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Subfascial Gluteal Augmentation

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The norms of beauty for the gluteal region have changed over the centuries, including during the past 10 to 15 years. Rubenesque curves of the Renaissance days are no longer viewed as attractive, nor is the straight skinny look of fashion models in the more recent past. Today women search for an athletic look with well-defined curves in the breast and buttock areas. This aesthetic has been the ideal in Latin American cultures for centuries but has now spread to countries around the world.

Current standards of beauty include good projection of the buttocks (Fig. 1) and a contour that, on the frontal view, forms the outline of a natural curve from the waist to the knee. For this reason, requests for gluteal augmentation are increasing. Interest in this procedure began in the late 1960s, even though no surgical technique had been described at the time. The early search for a way to augment the buttocks included silicone gel breast implants, but problems related to their use in the buttocks led to new research focused on developing implants designed specifically for gluteal augmentation and surgical techniques designed to enhance the aesthetic results. Today, many types of implants are available, as are several options for their placement.

Evolution of technique

Gluteal augmentation as a surgical procedure was introduced to clinical practice in 1969, when round mammary implants were used for reconstructive purposes [1]. Four years later breast implants were placed in the buttocks for cosmetic reasons [2]. Gonzalez-Ulloa [3] in Mexico was one of the first surgeons to reconstruct the gluteal region, either by lifting what he called "sad buttocks" or augmenting with implants. He reported his 10 years' experience of gluteal augmentation and lifting in 1991. Now, more than 35 years after the first gluteal procedure, few reports have appeared in the medical literature describing the technique, reporting long-term follow-up, and outlining the possible complications of this procedure.

Developing the concept of gluteal augmentation through the past 17 years has been an academic

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Fig. 1. Normal anatomy demonstrates the maximum projection of the buttocks at the level of the mons pubis. (*From* de la Peña JA. Subfascial technique for gluteal augmentation. Aesthetic Surg J 2004;24:265–73; with permission.)

adventure. During these years my coworkers and I progressively improved surgical technique and devised an anatomical system for gluteal augmentation that includes an ideal implant design and templates to assist in evaluating patients in the preoperative period and identify the most appropriate implant size [4].

Advantages and disadvantages for each anatomical space

Techniques for gluteal augmentation have progressed through four anatomic planes: subcutaneous, submuscular, intramuscular, and subaponeurotic. Some advantages and disadvantages of each anatomical plane are described in the article on the history of gluteal augmentation in this volume. Understanding the limitations of each anatomical space helps to explain why my colleagues and I developed the subaponeurotic technique for gluteal augmentation.

The first gluteal augmentations were performed using the subcutaneous space for introducing a round breast implant. Although the subcutaneous space had been used for breast augmentation, it has serious anatomical restrictions in the buttocks and should not be used for this operation. Understanding the anatomy of the subcutaneous space in the gluteal region illustrates why this anatomical plane has been abandoned for augmentation.

The system that maintains attachment of the skin to the underlying muscle fascia in the gluteal region is composed of aponeurotic expansions running from the gluteal aponeurosis along the muscle fiber axis and inserting into the dermis. When a gluteal implant pocket is developed in the subcutaneous space, these aponeurotic expansions are separately divided between the skin and its underlying structures. The skin is then loose and mobile, the implant is visible, and the implant is not held securely because any restraining structures that would keep an implant in a proper position have been dissected (Fig. 2). Thus, the results look unnatural, and migration of the implant into the sacral area is not unusual.

The first attempts at gluteal augmentation used breast implants in this subcutaneous space until Dow Corning released gluteal implants designed by Gonzalez-Ulloa [3]. Even with an implant specially designed for the buttocks, complications were common and serious, including extrusion, infection, and inferior implant displacement. To help address some of these problems, the second generation of implants included Dacron patches on the underside in the hope that these would fixate the implant within the pocket. Because these fixation patches did not sufficiently maintain the implant in a stable position, another generation of implant was developed

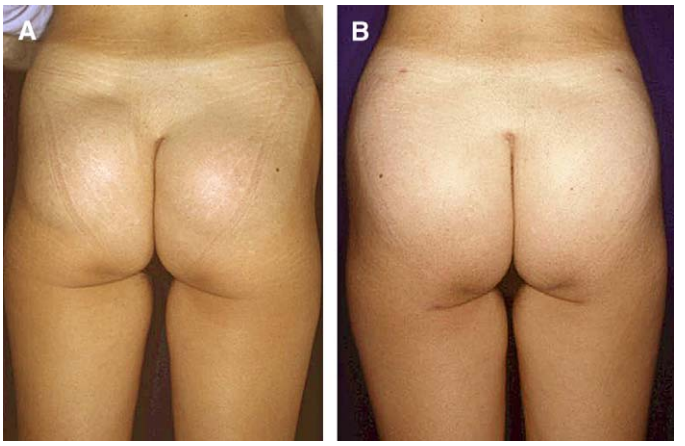


Fig. 2. (*A*) Preoperative views of subcutaneous mammary implants placed in the buttocks. (*B*) Same patient after replacement with anatomical subfascial gluteal implants.

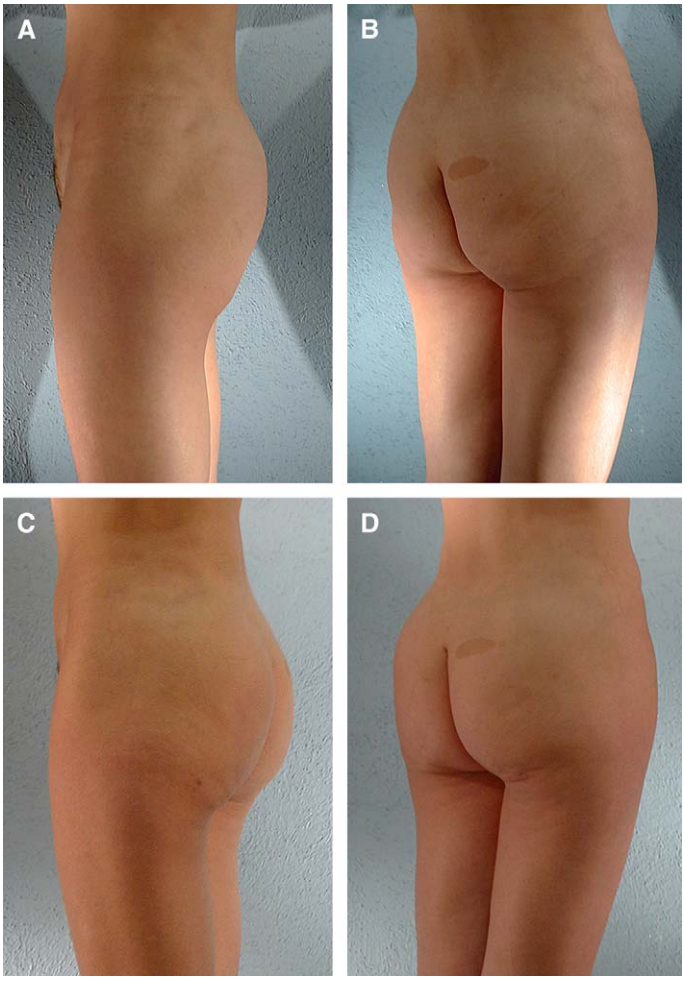


Fig. 3. (*A, B*) Preoperative views of a 37-year-old woman who had submuscular gluteal implants shows how high they are positioned and the resulting "double-bubble" effect. (*C, D*) Postoperative views 1 year after replacement with subfascial gluteal implants.

that included "ears" on the superior and inferior ends that could be sutured to the underlying tissues. However, this design was also ineffective.

The next development was the introduction of a new surgical technique by Dr Robles and colleagues of Argentina in 1984 [5]. They described placing implants in the submuscular space—which they called the "subgluteal cellular space"—as a way to preserve the system that holds the gluteal skin in position. Although dissecting the pocket for a submuscular gluteal implant maintains the aponeurotic expansion system, this technique produces fullness in the upper pole of the buttocks because anatomy dictates that implants be placed high when this technique is used. The result is higher projection than normal in the upper buttocks and a lack of volume in the lower third that makes this region look empty (Fig. 3). Another problem is the inability to correct ptosis in the lower buttocks with submuscular implant placement.

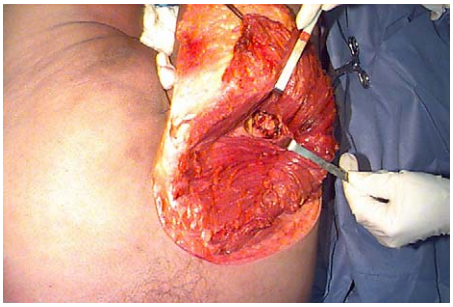


Fig. 4. The sciatic nerve emerges at the inferior border of the piriformis muscle. Note that this point is situated at the center of the buttocks in this cadaver dissection.

