GUIDELINES

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- Text—maximum of 500 words (not including references)
- References—maximum of five
- Authors—no more than five
- Figures/Tables—no more than two figures and/or one table

Authors will be listed in the order in which they appear in the submission. Viewpoints should be submitted electronically via PRS' *e*nkwell, at www.editorialmanager.com/prs/. We strongly encourage authors to submit figures in color.

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Viewpoints

Simple Two-Stage Reconstructive Technique for the Treatment of Infected Dura Mater

Sir:

An expanded polytetrafluoroethylene sheet is frequently used in the reconstruction of defects of the dura mater. However, these artificial implants are associated with a risk of severe infection after implantation.[1] In such situations, a pericranial flap has been used frequently,[2–4] but in serious situations such as infection from an artificial dura mater, easier and more reliable methods are required. In the present report, we describe a simple, reliable, two-stage duraplasty technique with which to cover the entire dural defect.

When an expanded polytetrafluoroethylene sheet or artificial implant is infected, the scalp, galea, and periosteum are raised, as a whole, from the cranial bone, and the infected transplanted artificial bone and expanded polytetrafluoroethylene sheet are removed completely. After washing thoroughly, the exposed arachnoid mater is covered with scalp (Fig. 1). After signs of infection disappear completely, the second operation is performed. The cranial skin is dissected over the galea so as not to expose arachnoid mater. Leaving some overlap around the primary dural defect, the pericranium is dissected from the scalp. At this stage, the pericranium is attached firmly to the remaining dura, sealing the cerebrospinal fluid (Fig. 2). Then, bony reconstruction with a titanium mesh plate is performed by fixing it to the surrounding intact cranial bone with titanium screws. The titanium mesh plate is then covered with a skin flap.

We performed this reconstruction procedure on two patients who suffered head injury and had received a previous implant of infected expanded polytetrafluo-

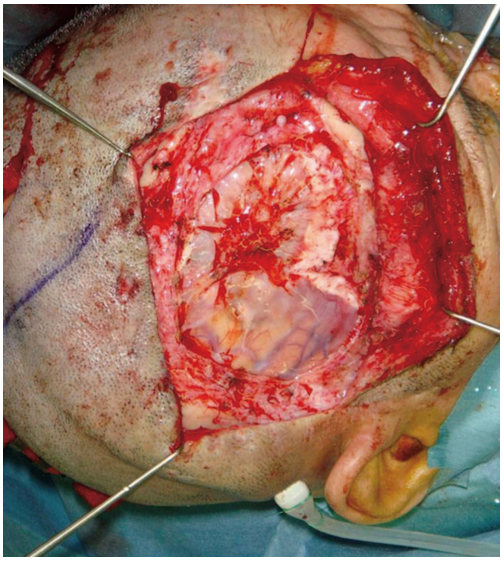

Fig. 1. After removal of the infected expanded polytetrafluoroethylene sheet, the arachnoid mater was exposed. The exposed arachnoid mater was covered directly with scalp.

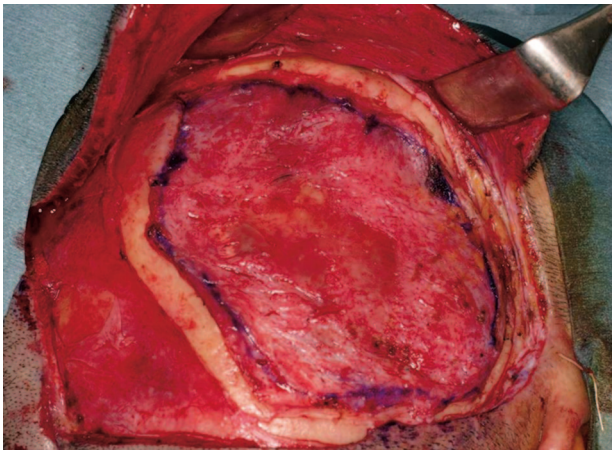

Fig. 2. Six weeks after the primary operation, a secondary operation was performed. The pericranium was attached firmly to the residual dura and sealed the cerebrospinal fluid.

roethylene sheeting. The size of the dural defects was 10 × 7 cm and 11 × 8 cm. The secondary operations were performed at 6 weeks and 1 year after the primary operations. In both cases, the pericranium was attached firmly to the residual dura, and the bony defect was reconstructed with a titanium mesh plate. There was no infection or exposure of the implant as a result of the present method.

In contrast to the conventional pericranial flap method, our method does not raise the galea and pericranium as a flap; instead, the whole scalp is lifted. The merits of our method over the pericranial flap method are that the flap (1) is easier to raise, (2) provides more reliable blood supply, and (3) leaves less dead space because the pericranium is not detached from the scalp. Also, with the present method, even if the pedicle of the pericranial flap is already ligated, the galea and pericranium can be applied to the dural defect and nourished by blood supplied from the skin. Also, because the flap attaches well to the residual galea, there is no need for suture to the residual dura mater. The present method is worth using when infection is severe and life threatening.

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Various Z-Plasty Designs for the Treatment of Columellar Scar in Rhinoplasty

Sir:

Columellar scarring may range from a simple wound incision depression to a major columellar deviation. These malformations should not be ignored but rather treated. As of the moment, the uses of Z-plasty have been limited in the correction of cleft noses.[1] Little has been mentioned regarding its vital role in columellar reconstruction, especially in the field of cosmetic rhinoplasty.

Four geometric variations of Z-plasty were used, namely, classic Z-plasty, double Z-plasty in series, mirror-image double Z-plasty, and compound double Z-plasty. For classic Z-plasty, the central limb was placed horizontally parallel to the long axis of the scar. The upper and lower limbs were placed correspondingly, making an angle of 45 to 60 degrees, creating two identical triangular flaps. Flaps were transposed and closed using 7-0 nylon.

Two Z-plasties were designed, one on top of the other, to cover the entire length of the scar (>1 cm). For better scar camouflage, the limbs of the Z-plasty should be limited to less than 1 cm in the facial region. Making a design larger than 1 cm will not only make the scar more obvious but also result in marked shortening of the width, which could greatly affect the columellar shape.

Double Z-plasties were placed side by side in a mirror image, maintaining a triangular area on top to preserve the columella in the center while altering the sides.

Two Z-plasties were also drawn side by side but this time one following the other. Release of scar contracture was accomplished with redirection of the columella to the central position.

To minimize noticeable scar, we emphasize the value of maintaining basic surgical principles. Dissecting in the right plane minimizes resection of blood vessels to preserve adequate supply to the tissue. Gentle handling of flaps is necessary to provide easy approximation of edges during wound closure.[2]

In the management of columellar scars, experience tells us that simple excision and resuturing are not adequate. The scar is almost always friable. It is superior to use the adjacent skin to cover the deficient area. Z-plasty can relocate healthier skin, change scar direction, interrupt scar linearity, and release or lengthen scar contracture.[3] It has the advantage of simplicity because it entails working in the same field, unlike in composite grafting or flap reconstruction. Likewise, the scar is barely visible to the naked eye because of its good color match.[4]

The technique mentioned above is generally being performed in conjunction with revision rhinoplasty. However, it can also be performed as a single procedure for columellar scar improvement.

Severe nasal contraction with loss of skin and soft tissue is a contraindication to Z-plasty. In these instances, the subnasale flap has been our procedure of

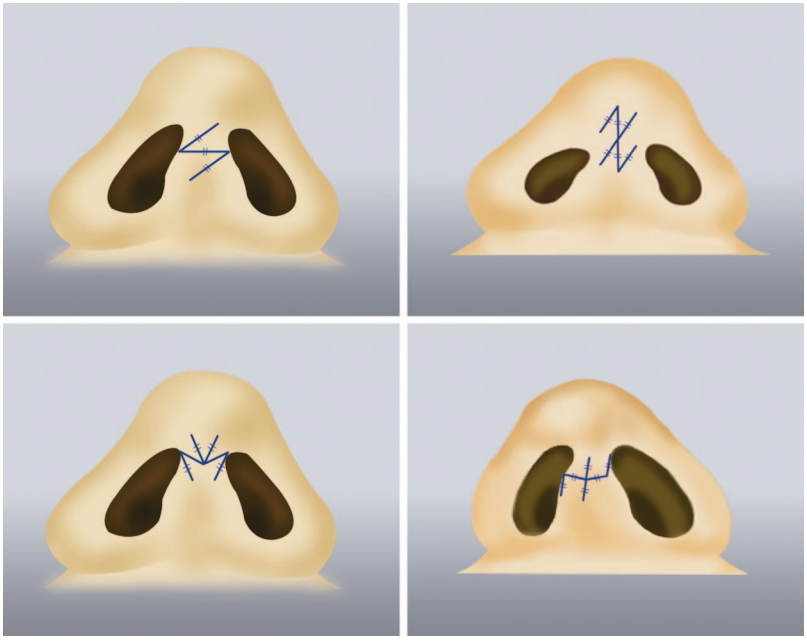

Fig. 1. The four geometric variations of Z-plasty.

choice for partial and total correction of columellar defects. It is typically performed when there is tissue deficiency in the low to mid columellar portion.[5]

Our several methods for correcting columellar scar were simple but yielded dramatic results. These treatments can be used and may be added to the surgeon's choice of surgical methods (Fig. 1).

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Postburn Philtrum and Upper Lip Reconstruction

Sir:

Facial burns cause multiple deformities. The upper lip and philtrum deformity is one of them. The upper lip restoration is composed of scar excision and

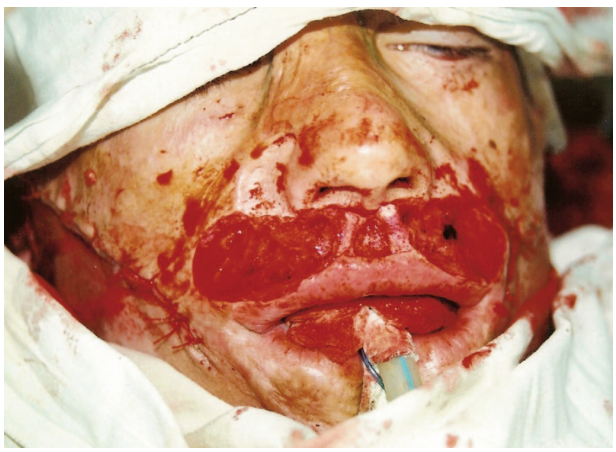

Fig. 1. In philtrum and upper lip resurfacing, scars are excised laterally of the stripes and between columns, and the epithelium is removed from the scar stripes (columns).

skin grafting.[1–3] As a result, the lip receives a rounded, smoothed shape that poses a major aesthetic defect. An effective method of philtrum reconstruction in burned patients has not been suggested so far. Major losses of the philtrum require a more innovative technique.[2] The author presents a new, effective method of simultaneous reconstruction of the upper lip and philtrum.

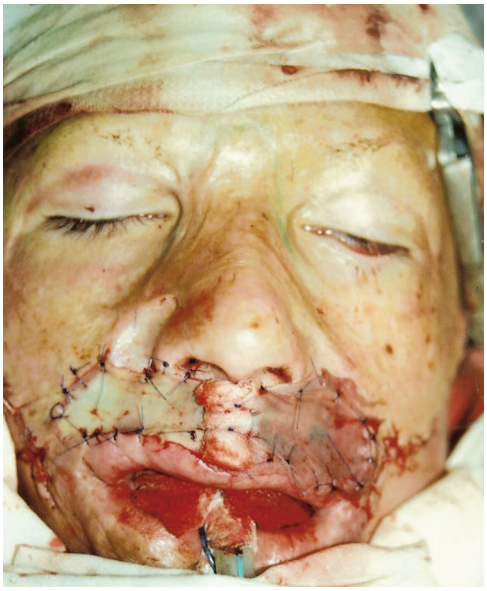

Fig. 2. The upper lip is covered with a split skin transplant, and philtrum formation is completed with a tie-over bolster dressing.

A series of 18 patients with postburn face deformities were operated on using the new method of philtrum restoration. The complete face, including the upper lip, was reconstructed in 10 patients; another eight patients with lesser facial deformities had the upper lip and philtrum reconstructed and the philtrum adjacent areas of the face. The follow-up results were evaluated from 6 months to 7 years after the operation.

