

# Buttock and Full Body Contouring Harmony




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## KEYWORDS

• Buttock fat grafting • Brazilian butt lift • Liposuction • Liposculpture • Lipocontour • SIME • SIM3D

## KEY POINTS

- Buttock surgery requires excellent anatomical knowledge.
- Buttock fat grafting is a safe procedure, with satisfactory results. However, the precise details must be considered to avoid complications.
- Fat infiltration should be performed in the subcutaneous space. Never intramuscular.
- Buttock volume is not enough. The shape is always as important as the volume and the buttock frame is as important as the buttock.
- Static injection migration and equalization or static injection migration and 3D superficial fat infiltration (SIM3D) should be considered as a safe and efficacious technique for fat buttock infiltration, providing projection and a round shape.

 Video content accompanies this article at <http://www.plasticsurgery.theclinics.com>.

## INTRODUCTION

Buttock augmentation has been an increasing esthetic trend in most cultures, particularly in the West. Statistics reveal<sup>1</sup> an increase in the use of both fat and implants.

However, a phenomenon sometimes observed in esthetic surgery is that in the desire to improve on past results, one can sometimes push the boundaries too far. Such procedures produce results that cease to be esthetic or may even surpass the boundaries of what is considered normal. Therefore, the key to perform natural and beautiful buttock surgery lies in 4 elements: technology, anatomy, harmony (good relationship of the proportion of tissues), and surgical techniques to achieve it (**Fig. 1**).

A simple contribution is the concept of the gluteal frame. This allows surgeons to appreciate the relationship between the buttock and the rest of the body. This concept correctly applies the

criteria of anatomy and harmony, allowing surgeons to choose the most appropriate technique. This has allowed us to know that a large buttock is not necessarily more beautiful but rather a buttock that relates appropriately proportionally to the surrounding frame.<sup>2</sup>

Finally, regarding surgical techniques, the most significant advancement of the last 5 years should be the progress in the safety of fat infiltration to the buttock. This has allowed us to modify the technique to minimize morbidity and avoid mortality.<sup>3-9</sup>

## TECHNOLOGY IN BUTTOCK AUGMENTATION SURGERY

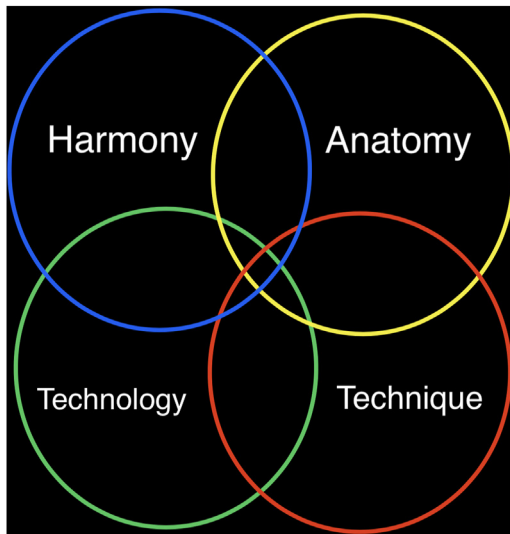
### *Ultrasonography*

Ultrasound has become essential in many areas, especially in plastic surgery. It helps to prevent, diagnose, and treat various conditions and is especially useful in the buttock. The best ultrasound is the linear probe from 7 to 15 megahertz. This

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**Fig. 1.** The 4 core principles to achieve an adequate buttock contour.

type of configuration allows us to obtain more superficial images 4 to 9 cm deep, which is more than sufficient for fat infiltration. During fat infiltration surgery in the buttock, ultrasound helps to locate the deep subcutaneous space; thus, by placing the tip of the cannula, we can ensure that the infiltration is deposited in a location that will not cause problems<sup>10</sup> (Video 1).

### ***Ultrasound Assisted Liposuction (UAL) (VASER or HEUS)***

Both surgical devices use ultrasonic technology. The application of high-intensity ultrasound using sonotrodes generates emulsification of fat in the areas of liposuction and regularization; the difference being that VASER® (Solta Medical, Bothell, WA) is a third-generation device, and HEUS® (Indemex, Mexico and Dominican Republic) is the fourth-generation device, which produces the same effect but with a lower heat release. This allows the device to be used without ports because it does not heat or burn the skin, providing advantages in terms of speed and security. In addition, it has a special treatment called ultrasonic superficial optimizer (OSU), which allows the sonotrode to perform its function effectively without generating harmful temperature (Video 2).

