

Liposuction-assisted Medial Thigh Lift in Obese and Non Obese Patients

Introduction: The abdomen, thighs and buttocks are often the areas of greatest concern to patients following massive weight loss due to bariatric surgery. The typical appearance of the patient who has lost a massive amount of weight derives from a combination of factors, including gender-dependent body morphology and a change in body mass index, which lead to skin and soft-tissue excess and poor skin tone. Thigh laxity and redundancy represents a great challenge to both patients and surgeons. Not only because of the difficulty to satisfy the patients, but also due to the higher incidence of complications especially, with those obese patients who have not undergone bariatric surgery before. The problems with such patients are due to the heavy thighs that require both debulking and tight anchorage to prevent scar migration or labial distortion. **Aim of the Work:** The aim of the present study is to improve the aesthetic outcome and avoid the complications of medial thigh lifting with simultaneous liposuction in obese and non-obese. **Patients and Methods:** A total of 25 female patients presented during the period from January 2007 to July 2011 complaining of moderate to severe thigh laxity with or without lipodystrophy. In 20 patients medial transverse thigh lift was performed, to treat medial thigh friction and laxity particularly in the upper half. Whereas, in the other five patients were suffering from upper and lower medial thigh bulkiness, vertical thigh lift was performed. **Results:** All patients recovered well in 2 weeks and showed improvement of thigh contour. Scar downward displacement in one patient. No skin necrosis or seroma. No labial distortion or separation encountered. **Conclusion:** Simultaneous liposuction and thigh lift gave good results provided proper patients selection, appropriate technique to each patient, meticulous, cautious liposuction and handling of the tissues and most importantly is the deep tight anchorage sutures to guard against the effect of heavy skin flaps.

KEYWORDS: Labial distortion, medial thigh lift, scar migration, vertical lift

INTRODUCTION

The abdomen, thighs and buttocks are often the areas of greatest concern to patients following massive weight loss (MWL) due to bariatric surgery. The typical appearance of the patient who has lost a massive amount of weight derives from a combination of factors, including gender-dependent body morphology and a change in body mass index (BMI), which leads to skin

and soft-tissue excess and poor skin tone. Women tend to have excess skin along the anterior abdominal wall, flank and hip regions as well as cellulite and excess skin along the thighs and buttocks. The buttocks and pubic areas often are ptotic and redundant.^[1] Men have similar changes however, the anterior, posterior and lateral thighs and buttocks are affected to a lesser degree and usually are without cellulite. Classic medial thigh lift surgery has considerable limitations in these patients.^[2-6]

Since its earliest description in 1957, thigh lift surgery has been performed for the removal and suspension of excess and ptotic soft-tissues of the proximal lower extremities. Medial thighplasty is aesthetic reshaping of the thigh after removal of excess medial skin and fat. Medial thighplasty may be limited to an upper thigh crescent excision adjacent to the labia majorum (or scrotum), or

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extended with a wide-band excision tapering at the knee for distal deformity. Ideally suited to individuals with localised skin excess and minimal adiposity of the thighs, the medial thigh lift has historically yielded satisfactory results, although it has been somewhat reluctantly embraced by surgeons due to the potential for scar prominence and malposition, labial distortion, under-correction of dermal excess and recurrent ptosis.^[2,3,7-12]

Developments in surgical techniques allow safe and efficient surgical correction of contour deformities.^[13] The trunk, buttocks and thighs represent areas of increased patient interest and surgical technique modification. Consequently, familiarity with the presentation and effective treatment of these contour alterations has become increasingly important.^[14-18]

The surgeon must also keep in mind the superficial vascular branches present in the leg and most importantly the lymphatic structures and their location. The saphenous vein and its largest branches are subject to possible injury during many of the procedures useful in thigh contouring. The lymphatic drainage of the leg is primarily concentrated medially, but the vessels tend to lie deeper than the saphenous vein until the vessels begin to coalesce in the femoral triangle where the saphenous vein turns to join the femoral vein. The operations chosen for thigh recontouring should be designed to avoid vascular complications at all costs.^[19]

In the present study, our main target is patients who suffer different degrees of thigh lipodystrophy with skin laxity and they were not candidates of bariatric surgery before. Performing thigh lift to those patients is always facing the problem of heavy skin flaps and the need for tight anchorage sutures to prevent downward displacement of the scars.