The operation is performed only when scars are mature. The positioning of the normal columns is outlined. The width of the scar strips that will later serve as the top (crest) of the philtral columns should be approximately 4 mm. Incisions on the lateral and medial sides of the marked columns are directed in under a 45- to 60-degree angle. The scars, lateral to the stripes and between them, are excised (Figs. 1 and 2). To make the groove deeper, the fat tissue is removed between the columns. Only the epidermis is tangentially cut off the columns. If scar column crests are short and interfere with the upper lip contracture release, they are lengthened with cross-cutting. The lip wound is covered with split skin graft, creating some hypercorrection. After the skin graft is fixed, the two U-shaped sutures are led through the skin transplant above the columns, both columns and under the groove's soft tissues. The bolster is prepared in accordance with the length of the deepening between the columns. It is then plunged on the bottom of the groove. Using a tie-over bolster dressing, compression is created. The tie-over dressings for the upper lip and the philtrum

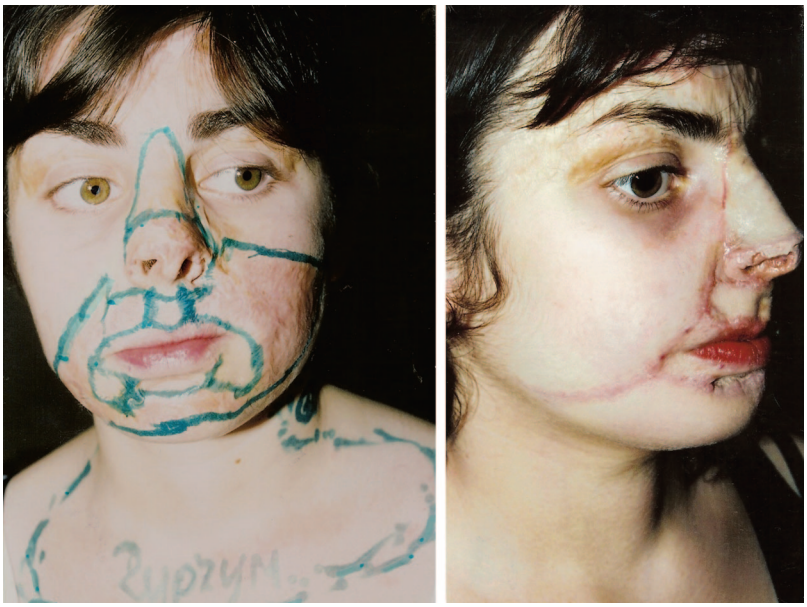

Fig. 3. Result of the philtrum and upper lip restoration with local scar stripes and skin grafting. (*Left*) Planning of the face reconstruction: the scar columns and scar boundaries are outlined. (*Right*) The philtrum and upper lip are restored. Cheeks and chin are resurfaced with a split ascending neck flap and the nose is resurfaced with a split skin graft.

are performed separately. The dressing is replaced for the upper lip in 5 days and for the philtrum in 7 days.

No complications emerged after surgery. As a result, the use of this method allowed achievement of normal aesthetic outlines and shape of the upper lip and the philtrum (Fig. 3).[4] According to my experience, the described method of philtrum restoration is an effective and important component of the upper lip reconstructive procedure.

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Use of an Arteriovenous Fistula in Facial Reanimation after Cystic Hygroma Resection

Sir:

The use of an arteriovenous fistula for a free flap has been described for soft-tissue deficits secondary to trauma, reconstructive efforts after surgical resections, and avoidance of vein grafts and diseased vessels in the diabetic foot.[1–3] In conditions such as these, native vessels may not be available because of previous surgical or radiation therapy. An arteriovenous loop may be the most reliable option for flap viability. We report the successful use of an arteriovenous fistula in reconstruction for facial paralysis after cystic hygroma resection using a free gracilis muscle transfer anastomosed to the loop. The arteriovenous fistula brings a reliable and robust blood supply to a wound bed scarred from multiple operations.

An 18-year-old man underwent multiple extensive resections of a recurrent cystic hygroma from the right skull base to the mediastinum. The facial nerve was resected in the original procedure. Right facial nerve grafting with the sural nerve was performed to buccal, zygomatic, and frontal nerve branches. Reanimation resulted in near-complete closure of the right eye, but movement of the lower facial muscles was minimal. An intact Bell phenomenon protected the remaining 1 mm of exposed globe.

At the age of 18, the patient continued to suffer from difficulties with speech, oral continence, facial asymmetry, drooling, and inability to smile. The patient had no recurrences from age 13 to 18 years. He presented for free gracilis muscle microneurovascular transfer for facial reanimation. Preoperative magnetic resonance and computed tomographic angiography showed that the right facial artery appeared to fill predominantly from the left-sided vessels. Before incision, a Doppler signal was found on the right. Dissection revealed extensive scar tissue, however, and no adequate vessels were found on the right. It was decided to tunnel an arteriovenous loop subcutaneously from the left to the right side of the neck. To create the fistula, a 39-cm portion of the greater saphenous vein was harvested by distally extending the incision that had been created for concurrent elevation of the gracilis muscle flap. The arteriovenous loop was fashioned by means of the microscope using the left facial artery and vein (Fig. 1). This was allowed to flow as the remaining portions of the procedure were completed: insetting of the gracilis muscle, placement of oral commissure sutures, and dissection of the nerve branch to the masseter muscle to power the transferred muscle. The arteriovenous fistula was then divided and the arterial and venous ends were anastomosed to the artery and venae comitantes of the gracilis muscle, respectively. The

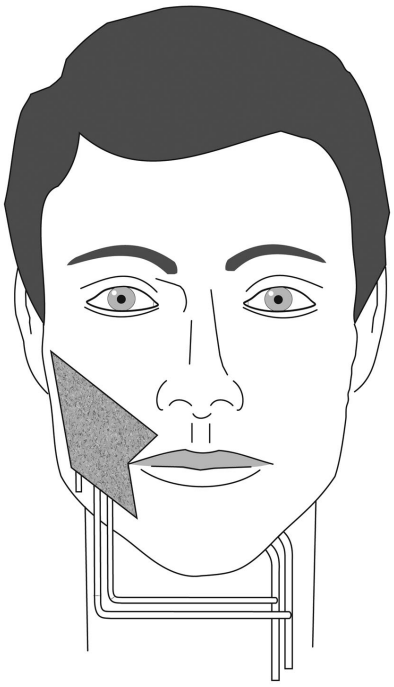

Fig. 1. Image of reconstructive details using free gracilis muscle and arteriovenous fistula for facial reanimation.

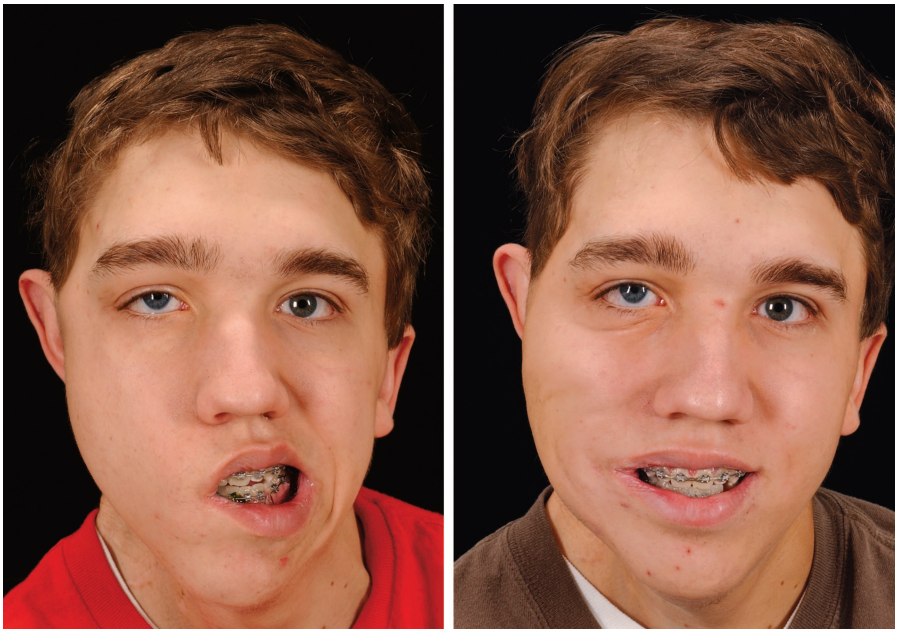

Fig. 2. (*Left*) Preoperative photograph showing the extent of facial muscle movement. (*Right*) Postoperative photograph showing the extent of facial muscle movement.

nerve repair was then performed, and insetting of the muscle was tailored for appropriate tension. The postoperative course was uneventful. Six-month follow-up revealed excellent movement of the transferred muscle, improved facial symmetry, and oral competence (Fig. 2).

This technique allowed for successful facial reanimation with free muscle transplantation in a complex case of facial paralysis. Arteriovenous loop creation provided the necessary recipient blood vessels for successful facial reanimation in this patient with extensive scarring from multiple previous operations.

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DISCLOSURE

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Management of Chronic Seroma following Latissimus Dorsi Breast Reconstruction: A New Technique

Sir:

The latissimus dorsi flap is a reliable method of reconstructing any part of the body.[1] Breast reconstruction using the latissimus dorsi flap is popular because it is reliable, not technically demanding, and cosmetically acceptable.[2] Despite its popularity, it is associated with a complication rate of approximately 25 percent.[3] The most common complication is the development of donor-site seroma that occurs in 21 to 79 percent of cases.[4] Several different techniques have been documented in the management of seroma with variable results, including pressure dressings, repeated aspirations, long-term drains, talc poudrage, benign neglect, fibrin sealant, quilting sutures, and triamcinolone injections.[1,4] Occasionally, seromas can become refractory to different treatments. In this article, we

describe a patient with chronic donor-site seroma managed successfully by simple modification of the foam used in topical negative pressure dressings [vacuum-assisted closure (V.A.C.; Kinetic Concepts, Inc., San Antonio, Texas)].

A 65-year-old woman was referred with a chronic donor-site seroma and clinically symptomatic infection 3 years following primary breast reconstruction using a latissimus dorsi flap with axillary node clearance for breast carcinoma. During these 3 years, she had recurrent seromas that required aspirations. These became infected and resulted in recurrent episodes of donor-site infection. On examination, she was found to have a seroma that was treated initially with ultrasound-

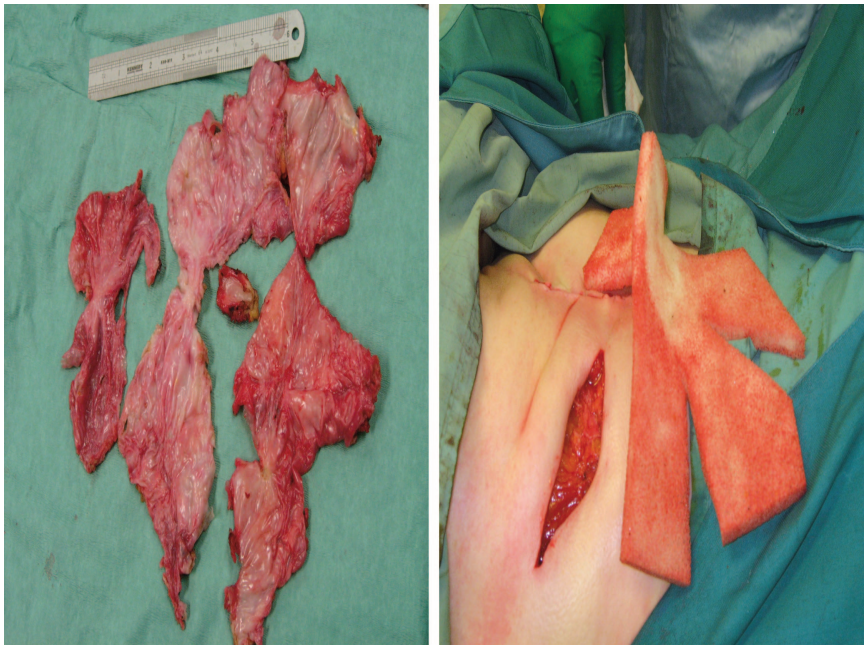

Fig. 1. (*Left*) The seroma capsule completely excised. (*Right*) The digitations created on the foam.

