GUIDELINES

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- References—maximum of five
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- Figures/Tables—no more than two figures and/or one table

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Tip Grafts in Closed Rhinoplasty: Insertion and Fixation Made Easy

Sir:

If the closed technique is to be used, after preparing the tip graft, the next step is to place it into a subcutaneous pocket made from one rim incision in the right or left vestibule. Sometimes this procedure may be quite difficult and troublesome and can result in graft malposition, especially if graft fixation is to be achieved with sutures through the skin. Such drawbacks make some surgeons elect to use the open technique when dealing with tip grafts.

A simple method of inserting the cartilage graft (to project the nasal tip) is through one rim incision in one of the vestibules. After the tip pocket is created, a section lifter (with its concave surface toward the skin) (Fig. 1) is used to guide the 6-0 nylon needle safely from the tip skin to the vestibule. After the needle has passed through the cartilage graft(s) (Fig. 1), the same section lifter is used to guide needle on its safe return route from the vestibule to the tip skin. Pulling both suture extremities through the tip skin will orient the graft to the correct position in the tip subcutaneous pocket. The suture is tied loosely over a small piece of cotton and left in place for only 24 hours.

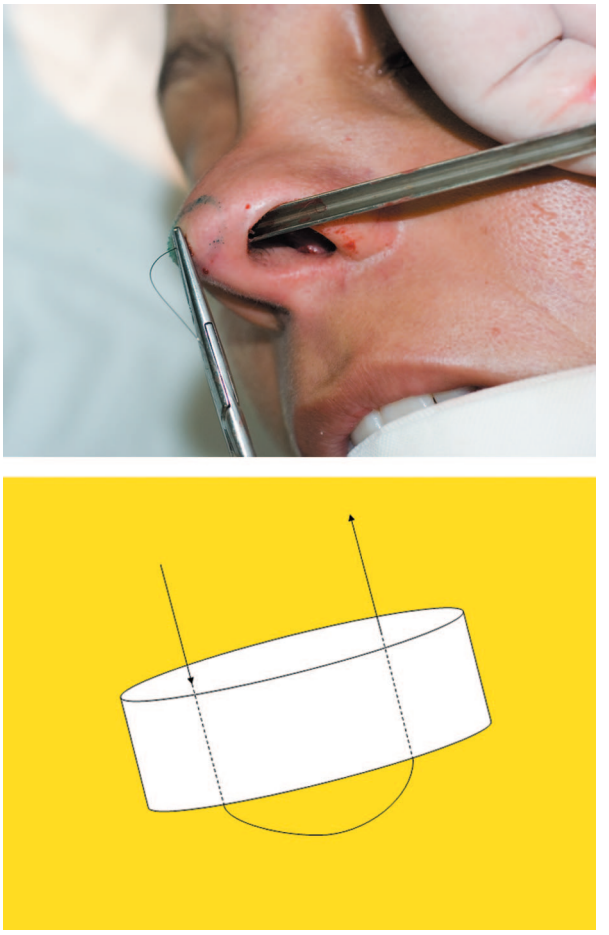

Fig. 1. (*Above*) Section lifter passing through one rim incision. Its concave surface safely guides the needle from the nasal skin to the nasal vestibule. (*Below*) The suture is passed through the cartilage graft.

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A New and Simple Marker for the Transcartilaginous Incision: The Cabas-Coffler Marker

Sir:

When performing a closed rhinoplasty using Peck's marking technique,[1] one designs the transcartilaginous incision to resemble a gull's wing. As part of the technique, the initial local infiltration of anesthesia should not distort the tip. Next, the suction tip is placed intranasally in the dome area to imprint the initial site of the transcartilaginous incision.[1] For some time, this maneuver has proved quite difficult to perform with accuracy, because the suction tip will only provide a round and limited imprint of the externally designed incision.

We have designed a simple marker that is able to imprint a dotted line in the vestibular skin that reflects exactly the line that has been drawn on the external skin. Known as the Cabas-Coffler marker (Fig. 1), it was created from a standard Allis forceps by rasping one side to make it smooth in order not to damage the nasal tip skin; the opposite side (i.e., the side that will imprint the dotted line in the nasal vestibular skin) was made sharper.

At first we used methylene blue dye to print the transcartilaginous incision in the vestibule. Today we find that totally unnecessary. By using the marker without any dye, a dotted line can still be obtained without blurring the vestibular skin (Fig. 2).

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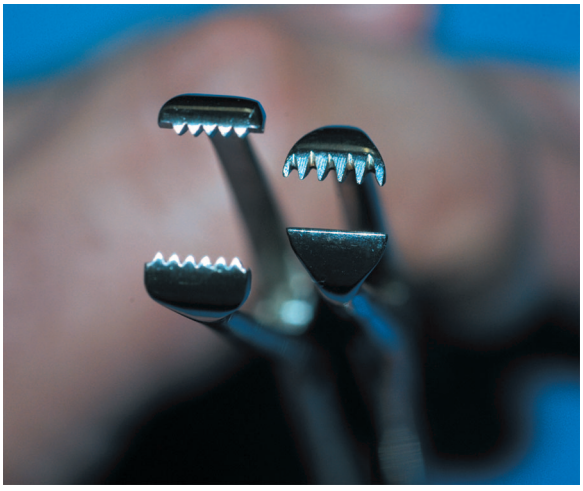

Fig. 1. (*Left*) The Allis forceps. (*Right*) Removing the teeth from one side of the Allis forceps and deepening those on the opposite side will create the Cabas-Coffler marker.

Fig. 2. The marker transfers the "gull's wing" line to the vestibular skin, thus making the incision more precise.

Arterial Embolization and Skin Necrosis of the Nasal Ala following Injection of Dermal Fillers

Sir:

The most common adverse effects of injection of biodegradable dermal fillers are bruising and erythema in the acute phase and allergic changes, abscess formation, and granulomatous change in the chronic phase.[1–3] The most serious side effect is localized tissue necrosis, which is induced by mechanical interruption of local vascularity, though it occurs very rarely (nine in 10,000 patients who underwent collagen implantation).[2] The only reported case of arterial embolization induced by hyaluronic acid injection involved the glabellar region.[4]

A 50-year-old Japanese woman with no previous history of cosmetic surgery underwent injection of hyaluronic acid gel (Restylane; Q-Med, Uppsala, Sweden) to shape the nasal tip contour and of human tissue–derived, reconstituted collagen matrix (Sheba; Hans Biomed, Daejeon, South Korea) for wrinkle correction of the upper white lip and nasolabial fold and augmentation of the upper vermilion. Immediately after the injection, the patient had a striking pain on the left side of her face. A few hours later she noticed reddish discoloration from the left side of the nose and upper lip to the glabellar region, which corresponded to the area nourished by the angular branch of the facial artery. By the third day of onset, blisters had appeared at the left nasal ala. When the patient consulted our hospital on the sixth day, a gangrenous skin necrosis measuring 1 × 1.5 cm was present on the left nasal ala (Fig. 1). Three-dimensional computed tomographic angiography performed on the ninth day demon-

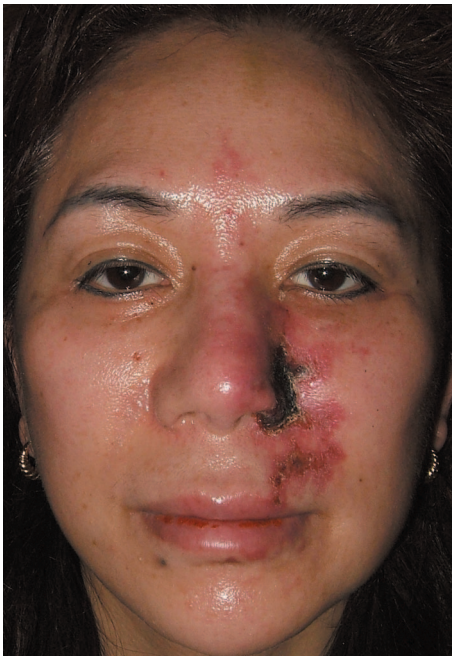

Fig. 1. View of the patient on her first visit (6 days after injection). Gangrenous skin necrosis is seen on the left nasal ala. Erythema was seen on the whole area nourished by the angular branch of the facial artery (i.e., the glabellar region, the left side of the nose, and the left upper lip).

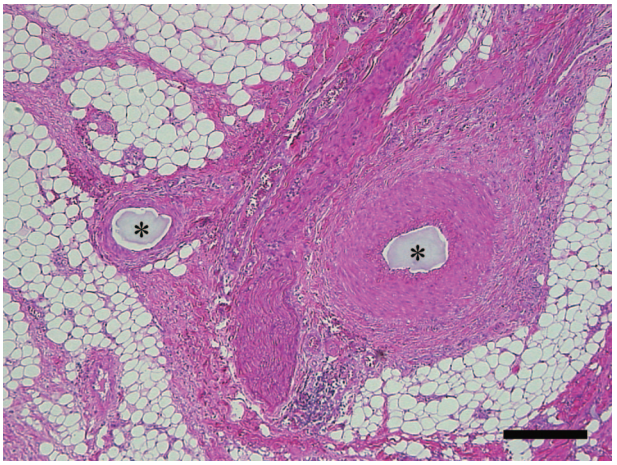

Fig. 2. Debridement sample. Photomicrograph of subcutaneous tissue shows intra-arterial foreign bodies (*) and thickening of the intima (hematoxylin and eosin stain; scale bar = 300 μm).

strated local occlusion of the angular branch of the facial artery and compensatory dilation of collateral vessels such as the infraorbital artery and its daughter branches. Intravenous administration of alprostadil (Prostandin; 120 μg/day) was then started, and the surrounding erythema decreased with time. The necrosis extended to the surrounding skin and subcutaneous tissue, and was surgically removed on the twelfth day. A full-thickness skin graft taken from the postauricular area was grafted to the residual skin defect on the day 43 and was successfully accepted.

In the present case, the alar skin resulted in massive necrosis, despite the absence of filler injection into the ala. Histopathological examination of the biopsy specimen from the nasal ala indicated intra-arterial and subdermal deposition of foreign bodies (Fig. 2), although we could not identify whether they were Restylane or Sheba. Sharp pain and the erythema in the early phase suggest acute and widespread embolization of the artery. Together with the results of the three-dimensional computed tomographic angiography, we diagnosed the patient as having arterial embolizations of the angular branch and its daughter branches.

Like the glabellar region, the nasal ala may be a particular region in which blood supply depends strongly on a single arterial branch. Otherwise, collateral blood supply was blocked by the concurrent filler injection to the nasal tip, which may have been a critical factor in this case. Although accidental intra-arterial injection of dermal fillers is apparently rare, the potential risk of vascular embolization should be noted, especially when injecting into the subcutis of the glabellar region, the nasal ala, and the nasolabial folds.

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Intraoperative Simulation Device Using Negative Pressure for Construction of Framework in Microtia Reconstruction

Sir:

Since the introduction of the Tanzer method in 1959, numerous modifications of Tanzer's costal cartilage framework for microtia have been described. One of the most important requisites for successful total ear reconstruction is an anatomically precise framework; therefore, construction of the three-dimensional coastal cartilage is the key procedure in auricular reconstruction. Nagata[1] introduced the three-dimensional framework carved according to a fixed ratio based on the anatomical structure of the normal ear cartilage. Chen et al.[2] introduced three-dimensional template models based on Nagata's method as an aid to constructing a well-defined framework. These concepts and ideas will have value when the ideal framework is able to be constructed meticulously by the surgeon's hands. In construction of the framework, however, it is difficult to accurately visualize the relief that occurs when the framework is put into the skin pocket, because the thickness of the skin under which the framework is placed is about 1 mm or more. Furthermore, the color of the framework is heterogeneous, and there are some partition lines on the framework that are obscure for imaging the surface appearance of the framework accurately. Therefore, to check the shape of the framework, it is necessary to place the framework into the pocket, suture the skin to achieve an airtight pocket, remove the air in the pocket through a suction tube, and repeat these process many times until the satisfactory shape is obtained.

We have designed a handy device that makes it possible to simulate the insertion of the framework and to check the result of reconstructed ear immediately. This device consists of the following components, made of acrylic resin (Fig. 1): (1) a round table with small holes in the center; (2) a cylindrical case into with the table just fits, with a connector for a suction tube; and (3) a ring that fits around the edge of the case.

The table is set in the case, and the framework is put in the center of the table. Two or three pieces of surgical glove material are put on the framework. The edge of the case is suppressed with the ring to make the closed space airtight. Finally, the suction tube is connected with the connector. The glove is stuck on the framework, and the expected shape of the ear appears on the table in a relief. This device makes it possible to easily check the shape of the framework many times until satisfactory relief can be obtained. As a result, there is marked improvement in the precision of the framework construction and a shorter operating time (Fig. 2).

To construct a more complete three-dimensional costal cartilage framework of the auricle, great skill is a prerequisite. For the purpose of education or training in framework construction, we use rubber blocks or root vegetables as materials instead of the costal cartilage. There is immediate feedback on the postoperative appearance. As a training tool, therefore, the device is very useful.

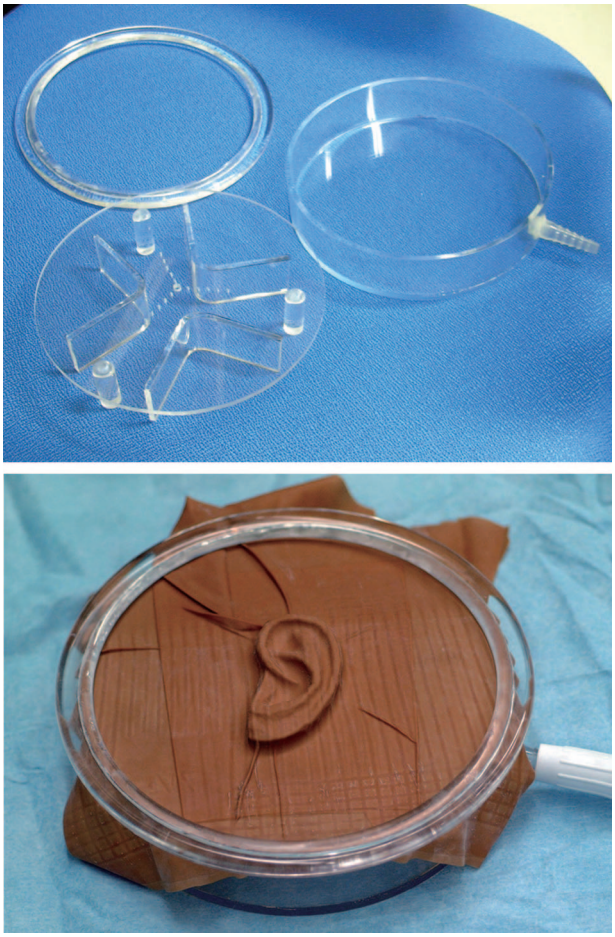

Fig. 1. (*Above*) The device consists of three components made of acrylic resin: a table with holes in it, a case with connector for suction, and a ring. (*Below*) Intraoperative simulation. Surgical gloves are used as a model for the skin.

