GUIDELINES

Viewpoints, pertaining to issues of general interest, are welcome, even if they are not related to items previously published. Viewpoints may present unique techniques, brief technology updates, technical notes, and so on. Viewpoints will be published on a space-available basis because they are typically less time-sensitive than Letters and other types of articles. Please note the following criteria:

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

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

We reserve the right to edit Viewpoints to meet requirements of space and format. Any financial interests relevant to the content must be disclosed. Submission of a Viewpoint constitutes permission for the American Society of Plastic Surgeons and its licensees and assignees to publish it in the *Journal* and in any other form or medium.

The views, opinions, and conclusions expressed in the Viewpoints represent the personal opinions of the individual writers and not those of the publisher, the Editorial Board, or the sponsors of the *Journal*. Any stated views, opinions, and conclusions do not reflect the policy of any of the sponsoring organizations or of the institutions with which the writer is affiliated, and the publisher, the Editorial Board, and the sponsoring organizations assume no responsibility for the content of such correspondence.

Viewpoints

Brain Plasticity after Unilateral Reconstruction in Möbius Syndrome

Sir:

Möbius syndrome was first described as a congenital, nonprogressive, bilateral, facial and abducens nerve palsy.[1] Along with these two, other cranial nerves might be affected, such as the third, fifth, ninth, tenth, eleventh, and twelfth cranial nerves. From the reconstructive point of view, treatment of this syndrome aims fundamentally at restoring the absent facial muscular function that leads to speech problems, lower lip incompetence, and lack of expression. Nowadays, free gracilis muscle innervated by the masseteric nerve is widely accepted as one of the best options for treating bilateral facial palsy.[2,3]

In October of 2009, a 4-year-old girl with Möbius syndrome in whom the hypoglossal nerve was affected came to our center. The child presented with incomplete bilateral eyelid occlusion, left tongue lateralization, competent masseter muscles, and total absence of commissural excursion on either side. A free gracilis muscle transplant neurotized to the masseteric nerve of the left hemiface was performed. Physical therapy began on postoperative day 28. In May of 2010, notorious excursion of the right commissure was observed. Videos and photographs before the first-stage procedure confirmed complete paralysis of the right lower face, thus showing spontaneous restoration of movement of the nonoperated side (Fig. 1). The second operation was cancelled and intensive physical therapy was recommended.

According to the principles of neuroplasticity, enhanced stimulation of a body part enlarges its cortical representation zones and may change its topographic order, whereas lack or complete loss of afferent input leads to an invasion of representational zones located adjacent to the area deprived of its input.[4] Nevertheless, not every stimulus induces significant changes in the cortex. Use-dependent cortical reorganization requires a high motivational drive because it emerges in response to practice of behavior-relevant tasks. Furthermore, it is during development when the brain has the greatest capacity to reorganize in response to experience.[5]

Möbius syndrome children present limited facial expression and often fail in social interaction. Acquiring the ability to smile and express themselves represents a great motivation for them. Considering the high motivational drive and the fact that most Möbius children present for treatment at early ages, they might be ideal candidates for developing plasticity of the facial motor cortex. Our observations reported here are, as far as we know, unique in the literature. What is most striking is the fact that, having complete paralysis, she achieved right commissural motion after left gracilis transplantation and physical therapy. Although we do not have the full explanation, we hypothesize that the child developed strong cortical reorganization. Before left hemiface surgery, our patient was unable to smile, not only because of her neurologic impairment but, more simply than that, because she did not know how. After left reconstruction, she discovered what it was to smile and how it should be done, and thus understood what she had to practice. Intensive physical therapy and a high motivational drive toward achieving facial expression following surgery on her left side surely contributed to developing changes in her facial motor cortex, enabling her to move her right lower face.

DOI: 10.1097/PRS.0b013e3182174439

Diego Marré, M.D.

Bernardo Hontanilla, M.D., Ph.D.
Department of Plastic and Reconstructive Surgery
Clinica Universidad de Navarra
Navarra, Spain

Correspondence to Dr. Hontanilla
Department of Plastic and Reconstructive Surgery
Clinica Universidad de Navarra
Av. Pio XII 36
31008 Pamplona, Spain
bhontanill@unav.es

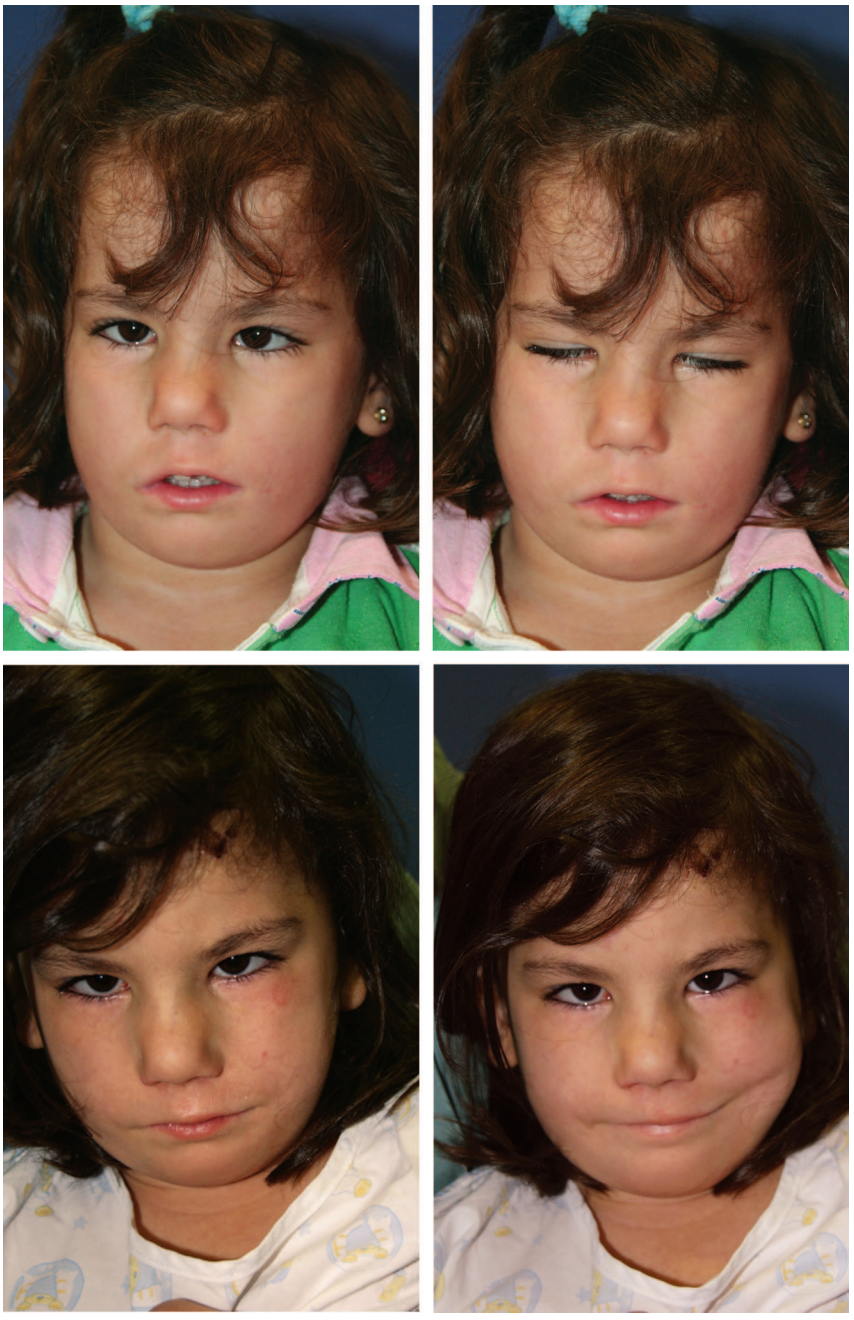

Fig. 1. (*Above*, *left*) Preoperative situation with the patient in repose; (*above*, *right*) postoperative situation with the patient in repose; (*below*, *left*) preoperative situation with the patient smiling; (*below*, *right*) postoperative situation with the patient smiling.

DISCLOSURE

There was no source of funds for this work. The authors have no financial interest in the methodology described in this article.

PATIENT CONSENT

Parents or guardians provided written consent for the use of patient images.

REFERENCES

1. Möbius PJ. Ueber angeborene doppelseitige Abducens-facialis-lähmung. *Munch Med Wochenschr.* 1888;35:91–94.
2. Zuker RM, Goldberg CS, Manktelow RT. Facial animation in children with Möbius syndrome after segmental gracilis muscle transplant. *Plast Reconstr Surg.* 2000;106:1–8; discussion 9.
3. Hontanilla B, Rodriguez-Losada G. Bilateral reconstruction of smile through muscle transplant neurotized to masseter nerves. *J Craniofac Surg.* 2011;22: 1099–1100.

4. Elbert T, Rockstroh B. Reorganization of human cerebral cortex: The range of changes following use and injury. *Neuroscientist* 2004;10:129–141.
5. Pascual-Leone A, Torres F. Plasticity of the sensorimotor cortex representation of the reading finger in Braille readers. *Brain* 1993;116:39–52.

Reconstruction of Cerebrospinal Fluid Leakage on the Occipital Region of the Head with the Pedicled Pectoralis Major Myocutaneous Flap

Sir:

Cerebrospinal fluid leakage is sometimes long-lasting and resistant to operative therapy. We report a case of a pedicled pectoralis major myocutaneous flap to prevent recurrence of cerebrospinal fluid leakage (Fig. 1). A 57-year-old man underwent a clipping procedure for a cerebral aneurysm, which was performed with craniotrypesis of the occipital region of the head. After the clipping procedure, cerebrospinal fluid leakage persisted. Lumbar peritoneum shunting was performed twice, but the leakage continued, and the bone flap and sutured dura mater on the occipital region became bacterially infected.

Sixty-one days after the clipping procedure, neurosurgeons removed the infected bone flap, augmented the leakage point on the dura matter with a silicone membrane, and placed bone cement on the dura mater to close a 3 × 5-cm bone defect (Fig. 1, *above, right*). To cover the bone cement, we fashioned a pedicled pectoralis major myocutaneous flap with thoracoacromial vessels on the left anterior thoracic region. An incision was made above the left clavicle, in the left anterior thoracic region, and on the left neck. The flap was raised and passed under the clavicle and subcutaneously to reach the occipital region of the head, after which the flap epidermis was removed (Fig. 1, *left*). The flap was placed on the occipital region with the dermal aspect facing the top (Fig. 1, *below, right*). The skin was sutured.

At a 5½-year follow-up examination, the patient suffered from no postoperative complications, including recurrence of the cerebrospinal fluid leakage, and there was no functional loss in daily life arising from partial loss of the left pectoralis major muscle. Scarring on the left anterior thoracic region had healed well (Fig. 2).

When cerebrospinal fluid leakage occurs postoperatively and the leak recurs or persists after 10 to 13 days of conservative management, a repair operation is indicated. Conventional operative techniques are (1) craniotomy, (2) extracranial extradural suture, and (3) cerebrospinal fluid shunting procedures.[1] In the pres-

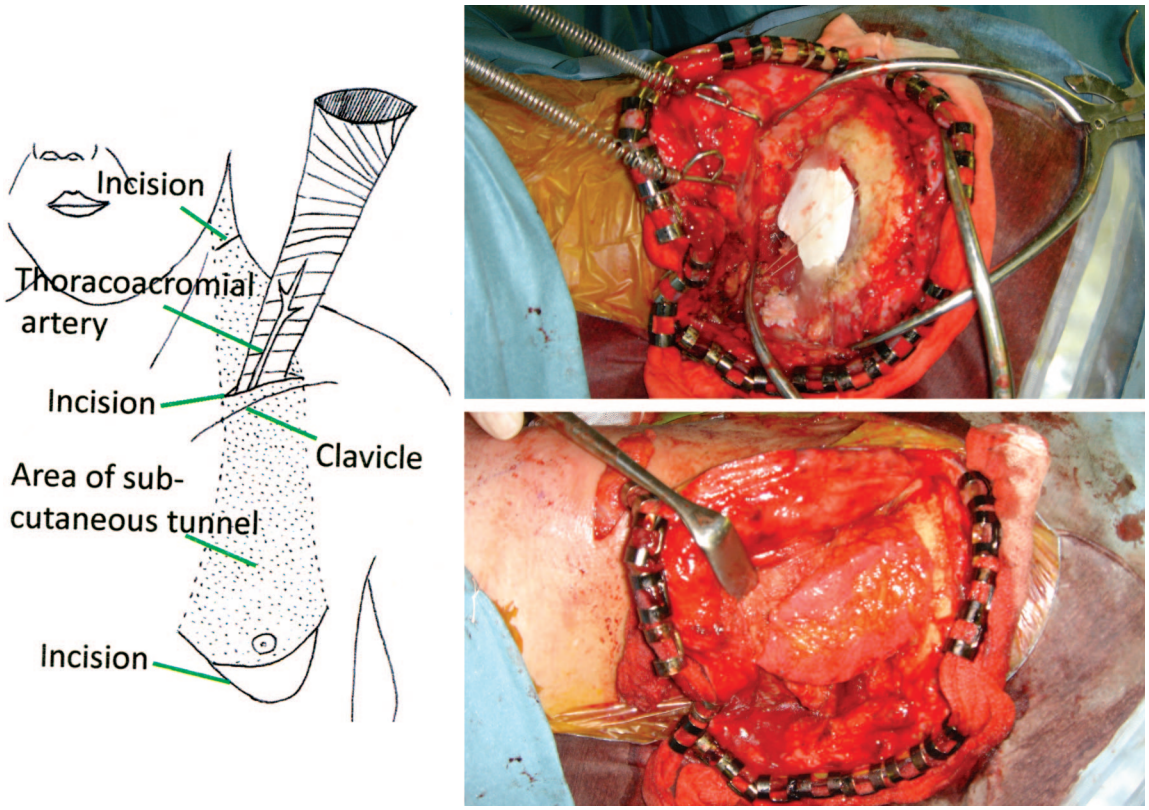

Fig. 1. Schematic view of a pedicled pectoralis major myocutaneous flap (*left*). The flip side of the pectoralis major muscle is shown, after passing subcutaneously and under the clavicle. The dura and bone defect were augmented with silicone membrane and bone cement (*above, right*). The bone cement was covered with the myocutaneous flap (*below, right*).

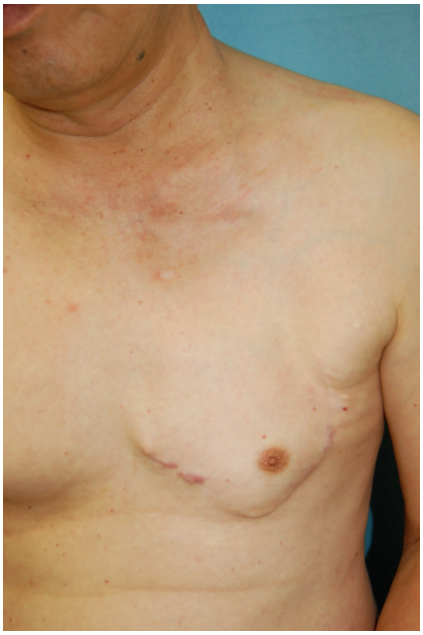

Fig. 2. The patient is shown 5½ years after the operation.

Table 1. Advantages and Disadvantages of the Pedicled Pectoralis Major Myocutaneous Flap to Cover the Occipital Area of the Head

Advantages
No requirement for microsurgery
Stable blood supply
Easy flap elevation and short operative time
Shorter scar compared with other local flaps such as the pedicled trapezius muscle flap and the latissimus dorsi muscle flap
Thick cutaneous muscle flap to be able to cover artificial materials to resist infection
Spared muscular strength for activities of daily living by leaving part of the pectoralis major muscle
Close pivot point to the occipital area
No need for a change of position during the procedure, as both flap elevation and coverage on the occipital area can be performed in a semilateral position with the head rotating slightly downward
Disadvantages
Risk of damaging the great auricular nerve when creating a subcutaneous tunnel under cervical skin, which in turn causes numbness on the lower portion of the auricle
Risk of damaging the accessory nerve, which causes trapezius muscle palsy when creating a subcutaneous tunnel
The bulkiness of the flap for the initial period after the surgery
Being unable to reach beyond the occipital area

ent case, the cerebrospinal leakage persisted for 2 months, with lumbar peritoneum shunting twice.

We considered it crucial to cover the artificial object with tissue that had good blood circulation to avoid the risk of infection. Various flaps have been used on the occipital area of the head, with the pedicled trapezius muscle commonly used, because it can cover a wide area without the need for microsurgery.[2] Several free flaps have been used to reconstruct head regions with cerebrospinal fluid leakages.[3]

The advantages of using pedicled flaps include no requirement for microsurgery and a stable blood supply. Furthermore, the operative time is shorter.[4] There is some risk of damaging the great auricular nerve and the accessory nerve when creating the subcutaneous tunnel. The advantages and disadvantages of the pedicled pectoralis major myocutaneous flap are summarized in Table 1.

To the best of our knowledge, this is the first report of a technique that uses the pedicled pectoralis major myocutaneous flap to repair cerebrospinal fluid leakage in the occipital region of the head. We consider this flap to be useful for such reconstruction.

DOI: 10.1097/PRS.0b013e3182174343

Shuji Suzuki, M.D., Ph.D.
Hiroshi Tanaka, M.D.
Isao Koshima, M.D., Ph.D.
Nagoya City University Hospital
Nagoya, Japan

Correspondence to Dr. Suzuki
Department of Dermatology
Nagoya City University Hospital
1 Aza-Kawasumi, Mizuho-cho, Mizuho-ku
Nagoya-shi, Aichi-ken 467-8602, Japan
drshuji@yahoo.co.jp

Presented at the 45th Chubu Area Annual Meeting of the Japan Society of Plastic and Reconstructive Surgery, in Hamamatsu, Shizuoka, Japan, July of 2010.

DISCLOSURE

The authors have no relevant financial interest in the findings presented in this article.

REFERENCES

1. Dagi TF. Management of cerebrospinal fluid leaks. In: Henry HS, ed. *Operative Neurosurgical Techniques.* 4th ed. Philadelphia: Saunders; 2000:164–177.
2. Chung C, Forte AJ, Momeni R, Fatima Masood Q, Narayan D. Muscle-flap salvage of prosthetic dural repair. *Plast Reconstr Surg.* 2010;63:213–217.
3. Wang HT, Erdmann D, Olbrich KC, Friedman AH, Levin LS, Zenn MR. Free flap reconstruction of the scalp and calvaria of major neurosurgical resections in cancer patients: Lessons learned closing large, difficult wounds of the dura and the skull. *Plast Reconstr Surg.* 2007;119:865–872.
4. Lesavoy MA, Dubrow TJ, Schwartz RJ, Wachym PA, Eisenhauer DM, McGuire M. Management of large scalp defects with local pedicle flaps. *Plast Reconstr Surg.* 1993;91:783–790.

