

---

# Correspondence and Brief Communications

---

Correspondence and brief communications are welcomed and need not concern only what has been published in this journal. We shall print items of interest to our readers, such as experimental, clinical, and philosophical observations; reports of work in progress; educational notes; and travel accounts relevant to plastic surgery. We reserve the right to edit communications to meet requirements of space and format. Any financial interest relevant to the content of the correspondence must be disclosed. Submission of a letter 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 Letters to the Editor 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 letters.

## **TRANSPLANTATION TOLERANCE AND CHIMERISM: WHAT ARE THEY AND DO WE NEED THEM?**

*Sir:*

Transplantation holds great potential for plastic surgery. It could prove to be the revolution that finally allows us to fulfill Gillies' principle of replacing "like with like." The recent composite tissue allotransplants, using hands, knees, and a larynx, have made this possibility a clinical reality. These procedures have been highly controversial.<sup>1</sup> The majority of criticism to date has focused on the reliance of these transplants on long-term immunosuppression, which potentially exposes the recipients to numerous risks, such as drug toxicity, infections, and even malignancies. Many critics believe that the benefit from the transplant does not outweigh these serious problems. Some have even called the procedures unethical.<sup>2</sup> Proponents of composite tissue allotransplantation, however, have argued strongly that this is not the case. They correctly state that it is not clear yet whether there is serious morbidity from the current protocols.<sup>3</sup> Many patients may be willing to accept the risk of serious harm as a trade-off for the benefit of having hands again or being able to talk. In any case, as reconstructive surgeons, we constantly balance risk against improving quality of life, so it could be argued that there is nothing special about the scenario of hand transplantation. There is no doubt that the morbidity of immunosuppression represents a challenge for the current hand transplants, but there is a more significant issue that could prove to be the real Achilles heel of immunosuppression-based reconstructive transplantation. That problem is chronic rejection.

Chronic rejection is a poorly understood, multifactorial

phenomenon that leads to significant allograft loss with time. Only 50 percent of renal allografts are still functional 10 years after transplantation,<sup>4</sup> and 3 to 5 percent of cardiac allografts are lost each year due to chronic rejection.<sup>5</sup> Unfortunately, although the advent of new immunosuppressants has dramatically reduced allograft loss due to acute rejection, there has been no impact on chronic rejection. In solid organ transplantation, this high level of chronic graft loss is acceptable for several reasons. First, in the face of a failing life-supporting organ, any transplant, even one that works for only 5 years, is better than no transplant. Second, many recipients of solid organ transplants have a chronic disease that will limit their lifespan; a transplant that last 10 years might outlive them. This is not the case in reconstructive transplantation. The current hand transplants are being performed in young patients who have a normal life expectancy. They want a hand that will work for 40 to 50 years, not just 10. The current hand transplants have experienced a high rate of acute rejection.<sup>6</sup> One would predict that these allografts will have a significant incidence of chronic rejection, which may limit their functional lifespan. Unless the problem of chronic rejection can be solved, reconstructive transplantation may not be a valid long-term therapy. Fortunately, there are solutions on the horizon.

Preventing chronic rejection has been one of the main objectives in solid-organ transplant research for many years. One avenue being explored is the removal of all immune reactivity between recipient and donor tissue. Although the cause of chronic rejection is multifactorial, it is known that immune responsiveness is one of the key events. Even the most effective immunosuppressive regimens cannot completely remove antidonor reactivity, hence the high incidence of chronic rejection. However, there is a way to get rid of all immune responsiveness between recipient and donor tissue. This scenario is known as "tolerance," a unique situation in which a recipient does not mount an immune response to the donor tissue but remains responsive to all other stimuli.<sup>7</sup> Tolerance has been generated in experimental animal models for many years. Excitingly, tolerance to renal allografts has also been achieved recently in humans.<sup>8</sup> If a suitable way of inducing tolerance to composite tissue allografts could be found, then the way would be open for the widespread clinical application of reconstructive transplantation.

Numerous ways have been described of achieving tolerance in animal models. All of these diverse protocols aim to manipulate the recipient's immune system so that it recognizes donor tissue as self. There are two main ways of doing this. One involves totally replacing the recipient's immune system with donor cells, so that the immune system is now "donor" and does not respond to the allograft. The other way of achieving tolerance is more subtle and relies on reprogramming, not replacing, the recipient's immune system. Initial studies in experimental animals looked at the replacement approach.<sup>9</sup> These studies mainly used high-dose irradiation to wipe out the recipient's immune system followed by infusion of donor hematopoietic cells to reconstitute the

animal. This led to a state known as chimerism, the presence of donor cells in the recipient. In these animals, because the whole hematopoietic system ended up being donor-derived, the chimerism was termed full chimerism. The introduction of new, more precise immunomodulatory agents allowed the reprogramming approach to be developed.<sup>10</sup> In these studies, the recipient's own immune cells persisted with the donor cells in a state called mixed chimerism. Mixed chimerism has significant advantages over full chimerism. It does not require the toxic conditioning regimens that full chimerism needs for the initial ablation of the recipient's immune system. In full chimerism, the fact that all the immune cells are of donor origin leads to a degree of immunoincompetence. The most significant problem is the risk that the donor cells might attack the recipient and cause graft-versus-host disease. This risk is much higher in full than in mixed chimerism because there are more donor cells around. Chimerism can deliver tolerance, but it comes at a price.

One question that arises from these studies is, do we need chimerism at all to get tolerance? Much of the work in murine models would suggest that high levels of chimerism are required to maintain tolerance. However, these findings do not carry over into large animal studies. Kawai et al.<sup>11</sup> have shown in monkeys that only transient chimerism is required to induce tolerance to renal allografts. This has also been demonstrated in a swine limb allograft model, in which low-level chimerism persisted for only 25 days but the limbs were accepted indefinitely.<sup>12</sup> These experiments suggest that although chimerism may be needed initially to induce tolerance, it may not be required to maintain tolerance. Such a scenario would have many advantages clinically, as the recipients would have no risk of graft-versus-host disease but would still be tolerant. Only time will tell whether the current reconstructive transplants will develop chronic rejection. If they do, the prevention of chronic rejection through tolerance may be the prerequisite for the safe and effective use of transplantation in plastic surgery. Achieving this without the need for long-term chimerism may prove to be the ideal solution.

DOI: 10.1097/01.PRS.0000123577.13397.D6

Shehan Hettiaratchy, M.A., F.R.C.S.  
Department of Plastic and Reconstructive Surgery  
Chelsea and Westminster Hospital  
London, United Kingdom  
shehan\_h@hotmail.com

#### REFERENCES

1. Lee, W. P. A. The debate over hand transplantation. *J. Hand Surg. (Am.)* 27: 757, 2002.
2. Strickland, J. W. Hand transplant: Technology over good sense. *Indiana Hand Center Newslett.* 3: 2, 1999.
3. Breidenbach, W. C., Tobin, G. R., Gorantla, V. S., et al. A position statement in support of hand transplantation. *J. Hand Surg. (Am.)* 27: 760, 2002.
4. Kouwenhoven, E. A., Ijzermans, J. N., and de Bruin, R. W. Etiology and pathophysiology of chronic transplant dysfunction. *Transpl. Int.* 13: 385, 2000.
5. Libby, P., and Poher, J. S. Chronic rejection. *Immunity* 14: 387, 2001.
6. Francois, C. G., Breidenbach, W. C., Maldonado, C., et al. Hand transplantation: Comparison and observations of the first four clinical cases. *Microsurgery* 20: 360, 2000.
7. Rossini, A. A., Dale, G. L., and Mordes, J. P. Induction of immunologic tolerance for transplantation. *Physiol. Rev.* 79: 99, 1999.
8. Buhler, L. H., Spitzer, T. R., and Sykes, M. Induction of kidney allograft tolerance after transient lymphohematopoietic chimerism in patients with multiple myeloma and end-stage renal disease. *Transplantation* 74: 1405, 2002.
9. Ildstad, S. T., and Sachs, D. H. Reconstitution with syngeneic plus allogeneic or xenogeneic bone marrow leads to specific acceptance of allografts or xenografts. *Nature* 307: 168, 1984.
10. Wekerle, T., Kurtz, J., Ito, H., et al. Allogeneic bone marrow transplantation with co-stimulatory blockade induces macrochimerism and tolerance without cytoreductive host treatment. *Nat. Med.* 6: 464, 2000.
11. Kawai, T., Cosmi, A. B., Colvin, R. B., et al. Mixed allogeneic chimerism and renal allograft tolerance in cynomolgus monkeys. *Transplantation* 59: 256, 1995.
12. Bourget, J. L., Mathes, D. W., Nielsen, G. P., et al. Tolerance to musculoskeletal allografts with transient lymphocyte chimerism in miniature swine. *Transplantation* 71: 851, 2001.

#### EARLOBE AGING PROCESS: ELONGATION OF THE FREE CAUDAL SEGMENT

Sir:

We read with great interest the article, "A Morphometric Study of the External Ear: Age- and Sex-Related Differences," by Brucker et al.<sup>1</sup> The authors measured 123 volunteers' ears to decipher various external ear parameters. Of interest was the association of increasing age and increasing ear length, which was specifically attributed to elongation of the earlobe. A similar study was performed in England measuring 206

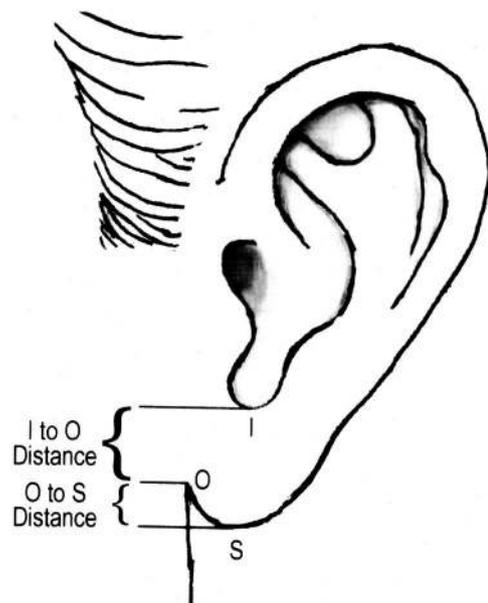


FIG. 1. The anatomical landmarks of the intertragal notch (I), otobasion inferius (O), and subaurale (S) are illustrated. Earlobe height parameters are defined with respect to the attached cephalic segment (I to O distance) and the free caudal segment (O to S distance).

healthy male subjects ranging between 30 and 93 years of age; it demonstrated an increase of 0.22 mm per year in the total ear length.<sup>2</sup> Unfortunately, this report did not consider the differential effect of the earlobe on the total ear length, as Brucker et al. did. Similar interest in this topic prompted us to study the effects of aging on earlobe length by evaluating the profile photographs of 44 patients who were evaluated for facial rejuvenation surgery.<sup>3</sup> We offer a clarification of the authors' conclusion that the earlobe lengthens with increasing age.

We have previously demonstrated that thorough evaluation of the earlobe requires attention to both the free caudal and the attached cephalic segments (Fig. 1).<sup>4</sup> Most recently, we have observed that aging changes of the earlobe result in elongation of the free caudal segment but not the attached cephalic segment.<sup>3</sup> In fact, although the authors<sup>1</sup> did not document this fact, they seem to have observed it based on their illustration of the aging earlobe shape. In conclusion, we urge independent analysis of both the attached cephalic segment as well as the free caudal segment in future reports analyzing earlobe morphology.

DOI: 10.1097/01.PRS.0000123582.81394.B8

*Arian Mowlavi, M.D.  
Bradon J. Wilhelmi, M.D.  
Elwin G. Zook, M.D.  
Plastic Surgery Institute  
Southern Illinois University  
School of Medicine  
Springfield, Ill. 62794-9653*

*Correspondence to Dr. Mowlavi  
Plastic Surgery Institute  
Southern Illinois University  
School of Medicine  
747 North Rutledge Street  
P.O. Box 19653  
Springfield, Ill. 62794-9653*

## REFERENCES

1. Brucker, M. J., Patel, J., and Sullivan, P. K. A morphometric study of the external ear: Age- and sex-related differences. *Plast. Reconstr. Surg.* 112: 647, 2003.
2. Heathcote, J. A. Why do old men have big ears? *Br. Med. J.* 311: 1668, 1995.
3. Mowlavi, A., Meldrum, D. G., Ghavami, A., Wilhelmi, B. J., and Zook, E. G. The aesthetic earlobe: Classification of lobule ptosis on the basis of a survey of North American Caucasians. *Plast. Reconstr. Surg.* 112: 266, 2003.
4. Mowlavi, A., Meldrum, D. G., Wilhelmi, B. J., and Zook, E. G. Incidence of earlobe ptosis and pseudoptosis in patients seeking facial rejuvenation surgery and effects of aging. *Plast. Reconstr. Surg.* 113: 712, 2004.

## MICROGENIA: AN UNUSUAL COMPLICATION OF CESAREAN DELIVERY

*Sir:*

In addition to the increased risks of infectious morbidity, transfusion, and prolonged hospitalization, another well-known but less-reported complication of cesarean delivery is laceration injury of the fetus.<sup>1</sup> Here we present a case report of a patient with microgenia as a result of a submental incision made during cesarean delivery.

A 22-year-old woman was referred to us with a vertical contracting scar in her submental area. She reported a limitation in head extension. She said that the incision in her submental area had occurred during her cesarean delivery, and the scar had contracted as she grew. Obstetricians who consulted with the patient had explained that with this atypical incision, she must have been in face presentation and a mentum anterior position during the cesarean delivery. Physical examination revealed a vertical submental contracting scar that restricted head extension (Fig. 1). There was an osteophyte in her mentum margin where the contracting scar began. She had a normal dental bite, but her mentum was retropositioned. Our operative plan was multiple Z-plasties and genioplasty, but the patient refused to



FIG. 1. Preoperative view of the lesion.

her chin operated on. Thus we only released the contracture band with multiple Z-plasties. While we were operating on the patient, we observed that the contracture band involved the platysma and that there was an osteophyte where the platysma inserted into the mentum. This osteophyte was also removed. The patient was satisfied with the operation.

The rate of cesarean delivery has risen in recent times. Although obstetricians were reporting that fetal lacerations occurred in only 5.9 percent of all cesarean deliveries, pediatricians in attendance for each delivery identified lacerations in 70 percent.<sup>1</sup> Thus fetal laceration injury is the most common complication of cesarean delivery; it is much more common than the other well-known complications, such as infection and transfusion. Laceration injuries occur in both elective and emergency cesarean deliveries. The possible hypothesis that may explain this injury is thinning of the lower segment of the uterus with increased cervical dilatation. Smith et al.<sup>1</sup> found a correlation between nonvertex presentation and fetal injury (6 percent in breech presentation, 1.4 percent in vertex presentation). Our patient was in face presentation and a mentum anterior position, which are indications for cesarean delivery. This position explains the interesting as well as life-threatening localization of the injury. The patient was alive but had an undesirable aesthetic problem, especially for a woman.

