



Buttock Augmentation With Solid Silicone Implants

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Abstract

Background: Buttock augmentation with solid silicone implants has become an increasingly popular procedure in the United States, but few outcomes studies have been undertaken to evaluate its safety and efficacy.

Objective: The author examines the results of buttock augmentation with solid silicone implants in his private practice.

Methods: A retrospective chart review was conducted of 200 consecutive patients who underwent bilateral buttock augmentation with a total of 400 solid silicone implants over an eight-year period from June 2001 through August 2009. Implants were placed in the subfascial position in 154 patients and in the intramuscular position in 46 patients. Most intramuscular implant placements occurred early in the series, before the author refined his technique. Data from all patients were analyzed to determine the rate of complication, need for surgical revision, and aesthetic outcome.

Results: Twenty-six men and 174 women were included in the study. The mean duration of follow-up was three years. The overall reoperation rate for these patients was 13% (n = 26). Seroma formation was the most common complication, occurring in 28% (n = 56) of patients. The infection rate was 6.5% for both subfascial and intramuscular implants (n = 13). The implant infection rate was 3.8% (15 of the 400 implants). Hematoma formation occurred in 2% (n = four) of patients. Wound dehiscence occurred in 1.5% (n = three) of patients. Capsular contracture was noted in 1% (n = two) of patients. Data showed that additional aesthetic procedures at the time of buttock augmentation did not affect the complication rate. In terms of patient satisfaction, patients with intramuscular implants complained more often about a lack of inferior gluteal fullness.

Conclusion: Buttock augmentation with solid silicone implants is a safe and satisfying procedure for both patient and surgeon. The most common complication in this series was seroma formation, which was treated with serial aspiration in most cases. Gluteal implants were successfully placed in either the subfascial or intramuscular position with no significant difference in complication rate, but subfascial implant placement can produce better aesthetic results in patients requiring inferior gluteal fullness.

Keywords

buttocks augmentation, body contouring, seroma, liposuction

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Buttock augmentation with solid silicone implants has gained popularity in the United States over the past decade, with 3638 buttock augmentations performed in 2008, as compared to 614 in 2002.¹ As interest in the gluteal region has increased, more studies have been published describing the aesthetic ideal and relevant anatomy of the region.^{2–4} Enhancement techniques, including autologous fat grafting alone or in combination with gluteal implant placement, have also been well described.^{5–10} Much of the literature regarding the complication rates for gluteal implants has come from plastic surgeons in Mexico and South America, where buttock augmentation is most often performed by placing a cohesive silicone gel implant.^{11,12} In the United States, the options are limited by the Food and Drug Administration (FDA) to only solid silicone elastomer implants for buttock augmentation.

Although patients and surgeons in the United States are becoming more interested in buttock augmentation, there is still a paucity of published data on complication rates with solid silicone elastomer devices. Understandably, many surgeons are reluctant to attempt buttock augmentation with solid silicone implants or recommend it to their patients given the very small number of published studies in peer-reviewed journals involving a large series of patients. Currently, there is

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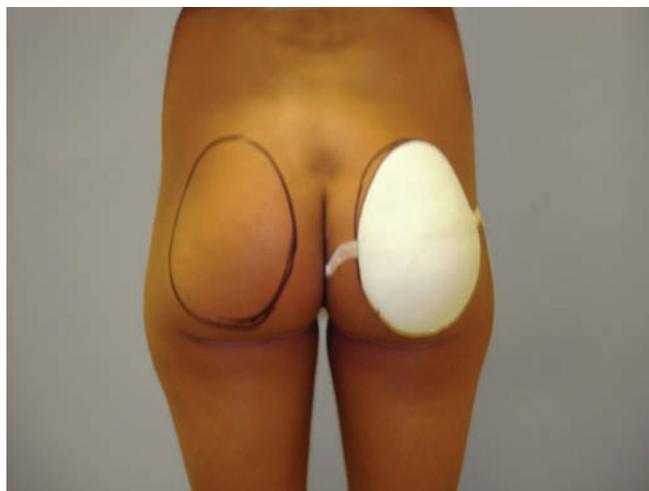


Figure 1. The patient is preoperatively marked for subfascial insertion of an oval implant.



Figure 2. The patient is placed in the prone position and bolsters are placed under the hips and chest. Sequential compression devices are placed on the lower extremities.

also a debate among surgeons who perform buttock augmentation as to the ideal position of the gluteal implant, with proponents of both subfascial and intramuscular placement.