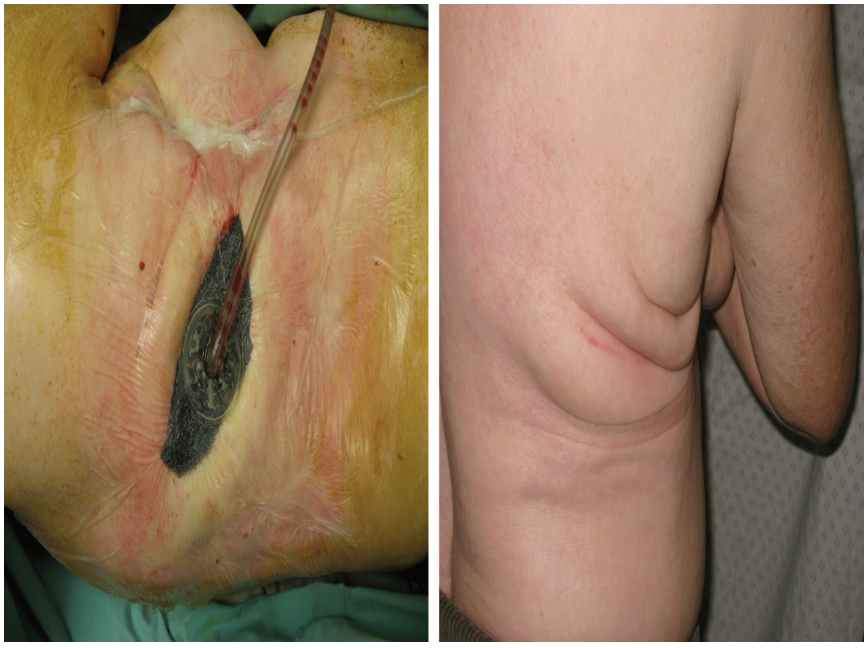

Fig. 2. (*Left*) The vacuum-assisted closure dressing in place with the normal vacuum-assisted closure foam on top of the polyvinyl alcohol foam inside the cavity. (*Right*) The completely healed wound.

guided drainage and steroid injection. This recurred quickly and required further aspiration. Because of its refractory nature, the decision was made to treat the seroma and its capsule surgically by excision and application of vacuum-assisted closure. Intraoperatively, she was found to have a large capsule, which was excised completely (Fig. 1, *left*). The wound was left open as an ellipse. A microporous polyvinyl alcohol foam (V.A.C. Vers-Foam) was used in the cavity because of its high tensile strength. Four digitations were created in the foam as in Figure 1, *right*. These were then branched into the different corners of the cavity and the vacuum-assisted closure dressing was applied (Fig. 2, *left*). This process helped to promote granulation from all directions of the cavity and eliminate the possibility of forming loculations inside the cavity. The patient had dressing changes every 5 days. Before dressing changes, 30 ml of 0.25% bupivacaine was injected into the cavity through the vacuum-assisted closure tubing and left for 30 minutes to anesthetize the sensitive granulation tissue when the sponge was removed. Similar digitations with shorter limb length were created in the subsequent dressing changes. The wound healed well and she has remained without recurrence of seroma for 1 year (Fig. 2, *right*).

Donor-site seroma is the commonest complication following latissimus dorsi breast reconstruction. Although small seromas resolve spontaneously, a collection greater than 100 ml is associated with complications such as wound dehiscence, implant exposure, and infection, and is best treated by drainage.[5] Occasionally, seromas are refractory, requiring further treatment in the form of steroid injections. In our case, the patient had a refractory seroma that was treated successfully by designing the foam to digitate into all corners of the cavity and applying topical negative-pressure dressing.

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Nipple Reconstruction on Implant-Only Breast Mounds: The Use of a Delay

Sir:

It is generally considered more difficult to reconstruct a nipple in a patient who has had nonautologous breast mound reconstruction.[1] This study presents a procedure for successful nipple reconstruction on implant breast mound reconstructions with thin covering skin flaps. A two-stage procedure using a modification of a previously described C-V–type flap technique[2] with the first stage as a delay is described, and the results with this technique are compared with a similar group of implant patients whose nipple reconstruction was performed in only one stage using the same modified C-V–type flap design.

The technique of two-stage nipple reconstruction using a modified C-V flap with a delay procedure was used in 14 patients (10 unilateral and four bilateral) for a total of 18 reconstructions. The longest follow-up has been 20 months; the shortest follow-up has been 4 months. All patients had saline implant reconstructions. Two patients were also irradiated. The results of the two-stage reconstruction using a delay were compared with the results of an earlier series of 22 consecutive nipple reconstructions performed in 17 patients (12 unilateral and five bilateral) where a delay was not used. The longest follow-up was 3½ years. The shortest follow-up was 4 months.

Typically, the flap components were adjacent to the mastectomy scar and, with this technique, this was not a concern. A modified C-V flap was then drawn (Fig. 1). These same markings were used in both the one- and two-stage procedures. In the delay technique, the perimeter of the entire flap was then incised through skin and subcutaneous tissue (if present). The medial and lateral flaps were undermined at their distal extent for only approximately 5 mm. The entire flap perimeter was then sutured closed.

With the single-stage technique, flap elevation was performed as the only nipple procedure. With the two-stage delay technique, the second-stage flap elevation was performed 2 weeks after the delay procedure. The sutures were removed (in the delayed series) and the flaps were raised.

In the initial series of single-stage reconstructions only, of the 22 total reconstructions, nine retained an average of 3-mm projection (41 percent) and 13 completely flattened (59 percent). All nipples that became flat did so within the first 3 months after reconstruction.

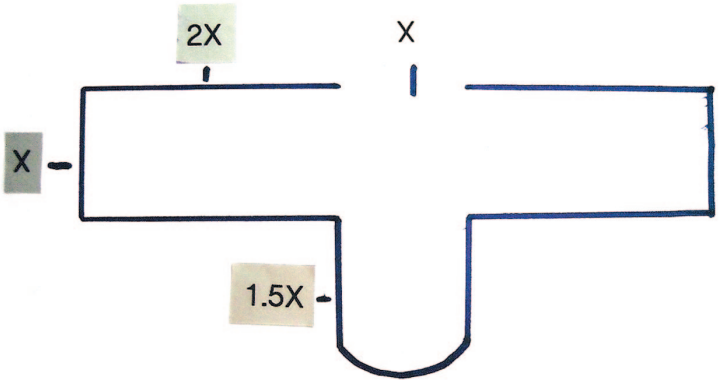

Fig. 1. Design of the modified C-V flap.

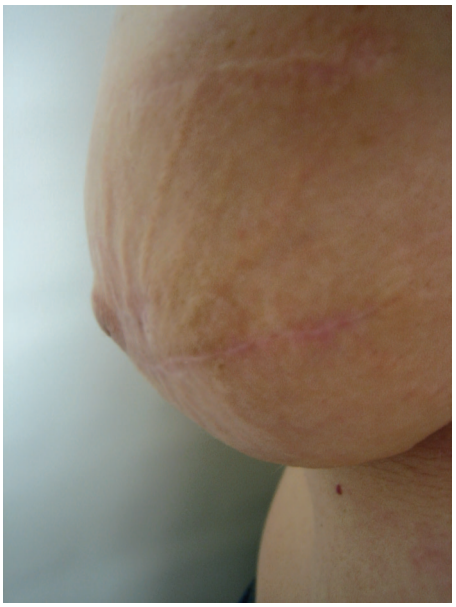

Fig. 2. Appearance of the breast after the second stage (delayed) of reconstruction.

Of the 18 total nipple reconstructions performed in two stages with a delay, 11 retained projection an average of 3.5 mm (61 percent) and seven lost projection and flattened (39 percent). Similar to the control, nondelay series, if the nipple reconstruction was to flatten, this always occurred within the first 3 months after surgery.

By performing a delay procedure before the actual elevation and reconstruction of the nipple, the underlying dermal circulation to the flap components is enhanced. This enhanced circulation improves flap viability which, in this series, improved nipple projection even when the flap was raised adjacent to the mastectomy scar (Fig. 2). This technique should be considered when nipple reconstruction using local flaps is planned for patients with implant reconstruction who have thin overlying breast skin and/or implant patients who request nipple reconstruction located adjacent to their mastectomy scar. The use of this two-stage technique incorporating various biological fillers to "fill" the enhanced nipple "skin envelope" is currently being investigated.

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Increasing the Versatility of the Latissimus Dorsi Skin Paddle in Breast Reconstruction

Sir:

The latissimus dorsi musculocutaneous flap has been used for soft-tissue reconstruction since 1897.[1] It has been modified multiple times along the way; examples include conversion into a perforator flap[2] or a muscle-sparing flap[3] in an effort to reduce donor-site morbidity and improve flap versatility. We would like to present a further modification to increase the versatility of this workhorse flap even more.

When harvesting a traditional latissimus dorsi musculocutaneous flap, the skin paddle is fixed in position relative to the underlying muscle, giving it a limited extent of coverage to the recipient site. However, if the skin paddle is undermined from the tips and a central portion is left untouched, the skin paddle tips can be manipulated up to 90 degrees relative to the pivot point.

The plane of undermining should be deep just above the latissimus dorsi muscle fascia, and the extent of undermining can be up to one-third on each side of the skin paddle, leaving the central third intact. This allows the skin paddle enough freedom to rotate either clockwise or counterclockwise up to 180 degrees. It is not necessary for the skin paddle to be centered over the main descending or transverse branches of the thoracodorsal artery or even over a large perforator to maintain vascularity.

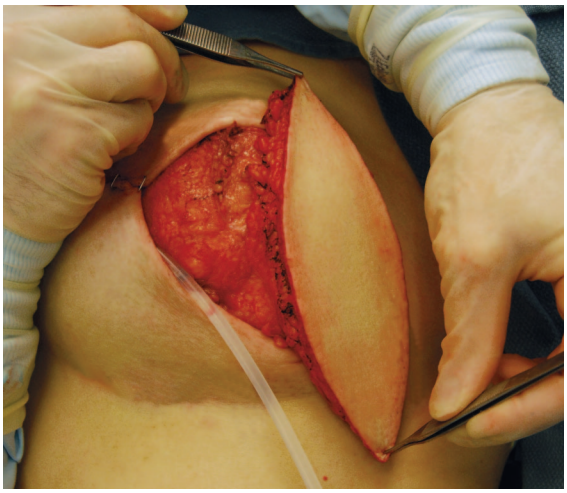

Fig. 1. Vertical orientation of latissimus dorsi skin paddle without the undermining technique gives insufficient coverage of the defect.

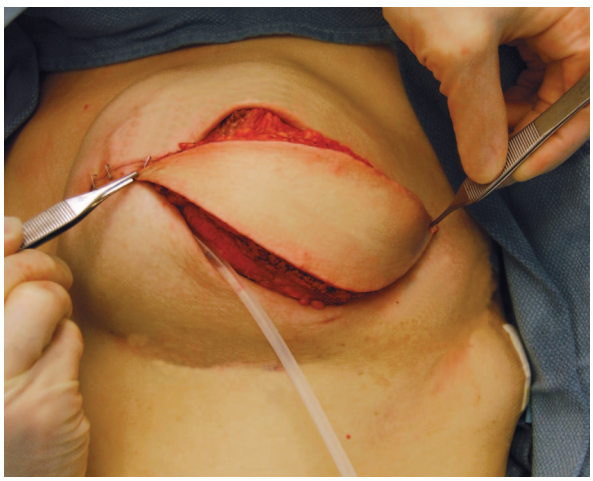

Fig. 2. Undermining both tips of the skin paddle (up to one-third on each side) gives a horizontal orientation, thus covering the defect sufficiently.

This technique increases the range of mobility of the latissimus dorsi flap skin paddle. The latissimus dorsi skin paddle not only pivots from the axilla but has a second arc of rotation centered over the latissimus dorsi muscle itself. Rotation of up to 180 degrees can be performed as needed to better improve skin paddle insetting and position with respect to the recipient skin defect. This is beneficial when the skin paddle orientation is slightly off relative to the defect orientation and latissimus dorsi muscle inlay. Undermining and rotating the skin paddle into its optimal position rather than reinsetting the whole latissimus dorsi muscle to improve skin paddle orientation is simpler, can save operative time, and helps minimize all tension during closure (Figs. 1 and 2). Thus, a minor modification of this musculocutaneous flap is able to increase the adaptability of this workhorse flap.

