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Philosophy, Technical Principles, Selection, and Indication in Body Contouring Surgery

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Abstract. The experiences of almost three decades of performing various types of body contouring surgery, in both pre- and postlipoplasty periods, using many different techniques are described. Contouring surgery for such body areas as the abdomen, flanks, inner and outer thighs, and buttocks is discussed in detail.

Key words: Body contouring surgery—Abdominoplasty—Flank lipoplasty—Thigh lipoplasty—Buttocks lipoplasty—Liposuction—Surgical philosophy

Body contouring surgery is a routine procedure used to improve the aesthetic appearance of the trunk, specifically the breasts, abdomen, flanks, buttocks, thighs, and upper arms. Upper arm surgery will not be presented in this article. Its basic principles were published by many authors including Lewis [30], Baroudi [5], GuerreroSantos [19], and Juri [25]. Very few improvements in technique have been made since.

During one's lifetime, skin flabbiness and fat deposits become more evident because of aging, dieting, weight variations, and hormonal and genetical problems. There are several reasons why body contouring surgery is popular with patients and doctors: the improvement of modern anesthesiology, safer surgical techniques, surgical teamwork, refinements in the final results, and autotransfusion methods. Television, radio, and newspaper coverage also help to popularize the surgery. As the contouring results were better evaluated by the patients, opinions also became more acute. All these factors have brought a very important aspect to the speciality, namely, continuous research to obtain better results.

Body contouring surgery can be divided into the pre- and the postlipoplasty periods. Before lipoplasty was included in the plastic surgery armanmentarium, traditional body contouring surgery received some criticism from both doctors and patients because the resulting scars did not compensate for the prior deformities. Many cases that underwent conventional surgery would not have if liposuction had been available at that time. Effectively, the introduction of lipoplasty brought us to new surgical horizons. A great number of deformities are now treated by this method, leaving no scars and is greatly accepted by both patients and doctors.

As with any new procedure, the initial euphoria over lipoplasty has now subsided. Lipoplasty cannot be used in all cases and is not a substitute for traditional surgery. Today, after reviewing the limitations and the possibilities of traditional surgery and lipoplasty, the procedures are used either alone or in combination and in the same or different surgical stages. The combined technique offers the patient a more satisfying result compared with when they are used separately.

Body contouring techniques were developed over the past few decades, before lipoplasty came on the scene. The surgery evolved with respect to safety conditions and the surgical team's training and qualifications. It became possible to perform more than one procedure in the same stage, with the same risks that would be involved as if they were done separately. Lipoplasty was substituted for traditional surgery or liposuction was added to the routine traditional surgical performance.

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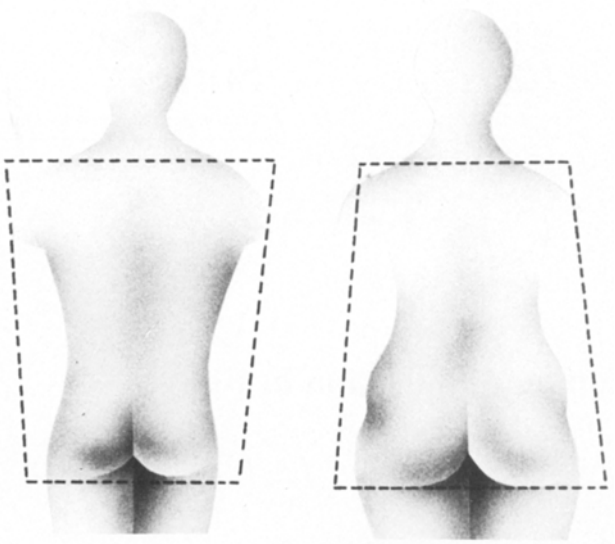


Fig. 1. Schematics of the two opposing body contour shapes. (*Left*) Android type has shoulders that are bigger than the hips. Usually the breasts are voluminous and the thighs are slim. No cellulite is detected up to the 40s. (*Right*) Gynoid body type has voluminous hips, buttocks, and thighs and predominate over the shoulders and upper trunk segment. Small breasts and cellulite are commonly observed

The philosophy of how to select a patient for, the indications of, what to offer from, and what to expect from body contouring surgery is presented in the remainder of this article.

Types of Body Contour

The shape, volume, and size of the body contour vary greatly. These variations can be observed in the same person during his/her lifespan. Ethnic background, sex, genetics, hormones, physical exercise, and diet are some of the factors that influence body contour. There are two basic types of body contour: android and gynoid. There are many intermediate types also.

In android body shape the shoulders are bigger than the buttocks. The thighs are slim with no localized fat deposits in the lateral femural region. In the gynoid body shape the upper arms are slim, the upper trunk segment and the breasts show reduced volume, the abdomen does not protrude, and the hips, buttocks, and thighs are voluminous (Fig. 1). These patients complain about a weight loss problem: While trying to reduce the lower segment of the trunk, the upper segment and face become slim. They also show cellulite-type skin all around the thighs and buttocks. Upper inner thigh regions are usually flabby and voluminous. Fat deposits, skin flabbiness, or both become more evident and unaesthetic with long-term excessive weight variation, hormonal and genetic influence, and, finally, aging. Physiotherapy, exercise, ointments, and all sorts of cosmetic treatments have proven insufficient in definitively eliminating these problems. There is a temporary improvement in the regional problem during treatment, but it recurs weeks or months after the treatment stops. Intensive and aggressive long-term massage to reduce local fat deposit is a traditional method used. This cosmetic treatment may reduce fat volume but it also leaves evidence of skin flabbiness. Skin massage manipulation destroys the fibrous and elastic collagen architectural structures of the skin which results in loose, flabby-looking skin. This is similar to the situation when liposuction is done in a region with evident flabby skin. After the surgery, the fat volume is reduced but the flabby condition becomes more obvious.

Body Contouring Surgery Classification

In the postlipoplasty period, the indications for body contour surgery changed significantly. Many cases that would have been treated by traditional surgery are now being handled with the more convenient liposuction. Nevertheless, the limitations of liposuction did not eliminate the necessity for conventional surgery. For special cases where liposuction and surgery were used in combination, the final results were even more gratifying compared with the results from the individual procedures. With these points in mind, we classified body contouring surgery into four groups.

Group I: cases with localized fat deposits with firm skin and no flaccidity. Only liposuction is indicated for this group. No traditional surgery is necessary. Patients are usually up to 35 years old, had no previous problems with weight variations, no skin flabbiness, and no excessive localized fat volume. In most cases, lipoplasty solves the problem in one procedure. In exceptional cases where there is a greater fat volume present, two surgical stages are indicated to avoid unacceptable final results due to too little or too much fat removal.

Group II: cases with localized fat deposits with firm skin and flaccidity within the limits of normality. Liposuction is indicated. Patients in this group may be around 35 years old or more. The amount of fat deposits will decide if lipoplasty should be performed in one, two, or more stages. Depending on the area of the body, skin condition, and fat volume, moderate or nonmoderate liposuction should be used. The limitations of liposuction and no the doctor's or the patient's desires will determine when to stop suctioning. The first stage of liposuction should remove the fat according to the local volume and the

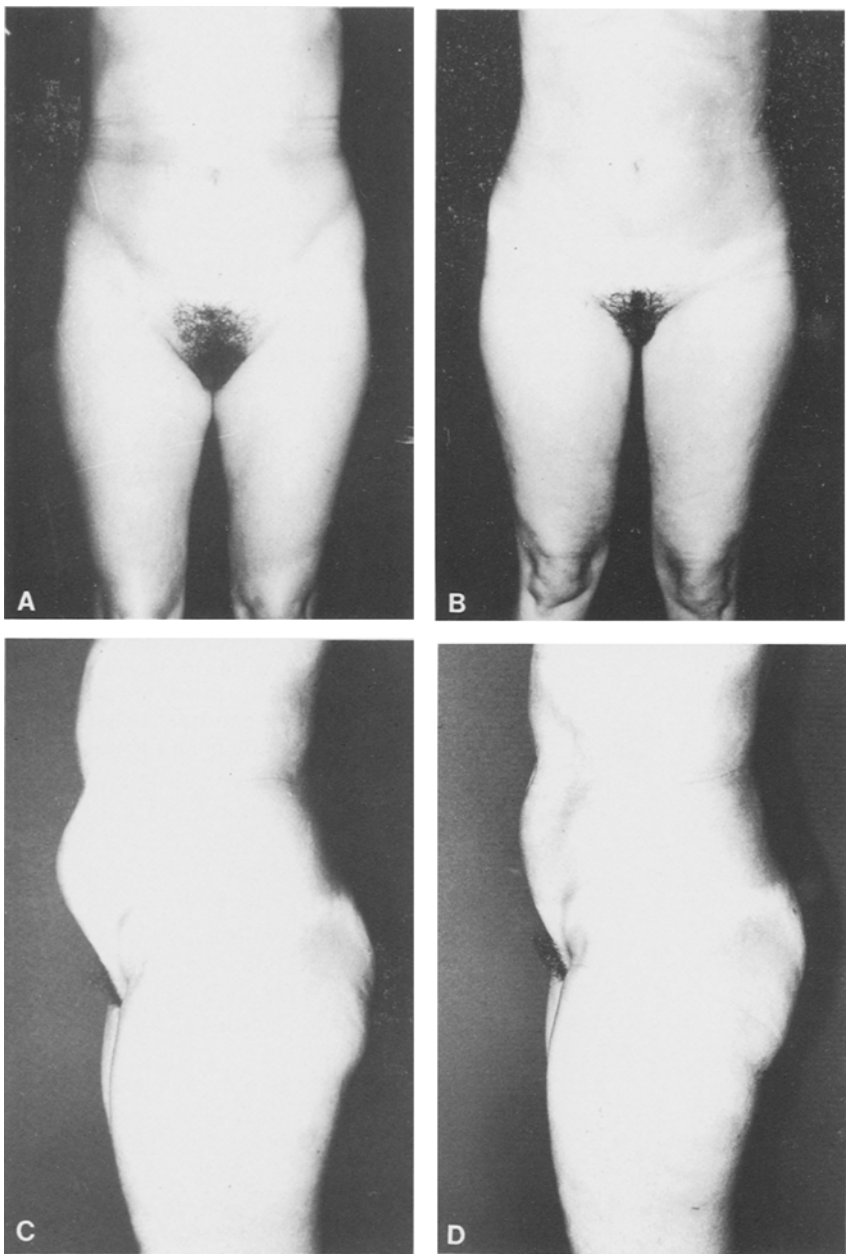


Fig. 2(A,C) Pre- and **(B,D)** postoperative front and lateral views of a 38-year-old patient with a moderately bulging abdomen and flank fat deposits but no skin flaccidity. Liposuction resulted in good skin retraction with no undulation or dips. This case indicates the use of lipoplasty only

skin conditions. In general, the reduction should be as much as half of the previous skin thickness determined by using the pinch test.

