GUIDELINES

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

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Purtscher’s Retinopathy as a Cause of Postoperative Blindness

Sir:

The most frightening sequela of managing periorbital trauma is acute postoperative blindness. As such, surgeons should be aware of the causes, diagnosis, and management options for patients who develop visual loss following surgery. A 16-year-old boy with no medical history or prior visual problems sustained trauma to the head and chest in a motor vehicle accident. The orbitozygomatic trauma required open reduction and internal fixation, including the use of cranial bone grafts to the orbital floor. Postoperatively, he was followed with head elevation, iced compresses, and close observation. Light perception was recorded serially. Gentle separation of the eyelids confirmed intact vision. He initially did well and was discharged to home on postoperative day 2.

At home on the fourth postoperative day, he noted a rapid decline in vision in the left eye. No tenderness, bleeding, or swelling was noted. A computed tomographic scan failed to demonstrate involvement of the nerve either by incomplete reduction or external compression. A retinal specialist determined the cause to be Purtscher’s syndrome based on the history and funduscopic findings. A course of high-dose steroids was prescribed.

Purtscher’s syndrome is a retinopathy of vascular origin first described in the early 1900s. The hallmark is a history of severe head or chest trauma, but a similar appearance has been described with acute pancreatitis, fat embolism, renal failure, childbirth, and connective tissue disorders. The pathogenesis was originally thought to be extravasation of lymph from retinal vessels following a sudden increase in pressure. Since then, several causes have been suggested, including raised intrathoracic pressure, vasculitis resulting from free fatty acids, and vascular occlusion caused by emboli.

Purtscher’s retinopathy is characterized by multiple white patches, hemorrhages, and optic disc edema on funduscop (Fig. 1). The white lesions (cotton-wool spots) represent retinal microinfarcts within the layer of nerve fibers. The findings may be unilateral or bilateral, and the effect on vision may be delayed for up to 48 hours after onset of the condition. Late physical findings include pigment migration and optic atrophy. The diagnosis is based on both the appearance of the fundus and the history of associated systemic injury (Fig. 2).

On follow-up examination at 3 months, the patient was noted to have 20/20 vision in the right eye and 20/200 in the left. A significant afferent pupillary defect was noted on the affected side. Dilated ophthalmoscopy revealed a return to a relatively normal retinal appearance despite some optic nerve pallor. At 1-year follow-up, he was noted to have a central

![Fig. 1. Preoperative axial computed tomographic scan demonstrating fracture of the left zygomaticomalar complex.](www.PRSJournal.com)
acuity of 20/25 with persistent peripheral visual field damage. The significant recovery of partial vision over the first 6 months is consistent with the course of Purtscher’s syndrome.

No specific treatment for Purtscher’s syndrome has been delineated. However, the use of early, parenteral, high-dose steroids and/or fenestration of the optic nerve sheath may be beneficial.1 An initial loss of vision in the range of 20/200 to hand movement visual acuity can improve over a period of months to a range of 20/30 to 20/200. It is important for plastic surgeons who manage facial trauma to be aware of this condition because early, high-dose, steroid therapy may be beneficial.

DOI: 10.1097/PRS.0b013e31817d5f27

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REFERENCES


Aesthetic Surgery in the Transplant Patient: Pushing the Envelope?

Sir:

A 62-year-old man presented to our surgical center requesting facial rejuvenation. He seemed a pleasant man with reasonable expectations and, on examination, there was significant facial skin laxity, making him appear older than his stated age (Fig. 1, left). Interestingly, he had undergone a heart transplant for cardiac failure secondary to viral myocarditis 16 years previously. The patient was taking prednisone, cyclosporine, and azathioprine and two medications for high blood pressure and another for high cholesterol.

On hearing this medical history, our initial reaction was to politely state that the risks of a cardiac event outweighed the benefits in his particular case. After all, this was elective, aesthetic surgery. However, in all other respects, the patient was an ideal candidate for this relatively simple procedure that would clearly make a significant improvement in his appearance and perhaps his life. We consulted both his primary medical doctor and his cardiologist, who performed several tests, including an echocardiogram. These tests revealed an element of chronic renal insufficiency, trace mitral and tricuspid valve regurgitation, and mild left ventricular hypertrophy. His ejection fraction was 60 percent. The patient’s medical doctors concluded that he was a good risk for the proposed procedures, which were rhytidectomy and bilateral upper lid blepharoplasty.

The patient underwent these procedures at our surgical facility, where he remained overnight. Total operative time was 2 hours 34 minutes, and estimated blood loss was 50 ml. Intraoperatively, cardiac pacing was available in the form of an automated external defibrillator. The entire operative and postoperative course was unremarkable and without complications. Two years later, the patient has a markedly more youthful appearance and is extremely satisfied with his result (Fig. 1, right).

We report this case not because of the procedures performed or the good outcome, but rather because of the important medical and ethical questions such a patient raises. Are immunosuppressed people acceptable surgical risks when the operation in question is aesthetic and voluntary? In this case, no infectious or wound-healing complications occurred despite the numerous immunosuppressive medications, but this is not unusual. Some have argued that patients such as ours are not chronically ill and therefore are ideal surgical candidates despite their immunosuppressed status.1 Furthermore, the transplant literature suggests that multidrug immunosuppressive regimens are well tolerated with respect to potential complications such as...
infection. Would one deny this man a vasectomy if that were the request? What of the young, human immunodeficiency virus–positive patient who has disfiguring lipoatrophy of the face or lipodystrophy of the trunk that can be treated surgically? There is also some precedent for aesthetic procedures in other transplant patients, with good outcomes. In our case, we saw no reason to deny treatment to a reasonable patient with a simple problem requiring a simple surgical solution. We certainly do not recommend a carefree approach to such patients; however, carte blanche refusal to treat them because of their immunosuppressed status may be inappropriate. In the future, possibly many more such patients will live long enough to seek our help.

DOI: 10.1097/PRS.0b013e31817d5f6a

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REFERENCES

Less Is More: VRAM Inset Modification in Glossectomy Reconstruction

Sir:

Total or subtotal glossectomy for advanced oral cavity carcinoma commonly leaves patients with significant functional deficits of speech and swallowing. In addition, these patients are at significant risk of post-glossectomy aspiration. The free vertical rectus abdominis myocutaneous (VRAM) flap has emerged as the primary workhorse for tongue reconstruction following large resections; however, the standard free VRAM flap reconstruction has produced inconsistent results with regard to postoperative speech and swallowing. We describe a simple technical modification that better...
recreates the native anatomy. Nine consecutive patients have thus far undergone this procedure and have been followed for at least 1 year.

All patients underwent percutaneous endoscopic gastrostomy tube placement and tracheotomy. During the ablative procedure, a second team harvested the contralateral VRAM flap. The recipient vessels were prepared; usually, the ipsilateral facial artery and common facial vein were used. After revascularization, the neotongue, consisting of skin and subcutaneous fat, was sutured posteriorly to the remaining tongue base. When the base of the tongue was resected, inset was to the remaining hypopharynx, and hyoid suspension was performed to maintain the relationship between the larynx and the neotongue. The floor of the mouth was reconstructed with an overlapping rectus muscle inset, supported at both the fascial and muscular surfaces to the inferior mandibular border (to periosteum or drill holes) (Fig. 1). Intraorally, muscle was attached to the remaining lingual mucosa or gingiva. The mandible, which was always preplated before mandibular split, was then closed. The remaining skin and subcutaneous fat were trimmed to size and left unsutured, thus sitting on underlying musculature to form a tongue-like protrusion (Fig. 2).

The VRAM skin and subcutaneous tissue assumed the palatal arch configuration, and within 2 weeks, subcutaneous fat developed uniform granulation tissue. This was followed by mucosalization of the granulation tissue and the underlying exposed rectus muscle and fascia.

Complications have been limited to one episode of cellulitis. All patients regained intelligible speech. One year postoperatively, all patients achieved weight maintenance and were tolerating unrestricted diets consisting of soft foods or greater consistency. No aspiration was evident by either clinical evaluation or video fluoroscopy. All patients were gastrostomy tube and tracheotomy free.

Glossectomy reconstruction with the VRAM flap has evolved with efforts to create a more functional tongue. Principally, maintenance of the neotongue bulk and convexity has produced improved function. Attempts to achieve this include flap neurotization and the creation of oversized flaps.

We describe a novel alternative to the standard method of glossectomy reconstruction that confers the advantages of creating neotongue bulk and convexity.

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Malposition of Alar Cartilages: A Personal Modification of the Sheen Technique

Sir:

Malposition of the alar cartilages is a common anatomical variation resulting in the cephalad position of the alar crus which, as described by Sheen and Sheen,1 shows a parenthesis deformity of the nasal tip on the frontal view. This anatomical variation should be recognized by the surgeon because this orientation of the alar crus causes an unacceptable aesthetic outcome, in addition to external valvular incompetence and an increase in the number of secondary rhinoplasties as Constantian2–4 has published.

It is important to note that the lateral crus is normally located 2 to 3 mm from the alar edge running parallel to the alar rim along half of its length. All of our rhinoplasties have been performed with a closed technique.

An infracartilaginous (marginal) incision is made 2 to 3 mm parallel to the alar rim and an intercartilaginous incision is made between the lateral crus and the superior edge of the alar cartilage. The vestibular skin between incisions is undermined after infiltration with local anesthetic. The lateral crus including the domus is isolated and exteriorized (isolation and total exteriorization of the lateral crus including the domus).

The same procedure is carried out on the contralateral side. Lateral cartilages are compared and the excess located cephalad is carefully dissected out after demarcation. At this point, we introduce our modification: a small cuneiform incision is made into the entire thickness of the domus along its inferior edge allowing an easier downward rotation of the alar cartilage (Fig. 1).