As the problem of skin mobility and implant visibility were solved, submuscular implant positioning added the risk of injury to the sciatic nerve (Fig. 4). The sciatic nerve emerges into the submuscular space in the lower third of the gluteal region from beneath the inferior border of the piriformis muscle. This anatomy limits the position of implants. Because implants cannot be placed lower

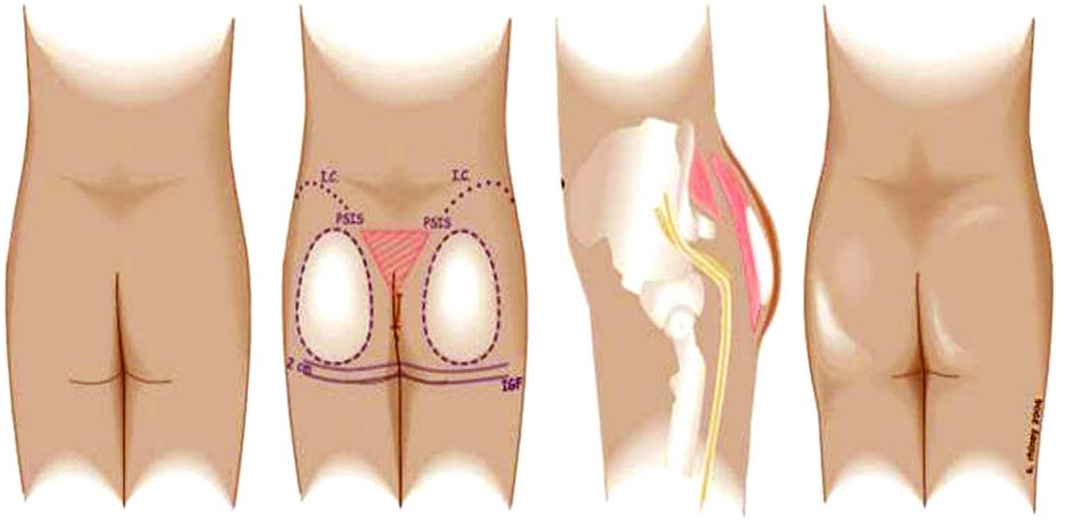


Fig. 5. Drawing of relevant anatomy and position of a subfascial implant, which must be centered in the buttock and totally covered by the fasciocutaneous flap. The sciatic nerve, visible on the lateral view, is a safe distance away from the implant pocket. (*From* de la Peña JA. Subfascial technique for gluteal augmentation. Aesthetic Surg J 2004;24:265–73; with permission.)

than the piriformis inferior border, they have to be placed in an unnaturally high position. This can make the upper buttocks look too large, especially when compared with the lack of volume in the lower third of the gluteal region. Implant size is also limited; they must be small enough to fit within the space beneath the gluteus maximus muscle without impinging on the sciatic nerve. The best option is to use round implants with a high profile, but, again, the buttock projection will be unnaturally high.

This technique is still used today and can be quite successful when small implants are placed in patients who have well-developed lower buttocks but lack volume in the upper third. Even in these cases, however, the submuscular position may produce a "double bubble" effect in thin patients, similar to the deformity that occurs when a breast implant is placed above the inframammary fold.

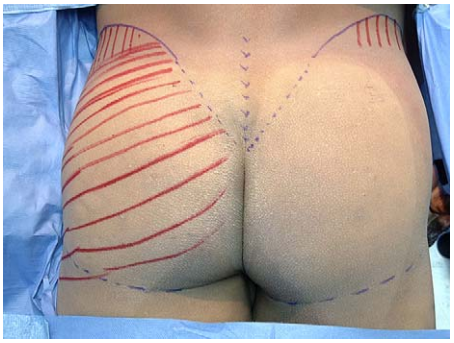


Fig. 6. The aponeurotic expansions run from the gluteal aponeurosis to the dermis in the direction of the red lines drawn on the skin.

Even with its limitation, the submuscular technique was the most popular for gluteal augmentation until other approaches were described.

Another anatomical position described for gluteal implants is the intramuscular space, which is created by separating the muscle fibers of the gluteus maximus to create an implant pocket with approximately 3 cm of muscle thickness overlying the implant. The muscle remains attached to the aponeurosis [6–8]. This minimizes the risk of injuring the sciatic nerve and allows an implant to be placed lower, in a more natural position. At the same time, disruption of the muscle fibers produces a high incidence of seroma.

Intramuscular dissection is technically challenging for several reasons. Because the implant is placed within the muscle, there are no anatomical landmarks to identify how much muscle will be above and below the implant. Thus, maintaining the proper thickness of muscle throughout the pocket is difficult. In addition, the potential for sciatic nerve injury still exists because the undermining is done blindly and there are few anatomic landmarks to assist in identifying and avoiding the nerve. Another technical difficulty is the lack of a natural tissue plane within the gluteus maximus muscle, which means the dissection creates major disruption of the muscle fibers. A textured implant placed in this position can produce chronic irritation as the muscle rubs against it.

At least some of the skin markings for intramuscular augmentation are done with the patient sitting, so the inferior part of the gluteal region is difficult to visualize. Marking the patient while she is sitting

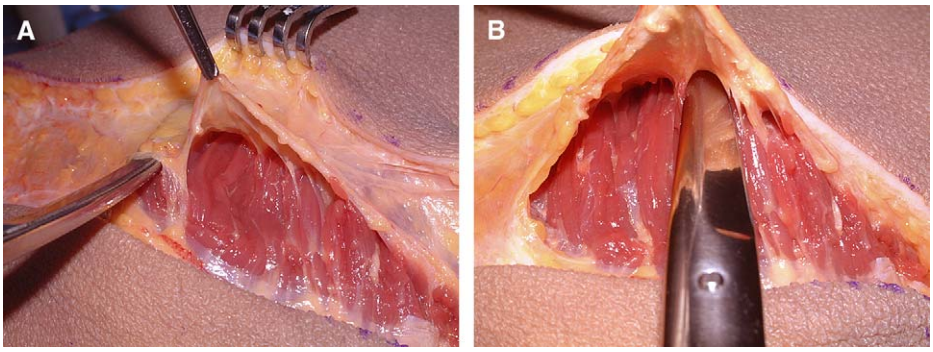


Fig. 7. (*A*) Aponeurotic expansions traverse the superior layer of the gluteal maximus muscle. (*B*) Dissection between the aponeurotic expansions is essential for creation of the implant pocket. This view gives a sense of the uniformity of the space that is shaped like the gluteus maximus muscle below.

minimizes the risk of injuring the sciatic nerve, but it may result in high placement of the implant, similar to that obtained with submuscular placement. A double bubble deformity also may occur, especially if the implant is not low enough to add volume to the lower part of the buttocks. The operation for intramuscular augmentation is painful and the postoperative recovery difficult because the patient must remain in a prone position for several days.

The subfascial plane

To solve the problems associated with the subcutaneous, submuscular, and intramuscular techniques, we searched for a new anatomical plane that would accommodate a gluteal implant and overcome shortcomings of the other approaches. Fig. 5 illustrates the anatomy of this tissue plane.

This technique is based on extensive cadaver dissections in which we studied the different anatomical layers of the gluteal region [9]. The gluteal fascia is very strong at the origins and insertions. It covers the gluteus maximus muscle, the largest and most superficial muscle in the region, and is responsible for the projection of the buttocks. The anterior two thirds of the gluteus medius muscle also provides bulk to the upper third of the buttocks. Medially, the gluteal aponeurosis inserts on the posterior iliac bone, the sacrum, and the coccyx; laterally it inserts on and envelops the greater trochanter and extends to the iliotibial line.

This thick aponeurosis covers the entire gluteal region and is capable of holding gluteal implants in a proper position because the fascia is stronger at the insertion sites and softer in the middle. The gluteal aponeurosis sends expansions to the skin, which insert into the deep dermis. It works as a system to adhere the skin and subcutaneous tissues in the gluteal region, in the same way the skin of the palm of the hand is attached to the deep tissues.