It will take about two months for the skin to retract its definitive texture. If a second liposuction is possible, a waiting period of 4–6 months is necessary. If skin flaccidity becomes evident and waves in the skin start to appear, a second liposuction cannot be recommended.

Group III: skin flabbiness is evident at inspection and palpation, and the fat deposits compromise the region aesthetically. Treatment with liposuction alone will make the skin flabbiness worse, and traditional surgery of skin and fat resections may or may not solve the local deformity. The surgeon must judge the amount of tissue to be resected by surgery and whether it should be combined with liposuction in the same or at different stages. Liposuction should be used as a complementary procedure to improve the final result. Patients must be warned about the surgical program, particularly when they present distortions in multiple regions. The surgery and the liposuction done in one or more stages either alone or combined should be evaluated in the pre- and postoperative periods according to the results obtained.

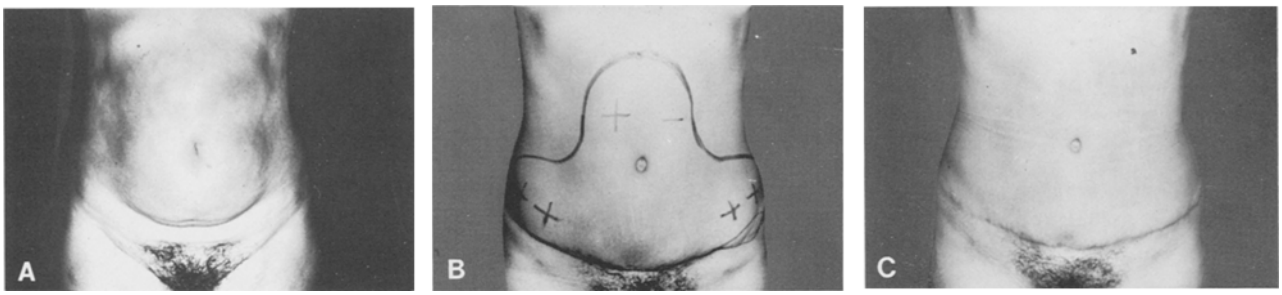


Fig. 3(A) Preoperative view of a 44-year-old patient with a flabby abdominal wall combined with fat deposits and rectus abdominal muscle diastasis. **(B)** Eight months postoperatively. Scar revision and a secondary liposuction were indicated. Skin demarcations indicate the regions to be liposuctioned. **(C)** Final result

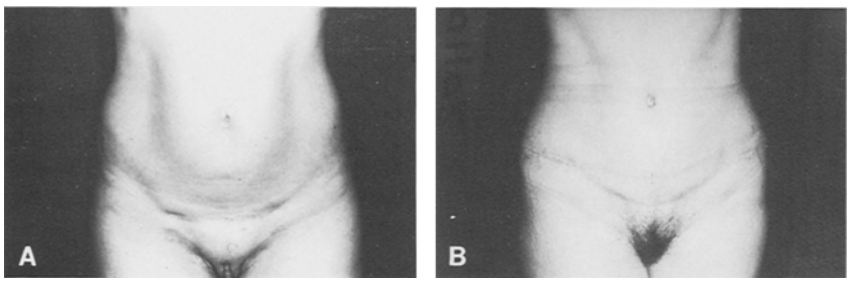


Fig. 4(A,B) Pre- and postoperative view of a 33-year-old routine abdominoplasty patient. Final scar looks like a bike's handle bar. The lower position of the scar in the pubic area and its rise toward the iliac spine on the sides help the scar to be hidden by modern-style bikinis.

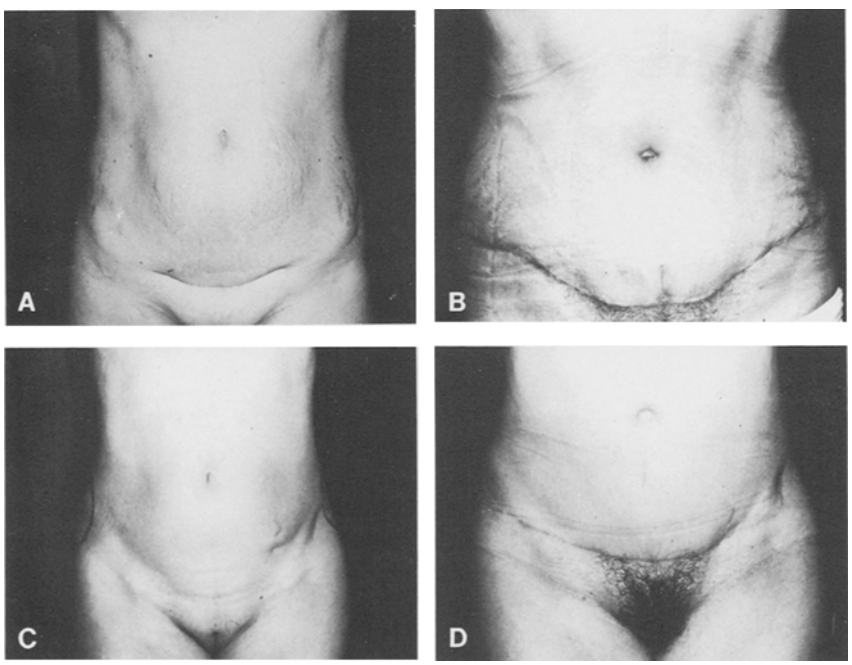


Fig. 5(A,B) Pre- and postoperative views of a routine abdominoplasty patient. A high preoperative umbilical position and moderate skin elasticity determine a small vertical compensatory scar in the pubic region. Patients should understand the tradeoff of a low transverse scar with this compensatory component with a higher scar without it. **(C,D)** In another patient, the primitive umbilical scar remains midway between the definitive umbilicus and the pubis

Group IV: only skin flabbiness is present. Neither significant fat deposits nor distortions in the body shape are detected. These cases should be treated with only traditional surgery to return the skin flaccidity to a firm condition.

In all groups, age health, fat deposit distortions, skin conditions, weight variations, the patient's psychological and emotional behavior, and social and professional status play a role. Doctors should be familiar with these aspects and be prepared to

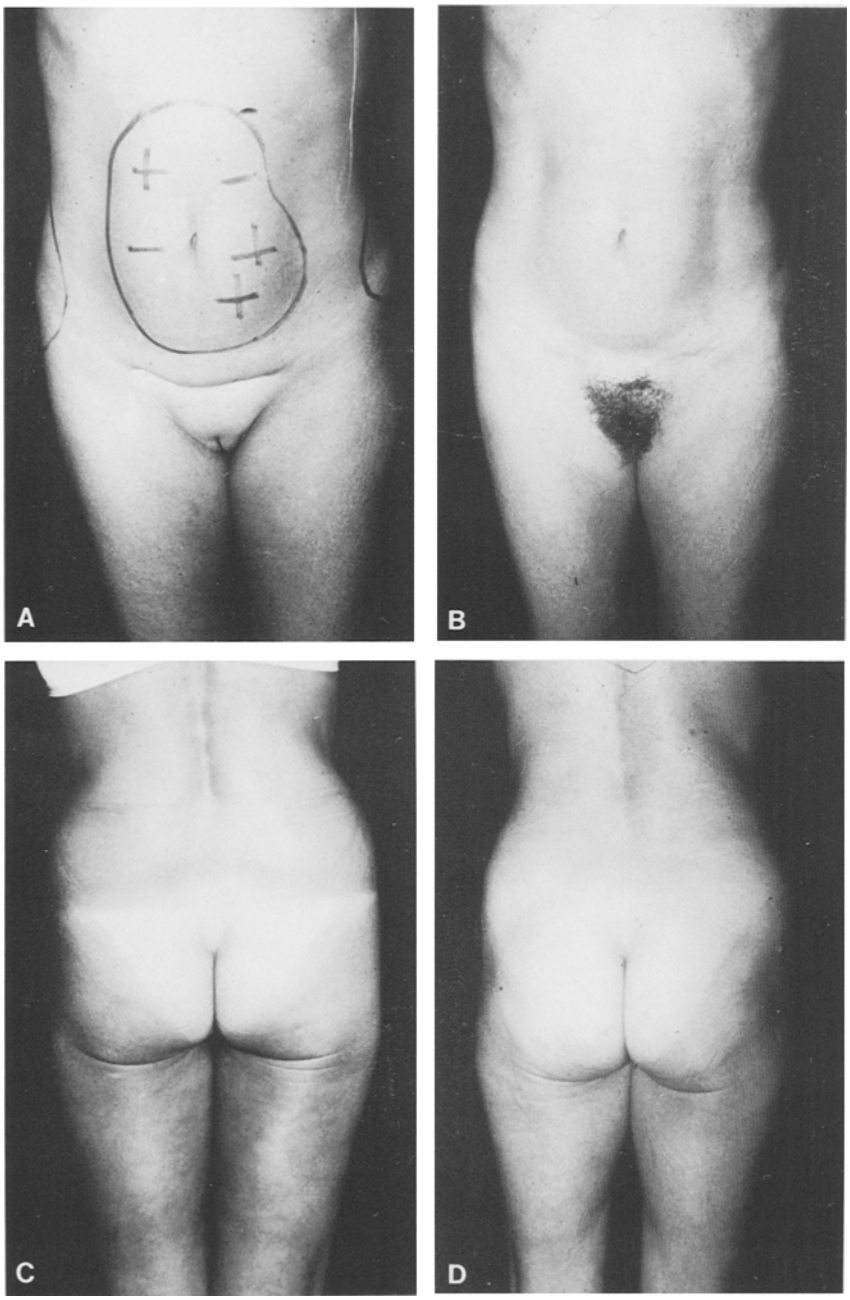


Fig. 6(A) Preoperative view in a 42-year-old patient with abdominal and flank fat deposits and moderate skin flaccidity in the hypogastrium. **(B)** Postoperative view one year later. The patient had a miniabdominoplasty and liposuction of the abdominal wall and flanks. **(C,D)** Pre- and postoperative posterior views of the flanks. A significant reduction was obtained because the patient lost weight (4 kg)

take responsibility to perform the surgery and to offer to their patients results within the limits of reality.