This author has previously presented data (including complication rates) from a review of his early experience in buttock augmentation with solid silicone implants.¹³ In an attempt to add to the body of knowledge regarding buttock augmentation, this article presents data from a retrospective evaluation of 200 cases of primary buttock augmentation performed over the past eight years by the author in his private practice. The manufacturers of the implants placed in this series were Silimed, Inc., Spectrum Designs Medical, and AART, Inc.

METHODS

Data Review

A retrospective chart review was conducted to identify and collect data from all patients who underwent primary bilateral buttock augmentation with solid silicone implants over an eight-year period from June 2001 to August 2009. A total



Figure 3. Subfascial dissection begins after incising the fascia of the gluteus maximus parallel to the skin incision.

of 200 consecutive patients were included. Patients who underwent secondary buttock augmentation procedures and revisional buttock implant surgeries were excluded.

Demographic information, implant size, concomitant procedures, drain placement, and implant position were recorded for each patient. The data were analyzed to determine the rate of complication, need for surgical revision, and aesthetic outcome. All patients in the series underwent outpatient bilateral buttock augmentation by the author in his American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF)-accredited office-based surgical facility.

Surgical Technique

Preoperative markings were made with the patient in the upright position. The template of the implant was outlined on the buttock at the desired location of the prosthesis (Figure 1). Following administration of general or epidural anesthesia, the patient was placed in the prone position on the operating table. Bolsters were placed under the hips and chest, and sequential compression devices were placed on the lower extremities (Figure 2). A surgical scrub of the operative site was performed prior to prepping the surgical site with povidone iodine solution. A rolled-up laparotomy sponge soaked with povidone iodine was placed over the anus. A single dose of cefazolin was administered intravenously prior to incising the skin.

A single midline intergluteal incision measuring 7 cm in length was made down to the sacral fascia. Subcutaneous undermining was then performed laterally from the midline in order to expose the fascia of the gluteus maximus muscle. For subfascial (SF) implant placement, which was the author's preferred technique later in this series, dissection was performed in the subfascial plane after incising the fascia of the gluteus maximus parallel to the skin incision (Figures 3 and 4). Precise pocket dissection was then accomplished with a fiberoptic retractor, long-tip electrocautery,

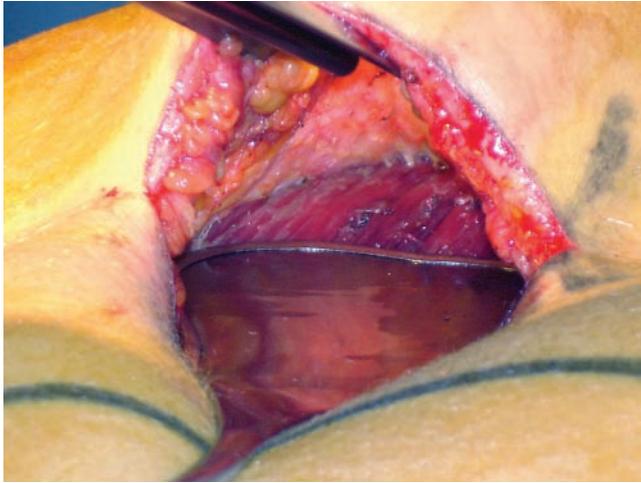


Figure 4. The exposed gluteus maximus muscle fibers are evident after completion of subfascial dissection.



Figure 6. Solid, round, silicone elastomer gluteal implant manufactured by AART, Inc.



Figure 5. A Senderoff subfascial gluteal retractor (Marina Medical Instruments, Inc., Sunrise, Florida), employed during subfascial dissection to maintain an optical cavity by exerting downward pressure on the gluteal muscles.



Figure 7. The implant is inserted through the repped intragluteal incision.

and a specially-designed gluteal retractor (Figure 5; Marina Medical Instruments, Inc., Sunrise, Florida). The gluteal retractor was employed during subfascial dissection to maintain an optical cavity by exerting downward pressure on the gluteal muscles while the lighted retractor exerted upward force on the fascia. For intramuscular (IM) implant placement (which was primarily employed for patients who presented earlier in this series), dissection between the fibers of the gluteus maximus muscle was performed after undermining the gluteus maximus fascia for 7 cm and then incising the muscle fibers parallel to their orientation. A combination of electrocautery dissection superiorly, along with mostly blunt dissection inferiorly and laterally, was used to dissect the intramuscular pocket.