Although the decision to perform a cesarean delivery may not be altered by the risk of fetal laceration, many parents may wish to know of this potential complication.

DOI: 10.1097/01.PRS.0000123587.35385.6A

*Naci Karaçal, M.D.*

*Ömer Ambarcıoğlu, M.D.*

*Tagui Mamedov, M.D.*

*Mesut Unsal, M.D.*

*Necmettin Kutlu, M.D.*

*Departments of Plastic and Reconstructive Surgery and Obstetrics  
and Gynecology  
Faculty of Medicine  
Karadeniz Technical University  
Trabzon, Turkey*

*Correspondence to Dr. Karaçal  
Karadeniz Technical University  
Lojmanları 22/1 61080  
Trabzon, Turkey*

#### REFERENCE

1. Smith, J. F., Hernandez, C., and Wax, J. R. Fetal laceration injury at cesarean delivery. *Obstet. Gynecol.* 90: 344, 1997.

#### PORO CARCINOMA?

*Sir:*

An 84-year-old man was referred to our plastic surgery outpatient clinic for a wider excision of a biopsy-proven "poro carcinoma" on the left scapula region (Fig. 1). He had lived with a warty lesion on his back for the last 22 years that had been diagnosed clinically by his general practitioner as a sebaceous wart, but the patient was not keen to have it removed. This wart started to ulcerate and grow significantly during the last 2 months before presentation. An incision biopsy showed the lesion to be a malignant eccrine poroma or "poro carcinoma."

A review of the literature showed that malignant eccrine poroma is a rare type of skin appendageal malignancy, with

fewer than 100 cases reported in the literature. Clinically, it often presents as a verrucous plaque or polypoid growth, which may be ulcerated, and it is easily misdiagnosed as pyogenic granuloma, Bowen's disease, basal cell carcinoma, amelanotic melanoma, or seborrheic keratosis.

Histologically, the tumor lies in both the epidermis and the dermis. The cell of origin is the intraepidermal eccrine sweat gland. It can either arise spontaneously or develop in a long-standing benign eccrine poroma<sup>1</sup> (Fig. 2).

Malignant eccrine poroma has a strong potential to metastasize to the adjacent skin, lymph nodes, viscera, and bone.<sup>2,3</sup> A metastatic rate of up to 50 percent has been reported in the literature.<sup>3</sup>

The treatment for malignant eccrine poroma is wide local excision with negative margins.<sup>2</sup> There is no record in the literature of the recommended margin of excision, which may have an effect on tumor metastasis and patient survival. The treatment of metastatic malignant eccrine poromas is even more complex, and at present there is no established protocol. Many chemotherapeutic regimens have been utilized with only a marginal response. A successful outcome has been reported with the use of melphalan, intraarterial infusion of 5-fluorouracil, and hyperthermia.<sup>4</sup> Radiotherapy is generally not effective. Perilesional injection of interferon-alpha and interleukin-2 has been reported to produce a partial response.<sup>5</sup>

In our patient, a 3-cm margin of excision was chosen based on the aggressive nature of this malignancy and the lack of available guidelines to suggest that a narrower margin would have been safer; the defect was reconstructed with a skin graft. The patient is under close observation and did not develop clinical metastasis for a period of 6 months postoperatively.

We would like to emphasize that a long-standing, innocent-



FIG. 1. An 84-year-old man with a malignant eccrine poroma, or "poro carcinoma," on the left scapula region.

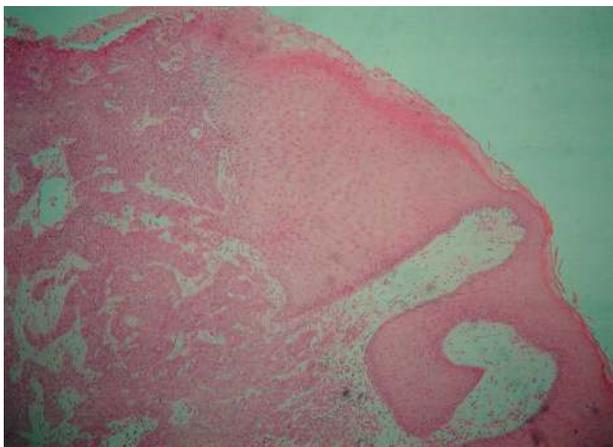


FIG. 2. Malignant eccrine poroma originates in the intra-epidermal eccrine sweat gland. It can either arise spontaneously or develop in a long-standing benign eccrine poroma.

looking seborrheic wart can turn into an aggressive malignant eccrine poroma over the years. The plastic surgeon should be always prepared for the unusual and the unexpected in the outpatient clinic.

DOI: 10.1097/01.PRS.0000123592.61950.F7

*Deemesh Oudit, M.R.C.S.Ed.*

*Mohammed Ellabban, M.Sc., F.R.C.S.I., F.R.C.S.*

*Gunasekar Vuppalapati, M.S., F.R.C.S.Ed., M.Ch.(Plast.)*

*Helen Stringfellow, M.D.*

*Ali Korashi*

*Departments of Plastic and Reconstructive Surgery and  
Histopathology*

*Royal Preston Hospital*

*Preston, United Kingdom*

*Correspondence to Mr. Oudit*

*Department of Plastic and Reconstructive Surgery*

*Royal Preston Hospital*

*Sharoe Green Lane North*

*Fulwood, Preston PR2 9HT*

*United Kingdom*

#### REFERENCES

1. Sahin, M. T., Turel, A., Gunduz, K., Kandiloglu, A. R., and Ozturkcan, S. Malignant eccrine poroma in an unusual location. *J. Eur. Acad. Dermatol. Venereol.* 16: 631, 2002.
2. Erel, E., Tarr, G., Butterworth, M. S., and Butler, P. E. Unusual metastatic spread of a malignant eccrine poroma. *Dermatol. Online J.* 8: 7, 2002.
3. Briscoe, K. E., Grage, T., and Kennedy, B. J. Sustained complete remission of metastatic sweat gland carcinoma following regional hyperthermic perfusion. *J.A.M.A.* 240: 51, 1978.
4. Harari, P. M., Shimm, D. S., Bangert, J. L., et al. The role of radiotherapy in the treatment of malignant sweat gland neoplasms. *Cancer* 65: 1737, 1990.
5. Dummer, R., Becker, J. C., Boser, B., et al. Successful therapy of metastatic eccrine poroma using perilesional interferon-alpha and interleukin-2. *Arch. Dermatol.* 128: 1127, 1992.

#### TRACHEOSTOMY SCAR REVISION USING ACELLULAR DERMAL MATRIX ALLOGRAFT

Sir:

Although a life-saving maneuver, a tracheostomy is invasive and wrought with long-term comorbidities, including pain, decreased neck motion, difficulty swallowing, and unsightly depressed scars. The wound from a tracheostomy is allowed to heal secondarily. As healing proceeds, adhesions may at-



FIG. 1. Preoperative views of a 48-year-old male patient with a depressed tracheostomy defect.



FIG. 2. Suturing of  $4 \times 5\text{-cm}^2$  AlloDerm patch into the tracheostomy defect, using interrupted 3-0 chromic sutures.

tach to the trachea, creating a “tracheal tug” as the patient swallows. AlloDerm (LifeCell Corporation, Branchburg, N.J.) is an acellular graft manufactured to remove the epidermal layer and cellular components of the dermis. This case report demonstrates the correction of a tracheostomy defect with the use of an acellular dermal matrix allograft. AlloDerm was

placed as an interpositional graft to correct the depressed scar and prevent tracheal adhesions to the skin.

A 48-year-old morbidly obese white man underwent a tracheostomy secondary to sleep apnea. Subsequently, a gastric bypass was performed and he lost 134 pounds. The patient’s sleep apnea resolved and the tracheostomy was removed. The patient presented to the office with reports of discomfort with swallowing as well as distress over the depressed scar (Fig. 1). He underwent excision of the previous scar with wide undermining of the skin in all directions, to release the tracheal tugging. AlloDerm was prepared in saline, placed over the defect, and secured in place (Fig. 2). The strap muscles and skin were closed over the AlloDerm. The patient was extremely happy with his surgical results (Fig. 3).

Repair of a tracheostomy defect is often indicated, given the untoward effects. Three main principles guide the repair: excision of the old scar, correction of the depression, and elimination of the tracheal tug. Poulard is credited as being the first to describe correction of depressed tracheal scars.<sup>1</sup> The scarred epithelium was removed and the adjacent skin and subcutaneous tissue were advanced to cover the defect. Although the procedure was pioneering, the tracheal tug persisted. Pressman’s technique uses the sternocleidomastoid muscle to correct the defect.<sup>2</sup> The extended dissection makes this technique somewhat impractical. Kulber and Passy<sup>3</sup> sutured the strap muscles in the midline to correct the deformity. However, fibrosis can limit the amount of muscle available for reconstruction. Vecchione and Pickering<sup>4</sup> proposed a Z-plasty technique using only the subcutaneous tissue. This technique does not always fill the concavity, and the possibility of recurrent tugging exists. Carlson et al.<sup>5</sup> proposed the use of allogeneic dura interposed between the strap muscles and the overlying dermis to prevent the tracheal tug. The risk of disease transmission, as well as stringent standards for storage and reconstitution, makes this graft difficult to use. Yiacomettis and Papadimitriou<sup>6</sup> proposed a platysma flap to correct the tracheostomy scar. Although the authors report no significant rescarring, the potential for adhesions remains.

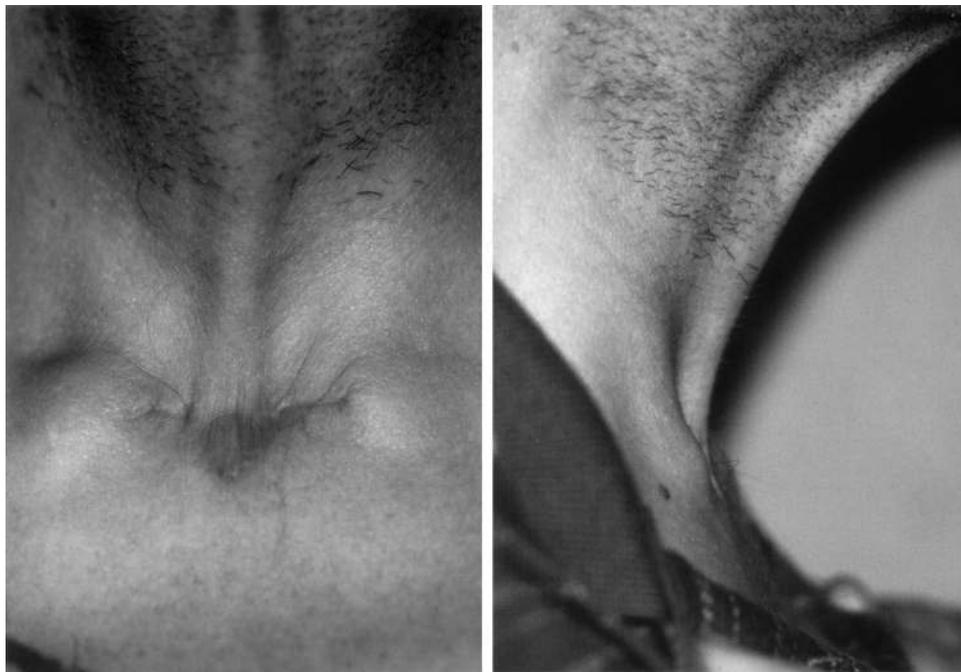


FIG. 3. Thirteen-month postoperative views after surgical correction.

Given the advances in genetically engineered dermal grafts, it is now possible to perform the tracheostomy scar revision easily and effectively, without the need for intricate flaps. Given the inherent risks with use of allogeneic dura obtained by freeze-drying cadaveric dura, genetically engineered tissue may eventually become a less risky and more economical alternative.

DOI: 10.1097/01.PRS.0000123596.81997.2E

*Vu Lu, B.S.  
Melissa A. Johnson, M.D.  
Tufts University School of Medicine  
Baystate Medical Center  
Springfield, Mass.*

*Correspondence to Dr. Johnson  
Division of Plastic Surgery  
Baystate Medical Center  
Suite 309  
2 Medical Center Drive  
Springfield, Mass. 01107  
melissa.johnson@bhs.org*

#### REFERENCES

1. Skigen, A. L., Bedrock, R. D., and Stopperich, P. S. Correction of the depressed, retracted, post-tracheostomy scar. *Plast. Reconstr. Surg.* 103: 1703, 1999.
2. Pressman, J. J. The repair of depressed tracheotomy scars. *Arch. Otolaryngol.* 74: 150, 1961.
3. Kulber, H., and Passy, V. Tracheostomy closure and scar revisions. *Arch. Otolaryngol.* 96: 22, 1972.
4. Vecchione, T. R., and Pickering, P. P. The subcutaneous Z-plasty. *Plast. Reconstr. Surg.* 56: 579, 1975.
5. Carlson, E. R., Marx, R. E., and Jones, G. M. Tracheostomy scar revision using allogeneic dura. *J. Oral Maxillofac. Surg.* 49: 315, 1991.
6. Yiacoymetis, A. M., and Papadimitriou, A. M. Platysma muscle turnover flap correction of tracheostomy scarring deformity. *Br. J. Plast. Surg.* 54: 205, 2001.

#### ENDOSCOPIC BROW LIFT: A RETROSPECTIVE REVIEW OF 628 CONSECUTIVE CASES OVER 5 YEARS

*Sir:*

The observations by Drs. Chiu et al. cannot be denied.<sup>1</sup> The facts clearly state there has been a decline in the number of endoscopic brow lifts performed in their institution. What can be questioned, however, is just what operation they were performing. Nothing in the article was said about the plane of dissection, that is, whether it was subgaleal or subperiosteal. Nothing was said about the release of the periosteum at the orbital rim and the extent of this release. (Did it go from the lower portion of the lateral orbital rims bilaterally?) Nothing was said about the cephalad dissection of the scalp, freeing up the attachments of the frontalis to underlying bone so as to allow it to aid in the elevation, and nothing was said about the type of fixation.

Comment was made, however, about the fact that there was a preponderance of coronal brow lifts being performed by the most senior members of the plastic surgery community. Does this, therefore, make it a more desirable method or simply point out that often it is the younger surgeons who are more

adept at new techniques or are more adaptable to change (youth is the capacity to adapt to change)?

In my personal series of 216 patients, my observations are the opposite of those of the authors! I have found the brow lift to be effective in nearly all cases, and it carries an extremely low complication rate. In evaluating the desirability of surgical procedures using a risk-reward ratio, it would rank as high as or higher than any procedure in my surgical armamentarium.