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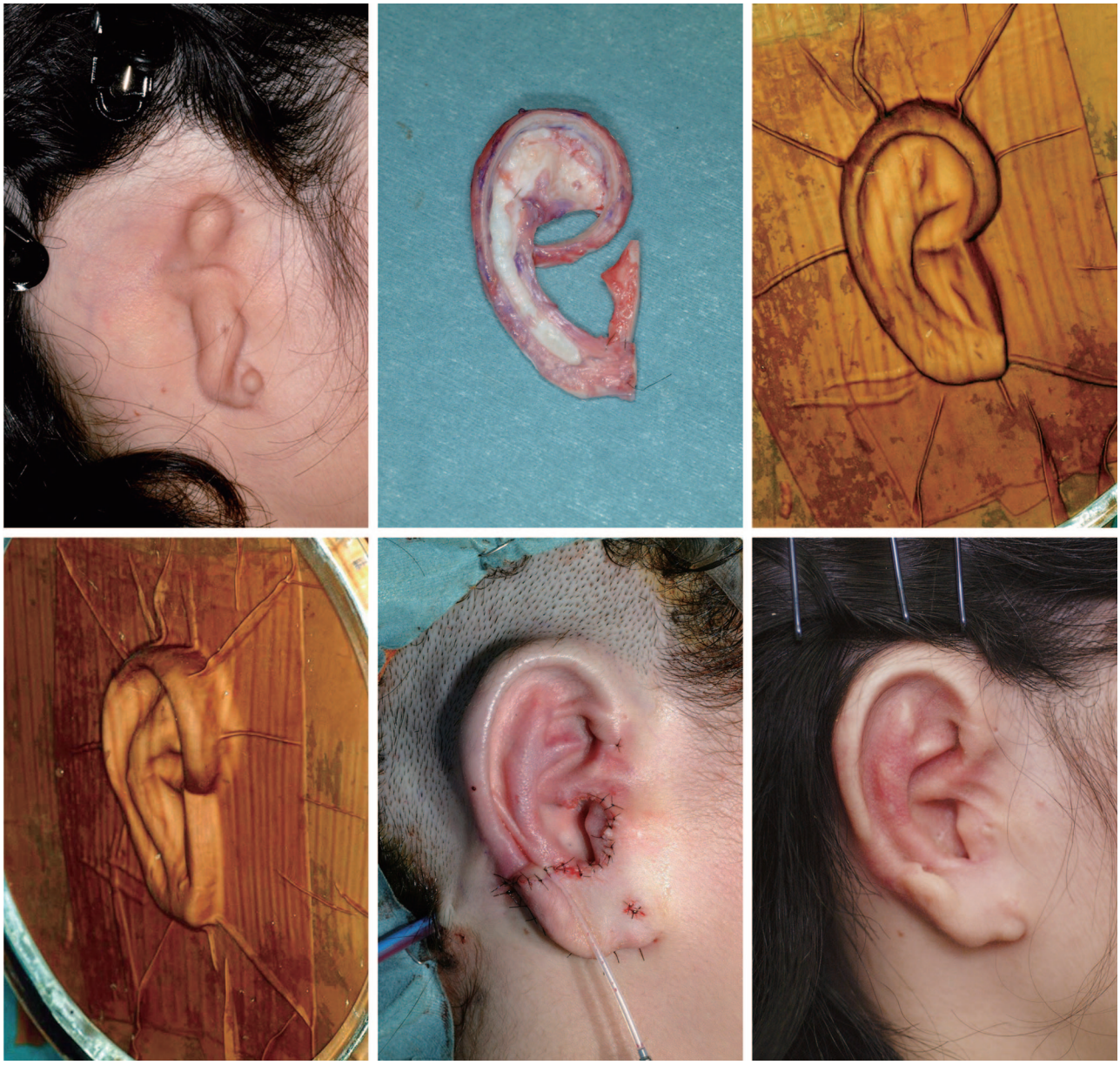

Fig. 2. (*Above, left*) Preoperative view of a 12-year-old girl with right lobule-type microtia. (*Above, center*) The costal cartilage framework. (*Above, right* and *below, left*) Intraoperative simulation using the device. (*Below, center*) After a satisfactory shape was obtained, the framework was set into the subcutaneous pocket. No further correction of the framework was needed in this case. (*Below, right*) Postoperative view 5 months after primary operation. Note that the shape of intraoperative simulation is similar to the long-term postoperative shape.

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The Split Ear Lobe Flap for Antihelix Reconstruction

Sir:

The external ear is a high-risk location for common malignancies of the skin such as basal or squamous cell carcinoma.[1] Radical treatment of these lesions has proved to be successful and durable as long as a wide excision is performed; thus an adequate reconstruction can be achieved. Three methods are usually indicated: healing by secondary intent, skin grafting, or a local flap. The peculiar anatomy of the different subunits and the depth of the excision are important variables to be considered in choosing a reconstructive procedure.

The antihelix has a convex surface covered by inelastic and adherent skin. Skin cancers localized in this aesthetic subunit often require full-thickness excision that includes the cartilage[2]; consequently, reconstruc-

tion is troublesome because of the limited availability of local flaps and the disadvantages of grafts due to the prolonged postoperative care and poor aesthetic results.[3,4] Spontaneous healing has also been advocated, but in our opinion, the resulting scar may interfere with long-term disease control.

We describe a new flap harvested from the ear lobe to cover either superficial or full-thickness defects of the antihelix. The split ear lobe flap is a rectangular, anteriorly based flap that is designed transversally on the anterior surface of the ear lobe and continues on posteriorly in a wedge fashion (Fig. 1). The flap is elevated by two parallel full-thickness incisions carried out from the central part of lobule toward its free edge. The posterior pedicle is then divided and the flap is split to obtain an "extended-length" flap (Fig. 2). Dissection in the subcutaneous tissue must carefully preserve the pedicle, which is randomly based on the rich subdermal plexus of the ear lobe; a width-to-length ratio not exceeding 1:4 is recommended to ensure the viability of the distal half of the flap. A wide arc of transposition, ranging from 30 to 150 degrees, makes the flap able to reach up to 4 to 5 cm from its base and allows the flap to repair defects of almost the entire antihelix without any tension. The donor area is closed directly with a minimally noticeable scar and no contour defects (Fig. 3). Complications include temporary venous congestion, which may occur only in cases of long and narrow flaps (width-to-length ratio exceeding 1:4.). The aesthetic outcome is good, with nice color, texture, and thickness matches between the flap and the skin.

Finally, this single-step, time-saving procedure does not require additional scars in distant areas, can be repeated, especially in older patients with large lobules, and preserves the retroauricular area as an important source of local flaps and grafts for ear or eyelid reconstruction.

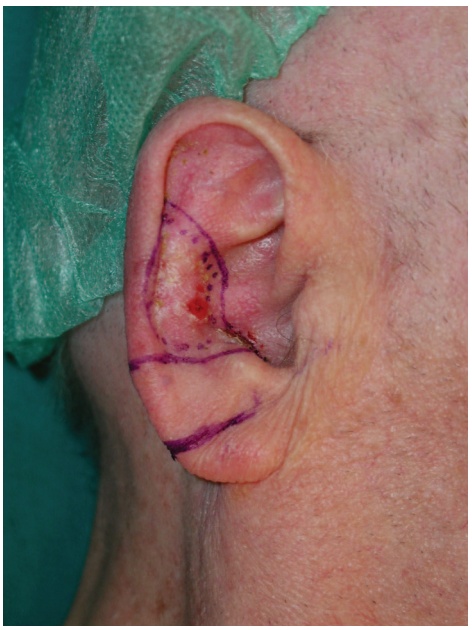

Fig. 1. A basal cell carcinoma of the antihelix, with split ear lobe flap planning.

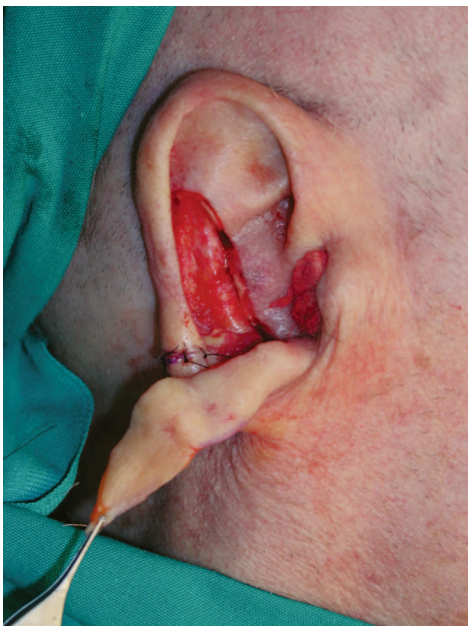

Fig. 2. The excision includes the cartilage during flap harvest.

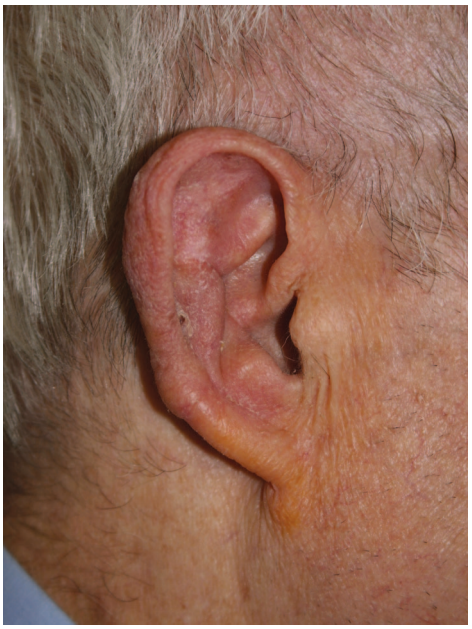

Fig. 3. Postoperative result.

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Can Bipolar Diathermy Enhance Scoring in Otoplasty? An Ex Vivo Study

Sir:

A common, unsatisfactory, long-term outcome of otoplasty is undercorrection and residual deformity,[1,2] with the complication rate increasing with postoperative time.[3] Scoring cartilage to permanently alter its shape is a well-established technique based on the natural ability of cartilage, stripped of perichondrium, to warp away from the scored surface. Aggressive scoring can cause unattractive and painful ridging and may result in suture tension, undercorrection, and recurrence. In older patients with stiffer cartilage, additional conchal weakening is probably indicated.[4] In clinical practice, a scalpel blade is the usual method, but our interest in thermal warping was stimulated by clinical observations during otoplasty that cartilage warping was enhanced after minimal applications of bipolar diathermy on the reverse of the scored surface. To investigate this, we developed an ex vivo pig ear model in which 16 strips of cartilage (3 cm × 2 cm × 2 mm) were harvested from 10 Landress pigs' ears, and the skin and perichondrium were removed (Fig. 1, *above* and *second from above*). Eight strips were scored with a no. 15 scalpel blade with a 1-mm-deep limiter. Three parallel scores were placed transversely approximately 2 mm apart across the center of each strip, and the deflection angle was calculated as the mean of the two angles measured around the pivot of the strip (Fig. 1, *second from below*). The cartilage tension was measured using the pulley apparatus devised by O'Neal et al.[5] On the reverse of each scored strip, three rows of six bipolar burns (30 W) were placed in the same position as the scoring, and the deflection and tension were measured. The remaining eight strips were cauterized only (60 W) with 18 separate burns placed in the center of each strip as before, and the deflection (Fig. 1, *below*) and tension were measured (Table 1).

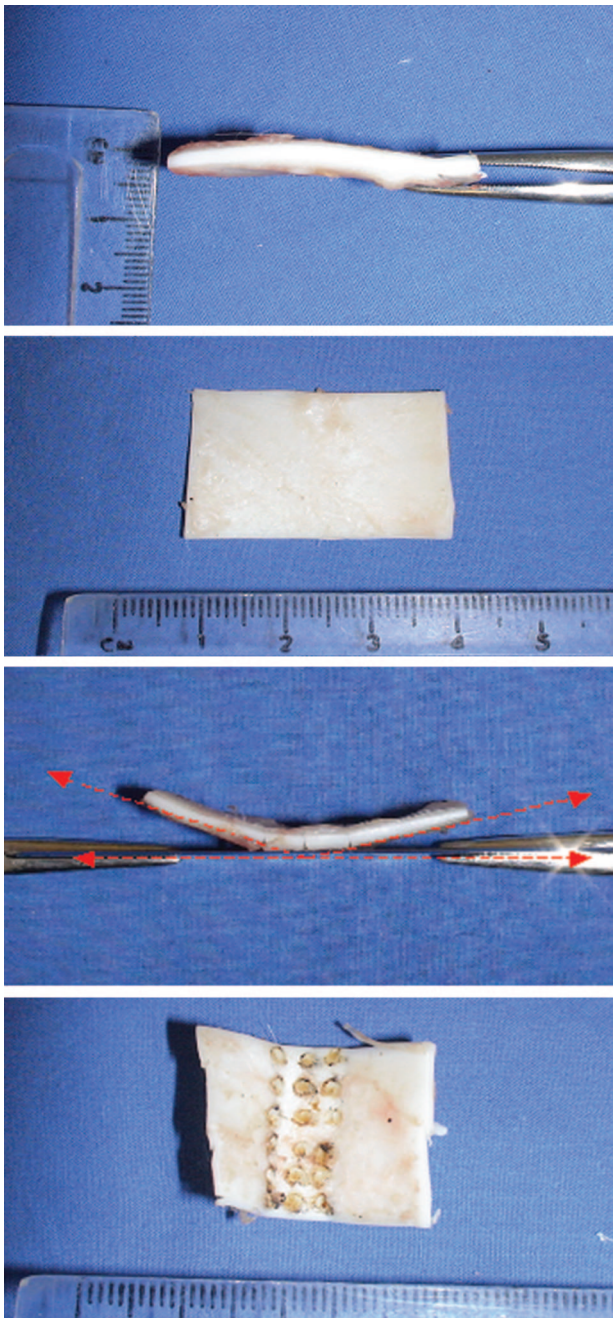

Fig. 1. (*Above*) Cartilage strip with thickness of 1.5 to 2.5 mm. (*Second from above*) A 2 cm × 3 cm cut strip of cartilage. (*Second from below*) Deflection after scoring and calculation of the deflection angle. (*Below*) Position of diathermy burns and deflection after diathermy in the diathermy-only strip.