The solid silicone gluteal implants were rinsed in saline and povidone iodine solution (Figure 6) prior to insertion

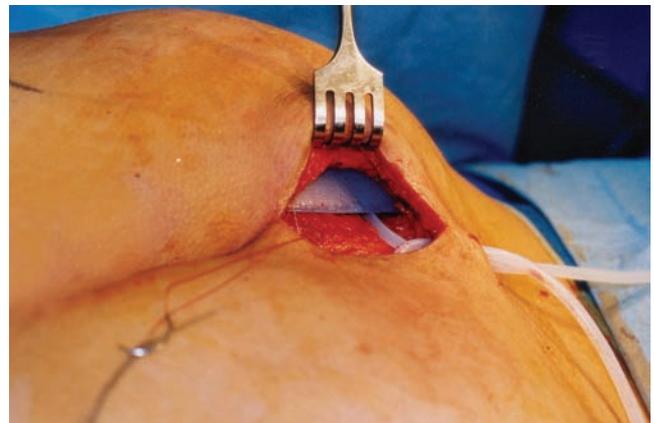


Figure 8. The subfascial implant is shown in position.

Table 1. Additional Aesthetic Procedures

Procedure	No. of Patients
Liposuction of back	51
Breast augmentation	2
Calf augmentation	2
Liposuction of abdomen	1
Liposuction of thighs	1
Scar revision	1
Sacral reduction	1

through the repped intergluteal incision (Figure 7). Implants were placed in either the SF or IM position after dissection of both pockets was complete and hemostasis was obtained (Figure 8).

Closed suction drainage was selected for all patients with implants in the IM plane (later in the series), whereas closed suction drainage for SF implant patients depended on the conditions observed during surgery. Meticulous wound closure was carried out with several layers of absorbable sutures. Care was taken to tack down each side of the midline incision to the sacral fascia, in order to reduce tension on the wound and avoid communication between pockets.

Drains were removed when less than 25 mL of fluid was obtained over a 24-hour period. If the amount of drainage did not diminish within 10 days or if the drain fluid turned cloudy, a sample was sent for culture. Oral antibiotics were initiated in these patients after culturing and were adjusted or discontinued as necessary after the culture results were obtained. Routine postoperative antibiotics were not prescribed due to the risk of producing resistant organisms. Compression shorts were applied immediately after surgery and patients were discharged with an oral analgesic. Muscle relaxants were not commonly prescribed. Patients were instructed to rest in the prone position and avoid sitting for one week. Early ambulation was encouraged to reduce muscle spasms and lessen the risk of venous thrombosis. Patients were advised to refrain from physical exertion (including exercise) for four to six weeks.

Of note, later in the series, the author began instructing patients to prepare for buttock augmentation by preoperatively applying an antiseptic body wash the night before and the morning of the operation. Preoperative bowel preps were not prescribed.

A video of the author's technique is available at www.aestheticsurgeryjournal.com.

RESULTS

A total of 400 solid silicone gluteal implants were placed in 200 patients during the eight-year period included in this study. Of the 200 patients who underwent buttock augmentation, 26 (13%) were men and 174 (87%) were women. The

Table 2. Reoperation Rates

Indication for Reoperation	No. of Instances (%)
Infection	11 (5.5)
Seroma	6 (3.0)
Aesthetic	6 (3.0)
Capsular contracture	1 (0.5)
Hematoma	1 (0.5)
Wound dehiscence	1 (0.5)

Table 3. Seroma Incidence

Treatment	No. of Instances (%)
Serial aspiration	45 (80.0)
Drain reinsertion	5 (6.3)
Implant removal (infection)	3 (1.5)
Replacement with smooth implant	1 (0.5)
Washout with drain insertion	1 (0.5)
Implant removal (exposure)	1 (0.5)

average patient age was 34 years for men and 30 years for women. The mean duration of follow-up was three years.

