding the abdomen may have his or her abdomen described as either pendulous, globous or flaccid. The pendulous type presents an accumulation of fat in the inferior abdomen and around the umbilicus, with the skin folding back over the pubis due to excess weight. The globous abdomen is rounded with generalized distention and a variable quantity of fat, with or without flaccidity of the aponeurosis and muscle system. The flaccid abdomen features skin that is loose, often with stretch marks or striae.

Table 9.1. Pitanguy's classification of aesthetic abdominal deformities

Type	Clinical presentation	Suggested technique
I	Abdominal lipodystrophy without skin flaccidity; absence of diastasis or hernia	Liposuction
II	Moderate abdominal lipodystrophy with diastasis	Mini-abdominoplasty or endoscopic abdominoplasty
III	Accentuated abdominal lipodystrophy with cutaneous flaccidity and excess; presence of diastasis; with or without associated scar	Standard abdominoplasty
IV	Skin flaccidity and/or lipodystrophy, with diastasis or eventration; associated scar	Atypical approach
O	Marked generalized abdominal lipodystrophy with absence of excess skin	These patients are not ideal candidates for abdominoplasty, and should be prepared for surgery by strict clinical treatment to lose weight

The author has proposed a classification of aesthetic abdominal deformities [6–8]. Aesthetic defects are those that modify the outline of the body, due mainly to the flaccidity of the abdominal wall, accumulation of fat, and weakening of the aponeurosis and muscle system. This classification has proven useful in selecting the most appropriate surgical procedure for each case, ensuring treatment with consistently satisfactory results, both aesthetic and functional (Table 9.1).

9.3 Preoperative Planning

The abdomen should be evaluated in itself and also in relation to the breasts and the trochanteric region, allowing the surgeon to decide whether or not an associated surgical procedure is indicated, in order to achieve a more harmonious overall result [9]. The patient is examined standing up, sitting, and lying down. Careful palpation should inspect for hidden hernias and muscle weakness. The surgeon should grasp the infraumbilical flap and pull downwards, so as to estimate the final tension that will be placed on the flap.

The patient's overall health and psychological status should be evaluated as for any aesthetic procedure. Appropriate laboratory examinations are routine, and specific assessments are requested case by case. Weight loss is part of the preoperative preparation for a considerable number of patients presenting with contour alterations of the abdomen, and the collaboration of a multidisciplinary team should be considered, which may include the endocrinologist and a nutritionist. Maceration, intertrigo and dermatitis are found in some patients, secondary to constant moisture and rubbing of skin folds caused by skin redundancy, particularly in patients with apron-like abdominal flaps. Any dermatological condition must be treated accordingly.

Aesthetic body contour deformities may be restricted to the abdomen; yet frequently these alterations af-

fect two or more distinct areas, demanding more complex surgical planning. Multiple or severe alterations are seen especially in patients who have undergone dramatic weight loss, and who thus will require a multi-stage program [10]. Not infrequently, these patients present with a variety of complaints, and the surgeon must decide and plan for two or more procedures accordingly. There are, of course, many benefits for the patient if associated procedures can be performed during one single operation and hospitalization [11–13].

The approach to multiple contour deformities in the patient who has suffered a great loss of weight is personal. Procedures such as mammoplasty, abdominoplasty, dermolipectomy and liposuction can be indicated, in various combinations [14–21]. More important than the technical procedure, however, is a correct diagnosis and careful surgical planning.

In associating procedures, the extent of the operation and surgical trauma, as well as the length of anesthesia, must not be greatly increased. Blood loss should be anticipated, and whenever indicated, autologous blood transfusion is planned beforehand. Combining procedures also demands that the surgical team be appropriately trained. The surgeon is seen as the leader of an orchestrated group, and the members are well prepared for each stage. The sequence of the operation should be logical and planned in such a manner that part of the team is closing one region while the surgeon undertakes the second or third procedure, leaving ample room for each member to work comfortably. One should not attempt newer approaches when associating techniques, as this may be time-consuming. We also prefer not to carry out combined plastic surgery procedures in conjunction with other specialties.

