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Minimal incision medial brachioplasty: two years experience.

Mohamed R. El-Hadidy, Hossam El-Din A. Ismael, Al-moddather M. El-Hadidy, Omar O. Shouman, Loai El-Bassiony

Plastic and Reconstructive Surgery Unit, Mansoura University Hospital, Egypt.

Summary

Minimal Incision Medial Brachioplasty: two years experience.

Brachioplasty is an aesthetic reshaping of the upper arm after removal of excess medial skin and fat. The growing popularity of bariatric surgery has increased the number of brachioplasties performed. One of the major drawbacks of brachioplasty is the unsatisfactory appearance of the surgical scar. Minibrachioplasty, that can achieve much of the improvement of a traditional brachioplasty while concealing the scars within the confines of a short-sleeve shirt or blouse. Over two years, 15 female patients were seen seeking for brachioplasty. Their ages range from 25 to 55 years. All patients were examined in an upright position with arms abducted at a 90 degree angle in relation to the body. Patients were categorized according to the skin tone and amount of fat into two groups. Group 1 included ten patients with excess fat and a moderate degree of skin laxity. This group underwent minimal incision medial brachioplasty associated with liposuction. Group 2 included five patients with massive weight loss after bariatric surgery presenting little fat tissue, severe brachial ptosis, and poor skin quality, and we used a buried de-epithelialized flap instead of excision of skin to augment the arm. Follow-up of these patients was about 18 months. All patients were pleased with their results. Our results showed that all patients achieved significant reductions of 15% to 25% in arm circumference measurements, and the resulting scars were smooth, flat and inconspicuous. Wound infections and small areas of incision dehiscence had occurred in 2 elderly patients. We treated them conservatively with oral antibiotics and local wound care and do not necessitate reoperation. Minimal incision medial brachioplasty technique can be used as the first choice procedure for most patients seeking arm reduction.

Key words: Minimal incision medial brachioplasty

INTRODUCTION

Brachioplasty is the aesthetic reshaping of the upper arm after the removal of excess medial skin and fat. The new contour should be attractive, the scars should be inconspicuous, and the complications should be minor. After bariatric surgery and massive weight loss, patients evolve a bizarre arm deformity that extends through the axilla and onto the chest¹.

One of the major drawbacks to brachioplasty has been the unsatisfactory appearance of the surgical scar. Changes in the location of incisions and the combination of liposuction with superficial excision have led to decreased risk to underlying nerves and lymphatics, with improved scarring and decreased postoperative edema. Minibrachioplasty highlights the evolution of upper arm contouring, because it combines the use of liposuction with a well-camouflaged area of excision to deliver a refined contour with minimal scarring to the select patient².

This article describes a minimal incision medial brachioplasty technique that can achieve much of the improvement of a traditional brachioplasty while concealing the scars within the confines of a short-sleeve shirt or blouse. Minimal incision medial brachioplasty can be performed either separately or in combination with other body-contouring procedures.

PATIENTS AND METHODS

Over 2 years, 15 female patients were seen seeking for brachioplasty. Their ages ranged from 25 to 55 years. All patients were examined in upright position with arms abducted at a 90 degree angle in relation to the body. The amount of fat tissue and the

degree of skin flaccidity were evaluated in relation to body weight. Patients were categorized according to the skin tone and amount of fat into two groups.

In group 1, ten patients with excess fat and moderate degree of skin laxity associated with overweight undergo liposuction and minimal incision medial brachioplasty.

In group 2, five patients with massive weight loss after bariatric surgery possessing little fat tissue and poor skin quality underwent minimal incision medial brachioplasty with buried de-epithelialized flap. Patients' arm circumferences were photographed and measured pre- and postoperatively. A written consent was obtained from all patients. Patients were informed about the potential complication of this procedure as visible scars, infection and nerve affection.

Patients were marked in the upright position with the anterior and posterior limits of the axillary incision marked in the axillary skin crease with the arm at the side of the patient. The arm is then abducted to 90 degrees and the two points are connected in the axillary fold, delineating the final position of the scar. Using medial traction on the upper medial arm skin, the amount of skin excision was marked in an elliptical fashion. This usually measures 3 to 5 cm in vertical distance (Figure 1).

In group 1, under general anesthesia, the area at the medial aspect of the arm where liposuction will be done is marked and the opening for the liposuction cannula was marked at the lower medial aspect of the arm.

Incisions in the axilla (arm pit) were made in the shape of an ellipse. We use an infiltration of anesthetic solution with 500 ml of saline solution, 20 ml of lidocaine 2%, 3 ml of sodium bicarbonate 8.4%, and 1 ml of adrenaline 1:1000 infiltrated through the skin area to be excised and through a small incision posterior to the elbow.

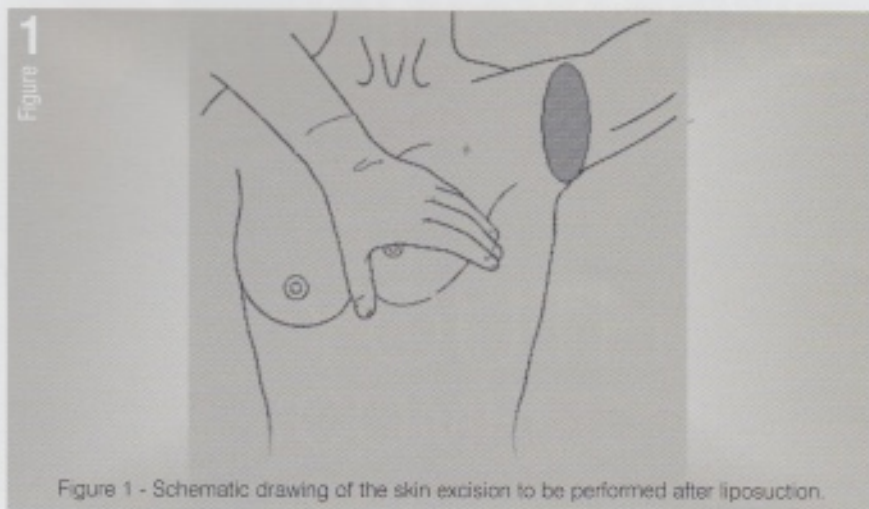


Figure 1 - Schematic drawing of the skin excision to be performed after liposuction.

Liposuction was performed throughout the posterior one-half of the circumference of the upper arm with a 3-mm Mercedes cannula. The liposuction was performed in both the deep and superficial planes to maximize skin contracture.

After Liposuction was performed to remove unwanted fat, excess skin was excised. Anchoring sutures were used to control the tension of the wound closure and scar from widening.

In group 2, with the patients under general or local anesthesia, we used a buried de-epithelialized flap instead of an excision of skin in order to create a more youthful appearance of the arm while supporting the scar on a bed of dermis. Closure is performed in a layered fashion with 3-0 Vicryl interrupted sutures in the deep dermis and 4-0 polydioxanone running subcuticular suture, and the skin is reapproximated and dressed with *Dermabond*.

The liposuction ports are closed with a single 6-0 fast-absorbing suture. No drains are used in this procedure. After the procedure was completed, a dressing of *Steri-Strips*, gauze, and a tubular elastic garment was applied. The arms were wrapped and patients were cautioned to keep their hands elevated at about heart-level and their arms straight at the elbow for the first two days following surgery to prevent swelling.

POSTOPERATIVE CARE

Antibiotics were administered perioperatively and continued for 3 days postoperatively. The patient is placed in a long-arm surgical garment which provides compression to the areas of liposuction, which is maintained for 3 weeks. The patient may shower 2 days after the procedure.

Patient activity is not limited after surgery and early ambulation is encouraged, though arm abduction is limited to less than 90 degrees for 3 weeks postoperatively. Patients were followed up for about two years.

RESULTS

Over two years, we performed a minimal incision medial brachioplasty on 15 patients.

The operative time was approximately 90 minutes for the two sides, but frequently the time was halved by team surgery.

Follow-up of these patients was about 18 months. All patients were pleased with their results. All patients had significant improvement in the appearance of the upper arm.

The results showed that all patients achieved significant reductions of 15% to 25% in arm circumference measurements, and the resulting scars were smooth, flat and inconspicuous. Wound infections and small areas of incision dehiscence had occurred in 2 elderly patients. We treated them conservatively with oral antibiotics and local wound care and do not necessitate reoperation. Nerve injury, hypertrophic scarring, major wound complications, and lymphedema have not been observed in our patients.