The most common implant size in this series was 275 cc; 375 cc was the second most common. Forty-six patients had implants placed in the IM position, before the author refined his technique, but the majority ($n = 154$) had implants placed in the SF position. Concurrent aesthetic procedures were performed in 30% ($n = 59$) of the patients. Liposuction of the back was the most common ($n = 51$). All concurrent procedures are listed in Table 1. The overall reoperation rate was 13% ($n = 26$). Indications for reoperation were grouped by category, including infection ($n = 11$), seroma ($n = 6$), aesthetic concerns ($n = 6$), capsular contracture ($n = 1$), hematoma ($n = 1$), and wound healing ($n = 1$) (see Table 2). Seroma formation was the most common complication, occurring in 28% ($n = 56$) of patients. Seromas were treated successfully with serial aspiration in 80% ($n = 45$) of the cases. Seroma rates between the SF and IM groups were similar early in the series, but increased in the SF group after routine aspiration was employed postoperatively, which resulted in the detection of seromas that had not been clinically evident. The method of treatment for seromas in this series is presented in Table 3.

The overall infection rate was 6.5% ($n = 13$ patients, or 15 of the 400 implants placed). Eleven patients required implant removal due to infection, whereas two patients were successfully treated for buttock cellulitis with antibiotics alone. Three infections occurred in the IM group and 10

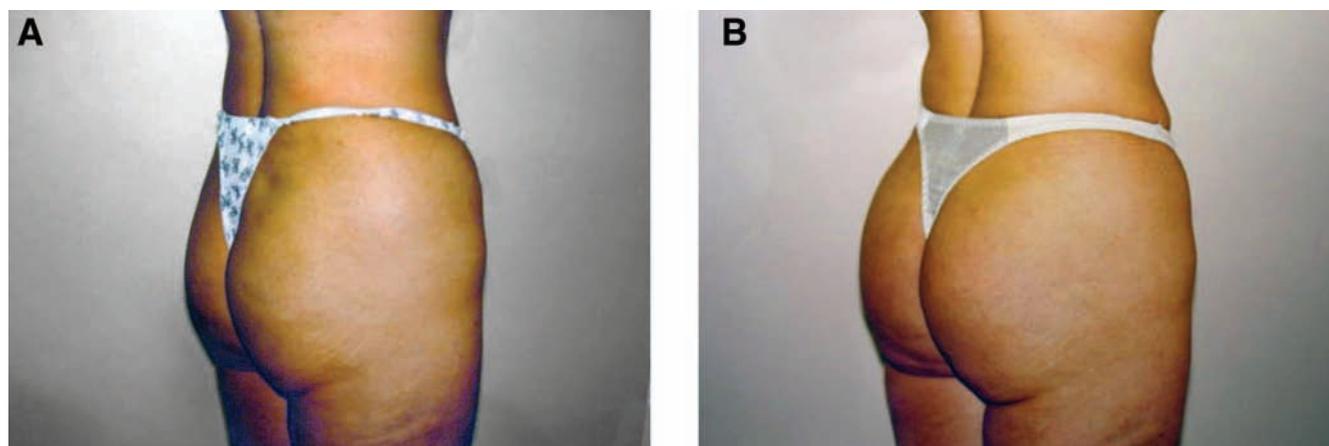


Figure 9. (A) This 44-year-old woman presented for buttock augmentation. (B) Six months after placement of 330-cc solid silicone gluteal implants through an intramuscular incision.

occurred in the SF group, producing identical infection rates of 6.5%. *Staphylococcus aureus* was the most commonly isolated pathogen and was cultured from the buttock implant periprosthetic fluid in 11 of the 13 patients with infected buttocks. *Escherichia coli* bacteria were cultured from the buttock implant periprosthetic space in one patient, who required explantation. No fluid was available for culture in one of the patients with buttock cellulitis. All four of the patients who underwent unilateral buttock implant removal due to infection underwent successful secondary buttock augmentation several months later.

Aesthetic indications for reoperation included two patients who desired larger implants, two patients who complained of palpability with their subfascial implants, and two patients who complained of intramuscular implant displacement. All aesthetic complications were evident within the first six months following surgery, after healing was complete and the periprosthetic capsule was mature. After one year, the aesthetic results did not significantly change. Late complications of any type were rare in this series and occurred after one year in only two patients, both of whom had chronic seromas that did not completely resolve. No relationship between duration of implant presence and rate of complication was found.

