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Gluteal augmentation surgery: indications and surgical management

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Summary The most common surgical techniques performed for gluteal augmentation employ the use of implants and a combination of liposuction/lipo-injection procedures. We review the major literature concerning this subject with emphasis on gluteal implants, the various indications, surgical techniques and complications are discussed and we present some of our cases.

Contour reconstruction, indications such as malformation, asymmetry, trauma and radiotherapy may require custom-made or regular implants, liposuction or lipo-injection procedures and sometimes free flaps. Gluteal implants for aesthetic purposes are widely used, particularly in South America, are easy to perform with a high success rate, whereas liposuction and lipo-injection procedures require considerable experience in Coleman fat injection.

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The importance of the gluteal structures, providing a cushioning effect in sitting was first stressed by Montagu in 1966.¹ He noticed that well-developed buttocks are a peculiar trait of man, and not seen in the other primates. Many of the muscles of the pelvis and lower extremity have become significantly developed in the evolution of the erect posture. The gluteus maximus has become particularly prominent in this evolution.¹ The latter muscle contracts to extend the hip joint, in running, climbing, or ascending

steps. It is critical in maintaining the balance of the trunk on the femur and via the ilio-tibial tract, through to the tibia. The gluteus maximus is the heaviest and coarsest fibred muscle in the body, and contributes to form the buttock. The other feature noted by Montagu¹ was the significant deposit of fat overlying the gluteus, which makes up the fold of the buttock. The thickness of the gluteal fat varies considerably in different individuals, and is much admired for its size, particularly in southern Africa.

The gluteal region has been recognized as an important secondary sexual characteristic and has its place in the concept of beauty in all communities. The morphology of the gluteal region has been studied in an objective way by aesthetic surgeons, defining the changes in the gluteal region with ageing and weight gain particularly. Babuccu et al.² first demonstrated objectively that, as women grow older, the width of the gluteal region decreases and the

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gluteal sulcus elongates laterally and inferiorly. Weight gain causes the gluteal region to become wider as the gluteal sulcus becomes shorter.²

Gluteal contour surgery was pioneered by Pitanguy³ in 1964 and was later improved with the developments of prosthetic implants,^{4,5} liposuction^{16–18} and fat grafting.^{19,20} The combination of these latter two procedures were used to improve gluteal contour.^{21–23}

Indications and surgical techniques and complications

Indications

Gluteal reshaping have been performed in order to correct gluteal ptosis,^{6,10} gluteal hypoplasia,^{7–13,19–22} or a combination of both.^{9,10} Similarly, gluteus maximus agenesis,^{10,14} hemiatrophy,¹⁰ asymmetry²⁰ and finally to correct fibrosis and deformation of the gluteal area after injections of silicone.¹⁰

Reshaping of the gluteal region can be divided into 'pure aesthetic' in which the gluteal region requires surgery because of small volume or ptosis. Ptosis, sometimes described as 'platypygia' meaning a broad, flat buttock and described by Douglas⁸ while others^{9,10} have used the term 'sad buttocks'.

The second classification 'contour reconstruction' can be due to a number of causes but is primarily of a secondary nature, many already mentioned, but particularly in our series related to HIV and longstanding bed rest.

Surgical techniques and complications

Numerous surgical techniques have been used to improve gluteal contour. Pitanguy³ in 1964 and Regnault et al.⁴ in 1979 altered the gluteal shape by the resection of tissue in the trochanteric region and gluteal fold. Lockwood⁵ obtained a better shape by elevating the entire gluteal region. Bartles⁶ in 1969 was the first to use breast implants for the correction of gluteal ptosis, followed by various authors.^{6–15} The development of liposuction followed by fat injections was pioneered by Artero in 1974. Subsequently other authors used liposuction followed by Coleman-type fat injection procedures.^{16–19,21–23} Various techniques have been employed to augment the buttocks using implants.

Gonzalez-Ulloa¹⁰ placed almond-shaped implants through a subcutaneous plane, followed by Robles and Tagliapietra¹¹ who introduced the prosthesis in the 'sub-gluteal cellular space' which is a non-vascular, intramuscular space formed between the gluteus maximus superficially and the gluteus medius and piriformis muscles deeply.