A subcutaneous pocket is created internally with a scissors along the alar rim (Fig. 2). The new shaped lateral cartilage is sutured into the new subcutaneous pocket including its inferior edge with 4-0 or 5-0 Vicryl suture (Ethicon, Inc., Somerville, N.J.).

We believe that the two incisions, in fact, support the downward rotation of the lateral crus, which is repositioned parallel to the alar rim along one-third of its length. This avoids the notching retraction of the nasal wings that can occur when one dissects out the excess cartilage of the lateral crus without repositioning it. Another benefit of this technique is the disappearance of the bifid tip because the downward repositioning of the lateral cartilages allows the domus to approach in the midline.

In 1993, Hamra5 published a modification of the classic technique for repositioning the alar cartilages that is similar to ours. Hamra, however, proposes a partial incision on the domus on the upper half of its width (and not on the inferior half as we do) together with a correction of the caudal region.

We believe that the incision on the inferior half of the domus allows for the subsequent approach of the domus without the interdomal suture. This is possible because the inferior incision eliminates the tension caused by the hypertrophic alar cartilages on the domus. They are then freed up to link to each other automatically. Our technique in repositioning of the
alar cartilages allows for an easier downward waving (rolling) of the malpositioned alar cartilages. DOI: 10.1097/PRS.0b013e31817d5efe

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REFERENCES

The “Butterfly Graft” as a Treatment for Internal Nasal Valve Incompetence

Sir:

There is a growing recognition that abnormality in the nasal valve area, which is located at the cross-section through the nasal passages at the caudal end of the upper lateral cartilages, causes nasal stuffiness more frequently than previously realized. Over the past few decades, this has led to the development of a multitude of nasal valve procedures. One such technique aims at increasing the valve area by widening and reinforcing the nasal valve angle with a curved piece of ear cartilage. This so-called butterfly graft was previously described for treating nasal valve insufficiency caused by reductive rhinoplasty. In this series, we prospectively evaluated this technique for both revision and primary cases.

Ear cartilage is harvested from the cymba conchae or from the shoulder of the antihelix. Although this is not strictly necessary, precise positioning of the graft is easiest through an external approach. Pockets are formed by partially freeing the vestibular skin from the undersurface of the lateral crura. The graft is then inserted and fixated over the lower edges of the upper lateral cartilages (Fig. 1). The sutures are passed through the lateral crura, the graft, the caudal borders of the upper lateral cartilages, and the vestibular skin/mucosa, thereby widening the valve angle while ensuring maximal stability. The graft eventually lies for its greatest part under the lateral crura, with minimal chance of external visibility (Fig. 2).

Eighty-four patients, with nasal valve incompetence on 157 sides (73 bilateral and 11 unilateral), were operated on by both authors in their respective hospitals. There were 48 men and 36 women, with an average age of 45.4 years (range, 19 to 71 years) and an average follow-up of 7.9 months (range, 3 to 31 months). Fifty-one patients (61 percent) had had at least one previous nasal operation; 33 patients (39 percent) were primary cases. In 58 patients (69 percent), additional procedures were performed for functional and/or cosmetic reasons, and 26 patients (31 percent) had only butterfly placement. Preoperatively and postoperatively, subjective scores for nasal airflow per side were collected on a 10-point scale, with 1 indicating total obstruction and 10 indicating a perfect nasal airway. Preoperatively, the average score for the 157 sides involved was 3.6 of 10 (range, 1 to 7); postoperatively, it was 7.4 of 10 (range, 3 to 10). The average improvement was 3.8 of 10 (range, 0 to 8). The average improvement was 4.3 of...
10 in the 33 primary cases compared with 3.6 of 10 in the 51 revision cases. The average improvement in the 26 patients who had only butterfly graft placement was 4 of 10 compared with 3.7 of 10 in the 58 patients who underwent concomitant procedures. Overall, postoperatively, 93 percent of sides operated on showed subjective improvement, and no sides were worse. There were no complications, although in some cases the graft caused slight supratip fullness that in time became barely noticeable. In our experience so far, both for revision and for primary cases, butterfly graft placement has generally been very effective as treatment for internal nasal valve insufficiency.

DOI: 10.1097/PRS.0b013e31817d60cc

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REFERENCES


Zunyeki Technique of Nasal Tip Rotation

Sir:

There have been unfavorable results in patients with severe nasal ptosis when performing one or all of the conventional techniques simultaneously, so the procedure proposed for it was named the Zunyeki technique by my medical team. The study design was based on cases of nasal ptosis in otorhinolaryngology outpatients from the Hospital Civil de Guadalajara between July of 2002 and September of 2004. Measurement was made through profile photographs of the nasolabial angle before and after surgery.

This study was a comparative clinical trial between two surgical techniques: cephalic border resection of the lateral inferior crura, clipping the caudal edge of the lateral

Fig. 1. Suture for nasal tip rotation with the Zunyeki technique.

Fig. 2. Nasal tip ptosis before the Zunyeki technique.
superior cartilages, and clipping of the superior septal angle (the “R-CLSI-S technique”; group 1; \(n = 16\)); and the Zunyeki technique (group 2; \(n = 16\)). The Mann-Whitney \(U\) test was used for the independent samples. Inclusion criteria included age 18 to 45 years, male or female sex, severe nasal ptosis, and nasolabial angle between 50 and 89 degrees. Noninclusion criteria included chronic degenerative diseases, coagulation disorders, and mental disorder. Exclusion criteria included withdrawal from the study by the patient’s own decision, hypersensitivity to anesthetic drugs, and complaints during the procedure. The Zunyeki technique consists of external rhinoplasty. We make a marginal incision, applying suture from the crura and columella graft to the perpendicular plate, and dissection of the nasal dorsum, achieving rotation of the nasal tip. We then insert a nonabsorbable suture (nylon 4-0) through the medial side of both alar cartilages (Fig. 1).

Results demonstrated a statistically significant difference after surgery (\(p < 0.01\)) and a significant difference between both study groups after surgery (\(p < 0.005\)). The sample size was \((n = 32)\) 16 patients for group 1 and 16 patients for group 2. Variables were analyzed in 18 men and 14 women. The minor initial angle registered in patients was 62 degrees (\(\mu = 75.13 \pm 9.67\) degrees) for group 1 and 49 degrees (\(\mu = 67.75 \pm 10.02\) degrees) for group 2. The maximum final angles were 102 degrees (\(\mu = 91.13 \pm 8.97\) degrees) and 120 degrees (\(\mu = 102.75 \pm 10.85\) degrees) for groups 1 and 2, respectively.

Ranks of difference obtained after surgery were 7 degrees minimum and 31 degrees maximum (\(\mu = 16.0 \pm 8.55\) degrees) for group 1 (Fig. 2) and 23 degrees minimum and 50 degrees maximum (\(\mu = 35.00 \pm 7.93\) degrees) for group 2 (Fig. 3). The resulting value table from the statistical analysis of both study groups demonstrated that the average nasolabial angle of group 2 was slightly superior to that of group 1, and the average values of the differences before and after surgery were double in group 2 (\(\mu = 35.00 \pm 7.93\)) in comparison with group 1 (\(\mu = 16.00 \pm 8.55\)) (Table 1).

Sutures are used in some procedures; they influence the nasal tip as the interdomal and transdomal sutures and the lateral crura.¹ Besides other existing techniques, the Zunyeki technique belongs to this suture procedure group. An active depressor septi muscle can accentuate a drooping nasal tip; modification of this muscle during rhinoplasty is important for achieving successful results on nasal tip rotation.² Some grafts have been used on the nasolabial angle to increase the nasal tip rotation,³ which can produce aesthetic effects.⁴ The other techniques for individual management of the cartilages are as follows: alar cartilage overlay, medial cartilage suture, and grafts in the nasolabial groove that cause changes in the projection and rotation of the nasal tip.⁵ The Zunyeki technique is capable of replacing these three techniques but does not have the projection effects of the nasal tip.

The Zunyeki technique has the capacity to regulate the rotation grade of the nasal tip. Statistical analysis showed that the Zunyeki technique has slightly better results in comparison with the conventional methods and good results in the long term.

DOI: 10.1097/PRS.0b013e31817d5ec0

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Table 1. Results of Analyzed Variables with Both Techniques, before and after Procedures

<table>
<thead>
<tr>
<th></th>
<th>Zunyeki Technique ((n = 16))</th>
<th>R-CLSI-S Technique ((n = 16))</th>
<th>Mann-Whitney (U) Test</th>
<th>(p) Value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle before surgery (degrees)</td>
<td>72.25 ± 8.76</td>
<td>75.13 ± 10.01</td>
<td>28</td>
<td>0.721</td>
<td>NS</td>
</tr>
<tr>
<td>Angle after surgery (degrees)</td>
<td>105.88 ± 8.39</td>
<td>91.13 ± 9.28</td>
<td>6</td>
<td>0.007</td>
<td>(p &lt; 0.01)</td>
</tr>
<tr>
<td>Angle difference between before and after surgery (degrees)</td>
<td>33.63 ± 9.09</td>
<td>16.00 ± 8.85</td>
<td>5.5</td>
<td>0.003</td>
<td>(p &lt; 0.005)</td>
</tr>
</tbody>
</table>

NS, not significant.
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REFERENCES

Repair of Question Mark Ear

Sir:
The question mark ear is a malformation involving a cleft between the helix and the earlobe. The upper portion of the ear appears protruding and the scapha is absent from the affected region. The severity of this ear malformation varies from a small notch in the helix to complete separation of the helix and the lobe. In this article, we classify the question mark ear into two categories: moderate and severe, according to the severity of the malformation. In the repair of moderate question mark ears, a local chondrocutaneous flap is used. In severe cases, tissue expander and autogenous rib cartilage are applied to reconstruct the deficiency of the lower part of the ear.

Question mark ear is a malformation involving a cleft between the helix and the earlobe. The upper portion of the ear appears protruding and the scapha is absent from the affected region. In this article, we classify question mark ear into two categories and discuss different operations.