These aponeurotic expansions are distributed in a transverse direction, along the axis of the muscle fibers throughout the gluteal region (Fig. 6). Because they originate on the deep part of the gluteal

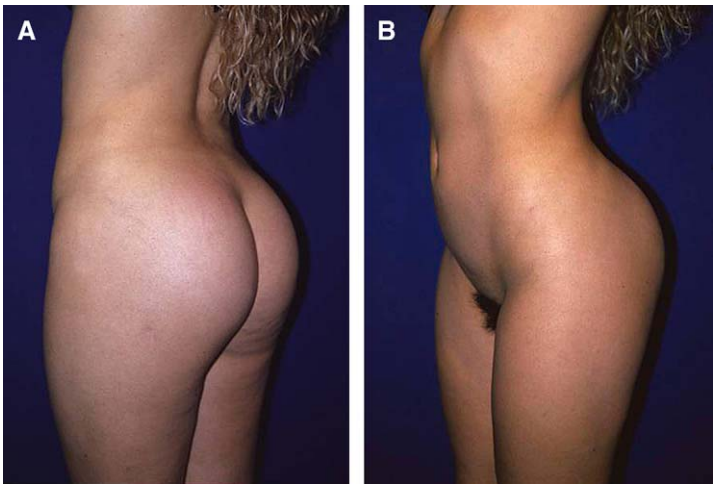


Fig. 8. These postoperative views of a 30-year-old woman demonstrate the very large projection attainable with the subfascial technique and anatomically shaped implants.

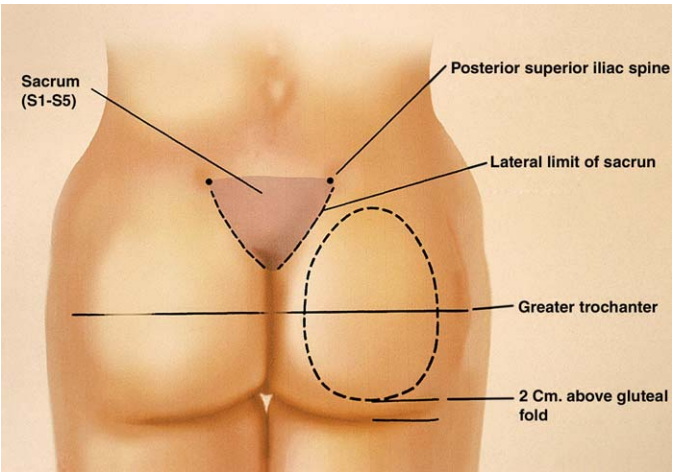


Fig. 9. Markings must follow the anatomic shape of the gluteal region and ensure that the implants will be lateral to the sacrum and positioned 2 cm above the infragluteal fold.

aponeurosis, the attaching fibers convert the superficial surface of the gluteus maximus muscle into a uniform space shaped like the muscle. To maintain this system of fascial attachments, we avoid any subcutaneous undermining and instead carefully develop a subaponeurotic space overlying the gluteus maximus muscle (Fig. 7). The aponeurotic expansions to the skin are preserved, and the subaponeurotic space allows proper positioning of an implant without risking injury to the deep neurovascular structures.

After an implant is placed in the space, an anatomic contour is created naturally because the gluteal aponeurosis is limited inferiorly by the infragluteal fold, where the gluteal fascia is bound by the posterior thigh fascia.

Indications and contraindications

As in every type of surgery, patient selection is the most important issue. Young, thin patients with an athletic build and little or no ptosis are the ideal candidates for subfascial augmentation. It also produces excellent results in thin patients with a short intergluteal crease. For most patients seeking gluteal augmentation, ancillary procedures, such as liposuction of adjacent areas, are often required to achieve optimal results.

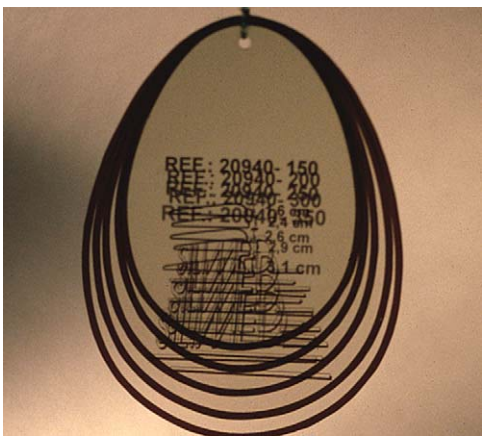


Fig. 10. The set of templates used for preoperative evaluation of implant size.

When significant buttock ptosis exists, the skin typically has poor elasticity and weak underlying support structures. Overweight and even moderately obese patients also may benefit from this technique but often require more extensive liposculpture. If large-volume liposuction is needed, staging the procedures is probably wise. Morbidly obese patients are not candidates for this surgery unless they lose weight, after which the laxity of tissues converts them into good candidates if they undergo excisional procedures to correct the back and gluteal regions. Unilateral implant placement is occasionally needed to correct asymmetry or reconstruct subcutaneous tissue lost through infection, trauma, or neurological problems that result in muscle atrophy.

Subfascial gluteal augmentation can be done successfully in most patients who lack projection of the buttocks, desire improvement of the gluteal shape, and are properly selected for cosmetic surgery. The procedure may be performed with small anatomical implants used for gluteal pexy or large implants to increase projection and volume (Fig. 8). Subfascial augmentation with anatomic shaped implants can correct minor degrees of gluteal ptosis but, as with breast surgery, implants are not the solution to severe ptosis. Because implants are placed below the gluteal aponeurosis and on top of the gluteal maximus muscle, implants with an anatomical shape are the best choice.

The anatomical system we designed for subfascial augmentation consists of templates for the

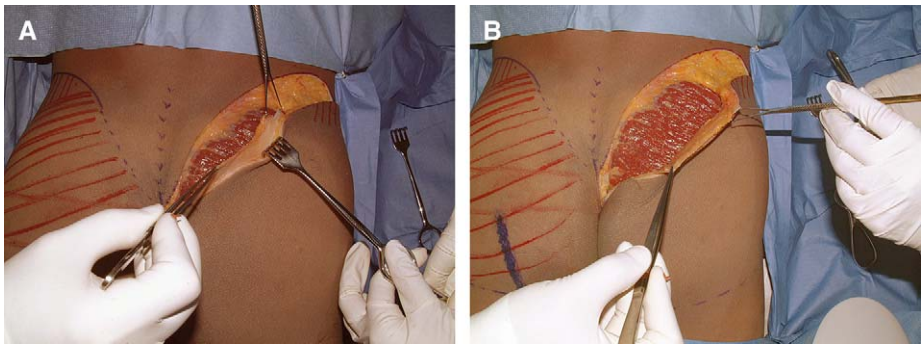


Fig. 11. Markings of important anatomical landmarks. (*A*) Incision of the gluteal aponeurosis begins at the lateral border of the sacrum. (*B*) Subfascial undermining starts from the incision in the gluteal aponeurosis.

preoperative skin markings, sizers, and either solid or silicone gel–filled implants. The solid elastomer devices have the maximum softness available, and the filled implants contain highly cohesive gel. To minimize the risk of displacement, the solid implants have a textured surface, and the gel implants have either a textured surface or a polyurethane foam cover.

Patients must be informed preoperatively about restrictions for sitting in the postoperative period because it will be limited to the bathroom. The possibility of wound dehiscence if postoperative instructions are not followed should be emphasized. If you sense that a patient will not adhere to the postop restrictions, she should not proceed with the surgery because serious complications may occur, such as wound dehiscence and gluteal space infection, that may require implant removal.

Pertinent anatomy

Subfascial implant placement for gluteal augmentation is recommended because it is the most superficial anatomical space that can hold an implant capable of molding and shaping the buttocks. The gluteus maximus muscle is used as a platform for the implant. This space is anatomically contoured by the gluteal aponeurosis and is limited inferiorly by the infragluteal fold where the gluteal aponeurosis attaches to the posterior thigh fascia. In other augmentation techniques, the pocket for the implant is developed in the pelvic cavity, and implants with more volume and projection are therefore required. The subfascial space is closed, which limits the possibility of the implant moving over the sacrum and altering the sacral triangle that is important for the aesthetics of the gluteal region.