The objective is to emulsify fat within the predetermined target area, translating to less surgeon fatigue in order to obtain fat by liposuction with less bleeding and a discreet effect of skin retraction. Its use is recommended, especially in high-definition areas, because it allows for a more straightforward definition and requires less effort

and decreased trauma to the body. It is especially useful when performing secondary liposuction as well as in tissues with increased fat density (such as in the male pectoral area). It is also considered that areas treated with ultrasound bleed less. There are 2 possible explanations for this finding. First, because the fat is emulsified, less trauma is required to extract the proper volume, which results in less trauma and therefore less bleeding. The second theory is that when performing the emulsification treatment, while passing the sonotrode a pretunneling is also being carried out, which allows a better distribution of the tumescence fluid, which improves the distribution of adrenaline within the tissues, allowing for increased vasoconstriction efficacy. However, using this technology augments the risk of seroma. Therefore, leaving a drain in treated areas is recommended.

### ***Canister***

Often times this topic is overlooked; however, the author thinks the specifics of where fat obtained will be deposited/stored are significant. The simplest method is to use a sterilized glass jar, wait for it to decant, strain the liquid obtained, and use the remaining fat yield. Multiple types of canisters exist; however, the characteristic that makes them worthwhile is proper isolation of fat. It is preferable that it has an adequate deposit volume with an egress valve in the dependent position to allow for efficient decanting of fluid. Various manufacturers produce canisters that meet these requirements.

Canisters that have a lower drain and allow the decanted liquid to exit through this hole also have the advantage of transporting fat to a pump for infiltration using the expansion vibration lipofilling (EVL) technique.<sup>11,12</sup> However, it is always necessary to check that the egress spout is of sufficiently large caliber (larger diameter than that of a Luer-Lock system) to prevent clogging of the harvested fat as it passes through the system.

### ***Power assisted liposuction (PAL) (Microaire, Vibrasat, Others)***

Performing liposuction with a vibrating device reduces the surgeon's push effort at the expense of device weight. This is the advantage of Microaire (MicroAire Surgical Instruments, Charlottesville, VA) compared with the others, which is much lighter and works very well, in addition to the diversity of cannula shapes and sizes. In addition to performing liposuction, the 4 or 5-mm basket cannulas can also be used for homogenizing irregular areas in a maneuver described as *SAFE*

*Lipo by Wall*.<sup>13</sup> The same set of cannulas and power-assisted device are also used with the EVL technique. This is an efficient method to infiltrate fat because a roller-pump controls the propulsion of fat through the entire system: Among the advantages of this technique are the speed of infiltration, the fact that the fat remains isolated from the environment, and it allows for adequate expansion of the treatment areas.<sup>11</sup>

### Cannulas

When performing liposuction, the authors recommends the following modification to the Microaire cannulas. A proximal superior angulation, also named the “ergonomic Cannula” helps the surgeon move the cannula more efficiently and smoothly while decreasing the tension on the wrist and elbow. When surgeons use a straight cannula for liposuction, the tip can sometimes point in an unfavorable direction; therefore, they try to compensate for this by raising the tip. As a result, straight cannulas become curved after use. Using this modified cannula will be helpful, ergonomic, and practical because angulation allows for many versatile and safe movements<sup>14</sup> (Video 3).

Although multiple fat infiltration cannulas exist, the most helpful one is a 4 mm cannula with a single hole for the SIME technique (reviewed in more detail later). In this way, one can allow fat to flow appropriately without frequently becoming clogged (which often occurs when the cannula is 3 gauges or less). Some surgeons prefer 5-mm cannulas with more holes. However, new infiltration techniques allow for safer fat deposition in a single-depth plane, which benefits from the use of a single-hole cannula. Similarly, a basket cannula is helpful and generally used when performing EVL.

Infiltration cannulas with a Luer-Lock valve have several disadvantages. The risk of cannula misguidance has been previously described.<sup>15</sup> Moreover, the small diameter valve frequently becomes clogged, preventing constant laminar flow during fat infiltration. The base of the Toomey cannula had a larger diameter, facilitating better flow. However, its main drawback is that when attached to a syringe and lubricated with liquid and fat, it can loosen and dislodge. This is due to the positive pressure of the syringe, which can cause accidental spills and loss of valuable fat grafts. Therefore, an adequate cannula should be connected and securely locked allowing us to perform the proper movements without compromising safety (Video 4).

### ANATOMY

Certain unsatisfactory results observed from patients presenting for revision and on social

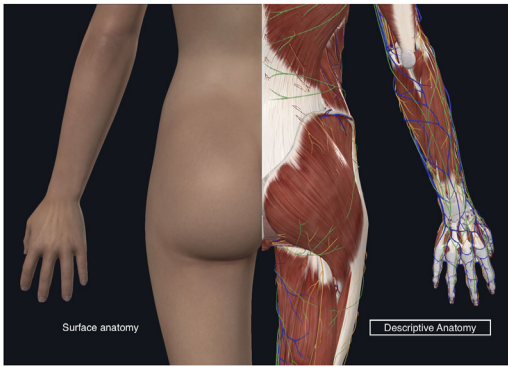
networks reveal that some surgeon do not respect or care for normal anatomy. Leaving esthetic canons can be rewarded by our patients in the short term, or even become a trend on social networks, but with time, they tend to lead to dissatisfaction. Eventually, patients will seek other surgeons to help them return to “normal.” I strongly recommend maintaining our patients with a normal range in terms of volume and shape, with anatomic boundaries being our guiding light.