The severity of question mark ear varies from a small notch in the helix (moderate type) to complete defect of the partial helix and the earlobe (severe type). Twelve moderate question mark ears were repaired using chondrocutaneous flap transposition and eight severe question mark ears were repaired using tissue expander and autogenous cartilage.

A chondrocutaneous helical flap was designed to make a helix of the cleft site.1 To enhance the downward advancement of the helical flap, a back-cut was used. Then, the helical flap was raised. A triangular region including the skin and cartilage tissue beneath the back-cut line was totally excised. The margin of the cleft was dissected and the wound surface was covered by the helical flap.

A two-stage operation was performed. In the first stage, an incision was made at the temporal hairline, parallel to the expander. Then, a subcutaneous pocket was created and a kidney-shaped tissue expander was inserted into this pocket. The second stage is then performed 1 month after the completion of inflation. In the second stage, an incision around the expander was made, so the expanded skin flap was elevated. A subcutaneous fascial flap was dissected at the same time. A three-dimensional framework made of autogenous costal cartilage was fabricated. Then, the framework was inserted between the two flaps. The expanded
skin flap covers the entire anterior surface of the cartilage framework. The fascial flap drapes over the posterior surface of the cartilage framework from behind (Figs. 1 and 2).

Vincent et al.\(^2\) appear to have been the first to describe the anomaly when they reported a 4-year-old girl with both ears affected and her father with unilateral involvement. Cosman et al.\(^3\) may have been the first to use the term “question mark ear” to describe the appearance of an ear with a cleft between the helix and the lobe.

The question mark ear is a major auricular malformation, showing composite tissue deficiency at the cleft site. Thus, the principle of the repair is to add composite tissue of cartilage and coverage skin at the cleft site. For closure of the cleft of a moderate question mark ear, Cosman et al. applied the method of Z-plasty. For fear of reducing ear size, Park\(^1\) performed chondrocutaneous composite tissue transplantation. We applied local chondrocutaneous flap to repair the malformation, and the size of the corrected auricle was similar to that of the unaffected auricle. It is difficult to repair severe question mark ear because of the size of the defect of cartilage and skin tissue; thus, we apply tissue expander and autogenous cartilage to repair the severe question mark ear and achieve good results.

DOI: 10.1097/PRS.0b013e31817d5f56

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REFERENCES


Aggressive Central Giant Cell Lesion of the Maxilla: Surgical Management and the Use of Adjuvant Interferon Alfa-2a

Sir:
We have followed with interest the work of Mulliken, Folkman, and Kaban on the role of interferon in the management of central giant cell lesions.\(^1\)\(^2\)

We submit a case illustrating the clinical utility of interferon and its compatibility with immediate skeletal and soft-tissue reconstruction.

A 17-year-old girl presented with a 15 × 12 × 10-cm, aggressive, giant cell lesion of the right maxilla invading the maxillary sinus, nasal cavity, anterior skull base, orbital floor, and maxillary dentition (Fig. 1). Traditional resection for this lesion would entail radical maxillectomy with an intracranial extension to achieve 1-cm margins.

To avoid the severe morbidity of such a resection, we planned enucleation of the mass and adjuvant therapy with interferon alfa-2a. The lesion was exposed by means of a Weber-Ferguson incision and enucleated, and peripheral osteotomy was performed with a burr. The orbital floor and piriform buttress of the maxilla were reconstructed with autologous calvarial bone graft and resorbable fixation. The residual cavity was obliterated with a rectus abdominis free flap (Figs. 2 and 3).

Two months postoperatively, the patient began an adjuvant regimen of subcutaneous interferon alfa-2a (3 million units/m\(^2\) per day).\(^1\) No adverse effects or toxicities were observed during therapy. After reexcision of a 0.5 × 0.5-cm area of suspected recurrence, the patient has been disease free for 5 years (Fig. 2, right).

Central giant cell lesions are benign osseous neoplasms of the jaws, and are classified as aggressive on the basis of rapid growth, size greater than 5 cm, dental resorption, cortical perforation, and recurrence. For nonaggressive lesions, medical therapy with intralimbic corticosteroids or systemic calcitonin has demonstrated some success.\(^3\)\(^4\) Aggressive lesions typically do not respond to medical therapy, and excision with 1-cm margins is required to decrease recurrence to 25 percent within 5 years.

Mulliken et al. have characterized giant cell lesions as primary vascular neoplasms\(^1\) sharing biochemical and behavioral similarities with the infantile hemangioma. Like hemangioma, giant cell lesions overexpress basic fibroblast growth factor (bFGF), a marker of tumor angiogenesis.\(^5\) Interferon has been shown to exhibit antiangiogenic properties by down-regulating bFGF gene expression and protein synthesis, which in turn slows endothelial cell migration and halts tumor progression.

The effect of interferon on immediate reconstruction following resection of giant cell lesions remains unknown. In our patient, resection of the lesion resulted in a large composite defect of the midface, necessitating immediate reconstruction to preserve facial architecture. Incorporation of autologous calvarial bone graft and the rectus abdominis flap appeared to be unaffected by subsequent interferon therapy. The rectus flap may also have served as delivery vehicle to increase local interferon concentration within the resection cavity.
In conclusion, this case supports the finding that interferon alfa-2a prevents recurrence of central giant cell lesions. The strategy of lesion enucleation and adjuvant interferon obviates the morbidity of wide resection and appears to be compatible with immediate skeletal and soft-tissue reconstruction, with acceptably low morbidity.

DOI: 10.1097/PRS.0b013e31817d5f3d

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The Composite Galeal Frontalis Pericranial Flap Designed for Anterior Skull Base Surgery

Sir:

The anteriorly based pericranial flap is widely applied for anterior skull base surgery. However, the promising blood supply is limited to the area immediately around the pedicle, meaning that the pericranial flap alone may be inadequate to provide a barrier between the nasal cavity and brain, to fill dead space, and to cover osteotomized bone segments and grafts. The composite galeal frontalis pericranial flap with a narrow pedicle was designed and used in seven anterior cranial base operations. Because harvest of the composite galeal frontalis pericranial flap by the conventional method may cause numbness and skin necrosis after radiotherapy, the pedicle width was designed to be narrow, excluding the supraorbital nerve and artery but including the supraorbital nerve and artery but including the supraorbital nerve and artery but including the supraorbital nerve and artery but including the supraorbital nerve and artery.

To harvest the flap, the scalp was sharply, not bluntly, dissected just over the galea using scissors with proper tension to the flap and scalp. This layer dissection was the most important and required the most skill. Dissection of the correct layer provided visible hair follicles in the fat of the scalp side, but careful attention should be paid to not damage the hair follicles to avoid postoperative alopecia. To separate the intracranial space from the nasal cavity (e.g., after tumor resection), the distal portion of the galeal frontalis pericranial flap served to seal off rupture of the dura in a watertight manner at the olfactory nerves for cerebrospinal fluid leakage with fibrin sealant, whereas the proximal portion was used as a barrier between the nasopharynx and the intracranial component (Fig. 2). The supraorbital bar was then replaced and fixed with plates, the frontal bone was put back, and the scalp was closed with drains.

As a complication, mild depression of the glabella was seen in two patients, caused by pedicle tension, but revision was not required. Postoperative visual disability including diplopia diminished within 1 month in all five patients who underwent medial wall reconstruction of the orbit. These five patients showed anosmia, as expected. This flap avoids any risk of numbness and skin necrosis of the forehead.

The composite galeal frontalis pericranial flap has both toughness as a pericranium and pliability and rich blood supply as a myofascia. Our designed flap includes the bilateral supraorbital arteries but excludes the supraorbital artery. Making a three-layer (i.e., galea, loose areolar tissue, and peristeum) compound must compensate for the reduction of blood supply in such a narrow pedicle. Although this flap cannot be applied for massive defects of the cranial base after a radical.

Fig. 1. Preoperative planning of bicoronal incision and the galeal frontalis pericranial flap. The supraorbital arteries are depicted in red and the supratrochlear arteries are depicted in orange. The solid line indicates a bicoronal incision for a transcranial approach. The dotted line shows the incision of the pericranium for the galeal frontalis pericranial flap.

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resection accompanied by sight-threatening orbital evisceration, it can be successfully used over the ceiling of the nasal cavity between the skeletally reconstructed medial orbits. Except for anosmia, resection of the intranasal structure, including the paranasal sinuses and orbital walls, and reconstruction can be achieved successfully from both functional and aesthetic viewpoints. We propose the composite galeal frontalis pericranial flap described here as an alternative strategy for reconstruction in minimally invasive anterior cranial base surgery.

DOI: 10.1097/PRS.0b013e31817d5ea9

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Preoperative Planning of the Abdominal Perforator Flap with Multidetector RowComputed Tomography: 3 Years of Experience

Sir:

The first option in breast reconstruction with autologous tissue is currently the abdominal perforator flap. The microvascular anatomy of the abdominal wall varies greatly. The location, number, caliber, and intramuscular trajectory of perforator branches of the deep inferior epigastric artery differ not only from one individual to another but also from one hemiabdomen to the other. A presurgically established vascular map can facilitate surgical planning in each patient. Over the past 3 years in our hospital, we have routinely used the multidetector scanner for the preoperative study of deep inferior epigastric perforator type abdominal flaps in breast reconstruction.

Protocol Image Analysis

Step 1

First, on the axial view, the deep inferior epigastric artery was evaluated along its entire length from its origin, paying special attention to the intramuscular or retromuscular course. Second, we studied the perforator arteries that are dependent on the deep inferior epigastric artery. Their caliber, course, and anatomical relationships were evaluated, locating the exact point of emergence through the aponeurosis of the abdominal rectus (Fig. 1).

Fig. 1. Axial view. The dominant perforator piercing the fascia is marked with an arrow.