Sequential Second Free Flap for Head and Neck Reconstruction in a Patient with Fanconi Anemia and Metachronous Squamous Cell Carcinoma

Sir:

Fanconi anemia is a rare genetic disease characterized by chromosomal instability, bone marrow failure, congenital malformations, and increased suscep-

tibility to both solid and leukemic malignancies. The incidence of solid malignancies approaches 28 percent by 40 years of age, with a high proportion of these being head and neck tumors.[1] In a series of 754 patients with Fanconi anemia, Kutler et al. reported that 3 percent developed head and neck squamous cell carcinoma, with a 50 percent relapse rate by the age of 40.[2] Although Fanconi anemia patients may develop multiple tumors over a lifetime, repeated operations/reconstructions are rarely seen because of their shortened life expectancies. Furthermore, surgeons may be hesitant to treat patients with Fanconi anemia because of an increased risk of complications, particularly if treatment involves extensive resection or possible free tissue transfer. We have previously described a successful mandibular reconstruction with a free fibula free flap in a patient with Fanconi anemia and squamous cell carcinoma of the mandible.[3] Unfortunately, the patient developed squamous cell carcinoma of the pharynx 18 months later. We now report subsequent pharyngeal reconstruction with a metachronous free flap.

Initially, a 43-year-old woman with Fanconi anemia was referred to our institution with an erosive floor-of-mouth mass ultimately diagnosed as squamous cell carcinoma. She underwent hemimandibulectomy and bilateral neck dissection followed by immediate reconstruction with a right fibular osteomyocutaneous flap. The patient recovered from surgery without complications and underwent adjuvant radiation therapy. Her postoperative result was satisfactory. Eighteen months later, she was found to have squamous cell carcinoma of the hypopharynx. She then underwent total laryngopharyngectomy and construction of a neopharynx using a tubed anterolateral thigh flap. The soft tissues of the right neck were resurfaced with a separate skin paddle based off of a second perforator; the left lateral neck received a split-thickness skin graft. The patient recovered without any hematologic complications but did suffer partial skin graft loss and a small pharyngocutaneous fistula. A modified barium swallow performed 6 weeks postoperatively demonstrated a small leak that resolved 1 month later, resulting in satisfactory cosmetic and functional outcomes. As recommended by our hematologists, during both hospitalizations, the patient's perioperative hemoglobin level and platelet count were maintained above 7 g/dl and 50,000 cells/ml, respectively, by means of hematopoiesis-stimulating agents and blood product transfusions. A total of 42 units of single-donor platelets and 13 units of packed red blood cells were administered while the patient was hospitalized after the second free flap.

In conclusion, patients with Fanconi anemia are at increased risk for perioperative hematologic complications. There are two published reports that describe successful free tissue transfer in Fanconi anemia patients.[3,4] To our knowledge, this is the first reported case of a patient with Fanconi anemia to undergo a second sequential free flap operation for metachronous head and neck cancer reconstruction. As this case demonstrates, such large-scale reconstructions can be successfully undertaken with careful perioperative management of patients with this disease.

DOI: 10.1097/PRS.0b013e3182173fc1

Karly A. Kaplan, M.D.
Alyssa J. Reiffel, M.D.
David I. Kutler, M.D.
Christine H. Rohde, M.D.
Jason A. Spector, M.D.

Correspondence to Dr. Spector
Division of Plastic Surgery
Weill Cornell Medical College
525 East 68th Street, Payson 709-A
New York, N.Y. 10065
jas2037@med.cornell.edu

REFERENCES

1. Kutler DI, Singh B, Satagopan J, et al. A 20-year perspective on the International Fanconi Anemia Registry (IFAR). *Blood* 2003;101:1249–1256.
2. Kutler DI, Auerbach AD, Satagopan J, et al. High incidence of head and neck squamous cell carcinoma in patients with Fanconi anemia. *Arch Otolaryngol Head Neck Surg.* 2003;129:106–112.
3. Chao JW, Cohen BD, Rohde CH, Kutler DI, Spector JA. Free fibular flap reconstruction of the mandible in a patient with Fanconi anemia. *Plast Reconstr Surg.* 2010;125:61e–63e.
4. Alkaabi M, Regan PJ, Kelly J, Mc Cann PJ, Ismael TS. Double paddle free fibular flap for reconstruction of the composite facial tumour in patient with Fanconi's anaemia. *J Plast Reconstr Aesthet Surg.* 2009;62:e471–e473.

The Superficial Nasalis Aponeurotic System (SNAS) Flap for Nasal Tip Reconstruction

Sir:

Nasal tip reconstruction continues to pose great challenges to the reconstructive surgeon. A matching substitute for the thick, sebaceous skin of the nasal tip is not easy to find. Recent publications on a variety of flaps for nasal tip reconstruction reflect and emphasize this problem.[1–3]

In this article, we present a novel axial flap from the nasal dorsum, pedicled on the superior alar branches of the nasal artery vessels contained in the superficial nasalis aponeurotic system (SNAS). These branches accompany the transverse nasalis muscle, perforate it, and run in the superficial nasalis aponeurotic system horizontally from the lateral side of the nose toward the nasal dorsum.[4] The transverse nasalis muscle runs into an aponeurotic system (superficial nasalis aponeurotic system), joining the opposite side and the other mimic muscles of the nose in the median of the nasal dorsum.[5]

An appropriate superficial nasalis aponeurotic system flap is designed after the tumor resection, all under local anesthesia. For this purpose, the skin of the dorsum nasi is incised in the form of a triangle tapering toward the nasal root (Fig. 1, *above, left*). On one side, a bilevel undermining of the lateral side of the nose is

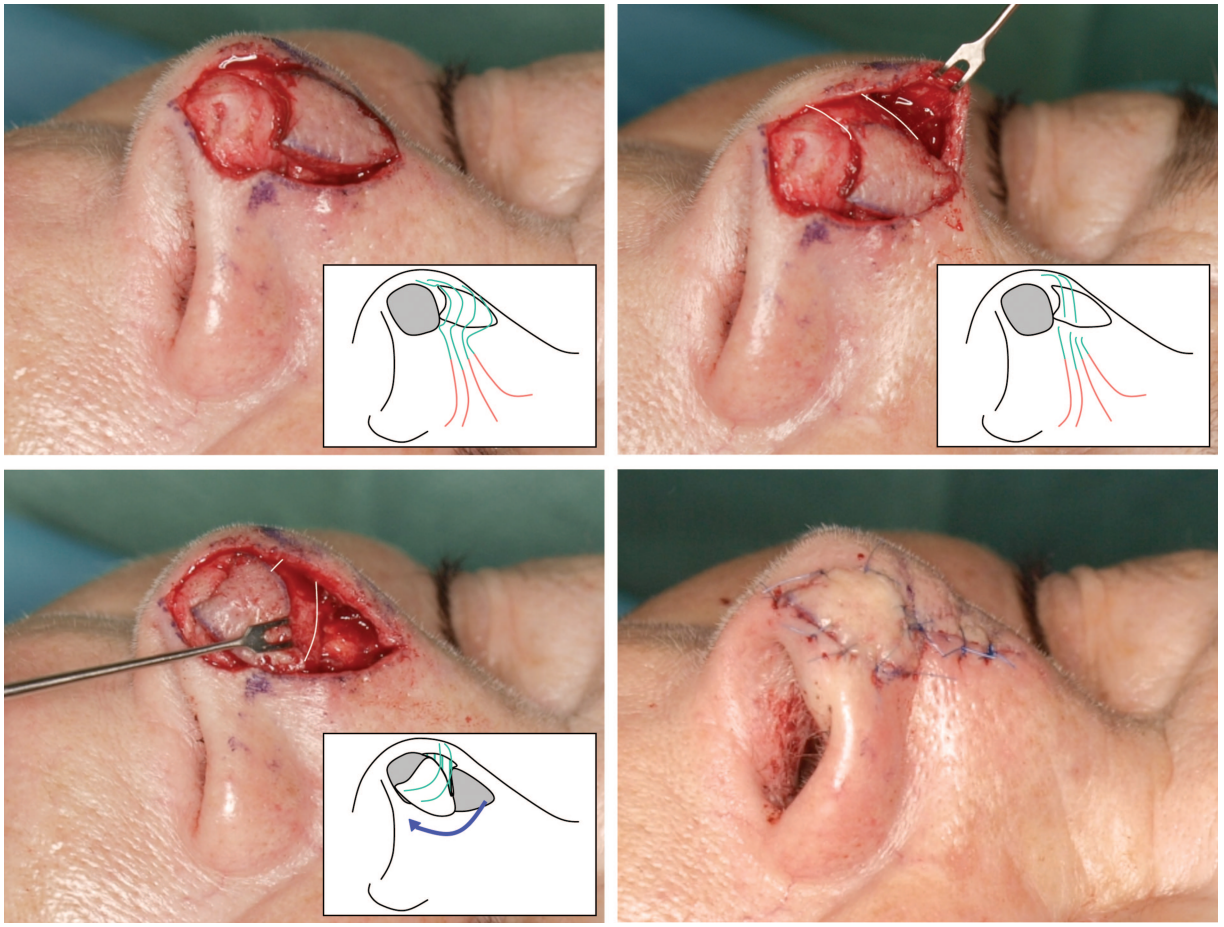

Fig. 1. Operative procedure of nasal tip reconstruction with the superficial nasalis aponeurotic system flap. Intraoperative photographs and corresponding schematic illustrations, with the transverse nasalis muscle shown in *red* and the superficial nasalis aponeurotic system in *green*. Note the highlighted superficial nasalis aponeurotic system pedicle (*above*, *right* and *below*, *left*).

performed, resulting in a pedicle of nasalis muscle and superficial nasalis aponeurotic system. The pedicle is incised horizontally to gain flap mobility (Fig. 1, *above*, *right*). Contralaterally, the lateral side is mobilized beneath the superficial nasalis aponeurotic system to ensure tension-free donor-site closure. The resulting fasciocutaneous superficial nasalis aponeurotic system flap is rotated 90 degrees (Fig. 1, *below*, *left*) and sutured in place in the nasal tip defect with subcutaneous and cutaneous single-knot stitches (Fig. 1, *below*, *right*).

In 10 consecutive cases, 9- to 22-mm nasal tip defects arising from excision of basal cell carcinoma were covered with superficial nasalis aponeurotic system flaps. In all cases, a R0 resection was achieved. All patients could be discharged with a vital flap. In nine cases, the postoperative course was completely uneventful and excellent nasal tip reconstruction could be achieved (Fig. 2). In only one patient was a partial flap loss observed after a fall on the nose resulting from vasovagal syncope shortly after hospital discharge. Nonetheless, the wound healed without any further intervention, resulting in a satisfactory outcome.

The flap presented here features a number of advantages. It is a pedicled flap with an axial blood supply in a thin, subcutaneous layer, the superficial nasalis aponeurotic system. Therefore, sufficient mobility of the flap can be achieved and the problem of dog-ear formation, often seen in skin-pedicled local flaps, is avoided. Because the flap was rotated, there were no distortions of the nasal tip and no asymmetries noted in the follow-up controls. The preparation is simple and completed as a single-stage procedure. The nasal dorsum with its thick, sebaceous skin is an ideal donor site for nasal tip substitution. Furthermore, it can be designed large enough to cover the whole nasal tip. Finally, the donor-site scar is short and inconspicuous and therefore preferable especially to bilobed flaps from the nasal dorsum. The superficial nasalis aponeurotic system (SNAS) flap is a safe method for nasal tip reconstruction, with an excellent aesthetic outcome, inconspicuous donor site, and no contour deformities of the nose.

DOI: 10.1097/PRS.0b013e3182174478

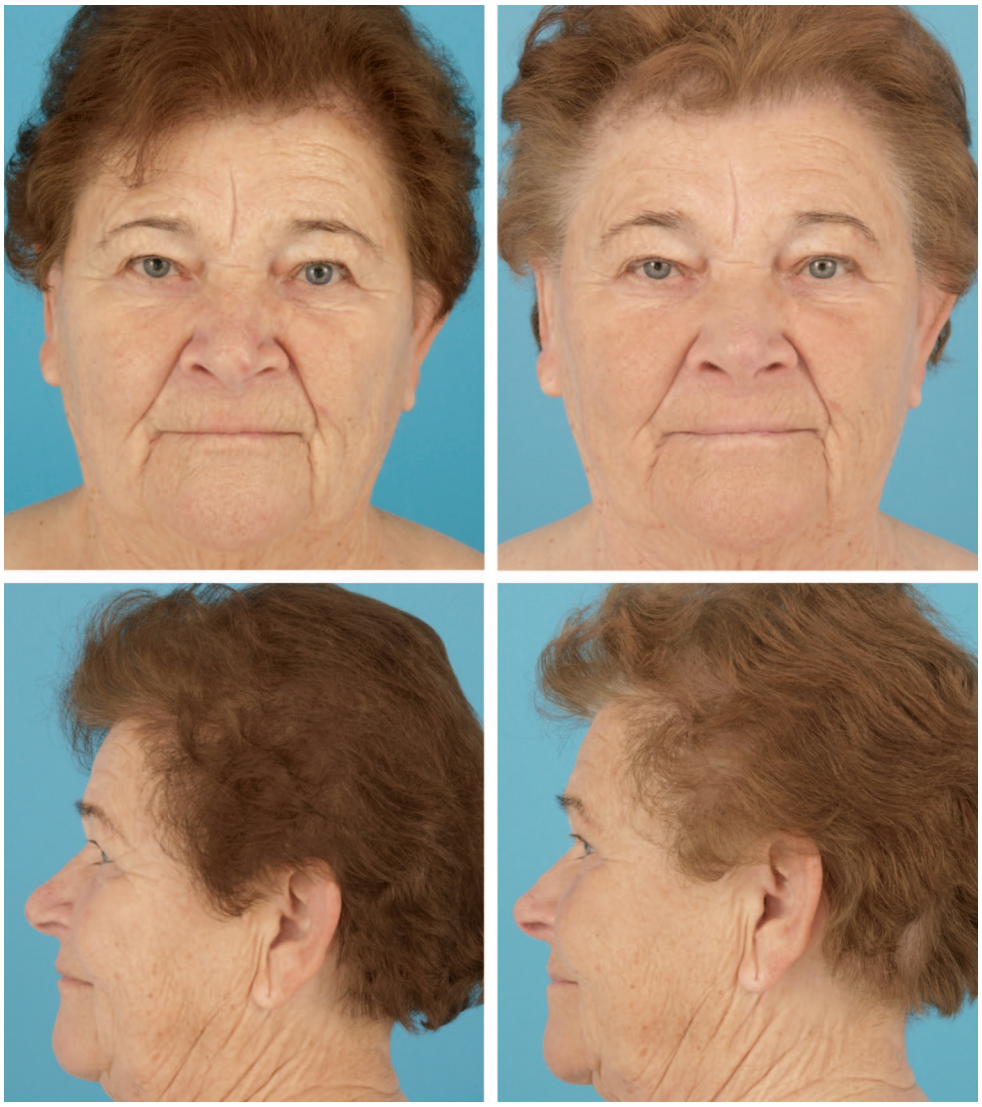

Fig. 2. Preoperative (*left*) and 3-month postoperative (*right*) views of a 76-year-old patient with a basal cell carcinoma on the left part of the nasal tip, and after nasal tip reconstruction with a superficial nasalis aponeurotic system flap.

Stefan Riml, M.D.
Heinz Wallner, M.D.
Lorenz Larcher, M.D.
Peter Kompatscher, M.D.
Department for Plastic, Aesthetic, and Reconstructive Surgery
University Academic Hospital Feldkirch
Feldkirch, Austria

Correspondence to Dr. Riml
Department for Plastic, Aesthetic, and Reconstructive Surgery
University Academic Hospital Feldkirch
Feldkirch, Austria
stefan.riml@lkhf.at

ACKNOWLEDGMENTS

The authors thank R. Csordas for editing the article and A. Piontke for excellent photodocumentation.

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this atricle.

PATIENT CONSENT

The patient provided written consent for the use of her images.

REFERENCES

1. O'Hara D, Greenberg S, LaRossa D. Superficial nasalis aponeurotic system (SNAS) flap reconstruction of nasal defects. *Ann Plast Surg.* 1997;38:379–384.
2. Thornton JF, Weathers WM. Nasolabial flap for nasal tip reconstruction. *Plast Reconstr Surg.* 2008;122:775–781.
3. Papadopoulos DJ, Trinei FA. Superiorly based nasalis myocutaneous island pedicle flap with bilevel undermining for nasal tip and supratip reconstruction. *Dermatol Surg.* 1999;25:530–536.

4. Nakajima H, Imanishi N, Aiso S. Facial artery in the upper lip and nose: Anatomy and a clinical application. *Plast Reconstr Surg.* 2002;109:855–861; discussion 862–863.
5. Letourneau A, Daniel RK. The superficial musculoaponeurotic system of the nose. *Plast Reconstr Surg.* 1988;82:48–55.

A Biocompatible Silicone Framework for External Ear Reconstruction Using a Phosphorylcholine Coating

Sir:

The application of a novel biocompatible framework for ear reconstruction is described in a patient who was not enthusiastic about autologous reconstruction using costal cartilage or the use of a temporal parietal flap required when using a Medpor prosthesis.

Preformed Silastic frameworks in ear reconstruction were first used by Cronin and Ascough in the 1970s,[1] but they were prone to problems, most notably that of extrusion. The nonvascular nature of synthetic materials impedes healing and induces deposition of scar tissue around the implant, which may distort the framework shape.

The silicone ear prosthesis was coated in a synthetic polymer (Fig. 1) incorporating phosphorylcholine (Vertellus Specialties Ltd., Middlesbrough, United Kingdom), which has a chemical nature similar to that of cell membrane lipids, and has been used to coat a number of implanted medical devices. Studies show that phosphorylcholine polymers significantly reduce protein deposition, cellular adhesion, and biofilm formation, and greatly reduce capsule thickness around implants.[2,3] This case is the first documented application of a phosphorylcholine-coated silicone framework prosthesis in humans.

Under local anesthesia, a subcutaneous pocket was dissected to accommodate the framework. The patient was pleased with the result, but the projection was not enough to quite balance the left side. After 4 years, the implant was exchanged with a slightly larger one. The first framework was easy to remove and was not distorted or covered with a scar capsule, as is normally encountered around silicone prostheses. Analysis of the explant with rhodamine dye showed that the phosphorylcholine coating was still evident on the framework.

This second framework has now been implanted for 1 year, has maintained good shape, and remains covered in soft healthy skin (Fig. 2). The patient routinely sleeps on his reconstructed ear, and it withstands the knocks of everyday life well.

The prosthesis underlies native temporomastoid skin such that there is no color mismatch with surrounding tissues. The flexible nature of the ear also feels more natural than that of a rigid costal cartilage construct. Its shape can be precisely determined preoperatively with the patient's input. A mold can be taken from the contralateral ear, if available, to help design the prosthetic framework, and removes the uncertainties of a single intraoperative attempt of carving costal cartilage. The phosphorylcholine coat should reduce encapsulation and thus the risk of distortion to the ear, but also allows for ease in exchanging the implant if the shape or size is unsatisfactory.