The gluteus can be analyzed using 2 anatomical criteria. The descriptive anatomy considers each single element, and the surface anatomy considers the entire area, considering the buttock rather than the gluteus maximus muscle (Fig. 2). Both are equally useful in designing our surgical plan.

When infiltrating fat into the buttock, the surgeon must consider a critical element, the subcutaneous cellular tissue, which should not be seen as a single structure but rather composed of 2 elements that can be used differently. It should be noted that these are 2 very distinct anatomic areas, the superficial and deep subcutaneous cellular tissues, divided by the fascia superficialis, which isolates and limits both locations along the entire length of the buttock, particularly in young patients. This effective isolation and integrity may sometimes be lost in older patients or in patients with enormous weight loss owing to a lack of tissue turgor.<sup>16</sup>

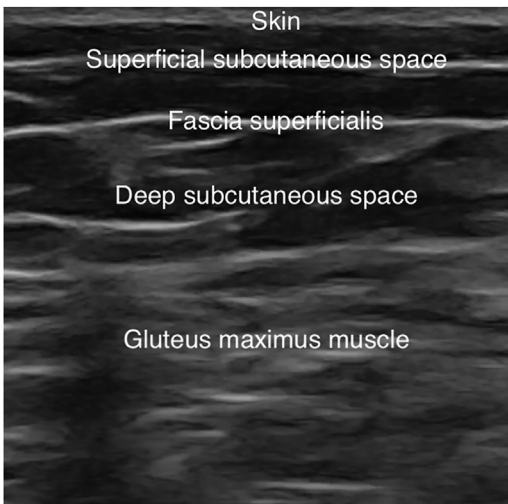
The superficial subcutaneous space is immediately underneath the skin (Fig. 3). This space comprises multiple septa in a swarm of connective tissues that allow the skin to be adequately fixed. If we advance a cannula through this area, we see that the skin retracts and wrinkles as it passes, which allows us to indirectly confirm its location and depth at that moment (Video 5). It has small spaces in which fat is very compact and does not accommodate much volume. If we attempt to infiltrate this area with high pressure and volume, lumps of fat are usually observed through the skin. If we abuse its capacity, the result will be a square plate by the infusion of excess fat, which is flat and too complex to mold to obtain a curved appearance.

Conversely, the deep subcutaneous space, bound by the superficial fascia superficially and the gluteus maximus fascia deep, has a much more potential capacity for expansion that allows for a greater volume of infiltrated fat. I have found that this is the better area to inject fat because it will make the buttocks rounder and more projected while controlling fat volume. The main advantage is that the fat that enters this area is safe without the risk of muscle infiltration (Video 5).



**Fig. 2.** Differences between surface anatomy, which observes the buttock as a unit, and descriptive anatomy that observes each part of the whole in segments.

Fat can successfully infiltrate the subcutaneous space, increasing the volume of the buttock, as previously demonstrated.<sup>6,9</sup> The gluteus maximus muscle is located deep to the targeted zone. It is vital to avoid infiltration with fat, even superficially, because its migration capacity can direct fat to the deep subgluteal space, thereby enhancing its volume and pressure. This can theoretically pull and injure the gluteal venous vessels by traction in the emerging foramen, causing macroscopic fat embolism (MAFE).<sup>3-5,7,8,17</sup> Therefore, the muscle should not be infiltrated. Caution regarding the danger of injury to the gluteal blood vessels located in the submuscular space, based on the anatomical area in which they are located (described as the “danger triangle”)<sup>18</sup> becomes unnecessary when we understand that infiltration must occur in the subcutaneous cellular tissue. Thus, the infiltrated area is irrelevant if it is superficial and not muscular. The fat should never be



**Fig. 3.** Elements of the gluteal anatomy in depth observed by means of a linear ultrasound.

injected at a depth that involves the gluteus maximus.

Considering the necessity for a high degree of safety, we must provide plastic surgeons who have a limited experience in these procedures with a reference on how to achieve esthetically pleasing and harmonious results while restricting fat transfer to the subcutaneous space. Harnessing various benefits of the distinct subcutaneous spaces one can optimize shape while augmenting volume.

## HARMONY

All plastic surgeons should appreciate the concept of harmony to deliver both normal and natural volumes. Therefore, plastic surgeons possess the responsibility to avoid creating a new species of human anatomy. Simply giving volume to the buttock is insufficient; each zone must be precisely addressed creating contrast between areas of concavity and convexity in a way that is esthetically pleasing. Anatomy guides surgeons because it is the only constant between patients of various shapes and sizes. In summary, harmony in body contours consists of achieving a good relationship between the volume and shape of the anatomical areas, so that the result is esthetic and natural. It can only be created correctly if the anatomy is respected and maintained.