Because of the disparity in our observations, I am prompted to and shall pursue an in-depth objective review of the long-term results of this procedure in my own practice and report it in this *Journal*. In the meantime, I would urge the readers (and my dear and respected colleagues in the justifiably esteemed Manhattan Eye Ear and Throat Hospital) to review their techniques and see what exactly they mean when they say "endoscopic brow lift" before they dismiss it as a passing fad.

DOI: 10.1097/01.PRS.0000123600.67295.57

*Thomas M. Biggs, M.D.  
1315 St. Joseph Parkway  
Suite 900  
Houston, Texas 77002*

#### REFERENCE

1. Chiu, E. S., and Baker, D. C. Endoscopic brow lift: A retrospective review of 628 consecutive cases over 5 years. *Plast. Reconstr. Surg.* 112: 628, 2003.

#### REPLY

*Sir:*

Our article reports the 5-year trend of endoscopic brow lifts performed at a single medical institution by a number of surgeons varying in age from 30 to 60 years.<sup>1</sup> Any plastic surgeon must draw conclusions based on his or her objective evaluation as well as the patient's satisfaction to determine whether a particular technique is effective. A surgeon who has success with a particular technique will continue to advocate its use. On the contrary, a surgeon who has limited success using the same technique will seek an alternative solution. It appears that there are numerous surgeons at our institution who have elected to abandon the endoscopic brow lift technique altogether. This decision was primarily based on surgeon and patient disappointment with the longevity of the results (often less than 1 year) as well as the frequent request for botulinum toxin type A injections by post-endobrow patients. Our impression from discussions with other surgeons around the country is that this is a common trend.

We agree with Dr. Knize and others that endoscopic brow lift will continue to be performed in the properly selected patient. As the endoscopic brow lift continues to evolve and its results improve, its popularity with our surgical staff may again be endorsed. Ultimately, the type of brow lift technique used does not matter as long as the patient is pleased with the final aesthetic result.

DOI: 10.1097/01.PRS.0000123600.67295.57

*Ernest S. Chiu, M.D.  
Daniel C. Baker, M.D.  
65 East 66th Street  
New York, N.Y. 10021*

## REFERENCE

1. Chiu, E. S., and Baker, D. C. Endoscopic brow lift: A retrospective review of 628 consecutive cases over 5 years. *Plast. Reconstr. Surg.* 112: 628, 2003.

### VACUUM-ASSISTED CLOSURE THERAPY AND ORAL ANTICOAGULATION THERAPY

Sir:

The use of negative pressure to promote wound healing in complex wounds by using the vacuum-assisted wound closure system has increased in popularity in the past decade.<sup>1</sup> There are numerous indications for vacuum therapy, but chronically infected wounds of the lower leg are the most common reason for vacuum treatment. Complication rates reported in the literature are low, with localized superficial skin irritation reported most often. We used vacuum therapy to treat two consecutive patients with infected traumatic wounds on the lower leg; both patients were receiving oral anticoagulation therapy. In both cases, we had to discontinue the vacuum therapy because of excessive bleeding from the wound site (the bleeding even necessitated blood transfusions). We would like to discuss this complication in our two patients.

In case 1, an 88-year-old woman presented 2 weeks after initial trivial trauma with an infected hematoma of the left lower leg measuring 4 to 7 cm. The patient had been taking oral anticoagulation therapy as a result of a cerebrovascular accident. The oral anticoagulation therapy was discontinued and the patient was given oral vitamin K. The infected hematoma was removed in the operating room the next day. Two days postoperatively, a vacuum-assisted closure system (125 mmHg of suction) was installed (Fig. 1). Within 24 hours, the system was occluded (Fig. 2), so it was removed. It was replaced, and again within 24 hours there was a bleeding complication. There were no abnormalities in the wound bed, and the bleeding seemed to be diffuse. The wound was dressed with nonadherent gauze daily, and it healed completely after 2 months.

In case 2, a 92-year-old woman presented with an infected hematoma on her left lower leg, 4 days after initial trauma. The wound was treated primarily with interrupted sutures. Phenprocoumon, which the patient had been taking for a recent case of deep venous thrombosis, was discontinued. After correction of her coagulation status, the necrotic skin area was excised and the hematoma was removed. Due to

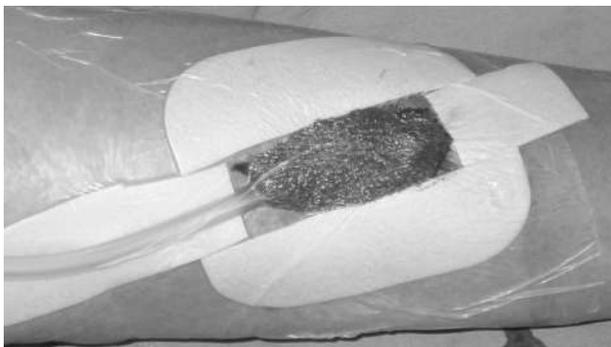


FIG. 1. The wound after installation of the vacuum-assisted closure system.



FIG. 2. The vacuum-assisted closure system is occluded with blood and is no longer functional.

continuous bleeding from the wound site, the patient received a total of 16 units of packed red blood cells.

We decided to treat the wound with a vacuum-assisted closure system (125 mmHg of suction) on the fifth postoperative day. Within 24 hours, the system was occluded with blood and no longer able to vacuum. It was removed and the wound was treated with a pressure bandage for 48 hours; after this, the vacuum-assisted closure system was replaced. The sponge was changed twice a week, and on posttrauma day 24, split-thickness skin grafting was performed. A new vacuum-assisted closure system (75 mmHg of suction) was used to anchor the skin graft. Within 12 hours, there again was a bleeding complication; due to blood clotting, the system could no longer vacuum. The sponge was removed and a pressure bandage was applied. No specific reason for the bleeding could be found in the wound bed. Eventually about 60 percent of the split-thickness skin graft took; the remaining wound granulated well under daily dressing with a nonadherent gauze.

Vacuum-assisted closure therapy is a noninvasive closed system that applies negative pressure to wound tissues.<sup>2</sup> Theoretically, it acts by removing excess tissue fluid from the extravascular space, which lowers capillary afterload and thereby promotes microcirculation during the early stages of inflammation. Vacuum therapy induces increased peripheral blood flow and improved local oxygenation, and it promotes angiogenesis. In addition, it exerts a mechanical force on the tissues and attracts the wound edges centripetally.<sup>3</sup> Indications for vacuum-assisted closure therapy are pressure sores, leg ulcers, wounds with skin defects, and burns; the closure system can also be used as a dressing to anchor a split-thickness skin graft.<sup>4</sup> Complications with the system are few. There is a low incidence of localized superficial skin irritation, and care should be given to patients with easily damaged skin.

In this report, we describe two patients receiving oral anticoagulation therapy whose vacuum therapy had to be discontinued because of excessive bleeding from the wound site. We believe vacuum therapy in patients receiving anticoagulation therapy, even when laboratory results are nor-

mal, could have dangerous complications and should therefore not be used.

DOI: 10.1097/01.PRS.0000123603.32963.11

*Pascal Steenvoorde, M.D., M.A.  
Anneke van Engeland, M.D.  
Jacques Oskam, M.D., Ph.D.  
Department of Surgery  
Rijnland Hospital Leiderdorp  
Leiderdorp, The Netherlands*

*Correspondence to Dr. Steenvoorde  
Department of Surgery  
Rijnland Hospital Leiderdorp  
Simon Smitweg 1  
2353 GA Leiderdorp, The Netherlands*

#### REFERENCES

1. Wanner, M. B., Schwarzl, F., Strub, B., et al. Vacuum-assisted wound closure for cheaper and more comfortable healing of pressure sores: A prospective study. *Scand. J. Plast. Reconstr. Hand Surg.* 37: 28, 2003.
2. Argenta, L. C., and Morykwas, M. J. Vacuum-assisted closure: A new method for wound control and treatment: Clinical experience. *Ann. Plast. Surg.* 38: 563, 1997.
3. Webb, L. X., and Schmidt, U. Wound management with vacuum therapy [in German]. *Unfallchirurg* 104: 918, 2001.
4. Voinchet, V., and Magalon, G. Vacuum assisted closure: Wound healing by negative pressure [in French]. *Ann. Chir. Plast. Esthet.* 41: 583, 1996.

#### A MODIFIED SYRINGE SUCTION DRAINAGE SYSTEM

Sir:

Closed suction drains are frequently used to drain hematomas and seromas after a variety of surgical procedures. Many commercial products have been developed for this purpose, but they are not available in every country or at every health center. Therefore, we describe a simple continuous suction drainage system that consists of a 20-cc disposable plastic syringe, a plastic suction catheter, and the free piston of a 10-cc syringe (Fig. 1).

The proximal end of a plastic suction catheter (14 ch) is cut and multiple holes are made in the distal end of it with fine scissors. The distal end with holes is passed into the surgical wound through a separate stab incision and fixed with a stay suture to the skin. After airtight closure of the surgical wound, the proximal end of the catheter is connected to a 20-cc syringe. The piston of a 10-cc syringe is pulled out and used to obstruct the piston of the 20-cc syringe. The piston of the 20-cc syringe is pulled backward in the syringe to apply a continuous negative pressure. The free piston of the 10-cc syringe is then placed on the 20-cc piston, between the distal ends of the column and the piston (Fig. 2). Thus, the free, 10-cc piston provides continuous negative pressure in the syringe. The two pistons are taped together to secure fixation of the free piston. This drainage system can be strapped to the dressing for the convenience of the patient. When the syringe becomes filled with blood, the distal end of the plastic suction catheter is clamped and detached

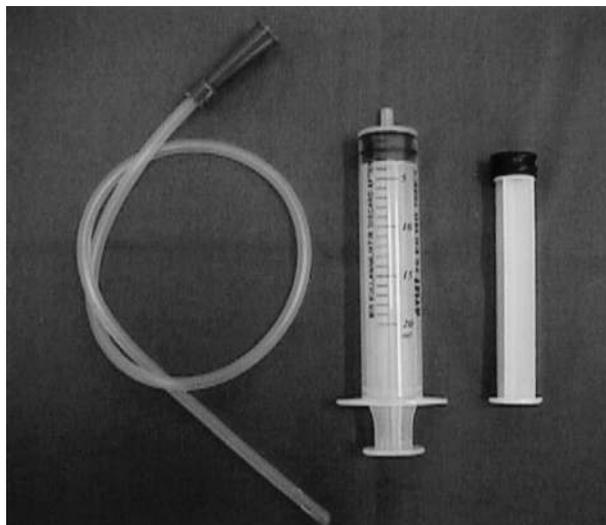


FIG. 1. Equipment for the modified syringe suction drainage system: a 20-cc syringe, a plastic suction catheter, and the piston from a 10-cc syringe.

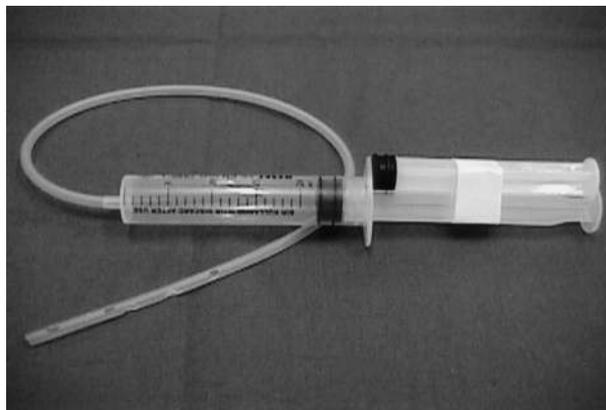


FIG. 2. The modified syringe suction drainage system. The free, 10-cc piston is inserted between the distal ends of the column and the piston of the 20-cc syringe. The two pistons are fixed together with adhesive tape.

from the syringe. The free piston is disconnected from the 20-cc syringe. The syringe is emptied by pushing the piston forward, and then the plastic suction catheter is reattached. If desired, a new 20-cc syringe can be used. The same free piston is affixed again, as described above, to maintain the continuous negative pressure.

Syringe suction drains have been reported by Singh et al.,<sup>1</sup> Borman,<sup>2</sup> and Park et al.<sup>3</sup> The Singh drain requires that a stainless steel spring be especially manufactured beforehand.<sup>1</sup> Therefore, it is not always available at every health center when it is needed. The Borman drain also requires a sterile Angiocath needle, which is broken with a clamp.<sup>2</sup> If the Borman syringe becomes filled with blood, it is not used again. A new syringe and sterile needle are necessary to maintain the suction drainage. Park et al. have used a wooden tongue depressor to obstruct the piston,<sup>3</sup> but the depressor cannot be kept in place for a long time because it is not fixed in place. Therefore, negative pressure cannot be maintained continuously. Our suction drainage system is easily and quickly made from supplies readily available in most oper-

ating rooms. The difference between our drain and other syringe suction drains is its ease of use and practicality. The function of our drainage system was checked with a manometer to establish that it maintains continuous negative pressure. A 20-cc syringe is generally sufficient for small areas, but for moderate areas, a 60-cc syringe can be used. Our device is a simple, sterile, and inexpensive closed suction drainage system that is reliable and effective. We have found it to be extremely useful in all small and moderate-size surgical wounds.

DOI: 10.1097/01.PRS.0000123604.74180.FC

Selçuk Akın, M.D.  
Department of Plastic and Reconstructive Surgery  
Faculty of Medicine  
Uludağ University  
16059, Görükle, Bursa, Turkey  
sakin@uludag.edu.tr

#### REFERENCES

1. Singh, A., Thind, M. S., Mander, K. S., and Singh, G. P. Syringe suction drain. *Br. J. Plast. Surg.* 45: 484, 1992.
2. Borman, H. A simple apparatus for fluid evacuation: Syringe suction drain. *Plast. Reconstr. Surg.* 104: 1939, 1999.
3. Park, D.-H., Song, C.-H., Han, D.-G., Ahn, K.-Y., and Byun, J.-S. A simple negative suction drain for ear reconstruction. *Plast. Reconstr. Surg.* 103: 972, 1999.

#### DEALING WITH A PARTIALLY EXTRUDED SUCTION DRAIN

Sir:

Suction drains are very practical tools in any kind of surgery. One of the more useful is the Jackson-Pratt drain, the tube of which is usually fixed to the skin with one or two stitches. Sometimes (e.g., during a dressing change) the tube is accidentally pulled so that its holes are exposed, causing the vacuum system to fail. In dealing with this situation, one can try to reintroduce the tube, which can be problematic, or as proposed here, one can fix the tube in its new position and apply an angiocatheter in the lumen of the tube up to the cavity to be suctioned.