In summary, our 5-year experience of this relatively simple method of ear reconstruction is very encouraging and is worthy of consideration for a larger, longer term trial. It avoids the more invasive approach of other forms of ear reconstruction and appears suitable for those unwilling or unable to undergo more complex surgery under general anesthesia. In this case, progressively larger prostheses were inserted as a means of tissue expansion, such that the patient was never without an ear. The use of a phosphorylcholine coat to reduce biofilm formation and scar tissue encapsulation has promising applications in other silicone-based products in reconstructive surgery.

DOI: 10.1097/PRS.0b013e318217444c

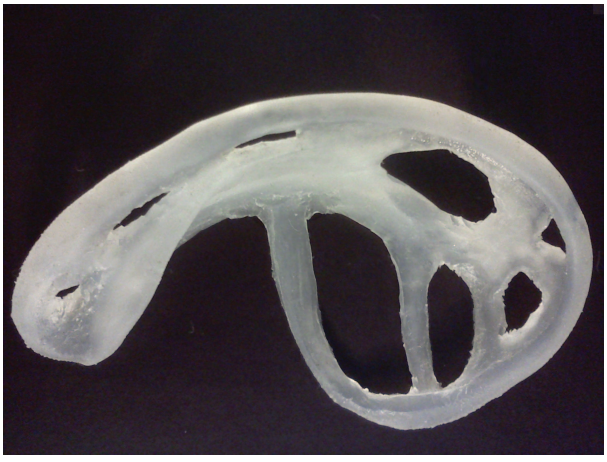

Fig. 1. Phosphorylcholine-coated silicone ear prosthesis.

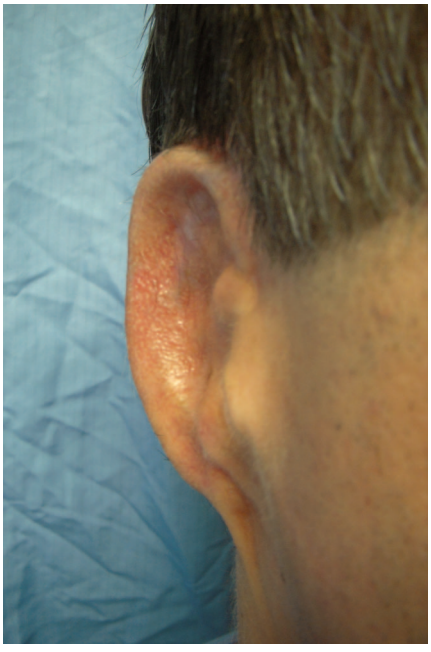

Fig. 2. Oblique view of the ear 1 year after insertion of a second prosthesis.

Colin Link, M.B.B.S.

Anthony Barabas, M.R.C.S.(Eng.)
St. Georges Hospital
London

Brent Tanner, F.R.C.S.
East Grinstead Hospital
East Grinstead, United Kingdom

Correspondence to Dr. Barabas
Department of Plastic Surgery
St Georges Hospital, London
Blackshaw Road
Tooting
London SW17 9QT, United Kingdom
tonybarabas@gmail.com

REFERENCES

1. Cronin TD, Ascough BM. Silastic ear construction. *Clin Plast Surg.* 1978;5:367–378.
2. Berry JA, Biedlingmaier JF, Whelan PJ. In vitro resistance to bacterial biofilm formation on coated fluoroplastic tympanostomy tubes. *Otolaryngol Head Neck Surg.* 2000;123:246–251.
3. Goreish HH, Lewis AL, Rose S, Lloyd AW. The effect of phosphorylcholine-coated materials on the inflammatory response and fibrous capsule formation: In vitro and in vivo observations. *J Biomed Mater Res A* 2004;68:1–9.

Preoperative Modeling of Costal Cartilage for the Auricular Reconstruction of Microtia

Sir:

There are various obstacles to be overcome in total auricular reconstruction, such as the decision regarding ear position, creation of the skin envelope, handling of remnants, fabrication of a three-dimensional framework, perspective view for multistage operations, and others. The construction of a maximum relief framework is the most difficult of these problems. Preoperative rehearsal performed with an accurate costal cartilage model would therefore be advantageous for surgeons. In this study, we established a system for three-dimensional modeling of costal cartilage from preoperative computed tomographic data with reverse-engineering techniques.[1]

Costal cartilage modeling was performed for two cases. Using 64-slice multidetector-row computed tomographic scanning, axial slices at 1.0-mm intervals were used for modeling. Segmentation and volume rendering was performed with MIMICS 13.1 (Materialise Interactive Medical Image Control System; Materialise, Leuven, Belgium). Because the computed tomographic value of costal cartilage is close to that of the surrounding tissues, automatic segmentation such as skin and bone[2,3] is not possible. Therefore, in axial slices, segmentation was performed manually. These data were converted to stereolithographic data.

Which costal cartilage should be output was decided based on the three-dimensional data. In case 1, fifth, sixth, seventh, and eighth cartilages on the right side were output; and in case 2, sixth, seventh, eighth, and ninth cartilages on the right side were output with Kezlex (Ono & Co., Ltd., Tokyo, Japan).[4] Right sixth, seventh, and eighth cartilage was harvested in both cases. The patients in case 1 and 2 were 9 and 14 years of age, respectively. The models were made from acrylic polyurethane, which allowed handling like real costal cartilage. Preoperative framework construction was performed with these models (Fig. 1).

The precision of modeling is the most important point for our purpose. Therefore, verification of accuracy was performed during surgery. The length, thick-

Fig. 1. Preoperative framework construction was performed with sixth, seventh, and eighth cartilages in patient 1.

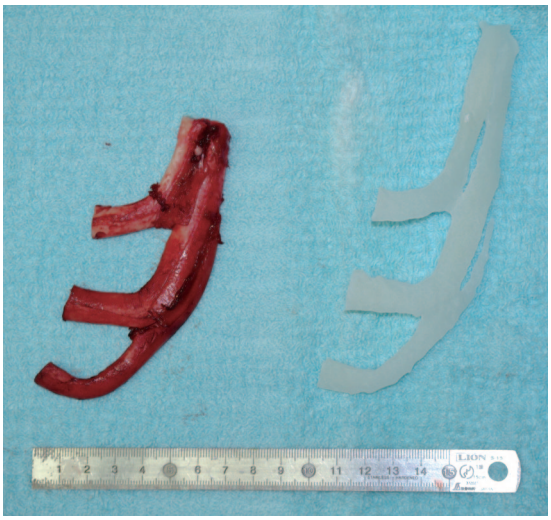

Fig. 2. Verification of the model in patient 1 was performed during surgery.

ness, and shape of the established models were perfectly consistent with the actual cartilage (Fig. 2).

Our model can be bent, cut, and sculpted like real costal cartilage. Therefore, simulation of framework fabrication, which is close to the real situation, is possible. The accuracy of modeling is the most important point in this type of simulation. In particular, for preoperative planning, the shape of the connection between cartilage and the length of the eighth or ninth costal cartilage are very important.[5] Therefore, during the operation, we compared our model with harvested costal cartilage, and confirmed that our models were very precise.

In addition to preoperative framework construction, this model would be useful for various purposes, depending on the surgeon's level of expertise. To minimize the amount of sacrificed cartilage, this model can be used to determine where cartilage can be preserved preoperatively. New types of framework can also be tested before actual application to patients. This model will also be useful for educational purposes and to allow residents to practice the procedures. In addition to microtia, the techniques used for digital modeling of costal cartilage can also be applied to other simulations, such as that of the pectus excavatum.

DOI: 10.1097/PRS.0b013e31821744eb

Junpei Miyamoto, M.D., Ph.D.
Department of Plastic and Reconstructive Surgery
School of Medicine
Keio University
Tokyo, Japan

Shimpei Miyamoto, M.D., Ph.D.
Division of Plastic and Reconstructive Surgery
National Cancer Center Hospital East
Chiba, Japan

Tomohisa Nagasao, M.D., Ph.D.
Department of Plastic and Reconstructive Surgery
School of Medicine
Keio University
Tokyo, Japan

Shogo Kasai, M.D.
Department of Plastic and Reconstructive Surgery
Sano Kousei General Hospital
Tochigi, Japan

Kazuo Kishi, M.D., Ph.D.
Department of Plastic and Reconstructive Surgery
School of Medicine
Keio University
Tokyo, Japan

Correspondence to Dr. Junpei Miyamoto
Department of Plastic and Reconstructive Surgery
Keio University School of Medicine
Shinanomachi 35
Shinjuku-ku, Tokyo 160-8582, Japan
j-miya@rr.iij4u.or.jp

ACKNOWLEDGMENTS

This work was supported in part by a Grant-in-Aid for Young Scientists provided by the Japanese government (Category B: 21791751) and Keio University Grant-in-Aid for Encouragement of Young Medical Scientists.

DISCLOSURE

The authors have no financial interest in any of the products or devices mentioned in this article.

REFERENCES

1. Miyamoto J, Nagasao T, Miyamoto S, Kasai S, Kishi K. Preoperative assessment of soft tissue deficiency in the temporal region with reverse engineering. *J Plast Reconstr Aesthet Surg.* (in press).
2. Miyamoto J, Nagasao T, Miyamoto S, Nakajima K. Biomechanical analysis of stresses occurring in vertical and transverse scars on the lower leg. *Plast Reconstr Surg.* 2009;124:1974–1979.
3. Miyamoto J, Nagasao T, Miyamoto S. Biomechanical analysis of surgical correction of syndactyly. *Plast Reconstr Surg.* 2010;125:963–968.
4. Mori K, Yamamoto T, Oyama K, Nakao Y. Modification of three-dimensional prototype temporal bone model for training in skull-base surgery. *Neurosurg Rev.* 2009;32:233–238; discussion 238–239.
5. Weerda H. Abnormalities: Classification and surgery of auricular dysplasias. In: *Surgery of the Auricle: Tumors, Trauma, Defects, Abnormalities.* 1st ed. Stuttgart: Thieme; 2007:204.

Use of Botulinum Toxin (Botox) in the Management of Masseter Muscle Hypertrophy: A Simplified Technique

Sir:

The purpose of this study was to investigate the changes in the masseter muscle after injection of botulinum toxin type A (Botox; Allergan, Inc., Irvine, Calif.) clinically, and to formulate a simple technique for administration of the drug to achieve optimal

results. A total of five patients with unilateral or bilateral masseter muscle hypertrophy were treated at the Department of Oral and Maxillofacial Surgery at Nair Hospital Dental College, Mumbai, India. The outcome was noted clinically (standardized photography) and ultrasonographically. Excellent results were obtained, with satisfactory regression of the hypertrophied muscle with intramuscular injection of botulinum toxin. Recurrence was noted in one case for which reinjection was given. No side effects were noted. Given below is a simplified technique that has shown promising results.

The drug used for injection was Botox, which is available as a freeze-dried powder ready for reconstitution with sterile 0.9% normal saline. Each vial contains 100 units of toxin. The toxin was reconstituted with 2.0 ml of saline to obtain a concentration of 50 U/ml. With the use of a tuberculin syringe (1-ml syringe with a 27-gauge, 0.5-inch needle), 40 units of botulinum toxin was injected at three different sites of the affected muscle in divided doses. The first injection was given into the site of maximal swelling seen on clenching. The other two points form a triangle, with the apex at point A. The other two points, B and C, signify the areas of hypertrophy but are less prominent as compared with point A (Fig. 1). It is very important to deposit the toxin within the muscle; superficial injections are to be avoided. This is done very easily by going bone deep and retrieving the needle, aspirating, and then injecting. After injections, the patients are advised to massage the muscles regularly for the subsequent 48 hours so that the toxin can spread evenly throughout the muscle mass.

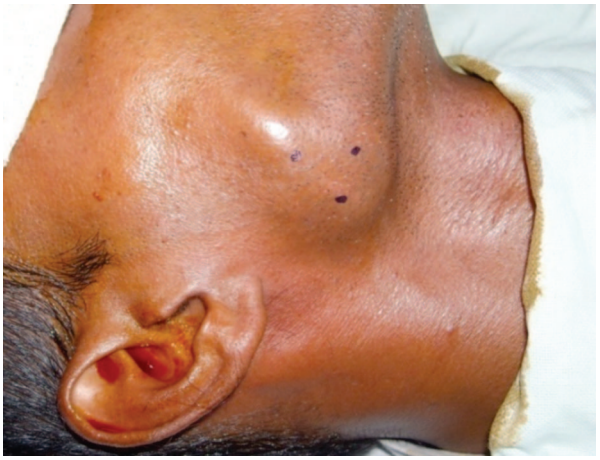

Fig. 1. The site of injection with botulinum toxin in masseter muscle hypertrophy.

Excellent results were seen after the follow-up period of 6 months, which were noted clinically (Fig. 2) and ultrasonographically (Table 1).

Unfortunately, Botox has a very short shelf life. Once the toxin is reconstituted, it has to be used within 4 hours.[1] Regardless of the above-mentioned issue, it is always advisable to use the toxin freshly prepared. The toxin, without reconstitution, can be stored at a temperature of 4°C for a period of 1 year. Contraindications for use of botulinum toxin are hypersensitivity to the drug, localized infection or inflammation, diseases of the neuromuscular system, and coagulopathy.[2]

Thus, it can be safely concluded that botulinum toxin has a definite role in the management of masseter muscle hypertrophy that can be performed on an out-

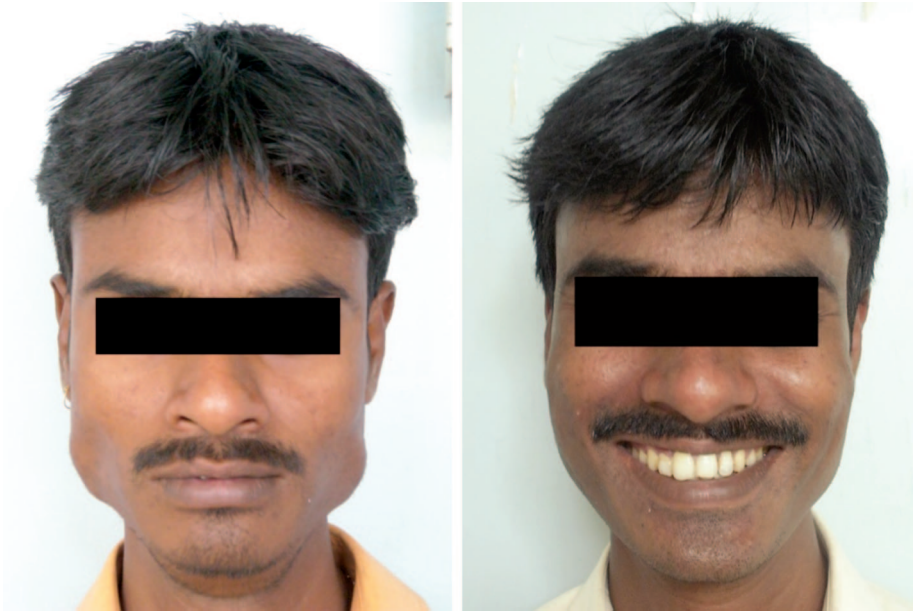

Fig. 2. Pretreatment (*left*) and posttreatment (*right*) photographs of the patient. Note the excellent results at the end of 6 months.

Table 1. Thickness of the Masseter Muscle (mm): Results Obtained on Ultrasound Study at the End of the Follow-Up Period

	Preoperatively		1 Wk Postoperatively		4 Wk Postoperatively		3 Mo Postoperatively		6 Mo Postoperatively	
Patient	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
1	18.6	17.7	18.5	17.6	16.6	16.8	14.5	14.3	13.3	12.9
2	13.2	19.2	13.2	19.2	13.2	17.4	13.2	15.8	13.2	12.4
3	13.5	17.3	13.5	17.4	13.5	15.7	13.5	14.7	13.5	12.9
4	18.2	18.4	17.5	15.1	15.4	14.5	12.3	11.5	11.3	11.4
5	17.4	18.4	16.3	16.6	15.2	14.9	14.7	14.5	12.8	12.5

patient basis, thus avoiding the morbidity associated with surgical correction of this deformity.

DOI: 10.1097/PRS.0b013e3182174463

Neelam Noel Andrade, M.D.S.

Gaurav Shekhar Deshpande, M.D.S.

Nair Hospital Dental College
Mumbai, India

Correspondence to Dr. Deshpande
Nair Hospital Dental College
Dr. A. L. Nair Road, Mumbai Central
Mumbai, Maharashtra 400008, India
drgaurav82@gmail.com

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

The patient provided written consent for the use of his images.

REFERENCES

1. Allergan, Inc. Press release. Irvine, Calif: Allergan.
2. Castro WH, Gomez RS, Da Silva Oliveira J, Moura MD, Gomez RS. Botulinum toxin type A in the management of masseter muscle hypertrophy. *J Oral Maxillofac Surg.* 2005;63:20–24.

Comparing Clinical Efficacy of Botox and Dysport in a Small Group of Patients

Sir:

Botulinum toxin type A (Botox; Allergan, Inc., Irvine, Calif.) injection is the most commonly performed aesthetic procedure in the United States, with over 5 million anatomical sites injected in 2008 alone.[1] The word Botox has become one of the most recognized brands in the world. As of April of 2009, a rival to Botox Cosmetic has been available in the United States: Dysport (Medicis Aesthetics, Scottsdale, Ariz.), the second formulation of botulinum toxin type A to gain U.S. Food and Drug Administration approval.

Although Botox and Dysport are formulations of the same protein, they differ in many aspects (Table 1).[2,3] It is worth noting that dosing of the two brands is not similar. For cosmetic uses in the upper face, studies have established a ratio of 2.5:1 of Dysport to Botox with comparable results.[4,5] Several studies have compared the pharmacologic properties of the two drugs,[6,7] in addition to their efficacy in treating various medical conditions.[8–11] However, no study has compared the two drugs simultaneously in the same patient until now.

The study followed the Declaration of Helsinki guidelines for research involving human individuals. The nature of the study was explained and all patients gave written consent to participate. We treated glabellar lines and wrinkles of five female patients (aged 39 to 47 years, with Fitzpatrick skin type I) by administering Botox on the right side of the face and Dysport on the left. Standardized injection sites were used as outlined in the American Society of Plastic Surgeons "Consensus Recommendations on the Use of Botulinum Toxin Type A in Facial Aesthetics."[12] Dilution of product was performed by standard protocol using preservative-free 0.9% sodium chloride (Hospiram Inc., Lake Forest, Ill.) to achieve a reconstitution with the previously discussed 1:2.5 ratio. An equal volume of 0.05 ml was injected at each site; Botox sites received 2 units each and Dysport sites received 5 units each. Six injection sites were used across the brow region on each side, with the right side delineated for Botox and the left side for Dysport (Fig. 1). Patients were photographed before injection and then at postinjection weeks 2, 4, 8, and 12 in three different poses: at rest, with raised eyebrows, and with brows furrowed together in a medial/inward direction.

All five patients had similar times of onset, intensity of action, and duration of action on both sides, as assessed by the patient, their spouse, and the senior author. All patients lost some of the potency of the effect of the neurotoxin by approximately 12 weeks after injection. However, even this far out, forehead motion was still affected and had not yet returned to baseline. None of the study patients had any adverse reactions, with two stating that their occasional migraine headaches seemed to be less severe.