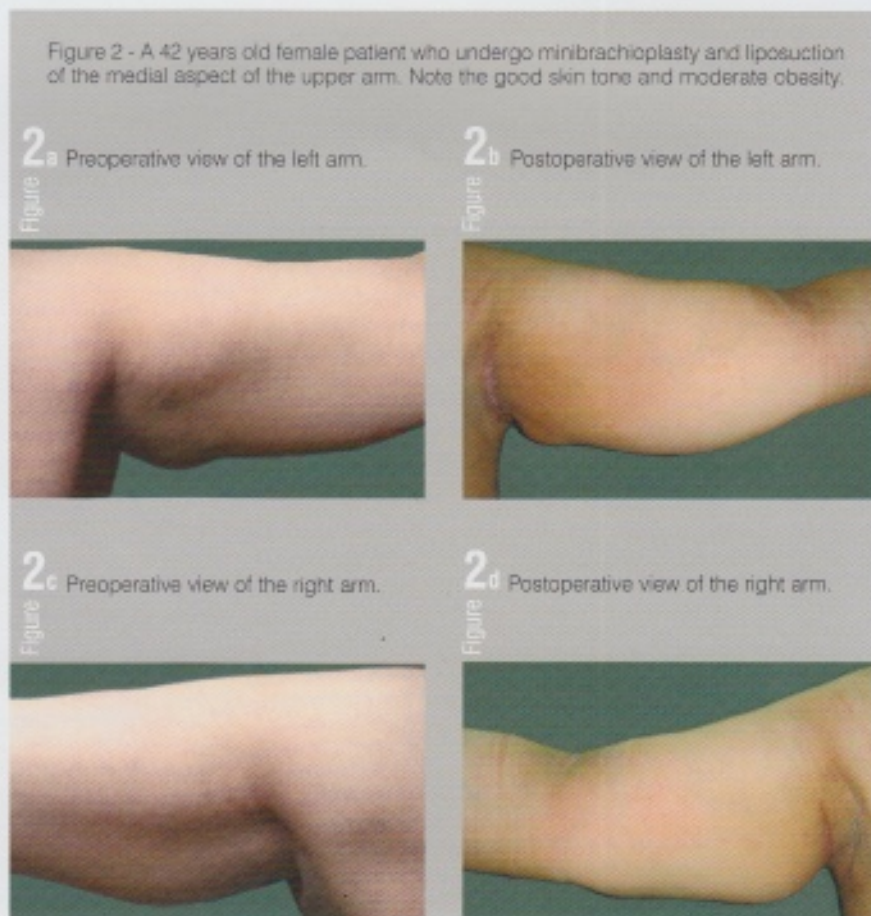


Figure 2 - A 42 years old female patient who undergo minibrachioplasty and liposuction of the medial aspect of the upper arm. Note the good skin tone and moderate obesity.

Figure 2a Preoperative view of the left arm.

Figure 2b Postoperative view of the left arm.

Figure 2c Preoperative view of the right arm.

Figure 2d Postoperative view of the right arm.



Figure 3a



Figure 3b



Figure 3c



Figure 3d

Figure 3
A 48 years old female patient who undergo
minibrachioplasty and liposuction of the
medial aspect of the upper arm.

Figure 3a: preoperative view of the left arm.
Figure 3b: postoperative view of the left arm.
Figure 3c: preoperative view of the right arm.
Figure 3d: postoperative view of the right arm.

Figure 4
A 40 years old female patient with
massive weight loss after bariatric
surgery possessing little fat tissue
and poor skin quality underwent
minibrachioplasty with
buried de-epithelialized flaps.



Figure 4a



Figure 4b

Figure 4a: preoperative view of the right arm.

Figure 4b: postoperative view of the right arm.

DISCUSSION

Plastic surgeons are often confronted with the difficult problem of treating excess upper-arm bulk. In patients with both excess fat and a significant amount of loose skin, lipoplasty (liposuction) alone may reduce the fat but leave the upper arms with unattractive, hanging skin.

Surgical correction of cosmetic deformity of the upper arm has been performed since 1943 when *Posse* done the first upper arm reduction technique via an elliptical incision³. In 1954, *Correa-Isturza* and *Fernandez* published the first aesthetic brachioplasty technique⁴. In 1975 *Pitaranguy* described surgical correction for lipodystrophy of the lateral thorax, upper arm, and elbow as a single procedure⁵. In the same year, *Baroudi* described a dermolipectomy of the upper arm that placed the scar in the brachial sulcus². This procedure removed an ellipse of skin from the upper arm, with the scar oriented longitudinally⁶.

Juri et al. described the use of a quadrangular flap and the first T-closure in their efforts to move tissue proximally into the axilla and then excise it with axillary incisions⁷.

Borges then described the use of W-plasty incisions in an effort to improve the aesthetic result⁸.

In 1989 *Goddio* described using a buried de-epithelialized flap instead of an excision of skin. The buried flap is supposed to fill the medial aspect of the arm and create a more youthful appearance while supporting the scar on a bed of dermis⁹.

Lockwood then applied the concept of suspension of the superficial fascial system¹⁰. *Gilliland* and *Lyo*s described circumferential para-axillary superficial tumescent liposuction as an alternative to brachioplasty¹¹.

The procedure utilizes the skin retraction that occurs with superficial liposuction. *De Souza Pinto et al.* recommend the use of the italic

double S molds for brachioplasty marking to achieve bilateral, symmetrical, minimal, localized scarring and to decrease surgical time and morbidity¹².

Teimourian and *Malekzadeh* described creating an axillary ridge to treat patients with generalized accumulation of fat and moderate skin laxity¹³. The first description of brachioplasty after massive weight loss was included in a case report by *McCraw*¹⁴.

*Regnault*¹⁵ described brachioplasties with varying longitudinal scars depending on the amount of excess skin. The shorter-scar version is similar except that the skin excision described previously creates a vector of pull only anteriorly and proximally.

The difficulties with brachioplasty have remained, despite the descriptions of many different surgical procedures. The study of *Konietgen J* and *Moran SL* reported that the overall complications rate with brachioplasty

was 25 percent. The complications noted were seroma, hypertrophic scarring, cellulitis, wound dehiscence, subcutaneous abscess, and nerve injury to the medial antebrachial cutaneous nerve.

Their study concluded that brachioplasty can be performed with a very low incidence of major complications, but both surgeon and patient should be aware of the possible risks associated with brachioplasty¹⁶.

In our work, the complications rate is decreased secondary to short incision and superficial excision plane. Wound infection and dehiscence is the only complication in our series which is similar to the work of Trussler and Rohrich¹⁷.

Procedures with axillary scars only address skin excess in the longitudinal direction, whereas procedures with an incision extending toward the elbow in the brachial sulcus are able

to address both longitudinal and transverse skin excess. However, the presence of a scar along the medial border of the arm is not acceptable to many people².

In our work, patients in group 1 undergo mini-brachioplasty and liposuction. They had a significant improvement with minimal complications. Liposuction helped the skin to contract and our results are similar to the work of Abramson in 2003².

The mini-brachioplasty described above utilizes the skin contractility from liposuction combined with skin excision to address both longitudinal and transverse skin excess. This procedure works best when the majority of skin excess is located in the proximal one half of the upper arm.

In group 2, our patients had excess skin and minimal adipose tissue. We used the buried de-epithelialized flap to fill the medial aspect of the

arm and create a youthful appearance. This procedure improves upper arm contour while allowing the patient to wear a short-sleeve shirt without visible scars which is similar to the work by Goddio⁹, but his final scar was in the medial aspect of the arm.

CONCLUSION

The results showed that all patients achieved significant reductions of 15% to 25% in arm circumference measurements, and the resulting scars were smooth, flat and inconspicuous. Mini-brachioplasty technique can be used as the first choice procedure for most patients seeking arm reduction.

Modification of the procedure may be necessary in obese patients or those with poor skin tone and elasticity.

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Extreme liposculpture: from knee to ankle.

Peroni Ranchet A

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Summary

Extreme liposculpture: from knee to ankle

The Author describes his liposuction surgery technique from knee to ankle.

He has carried out liposculpture in these body regions for more than twenty years, achieving excellent results.

The Author has studied and implemented a particular type of cannula, specifically indicated for ankle suctioning and aimed to make handling easier.

INTRODUCTION

After almost thirty years of experience in liposuction surgery, there are still some body regions in which the plastic surgeons do not dare to venture, fearing poor results or high operating risk. The failure to meet this demand leads to considerable psychological pain in potential candidates, especially women, who for example do not feel at ease wearing skirts. The fullness over the knee, exposed below the skirt, gives the impression of a similar fullness in the thigh, whereas the thigh seems too slender when a bathing suit is worn.

Over the years, moreover, when in standing position, the fat over the knee tends to come down and "wrap up" the knee cap.

Another significant concern is the lack of a well-defined and slender shape of the leg, whereby women feel "forced" to wear boots but in the most serious cases it is even impossible for the leg to fit in the boots.

The Author has carried out liposculpture in these body regions for more than twenty years, achieving excellent results in the knees (starting from the distal third of the thighs), the legs and the ankles (released from the oppression of fat dysplasia, which covers and conceals the true anatomic contours).

DESCRIPTION OF SURGERY

In milder cases it is possible to identify the posterior as well as the antero-lateral fat columns.

The thickness is appreciated by palpation in upright position and the contours are marked. In more severe cases the dysplasia is widespread and suction is required everywhere, even on the anterior surface of the tibia.

We start posteriorly by performing the inferior incision over the malleolus at the very beginning

of the columns, while the superior incision is made at the popliteal folds.