Preoperative planning

Patients are prepared for surgery in advance with instructions to follow a low-fiber diet 3 days in advance and suspend any aspirin, vitamin E, and any medication that promotes bleeding during the operation. They are admitted to the hospital the

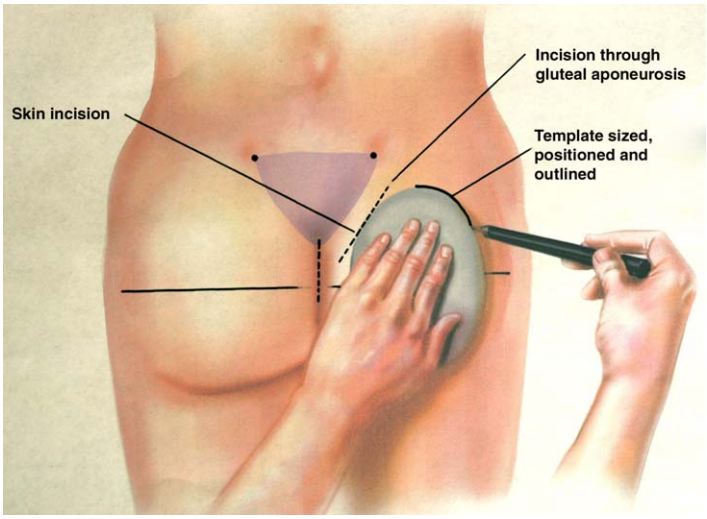


Fig. 12. The gluteal augmentation plan is as follows: skin incision lateral to the intergluteal crease along the border of the sacrum, gluteal fascia incision, and subfascial pocket development that uses the gluteus maximus muscle as a platform for the implant. The horizontal line across each buttock will be matched to a comparable line on the permanent implant to help guarantee correct implant positioning.

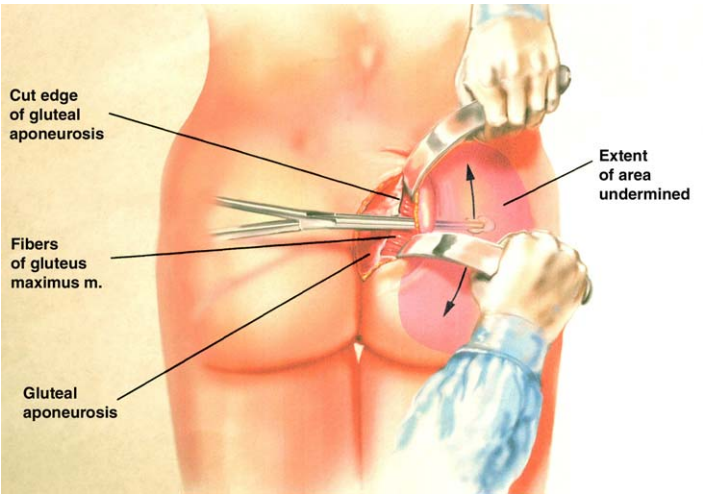


Fig. 13. Undermining of the fascia must extend 2 cm beyond the periphery of the implant.

night before surgery to mark the skin, administer an enema, and start antibiotics.

Knowing in advance the exact measurements of the subaponeurotic space as well as the patient expectations makes it easy to determine the implant size that will be needed. Our anatomical system designed for this operation contains a range of implants with varying base sizes and very little increase in projection. The most appropriate size can be selected before surgery and confirmed with implant sizers during surgery.

Markings

With the patient in the upright position, skin markings are made as illustrated in Fig. 9 using a custom-designed template (Fig. 10). The template must be centered over the gluteal region within an area at least 2 cm above the infragluteal fold and 2 cm lateral to the border of the sacrum. This preserves intact the sacral triangle as an aesthetic landmark of this region. Laterally the template must not extend beyond the posterior border of the greater trochanter. It is important to make sure that the transverse diameter of the gluteal region is not increased. If indicated, skin markings for adjunctive procedures such as liposculpture are made simultaneously with the augmentation markings.

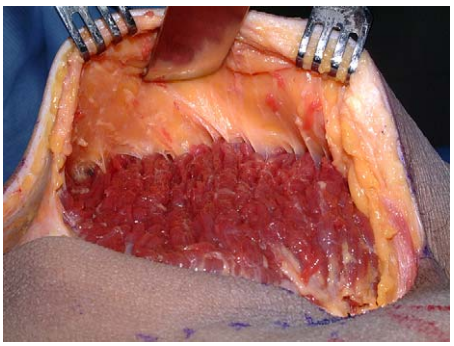


Fig. 14. Cadaver dissection demonstrates the fasciocutaneous flap that has been raised in keeping with the principles of this operation. A large incision has been made only for demonstration purposes; a normal incision is 6 to 7 cm in length lateral to the intergluteal crease. (*From* de la Peña JA. Subfascial technique for gluteal augmentation. Aesthetic Surg J 2004;24:265–73; with permission.)

Positioning

Before positioning patients on the operating table, elastic compression stockings are placed for every patient, and sequential compression pumps are used when indicated for deep vein thrombosis (DVT) prophylaxis. General or epidural anesthesia is used for the procedure. If epidural anesthesia is used, the catheter may be left in place for pain control after surgery.

Patient positioning is very important to reduce postoperative pain. The patient is placed on the table in the prone position, prepped, and draped. A 4 × 4 gauze pad soaked in povidone iodine is placed in the anus and the perianal area covered with an adherent sterile drape. Special care must be taken to protect the face, and temporary tarsorrhaphy sutures are convenient. Pressure sites such as the iliac spines and shoulders are protected with gel cushions.

Although the surgery is done with the patient in the prone position, the patient is moved to the supine position postoperatively.

Operative technique

The surgical technique consists of making 2 paramedial skin incisions—2 cm apart—adjacent to

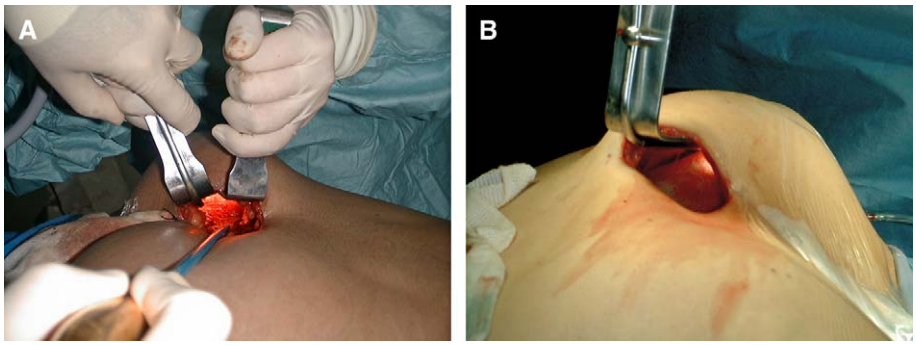


Fig. 15. (*A, B*) Fiberoptic retractors are helpful during the undermining and elevation of the fasciocutaneous flap.

the intergluteal crease, which leaves the crease intact. Subcutaneous undermining over the sacral region is minimal and is beveled from the skin incision toward the lateral border of the sacrum, where subfascial dissection begins and the predesigned pocket is developed to accommodate the implant loosely inside (Fig. 11).

The skin incision has changed over the years. We first used a midline incision over the sacrum to the coccyx, as described by Robles and colleagues in 1984 [5]. This was followed by deepithelializing an ellipse of skin to maintain the skin and fat in the midline and do the subcutaneous undermining independently. Despite this modification, the rate of small wound dehiscences remained high. In 2004, we started using the two paramedial incisions 2 cm apart, after which the dehiscence rate decreased to 4%.

The paramedial incisions are 6 to 7 cm long and made in the skin and subcutaneous tissues 1 cm lateral to the midline. Each incision is beveled in an oblique fashion from the skin edge in the paramedial region toward the gluteal aponeurosis at the lateral border of the sacrum. The subcutaneous tissue at the midline is left intact.

Fig. 16. The sizer must be adequate for the gluteal region. (*From* de la Peña JA. Subfascial technique for gluteal augmentation. Aesthetic Surg J 2004;24:265–73; with permission.)

The incisions start 3 cm above the anus, which corresponds to the level of the distal tip of the coccyx, and extend cephalically for 6 to 7 cm (Fig. 12). They then proceed laterally through the subcutaneous tissue to the presacral fascia until the lateral border of the sacral bone is reached. At that location, an 8- to 10-cm incision is made parallel to the lateral edge of the sacrum in the gluteal aponeurosis and the subfascial space is entered (Fig. 13). It is important not to cut any of the muscle fibers of the gluteus maximus muscle. A Klein needle is used to infiltrate tumescent fluid under the aponeurosis. This facilitates the identification of the avascular plane deep to the fascia, an area containing a network of septa, or expansions, emerging from the posterior aspect of the gluteal aponeurosis. These aponeurotic expansions are not easily divided, but the tumescent infiltration permits sharp dissection of the septa in the subfascial plane. Accurate dividing of the expansions in this plane raises an intact fasciocutaneous flap (Fig. 14) in the area outlined by the template marking.