The buttocks are round mounds, a three-dimensional area of convexity between the lower back and upper thighs. However, we must remember that the goal is to recreate the shape achieved by the gluteus maximus muscle. Therefore, the entire buttock cannot be augmented evenly. The rectangular muscle originates in the sacrum and inserts onto the trochanter and iliotal tract. To achieve a proper anatomical shape, the inner lower region usually does not infiltrate.

The relationship between the waist and hip is usually described as a ratio of 0.7 to 0.6, as well as the buttock and leg (according to Singh’s article<sup>19,20</sup> on the relationship of tissue proportions). The psychologist Singh affirms that this is the “ideal” proportion, which is considered attractive to human beings regardless of culture. We invite readers to read the studies of different relationships between the anatomical areas.<sup>21-24</sup> However, very often, the result between the dimensions of the tissues range from 0.7 to 0.65 (buttock-leg, waist, hip, and so forth) depending on patient desires or the surgeons artistic eye.

Laterally, the area we want to augment the most corresponds to point c of Mendieta landmark article,<sup>2</sup> which lies at approximately the level of the greater trochanter. Marking it preoperatively

allowed us to accurately locate it regardless of intraoperative patient positioning. However, fat is carefully grafted such that the newly created point of maximal projection maintains a continuous, gentle transition to the thigh. A small, lateral concavity corresponds to vertical and inferior displacement of the iliotibial tract between the gluteal muscle and the hip. This trait is appreciated in athletic and thin patients but not necessarily in those to whom we want to give more volume or have a mass index greater than 25. No grooves were observed in these cases.

Achieving a rounded, esthetically pleasing gluteal augmentation result requires working well on the entire aspect of the frame. Mendieta showed us that the lateral frame is optimized by looking for the A or curved aspect<sup>2</sup>; however, until now, the gluteal frame has only been considered in terms of how the hip influences the shape. However, the current framework is composed of the sacrum, supragluteal region, spine, hip, infragluteal groove, and superior thigh.<sup>25,26</sup> The paravertebral muscles should be delimited with the midline marked in the sacrum area and a small channel that extends from the intergluteal site to both sides in the form of butterfly wings, which have the dimples of Venus as the upper limit.

All areas surrounding the buttock and its structures (ie, muscles and fascia, fat, and skin) are prone to change. Each structure can exhibit deficiencies, alterations, or inadequate harmony/balance.

## AVOIDING BUTTOCK-THIGH DISPARITY

One of the most frequently observed problems in buttock surgery is when the surgeon considers the buttock to be an isolated structure. In normal anatomy, a bulky or muscular buttock is always accompanied by an equally strong or bulky thigh (hamstrings posteriorly and quadriceps femoris anteriorly). One should always consider placing fat in the transition between the buttock and thigh to avoid this disparity, and the key site is an infragluteal fold. Thus, an elongated fold beyond the midline should always be avoided. It must be ensured that it has adequate angulation with a beautiful transition lateral to the midgluteal spot. In a previous publication, we refer to this as “vectorial treatment of the infragluteal fold,” a way to work correctly address deformities in that area.<sup>27</sup> The posterior portion of the thigh is augmented in parallel for balance.<sup>28</sup>

## THE TECHNIQUE

For this technique, I recommend reviewing what has been written about Lipocontour.<sup>25,26,29</sup> This

form of standardized preoperative marking guides us by utilizing the underlying anatomy as a road-map. Although the patient is placed in different positions throughout the operation, we can continue the liposuction, knowing which areas have been addressed and avoid overzealous suction and dermal injury. This also helped standardize results.

Once fat is harvested with liposuction, it is decanted in the closed canister. If the canister has an inferiorly placed egress valve, all serous-sanguinous fluid is drained. If the canister lacks a valve in the dependent position, we remove the decanted fluid by aspiration from a thin (3 mm) liposuction cannula. Once fat reaches the cannula, it becomes clogged, indicating that the fluid had been adequately evacuated. Once all of the fat is isolated, it is placed in 60-mL syringes (Video 4). We then proceeded with infiltration.

*Infiltration incisions:* Generally, incisions are made in the upper part of the intergluteal groove, infragluteal folds, hip, and sometimes at the peak of each buttock. The last incision is disadvantageous from an esthetic perspective because it can be easily seen. Nevertheless, this is beneficial when working on the waist and infiltrating the buttocks.

*Liposculpture is performed in 4 positions:* front, back, and sides. During the last year and a half, I have changed my practice and now infiltrate the gluteus from the lateral position; it has provided outstanding results because it allows observation of tissue responsiveness as fat is grafted and how it responds in real-time to the infiltration (Videos 4 and 6). However, I finalize and execute final refinements with the patient in the prone position. I have found that this enables me to improve projection in a more balanced manner. In general, the practice limits fat liposuction to no more than 5 L. The infiltrated volume on average per buttock, and the hip ranges from 750 to 1000 cc per side. Almost half of this volume goes into the infiltration of the hips and legs and the other half into the buttock.