Abdominoplasty

Indications for abdominoplasty changed significantly after the arrival of lipoplasty. The anterior abdominal wall becomes flabby and may accumulate fat deposits during one's lifetime. The causes of this are already known. Conventional abdominoplasty can be evaluated with the following points taken into account:

(1) Traditional surgery should no longer be indicated for cases from groups I and II. These patients present fat deposits in specific areas of the upper or the lower abdomen, sometimes combined with skin flabbiness. Liposuction should be normal or moderate and performed in one or two surgical stages. The average amount of fate removed in one stage should be around 40% of the total fat thickness present. Caution at this stage will help to avoid secondary problems (Fig. 2).

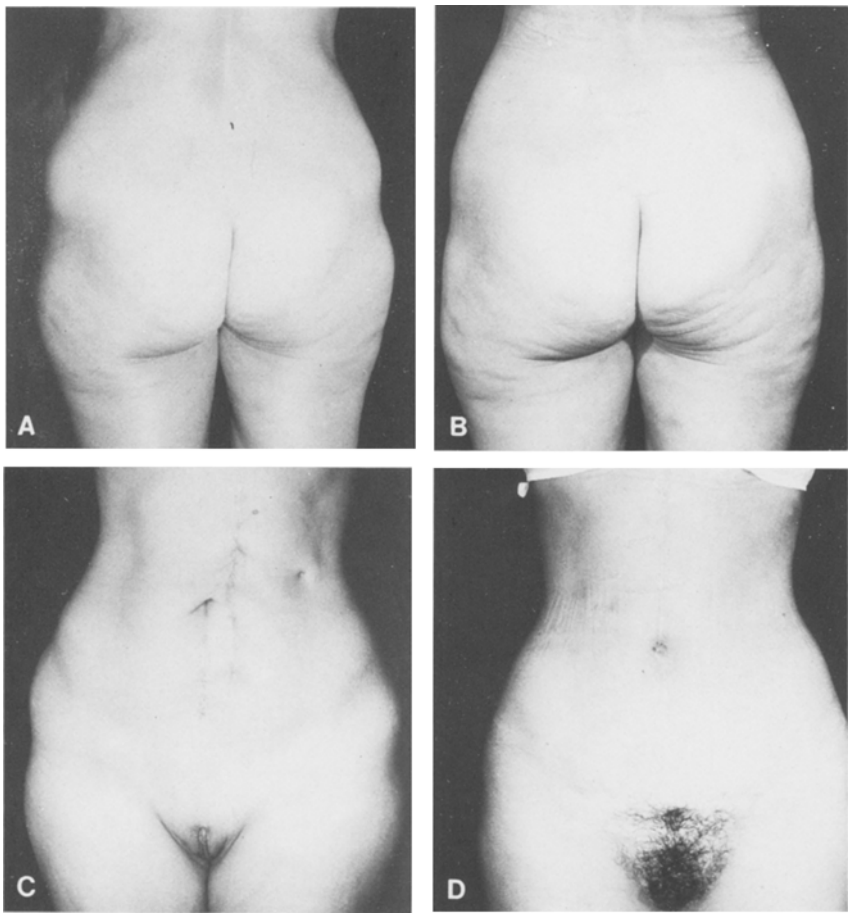


Fig. 7(A,B) Pre- and one year postoperative views of a 41-year-old patient who had a flank liposuction combined with vertical abdominoplasty. The body contour improved because of the reduction of the bulging fat flank deposits. **(C,D)** Pre- and postoperative front views of the same patient. The abdominal wall was improved after the excision revision of the scars and new resultant skin tone was obtained. The final single scar became quite acceptable

(2) Traditional abdominoplasty is indicated when fat deposits and flabby skin are present in the upper, middle, or lower abdomen. Fat distribution and thickness may vary. Routine abdominoplasty removes excess skin and fat from the infraumbilical region. Excess fat is resected at the fascia superfialis level but the skin remains stretched. However, two or three months after the procedure, in a significant number of patients residual fat is still observed above the scar line and in all the hypogastrium. This distortion is easily seen when the patient wears tight slacks, a dress, or a bikini. This type of abdomen indicates conventional surgery followed, after a minimum of 6 months, by lipoplasty. The abdomen remains like those of group I or II, i.e., with a good skin tone and with the residual fat able to be suctioned while causing no secondary problems (Fig. 3).

(3) Recently, the style of bathing suits changed completely, and thus changed women's behavior with respect to body exposure. The exiguous sizes of these suits created a great concern about the placement of the abdominoplasty scar. Patients ask for short scars that can be completely covered by the small pieces of material that cover only the pubic region.

We changed the abdominoplasty incision to a "bike's handle bar" shape; it seems more anatomical. The pubic area's scar segment is no more than 7 cm above the vulvar anterior commisure. The lateral segments are oriented bilaterally toward the anterior superior iliac spine. The scar is better covered by a bathing suit and panty underwear (Fig. 4).

When the umbilicus is high or when the skin is not flaccid enough to be stretched to reach the pubis, a vertical scar midway between the umbilicus and the pubis may be required (Fig. 5).

(4) For moderately flabby skin at the hypogastrium the miniabdominoplasty became the logical solution. When indicated this procedure is usually combined with liposuction of the abdomen. The regions to be suctioned should be marked while the patient is standing. Using the pinch method near the pubis, an elliptical skin area is outlined to evaluate the amount of fat to be resected. The surgery starts with the patient in supine position under peridural or general anesthesia. Routine lipoplasty is performed, followed by skin resection. The skin undermining

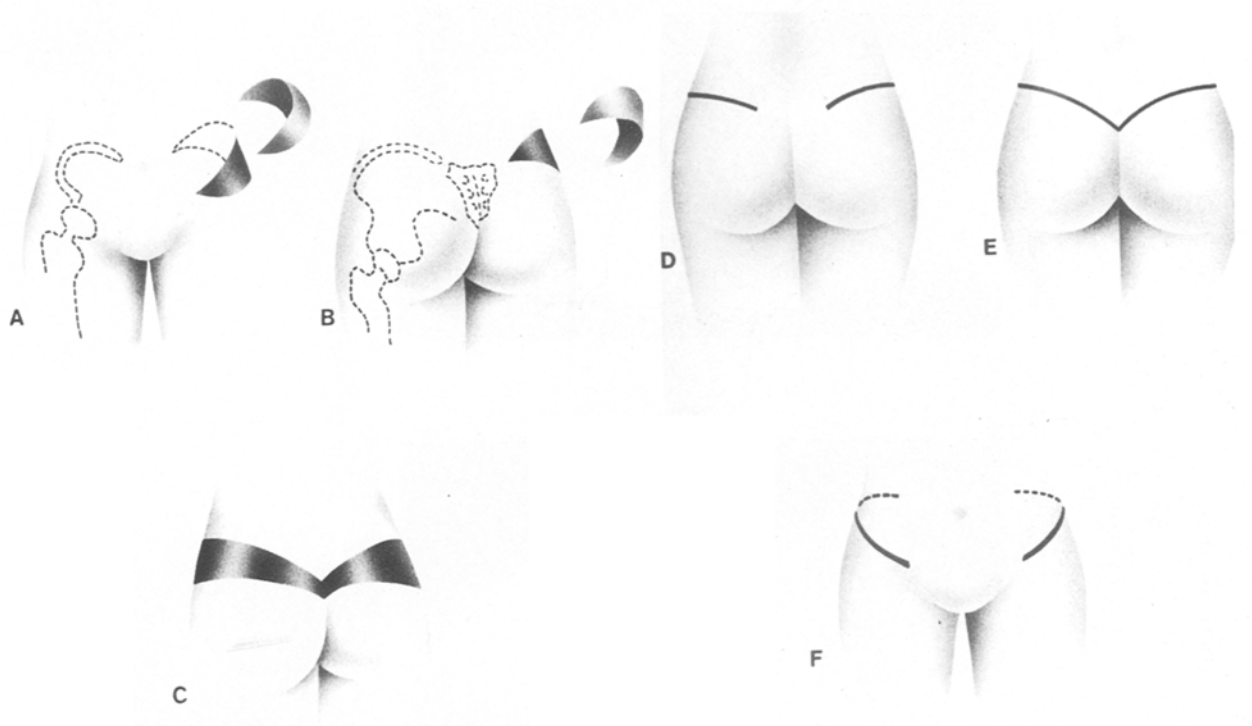


Fig. 8. Schematic of the surgical flankplasty indicated for cases of skin flaccidity possibly combined with fat deposits. **(A,B)** Fusiform skin resection is performed from the posterior to anterior iliac spine. The amount to be resected depends on the excess skin. **(C)** The resection can join the other side's resection. **(D–F)** Final scar positioning with or without joining the resections. When the incisions are joined, the scar appears like an open V

should be moderate, according to the amount of resection, to avoid dead space. The incision is sutured following the routine and no drain is required. The patient remains in the hospital for 24 hours. An elastic girdle is to be worn for 10 days (Fig. 6). Swelling in the suctioned areas, mostly in the infraumbilical region, is observed during the first month. Edema is observed during the second month. The final result is seen at the end of the second month. Exercise is allowed during the second month.

