Operative Techniques in Plastic and Reconstructive Surgery

Editor
Lawrence L. Ketch, MD, FAAP, FACS

BODY CONTOURING AND LIPOSUCTION
Part III

Guest Editor
Alan Matarasso, MD, FACS

W. B. Saunders
A Unit of Elsevier Science (USA)
Abdominal Contour Surgery in the Male Patient

Alan Matarasso, MD, and Steven G. Wallach, MD

Despite the paucity of literature on male abdominal contour surgery, recent trends suggest that contouring of the male abdomen has become more common. The male abdomen can be evaluated according to the abdominoplasty system of classification and treatment used in females. However, despite this, differences exist between males and females in three treatable soft tissue layers, some of which is a function of pregnancy and hormonal changes in females. Consequently, males undergoing abdominal contour procedures generally fall into two treatment categories: (1) liposuction and (2) full type IV abdominoplasty. Examination, classification, patient selection, and operative treatment of the male abdomen are discussed.

Copyright 2002, Elsevier Science (USA). All rights reserved.

There are few anatomic areas in males that cause the degree of consternation that the abdomen does. Abdominal girth and waistline measurement is a constant source of anxiety and reflection. Indeed for many individuals the appearance of their abdomen serves as a barometer for their health, fitness, senescence and sexuality.

Perhaps the most striking characteristic of males is the absence of an hourglass figure accentuated by a narrow waistline, which is typically observed in females. Rather, males have a more uniform silhouette with a natural tendency toward fat deposition in the flanks ("love handles"), which is the most common reason men request surgery of the abdomen. Furthermore, from their 30's on, the male physique and body composition discernibly changes. Differences exist between males and females in all three of the treatable soft-tissue layers of the abdomen: skin, fat, and muscle.

The male integument is less prone to over-stretching and laxity than females, perhaps as a result of its thickness and not being influenced by pregnancy or a preponderance of female hormones. Consequently, excessive skin redundancy in males is usually observed in those patients who have undergone significant weight loss or fluctuations.

With advancing age, male fat patterning is altered and there is an "internalization" of fat with an increase in intra-abdominal fat and a corresponding decrease in subcutaneous fat, as well as infiltration to and between muscles. Overall, there is a decline in lean body mass and fat redistribution.

Finally, differences between genders exist in the muscular layer. Females often present with a lower abdominal rectus muscle diastasis, creating a visible umbilical to pubic "bulge." Males often have a rectus diastasis in the upper abdomen, which contributes to a "beer-belly" appearance. The combination of intra-abdominal fat accumulation and upper rectus muscle diastasis results in the characteristic waist and abdomen disproportion seen in males. This is the most frequently observed source of dissatisfaction and frustration—even in patients with relatively stable weight patterns.

Males have fewer variations in their anatomic presentation when compared to females. Therefore, the necessity for various surgical procedures are generally fewer in men—typically liposuction or a full abdominoplasty are sufficient, in contrast to a wider range of procedures performed in females. In both genders, the goals remain the same; that is, to reduce excess skin, decrease the subcutaneous adipose tissue, and repair the muscular diastasis through the least conspicuous incision and with the minimum risk of morbidity and mortality.

Patient Examination and Diagnosis

The circumferential aesthetic units of the abdomen should be examined with the patient in a standing, sitting, supine and lateral hip flexed (diver's) position. Differences in intrinsic anatomy, body proportions, umbilical variations, location of scars or hernias, and the status of the treatable soft-tissue layers (skin, fat, and muscle) are noted. Findings regarding the condition of the skin, the degree of fat accumulation, and the extent of the muscular diastasis or weakness are discussed with the patient in the presence of a 3-way mirror. A discussion with the patient regarding the potential for improvement from the various surgical procedures ensues. Individual tolerance for potential complications, incisions, and recovery is factored into the decision-making process. Together, these issues are reconciled, and the patient is then "staged" to an appropriate level of treatment, according to the abdominoplasty system of classification and treatment.

Patient Classification

In the past, an abdominoplasty was a relatively uniform procedure that was performed through variations of a low, transverse hip-to-hip skin incision. With the application of liposuction to body contouring surgery a new dimension in abdominal contouring evolved (Fig 1). The term abdominoplasty as a system of classification and treatment was developed to reflect this alteration and has been discussed in great detail in other publications (Fig 2 and Fig 3). Salient points are noted in Tables 1 and 2.

Therefore, what as recently as the previous two decades was one operative approach for all patients, is now a range of 7 choices, based on variations in patients' anatomy. Despite the possibilities, in males, abdominal contour is largely limited to abdominal liposuction or a full abdominoplasty.