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Magnetic Resonance Imaging–Based Breast Volumetry in Breast Surgery: A Transfer from Neurosurgery

Sir:

Quantitative breast volume assessment may optimize the results in breast surgery. Methods such as the anthropomorphic method, using thermoplastic sheets, counting displaced water, and three-dimensional photography have been described.[1]

We thought that magnetic resonance tomography, which is an accepted diagnostic and volumetric tool for the female breast, might serve also as a breast volumetry measure.[2,3] Calculating volumes of specific organs or tissues is possible because of the different densities of various tissues.[4]

Current image-guided neuronavigation in neurosurgical procedures provides helpful surgical guidance for planning and performing the procedure by referencing the coordinate system of the brain to a parallel coordinate system based on three-dimensional image data of the patient on the console of the computer workstation. The medical images become point-to-point maps of the corresponding actual locations of the brain.[5] Current neurosurgical systems include a tool with which to calculate the volume of the previously marked lesion. We hypothesized that magnetic resonance imaging data sets of the breast could be processed like cranial magnetic resonance imaging data for magnetic resonance imaging–based breast volumetry.

In a pilot approach, we studied a 42-year-old woman who had undergone bilateral breast augmentation with 270-cc silicone implants on both sides 8 years previously. Magnetic resonance imaging examinations had been performed with a 1.5-T magnetic resonance scanner (MRT Gyroscan Intera 1.5 T; Philips, Hamburg, Germany) with the patient in the prone position. The implant was intact on the magnetic resonance imaging scans. Given the known size of the intact implant from the implant pass, another blinded examiner performed the volume analysis of the breast using Brainlab I Plan 2.6 navigation software.

The process of marking the borders of the breast implant within the patient's breast is simple and straightforward (<2 minutes) (Fig. 1). The amount of the overlying breast tissue is easily measured and calculated by the software as well (Fig. 2). The magnetic resonance imaging–based volumetry of the implants was 273 cc for the right side and 275 cc for the left side, with 270-cc built-in implants based on the implant pass. Thus, the magnetic resonance imaging breast volumetry was within a 2 percent error of the size of the original breast implant. Also, the volume of the total breast with the implant could be calculated in the same setting, which was 570 cc on the right side and 559 cc on the left side.

The advantage of magnetic resonance imaging–based breast volumetry is the fact that often magnetic resonance imaging data are available to rule out implant rupture,[2] to quantify capsular contracture, and for breast cancer screeninig.[3] The use of magnetic resonance imaging–based volumetry is intriguing because the navigation software is often available in the hospitals were neurosurgical units are on call. We thought to transfer the current neurosurgical practice for magnetic resonance imaging–based breast volumetry. We found our pilot results encouraging, with a variation of less than 2 percent, in contrast to the real implant size in two measurements with blinded operators. However,

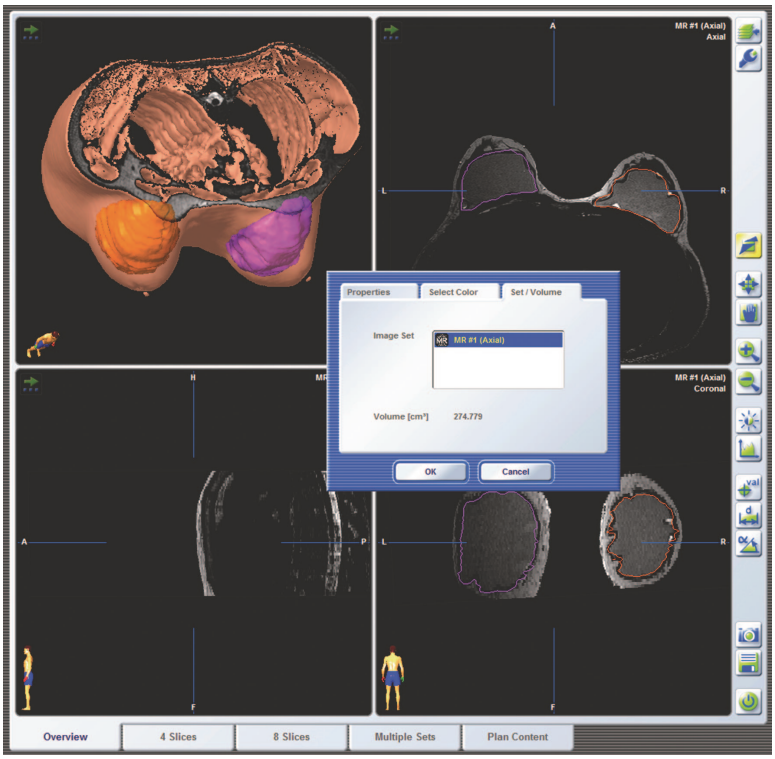

Fig. 1. Using Brainlab I Plan 2.6 navigation software, the mammary implants are marked on axial slices by surrounding them with a digital pen guided by the computer mouse. This process can be performed simply and quickly. An included volume analysis tool calculates the volume of the marked tissue, like the left-sided breast implant in this screen shot. The calculated volume was 275 cc, with 270 cc given in the implant pass.

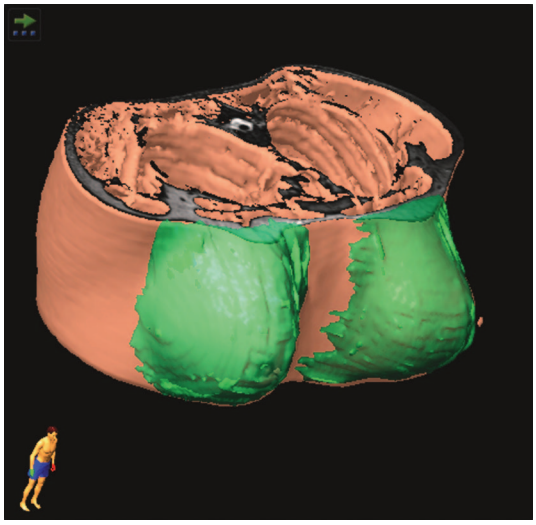

Fig. 2. The entire female breast can be visualized and the volume can be analyzed. Because axial, sagittal, and coronal slices can be processed, a naturalistic image of the breast is available. Analyzed breast volumes were 570 cc on the right side and 559 cc on the left side.

large-scale prospective trials are warranted to elucidate the value of preoperative magnetic resonance imaging–based breast volumetry.

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DISCLOSURE

None of the authors has any commercial associations that might pose or create a conflict of interest with information on products presented in this article.

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Salvage of an Infected and Exposed Breast Device with Implant Retention and Delayed Exchange

Sir:

A 35-year-old white woman with a history of penicillin allergy underwent bilateral subpectoral augmentation mammaplasty in March of 2008. Intramuscular (Roche Pharmaceuticals, Basel, Switzerland) (1 vial/24 hours for 2 days) and oral ceftriaxone (500 mg/24 hours for the other 5 days) was administered after the intervention. Thirty-five days after she was discharged to home, the patient was referred to us because a 0.5-cm region of inframammary fold overlying the device broke down and the implant became exposed. She was afebrile and without signs of infection. Thus, we débrided all compromised tissue, opting for simple closure of the wound because sufficient viable soft tissue remained. Although oral antibiotics were administered, unfortunately, 10 days later, the patient presented with fever (40°C) and erythema on the left side, purulent material drainage, and left implant exposure. Pus culture grew *Staphylococcus aureus.* The abscess was drained (Fig. 1) and the patient placed on intravenous teicoplanin (Targocid; Sanofi-Aventis, Bridgewater, N.J.), 400 mg/24 hours for 5 days. Because the patient desired an attempt at implant salvage, refusing device explantation, she was started on saline, povidone-iodine (Betadine; Purdue Pharma, Stamford, Conn.), and antibiotic (Targocid) irrigations of the submuscular pocket three times per week. In addition, she was treated with 10 cycles of hyperbaric oxygen therapy (2 to 3 atm for 90 minutes each) and oral antibiotics. The patient was readmitted at the end of May by our unit and underwent capsulotomy, implant exchange, and definitive pocket closure with a closed-suction drainage catheter. After the infectious disease unit was consulted, the patient was started on intravenous daptomycin (Cubicin; Cubist Pharmaceuticals, Lexington, Mass.), 350 mg/24 hours for 5 days. At 2 months, the patient was symptom-free, without signs of infection or capsular contracture, and achieved a satisfactory result (Fig. 2).

Among the potential complications associated with the use of breast prostheses are the risks of periimplant infection and device extrusion, with an infection rate following breast augmentation ranging from 1 to 2 percent.[1,2] Traditional recommendations for these problems dictate antibiotic treatment alone and/or device removal, with delayed replacement of the implant.

Few reports have described successful techniques for salvage of an infected breast tissue device or salvage of

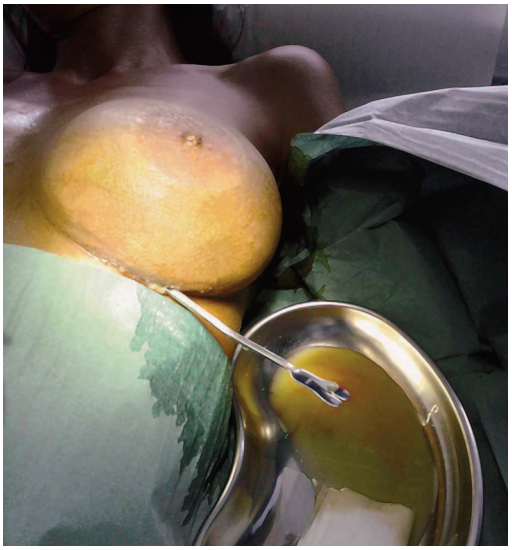

Fig. 1. Drainage of the abscess through the small exposed region.

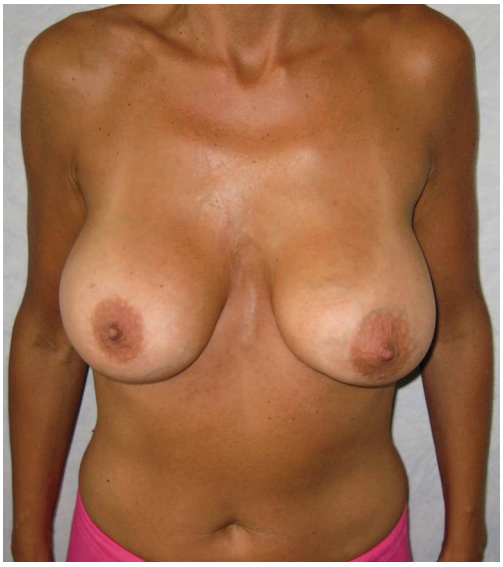

Fig. 2. Final cosmetic outcome after left breast implant salvage.

an exposed but not infected implant, whereas no case exists reporting successful management for salvage of an infected and exposed breast implant after cosmetic augmentation. Yii and Khoo[3] proposed a combination of capsulectomy and continuous irrigation with saline and intermittent antibiotic instillation to salvage infected expanders in breast reconstruction.

Spear and colleagues[4] developed treatment guidelines for implant infections, threatened device exposure, and actual device exposure. They submitted patients with severe implant infection and actual exposure (both reconstructive mammoplasties) to device removal posing a 0 percent salvage rate (without a real attempt at salvage).

Chun and Schulman[5] described the successful salvage of nine consecutive severely infected breast prostheses after mastectomy reconstruction, adopting a technique of immediate intravenous antibiotics followed by early device exchange and a long course of postoperative antibiotics.

Salvage of an infected and exposed breast cosmetic implant must achieve two main goals: resolution of the infection and maintenance of the aesthetic outcomes, principally by avoiding device explantation. The described approach provides a means of achieving these objectives and was successful in our patient.

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DISCLOSURE

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Malignant Skin Tumor in a Composite Tissue (Bilateral Hand) Allograft Recipient

Sir:

Composite tissue allografts are a clinical reality, with more than 40 hand allografts and three facial allografts transplanted worldwide.[1] Composite tissue allografts require large amounts of immunosuppression to prevent acute rejection, increasing the likelihood of observing adverse outcomes resulting from their use.

The state of nonspecific immunosuppression predisposes the patient to the development of malignant skin lesions. The overall incidence of skin cancers in the immunosuppressed transplant population is 20.6 times that of the general population,[2] and the presentation of skin cancer is 20 to 30 years earlier than in nonimmunosuppressed patients.[3] To date, there is no reported malignancy in a composite tissue allograft recipient (International Registry on Hand and Composite Tissue Transplantation).[4] In this article, a malignant skin tumor in a composite tissue allograft recipient is reported, and brief guidelines for skin cancer prophylaxis are provided.