Fig. 2. Photograph obtained before repositioning of the supraorbital bar. The distal portion (arrowhead) served for watertight closure of the dura to prevent cerebrospinal fluid leakage, and the proximal portion (arrow) was used as a barrier between the nasopharynx and the intracranial component (white arrow indicates the bone graft).
The criteria for choosing perforators include the following:1–3:

1. **Caliber.** The largest caliber, proportional to the blood flow; 0.6 to 3.2 mm was established as the useful range diameter.

2. **Location.** We chose a perforator that allowed a flap design enabling a direct and aesthetic closure. This was preferably centered in the tissue to be transferred, although this was not indispensable.

3. **Anatomical relationships.** We selected a perforator whose course facilitated dissection. A direct branch from the deep inferior epigastric artery was preferred because it was expected that the intramuscular course would be shorter, with fewer muscular branches. We also took into account whether the perforator vessel emerged from a tendinous band, as this type of perforator usually follows a retromuscular course that makes its dissection easier.

**Step 2**

We performed a three-dimensional reconstruction of the abdominal skin surface. According to a coordinate system whose center is the umbilicus, we associated each perforator with a coordinate point. Using this simple coordinate system, the perforator map was transferred to the data registration sheet before transfer to the patient’s skin surface (Fig. 2).

Our present results show that multidetector-row computed tomography is a highly reliable tool for identifying and locating the dominant abdominal perforator, with a positive predictive value of 100 percent. The ability of multidetector-row computed tomography to preoperatively detect the dominant perforator vessel leads to a significant saving in harvesting time—almost halved in our series—and a significant drop in postoperative complications, mainly those associated with partial necrosis of the flap and fat necrosis. Because the only new parameter introduced in our working method is multidetector-row computed tomography, it is logical to think that this improvement may be the result of choosing—with the help of multidetector-row computed tomography—the best abdominal perforator vessel for each flap, bearing in mind not only its caliber but also its course and anatomical relationships.

DOI: 10.1097/PRS.0b013e31817d5eea

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The preliminary results of this study were presented at the 10th International Course of Perforator Flaps, in Ankara, Turkey, on September 6, 2006; and the Third Meeting of the World Society of Reconstructive Microsurgery, in Buenos Aires, Argentina, October 21 through 22, 2005.

**DISCLOSURES**

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

**REFERENCES**


Hidradenitis Suppurativa Sternalis: Surgical Treatment of This “No-Touch Zone.” A 10-Year Follow-Up

**Sir:**

Hidradenitis suppurativa is a chronic, socially debilitating disease of apocrine gland-bearing skin with a predilection for intertriginous areas. Our interest focused on hidradenitis suppurativa sternalis. The cause is still not completely known, but medical treat-
ment with antibiotics, local wound care, and limited incisions gives only temporary relief. Although there exist many articles on hidradenitis, we could not find any report on surgical treatment of hidradenitis suppurativa sternalis in the available literature. Therefore, our interest focused on this “no-touch zone” because this region is especially debilitating for sufferers of hidradenitis suppurativa sternalis, both physically and psychologically, and often leads to social isolation, failed relationships, and/or depression. In therapy-resistant patients, our experience has shown that only radical debridement prevents recurrence.

In three female patients suffering from hidradenitis suppurativa sternalis (Fig. 1), we used the myocutaneous pectoralis major paddle flap for tension-free defect closure to avoid hypertrophic scars. After wide excision, a defined ellipsoid paddle not wider than 9 to 10 cm and not longer than 18 cm was outlined. The rectus sheath with the fascia of the serratus muscle was elevated together with the skin paddle up to the origin of the abdominal part of the pectoralis major muscle. During flap elevation, it is possible to take the whole muscle with the skin-fascia paddle or only a part of it. In our cases, only parts of the muscle were used, especially the lower section of the sternocostal part and the abdominal part of the muscle together with the skin-fascia paddle. After careful identification of the thoracoacromial vessels, the muscle was removed at its insertion. By dissection as described, the contour of the anterior axillary fold can be preserved.

In all cases, there was no reoccurrence of hidradenitis suppurativa sternalis or partial or total flap loss. There was primarily wound healing in all patients. No further surgical treatment such as debulking of the flap was necessary (Fig. 2).

The pectoralis major paddle flap is well established in reconstructive surgery. Despite the increased use of microvascular flaps, this regional flap remains an excellent choice at this area because of the excellent color match, the anatomical shape of the reconstructed area, and the minimal donor-site morbidity. In our long-term experience with keloid scars, especially in this region, we obtained less hypertrophic scar formation when tension-free wound closure was possible. In addition, if bone is exposed, vascualrized tissue for defect reconstruction should be the first choice. No reoccurrence of hidradenitis suppurativa was observed after a follow-up of 10 years. In all cases, a normal breast contour was preserved without any distortion of the nipple. In conclusion, we think that our treatment of this no-touch zone using the pectoralis major paddle flap is an easy and short surgical procedure that remains an excellent alternative in therapy-resistant patients suffering from hidradenitis suppurativa sternalis.

DOI: 10.1097/PRS.0b013e31817d5ed6

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Fig. 1. A 27-year-old patient with hidradenitis suppurativa sternalis after mammaplasty 4 years previously.

Fig. 2. Postoperative result 10 years after surgical intervention. The right breast is essentially unchanged.
Pectoralis Major Perforator Flap for Filling the Lower Part of the Sternal Reconstruction Defect

Sir:

One-stage sternectomy defect reconstruction with vascularized muscle is always a challenge for pectoralis major muscle flaps in the lower part of the defect because of its limited reach.1–5 The rectus abdominis can be used to fill the entire defect but comes at the price of abdominal wall morbidity, especially in overeaters. We have easily filled the lower part of the defect with a rotated pectoralis muscle perforator flap islanded on one or two of the inferior internal mammary artery perforators.

A left pectoralis flap islanded on the thoracoacromial vessels adequately fills the upper two-thirds of the sternal defect (Fig. 1). A right pectoralis major is raised and completely islanded on four or five internal mammary artery perforators originating below the medial first to fifth ribs, and its thoracoacromial vessels and muscle attachments are completely detached from the chest wall (Fig. 2). The largest, most medial and inferior of the perforators is chosen. The other perforators are temporarily clamped with vascular microclamps for 10 minutes to ensure that circulation through the chosen perforator(s) is adequate to perfuse the entire muscle. Examination of the pectoralis major blood flow on the far edges of the muscle following the aforementioned time will ensure that the entire muscle is viable before rotating it into the inferior sternal defect. Nonessential perforators that impede the rotation and inferior reach of the muscle flap are clipped and cut, leaving a pectoralis flap based on only one or two of the third, fourth, or fifth perforator(s) of the internal mammary artery. The flap is then rotated into the lower defect easily, without strain on the supplying perforator(s).

It is our observation that the pectoralis muscle perforator flap is another option for the filling of the lower sternal defect for outcome improvement in this difficult reconstructive situation.

DOI: 10.1097/PRS.0b013e31817d65f0

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Fig. 1. Left pectoralis muscle islanded on the thoracoacromial vessels covering the upper sternal defect. Right pectoralis muscle islanded on the third internal mammary artery perforator filling the lower sternal defect.

Fig. 2. Right pectoralis muscle completely islanded on the internal mammary perforators below the first though fourth ribs, with the clamps on the first, second, and fourth perforators. Muscle perfusion is through the third internal mammary artery perforator only.
Enterocutaneous Fistula Associated with an Unrecognized Retained Vacuum-Assisted Closure Sponge

Sir:

The vacuum-assisted closure system has become almost a universal panacea for wound management, but some precautions must be invoked. Adverse physiologic and infectious sequelae have been reported. The mere presence of the device itself can cause mechanical complications such as pressure sores. Although an important adjunct for the management of moderate- or high-output enterocutaneous fistulas, especially to prevent skin excoriation from the effluent or even to promote their closure, it is plausible to speculate that the device itself could be an etiologic agent that could cause such an enterocutaneous fistula or at least an irritant preventing spontaneous closure.

We are currently treating a 54-year-old, morbidly obese, diabetic woman who, following acute diverticulitis, developed a necrotizing fasciitis and destruction of most of her abdominal wall. The exposed viscera were allowed to granulate over and then skin grafts were placed with assistance in wound management using the vacuum-assisted closure system. For 10 months afterward, she persisted with an enterocutaneous fistula draining through the skin-grafted region just above the pubis (Fig. 1). Routine radiographs and even computed tomographic scans during this period were never helpful in delineating any causative factors. At the time of resection of the fistulized small bowel segment and definitive abdominal wall closure with an anterolateral thigh muscle perforator local rotation flap, a retained vacuum-assisted closure sponge (Fig. 1) was found within the phlegmon at the site of the fistula. She has since gone on to have an uneventful recovery.

It is well known that foreign bodies can be associated with intestinal fistulas. Whether the retained vacuum-assisted closure sponge actually caused or prevented fistula closure in this case, although circumstantial evidence for the latter is incriminating, can only be a speculative conclusion. Regardless, the fact that this foreign body event went unrecognized over such an extensive period is worrisome. It is a standard practice that all laparotomy pads and gauze sponges used in most operating theaters have some form of intrinsic radiopaque marker precisely to reduce the risk of their being overlooked by routine radiographic surveillance. Because the vacuum-assisted closure system is now so commonly used throughout the body, including within most body cavities, it would seem reasonable to expect any vendors to devise some modification so that any component part can similarly be readily identified to minimize the future chance of such sequelae as occurred in our patient. This is a serious safety and also potential liability issue.

DOI: 10.1097/PRS.0b013e31817d6528

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Abdominal Dermolipectomy: Risks and Complications in Smokers Treated from 2004 to October of 2006

Sir:

We analyzed 102 patients treated from 2004 to October of 2006, both men and women who had undergone abdominal dermolipectomy; patients affected by hypertension or mellitus diabetes were excluded from this study. The parameters considered were age at the moment of the operation, body mass index, color and width of the wound, and smoking habit. Patients were divided in two groups: nonsmokers (45.3 percent) and smokers (54.7 percent). We set the cutoff to be considered a smoker at 5 cigarettes or more per day. Of the wound-healing problems, we have included wound dehiscence, adiponecrosis, and infections, verified on the basis of culture examination positivity.

