The Cirque du Soleil and The TULUA Technique

Antidotes to the Traditional Abdominoplasty

Antidote (n.): whatever tends to prevent mischievous effects.

It has been the unique mission of the renowned acrobatic circus troupe, Cirque du Soleil, to design a performance with the inherently competing goals of aesthetics and safety, *without compromising one or the other.* Of course, this kind of challenge should sound familiar to any aesthetic surgeon who has considered their technique of abdominoplasty…thoughtfully. Because the abdomen, more than any other anatomic zone in our operative realm, will reliably challenge the surgeon with confounding physical deformities and double as one of its riskiest. What other procedure demands so much at one time: to maximally address redundant fascia, fat, and skin, through the shortest, finest quality, most hidden scar whilst also avoiding skin death, dehiscence, infection, seroma, and VTEs?

A survey of the evolution of this procedure, like any other complex human endeavor, manifests a constant tinkering of technique, relentlessly improving both its aesthetics *and* safety. This observation is at the heart of the present chapter in this august and innovative text: for Dr. Vellagos and his TULUA technique represent yet another valuable tinkering step in our collective quest to "better." But is more compelling and educational if I frame this novel procedure as actually an advance in *philosophy*. I say philosophy because a surgeon without a guiding philosophy is nothing more than a technician with a tool. A consistent, immutable principle of surgery should be underfoot and drive every one of these step-wise advancements in our abdominoplasty: to cure the patient but *do no harm*; to perform what I like to call an "*aesthetically safe*" surgery. Every daring chapter by this tome's surgeon-authors follows this credo, as so elegantly validated by the common thread of the TULUA technique.

So in this chapter, I will exploit the TULUA technique as a seminal example - as an "exhibit A," if you will - of another innovative step in the abdominoplasty's evolutionary history, a step that, when connected to those before it, plots our collective "learning curve"...so far.

I say "so far", because the maturation of the abdominoplasty is far from over. We have certainly come a long way from the simple panniculectomy of yore, but we have a long way to go before we can say we have mastered our treatment of the abdomen. And before anyone–including the authors that grace this text–declare that their technique is the ultimate solution to the abdominoplasty, allow me to list the unsolved *aesthetic* and *complication* challenges that defy all of us today:

Aesthetics

1. *The striated skin*: We may strive to excise all the striated skin, but invariably we must leave some of this damaged tissue behind.
2. *The residual skin*: We may attempt to resect much of the redundant skin, but will often have to leave, particularly upper abdominal, excess behind.
3. *The subcutaneous fat*: We may attempt aggressive liposuction, including the central flap centrally, but on account of the ever-present fear of ischemia will still knowingly leave excess fat behind.
4. *The abdominal fascia*: We may diligently plicate the lax fascia, but we can't rehab its collagen deficiency and prevent the inevitable relapse.
5. *The omental fat*: We might either eschew treating the patient with omental hypertrophy or valiantly plicate against it, but we will be reliably defeated by its opposing brute force.
6. *The umbilicus*: We will apply one of a myriad of strategies to inset/recreate an umbilicus, but they will all too often realize something less than natural-looking.

Complications

1. *Skin necrosis*: We may be diligently perforator preservative, but with every abdominoplasty flap we create undeniably random in nature, the specter of ischemia will forever haunt us.
2. *Skin dehiscence*: We might cleverly conduct the wound closure, but wound separation will always remain an inherent risk with our aim of maximal skin resection and purposeful wound closure under some tension.
3. *Wound infection*: We may install diligent decontamination protocols, but the risk of infection endures considering the obligatory attenuated blood supply, expansive wounds, lengthy operative times, and tension-filled closures.
4. *Wound Seroma*: We can apply one of our clever preventative strategies, but fluid collections will always be a wild card with the necessary elevation of skin flaps and disruption of lymphatics
6. *Umbilical Demise*: We may handle the umbilical stalk ever so gently, but its elongated, and blood-starved versions can forever make its survival upon translocation more of a crap shoot.