It was not possible to assess statistical power before the study, as there are no experimental precedents. A statistical difference was not detected between a no. 15 blade and diathermy in deflection angle ($p = 0.26$) or cartilage tension ($p = 0.36$). There was a significant increase in both the mean deflection angle (243 percent) and cartilage tension (168 percent) when scoring was combined with diathermy compared with scoring

Table 1. Deflection Angles and Cartilage Tension in Strips Subjected to Scoring Only, Bipolar Only, and Scoring with Bipolar Diathermy

	Range		Mean		SD	
	Deflection Angle (°)	Cartilage Tension (N)	Deflection Angle (°)	Cartilage Tension (N)	Deflection Angle (°)	Cartilage Tension (N)
Scored only (n = 8)	17–40	0.15–0.25	24.5	0.19	7.86	0.038
Bipolar only (n = 8)	15–26	0.15–0.20	20	0.175	4	0.027
Scored andBipolar (n = 8)	53–75	0.25–0.42	59.63	0.32	10.73	0.065

alone (Fig. 2). This increase was highly statistically significant (deflection angle, $p = 4.69^{-6}$; cartilage tension, $p = 2.9^{-4}$).

These results indicate that bipolar diathermy is as effective as scoring in warping cartilage. Reverse-side bipolar diathermy in addition to scoring dramatically enhanced cartilage warping and produced a significantly more robust end result. Bipolar diathermy combined with scoring may be an effective combination for achieving additional, stronger, and more stable conchal weakening, although further studies of long-term cartilage stability and power effects are required.

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Fig. 2. Selected examples of cartilage deflection: (*above*) baseline measurements; (*center*) scored cartilage; (*below*) scored cartilage and bipolar diathermy (30 W).

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DISCLOSURE

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Retroauricular-Calvarial Bone Island Flap Transfer to the Cheek

Sir:

The retroauricular region is a useful donor site for reconstructing the preauricular-temporal area, eyelids, cheek, or nose. Flaps from this area can be elevated based on the superficial temporal artery or the posterior auricular artery. In addition to this area, the superficial temporal artery supplies the temporal region, and the calvarial bone flap based on the superficial temporal artery is widely used.[1] We transferred a retroauricular arterial island flap combined with a calvarial bone flap (retroauricular-calvarial bone island flap) with good results.

A 72-year-old man presented with a hemangiopericytoma with malignant potential in his right cheek. Preoperative examinations revealed invasive growth of the tumor into the zygoma and orbit. The tumor was completely excised along with a 3 × 3.5-cm area of skin, the zygomatic branch of the facial nerve, and a part of the zygoma and the lateral wall of the orbit. The composite flap was elevated as a reversed flow flap based on the anterior branch of the superficial temporal artery to increase the length of the vascular pedicle (Fig. 1). The bone flap was divided longitudinally into two segments and used in the bone defect. The skin island was used for skin coverage, and it included the posterior auricular nerve, which was sutured to the nerve gap of the facial nerve.

The postoperative course was uneventful, with complete healing. Bone scintigraphy revealed good accumulation of the radioisotope at the site of the calvarial bone graft. The patient was able to completely close his right eyelid 7 months after surgery, and a satisfactory result was obtained (Fig. 2).

Although Guyuron,[2] Kobayashi et al.,[3,4] and many other authors have reported on clinical uses of the retroauricular island flap, we were unable to find any reports in the literature that mentioned combining a retroauricular flap and a calvarial bone flap. We used this composite flap as a reversed flow flap based on an anterior branch of the superficial temporal artery, as reported by Song et al.[5] Great care must be taken not to damage the temporal branch of the facial nerve, because the pedicle is extended in the medial direction in such cases. However, we observed good vascularity in the elevated skin and bone flap and obtained good results with minimum absorption of the bone grafts.

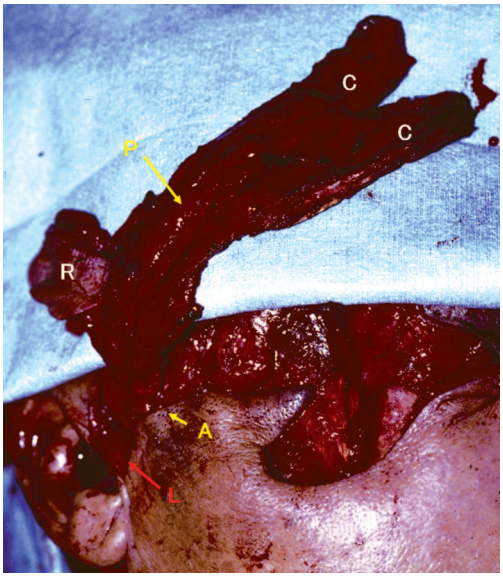

Fig. 1. View after flap elevation. Superficial temporal vessels are ligated just proximal to the junction of the anterior branch (*L*). Both the retroauricular arterial island flap (*R*) and the outer table calvarial bone flap (*C*) are elevated based on the anterior branch (*A*) of the superficial temporal vessels as a reversed flow flap (*P*, parietal branch of the superficial temporal artery).

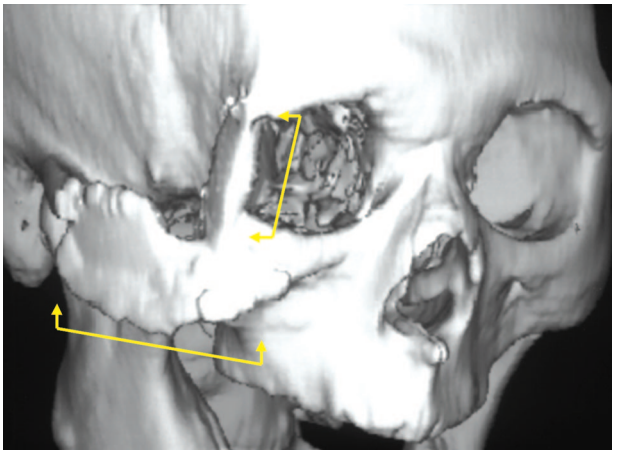

Fig. 2. Three-dimensional computed tomography image of the grafted calvarial bone flap (*arrows*) more than 1 year after transplantation.

A Doppler flow meter or color Doppler flow imager is useful in determining whether the dominant pedicle is the posterior auricular artery or the superficial temporal artery. A surgical delay procedure must be considered when the dominant blood supply flows from the posterior auricular artery. However, our new technique offers many advantages, including that composite tissue, such as skin, bone, and nerve, can be transferred based on a single vascular pedicle in one stage, donor-site morbidity is minimal, and flap vascularity is reliable when combined with meticulous preoperative assessment and intraoperative dissection. Moreover, other combinations are possible, such as a retroauricular flap combined with a temporoparieto-fascial flap.

We think this technique represents another choice for the reconstruction of complex defects in the cheek or orbital region.

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Power-Assisted Liposuction Treatment of Cervicodorsal Fat Pad in Human Immunodeficiency Virus–Associated Lipodystrophy

Sir:

Individuals infected with the human immunodeficiency virus now have a much greater chance of long-term survival due to highly active antiretroviral therapy, which can reduce viral load to nearly undetectable levels. However, prolonged use of this therapy has the potential to effect significant changes in fat metabolism. Numerous human immunodeficiency virus–associated lipodystrophies have been described, characterized by either lipoatrophy or fat hypertrophy.[1] Enlargement of the cervicodorsal fat pad, or "buffalo hump," is among the most disfiguring of these disorders.

Several studies have identified suction-assisted lipectomy and ultrasound-assisted liposuction as effective ways of treating the cervicodorsal deformity; a review of these reports, however, reveals significant rates of recurrence. We report our experience with power-assisted liposuction in the effective surgical management of human immunodeficiency virus–associated cervicodorsal lipodystrophy.

We conducted a retrospective review of five human immunodeficiency virus–positive patients who had power-assisted liposuction performed for treatment of an enlarged cervicodorsal fat pad. Patient data, operative data, and follow-up parameters were analyzed.

Five patients were evaluated and treated for cervicodorsal lipodystrophy by the senior author (Table 1). All five patients underwent power-assisted liposuction without complication. Representative preoperative and postoperative views are shown (Fig. 1). The mean follow-up time was 7.3 months (range, 2.5 to 16 months), with no recurrence over this time.

The development of lipodystrophy in human immunodeficiency virus–positive patients can have devastating physical and emotional consequences. The buffalo hump deformity has been shown to result in pain, dysesthesia, difficulty with head rotation and dressing,

Table 1. Demographic and Operative Data

Patient	Age/Sex	Year of HIV Diagnosis	CD4 Count	Viral Load	HAART Regimen	Comorbidities	Date of Operation	Tumescent Solution (cc)	Lipoaspirate (cc)	EBL (cc)
1	36/M	1996	622	82,362	DdI, D4T, Abacavir, Nelfinavir; VidexEC, Nevirapine, Abacavir; Trizivir, Nevirapine	None	3/15/03	600	550	100
2	44/M	1981	345	155,258	AZT, DDI, Saquinivir; Agenerase, Zerit, lamivudine, Viread, Efavirenz, DdI	Dyslipidemia	2/12/04	350	250	50
3	48/M	1985	120	<50	Efavirenz, lamivudine, Tenofovir	DM, dyslipidemia, HTN, proteinuria	7/17/03 7/13/04	1000 600	900 475	100 25
4	54/M	1989	651	165	Lamivudine, Tenofovir	Dyslipidemia	12/7/04	550	350	150
5	60/M	1994	420	585,000	AZT, lamivudine; d4T, DdI, Efavirenz, Tenefovir, Lopinavir, Ritonivir, Indinavir	Obesity	4/22/05	480	800	100

EBL, estimated blood loss.

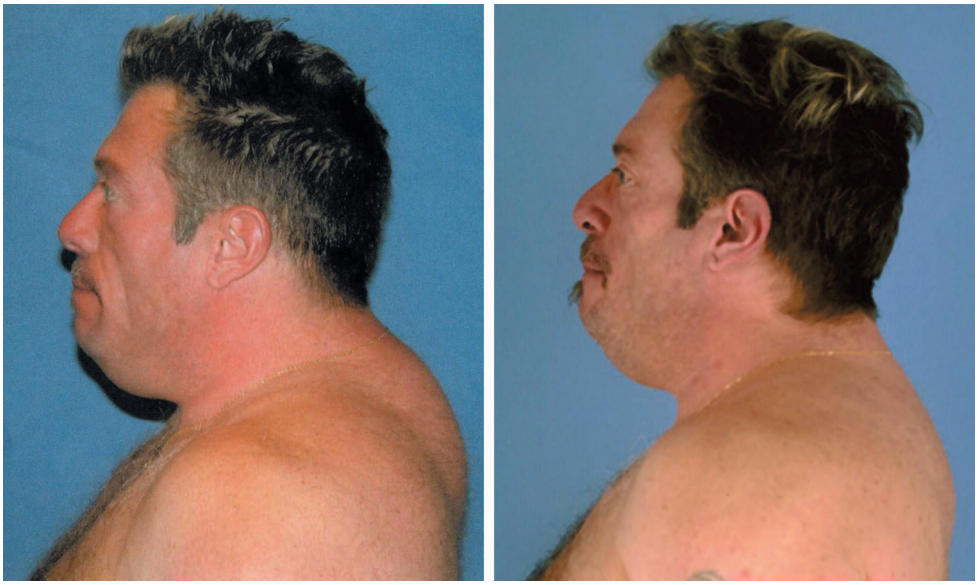

Fig. 1. (*Left*) Preoperative and (*right*) postoperative views of a representative patient.

discomfort with lying supine, psychiatric disorders, and decreased compliance with antiretroviral medications.[2,3]

Cervicodorsal lipodystrophy has been shown to be refractory to medical management; the only treatment shown to be efficacious is surgery. Suction-assisted lipectomy has evolved as the technique of choice.[2,3] Some authors have recognized the fibrous nature of the buffalo hump and have favored the use of ultrasound-assisted liposuction.[4] Potential downsides to ultrasound-assisted liposuction include longer procedure times, the need for more expensive equipment, the risk of dermal burns and necrosis at the suction sites, hyperpigmentation, sensory alteration, contour irregularities, seroma formation, and a longer learning curve.[4] Moreover, several studies on the use of ultrasound-assisted liposuction in treating this disorder report recurrence rates of 30 to 50 percent.[2]

Due to these risks and to the high rates of recurrence reported with the use of ultrasound-assisted liposuction, we have used power-assisted liposuction to manage the buffalo hump deformity. Power-assisted liposuction has been found to demonstrate a significantly greater operative efficacy (i.e., less operative time per unit of lipoaspirate), cause less operator fatigue, and have a more favorable cost-benefit ratio compared with both ultrasound-assisted liposuction and traditional suction-assisted lipectomy.[5] We found power-assisted liposuction to be particularly useful in aspiration of the highly fibrous and septated fat of the buffalo hump. One patient required a secondary procedure, but this was due to an initial undercorrection, not to limitations of the liposuction equipment or to recurrence of the deformity. We have demonstrated that excellent long-term results can be obtained with the use of power-assisted liposuction in this patient population for this indication, and it remains the technique of choice for managing cervicodorsal lipodystrophy at our institution.

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Intraflap Perforator Anastomosis in DIEP Breast Reconstruction: A Technique to Preserve Rectus Muscle Continuity

Sir:

The accepted standard for autologous breast reconstruction is microvascular transfer of lower abdominal tissue as a deep inferior epigastric perforator (DIEP) flap. Often an insufficient number perforators of adequate size are found on raising the flap, necessitating either the transverse division of intervening muscle fibers between perforators from different rows or the conversion of a planned DIEP flap to a transverse rectus abdominis myocutaneous (TRAM) flap. We present a novel approach to a case of DIEP flap elevation in which two distant perforators were required to maintain flap vascularity.

On preoperative assessment, a 27-year-old woman was felt to be a suitable candidate for a DIEP flap delayed breast reconstruction. Intraoperatively, two main perforators were found on the right side and multiple small perforators were found on the contralateral side. One perforator was located medial to the medial edge of the muscle and one was 0.5 cm from the lateral edge (Fig. 1). Temporary microsurgical clip application demonstrated that neither of these perforators alone was sufficient to supply the flap. Harvesting the flap with both perforators intact would ordinarily have necessitated near total rectus abdominis division, thus compromising the advantages of DIEP flap elevation.

To avoid division of the rectus muscle, the lateral perforating artery and vein were divided just distal to the bifurcation of the deep inferior epigastric vessels. After the free end of the vessels is released by dissection from their course through the muscle, the muscle was retracted laterally, thus maintaining its lateral nerve supply, and the lateral division was reattached to its stump, but medial to the muscle, by standard microsurgical end-to-end anastomosis using 10-0 nylon (Fig. 2). Thereafter, the flap was released by division of the deep inferior epigastric vessels; following transposition, anastomosis to the internal mammary vessels was performed. The rectus sheath was closed primarily without synthetic mesh. The patient made an uneventful postoperative recovery, with no fat necrosis or abdominal complications. She remains well at 1-year follow-up.