Finally, the surgeon who agrees to operate on the patient's abdominal deformity should openly enquire into the patient's expectations and motivations, and the limitations of the surgical procedure should be explained, especially regarding the placement of final scars. Caution should be taken when the patient de-

mands an incision that will be covered only by a certain type of bathing suit, because fashion trends will pass, while the scar is permanent.

9.4

Surgical Technique

9.4.1

Abdominoplasty

The principles of the author's technique in abdominoplasty have been adhered to since the first publications. It is true that the placement of scars has changed according to the model of beach attires, and currently the incision is placed immediately above the pubic area with a horizontal lateral extension, curving upwards. There may be certain variability, dictated by the patient's preference for bathing suits. A long suture is useful to check for symmetry (Fig. 9.1).

Following the lower incision, the fatty layer above the pubis is beveled, assuring a certain amount of adipose tissue, preventing the displeasing depression over the midline that sometimes occurs. Knife dissection proceeds over the muscle fascia until the umbilicus is reached. A circular incision is done around the umbilicus, and the lower abdominal flap is divided. Sharp undermining reaches the costal margins, but the dissection should be limited laterally.

Muscle diastases are repaired through plication of the rectus abdominis aponeurosis, without opening the muscle fascia, as had been previously done. This reinforcement of the abdominal wall, which was first proposed by the authors [5], begins at the xyphoid process to correct epigastric protrusion and extends down to the pubis. Strong non-absorbable sutures are placed in an "X" fashion, inverting the knot, tightening the aponeurosis of the rectus abdominis muscle (Fig. 9.2).

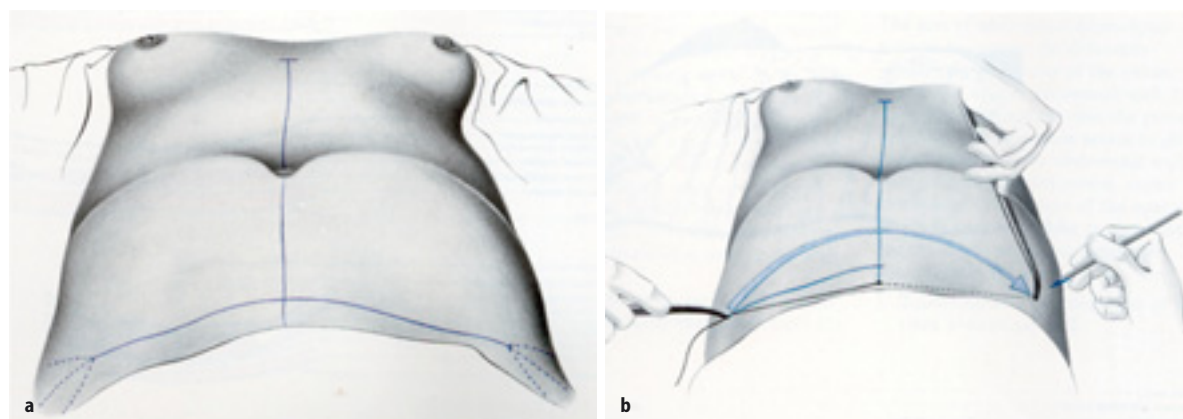


Fig. 9.1. **a** Drawing shows the various incisions that may be used, as long as they are kept hidden by bathing trunks. **b** A long suture, placed at the midline, is useful to check for symmetry