The tube is cut, leaving a fragment that is 2 to 2.5 cm shorter than the catheter to be used, and secured with adhesive tape (Steri-Strips) or even sutured to the skin. A 16-gauge Abbocath (Abbott, Sligo, Ireland) is then introduced into the lumen of the tube. The metal needle is kept inside it and is pushed until it passes into the skin (Fig. 1). With this maneuver, the openings of the tube that were accidentally exposed are now occluded and the wound is only communicated to the exterior via the catheter. The metal needle is withdrawn and a syringe is connected to the cone of the catheter to suction the fluids from the cavity; after that, the catheter can be closed with a cup (Fig. 2). If there is a large amount of wound fluid, the syringe can be emptied several times a day or a larger one can be used (e.g., 50 ml). When the volume obtained is deemed to be adequate, the catheter-tube system can be easily removed.

When a suction drain has been accidentally pulled out and its openings exposed, causing failure of the vacuum system, we propose that an angiocatheter be introduced into the tube to seal the perforations and allow the connection of a syringe to

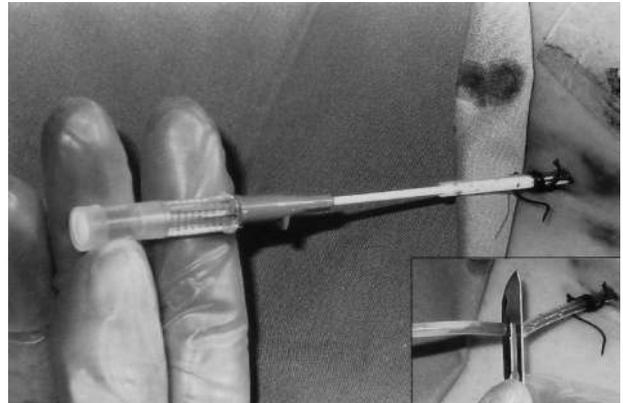


FIG. 1. The tube is cut 2 to 2.5 cm shorter than the catheter (*inset*). The metal needle of the catheter is introduced into the lumen of the tube.



FIG. 2. A syringe is applied to the catheter to suction fluid from the wound. The catheter is closed with a cup (*inset*).

continue suctioning the fluids of the operated area.

DOI: 10.1097/01.PRS.0000123606.77614.2F

José M. Piqueras-Pérez, M.D.  
Germán Ciria-Lloréns, M.D., Ph.D.  
María A. Pérez-Hernández, M.D.  
Miguel P. Bengoechea-Beeby, M.D., Ph.D.  
José L. Pellicer-Artigot, M.D., Ph.D.  
Alfonso Abascal-Zuloaga, M.D., Ph.D.  
Department of Plastic and Reconstructive Surgery  
Río Hortega University Hospital  
Valladolid, Spain

Correspondence to Dr. Piqueras-Pérez  
Consulta de Cirugía Plástica  
Hospital Universitario Río Hortega  
Rondilla de Santa Teresa, 9  
47010 Valladolid, Spain

#### MICROTIA AND PECTORALIS MUSCLE AGENESIS

Sir:

A 6-year old boy with a small right ear was seen in our clinic in 1999. He had normal birth weight, 46XY genotype, and normal male phenotype. He was born the third child of unre-



FIG. 1. (Left) Postoperative view of right unilateral microtia of the patient. (Center) View of the patient's right pectoralis muscle deficiency. (Right) Left lateral view.

lated parents after an uncomplicated pregnancy. His brothers did not have any anomalies.

On examination he was found to have right ipsilateral microtia and pectoralis muscle deficiency. He was undergrown compared with his age group (below the third percentile). These anomalies did not belong to any syndrome.

The patient was operated on under general anesthesia. His right sixth, seventh, and eighth ribs were harvested to create an ear framework. This framework was inserted in a skin pocket on the postauricular region. A Minivac drain was withdrawn on the sixth postoperative day. No postoperative complications were observed. He was discharged and followed up for the second operation (Fig. 1).

Microtia occurs in newborn infants with a population frequency of 0.03 percent. About half of these cases are isolated malformations; the remainder occur in association with other anomalies. Melnick and Myrianthopoulos<sup>1</sup> described mandibular hypoplasia, epibulbar dermoids, and their association with cervical vertebrae anomalies such as oculoauriculovertebral dysplasia, Goldenhar syndrome, and hemifacial microsomia. Microtia is a common anomaly in these situations. Kaye et al.,<sup>2</sup> in their statistical analysis of microtia and associated anomalies, demonstrated that there is a positive association with ipsilateral microtia, mandibular hypoplasia, and cervical vertebrae anomalies. They did not mention the pectoralis muscle deficiency. König et al.<sup>3</sup> presented a 2-week-old male patient who had ear anomalies associated with the mandibula and the cardiovascular, skeletal, and gastrointestinal systems. They reported that there was a considerable overlap between the clinical features of the patient and O.D. Townes-Brocks syndrome. Hersh et al.<sup>4</sup> published a case of Michel's anomaly associated with type I microtia and microdontia. Cohen et al.<sup>5</sup> advanced that short stature with microtia was a new syndrome. They demonstrated the skeletal anomalies (dislocation in the elbow, abnormally shaped glenoid fossa, hook-shaped clavicle, clinodactyly) associated with microtia. Hurst et al.<sup>6</sup> reported a new syndrome that included the anomalies malformed ears, craniosynostosis, and short stature.

Wilson et al.<sup>7</sup> showed that Poland syndrome, which was described by Poland in 1841, might have different expressions. They studied 20 patients with Poland syndrome and reported that pectoralis muscle deficiency and hand anomalies have different variations, but no ear anomaly was described.

As we could find no syndrome or case report in the literature describing an association between microtia and pectoralis muscle deficiency, this case is thought to be a different microtia case report. Our experience from this case suggests that close attention should be paid to other systemic anomalies when examining a patient with microtia.

DOI: 10.1097/01.PRS.0000123609.01414.D0

Meltem Çilingir, M.D.

Cabbar Malkoç, M.D.

Ali Duman, M.D.

Sinem Eroğlu, M.D.

Naci Karacaoglan, M.D.

Department of Plastic and Reconstructive Surgery  
Haydarpaşa Numune Teaching Hospital  
Istanbul, Turkey

Correspondence to Dr. Çilingir

Hattat Bahattin sokak Günen

Apt. No. 19/4 Göztepe

Istanbul, Turkey

#### REFERENCES

1. Melnick, M., and Myrianthopoulos, N. C. *External Ear Malformations: Epidemiology, Genetics and Natural History*. New York: Alan R. Liss, 1979.
2. Kaye, C. I., Rollnick, B. R., Hauck, W. W., Martin, A. O., Richtsmeier, J. T., and Nagatoshi, K. Microtia and associated anomalies: Statistical analysis. *Am. J. Genet.* 34: 574, 1989.

3. König, R., Schick, U., and Fuchs, S. Townes-Brocks syndrome. *Eur. J. Pediatr.* 150: 100, 1990.
4. Hersh, J. H., Ganzel, T. M., and Fellows, R. A. Michel's anomaly, type I microtia and microdontia. *Ear Nose Throat J.* 70: 155, 1991.
5. Cohen, B. I., Temple, K. I., and Symons, J. C. Microtia and short stature: A new syndrome. *J. Med. Genet.* 28: 786, 1991.
6. Hurst, J. A., Winter, R. M., and Baraitser, M. Distinctive syndrome of short stature, craniosynostosis, skeletal changes and malformed ears. *Am. J. Med. Genet.* 29: 107, 1988.
7. Wilson, M. R., Louis, D. S., and Stevenson, T. R. Poland's syndrome: Variable expression and associated anomalies. *J. Hand Surg. (Am.)* 13: 880, 1988.

### THE USE OF BOTULINUM TOXIN IN TREATING A TWITCHING TRAM FLAP

Sir:

Muscular spasms as a consequence of reconstructive breast surgery are uncommon. Severe cases are often treated by surgical denervation. We describe a case of muscular spasms following a pedicled transverse rectus abdominis musculocutaneous (TRAM) flap that was successfully diagnosed and treated with botulinum toxin.

A 62-year-old woman with lobular carcinoma underwent a skin-sparing mastectomy and axillary clearance with immediate pedicled TRAM flap reconstruction at a different hospital. Histological analysis revealed a 4-cm grade 2 invasive lobular carcinoma reaching the deep margin, and six of 11 lymph nodes were positive. She received a course of postoperative radiotherapy.

Three years later she presented to our clinic with a 2-year history of painful spasms in her epigastrium that radiated to her reconstructed breast and axilla. These spasms occurred spontaneously up to 10 times per day and were exacerbated by coughing, sneezing, and certain postures, such as standing up from a chair. The pain was not relieved with analgesia but was partly alleviated by pressing on the epigastrium. These symptoms were causing her such distress that she requested removal of the flap.

On examination, a moderate epigastric bulge was easily palpable, and raising a straight leg caused epigastric pain to radiate to her left upper chest wall.

A trial of botulinum toxin (Botox, Allergan, Inc., Irvine, Calif.) was initiated as a diagnostic and potentially therapeutic procedure. A nerve stimulator was used to identify the point of maximum contraction within the rectus muscle, and this site was injected with 100 units of Botox. The painful spasms the patient previously experienced ceased completely within 1 week of the injection. The patient was not keen on further injections of Botox, so for definitive management she has been scheduled for elective denervation and debulking of the muscle flap pedicle.

Carruthers first described botulinum toxin for the treatment of strabismus in 1980. Since Food and Drug Administration approval in 1989, its licensed indications now include various forms of dystonia, hemifacial spasms, spasticity, and other neurological conditions.<sup>1</sup> Recently Botox has been used to treat spasmodic latissimus dorsi flaps.<sup>2</sup> It has also been used recently in the management of pectoral spasm after subpectoral breast implant insertion.<sup>3</sup> As far as we are aware, this is the first reported case of spasms related to a pedicled TRAM

flap that were treated and resolved with the use of Botox.  
DOI: 10.1097/01.PRS.0000123612.77138.25

Helena van Dam, M.B.B.Ch., M.R.C.S.  
Charles Nduka, M.A., M.D., M.R.C.S.  
Nigel Carver, F.R.C.S., F.R.C.S.(Plast.)  
Department of Plastic Surgery  
The Royal London Hospital  
Whitechapel, London  
United Kingdom

Correspondence to Ms. van Dam  
Department of Plastic Surgery  
The Royal London Hospital  
Whitechapel, London E1 1BB  
United Kingdom

### REFERENCES

1. Sommer, B., and Sattler, G. (Eds.). History of the clinical use of botulinum toxin type A. In *Botulinum Toxin in Aesthetic Medicine*. Vienna: 2001. Pp. 1-5.
2. Schwartz, M. S., Wren, D. R., and Filshie, J. Neuromyotonia in a muscle flap producing a convulsing breast: Successful treatment with botulinum toxin. *Mov. Disord.* 13: 188, 1998.
3. Senior, M. A., and Fourie, L. R. Botox and the management of pectoral spasm after subpectoral implant insertion. *Plast. Reconstr. Surg.* 106: 224, 2000 (erratum published in *Plast. Reconstr. Surg.* 106: 1447, 2000).

### DERMAL SUBSTITUTE (INTEGRA) FOR OPEN NASAL WOUNDS

Sir:

Nasal wounds after cancer resection have traditionally been covered with local flaps or skin grafts. When bone or cartilage is exposed, the coverage is complicated by a recipient bed that may prohibit the use of skin grafting.<sup>1-3</sup> Dermal substitute (Integra) is a tissue-engineered skin substitute with the capability of revascularization that gives an alternative to autografting. Integra takes over avascular structures to create a graftable tissue bed and adds thickness to wounds to avoid depression deformities.<sup>4,5</sup> We present three cases of successful Integra coverage of nasal wounds with exposed cartilage following skin cancer resection.

In case 1, a 41-year-old woman had a basal cell carcinoma excised from the nose. She was previously healthy except for a basal cell carcinoma excision from the nose 3 years earlier followed by external beam radiation to the nose. On examination, she had several ulcers over the nose with some radiation dermatitis over previously irradiated skin. She underwent Mohs surgery, which left a 3-cm open wound over the dorsal and anterior surfaces of the nose with exposed cartilage. The defect was covered with Integra (Fig. 1), which revascularized over a 3-week period (Fig. 2). Final split-thickness skin grafting over the Integra was completed at 4 weeks, and the patient achieved a satisfactory aesthetic result at 6 months (Fig. 3).

In case 2, a 56-year-old man with melanoma of the nose underwent excision with wide margins. A 4-cm defect with exposed cartilage was covered with Integra. Final coverage over the dermal substitute with a split-thickness skin graft was performed at 5 weeks, with excellent results at 8 months.



FIG. 1. Dermal substitute (Integra) covering large nasal defect after basal cell carcinoma excision.



FIG. 2. Dermal substitute at 3 weeks with revascularization.



FIG. 3. Split-thickness graft at 6 months.

In case 3, a 74-year-old man had a large basal cell carcinoma excised from his nose, which left a 3-cm open wound with exposed cartilage. He underwent Integra coverage and

refused final skin grafting. The dermal substitute reepithelialized with good aesthetic results at 6 months.

All three patients underwent disfiguring nasal resections with exposed cartilage. They all underwent dermal substitute (Integra) placement as outpatients with eventual final coverage with a split-thickness graft, except for the patient in case 3. All three patients had an excellent healing process and a satisfactory final aesthetic appearance.

Dermal substitute (Integra) is a bioengineered material made of an underlying bovine collagen and glycosaminoglycan layer that is in direct contact with the patient's tissue and an overlying layer of silicone, which is removed at the time of final wound closure. The external silicone layer functions as the epidermis and forms a seal below the more vulnerable collagenous layer to help prevent infection and dehydration.<sup>1,5</sup> Integra is used effectively in major burns and is approved by the Food and Drug Administration for the treatment of burns.<sup>2,4</sup>

Integra, although used extensively for wound closure in burns, has not been widely studied for the closure of other types of wounds, such as chronic ulcers and surgically excised wounds.<sup>1-3,6</sup> Dermal substitute allows for an alternative to other forms of grafting, helps in the revascularization of previously avascular tissues, thereby allowing improved grafting capabilities, and decreases the tissue defect by preventing depression deformities. This review not only reports the successful use of dermal substitute in surgically created wounds but also challenges its use in other applications in which there are avascular structures such as tendon and bone.