Indications and Techniques

Tables 1 and 2 outline the variety of options available for abdominal contour surgery in men and women.

Recent statistics reported by the American Society of Aesthetic
Plastic Surgery indicates that men account for over 1 million cosmetic procedures and there was a 43% and 25% increase in the number of men undergoing abdominoplasty and liposuction, respectively, since the previous year. Based on the unique characteristics of males as described and their often-expressed preference for a less invasive procedure and rapid recovery period, the following procedures are the most common ones performed in men.

**Operative Procedures**

**Type I Liposuction and Subtype 1a Extended Liposuction**

*Indications.* Suction-assisted lipectomy (Type I) is indicated in patients who have minimal skin laxity and flaccidity of the musculofacial system and variable amounts of subcutaneous fat, who can be expected to adapt to the contour change that results from liposuction. Classically these patients have good skin tone and excess fat in a wide belt-like fashion across the abdomen to the flanks.

*Extended liposuction (Subtype 1a) (Table 2),* is a more extensive form of liposuction and is a frequent procedure in males. It is based on a greater degree (multiple aesthetic units being treated), extent (deep and superficial layer fat removal), and volume of aspirate (a “pure” fat fraction exceeding the usual 1500 cc “large volume” parameters) than traditional liposuction. While the amount of subcutaneous fat accumulation varies from patient to patient, males consider extended liposuction to be the procedure of choice since skin tone is often better than in females, and there may be less of a rectus muscle diastasis.
supine position. The anterior abdomen is then infused with supersaturated local anesthesia consisting of 1 liter of Ringers lactate, 20 cc of 1% lidocaine and 1 cc of 1:1000 epinephrine. The patient is turned to the prone position on the operating room table, and the premarked areas are infiltrated with local anesthesia. Three-holed, Mercedes-type cannulae, ranging from 3.2 mm to 4.8 mm of internal diameter are utilized. Machine-driven suction lipectomy commences through the same incisions used for the introduction of local anesthesia. Suction progresses in each aesthetic unit, from deep to superficial, in a multi-directional, criss-cross fashion. The sites are evaluated, using pinch, panel-beater, and skin lifting tests. The crease of the lumbar roll adjacent to the anterior superior iliac spine is disinserted by bluntly undermining with the cannula below the hip crease that forms with the iliac crest, in an attempt to allow the tissue to redrape. This is similar to the action used with the inframammary crease in gynecomastia surgery. The anatomic configuration of the lumbar roll and excess loose skin often precludes obtaining a totally uniform or "V" configuration that men desire. Patients should be aware of this preoperatively to avoid dissatisfaction or a need for secondary surgery.

The patient is then turned to the supine position, and the anterior abdomen is treated in quadrants, while comparing volumes and outcomes. It is useful to reverse jackknife the operating room table when treating the anterior abdomen to allow tangential introduction of the wetting solution, and even plane of liposuction, thereby reducing the possibility of intrabdominal penetration. The fat in the epigastric area, like the flanks, is often more fibrotic and harder to remove. From this position, the flank area is again treated, overlapping the portions that were addressed while the patient was prone. The periumbilical and mons pubis area are evaluated independently and suctioned in proportion to the surrounding areas. Final contouring is performed until symmetry is obtained. The incision sites are milked of any excess injectate, and the wounds are closed with staples or sutures. A compression garment can be used at the discretion of the patient and surgeon (Fig 7).

**Power-Assisted Liposuction**

Power-Assisted Liposuction (PAL) is a beneficial technique in liposuction in general and for males. The rapidly reciprocating cannula facilitates fat removal and is useful in males with fibrotic fat deposits. We prefer an electrically powered system, and do not alter the technique as a result of the instrumentation.

**Type IV Full Abdominoplasty with or Without Liposuction**

**Indications**

A full abdominoplasty is ideal for those patients with severe skin laxity and considerable upper and lower flaccidity of the
musculofascial system. Concomitant, supplemental liposuction is performed when indicated. However, if extensive amounts of liposuction are required, this should be staged or performed secondarily, after sufficient wound healing and skin contraction have occurred.