Solutions

In the face of these aforementioned hurdles, our profession has, true to its DNA, confronted each one with creative gusto and fruitfully advanced us all on our collective learning curve. Allow me to enumerate, in relative chronological order,

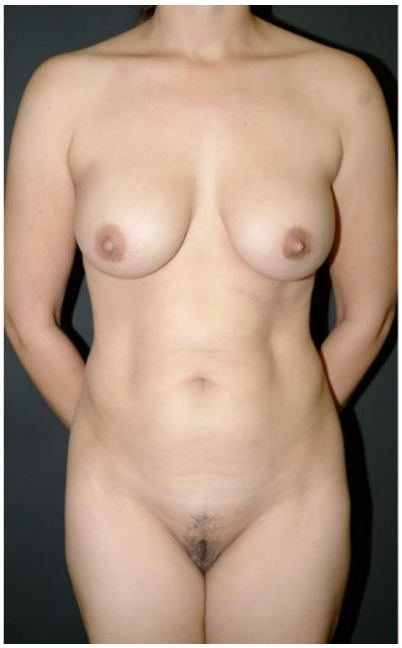
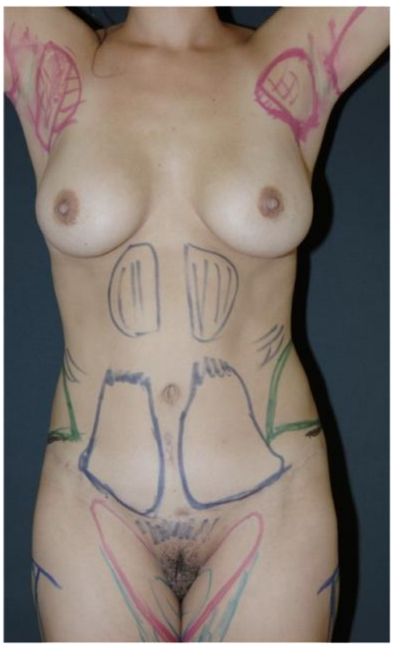
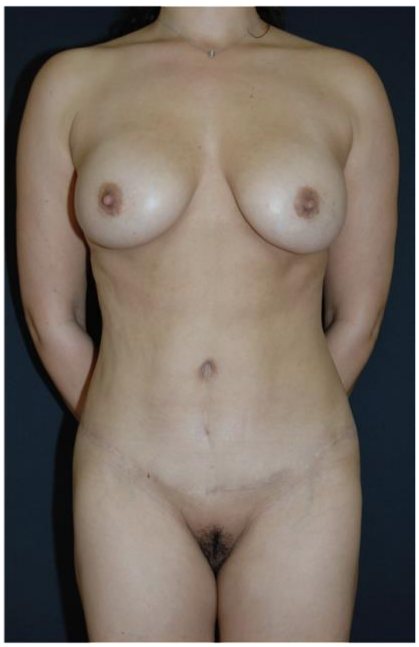
some of our colleagues' seminal innovative strategies, as valiant antidotes to these same challenges.

1. *Zonal liposuction*: Alan Matarasso's clear clarion call *should* still ring true today. This mindful respect for the abdominal wall vascular anatomy established a more "intelligent" approach to concomitant liposuction by stratifying the skin's vascular vigor into distinct cautionary zones - based on human anatomy that hasn't evolved since.

2. *Discontinuous dissection*: Ted Lockwood's milestone concept of preserving abdominal wall perforators with the application of discontinuous dissection reduced the risk of skin flap ischemia dramatically whilst allowing no lesser a resection of excess skin.

3. *Lipoabdominoplasty* – Osvaldo Saldhana's variation on the theme strategy of upper abdominal "selective undermining" in the lipoabdominoplasty offered permission to conduct contemporaneous liposuction in the very zones traditionally labeled as red and verboten. However, as supported by the results presented, this approach would appear to be most prudent in the more "ideal" patient if an ischemic flap is still to be soberly avoided.

4. *Second-Stage Liposuction:* This author, despite careful patient selection, diligent discontinuous dissection, and anatomically sensitive liposuction, has still been witness to memorable episodes of "breakthrough" ischemia. And this pain point should not be entirely surprising when one considers that the skin, as noted above, is truly a random flap - and one that no reconstructive surgeon would ever electively liposuction! So these experiences begot my present protocol of the planned "second-stage" liposuction, 6 months or more post the initial abdominoplasty. And efficaciously, this delayed strategy allows for liposuction to be accomplished with abandon in turn delivers results even more complete.

Preop HTA Six mo's Post HTA Late Postop
Preop 2nd Stage Lipo

An example of the "Second Stage" liposuction to prophylax against ischemia/necrosis *and* facilitate better results.

4. *High Lateral Tension Abdominoplasty:* Ted Lockwood's revolutionary insights not only challenged but ultimately dethroned many of the orthodoxies that had girded the traditional abdominoplasty for decades. The primary disrupting idea was that there was as much and often more excess skin laterally than centrally and often significant excess below the incision, in the pubis and groin. Up until then, the surgeon habitually lopped off all the central suprapubic skin and then predictably recruited the aforementioned "hidden" subincision excess, ectopically elevating the pubis and remaining incision and ensuring a closure under "undue" tension. So instead, Lockwood turned the procedure on its head and instead started the skin excision from the lateral end of the excess and properly treated this "cryptic" skin excess below.