A total of two bilateral hand allograft transplantations have been performed at our unit since 2006. Our first recipient was a 48-year-old woman who received alemtuzumab (Campath-1H; Ilex Pharmaceuticals, San Antonio, Texas) and triple therapy consisting of tacrolimus, mycophenolate mofetil, and prednisone. On postoperative day 190, tacrolimus was switched to sirolimus. The patient suffered a total of two acute rejection episodes on postoperative days 120 and 221 that were graded I and II, respectively. She was treated successfully using intravenous methylprednisolone boluses. On postoperative day 360, a pigmented, smooth, round, nodular, unfixed lesion 3 mm in diameter that had recently appeared on her right nasal ala was excised. It was diagnosed by the pathologist as a basal cell carcinoma with margins free of lesion. The patient has been free from recurrence since then.

This the first report of a skin malignant lesion in a composite tissue allograft recipient so far. It underscores the fact that composite tissue allograft recipients under potent immunosuppressive regimens such as lymphocyte depleter and triple therapy plus intravenous steroid treatment for acute rejections should undergo careful follow-up for drug side effects and complications, including skin cancer. These patients should be screened at least every 6 months for skin lesions. Surgical excision offers a greater than 90 percent overall cure rate. Because most basal cell tumor recurrences appear 1 to 4 years after treatment, follow-up should continue for at least 5 years.[5] Although exposure to ultraviolet light is just one factor important in the cause of skin cancer, it is the sole factor that can be avoided. The patients need to be educated about the dangers of ultraviolet exposure, and sun protection measures should start as soon as the patients are accepted in the composite tissue allograft program. Recommendations should include sun avoidance by using wide-brimmed hats, long-sleeved shirts, and long pants; avoidance of sunbathing; and scheduling activities so that the midday sun is avoided. The use of sunscreen creams is not a substitute for sun avoidance. Despite the efforts made, the avoidance strategies used by the patient are probably inadequate.[6] We hope this report aids counseling on skin cancer prophylaxis for composite tissue allograft recipients, and helps to keep the risk of skin malignancy in the mind of composite tissue allograft surgeons.

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DISCLOSURES

None of the authors has a financial interest in the drugs mentioned in this work. Alemtuzumab was used off label. The recipients signed a specific consent form approved by the Ministry of Health for the use of alemtuzumab in composite tissue allotransplantation.

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Flexor Pollicis Longus Tendon Rupture after Volar Plating of a Distal Radius Fracture

Sir:

Tendon irritation and rupture was a frequent complication of distal radius fracture plating from a dorsal approach.[1,2] More recently, volar, fixed-angle locking plates have become popular in the treatment of these fractures. Advocates assert that flexor tendon problems can only occur with loss of reduction, as the plate resides in the space of Parona and is not in contact with the flexor tendons.[3]

A 65-year-old woman sustained a comminuted, intraarticular fracture of the distal radius. She underwent open reduction and internal fixation of the fracture using a second-generation, low-profile, fixed-angle vo-

lar locking plate performed by an outside surgeon. The patient's fracture united, and she recovered good mobility and was discharged from care several months after surgery.

Ten months after surgery, the patient noted pain in her right volar radial-side wrist. She did not think much of the pain until 2 weeks later, when she suddenly became unable to flex her right thumb interphalangeal joint. At that time, there was no evidence of thumb interphalangeal flexion even with maximal wrist and thumb metacarpophalangeal joint extension. Radiographs showed union of the fracture and appropriate position of the hardware (Fig. 1).

During surgical exploration, the flexor pollicis longus tendon was disrupted at the level of the distal radius. The volar distal radius plate was observed deep to the flexor pollicis longus (Fig. 2). There were no prominent or sharp screw heads, and the plate was fully in contact with the bone. The plate was removed, and the flexor pollicis longus was reconstructed with a palmaris longus graft. The patient recovered full mobility of her thumb interphalangeal joint.

Most cases of flexor pollicis longus rupture after volar distal radius plating occurred with older, flat plates that the surgeon contoured to the bone by hand. The patient reported by Klug and colleagues[4] received a first-generation, fixed-angle, locking volar radius plate designed to sit on the volar lip of the radius. In this position, the distal edge of the plate and distal screws in closer proximity to the flexor pollicis was longer than with second plates designed to reside in the space of Parona.

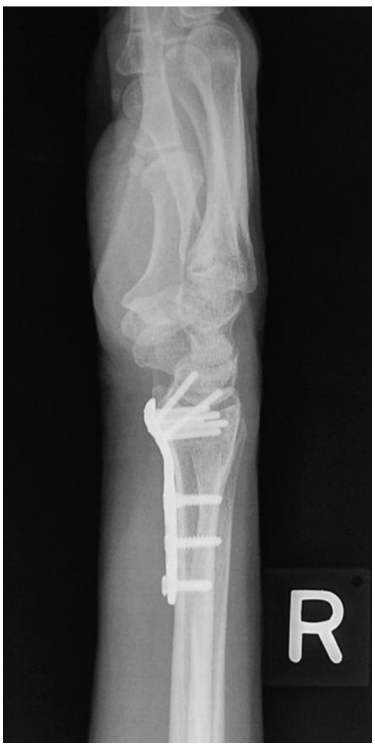

Fig. 1. On a lateral radiograph of the wrist, the plate is well-apposed to the volar surface of the distal radius.

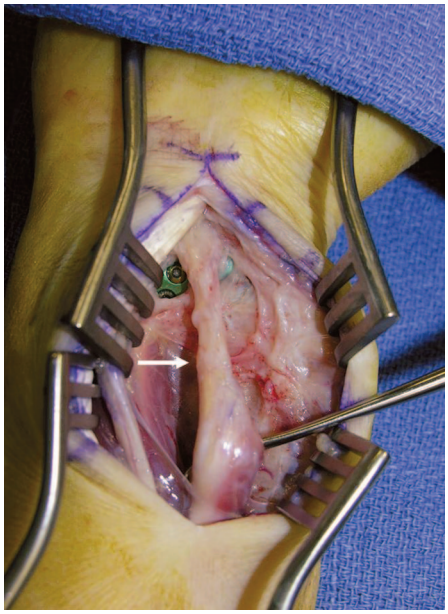

Fig. 2. Disruption of the flexor pollicis longus over the hardware is shown (*arrow*). There were no prominences of the screws or distal edge of the plate.

Flexor tendon irritation has been reported in two patients with the second-generation plates.[5] In one case, the flexor pollicis longus was affected, and in the other, the flexor digitorum profundus to the index finger was affected; in neither case did the tendon rupture. The authors attributed tendon irritation to the plate being placed too far distally, causing the distal edge of the plate to reside anterior to the volar rim of the radius.

The patient in this report experienced a prodrome of volar, radial-sided wrist pain without loss of function, much like patients in previous reports.[4,5] Only 2 weeks passed between the onset of pain symptoms and the loss of flexor pollicis longus function. Surgeons performing volar plating of distal radius fractures using volar, fixed-angle plates designed to rest in the space of Parona should be aware that onset of volar, radial-sided wrist pain several months after surgery may represent tendon irritation. Assuming the fracture is well healed, hardware removal represents the best treatment option to prevent rupture.

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Long-Term Survival with Decreased Morbidity in the Treatment of a Malignant Peripheral Nerve Sheath Tumor

Sir:

Malignant peripheral nerve sheath tumors are highly aggressive lesions requiring wide surgical resection and tumor bed irradiation.[1] Chemotherapy is controversial and of marginal benefit at best. The prognosis of malignant peripheral nerve sheath tumors remains unknown because of their rarity, with the largest case series indicating a 10-year cure rate of 32 percent and more recent series showing 63 percent 5-year survival with 30 percent disease-free survival.[1,2]

In this article, we report an innovative multidisciplinary treatment approach to an isolated median nerve malignant peripheral nerve sheath tumor. This approach significantly reduced therapeutic morbidity without compromising the oncologic treatment and subsequent disease-free survival of the patient.

A 73-year-old man with no family history or physical findings of neurofibromatosis presented with a painless 1-cm mass of the right medial arm. An incisional biopsy indicated a neurofibroma. After biopsy, the mass rapidly grew to 3 cm. The patient then complained of mild discomfort radiating from the forearm into the hand along the median nerve dermatome. No motor deficits were noted. A second biopsy demonstrated abnormality consistent with low-grade myxoid malignant peripheral nerve sheath tumor. The patient underwent wide surgical resection of the median nerve with preservation of the brachial artery. Four sural nerve cable grafts were placed, opponensplasty was performed, intraoperative brachytherapy was facilitated by placement of nine trocars, and a latissimus dorsi flap with a split-thickness skin graft was used for coverage (Fig. 1). The resection was proximal to the anterior interosseous nerve and branches of the flexor digitorum superficialis. The patient received a total of 31 Gy of intraoperative brachytherapy radiation completed in five doses, with an additional external beam radiation therapy tumor bed boost of 36 Gy in two fractions. The hospital stay was uncomplicated and the patient was disease-free as followed by physical examination and chest radiographs at 5-year follow-up. After intensive physical and occupational therapy, he now has 3/5 flexor strength at the metacarpophalangeal joints of the right hand, 1/5 opponens strength, with normal sensation of the palmar surface and limited but protective sensation of the fingers.

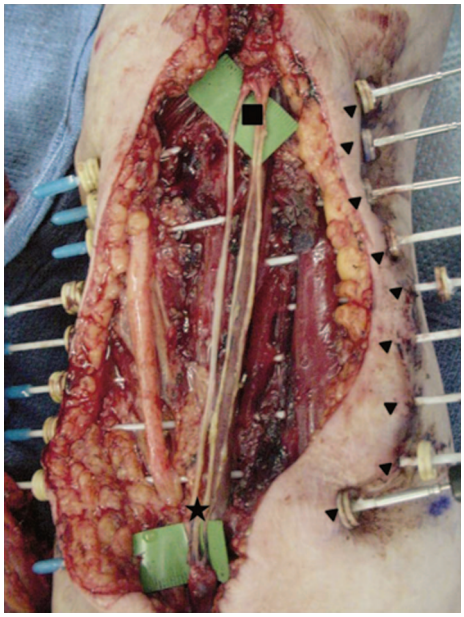

Fig. 1. Intraoperative view showing nine brachytherapy catheters (*triangles*), the proximal (*star*) and distal (*square*) ends of the resected median nerve with four sural nerve cable grafts, and the dissected brachial artery.

The presence of negative margins is the primary predictor of both disease-free survival and survival in malignant peripheral nerve sheath tumors. Negative margins and radiotherapy in conjunction decreased local recurrence rates up to 56 percent in one study.[3] Using intraoperative brachytherapy for targeted radiation therapy in conjunction with external beam radiation therapy allowed preservation of structures close to tumor margins that would not be preserved in traditional wide excision approaches. As clinical advances are being made in the field of oncology and radiation oncology, further opportunities will present for reconstructive surgeons to preserve function while treating this disease process.

Major case series reports to date have focused on oncologic outcomes of malignant peripheral nerve sheath tumors but have not addressed the effects of reducing morbidity with reconstructive surgical approaches.[3–5] The case presented incorporates a novel oncologic and reconstructive treatment for an isolated malignant peripheral nerve sheath tumor that minimizes functional

impairment in a patient that is disease free at 5-year follow-up.

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DISCLOSURES

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Acute Dorsal Radiocarpal Dislocation Associated with Scapholunate Ligament Avulsion: A Proposal for Surgical Treatment

Sir:

Dislocations of the radiocarpal joint are rare. According to Dunn,[1] they represent 0.2 percent of all dislocations. This injury usually combines a volar radiocarpal ligamentous tear and a bony avulsion of the radial and ulnar styloid.[2,3] In some cases, it is associated with carpal bone fractures or intracarpal ligament tears.[4,5]

Many treatments for radiocarpal dislocations have been described, but there is no clear evidence of the optimal management. Two classifications have been proposed that can help with the therapeutic decision: those of Moneim et al.[4] and Dumontier et al.[3]

A 25-year-old man was involved in a motocross accident. He had pain, tenderness, and deformity in his left wrist, with no tendon or neurovascular deficit. Radiographs showed a dorsal radiocarpal dislocation with a radial styloid avulsion (Fig. 1). There were no associated fractures or carpal malalignment. Closed reduction was accomplished in the emergency room. Postreduction radiographs showed the radial styloid avulsion involving less than one-third of the width of the scaphoid fossa (Dumontier type I) and a scapholunate gap. Computed tomographic scanning revealed an avulsion of the radial volar rim and the proximal pole of the scaphoid.