This illustrates that the differences in the two main players in the cosmetic-wrinkle relaxing agents of botulinum toxin are minimal and undetectable even to patients. Although this is a small cohort of patients, the unanimity of the results leads us to believe that our conclusions are correct. Although different drugs

Table 1. Data for Botox and Dysport from Their Respective Package Inserts

	Botox*	Dysport†
Manufacturer	Allergan, Inc., Irvine, Calif.	Medicis Aesthetics, Scottsdale, Ariz.
Form	Vacuum-dried	Lyophilized
Vial contents	100 units type A toxin, 0.5 mg albumin, 0.9 mg NaCl	300 units type A toxin, 125 μg albumin, 2.5 mg lactose
Cost	$525	$475
Complex size	900 kDa	500–900 kDa
Neurotoxin protein/100 units	5 ng	2.5 ng
Storage	Refrigerated, 36 mo	Refrigerated, 24 mo
Reconstitution	2.5 ml of 0.9% NaCl (preservative-free)	1.5 or 2.5 ml of 0.9% NaCl (preservative-free)
Viability after reconstitution	Refrigerated, 24 hr	Refrigerated, 4 hr

NaCl, sodium chloride.
*Botox Cosmetic (onabotulinum toxin A) (package insert). Irvine, Calif: Allergan; 2010.
†Dysport (abobotulinum toxin A) (package insert). Scottsdale, Ariz: Medicis Aesthetics; 2009.

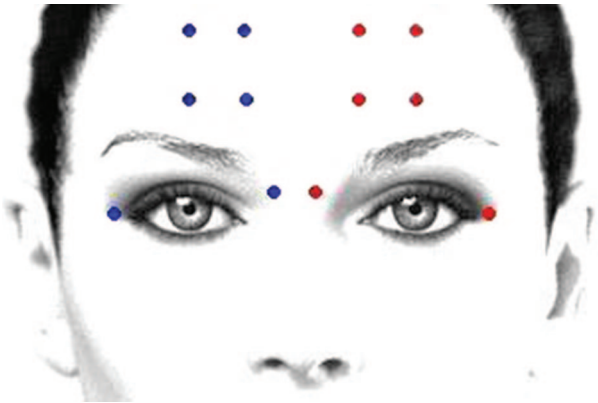

Fig. 1. The right side received Botox (*blue dots*) and the left side received Dysport (*red dots*). An equal volume of 0.05 ml was administered to six corresponding areas on opposite sides of the face. Botox sites consisted of 2 units each; Dysport sites consisted of 5 units each.

may cause variations in action among a large group of patients, a given individual will not be able to tell the difference between these two cosmetic neurotoxins. Thus, practitioners should decide which form of botulinum toxin type A to use based on their personal experience, patient preference, and cost.

DOI: 10.1097/PRS.0b013e31821744c1

Carl H. Manstein, M.D., M.B.A.

Omar E. Beidas, M.D.
Division of Plastic Surgery
Holy Redeemer Medical Center
Meadowbrook, Pa.

Correspondence to Dr. Manstein
Division of Plastic Surgery
Holy Redeemer Medical Center
1602 Huntingdon Pike
Meadowbrook, Pa. 19046
cmanstein@comcast.net

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCES

1. American Society of Plastic Surgeons. *2000-2009 U.S. Plastic Surgery Statistics Cosmetic Reconstructive Procedure Trends.* Arlington Heights, Ill: Department of Public Relations, American Society of Plastic Surgeons; 2010:1–22.
2. Allergan. Botox Cosmetic (onabotulinum toxin A) (package insert). Irvine, Calif: Allergan; 2010.
3. Medicis Aesthetics. Dysport (abobotulinum toxin A) (package insert). Scottsdale, Ariz: Medicis Aesthetics; 2009.
4. Ascher B, Zakine B, Kestemont P, Baspeyras M, Bougara A, Santini J. A multicenter, randomized, double-blind, placebo-controlled study of efficacy and safety of 3 doses of botulinum toxin A in the treatment of glabellar lines. *J Am Acad Dermatol.* 2004;51:223–233.
5. Monheit G, Carruthers A, Brandt F, Rand R. A randomized, double-blind, placebo-controlled study of botulinum toxin type A for the treatment of glabellar lines: Determination of optimal dose. *Dermatol Surg.* 2007;33:S51–S59.
6. Dressler D, Benecke R. Pharmacology of therapeutic botulinum toxin preparations. *Disabil Rehabil.* 2007;29:1761–1768.
7. Rosales RL, Bigalke H, Dressler D. Pharmacology of botulinum toxin: Differences between type A preparations. *Eur J Neurol.* 2006;13:2–10.
8. Chapman MA, Barron R, Tanis DC, Gill CE, Charles PD. Comparison of botulinum neurotoxin preparations for the treatment of cervical dystonia. *Clin Ther.* 2007;29:1325–1337.
9. Simonetta Moreau M, Cauhepe C, Magues JP, Senard JM. A double-blind, randomized, comparative study of Dysport vs. Botox in primary palmar hyperhidrosis. *Br J Dermatol.* 2003;149:1041–1045.
10. Nussgens Z, Roggenkämper P. Comparison of two botulinum toxin preparations in the treatment of essential blepharospasm. *Graefes Arch Clin Exp Ophthalmol.* 1997;235:197–199.
11. Sampaio C, Ferreira JJ, Simdes F, et al. DYSBOT: A single-blind, randomized parallel study to determine whether any differences can be detected in the efficacy and tolerability of two formulations of botulinum toxin type A—Dysport and Botox—assuming a ratio of 4:1. *Mov Disord.* 1997;12:1013–1018.
12. Carruthers J, Fagien S, Matarasso SL; Botox Consensus Group. Consensus recommendations on the use of botulinum toxin type A in facial aesthetics. *Plast Reconstr Surg.* 2004;114(6 Suppl):1S–22S.

Spectrum of Imaging Findings in the Silicone-Injected Breast

Sir:

Silicone injection for breast augmentation was commonly performed in the 1960s. This procedure was subsequently abandoned and replaced by silicone breast prostheses. Non–medical grade silicone breast injection for augmentation is still being performed in the United States, Asia, and South America. Familiarity with the associated imaging findings is important for mammographic interpretation and surgical management.

The presence of injected silicone may first be discovered on mammography. High-density silicone granulomas are the hallmark of silicone-injected breasts (Fig. 1).

Technically, mammography may be difficult to perform in patients who have undergone silicone injection for augmentation. Compression of the breasts is limited because the silicone-injected breast increases in thickness. Penetration of the silicone-injected breast requires increased radiation exposure.

Several mammographic patterns can be seen on mammography, including macronodular, micronodular, and mixed patterns.[1] Silicone granulomas with calcified rims may develop. Another mammographic appearance is a single conglomerate dense mass. Occasionally, an implant will be placed in the silicone-injected breast that further obscures breast tissue. Differentiation of injected silicone from extracapsular rupture of a silicone implant may be challenging. Extracapsular silicone from breast implant rupture usually presents mammographically as larger, rounder globules of silicone that are less numerous compared with injected silicone.

A variety of postsurgical changes related to treatment by subcutaneous mastectomy or reduction mammaplasty may be evident on mammography. After subcutaneous mastectomy, residual silicone may still be evident (Fig. 2). In all cases, a significant amount of breast tissue is obscured by the silicone, and it is virtually impossible to detect malignancy on mammography.

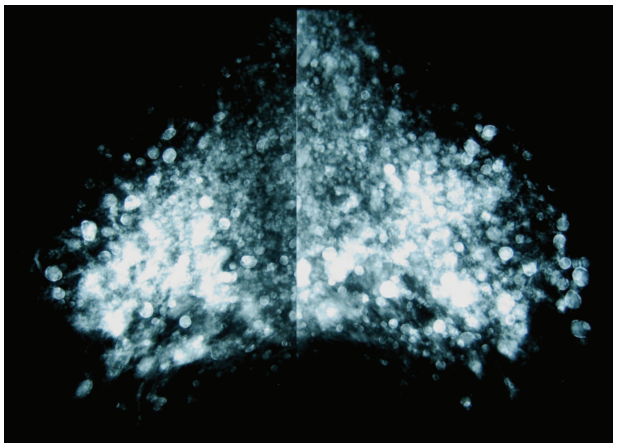

Fig. 1. Bilateral craniocaudal views of a 57-year-old woman following free silicone injection demonstrate multiple silicone granulomas in a mixed pattern.

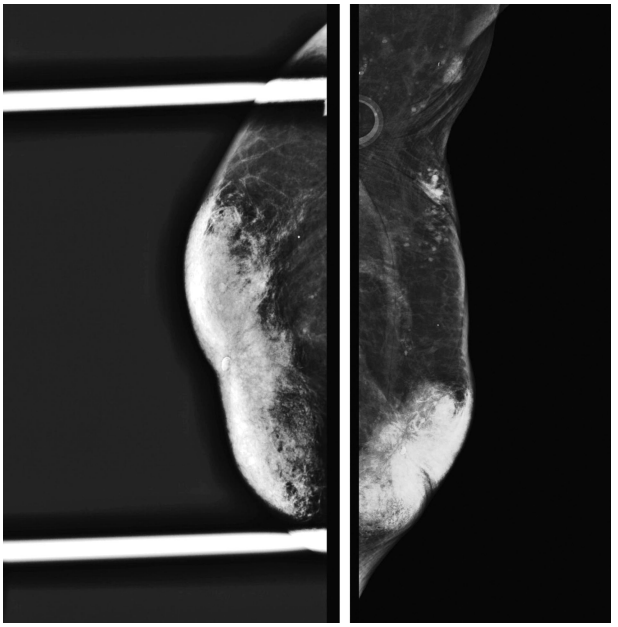

Fig. 2. Craniocaudal (*left*) and mediolateral oblique (*right*) views of a 71-year-old woman following right subcutaneous mastectomy for treatment of pain related to silicone granulomas demonstrate high-density material within the anterior portion of the breast and thickening and retraction of the skin related to subcutaneous mastectomy.

Mammography detects silicone lymphadenitis as enlarged, very dense nodes indistinguishable from lymph node involvement with breast cancer metastasis or other metastatic tumors. Silicone migration into the abdomen may be apparent on mammography.

The sonographic appearance of free silicone in the breast was described by Harris et al. as a "snowstorm" appearance that obscures the posterior breast tissue.[2] Chest computed tomography images the breasts and may identify injected breast silicone (Fig. 3). Multiple, round, dense nodules are evident in the silicone-injected breast on computed tomographic scanning.

Magnetic resonance imaging findings include multiple masses of low signal intensity on T1-weighted images.[3] Because of the differential magnetic resonance imaging properties of injected silicone and breast cancer, magnetic resonance imaging may also incidentally detect breast cancer obscured on mammography by dense overlying silicone (Fig. 4).[4]

Management of the silicone-injected breasts is not standardized. Treatment regimens include bilateral subcutaneous mastectomy with placement of subpectoral implants, unilateral subcutaneous mastectomy, or simple mastectomy.[5] Overlap of symptoms and clinical findings may make diagnosis of breast cancer extraordinarily difficult in the silicone-injected breast.

Medical grade injected silicone for breast augmentation was abandoned in the United States many years ago. Patients continue to undergo non–medical grade

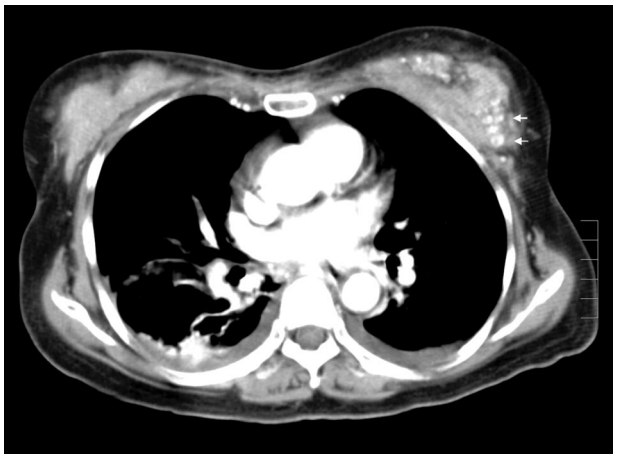

Fig. 3. Computed tomographic scan of a 63-year-old woman following silicone injection demonstrates multiple calcified nodules in the left breast (*small white arrows; above, right*).

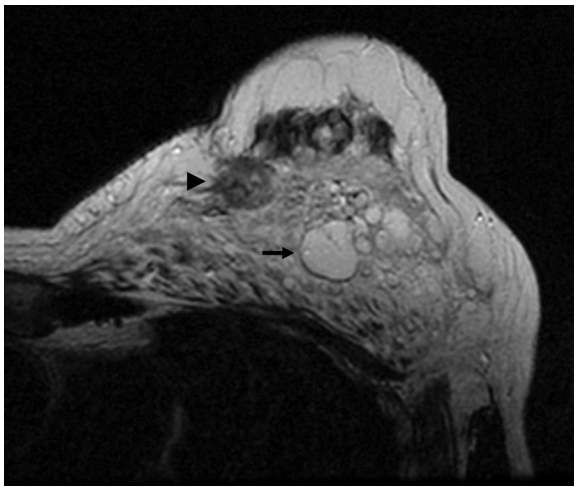

Fig. 4. T2-weighted magnetic resonance imaging scan of a 64-year-old woman following silicone injection demonstrates high-intensity, well-circumscribed white nodules in the posterior breast (*arrow*) representing injected silicone. There is also an ill-defined darker mass in the anterior breast (*arrowhead*) suggestive of breast cancer.

silicone injection for breast augmentation and may present to plastic surgeons for treatment. Evaluation using various imaging modalities enhances surgical evaluation and management of the silicone-injected breast. Magnetic resonance imaging may be most helpful in excluding underlying breast cancer.

DOI: 10.1097/PRS.0b013e31821744d5

A. Jill Leibman, M.D.

Monika Misra, M.D.

Department of Radiology
Jacobi Medical Center, and
Albert Einstein College of Medicine
Bronx, N.Y.

Correspondence to Dr. Leibman
Department of Radiology
Jacobi Medical Center
1400 Pelham Parkway South
Bronx, N.Y. 10461
ajleibman@pol.net

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCES

1. Scaranelo AM, de Fátima Ribeiro Maia M. Sonographic and mammographic findings of breast liquid silicone injection. *J Clin Ultrasound* 2006;34:273–277.
2. Harris KM, Ganott MA, Shestak KC, Losken HW, Tobon H. Silicone implant rupture: Detection with US. *Radiology* 1993; 187:761–768.
3. Caskey CI, Berg WA, Hamper UM, Sheth S, Chang BW, Anderson ND. Imaging spectrum of extracapsular silicone: Correlation with US, MR imaging, mammographic, and histopathologic findings. *Radiographics* 1999;19: S39–S51.
4. Cheung YC, Su MY, Ng SH, Lee KF, Chen SC, Lo YF. Lumpy silicone-injected breasts: Enhanced MRI and microscopic correlation. *Clin Imaging* 2002;26:397–404.
5. Parsons RW, Thering HR. Management of the silicone-injected breast. *Plast Reconstr Surg.* 1977;60:534–538.

The SGAP Flap in Breast Reconstruction: Backup or First Choice?

Sir:

Deep inferior epigastric artery perforator (DIEP)/transverse rectus abdominis musculocutaneous flaps are typically first-choice procedures for autologous breast reconstruction. The superior gluteal artery perforator (SGAP) flap[1] carries substantial fat even in slim women, yet is generally only selected when DIEP/transverse rectus abdominis musculocutaneous flaps are impractical.

Few studies have evaluated SGAP outcomes objectively.[2,3] This study investigates whether the SGAP flap should be considered a primary rather than secondary option.

We reviewed *consecutive* unilateral reconstructions using DIEP and SGAP flaps performed by one surgeon. Data included age, sex, history of previous abdominal surgery, hospital stay, duration of surgery, blood loss, blood transfusion, type of anastomosis, timing of reconstruction, and follow-up.

Outcome measures were flap survival and complications. Complications included hematoma, vascular problems requiring take-back, drain exchange, delayed closure, complete or partial flap loss, cellulitis, congestive heart failure, fat necrosis, and cardiopulmonary arrest.

Descriptive statistics were calculated for all variables. Numerical variables were compared using the nonparametric Wilcoxon rank sum test and are reported as

medians with interquartile ranges. Categorical or nominal variables were compared using the chi-square test or Fisher's exact test, as appropriate.

A line connecting the coccyx to the anterior superior iliac spine formed the axis of the ellipse that defines the SGAP flap and produces a concealed scar. Skin islands measured 10 to 14 cm × 25 to 30 cm. The SGAP flaps were raised on one to two perforators, whereas the DIEP flaps had two to five perforators.

Recipient vessels were the internal mammary artery and vein. Over 5 years, 16 SGAP and 24 DIEP flaps were performed. A comparative analysis was conducted (Table 1). The two groups were similar regarding age, length of stay, blood loss, complication rate, and rate of transfusion. The SGAP flap averaged 1 hour longer, 9 hours versus 7.9 hours ($p = 0.007$). The take-back rate was similar, and all survived. Figures 1 and 2 demonstrate a patient who underwent DIEP flap surgery on her left side and subsequent SGAP flap surgery on her right.

Table 1. Comparison of SGAP and DIEP Flap Patients

Variable	SGAP	DIEP	*p*
No. of patients	16	24	
Median age, years	54	49	0.4
Median LOS, days	5	5	0.5
Previous flap	5	0	0.007
Previous abdominoplasty	3	0	0.06
OR time, hr	9	7.9	0.007
Median EBL, cc	300	252.5	0.2
Immediate reconstruction	7	12	0.8
Complication rate	3	2	0.4
Transfusion	5	4	0.4
Median no. of units transfused	1	1	1
Need for take-back to OR	1	1	1
Flap survival, %	100	100	1
Median follow-up, days	311	360.5	0.3

LOS, length of stay; OR, operating room; EBL, estimated blood loss.

The SGAP flap may have greater technical demands than the DIEP flap as reflected by longer operating times. However, some of the time represents intraoperative repositioning.

Baumeister et al. examined 81 SGAP flaps and found a 93 percent survival rate.[4] They too concluded that the SGAP flap should be considered as a first option, but a direct comparison with other free tissue transfers was lacking. Guerra et al. also found a high "success rate" for the SGAP flap (98 percent survival).[3]

Subjectively, the SGAP flap patients had less discomfort and, of course, the risks of abdominal weakening, bulge, or hernia were eliminated. Furthermore, the lack of direct "mirror visibility" significantly lowered the patient's awareness of a donor scar hidden inside the panty line.

Ample abdominal tissue favors DIEP flaps. However, compromises are made simply to use it. For instance, when tissue is scarce, smaller than optimal reconstructions are accepted and revisionary breast augmentations are performed later. Often, to maximize tissue harvest, more skin is taken, thus preventing a safe tension-free closure.