Aim and goals

The aim of the present study is to improve the aesthetic outcome and avoid the complications of medial thigh lifting with simultaneous liposuction in obese and non-obese patients.

PATIENTS AND METHODS

A total of 25 female patients presented during the period from January 2007 to July 2011 complaining of moderate to severe thigh laxity with or without lipodystrophy. Their age ranged between 25 and 45 years with BMI <27. Patients with MWL were not included in this study.

All patients were candidates of a previous body lifting and liposuction procedures to correct contour deformity. In some patients, laser (neodymium-doped yttrium aluminum garnet) lipolysis and tightening were tried, but with unsatisfactory result.

Pre-operative work-up; all patients were subjected to:

- Full history taking
- Complete clinical examination and investigations to detect any associated obesity related or irrelevant illness
- Colour duplex study to rule out deep vein thrombosis which is a contraindication to the procedure
- Meticulous assessment of the thigh laxity and the area of greatest concern to the patients, the amount of skin going to be excised, the proper technique to be used that will solve the problem
- Photographing the patients in different views
- Assessment of the patients' results and grading them (1-4) according to the following points:
 - a. Scars as regards quality and placement
 - b. Thigh contour: Regular and symmetrical or irregular and asymmetrical
 - c. Labial distortion and separation
 - d. Complications: Lymphoedema, deep vein thrombosis, seroma or skin necrosis
 - e. If secondary corrective procedure is needed.

PRE-OPERATIVE MARKING

Standing

For transverse thigh lift, I marked a line extended between the anterior superior iliac spine and the pubic tubercle to delineate the inguinal ligament, then another line was marked 1-2 cm below and parallel to the above line and lying within the groin crease defining the proposed incision line. The medial end of the incision line was directed postero-inferiorly 3-4 cm away from the labial edge. The lower excision line was marked while pulling the lax skin up without tension both during thigh abduction, adduction and external rotation.

For vertical thigh lift, I used the pinch test to mark the skin ellipse of the medial thigh that needed to be removed. The centre of this ellipse was laid posterior to the meridian of the thigh and began just behind the medial condyle of the knee and extended vertically in a posterior direction to the perineum. The upper end of the ellipse stopped 3-4 cm below the edge of the labia majora then drifted backward towards the ischial tuberosity if necessary to avoid dog ears.

Lithotomy position

The same tests were repeated during the abduction and external rotation of the thigh to avoid any traction or pull on the labia majora.

Operative procedures

All patients were given general anaesthesia in a supine position and antithrombotic compression sleeve was applied. As a preliminary step in all patients, I started

with infiltration of tumescent fluids and liposuction of the anterior and medial aspects of the thigh. Circumferential thigh liposuction was performed in two of the vertical lift patients. The level of liposuction was kept in a superficial plane in the area of the femoral triangle to avoid injury of the lymphatic vessels and the skin thickness was kept not <1.5 cm.

Extended medial transverse thigh lift

This procedure was performed among 20 patients where the medial thigh touches and suffering intertrigo and the previous abdominoplasty didn't provide satisfactory tightening of the anterior and lateral aspects of the thigh.

Skin incision was started through the groin crease line, extended laterally beyond the anterior superior iliac spine and medially stopped about 3-4 cm from the edge of the labia majora (the point at which pinch has minimal traction on the labia) and then curved away posteriorly towards the ischial spine. Then, a skin flap was raised inferiorly based and the dissection planes in all cases were maintained superficially above the saphenous vein and its tributaries. Again, the amount of skin ellipse needed to be excised should be tested without over tension in all possible thigh positions. The excess skin was excised in a piece-meal manner and stay sutures were used to identify the appropriate direction of pull that gave the desirable lifting without crumbled skin or dog ears.

After careful haemostasis, I used deep subcutaneous anchoring sutures of 2/0 polydioxanone suture (PDS) or vicryl to hook the lower skin flap to the lower border of inguinal ligament or Colles' fascia and to the adductor muscles fascia and if possible to the periosteum of the pubic ramus. Finally, the skin was closed using 3/0 vicryl or PDS. No suction drains were needed, dressing

and pressure garments were applied intra-operatively [Figure 1].