5. *Progression Tension Sutures*: Harlan Pollock based his quantum leep in seroma prevention on a tenet that is as old as the suture: wounds abhor a vacuum. So he simply conflated the two and used sutures to close down the dead space. And while at it, this maneuver advanced the skin flap, allowing for both a little more skin excision and a reduction in closure tension.

6. Reverse and Fleur-de-Lys abdominoplasties: These strategies have been quivers in our armamentarium for seemingly forever. But as this author has bemoaned, despite all our diligent efforts with the traditional abdominoplasty, residual excess skin is a frustrating inevitability, particularly at the upper abdomen and particularly in the weight loss patient. These additional strategies, applied in the right circumstances can and do address the excess skin more globally, more completely than any other.

(Photos to be included)

5. *Pinch Abdominoplasty*: On account of the ever-present peril of skin flap necrosis in the less-than-ideal BMI patient, this author's initial strategy was to simply deny surgery. As much as this was a sure-fire preventative approach, it did leave many presenting patients in a state of abdominal procedure "purgatory" - to be offered a full-on abdominoplasty may have reasonably treated the deformity but at too great a risk, and to undergo an aggressive liposuction may have ameliorated the deformity but overall not do the deformity justice. So, like Dr. Villegas, I started tinkering with the various "pieces" of our many available strategies and pieced them together, like so many Legos, into a "chimera" of an abdominoplasty. And true to its nature, depending upon the patient's presentation, this strategy can be "shape-shifted" in small but potent ways to both reduce risk and promote results. And this technique is bestowed the fitting appellation of a "pinch" lipo-abdominoplasty - projecting my consistent underlying philosophy of "less is more" - less invasive surgery that can still deliver more outsized results. Allow me to outline the essential components of this strategy:

a. The entire abdomen and its environs are first safely liposuctioned, with relative abandon, as if it were a routine lipo-only procedure.

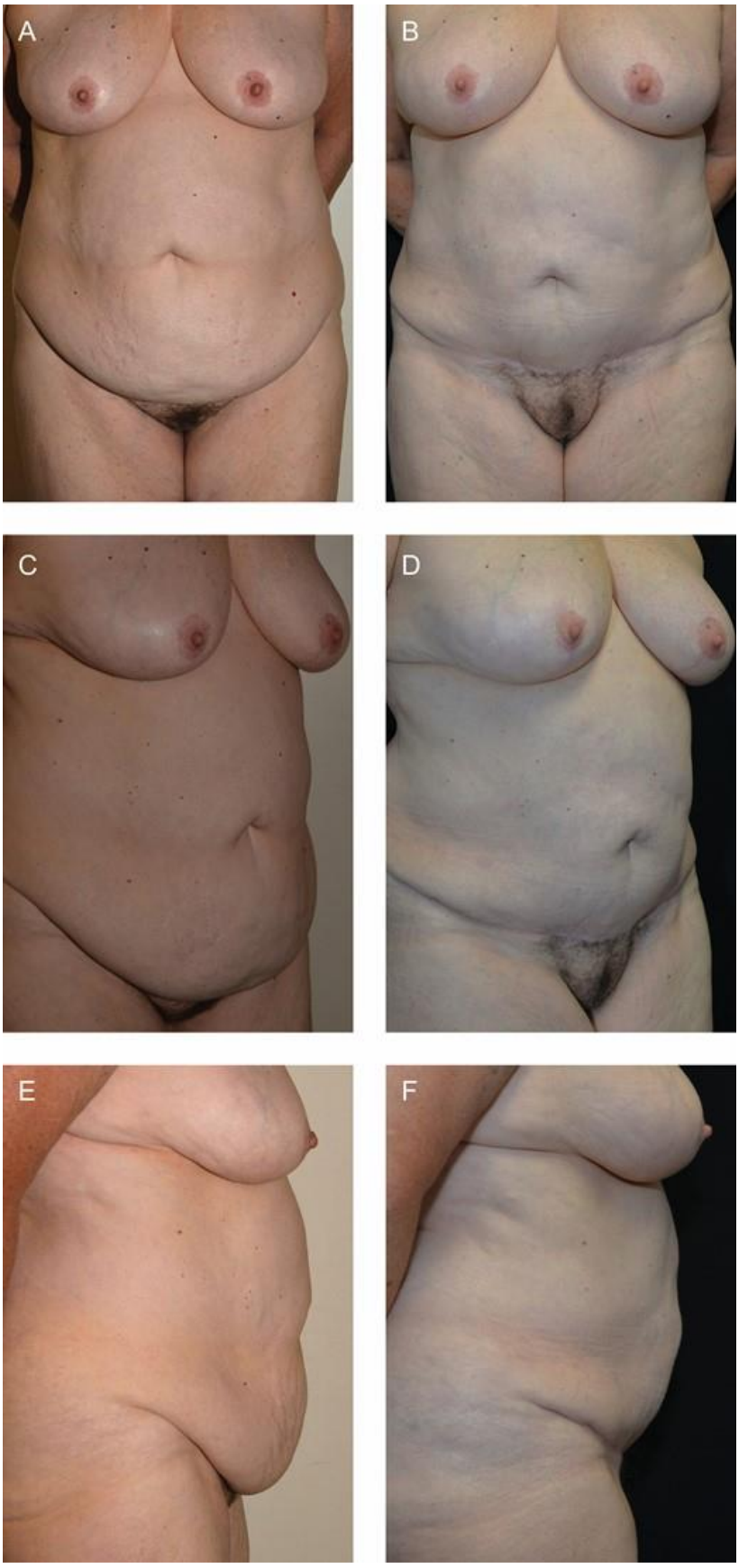
b. The lower abdominal skin excess is mindfully undermined as much as can be assuredly excised since it represents the most vascularly compromised tissue - a proven strategy that mirrors the skin resection of a mainstream panniculectomy, and its inherent safety.