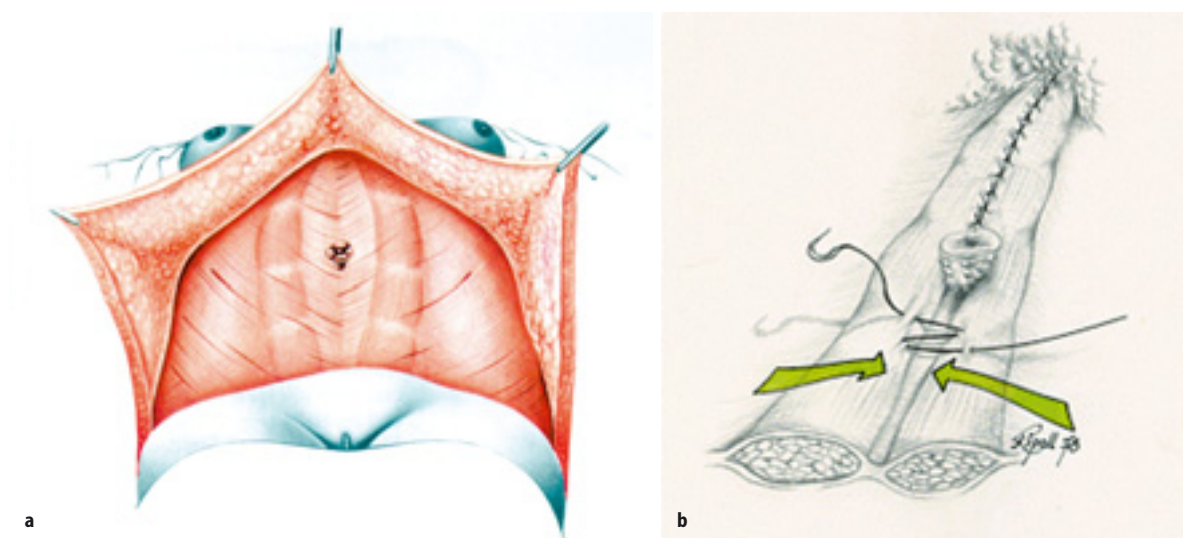


Fig. 9.2. **a** Plication of the rectus abdominis muscle, as described initially by the senior author, extends from the xyphoid to the pubis, without opening of the aponeurosis. **b** Detail of inverted sutures

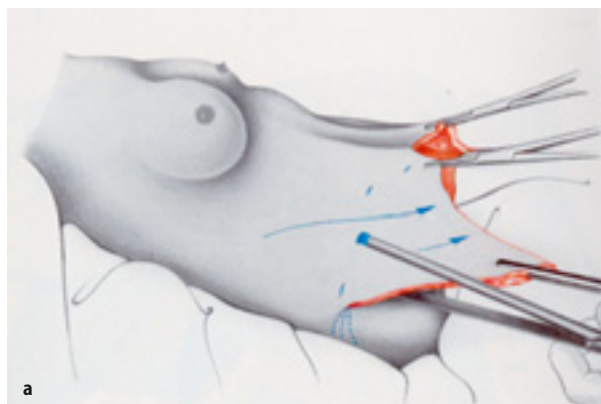


Fig. 9.3. a, b The patient is flexed prior to demarcation of excess tissue. A temporary suture is placed in the midline to equally distribute and fix the flaps, and a long Pitanguy flap demarcator is used to estimate amount of excess tissue

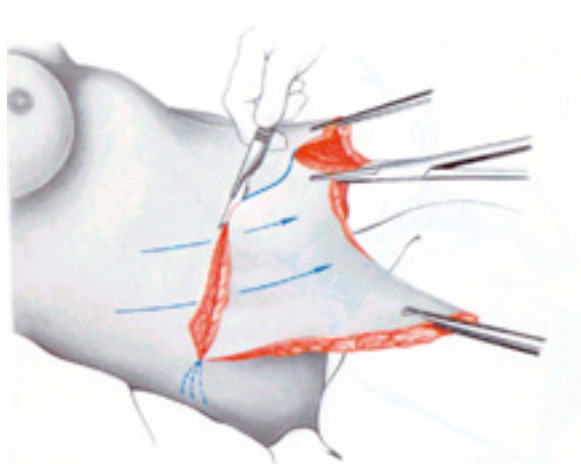
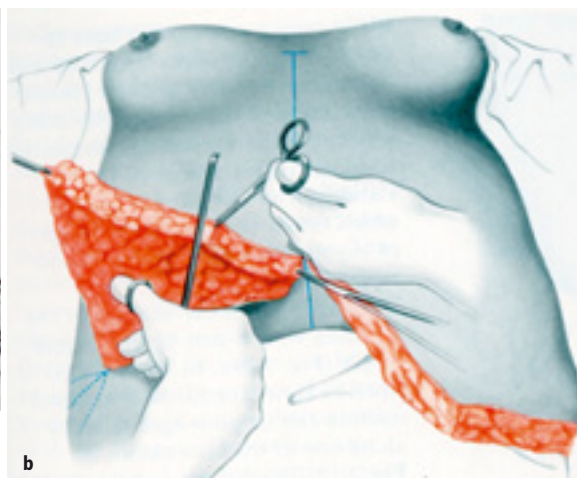