After placing the patients in recumbency, we measured every scar in millimeters and recorded the average value of three consecutive measurements. We have classified the scars as “satisfactory” and “unsatisfactory”: a 5-mm or smaller scar was considered satisfactory, and we have given it a risk score between 0 and 3. A 6- to 10-mm scar received a risk score between 4 and 9, and a 10-mm or larger scar was rated 10 and considered unsatisfactory (Table 1).

Then, we compared the scar and its surrounding skin color and described eventual differences: when the scar color was identical to the surrounding skin, the score was awarded 0 points, whereas in any other situation it was awarded 1 point. Lighter scars have been considered bad quality because they become more prominent with sun exposure: this is the reason why they have received a higher score (4 points) than the darker scars (2 points). Finally, we used the t test for unpaired data to compare the incisional data and the chi-square test for scoring system results.

The patients studied were 71 women and 31 men aged between 30 and 60 years and with a body mass index between 20 and 35. No significant difference between smokers and nonsmokers was observed concerning age and body mass index. On the contrary, there was a statistically significant difference between smokers and nonsmokers (p < 0.01): 43.9 percent of smokers showed wound-healing problems versus 12.8 percent of nonsmokers. The size of the scars was 2.84 ± 0.33 mm in smokers and 2.10 ± 0.21 mm in nonsmokers (p = 0.06).

Smokers developed light, wide, aesthetically worse scars more frequently than nonsmokers. The color distribution of the scars demonstrated that 26 percent of smokers developed lighter scars compared with 12 percent of nonsmokers (p < 0.05). Concerning the dark scars, there was an equal distribution in the two groups: 25 percent in smokers and 27 percent in nonsmokers.

When we took the scar classifications satisfactory and unsatisfactory into account, we noticed that 25 percent of smokers showed unsatisfactory scars in comparison with 17 percent of nonsmokers (p < 0.002). Five smokers developed an infection that required an extension of antibiotic therapy: only two nonsmokers did as well.

Healing by secondary intention, resulting from wound dehiscence, has been found in 21 percent of smokers and 5 percent of nonsmokers. Clinical studies have revealed that cigarette smoke compromises the wound-healing process, with a consequent poor aesthetic result.

DOI: 10.1097/PRS.0b013e31817d65b5

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An Unusual Association of Perianal Cutaneous Vascular Lesion, Anogenital Malformations, and Tethered Spinal Cord

Sir:

We report here a rare case of a baby girl with congenital perianal cutaneous vascular lesion, anogenital malformations, and tethered spinal cord. Girard et al. recently made note of these associations and have sought to emphasize the characteristic findings by proposing the acronym of PELVIS syndrome. A literature search revealed only 11 reported cases of this sequence of anomalies. Perineal cutaneous vascular lesions, external genital malformations, lipomyelomeningocele, vesicorenal abnormalities, imperforate anus, and skin tags are the findings associated with this proposed syndrome.

Our patient is a 4-month-old girl who is the second child of healthy, nonconsanguineous parents. After a normal and unremarkable pregnancy, she was delivered vaginally at 39 3/7 weeks to a 32-year-old G2P2 mother. The baby's weight was 7 pounds 10 ounces. The delivery was uncomplicated and spontaneous, with Apgar scores of 9 and 9.

As described in the PELVIS syndrome, the patient presented at birth with an anteriorly displaced imperforate anus, large labia majora, sacral dimple, and a vaginal skin tag. Water-soluble contrast enema revealed that there was no fistula between the vagina and bowel. She was evaluated by pediatric surgery and underwent diverting colostomy and a mucous fistula. The patient was also noted to have a 5 × 5-cm macular red patch that was diagnosed by plastic surgery as a perianal cutaneous vascular lesion (Fig. 1).

Because of this midline cutaneous vascular lesion and imperforate anus, spinal and renal ultrasound examinations were performed. Mild fullness of the upper pole of the right renal pelvis was noted along with a very small amount of free fluid along the interior aspect of the left kidney. More significantly, evidence of a tethered spinal cord with the conus terminating at L5 to S1 was found. Imaging also demonstrated an accompanying 1 × 2-cm lipoma involving the conus and the filum terminalis.

The patient underwent surgery again for the treatment of the tethered spinal cord by neurosurgery. To allow for the anal opening to be repositioned through more normal skin at the correct anatomical site, the cutaneous vascular lesion was treated with potassium-titanyl-phosphate laser at the time of tethered cord release. Because of the abnormal genitourinary anatomy, the urology department was consulted and the workup showed that the opening of the urethra was located deep in the vaginal canal with a urogenital sinus. Two vaginal skin tags were found and excised (Fig. 2) at the time of tethered cord release. Subsequently, she will undergo repair of the anogenital malformations. Plastic surgeons treating cutaneous vascular lesions in the perianal region should be aware of the possibility of associated findings such as...
anogenital and urogenital malformations and tethered spinal cord.

DOI: 10.1097/PRS.0b013e31817d654c

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Gains from the Separation of Conjoined Twins

Sir:

Conjoined twinning is a rare congenital malformation. A pair of gastrothoracopagus conjoined twins were admitted to our hospital in April of 2005. They survived and were successfully discharged, and this was the seventh successful case reported in China.

Full-term female gastrothoracopagus A and B twins with a common umbilical cord and placenta, born on May 8, 2005, by cesarean section, were admitted 23 days after birth, with a total body weight of 5100 g. The conjoined part ranged from the level approximately 3 cm above the nipple to the umbilicus (Fig. 1). Type B ultrasound, computed tomography, and magnetic resonance imaging showed that the anterior parts of the fourth through tenth ribs were absent, as was most of the superior abdominal wall, so that the pericardial and abdominal cavities were communicating, and the livers were also conjoined. They had independent circulatory, alimentary, and genitourinary systems. There was a bridge between their hearts: dextrocardia with atrial septal defect for twin A and dextroposition superior vena cava for twin B. The skin expanders were embedded 60 days after birth when the patients’ general status was fine and the total body weight had reached 6400 g.

The first-stage operation was performed under venous and local anesthesia; four 150-ml cylindrical expanders were embedded, with the injection pots placed outward. The sutures were removed 1 week later and we began to inject normal saline into the expanders two to three times per week until reaching the nominal volume in the third week. One week later, that is, 90 days after birth, the separation was performed (Fig. 2).

The second-stage operation was performed under systemic anesthesia. Two expanders were removed. Then, we entered the thoracic cavity and the pericardium was connected. Their hearts were independent after opening the pericardial cavity, and there was a vessel (approximately 1 cm in diameter) between two ventricles (one for each heart), which was ligated and cut off. Then, we separated the thorax. Afterward, we turned into the abdominal cavity and observed the independent portal systems and alimentary tracts. The anterior margins of their livers were fused. We separated them gradually, and the section was approximately 10 × 13 cm. We sheared the junction of the diaphragm and completely separated the two infants. Allogenic pericardium grafting was used to repair the defect of the pericardium. A monofilament polypropylene patch was used to reconstruct the abdominal wall. A porous high-density polyethylene implant (Medpor; Porex Surgical, Newnan, Ga.) was used to reconstruct the defect of the sternum and ribs. We covered the Medpor supporter with expanded skin flaps, and the thoracic wall was closed, but the closure of the abdominal wall was difficult to manage. Thus, we designed a local rotating skin flap (approximately 12 × 6 cm) in the right hypogastrium to repair the defect, advanced the left inferior expanded flap to the right to cover the donor site, and sutured the wound free of tension. Both of the twins survived, with a body weight of 4500 g and 4700 g, respectively, on discharge.

Fig. 1. The conjoined part ranged from the level approximately 3 cm above the nipple to the umbilicus.

Fig. 2. Photograph obtained postoperatively.
An accurate assessment of conjoined lung, heart, and great vessels is critical for a successful separation. Good nourishment, sufficient preoperative preparation, and excellent physiologic status are critical for a good prognosis.

Allogenic pericardium is a preferable repair material for pericardium, as it avoids conglutination. For sternum defects, Medpor has the advantage that it allows blood vessels to grow into it, and the granulation tissue can evolve early. In this patient, we could see that there was well-developed granulation tissue on the surface of the Medpor implant, and the transferred skin flaps healed rapidly, and this material is plastic in warm water. There have been successful cases of repair of the abdominal wall with a terylene patch, and no better material has been available to replace it until now. Use of expanded skin for coverage may be the optimal method at present.

Skin expansion is a favorable method with which to repair skin defects, although the application of skin expanders to conjoined twins has rarely been reported. From this case, we realized that skin expansion in infants can be achieved rapidly; however, postoperative care should be intensified, and local compressing should be avoided to reduce postoperative complications.

DOI: 10.1097/PRS.0b013e31817d6566

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Incidence of Mondor Disease in Breast Augmentation: A Retrospective Study of 2052 Breasts Using Inframammary Incision

Sir:

Mondor disease, or thrombophlebitis of the thoracoepigastric system of veins, is a self-limiting and benign disease without any systemic involvement. Fagge first described it in 1869, but it was not until 1939 when Henri Mondor described a series of four cases with the clinical abnormality that it became an established entity. An incision, usually transverse, on the thoracoabdominal wall results in division of the vertically oriented superficial veins. Retrograde blood flow is prevented because of the presence of valves in these superficial veins, resulting in blood stasis, leading to thrombus formation. This usually appears 2 to 3 weeks after surgery and is felt as a painful, firm cord on the thoracoabdominal wall and is visible when the arms are abducted. This bowstring sign is uncomfortable but diagnostic of Mondor disease (Fig. 1). The thrombus becomes organized and eventually canalizes. The other noninvasive causes of Mondor disease include breast cancer, tight-fitting dresses, and tight bras.