Vertical medial thigh lift

This procedure was performed in patients where the skin laxity and lipodystrophy affecting the whole thigh medially and the transverse thigh lift will not address the knee problems that most matter to them. The procedure started with superficial liposuction as mentioned above in addition to suction of the knee region. The incision line began just below and behind the medial condyle of the knee and extended up in the direction of the perineum and stopped 3 cm below the edge of the labia major with gentle posterior curve towards the ischial spine. In case where there was still posterior thigh laxity this line should be extended through the gluteal crease.

During my dissection, I used to pay utmost care to the saphenous vein and its tributaries and to protect the lymphatic vessels. I tested the skin ellipse again to be excised without over tension and am better to be done in a piece-meal manner. Thigh abduction, flexion and external rotation were dynamically simulated during dissection and excision to confirm the exact amount of skin excess [Figure 2].

Finally, careful haemostasis was done followed by insertion of suction drain and skin was closed in layers using 2/0 vicryl and 3/0 PDS subcuticular sutures. Compression garments were applied and careful attention was paid to the limb circulation in the immediate post-operative period.

RESULTS

A total of 20 patients underwent extended medial transverse thigh lift and five patients underwent vertical medial thigh lift with liposuction. The volume of liposuction ranged



Figure 1: Intra-operative view of extended media transverse thigh lift

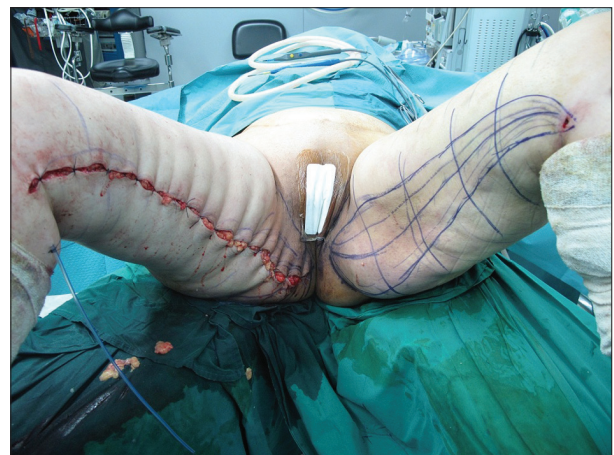


Figure 2: Intra-operative view of vertical thigh lift demonstrating closure of the right thigh and laxity of the lift one

between 3 and 5 L, while in two patients with markedly obese thighs the volume reached 8 L.

Operative time in the medial transverse thigh lift ranged between 3 and 5 h, while in the vertical thigh lift was 6 and 8 h. Blood transfusion needed only in one patient with vertical thigh lift where 8 L were liposuctioned and her haemoglobin was 11 g pre-operatively.

Hospital stays ranged between 2 and 5 days. Drains were used in the vertical lift only and were removed after 2 days and sutures removed after 2 weeks.

All patients were given grade 1 (92%) as shown in the grading Table 1 except two patients were given grade 2 (8%) because of scar descent and visibility.

No skin necrosis or seroma, one patient developed superficial thrombophlebitis and required hospital stay for 5 days and anticoagulant treatment.

No labial distortion or separation encountered. No keloids or hypertrophic scars and lymphoedema were reported in the present study [Figures 3a-d, 4a-d, 5a-d and 6a-d].

All patients recovered well within 2 weeks without wound complications.

Scar displacement and visibility from the under wear occurred in two patients as they had bulky thighs and the incision line was placed little lower than the groin crease in early cases of the study to avoid labial traction. None of the patients needed further touch up. Follow-up scheduled every 3 months for 1 year.