Fig. 9.4. After demarcation each flap is incised, beveling the adipose tissue

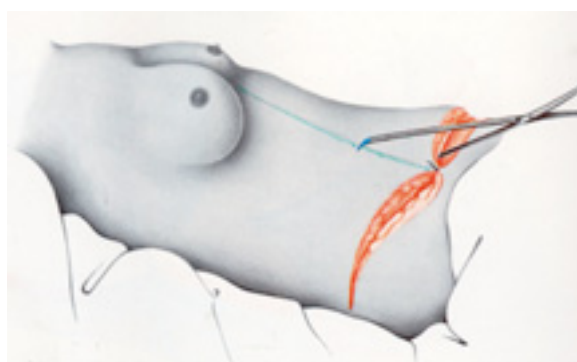


Fig. 9.5. The flap demarcator is helpful in the demarcation of the new position of the umbilicus. The incision is transverse, in a straight line without removal of tissue, which becomes triangular by the traction of the flaps

When the pedicle of the umbilicus is very long, it may be shortened with sutures, anchoring it firmly to the abdominal wall. This should be done without exaggeration, especially in patients with a thick panniculus, so as to avoid excessive traction.

The table is now elevated, raising the patient's trunk to an angle of 15°, and a temporary suture at the midline fixes the flap. The assistant pulls each flap downwards and towards the midline. A long Pitanguy flap demarcator is useful to estimate the precise amount of excess tissue, and this is marked (Fig. 9.3). The same procedure is done to the opposite side, and both flaps are checked for symmetry, before final dermolipectomy (Fig. 9.4).

The umbilicus should be exteriorized at a level corresponding to its natural position, without traction to avoid displacement. The same demarcator checks for the correct position of the umbilicus on the exterior surface of the abdominal wall (Fig. 9.5). Our preferred

method of creating the neo-umbilicus has been through a transverse, or semicircular, incision measuring approximately 2 cm, which is done at the demarcated point. There is thus no resection of skin. It will be noticed that this straight line becomes a natural triangle when the flap is positioned. A resection of subcutaneous tissue is removed below this incision in a "cork-like" fashion, so as to cause a smooth periumbilicus depression (Fig. 9.6). The umbilicus is then brought to the surface of the flap, using long sutures (Fig. 9.7).

Before final sutures, suction-assisted lipectomy is performed, in areas not undermined. Closure is done by planes, bringing the flaps inwards, so as to avoid "dog-ears" and not elongate the final scar (Fig. 9.8).

Atypical approaches to the abdomen are dictated mainly by preexisting scars. Vertical incisions below the umbilicus allow the surgeon to compensate the flaps medially, reducing the lateral extension of the lower horizontal scar. On the other hand, a vertical scar