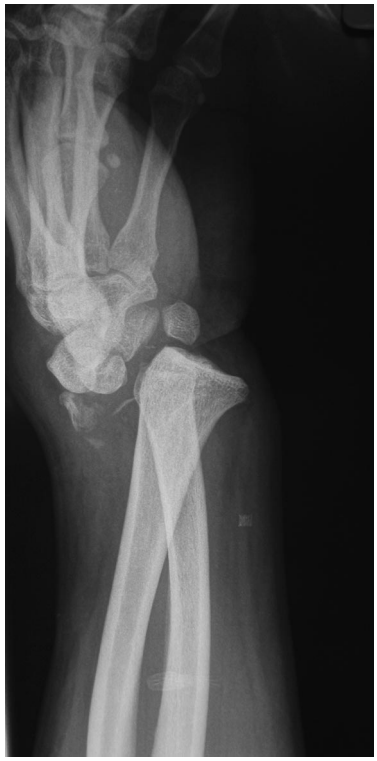

Fig. 1. Dorsal radiocarpal dislocation with a radial styloid avulsion (lateral view).

Six days after admission, open reduction and internal fixation was performed. The volar approach was performed first. Volar radiocarpal ligaments were torn off the radius and the articular capsule was avulsed from the volar lip of the radius. They were reattached by three bone anchor sutures. The dorsal approach showed an osteochondral fracture involving the proximal pole of the scaphoid, with no scapholunate ligament disruption. The scapholunate ligament was reattached by one anchor suture (Fig. 2) and stabilized with two percutaneous Kirschner wires (lunate-scaphoid and scaphoid capitate). The radial styloid avulsion was reattached with two screws.

The distal radioulnar joint was stabilized with two Kirschner wires. A splint was applied. Both were removed after 6 weeks.

At 2-year follow-up, the patient reported no pain and had returned to all previous activities without restriction.

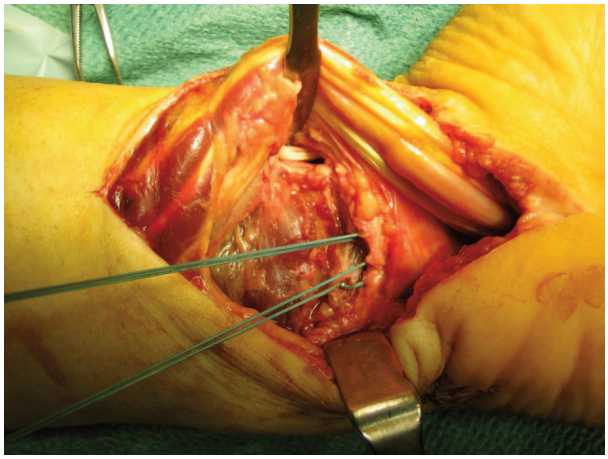

Fig. 2. A dorsal approach showed an osteochondral fracture involving the proximal pole of the scaphoid that was reattached with one suture.

Range of movement was as follows: extension, 40 degrees; flexion, 45 degrees; pronation, 70 degrees; and supination, 60 degrees. Radiographs demonstrated no radiocarpal or scapholunate collapse. The Spanish version of the Disabilities of the Arm, Shoulder and Hand questionnaire score was 47 (30 = best and 150 = worst).

Radiocarpal dislocations are rare injuries. They must be differentiated from severely displaced distal radius fractures or carpal fracture-dislocations.[3] It is important to determine the extent of the ligamentous injury.[4]

We report on a dorsal radiocarpal dislocation combined with scapholunate dissociation. Open reduction and careful ligament repair was achieved. To our knowledge, there are no other reports in the literature regarding acute surgical repair of volar radiocarpal ligaments and scapholunate ligament in cases of radiocarpal dislocation.

In our opinion, assessing the presence of intracarpal ligamentous tears is essential for determining treatment and prognosis.[4] The aim of surgical treatment should be to restore bone and ligamentous anatomy. We believe that the good outcome observed in our report (wrist motion was moderately impaired and the Spanish version of the Disabilities of the Arm, Shoulder and Hand questionnaire score was 47) is related not only to primarily restoring the volar radiocarpal ligament but also to revising the scapholunate and dorsal soft-tissue structures.

We report on a dorsal radiocarpal dislocation associated with a scapholunate ligament avulsion. In our opinion, assessing the presence of intracarpal ligamentous tears is essential for determining the treatment and prognosis of the lesion. Even when successful reduction and fixation of these lesions is carried out, degenerative changes of the wrist are expected to occur.

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DISCLOSURE

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Liebenberg Syndrome: First Case of Monovular Twins

Sir:

Liebenberg syndrome is a very rare condition characterized by dysplasia of bony components of elbow joint, abnormalities in dimension and shape of carpal bones, and brachydactyly. After Liebenberg's[1] description of a five-generation pedigree with autosomal dominant inheritance, the same family was reexamined by Beighton[2,3] in 1985; additional affected persons were identified. Tiberio et al.[4] in 2000 reported on a mother and two sons whose clinical and radiographic features resembled those of Liebenberg syndrome. We report the first case of monovular twins, girls, second-born to nonconsanguineous healthy parents, both affected in both upper arms. They presented with bilateral radial club hands at birth. They were referred to our center at 18 months. On clinical evaluation, some dysmorphic features were noted, such as flattening of the eyebrow arch, flat nasal bridge with hypoplastic nasal tip and anteversion of the nasal wings, long filtrum, thin lips, oval shaped mouth, ogival palate, altered dermatoglyphics, and accentuated sacral dimple. In the anatomical position, the elbow joints were flexed bilaterally at 80 degrees, combined with a supination and varism

posture. The wrist joints were deviated radially. Neuromotor development was normal. Anteroposterior radiographs of the arm, forearms, and hands were obtained and showed dysplasia of bony components of the elbow joint, anticipated appearance of the capitate and hamate, and triquetral hyperplasia. Radiographs taken at 18 months show dysplasia of all bony components of the elbow joint (Fig. 1), where the radius and ulna have the same round shape and same length, without synostosis, and the joint is enlarged and poorly modeled; the wrist (Fig. 2) presents a normal capitate, enlarged hamate, a lunate with ossification center that is normally absent at this age; and finally, a very important hypertrophic triquetrum with radial deviation of the wrist. A magnetic resonance imaging scan obtained at age 2 years (Fig. 3) shows abnormal radial and ulna head. The carpal bones are not fused but are larger and their ossification centers appear earlier than the normal ones.[5] There are no substantial differences in the length and shape of metacarpals and phalanges. These radiographic findings are consistent with previous authors' descriptions. The main considerations regarding the differential diagnosis[6] between Liebenberg syndrome and other disorders involving elbow dysplasia, carpal bones, and hand anomalies concern prognosis and genetic counseling. In fact, Liebenberg syndrome seems to cause no other relevant problem apart from limited flexion-extension of the elbow and wrist. No report of surgical treatment has ever been published: according to our observations, the main problems are elbow joint instability and range-of-motion reduction of the elbow joint, resulting in difficulties in daily activities. Corrective osteotomy of triquetrum may be planned if radial deviation worsens with time. A DNA study is ongoing.

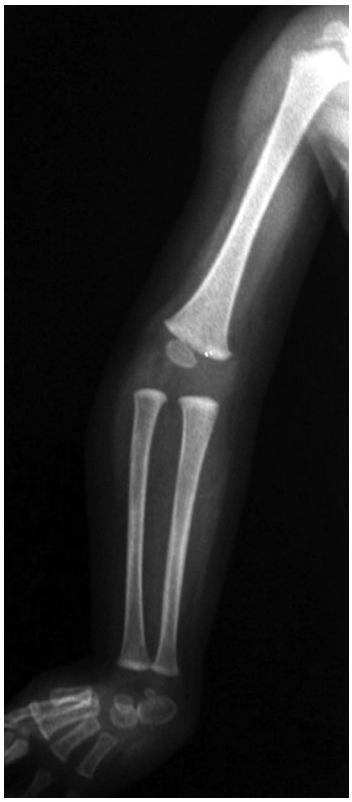

Fig. 1. Anteroposterior radiograph of the forearm.

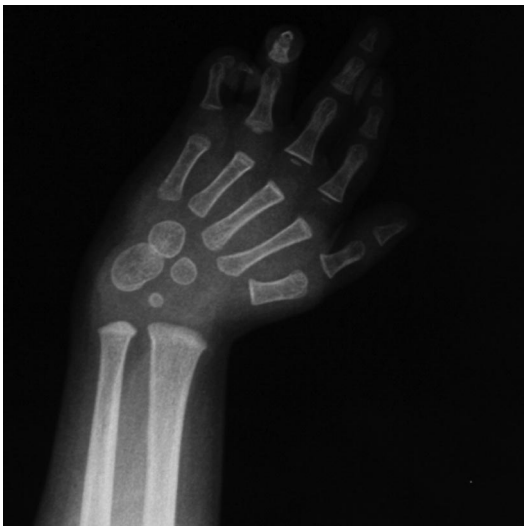

Fig. 2. Anteroposterior radiograph of the wrist.

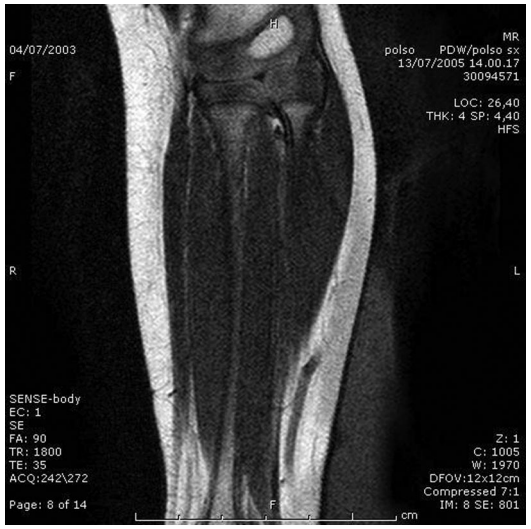

Fig. 3. Magnetic resonance imaging scan of the wrist at age 2 years. Note the round shape of the ulna head.

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Do Waistline and Umbilical Position Really Change after Abdominoplasty?

Sir:

Do the horizontal and vertical dimensions of the trunk truly change after abdominoplasty? Previous studies have focused on the umbilical position during preoperative evaluation, but alterations in waistline size, trunk dimensions, and umbilical position following abdominoplasty have not been evaluated thoroughly.[1,2] This study sought to investigate these changes following traditional full abdominoplasty.

Baseline measurements were obtained preoperatively that included waist circumference at the level of the umbilicus and distances from the xiphoid to the umbilicus and from the umbilicus to the most superior aspect of the labia majora (Fig. 1). Eleven female patients with abdominal lipodystrophy ranging in age from 28 to 72 years were treated with a standard full abdominoplasty procedure over a 6-month period (June of 2005 to January of 2006) by a single surgeon (A.M.), according to previously published methods at the Manhattan Eye, Ear and Throat Hospital.[3,4] Postoperative measurements at 1 week and 6 months were then recorded.

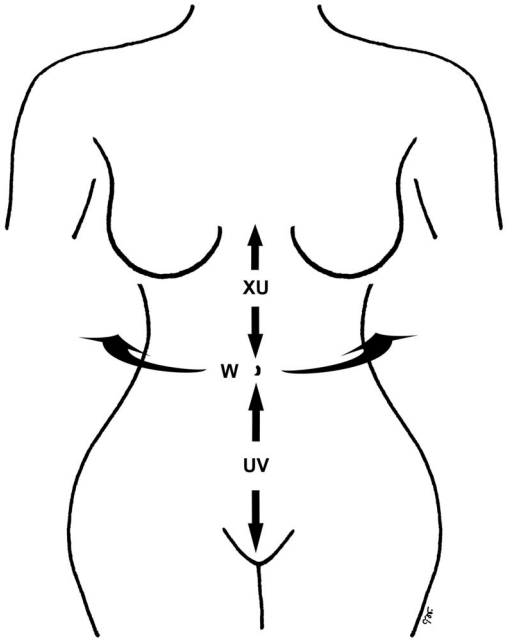

Fig. 1. Measurements obtained preoperatively and postoperatively. *W*, waist circumference at the level of the umbilicus; *XU*, distance from the xiphoid to the umbilicus; *UV*, distance from the umbilicus to the superior aspect of the labia majora. (Courtesy of Thanapong Waitayawinyu.)