DISCUSSION

Rejuvenation of the medial thigh requires removal of fat as well as excision and redraping of the entire medial thigh skin. The type and extent of deformity seen in the thigh of bariatric and non-bariatric surgery patients is extremely variable. Some of the patients who did deposit a high



Figure 3a: Pre-operative view showing bulky thigh and medial laxity



Figure 3b: Pre-operative view with thigh abduction

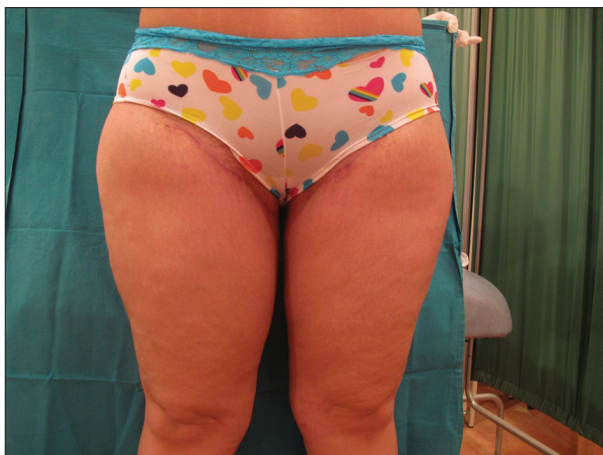


Figure 3c: At 6 months post-operative view of extended medial transverse thigh lift and liposuction, demonstrating the nicely seated incision line within the groin crease



Figure 3d: At 6 months post-operative view showing good thigh contour

Table 1: Patient’s assessment grading compiled by the author

Grades	Scars	Labia majora	Thigh contour	Major complications	Secondary correction
1	Linear, thin and seated in the crease	Normal	Regular and symmetrical	None	None
2	Visible but of good quality	Normal	Regular and symmetrical	None	None
3	Displaced and hypertrophic	Labial separation	Asymmetric	Lymphoedema	Revision of the deep anchoring sutures
4	Displaced and keloidal	Labial separation and distortion	Asymmetric and irregular	DVT	Total revision with tissue advancement procedure

DVT: Deep vein thrombosis



Figure 4a: Pre-operative view showing irregular medial thigh contour following previous Laser liposuction procedure



Figure 4b: Medial thigh depression due to previous liposuction

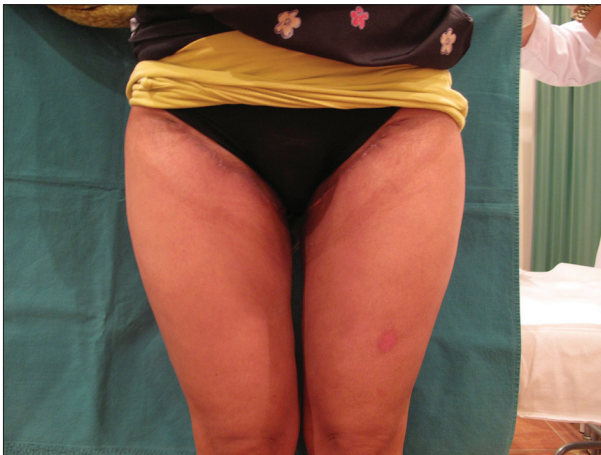


Figure 4c: At 3 months post-operative view after liposuction assisted medial thigh lift with nice thigh contour



Figure 4d: At 3 months post-operative view with inconspicuous groin crease scar

percentage of their excess fat in the thigh may present after bariatric surgery or liposuction with excellent deflation of the fat and primarily a loose circumferential skin-fat envelope. These patients are ideal to operate on, but only after they have undergone a belt lipectomy to lift the anterior, lateral and posterior aspects of the thigh. The most common thigh presentation in most female patients is one of a minimally deflated thigh despite an overall excellent weight loss and highly significant BMI change. These patients most often undergo extensive

liposuction of the thighs when their belt lipectomy is performed to deflate the thighs in preparation for an excisional procedure.^[19] In the present study, all the patients had undergone previous abdominoplasty and their body weight was stable for a period of 6 months and most of them were presented with bulky thighs that needed deflation and lifting at the same time.