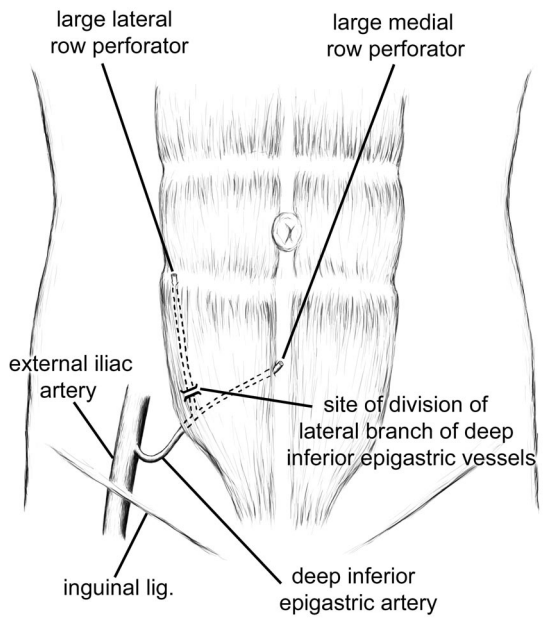

Fig. 1. Distribution of perforators.

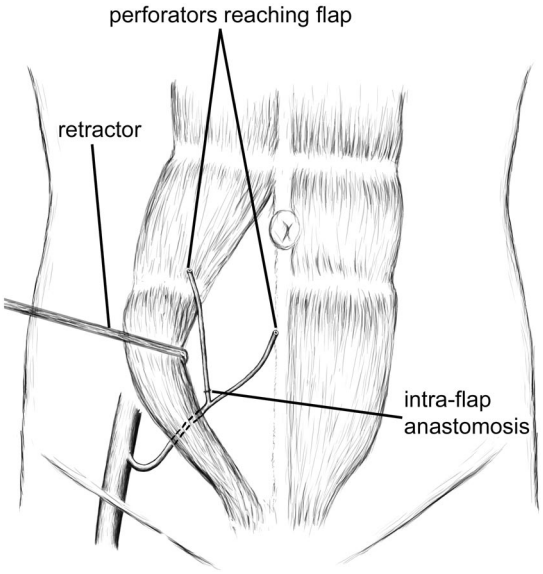

Fig. 2. Transposition of perforators around the rectus muscle.

Free TRAM flaps are perceived to be have a reliable vascular supply and are less complicated to raise[1,2] compared with DIEP flaps. However, the advantages of DIEP flaps include improved pain profiles, faster recovery, better patient satisfaction, with neither a significant increase in operating time nor a decrease in cost effectiveness, and significantly reduced donor-site morbidity.[3,4] The main disadvantage of the DIEP flap is the elevated incidence of fat necrosis compared with the TRAM flap.[2] For this reason, more than one perforator is often necessary.[5]

In conclusion, this technique allows reliable harvest of a DIEP flap when a single perforator is inadequate, while avoiding the increased abdominal wall integrity complications of TRAM flaps. Although this technique introduces an extra arterial and venous anastomosis, the position of the anastomosis is beyond the bifurcation of the common vessel. Thus, the theoretical risk of thrombosis propagation to the main vessel is unlikely to occur due to the continued flow in the main vessel to the nonanastomosed perforator.

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Salvage of an Infected Breast Tissue Expander with an Implant Sizer and Negative Pressure Wound Management

Sir:

A 38-year-old nurse underwent bilateral subcutaneous mastectomies for severe fibrocystic mastopathy with immediate placement of bilateral tissue expanders. One week before planned removal of the expanders and permanent implant placement, the patient presented with fever and erythema on the right side (Fig. 1). Faced with an obviously infected expander, the patient was counseled regarding treatment options.

After hospital admission, the infectious disease unit was consulted for antibiotic therapy against methicillin-resistant *Staphylococcus aureus*. At the first operation, the tissue expander was removed and the pocket was debrided. A 325-ml implant sizer was sandwiched between two layers of vacuum-assisted closure (KCI, San Antonio, Texas) polyethylene sponges, and the wound was sealed. The sizer access port was externalized in case postoperative adjustment was needed. The sizer was filled to 325 ml, and the vacuum device was connected to 125 mmHg of continuous wall suction.

On hospital days 4 and 7, the procedure was repeated and wound cultures were obtained. Results of the cultures from hospital day 7 debridement were negative. On hospital day 10, the wound was once again irrigated and debrided and a temporary Mentor (Santa Barbara, Calif.) high-profile implant (no. 350-3380) was placed and filled to 380 ml. The patient was discharged the following day with a drain in place. She was prescribed oral linezolid for 6 weeks. Ten weeks after presentation of infection, she returned to the operating room. The right temporary implant and left tissue expander were removed and exchanged for permanent implants. The patient has remained free of infection and is satisfied with her aesthetic result (Fig. 2).

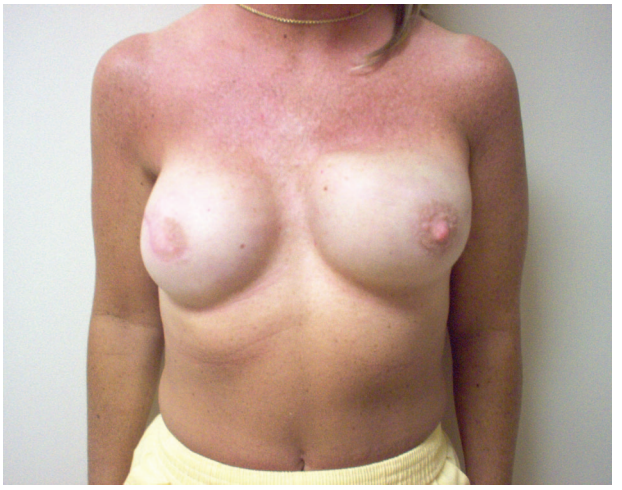

Fig. 1. Temporary implant sizer in affected right breast with tissue expander in left breast.

Infection is one of the most common complications of tissue expanders and implants during breast reconstruction, with an infection rate ranging from 1 to 24 percent.[1] This expensive and time-consuming complication is traditionally treated with intravenous antibiotics and removal of the device. Once the expander is removed, the soft tissue retracts rapidly to close the

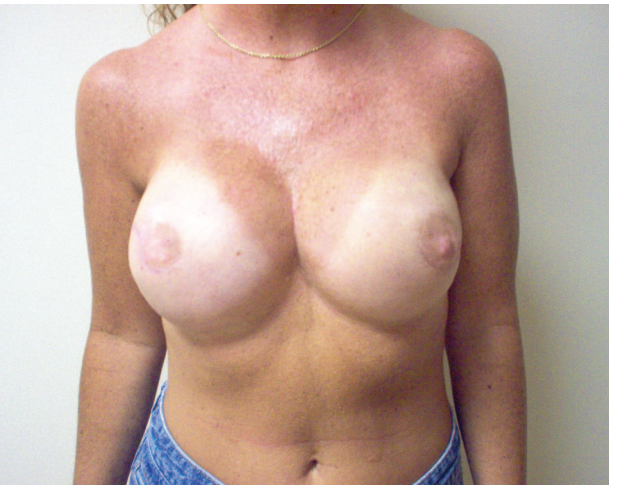

Fig. 2. Final cosmetic result after implant salvage.

expanded pocket. Due to this phenomenon, the opportunity for immediate reconstruction is lost and a second attempt is usually considered at a later date.

The majority of cases reported identify *Staphylococcus epidermidis*, *S. aureus*, or *Serratia marcescens* as the bacterium responsible for implant infection. In 1999, Disa et al. demonstrated that infection was the most common complication (50 percent) necessitating operative intervention for expander removal.[2]

Few reports have described successful techniques for salvage of an infected breast tissue expander or implant. In 2004, Spear et al.[3] evaluated treatment strategies for implant infections. Patients with severe implant infection posed a 28.5 percent salvage rate ($p = 0.0017$). In 2002, Yii and Khoo[4] conducted a study on salvage of infected expanders in breast reconstruction. Implant infections were managed through a process of capsulectomy and continuous irrigation with saline and intermittent antibiotic instillation. Only one in four patients with methicillin-resistant *S. aureus* infection was salvaged using their technique.

Salvage of an infected tissue expander reconstruction must achieve two main objectives: resolution of the infection and maintenance of the expanded soft-tissue pocket for the implant. The described technique provides a means of achieving these goals and was successful in our patient.

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DISCLOSURE

There are no financial conflicts or interests to report in association with the contents of this communication.

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Inverted Nipple: Use of an Effective and Personalized Splint after Surgical Correction with Pitanguy's Technique to Avoid Relapse of the Inversion in 28 Cases

Sir:

The inverted nipple is a common deformity characterized by the relative shortness of the lactiferous ducts, which tether the nipple and prevent it from projecting.[1] This condition is combined with resistant collagen fibers and insufficient bulkiness of connective tissue beneath the nipple. It has been recognized since 1849, when Sir Ashley Cooper first made note of it.[2]

This deformity can be either congenital or acquired. It has been widely described and graded, and it is possible to correct it using a broad variety of surgical techniques in relation to the severity of the inversion presented by the nipple.[3,4]

Relapse of the inversion is very common and is the most noticeable consequence of correction, when the lactiferous ducts are not exactly divided. For this reason, it is fundamental to stress the importance of follow-up as well as that of the surgical maneuvers chosen to achieve and maintain a lasting result.

We used Pitanguy's technique,[5] which involves the actual release of the fibrous tissue between the ducts with a direct approach made through a trans–nipple-areola incision, to correct 28 grade II inverted nipples, following the classification proposed by Han and Hong (the nipple can be pulled out, but it cannot maintain the projection and tends to return to its original position). The ducts were dissected free from the surrounding fibrous muscular tissue and released. The tissues were then approximated and sutured using a 3.0 Vicryl suture, the deep layers first, to provide more bulk to the nipple-areola complex. Surgery was performed with the patient under local anesthesia.

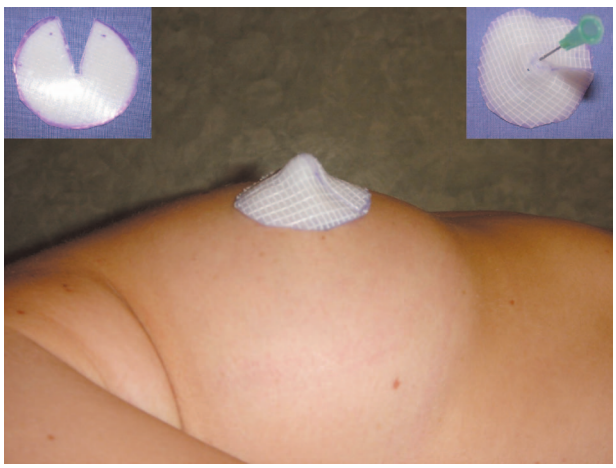

Fig. 1. The round Thermoplast splint after removal of a triangular piece so that the edges could overlap. A 16-gauge needle is used to create two holes in the splint, and the splint is placed on the nipple-areola complex.

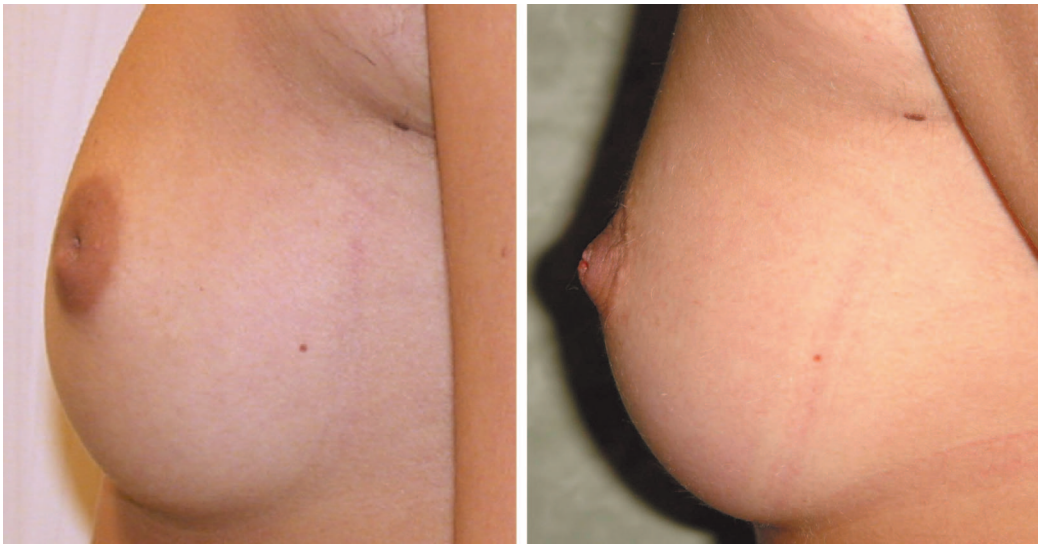

Fig. 2. Preoperative and postoperative views of grade II inverted nipple.

To prevent relapse of the inversion, we combined this technique with the use of a splint, designed by us and made of Thermoplast, which must be round, without a triangular piece, to allow the edges to overlap (Fig. 1). We formed the device by taking a mold of the nipple after surgical correction. A paraffin gauze pad was interposed to prevent pressure sores from developing on the areola. Using a 16-gauge needle, we made two holes in the device and maintained nipple eversion by suturing the nipple to the splint with a transfixed 4.0 Ethilon suture.

At first patients had to keep the splint in place for 3 weeks. We then removed the stitch, but patients had to keep the splint in place for an additional 4 weeks, to protect the surgical site beneath the brassiere and to make patients feel safe. After removal of the splint, we found no evidence of nipple necrosis or any kind of skin distress. At the 3-, 6-, and 12-month follow-ups, we found no evidence of relapse. We finally obtained complete symmetry of the nipple-areola complex with no noticeable scars. The splint is very easy and cheap to construct, and it guarantees effective prevention of nipple re-eversion at long-term follow-up (Fig. 2).

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Bilateral Breast Deformity after Neonatal Tube Thoracostomy in Fraternal Twins

Sir:

Chest tubes are required in neonates to treat pulmonary problems in infancy. Scarring from chest tube insertion may cause significant deformities, especially if the tube is placed through developing breast tissue. This is more likely to occur when chest tubes are placed anteriorly, toward the midclavicular line.

Two female fraternal twins were born at 27 weeks gestation after premature rupture of membranes. Both had difficulty breathing and required emergent intubation. Both further developed bilateral pneumothoraces due to the positive pressure ventilation, which was treated with bilateral tube thoracostomy via a presumed anterior approach. Fifteen years later, they presented to us with complaints of bilateral breast deformity.