All 11 patients completed the study without complications. There were statistically significant net reductions in waist diameter (net mean decrease of 5.0 cm at 7 days and 7.9 cm at 6 months), xiphoid to umbilical distance (net mean decrease of 2.2 cm at 7 days and 2.8 cm at 6 months), and umbilicus to labia majora distance (net mean decrease of 4.4 cm at 7 days and 5.09 cm at 6 months) (Table 1).

Van Uchelen et al. evaluated the long-term durability of plication with ultrasonography. Six percent of the patients felt that their waist had gained in size, 60 percent felt it was unchanged, and 33 percent felt their waists had become slimmer.[5]

Table 1. Measurements of Waist Circumference, Xiphoid to Umbilicus, and Umbilicus to Superior Aspect of Labia Majora*

	Preoperatively	7 Days	6 Months
	W	W	W
Mean/median, cm	83.73/88.5	78.27/78	75.86/77
p	0.0006	0.0002	0.0191
	XU	UV	UV
Mean/median, cm	18.07/18.5	15.86/15.5	15.32/15.5
p	0.0011	0.0001	0.0448
	UV	UV	UV
Mean/median, cm	21.32/21.5	16.91/17.5	16.23/16.5
p	0.0001	0.0001	0.0128

W, waist; XU, xiphoid to umbilicus; UV, umbilicus to superior aspect of labia majora.
*$p < 0.05$ statistically significant.

Our study is limited because of the small study group and does not take into account changes in diet or exercise or use fixed bony reference points. However, the data demonstrate consistent reductions in waist diameter (net mean decrease of 5.0 cm at 7 days and 7.9 cm at 6 months), xiphoid to umbilical distance (net mean decrease of 2.2 cm at 7 days and 2.8 cm at 6 months), and umbilicus to labia majora distance (net mean decrease of 4.4 cm at 7 days and 5.09 cm at 6 months). Comparison of preoperative and postoperative circumferential waist measurements revealed a significant decrease following plication that tightens the rectus fascia in the horizontal vector and persists because of the continual resolution of postoperative edema.

This study also shows that the position of the umbilicus is displaced cephalically following abdominoplasty. Vertical plication and the superior pull of the tightened skin flap shortens the distance between the xiphoid and the umbilicus.

Finally, our data display the decrease in distance between the umbilicus and the labia majora postoperatively. Removal of excess abdominal tissue below the umbilicus decreases the distance between the two points. The vertical pull of the infraumbilical rectus plication combines with the former to pull on the mons, which rejuvenates the aging vulva by unraveling and elevating the mons ptosis.

This study demonstrates reductions in waist diameter and vertical trunk dimensions along with changes in umbilical position after abdominoplasty that persist at 6 months after surgery.

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DISCLOSURE

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Medial Thigh Fasciocutaneous Flaps for Reconstruction of the Scrotum following Fournier Gangrene

Sir:

Reconstruction of the scrotum following loss of scrotal skin caused by Fournier gangrene or trauma remains a challenge for plastic surgeons. Several re-

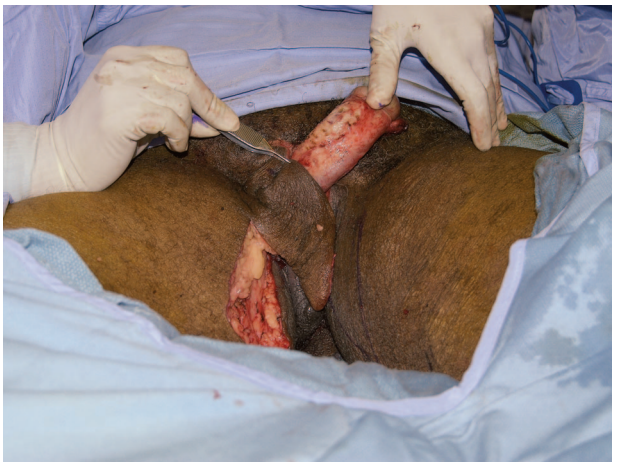

Fig. 1. Rotation of a medial thigh fasciocutaneous flap to cover the testes.

Fig. 2. The final result, showing the new scrotum created by two flaps.

constructive options, including primary closure, skin grafting, and flaps, are available.[1,2] We have attempted several techniques and now favor single-stage reconstruction of the scrotum with medial thigh fasciocutaneous advancement flaps for reconstruction after Fournier disease.

The medial thigh fasciocutaneous advancement flap uses a triangular island of skin and subcutaneous tissue on the proximal aspect of the medial thigh. The dimensions of the flap vary according to the defect's requirements and can be safely measured up to 6 × 15 cm. The flap to cover the scrotal defect is raised distally, advanced cephalad, and rotated medially toward the inguinal canal (Fig. 1) to create an ipsilateral hemiscrotum. Performing this maneuver bilaterally allows for creation of a new scrotum with both flaps sutured together, creating a new midline raphe (Fig. 2). The defects on the donor sites are closed primarily in layers. A drain is left in place for 2 or 3 days. The senior author has performed scrotal reconstruction with the medial thigh fasciocutaneous advancement flap on four consecutive patients in the setting of Fournier gangrene, with no flap loss and with excellent functional and cosmetic results.

Medial thigh fasciocutaneous flaps allow for a more natural appearing scrotum with less bulkiness than myofasciocutaneous or free flaps.[2,3] A comparison of published techniques is offered in Table 1.[1–5] Our clear preference is reconstruction with the medial thigh fasciocutaneous advancement flap.

In very obese patients, the medial thigh fasciocutaneous advancement flap should be avoided to prevent an excessively thick neoscrotum. Because the donor area is closed primarily, the medial thigh fasciocutaneous advancement flap results in less donor-site morbidity than other techniques. Also, the skin of the medial thigh provides an excellent color, hair distribution, and texture match. In our experience, the cosmetic results achieved with medial thigh fasciocutaneous flaps have been far superior to other techniques.

Table 1. Treatment Options for Scrotal Reconstruction after Fournier Gangrene

Technique	Advantages	Disadvantages	Comments
Primary closure	One-third of the residual scrotum can resurface the scrotum[4]	Uninvolved scrotal skin is often edematous, lacks elasticity to close the defect; disfigured scrotum if the closure is performed under tension	We have not seen enough residual skin after Fournier gangrene in our experience to use this technique
Subcutaneous thigh pockets	Safe and rapid coverage	Reports of testicular atrophy; stretching of the cords or compression of the testes, may cause pain; psychological stigma of a missing scrotum	This technique is used by other surgical specialties at our institution as a bridge to protect the testicles until we perform the reconstruction
Split-thickness skin grafts	Easy to apply, easily conforms to irregular surface; thin cover, cool for spermatogenesis	Testes devoid of the tunica vaginalis without healthy granulation tissue will not support a graft[1]; grafting to perineum is difficult because of mobile wound bed with complex contours and limited access	In our hands it produces an unnatural appearing scrotal sac, and we feel it exposes the testicles to risk for mechanical trauma with only a thin cover
Tissue expansion	Provides full-thickness skin cover, good cosmetic and functional results with reduced risk for contracture[5]	Scrotum is reconstructed in a multistage repair; time and morbidity of expansion	We have no experience with this approach; it seems impractical to us
Preputial flap	One-stage procedure	Cannot be used in the setting of extensive tissue defects	Limited to uncircumcised patients
Fasciocutaneous flaps	Single stage; independent blood supply, can cover a contaminated field; preservation of sensation branches of the ilioinguinal, posterior cutaneous, femoral, and obturator nerves included in the flaps	Incision at harvest site	Multiple described variants of flaps raised from medial, posterior, and anterolateral thigh,[2] lower anterior abdominal wall, and the periumbilical region; in our hands, the medial thigh flap works well and seems the easiest solution
Myofasciocutaneous flaps and muscle flaps with skin grafts	One-step cover; multiple options based on rotation of the adductor minimus, gracilis, and rectus abdominis	Bulky, unnaturally thick cover; may create excessively warm environment and possibly affect spermatogenesis; donor-site morbidity	We have not had cases were we felt harvesting muscle for scrotal reconstruction would be advantageous
Omental flaps	Well-vascularized cover that can easily contour to the complex soft-tissue defect[3]	Inferior midline incision of the lower abdominal wall	Potential for complications, such as violating the abdominal wall

Although a unilateral medial thigh fasciocutaneous advancement flap can be used, it is our preference to use bilateral flaps for cases of complete scrotal skin loss. This requires smaller flaps on each thigh, resulting in defects that can be closed primarily with ease. Also, the neoscrotum has a more natural appearance if it is created with bilateral flaps, resulting in a tension-free closure at the midline, imitating the scrotal raphe. Finally, having attempted both a proximally and a distally based flap, we would like to make known that we prefer the proximally (cephalad) based flap. It can be raised all the way to the inguinal ligament, rotated medially, and advanced without difficulty, allowing for a tension-free closure.

We believe the advantages of the medial thigh fasciocutaneous flap for reconstruction of the scrotum after Fournier gangrene include improved and unparalleled cosmetic outcome, reestablishment of a near natural environment for the testes, and minimal morbidity in a technically uncomplicated, single-stage operation.

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DISCLOSURE

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A Note of Caution on the Use of the Distally Based Anterolateral Thigh Flap: Anatomical Evidence

Sir:

The reconstruction of soft tissue over the knee joint represents a challenge for plastic surgeons. As a result of anatomical research and clinical trials, new pedicled flaps have been recently proposed to manage these difficult wounds. The article published in this *Journal* in December of 2004 by Shin-Chen Pan et al.[1] is of particular interest and has stimulated an anatomical investigation regarding the variability in the length, branching pattern, and distal anastomosis (with the lateral genicular artery or profunda femoris) of the descending branch of the lateral circumflex femoral artery with regard to the planning of distally based, pedicled anterolateral thigh flaps.

Sixteen embalmed cadaver legs at the University of Glasgow were dissected to better define the descending branch of the lateral circumflex femoral artery. A longitudinal incision was made from the anterior superior iliac spine to the superolateral aspect of the patella. The septum between the tensor fasciae latae above, the vastus lateralis below, and the rectus femoris medially was opened to expose the lateral circumflex femoral artery from its origin. The main branches supplying muscles, fascias, fat, and skin of the anterolateral aspect of the thigh were then dissected out, reflecting the iliotibial tract proximally to facilitate visualization. In all cases, perforators arose between the origin of the branch to the rectus femoris and the point where the descending branch enters the vastus lateralis.

The descending branch was measured to its terminal branchpoint (most occur within the vastus lateralis) from the origin of the branch to the rectus femoris, because this branch is typically described as a dominant supply to the rectus femoris and therefore preserved. The measured length was 9.8 cm (range, 4.5 to 15.5 cm), and the descending branch terminated within the vastus lateralis in the majority of the cases (13 of 16 cases). The descending branch terminated by bifurcation within the intermuscular septum into an intraseptal continuation (length, 8, 5, and 8.5 cm, respectively) that anastomosed with the lateral genicular artery a few centimeters above the knee joint, and a lateral division that terminated within the substance of the vastus lateralis in only three of 16 specimens. This latter pattern of termination has been described,[2] but our results suggest that the incidence is relatively low. By implication, when planning a distally based anterolateral thigh flap, one must potentially include the division into the vastus lateralis as the pivot, or include a large cuff of this muscle. In particular, when the descend-

ing branch enters the proximal two-thirds of the vastus lateralis, without a clear septal continuation, the viability of a distally based anterolateral thigh flap must be prejudiced.

Although clinical series promote the distally based anterolateral thigh flap,[3] case numbers are low, and anatomical studies regarding the course of the descending branch down to the knee are lacking. The anatomical findings presented suggest that greater caution is required in selection of the distally based anterolateral thigh flap for coverage of the knee, given the apparent lack of a clear continuation between the descending branch and the lateral genicular artery in the majority of cadavers studied. Given that the descending branch entered the vastus lateralis within 8 cm of the rectus femoris pedicle in four cases, caution should perhaps also be exerted in recommending that the distally based flap will necessarily reach the knee, and there may be a role for preoperative vascular imaging to confirm the existence of suitable anatomy.

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Bilateral Sciatic Neurapraxia following Combined Abdominoplasty and Mastopexy

Sir:

We recently encountered an interesting case of complete bilateral sciatic neurapraxia following combined abdominoplasty and mastopexy, which we found educational for discussion because it highlights the commonly undermined importance of proper surgical positioning.