DOI: 10.1097/01.PRS.0000123614.73743.4D

*Neri M. Blanco, M.D.  
James Edwards, M.D.  
William A. Zamboni, M.D.  
Department of Surgery  
Division of Plastic Surgery  
University of Nevada School of Medicine  
Las Vegas, Nev.*

*Correspondence to Dr. Zamboni  
Department of Surgery  
Division of Plastic Surgery  
University of Nevada School of Medicine  
2040 West Charleston Boulevard  
Las Vegas, Nev. 89102*

#### REFERENCES

1. Bello, Y. M., and Falabella, A. F. Use of skin substitutes in dermatology. *Dermatol. Clin.* 19: 555, 2001.
2. Ramzy, P. I., Barret, J. P., and Herndon, D. N. Thermal injury. *Crit. Care Clin.* 15: 333, 1999.
3. Boyce, S., Kagan, R., Yakuboff, K. P., et al. Cultured skin substitutes reduce donor skin harvesting for closure of excised, full-thickness burns. *Ann. Surg.* 235: 269, 2002.
4. Valencia, I. C., Falabella, A. F., and Eaglstein, W. H. Skin grafting. *Dermatol. Clin.* 18: 521, 2000.
5. Dantzer, E., and Braye, F. M. Reconstructive surgery using an artificial dermis (Integra): Results with 39 grafts. *Br. J. Plast. Surg.* 54: 659, 2001.
6. King, P. Artificial skin reduces nutritional requirements in a severely burned child. *Burns* 26: 501, 2000.

### NIPPLE-AREOLA COMPLEX AUTONOMIZATION AND DELAYED NIPPLE-SPARING SUBCUTANEOUS MASTECTOMY

Sir:

This is a short report of a very intriguing approach to the problem of nipple-areola complex viability, whenever the whole breast has to be removed (for infectious or oncologic purposes)<sup>1-5</sup> without hampering vascularization of the nipple-areola complex.<sup>6</sup> We suggest a two-step strategy: the first step can be performed as an outpatient procedure with tumescent anesthesia of the nipple-areola skin and subcutaneous fat. With a very small stab incision, we introduce laparoscopic electrified scissors and detach the nipple-areola complex from the breast galactophoric stalk with careful hemostasis (Fig. 1, *above, left*); collagen fleece is stratified between the cut surfaces to block any further vascular supply from the breast tissue. The vascular network of the nipple-areola complex is therefore maintained only by dermal and subcutaneous vessels.

Four weeks later, with the patient under further tumescent anesthesia, we remove the entire breast, within its capsule, without any risk of nipple-areola complex viability; we perform four random biopsies in the fat of each quadrant to ensure that no gland remnant has been left behind. The nipple can also be slide-smeared from underneath, or a disk biopsy can be performed with a knife to check for cell atypia (Fig. 1, *above, right, and below, left*).

A prosthesis can be now inserted under the pectoralis muscle. The dermal pedicle can be used to raise the nipple

if mastopexy is required. We have performed 10 of these procedures now without any damage to the nipple-areola complex, except in our very first case, in which we had a heat injury to part of the areola due to the learning experience. Sensitivity and erection are usually preserved (Fig. 1, *below, right*). We suggest this method for whenever complete subcutaneous mastectomy has to be performed for preventive oncologic reasons, without the psychological impact of nipple removal.

DOI: 10.1097/01.PRS.0000123617.67600.41

*Beniamino Palmieri, M.D.*

*Giorgia Benuzzi, M.Biol.*

*Simone Grappolini, M.D.*

*Alberto Costa, M.D.*

*George Baitchev, M.D.*

*Department of General Surgery and Surgical Specialty*

*University of Modena and Reggio Emilia*

*Surgical Clinics*

*Modena, Italy*

*Correspondence to Prof. Palmieri*

*Department of General Surgery and Surgical Specialty*

*University of Modena and Reggio Emilia*

*Surgical Clinics*

*Via del Pozzo, 71*

*41100 Modena, Italy*

*palmieri@unimo.it*

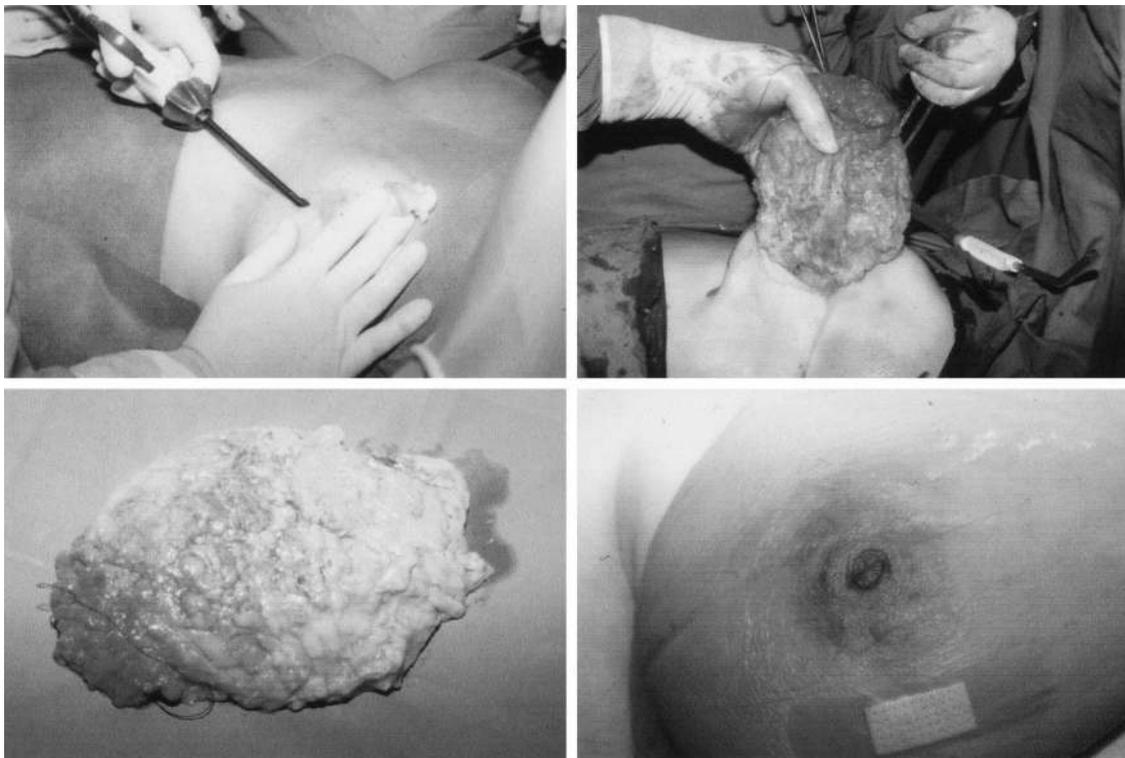


FIG. 1. Vascular network coagulation and galactophore stalk dissection: (*above, left*) the skin of the nipple-areola complex is cooled with sponges soaked in ice water; (*above, right*) the whole breast is removed via the incision at the end of the deep dissection; (*below, left*) appearance of the gross specimen: no capsule damage can be seen; (*below, right*) outcome of nipple-areola complex autonomization.

## REFERENCES

1. Klijn, J. G., Janin, N., Cortes-Funes, H., and Colomer, R. Should prophylactic surgery be used in women with a high risk of breast cancer? *Eur. J. Cancer* 33: 2149, 1997.
2. Hartmann, L. C., Schaid, D. J., Woods, J. E., et al. Efficacy of bilateral prophylactic mastectomy in women with a family history of breast cancer. *N. Engl. J. Med.* 340: 77, 1999.
3. Josephson, U., Wickman, M., and Sandelin, K. Initial experiences of women from hereditary breast cancer families after bilateral prophylactic mastectomy: A retrospective study. *Eur. J. Surg. Oncol.* 26: 351, 2000.
4. Meijers-Heijboer, H., van Geel, B., van Putten, W. L., et al. Breast cancer after prophylactic bilateral mastectomy in women with a *BRCA1* or *BRCA2* mutation. *N. Engl. J. Med.* 345: 159, 2001.
5. Metcalfe, K. A., Goel, V., Lickley, L., Semple, J., and Narod, S. A. Prophylactic bilateral mastectomy: Patterns of practice. *Cancer* 95: 236, 2002.
6. Nakajima, H., Imanishi, N., and Aiso, S. Arterial anatomy of the nipple-areola complex. *Plast. Reconstr. Surg.* 96: 843, 1995.

#### DE NOVO MALIGNANT ECCRINE POROMA OF THE NOSE: A REVIEW OF THE MIDFACE AS A LOCATION

Sir:

Malignant eccrine poroma is a rare skin appendage tumor that originates from the intraepidermal portion of the eccrine sweat ducts.<sup>1</sup> Pinkus and Mehregan<sup>2</sup> described the first definitive case with multiple epidermotropic metastases. The most common sites for malignant eccrine poroma are the lower extremity, trunk, and head.<sup>3,4</sup> We present a case of malignant eccrine spiradenoma that arose de novo on the nose.

A 75-year-old man presented with an ulcerating, bleeding tumor at the left ala nasi. He had a 3-year history of a slowly enlarging tumor that occurred de novo. Macroscopic evaluation revealed a 1.5-cm-diameter, round, centrally ulcerated and peripherally scarred lesion (Fig. 1). His skin was also sebaceous. No regional lymph node was palpated. With the



FIG. 1. Preoperative view of malignant eccrine poroma located on the ala nasi.

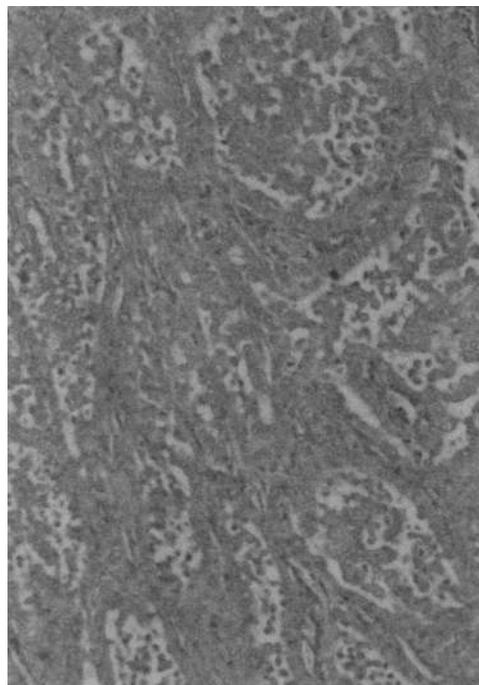


FIG. 2. Histopathologic view of hematoxylin and eosin stain under light microscope (100 $\times$  magnification).

patient under local anesthesia, the lesion was excised with a 1-cm margin; lower lateral cartilage was left intact. Frozen section analysis revealed tumor-positive surgical sites, so a wider reexcision was performed to remove lower lateral cartilage. The nasal mucosa was left intact. The final defect (6 cm in diameter) was reconstructed with a tailored cheek advancement flap. Histopathologic analysis showed that the tumor cells were strongly periodic acid-Schiff–positive and stained immunohistochemically. Tumor cells continued into the epidermis, with infiltration enlarging as large anastomosing bands into the reticular dermis. The cells were polygonal, with eosinophilic cytoplasm and a pleomorphic nucleus (Fig. 2). At the 12-month follow-up, there was no sign of recurrence (Fig. 3).

More than 100 cases of malignant eccrine poroma have been reported in the literature<sup>5</sup> since it was first described. Labels such as malignant hydroacanthoma simplex, eccrine porocarcinoma, and poroepithelioma correspond to the same tumor.<sup>6</sup> Malignant eccrine poroma may arise de novo or in a long-standing eccrine poroma,<sup>3,7</sup> and it often presents a verrucous plaque that may be ulcerated.<sup>6</sup> The age distribution varies between 19 and 94 years.<sup>8</sup> In the head and neck region, the ear, cheek, and nose have been sites of tumor localization. In a review study of 60 cases, the nose was affected in only one case (1.67 percent).<sup>4</sup> Similarly, in another study, the nose was affected in one case.<sup>9</sup> On the other hand, Moore et al.<sup>10</sup> reported that head and neck poromas, which occasionally are the preexisting lesions of malignant eccrine poroma, were usually asymptomatic and never correctly diagnosed clinically. A review of the literature proves that the face is not a primary predilection site for malignant eccrine poroma, and the nose is a rare site in the face.

Sebaceous skin is a challenge because of both the assertion that sebaceous adenomas are really carcinomas and the dif-

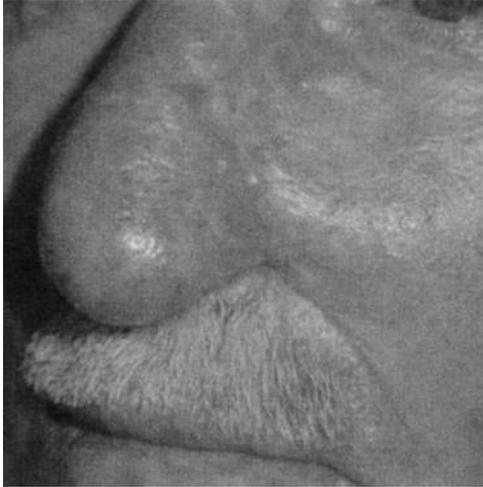


FIG. 3. Appearance of the patient 12 months postoperatively.

difficulties in drawing boundaries between sebaceomas and other lesions, including apocrine poroma with sebaceous differentiation.<sup>11</sup> In differential diagnoses, different immunohistochemical studies have been investigated. In an angiotensin receptor study, expression of angiotensin type 1 receptors, rather than type 2 receptors, was reported to be useful in the histopathologic analysis of malignant eccrine poroma.<sup>12</sup> However, in a P53 protein expression study, the P53 gene was reported to be involved in the carcinogenic pathway of porocarcinoma.<sup>13</sup> In the evaluation of genetic changes, although p53 protein stabilization and allelic loss were noted, the low frequencies of alterations in sweat gland carcinomas might be explained in part by the relative protection of cutaneous appendages from ultraviolet light and other environmental mutagens.<sup>14</sup>

In the management of sweat gland tumors, surgery is the first choice.<sup>15</sup> Because malignant eccrine poroma presents an “infiltrative” advancing margin and is prone to local recurrence, wide excision with close attention to the surgical margins by the reporting pathologist is of great importance. Regional lymphadenectomy, if clinically indicated, might also be performed.<sup>8,16</sup> In addition, Mohs micrographic surgery has also been reported with successful outcomes.<sup>17,18</sup> Although metastatic eccrine porocarcinoma has proven to be resistant to many chemotherapeutic agents, there is a report of the successful use of docetaxel.<sup>19</sup> On the other hand, a chemotherapy protocol consisting of isotretinoin and interferon-alpha has been reported to confirm the advantages of polychemotherapy in the treatment of metastatic malignant eccrine poroma.<sup>20</sup> Similarly, the use of interferon-alfa-2a has been reported to stop the progression of the malignant eccrine poroma.<sup>21</sup> The prognosis may vary and includes local recurrence, lymph node metastases, distant metastases, and death.<sup>3</sup> The clinical course may be more aggressive if there are more than 14 mitoses per high-power field, there is lymphovascular invasion, and tumor depth is greater than 7 mm.<sup>3</sup>

In conclusion, malignant eccrine poroma is a rare neoplasm with a wide variety of clinical courses. The head and neck region is relatively less frequently affected, and the nose is not a predilection site. In the treatment of a malignant eccrine poroma located in the nose, wide excision of the

tumor, to prevent local recurrence, may contribute to a disease-free life.