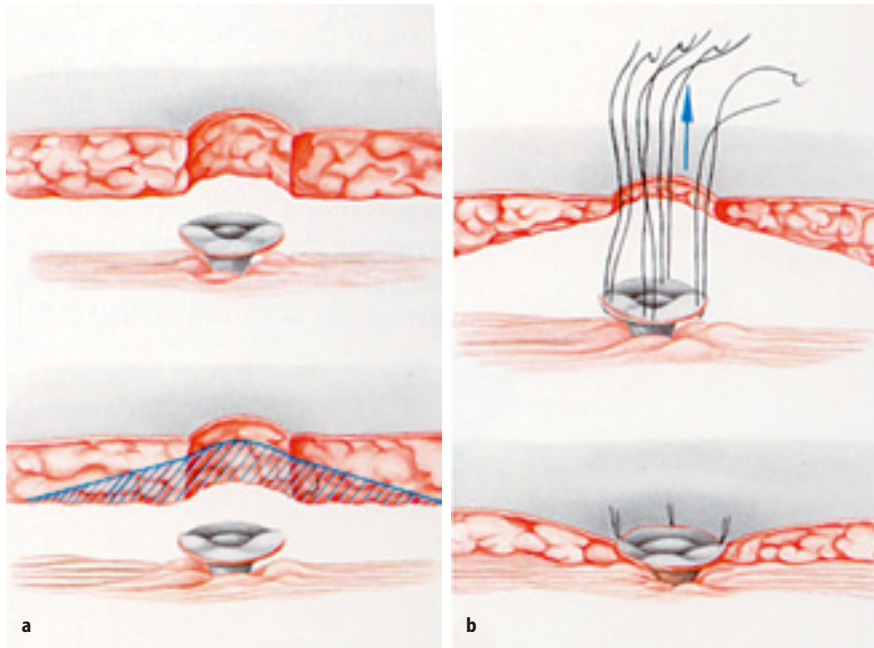


Fig. 9.6. a, b A cone of subcutaneous tissue is resected, allowing for the exteriorization of the umbilicus and its pedicle

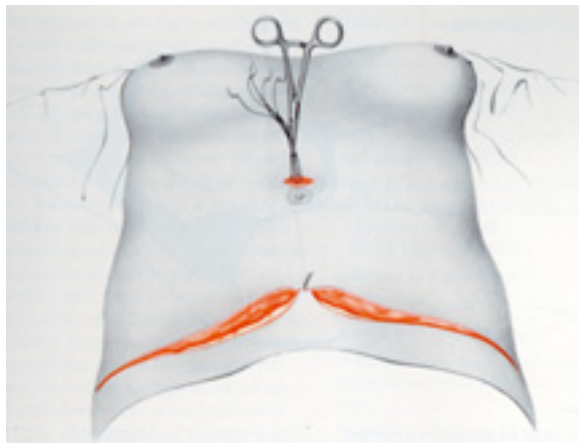


Fig. 9.7. The umbilicus is pulled out and then is sutured in its place

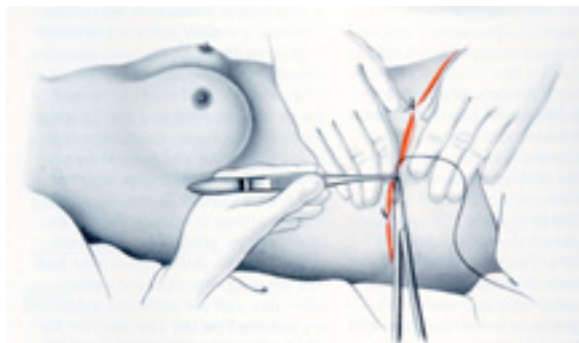


Fig. 9.8. Final sutures are done by planes, with the assistant pulling the flap inwards so as to decrease lateral extension of the final scars

that extends from the upper to the lower abdomen may allow the surgeon to forego a horizontal incision altogether, permitting the correction of redundant skin by bringing the undermined flaps towards the midline (Cases 1–5: Figs. 9.9–9.13).

Hernias or eventrations may preclude primary closure of the aponeurosis, and an alloplastic mesh will become essential to permit closure of the defect and assure equal tonus of the entire abdominal wall [22] (Cases 6–9: Figs. 9.14–9.17).

Serosanguineous collections are one of the most frequent complications following abdominoplasties, yet in our experience the rate of collections has been low. A few maneuvers have been adopted and have proven useful in preventing collections. These include the covering of all tissues with moist sterile towels to avoid desiccation during surgery, and rigorous hemostasis with the routine placement of drains.