In aesthetic surgery, Mondor disease has been largely cited in case reports. This is the first and largest retrospective study conducted to establish the true incidence of Mondor disease in breast augmentation.

Fig. 1. Photographs of a case of bilateral Mondor disease with the bowstring sign in a 33-year-old patient after bilateral muscle-splitting breast augmentation using an inframammary crease incision. Thrombophlebitis typically appears 3 weeks postoperatively. (Above) Postoperative front view with the hands fully abducted. Arrows indicate the bowstring sign of the thrombosed veins under the incision line of both breasts. (Below) Postoperative left oblique view of the same patient. Arrows indicate thrombosed veins under the incision line of both sides.
Data from 1026 bilateral breast augmentations performed by the author using an inframammary incision were collected. All other approaches for augmentation, augmentation with mastopexies, revision operations, and previous scarring on the chest wall were excluded from the study. Each breast was counted as a single unit. There were 13 cases of Mondor disease in 2052 breasts (0.63 percent), involving 11 patients, for an overall incidence of 1.07 percent in 1026 cases studied. Five of these abnormalities were on the left, four were on the right, and two were bilateral. Of those patients who developed this abnormality, five underwent subglandular, three underwent muscle-splitting biplane, and two underwent partial submuscular pockets; three of the 11 patients had drains. In the author’s muscle-splitting biplane technique, the initial dissection is in the subglandular plane up to the lower level of the nipple-areola complex, and at this level, the medial two-thirds of the muscle is split obliquely, along the direction of its fibers, to create an upper submuscular pocket without releasing the pectoralis major muscle. The group that developed Mondor disease had an age distribution of 25 to 51 years, which is younger than that reported by Weinstein. Hou et al. followed up 9675 cases in the breast oncology clinic and found an overall similar incidence of 0.95 percent. The incidence of hematoma, capsular contracture requiring surgery, and infection in 1026 breast augmentations was less than 2 percent over a period of 7 years. It is obvious that with an incidence of 1.07 percent, Mondor disease is more prevalent than is commonly thought. Its occurrence in breast augmentation is as common as other complications that occur routinely. To avoid patient stress, the abnormality needs to be well explained to patients who elect breast augmentation, especially when an inframammary incision is selected.

Treatment is reassurance and administration of nonsteroidal anti-inflammatory drugs. It usually subsides between 6 and 8 weeks, without any side effects on the outcome of the operation. DOI: 10.1097/PRS.0b013e31817d6629

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REFERENCES

A New Approach to Nipple Reconstruction: The Modified S-Flap

Sir:

Many different techniques have been described by plastic surgeons to achieve nipple reconstruction. The most important aspect of nipple reconstruction is persistence in nipple projection and its comparison to the contralateral nipple. In an attempt to maintain nipple projection and aesthetics, we have devised a new approach to nipple construction using what we call a modified S-flap. The S-flap nipple reconstruction technique was designed to address certain characteristics of other nipple reconstruction techniques that may lead to unwanted contraction of nipple or loss of projection, shape, and size.

The S-flap nipple reconstruction was performed on all patients requesting nipple reconstruction following breast reconstruction over a 5-year period (July of 1999 through July of 2004). The technique was described to our patients as a modified S-flap reconstruction. An elliptical incision was performed down to the subcutaneous fat layer with modified S-flap extensions to prevent constriction of the randomized bare skin flaps. The faces of the randomized skin flaps were opposed to each other. These flaps are then assimilated to the contralateral nonoperative nipple during suturing. Figures 1 and 2 illustrate the design of our proposed

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**Fig. 1.** The modified S-flap design. A 4 × 2-cm elliptical incision was performed down to the subcutaneous fat layer with modified S-flap extensions to prevent constriction of the randomized bare skin flaps. Each letter corresponds to the specific points of angulations of the S incision. (Reprinted with permission from Frank Papay, M.D.)
reconstruction. Areola tattooing was performed approximately 8 to 10 weeks after surgery if satisfactory wound healing was achieved. The base of the nipple was also tattooed, but the S-flap walls and tip of the nipple were left untattooed to decrease injury and contraction. This would preserve the nipple projection.

As the final stage of breast reconstruction, nipple reconstruction changes the breast mound into a complete anatomical breast by achieving the aesthetics of the contralateral breast. Nipple reconstruction also increases self-esteem in the patient.\(^1,3\) Nipple projection, areola color, and symmetry are extremely vital for complete nipple reconstruction.\(^4\)

A number of flap designs for nipple reconstruction have been well described in the literature. The techniques that have withstood the test of time are those that are surgically reliable and maintain nipple projection. The main obstacle in achieving acceptable nipple shape and size is contraction.\(^4\) The current standard of nipple-areola reconstruction is a technique that includes pulled-out flaps or star flaps to increase nipple projection and intradermal tattooing for areola pigmentation.\(^1,2,4,5\)

Some authors believe that there should be stratification of nipple reconstruction depending on the type of breast reconstruction used.\(^5\) Moreover, some authors believe that nipple projection is determined by the quality of the reconstructed skin dermis, namely, its thickness and vascularity. Our proposed method of the modified S-flap nipple reconstruction has not only preserved size and shape of the nipple-areola complex but also proved to be aesthetically acceptable to our patients.

DOE: 10.1097/PRS.0b013e31817d65a1

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**REFERENCES**

was determined by telephone survey and review of preoperative photographs.

Postoperatively, newly developed striae were classified subjectively as mild, moderate, or severe (Figs. 1 and 2). Patients were counseled that the stretch marks would fade with time, but vitamin E, cocoa butter, or bag balm cream were also recommended.

All patients were healthy and ranged in age from 18 to 32 years (mean, 23 ± 4.3 years). Ninety-five percent of patients (n = 21) had not had term pregnancies, with 82 percent of patients (n = 18) specifically being nulliparous (Table 1). One patient (5 percent) had breast-fed in the past. Twenty-one of the 21 patients for whom data were available had striae elsewhere on their body before augmentation. Twenty-eight percent (n = 6) were smokers and 45 percent (n = 10) used oral contraceptives at the time of surgery. Implant volume ranged from 345 to 600 cc (mean, 452.5 ± 58.8 cc). Time from surgery to onset of the striae ranged from 1 1/7 to 26 5/7 weeks (mean, 11.17 ± 5.25 weeks). Sixty-eight percent (n = 15) of the striae were classified as mild, whereas 27 percent (n = 6) were moderate and one case (5 percent) was severe. The mean follow-up period was 17.5 months (range, 2 to 76.5 months).

Breast augmentation was the second most common cosmetic surgical procedure performed in the United States last year according to the American Society for Aesthetic Plastic Surgery. The development of striae following this procedure is a morbid complication that must be recognized, especially given the lack of effective therapies. In our case series, we confirm the roles of young age, nulliparity, and history of striae distensae as risk factors for the new development of striae following augmentation. All cases occurred in the subpectoral position, and association with oral contraceptives was not established. Although our series is small in number, it offers some insight into the character of striae distensae. Until a proven treatment is found for striae, we emphasize the importance of informing patients preoperatively of their risk factors to recognize the possibility that striae distensae may develop following breast augmentation.

DOI: 10.1097/PRS.0b013e31817d64f6

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DISCLOSURES

We hereby certify that, to the best of our knowledge, no financial support or benefits have been received by me or any coauthor, by any member of our immediate families, or by any individual or entity with whom or with which we have a significant relationship from any commercial source that is related directly or indirectly to the scientific work reported on in the article.
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<th>Implant Volume (cc)</th>
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Mean ± SD: 23.1 ± 4.3 148.9 ± 66 452.5 ± 58.8 11.17 ± 5.25 17.5 ± 16.9

*Total.
We understand any example of such a financial interest would be a stock interest in any business entity that is included in the subject matter of the article or that sells a product relating to the subject matter of the article.

REFERENCES


The Smooth Spectrum Saline Implant Leakage Rate

Sir:

Much confusion exists with regard to the leakage rates of saline implants. Leakage in saline implants may be the result of valve failure or shell failure. What is clear is that textured saline implants have a higher leakage rate than smooth saline implants. Saline implants currently have diaphragm valves, which have a lower leakage rate than the leaf valves they replaced. Spectrum implants (adjustable saline implants) have a triple-valve system, which has an even lower leakage rate than the diaphragm valve.

There is a misconception among surgeons that Spectrum implants have a higher leakage rate than regular saline implants. This misconception arises from advertisements and consumer-oriented documents that Inamed (Irvine, Calif.) and Mentor (Santa Barbara, Calif.) have published.

The published data would seem to indicate that Spectrum implants have the highest leakage rates. However, as Table 1 shows, published data on leakage rates are incomplete. On the one hand, Inamed has not published data on textured implant leakage rates; on the other, Mentor has not published data on smooth Spectrum implants. A study was therefore undertaken to assess the leakage rate of Smooth Spectrum, which has not been previously published.

A total of 366 implants were reviewed. These data are reflected in Table 2.

Deflation/ruptures occurred as follows: three ruptures at year 1 (at 4, 6, and 13 months), two ruptures at year 2 (12 and 21 months), and one rupture at year 8 (91 months). The 7-year leakage rate for Smooth Spectrum implants is 1.09 percent, which is lower than published rates for any other saline implant. The low leakage rate of the Smooth Spectrum implant is related to the lack of texturing and the superior Spectrum valve.

DOI: 10.1097/PRS.0b013e31817d6616

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REFERENCES


Table 1. Published Rupture Rates for Inamed and Mentor Implants

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Table 2. 8-Year Deflation Rates for Mentor Smooth Spectrum Implants*

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*Data from H. Becker, unpublished data.
Polyacrylamide Hydrogel Injection for Breast Enhancement: Should It Be Banned?