(5) The extended miniabdominoplasty is a more difficult procedure. After the lipoplasty, the skin flap from the infra- and the supraumbilical regions is undermined up to the xiphoid level through a small incision, similar to the traditional abdominoplasty. A tunnel-like access, opened by a special type of retractor, allows viewing of the muscle plication. The umbilicus may be sectioned from its stalk and relocated, for aesthetic reasons. After the rectiplication, excess skin is resected. When the umbilicus is sutured back in its previous position, only a small amount of skin from the lower skin flap segment is resected. When the umbilicus is placed in a higher position because of the downward displacement of the skin flap, the primitive skin hole is sutured and remains a few centimeters below the umbilicus's new position. A small scar is placed in the midline. The extended miniabdominoplasty reduces the waistline and allows a greater amount of skin to be resected without increasing the length of the incision. There is a high incidence of seroma associated with this procedure but there have been no statistical studies published in the literature.

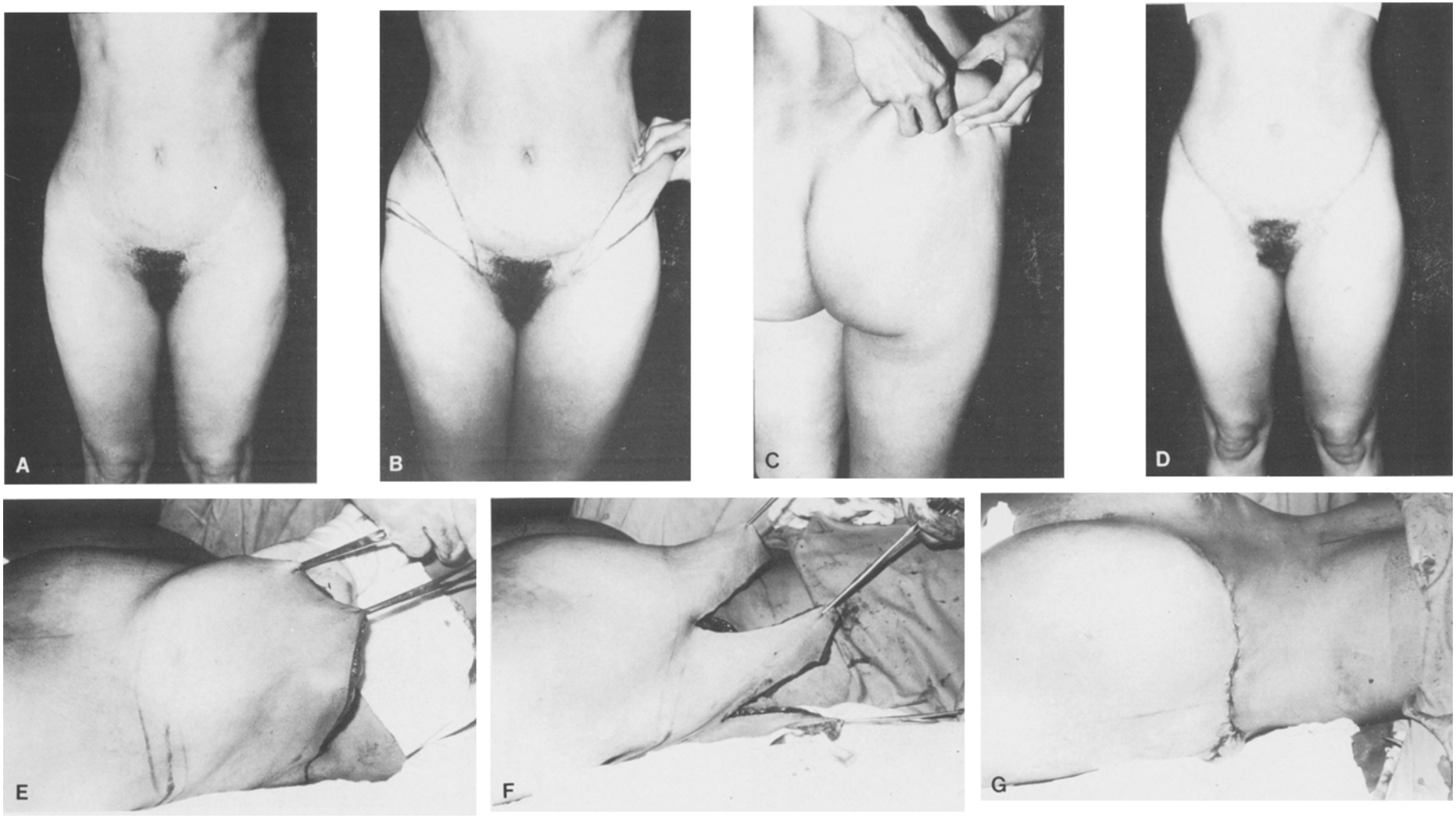
(6) Finally, a flabby abdomen with no fat deposits is treated with a traditional abdominoplasty.

Flankplasty

The flank regions can have bulges caused by fat deposits, sometimes combined with skin flaccidity. In the postlipoplasty period, this condition is treated with liposuction only, surgical resection, or both, in one or more stages. Each case requires a specific approach depending on the aesthetic problem. This flank deformity is rarely isolated; generally, there are fat deposits in the surrounding regions and the flanks form bulges after routine abdominoplasty (see Fig. 13).

The surgical procedures used for treating the flanks are as follows:

(1) Lipoplasty: The area to be treated is marked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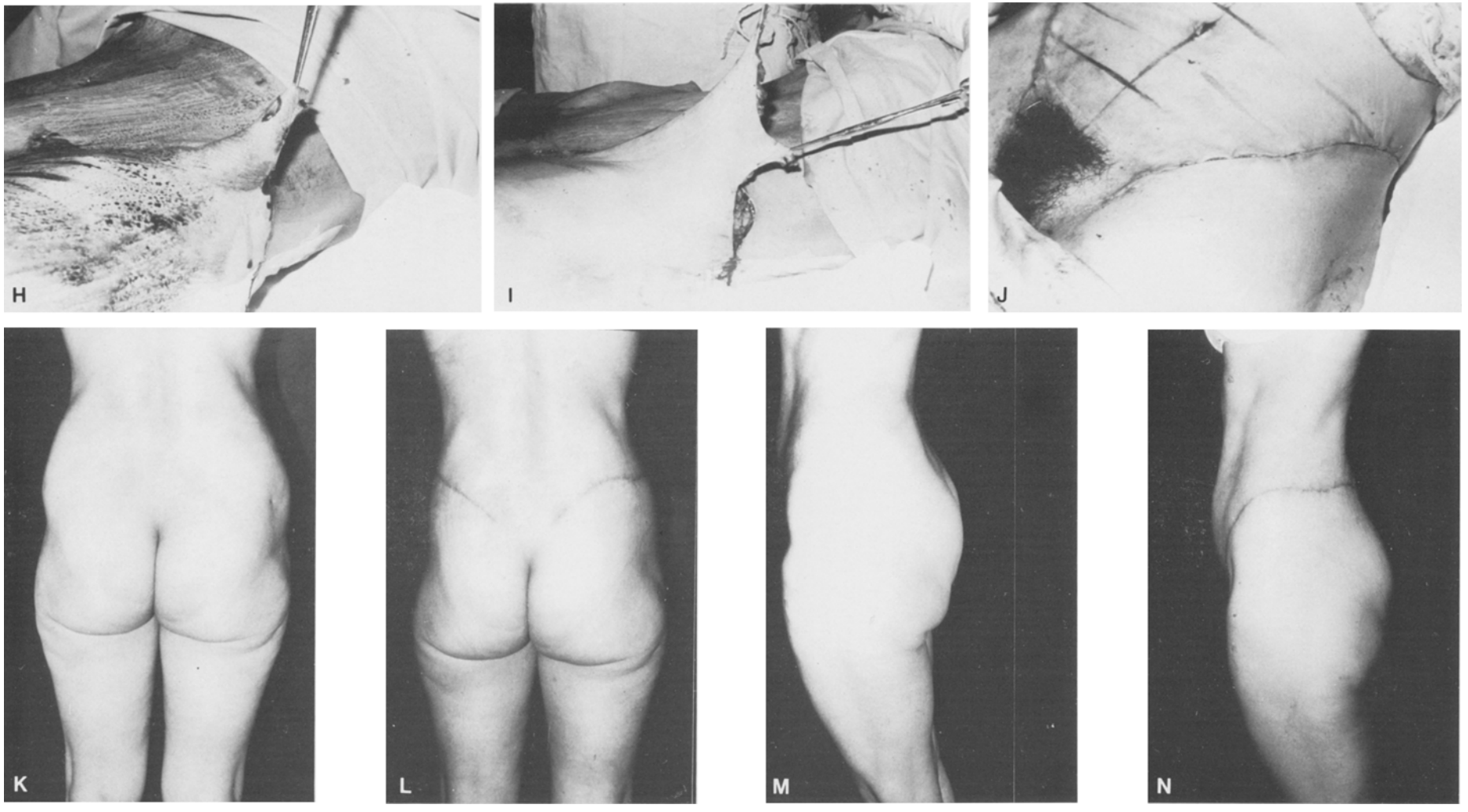


Fig. 9(A–C) Preoperative views of a 36-year-old patient with excessive skin flaccidity caused by several body weight variations and lipoplasty of the buttocks and lateral femoral regions. **(D)** View three months after a flankplasty was performed using the technical procedures described in the Fig. 8. **(E–G)** The surgery starts with the patient in the prone position. The excess skin is undermined, resected, and sutured. **(H–J)** The patient is then turned to the supine position and the excess anterior skin is resected and sutured. **(K,L)** Pre- and postoperative posterior views. Significant reduction of the flanks is obtained. The buttocks are still flaccid, especially at the lower part. A second stage is recommended for cases like this. **(M,N)** Pre- and postoperative lateral views. The buttock ptosis has improved but is still present. A bathing suit normally covers the scar lines. The recent followup shows that the scars are still quite evident. They will fade after approximately 8 months

while the patient is in the standing position. The liposuction is performed under peridural or general anesthesia with the patient in the prone position. The access view is on the gluteal region through small incisions on each side of the area covered by a bikini. The access regions are then covered with a polyurethane sponge custom-made for the liposuction area. It offers a better and uniform compression. The sponge may be removed after 48 hours. The patient also wears an elastic girdle for 7–10 days postoperative (Fig. 7).