Anaesthesia and vasoconstriction by infiltration should be abundant by using infiltration needles and advancing them on the superficial fascia. The advancement of the needle is followed by means of palpation in order to check on its course and location. A retrograde injection is carried out. Three-to-four mm cannulae are used for suctioning, according to the thickness of the fat pad. We begin from the deeper levels and move gradually towards the surface. The optimal colour of the suctioned fat should be lemon yellow. The movements of the cannula should be as longitudinal as possible and monitored through palpation. The subdermal layer should be reached in order to allow for maximal skin retraction. All fat residues should be removed, especially at knee (over and around the knee cap) and ankle levels. At the end of the suction phase, it is recommended to pass the tip of the cannula on the subdermal layer without suctioning.

Once completed the posterior region, the patients are made to lie on their backs, and the same procedure is performed in the anterior region of the leg.

Soon after stopping the suction, the incisions are sutured and dressed. 140-denier compression tights are necessary for one week.

One week later, the stitches are removed and a massage cycle is started. The compression tights should be worn at daytime only, for 3-4 months, until the final results are achieved.

The Author has studied and implemented a particular type of cannula, specifically indicated for ankle suctioning and aimed to make handling easier: thanks to its design, the surgeon does not hit the patients' heel or dorsum of the foot with the handle, while keeping the exact sliding plane of the cannula.

Key words: Extreme liposculpture; Ankle suctioning

Figure 1. Preoperative anterior view: the fat pad is wrapped around the knee cap. The dysplasia is widespread throughout the leg.



Figure 2. Preoperative posterior view: the dysplasia is widespread throughout the region.



Figure 3. Preoperative lateral view: the skin and the fat pad have evidently slid down over the knee cap. Widespread lipodystrophy.



Figure 4. Postoperative anterior view: removal of the adipose tissue over the knee cap, with skin retraction. The knee cap is now more evident. Knee, calf and ankle modelling.



Figure 5. Postoperative posterior view: medial emptying of thighs and knees, calf modelling and ankle thinning.

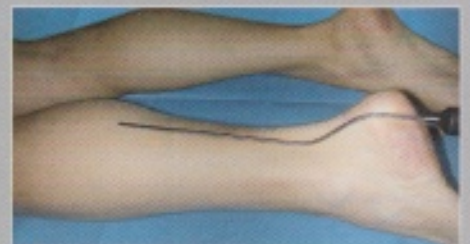


Figure 6. Postoperative lateral view: disappearance of the fat excess over the knee cap and modelling of the entire leg.

The cannula designed by the Author for ankle suctioning



Example of use of the cannula.



Surgical therapies for reconstructive phalloplasty in a female-to-male transsexual: literature overview and analysis of case reports.

Muggianu M, Barabino P, Callegari S, Puggioni V, Robello G, Puricelli O, Santi PL

Institute for Study and Research for Cancer - Department of Plastic and Reconstructive Surgery of Genova, Italy

Summary

Surgical therapies for reconstructive phalloplasty in a female-to-male transsexual: literature overview and analysis of case reports.

In the last 20 years, 50 patients suffering from F-M transsexual syndrome were referred to our Department of Plastic and Reconstructive Surgery at the University of Genova: 33 of them underwent reconstructive phalloplasty using different surgical techniques. This report analyses the advantages and disadvantages of the various reconstructive techniques, the patient satisfaction and the aesthetic results obtained.

In the cases examined, the most used technique is the transposition of the rectus abdominis muscle at the pubic level, by covering it with a free radial muscle flap taken from the forearm. The advantages of this technique compared with the others are the good volume and stiffness of the neo-penis, an appropriate quantity of well-vascularised skin to cover it, the aesthetic acceptability to the patient, the return of tactile and erogenous sensibility and the lowest number of surgical procedures (one-stage operation).

Regarding the overall patient satisfaction (approximately 70%), the majority reported to be highly satisfied with the results obtained through the reconstruction, and succeeded in having a satisfactory sexual life.

To conclude with, as we are dealing with a disorder involving the whole patient personality, and despite the objective limits of the surgical technique, it is asserted that the patient reaches a good level of satisfaction thanks to a better social life.

Key words: Reconstructive phalloplasty, Reconstructive urethra, Female-to-male transsexual patient

INTRODUCTION

The term "transsexualism" is used to identify a syndrome in which there is a dissociation among the chromosome, gonadic, hormonal and psychic sex, due to the fact that the individual with a genotype and a phenotype of a gender thinks of belonging to the opposite one.

The transsexual patient, being affected with a deep disease in gender identity, needs a multi-subject approach which involves, besides the generic and the plastic surgeon, the psychologist¹, the endocrinologist and the legal doctor. In our structure, the patient, who is undergoing surgery for female-to-male modification of the sexual characters (RCS, *Sexual Characters Reattribution*), after obtaining legal permission², has to make some interviews with the psychologist of our staff in order to consider her expectations and avoid any serious psychiatric disease.

In many cases, a 6 month period of interviews is enough to be put in the surgery list; the psychologist takes care of the patient before and after the operation, especially helping her to get accustomed to her new identity. Only in some cases, the patient follows a longer procedure, if the psychologist considers it necessary to overcome her bad feeling. In our experience, the psychological support has proved effective in reducing overrated and unreal expectations connected with the operation.

Our case reports refer to the female-to-male syndrome and analyze the different techniques used in phalloplasty over the years, from 1989 to

nowadays, in the Department of Plastic and Reconstructive Surgery at the University of Genova. 50 F-M transsexual patients were referred to our structure: for 33 of them, phalloplasty was carried out with different methods³; 1 patient underwent surgery for positioning testicular prostheses; 9 patients underwent demolition surgery; 7 patients gave up after a period of individual psychotherapy (see graphic number 1).

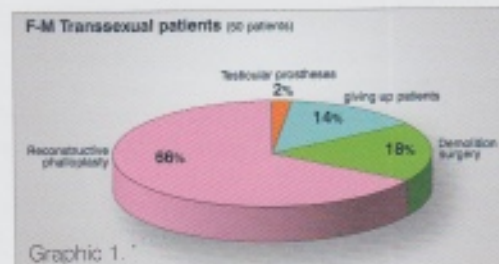
This paper examines the pros and cons of each method for reconstruction, the patient satisfaction and the aesthetic results obtained.

MATERIALS AND METHODS

The surgical approach for female-to-male modification of the external genitalia and breasts includes a demolition stage of exeresis and a following reconstructive one.

In particular, the surgical procedures concerning the former include⁴: bilateral subcutaneous mastectomy, hysterectomy-bilateral salpingo-oophorectomy, obliteration of the vagina, virilizing hormonal therapies (testosterone); the latter do: neophalloplasty, insertion of testicular prostheses, penis prostheses, urethra creation if necessary.

The goals of neo-phalloplasty are both morphological and functional: aesthetic acceptability to the patient, enough bulk to tolerate the insertion of a penile stiffener, the creation of a competent urethra allowing voiding while standing, the



return of tactile and erogenous sensibility, as few operations as possible.

The operation for secondary sex character modification is completed with the creation of the scrotum, the testicles and the insertion of the penis prostheses in day surgery in a following stage. As for reconstructive phalloplasty, literature reports different methods over the years: tubulized abdominal flaps, muscular flaps or mio-cutaneous flaps based on the groin muscle and on the rectus abdominis muscle and free flaps.

The first techniques adopted were tubulized flaps taken from the abdominal area; later, at the end of the '80s, in order to improve the aesthetic appearance and the neopenis stiffness, miocutaneous groin flaps (Horton⁵) and rectus abdominis muscle flap (Gübert, Horton, Sant⁶ et al.) were proposed: the derma component or dermoadipose one was used to form the axis of the new penis, while the muscular one was employed as a support to guarantee volume and stiffness.

The disadvantages of this procedure are the difficulty of suturing the flap on itself, in particular in those patients in whom the dermoadipose wall is too thick, the lack of sensibility and visible abdominal vertical scars.

To overcome this problem, the vertical rectus abdominis muscle flap (Santi 1988) may be used covered in the dorsal portion by a skin flap: this technique allows to bring a good muscle segment inside the neopenis and guarantees better stiffness, but the excessive thickness of the flap, the retraction of the skin graft and the lack of sensibility are its drawbacks.

A further evolution of this technique is represented by the association of the rectus abdominis muscle flap with the dorsal muscle flap of the foot (Gübert e Horton 1987). With this method, the sensibility, given by the free flap, is obtained thanks to the nerve anastomosis carried out between the foot dorsal nerve and the clitoris dorsal nerves. However, the disadvantages are the bad retractive scar in the donor side of the two flaps (vertical abdominal scar and dorsal foot) and the limited size of the free flap.

In 1984 Chang⁷ suggested to use the Chinese or radial forearm flap obtaining the following results: good looking appearance, sensibility (anastomosis between lateral and medial antebrachial cutaneous nerve and dorsal nerve of clitoris), even if inappropriate stiffness (lack of internal support) and a limited size of the neopenis still remain.