One twin was noted to have contractures at the lateral aspects of both breasts with adherence of the overlying skin at the level of the midlateral breast (Fig. 1). There appeared to be normal development of the remainder of the breast and nipple-areola complex.

The second twin was noted to have a similar deformity on her left side. However, the right breast was noted to be severely hypoplastic in comparison to the left and had secondary deformity of the nipple-areola

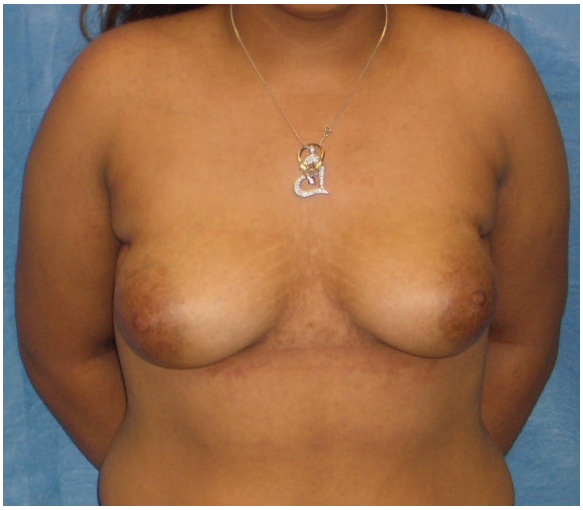

Fig. 1. Anterior preoperative view of twin A.

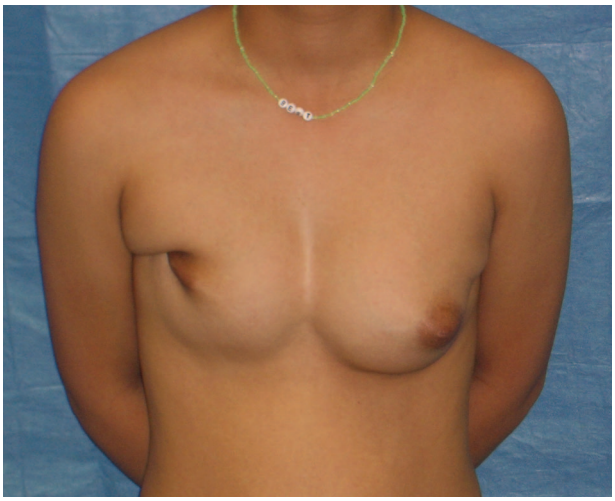

Fig. 2. Anterior preoperative view of twin B.

complex, which was retracted in the direction of the axilla (Fig. 2).

Two recommendations exist in the neonatal and pediatric surgical literature for placement of chest tubes.[1,2] One method favors placing the chest tube in the midclavicular line, while the other recommends placing the tube in the anterior midaxillary line. Although midclavicular line chest tube placement is still considered acceptable by many practitioners, scarring can be significant and cause secondary deformity of the surrounding tissues. This is especially problematic if placement is too low and inhibits normal breast development. While not initially recognizable, the deformity becomes apparent during puberty with rapid breast development. The deformation may have significant psychosocial effects and, in severe cases, interfere with lactation. Most patients will require contracture release with reconstruction to prevent further deformity.

Although this is a severe complication, there are very few reports in the literature. A MEDLINE search from 1966 to the present discovered only scant references documenting cases of breast deformity after tube thoracostomy.[3] In one publication, Rainer et al.[4] reported two female patients with breast scarring after chest tube placement requiring reconstruction. Through anatomical dissections on five newborns, the authors found that breast tissue in this age group extended from the second to the sixth rib in the midclavicular line. Placing a chest tube below the second rib anteriorly could potentially lead to complicated scars. The reported advantages of anteriorly placed chest tubes are that they are more effective at evacuating pneumothoraces versus posterior chest tubes.[5]

Given the added morbidity of possible breast tissue injury and scarring, and the psychological stresses that are associated with these deformities, it is recommended that such tubes be predominantly placed in the midaxillary line. If anterior tubes are required, they should be judiciously placed above the second rib to avoid injury to the breast tissue. These recommendations should apply not only to the neonatal intensive care unit setting but also to cases of pediatric trauma.

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Nipple Aspirator: A Self-Designed Instrument for Inverted Nipple

Sir:

Nipple inversion is generally a congenital disease, but it sometimes occurs after ductitis or breast operation.[1] Anatomically, it is a result of shortened

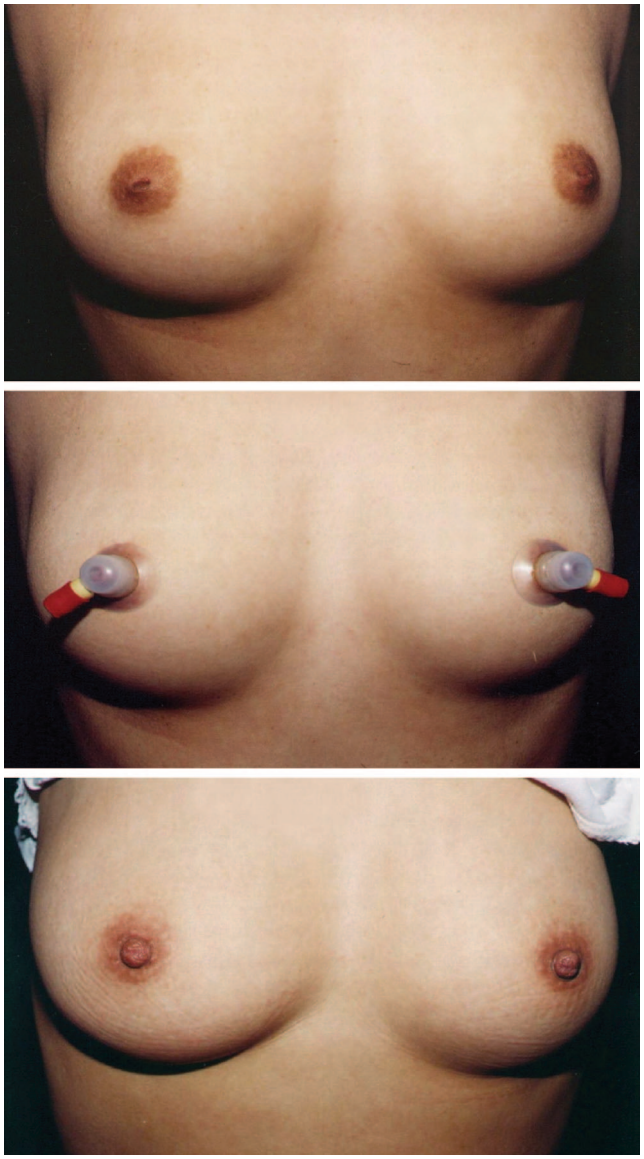

Fig. 1. (*Above*) Pretreatment view. (*Center*) The patient wearing the nipple aspirator. (*Below*) Posttreatment view.

lactiferous ducts, dysplasia of nipple smooth muscles, and insufficient soft tissue.

For years, doctors have preferred surgical procedures to narrow the nipple neck or consolidate bulk tissue. However, these procedures may injure the ductal system and affect milk drainage,[2] and they sometimes induce scar formation around the areola.[3] We have developed a nipple aspirator to correct the deformity in a noninvasive way (national patent no. is 99.228562.3).

The aspirator is designed based on negative pressure suction, skin traction, and prolongation. It basically has three parts: a nipple cap, a negative pressure suction apparatus, and a one-way gas valve. All three components are made from poisonous and high-pressure-resistant polyethylene.

The cap has an internal ring to hold the projected nipple and avoid suction of the surrounding tissue. The suction apparatus looks like a syringe and acts with the valve to produce and maintain negative pressure.

First, the linkage part of the syringe is inserted to push the unidirectional valve open. The nipple is then covered and 3 to 4 ml of air is drawn. Finally, the syringe is taken down to allow the valve to close spontaneously. It should be noted that the instrument should be used under a doctor's supervision.

It is suggested that the patient wear the device carefully and gently and adjust wearing time in a stepwise manner. The treatment should last no less than 3 months.

About 2000 patients ranging in age from 14 to 36 years old (1936 with bilateral deformity and 64 with unilateral deformity) used the device from March of 1999 to March of 2004. Among these patients, 1960 were single, 40 were married, and five were pregnant.

The nipples mostly regain their normal weight within 30 days, but this period was prolonged to more than 3 months in serious cases ($n = 5$). A 3- to 60-month follow-up revealed no recurrence. The healing rate was 100 percent, and the validity rate was 99 percent (Fig. 1).

Some patients experienced blood secretion and mild discomfort in the initial days of use. These complaints disappeared over time. Mucosa formation occurred occasionally after long-time wear.

The aspirator can be worn all day to keep the pitted nipple under constant negative pressure; this will help stretch the ducts and lift the nipple. More importantly, supporting tissues will grow around the ducts over time, and finally lead to real projection. Therefore, this device may provide another option for patients with nipple inversion.

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Surgical Reconstruction of Iatrogenic Symmastia

Sir:

Symmastia, medial confluence of the breasts producing a web across the midline, is occasionally encountered clinically, but it is uncommon.[1] It may be congenital or iatrogenic. Iatrogenic symmastia occurs following overaugmentation, when the midline sternal attachment becomes disrupted. This usually occurs as a result of overaggressive dissection of the implant pocket medially, which results in communication of the two breast implant pockets and obliteration of the cleavage. We present one case to highlight the problem and to present the surgical approach used to correct the deformity.

A 27-year-old woman presented to our department with the complaint of a soft-tissue web over the sternum connecting the breasts. She had undergone breast augmentation elsewhere several months earlier (Fig. 1). She was dissatisfied with the existence of a central breast web. With access through the inframammary folds, her 295-cc silicone gel implants were removed. We observed a communication of the two breast implant pockets with obliteration of the cleavage. The anterior and posterior capsule was then incised medially on each side one to two fingerbreadths apart. The flaps were sutured to each other with two rows of absorbable suture (Vicryl 3-0 W9890). We also performed transcutaneous suturing of the presternal soft tissue to the sternum periosteum utilizing Vicryl 2-0 W9718 suture. Then 265-cc silicone gel–filled prostheses (round with textured surface) were implanted subpectorally. Routine closure was performed and a supportive garment was applied. At 2-year follow-up, the result is still favorable. Our patient was successfully treated with no recurrence, parasternal scarring, or infection (Fig. 2). Neither puckering nor dimpling was visible in the patient's central chest.

Iatrogenic symmastia is difficult to treat and recurrence is common. Correction requires combined restoration of the presternal subcutaneous integrity and medial closure of the pocket. In our case, we removed the implants and performed a combination of medial closure of the pocket on each side and transcutaneous suturing of the presternal soft tissue to the sternum periosteum. The prostheses were implanted during the same stage. It is essential that oversized implants not be used. The tension of the implant must not be allowed to work against the suture repair. Several other methods have been described for surgical reconstruction of iatrogenic symmastia, such as allogenic dermal grafting,[2] fibrin-based tissue glue,[3] and delayed filling of the adjustable implant.[4] Even though it has been reported that transcutaneous fixation may lead to scarring and infection,[5] in our hands, the combination of medial closure of the pockets and transutaneous suturing of the presternal soft tissue to the sternum periosteum was successful. It led to reconstruction of the presternal median cleavage without parasternal scarring or infection. The result was judged satisfactory by both the patient and the surgeons. The combination of medial closure of the pockets and transcutaneous suturing of the presternal soft tissue to the sternum periosteum provides one satisfactory option to the surgical reconstruction of iatrogenic symmastia.

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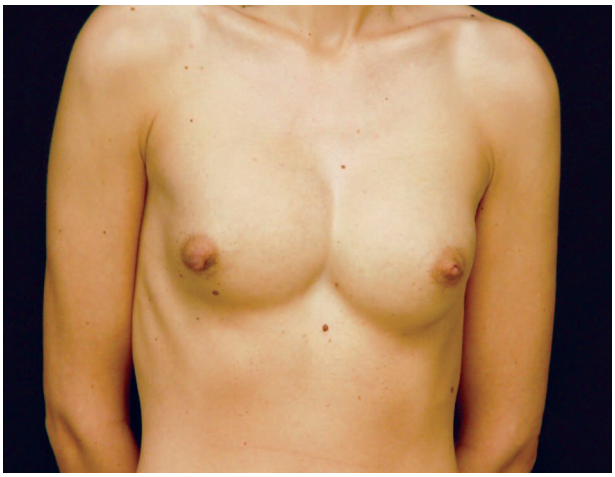

Fig. 1. A 27-year-old woman with a soft-tissue web over the sternum connecting the breasts.

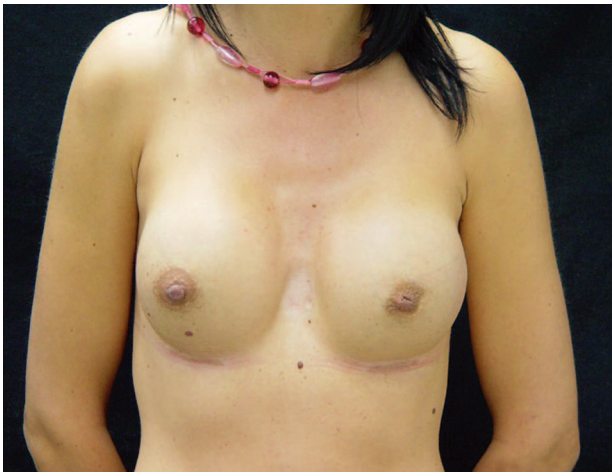

Fig. 2. Two-year postoperative result.

DISCLOSURE

Neither author has any financial interests in this communication.

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A New Technique to Identify Leak in Tissue Expander

Sir:

Tissue expanders are an important part of the armamentarium of cosmetic, reconstructive, and burn surgeons in their effort to beautify patients, treat disabilities, and improve form and sense. However, tissue expander leakage, whether from the port site, tubing, or the expander itself, poses severe problems for the surgeon. Identification of the leak can often pose problems. We hypothesized that the use of radiocontrast dye and fluoroscopy may provide a new technique to resolving this dilemma. The idea stemmed from the routine use of this technique to identify leaks in various general surgical situations, such as T-tube cholangiogram studies and post–gastric pull-up procedures. In this communication, we summarize our experience with this technique.