## CONSTRUCTION OF BUTTOCKS WITH FAT INFILTRATION

There is not universally accepted or foolproof method to infiltrate fat into the buttocks and achieve good results. The pleasant appearance of the buttock depends not only on its volume but also on the shape of the buttock and the surrounding area. However, achieving excellent buttock results usually requires the grafting of large volumes. The main challenge when infiltrating fat is to achieve a round buttock with proper projection and shape. When surgeons inject fat

indiscriminately with the goal of increasing volume, we have observed that this does not necessarily correct shape. This becomes problematic especially in patients who desire a rounder shape but present with an already fat-filled square buttock because it accepts less fat infiltration in areas that need it most. The first thing that is built is the volume and projection, and the last is the shape, which sometimes may require additional liposuction or internal ligamentous releases.

### STATIC INJECTION MIGRATION AND EQUALIZATION AND SIM3D

Dr Dan del Vecchio is credited for publishing the Static Injection Migration and Equalization (SIME) technique; a handy and safe tool incorporated into the fat infiltration portion of buttock augmentation procedures.<sup>30</sup> SIME are the steps to safely and efficiently infiltrate fat into the buttocks. To summarize, the deep subcutaneous space must be identified using ultrasonography during surgery, and the tip of the infiltration cannula should be correctly positioned in the deep fat compartment. It remains static during fat infiltration. It is important to locate the best place for SIME. We do this by identifying the area with the most significant gluteal volume deficit and starting infiltrating a volume of 120 to 180 cc (Video 7).

Once infiltrated, we can appreciate how the fat is distributed based on internal pressure/resistance gradients creating passive diffusion. The surgeon can reinject fat into the same deep space but in a different place. The advantage of identifying the space using ultrasound is that the surgeon can perform infiltration during cannula recoil, knowing that it will not violate the fascia and inadvertently infiltrate fat into a dangerous area. Once infiltration is completed in 2 or 3 SIME sites, equalization can be performed with a 4-mm basket cannula to disperse the fat more homogeneously. This maneuver changes the internal subcutaneous structure creating additional capacitance for fat to migrate to and fill in. Ultimately, this allows the surgeon to affect external buttock contours by manipulating internal fat positioning. With ultrasound, we can corroborate that the fat migrates in the subcutaneous space laterally but respects the deep facial plane preventing fat migration into the muscle. It also generally respects the superficial space if it has not been previously damaged/violated. Some publications warn against this method of bolus infiltration<sup>8,31</sup> due to a high risk of complications, including a lack of fat integration, oily cysts, seromas, and even abscesses; evidence has shown that this is not the case. Ultrasonographic studies were

performed on more than 35 patients who underwent this technique with a follow-up period of up to 6 months. None of the patients had significant infection, seroma, or cyst. (The only cyst I have been able to document was a small 2-mm cyst.) A few cases are still being studied; however, thus far, the results have been satisfactory and without problems. I think this is mainly due to the ability of fat to migrate at the level of deep subcutaneous cellular tissue,<sup>9</sup> which allows the infiltrated fat to spread and does not remain a single isolated bolus of fat. Proper equalization techniques and manual massage allows for dispersion of fat between tissues to increase integration capacity.

**Figs. 4–7** show before and after buttock fat infiltration with SIM3D.

Fat infiltrates all surrounding tissues in the deep subcutaneous infiltration and compartments.<sup>32</sup> To obtain adequate projection and shape, the surgeon might perform anywhere from 2 to 4 different SIME deposits according to the buttock projection needs. It is important to always use ultrasound-guided visualization of the cannula to confirm the depth of fat grafting. The last SIME step involves equalization (Video 6), which is the dispersion of the infiltrated fat with a 4 or 5 mm basket cannula so that the fat is better distributed. I have found that this last step is not always necessary and should be used cautiously because it helps in the distribution of fat but also reduces the projection achieved with this technique. That is why I recently began performing SIM3D. After performing SIM (without the E for equalization), the three-dimensional (3D) technique is performed, which is a technique of infiltration of the subcutaneous superficial space in small volumes like using a 3D printer (hence the name) to shape better the buttock. When a 3D printer works, it make a long journey with the printer head (in this case, the infiltration cannula) but the material is only deposited in small parts in the areas objective, according to the shape you want to give it. Similarly, when infiltrating fat, although the cannula moves in large routes, we only infiltrate the fat in the areas in which we want to provide more volume selectively and, thus, achieve a more esthetic and rounder buttock (Video 8).