Recently, a 28-year-old healthy woman with a body mass index of 32.4 kg/m^2 underwent abdominoplasty and mastopexy performed under general anesthesia. After plication of the rectus abdominis muscles, the patient was repositioned from the supine to the Fowler position (torso inclined, hip flexed 60 degrees, and knees fully extended). Both abdominoplasty and mastopexy were completed in this position over a period of 3 hours. Immediately postoperatively, the patient complained of progressively worsening bilateral lower extremity weakness and numbness. Complete neurologic examination revealed an isolated and complete bilateral sciatic neurapraxia with loss of sensory and motor nerve function. Further examination revealed an area of nonblanching hyperpigmentation suggestive of a stage I decubitus ulcer of the buttocks overlying the area where the proximal sciatic nerve traverses, helping to confirm the diagnosis of sciatic neurapraxia.

Unfavorable positioning during surgery is the underlying cause of this complication. Although cases of postoperative sciatic neurapraxia are commonly encountered in orthopedic surgery, obstetrics and gynecology, neurosurgery, and urology because of the frequent use of lithotomy and seated positioning during surgery, no reports of postoperative sciatic neurapraxia have been described following aesthetic surgery. Three mechanisms of postoperative sciatic neurapraxia that have been reported in the literature are relevant to aesthetic surgery: compression neuropathy, traction injury, and piriformis syndrome. Our patient most likely experienced compression of the sciatic nerve caused by a combination of unfavorable surgical positioning and her obese body habitus, resulting in prolonged pressure in the gluteal region. Traction injury was also a contributing factor, because in the Fowler position the knees are left extended and the sciatic nerve is stretched during hip flexion.

Few studies have reported the risk factors associated with postoperative sciatic neurapraxia. A retrospective analysis of operations performed in the lithotomy position found that old age (>70 years), prolonged operation time (>180 minutes), and inappropriate positioning were risk factors for developing postoperative lower extremity neuropraxia.[1] "At-risk" patient positions also include semi-Fowler (hip flexed 30 degrees, knees extended), Fowler (hip flexed 60 degrees, knees extended), high-Fowler (hip flexed 90 degrees, knees extended), and seated (hip and knee flexed 90 degrees).[2] Severe hypotension[3] during surgery, obesity,[4] and spinal anesthesia may be risk factors as well.[3]

Although a combined abdominoplasty and mastopexy procedure is a relatively safe procedure,[5] attention should be paid to proper patient positioning. We suggest minimizing time in the reflexed position and looking for defects in the operative table padding. If the hip must be flexed, we recommend placing the patient in a "beach chair" position, with an appropriate degree of knee flexion to take tension off of the sciatic nerve.

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Influence of Foot Height on Tissue Oxygenation of Diabetic Feet

Sir:

Adequate tissue oxygenation is an essential factor in diabetic wound healing.[1] In managing diabetic foot ulcers, foot elevation has been generally recommended to reduce edema and prevent other sequential problems.[2] Elevation decreases the local hydrostatic pressure and the superficial venous pressure, thereby reducing edema and the interstitial spillage of macromolecules. By decreasing the extravasation of macromolecules into the extravascular space, the inflammatory response is reduced. Stifling of the inflammatory response may limit the release of mediators detrimental to the process of wound healing.[3] However, foot elevation may decrease tissue oxygenation of the foot more than the dependent position because the dependent position is known to increase blood flow within the arterial system.[4,5] In addition, diabetic foot ulcers, which have peripheral vascular insufficiency, generally have less edema than other wounds. Therefore, we argue that foot elevation may not be helpful for healing of vascularly compromised diabetic foot ulcers. The purpose of this study was to evaluate the influence of foot height on tissue oxygenation and to determine optimal foot position to accelerate wound healing of diabetic foot ulcers.

This study included 122 cases (73 men and 47 women; two men had bilateral disease) of diabetic foot ulcer patients aged 40 to 93 years (mean, 63 years) admitted to the Department of Plastic Surgery of Korea University Guro Hospital. Foot transcutaneous partial oxygen tension was measured before and 24 hours after elevation in 21 patients. To achieve elevation, four cushions were used (Fig. 1); the total cushion level was approximately 24 cm in height. In addition, transcutaneous partial oxygen tension values were measured before and 24 hours after foot lowering ($n = 122$). Feet were lowered to the patient's tibial height, approximately 30 to 35 cm, beside a bed handrail (Fig. 2). Because of the large number of lowering measurements, we divided them into five subgroups according to initial transcutaneous partial oxygen tension: less than 20 mm Hg, 20 to 29 mm Hg, 30 to 39 mm Hg, 40 to 49 mm Hg, and 50 mm Hg or more. A paired t test was used for statistical significance.

Fig. 1. For elevation, four cushions were used, resulting in 24 cm of elevation. Transcutaneous partial oxygen tension was measured after 24 hours of elevation.

Fig. 2. Feet were lowered beside a handrail, to the height of the patient's tibial length, approximately 30 to 35 cm. To measure transcutaneous partial oxygen tension, we waited 24 hours after lowering.

Foot elevation lowered transcutaneous partial oxygen tension. Before elevation, the average transcutaneous partial oxygen tension was 32.5 ± 22.2 mm Hg and decreased to 23.8 ± 23.1 mm Hg after elevation, representing a decrease of 26.8 percent. This difference was statistically significant ($p < 0.01$). In contrast, foot lowering had a positive effect on transcutaneous partial oxygen tension. The average baseline transcutaneous partial oxygen tension was 44.6 ± 23.8 mm Hg and increased to 58.0 ± 2 5.9 mm Hg after lowering, an increase of 30.1 percent. This difference was also statistically significant ($p < 0.01$). All subgroups had increased transcutaneous partial oxygen tension values after foot lowering. The subgroups with low initial transcutaneous partial oxygen tension levels had a much greater increase of transcutaneous partial oxygen tension levels after foot lowering. The subgroup with an initial transcutaneous partial oxygen tension less than 20 mm Hg increased 137 percent from baseline (from 9.15 ± 5.36 mm Hg to 21.7 ± 13.4 mm Hg). The subgroup 20 to 29 mm Hg increased 61.4 percent from baseline (from 26.8 ± 2.02 mm Hg to 43.2 ± 12.1 mm Hg). Paired *t* test values for the differences between the before and after scores in each subgroup divided by the initial transcutaneous partial oxygen tension values showed significant and consistent differences ($p < 0.01$).

This study demonstrates that foot lowering, rather than elevation, significantly augments tissue oxygenation of the diabetic foot and may reinforce wound-healing potential.

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Choosing a Residency Program

Sir:

Choosing a program may sound comical to a fourth-year medical student who is having nightmares about whether he or she will land one of the relatively few spots in a plastic surgery residency. However, the purpose of this article is not to tell a candidate how to get into a program but rather give the reader a single, thought-out perspective from a just-starting plastic surgery intern on how to choose one. That's right, choose one. In the full spirit of the match, the student should never rank a program based on what they believe may be their chances, but rather which program is the best fit.

Plastic surgery is a tremendously vast field requiring years of specialty-specific training. As a response, some residencies have approached training much like other fields, such as orthopedic surgery, in a progressively more categorical fashion. These programs are including more and earlier plastic surgery training at the expense of some general surgery experience. On the other end of the spectrum, some residencies have abandoned training medical students and protest that fellowship training of surgeons is most appropriate. The truth is that most options will fall in between, with integrated programs closer to the former and combined programs the latter. Choosing which structure is right for you is one of the most important early decisions a candidate has to make.

Other components of a program one should consider include the breadth of experience, faculty, residents, facilities, research opportunities, and freedom. Every program will boast that they easily reach their "numbers," but every program has its strengths and weaknesses when in comes to breadth and depth of experience. It is important for the candidate to understand which program is strong in hand, craniofacial, microsurgical, breast, and/or aesthetic surgery. Although many student candidates will not know their specific future clinical interests, some may have an idea of what they are most drawn toward. These candidates would benefit most from this information.

Regardless of curriculum and case volume, the candidate needs to identify the mentality and work environment of each program. Every candidate has a different personality, as does every program. Interfaculty, interresident, and faculty-resident interactions and relationships are important to notice. Candidates will want and require varying levels and forms of mentorship and camaraderie. Like an anticipated first date, you need to be yourself. Only then will you know whether you have found the right match.

Often, candidates detest the facility tour given at interviews. However, many complaints coming from

residents are concerned with various parts of the hospital or their interactions with other departments. The hospital tour is an excellent opportunity to learn more about not only the facilities but also the everyday difficulties residents face within a hospital.

Just as important as your work environment is your living environment. The few hours you will spend outside of the hospital might as well be as enjoyable as possible. However, what a candidate finds pleasure in will be based on marital status, children, expenses, and interests, to name a few. Probe the residents about the livability of a city based on your criteria. To some, this is one of the most important factors.

If research is an interest of the candidate, familiarity with the research opportunities within the residency program is critical. Having the freedom to perform research is insufficient. Experienced mentors with established laboratories and infrastructures are needed for proper mentorship of an aspiring scientist.

Lastly, it does not matter how strong a program's research or clinical capabilities are unless the residents have the freedom to explore and invent. A candidate should look for a program that supports new research ideas, independent clinical experiences, and personal growth.

These are just some of the major factors I considered when choosing a residency. Each candidate will weigh these factors differently and undoubtedly add individual factors. I approached the process in a classically obsessive-compulsive fashion, using a spreadsheet with a weighted scoring system. In the end, I had my scores and my gut feeling. Fortunately, they both told me the same thing. Bottom-line, be true to yourself and the process, and you will find the right match.

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New System of Collecting Fat with a Bottle of Redon Drainage

Sir:

The Coleman technique[1] is an usual procedure in our department for treatment of human immunodeficiency virus lipodystrophy. The fat has been harvested so far by using 50-cc syringes, as described by Coleman, to ensure fat survival. However, this is a time-consuming technique. We have developed a way to do it in less time and in a more comfortable way. To collect the fat, we use a liposuction machine at a negative pressure of 0.4 atm and a Redon bottle.

The aspiration cannula is connected to the bottle of Redon drainage and the bottle is connected to another tube connected to the aspirator (Fig. 1). The selected negative pressure to aspirate is 0.4 atm because it is a safe pressure for the adipocyte integrity as described by Prado et al. in their study.[2]

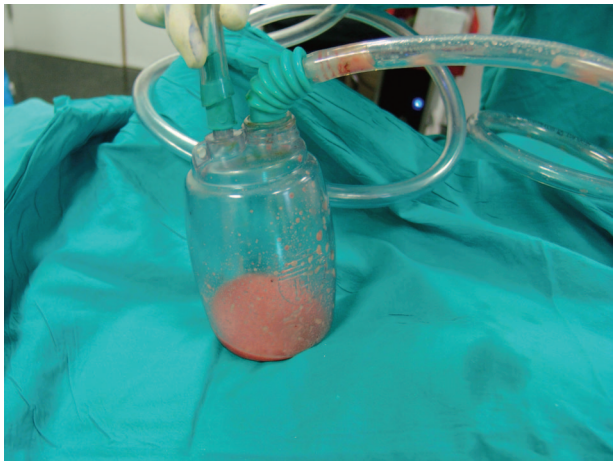

Fig. 1. A Redon bottle with the two tubes connected: one to the aspirator and the other to the aspiration cannula and with the liposuctioned fat inside.

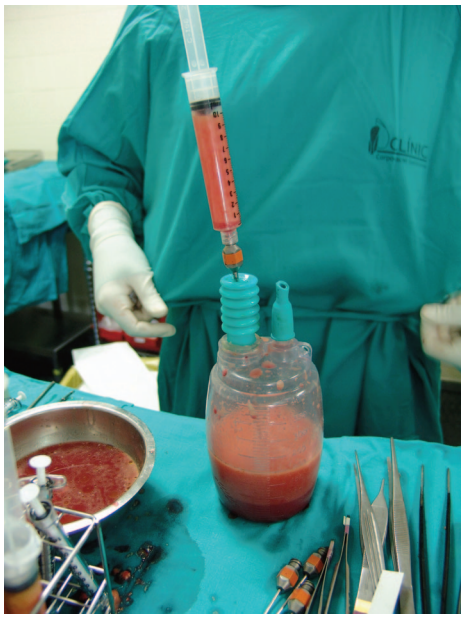

Fig. 2. Fat is extracted from the Redon bottle with a syringe and a liposuction cannula once the Redon bottle has been filled and before centrifugation.

As the nurse uses the first full bottle for processing (Fig. 2), centrifuging, and transferring the fat to the 1-mm syringes, the surgeons can harvest more fat using new Redon bottles. This system for harvesting the fat reduces the operating time for the Coleman technique.

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DISCLOSURE

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