It would seem that Vergara and Marcos¹³ used a similar space deep to the gluteus maximus. Initially, the incision was made bilaterally in the infra-gluteal sulcus,^{6–10} followed by bilateral coccygeal incisions¹⁰ and finally with a single median 5–7 cm incision, which is well-camouflaged.^{10,11,13,24}

Complications

Following the use of gluteal implants, wound infections have been described,⁸ also rupture of the gluteal

Table 1 Indications for gluteal contour surgery

1. 'Pure aesthetic' indications
A – small volume
B – ptosis ('platypygia' or 'sad buttock')
2. 'Contour reconstruction'
A – malformation or agenesis involving (eventually with asymmetry) the gluteus maximus muscle
the fat pad
both
B – asymmetry between the two gluteal regions
C – trauma
D – previous surgery for oncology for cosmesis for previous reconstruction (e.g.: pressure sore)
E – previous radiotherapy
F – fibrosis following gluteal silicon injections for cosmetic purposes
G – loss of substance following myopathies
H – loss of substance following connectivopathies
I – loss of weight (e.g. diet, gastric bandage, anorexia, HIV)
J – loss of substance following long standing in bed for medical reasons (causing muscles and fat pad atrophy).

prosthesis,^{25,26} (in both these cases a single gluteal prosthesis was broken because of trauma falling on the buttock, on one occasion 45 days after surgery²⁵ and 9 years after surgery²⁶).

In the largest series reported in literature by Robles,²⁴ 3% of the 160 gluteal augmented patients experienced a rupture, or complications such as infection, extrusion or haematoma.

In a series of 16 operated patients by Vergara and Marcos¹³ in which the gluteal implants were positioned in the intramuscular space between maximus and medius, no complications occurred.

Liposuction—lipo-injection techniques

After the introduction of liposuction^{28,29} a new alternative was available for contouring gluteal area.^{16–18} Later, a demonstration of fat survival in long-term follow-up studies^{30,31} led the surgeons to perform body-contouring surgery using lipo-injection in the gluteal area as well.¹⁹ Good results in terms of aesthetic outcomes are reported in the literature,^{21–23} after combined liposuction/lipo-injection procedure for gluteoplasty, even at long-term follow-up.

Cardenas-Camarena,²¹ performed lumbo-sacral liposuction in all his gluteoplasties whereas subgluteal and trochanteric liposuction were done only when indicated. The volumes of infiltrated fat varied from 120 to 280 cc per gluteus (mean being: 210 cc).

Very large volumes of fat are often required and pre-operatively the patient is requested to put on as much weight as possible for maximal harvesting of the fat. In his series of 62 gluteoplasties with combined procedures, he



Figure 1 Example of patient who received silicone implant augmentation for correction of small volume buttocks. First two pictures on the superior line: status before surgery. All the other pictures: status after surgery. Note the shape of the gluteal area and implant when the patient is asked to clunch the gluteus maximus muscle, in the lowest picture on the left side.

reported four seromas and one case of probable fat embolism syndrome with a satisfactory outcome.²¹

Present series

During the last four years, we have performed gluteal contour surgery for various indications in 10 patients, six

female, three male and one male to female transsexual (Table 1). Seven of these patients were primary aesthetic cases who wished to improve their gluteal contour. Two cases (both males) were pure gluteal volume augmentations (Fig. 1). Four (three females and one male to female transsexual) were corrections of 'sad buttocks' (Fig. 2). All



Figure 2 Example of patient who received silicone implant augmentation for correction of buttock ptosis. First two pictures on the superior line: status before surgery. Third and fourth pictures on the inferior line: status after surgery.

these six cases received bilateral gluteal implants (from Polytech Silimed Europe GmbH). One extra patient, a 38-year-old male HIV+, received bilateral gluteal augmentations (volume 250 cc) to reshape the gluteal contour for muscle wasting subsequent to HIV. The volume of the implant inserted was 250 cc in five cases and 350 cc in two cases. In all these patients the technique used for implant positioning was the same as described by Robels and Tagliapietra.¹¹ A vertical 5 cm incision in the midline of the coccygeal region was deepened and access achieved to the medial part of the gluteus maximus. The muscle was then divided for approximately 5 cm and deepened until the intramuscular plane between maximus and medius was defined. A space was then developed between the two muscles in an infra-lateral direction towards the greater trochanter. After thorough irrigation of the space, the prosthesis was inserted and the muscle closed without drainage. The wound was then closed with a subcuticular

suture. The implant does not overlie the ischial tuberosity so does not take direct pressure on sitting. In seven cases the post-operative period was uneventful and at long-term follow-up no complications such as capsular contracture or implant displacement or breakage has occurred. To date, all the patients have been satisfied with surgery.