The relative amount of fat infiltrated during each portion of the procedure approximates 75% SIM and 25% 3D. It is important to highlight 2 essential characteristics of this technique: fat deposition is always carried out within the superficial subcutaneous tissue and fat deposition is carried out in small quantities at low pressure. We recommend that fat deposition be performed by squeezing the syringe gently, accompanying the movement of the cannula, with the fat flowing naturally,



**Fig. 4.** A 23-year-old woman, 6 months after surgery. We observed more defined and narrower waist according to Lipocontour marking, decrease in sacral volume, and increase in gluteal volume with the SIM3D technique.

accompanying the movement without exerting excessive pressure. In this manner, we can achieve a good area shape and create a round contour. As mentioned previously, a 4 to 5-mm single-hole cannula is recommended for SIM so that we know exactly where we are placing the fat; for 3D, we recommend that a 3 to 4-mm cannula of 3 or 4 cross holes be used so that the dispersion is greater.

Although the size of the subcutaneous space can vary from patient to patient due to age, sex, and other variables,<sup>16</sup> the fascia superficialis consistently separates the deep and superficial subcutaneous spaces. When the tumescent solution infiltrates into the deep space, the superficial fascia effectively isolates the spaces, preventing fluid flow into the surface space. SIM3D fat transfer allows fat to be placed in an optimized manner, understanding the histological characteristics of each site and, at the same time, making it safe.

Generally, 50% of the infiltration volume of the buttock is performed in the prone position, and the other 50% in the lateral decubitus position (25% per side). The lateral position allows for one to appreciate volume deficiencies in different areas, which usually requires more volume in the

lower and lateral gluteal areas. I usually place more fat in this area and the hip.

Once the necessary fat is grafted, a closed suction drain is placed in the subcutaneous space existing from the sacrum and a second one in the abdominal area for 7 days. All incisions are closed with a single or X-spot of vicryl rapid 3-0, so there is no need to be removed. Bandages and cotton are placed for comfortable compression in the abdominal area, whereas there is no compression placed on the buttock area. The patient goes to the recovery area, where she will recuperate from anesthesia, and once fully improved, with tolerance of fluids, they can go home. The postoperative instructions for the patient include a regular diet, antibiotics, and analgesics for one week.

**Figs. 8 and 9** show immediate postoperative result.

## POSTOPERATIVE CARE

When performing any flap (tissue transfer procedure) in reconstructive plastic surgery, we avoid tight high-compression bandage. Therefore, why should high compression be indicated in



**Fig. 5.** A 22-year-old woman was 6 months after SIM3D and Liipocontour surgery. It is observed more narrower waist, decrease of fat of the back, the volume is increased with fat in the point c of Mendieta, and the gluteal volume is increased.



**Fig. 6.** A 34-year-old woman to 1 year of SIME and Lipocontour surgeries. It is observed better definition of the waist, anatomical marking of the area of the sacrum, increased gluteus and fat was placed in the waist, and the vector technique was used to improve the infragluteal groove.





**Fig. 7.** A 27-year-old woman to 6 months of surgery. We observed better definition of the waist with Lipocontour, placement of fat in leg, and increase of buttock technique SIME.

liposuction flaps? Therefore, I usually put cotton and bandages on patients for a week, and subsequently recommend compression garments. I also asked patients not to lean or sit on the buttock area for 2 to 3 weeks, which, in theory will maintain a better shape of the buttocks. Unless contraindicated due to concomitant surgery of the anterior torso, they are asked to rest, sleep, and lay down in the prone position at home. If they undergo a tummy tuck or breast augmentation, they are advised to lie on their back but with a pillow that serves as a support on the lower back and leg, which relieves weight and direct pressure on the buttock. The patients are only allowed to sit when using the bathroom. A handy tool is a cushion that helps patients sit on the thigh, releasing pressure to the buttocks, which they are instructed to use for 3 weeks.

After 3 weeks, the patients are allowed to sit on their buttocks. For many years, I allowed the patients to sit on their buttocks immediately and lie on their backs without any restrictions, even immediately after the surgery. Although I did not observe major complications, I did notice a flattened appearance and loss of projection at the 3-week follow-up visit. Thus, I initiated these restrictions. The main esthetic advantage I observe is the maintenance of the projection and the rounded shape of the gluteal projection.

It also indicated antibiotics (usually levofloxacin) for a week after surgery and analgesic medications. After this week, diosmin-hesperidin may have improved inflammation.

Generally, a closed-suction drain is placed in the subcutaneous space for areas of liposuction—an

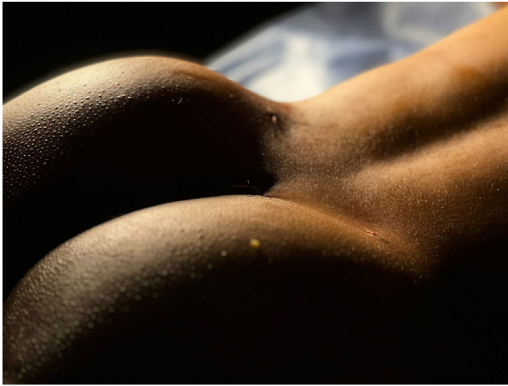
anterior drain exits through one of the inguinal post sites and the posterior drain is placed through the sacral port site. This closed drainage system has the advantage of allowing the quantification of drainage, observation of the characteristics and volume of the drained drainage, and avoidance of contamination. In general, we removed it within 1 week of surgery.