At last, in 1990 Sant⁸ and others proposed to associate rectus abdominis muscle flap with radial free flap thus exploiting the advantages of the two techniques, recognized as very reli-

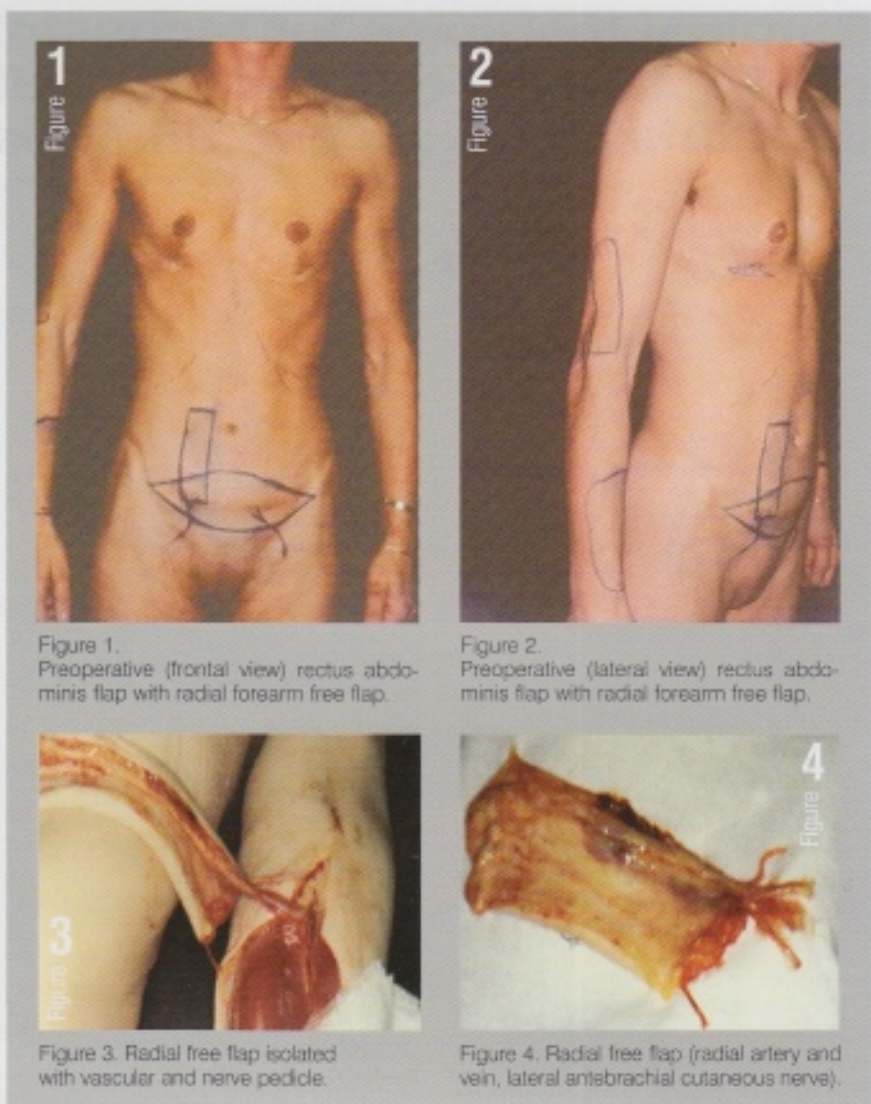


Figure 1. Preoperative (frontal view) rectus abdominis flap with radial forearm free flap.

Figure 2. Preoperative (lateral view) rectus abdominis flap with radial forearm free flap.

Figure 3. Radial free flap isolated with vascular and nerve pedicle.

Figure 4. Radial free flap (radial artery and vein, lateral antebrachial cutaneous nerve).

able by most authors so far, assuring good sensibility, satisfactory appearance and good stiffness.

Lately, the use of the lateral forearm free flap (Bloem et al. 1993) has been described for neophalloplasty in one-stage procedure.

33 out of 50 patients who were referred to the Department of Plastic and Reconstructive Surgery at the University of Genova underwent both demolition and reconstructive surgery for adjustment of the secondary sexual characters; for this purpose, some of the techniques described in literature were combined with the experience gained in post-oncological reconstructive surgery of the penis.

An inferior transposition of a rectus abdominis musculocutaneous flap with resurfacing, was performed on 24 patients (Chang) by using a radial forearm free flap (Figure 1).

Through a suprapubic skin incision, the abdominal skin was raised and, after the inci-

sion of the right rectus fascia, the underlying muscle was isolated with its vascular pedicle which is the inferior epigastric artery and vein; a subcutaneous tunnel was developed to allow transposition of the muscle to the pubic area where the labia majora were dissected and the clitoris was de-epithelialized and buried into the flap.

At this point, the rectus muscle flap was resurfaced with a radial forearm free flap (Figure 3-4); its vascular pedicle, radial artery and vein, was anastomosed with a branch of the superficial femoral artery and vein, while the dorsal nerves of clitoris were sutured with lateral and medial antebrachial cutaneous nerves.

The radial flap ranges from 6 to 8 cm in width and from 14 to 16 cm in length, depending on the forearm dimension. That may be considered a limit of the technique above mentioned for a suitable phalloplasty.

2 patients, who refused the free flap method,



5
Figure

Figure 5. Isolated microvascularized gracilis flap.

Figure 6. Tubulized microvascularized gracilis flap.

Figure 7. Tissue expander of the labia majora.



7
Figure

were surgically treated with the transposition of the rectus abdominis muscle covered with a skin graft at full thickness, taken from the inferior abdominal area.

3 patients were re-operated because of bleeding anastomosis and consequent retraction of the rectus abdominis muscle flap. In these cases, a gracilis musculocutaneous flap (Figure 5-6), taken from the medial region of the thigh, was drawn and positioned on the pubic area and then tubulized, while the rectus abdominis muscle was utilized for reconstruction of the scrotal volume⁹.

The gracilis muscle is a narrow and thin little band obliquely positioned on the medial surface of the thigh and vascularised by some vessels which enter the deep surface of the muscle coming from the deep femoral artery. For 2 patients, who presented good local anatomical situations, such as hypertrophy of the labia majora, and refused the scar retrac-



6
Figure



8
Figure

Figure 8. Intraoperative view of the rectus abdominis muscle flap transposed.

Figure 9. Dermoadipose tubulized flap around a Foley catheter.



9
Figure

tion due to the radial flap draw, we associated the technique of the transposition of rectus abdominis muscle flap with the skin expansion of the labia majora in order to obtain a proper cover of the transposed rectus abdominis muscle (Figure 7-8).

Infact, the skin of this region is the most similar in colour and quality to the penis one and the most suitable for covering the transposed rectus abdominis muscle, besides guaranteeing a better erogenous sensibility of the genitalia area.



Figure 10
Chang flap tubulized on Foley catheter.



Figure 11
Lateral arm flap tubulized in side.



Figure 12
Immediate Postoperative Urethra performed by trans flap.



Figure 13
Postoperative 2 months later.

Just in one case, we used the original Chang technique which consists in utilizing the sole free radial flap previously anastomosed thanks to the above mentioned method and simply tubulized in the pubic area.

Recently, another reconstructive technique has been carried out on a 33-year-old patient: in one stage, we have performed a subcutaneous bilateral mastectomy and the neopenis reconstruction with the usual forearm flap methodology, partially modified by substituting the rectus abdominis muscle with triangular-shaped subcutaneous abdominal fat which was tubulized and upset downwards.

DISCUSSION

In our case reports, the most used technique is the transposition of the rectus abdominis muscle covered with the radial free flap taken from the forearm. The advantages of this method are an appropriate degree of stiffness and volume of the neopenis, aesthetic acceptability to the patient, tactile and erogenous sensibility and the one-stage sur-

gery procedure.

Although the muscular component may slightly atrophise in the following months, thanks to this technique, the penis moves very naturally on the internal support and remains elastic and pliable.

According to our experience, this surgery procedure is the gold standard to obtain the best results in neophalloplasty. However, some disadvantages concern the excessive muscular atrophy, which might cause a volume decrease up to 30-40%, the possibility of microvascular thrombosis with failure of the radial free flap (equal to 20-30%), the operation time (abt 6-7 hrs), the long-lasting visible scars on the donor sides.

The patients, who underwent transposition of the rectus abdominis muscle flap covered with free skin graft, on one side, took the advantages of the reduced operation time with a consequent short hospitalization (3-4 hours), but, on the other, experienced deformation of the neopenis due to skin graft scar fibrosis with following long term results likely to be less than optimal and inadequate sexual performance.

On 2 patients we used the gracilis musculocutaneous flap, recognizing the importance of the inclusion of a muscular flap along the axis of the neopenis. However, the gracilis muscle is too thin to provide sufficient strength and support, thus causing postoperative atrophy because of the reduction of the subcutaneous fat; the vascular pedicles are not so reliable and the skin island tends to retraction. The only advantage of this technique is the reduced operation time (about 3 hrs).

The utilization of the labia majora tissue expander, performed in 2 selected cases and on patients' request, might represent an alternative reconstructive technique, which is just acceptable: in these cases, the neopenis healed without any complication, but, 4 months later, the retractile expanded skin causing disfigurement and shortening of the neophallus. The patients were partially unsatisfied with length, but rewarded by their sexual life for preserving tactile and erogenous sensibility of the external genitalia.

In one case, we employed the sole tubulized radial free flap because the patient had psychosomatic characteristics suitable for small-sized neophalloplasty. This kind of flap gives an optimal morphologic result, however, in our opinion, the lack of an internal support produces insufficient stiffness of the neopenis.