DOI: 10.1097/01.PRS.0000123619.69284.85

Emrah Arslan, M.D.

Canten Tatar, M.D.

Alper Aksoy, M.D.

Necmettin Tutuncu, M.D.

Departments of Plastic and Reconstructive Surgery and Pathology  
Mersin University Medical Faculty  
Mersin, Turkey

Correspondence to Dr. Arslan

12000 Fairhill Road, No. 302

Cleveland, Ohio 44120

arslane@ccf.org

#### REFERENCES

1. Wick, M. R., and Coffin, M. C. Adnexal carcinomas of the skin: I. Eccrine carcinomas. *Cancer* 56: 1147, 1985.
2. Pinkus, H., and Mehregan, A. H. Epidermotropic eccrine carcinoma. *Arch. Dermatol.* 88: 597, 1963.
3. Robson, A., Greene, J., Ansari, N., et al. Eccrine porocarcinoma (malignant eccrine poroma): A clinicopathologic study of 69 cases. *Am. J. Surg. Pathol.* 25: 710, 2001.
4. Urso, C., Bondi, R., Paglierani, M., Salvadori, A., Anichini, C., and Giannini, A. Carcinomas of sweat glands: Report of 60 cases. *Arch. Pathol. Lab. Med.* 125: 498, 2001.
5. Erel, E., Tarr, G., Butterworth, M. S., and Butler, P. E. M. Unusual metastatic spread of a malignant eccrine poroma. *Dermatol. Online J.* 8: 7, 2002.
6. Sahin, M. T., Turel, A., Gunduz, K., Kandiloglu, A. R., and Ozturkcan, S. Malignant eccrine poroma in an unusual location. *J. Eur. Acad. Dermatol. Venereol.* 16: 631, 2002.
7. Holden, B., Colome-Grimmer, M., Savage, C., Stierman, K., and Pou, A. M. Malignant eccrine acrospiroma with metastasis to the parotid. *Ear Nose Throat J.* 81: 352, 2002.
8. Goedde, T. A., Bumpers, H., Fiscella, J., et al. Eccrine porocarcinoma. *J. Surg. Oncol.* 55: 261, 1994.
9. Labbe, D., Harbon, S., Domp Martin, A., Mandard, J. C., Leroy, D., and Compere, J. F. Malignant eccrine poroma: Apropos of 2 facial sites [in French]. *Ann. Chir. Plast. Esthet.* 34: 146, 1989.
10. Moore, T. O., Orman, H. L., Orman, S. K., and Helm, K. F. Poromas of the head and neck. *J. Am. Acad. Dermatol.* 44: 48, 2001.
11. Misago, N., Mihara, I., Ansai, S., and Narisawa, Y. Sebaceoma and related neoplasms with sebaceous differentiation: A clinicopathologic study of 30 cases. *Am. J. Dermatopathol.* 24: 294, 2002.
12. Takeda, H., and Kondo, S. Immunohistochemical study of angiotensin receptors in normal human sweat glands and eccrine poroma. *Br. J. Dermatol.* 144: 1189, 2001.
13. Akalin, T., Sen, S., Yuceturk, A., and Kandiloglu, G. P. p53 protein expression in eccrine poroma and porocarcinoma. *Am. J. Dermatopathol.* 23: 402, 2001.
14. Takata, M., Hashimoto, K., Mehregan, P., et al. Genetic changes in sweat gland carcinomas. *J. Cutan. Pathol.* 27: 30, 2000.
15. Arslan, E., Unal, S., Cinel, L., Demirkan, F., and Cin, I.

- Malignant eccrine spiradenoma occurring on a traumatized area. *Plast. Reconstr. Surg.* 110: 365, 2002.
16. Pernia, L. R., Guzman-Stein, G., and Miller, H. L. Surgical treatment of an aggressive metastasized eccrine poroma. *Ann. Plast. Surg.* 30: 257, 1993.
  17. Wittenberg, G. P., Robertson, D. B., Solomon, A. R., and Washington, C. V. Eccrine porocarcinoma treated with Mohs micrographic surgery: A report of five cases. *Dermatol. Surg.* 25: 911, 1999.
  18. McMichael, A. J., and Gay, J. Malignant eccrine poroma in an elderly African-American woman. *Dermatol. Surg.* 25: 733, 1999.
  19. Plunkett, T. A., Hanby, A. M., Miles, D. W., and Rubens, R. D. Metastatic eccrine porocarcinoma: Response to (Taxotere) chemotherapy. *Ann. Oncol.* 12: 411, 2001.
  20. Barzi, A. S., Ruggeri, S., Recchia, F., and Bertoldi, I. Malignant metastatic eccrine poroma: Proposal for a new therapeutic protocol. *Dermatol. Surg.* 23: 267, 1997.
  21. Huet, P., Dandurand, M., Pignodel, C., and Guillot, B. Metastasizing eccrine porocarcinoma: Report of a case and review of the literature. *J. Am. Acad. Dermatol.* 35: 860, 1996.

#### SUBCLINICAL INFECTION AS A POSSIBLE CAUSE OF SIGNIFICANT BREAST CAPSULES

Sir:

I read with interest the article published in the April 15, 2003, issue of *Plastic and Reconstructive Surgery* entitled "Detection of Subclinical Infection in Significant Breast Implant Capsules," by Pajkos et al. (*Plast. Reconstr. Surg.* 111: 1605, 2003). This has been a long-term research interest of ours.

Coagulase-negative staphylococci were originally thought to be "nonpathogenic," but as the authors point out, these organisms have been associated with clinical infections with increasing frequency, especially in operations using foreign prosthetic material, where they may lie dormant and protected in a surface biofilm layer.<sup>1,2</sup> There is also accumulating evidence that lends support to the hypothesis that subclinical infection (especially with *Staphylococcus epidermidis*) may be a cause of symptomatic capsular contracture.

In a series of well-designed experiments and clinical observations, Burkhardt and coworkers<sup>3,4</sup> found that half-strength Betadine irrigation solution (5% povidone-iodine) protected against *S. epidermidis* contamination and reduced the capsular contracture rate with saline-filled implants in a more than 2-year follow-up. Others have demonstrated the efficacy of Betadine as an irrigation solution in diminishing bacterial load.<sup>5</sup> Although antibiotic irrigation solutions and the local delivery of antibacterials to a wound have been well addressed in the surgical literature, some controversy as to clinical efficacy still exists, contrasted with the use of systemic antibiotic prophylaxis, the efficacy of which has been well established in high-risk surgery.<sup>6,7</sup>

As in the study by Pajkos et al., we had previously shown a high incidence of positive periprosthetic and capsular cultures around breast implants, and there was a statistical correlation between the presence of positive cultures and clinically significant capsular contracture.<sup>8</sup> Others have also demonstrated a high incidence of positive capsular cultures for *S. epidermidis* where implants have been removed from "symptomatic" patients.<sup>9</sup> Once again, coagulase-negative staphylococci were implicated. Burkhardt and colleagues

frankly admitted that further substantiation of their proposed theory of an infectious etiology of capsular contracture would be required. If an infectious cause of capsular contracture is indeed the case rather than use of an antimicrobial irrigation at the time of implant insertion, a more long-lasting antibacterial effect might be sought.<sup>10</sup> The antimicrobial coating of central venous catheters has lowered infection-related complications of those devices.<sup>11</sup> Burkhardt and coworkers<sup>12</sup> used intraluminal antibiotics. We have evaluated antimicrobe-impregnated saline-filled silicone implants.<sup>13,14</sup> There are, however, potential risks with all these antimicrobial interventions (irrigations and impregnations). They may possibly alter the mechanical integrity of the implants.<sup>2</sup>

Despite all these studies, a conclusive leap from in vitro and laboratory studies to an actual bacterial etiological cause of capsular contracture remains elusive. The diagnosis of an infective requires that all three of Koch's postulates be fulfilled.<sup>15</sup> It seems that with regard to capsular contracture, the first two have been fulfilled, namely, that the organism should be found in sufficient quantity in the lesion to account for its effects and that the organism should be cultivated from the lesion in a pure state on an artificial medium. The third postulate requires that the organism grown in artificial culture should be capable of producing a similar lesion in another member of the species. For obvious ethical reasons, this last of the postulates would be difficult to prove. Thus, investigators need to resort to animal inoculation. There is some slender published evidence that *Staphylococcus* may accelerate development of capsular contracture in experimental animals,<sup>16,17</sup> but little other evidence is available. Furthermore, experimental determination of capsular contracture without killing an animal is not an easy matter.<sup>18,19</sup> We have wrestled with the problem of induced capsular contracture in an animal model in the laboratory with only limited success. I look forward to the authors' comments on these problems, namely:

1. Potential use of antiseptics and antibacterials in relation to the mechanical integrity of implants.
2. What their current clinical practice recommendations might be to reduce the incidence of symptomatic capsular contracture.
3. The preponderance of evidence and conclusiveness of symptomatic capsular contracture being directly caused by an infective agent and whether they believe we will be able to satisfy the third of Koch's postulates with regular to capsular contracture.

I look forward to the ongoing research in what I have found still to be the rather elusive problem of the cause(s) of breast implant symptomatic capsular contracture.

DOI: 10.1097/01.PRS.0000123620.92330.BC

David T. Netscher, M.D.  
Division of Plastic and Reconstructive Surgery  
Baylor College of Medicine  
Houston, Texas 77030  
netscher@bcm.tmc.edu

#### REFERENCES

1. Bayston, R., and Penney, S. R. Excessive production of mucoid substance in staphylococcus S111A: A possible factor in colonization of Holter shunts. *Dev. Med. Child Neurol. Suppl.* 27: 25, 1972.
2. Galland, R. B., Heine, K. J., Trachtenberg, L. S., and Polk, H. C., Jr. Reduction of surgical wound infection

- rates in contaminated wounds treated with antibiotics combined with systemic antibiotics: An experimental study. *Surgery* 91: 329, 1982.
3. Burkhardt, B. R., Dempsey, P. D., Schnur, P. L., and Tofield, J. J. Capsular contracture: A prospective study of the effect of local antibacterial agents. *Plast. Reconstr. Surg.* 77: 919, 1986.
  4. Burkhardt, B. R. Capsular contracture: Hard breasts, soft data. *Clin. Plast. Surg.* 15: 521, 1988.
  5. Adams, W. P., Conner, C. H., Barton, F. E., and Rohrich, R. J. Optimizing breast pocket irrigation: An in vitro study and clinical implications. *Plast. Reconstr. Surg.* 105: 334, 2000.
  6. Burdon, D. W. Principles of antimicrobial prophylaxis. *World J. Surg.* 6: 262, 1982.
  7. Nichols, R. L. Use of prophylactic antibiotics in surgical practice. *Am. J. Med.* 17: 686, 1981.
  8. Netscher, D. T., Weizer, G., Wrigoda, P., Walker, L. E., Thornby, J., and Bowen, D. Clinical relevance of positive breast periprosthetic cultures without overt infection. *Plast. Reconstr. Surg.* 96: 1125, 1995.
  9. Ahn, C. Y., Ko, C. Y., Wagar, E. A., Wong, R. S., and Shaw, W. W. Microbial evaluation: 139 implants removed from symptomatic patients. *Plast. Reconstr. Surg.* 98: 1225, 1996.
  10. Netscher, D. Optimizing breast pocket irrigation: An in vitro study and clinical implications (Discussion). *Plast. Reconstr. Surg.* 105: 339, 2000.
  11. Darouiche, R. O., Raad, I. I., Heard, S. O., et al. A comparison of two antimicrobial-impregnated central venous catheters: Catheter study group. *N. Engl. J. Med.* 340: 1, 1999.
  12. Burkhardt, B. R., Fried, M., Schnur, P. L., and Tofield, J. J. Capsules, infection, and intraluminal antibiotics. *Plast. Reconstr. Surg.* 68: 43, 1981.
  13. Darouiche, R. O., Meade, R., Mansouri, N. D., and Netscher, D. T. In vitro efficacy of antimicrobe-impregnated saline-filled silicone implants. *Plast. Reconstr. Surg.* 109: 1352, 2002.
  14. Darouiche, R. O., Netscher, D. T., Mansouri, N. D., and Meade, R. Activity of antimicrobial-impregnated tissue expanders. *Ann. Plast. Surg.* 49: 567, 2002.
  15. Walter, J. D., and Israel, M. S. The diagnosis of infective disease. In *General Pathology*, 4th Ed. Edinburgh: Churchill Livingstone, 1974. P. 646.
  16. Kossovsky, N., Hegggers, J. P., Parsons, R. W., and Robson, M. C. Acceleration of capsule formation around silicone implants by infection in a guinea pig model. *Plast. Reconstr. Surg.* 73: 91, 1984.
  17. Shah, Z., Lehman, J., and Tan, J. Does infection play a role in breast capsular contracture? *Plast. Reconstr. Surg.* 68: 34, 1981.
  18. Caffee, H. H. Measurement of implant capsules. *Ann. Plast. Surg.* 11: 12, 1983.
  19. Peterson, R. D., Bowen, D., Netscher, D. T., and Wigoda, P. Capsular compliance: A measure of a "hard" prosthesis. *Ann. Plast. Surg.* 33: 337, 1994.

#### REPLY

Sir:

Thank you for the opportunity to respond to Dr. Netscher's correspondence in regard to our study "Detection of Subclinical Infection in Significant Breast Implant Capsules" (*Plast. Reconstr. Surg.* 111: 1605, 2003). We agree entirely that Koch's postulates

need to be fully satisfied to prove a causal link between sub-clinical infection with *Staphylococcus epidermidis* and the generation of periprosthetic capsular contracture.

Our laboratory is in the process of generating an in vivo model to support the infective hypothesis. We are using a porcine model and hope to report back to the *Journal's* readers with our findings in the near future. Preliminary results using the human strain of *S. epidermidis* isolated from our published study have shown a strong correlation between inoculation at varying dilutions of the pathogen and the generation of a periprosthetic biofilm in our study animals. We will need to await the results of long-term implantation to correlate the presence of this biofilm with the generation of capsular contracture.