**Technique**

Patients are marked for surgery wearing their preferred clothing styles, and this is reviewed together with them. While brief clothing styles is a concern in males, the parameters for incision placement in males are often more flexible than for females. When the patient flexes, the proposed elliptical skin incision between the umbilicus and mons pubis is grasped to determine the feasibility of closure and the lateral extent of the incision. The lower skin incision marking is then placed, while the patient grasps and pulls the skin flap upward to a position slightly below the pre-determined level while curving toward the anterior superior iliac spine, terminating at the skin crease. This

![](image)

**Fig 3. The minimal access system of abdominoplasty. Reprinted with permission.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Skin</th>
<th>Fat</th>
<th>Musculofascial System</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1a</td>
<td>Minimal laxity</td>
<td>Excess fat</td>
<td>Minimal flaccidity</td>
<td>Extended SAL</td>
</tr>
<tr>
<td>Type 2a</td>
<td>Mild laxity (vertical scar)</td>
<td>Variable</td>
<td>Mild lower abdominal flaccidity</td>
<td>&quot;Open mini&quot;</td>
</tr>
<tr>
<td>Type 3a</td>
<td>Minimum laxity</td>
<td>Variable</td>
<td>Lower/upper abdominal flaccidity</td>
<td>Endoscopic muscle access</td>
</tr>
</tbody>
</table>

**NOTE:** Bold columns distinguish these subtypes from their precursors in Table 1. Reprinted with permission.
Fig 4. The 6 aesthetic units to insure complete treatment in males. Females often complain of two dorsal back rolls—a seventh unit. Reprinted with permission.19

accounts for subsequent upward wound migration and scar contracture. The incision should not cross the inguinal creases. The upper incision is designed like a handlebar moustache,11 slightly arched at the most lateral aspects, which helps minimize any subsequent dog-ear formation at the time of wound closure.

The patient is then placed on the operating room table with the arms on padded arm boards, and a footboard is secured. While the patient is awake, the table is maximally flexed to a “jack-knife” position, mimicking the final intraoperative position that is required for wound closure to ascertain the ability of the table to do so and to assure patient comfort. Venous compression pumps are placed on the patient’s legs or feet before the administration of any sedation or anesthesia. General anesthesia is then induced, and the field is evenly infiltrated with superwet anesthesia. Large volumes of local anesthesia are unnecessary; it impedes electrocoagulation and allows a sufficient reserve to be used for any adjacent sites to be liposuctioned. A 2-0 silk marking suture on a Keith needle is placed at the xyphoid and pubis and overlapped and clamped to verify symmetry. Surgery begins with liposuction in the premarked areas according to suction areas (SA 1-4) (Fig 5 and 6). The umbilicus is then circumscribed, freeing it from the skin, while preserving some surrounding fat. The upper skin incision is made and the flap is undermined in an inverted “V”-type fashion, to preserve the maximum amount of lateral intercostal blood supply that becomes the dominant blood supply after the flap is elevated. Elevation continues to the xyphoid process centrally and laterally by blunt dissection to the costal margins, only as necessary to achieve wound closure without tension. The table is flexed, and the upper flap redraped over the lower abdominal pannus in a “vest-over-pants” fashion, as described by Planas, for the contingency of wound closure.12 The pannus is then excised en-bloc, while the assistant surgeon identifies and electrocoagulates the vascular perforators. The table is unflexed, and the rectus muscle is then vertically incriminated from xyphoid to pubis with 2-0 Neurolon sutures or a 0-nylon loop suture. The sheath can be injected with 0.25% marcaine with ephinephrine for pain management. A temporary plastic button is secured to the umbilicus for subsequent identification through the abdominal wall.

The table is flexed, and the flap is advanced and sutured to the mons pubis in the midline. The deep layer of the wound is then closed with long acting, absorbable sutures beginning on each side and progressing from lateral to medial, while the assistant surgeon adjusts the skin edges to advance the “dog ears” toward the midline. Liposuction can be performed on the mons pubis and it can also be unfurled and stabilized by placing absorbable sutures to prevent upward migration.11,14 Two Jackson Pratt drains are brought out through the incision and sutured to the wound. The skin is closed with staples.

The umbilical button is palpated while verifying the position of the new umbilical site. A 2.5-cm curvilinear incision centered in the midline with the aid of a suture from the xyphoid is made in the subcutaneous fat. Electrocautery is used to completely expose the button, and a wedge of adipose tissue from the upper and lower half of the flap is removed. In individuals with a thin abdominal flap, closure of the umbilical stalk to the skin incorporates the fascia at 6 o'clock, with half-buried mattress suture. In others, the half-
embolic measures (i.e., pneumatic compression boots, pharmacologic intervention)

**Postoperative Patient Management**

**Immediately Postoperative**

Hydration

Early ambulation

Aggressive respiratory care, supplemental oxygen, and blood pressure control

Reinforced (tape, towels, or foam) compression binders with release at regular intervals (15 minutes every hour)

Bed remains in flexed position, unplugged NPO

**Postoperative Days 1-7**

Closed, prolonged suction drainage (for "open" procedures only) until drainage falls below 30 cc/24 hours