The three remaining cases to be presented were more complex and required a non-uniform approach.

Case 1

The patient was a 43-year-old female who had previously received excessive liposuction of the gluteal, lumbo-sacral and thigh areas elsewhere. The result of this procedure had left her buttocks flattened and unsightly. A 250 cc gluteal implant was inserted in the inter-muscular plane in the previously described manner but this left her with a fullness at



Figure 3 Before (left side) and after (right side) pictures of patient described in case 2.

the lower part of her buttock but rather flat in the supra-gluteal area. It was therefore necessary to provide her with a custom-made prosthesis to fill precisely the area involved and this was placed in the superficial plane rather than sub-muscular.

Case 2

A 36-year-old female had a congenital hypotrophy of the left lower limb, specifically involving the left gluteus maximus and its overlying fat. The calf muscles were also

hypoplastic resulting in a clear asymmetry between the right and the left limbs. She had never worn swimwear over 15 years. A unilateral gluteal augmentation using a custom-made silicone implant was inserted in the subcutaneous plane (Fig. 3). A silicone implant was then inserted into the medial left calf and liposuction was performed to the contra-lateral limb, particularly over the gluteal, thigh and calf areas in order to achieve symmetry. The surgery was



Figure 4 Lateral pre-operative view of patient described in case 3 (free TRAM flap).



Figure 5 Early post-operative view of patient described in case 3 (free TRAM flap).



Figure 6 Late post-operative view of patient described in case 3 (free TRAM flap).

successful and the patient could employ more revealing clothing.

Case 3

A 45-year-old female was referred with lipodystrophy of the left buttock and posterior upper thigh (Figs. 4 and 5). She also had small areas of lipodystrophy around her knees and ankles. A free TRAM flap was harvested from the abdomen, measuring 27×10 cm, based on the inferior epigastric vessels. The inferior gluteal vessels were then defined in the buttock region and the flap transferred and revascularised. The flap itself was de-epithelialised and inserted into the subcutaneous plane. The smaller areas of lipodystrophy on the upper part of her leg were corrected with Coleman fat injections.

A satisfactory outcome was achieved and she was pleased. Prosthetics would have been impossible as they would not have been sufficiently flexible when the hip was flexed (Fig. 6).

Discussion

Well-rounded buttocks are highly prized as a secondary sexual characteristic, particularly in South America and Africa. There has been a tendency in the Western world by women to seek a flat buttock, probably in response to the perceived beauty of supermodels and couture fashion. There is a distinct return to the more rounded female shape, and particularly in the buttocks. The homosexual

community is particularly aware of the benefits of augmentation.

Surgical techniques

The surgical techniques have developed over the years to provide augmentation with minimal scarring, whether it be liposuction, lipo-injection or the implantation of prostheses.²¹

The implants have the disadvantage of being a foreign material, but are simple and easy to perform. If they are placed above the muscle in the subcutaneous plane, they can be more obvious and rippling visible in 18 months' time. The intramuscular plane has the advantage of being better protected from trauma but on clenching the muscle, the prosthesis may be more apparent.

The liposuction–lipo-injection gluteoplasty is a serious technique involving the injection of large volumes of fat taking some hours to perform. Coleman describes his fat liposculpture³² with good survival of fat injected. However, there is no doubt that considerable absorption does occur and may make the result rather unpredictable.

In both cases, patients need to be well-motivated and psychologically prepared. Total co-operation in the post-operative period is essential, particularly in avoiding sleeping on the prostheses.

In HIV+ patients, two cases of *Mycobacterium avium* infection had occurred.^{27,33,34} It should not, however, be considered a contra-indication to surgery.

The gluteal region has recently been recognized as an important secondary sexual character, and has its place in the concept of beauty in the community.

Gluteal enhancement either using a silicone prosthesis in the intramuscular or superficial plane or liposuction/lipo-injection procedures can be employed successfully.

In more complex cases, some imagination and employment of several of these techniques may be required in order to enhance the quality of the patient's life.

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