If the infective hypothesis is proven, the question of how to confer resistance of prosthetic materials to bacterial contamination and subsequent biofilm formation will need to be answered. We do believe that antiseptic washout of the implant pocket and perioperative systemic antibiotics reduce the likelihood of subclinical infection at the time of surgery. The more difficult problem, however, is to provide a more medium- to long-term resistance to infection. We are concurrently investigating a number of other strategies to increase the resistance of implant surfaces to biofilm formation in vitro. These include modifications of the silicone elastomer, the use of "anti-sense" bacterial disruptors, and the investigation of biological coatings that prevent bacterial adhesion. The issue of how these treatments will affect the mechanical strength of the implants will need to be formally assessed before clinical usage.

Finally, many colleagues have asked our advice on how to prevent biofilm formation in their surgical practice. Given our current findings, it would seem prudent to prevent the access of *S. epidermidis* to the surface of the implant at the time of surgery. Systemic perioperative antibiotic prophylaxis and antibiotic/antiseptic pocket irrigation have been studied and shown to be effective in reducing bacterial contamination and should now be performed by all of us who wish to combat subclinical infection. Other anecdotal strategies (that we use in our practice) include use of an introducing sleeve to prevent skin contamination of the implant, care to avoid dissection into the breast tissue at the time of pocket dissection, and the use of a fresh pair of gloves when handling the implant. In addition, our patients are advised to have antibiotic prophylaxis if they are to have any subsequent dental or surgical procedures, to reduce the risk of hematogenous infection. DOI: 10.1097/01.PRS.0000123621.43040.B9

Anand K. Deva, F.R.A.C.S.  
 Department of Plastic and Reconstructive Surgery  
 Liverpool Hospital  
 University of New South Wales  
 Sydney, Australia  
 ananddeva@unsw.edu.au

#### AUGMENTATION/MASTOPEXY: "SURGEON BEWARE"

Sir:

I read with interest the editorial entitled "Augmentation/Mastopexy: 'Surgeon, Beware,'" by Dr. Spear (*Plast. Reconstr. Surg.* 112: 905, 2003). Although I agree that augmentation/

mastopexy is challenging, I believe that “mischief and major disasters” can be significantly reduced by adherence to the following guidelines:

1. *Place implants in a submuscular position.* This reduces the risk of implant exposure, devascularization of the overlying breast tissue (with consequent nipple or skin flap loss), and excessive postoperative implant descent.
2. *Perform augmentation before mastopexy.* Preoperative mastopexy markings are simply educated guesses, as the precise amount of skin excess is unknown until after the implants are placed. Tailor-tacking (and any necessary adjustment) of the preoperative markings should be performed with the patient in a semi-upright position on the operating table *after* implant placement. This prevents underresection of skin with consequent persistent nipple and/or breast ptosis. More importantly, it prevents overresection of skin with consequent excessive tension on the closure, which leads to widespread scars and skin flap loss.
3. *Do not perform augmentation with a Wise-pattern mastopexy.* Periareolar and vertical augmentation/mastopexy patterns generally can be performed without excessive skin flap tension and tissue devascularization. However, an inverted-T closure paired with an augmentation requires significant undermining, which often leads to an unacceptably high rate of complications. In the very small subset of patients requiring a Wise pattern, consideration should be given to staging of the procedures.
4. *Do not be afraid to resect breast tissue.* Although the surgery is meant to enlarge the breasts, a small amount of breast tissue may need to be excised to facilitate closure without excessive tension. In particular, resection of parenchyma superior to the nipple-areola complex may be required to enable significant tension-free nipple-areola elevation. Similarly, a vertical mastopexy pattern requires vertical wedge excision of lower-pole parenchyma. This reduces closure tension, the need for undermining, and the risk of persistent lower-pole ptosis.

Women who request elevation and enlargement of the breasts are interested in achieving both goals with a single procedure. I believe that, judiciously performed, augmentation and mastopexy can be combined with a very acceptable complication rate.

DOI: 10.1097/01.PRS.0000123622.72749.19

Ronald M. Friedman, M.D.  
6124 West Parker Road  
Suite 232, Building 3  
Plano, Texas 75093

### AESTHETIC RECONSTRUCTION OF THE TUBEROUS BREAST DEFORMITY

Sir:

We would like to respond to Drs. Spear and Ganz's discussion of our article, “Aesthetic Reconstruction of the Tuberosus Breast Deformity.”<sup>1,2</sup> We are grateful to Drs. Spear and Ganz for taking the time to read our article and for their comments. In response, however, we would like to clarify some misunderstandings. Our aim in publishing this article was to try to share our understanding of the etiology behind the deformity and the steps we believe are necessary to correct it.

We are not sure whether Drs. Spear and Ganz believe that the development of a constricting ring is the cause of the deformity, as do we and others.<sup>3-6</sup> We consider that the only way to correct the deformity is to deal with this constricting ring, and that simply increasing the base diameter of the breast with an implant and reducing the size of the areola with a circumareolar mastopexy, as Drs. Spear and Ganz suggest, in fact accentuate the deformity, and many authors agree with us.<sup>7-11</sup> However, at no point in the article do we claim that our technique does away with implants. We believe that in most cases a breast implant is necessary, and we invariably place the implant in a subglandular position.

By transecting the lower pole of the breast, we are dividing this constricting ring, freeing up the breast, and creating two pillars. The tuberous breast is long, with a narrow base, and by transecting the lower pole, we are able to spread the breast tissue, thus achieving a breast shape that is flatter and wider, usually at the expense of projection. This is possible because breast tissue is not rigid and allows some molding. To avoid leaving a gap at the 6 o'clock margin, where the transection takes place, we try to bring the pillars *loosely* together with sutures. We are not repairing the transected breast, and we are certainly not reconstituting the constricting ring. If the pillars are very long, as in the case depicted in Figure 2 of our article, then we can use them to create some added volume at the lower part of the breast, exactly where it was lacking initially, by redraping the loose distal part of the pillars in a double-breasted fashion.

We apologize for not showing a frontal view of the patient in Figure 5 (case 5). This was not done to hide something, as Drs. Spear and Ganz imply, but simply because the image was unavailable. This was one of the few cases in which no implant was used, and we wished to show what was possible with our technique. We do not think that frontal views would have added much additional information in this case.

We hope that we have been able to clarify any misunderstandings, and we would welcome other authors' comments on the subject.

DOI: 10.1097/01.PRS.0000123623.12652.54

Apostolos D. Mandrekas, M.D.  
George J. Zambacos, M.D.  
“Artion” Plastic Surgery Center  
Athens, Greece

Correspondence to Dr. Mandrekas  
“Artion” Plastic Surgery Center  
11 D. Vassiliou Street  
Psychiko, Athens 15451, Greece

### REFERENCES

1. Mandrekas, A. D., Zambacos, G. J., Anastasopoulos, A., Hapsas, D., Lambrinaki, N., and Ioannidou-Mouzaka, L. Aesthetic reconstruction of the tuberous breast deformity. *Plast. Reconstr. Surg.* 112: 1099, 2003.
2. Spear, S. L., and Ganz, J. C. Aesthetic reconstruction of the tuberous breast deformity (Discussion). *Plast. Reconstr. Surg.* 112: 1109, 2003.
3. Ribeiro, L., Canzi, W., Buss, A., and Accorsi, A., Jr. Tuberous breast: A new approach. *Plast. Reconstr. Surg.* 101: 42, 1998.
4. Ribeiro, L., Accorsi, A., Jr., Buss, A., and Marcal-Pessoa, M. C. Short scar correction of the tuberous breast. *Clin. Plast. Surg.* 29: 423, 2002.

5. Gasperoni, C. Personal communication. Athens, Greece, 1998.
6. Atiyeh, B. S., Hashim, H. A., El-Douaihy, Y., and Kayle, D. I. Perinipple round-block technique for correction of tuberous/tubular breast deformity. *Aesthetic Plast. Surg.* 22: 284, 1998.
7. Rees, T. D., and Aston, S. J. The tuberous breast. *Clin. Plast. Surg.* 3: 339, 1976.
8. Grolleau, J.-L., Lanfrey, E., Lavigne, B., Chavoin, J.-P., and Costagliola, M. Breast base anomalies: Treatment strategy for tuberous breasts, minor deformities, and asymmetry. *Plast. Reconstr. Surg.* 104: 2040, 1999.
9. Teimourian, B., and Adham, M. N. Surgical correction of the tuberous breast. *Ann. Plast. Surg.* 10: 190, 1983.
10. Scheepers, J. H., and Quaba, A. A. Tissue expansion in the treatment of tubular breast deformity. *Br. J. Plast. Surg.* 45: 529, 1992.
11. de la Fuente, A., and Martin del Yerro, J. L. Periareolar mastopexy with mammary implants. *Aesthetic Plast. Surg.* 16: 337, 1992.

### LASER TREATMENT OF CONGENITAL MELANOCYTIC NEVI

Sir:

The article by Reynolds, Kenealy, and Mercer describing their experience with the carbon dioxide laser in giant congenital melanocytic nevi<sup>1</sup> raises a number of concerns. The authors are no strangers to hyperbole, and following their previous case report, Arons from New Haven, Connecticut, cautioned them on the use of the word "successful."<sup>2</sup> While the authors again claim significant cosmetic improvement without providing evidence to support this, it is the term "giant" that is misleading in this series.

The primary concern about congenital melanocytic nevi is their malignant potential. The available evidence is difficult to interpret. Congenital melanocytic nevi form a heterogeneous spectrum.<sup>2</sup> A critical question that needs to be addressed is whether the malignant potential of a lesion is dependent on absolute or relative cell number. The clinical correlate of this is whether you categorize lesions by absolute or relative size. Quaba and Wallace<sup>3</sup> elected to use relative size, defining a "large" congenital melanocytic nevus as being greater than 2 percent of body surface area. Arbitrary absolute size categorization of congenital melanocytic nevi is generally regarded as follows: small, less than 1.5 cm in largest diameter; intermediate, greater than 1.5 but less than 20 cm in largest diameter; and giant, largest diameter greater than 20 cm.<sup>4</sup> The study by Reynolds et al.<sup>1</sup> gives no dimensions for the lesions in the nine patients treated, although of the two patients shown, few clinicians would regard the patient shown in Figure 2 (case 4) as having a giant congenital melanocytic nevus.

These concerns, however, are eclipsed by concerns about the safety of the procedure. In the previously reported single case,<sup>5</sup> the patient became unwell after the treatment, which is not unexpected. Subjecting a neonate to an extensive "therapeutic" burn is a very risky procedure, but what about the oncological risk that has been dismissed by these authors?

In the early 1990s, when I first became involved in exploring the role of laser treatment for melanocytic nevi, the clinical focus was on dysplastic or atypical nevi. After extensive discussion with the late David Kenealy, former director of Laser Services at Frenchay Hospital, Bristol, United Kingdom, we decided to investigate laser melanocyte interactions in vitro. Using the Q-switched 532-nm neodymium:yttrium-alu-

minum-garnet laser, melanoma cells in culture were exposed to sublethal laser energy. Frankly, the results were alarming. The cell line used, Sk-mel-23, is a transformed line and proliferation was not an issue. After exposure to the sublethal energy, there was upregulation of focal adhesion kinase proteins and  $\alpha 3$  and  $\alpha 4$  integrin subunits and proteolysis of integrin  $\beta 1$  subunit.<sup>6</sup> This suggested that the cell was becoming more malignant (i.e., developing metastatic potential). Further studies, as yet unpublished, have demonstrated that the exposed cells become more resistant to apoptosis inducers, another indicator of increased malignancy. This concern is reinforced by the work from the Hong Kong University group led by Dr. Henry Chan.<sup>7</sup> Using the Q-switched 755-nm laser, three melanoma cell lines were treated, HTB66, SK-mel-24, and G361. Of these three cell lines, the level of p1614a protein in cell line HTB66 was significantly increased after laser irradiation. The *p16* gene has been proposed as a candidate gene for melanoma.

The Frenchay authors also question the role of ionizing radiation in the development of melanoma. It is the *nonionizing* part of the electromagnetic spectrum that is generally implicated in the development of malignant melanoma, principally ultraviolet radiation. The long-term effect of the carbon dioxide laser operating with a wavelength of 10,600 nm is unknown.<sup>8</sup>

The authors have made a bold move in their clinical experimentation, but some concurrent in vitro studies would be advisable. What is the effect of temperature on malignant transformation in melanocytes? Christophers<sup>9</sup> believes the epidemiological evidence supports a hypothesis that melanoma incidence increases with increases in skin temperature. Perhaps the Frenchay group could continue their laboratory research to explore this novel perspective with regard to laser-induced thermal injury and cultured melanoma cells. DOI: 10.1097/01.PRS.0000123624.85119.ED

Andrew Burd, F.R.C.S.Ed., F.H.K.A.M. (Plastic Surgery)  
Division of Plastic and Reconstructive Surgery  
Department of Surgery  
The Chinese University of Hong Kong  
Prince of Wales Hospital  
Hong Kong  
andrewburd@cuhk.edu.hk

### REFERENCES

1. Reynolds, N., Kenealy, J., and Mercer, N. Carbon dioxide laser dermabrasion for giant congenital melanocytic nevi. *Plast. Reconstr. Surg.* 111: 2209, 2003.
2. Arons, M. S. Successful treatment of a giant congenital melanocytic naevus with high-energy pulsed CO<sub>2</sub> laser. *Br. J. Plast. Surg.* 51: 570, 1998.
3. Quaba, A. A., and Wallace, A. F. The incidence of malignant melanoma (0 to 15 years of age) arising in large congenital nevocellular nevi. *Plast. Reconstr. Surg.* 78: 174, 1986.
4. Mackie, R. M. Melanocytic naevi and malignant melanoma. In R. H. Champion, J. L. Burton, D. A. Burns, and S. M. Breathnach (Eds.), *Rook/Wilkinson/Ebling Textbook of Dermatology*, Vol. 2, 6th Ed. Malden, Mass.: Blackwell Science, 1998. P. 1717.
5. Kay, A. R., Kenealy, J., and Mercer, N. S. G. Successful treatment of a giant congenital melanocytic naevus with the high energy pulsed CO<sub>2</sub> laser. *Br. J. Plast. Surg.* 51: 22, 1998.
6. Zhu, N. W., Perks, C. M., Burd, A. R., and Holly, J. M. Changes in the levels of integrin and focal adhesion

- kinase (FAK) in human melanoma cells following 532nm laser treatment. *Int. J. Cancer* 82: 353, 1999.
7. Chan, H. H., Xiang, L., Leung, J. C., Tsang, K. W., and Lai, K. N. In vitro study examining the effect of sublethal QS 755nm lasers on the expression of p16INK4a on melanoma cell lines. *Lasers Surg. Med.* 32: 88, 2003.
  8. Kaufmann, R., and Beier, C. Pigmented and non-pigmented benign skin tumours. In H. P. Berlien and G. J. Müller (Eds.), *Applied Laser Medicine*. Berlin: Springer-Verlag, 2003. P. 529.
  9. Christophers, A. J. Melanoma is not caused by sunlight. *Mutat. Res.* 422: 113, 1998.