As for the last case described, the abdominal dermo adipose flap covered by the radial free flap offers unquestionable advantages to the abdominal wall, because the rectus abdominis muscle remains untouched; yet, at this stage, the patient follow up lasts approximately six months. Therefore, even if volume and stiffness are considered acceptable, the wound healing is not completed. As a matter of fact, the operation did not have any complication and the reconstructed genitalia morphology appeared satisfactory. At the end of the reconstructive procedure, the urethral was constructed on 13 out of 33 patients, because the following complications always occurred: urethroperineal fistula and stenosis caused by the difficulty of connecting the female urethral meatus to the urinary tract of the penis orientated with different anatomical axes.

In 4 patients, the urethral was made with a full thickness skin graft which was applied around a no.16-18 Foley catheter and the transposed muscle was rolled and sutured around it (Figure 9). The functional result was compromised by stenosis and fistula duct.

In other 4 patients, a peritoneal flap, adjacent to the posterior rectus fascia, was sutured around a Foley catheter; in this case, we supposed the metaplasia of the peritoneal epithelium turning into multilayer epithelium, which is typical of the

urinary tracts, but stenosis, fistula and total obliteration of the duct still occurred.

In 1 patient, the urethra was obtained through a fascia and peritoneal flap linked with a skin graft, causing unfortunately the same complications over mentioned.

In 3 cases, the penile urethra was made thanks to Chang's modified technique: the central part of the radial free flap was tubulized on Foley catheter and sutured in double layer, trying to connect it to the female urethra. In these cases, the neo-duct stayed open, but a fistula occurred at the anastomosis level where connected with the female urethra. Just in one case, a patient had a working urethra obtained by a free arm¹⁰ flap tubulized on Foley catheter and positioned inside the muscular component (Figure 11). The rectus abdominis muscle flap was transposed in the pubic area and then microsurgery anastomosis was performed between the deep brachial artery, and satellite veins, and the superior epigastric artery of the rectus abdominis muscle: even if that was a free flap with a little pressure flow, there was not any complication about vascularisation (Figure 12).

The creation of a competent urethra allowed voiding while standing (Figure 13).

CONCLUSION

Some cases of female-to-male modification carried out in the Department of Plastic and Reconstructive Surgery at the University of Genova have been reported.

We have taken notice of the patient satisfaction through some interviews with the psychologist. The evaluation principles are related to an aesthetically appealing look of the neophallus, and mainly to sexual penetration and rigidity of the neopenis which guarantees a satisfactory sexual life.

33 out of 50 patients, which were referred to our department, underwent reconstructive phalloplasty with different techniques and were observed for the following 24 months.

As for the general patient satisfaction¹¹ (approximately 70%), the subjects who seek phalloplasty want their external genitalia to have a scrotum, a glans, and want to be able to void in standing position. It is known that in phalloplasty obtaining sufficient rigidity¹² allowing for sexual penetration is quite hard. The main limiting factor is that there is no good substitute for the penis erectile tissue: in many cases, the insertion of various transplants and implants led to complication and failure. In the last years, the lipofilling technique grew in importance aiming at improving the skin trophism and contrasting the physiologic atro-

phy of the muscle and the consequent decrease of the neopenis volume. Only in 30% of cases, patients were not so satisfied with the poor stiffness and length of the neopenis, therefore we positioned autologous cartilage or a rigid implant, with unfortunate tendency to be eroded and extruded. To sum up, it is asserted that, despite the objective limits of the surgical technique, the patient, who undoubtedly suffers from a disorder which involves the whole personality, will reach a good level of satisfaction thanks to a better social life.

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Vulvo-perineal reconstruction with V-Y flap after extensive surgery for vulvar cancer.

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Summary

Vulvo-perineal reconstruction with V-Y flap after extensive surgery for vulvar cancer.

Background - Soft-tissue reconstruction following vulvar cancer resection is a difficult challenge because of the functional, locational, and cosmetic importance of this region. Although numerous flaps have been designed for vulvar reconstruction, each has its disadvantages.

Methods - The Authors present their experience with the antero-medial fasciocutaneous V-Y advancement flap for vulvovaginoperineal reconstruction after vulva cancer resection. This flap is supplied by underlying fascial plexus derived from perforators of the superficial and deep femoral artery and indirect branches through musculocutaneous perforators of underlying muscle.

Result - All flaps survived completely, with no severe major complications.

Conclusions - This flap is reliable, sensate, easy to perform, and has matched local skin quality and concealed donor-site scar on the antero-medial side of thigh. In addition, it can cover large vulvovaginal defects. In our experience, the antero-medial thigh fasciocutaneous V-Y advancement flap has proven very useful for vulvar reconstruction, especially at the point of donor-site scar, flap thickness, and degree of flap advancement.

Key words: Vulvo-perineal reconstruction, V-Y flap, Vulvar cancer.

INTRODUCTION

Vulvar cancer accounts for 5 percent of all female genital cancers and 1 percent of all malignancies in women. It can be observed more frequently after the fifth or sixth decade of life. Recently, there has been an increase in the incidence of vulvar cancer. Vulvar cancer is a diffusing disease that permeates into regional lymphatics, requiring radical resection with inguinal lymph node dissection for treatment. Characteristically, this area is easily contaminated by secretions from the vaginal exocrine gland and vulnerable to infection after flap surgery. Furthermore, soft-tissue reconstruction following vulvar cancer surgery presents a difficult challenge. In the past, radical vulvectomy defects had been reconstructed using two bilateral longitudinal incisions and repaired by primary closure, skin grafts, and local flaps. There is no doubt that flaps are superior to skin grafting or direct closure in terms of the aesthetic and functional aspects of reconstruction.

Many flaps have been used in the search for a reliable, single-stage, technically simple flap to repair the majority of surgical defects. This has led to numerous surgical options, ranging from random to axial, fasciocutaneous, and musculocutaneous flaps.

The use of flaps is required not only for covering large defect but also for free tension closure to avoid wound diastase, delayed healing with possibility of infection, stenosis, retraction with perineal disfunction, longer hospitalization and poor cosmetic results.

We think that the "ideal" flap should bring to the defect a good vascularized pad of skin and subcutaneous fat the same thickness of the wound, bring a variable amount of tissue able to close both small to wide wounds, reestablish functional needs, minimize negative impacts on both walking and sitting, create a natural aesthetic appearance, possibly be a sensitive flap, and require a single-stage operation.

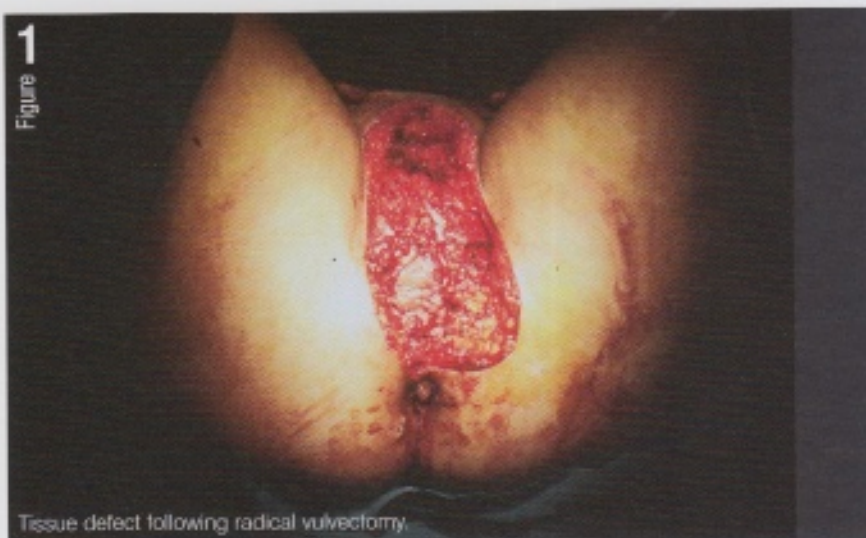


Figure 2



Immediate postoperative result.

PATIENTS AND METHODS

This study presents a retrospective review of our past 15 years of experience using 23 flaps in 20 vulvar reconstructions following extensive vulvectomies.

All patients who underwent a V-Y flap vulvar and/or perineal reconstruction after radical surgery for vulvar neoplasia at *Fondazione San Matteo Hospital* in Pavia from January 1993 to December 2008 were included (figs 1, 2 and 3). Data were collected with regard to age, histology, FIGO 1994 stage, previous surgery, demolitive and reconstructive surgery performed, local morbidity, length of hospital stay, stenosis of the vaginal introitus and urethral meatus deviation.

Twenty three patients, who had been presenting with vulvar neoplasia, underwent V-Y flaps surgery to restore the vulvar and/or perineal region. Their ages ranged from 41 to 83 years, with an average age of 70). Eighteen patients presented with primitive carcinoma of the vulva, three with local relapse, and 2 with vulvar *Page's disease*. Three patients received preoperative vulvar and inguinal radiation, two with concomitant chemotherapy.

FIGO 1994 stage was: IB in 6 cases; stage II, 8; stage III, 2; stage IVA in 2 cases.