We conclude that the SGAP flap should be considered first for breast reconstruction more often—not

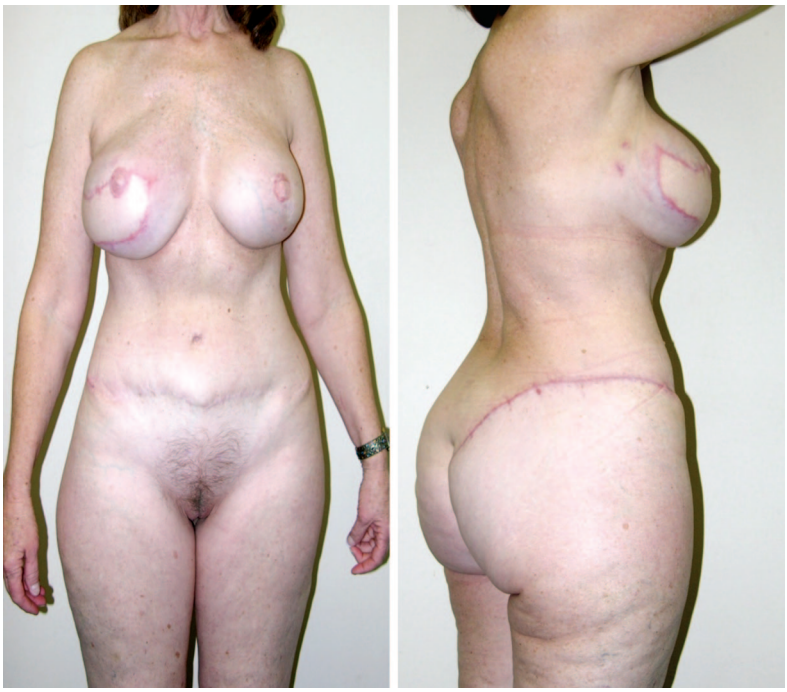

Fig. 1. Patient who underwent DIEP flap surgery on her left side and SGAP flap surgery on her right.

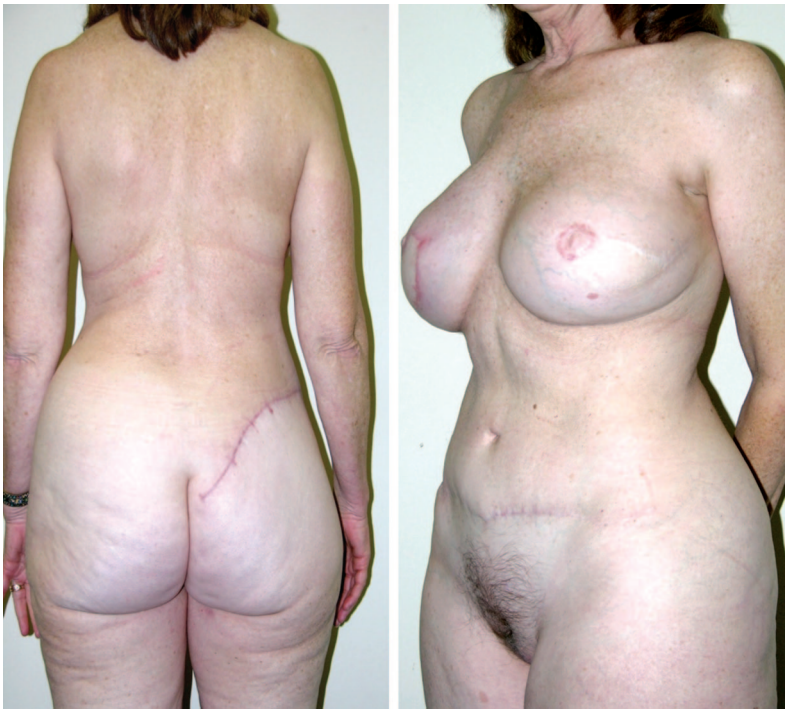

Fig. 2. The same patient as in Figure 1.

simply as an alternate should a DIEP flap fail or be unfeasible.

DOI: 10.1097/PRS.0b013e31821744a4

Arezou Yaghoubian, M.D.

J. Brian Boyd, M.D.
Division of Plastic Surgery
Department of Surgery
Harbor–UCLA Medical Center
Torrance, Calif.

Correspondence to Dr. Boyd
Harbor–UCLA Medical Center
1000 West Carson Street, Box 25
Torrance, Calif. 90509
jbrianboyd@yahoo.com

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCES

1. Allen RJ, Tucker C Jr. Superior gluteal artery perforator free flap for breast reconstruction. *Plast Reconstr Surg.* 1995;95:1207–1212.
2. Blondeel PN. The sensate free superior gluteal artery perforator (S-GAP) flap: A valuable alternative in autologous breast reconstruction. *Br J Plast Surg.* 1999;52:185–193.
3. Guerra AB, Metzinger SE, Bidros RS, Gill PS, Dupin CL, Allen RJ. Breast reconstruction with gluteal artery perforator (GAP) flaps: A critical analysis of 142 cases. *Ann Plast Surg.* 2004;52:118–125.
4. Baumeister S, Werdin F, Peek A. The sGAP flap: Rare exception or second choice in autologous breast reconstruction? *J Reconstr Microsurg.* 2010;26:251–258.

Novel Use of Acellularized Dermis for Breast Reconstruction

Sir:

A 58-year-old white woman presented for breast reconstruction following a planned nipple-sparing mastectomy on the right side for invasive ductal carcinoma. The patient's medical history included resection of a Wilms' tumor with right nephrectomy at 8 months of age followed by extensive radiation therapy that was principally focused to the right side of the chest and abdominal wall. The patient consequently suffered from scoliosis, intestinal obstructions, pancreatitis, colon cancer (resulting in over 30 intraabdominal procedures), osteoporosis, chronic renal failure, and malabsorption. The field of irradiation included the lower aspect of the right breast, where she was now diagnosed with invasive breast carcinoma. On examination, the patient revealed a well-healed scar situated in the right flank with evidence of radiation changes seen extending from the chest wall down to the anterior superior iliac spine.

The use of a transverse rectus abdominis musculocutaneous–latissimus dorsi flap was impossible, given her previous incisions and her severe scoliosis secondary to the radiation exposure.[1] The use of a tissue expander in an irradiated field raised concerns, given the expected extent of fibrosis in these cases. In addition, the smallest expander that was commercially available was too large to be inserted in the subpectoral space. Given the limited surgical options, the patient agreed to undergo acellularized

dermis placement with subsequent fat grafting for her breast reconstruction.[2]

For the first step of the reconstruction, two 6 × 4-cm, extrathick pieces of acellular cadaveric dermis (AlloDerm; LifeCell Corp., Branchburg, N.J.) folded over twice were sutured together in layers, ultimately resulting in a cone-shaped pyramid that was inserted as a spacer underneath the skin flaps (Fig. 1, *above*).

For the fat grafting part of the procedure 5 months later, an incision was made in the left gluteal region and a suitable size piece of fat was harvested from the dermis and the subcutaneous fat.[2] We prefer this method of fat harvesting because it is proven to have results as predictable as those achieved with lipoaspirated fat regarding the viability of fat cells while being superior in terms of molding capability when filling large defects (Fig. 1, *below*).

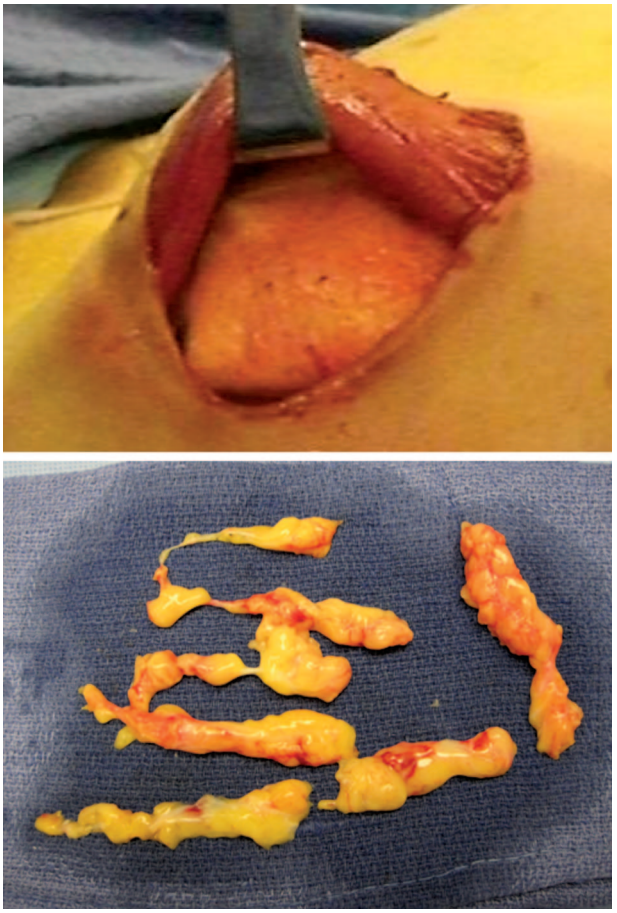

Fig. 1. Breast reconstruction using acellularized dermis and harvested adipose tissue. (*Above*) Three pieces of acellularized dermis were layered and sutured onto the patient's chest wall to create a scaffold and establish an intact, soft-tissue thickness, capillary-rich bed intended to enhance survival and volume of fat grafting. (*Below*) Four months later, limited subcutaneous fat was harvested en bloc from the left gluteal region. The fat was cut into strips less than 1 cm wide and seeded onto the previously grafted acellularized cadaver dermis.

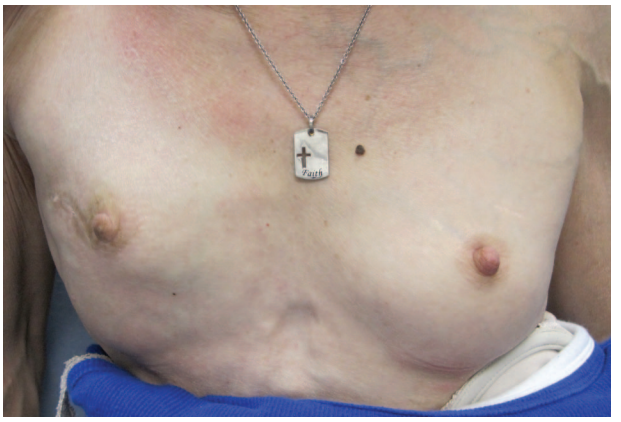

Fig. 2. Postoperative result of breast reconstruction using acellularized dermis and harvested adipose tissue. The novel technique reproduced an acceptable breast mound intraoperatively and more than 16 months later.

The right breast was entered through the previously made incision. The fat was cut into strips less than 1 cm long and layered in the defect requiring volume augmentation in the inferior pole. The acellularized cadaver dermis construct was found to be intact and vascularized. Additional fat grafting was repeated 4 months later with harvest from the right gluteal region, leading to a satisfactory final result (Fig. 2).

This technique displays a novel use of acellularized cadaveric dermis for breast reconstruction in combination with fat grafting in patients with limited surgical options after radiation treatment. The use of acellular dermis in this context is particularly helpful, as the extracellular matrix glycosaminoglycan scaffold provides support and can be vascularized to aid in the survival of the transplanted fat.[3–5]

DOI: 10.1097/PRS.0b013e3182174501

Laura Tom, B.S.

Niclas Broer, M.D.

Don Hoang, B.S.

Deepak Narayan, M.D.

Department of Plastic and Reconstructive Surgery
Yale University School of Medicine
New Haven, Conn.

Correspondence to Dr. Narayan
Department of Plastic and Reconstructive Surgery
Yale University School of Medicine
P.O. Box 208062
New Haven, Conn. 06520-8062
deepak.narayan@yale.edu

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCES

1. Panettiere P, Marchetti D, Accorsi D. The serial free fat transfer in irradiated prosthetic breast reconstructions. *Aesthetic Plast Surg.* 2009;33:695–700.
2. Chan CW, McCulley SJ, MacMillan RD. Autologous fat transfer: A review of the literature with a focus on breast cancer surgery. *J Plast Reconstr Aesthet Surg.* 2008;61:1438–1448.
3. Shepherd BR, Enis DR, Wang F, Suarez Y, Prober JS, Schechner JS. Vascularization and engraftment of a human skin substitute using circulating progenitor cell-derived endothelial cells. *FASEB J.* 2006;20:1739–1741.
4. von Heimburg D, Zachariah S, Low A, Pallua N. Influence of different biodegradable carriers on the in vivo behavior of human adipose precursor cells. *Plast Reconstr Surg.* 2001;108:411–420; discussion 421–422.
5. Harper JR, McQuillan DJ. Extracellular wound matrices: A novel regenerative tissue matrix (RTM) technology for connective tissue reconstruction. *Wounds* 2007;19:163–168.

A Successful Salvage Protocol for Breast Implants

Sir:

Breast augmentation is the most common procedure in cosmetic surgery. For many years, the presence of infection in the setting of breast prostheses has necessitated implant removal and delayed reinsertion.[1–5]

Although successful salvage of prostheses in the presence of periprosthetic infections has been reported before, it is not a generally accepted practice. We review our experience with implant salvage in patients with periprosthetic infections following cosmetic breast surgery with implants for a 1-year period. The protocol included a "sequential cleaning," an implant replacement, and prolonged postoperative antibiotics. Six patients, all with silicone cohesive gel prostheses, underwent implant salvage. Patients with periprosthetic infections were submitted to this protocol if they manifested the following criteria: clinical infection symptoms, no sign of sepsis (clinical and/or laboratorial), and implant exposure less than 48 hours.

The risks involved in saving the implant were systematically clarified to the patients, as the procedure could be successful or not. Wound swabs from the pocket were sent for culture and sensitivity testing.

The implant was removed. The sequential cleaning steps were as follows:

1. The cavity of the capsule was scrubbed with chlorhexidine gluconate 2% scrub, and an abdominal swab wet with chlorhexidine alcohol 0.5% solution was left in the pocket for 5 minutes.
2. The cavity of the capsule was scrubbed with abdominal swabs full of half-strength hydrogen peroxide, and an abdominal swab wet with half-strength hydrogen peroxide was left in the pocket for 5 minutes.
3. The cavity was then irrigated with copious amounts of normal saline, approximately 2 liters. The cavity of the capsule was scrubbed with povidone-iodine surgical scrubs, an abdominal swab wet with povidone-iodine was left in the pocket for 5 minutes, and then a drain was positioned.

Subsequently, a new implant was placed in the pocket and the scar was closed in four layers with nonabsorbable sutures. A solution consisting of 1.5 g of cefuroxime diluted with 18 ml of saline plus 80 mg of gentamicin (2-ml ampule) plus 40 ml of povidone-iodine was given through the drain. The drain was kept closed for 4 hours.

Postoperatively, patients received intravenous antibiotics, 1.5 g cefuroxime (three times per day) plus gentamicin 120 mg (one dose) for 24 hours. Patients were discharged from the hospital without drains and with oral ciprofloxacin 500 mg (three times per day) for up to 10 days. The antibiotics should be adjusted according to the antibiogram result. The patients were followed closely for 8 months.

Five of the patients had periprosthetic infections following simple primary breast enlargement, and one was associated with a mastopexy procedure. Of these six patients, *Pseudomonas aeruginosa* was isolated in one, *Staphylococcus aureus* was isolated in three, and mixed flora was isolated in two. All patients managed to keep their implants and, at more than 1-year follow-up, there were no signs of rejection or capsular contracture in any of the patients.

DOI: 10.1097/PRS.0b013e3182173fd3

Marcos Sforza, M.D.
Dolan Park Hospital
Bromsgrove, United Kingdom

Katarina Andjelkov, M.D., Ph.D.
University of Belgrade
Belgrade, Serbia

Renato Zaccheddu, M.D.
Dolan Park Hospital
Bromsgrove, United Kingdom

Correspondence to Dr. Sforza
65 Liberty Place
Sheepcote Street
Birmingham B16 8JB, United Kingdom

Presented and recognized as the Best Scientific Exhibit at the 2009 Meeting of the American Society for Aesthetic Plastic Surgery, in New York, New York.

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCES

1. Perras C. The prevention and treatment of infections following breast implants. *Plast Reconstr Surg.* 1965;35:649–656.
2. Yii NW, Khoo CT. Salvage of infected expander prostheses in breast reconstruction. *Plast Reconstr Surg.* 2003;111:1087–1092.

3. Chun JK, Schulman MR. The infected breast prosthesis after mastectomy reconstruction: Successful salvage of nine implants in eight consecutive patients. *Plast Reconstr Surg.* 2007; 120:581–589.
4. Spear SL, Howard MA, Boehmler J, Ducic I, Low M, Abbruzzesse MR. The infected or exposed breast implant: Management and treatment strategies. *Plast Reconstr Surg.* 2004;113: 1634–1644.
5. Spear SL, Seruya M. Management of the infected or exposed breast prosthesis: A single surgeon's 15-year experience with 69 patients. *Plast Reconstr Surg.* 2010;125:1074–1084.

The Role of Postoperative Antibiotics in Reducing Biofilm-Related Capsular Contracture in Augmentation Mammaplasty

Sir:

Important work has been published recently in further establishing the cause of capsular contracture as being secondary to subclinical biofilm formation.[1] As this issue of biofilms and contracture has now been investigated in multiple well-designed studies from separate institutions, the cause of capsular fibrosis has been demonstrated beyond much reasonable doubt. We must now more vigorously transition from the question, "what causes this?" to "how can we prevent this?"

In prior elegant studies by Adams et al., it has been established that antibiotic irrigation is efficacious in reducing rates of capsular contracture.[2] Despite a significant reduction in contracture by means of intraoperative irrigation and meticulous sterile technique, the literature and anecdotal experience suggest that contracture remains a common complication following augmentation mammaplasty. Despite the most stringent precautions, there is likely some level of unavoidable exposure to *Staphylococcus epidermidis* when introducing the implant into the breast pocket. In addition, the implant is always at risk of inherent exposure to the natural flora of the breast, particularly when using a periareolar incision. Thus, relying strictly on intraoperative precaution is fraught with limitations. It remains to be determined whether any further preventative measures can be taken beyond the aforementioned intraoperative precautions. Unlike intraoperative antibiotic irrigation, postoperative antibiotic prophylaxis has been met with much less conclusive laboratory or prospective clinical data.

At the 2010 meeting of the American Society for Aesthetic Plastic Surgery, we presented data examining the efficacy of postoperative prophylactic antibiotics in 249 patients undergoing primary and secondary cosmetic breast augmentation (Table 1).[3] We were unable to demonstrate a reduction in capsular contracture with postoperative antibiotics. However, it would be shortsighted to definitively declare that postoperative antibiotics have no effect regarding the reduction of capsular contracture. As this was a retrospective cohort study, we were unable to determine patient compliance. Furthermore, we effectively examined only one duration of postoperative prophylaxis (3 days) and only one class of antibiotics (nearly all patients received cephalosporins). In fact, in a recent experimental trial, various classes of antibiotics, such as aminoglycosides and fluoroquinolones, were demonstrated to be more effective against *Staphylococcus* biofilms.[4]

Table 1. Comparison of Complications between Patients Who Received Postoperative Antibiotics and Those Who Did Not

	Antibiotics (%)	No Antibiotics (%)	p*
Total no. of patients	136 (54.6)	113 (45.4)	
Total complication rate	20 (14.7)	15 (13.3)	0.752
Infection	1 (0.7)	1 (0.9)	1.00
Capsular contracture	12 (8.8)	8 (7.1)	0.617

*A value of $p < 0.05$ was considered statistically significant.