A plaster shield, molded over a thick, soft dressing, has been adopted as part of our routine [23]. This becomes, as it were, a custom-designed anterior abdominal plate, covering all undermined tissues, and is maintained for the first two postoperative days. A 2-kg weight is placed to assure an even and firm pressure, guaranteeing adhesion of the dissected flap (Fig. 9.18). This diminishes the risk of hematoma and seroma, and has been noted to decrease patient discomfort during the first 48 postoperative hours.



Fig. 9.9a, b. Case 1. **a** Preoperative 31-year-old woman with lower abdominal flaccidity and diastasis (type II deformity). **b** Two years postoperatively following mini-abdominoplasty



Fig. 9.10a, b. Case 2. **a** Preoperative 45-year-old woman with abdominal flaccidity, lipodystrophy, and rectus diastasis (type III deformity). **b** Two years postoperatively following standard abdominoplasty



Fig. 9.11a, b. Case 3. **a** Preoperative 46-year-old woman with abdominal flaccidity, lipodystrophy, and rectus diastasis (type III deformity). **b** Two years postoperatively following standard abdominoplasty



Fig. 9.12a–d. Case 4. **a, b** Preoperative 36-year-old woman with abdominal flaccidity (type III deformity) and breast ptosis.



Fig. 9.12c, d. Two years post-operatively following standard abdominoplasty, placing the incision so as to respect the lower type of bathing trunks and mastopexy procedure



Fig. 9.13a–d. Case 5. **a, b** Preoperative 51-year-old man with abdominal deformity type III following weight loss of 45 kg.



Fig. 9.13c, d. Two years post-operatively after standard abdominoplasty with suction-assisted lipectomy of the anterior chest for correction of pseudogynecomastia

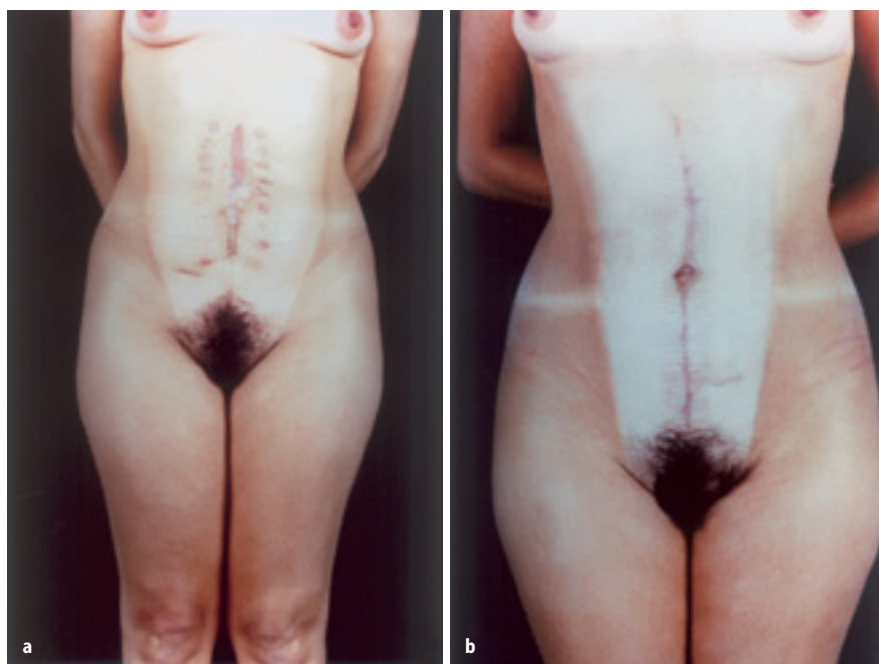


Fig. 9.14a, b. Case 6. **a** Preoperative 29-year-old woman with an unsightly longitudinal scar due to a previous exploratory laparotomy (type IV deformity). **b** One year postoperatively after vertical abdominoplasty with muscle reinforcement

Fig. 9.15a, b. Case 7. **a** Preoperative 35-year-old woman presented with an incisional hernia in the lower abdomen (type IV deformity) and breast ptosis. **b** Four years postoperatively following standard abdominoplasty without mesh reinforcement, together with a mastopexy