Eighteen patients were treated by radical vulvectomy, in two patients a radical emivulvectomy and in three a radical perineal excision for relapse were performed. Reconstruction with



Figure 3

Result after 2 months.

bilateral V-Y flaps patients was done' and monolaterally in five, in two of them a contralateral different flap was chosen.

We used two different V-Y advancement flaps: a subcutaneous pedicle flap and a musculocutaneous gracilis flap. In larger defects, where further mobility of the flap is required, the gracilis muscle is distally identified and divided in order to obtain a better release and advancement of the flap.

RESULTS

No patient experienced any complication during surgery. Patients generally reported satisfactory medical conditions at mean 10 days (range 4-15) and than were discharged from the hospital with a mean of 13 days.

Major complications included mono- or bi-lateral lymphocele in two patients, within 6 months after surgery; fever and local infection (inguinal/vulvar swab positive for either *Proteus*, *Klesbiella* and *Providencia Retgani*) in four

patients, within 6 days after surgery; inguinal hematoma in one patient, three weeks after surgery; bilateral superficial venous thrombosis in one patient, 1 month after surgery; diarrhea in one patient, at day 6 after surgery. Four patients reported stitch diastasis of the cutaneous margin from the vaginal edge of 1.5 up to 2 cm, detected 4-13 days after the operation. In all but one case, satisfactory healing occurred without further surgery. Two patients experienced introital stenosis surgery after relapse and two after radiation. Although sexual function was not declared, the remaining patients had a satisfactory introitus with accepted a medium size speculum. One patient underwent Z-plasty 1 year after surgery because of an urethral meatus deviation and another one complained misdirection of the stream.

DISCUSSION

Several flaps have been described for use in the vulvar area but the V-Y flap has received relatively little attention, particularly with regard to the satisfactory results that can be obtained. On the contrary, the great value of the technique is given by its reliability and the simplicity with which it can be performed. Moreover, previous local irradiation does not preclude absolutely the use of these flaps. The gracilis muscle is elevated, with the same V-Y advancement pattern, exclusively when larger well vascularised is required by the dimension of the soft tissue resection. The deep defects of the vulva and perineum following extensive radical excisional surgery can be, in fact, effectively covered by this thicker flap in one-stage primary repair.

CONCLUSION

The V-Y advancement flap technique represents a relatively simple and effective procedure for vulvar defects when performed either with a subcutaneous pedicle or as a myocutaneous unit. We believe that in most instances the V-Y flaps represent a valid option for vulvar reconstruction thanks to the simplicity and rapidity with which it is performed. Moreover, these flaps demonstrate good versatility and reliability. Preoperative radiation therapy does not appear to be an absolute drawback. Considering the increasing focus of gynaecologic oncologists on preserving normal body image, this technique may have valuable role to play.

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Supraumbilical laxity after miniabdominoplasty with muscle plication and no umbilicus transposition: Surgical treatment and prevention.

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Summary

Supraumbilical laxity after miniabdominoplasty with muscle plication and no umbilicus transposition: Surgical treatment and prevention.

Abdominoplasty is a surgical procedure that removes excess abdominal skin and fat (panniculectomy), and tightens lax anterior abdominal wall muscles. Several grades of abdominal laxity and defects of the abdominal wall and umbilicus can be found out while planning and performing an abdominoplasty; different techniques can be carried out in order to correct these defects. This study presents a modified miniabdominoplasty technique (which adds a half moon umbilical incision) in order to avoid important tissue laxity and epigastric bulking after miniabdominoplasty without umbilical transposition in patients with important musculofascial laxity, which is feasible and safe, with a reduced operating time, and gives good aesthetic and functional results.

Key words: Miniabdominoplasty, Umbilicoplasty, Umbilicus reshaping, Ombie umbilicus, Supraumbilical laxity, Muscle plication.

INTRODUCTION

When performing an abdominoplasty, three fundamental defects of the abdominal wall must always be addressed by the plastic surgeon. They include redundant skin, excess fat, and musculofascial laxity. Plastic surgeons have found that this procedure consists of dermolipectomy and rectus plication, extremely effective in restoring the abdomen to its youthful shape in the vast majority of patients¹.

The classic mini-abdominoplasty is a surgery generally indicated for cases in which cutaneous laxity of the abdomen's inferior region is associated with adiposity and/or musculofascial laxity.

However, in some cases, the characteristics of the abdomen are such that resort to a traditional mini-abdominoplasty would involve an unsatisfactory final result due to the unavoidable caudalization of the navel and supraumbilical skin excess which leads to supraumbilical laxity and epigastric bulking² (Figure 1). In addition to this, when important abdominal wall reconstruction is required, it is very difficult to perform a complete supra and infraumbilical muscle plication with the only suprapubic incision and particularly when

there is an umbilical hernia with an "ombie umbilicus" to correct.

Various techniques have been proposed in order to obtain better results in miniabdominoplasty without navel transposition that generally include additional visible abdominal scars (vertical, horizontal, suprapubic, supraumbilical, etc.)³⁻⁷.

We use a halfmoon umbilical incision in order to perform a supraumbilical tissue reshaping and to facilitate supraumbilical muscle plication.

MATERIALS AND METHODS

Accurate evaluation of the abdominal wall is performed with hernia and rectus diastasis marking. The xiphoid apophysis and the midline to the pubic area are drawn (Figure 2).

We identify pubic scars and draw the patient's underwear (with low waistband). If there is a pubic scar (Pfannenstiel for ex.) we try to use it as the lower incision.

Two oblique lines from the lower line are drawn till the anterior-superior iliac spine. It is important to draw a half moon (2-3 cm width) on the



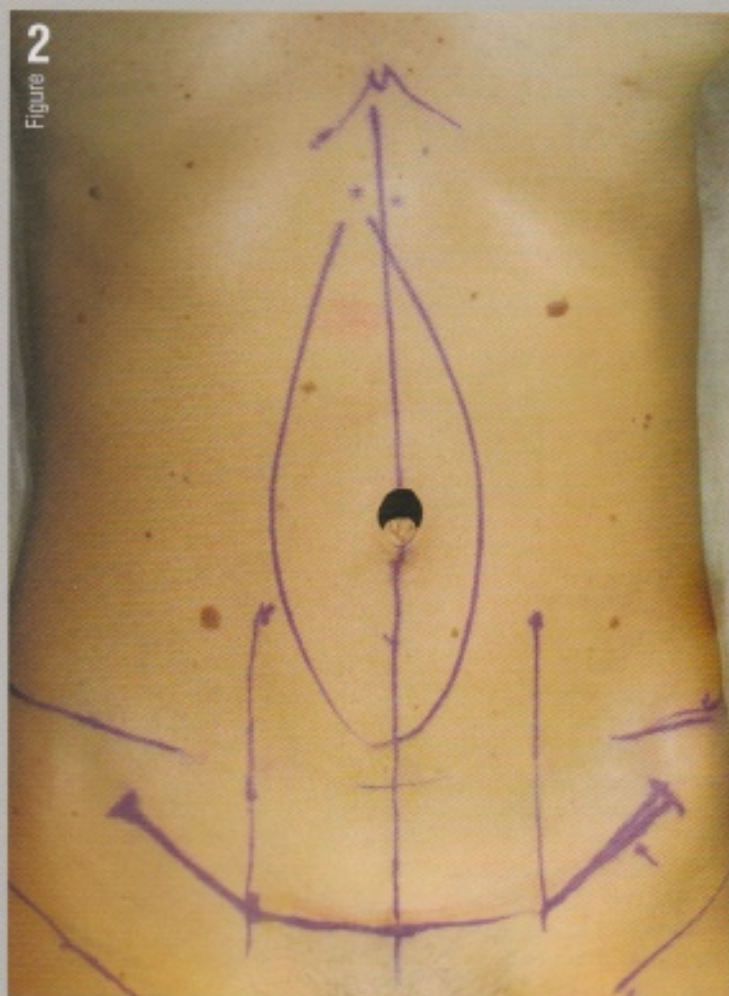


Figure 2

Figure 2. Pre-op markings

Figure 3. Triangular stitches to reshape the umbilicus and the supraumbilical skin (like a periareolar suture).

Figure 4. Muscle diastasis during pregnancy



polyglactin 3/0 and triangular stitches to reshape the umbilicus (Figure 3) and the supraumbilical skin (like a periareolar suture). In certain cases, when there is umbilical hernia, it is possible to correct not only the hernia but also an outie umbilicus which is frequently present. Finally a compressive dressing is placed.

CASE REPORT

The patient was 35 years old affected by important rectus abdominis diastasis after 2 pregnancies. We had met the patient during the 3rd month of the second pregnancy (Figure 4) and an important diastasis was diagnosed.

upper part of the umbilicus (can be reshaped after muscle plication and suture of the pubic incision).

The supra fascial undermining is performed to the xiphoid and costal margins isolating the umbilicus. The upper part of the umbilicus is dissected through the half moon incision, which facilitates undermining.

Once the undermining is performed, supra and infraumbilical vertical muscle plication is carried out with Polyester 0 and Polyglactin 0 (simple stitches) and running suture in Polyglactin 2/0. With a half moon incision a retractor can be introduced in order to facilitate the supraumbilical muscle plication, which is sometimes difficult to perform through the only suprapubic incision.