Using Tamboto's experimental model, we suggest that a study should be conducted examining postoperative antibiotics. Assuming that the pharmacokinetics are at all comparable in a porcine model, confounding variables that plague the study of postoperative prophylaxis in clinical trials would be all but eliminated. Perhaps a particular duration of postoperative prophylaxis or class of antibiotics will be found to reduce biofilms.

In contrast, if it can be proven that postoperative antibiotics of any reasonable class or duration are ineffective against these often resistant biofilms, the need for postoperative prophylaxis can be further put to rest.[5] Perhaps no reduction will be seen with postoperative prophylaxis and our clinical observation will be upheld.

In summary, our retrospective clinical information yielded no signs that administration of postoperative antibiotics for 3 days was effective in reducing capsular contracture (i.e., biofilms). However, we are recommending further study of postoperative prophylaxis and biofilms.

DOI: 10.1097/PRS.0b013e3182173fe5

Michael N. Mirzabeigi, M.S.
Hani Sbitany, M.D.
Shareef Jandali, M.D.
Joseph M. Serletti, M.D.
Division of Plastic Surgery
University of Pennsylvania Health System
Philadelphia, Pa.

Correspondence to Mr. Mirzabeigi
Division of Plastic Surgery
University of Pennsylvania Health System
3400 Spruce Street
10 Penn Tower
Philadelphia, Pa. 19104
michael.mirzabeigi@uphs.upenn.edu

DISCLOSURE

The authors have no disclosures or sources of funding to acknowledge.

REFERENCES

1. Tamboto H, Vickery K, Deva AK. Subclinical (biofilm) infection causes capsular contracture in a porcine model following augmentation mammaplasty. *Plast Reconstr Surg.* 2010;126: 835–844.
2. Adams WP Jr, Rios JL, Smith SJ. Enhancing patient outcomes in aesthetic and reconstructive breast surgery using triple antibiotic breast irrigation: Six-year prospective clinical study. *Plast Reconstr Surg.* 2006;117:30–36.
3. Mirzabeigi MN, Abdollahi H, Ortlip T, et al. The efficacy of postoperative prophylactic antibiotics in primary and secondary cosmetic breast augmentation. Paper presented at: 2010 Annual Meeting of the American Society for Aesthetic Plastic Surgery; April 25, 2010; Washington, DC.
4. Singh R, Ray P, Das A, Sharma M. Penetration of antibiotics through *Staphylococcus aureus* and *Staphylococcus epidermidis* biofilms. *J Antimicrob Chemother.* 2010;65:1955–1958.
5. Qu Y, Daley AJ, Istivan TS, Rouch DA, Deighton MA. Densely adherent growth mode, rather than extracellular polymer substance matrix build-up ability, contributes to high resistance of *Staphylococcus epidermidis* biofilms to antibiotics. *J Antimicrob Chemother.* 2010;65:1405–1411.

Accessory Breast Tissue in the Axilla: Classification and Treatment

Sir:

Axillary breast tissue affects between 2 and 6 percent of women.[1] The variability of presentation and the possibility of other disease make this problem clinically challenging, and although it is a well-known entity, there is no established classification system to guide its management.[2] Determining which surgical technique to use is critical to achieving an optimal outcome.

In cases where the excess tissue is contiguous with the normal breast, with similar consistency on palpation, suction lipectomy will often suffice for recontouring the axilla, and it is preferable to direct excision. Although this approach does not provide a tissue sample, it has the advantages of smaller incisions, feathering of tissue removal for a smoother contour, and the creation of less dead space. In cases where there is a firm core of palpable glandular tissue within the mass, a combination of direct excision and suction lipectomy is necessary. Failure to excise the glandular elements may result in a residual mass and the necessity for a secondary procedure.

Direct excision of larger masses results in long unsightly scars, disruption of numerous lymphatic channels, and a significant amount of axillary dead space. This may result in postoperative seroma formation and prolonged lymphatic drainage into the cavity.

Nine patients were treated for excess axillary breast tissue over a 6-month period. The average age at presentation was 42 years, and eight patients presented with bilateral symptoms. None of the patients had any chronic medial illness or a history of breast disease. In total, 17 axillae were treated, including two type I, four type II, five type III, and six type IV axillae. Two axillae were treated with liposuction alone, 10 were treated with direct skin and tissue excision, and five underwent a combination of suction lipectomy and skin excision. The mean follow-up was 6 months.

All excised tissue revealed benign breast tissue, and skin specimens were similarly free of disease. One patient with type I axillary breast tissue who was treated with liposuction alone presented postoperatively with a remaining core of breast tissue. One patient treated with direct tissue excision presented with a postoperative seroma that required serial drainage followed by percutaneous drain placement for 2 weeks until drainage resolution. The most prevalent source of postoperative dissatisfaction was unsightly scarring and prolonged discomfort at the incision site (Table 1).

Based on our experience treating excess axillary breast tissue, we devised a simple treatment algorithm for this problem whereby distinct excess parenchymal tissue, excess axillary fat, and axillary skin are treated as separate entities. Morbidity is minimized through the use of closed suction drains, well-designed incisions, and direct excision of tissues that are not amenable to treatment by means of suction lipectomy.

The most common complaints after removal of excess axillary breast tissue include incomplete excision,

Table 1. Classification of Excess Axillary Breast Tissue and Management Algorithm

Type	Features on Examination	Management
I	Small palpable mass, barely visible on examination; little or no skin excess; feels distinct from normal breast, and/or has a firm central core	Direct excision with no skin removal
II	Small visible mass; little or no skin excess; feels or appears contiguous with normal breast, and has similar consistency	Suction lipectomy alone
III	Visible mass; excess skin present; contiguous with the normal breast, and of similar consistency	Suction lipectomy with skin excision
IV	Large mass; excess skin present; distinct from normal breast tissue, and/or has a firm central core	Direct excision of tissue and skin, with or without suction lipectomy to improve final contour

seroma, pain, intercostal nerve injury, ugly scarring, and contour deformity.[3,4] Many of these complications can be avoided with careful planning, attention to contour, and meticulous dissection.

DOI: 10.1097/PRS.0b013e3182173f95

Sophie A. Bartsich, M.D.

Ferdinand A. Ofodile, M.D.

Harlem Hospital Center
New York, N.Y.

Correspondence to Dr. Bartsich
300 East 59th Street, Apt. 805
New York, N.Y. 10022
sophiebartsich@hotmail.com

DISCLOSURE

Neither author has any financial interests to disclose.

REFERENCES

1. Harris JR, Lippman ME, Morrow M, Osbourne CK. *Diseases of the Breast.* 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2000.
2. Lesavoy MA, Gomez-Garcia A, Nejdi R, Yospur G, Syiau TJ, Chang P. Axillary breast tissue: Clinical presentation and surgical treatment. *Ann Plast Surg.* 1995;35:356–360.
3. Down S, Barr L, Baildam D, Bundred N. Management of accessory breast tissue in the axilla. *Br J Surg.* 2003;90:1213–1214.
4. Greer KE. Accessory axillary breast tissue. *Arch Dermatol.* 1974; 109:88–89.

Lone Star Retractor for Pediatric Hand Surgery

Sir:

Adequate operative exposure is important during pediatric hand surgery, which demands precise exposure in a small surgical field. A good retractor must be safe, simple, and easy to use, providing adequate retraction and a wide field of view.[1,2] Self-retaining retractors are preferable to conventional retractors because they free up assistants and reduce the number of hands crowding the operative area.

Arem described a self-retaining retractor for use in hand surgery consisting of weights applied to stay sutures.[3] Although preferable to handheld retractors, this is difficult to reposition and cannot easily provide tension in multiple directions. Pearl et al. described a self-retaining retractor consisting of stay sutures fixed through cuts in the rim of a plastic bowl.[2] This provides disposable and inexpensive exposure; however, creation and assembly is cumbersome, and the inflexible ring limits intraoperative repositioning.

The ideal self-retaining retractor would provide good exposure, gentle yet adequate tension, and easy and quick repositioning of each digit individually in multiple planes. The Lone Star retraction system (Cooper Surgical), consisting of elastic stay hooks positioned by means of slots on the periphery of a disposable adjustable plastic ring frame, is a relatively inexpensive (approximately CaD $200)[4] yet extremely effective self-retaining retractor for use during pediatric hand surgery.

The sterile disposable Lone Star retractor consists of a hinged frame and hooks attached to elastic stays (Fig. 1). After the patient is prepared and draped, 2-0 silk stay sutures are placed through the nail plate and pulp of each digit and tied in a deliberately loose loop. One limb of the frame is secured with towel clips to the surgical drapes in the vicinity of the hand. The other limb is positioned upright, and the hinge between the two limbs is tightened. The hook of each elastic stay is placed through one of the previously placed loops in each finger and is then anchored on the frame. The elastic stays and the hooks are repositioned as necessary during the stages of the procedure (Fig. 2). On completion, the frame and stays may be left in place to facilitate application of a dressing, after which the stays and silk sutures are removed.

The Lone Star retraction system has previously been described as an effective way of obtaining complete eversion of prolapsed hemorrhoids.[4] Several features make this an appealing self-retaining retractor for use during pediatric hand surgery. First, the hinged frame with multiple slots for the stays provides the surgeon with many options in three-dimensional positioning of individual digits. Second, the long elastic stays keep the surgical site remote from the frame and allow the digits to remain stable in any position and to avoid excessive tension. Finally, the combination of hooks on the stays and suture loops on the digits facilitates quick repositioning. Because it is adjustable, disposable, quick to assemble, and easy to use, we believe that the Lone Star retraction

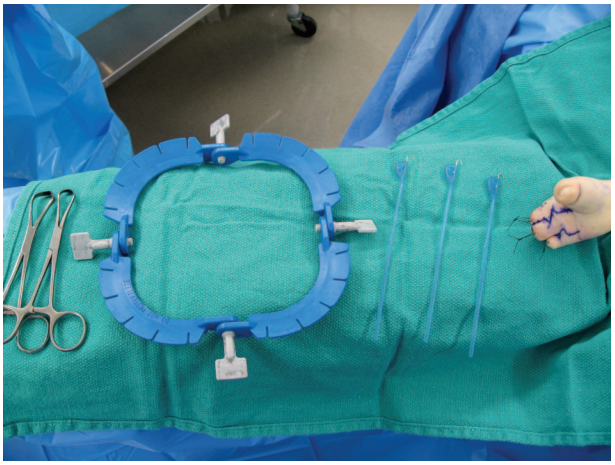

Fig. 1. The components of the Lone Star retractor include the hinged and slotted frame and the elastic stays with attached hooks. Also shown are 2-0 silk stay suture loops in the nail plate and pulp of the digits. Towel clips are used to secure the retractor frame to the arm board.

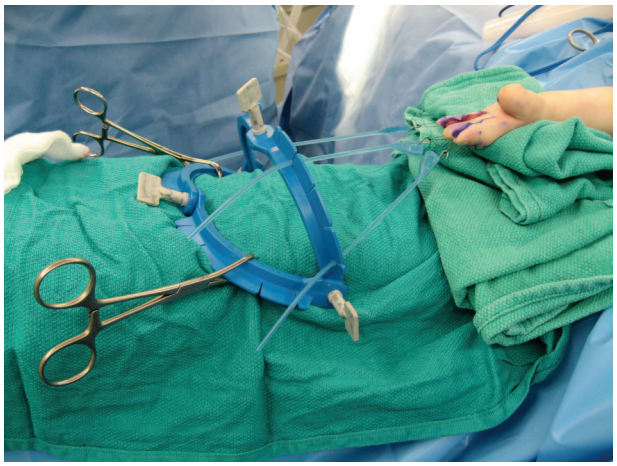

Fig. 2. The Lone Star disposable plastic ring is positioned using the adjustable hinges and secured using towel clips. The hook on each elastic stay is placed through the suture loop on the selected finger. The elastic stay is in turn anchored in the appropriate slot on the frame.

system provides a versatile and superior alternative to conventional handheld or self-retaining retractors used during pediatric hand surgery.

DOI: 10.1097/PRS.0b013e318217457c

Aaron Knox, M.D.
Division of Plastic Surgery
University of British Columbia
Vancouver General Hospital
Vancouver, British Columbia

A. Robertson Harrop, F.R.C.S.C.
Division of Plastic Surgery
Department of Surgery
Alberta Children's Hospital
Calgary, Alberta, Canada

Correspondence to Dr. Harrop
Division of Plastic Surgery
Department of Surgery
University of Calgary
Alberta Children's Hospital
2888 Shaganappi Trail NW
Calgary, Alberta T3B 6A8, Canada
robertson.harrop@albertahealthservices.ca

The corresponding author has full access to the data in this study and takes responsibility for the integrity of the data and accuracy of the data analysis.

DISCLOSURE

Neither author has any commercial associations or financial disclosures to declare.

REFERENCES

1. Doi H, Ogawa Y. A new malleable self-retaining retractor. *Ann Plast Surg.* 1997;38:543–545.
2. Pearl CB, Aguillon A, McLaughlin E, Yu J. Inexpensive self-retaining retractor for minor surgical procedures. *Ann Plast Surg.* 2003;51:633–635.
3. Arem AJ. Self-retaining weighted retractors for hand surgery. *Ann Plast Surg.* 1980;5:326–327.
4. Carriero A, Dal Borgo P, Pucciani F. Stapled mucosal prolapsectomy for haemorrhoidal prolapse with Lone Star Retractor System. *Tech Coloproctol.* 2001;5:41–46.

Francisella tularensis Osteomyelitis of the Hand following a Cat Bite: A Case of Clinical Suspicion

Sir:

Tularemia is an uncommon zoonosis causing a variety of disease processes ranging from subclinical soft-tissue infection to septic shock and death. Its virulence has led to classification as a "class A select agent" by the U.S. Department of Agriculture, with the potential for use in bioterrorism. Although it is most commonly transmitted through contact with infected rabbits or vectors such as ticks, other animals including cats, squirrels, and hamsters have also been implicated.[1–3] *Francisella tularensis* is extremely fastidious and is rarely isolated on routine cultures. Often, *Pasteurella* and staphylococcal species are grown and treatment begun that does not cover *F. tularensis*. This scenario is further enabled through the polymicrobial flora and needle-like teeth of the feline mouth, inoculating organisms deep into soft tissue and bone. The authors have realized this perfect storm in the clinical course of a 10-year-old girl who developed a persistent hand infection complicated by *F. tularensis* osteomyelitis following a cat bite.

The patient presented with recurring fever to 103°F that was persistent roughly 15 days after a cat bite. Cultures obtained from the patient previously grew *Pasteurella*, and the patient had been treated with amoxicillin clavulanate, trimethoprim/sulfamethoxazole, and valacyclovir for herpetic whitlow, and intravenous vancomycin at admission. We began serial incision and drainage of the infected digit, and sent another culture specimen with specific emphasis for *F. tularensis*. This time, the results of the culture were positive and a magnetic resonance imaging scan confirmed osteomyelitis. Therapy was directed to gentamicin, which has a literature-reviewed 86 percent rate of efficacy against tularemia[4]; however, amputation was considered. Fortunately, she responded well and was able to maintain full dexterity of her hand at 2-month follow-up (Fig. 1) and continues to do well 6 months postoperatively.

This case describes a rare disease manifestation with a complication that has not yet been reported. It is important for plastic surgeons to be familiar with tularemia and its epidemiologic profile. A patient with recurring fever and persistent infection in the context of a cat bite and despite appropriate coverage for previous cultures necessitates an emergent workup for tularemia. Therefore, clinicians in endemic areas

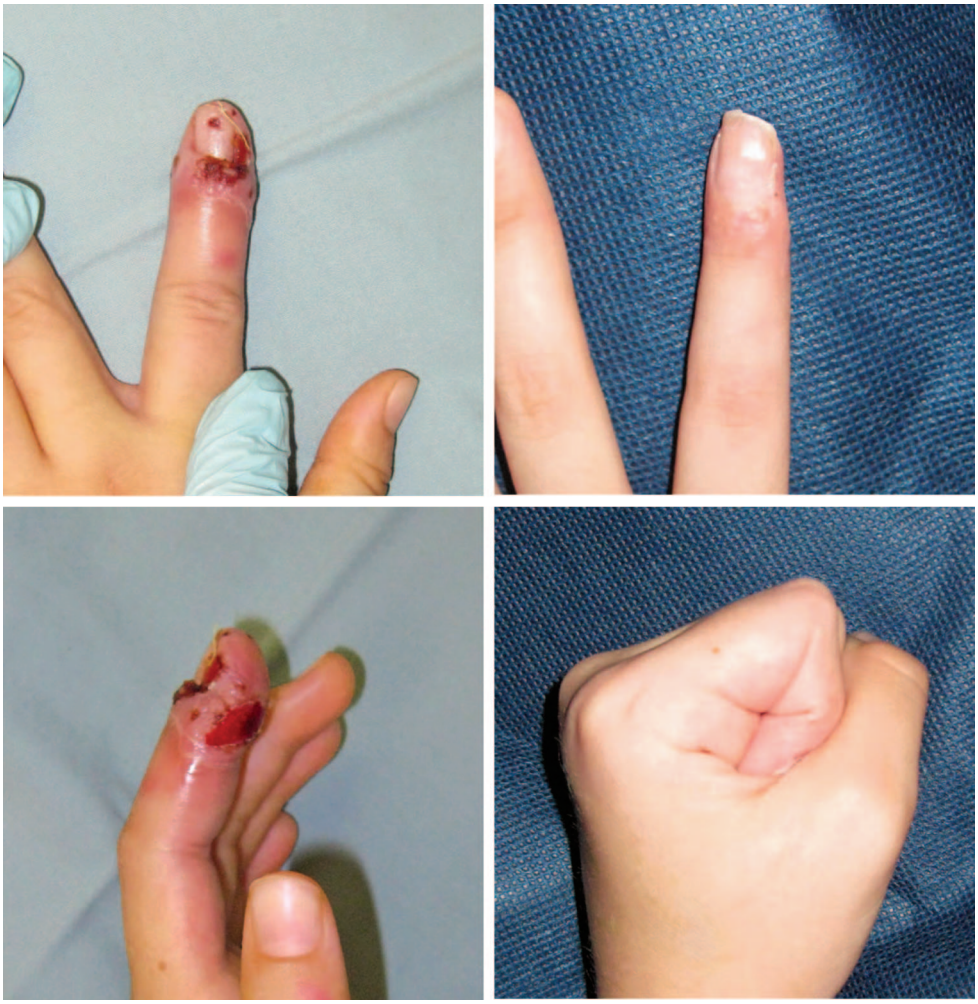

Fig. 1. The dorsal surface of the patient's left hand on initial preoperative evaluation (*above, left*) and at the 2-month follow-up visit (*above, right*). The radial aspect of the patient's left index finger on initial preoperative evaluation (*below, left*) and at 2-month follow-up (*below, right*) demonstrating maintained form and function.