## COMPLICATIONS

Although it is generally considered safe, potential complications have resulted from the procedure, as with any surgical procedure. A complication of fat infiltration in the buttocks is the development of fat necrosis. The formation of nodules under the skin is caused by fat cell death and calcification. This can cause pain and discomfort, resulting in an uneven or lumpy appearance of buttocks. Although this complication is not life threatening, it can be esthetically displeasing, and in severe cases, surgical removal of necrotic tissue may be necessary.

Another possible complication of fat infiltration into the buttocks is infection.<sup>33</sup> The infection of the incision site can occur either naturally or accidentally when bacteria is introduced into the subcutaneous space during the procedure. Infections can be treated using antibiotics. In severe cases, it may be necessary to perform surgical intervention to drain the infected area.

Seroma formation is another potential complication after fat infiltration into buttocks. Swelling and discomfort can be caused by a seroma, which is a collection of fluids that can occur after surgery.



**Fig. 8.** Immediate postoperative image of a gluteal increase with fat infiltration with SIM3D and Lipocontour technique.

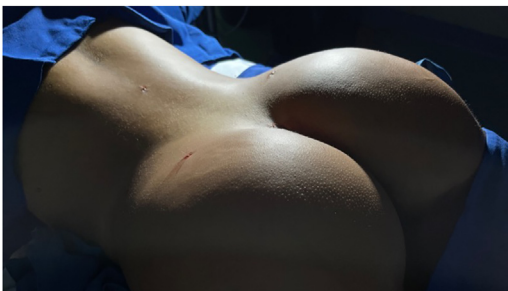
Most seromas resolve independently; however, ultrasound-guided puncture or surgical drainage may be necessary in severe cases.

When fat is treated with care and sterility during the procedure is not compromised, complications are infrequent, despite the large volume of fat that is being transferred. It is crucial to carefully follow all postoperative instructions to minimize the risk of complications. Patients should also immediately report any symptoms or concerns to their surgeons to ensure prompt and appropriate treatment.

### ***Aesthetic Complications***

So far, the only uncertainty in fat infiltration and what can be considered a consequence rather than a complication is the loss of volume during 6 months after fat infiltration. The volume is reabsorbed, and although no study has defined the extent to which it is absorbed, it is generally considered that approximately 40% to 50% of the infiltrated fat is lost.

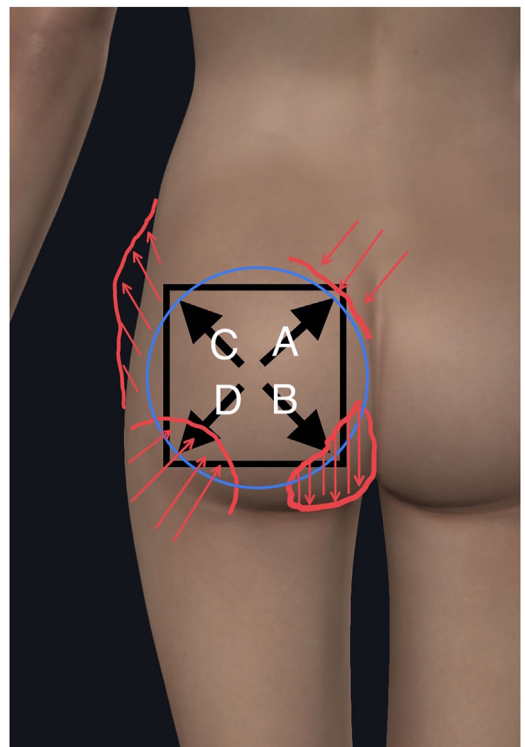
Other esthetic complications of importance include a lack of adequate projection of the



**Fig. 9.** Immediate postoperative image of a buttock augmentation with fat infiltration with SIM3D and Lipocontour technique.

gluteus anteroposterior and complications in the 4 corners. The 4 corners that fail are buttock areas with specific related problems, which is usually the main reason patients are present to my office dissatisfied with their previous results (**Fig. 10**).

1. Superio-medial corner (Region A): Generally, this area is not adequately filled with fat, which does not generate fullness or contour. It usually occurs if the upper intergluteal area is used as an approach because fat comes out quickly through the incision owing to its contiguity. This can easily be resolved by properly infiltrating the area through a distant incision.
2. Inferio-medial corner (Region B). This area represents a congenital anatomic variant that corresponds to a bulge that some patients present with (colloquially referred to as “dirty diapers”). Excess tissue makes the buttocks seem square and irregular, exacerbated by a strong ischial cutaneous ligament.<sup>34</sup> This can be solved by using a 4 to 5-mm basket cannula to release the ligament attached to the skin, applying energy, usually a laser or VASER, or taking the excess volume. It is common to not completely solve this if the problem is big. Therefore, direct skin resection should be considered.