A dye contrast study was performed under fluoroscopic guidance in a patient who had a tissue expander insertion performed in the cervical region for a post-burn facial scar. The expander was gradually inflated with saline a few weeks after insertion of the expander. After a few sessions of expansion, it was noted that the skin expansion was not commensurate with the amount of saline being injected into the expander. However, since there was no spontaneous deflation of the expander over the next few weeks, a radiologic contrast study was performed to determine whether there was a leak. Twenty milliliters of nonionic contrast was injected through the port into the expander. Under fluoroscopic guidance, the contrast was seen to fill the expander successfully. The port and the tubings were visualized in excellent detail. Spot films and delayed films were taken (after 24 and 48 hours). There was no evidence of extravasation of the contrast into cervical tissues. A review of literature found no mention of the use of such a technique for this purpose. There is mention of the use of methylene blue dye to look for leakage from a tissue expander.[1]

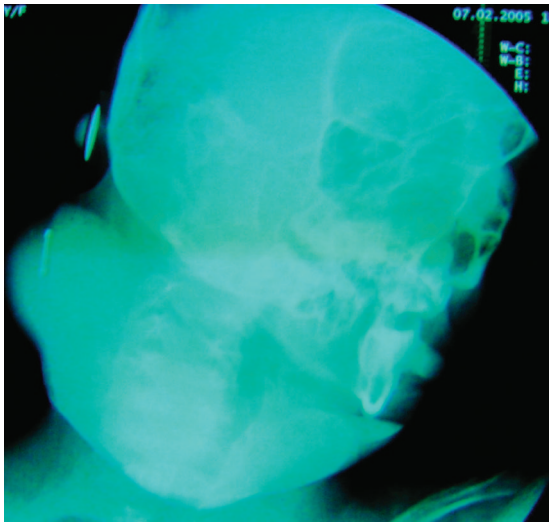

Fig. 1. Fluoroscopic view of the tissue expander with the radiocontrast agent.

What this small project allowed us to conclude was that this technique has a potential role in identifying leaks, as today very high-resolution digital skiagrams are available that show exquisite details (Fig. 1). There is hardly any risk of radiation due to such improved techniques. Thus, for such patients, there may be more visits to the radiology department by plastic surgeons.

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DISCLOSURE

This is to certify that none of the authors has any financial interest in any product shown or any technique depicted.

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Chondroma or Chondrosarcoma? An Indication for Sternum Resection

Sir:

Primary sternal tumors are very rare and predominantly malignant. Chondroma and chondrosarcoma present as slowly growing, painful, and fixed structures. A definite clinical or radiological distinction is impossible, and the histological differentiation can be extremely difficult.

A 33-year-old patient had been complaining for 8 months of increasing sternal pain during physical exertion. Thoracic computed tomography examination disclosed a suspected malignant mass lesion measuring 3 × 4.8 × 2 cm in the body of sternum (Fig. 1) and a pathological fracture (Fig. 2). Two computed tomography–guided transsternal punch biopsies were performed at an external institution. Histological analysis revealed aspects of a low-grade fibrotic inflammatory reaction consistent with eosinophilic granuloma. Next, open chest surgical biopsy was performed and yielded a chondroid tumor of uncertain status with central necrosis. We performed an oncologically appropriate partial sternal resection that included the bilateral sternocostal joints and the adjacent parietal pleura, with a safety margin of 4 cm. Histological assessment showed an enchondroma with low-grade marginal eosinophilic reaction excised in healthy tissue. The defect was closed with bilateral pedicled pectoralis major muscle flaps.

Chondrosarcoma is the most common malignant tumor of the chest wall and accounts for about one third of all malignant thoracic wall tumors.[1,2] Chondroma accounts for about 20 percent of all benign costal tumors, whereas only 11 cases of sternal chondroma have been reported so far.[3,4] There is no correlation between clinical symptoms and tumor size. Pain is often a sign of a pathological fracture or rapid growth. A small percentage of benign chondromas or osteochondromas can transform to "secondary" chondrosarcomas due to malignant degeneration.[2,5]

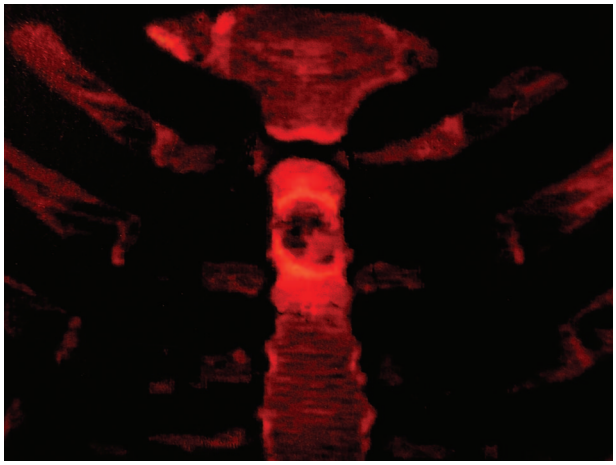

Fig. 1. Suspected malignant mass lesion measuring 3 × 4.8 cm (anteroposterior view).

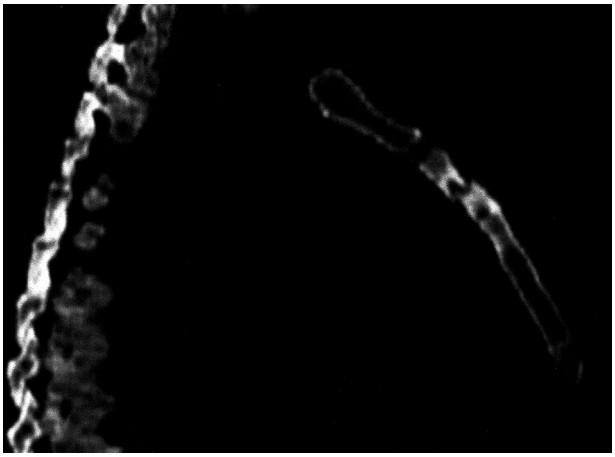

Fig. 2. Pathological fracture of middle part of the body of the sternum (lateral view).

Both types of tumor have a radiologically roundish to oval shape, are bone destructive, and frequently have central lytic areas and necrosis. The tumor edges often have a sclerotic-calcified appearance and are usually poorly demarcated. None of the available radiological methods allow a differentiation between low-grade chondrosarcoma and chondroma. Since metastases are already present at initial diagnosis in 10 percent of all thoracic chondrosarcomas,[2] preoperative staging is indicated.

Both tumors are of cartilaginous origin. The histological diagnosis of a chondroma can vary—enchondroma, periostal chondroma, or osteochondroma—depending on the prevailing cells of origin (e.g., medullary, periosteal, or osseous). Fine-needle or punch biopsies do not allow clear differentiation. Open, surgical excision biopsy is clearly superior to other techniques for obtaining informative, nonnecrotic tumor material. Difficulties involved in making a differential diagnosis, an increased relapse rate, a higher rate of disseminated malignancies, and a reduced survival rate with small resection margins have been described.[4] A 5-year survival rate of 80 percent has been reported for thoracic chondrosarcoma with complete resection, as opposed to 50 percent with incompletely resected tumors.[2] Chemotherapy is ineffective, and radiotherapy is only indicated in nonresectable cases.

Considering our patient's clinical course, including three previous biopsies with different histologic results, we recommend a radical resection of the respective part of the sternum irrespective of the exact preoperative histology. Sternal chondroma is much less common than chondrosarcoma, but the preoperative diagnostic uncertainties warrant the same aggressive surgical approach for benign and malignant types of chondroid sternal tumors.

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Coronary Spasm as a Trigger of Acute Myocardial Infarction in a Young Patient Submitted to Liposuction

Sir:

The most commonly performed plastic surgery procedure in the United States is liposuction. During the last 10 years, the number of patients undergoing liposuction has increased fourfold, reaching 195,135 procedures in 2001.[1] The advent of wetting solution with 1:1000 epinephrine has greatly improved liposuction safety. It is introduced into subcutaneous tissue before lipoaspiration, thus reducing bleeding.

Several recent studies have focused on cardiac complications associated with liposuction. Epinephrine toxicity may play a role, but this is difficult to prove because it has an ultrashort half-life (2 minutes), it is difficult to distinguish between endogenous and exogenous epinephrine, and it is often administered during attempted resuscitation.

A 42-year-old woman with controlled hypertension was scheduled for liposuction. Preoperative laboratory screening results were normal. An exercise electrocardiogram showed no signs of coronary artery disease. In the operating room, she was monitored, submitted to continuous epidural anesthesia, and sedated with continuous propofol.

The surgeon prepared a wetting solution of 200 ml of normal saline with 1 mg of epinephrine and introduced it into the subcutaneous liposuction area. There were no complications during the operation. Four hours later, the patient was awake and complained of a sudden dizziness during transit to the postanesthesia care unit, where an electrocardiogram showed acute atrial fibrillation with high ventricular response (160 bpm) and ST-segment elevation in leads D1, aVL, and V6. She was treated with 300 mg of intravenous amiodarone and 300 mg of oral ASA. Laboratory values were in the normal range, except for troponin I levels, which reached 2.4 $\mu g \cdot L^{-1}$. In the coronary care unit, after 48 hours, coronary catheterism showed 70 percent obstruction in the first acute marginal branch of the left circumflex artery and a mild lesion in the anterior descending artery. This second stenosis was not critical and was not related to the area of myocardial infarction (Fig. 1).

Most ischemic episodes tend to start at the end of surgery, during the emergence from anesthesia.[2] This period is characterized by increases in heart rate, blood pressure, sympathetic tone, and procoagulant activity, which may trigger coronary vasospam, plaque disruption, and coronary thrombosis.[3]

Although the understanding of perioperative myocardial infarction pathophysiology is not entirely clear, there is evidence that coronary plaque rupture is the predominant causative mechanism behind this complication.[4]

Some patients with atherosclerotic lesions may develop acute myocardial infarction without evidence of plaque rupture and superimposed thrombus formation. This may happen if the myocardial oxygen demand is higher than the supply. It is thus conceivable that postoperative coronary thrombosis can be the consequence rather than the cause of prolonged myocardial ischemia and infarction.

The time to peak exogenous epinephrine level is 1 to 4 hours after the beginning of infiltration, and exogenous epinephrine concentrations do increase during liposuction. Reports of myocardial infarction, fluid

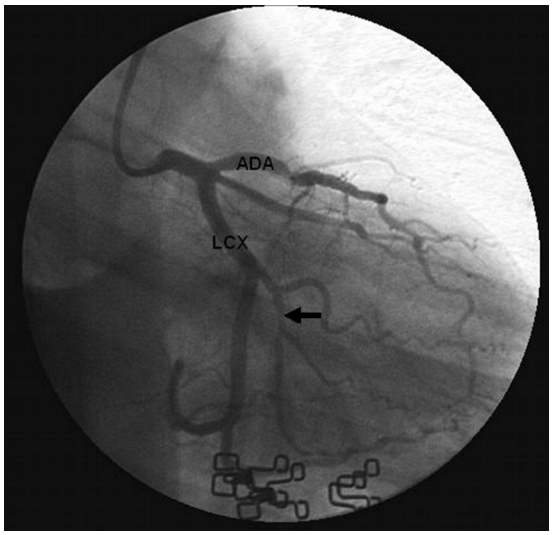

Fig. 1. Left coronary artery with mild stenosis at the anterior descending artery and a 70 percent obstruction in the first acute marginal branch (*arrow*) of the left circumflex artery.

overload, pulmonary edema, and arrhythmias during liposuction may be attributable to epinephrine, and these conditions may contribute to cardiac complications in predisposed patients.[5]

In this case, we saw no coronary thrombus or plaque disruption, but we did see a significant stenosis in one of the coronary arteries. Normally, absorption of epinephrine from the wetting solution is not associated with any damage to a heart with normal coronary arteries, but ischemia and even myocardial infarction may result from a moderate spasm of a damaged artery. Therefore, we recommend an observation period of at least 8 hours even in patients with normal preoperative evaluation, because of epinephrine absorption from the wetting solution.

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Difficult Groin Reconstruction Using Contralateral Rectus Abdominis Myocutaneous Flap

Sir:

Management of a nonhealing femoral wound after vascular surgery or severe irradiation is a challenging problem. A variety of myocutaneous flaps, such as the tensor fasciae latae, rectus abdominis, gracilis, sartorius, and gluteus maximus, have been used in the treatment of femoral wounds.[1–4] However, all of the flaps reported have been ipsilateral to the affected side. Recently, we used contralateral rectus abdominis myocutaneous flaps to cover a femoral wound in two cases when ipsilateral flaps were not possible. To our knowledge, there is still no report of this in the English or Chinese literature.

In case 1, the patient had received an expanded polytetrafluoroethylene femoral arterial vascular graft 2 years earlier. The prosthetic vascular graft had acute thrombosis. He underwent emergency surgery to remove the embolus through the right-side femoral artery. However, the prosthesis became infected and exposed to the femoral ulcer. *Staphylococcus epidermidis* was positive in organism culture. In consideration of the femoral vascular graft thrombosis, a contralateral rectus abdominis myocutaneous flap was selected. The flap was created and transferred to the wound and survived completely. The patient was followed up at 3 months and 2 years postoperatively. The limb was preserved.

Case 2 involved a 43-year-old man with a chronic right femoral wound and lymphedema of the right leg after groin dissection and irradiation therapy. The primary diagnosis was sarcoma. The wound had been present for 4 years. The 6 × 13-cm ulcer was surrounded by severe scar contracture. There was severe lymphedema of the right leg. Based on the scar, the ipsilateral inferior epigastric vessels may have been involved. A rectus abdominis myocutaneous flap on the same side was abandoned. Due to the lymphedema of the leg, the tensor fasciae latae, gracilis, and sartorius muscles were immersed in the edematous fluid; therefore, a contralateral rectus abdominis myocutaneous flap was chosen. The flap took completely. The lymphedema was significantly reduced. The patient was seen for a follow-up visit at 3 months and was interviewed by telephone 3 years postoperatively. He was quite satisfied with the outcome.

It is believed that successful muscle transfer can improve healing time, lower bacterial counts, and improve antibiotic delivery. The vascularized muscle increases local oxygen tension and enhances the ability of macrophages to combat infection. The muscle flap also provides tissue bulk to obliterate dead space and diminishes the risk of recurrent infection.[1] The successfully transferred myocutaneous flap can also improve lymph circulation and can benefit obstructive lymphedema. Our result confirms this. The lymphedema was significantly reduced.

It is of paramount importance to ensure that pedicle vessels are not obstructed when flaps are used. Morasch et al.[1] suggested intraoperative assessment of patency with a handheld Doppler scanning probe. There is also value in harvesting a muscle from a site that is far away from the wound. When there is doubt about the donor

vessel patency of the ipsilateral side, the flap from the healthy contralateral side should be considered. Our experience with these two cases of repair provides the evidence that the contralateral rectus abdominis flap is a valuable technique in some difficult conditions.
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A Novel Method of Rapid Nail Bed Repair Using 2-Octyl Cyanoacrylate (Dermabond)

Sir:

Accurate primary repair of acute nail bed injuries prevents later nail deformity,[1] but suture apposition using 6-0 or 7-0 absorbable sutures[2] can be time consuming. Excessive forceps handling and poor suture technique may cause trauma and ischemia, potentially affecting the outcome. We suggest using Dermabond (2-octyl-cyanoacrylate) topical skin adhesive for a simpler, less traumatic repair.