Sharp dissection, lighted retractors, and long instruments are mandatory for safe retraction, cutting, and coagulation to ensure that all aponeurotic expansions over the muscle are divided (Fig. 15). Bleeding is minimal if undermining and coagulation are done carefully and simultaneously. Perforator vessels from the superior and inferior gluteal arteries are identified and ligated. To facilitate undermining it is advisable to dissect from medial to lateral and from cephalic to caudal, while maintaining a wide field of exposure without going beyond the skin markings.

We prefer to develop both pockets (left and right) before inserting the implants so the volume of the buttock plus an implant on one side does not interfere with dissection of the contralateral pocket. Once the pocket dissection is completed, a sizer is inserted to evaluate the size and shape of the pocket and confirm the proper implant size for the patient (Figs. 16 and 17). Sizers are inserted using a

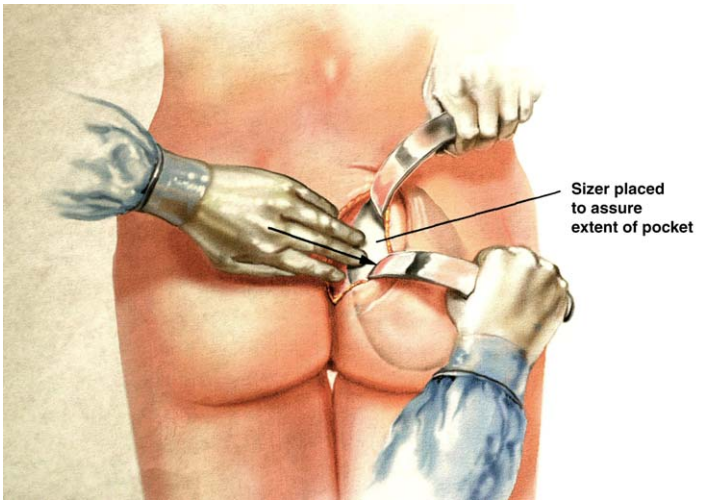


Fig. 17. Once the pocket is completed, insert a sizer, evaluate the pocket, and assess implant size. The implant should fit loosely in the space.

no-touch technique. While the sizers are being evaluated, the permanent implants are soaked in a solution containing antibiotic (garamycin 80 mg) in 200 mL saline.

After each pocket has been double-checked for hemostasis, a constant vacuum drain is placed in both pockets to help maintain perfect adhesion of the soft tissues to the implant. Then a solid elastomer or cohesive silicone-gel implant is inserted using the no-touch technique and making sure the implant is perfectly aligned on its long axis. The implant should fit loosely in the pocket and the tissues rearranged to fit comfortably over the implant. Because the implants used are anatomically shaped, the gluteal aponeurosis overlying them adopts a natural contour. The greater strength of this fascia at its origins and insertion sites ensures that an implant will not move higher than the sacrum. Correct positioning is illustrated in Fig. 18.

A watertight closure is critical at all levels. Once the implants have been inserted, begin closure by reattaching the gluteal aponeurosis at the same level where it was cut, and make sure no tension is placed on the suture. Absorbable suture such as 2-0 Monocryl (Ethicon, Inc, Somerville, NJ) should be used. Then separately close the deep and superficial subcutaneous tissues near the sacrum. Finally, each skin incision is closed separately and the intergluteal crease is maintained in the midline. For skin closure, we use a running suture of 4-0 Monocryl and seal the wound with Dermabond (Ethicon) to make sure the wound remains watertight.

Compression garments are applied, and a urinary catheter is left in place for 12 hours. The patient is sent to the recovery room in a supine position,

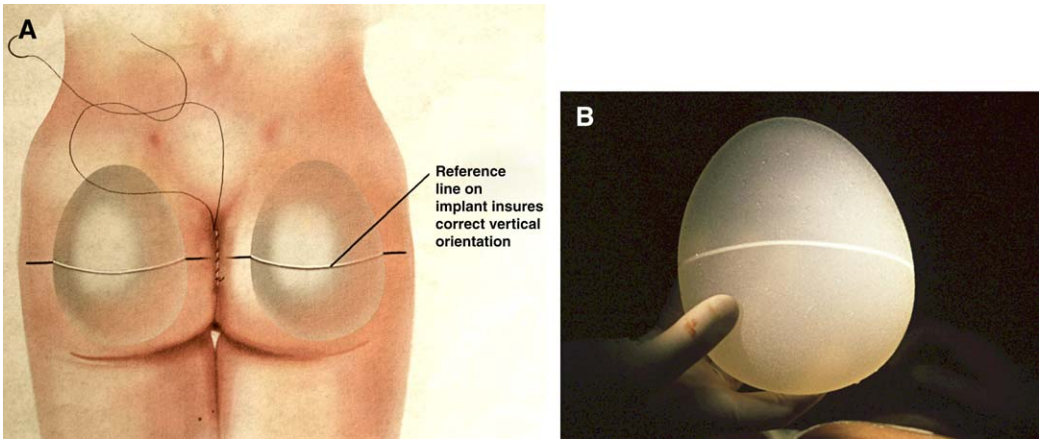


Fig. 18. (*A*) This posterior view shows an implant in its correct position in relation to the sacrum, intergluteal sulcus, and lateral limits. The midline incision depicted in the drawing has been abandoned in favor of 2 paramedial incisions. (*B*) The white transverse line on the implant ensures perfect positioning and alignment.

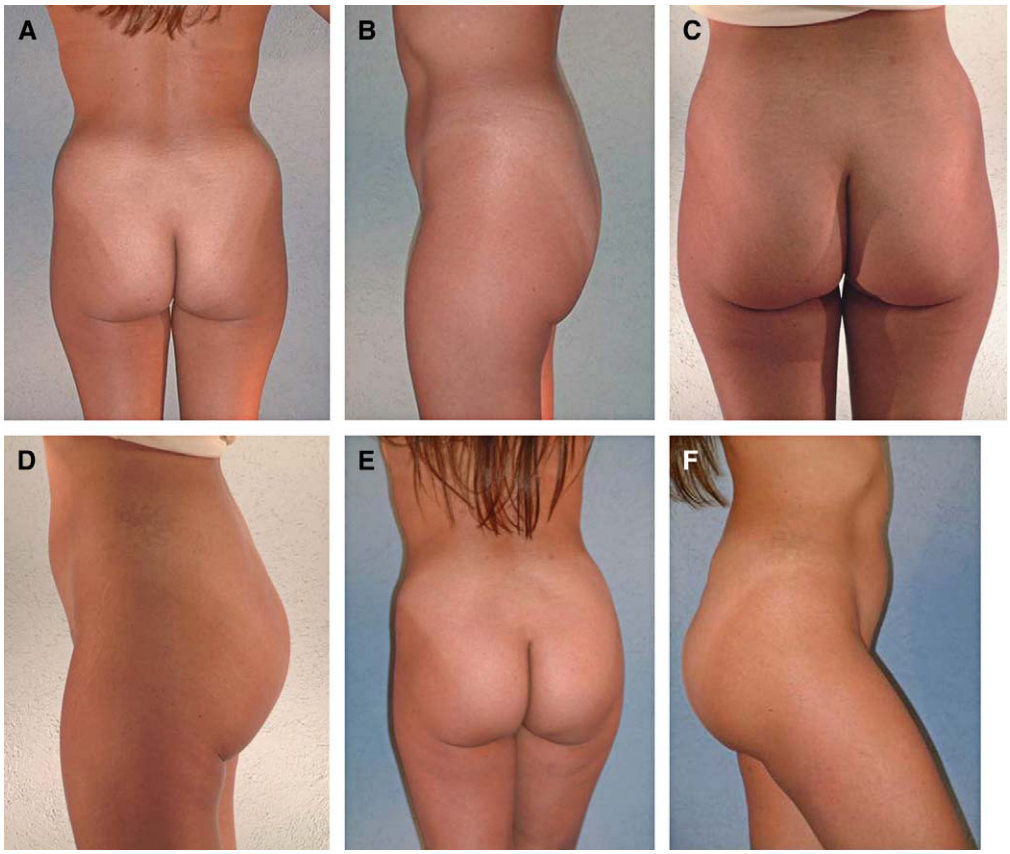


Fig. 19. (*A, B*) Preoperative views of a 34-year-old woman. (*C, D*) Postoperative views 3 months and (*E, F*) 1 year after liposculpture and subfascial gluteal augmentation with 385-cc Silimed cohesive gel-filled high-profile implants. (*From* de la Peña JA. Subfascial technique for gluteal augmentation. Aesthetic Surg J 2004;24:265–73; with permission.)

and pillows are placed above and below the buttocks for patient comfort.