**Fig. 10.** The 4 corners deficits. Elements that are improperly treated after an infiltration of fat into the buttock.

3. Superio-lateral corner (Region C): This area most frequently generates problems because there is usually a lack of liposuction in the tissue above or below the edge of the iliac crest. Therefore, the gluteal frame was inadequate. This problem can be avoided through the guidance of the Lipocontour line (Video 9). The line in the anterior abdomen corresponds to the inguinal fold. Behind the highest point of the intergluteal line, 2 transverse lines were drawn, which, when joined laterally, always corresponded to the inguinal lines, forming a slight angulation. This line is essential because it properly demarcates the boundary between the waist and hip. Above this line, the volume should always be aspirated and decreased, and below, the volume should always increase until reaching the lateral zenith corresponding to point C of the Mendieta or trochanter, where there should be more significant lateral expansion. With this guide, it is very difficult to lose sight of the target, and it will always help the surgeon to guide the patient in a lateral position. Anatomically, it corresponds to approximately 2 to 4 cm below the edge of the iliac crest at the height of a vertical line drawn from the axillary line posterior to the middle of the thigh.
4. Inferio-lateral corner (region D), usually corresponds to a depression in the buttock that is not sufficiently filled by fat infiltration and leaves a V-buttock appearance. Vector treatment of this area will help avoid this, especially in the vertical and oblique approaches. However, it is common to find difficulties with its expansion. The solution is to infiltrate the appropriate fat volume, which is often more significant than initially considered by the surgeon.

Careful consideration of these boundaries coupled with calculated intraoperative maneuvers described above prevents postoperative deformities and optimizes results when molding buttocks.

### PATIENT SELECTION AND THE PREOPERATIVE EVALUATION/CONSULTATION

Who should decide between buttock and full-body contouring? Is this only when a patient requests a total body transformation or is it the surgeon's preference to suggest additional contouring areas?

This is a delicate balance among the patient's desire, artistic appreciation of the surgeon, and patient's health and financial burden. On many occasions, the surgeon will know what to do to

achieve harmony in the patient's body but will need the right conditions to achieve it (eg, hemoglobin levels, fat available with low body mass index [BMI]).

It is necessary to guide the patient to what might deliver a more anatomical and beautiful result, which will always depend on the underlying anatomy of the patient. Sometimes, a small change or addition can achieve a spectacular result. On other occasions, this is impossible because the required surgery exceeds the safety level that can be provided to the patient. Therefore, it is not only a decision based on the patient's or the surgeon's desire but also on what can be done according to the patient's anatomy and physiologic condition. However, if possible, I think that the proper balance lies in listening to the patient's general desire, explaining what is best to achieve his dream according to our diagnosis and artistic ability, and in the end, in the decision of an informed patient, because it is their body, and we must respect the decision. If we disagree with the patient's decision, we should respectfully inform the patient and refer to another qualified surgeon.

### SUMMARY

In conclusion, buttock augmentation has become a popular trend in many cultures, particularly in the West, with increasing use of both fat and implants. However, similar to any esthetic surgical procedure, it is essential to avoid exaggerated contours by excessive procedures, fat evacuation and fat grafting, which can result in unappealing or grossly abnormal appearing outcomes. To achieve a beautiful buttock, it is essential to consider the elements of technology, anatomy, harmony, and the appropriate surgical techniques. The concept of the gluteal frame has been a valuable addition to understanding the relationship between the buttock and rest of the body, allowing surgeons to choose the most appropriate technique for each patient. In addition, the safety of fat infiltration into the buttocks has significantly improved recently, allowing for modifications to the technique and avoiding potential problems. The construction of a round-projected buttock with fat infiltration is challenging. Although the volume of fat injected plays a crucial role in achieving a substantial buttock result, the shape of the surrounding area is crucial for a pleasant appearance. In our experience, building the volume and projection of the buttock is performed first, followed by the shape. Using ultrasound to identify the deep subcutaneous space, the SIME technique helps achieve safe

and good gluteal volume and projection. The 3D technique helps obtain a better buttock shape by depositing a small volume in areas requiring complementary infiltration. In summary, buttock augmentation can produce esthetically pleasing results when appropriate elements are considered and applied correctly.

### CLINICS CARE POINTS

- Use technology. It will make your surgery easier and safer, especially the use of imaging ultrasound.
- For a beautiful and natural buttock augmentation outcome, relay in the anatomy, both superficial and descriptive. The anatomy should always influence us because this is constant from patient to patient and serves as a guide.
- Always avoid fat infiltration in the muscle.
- SIME is the safest fat infiltration technique available now.
- SIM3D is a complementary technique for shape a round buttock. It is still safe because it is based on superficial fat infiltration along with the deep SIME fat infiltration. SIME gives projection and volume and 3D provides the shape.

### DISCLOSURE

The author declares has nothing to disclose.

### SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at <https://doi.org/10.1016/j.cps.2023.05.002>.

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