Progressive diet as tolerated

Antibiotics, vitamins, homeopathic supplements, stool softeners, laxatives

Continued DVT prophylaxis

**Weekly**

Inspection for seroma accumulation weekly for 6 weeks

Begin Postop Days 10-14

Ultrasound therapy and lymphatic massage

Wound scar modification (i.e., tape, silicone sheeting, etc. as indicated)

**Complications**

The complications that can be encountered in the most frequently performed operations in male liposuction (Type 1), extended liposuction (SA1 Type 1a) and a full abdominoplasty

---

**Preoperative Patient Management**

Four weeks preoperatively

- Cease all nicotine exposure (active and passive)
- Stop all medications that affect clotting
- Medical evaluation (as indicated)
- Hematologic (DVT) work-up, if necessary

Two weeks preoperatively

- **Begin** vitamins (i.e., Slo-Niacin 500 mg PO QID and vitamin C 1 g QID) with large volumes of water, as indicated

Three days preoperatively

- **Begin** antimicrobial scrubs extending beyond the surgical field
- **Begin** homeopathic medications and continue postoperatively

Preoperatively

- **Assess** ability of OR table to achieve full flexion
- **Assess** patient comfort on table
- **Ensure** adequate hydration, antibiotics, corticosteroids, anti-

---

![Diagram of abdominal anatomy](image)

Fig 5. (Left) Pre: The blood supply to the anterior abdominal wall. Note Hunger zones I to III (Right) Post: Vascular anatomy in the postabdominal patient and its relationship to potential areas of suction lipectomy. (DSEA = deep superior epigastric artery; SSEA = superficial superior epigastric artery; MPA = marginal phrenic artery; DIEA = deep inferior epigastric artery; SCIA = deep circumflex iliac artery; SIA = superficial inferior epigastric artery; SEPA = superficial external pudendal artery; segmental perforators (zone III) = intercostal, subcostal, lumbar arteries.). Reprinted with permission.

buried suture is only used at the 6 o'clock position or none at all. The remaining areas are closed with interrupted sutures. The umbilical cavity is packed with a strip of Xeroform gauze. A single layer of Telfa dressing is applied to the incisions. An abdominal binder is applied and the patient is transferred to a flexed hospital bed (Fig 8).

![Diagram of suction areas](image)

Fig 6. The anatomic regions for suction lipectomy in abdominoplasty, suction areas: SA2 (cautious), SA3 (limited), SA1 (safe), and SA4 (unrestricted). Reprinted with permission.
with or without liposuction (Type IV) are similar to those reported elsewhere and do not vary according to gender.\textsuperscript{15-17}

**Anesthesia**

All “closed” abdominal contour procedures are performed with monitored, intravenous sedation anesthesia or spontaneous ventilation general anesthesia. All “open” procedures are performed under general anesthesia. Systemic anesthesia is supplemented by the infiltration of “tumescent” fluid in this superwet dosage range (approximately 1-2 cc of injectate per cc of aspirate) evenly dispersed in the subcutaneous adipose tissue. The solution is administered to not exceed 35 mg/kg.\textsuperscript{18}

At the completion of surgery, the aspirate is set aside and allowed to fractionate. Typically, this averages approximately 20% fluid and 80% fat, or a ratio of 1:1 “pure” fat to fluid “injectate.” Fluid replacement by hypodermolysis is supplemented with intravenous hydration and oral intake to a total of approximately 2 to 3 cc of fluid per cc of fat aspirate during the first 24 hours. This necessitates alerting the anesthesiologist to an alteration in conventional considerations for liposuction fluid replacement. This formula accounts for replacement and maintenance fluid requirements.

**Conclusion**

Males have a larger body surface area, distinguishing physical characteristics and unique aesthetic concerns that present a different therapeutic challenge than females. Typically, they enter with a different perspective than females and are less inclined to pursue minor anomalies, or return regularly for frequent follow-up care. The major area of disappointment in males is the inability to alter the intraabdominal submuscular fat compartment where fat redistributes with advancing age that results in enlarged abdominal girth. The alteration in fat patterning to the submuscular intraabdominal location has a significant impact on the appearance of the abdomen in men and women as they age. Conveying the relationship and significance of subcutaneous to submuscular fat and the change in fat patterning with advancing age is one of the more challenging aspects to patient education. In general, males who have not had large weight fluctuations present with skin of good quality and tone and can benefit from liposuction surgery; those that have poor skin tone with or without rectus muscle diastasis, may be candidates for a full abdominoplasty. These two procedures represent the overwhelming types of abdominal contour operations performed in males.
References