(2) The flankplasty is performed by using an extensive fusiform skin and fat resection that extends from the anterior to the posterior iliac spine. The final scar's long axis is placed on the projection of the iliac line, a few centimeters above or below it depending on the amount of skin resected, the local tension caused by the suture, and the skin's elasticity. The posterior end of fusiform starts 2–6 cm from the intergluteal line. Cases where there is redundant skin flab at the sacral region require an extra resection. In these cases, the incisions meet on the other side under a face-up open-V shaped aspect. This eliminates the excess skin but leaves a larger scar. Use of this procedure should be even more selective (Fig. 8). It should be kept in mind that the amount of tissue resected must be the amount to be undermined. The suture is made in planes, there should be no dead space, and there should be meticulous hemostasia. These details help prevent seroma. Complementary liposuction, before or after surgery, is indicated according to the residual fat deposits still present (Fig. 9).

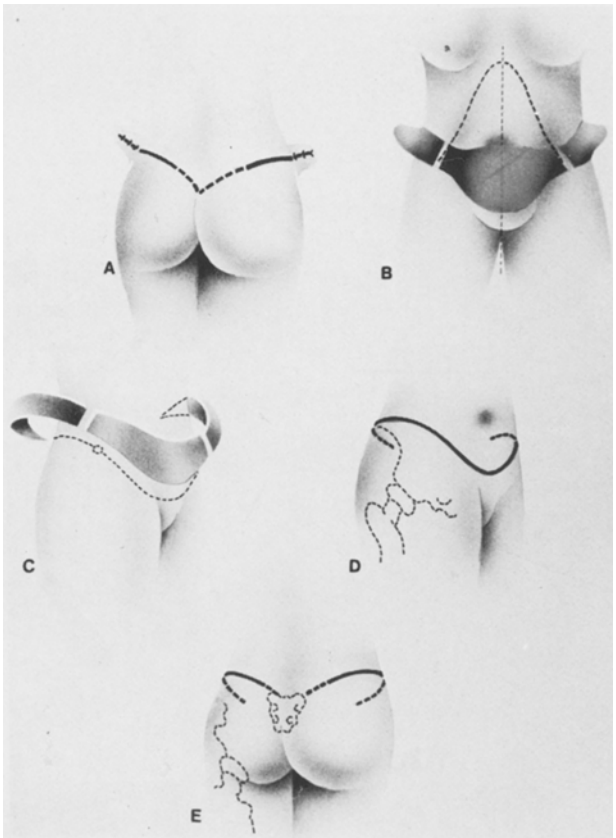


Fig. 10. Schematic of the different surgical steps involved in the abdominoplasty and flankplasty performed in the same stage. **(A)** Surgery starts with the patient in the prone position. The flankplasty is done first. The final suture may be joined at the sacral region. **(B)** The patient is turned to the supine position and the abdominoplasty is performed. The dotted line on the anterior abdominal wall represents the undermined skin area. **(C)** The dark area on the flanks and the abdominal regions represents the skin tissue resected. **(D,E)** Scar positioning after the surgery

Abdomen and Flanks

In certain cases the flankplasty and the abdominoplasty can be performed in the same stage. These procedures can be used under the following conditions:

(1) Miniabdominoplasty combined with liposuction of the flanks and the different regions of the abdominal wall is indicated for mild cases of fat deposits and mild flabbiness of the upper and the lower abdomen, and also for bulged flanks with good skin tone. The liposuction produces an excellent new contour (see Fig. 6).

(2) The abdominoplasty, when combined with lipoplasty of the flanks, should be performed in the same stage. The flanks can be suctioned through the same incision used for the abdominoplasty. In this case, the flanks' suction will be connected with the abdominal surgical region. If a separate incision is used, the flanks and the abdomen will remain separated. Plastic surgeons who use this procedure believe it is safer since it avoids possible contamination between the two regions (Fig.7).

(3) Abdominoplasty, combined with surgical resection of the flanks, is an even more selective procedure, recommended for cases for which liposuction fails. The surgery starts with the flankplasty and finishes with the abdominoplasty (Fig. 10).

The flank is marked basically in the same manner as described above for flankplasty alone. Patients should be standing and the pinch method is used to estimate the amount of skin to be resected and where the final scar is to be placed. The sacral fat deposit or its flabbiness determines whether suction or skin resection should be done in this area. The abdomen may be marked up at this stage while the patient is in a standing position, or in a supine position after the flankplasty.

The patient is placed in the prone position under peridural or general anesthesia. The elliptical skin and fat resection in the flank is performed. The fat

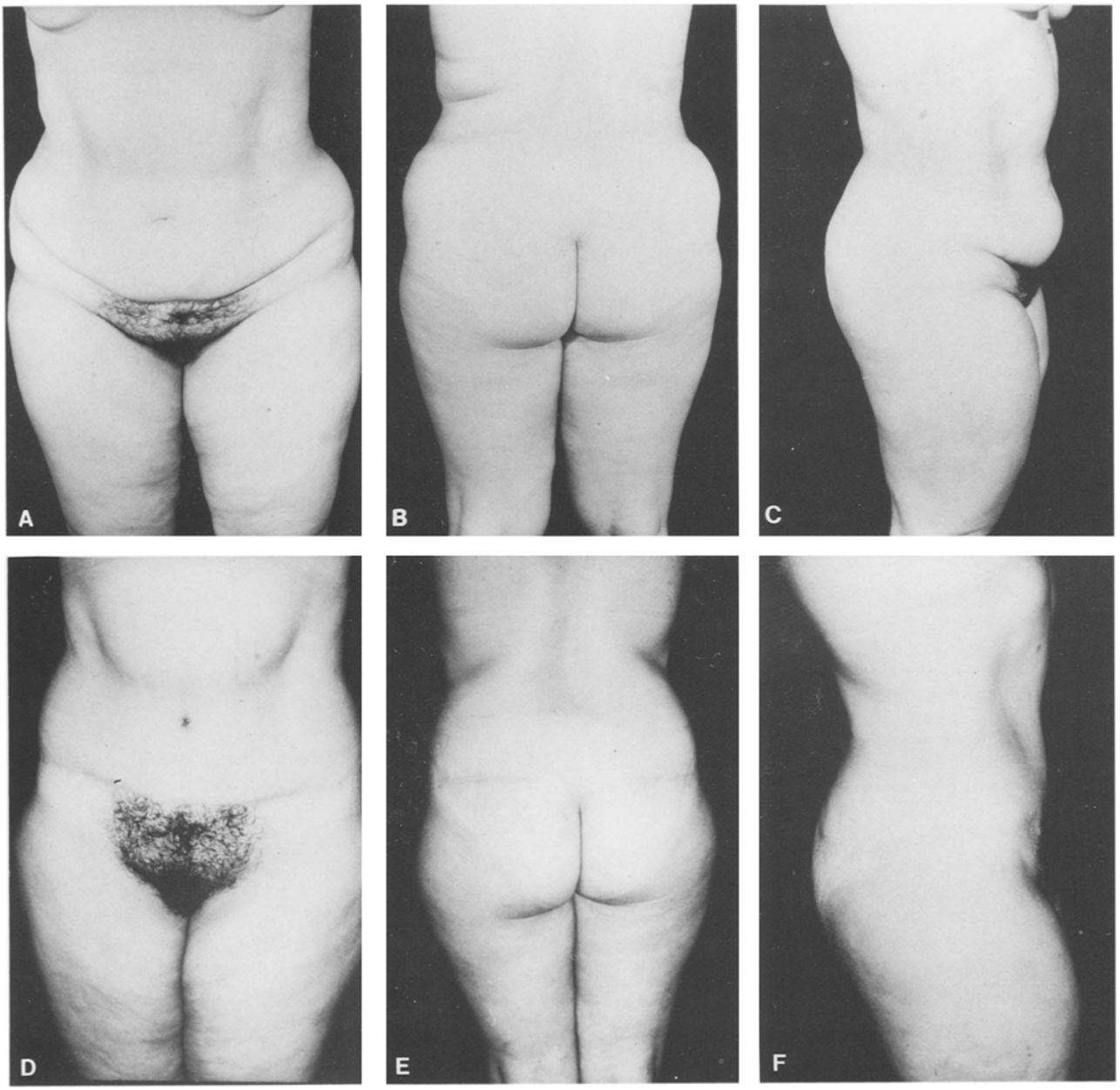


Fig. 11(A,D) Pre- and postoperative views of a 43-year-old patient, who had a flankplasty and an abdominoplasty in the same surgical stage. Flabby skin combined with fat deposits were evident. **(B,E)** Pre- and postoperative posterior views show scar positioning; they do not join at the sacral region. A second stage of liposuction was indicated 6 months postoperatively but refused by the patient. **(C,F)** Pre- and postoperative lateral views. Despite the extended scar almost entirely around the body, the overall shape was improved

resection should reach the deep layer near the fascia. After meticulous hemostasia, the suture is placed starting in the deep fat layer; 2-0 Vycril stitches are used to avoid dead space. A second suture layer is placed at the dermal level with 3-0 Vycril stitches, and finally running intracuticular 4-0 Vycril stitches complete the suture. The anterior end of the flank incision cannot be closed surgically while the patient is in the prone position. The skin excess is protected with PDO pads before the patient is turned to the supine position. The abdominoplasty is peformed routinely by the following steps: skin is marked, the skin flap is undermined, the fascia is folded, the excess skin is resected, an umbilicalplasty is performed, and, finally, the suture, drains, and bandages are placed.