Once the plication has been performed, the excess of skin is removed and the umbilicus is reshaped. The width of the halfmoon depends on the amount of tissue excess of the supraumbilical area (mean 2 cm). It is very important to suture (partially or definitively) the pubic incision (after excess abdominal skin removal) so as to better reshape the upper part of the umbilicus and the abdomen. The upper part of the halfmoon can be trimmed if there is too much redundant skin. If, after muscle plication epigastric bulking is noticed, additional lateral undermining and additional supraumbilical skin resection can be performed.

Particular attention is paid during the suture: We use



Figure 4



Figure 5. Pre-op

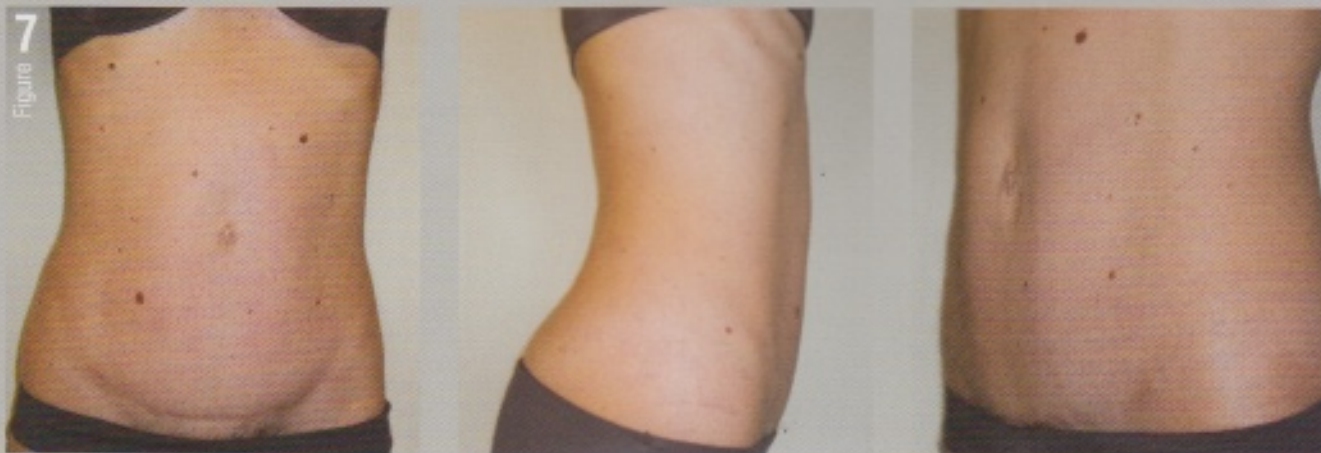
12 months after the delivery, a mini abdominoplasty was performed. The patient had 10 cm. of muscle diastasis with umbilical hernia and an outie umbilicus (Figs 2-5-6).

A miniabdominoplasty was carried out with a half moon umbilical incision (a supraumbilical nevi was removed and histologically analyzed while removing the half moon flap). Supra and infraumbilical vertical muscle plication was carried out with Polyester 0 and Polyglactin 0 (simple stitches) and running suture in Polyglactin 2/0. Only 5 cm of lower abdominal excess skin removal was performed. In this case a good result was obtained with hernia correction, waistline improvement, muscle plication and umbilicus reshaping (from outie to innie) (Figure 7).

Figure 6. Pre-op. Hernia and "outie" umbilicus.



Figure 7. 1 year post-op.



CONCLUSIONS

With this modified technique it is possible to improve tension of the entire abdomen, decrease waist perimeter, and improve uniformity in the contour of the anterior and lateral view, avoiding the epigastric bulking generated when infraumbilical vertical plication is sometimes used alone. The half moon incision provides good supraum-

bilical fascia exposure that helps the surgeon to correct abdominal wall defects and avoids and/or reduces supraumbilical laxity and epigastric bulking in those patients in which abdominoplasty with navel transposition is contraindicated.

The umbilicus can be reshaped from outie to innie particularly after hernia correction.

It is also possible to treat and correct epigastric bulking in those patients in which a miniabdominoplasty (maybe without supraumbilical muscle plication) has been performed (Figure 1); in these cases it is sometimes possible to correct it with the only half moon incision and supraumbilical skin reshaping.

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Lo stato dei capelli come sintomo di patologia interna: casi clinici e diagnosi differenziale

Venerdì 25 Settembre 2009

Ore 17.00

- Chirurgia della calvizie come tecnica di chirurgia plastica ricostruttiva
- La terapia medica complementare alla chirurgia della calvizie: proposte di protocolli e casi clinici
- Indicazioni terapeutiche della chirurgia della calvizie

TAVOLA ROTONDA DI CHIRURGIA TRICOLOGICA

G. Agostinacchio, V. Gambino, M. Maspero,
P. Rosati, L. Sala, M. Toscani, P. Tesaro

Moderatore: Fabio Rinaldi

Sabato 26 Settembre 2009

Presidente: Marcella Guarrera

Ore 09.00

ASPETTI DERMATOLOGICI
(Stefano Veraldi, Fabio Rinaldi)

Ore 10.00

DIAGNOSI DERMATOLOGICA ISTOLOGICA
(Raffaele Gianotti)

Ore 11.00

ASPETTI NUTRIZIONALI E INTERNISTICI
(Alessandro Saibene)

Ore 12.00

ASPETTI ENDOCRINOLOGICI
(Roberto Lanzani)

Ore 13.00

LUNCH

Ore 14.00

ASPETTI GINECOLOGICI
(Enrico Pedrini)

Ore 15.00

ASPETTI PSICHIATRICI
(Cesare Maffei)

Ore 16.00

LA TERAPIA GALENICA
(Mauro Castigliani)

Ore 17.00

DISCUSSIONE E COMPLIAZIONE ECM

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Microdermabrasion after Dermabrasion and Ultra-thin Skin Graft: A new Hope for Post-burn Scars.

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Summary

Microdermabrasion after Dermabrasion and Ultra-thin Skin Graft: A new Hope for Post-burn Scars.

Permanent depigmentation and rough irregular surface usually occurs after deep burn wounds which heal by secondary intention. This problem can be treated by dermabrasion and thin split-thickness skin grafting. Thirty patients whose ages ranged from 17 to 41 years (20 female, 10 male) were treated. All patients had suffered from post-burn rough hypertrophic, depigmented scars on different sites of their bodies. All patients underwent triple therapy of dermabrasion of hypopigmented rough scars and simultaneous ultra-thin skin graft using a motor-driven dermabrader and electrical dermatome. Microdermabrasion was started after healing the graft.

All grafts were healed well with minimal complications, the donor site healed rapidly. Adequate repigmentation, flat surfaces and smooth edge of the graft were obtained in the patients that complete the out department regimen of microdermabrasion (at least two months).

In conclusion, mechanical dermabrasion is the preferred method of creating raw surfaces in suitable time; the depth of tissue ablation can be controlled. The smooth raw surfaces created can be sustaining thin skin grafts well. In spite of the clinical improvement of the texture and colour match especially in the graft edges, further histological study is essential to clarify the mechanism of microdermabrasion.

Key words: Post-burn Scars; Permanent depigmentation; Microdermabrasion

INTRODUCTION

The presence of hypertrophic scars limits social interaction and affects daily activities by limiting range of motion.

Because thermally induced scars are typically recalcitrant to treatment owing to their proliferative nature, their appropriate management remains a challenge to physicians from a variety of specialties.

Permanent depigmentation occasionally develops after deep partial-thickness and full thickness burn injuries, which heal by secondary intention. Depigmentation, which is also referred as leukoderma, can cause severe aesthetic problems, particularly in dark-skinned individuals.

The pathophysiology of post-burn depigmentation remains obscure.

Studies investigating changes in pigmentation of excisional wounds suggest that scar tissue provides a barrier to melanocyte migration and melanin transfer¹.

Various surgical procedures were described aiming at autotransfer of melanocytes to the site of post-burn depigmentation after creation of raw surface by surgical excising or dermabrasion at these sites of depigmentation.

Dermabrasion is the preferred method of creating raw surfaces and this can be done by motor driver dermabrader or carbon dioxide laser²⁻⁶.

The microdermabrasion not used in the previously mentioned procedures to soothing and



improve the line of demarcation between the ultra-thin graft and normal skin.

The current clinical study was undertaken to evaluate the result of Microdermabrasion after Dermabrasion and ultra thin Skin Graft in treatment of Hypertrophic, Hypopigmented post burn Scar.