Hematomas occurred in 2% of patients ($n =$ four); these were treated with wound exploration in three patients and unilateral buttock aspiration in one. Wound dehiscence occurred in 1.5% of patients ($n =$ three). Two superficial wound separations were treated with local care only, and one wound dehiscence (which was limited to the deep subcutaneous layer) was treated with debridement and closure in the operating room. Capsular contracture was noted in two patients (1%), both of whom had postoperative seromas. Data showed that additional aesthetic procedures at the time of buttock augmentation did not affect the complication rate. There were no cases of sciatic nerve injury or gluteal muscle weakness. Keloid or hypertrophic scarring of the intergluteal incision did not occur, although drain-site scar hypertrophy did occur in several patients.

IM patients required more time to recuperate and complained of more pain than SF patients. Final aesthetic results were evident more quickly in SF patients than in IM patients. SF implants exhibited better overall buttock projection, whereas IM implant placement often resulted in a lack of inferior gluteal fullness. Two representative cases are shown in Figures 9 and 10.

DISCUSSION

This author began placing solid silicone implants for buttock augmentation in 2001. For the first several years, these implants were either oval or round and were placed intramuscularly. However, at that time, IM implant placement required a tedious (and often blind) dissection, with an ill-defined dissection plane within the intertwined fibers of the gluteus maximus and gluteus medius muscles. In addition, inferior pole dissection was limited by the presence of the sciatic nerve.

In these early surgeries, the recovery period was difficult for patients due to the pain associated with tearing of the musculature of the buttocks. Ambulation was difficult immediately after surgery and narcotic analgesics were required for one to two weeks. Muscle relaxants were prescribed, but with limited benefit. Postoperative evaluation of the results revealed buttocks with adequate upper pole fullness, but with inadequate lower pole fullness in many cases. The inadequate lower pole fullness did resolve in some patients, depending on the amount of tissue relaxation occurring in the months after surgery. In patients with long buttocks, IM implant placement was unsuccessful in augmenting the lower third of the buttock.

After De La Pena¹⁴ described his technique for SF implant placement, the author began to place the implants in the SF plane in select patients with thick subcutaneous tissue. It became rapidly evident that SF implants could be placed more quickly than IM implants, with less tissue trauma and less resultant blood loss. SF implants could also be positioned to provide projection in all zones of the