Adjunctive procedures

The most frequent procedure done simultaneously with gluteal augmentation is liposuction of areas adjacent to the buttocks, such as the waist, lower back and posterior and lateral thighs. Combining liposuction of these areas with gluteal augmentation can greatly improve the aesthetic results (Fig. 19). The more defined waistline curve and more attractive contour of the upper part of the gluteal region that is gained with implant augmentation can be further enhanced by liposuction of the lower back (Fig. 20). However, the areas to receive liposuction should not adjoin the implant pocket to minimize the possibility of blood and tumescent fluid draining into the implant pocket. Excisional procedures remote from the gluteal augmentation also may be performed, as seen in the patient shown in Fig. 21 who also had an abdominoplasty to tighten skin.

We prefer to use ultrasonic liposuction, especially for the back, because it seems to produce fewer hematomas and less ecchymosis and blood loss. However, standard suction-assisted liposuction may be used to enhance the contour of the buttocks.

In very thin patients another procedure that may be done simultaneously is placement of calf implants. The volume gained in the gluteal region is better balanced if the calf volume is also augmented.

Postoperative care

On the day of surgery, patients are instructed to stay in bed with the compression garment in place. However, they are encouraged to move the legs and feet as soon as possible, and they can lie in lateral, supine, or prone positions. They are allowed to sit only when using the bathroom. Leaving a urinary catheter in place for 12 hours ensures that no sitting is necessary immediately after surgery.

Ambulation is started the next morning. Once ambulatory, patients may stand, walk, lie in bed, or be

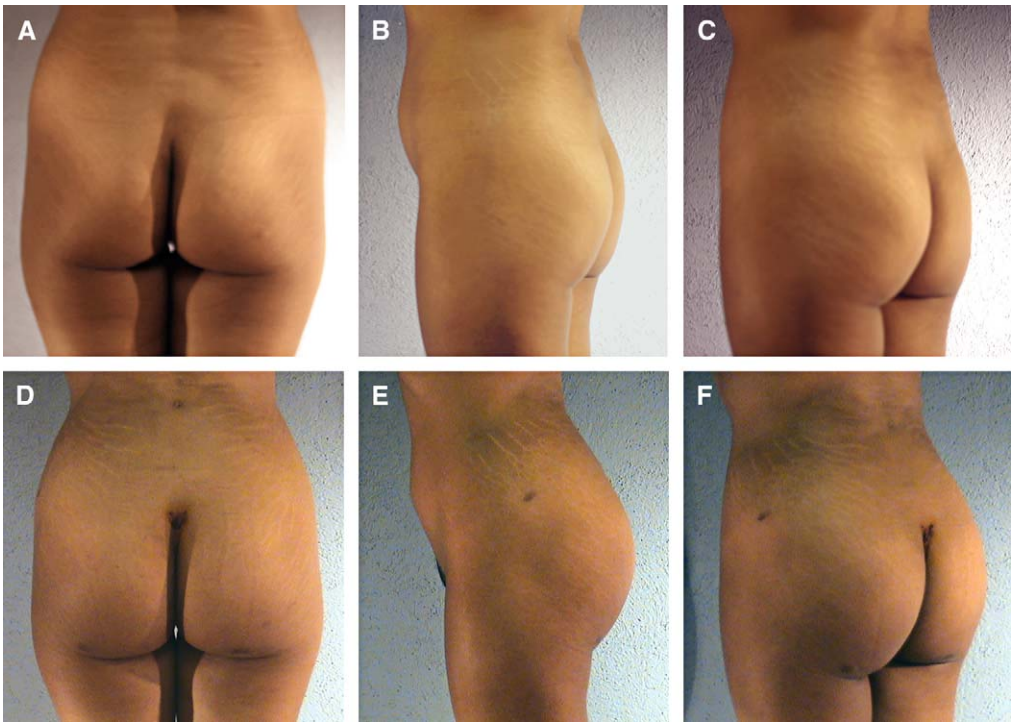


Fig. 20. (*A, B, C*) Preoperative views of a 27-year-old woman. (*D, E, F*) Postoperative views 1 month after liposuction of the waist and hips and subfascial gluteal augmentation with 330-cc Silimed high-profile cohesive gel implants.

upright on their knees, but sitting is restricted to the bathroom only for the first 2 postoperative weeks.

The constant vacuum drains (Fig. 22) are usually left in place for 7 to 10 days and removed once the drainage is less than 30 cc per day. Antibiotic ointment is applied at the entry site of the drains. The wound does not need any special treatment, but when seen for follow-up in the office, the patient may require additional Dermabond to maintain the watertight seal of the incision.

After 2 weeks, the patient may return to normal activities, except for exercise and prolonged sitting. For the first 3 weeks, driving is not permitted, and patients are told to avoid tub bathing and use a shower instead. Exercise is permitted after 2 months, although patients are asked to refrain from activities that would apply pressure to the buttocks or stretch the incision, such as riding a bicycle or horse, which might lead to wound dehiscence. It is advisable to take good care of the scar for the first 3 months after surgery.

Implants

After the first gluteal implant was designed by Gonzalez-Ulloa, many surgeons abandoned the procedure because of consistently poor results. Later, the round implants developed by Dr Robles for submuscular augmentation were somewhat more successful. When we started inserting implants in the subfascial anatomical space, success was limited by the lack of implants appropriate for this placement. For some years my coworkers and I inserted high-profile, anatomic cohesive gel implants designed for breast reconstruction (McGhan style 153). This implant had two compartments joined together that helped maintain the anatomical shape. Although these devices improved results, they were designed for reconstructing a breast mound and the vertical axis was too short for gluteal augmentation.

A new search began for a solution and ended with development of a new line of implants designed for subfascial augmentation [4]. After anthropometric evaluations, we concluded that the maximum projection point for gluteal augmentation should be at the level of the mons pubis (Fig. 23). Successful transposition of this point to the buttocks requires an implant specifically designed to accomplish this goal (Fig. 24).

The resulting design for anatomical gluteal implants are manufactured in seven different sizes by Silimed (Rio de Janeiro, Brazil, and Dallas, TX). The shape is identical in all the sizes, but variations occur in the base dimensions and, minimally, in the projection. Three different implant styles are available (Fig. 25):

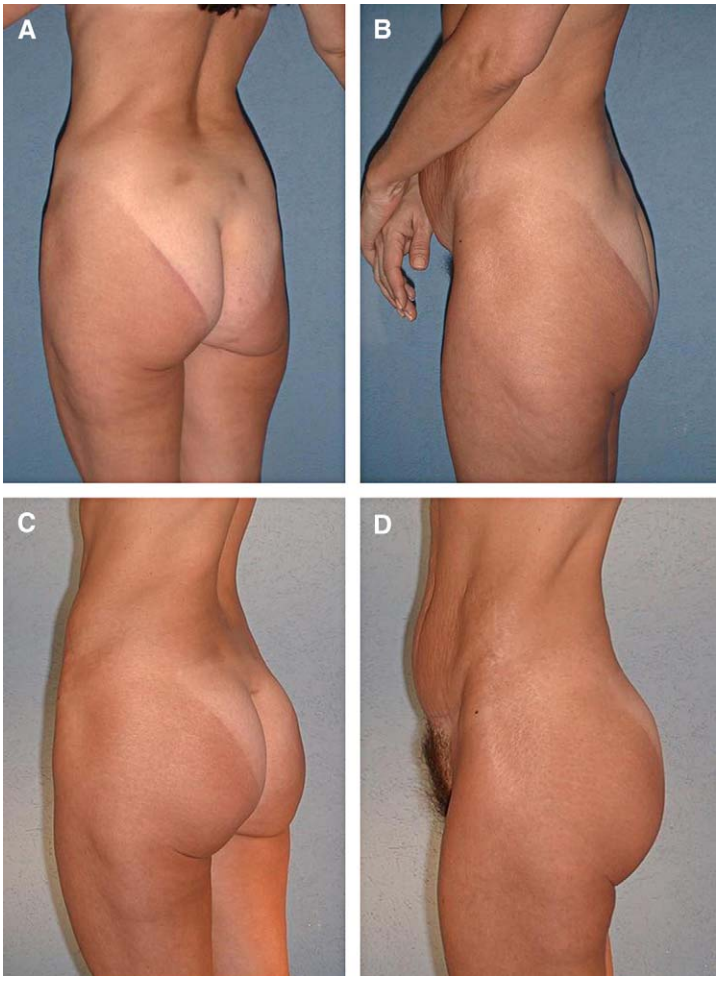


Fig. 21. (*A, B*) Preoperative views of a 50-year-old woman. (*C, D*) Six months after subfascial anatomical implant placement and an abdominoplasty.