(Fig. 2)[5,6] must maintain a high degree of clinical suspicion, as early diagnosis and management can prevent serious consequences such as osteomyelitis, amputation, or even death.

DOI: 10.1097/PRS.0b013e3182174626

James C. Yuen, M.D.

Maximilian V. Malotky, M.D.

Department of Plastic and Reconstructive Surgery
University of Arkansas for Medical Sciences
Little Rock, Ark.

Correspondence to Dr. Yuen
4301 West Markham, Slot 720
Little Rock, Ark. 72205
mvmalotky@uams.edu

DISCLOSURE

The authors received no funding for this work and have no financial interests to disclose.

REFERENCES

1. Kravetz JD, Federman DG. Cat-associated zoonoses. *Arch Intern Med.* 2002;162:1945–1952.
2. Magee JS, Steele RW, Kelly NR, Jacobs RF. Tularemia transmitted by a squirrel bite. *Pediatr Infect Dis J.* 1989;8:123–125.
3. Centers for Disease Control and Prevention (CDC). Tularemia associated with a hamster bite—Colorado, 2004. *MMWR Morbid Mortal Wkly Rep.* 2005;53:1202–1203.
4. Enderlin G, Morales L, Jacobs RF, Cross JT. Streptomycin and alternative agents for the treatment of tularemia: Review of the literature. *Clin Infect Dis.* 1994;19:42–47.
5. McNabb SJ, Jajosky RA, Hall-Baker PA, et al. Centers for Disease Control and Prevention (CDC). Tularemia. Number of reported cases—United States and U.S. Territories, 2006. *Morbid Mortal Wkly Rep.* 2008;53:71.
6. McNabb SJ, Jajosky RA, Hall-Baker PA, et al. Summary of notifiable diseases—United States, 2005. *MMWR Morb Mortal Wkly Rep.* 2008;55:1–92.

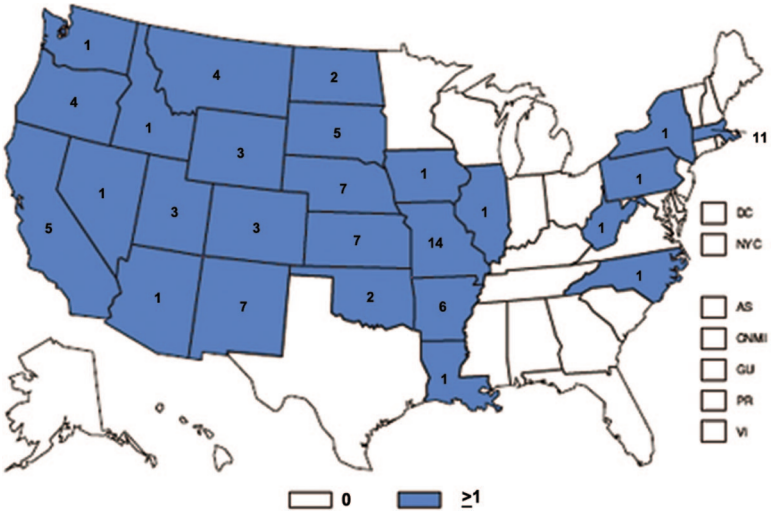

Fig. 2. Number of reported cases of tularemia in the United States and U.S. territories in 2006. Five states (Arkansas, Kansas, Massachusetts, Missouri, and Nebraska) accounted for 50 percent of the cases of tularemia reported to the Centers for Disease Control and Prevention in 2006.

German Standardized Translation of the Michigan Hand Outcomes Questionnaire for Patient-Related Outcome Measurement in Dupuytren Disease

Sir:

As highlighted in a recent article in the *Journal*, patient satisfaction outcomes in plastic and hand surgery are rare and often unvalidated,[1] with a need for further refinement in the future. In hand surgery, the Disabilities of the Arm, Shoulder and Hand outcome measure has been used in a number of clinical trials.[2] The Disabilities of the Arm, Shoulder and Hand questionnaire has good validity with the quality of life subscale of the Medical Outcomes Study 36-Item Short Form Health Survey.[3] However, side differences of the hand are often not adequately displayed because the "better" hand often scores higher than the "impaired" hand. As such, Disabilities of the Arm, Shoulder and Hand values for Dupuytren disease can be reported as good despite limited range of motion.[4] Another study of 46 patients undergoing selective aponeurectomy reported a baseline Disabilities of the Arm, Shoulder and Hand score of 12 ± 13 and 7 ± 9 at 10 months postoperatively.[5]

Supplemental digital content is available for this article. A direct URL citation appears in the printed text; simply type the URL address into any Web browser to access this content. A clickable link to the material is provided in the HTML text of this article on the *Journal*'s Web site (www.PRSJournal.com).

The Michigan Hand Outcomes Questionnaire was implemented in 1998 by Kevin C. Chung to provide a patient-related outcome measure.[6] It is responsive to clinical change[7] and has been used in a number of hand disorders such as in Dupuytren disease. One feature of the Michigan Hand Outcomes Questionnaire are side-specific questions (i.e., left hand, right hand, both hands), which is of special consideration especially in Dupuytren disease, where often one hand is involved to a more severe degree. A surgical trial demonstrated an improvement in the Michigan Hand Outcomes Questionnaire score from 58 ± 16 to 75 ± 16 at 3 months following selective aponeurectomy and to 87 ± 12 at 14 months following selective aponeurectomy.[8]

Because language adaptation is key to use of the Michigan Hand Outcomes Questionnaire in a different lingual environment, we sought to translate the Michigan Hand Outcomes Questionnaire to German as an additional patient-related outcome measure. To date, validated translations of the Michigan Hand Outcomes Questionnaire have been posted in Dutch, Spanish, Chinese, and Japanese.

The Michigan Hand Outcomes Questionnaire was translated using a team of translators fluent in both English and the desired language (German). The translation process consisted of the following components:

Forward translation: Two translators independently translated the Michigan Hand Outcomes Questionnaire from English to German. The translators then met to evaluate both translations and arrive at a consensus version.

Backward translation: Two other translators independently translated the new version of the Michigan Hand Outcomes Questionnaire from German into English. The backward translation version was compared

with the original English version. All four translators then met to discuss and resolve any discrepancies.

See **Document, Supplemental Digital Content 1,** for the validated German version of the Michigan Hand Outcomes Questionnaire, which we plan to use prospectively in Dupuytren disease trials as an additional valuable patient-reported outcome measure, ***http://links.lww.com/PRS/A347.***

DOI: 10.1097/PRS.0b013e318218fd70

Karsten Knobloch, M.D.

Marie Kuehn

Stephan Papst, M.D.

Robert Kraemer

Peter M. Vogt, M.D., Ph.D.

Plastic, Hand, and Reconstructive Surgery
Hannover Medical School
Hannover, Germany

Correspondence to Dr. Knobloch
Plastic, Hand, and Reconstructive Surgery
Hannover Medical School
Carl-Neuberg-Str. 1
30625 Hannover, Germany
knobloch.karsten@mh-hannover.de

REFERENCES

1. Clapham PJ, Pushman AG, Chung KC. A systematic review of applying patient satisfaction outcomes in plastic surgery. *Plast Reconstr Surg.* 2010;125:1826–1833.
2. Beaton DE, Davis AM, Hudak P, McConnell S. The DASH (Disabilities of the Arm, Shoulder and Hand) outcome measure: What do we know about it now? *Br J Hand Ther.* 2001;6:109–118.
3. SooHoo NF, McDonald AP, Seiler JG III, McGillivary GR. Evaluation of construct validity of the DASH questionnaire by correlation to SF-36. *J Hand Surg Am.* 2002;27:537–541.
4. Degreef I, Vererfve PB, De Smet L. Effect of severity of Dupuytren contracture on disability. *Scand J Plast Reconstr Surg Hand Surg.* 2009;43:41–42.
5. Herweijer H, Dijkstra PU, Nicolai JP, Van der Sluis CK. Postoperative hand therapy in Dupuytren's disease. *Disabil Rehabil.* 2007;29:1736–1741.
6. Chung KC, Pillsbury MS, Walters MR, Hayward RA. Reliability and validity testing of the Michigan Hand Outcomes Questionnaire. *J Hand Surg Am.* 1998;23:575–587.
7. Chung KC, Hamill JB, Walters MR, Hayward RA. The Michigan Hand Outcomes Questionnaire (MHQ): Assessment of responsiveness to clinical change. *Ann Plast Surg.* 1999;42:619–622.
8. Johnston P, Larson D, Clark IM, Chojnowski AJ. Metalloproteinase gene expression correlates with clinical outcome in Dupuytren's disease. *J Hand Surg Am.* 2008;33:1160–1167.

Comparison of Meshed versus MEEK Micrografted Skin Expansion Rate: Claimed, Achieved, and Polled Results

Sir:

There has been ample evidence that meshed skin grafts did not provide their claimed expansion rates.[1,2] Although for the majority of surgeons this finding might not be new, even less is known about the actual knowledge among them.

In the first part of our analysis, we evaluated the true expansion rates for a widely used and claimed 1:3 expansion rate of split-thickness skin grafts harvested by one experienced surgeon using the anterior thigh as the donor site (Air Dermatome; Zimmer, Dover, Ohio) before and after respective meshing ($n = 21$, Dermacarriers II in combination with Meshgraft II; Zimmer) or micrografting ($n = 7$, MEEK Micrograft Gauze; Humeca BV, Enschede, The Netherlands). In the second part, by the use of an anonymized written questionnaire, 40 surgeons were polled for their estimates of expansion rates during an annual meeting. Data are represented at mean ± SD, and values of $p < 0.05$ were considered statistically significant.

The claimed 1:3 expansion rate was achieved by only 53.1 percent using the mesh (1:1.59 ± 0.15) and by 99.8 percent using the micrografting technique (1:2.99 ± 0.09; $p = 0.0001$, Mann-Whitney test), respectively (Fig. 1). Regardless of the level of experience, all participants overestimated the achieved expansion rate of the widely used 1:3 mesher by 55 percent (1:2.47 ± 0.69; $p = 0.0004$), and there was no statistically significant difference between senior surgeons' and residents' estimates.

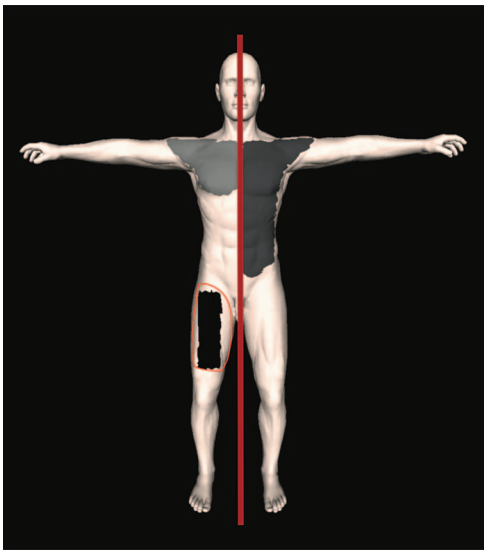

Fig. 1. Comparison of the 1:3 mesh carrier and 1:3 micrograft gauze based on achieved expansion rates. A 310-cm^2 split-thickness skin graft harvested from the model's right upper thigh (*black*) can achieve coverage of up to 493 cm^2 total body surface area with a mesh graft (*left, light gray*), or 927 cm^2 total body surface area with a micrograft (*right, dark gray*), respectively. When intending to cover 927 cm^2 with a 1:3 mesher, the required donor skin extends to the medial and lateral thigh (area marked in *red* around the *black* donor site). Drawings and calculations were based on a male three-dimensional model with 180-cm height and 85-kg weight using BurnCase 3D (RISC Software GmbH, Hagenberg, Austria).

The expansion rate depends on a number of factors related to the skin graft's quality itself[1,2] and recipient wound bed.[3] Nonetheless, the accurate estimation of the required donor site based on the technique used is particularly important when grafting large surface areas[4]: planning an operation with a 1:3 mesher based on a 1:2.47 ratio (polled mean) may result in overestimation of the true expansion rate by 55 percent, and may require consequent adaptation of the operative procedure when addressing large surface areas (e.g., repositioning, redraping, reharvesting).

Although meshed skin grafts become even more unreliable beyond 1:6 expansions,[2] micrografting allows for use of even small skin remnants and mimics the true expansion rate used by 86.5 to 99.8 percent when using expansion rates of 1:3 and above (data not shown). Because more than 57 percent of the polled participants with previous experience in micrografting based their indication for switching to this technique on claimed expansion ratios, our results can help to define more accurate cutoff values for the use of either technique, and to improve the economic use of donor sites in the future.[5]

DOI: 10.1097/PRS.0b013e318217463a

David Benjamin Lumenta, M.D.

Lars-Peter Kamolz, M.D., Ph.D.

Maike Keck, M.D.

Manfred Frey, M.D., Ph.D.

Division of Plastic and Reconstructive Surgery
Department of Surgery
Medical University of Vienna
Vienna, Austria

Correspondence to Dr. Lumenta
Division of Plastic and Reconstructive Surgery
Department of Surgery
Medical University of Vienna
Waehringer Guertel 18-20
A-1090 Vienna, Austria
david.lumenta@meduniwien.ac.at

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article. No outside funding was required.

REFERENCES

1. Peeters R, Hubens A. The mesh skin graft: True expansion rate. *Burns Incl Therm Inj.* 1988;14:239–240.
2. Vandeput J, Nelissen M, Tanner JC, Boswick J. A review of skin meshers. *Burns* 1995;21:364–370.
3. Fifer TD, Pieper D, Hawtof D. Contraction rates of meshed, nonexpanded split-thickness skin grafts versus split-thickness sheet grafts. *Ann Plast Surg.* 1993;31:162–163.
4. Lumenta DB, Kamolz LP, Frey M. Adult burn patients with more than 60% TBSA involved-Meek and other techniques to overcome restricted skin harvest availability: The Viennese Concept. *J Burn Care Res.* 2009;30:231–242.
5. Erba P, Ogawa R, Vyas R, Orgill DP. The reconstructive matrix: A new paradigm in reconstructive plastic surgery. *Plast Reconstr Surg.* 2010;126:492–498.

The Shield Protection Technique for Microvascular Anastomoses

Sir:

The keys to patent microvascular anastomoses are the technical competence of the operating surgeon and his or her assistant.[1] In anastomosis of very small vessels, such as in perforator flaps, additional techniques to increase the procedure's reliability are desirable.[2] Many techniques to improve the overall success rates of microvascular procedures in free flap surgery are available but are based mainly on the application of tubes or stents that require an additional incision for removal of the tube, causing extravascular damage and the additional risk of thrombosis.

We evaluated a microsurgical technique based on a 0.1-mm piece of sterilized tinfoil with a convex and circular form (in the shape of a shield) with an 8-0 or 9-0 microsuture placed in the middle for ease of handling while performing anastomoses. The shield was inserted carefully into the vessel lumen after completion of the first two interrupted sutures (Figs. 1 and 2, *above, left*). The vessel was turned and the posterior wall sutured completely (Fig. 2, *above, right*). The vessel was

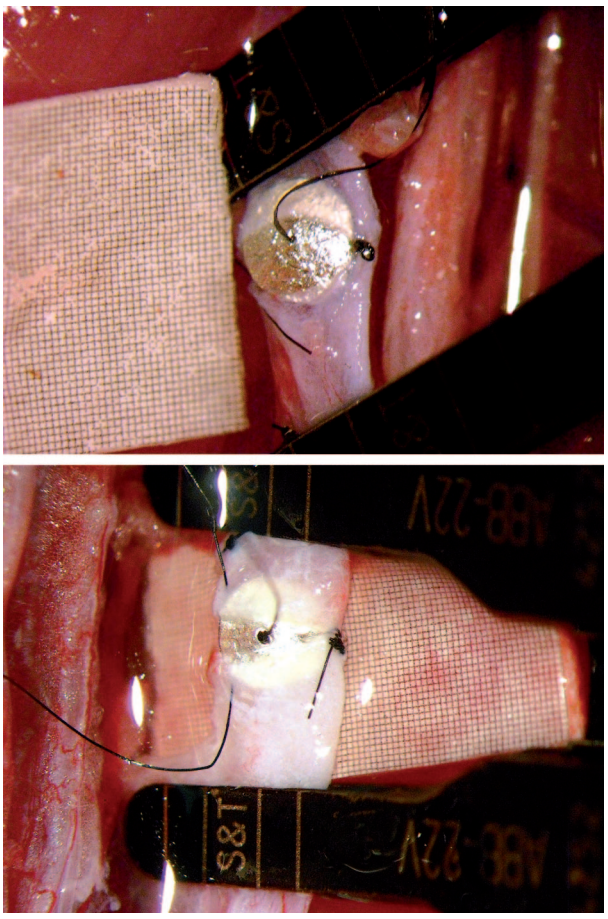

Fig. 1. Insertion of the shield into the lumen of the vessel. (*Above*) Insertion into the inferior cava vein of the rat. (*Below*) Insertion into the aorta.