PATIENTS AND METHODS

This clinical study has been carried out at the *Plastic Reconstructive Department of Mansoura University*. Thirty patients whose ages ranged from 17 to 41 years (20 female, 10 male) were treated. All patients had suffered from post-burn hypertrophic, depigmented scars with slight surface irregularities on different sites of their bodies within 6 month to 7 years prior to presentation. These patients subjected to a total of 30 operative procedures of dermabrasion and thin skin graft using a motor-driven dermabrader and electrical dermatome (Figure 1). After healing the graft the microdermabrasion was used. The most common causes of burn injury were scald and fire injuries. The time interval between the date of the burn injury and operation ranged from 6 months to 7 years. The surface area of treated leukoderma sites ranged from 0.5 to 3 percent of total body surface area. The postoperative follow-up period ranged from 1 to 12 months, with an average period of 8 months. The demographics are summarized in Table 1

Table 1
Demographics data of the patients

Patients (no.)	30
Mean age	27
Sex	
Female	20
Male	10
Site of lesion	
Face	10
Neck	9
Shoulder	4
upper limb	7
Cause of burn	
Scald	15
Fire	10
Chemical	5
Time from injury to operation	
Range	6 month – 7 year

OPERATIVE PROCEDURE

The procedure is done under general anesthesia. The skin of the depigmented, wrinkled areas and the skin graft donor areas was prepared with povidone/iodine topical antiseptic solution and draped in a routine sterile fashion. The areas were wiped with saline-soaked gauze and dried with a gauze sponge. The hypopigmented areas were dermabraded with a motor-driven dermabrader without tourniquet (Figure 1).

The dermabrasion should be deep enough to cause even punctuate bleeding from the superficial dermis and to remove the surface irregularities leaving behind it smooth and flat surface. Gauze soaked with 1:100,000 epinephrine is applied topically to the raw area for haemostasis.

An ultra-thin split thickness epidermal skin graft (0.2 to 0.3 mm in thickness) was harvested from the unburned thigh regions with a electrical dermabrader (*Pad-gett Electrodermatome*) (Figure 1).

The grafts varied in width from 5-10 cm and

the length varied according to the needs of the individual patient.

After the establishment of haemostasis, the epidermal grafts were smoothly applied to the dermabraded region and fixed with fine (5/0) polypropylene sutures (Figure 2-3).

The graft and the donor site are covered with petrolatum gauze, gauze soaked with povidone/iodine and absorbent gauze and bandage. A plaster of Paris splint is used to immobilize the upper limb for 10 days. The first dressing was done after fifth day postoperative followed by frequent dressing every 48 h. After the graft was stabilized (three weeks postoperative) the patients subjected to receive our department regimen of dermabrasion in outpatient clinic, one treatment a week for a total of eight treatments, with each session lasting 15 to 25 minutes. No topical or local anesthesia before treatment. Each subject was instructed to apply of emollient and sun block daily to minimize the risk of sun exposure and to prevent post-inflammatory hyperpigmentation. Standardized photographic documentation was performed before and after each treatment.



Figure 2 - Left (preoperative) 18 years male patient with sever post-burn hypertrophic leukodermic scar over the neck with multiple web. (Right) The patient after two months postoperative.



Figure 3 - (preoperative) 23 years girl with sever post-burn hypertrophic leukodermic scar over the neck with multiple web.



Figure 3a- Intraoperative, the wound after dermabrasion.



Figure 3b - After application of ultrathin skin graft.



Figure 3c - The patient after the first dressing post operatively.



Figure 3d - The patient after 1 month postoperative

RESULTS

All patients were followed up for a minimum 8 months after surgery.

The repigmented areas were photographed before the operation and at monthly intervals after the operation. The results were subjectively evaluated by the surgeons. The Final result in the recipient site was graded for colour, texture and smoothness of the graft according to the scale shown in Table 2.

The result in the recipient site was considered satisfactory by all patients because the treated areas had slight miss-match in pigmentation or

texture. However, the skin graft appeared from the start pink in colour; subsequently, the grafts became hyperpigmented, and the hyperpigmentation gradually improved but slightly hyperpigmented when compared to the surrounding normal skin (i.e. demarcation between skin graft and normal skin exists, especially for smaller areas). Finally the texture and colour match between the graft and the surrounding skin considered satisfactory to excellent.

Complications were minimal as sliding the edge of the graft from the recipient site multi-

ple, small vesicles were appears after healing of the thin skin graft which disappeared spontaneously, hyperpigmentation of the skin graft. The donor sites have been observed to be healed within one week postoperative. Within a few months the pigmentation at the donor site is almost normal.

This procedure has consistently and reliably resulted in satisfactory to excellent repigmentation of non-pigmented areas following burn injuries. As regard the microdermabrasion the twenty-five subjects completed the entire my department protocol. Five subjects were discontinued.

The results of microdermabrasion after consecutive session at least 8 sessions were very satisfied to the all twenty-five patients. The patients start to achieve clinical improvement after 2 months from the procedure to smoothen the edges of the graft also texture and colour match of the skin.

Table 2
Grading of the final result in the recipient site

	Excellent	Satisfactory	Poor
Colour, texture and smoothness of the graft	Excellent colour and texture match with surrounding skin	Slight miss-match in pigmentation or texture	Obvious miss-match in pigmentation or texture

DISCUSSION

Skin colour varies according to changes in three-colour sources: melanin within the epidermis, oxyhaemoglobin within the skin vessels, and the cutaneous yellow pigments (bile and carotene). Melanin synthesis occurs in the melanosomes of melanocytes. Melanocytes have dendritic-like processes, in the skin it rest at the dermo-epidermal junction on the basement membrane. Melanosomes are transported from the melanocyte to about 36 neighboring keratinocytes and these interactive groups of cells are known as the epidermal-melanin unit⁷. The mechanism of this transport is unknown but may be related to filaments within the dendrites of melanocytes, membrane fusion and phagocytosis.

Although the true pathogenesis of skin dyspigmentation remains obscure, the hypopigmentation may be due to decreased melanin synthesis within the melanocyte or may be related to inadequate transfer of melanin from the melanocyte to the neighboring keratinocytes⁸. Another Authors suggests the hypopigmentation may be due to scar tissue provides a barrier to melanocyte migration and melanin transfer⁹. In my study the dermabrasion allowed for removal of the hypopigment epithelium and the ultra-thin skin graft allows for mechanical transfer the melanin-containing, basal cell bearing layer of the epidermis

Kahn and Cohen¹⁰ believe that hair follicles are the major source for melanocytes. These melanocytes migrate from the depths of the dermis to reside in the basal layer of the epidermis, which gives colour to the skin. So the leukoderma is due to the decreased concentration of hair follicles in that area. They also concluded that dermabrasion and thin skin graft has consistently and reliably resulted in good to excellent repigmentation of non-pigmented areas following burn injuries.

Erol and Atabay² concluded that dermabrasion is the preferred method of creating raw surface. Mechanical dermabrasion is done by a motor-driver dermabrader and abrasion should be deep enough to cause even dermal bleeding. The great advantage of this procedure is that it leaves a completely viable dermis that binds well with the skin graft.

Acikel and Unkur¹¹ studied the utilization of carbon dioxide laser for dermabrasion of post burn leukoderma and demonstrated a varying amount of thermal damage zone in the remaining dermis. Skin graft loss was demonstrated in 18% of cases. In current study the graft losses mainly due to mechanical factors about 3%. On the other hand, carbon dioxide laser has been used for skin de-epithelization with the

great advantage of being very rapid in action with minimal haemorrhage. There is a layer of thermal damage to the remaining dermis which should be very minimal to allow taking of the skin graft. If too much thermal damage remains, skin graft take is affected⁵.

Deghdy and EL-morsy¹² concluded that mechanical dermabrasion and simultaneous thin skin grafting is the treatment of choice for patients with post burn leukoderma, skin graft hyperpigmentation may be avoided by long term sun protection after the operation. They also mentioned hypertrophic scarring around the edge skin graft one of the complication, in current study the proper utilization of the microdermabrasion as a prophylaxis in high risk individuals can avoided that problems.

Microdermabrasion is office-based noninvasive mechanical resurfacing technique. The microdermabrator contains aluminum oxide or sodium chloride crystals that strike the skin and produce superficial trauma. It is theorized that the repetitive intraepidermal injury causes gradual improvement in damaged skin by stimulating fibroblast proliferation and collagen production, leading to new collagen deposition in the dermis.

Common side effects were mild to moderate discomfort occurring on bony areas during the treatment and an itching and tingling sensation for 2 days after treatment. No infections or scars were observed postoperatively¹³.

The results of microdermabrasion especially after consecutive session at least 8 sessions were very satisfactory to all patients. Although the true effect of microdermabrasion on skin graft remains obscure.

Our opinion the microdermabrasion plays an important role in improving and soothing the line of demarcation between skin graft and normal skin may be due to, it activates a dermal remodeling/wound healing cascade with minimal epidermal disruption¹⁴.

Other Authors suggest that both NaCl and Al₂O₃ microdermabrasion alter the epidermal barrier. These changes in epidermal barrier function may be responsible for the clinical improvement following microdermabrasion¹⁵. We recommend with the triple therapy (dermabrasion, ultra-thin graft and microdermabrasion) in all cases of rough hypopigmented burn scars. Also further histological study is essential to clarify the mechanism of microdermabrasion.

CONCLUSION

Mechanical dermabrasion is the preferred method of creating raw surfaces in

suitable time; the depth of tissue ablation can be controlled. The smooth raw surfaces created can be sustaining thin skin grafts well. In spite of the clinical improvement of the texture and colour match especially in the graft edges, further histological study is essential to clarify the mechanism of microdermabrasion.

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