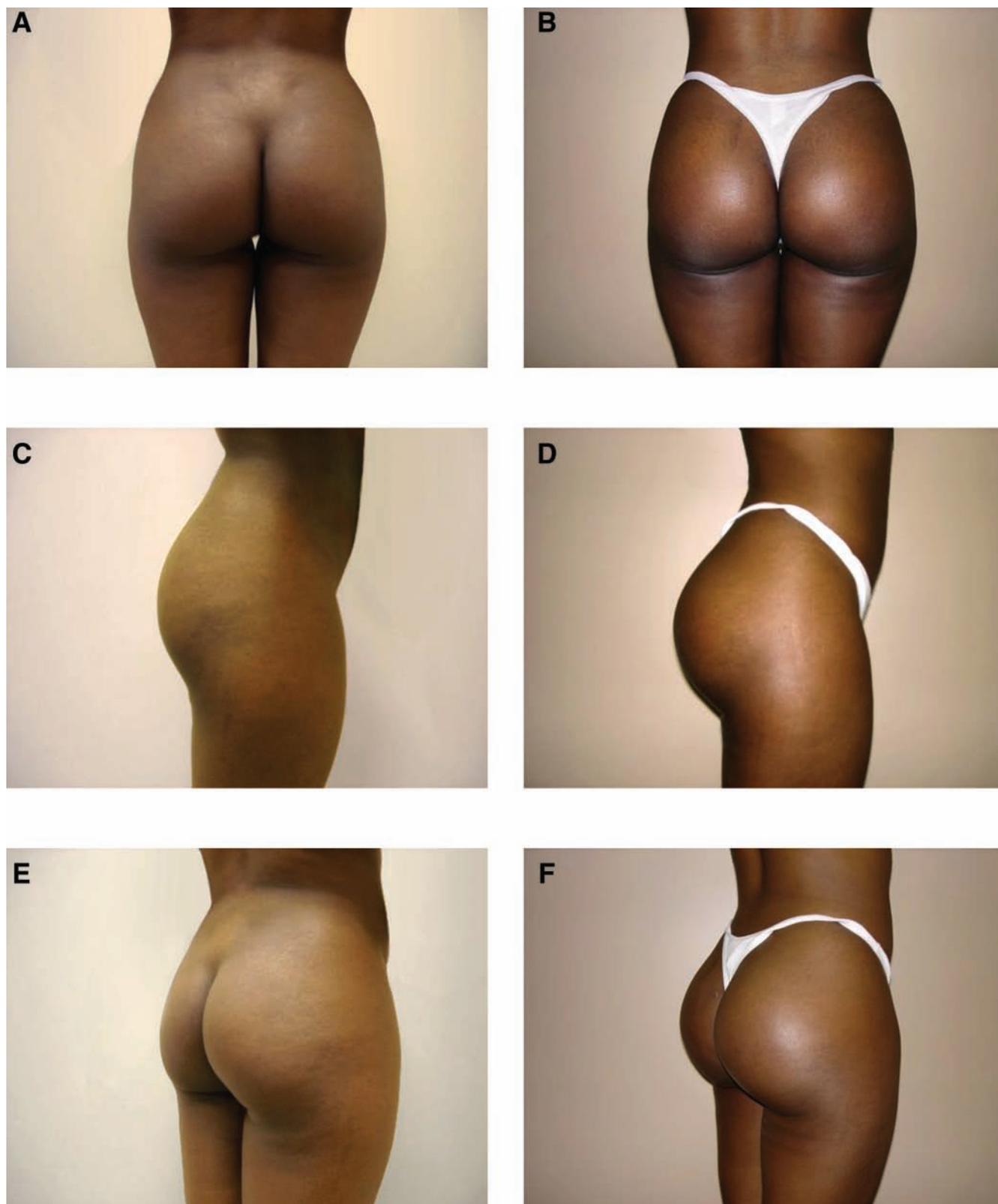


Figure 10. (A, C, E) This 24-year-old woman presented for buttock augmentation. (B, D, F) Six months after placement of 375-cc solid silicone implants through a subfascial incision.

buttock, so they proved particularly useful in patients with long buttocks, as there were no obstacles to dissection down to the infragluteal fold. Aesthetic evaluation revealed adequate projection in the upper, central, and inferior aspects of the buttocks. Postoperatively, patients were able to ambulate with less pain than patients who underwent IM implant placement. Also, this implant position was not susceptible to muscular forces, which previously had the potential to keep the implants superiorly positioned or displace them laterally in patients with strong gluteal muscles. With the introduction of softer solid elastomer implants by several US implant manufacturers, concerns over implant palpability also waned. Patient satisfaction appeared higher with SF implant placement, so as success with subfascial implant placement grew in the author's practice, the indication for IM placement was limited to patients with thin subcutaneous tissue.

Studies on infection rates in gluteal augmentation range from 3% in one combined series to 7% reported in another series for SF implants.¹² For IM implants, Mendieta¹⁰ reported an infection rate of 2%. In a previous study, this author reported a 5% overall infection rate in a review of his initial experience with gluteal implants.¹³ In the present study, there was no difference in infection rates between IM and SF implants. Although a 6.5% overall infection rate was found in this series of 200 patients, a review of the last 50 primary buttock augmentations by the author (all of which involved SF implant placement) revealed a 2% infection rate ($n = \text{one}$). This reduction in infection rate can be attributed to several preventative measures. Since *S aureus* was found to be the most common cause of infection, an initiative to minimize skin contact and reduce skin flora around the incision was undertaken with positive results. Administration of an alcohol-based preoperative surgical scrub by the patient prior to surgery was also advised later in the study. Furthermore, a preoperative prep of the surgical site with a povidone iodine soap solution prior to povidone iodine skin prep became standard. Last, a sterile towel was placed over the buttocks during dissection in order to minimize skin contact.

Seroma formation is common to both IM and SF implants. In the United States, solid silicone elastomer implants are placed (in contrast to the cohesive gel implants available outside the United States), which may account for differences in reported seroma rates. In this series, routine aspiration of the augmented buttock produced a high incidence of seroma due to detection of seromas that were not clinically evident at the time of aspiration. Routine aspiration early in the postoperative period can prevent small seromas from growing in size to the point where drain insertion may be necessary or infection may occur. Therefore, aspiration is recommended one week after drain removal to ensure the absence of residual fluid and to prevent reaccumulation. Serial aspiration may be required one or two times per week for several weeks for persistent seromas. Untreated large seromas are a risk for implant malposition and extrusion, as trapped serous fluid may dissect through tissue planes. Liberal drain placement can reduce the rate of seroma formation. However, routine drain insertion must be weighed