Two technical details should be mentioned: (1) Skin undermining at the epigastric and hypochon-

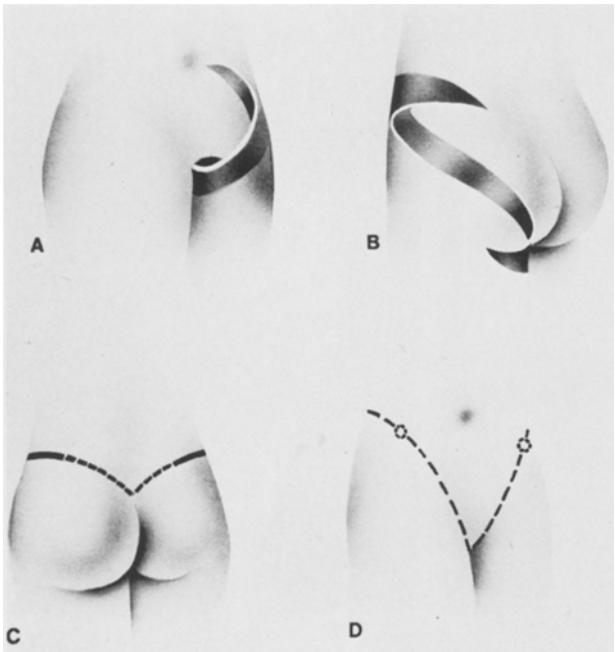


Fig. 12. Schematic of the surgical steps involved in a flankplasty combined with a upper inner thighplasty done in the same surgical stage. **(A,B)** An extensive elliptical skin strip resection is made in the flanks along the inguinal and pudendal regions and ends at the gluteal folds. The amount of skin undermined should be the amount to be resected, with no dead space. Suturing should be in layers from the Colle's fascia up to the skin level. **(C,D)** Final scar position, with or without joining at the sacral region

driac regions should be conservative to avoid the skin flap blood supply. (2) At the area where the flanks meet with the abdomen, the excess skin should be dissected as little as possible and be as symmetrical as possible.

The final suture follows the transversal pubic and inguinal lines to the anterior superior iliac spine, usually a few centimeters above it, runs parallel to the posterior iliac line, and ends near the intergluteal sulcus. When it reaches the other side, the suture is V-shaped, as already described. Steristrips cover the entire suture and suction drains are placed in the abdominal area where they remain for three days. PDO pads cover the suture and, finally, elastic girdle is worn by the patient for 30 days. No special care is necessary in the postoperative period at the hospital. The patient can lie down freely on the bed. Postoperative care is similar to that given for abdominoplasty only (Fig. 11).

Upper Inner Thighplasty

The treatment of the upper inner thigh region in the postlipoplasty period was in need of some revision. The traditional surgical procedures did not change: The incision lines, skin dissection, and resection are similar to the prelipoplasty period.

The selection of which technique to use depended on the extent and type of problem to be treated. The fat volume and the skin quality became basic factors in the decision. When to use surgery only, liposuction only, or both is summarized as follows:

(1) Small to mild localized fat deposits and firm skin are easily removed by lipoplasty is one surgical stage with good results. No traditional surgery is required.

(2) When there is more extensive deposit of fat with firm skin, liposuction in two surgical stages is recommended. The skin will retract normally avoiding undulations and unacceptable flabbiness. The second lipoplasty may be done six months after the first.

(3) Flabby skin combined with fat deposits requires traditional surgery and liposuction done in the same stage.

(4) For patients with flabby skin only, no liposuction is indicated.

The patient should realize that the final result is restricted to the upper third of the thigh only. Very often the patient will take the skin of the top part of the thigh in both hands and stretch the skin and ask the surgeon for results similar to this. Presently, there is no surgical technique that can yield this result. The doctor should clearly explain the limitations of surgery in order to avoid problems with the patient later on.

Lockwood [32] described the procedure of deep suturing of the lower skin edge incision to the Colle's fascia. This maneuver limits the descending scar problem. Unfortunately, it does not work in all cases. The surgery can leave the problem of descending scars, scar broadness, and even external genitalia distortion when there is any attempt to resect the excess skin. There is not enough tension in the suture. These problems become evident a few months after surgery and the patient complains about it.

Upper Inner Thigh and Flankplasty

Patients with unaesthetic problems in the flanks and in the upper inner thigh region may receive combined treatment in one surgical stage. The use of liposuction, traditional surgery, or both, is indicated according to the specific case.

Patients should be marked while in the standing position with the lower limbs slightly apart. The outlines on the flanks and thighs are determined by the pinch method to evaluate the amount to be resected or suctioned.

The surgery starts with the patient in the prone position under epidural or general anesthesia. The

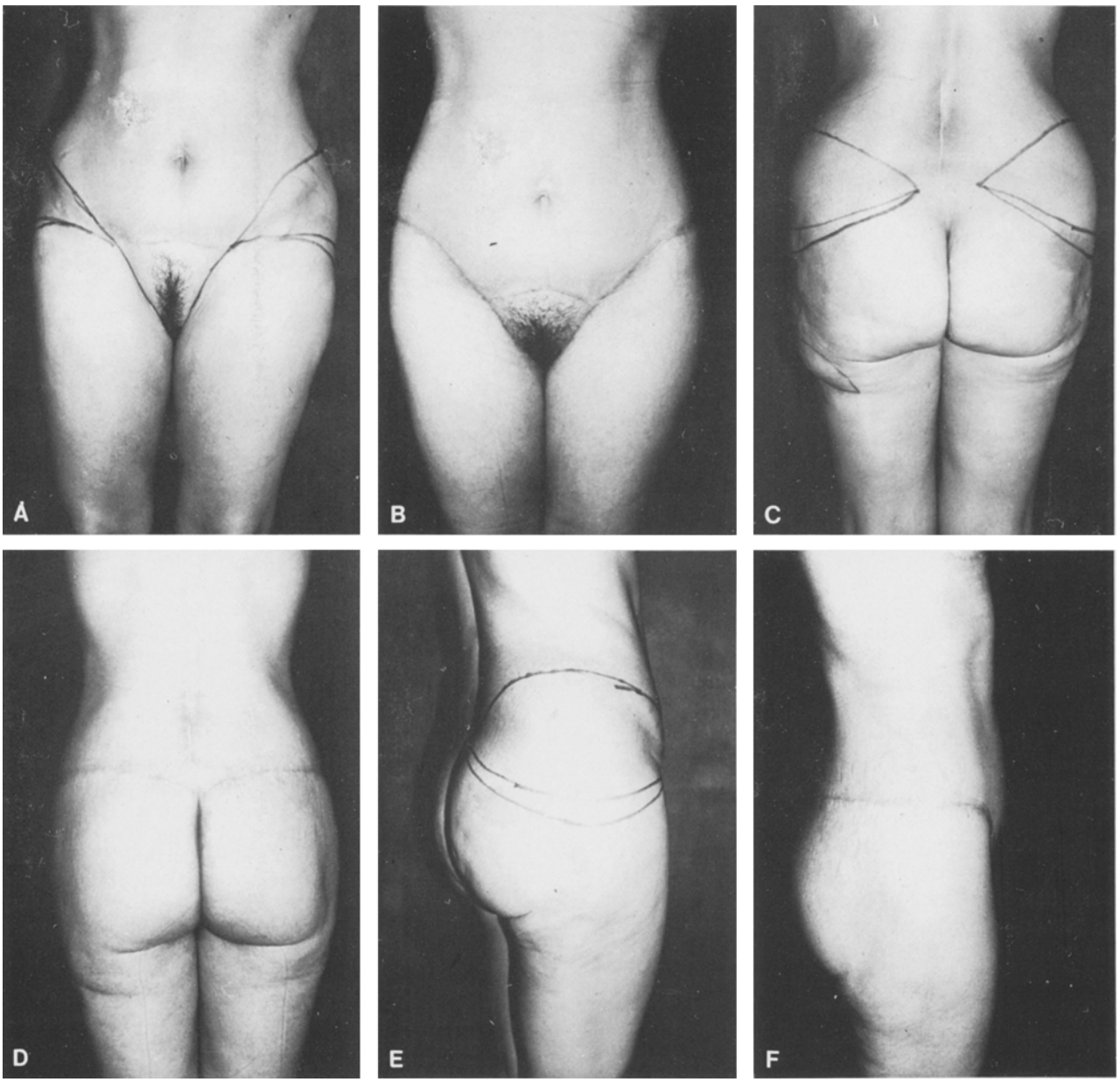


Fig. 13(A,B) Pre- and postoperative views of a 43-year-old patient who had two operations on the flanks and upper inner thighs. The patient had a routine abdominoplasty elsewhere a few years before this surgery. A scar revision in the pubic region was performed at this stage. **(C,D)** Pre- and postoperative posterior views after two consecutive surgical and liposuction stages. There was a 9-month interval between the first and the second stages. **(E,F)** Pre- and postoperative lateral views. The scar is placed in the regions normally covered by a bathing suit

surgical resection or liposuction is also performed in this stage. The surgical flank resection follows the procedure already described. The anterior skin limits of the flanks and the thighs remain incomplete while the patient is in the prone position. The excess skin at the anterior iliac spine is protected when the patient is turned over to the supine position. The upper inner thighplasty is done with the patient in the supine position, the limbs opened, and semiflected over the hips. At the end of the procedures, each of which was already described, a long skin strip is resected as shown in Figure 12. In the area between the flanks and the thigh the skin and excess fat are resected under the most judicious criteria to obtain the best possible symmetry.

The final scar starts at the gluteal sulcus posteriorly, follows the external surface of the labia majora, and is 2 or 3 cm above the primitive genital sulcus that separates the genitalia from the pudent region. It then reaches the inguinal crest running

parallel but a few centimeters above it, up to the anterior superior iliac spine. Finally, it takes a face down concave line, parallel to the posterior iliac line but above or below it, ending either a few centimeters before the intergluteal sulcus or joining with the other side in a V-shaped scar line (Fig. 13). Postoperative care is similar to that given for each region alone. The patient can lie down on the bed freely. The patient should remain in the hospital one to two days.

All attempts to resect more skin tissue should be evaluated beforehand to avoid the unpleasant problem of a descending scar line. The external genitalia and the inguinal line are not good supports for the suture under tension. A few months after the operation, the descent of the scar is evident and is seen when wearing a bathing suit.

A second problem related to external genitalia deformation is the opening of the labia majora and the flattening of the pubis.