We performed 10 consecutive nail bed repairs on 10 patients using only Dermabond topical skin adhesive (Ethicon). All had acute lacerations of the sterile matrix, classified into simple, stellate, and severe crush according to Zook and Brown's classification.[2] Germinal matrix injuries and injuries requiring procedures beyond simple nail bed repair were excluded.

Pulp and lateral nail fold lacerations were sutured with 5-0 nylon. Tuft fractures were reduced. The nail bed fragments were apposed gently using fine forceps, facilitated by cupping the pulp between the tips of the surgeon's thumb and index and middle fingers. Dermabond was applied lightly over the entire sterile matrix in three layers, with a 30-second interval between layers. Too much pressure during application will force the edges apart, allowing adhesive to enter the wound and compromise healing. After allowing the nail bed to set for a further 60 seconds, an acrylic nail splint was secured between the nailbed and eponychial fold. The average total time taken to repair the nailbed, excluding debridement and skin suture, was 4.2 minutes (range, 3 to 5 minutes).

Table 1. Nail Bed Injury and Final Outcome

Patient	Injury	Average Nail Cosmesis Score at 6 Months
1	Stellate	11 (excellent)
2	Stellate + tuft fracture	10 (good)
3	Stellate + nail fold injury	9 (good)
4	Simple	11 (excellent)
5	Simple	10 (good)
6	Simple	12 (excellent)
7	Simple	9 (good)
8	Simple	11 (excellent)
9	Crush + tuft fracture	7 (fair)
10	Stellate	10 (good)

We have developed a new nail cosmesis score based on ridging (0 to 1), sheen (0 to 1), splitting (0 to 3), deformity (0 to 3), and lifting (0 to 4) of the new nail. Nails were rated excellent (11 to 12), good (8 to 10), fair (6 to 7), or poor (<6). Four independent hand surgeons assessed the outcome using 3-megapixel digital photographs taken at 6-month follow-up.

Table 1 shows the initial injury and final outcome for all patients. Figure 1 shows the injury and final result for patient 1.

Large, randomized, controlled trials have shown faster wound closure using octyl-cyanoacrylate, with cosmesis and complication rates equivalent to those with standard suture techniques.[3] The strength of skin repair using cyanoacrylates is equivalent to that with a 4-0 Monocryl suture repair. The polymer film produced is water-resistant and bacteriostatic. It has been used safely to restore damaged nail plates and to secure nail splints to the repaired nail bed.[4,5]

Nail bed lacerations without tissue loss are easily apposed with little tension. This study demonstrates that topical skin adhesives can be used safely to repair nail beds rapidly without magnification and with only basic surgical training required. Other benefits include less tissue handling and trauma from forceps and needles, less ischemia from improper suturing, and no risk of needle injury. The results at 6 months are comparable to those achieved with a standard suture repair.

Our findings are limited to the repair of sterile matrix lacerations. Germinal matrix lacerations were excluded because the technique was unproven and complications involving this part of the nail bed are difficult to correct. More severe nail bed injuries involving the germinal matrix may have worse cosmetic outcomes, as with conventional repairs. The nail cosmesis score we devised is useful

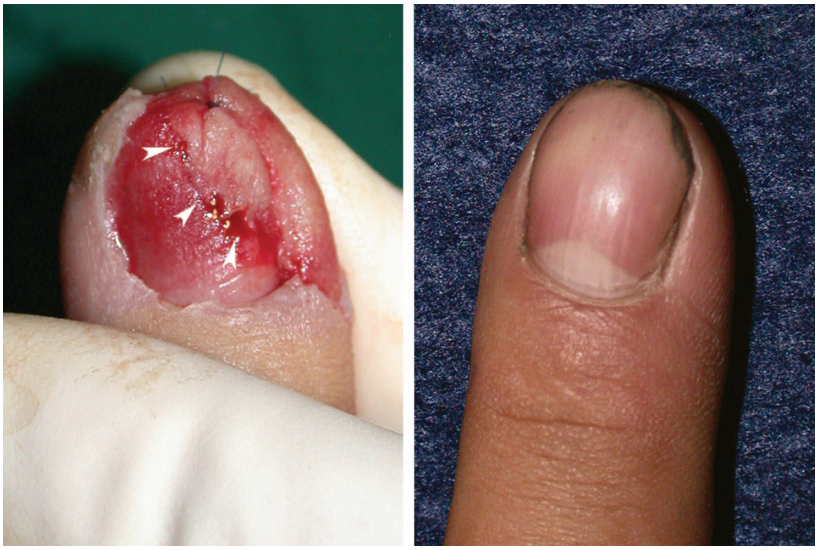

Fig. 1. (*Left*) Nail bed laceration (*arrows*), fragments apposed and held with Dermabond. (*Right*) Excellent result 6 months after Dermabond repair.

for studies involving fingernail appearance but will need further evaluation and formal validation.

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DISCLOSURE

None of the authors has any financial interest in or commercial associations with any parties that might pose or create a conflict of interest with information presented in this communication.

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The Clenched Fist Syndrome Revisited

Sir:

The clenched fist syndrome has been reported as a finding associated with conversion phenomenon. Other mental disorders manifesting as hand abnormalities include the "psycho-flexed hand" and SHAFT syndrome. Manifestations of psychiatric disorders as significant hand abnormalities have been reported with conversion phenomenon. The clenched fist syndrome has been described in patients presenting with tightly clenched fists after a minor incident with associated pain and swelling.[1] The psycho-flexed hand also has been described as flexion contractures of the long, ring, and small fingers with no organic etiology in patients with psychiatric illness.[2] A form of Munchausen's syndrome, the SHAFT syndrome is found in patients seeking multiple surgical interventions as secondary gain.[3]

D.G., a 19-year-old, right hand–dominant woman, presented for a second opinion with a history of slipping at work in a restaurant approximately 5 months before presentation. The patient stated that she fell onto her hyperextended right hand. Radiographs were negative. The initial treating physician treated her with cast placement, subsequent splinting, and attempted hand therapy. According to the patient, "my hand has been in a tight fist since I fell. I cannot move it." Pain was reported with any movement of the fingers, for which she took Vicodin. Intermittent swelling was also noted. She was unemployed at the time of presentation.

On examination, she had adequate flexion and extension of the elbow (Fig. 1, *above*). The wrist was ac-

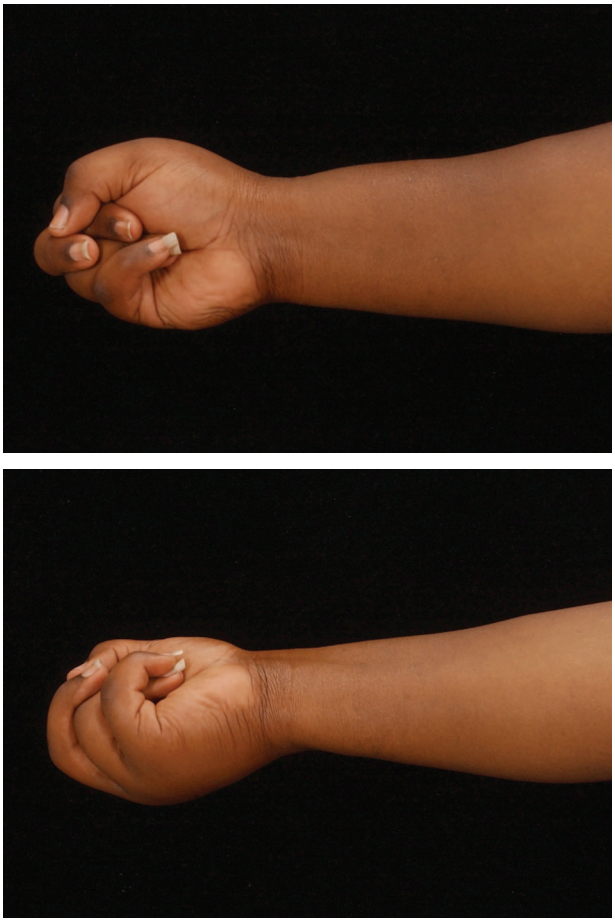

Fig. 1. (*Above*) This patient's fist is in the clenched position, which is characteristic of this condition. The patient is unable to open or close her fingers from this posture. Any attempt at passive movement causes her intense pain. (*Below*) Lateral view shows the patient's fingers fixed in the clenched position.

tively extended, with adequate radial and ulnar deviation. No change in digital flexion was noted with wrist motion. Wrist flexion could not be performed actively or passively secondary to pain. All digits were held in tight flexion at the metacarpal and interphalangeal joints, including the thumb. The small finger was overriding the ring finger in the clenched position (Fig. 1, *below*). The patient was unable to do any active digital extension secondary to severe pain. Also, the patient aggressively stopped any degree of passive digital extension. After a wrist block was performed, minimal passive extension of the thumb and index finger was performed with resistance and limited because of pain. Psychiatric evaluation and aggressive hand therapy were recommended. The patient was seen by the hand therapy unit the same day, and follow-up appointments were scheduled. The patient failed to keep any appointments, despite multiple notifications.

The physical findings of a clenched fist, pain, swelling, and "paradoxical stiffness" after a minor trauma should alert the physician to an underlying psychiatric abnormality.[1] Paradoxical stiffness is the finding of unchanged finger flexion with wrist motion.[1] Options in diagnosis and treatment include serial casting, biofeedback, hand therapy, differentiating from reflex sympathetic dystrophy, and psychiatric evaluation. A multidisciplinary approach to treatment is recommended. Unfortunately, noncompliance and a resistance to nonsurgical treatment modalities prevented our patient from gaining any function in her dominant clenched hand. There have been reports of some success with multimodality treatment.[1] Awareness of these conversion phenomena in the field of hand surgery is important, not only for accurate diagnosis but also for choosing appropriate, supportive, and nonsurgical treatment options.

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DISCLOSURE

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Microvascular Transfer of a "Lymphatic-Bearing" Flap in the Treatment of Obstructive Lymphedema

Sir:

A number of operations have been advocated for the management of obstructive lymphedema. The reestablishment of lymphatic pathways following free tissue transfer has also been documented with lymphoscintigraphic studies in patients who have undergone free flap reconstruction.[1–3] We present a new approach to treating obstructive lymphedema using a posterior tibial artery "lymphatic-bearing" free flap, with not only a vascular pedicle but also a lymphatic pedicle to bridge the lymphatic obstruction site.

A 23-year-old man presented with lymphedema in his right lower extremity following an extirpative

operation for removal of a mass in the right groin 4 years earlier. He was referred to our department with complaints of a recurrent bout of lymphangioitis and increased swelling of his right lower extremity. Preoperative lymphoscintigraphy demonstrated the blockade of lymphatic drainage in the right groin (Fig. 1).

A 7 × 9-cm defect was created after scar excision in the right groin. We then designed an 8 ×10-cm posterior tibial artery "lymphatic" flap in the left lower leg. Before the flap was harvested, 2 ml of patent blue dye was injected into the web space of left foot to visualize the superficial lymphatics of the right leg (Fig. 2). The proximal posterior tibial artery and its accompanying venae comitantes were used as the vascular pedicle of the flap, while one large lymphatic acted as a bridge for direct reconstruction of the lymphatic pathway. The flap was transferred as the standard procedure, but the proximal lymphatic of the flap was anastomosed with a lymphatic collector below the right inguinal ligament, a distal lymphatic of the flap with a lymphatic collector in the middle of medial thigh.

The flap survived completely, and the patient has not had an episode of lymphangioitis with the obvious lymphedema reduction in the affected leg since the reconstructive procedure. A postoperative follow-up lymphoscintigram at 6 months showed marked improvement of lymphatic drainage by demonstration of the lymphatic pathway along the microsurgically reconstructed lymphatic route (Fig. 3).

The early replacement of resected lymph collectors is the most logical surgical approach to overcome a localized obstruction of lymph flow. Bridging of localized obstruction of lymph drainage by transplantation of lymph collectors was developed by Baumeister et al. in 1981.[4] In this patient, we transplanted the lymphatics, which were carried by a free flap with both rich blood and lymph supply, to reconstruct the lymphatic pathway in the obstructive lymphedema. There are two advantages to the lymphatic-bearing flap: first, it can improve the tissue coverage for the lymphatic blockade site; and second, the lymphatic vessels included in a free flap can act as a lymphatic "bridge" to restore the lymphatic outflow by additional microvascular anastomoses with lymphatic vessels in the recipient site.

A lymphoscintigram taken at 6 months after opera-

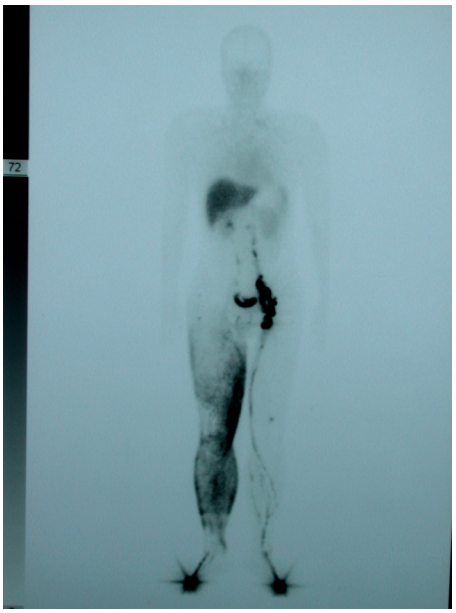

Fig. 1. Preoperative lymphoscintigram shows obstruction of lymphatic drainage in the right groin at 60 minutes after injection.

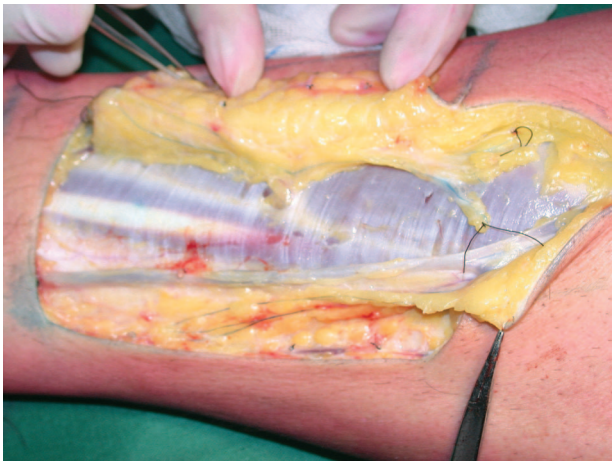

Fig. 2. Intraoperative visualization of the superficial lymphatics by staining with patent blue dye (note the big lymphatic marked by a suture).