c. The umbilicus is either left in situ or floated but only as much as aesthetics will allow. And now, because of this constraining speed bump, I am cautiously tempted to emulate Villegas' strategy of offering up the resident umbilicus in exchange for the freedom to more robustly address the lower abdominal excess skin.

d. The fascia plication is most often *purposefully* not conducted, with my acquiescence to the lurking excess intraabdominal fat and its virtually expunging of the risk of the dreaded VTE. And to second this motion of benefits to no plication, this "non-treatment" ensures a significant reduction in post-operative

pain, recovery time et al — all laudable benefits in these otherwise constitutionally higher-risk, higher-maintenance patients.

e. The pre-marking, skin excision, and final closure are guided by the sound and proven tenets of the high-tension abdominoplasty: purposefully hidden, low-lying wound closure, concerted treatment of the redundant tissues below the incision, and deliberate lateral wound extensions for more comprehensive correction.


A
B
C
D
E
F

(A–F) This 58-year-old female with a body mass index of 27.5, status post a 60-pound weight loss, is a prime example of the anatomically challenging, higher risk patient with whom I now invoke the kinder-gentler "pinch abdominoplasty". (A,C,E)
She underwent a global liposuction, with a 2800-cc total aspirate, to include the full abdomen, hips, waist and pubis. The skin flap was undermined conservatively, just enough to liberate and float the umbilicus and unfurl the pannus, invoking the aid of Lockwood discontinuous dissectors as necessary. With no abdominal wall plication conducted, as much of the undermined skin as possible was then excised. She healed entirely per primum.The postoperative photographs are at 13 months. (B,D,F) The results are admittedly imperfect but manifestly safer.

DIFFERENT CASE EXAMPLE?

6. *TULUA*: So now we come to the reason Dr. Villegas has invited us all to contribute to this manual in the first place - to translate our personal interpretations of the TULUA procedure into useful commentary. Well, having never conducted this procedure, the reader, or even the other authors herein, could understandably discount my thoughts out of hand. But as was the case when I formally commented on Dr. Vellagas's publication in our ASJ, there can be real benefits to having others assess a new technique from afar - *before* having drunk the cool-aid!

So let's look at how the Tulua fares with each of the challenging anatomic components of the abdominal deformity.

Fascia:

The linchpin of the TULUA technique has given us a refreshing opportunity for a "surgical pause" - to ponder how we have been habitually treating the fascia in our abdominoplasties. Compared with the mountains of machinations of print about how best to treat the excess skin or fat, there has been comparatively little thought given to how best to treat the excess fascia. So Dr. Villegas' compelling case for a vertically oriented plication is radically counterintuitive.
And beside its deep fascial merits, this approach promises a more superficial benefit as well by delivering an efficacious amalgam of two well-proven techniques—Harlan Pollock's progressive tension sutures and Ted Lockwood's discontinuous dissection. This horizontally oriented plication favorably draws the wound edges together instead of the usual perforator scything effect of flap undermining and at once helps shrink the dead space, bridging the yawning gap and promoting closure under less tension.
Now let us return to this technique's approach to the fascia. The subject of the general effects of aging, pregnancy, weight, etc, on abdominal fascial integrity and