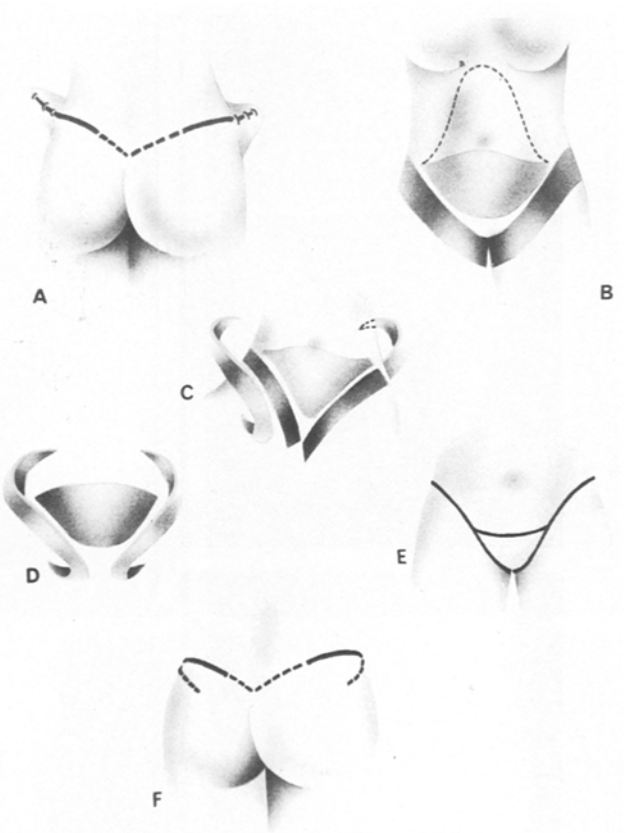


Fig. 14. Schematic of a combined flank, upper inner thigh, and abdominoplasty performed in the same surgical stage. **(A)** The surgery starts with the flankplasty. The patient is operated upon routinely in the prone position. After resection of the excess skin and liposuction when necessary, the suture remains separate or is joined at the sacral region (continuous or dotted line, respectively). The "dog ears" remain covered and the patient is turned to the supine position. **(B)** The dark areas represent the excess skin to be resected from the abdomen and the upper inner thighs. The dotted line on the abdomen shows the limits of the skin undermining. **(C)** The second step of the program is performed at the upper inner thigh regions according to the described techniques. **(D)** The dark areas represent the excess skin resected from the thighs and the lower abdominal segments. **(E,F)** Final scar after the final suturing. The pubis has a triangular shape surrounded by the scars

Upper Inner Thigh, Abdomen, and Flanksplasty

The combined procedures for treating the thigh, the abdomen, and the flank make up a program that should be used for cases that need to be treated in one or more surgical stages. The final result should justify use of the combined procedures. The extension and quality of the scars should also be considered before surgery begins.

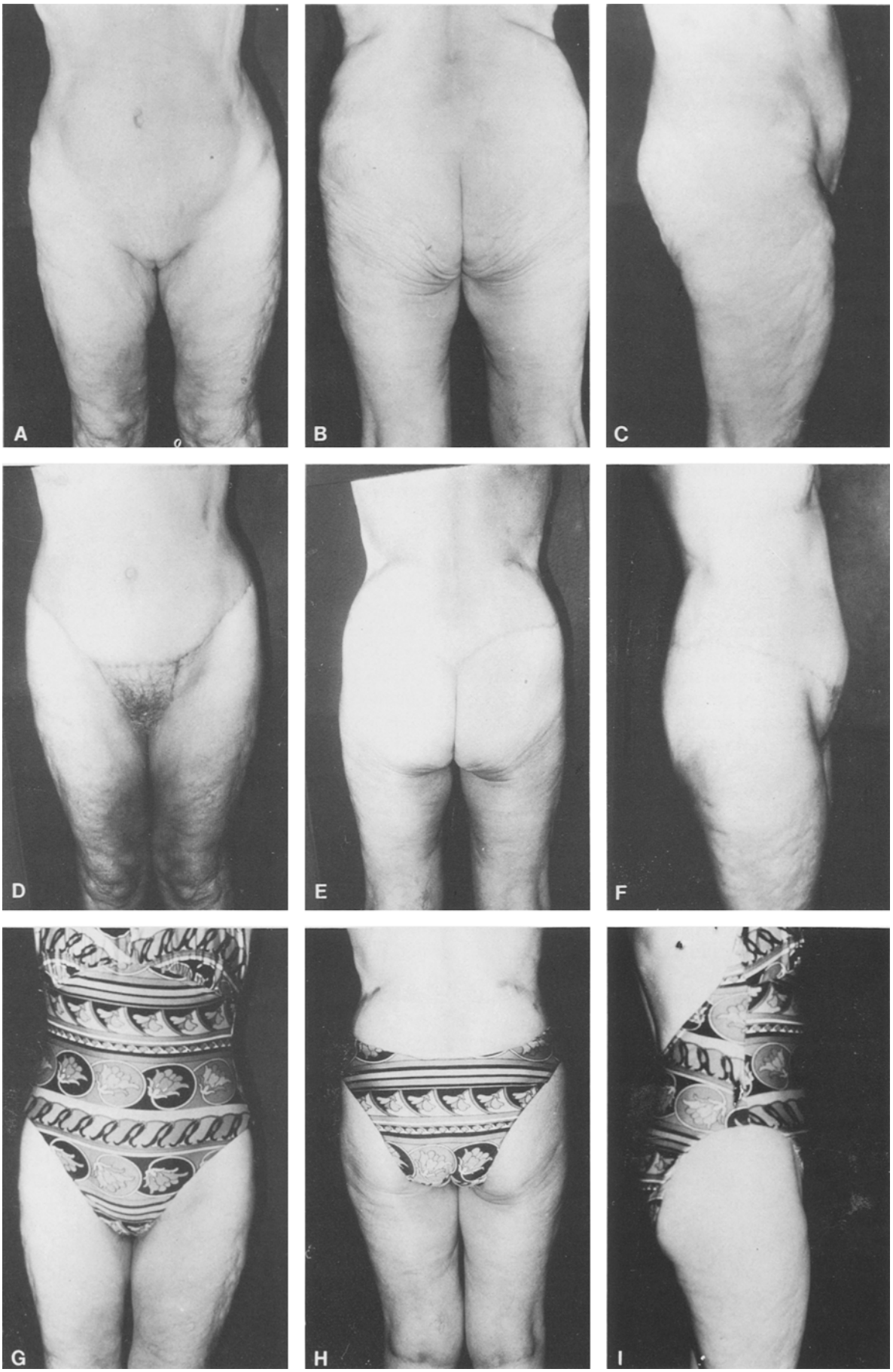
Each region presents its own aesthetic problem and where skin flabbiness and fat volume determine the selection of the technical procedure used. In general, most candidates for treatment have already tried various diets, exercise, massage, and so on, but had poor results. Surgery becomes the only solution left, no matter what the length of the resulting scar.

The surgery involves the following steps:

While the patient is standing with the upper arms on the head and the lower limbs separated, the flanks and the upper inner thighs are marked according to the local fat volume and skin flaccidity. The pinch method estimates the amount to be resected. The abdomen can also be marked at this time or while the patient is in supine position.

Surgery starts with the flankplasty which is done with the patient in the prone position. The patient is then turned over to the supine position and the thigh surgery and the abdominoplasty are performed (Fig. 14). All the surgical steps involved were described above when each was used alone. Two additional points should be made, however: (1) The junction of the abdominal flap with the pubis and the inguinal

Fig. 15(A,D) Pre- and three-month postoperative views of a 67-year-old patient who submitted to a flank, thigh, and abdominoplasty in the same surgical stage. **(B,E)** Pre- and postoperative posterior views. **(C,F)** Pre- and postoperative lateral views. **(G–I)** The patient wears a conventional bathing suit. Flabbiness was reduced and the body's contour and skin tone were improved. The thigh skin became less flabby only from the midlevel upward. Possible scar or surgical revisions are a part of the overall program only after a minimum of six months has transpired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incision is a critical area; the skin quality is poor. When there is tension along the suture, local necrosis and dehiscence frequently occur. To avoid or minimize this problem, minimal tension and a blunt skin suture at this junction are recommended.

(2) Avoid distortions in the public region. The pubis should have a triangular shape surrounded by suture lines without symmetrical distortions. Unfortunately, even after taking all these precautions, some asymmetry of the pubis is still observed. Surgical and postoperative care are the same as if the surgical steps were performed separately. Patients should be warned that dehiscence at the triangular suture junction could possibly be a problem. Suture revision or secondary healing is part of the postoperative care (Fig. 15).

Autotransfusion should be done before surgery. Depending on the patient's age and the extent of surgery, one to two units of blood should be transfused during surgery. The postoperative recovery is usually uneventful and as if only one procedure was performed.

Philosophy and Comment

Patients who are candidates for body contouring surgery are not happy with their image. They try a continuous program of diets and physical exercise activities in an attempt to return to their ideal proportions. They usually start with diet control and combine it with physiotherapy, exercise, injection of all sorts of products, massage, etc. After one or more failures, their last hope is plastic surgery. When they go to a plastic surgeon's office after trying these programs, their hopes and expectations are based on fantasy. They want to attain an ideal body shape, and after the failure of these programs, they think that surgery is the last resort.

The technical and philosophical concepts of body contouring surgery can be summarized as follows:

(1) Liposuction contributed greatly to body contouring surgery by increasing the possibility of aesthetic improvement, leaving unconspicuous scars, and having low risk and fast recovery. Over time and with experience the specialists concluded that there are limitations to lipoplasty as a solution for all types of problems. Liposuction became the technique of choice for treating cases of localized fat deposits with or without moderate skin flabbiness. Depending on the body region, fat volume, aging process, and skin quality, liposuction should be done in one or two surgical stages to avoid secondary problems of skin undulation, seroma, hematoma, necrosis, or other types of unpredictable complications.

(2) Cases of effective skin flabbiness and localized fat deposits should be treated with combined procedures in the same or different surgical stages. Skin resection makes the skin firm again, creating the condition for liposuction without the possibility of secondary flabbiness.

Lipoplasty can also be used in preparing for conventional surgery by removing excess fat, or as a secondary procedure after a traditional surgery for localized sculpturing. Finally, traditional body contouring surgery is used for cases where no fat deposits exist but the skin is flabby.