Fig. 9.16a–c. Case 8. **a** Preoperative 35-year-old man with an incisional hernia after an exploratory laparotomy (type IV deformity). **b** Reconstruction of the abdominal wall was performed after tissue expansion with two "croissant" shape expanders through an atypical abdominoplasty with mesh reinforcement. **c** Two years postoperatively

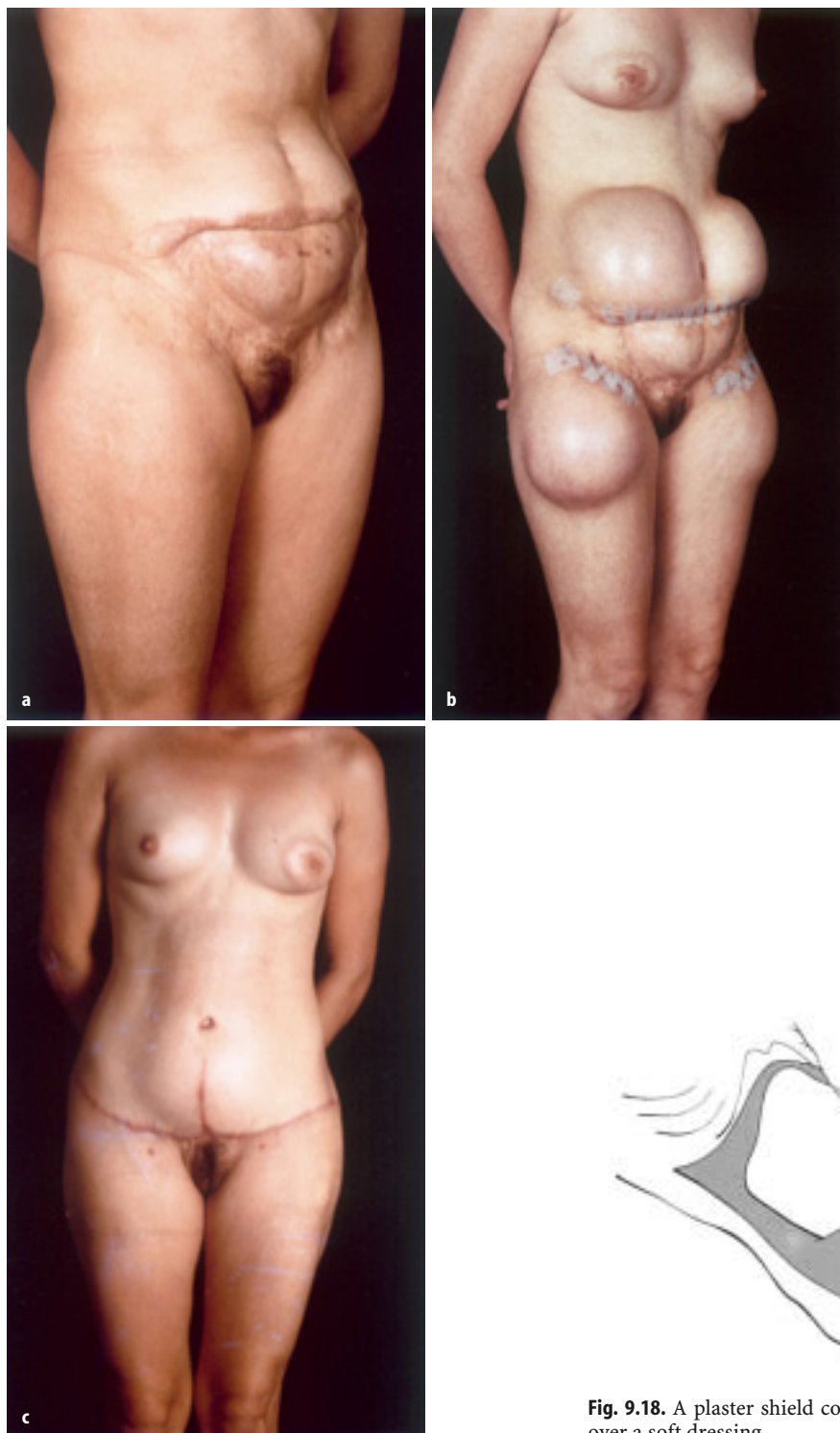


Fig. 9.17a–c. Case 9. **a** Preoperative 46-year-old woman with an incisional hernia in the lower abdomen (type IV deformity) and breast ptosis. **b** Atypical abdominoplasty with mesh reinforcement was performed after tissue expansion in the upper abdomen and superior thighs. **c** Two years postoperatively