There are differing schools of thoughts on the role and staging of liposuction in medial thigh lift patients. Some



Figure 5a: Pre-operative view showing medial thigh skin laxity following liposuction



Figure 5b: Pre-operative view showing irregular medial thigh contour



Figure 5c: Post-operative view following liposuction-assisted medial thigh lift showing good thigh contour

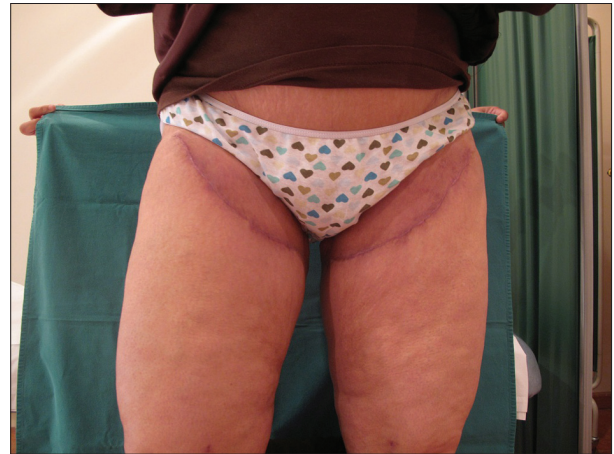


Figure 5d: Post-operative view showing downward displaced visible scar

surgeons prefer to perform simultaneous liposuction arguing that it allows one area to be treated and rejuvenated in one session while eliminating the need for extra surgery. However, significant oedema caused by the procedure can not only reduce the vascularity of the flaps, it may even compromise the final outcome. Others prefer to perform liposuction 6 months prior to the excision. Debulking of the area is thus achieved and the potential risks to the flaps due to resultant oedema are also eliminated. The demerits are an extra surgical stage, hospitalisation, increased costs and additional recovery time. In addition, the tissues may be stiffer making the later flap advancement more problematic.^[20]

Overall, to attain a significant improvement in the thighs, they should be deflated either naturally by the process of weight loss, or surgically by liposuction before their final excisional procedure. In our series, liposuction was performed simultaneously with the thigh lift in the same session. Synchronising liposuction with the lifting enabled us to harvest more skin and facilitated the dissection with

minimal blood loss. On the other hand, bruising and oedema were more evident than in cases where liposuction was performed in a previous session. However, there were no wound healing complications in my patients. Furthermore, liposuction allowed the preservation and isolation of lymphatic vessels easily during the dissection thus lymphoedema was not a concern in the present study.

The treatment of medial thigh excess, before the current era of MWL morphology, has been fraught with potential problems related to scar migration, vulvar distortion and recurrence.^[21] Lockwood described the necessity of deep tissue anchoring techniques to minimise complications and maximise the durability of results in thigh lifting.^[3,9,10] Thus most of the current medial thigh lift techniques are based on Lockwood' concept of supporting tissues with sutures. The author's substantial approach is to support the flap while reducing distortions of the vulva and mons pubis. The success of this procedure depends on patient selection, surgical planning and patients' realistic expectations.^[3,11,22]



Figure 6a: Pre-operative view showing bulkiness and laxity affecting the whole medial thigh above and around the knee

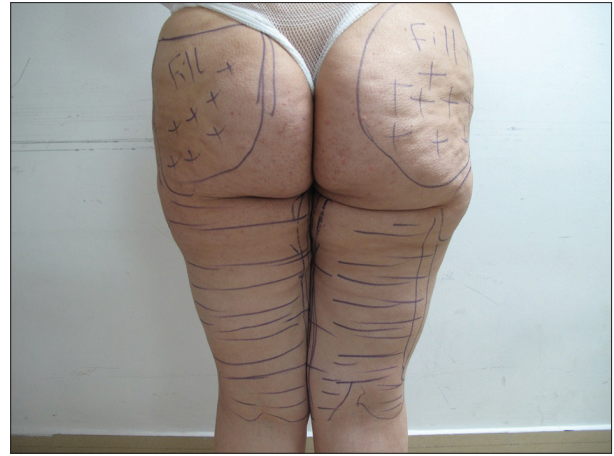


Figure 6b: Pre-operative view showing the posterior aspect of the thigh



Figure 6c: At 6 months post-operative after liposuction-assisted vertical thigh lift with good thigh contour and definition of the knee region



Figure 6d: At 6 months post-operative view with hidden vertical scars

In the present study, the extended medial transverse thigh lift had provided tightening of the medial, lateral and anterior aspects of the thigh. In fact this was facilitated by the previous lipoabdominoplasty which provided some tightening to these areas through the lateral tension or flankplasty extension of the abdominoplasty.