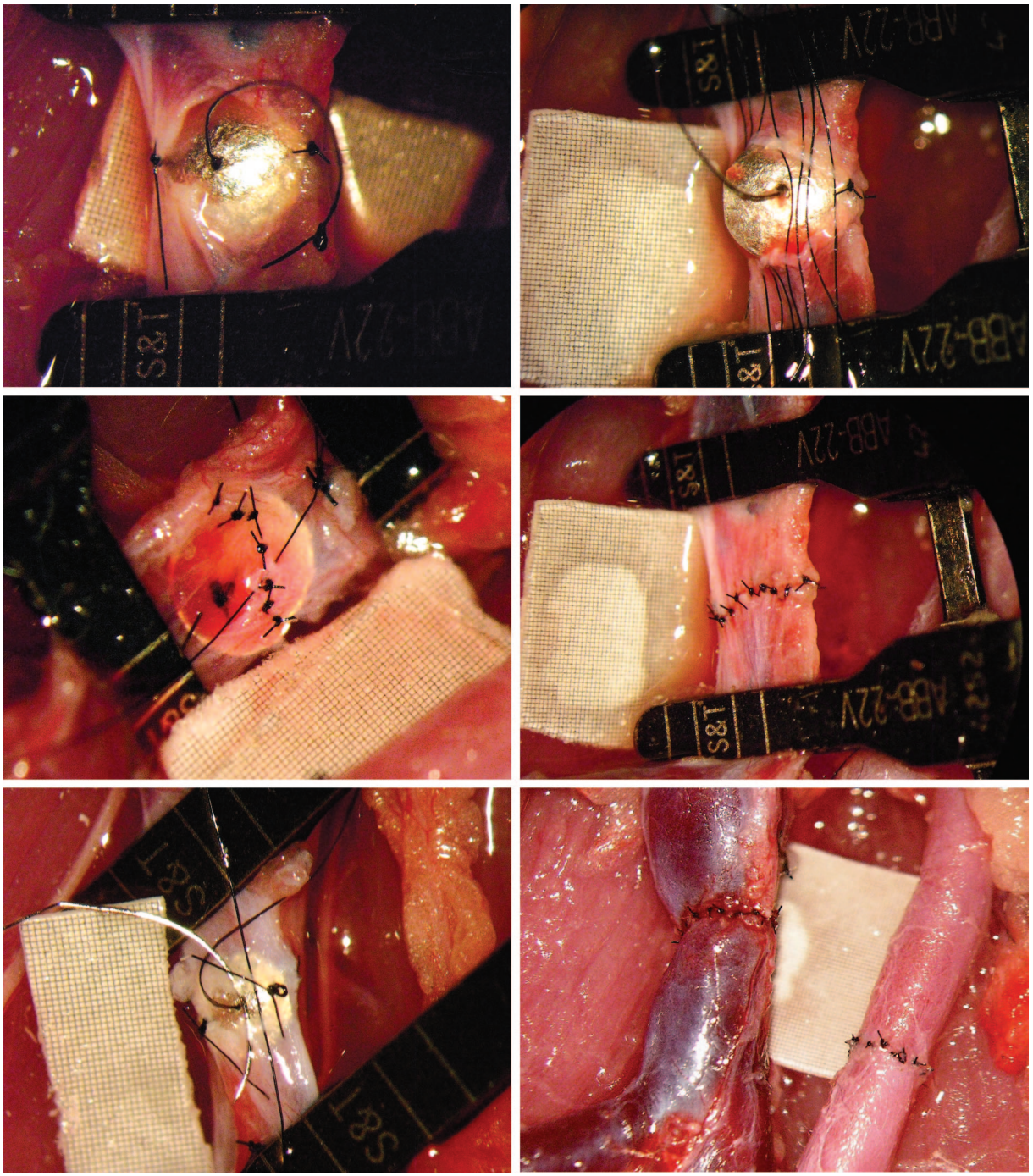

Fig. 2. Anastomosis using the shield protection technique in the inferior cava vein of the rat. (*Above*, *left*) First, two stitches were performed at an angle of 150 to 180 degrees in the vessel. The shield was inserted between the first two stitches. (*Above*, *right*) The inserted shield was then used to avoid suturing the back wall and to dilate the vein. The concavity of the shield allows an overview of the back walls of the vessel. (*Center*, *left*) Starting the front wall of the vein, placing sutures, and leaving. (*Center*, *right*) The open guide sutures were used to allow removal of the inserted shield. The shield was easily removed from the lumen of the vessel. (*Below*, *left*) Completion of the venous anastomosis after the last interrupted sutures were completed. (*Below*, *right*) Both vessels, the aorta and the inferior vena cava, were completed using the shield protection technique.

again turned and the gap in the anterior wall was closed (Fig. 2, *center*, *left*). Finally, the shield was removed through the open sutures, which were then tied (Fig. 2, *center*, *right* and *below*).

The described technique was evaluated in a total of 249 anastomoses in rats, 133 arterial and 116 venous. In 73 arterial anastomoses (54.89 percent) and in 58 venous anastomoses (50 percent), the shield protection technique was used. A total of 25 complications (6.3 percent) were noted in arteries, whereas 54 complications occurred in veins (15.5 percent). There was a significant difference in the rate of complications between arteries and veins ($p < 0.0001$).

The rate of stenoses caused by suturing the back wall was significantly lower by using the shield protection technique in both arteries ($p = 0.02$) and veins ($p < 0.0001$). No difference was noted between the time of anastomosis between the control group and the shield protection technique in arteries ($p = 0.08$) or in veins ($p = 0.71$).

The shield protection technique has been shown to be effective for both arterial and venous anastomoses. There seems to be little reason why this cannot be transferred to clinical cases where small-vessel anastomosis may be particularly difficult.

It is well recognized that venous anastomoses are more challenging to perform than arterial anastomoses and are associated with up to threefold higher rates of complications, something we found in the evaluation comparing the rate of complications between arterial and venous anastomoses.[3] Although successful free-flap transfer and replantation surgery requires more than simply the microvascular anastomoses, it is considered to be the chief culprit behind vascular compromise and is worthy of special attention.[4,5]

We feel that the inserted shield reduced the overall rate of complications in both groups because of improved visual control of the gap between the vessel edges and dilatation of the vessel, and because this procedure makes it more difficult to accidentally pick up the posterior wall with the anterior wall. The most important factor associated with the shield technique might be that less experienced microsurgeons can more easily visualize suturing of the vessels, especially in venous anastomosis.

DOI: 10.1097/PRS.0b013e318217448c

Thomas Mücke, M.D.

Lucas Ritschl
Department of Oral and Maxillofacial Surgery
Technische Universität München
Klinikum Rechts der Isar
München, Germany

David A. Mitchell, F.D.S., F.R.C.S.

Anastasios Kanatas, M.F.D.S., M.R.C.S., Ph.D.
Department of Oral and Maxillofacial Surgery
Oral and Facial Specialties Department
Mid Yorkshire Hospitals NHS Trust
West Yorks, United Kingdom

Klaus-Dietrich Wolff, Ph.D., M.D., D.D.S.
Department of Oral and Maxillofacial Surgery
Technische Universität München
Klinikum Rechts der Isar
München, Germany

Correspondence to Dr. Mücke
Department of Oral and Maxillofacial Surgery
Klinikum Rechts der Isar der Technischen Universität München
Ismaninger Str. 22
81675 München, Germany
th.mucke@gmx.de

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article. No outside funding was required.

REFERENCES

1. Webb WR, Peacock EE Jr. Success of a properly planned surgical procedure is dependent on manual skill. *Ann Surg.* 1980;191:388–390.
2. Kao HK, Chang KP, Wei FC, Cheng MH. Comparison of the medial sural artery perforator flap with the radial forearm flap for head and neck reconstructions. *Plast Reconstr Surg.* 2009; 124:1125–1132.
3. Cobbett J. Small vessel anastomosis: A comparison of suture techniques. *Br J Plast Surg.* 1967;20:16–20.
4. Hayhurst JW, O'Brien BM. An experimental study of microvascular technique, patency rates and related factors. *Br J Plast Surg.* 1975;28:128–132.
5. Khouri RK. Avoiding free flap failure. *Clin Plast Surg.* 1992; 19:773–781.

Micro–Seed Grant Funding for Residents: Fostering Academic Productivity in Plastic Surgery

Sir:

Research productivity of residents during training remains a challenge because of high clinical demands, restricted work hours, and funding constraints. The "Thuss Award" is a yearly research micro–seed grant established in 1989 by the Thuss family to honor the late Dr. Charles J. Thuss, Jr. Two thousand dollars (increased from $1000 in 2007) is awarded through competitive review to a single plastic surgery resident engaged in full-time clinical work to fund a previously unfunded research project. We aim to validate the use of micro–seed grants for resident research in improving resident research productivity.

A list of all previous Thuss Award winners from 1989 through 2006 and all graduating residents from 1989 to 2008 was compiled. Residents' exit curricula vitae on file were inspected for number of peer-reviewed publications. Statistical comparison was performed using unpaired *t* tests.

A questionnaire was developed to quantitatively assess the academic productivity beyond residency of award recipients. We added the number of research grants received, total monetary value of research

grants, and number of faculty positions held to the measures of productivity. Responses were collected from August to October of 2007. Between 1989 and 2008, there were a total of 66 residents completing the plastic surgery program at Stanford. Sixty-three of their curricula vitae were available (95 percent). Between 1989 and 2006, there were 12 one-time and three two-time Thuss Award recipients. The average number of publications by award residents was 6.86 ± 5.46 publications compared with the number by nonaward residents, with 4.93 ± 4.72 publications at the completion of their residency, but this difference was not statistically significant ($p = 0.14$).

For the questionnaire, we received responses from 11 of 15 e-mailed surveys (73 percent). Award winners reported 22.8 ± 25.4 peer-reviewed publications; 5.7 ± 10.5 research grants were received, totaling $1,646,059 ± $4,620,110. Fourteen faculty positions had been held (mean, 1.5; median, 1).

We have found that Thuss Award recipients appeared to have more publications compared with nonaward residents. The academic productivity of past winners of the Thuss Award beyond residency is quite impressive, although a few recipients accounted for the bulk of the productivity. Despite the fact that our analysis relied on self-reporting, there was no control for productivity as a measure of time, and we have no long-term control group of nonaward winners, this information illustrates the continuation of plastic surgery research despite the challenges in the current educational environment.

Grewal et al.[1] found that more scientific publications is a predictive factor for future academic practices, which is supported by the increase in academic productivity of the award recipients and past winners. The Thuss Award has value in encouraging residents to compete for a department-based award and helps to foster an interest in plastic surgery research. Although the award is a relatively small amount, it can help motivate residents to make scholarly contributions and pursue research projects that might not otherwise be funded. Residency programs should consider including seed grant funding as part of their efforts to increase academic productivity among residents.

DOI: 10.1097/PRS.0b013e3182174426

Christina K. Chung, M.D.

Todd A. Richards, M.D., M.B.A.

Gordon K. Lee, M.D.

Division of Plastic and Reconstructive Surgery
Stanford University School of Medicine
Palo Alto, Calif.

Correspondence to Dr. Lee
Division of Plastic and Reconstructive Surgery
Stanford University School of Medicine
770 Welch Road, Suite 400
Palo Alto, Calif. 94304-5715
glee@stanford.edu

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCE

1. Grewal NS, Spoon DB, Kawamoto HK, et al. Predictive factors in identifying subspecialty fellowship applicants who will have academic practices. *Plast Reconstr Surg.* 2008;122:1264–1271; discussion 1272–1273.

Career Steps in German Academic Plastic Surgery

Sir:

Academic plastic surgery is essential for the future of our surgical expertise. However, from a transatlantic perspective, career steps in academic plastic surgery in Germany are substantially different from those in North America.

Depending on the medical university, requirements have been instituted to obtain the next academic degree after medical doctor, the "privatdozent (P.D.)" in Germany, which usually takes approximately 6 to 8 years of publishing. After successful initiation as a privatdozent, one might apply as "professor" 2 to 6 years later, again depending on the performance in terms of publications, research, and education.

On the basis of Humboldt's triad (clinic, research, education), the applicant has to fulfill several requirements which, notably, differ substantially throughout the German medical universities for both privatdozent and professor. We have analyzed the current requirements for obtaining the academic degree privatdozent at German medical universities with plastic surgical departments or subdepartments. To date, among 46 university hospitals in Germany, there are only nine independent plastic reconstructive surgical departments and four additional plastic surgical subdepartments in trauma surgery departments (one plastic surgical university department for each 6.3 million citizens).[1] This analysis revealed that within the past 5 years, 24.8 million was received from federal grants by academic plastic surgical departments in Germany.

Notably, there are no uniform requirements in Germany to obtain the career steps privatdozent or professor. As far as publication requirements for privatdozent are concerned (Table 1), 33 percent of the independent departments and 25 percent of the subdepartments for plastic reconstructive surgery give clear requirements, such as eight or more first authorships, whereas others are not clear in this regard. One university (Aachen) requires a cumulative impact factor of 15, with eight first authorships. Currently, no medical university with a plastic surgical department requests a certain amount of nonindustrial or industrial funding. However, especially nonindustrial funding from the German authorities (German Research Foundation, German Federal Ministry for Education and Research) is key in this regard. As far as education is

Table 1. German University Requirements to Obtain the Academic Degree Privatdozent Based on Habilitation at Nine Independent Departments and Four Subdepartments for Plastic and Reconstructive Surgery

	MEDLINE-Listed Articles Required	Minimal Impact Factor Requested	Education	Thesis	Time Interval from Doctor Thesis
Individual department (W3)					
Hannover	15 (8 first or senior authorships)	Not specified	Regularly, not further specified	Yes	*Fachaxt* (at least 6 yr)
Magdeburg	10	Highest ranked journals	At least 2 yr educational work	Yes	*Fachaxt* (at least 6 yr)
Bochum	Not specified	Not specified	Certificate of successful educational work	Yes	*Fachaxt* (at least 6 yr)
Aachen	Not specified	Cumulative 15 (10 of the last 5 yr, 8 first authorships)	2 yr 2 hr/wk	Yes	*Fachaxt* (at least 6 yr)
Erlangen	Not specified	Not specified	Certificate of successful educational work	Yes	4 yr
Heidelberg	Not specified	Not specified	2 yr plus didactic certificate	Yes	Not specified
Tübingen	15 (10 first authorships)	Not specified	Regular education or didactic certificate	Yes	*Fachaxt* (at least 6 yr)
Freiburg	Not specified	Not specified	Not specified	N/A	Not specified
München TU	Not specified	Not specified	2 hr/wk in 4 yr plus presentation	Yes	Not specified
Subdepartments (W2)					
Regensburg	Not specified	Not specified	2 hr/wk for 1 yr	Yes	Not specified
Lübeck	Not specified	Not specified	Regular education	Yes	*Fachaxt* (at least 6 yr)
Essen	Not specified	Not specified	Regular education, didactic certificate	Yes	Not specified
München LMU	15 (half first authorships)	Not specified	2 yr 2 hr/wk plus didactic workshop (5 days)	Yes	Not specified

N/A, not applicable.

concerned, lectures are requested regularly by all universities. The range of education requires most often 2 to 24 years of continuous education, partly with 2 hours per week. Some universities such as Hannover Medical School have started initiatives to endorse education by programs such as "active in education," a 200-hour program to promote educational techniques. All universities require that a mandatory thesis (*Habilitationsschrift*) accompany the application. As far as the minimum required time interval from doctoral thesis to application for privatdozent is concerned, 54 percent require a completed residency as plastic and aesthetic surgeon, which takes at least 6 years in Germany. In Erlangen, one may apply 4 years after the doctoral thesis during residency, whereas the others are not explicit in this regard.

Thus, given the aforementioned differences in the academic career steps in Germany, one might consider a more uniform career planning in academic plastic surgery in Germany.

DOI: 10.1097/PRS.0b013e3182173fae

Karsten Knobloch, M.D.

Heiko Sorg, M.D.

Peter M. Vogt, M.D., Ph.D.

Plastic, Hand, and Reconstructive Surgery
Hannover Medical School
Hannover, Germany

Correspondence to Dr. Knobloch
Plastic, Hand, and Reconstructive Surgery
Hannover Medical School
Carl-Neuberg-Str. 1
30625 Hannover, Germany
knobloch.karsten@mh-hannover.de

REFERENCE

1. Giunta RE, Machens HG. Science and research in academic plastic surgery in Germany (in German). *Handchir Mikrochir Plast Chir.* 2009;41:359–363.

"Friending" Facebook?

Sir:

Plastic surgery, particularly aesthetics, is a business that requires as much economic acumen as surgical skill to remain financially viable.[1] Given today's intensely competitive cosmetic surgery landscape that has been exacerbated both by uncertified physicians participating in aesthetic rejuvenation and by the country's recent 12 percent decline in cosmetic procedures, aesthetic plastic surgeons and residents in-training face increased pressure to recruit patients to clinics.[2] To this end, many have turned to social media outlets such as Facebook to market themselves through online presence. Although this seems to be a reasonable idea, certain ethical issues are beginning to present themselves, especially from the resident cosmetic clinic angle, that deserve consideration.

To be sure, Facebook creates tremendous value in terms of one's outreach potential, with Microsoft Corp.

(Redmond, Wash.) spending $240 million for a mere 1.6 percent ownership stake.[3] Facebook's unique ability to align seemingly diverse individuals of differing age, sex, profession, sexual orientation, and race for a certain cause or interest enables it to be a powerful marketing tool, from selling plastic surgery CME podcasts to resident tummy tucks. Admittedly, although the majority of residents tended to join Facebook for the social phenomenon (i.e., to reconnect with old friends, keep in touch with current colleagues, and to find new ones when entering a new city), many are capitalizing on the site's business benefits. For example, we now use our Facebook pages to acquire donations for Cents of Relief, a nonprofit organization aiming to provide health care for victims of human trafficking. Others, particularly in academics, can use the site to send out surveys related to research initiatives to assess public opinion on medical or surgical interventions. The uses of Facebook are boundless, making it an almost indispensable tool for all, including plastic surgeons.

To keep a broad base of support, privacy settings cannot be too limited to engage potential supporters or clients for the initiative at hand. Regardless, privacy options tend to be ignored in the medical community, with one study highlighting that among over 300 physicians using Facebook surveyed, 25 percent failed to establish privacy parameters, permitting the public access to personal information.[4] This can permit individuals originally "friended" for solely business purposes intimate access to residents, including viewing their party pictures, asking them on a dinner date, or requesting online cosmetic consultation. Consider the innocuous move of advertising a cleft mission charity gala on Facebook that ends up not only with donors but also cosmetic patients unable to be seen because of overbooked clinics seeking a discounted consultation. Or, drawing from primary author's personal experience, performing a rectal examination on a wheelchair-bound patient only to find out days later the same patient "friending" him on Facebook with a message asking to grab drinks. Dealing with each of these encounters mandates weighing the pros and cons, as the cosmetic patient may turn out to be extremely philanthropic, and the patient whom you decline as a friend may turn into one requiring long-term treatment for nonhealing pressure ulcers.

Physicians and residents must remain cognizant of the ethical issues posed by the intertwining of personal life and professional career on Facebook. The overlap between business and play can jeopardize the doctor-patient relationship. Currently, the American Society of Plastic Surgeons does not regulate board-certified plastic surgeons with regard to using social media outlets, and it may never choose to, as this delves into personal matters. Thus, the onus falls on plastic surgeons and residents to remain very cautious when using Facebook as a business and recruiting tool because of unforeseen consequences stemming from the social realm. If used correctly, Facebook can be a plastic surgeon's friend rather than foe, allowing communication with colleagues, survey-based academic research projects, increased patient volume, and other avenues of the Internet yet to be innovated.[5]

DOI: 10.1097/PRS.0b013e3182173ff8

Anup Patel, M.D., M.B.A.

Niclas Broer, M.D.

Shitel Patel, M.D.

Antonio Forte, M.D.

Devinder Singh, M.D.

Section of Plastic and Reconstructive Surgery
Yale University School of Medicine
New Haven, Conn.

Correspondence to Dr. Anup Patel
Section of Plastic and Reconstructive Surgery
Yale University School of Medicine
New Haven, Conn. 06510
anup.patel@yale.edu

REFERENCES

1. Levin LS. The business of academic plastic surgery. *Plast Reconstr Surg.* 2010;126:303–307.
2. American Society of Plastic Surgeons. Annual National Clearinghouse of Plastic Surgery Statistics. Available at: http://www.plasticsurgery.org. Accessed August 28, 2008.
3. MSNBC. Microsoft invests $240 million in Facebook. Available at: http://www.msnbc.msn.com/id/21458486/. Accessed September 17, 2010.
4. MacDonald J, Sohn S, Ellis P. Privacy, professionalism and Facebook: A dilemma for young doctors. *Med Educ.* 2010;44:805–813.
5. Rohrich RJ, Rosen J, Longaker MT. So you want to be an innovator? *Plast Reconstr Surg.* 2010;126:1107–1109.