Sir:

Polyacrylamide hydrogel, also called Interfall (Gel Interfall; Ukraine Interfall Co., Ltd., Kiev, Ukraine) or Amazing Gel (Jilin Fuhua, sole producer and distributor, China), has been widely used for breast augmentation and facial soft-tissue contouring in the former Soviet Union, Eastern Europe, and China. The gel—more commonly known as PAAG in Hong Kong and China—is estimated to have been used on more than 300,000 mainland Chinese women in cosmetic procedures such as breast and nose augmentation. The figure in Hong Kong is uncertain, although it is estimated to be in the hundreds or thousands, with most of them having injections performed across the border in mainland China. Christensen et al. reported good results in augmentation mammoplasty in thousands of women using polyacrylamide gel injection and concluded that the gel is “non toxic, well tolerated by the breast and does not give rise to severe pain, fibrosis, and capsular shrinkage.” On the contrary, several authors have reported complications such as indurations, palpable lumps, gel migration and loss of contour, hematoma, and subsequent infection associated with breast augmentation using this product. We likewise have seen devastating complications associated with the use of injected polyacrylamide hydrogel in breast enhancement.

Over the past 3 years, 11 female patients aged 25 to 45 years were referred to us for management of complications associated with the use of polyacrylamide hydrogel. Seven of them presented with gel migration to the upper abdomen, lateral chest wall, and lower neck, all proven with magnetic resonance imaging studies. Four patients presented with intractable infection, breast abscesses, chronic sinuses, or subsequent complete loss of breast tissue following serial debridement. Some form of psychological stress, anger, and anxiety to the extent of depression was evident in all the patients. Another cause of concern was fear of malignant change associated with the injection of polyacrylamide hydrogel. Acrylamide is classified as a group 2A substance (probably carcinogenic to humans) by the International Agency for Research on Cancer. It has inherent toxic properties such as neurotoxicity, genotoxicity (to both somatic and germ cells), carcinogenicity, and reproductive toxicity in rodent models. Acrylamide undergoes epoxidation and produces glycinamide; both compounds are genotoxic and carcinogenic in mice.

Injected polyacrylamide gel enhances breast tissue density homogenously in mammograms. Moreover, foreign body reaction or recurrent infection can also confuse detection of microcalcification, rendering breast screening extremely difficult.

The Consumer Council of Hong Kong issued a warning regarding the possible complications associated with the use of polyacrylamide hydrogel in April of 2006. After this, 243 women called its hotline and expressed concern about having received polyacrylamide hydrogel injections to their breasts. Sixty-three of these women complained of complications associated with the injection and six women have lost their breasts as a result.

In mainland China, the exact number of patients who have suffered from complications associated with polyacrylamide hydrogel injection to the breast is unknown. However, realizing the magnitude of the problem and the rising number of lawsuits seeking compensation in courts, the Chinese State Food and Drug Administration called for an immediate ban on the production, sale, and use of polyacrylamide hydrogel on April 30, 2006. After this, a Shenzhen hospital sued by patients for using polyacrylamide hydrogel in plastic surgery procedures was shut down by local authorities. More class-action lawsuits related to polyacrylamide hydrogel are expected in mainland China.

Polyacrylamide gel injection for breast enhancement is probably being practiced elsewhere in many parts of the world where the local regulatory authorities have not prohibited the use of the substance. We would therefore like to bring a word of caution to those who might consider using polyacrylamide gel as a means of augmentation mammoplasty, namely, that this material has uncertain toxicity and oncogenicity and is associated with the possibility of devastating infective complications and migration that cannot be overlooked. The procedure is irreversible and it is impossible to completely remove the gel once injected and should complications arise. For patients who have had polyacrylamide gel injection and remain asymptomatic, no further action other than documentation of possible migration by imaging studies such as magnetic resonance imaging or computed tomographic scanning is recommended.

DOI: 10.1097/PRS.0b013e31817d6604

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Multilevel Replantation of the Palm and Digits

Sir:

According to the classic teaching, replantation of multilevel amputations (multiple levels in the same limb) is contraindicated; what is recommended is only to replant the proximalmost segment in selected cases. Recently, authors from China have challenged this principle, and several clinical cases and series have been published in Chinese journals. A case of a multilevel amputation of the left hand with four segments replanted successfully is reported. To the best of the author’s knowledge, this is the first case reported outside China.

A 50-year-old man presented with a sharp oblique transmetacarpal amputation, with separate amputations of the third, fourth, and fifth fingers though zone II, making four amputated segments (Fig. 1). The proximal palmar segment was temporarily perfused using a silicone catheter in the ulnar artery. The third, fourth, and fifth fingers were replanted at the side table onto the proximal palmar segment using standard surgical and microsurgical techniques. The proximal interphalangeal joint of the fourth finger was fused. One collateral artery and two veins were repaired in every finger, except for the fifth, where two arteries were repaired. The composite segment (palm and fingers) was then replanted onto the stump. The total operative time was 9 hours. The postoperative period was uneventful and the replanted parts survived completely.

The functional result (Fig. 2) was a combined active range of motion (metacarpophalangeal plus proximal interphalangeal plus distal interphalangeal) of 140 degrees for the second finger, 90 degrees for the third and fourth fingers, and 65 degrees for the fifth finger, with a Semmes-Weinstein monofilament test of 3.61 for both sides of the second and fifth fingers; 4.31 for the palm, radial aspect of the third, and ulnar aspect of the fourth; and 4.56 for the ulnar aspect of the third and radial aspect of the fourth fingers. The patient did not return to his previous employment but uses his hand for activities of daily living.

Fig. 1. (Left) The stump showing the sharp oblique transmetacarpal level of amputation. (Right) The double-level amputation of the palm and the third, fourth, and fifth fingers.
The largest case series to date, 22 patients, has been reported by Pei et al. According to these authors, intercalary digital segments less than 1 cm long should not be replanted, and if large segments with significant muscular component are present, replantation should start from proximal to distal. If only digits are involved, replantation should proceed from distal to proximal at the side table to speed up the procedure, as ischemia time is less of a problem.

The order of replantation in this case was from distal to proximal to reduce blood loss. Ischemia time was zeroed using temporary catheter perfusion, also making side-table replantation easier, with improved visualization. The main difficulty of side-table replantation of segments is judging the quality of blood vessels. Multilevel amputations should probably be considered not a contraindication for replantation any longer but rather a relative indication in the proper microsurgical environment. The recent literature and the present case demonstrate that reasonable results can be obtained in these devastating injuries.

DOI: 10.1097/PRS.0b013e31817d65dc

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Hydrosurgical Tangential Excision of Partial-Thickness Hand Burns

Sir:

Successful treatment of hand burns requires a balance between providing adequate and reliable soft-tissue coverage and maximizing long-term maintenance of intrinsic function. Debridement of hand burns is complicated by the absence of thick subcutaneous and muscular layers protecting underlying vital structures—only a thin fasciocutaneous layer protects bones and tendons of the hand. Timing of debridement and choice of reconstructive method are guided by reducing the amount of unnecessary excision and maximizing the area of viable tissue. We present a case of successful treatment of deep partial-thickness hand burns using precision hydrosurgical tangential excision before split-thickness skin grafting.

A 54-year-old, right-hand-dominant man with a history of right forearm injury resulting in ulnar neuropathy and ulnar artery occlusion presented to our trauma center with a burn on the dorsum of his right hand sustained during a fall into a bonfire. The deep partial-thickness burns covered approximately 4 percent total body surface area. We initiated intensive hand therapy on postburn day 1 and continued Silvadene dressing (Marion Laboratories, Kansas City, Mo.) changes while allowing the burns to demarcate. On postburn day 5, we tangentially excised the burns using...
the Versajet Hydrosurgery System (Smith & Nephew, Cambridge, England) with a setting of 6 (range, 1 to 10) and special care to orientate the handpiece at a 45-degree angle to prevent longitudinal notching of the dermis (Fig. 1). In so doing, we were able to quickly debride layer by layer down to viable tissue, preserving healthy dermis and paratenon. Split-thickness sheet grafting (thickness, 0.0125 inch) was then performed. The grafts were evaluated after 5 days and achieved 100 percent take. We continue to follow the patient in our outpatient hand clinic, and he has achieved an excellent functional and aesthetic outcome (Fig. 2).

Hydrosurgical excision uses the Venturi effect, which is produced by a high-speed jet of sterile saline traveling parallel to the wound surface. Pressures of up to 15,000 pounds per square inch can be reached and focused on 8 to 14 mm of tissue at a time. A localized vacuum is created, which allows for precise tissue debridement with a combination of cutting and aspiration of the tissue.2 The mobile handpiece combined with the adjustable power console allows the surgeon to carefully debride necrotic eschar while preserving underlying healthy tissue.

Recent burn literature reports use of the Versajet system in burns of the wrist and forearm.3–5 Pediatric burns were excised and grafted successfully using low-pressure settings to preserve as much healthy dermis as possible. Older children and adults required higher settings to debride thicker dermis and eschar. The small aperture of the handpiece was found to facilitate the debridement of awkward areas such as web spaces between fingers but also hindered debridement of large surface areas. Hydrosurgical excision was found to be beneficial before split-thickness skin grafting or, when healthy dermis is preserved, before application of Biobrane (Smith & Nephew).

We are encouraged by our initial results with hydrosurgical excision in burn patients. With growing experience and practice, we expect hydrosurgery to augment the well-established utility of sharp excision. DOI: 10.1097/PRS.0b013e31817d657a

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REFERENCES

Posterior Interosseous Branch Palsy following Pneumatic Tourniquet Application for Hand Surgery

Sir:

A 53-year-old woman was evaluated for bilateral carpal tunnel syndrome. An electromyogram confirmed the diagnosis of chronic bilateral median nerve compression.
She underwent carpal tunnel release of the right wrist first. After applying a pneumatic tourniquet on her proximal forearm, the extremity was exsanguinated with an elastic bandage wrap and hand elevation. Anesthesia consisted of a local block with 5 cc of 1% lidocaine with epinephrine 1:1000. A standard carpal tunnel release was performed uneventfully. The pneumatic tourniquet was inflated for a total of 12 minutes at a pressure of 250 mmHg.