Fig. 9.18. A plaster shield covers all the dissected flap, placed over a soft dressing

9.5

Liposuction (Cases 10, 11: Figs. 9.19, 9.20)

An important contribution to contouring of the trunk was the introduction of suction-assisted lipectomy (SAL) in the late 1970s, which has permitted the removal of fat deposits by means of minimal incisions. Modeling of the abdomen has been considerably im-

proved, either as a single procedure or associated with abdominoplasty, allowing the surgeon to complement a dermolipectomy with liposuction to enhance the waistline.

Suction-assisted lipectomy has also decreased the necessity for extensive undermining, thus contributing to lessening the rate of complications, such as serosanguineous collection and flap ischemia. Liposuction is

Fig. 9.19a, b. Case 10. **a** Preoperative 26-year-old patient with lower abdominal lipodystrophy (type I deformity). **b** Two years postoperatively after liposuction

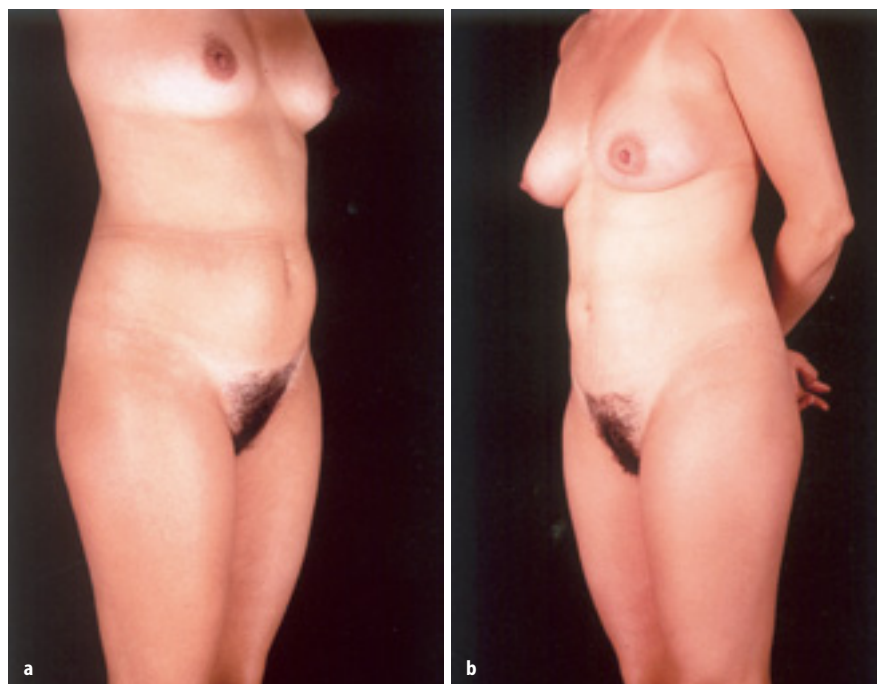


Fig. 9.20a, b. Case 11. **a** Preoperative 22-year-old patient presented with lower abdominal lipodystrophy (type I deformity). **b** Two years postoperatively following liposuction



frequently done to other anatomical areas in association with abdominoplasty. It should be emphasized that liposuction should be restricted to non-undermined areas. Two primary arterial plexi are responsible for the irrigation of the abdominal wall: a subdermic superficial system and a deeper, more profound musculoaponeurotic system. Many blood vessels form anastomotic connections between the two levels, particularly in the periumbilical region. This vascular anatomy must be respected so as not to risk causing a decrease in vascularization of the abdominal flap.

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