its repair remains a veritable research orphan. And the more experimental, albeit equally more arcane articles on the topic all support our intuitive vertically oriented plication because the fascia relaxes in a more horizontal vector. This same tactic of vector analysis is applied in the pinch blepharoplasty and rhytidectomy. Now the closest we have ever gotten to a more "transverse" tack are the adjunctive customized fascial plications sometimes placed at the lateral lower abdomen to fine-tune the waist. But despite the author's counterintuitive, if not disorienting, modus operandi, void of any abdominoplasty-specific studies, it is imprudent for this author to either confidently decry or swiftly support the author's claims of its superiority. Regardless, the $64,000 question that this challenging idea spawns is this: "Does it even matter which direction the fascial repair is adjudicated?" Despite my prior fastidious criticisms, the arguably comparable aesthetic results presented suggest the answer could very well be that it doesn't. But just as I enunciate this potential parity, additional niggling questions leak from the other side of my mouth:

- Because this transverse repair is effectively shortening the core of the trunk and the underlying rectus muscles, could we witness more long-term, unaesthetic effects on musculoskeletal function and body shape?
- Because the fascial repair is only infraumbilical and uniquely aggressive in its breath, should we fear, as Villegas has transparently voiced himself, a late presentation of compensatory bulging of the untreated fascia in the supraumbilical/epigastric region?
- Because there is no direct tightening of the truncal core with this orientation of fascial tightening, may we fail to realize the potential salutary improvements of both bladder incontinence and back pain?
- Because this vertically oriented plication is antithetical to the usual "against the grain" repair, may there be a greater instance of late recurrent laxity on account of a cheese wiring of the fascia eventually resulting, by the author's own observations, in a higher riding umbilicus than originally planned.

Skin:

The TULUA strategy's deliberate sacrificing of the umbilicus, vanquishes any vascular concerns and liberates the surgeon to excise all infraumbilical skin. And with its harnessing of the shrinking effect, the wound may be confidently closed and with less dead space.

But, just as this technique clearly "giveth", it also "taketh away"

- Because all the infraumbilical skin is deliberately excised, as I have cautioned in the past (),the wound closure, may unavoidably recruit excess

skin hiding at the pubis and groin, ultimately delivering an ectopic central scar and pubis. And one could argue that this untoward effect may be amplified by the vertically oriented fascial plication.

- Because the lower abdominal skin is per force excised through a fully vertical vector, it negates the salutary effect of a more oblique draw - a la the "high tension" -that can recruit more of the horizontally excess upper abdominal excess skin.
- Because the upper abdomen is treated with liposuction solely, an albeit maximally safe strategy, it may also contribute to residual upper abdominal redundancy. And worse, as I have woefully discovered, unless we ask the patient to bend at the waist, there can be an impressive degree of untreated upper abdominal excess often unintentionally - or intentionally - concealed by the patient or surgeon with the body standing fully erect "at length". So, as seen in some of the TULUA postoperative images, although there is no deliberate effort to show the extent of untreated skin at the mid and upper abdomen, it does not require a lot of imagination for a surgeon's eye to discern that it is lurking there! (SHOW PICS TO DEMONSTRATE)
- Because the neo-umbilicus technique includes a skin graft there is not an insignificant reported incidence of haltingly slow wound healing in the area.

So as clear-eyed as possible, after this rendering of an overview of the state-of-the-state in the abdominoplasty, one can see how the Tulua helps bring us closer to the holy grail of aesthetic surgery - to deliver the best aesthetic result with the greatest safety. And summarily, the TULUA procedure firmly embeds these same two tenets:

- Inherently safe- The TULUA strategy deliberately excises only skin that has been elevated, safely leaving no vascularly compromised skin behind and, in turn, permits the safe unrestricted liposuction of all the remaining skin. And with the novel horizontal plication of the fascia, the TULUA also cleverly ratchets the wound advantageously smaller, reducing both the risk of seroma and undue tension at the closure.
- Aesthetically effective - The TULUA technique with its horizontal plication strategy, cleverly addresses all of the lower abdominal skin excess and with its vascularly preservative merits, safely treats all of the excess fat.

And now we have come full circle, reiterating my thoughts at the start: the author has valiantly, and relatively successfully, created a virtual antidote - a strategic elixir - to vanquish the often mischievous effects of the traditional abdominoplasty. So, whether or not we adopt this technique, it inspires us all to seek similar

antidotes to our own potentially mischievous surgeries and anoint this strategy as a worthy addition to our oeuvre of innovation.