In his study of nine patients, Kolker performed circumferential thigh lift using the previous abdominoplasty incision line as a long line for deep anchoring and tension distribution, alleviating the burden borne by Colles' fascia and the groin anchor points.^[23] In my patients, only deep sutures anchoring the lower skin flap to Colles' fascia and the fascia overlying the adductor group of muscles were enough to avoid labial separation. Scar migration was encountered in two patients earlier in the study with bulky thighs, but the overall results were successful.

The medial transverse thigh lift does not improve circumferential redundancy of the middle to lower thighs. Vertical medial thigh band extensions have been described, but for the most part with no technical details. With the era of MWL resulting from different bariatric surgery techniques, Regnault described the extended thighplasty and other authors described the L-thighplasty where a vertical extension from a circular excision around the lower buttocks and across the groins but with unacceptable scars.^[24,25] The long limb excision reduces circumferential excess to tighten the anterior, medial and posterior aspects of the thigh. The short limb suspends the upper thigh and improves the mons pubis.^[26]

In the present study, I performed medial vertical excision without horizontal or circular extensions in five patients who presented with upper and lower thigh laxity and bulkiness mainly around the knee region. In such cases, transverse excision will not be enough to solve the problem. In all patients with vertical lift the scar was

located posterior to the median line of the thigh and was not visible from front and was accepted by the patients. Furthermore, because of the backward direction of the scar toward the ischial spine, labial distortion was avoided in my series which is considered a major mishap with transverse excision. Most of these scars mature into fine lines and are not visible on exposed thighs during walking.

Combining abdominoplasty and lower body lift with the L-thighplasty does improve severe lower torso and thigh laxity with reasonable scars and minor complications.^[26] Ted Lockwood, originally combined these procedures.^[3] However, by 2001 he preferred to stage the transverse medial thigh lift after the lower body lift.^[27,28] He argued that medial thigh laxity is improved by the abdominoplasty and lower body lift. A staged upper medial thigh lift is performed later, if necessary.^[3]

I found Lockwood's opinion is more profound and practical; we followed the same policy in our study, performing the abdominoplasty first allowed to express more tension to the anterior and lateral aspects of the thigh. In addition, any residual deformity from previous surgery can be corrected with the thigh lift later. Thus, I preferred staged procedures to avoid serious complications of lengthy operations, the need for blood transfusion, prolonged recumbency and the possibility of deep vein thrombosis and pulmonary embolism.

Significant venous problems should instigate a vascular consult and any evidence of lymphedema should be considered a contraindication to lower-extremity recontouring. In the present study, none of our patients suffered post-operative lymphoedema or deep vein thrombosis as the level of liposuction in the medial vascular territory of the thigh was superficial to all important vessels.

It is very important for those who are going to include a horizontal resection of skin to evaluate the degree to which any downward traction is transmitted across the perineal junction to produce lateral traction on the labia. The complication of labial spread with subsequent exposure of the labia minor can produce significant symptoms and has often been the primary complaint leading to medicolegal action in thigh-reduction procedures. Some authors were recommend avoiding horizontal excisions if at all possible and where they must be done, extreme measures to prevent labial distraction are warranted, but occasionally unsuccessful.^[19]

In the present study, labial spreading or separation was not encountered as the incision line drifted few

centimetres away from the labial margin and the meticulous testing before final skin excision and lastly the deep anchoring sutures of the lower flap to the fascia covering the adductor longus muscle and to the Colles' fascia.

Adverse results associated with current medial thigh lifting procedures include pigmented or hypertrophic scars; flattening of the vulva as a result of traction created by the lower flap on the vulvar tissues; caudal wound migration that cannot be hidden when the patient is wearing a swimsuit; and recurrence of inner thigh ptosis, which may require additional corrective surgery.^[2,4,29] Proper patient selection, accurate problem detection, choosing appropriate technique and following strict rules mentioned above, all these can offer a safe and successful surgery.

Thighplasty is gaining popularity and ascending curve owing to the increase in the number of bariatric surgery and the daily coming new trends that encourage more patients to go through it safely. Liposuction assisted thigh lift improves thigh contour while providing discontinuous thigh undermining. Anchoring of the skin flap to the Colles' fascia and to the fascia of the adductor muscles reinforces the transverse medial lift and avoids scar descent.

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