1. High-profile cohesive silicone gel with a textured elastomer surface.
2. High-profile cohesive silicone gel with a polyurethane foam cover.
3. Soft, solid silicone elastomer with a textured surface.

Fig. 22. Immediate postoperative view with constant vacuum drains brought out in the infragluteal fold.

As shown in Fig. 10, each style and size of implant comes with templates and sizers (Fig. 26) that match the permanent implants. The posterior surface of the implant has a concave shape to maintain perfect contact with the gluteus maximus muscle and also ensure that the implant edges are inside the base and therefore less palpable through the skin (Fig. 27).

The highly cohesive silicone gel maintains the implant's shape and volume distribution. My coworkers and I have used the elastomer implants primarily for surgical demonstrations in the United States and Canada, where gel-filled gluteal implants are unavailable. Although the results are good and patients are pleased with the results, they also complain that the firmness of the implant is uncomfortable.

For this reason, we most frequently use the cohesive silicone-gel implant with a textured surface. The gel implant with the polyurethane cover is primarily used for patients who have a surgically disrupted anatomy because of a previous gluteal

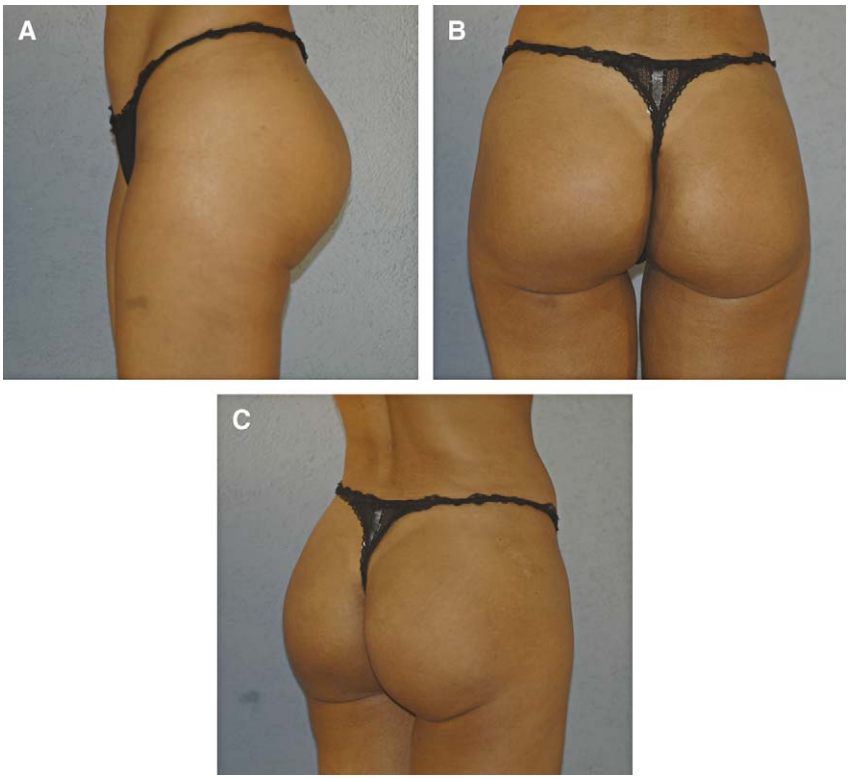


Fig. 23. (*A, B, C*) Photos of a 34-year-old woman taken 2 years after subfascial gluteal augmentation with 445-cc Silimed cohesive silicone gel implants. The proper position of gluteal projection opposite the mons pubis has been maintained over time.

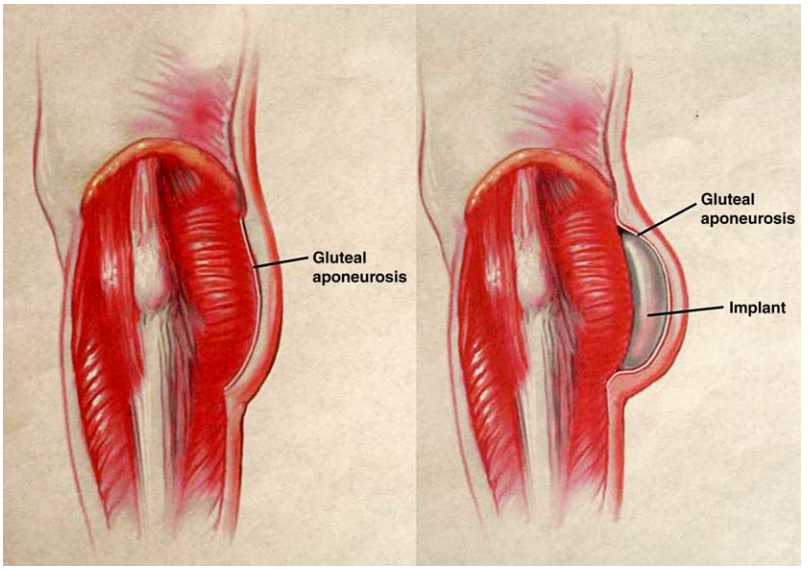
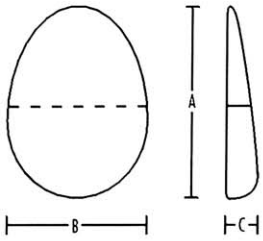


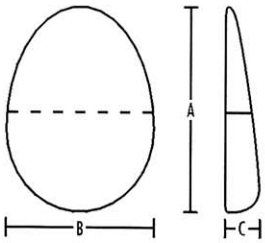
Fig. 24. Even in the subfascial plane implants must be properly positioned, with the maximum projection point at the level of the pubis. The illustration shows that subfascial placement is lower than is possible with submuscular placement.

Desenho / *Diseño del* / Design by
Dr. Abel de La Peña



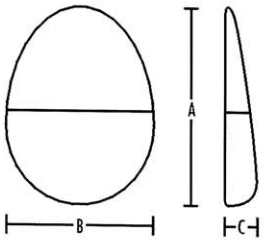
2) Gel de Silicone / *Gel de Silicona* /Silicone Gel
Superfície Texturizada / *Superficie Texturizada* /Textured Surface

REF	VOL cc	DMS cm A	B	C
20940-145	145	13,7	9,9	2,0
20940-225	225	14,6	10,4	2,9
20940-275	275	15,8	11,5	3,0
20940-330	330	17,1	12,4	3,2
20940-385	385	17,4	12,8	3,6
20940-445	445	17,8	13,1	4,1
20940-550	550	18,3	13,8	4,4



2) Elastômero de Silicone / *Elastomero de Silicona* /Silicone Elastomer
Superfície Texturizada / *Superficie Texturizada* /Textured Surface

REF	VOL cc	DMS cm A	B	C
20942-135	145	13,7	10,1	2,0
20942-145	233	14,5	10,4	2,9
20942-160	275	16,0	11,6	3,0
20942-170	343	17,2	12,5	3,2
20942-175	385	17,3	12,8	3,5
20942-180	435	17,7	13,2	3,8
20942-185	540	18,3	13,7	4,3



2) Gel de Silicone / *Gel de Silicona* /Silicone Gel
Espuma de Poliuretano / *Espuma de Poliuretano* /Polyurethane Coated

REF	VOL cc	DMS cm A	B	C
30940-145	145	13,7	10,2	2,4
30940-225	225	14,8	10,7	3,1
30940-275	275	16,0	11,7	3,4
30940-330	330	17,2	12,6	3,5
30940-385	385	17,4	12,9	3,7
30940-445	445	17,8	13,2	4,2

Fig. 25. The three different types and seven sizes of implants available in the anatomic system for subfascial gluteal augmentation.

augmentation that needs correction. Although the polyurethane cover makes implant insertion and positioning more difficult, later displacement is unusual, and capsule contracture has not occurred.

Complications

Most of our patients are seeking cosmetic augmentation for the first time and receive two identical implants. However, some patients are seeking implant exchange (Fig. 28). The incidence of infection is less than 1% and treatment requires temporary removal of the implant. Seroma and hematoma are usually prevented with meticulous surgical technique, but if they occur, evacuation is required. The best way to diagnose the problem is with ultrasound. Wound dehiscence and implant extrusion are caused by technical errors in closing the aponeurosis or excessive tension during the closure. Scars may be noticeable if the skin is detached from

Fig. 26. Example of a concave sizer that is an important part of this implant system.