Three weeks after surgery, the patient was unable to extend her wrist or her index, middle, or ring fingers (Fig. 1). Flexion remained normal, as did sensation of the entire hand. The video clip included demonstrates the patient’s deficit. Compare the motion of the affected right side to her left wrist. (See Video, Supplemental Digital Content 1, which demonstrates the patient’s inability to extend the wrist or her index, middle, or ring fingers on the right side while attempting extension of both hands, http://links.lww.com/A455).

The first described case of paralysis of the upper limb following standard tourniquet application was reported over 125 years ago.1 The high incidence of complications led to the development of pneumatic tourniquets. These allow for objective measurement and more even distribution of the pressure. The complications range from superficial blistering, abrasions, contusions, and lacerations to transient or permanent neurovascular injuries and compartment syndromes. Peripheral nerve damage occurs as a result of ischemia distal to the tourniquet cuff and mechanical compression beneath it.2

The radial nerve is the most susceptible nerve to tourniquet injuries, with an estimated incidence of one palsy in 13,000 applications.3 Posterior interosseous nerve syndrome is caused by compression of the named nerve, an extension of the deep branch of the radial nerve. This occurs at the proximal part of the superficial layer of the supinator muscle, which can form a fibrous arch known as the arcade of Frohse.4 The muscles innervated by the posterior interosseous include the digit extensors, the extensor carpi ulnaris, and the abductor pollicis longus.

The resulting clinical deficits include weakness in extension of the metacarpal joints, the interphalangeal joints, and the wrist. Weakness in abduction of the thumb occurs secondary to deficits of the abductor pollicis longus and radial deviation of the wrist in extension. This results from sparing of the extensor carpi radialis function.5 In addition, some patients with posterior interosseous nerve syndrome report tenderness distal to the lateral epicondyle and over the arcade of Frohse. Treatment of posterior interosseous nerve syndrome consists of extensor splints and range-of-motion and strengthening exercises.

Compression paralysis seen with tourniquet use is almost always associated with gradual clinical improvement.5 Our patient subjectively reported 50 percent improvement 3 months after the injury. This was paralleled by the objective findings of the electromyogram, with approximately 50 percent of the nerve function compromised while demonstrating signs of regeneration.

The patient presented in this article underwent a short procedure and was not—as established by calibrating the cuff—subjected to unsuspected high pressures. This case illustrates the characteristic clinical findings of posterior interosseous nerve injuries with the help of online video. It allows us to review the resulting deficits in hand function and reminds us that

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even careful use of this “benign” device can result in soft-tissue injuries.

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REFERENCES

Skeletal Traction Treatment of Severe Finger Contracture: A New Innovative Skeletal Distraction Device

Sir:

This report introduces a novel skeletal distraction device for the treatment of severe finger contractures. Severe finger contractures (e.g., in advanced stages of Dupuytren’s disease) are a great challenge for surgeons. The main problems are the shortened ligaments of the involved joints and the shortened vessels, nerves, and tendons. Correcting severe finger contractures in one step carries a high risk of finger necrosis and unsatisfying functional results.

Since the invention of the continuous traction method for the treatment of severe finger contractures in Dupuytren’s disease, the rate of finger amputations and complications in this special entity has decreased. Several nonskeletal fixed and skeletal fixed distraction devices have been invented for this type of distraction treatment. However, systems available at present do not consider all aspects and problems associated with continuous traction treatment of severe finger contractures.

We present an innovative external skeletal fixed distraction device for the treatment of severe finger joint contractures (e.g., in advanced stages of Dupuytren’s disease). The newly developed skeletal fixed distraction device acts as an angular distractor that allows additional longitudinal distraction of the treated joints at the same time. The longitudinal distraction during the angular correction is important to prevent cartilage damage and to stretch the ligaments of the treated joints. In addition, this device allows the independent treatment of two joints in one finger independently.

We treated five patients with severe joint contractures of the proximal interphalangeal joint and the metacarpophalangeal joint of the fifth finger because of Dupuytren’s disease. All patients were able to perform the distraction themselves after a short introduction in the use of the distraction device. The mean distraction period was 22 days. All treated joints were distracted until full extension was achieved. In all patients, a limited fasciectomy was performed 3 days after extension of all joints was completed. Neither a pin-track infection nor algodystrophy was observed in our patients. The mean follow-up period was 8.6 months. The results after the follow-up period were slightly bet-

Fig. 1. Result of a 62-year-old woman before the start of distraction and during the distraction period, 12 months after the limited fasciectomy.
The M-Shaped Thigh Lift

Sir:

The authors propose a new approach to the old aesthetic problem of skin and fat laxity in the hip-buttock-thigh region caused by lipodystrophy (the saddlebag deformity). The ample excision is performed through an M-shaped skin incision. The traditional supragluteal circular incision is complemented by bilateral downward extensions in the lateral thighs. The adequacy of the resection, leading to superior aesthetic results, seems to compensate for the resultant long and visible thigh scar and should be considered in selected patients.

Living for the rest of their lives with extensive scars is a condition with which massive weight loss patients will have to deal to obtain adequate body contour. This is not an apology for unnecessary surgical scars, but excessively economical skin and fat resections frequently lead to insufficient aesthetic results.

Two different techniques to remove more skin and fat laxity in the severe saddlebag deformity were described recently.1,2 The first one proposed a change in the patient’s position on the operating table, with full abduction of each operated thigh before closure in the prone position, and reported “significantly lower deformity severity scores.”1 Some excess circumferential skin laxity extends beyond this technique’s resection limits. The second technique included suction lipectomy and direct excision of skin and fat, with the circular defects being closed with purse-string sutures, with “greatly improved contour and minimal deformity or scarring.”2 Results may change because superficial purse-string sutures require skin wrinkling and depend on the strength of one main suture.

In agreement, this viewpoint article advocates more skin and fat laxity removal in the severe saddlebag deformity. An M-shaped incision was planned. The central part of this incision is similar to previously described techniques, but the focus is in the lateral thigh, where this deformity is more evident. The lateral vertical portion of this incision allows easy and adequate skin and fat removal. The final skin tension in the lateral thigh resembles that of a routine suction lipectomy, and the body contour obtained is fully adequate (Fig. 1).

Conventional hip-buttocks-thigh lift procedures rely on the excision of skin and fat from the transition to the dorsum area and from the inner thigh and central buttocks creases.3–5 A vertical inner thigh extension is frequently used, and the resultant long scar is considered aesthetically suitable. Unfortunately, in the saddlebag deformity, the main component of skin and fat laxity resides in the lateral thigh, pro-

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Disclosures

Both authors have applied for a patent for the introduced distraction device. It is registered at the European Patentamt in Munich No. DE 102004014075.8. The work was not supported by any funds.

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truding to the side and thus is much less affected by medial thigh area flap traction.

A long vertical scar in the lateral thigh may seem to be too exposed, but postoperative photographs show that it is visible only on the lateral view. Frontal and rear aspects are not maculated by this scar.

DOI: 10.1097/PRS.0b013e31817d658e

**DISCLOSURES**

No financial support or benefits have been received by the authors of the present article. There is no relevant commercial or financial relationship.

**REFERENCES**


**Secondary Free Fibular Flap for Providing Rigidity in a Radial Forearm Phalloplasty**

Sir:

Phalloplasty is the central step in the surgical treatment of gender reassignment in female-to-male transsexual patients. Providing rigidity is an important part of a successful phalloplasty, although duplication of the physiologic erection mechanism is beyond the current technology. Fibular osteocutaneous flaps and radial forearm osteocutaneous flaps have been described with vascularized bone as a stiffener in primary phalloplasty. The stiffener can also be inserted as a secondary procedure, after full sensory recovery has taken place. Although success rates of inflatable prostheses in the treatment of male impotence are reported to be high, the results in transsexuals have been much worse. Autologous, nonvascularized stiffeners have been used, with poor results. Vascularized iliac bone has been used as a stiffener in a case of diabetic male impotence, and a fibular flap was reported to provide rigidity in a case of posttraumatic male impotence, with acceptable long-term results. The use of a free fibular osseous flap to provide rigidity in a patient with a previous phalloplasty performed with a sensate radial forearm flap is reported.

A 23-year-old female-to-male transsexual with a previous phalloplasty (a sensate free radial forearm cutaneous flap, connected to the left femoral vessels) re-
quested a stiffening procedure 1 year after surgery. A 14-cm-long free fibular osseous flap was inserted, revascularized to the right femoral vessels using the greater saphenous vein as a Corlett loop (Fig. 1). The proximal end of the bone was fixed with absorbable sutures to the pubic symphysis, and the distal end was rounded up to avoid erosion. A suprapubic catheter was inserted and maintained for 1 week, until most of the swelling had subsided. Sexual intercourse was possible, at a follow-up of 3 years (Fig. 2).

The use of a free flap as a stiffener after a microvascular phalloplasty, although effective, has the disadvantage of its technical complexity. It is probably wiser to use an osteocutaneous flap for the initial phalloplasty (the author now uses the osteocutaneous radial flap), thus obviating the need for this secondary procedure. In patients who already have a flaccid neophallus, the technique reported here may, nevertheless, be a reasonable alternative to an inflatable prosthesis. The case reported is, to the best of the author’s knowledge, the first use of a free fibular osseous flap as a secondary stiffener in a female-to-male transsexual.

DOI: 10.1097/PRS.0b013e31817d65c8

Fig. 1. The fibular flap before insertion and revascularization. The Corlett loop in the right femoral artery is seen.

Fig. 2. Postoperative rigidity.

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