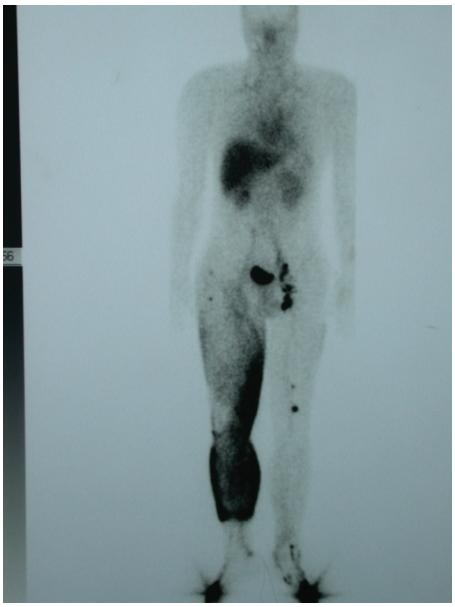

Fig. 3. Six-month postoperative lymphoscintigram demonstrating the lymphatic pathway across the reconstructed right groin.

tion demonstrated lymph flow across the previous obstruction site along the reconstructed route, which may result from both the reconstructed lymphatic pathway and the flap transplantation. This preliminary report suggests that this operative intervention might be a viable option in the treatment of obstructive lymphedema.

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Biobrane: A Versatile Tool in the Armamentarium of the Reconstructive and Burns Surgeon

Sir:

Biobrane is becoming increasingly popular in the management of superficial and moderate-depth partial-thickness burns. When used appropriately, it has been shown to reduce pain levels, healing time, inpatient stay, and nursing requirements when compared with traditional dressings. We would like to draw the attention of the reconstructive community to the versatility of Biobrane above and beyond these well-known indications.

Biobrane is a biosynthetic wound dressing first developed by Woodruff in 1979. It has many of the "ideal" properties highlighted by Pruitt and Levine in 1984.[1] There is a great deal of literature available outlining the successful use of Biobrane in the management of partial-thickness burns in pediatric patients. There is also evidence for its use in the treatment of partial- and full-thickness burns in the adult, particularly in large burns and those involving joints and the hand. Various application modifications have been published to overcome coverage of difficult areas (e.g., use of the Biobrane glove to dress the foot and the Biobrane "jacket" to dress the torso). In addition to covering the burn wound, it is also used in the management of split-thickness skin graft donor sites, in both burned and nonburned patients. Its use in stenting split-thickness skin grafts has also been advocated.

The use of Biobrane has been reported to cover the axillary defect following surgical excision for hidradenitis suppurativa.[2] This single-stage procedure, with no donor-site morbidity, exhibited the ability to use Biobrane in colonized tissues. The limitations included a longer healing time and increased cost of dressing.

Biobrane has also been used successfully after laser resurfacing of the face.[3] It was well tolerated, minimized pain and drainage, decreased erythema, reduced healing time, and simplified nursing care. Similarly, Biobrane has been used as a dressing after mechanical dermabrasion. This study showed that Biobrane reduced erythema and healing time by up to 50 percent when compared with air-exposed wounds.

The use of Biobrane has been reported in the successful treatment of serious skin conditions, such as toxic epidermal necrolysis[4] and paraneoplastic pemphigus. Biobrane was applied to the extensive areas of erosion to assist in pain management and to provide a temporary barrier function. The treatment of serious skin conditions such as toxic epidermal necrolysis and pemphigus with Biobrane is an area that warrants further evaluation, as it may contribute to the overall treatment and comfort of these patients. Chronic wounds such as large venous ulcers have also been managed successfully using Biobrane.

There are several case reports concerning the use of Biobrane in the contemporary literature. The skin substitute was used in the treatment of a life-threatening esophageal fistula by covering an expandable metallic stent and in the management of subcutaneous colostomy perforation. Biobrane has also been used in the successful management of sternotomy wounds that were not closed immediately due to massive intraoperative edema formation.

Adverse affects following the use of Biobrane are uncommon, but surgeons should be aware of the possibility of contact dermatitis, hypersensitivity, and hypertrophic scarring.[5]

We believe that Biobrane is a highly versatile tool that should be in the armamentarium of all reconstructive and burns surgeons. Further randomized controlled

trials assessing its use in a variety of conditions are warranted.
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DISCLOSURE

None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this communication.

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The Role of Travel Guides in the Prevention of Skin Cancer

Sir:

The association between skin cancer and sun exposure is well documented, yet despite this, sunbathing remains popular.[1] Sun protection advice for travelers could reduce their risk of ultraviolet skin damage and development of skin cancer. We examined the sun protection recommendations in five travel guides to Spain.

Specific sun protection information with respect to "time of day; sun creams; duration of exposure; anatomical sites; clothing; high-risk activities; [and] sunglasses and sun exposure in children" was looked for in the following guides: *Lonely Planet 2003*, *Insight Guides 2004*, *The AA KEY Guide 2004*, *The Green Guide 2004*, and *Fodor's 2005* (Table 1).

Ultraviolet light has direct mutagenic effects and is associated with an increased risk of skin cancers. Melanoma incidence is rising in the United Kingdom, and two-thirds of all cases can be attributed to sun exposure.[2] Prevention by improving public awareness of the risks of sun exposure is essential. An Australian campaign of public education focusing on the use of protective clothing and suncreams[3,4] resulted in a slower rise in melanoma incidence, and new cases were histologically thinner.

The strongest ultraviolet rays are between 2 hours before and 2 hours after solar noon, regardless of cloud cover. During this part of the day, sun block should be applied regularly and not just on "hot days," as recommended by guide B. Factor 15 is the minimum sun protection factor that should be used, but this was only recommended by guide E. Regular reapplication is necessary under routine circumstances but is essential for high-risk activities, where minimal clothing is frequently worn and the sun block is rubbed off, points on which none of the guides commented. That special care should be taken with exposed anatomical sites was not mentioned by any of the guides. The head and neck region, where melanoma is more common, has a prognosis compared with other sites, and yet only hats were recommended by guides C, D, and E. The composition of fabric and whether it is dry or wet is a significant factor in the sun protection afforded by regular clothing. Clothing designed to protect from ultraviolet rays is now available,[5] but they were not recommended by any of the guides. The risks of poor sunglasses that dilate the pupil and yet do not provide protection from ultraviolet A and B light were not highlighted. Sunglasses were recommended by guide C, but not the most beneficial wraparound style. Children are generally unaware of the risks of sunburn and few adults will know that a blistering sunburn before the age of 10 years is associated with an increased risk of melanoma in later life.[6] Sun protection factor 30+ sun creams and protective clothing are essential for children. Only guide E mentioned children, and this was in the context of poor advice.

Travel guide readers are a group of individuals who are at high risk of being sunburned. The guides could help raise public awareness of skin cancer by including a comprehensive section devoted to the dangers of ultraviolet exposure and methods of sun protection.
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Table 1. Comparative Guide Advice to Established Sun Protection Recommendations

	Guide				
Recommendation	**A**	**B**	**C**	**D**	**E**
Time of day	Nil	"Restrict physical activity to morning or late afternoon"	Nil	Nil	"Stay in the shade between noon and 2 pm"
SPF of sun cream	Nil	"On hottest days, carry sun block. . ."	Recommended,SPF not stated	Recommended	Advise high-factor sun cream (15+)
Duration of exposure	Nil	"Limit sun time for the first few days"	Nil	Nil	Nil
Children	Nil	Nil	Nil	Nil	High-factor sun cream; keep covered until acclimatized; shade during the middle of the day; better a wet T-shirt than a sunburnt child
High-risk activities	Nil	Nil	Nil	Nil	Nil
Anatomical sites	Nil	Nil	Nil	Nil	Nil
Protective clothing	Nil	"On hottest days, cover yourself up"	Wear a hat	Hat recommended	Advise loose clothing and covering your head
Sunglasses	Nil	Nil	Good-quality sunglasses recommended	Nil	Nil

SPF, sun protection factor.

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Fillers and Biocompatibility: Lack of Human Complement Activating Capacity

Sir:

One of the human complement properties is to be an important biocompatibility marker, sometimes involved in both immediate and delayed reactions against foreign substances for the organism. In this study, the foreign substances were the fillers (i.e., injectable dermal materials used for the correction of defects, wrinkles, and hollow scars), which are becoming more and more popular. The aim of our study was to estimate by means of in vitro studies, standardized for modality of execution, the interaction between human complement and some fillers.

The fillers we tested were chosen from among numerous varieties and represent both biological products (hyaluronic acid and collagen based) and synthetic ones[1]: Matridur (cross-linked hyaluronic acid), Cosmoderm (human collagen), Dermalive (hyaluronic acid with an acrylic gel), Juvederm (bacterial hyaluronic acid), and silicone. We also used a pool of normal human serum collected from 10 healthy volunteers.

We measured functional complement using various techniques,[2] including total hemolytic complement (or CH50),[3] classic pathway activity (or C1,4,2H50), alternative pathway activity (APA), alternative pathway C3 convertase (2sAPA), hemolytic C4, and hemolytic factor B. Immunochemical analysis included single radial immunodiffusion, immunoelectrophoresis,[4] and counterimmunoelectrophoresis.[5]

To estimate every complement activity, we incubated fixed amounts (5 μl) or dilutions (1:10) of the various fillers with the pool of sera at 37°C for 60 minutes, and performed different tests.

At the end of the incubation period, we measured the total hemolytic complement, the residual value of which has been compared with the value obtained using the same pool of sera, dealt at the same temperatures and times but in the absence of substances (fillers); the residual value did not demonstrate any

Table 1. Incubation (Total Hemolytic Complement Fillers–Normal Human Serum 143.15)*

Filler	Total Hemolytic Complement (U/ml)	
	Serum + Filler	Control (serum + PBS)
Matridur	145.93	128.79
Cosmoderm	120.61	128.79
Dermalive	126.47	128.79
Juvederm	134.50	128.79
Silicone	116.684	117.31

PBS, phosphate buffered saline.
*We compared the total hemolytic complement value of control serum and serum in which we added the filler. For every filler we tested, the variations in total hemolytic complement value compared with the control were not absolutely significant. This demonstrates that there is no complement activation.

significant total hemolytic complement variations (Table 1). At the end of the incubation period, we measured the activities of the classic and alternative pathways; the pool of human sera with fillers did not demonstrate any significant variations of these two complement activities. Finally, we searched cleavage fragments (complement-activating capacity gauges) of C3 and B factors by means of immunoelectrophoresis and counterimmunoelectrophoresis; these fragments were not detected in the incubation mixtures.

Our results demonstrate, under the experimental conditions used, the inability of the studied fillers to activate the complement. In fact, consumption of the various complement activities was not demonstrated under any circumstance, after incubation of normal human serum with significant amounts of fillers, and nor neither was the release of any activation factors demonstrated. Therefore, the lack of effect of such complex and heterogenous substances on the complement excludes a role of this important multienzymatic system in the plasma and interstitial fluids, in the rarely reported undesired reactions caused by some fillers.

We must specify that the accuracy of the hygienic conditions in our experiments was absolute. In some surgical and aesthetic procedures, the lack of good hygiene can be the cause of potential complement involvement that does not depend on the presence of fillers.

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Withholding Warfarin Therapy for Atrial Fibrillation Patients in the Perioperative Period

Sir:

Patients with atrial fibrillation are often anticoagulated for prevention of stroke and systemic emboli. Plastic surgeons are increasingly faced with having to decide whether to temporarily stop anticoagulation for atrial fibrillation patients requiring surgery or to recommend alternative therapies.

In the plastic surgery community, there is a pending malpractice action against a surgeon who stopped a patient's warfarin in advance of a cholecystectomy. The patient had a stroke before surgery from an atrial clot embolism during the time that anticoagulation was withheld. In reaction, some physicians have now ceased allowing their patients to stop warfarin therapy for office procedures, citing risks for stroke. A rational plan for withholding warfarin before surgical procedures can be outlined and the risks presented to the patient and his or her responsible primary care physician or cardiologist.

Nonvalvular atrial fibrillation is the most common arrhythmia causing embolic complications in particular stroke. The incidence of sustained arrhythmia increases with age, affecting 4 percent of the U.S. adult population and 10 percent of octogenarians. Echocardiograms demonstrate that 15 percent of nonanticoagulated patients with atrial fibrillation have a left atrial thrombosis with the potential for vascular embolism. Multiple clinical trials with warfarin therapy have confirmed a greater than 50 percent reduction in the annual stroke rate for these at-risk patients, decreasing events from 5 percent to less than 2 percent in most studies. Aspirin (325 mg per day) worked equally well for prophylaxis of embolism for atrial fibrillation patients less than 75 years of age, if they had no additional risk factors for transient ischemic attacks, previous strokes, hypertension, congestive heart failure, diabetes mellitus, clinical coronary artery disease, or thyrotoxicosis. Aspirin, however, was inadequate long-term pro-

phylaxis for the high-risk patient or those older than 75.[1]

Stopping warfarin 3 days in advance of an operation and resuming therapy the evening of the procedure results in a window of 6 days when the patient is not adequately anticoagulated. The risk of an embolic event or stroke increases during this pause in anticoagulation therapy. Prophylaxis for stroke of the atrial fibrillation patient of less than 75 years of age without high-risk factors can be accomplished with a daily dose of 325 mg of aspirin. It is unclear whether aspirin therapy for the older patient or patient with additional risk factors has any benefit in temporarily decreasing stroke risks.

In this latter category of high-risk atrial fibrillation patients, the primary care physician and/or cardiologist must decide with the patient on an individual basis whether the risk of stopping warfarin is excessive. The patient and the patient's family must be aware of the increased risk for transient ischemic attacks or strokes if therapy is temporarily halted. Alertness for the symptoms of clot embolism and a plan for seeking emergency treatment should be imparted to the patient's family or caretaker if warfarin is to be stopped. This information can be provided with a handout that is reviewed and documented in the patient record in advance of withholding warfarin. Ultimately, the decision to stop warfarin remains with the patient and his or her prescribing physician. The risks need to be disclosed to the patient, however.

Operating on patients receiving aspirin therapy may result in ecchymosis and, rarely, hematoma. It is safe to administer aspirin before small procedures, such as skin cancer resections. If aspirin is taken for the 6-day window when the warfarin is not effective, this may protect the atrial fibrillation patient less than 75 years of age, who is otherwise at risk for vascular emboli. Another option for the high-risk atrial fibrillation patient is to stop warfarin and simultaneously initiate interim coverage with subcutaneous Lovenox or heparin therapy. The Lovenox can be held for 12 hours in the perioperative period and resumed until warfarin anticoagulation is in place and international normalized ratio levels for anticoagulation are achieved. Other options include withholding surgery and seeking alternative treatments, such as radiation therapy for skin cancers.

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