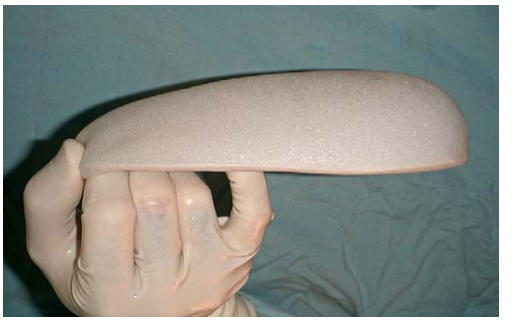


Fig. 27. The anatomical shape of the gluteal implants includes a posterior concave surface that produces a less palpable implant edge.

the presacral fascia or there is wound dehiscence during the healing process.

Sensation in the gluteal region is lost during the first 6 weeks, and full recovery of normal sensation may take 4 months. Patients must be made aware of this surgical side effect because an injury to the area, such as a burn or puncture wound, may go unnoticed by the patient.

After searching for the ideal technique for gluteal augmentation over the past 17 years, my coworkers and I have concluded that subfascial implant positioning produces the best results. The gluteus maximus muscle becomes a platform

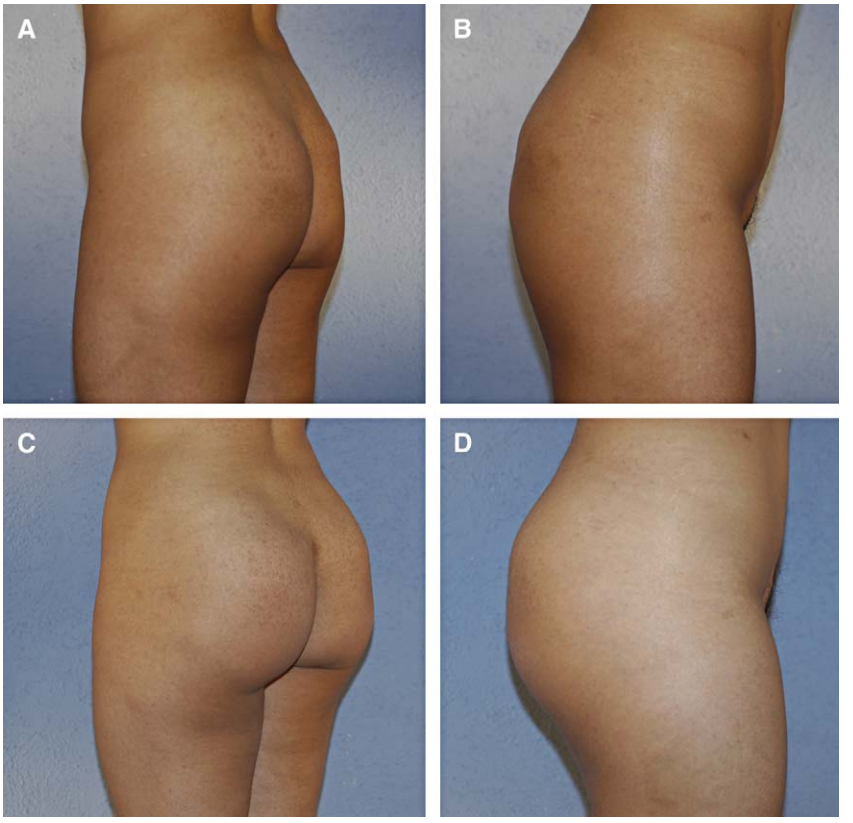


Fig. 28. (*A, B*) Preoperative views of a 42-year-old woman who had submuscular gluteal implants previously removed and extruded silicone gel in the submuscular space. (*C, D*) Three months after subfascial gluteal augmentation with 445-cc Silimed cohesive gel-filled implants, some of the contour deformity remains but the result is much improved.

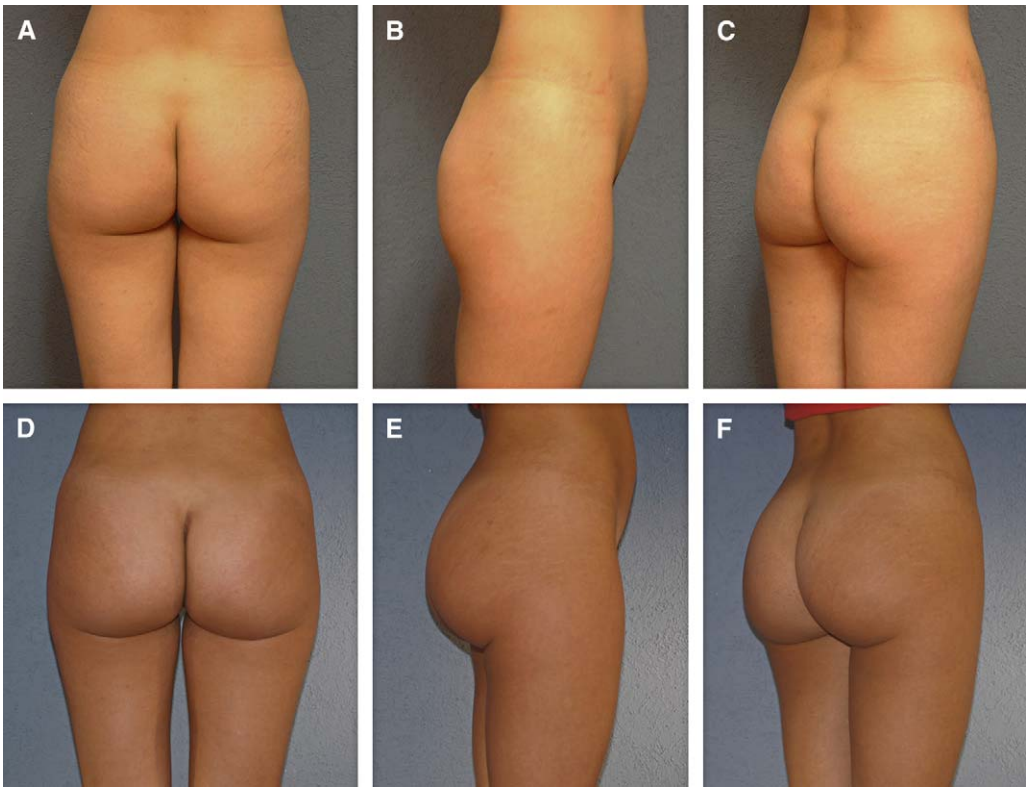


Fig. 29. (*A, B, C*) Preoperative views of a 31-year-old woman. (*D, E, F*) Postoperative views 4 months after subfascial gluteal augmentation with 550-cc Silimed cohesive gel-filled implants.

for the implant, and the gluteal aponeurosis serves as a strong molding cover. As shown in Fig. 29, the technique produces natural and reliable results that are ideal for cosmetic gluteal augmentation.

Patients are extremely satisfied with the surgical results of subfascial gluteal augmentation. They often comment about looking better in clothing, feeling increased self-esteem, and having a new body contour that surpassed their expectations.

Clinical caveats

Several technical elements can improve the success of subfascial gluteal augmentation. When performing this surgery, the most important points to remember are the following:

- Patients are placed in the prone position on the operating table.
- Skin incisions are made lateral to the midline.
- Subcutaneous undermining in the sacral area is minimal and the skin and tissue at the midline remain intact.
- Subfascial undermining and flap elevation begin at the lateral border of the sacrum, where the subfascial space is entered.
- The anatomical implants specially designed for gluteal augmentation in the subfascial space should fit loosely in the subfascial pocket.
- A closed suction drain is placed in each implant pocket.
- All closures must be watertight.

References

[1] Bartels RJ, ÓMalley JE, Douglas WM, et al. An unusual use of the Cronin breast prosthesis. Case report. Plast Reconstr Surg 1969;44:500.
[2] Cocke WM, Ricketson G. Gluteal augmentation. Plast Reconstr Surg 1973;52:93.
[3] Gonzalez-Ulloa M. Gluteoplasty: a ten year report. Aesthetic Plast Surg 1991;5:85–91.
[4] de la Peña JA. Subfascial technique for gluteal augmentation. Aesthetic Surg J 2004;24:265–73.

[5] Robles JM, Tagliapietra JC, Grandi MA. Gluteoplastia de aumento: implante submuscular. Cir Plast Iberolatinoamericana 1984;10: 365–9.
[6] Vergara R, Marcos M. Intramuscular gluteal implants. Aesthetic Plast Surg 1996;20: 259–62.
[7] Vergara R, Amezcua H. Intramuscular gluteal im plants. Aesthetic Surg J 2003;23:86–91.
[8] Mendieta CG. Gluteoplasty. Aesthetic Surg J 2003; 23:441–55.
[9] de la Peña JA, Lopez MH, Gamboa LF. Augmentation gluteoplasty: anatomical and clinical considerations. Key Issues Plastic Cosmetic Surg 2000;17:1–12.