(3) During the first consultation, the most common and important questions asked by the patient are: "What is offered by and what is to be expected from surgery." "How many surgical stages should be required and how will they be programmed." And finally, "How much will all this cost me?" The patient is answered according to the problems presented, the extent of his/her emotional outlook, and the patient's cultural and economic levels. The patient's situation must be evaluated in advance to justify the final scar. The patient and the doctor should discuss this matter and any complications that could occur. Otherwise, the surgeon could be considered negligent and a malpractice suit could be a possibility.

How long the results will last is another important question. It depends on the combined factors of age, body weight variations after the surgery, exercise, and natural skin flabbiness. The presence of any of these factors may cause unfavorable results after months or in a few years. The breasts, the upper inner thigh, and the arms are the most affected regions. Again, it is important that information with respect to this question be given before surgery.

(4) The concept of the "surgical program" is fundamental and should be discussed. It is not safe to perform five or six surgical procedures in one stage. Revisions should be part of this program after a minimum of 4–6 months after the first stage or even less when necessary.

(5) Multiple procedures performed in one stage require a qualified surgical team that should work like an orchestra. The chief surgeon should perform all the major surgical steps. What to delegate to the first assistant is a decision that may have legal ramifications. It is logical to leave the suture refinements for the team in order to save time and reduce the time under anesthesia.

(6) The procedures involved in combined surgery follow a logical order. The order of priority is evaluated according to the patient's desire. Preferential surgery starts the program. If the patient's conditions do not allow the program to be continued, the remainder of it will be canceled. Surgery with the good possibility for secondary revision surgery

should also have a logical priority. If and when a second surgical stage is performed, it is easier to make the necessary corrections.

(7) Those who perform body contouring surgery, seem to agree with these concepts. Those who want to enter this field should keep this philosophy in mind. They should start with moderate combined procedures and work toward a more complex program as the surgical team becomes more experienced.

(8) Doctors should always be modest. Whatever experience he/she has in this area, he/she cannot solve all problems. There are still patients with problems that have not been statistically evaluated and that do not fit into this program. They go from office to office, searching for solutions to their problems but do not try to improve their body contour, depending totally on the surgeon to solve the problem. The specialist should be aware of this type of patient. Accepting this challenge is a personal decision. There are doctors who do it because of their personal philosophy, and there are those who will not do it out of conscience or to avoid future problems. The specialist should be technically qualified to know his/her limitations when he/she accepts the responsibility for this type of patient.

These patients belong to a group of obese people who are not disciplined in their diet, psychologically intolerant to discomfort, and have many degrees of hyperemotional reactions but are always anxious to solve their physical distortions. They live in a cycle of physical degeneration and psychological depression and occasional slight improvement from dieting but see themselves in a disharmonic condition. Analysis and psychological treatment have proven to be insufficient for the majority of these cases. The long-term periods of dieting with limited results always discourage these bulimic patients.

These patients finally say, "Why not four hours of surgery instead of four months of diet?" Surgery seems to be more efficient. It breaks the cycle. The new body image after the surgery, even with moderate results, stimulates these patients to never return to their previous condition. The surgery gives the patients the impulse to work toward a new body image and self-esteem. They change their psychological behavior, obey the rules of diet control, and become motivated to exercise.

The surgical program with more than one stage is welcomed. The expectation of a new physical condition is part of the emotional reaction. They submit to the program with an overdose of hope, waiting for the best results. They should trust the doctor unconditionally, and the doctor should not fail in his promises. The final result should satisfy the patient and the doctor for future program recommendations.

Problems and Solutions

No specific problems related to combined surgery and liposuction have been reported. The problems should not be different from those encountered if the individual surgical procedures were performed alone. The combined procedures always increase morbidity. If it reaches statistically unacceptable levels, doctors should reevaluate the limitations of their procedures. Every patient should be told about these problems beforehand, especially those that are most common, to avoid patient–doctor misunderstandings. It is impossible here to analyze, discuss, and illustrate each of the major problems seen after surgery. They exist at all levels and degrees. How to avoid them and how to treat them should be the subject of another article.

References

1. Agris J: Use of dermal-fat suspension flaps for thigh and buttock lifts. Plast Reconstr Surg **59:**817, 1977
2. Agris J: Suction Assisted Lipectomy: A Clinical Atlas. Houston: Eclectic Publishing Co., 1983
3. Avelar JM: Abdominoplasty: technical refinement and analysis of 130 cases in eight years follow-up. Aesth Plast Surg **7:**205, 1983
4. Baroudi R: Umbilicalplasty. In: Lewis JR Jr (ed): Clinics in Plastic Surgery. Philadelphia: W.B. Saunders, 1974, pp 431–448
5. Baroudi R: Dermatolipectomy of the upper arm. Clin Plast Surg **2:**485, 1975
6. Baroudi R: Body sculpturing. Clin Plast Surg **11:**419, 1984
7. Baroudi R: Lipolysis combined with conventional surgery. In: Hetter GP (ed): Lipolysis: The theory and practice of blunt suction lipectomy. Boston: Little, Brown, 1984
8. Baroudi R: Body contouring surgery. Clin Plast Surg **16:**263, 1989
9. Baroudi R, Carvalho, CGS: "Lifting" de la cara supero interna del muslo: Estudio analitico a corto y largo plazo. Cir Plast Iberolatinoam **7:**391, 1981
10. Baroudi R, Keppke EM, Tozzi-Neto F: Abdominoplasty. Plast Reconstr Surg **54:**161, 1974
11. Courtiss EH: Suction lipectomy: A retrospective analysis of 100 patients. Plast Reconstr Surg **73:**780, 1984
12. Delerm A, Girotteau Y: Plastic curo-femoro-fessiere ou circum fessiere. Ann Chir Plast **18:**31, 1973
13. Dolsky RL: Body sculpturing by lipo-suction extraction. Aesth Plast Surg **8:**75, 1984
14. Farina R et al: Riding-trousers-like type pelvicural lipodystrophy. Br J Plast Surg **13:**174, 1960
15. Fournier PF, Otteni FM: Lipodissection in body sculpturing: The dry procedure. Plast Reconstr Surg **72:**598, 1983
16. Goldwyn RM: Abdominoplasty as a combined procedure: Added benefit or double trouble? (editorial). Plast Reconstr Surg **78:**383, 1986
17. Gonzalez-Ulloa M: Circular lipectomy with transposi-

tion of the umbilicus and aponeurolytic technique. Cirurgia **27:**394, 1959
18. Grazer FM, Klingbeil JR: Body Image: A Surgical Perspective. St. Louis: C.V. Mosby, 1980
19. Greminger RF: The mini-abdominoplasty. Plast Reconstr Surg **79:**356, 1987
20. Guerrerosantos J: Hip–buttock–thigh plasty. In: Goldwyn RM (ed): The Unfavorable Result in Plastic Surgery (2nd ed). Boston: Little, Brown, 1984, pp 865–888
21. Hetter GP: Lipoplasty: The Theory and Practice of Blunt Suction Lipectomy. Boston: Little, Brown, 1984
22. Hodgkinson DJ: Medial thighplasty: prevention of the scar migration, and labial flattening. Aesth Plast Surg **13:**111, 1989
23. Illouz YG: Illouz's technique of body contouring by liposis. Clin Plast Surg **11:**409, 1984
24. Illouz YG: Surgical remodeling of the silhouette by aspiration liposis or selective lipectomy. Aesth Plast Surg **9:**7, 1985
25. Juri J, Juri C, Elias JC: Arm dermolipectomy with a quadrangular flap and "T" closure. Plast Reconstr Surg **64:**521–525, 1979
26. Kesselring UK: Suction curettage to remove excess fat for body contouring. Plast Reconstr Surg **69:**572, 1982
27. Kesselring UK: Regional fat aspiration for body contouring. Plast Reconstr Surg **72:**610, 1983
28. Lewis CM: Early experience of aspirative lipoplasty of the abdomen. Aesth Plast Surg **11:**33, 1987
29. Lewis JR Jr: The thigh lift. J Int Coll Surg **27:**330, 1957
30. Lewis JR Jr: Atlas of Aesthetic Plastic Surgery. Boston: Little, Brown, 1973
31. Lewis JR Jr: Surgery of hips, buttocks, and thighs. In: Goldwyn RM (ed): Long-Term Results in Plastic and Reconstructive Surgery. Boston: Little, Brown, 1980
32. Lockwood TE: Fascial anchoring technique in medial thigh lift. Plast Reconstr Surg **82:**300, 1988
33. Mühlbauer W: Radical abdominoplasty, including body shaping: representative cases. Aesth Plast Surg **13:**105, 1989
34. Pitanguy I: Thigh lift and abdominal lipectomy. In: Goldwyn RM (ed): The Unfavorable Result in Plastic Surgery: Avoidance and Treatment. Boston: Little, Brown, 1972, pp 387–395
35. Planas J: The "crural meloplasty" for lifting the thighs. Clin Plast Surg **2:**495, 1975
36. Rebello C: Plastica de Abdome. A folia Med **56:**51, 1968
37. Regnault P: Basic principles and indications of liposuction. In: Regnault P, Daniel RK (eds): Aesthetic Plastic Surgery. Boston: Little, Brown, 1984, pp 679–692
38. Regnault P, Baroudi R, Carvalho CGS: Correction of lower limb lipodystrophy. Aesth Plast Surg **4:**215, 1980
39. Rosenthal SG: Trochanteric lipectomy: A new approach. Plast Reconstr Surg **69:**356, 1982
40. Schrudde J: Lipexeresis as a means of eliminating local adiposity. Aesth Plast Surg: **4:**215, 1980
41. Schrudde J: Lipexheresis (liposuction) for body contouring. Clin Plast Surg **11:**445, 1984
42. Teimourian B: Suction Lipectomy and Body Sculpturing. St. Louis: C.V. Mosby, 1987
43. Vilain R, Darbour JC: Aesthetic surgery of the medial thigh. Ann Plast Surg **17:**176, 1986
44. Vogt T, Dicksheet S: Suction curettage and alternatives to remove excess fat. Plast Reconstr Surg **69:**724, 1982