against the risk of infection from providing a potential portal of entry to the periprosthetic space in the postoperative period. The author advocates routine drain placement for IM implant patients and selective drain placement in SF patients. Although most drains were removed within five to seven days in this series, several patients required several weeks of closed suction drainage. Prolonged drainage in these patients was a sign of infection, not likely the cause of the infection. Patient compliance with limited physical activity during the immediate postoperative period is important in reducing seroma formation. Excessive walking can produce friction between the implant and the periprosthetic space, which may delay the formation of a well-healed capsule and result in the production of serous fluid. Compression shorts may also help reduce the incidence of seromas.

The wound dehiscence rate of 1.5% in this series was markedly lower than the 14% to 30% rates reported in several other series.^{10,15} Implant size is a likely contributor to wound-healing complications. In a series of 160 cases of gluteal augmentations by Vergara,¹⁶ where implant size ranged from 250 to 350 cc, there were no instances of wound dehiscence. Similarly-sized implants were placed in this series, with 275 cc being the most common size and 375 cc being the second most common size. Reduction of tension during wound closure is vital to ensure healing and may be achieved with multiple layers of absorbable sutures. Care should be taken to tack down each side of the incision to the presacral fascia, followed by obliteration of subcutaneous dead space and deep dermal suturing. Again, immobilization is important during the healing period. The author did not find it necessary to utilize bilateral paramedian incisions or central deepithelialized skin islands to avoid wound-healing complications with the procedure.

Round implants were most common in this series. Although oval implants were placed early in this series, they are now reserved for patients with long buttocks undergoing SF implant placement. As the periprosthetic space becomes soft and pliable, oval implants may rotate in the postoperative period, resulting in asymmetrical areas of projection. Textured implants offer no advantage over smooth or lightly textured implants and may encourage chronic seroma formation due to resultant friction in the periprosthetic space. In the author's experience, in revisional buttock implant surgery, serous fluid around textured implants was common. In this series, conversion from a textured implant to a smooth implant led to resolution of a chronic seroma in one patient.

There are certainly limitations to what can be achieved with buttock implants alone. Therefore, patient selection is vital to ensuring a good result. The best candidates for buttock augmentation in this series were women with ample subcutaneous buttock fat and good skin elasticity. These patients were good candidates for SF implant placement, although an IM implant also provided a good result. A short, round buttock was found to be more amenable to round implants than a long buttock, where oval implants were placed on occasion. In patients with infragluteal fold skin ptosis after implantation, crescentic skin excision can be performed, although the scar may be unacceptable for some

patients. Liposuction of the lower back was the most common additional procedure at the time of implantation and did not increase the complication rate. Liposuction has previously been determined to be safe and effective in improving the aesthetic results of gluteal augmentation.¹⁷ Poor candidates for buttock augmentation include obese patients, due to difficult dissection and postoperative shearing forces on the implant and wound. Extremely thin patients with inadequate soft tissue coverage are also poor candidates for buttock implantation.

Gluteal enhancement through injection of fat and several biopolymers (which are not FDA approved at this time) has become common outside the US. Several patients in this series presented for gluteal implants after resorption of injectable fat or disappointment with injection of other substances. A few patients did not disclose their prior history of buttock injections, which only became evident intraoperatively. This group of patients presented technical challenges of varying degrees during buttock implant surgery, due to the presence of an indistinct dissection plane obscured by fat infiltration of both muscle and fascia and as a result of scar tissue from reaction to biopolymer injection. Pocket dissection in these patients was found to be bloody, tedious, and lengthy. In addition, the lack of compliance of the skin in patients injected with synthetic materials resulted in increased tension on the wound after implant insertion. The potential risk of complications from buttock augmentation with an implant in patients who have undergone buttock injections should be considered when determining eligibility for this procedure.

CONCLUSIONS

Buttock augmentation with solid silicone implants is a safe procedure with unique complications that can be minimized through careful planning and patient management. Gluteal implants can be successfully placed in either the subfascial or intramuscular position, with no significant difference in complication rates. Most complications of buttock augmentation occur during the immediate postoperative period and are less common after healing is complete. SF implant placement is easier for both the patient and the surgeon, and can produce better aesthetic results in selected patients.

Disclosures

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