### NONMELANOMA OF THE SKIN AND MOHS SURGERY

Sir:

We appreciate the study by Dr. Thomas and colleagues regarding the optimal excisional margins for nonmelanoma skin cancer.<sup>1</sup> Their finding that a 4-mm margin provides histologically tumor-free margins in greater than 95 percent of excisions for nonmelanoma skin cancer is of benefit in establishing surgical margins in the excision of nonmelanoma cutaneous malignancies. However, we believe that some of the conclusions drawn regarding these results and their relation to the utilization of Mohs micrographic surgery could be misleading to those surgeons who are not intimately familiar with Mohs surgery.

The authors' comparison of histological cure rates using standard excision with 4-mm margins and those using Mohs surgery could be easily misinterpreted as an endorsement for the two techniques being equally effective in obtaining a surgical cure. However, a difference exists between histologic clearance and surgical cure. This is a fact that, unfortunately, is not appreciated by as many as 30 percent of our colleagues.<sup>2</sup> The majority of surgical pathologists continue to utilize either cross-sectioning or bread-loaf sectioning in the processing of tissue specimens. With these methods, less than 1 percent of the excised margin of the tumor is actually visualized. In contrast, the Mohs technique of sectioning tissue allows for the examination of the entire peripheral and deep margins for tumor involvement. As a result, the potential for unrecognized margin involvement is much higher with step-sectioning of tissue than with the Mohs technique. This difference translates into higher rates of tumor recurrence for standard excision. A review of more than 10,000 cases of basal cell carcinoma treated with either standard surgical excision with traditional margin assessment or Mohs micrographic surgery revealed a long-term (greater than 5 years) recurrence rate of 10.1 percent for surgical excision versus 1.0 percent for Mohs surgery.<sup>3</sup>

We also contend that the authors' suggestion that a disadvantage of Mohs micrographic surgery for the management of primary nonmelanoma skin cancer lies in its expense is unsubstantiated by the literature. We recognize that the cost of medical care differs from country to country, and Mohs surgery may possibly be more expensive than other standard treatments in the authors' home country of Australia. However, this is not the case in the United States. In fact, in a cost analysis of the treatment of 400 cases of nonmelanoma skin cancer, the average cost of Mohs surgery was similar to that of office-based excision with permanent section margin control, and it was lower than the cost of either office-based excision with frozen section margin control or ambulatory surgery facility-based excision with frozen sec-

tion margin control.<sup>4</sup> This finding is partially explained by the fact that the single reimbursement code for Mohs micrographic surgery covers the excision as well as the technical and professional components of the histologic review. Also, nonmelanoma skin cancers treated with Mohs micrographic surgery are associated with smaller postexcisional defects and are less likely to require tissue flaps or grafts for closure than those treated with standard surgical excision.<sup>4,5</sup> In addition, the higher primary cure rate with Mohs surgery decreases the need for and expense of secondary procedures.

As stated in the authors' opening paragraph, the primary objective of skin cancer surgery is to provide patients with complete excision of the tumor to prevent recurrence or metastatic disease while minimizing attendant morbidity by decreasing the amount of normal skin sacrificed. In relation to this, the authors have presented valuable information regarding optimal margins for standard surgical excision. However, we fear that some of their comments might lead readers to conclude that Mohs micrographic surgery should be reserved solely for tumor recurrences. Given the lower rate of recurrences and comparable cost, we believe that Mohs micrographic surgery is an effective and economical method for the management of primary nonmelanoma skin cancers in high-risk locations or of aggressive histologic subtypes.

DOI: 10.1097/01.PRS.0000123625.76158.73

*Brent Pennington, M.D.*  
*Brent R. Moody, M.D.*  
 Department of Medicine  
 Division of Dermatology  
 Vanderbilt University Medical Center  
 Nashville, Tenn.

*Correspondence to Dr. Pennington*  
 Department of Medicine  
 Division of Dermatology  
 Vanderbilt University Medical Center  
 1301 22nd Avenue South  
 Nashville, Tenn. 37232-5227

### REFERENCES

1. Thomas, D. J., King, A. R., and Peat, B. G. Excision margins for nonmelanotic skin cancer. *Plast. Reconstr. Surg.* 112: 57, 2003.
2. Abide, J. M., Nahai, F., and Bennett, R. G. The meaning of surgical margins. *Plast. Reconstr. Surg.* 73: 492, 1984.
3. Rowe, D. E., Carroll, R. J., and Day, C. L. Long-term recurrence rates in previously untreated (primary) basal cell carcinoma: Implications for patient follow-up. *J. Dermatol. Surg. Oncol.* 15: 315, 1989.
4. Cook, J., and Zitelli, J. A. Mohs micrographic surgery: A cost analysis. *J. Am. Acad. Dermatol.* 39: 698, 1998.
5. Bumsted, R. M., and Ceilley, R. I. Auricular malignant neoplasms: Identification of high-risk lesions and selection of method of reconstruction. *Arch. Otolaryngol.* 108: 225, 1982.

### REPLY

Sir:

We appreciate the opportunity to reply to the letter from Drs. Pennington and Moody. We agree that clinically there may be a difference between histologic clearance and surgical

cure, if the histologic clearance represents a sampling error. As discussed in our article,<sup>1</sup> we have relied on published work that correlates the adequacy of histologic clearance with the recurrence rate. For this reason, we chose an "adequate" histologic clearance as being beyond one high-power field or 0.5 mm, since this equates with a recurrence rate of 1.2 percent for basal cell carcinoma of the face, according to Pascal et al.<sup>2</sup> The review article by Rowe et al.,<sup>3</sup> which is referred to by the correspondents, concludes that there is a recurrence rate of 10.1 percent after "standard surgical excision with traditional margin assessment." Such a generalization is clearly not true, in our clinical opinion, nor is it valid to draw this conclusion from the article by Rowe et al., since (1) the studies reported had no "standard" method of surgical excision, which is precisely the purpose of our study (i.e., to establish standard guidelines for surgical excision), (2) several of the studies reviewed in this article included patients with positive margins at follow-up (we know that these will have a 12 percent recurrence rate, according to Pascal et al.), and (3) several of the articles reporting the higher recurrence rates involved the eyelids, where there will be a tendency to conserve tissue at the expense of adequate tumor clearance. The cost of Mohs surgery, as quoted in the article by Cook and Zitelli,<sup>4</sup> is 7 percent more expensive than office-based traditional surgical excision. However, this analysis gives the actual costs of Mohs surgery and compares this with the hypothetical cost of office-based excision and permanent section, assuming an 11 percent reexcision rate due to positive margins. Again, this is an invalid assumption. Our article suggests that a 2 percent reexcision rate would be required in the immediate postoperative period due to positive margins and a 1.2 percent reexcision rate for recurrence within 10 years, according to Pascal et al. Perhaps more relevant than the extra expense of the Mohs surgery is the time factor. Cook and Zitelli state that the average time for the patient to be in the office for Mohs surgery is "less than 5 hours." This would compare with the average time of less than 1 hour for the patient having surgery with permanent section.

Ultimately, the Mohs technique raises the question of how detailed the histologic examination has to be. There is nothing intrinsically special about Mohs surgery; it is a type of frozen section analysis that attempts to look at more of the surgical margin than routine transverse sectioning. Is this necessary? Our study suggests that for 96 percent of primary nonmelanotic skin tumors less than 2 cm in diameter, routine permanent section is entirely adequate. We have tried to evaluate how the other 4 percent can be identified so that they can be treated differently. We agree that patients with tumors in difficult areas, such as the eyelid or near the external ear canal, should have more extensive histologic analysis by frozen section at the initial surgery. Also, patients with aggressive lesions, such as morpheic, infiltrating, or micronodular basal cell carcinoma, may benefit from more detailed initial frozen section analysis. The problem here, our article suggests, is that clinically these lesions are too difficult to diagnose unless there is a preoperative biopsy. These subtypes of basal cell carcinoma must be treated more aggressively, and the pathology report stating their presence should ring alarm bells for the surgeon. Hence we would rely on frozen section analysis when reoperating on these tumors if the original

permanent section showed incomplete or narrow excision margins.

DOI: 10.1097/01.PRS.0000123625.76158.73

*Bruce Peat, F.R.A.C.S.  
Damon Thomas, M.B., Ch.B.  
Allan King, F.R.C.P.A.  
Department of Plastic and Reconstructive Surgery  
Middlemore Hospital  
Otahuhu, Auckland, New Zealand*

*Correspondence to Mr. Peat  
Department of Plastic and Reconstructive Surgery  
Middlemore Hospital  
Otahuhu, Auckland, New Zealand  
bpeat@clear.net.nz*

#### REFERENCES

1. Thomas, D. J., King, A. R., and Peat, B. G. Excision margins for nonmelanotic skin cancer. *Plast. Reconstr. Surg.* 112: 57, 2003.
2. Pascal, R. R., Hobby, L. W., Lattes, R., and Crikelair, G. F. Prognosis of "incompletely excised" versus "completely excised" basal cell carcinoma. *Plast. Reconstr. Surg.* 41: 328, 1968.
3. Rowe, D. E., Carroll, R. J., and Day, C. L. Long-term recurrence rates in previously untreated (primary) basal cell carcinoma: Implications for patient follow-up. *J. Dermatol. Surg. Oncol.* 15: 315, 1989.
4. Cook, J., and Zitelli, J. A. Mohs micrographic surgery: A cost analysis. *J. Am. Acad. Dermatol.* 39: 698, 1998.

#### A LETHAL NECROTIZING FASCIITIS AFTER HUMAN BITE

*Sir:*

We report the extremely rare transmission of group A streptococci after a human bite on the leg that led to severe necrotizing fasciitis. Even extensive surgical excision with amputation and antibiotics could not save the patient from the fatal outcome. We think the initial delay of 24 hours between the bite and emergency room admission and a second delay of 5 hours before the first operation was devastating.

A 42-year-old woman presented to the emergency department with a 3 × 3-cm bite mark on her left calf and a surface temperature of 38.3°C. She came directly from the airport after a return flight from Bamako, Mali. She had been bitten on her calf the day before the flight by an unknown young child during a farewell ceremony in the Dogon country. She was moderately obese and had a history of marijuana and tobacco use. On admission, no lymphangitis, lymphadenitis, or peripheral pulse was present; she was alert and oriented but in acute distress. Her blood pressure was 106/64 mmHg, her pulse was 146 beats/minute, and respirations, 24. A pathology analysis was significant for leukocytosis of 19,000/mm<sup>3</sup>. Results of human immunodeficiency virus testing were negative. The patient's clinical condition deteriorated during evaluation, and she required emergency intubation and intensive medical support. The ultrasound examination was noncontributive. During the first hour in the emergency room, a burned appearance of the overlying skin around the initial mark was observed. Necrotizing fasciitis with toxic shock syndrome was suspected, and removal of necrotic fascia in the operating room by the plastic and reconstructive surgery team was planned. She was immediately given penicillin and gentamicin intravenously. During the radical surgical

débridement, the diagnosis was confirmed and verified by pathological examination of two tissue samples. Bacteriologists found group A streptococci in three swabs taken from the necrotic fascia. The wound was excised circularly from the knee to the gluteal area. The immediate effect of the removal of necrotic fascia in conjunction with antibiotics was an impressive improvement in her general condition. The wound was inspected daily by the surgical team in the intensive care unit to ensure tissue viability. After 10 days, the wound was surrounded by burned-like skin in the gluteal area. Her stay in the intensive care unit was rapidly eventful, as she required ventilation, tracheostomy, and inotropic support.

Because of her poor and constantly deteriorating condition, the patient was considered a poor candidate for repeated surgery and especially left limb desarticulation. She developed nosocomial pneumonia, and her blood culture grew *Pseudomonas aeruginosa*. Multiple organ failure developed in the patient, and she died on postoperative day 21. Autopsy findings were consistent with severe suppurative retroperitoneal infection, bilateral pleuritis, and multiple organ failure.

Human bites are usually serious, with a bacteriology reflecting the human oral flora (*Staphylococcus aureus*, *Eikenella corrodens*, *Haemophilus influenzae*, and various anaerobic bacteria). We are aware of only two reports of severe streptococcal soft-tissue infections associated with a human bite, and our case seems to be the only fatal one.

DOI: 10.1097/01.PRS.0000123626.24313.31

A. M. Danino, M.D.

G. Malka

Department of Plastic and Reconstructive Surgery  
Dijon University Hospital  
Dijon, France

Correspondence to Dr. Danino

Department of Plastic and Reconstructive Surgery  
Dijon University Hospital  
Hôpital Général  
3 Rue du Faubourg Raine  
21000 Dijon, France  
alain.danino@chu-dijon.fr

## CEREBRAL FAT EMBOLISM INDUCED BY FACIAL FAT INJECTION

Sir:

We report a case of cerebral infarction following fat injections into the face and highlight the use of magnetic resonance imaging in the diagnosis of this rare adverse event.

A 39-year-old right-handed man with no past medical history, except for a left eye retinoblastoma diagnosed in 1965, received autologous fat injections in the left side of the face to repair a soft-tissue defect caused by radiotherapy and evisceration of the left eye. The procedure consisted of taking autologous semi-liquid fat from abdominal areas and injecting, after centrifugation, 17 1-ml samples into the left temporal pit, upper and lower left eyelids, and left glabellar area. The immediate postoperative period was marked by confusion, hypertonia, and high blood pressure requiring endotracheal reintubation and sedation. The patient was admitted to the intensive care unit 6 hours after symptom onset. There was hypertonia and bilateral Babinski and flexion reflex of the lower limbs. On the second day, spontaneous movements of the left hand were the first signs of neurological improvement. One month after the patient was discharged from the intensive care unit, we observed an improvement of vigilance status and

upper limb mobility, but the patient was still experiencing mutism and paraplegia. One year after hospital discharge, the patient is classified as having a Rankin score of IV.

A cerebral computed tomography scan performed immediately after admission to the intensive care unit was normal. Transthoracic echocardiography with contrast media challenge did not find patent foramen ovale or right-to-left intracardiac shunt.

A cerebral magnetic resonance imaging scan was performed 48 hours after the onset of symptoms. The diffusion-weighted imaging scans revealed recent ischemic lesions in the territory of the two anterior cerebral arteries, which explained the neurological defects (Fig. 1). T1-weighted images showed fat emboli in the brain arteries as spontaneous high signal intensity of pericallosal branches of anterior cerebral arteries (Fig. 2). Three weeks after the onset of symptoms, a second magnetic resonance imaging scan revealed a cortical lamellar necrosis in the region of the left anterior cerebral artery (Fig. 3). Magnetic resonance angiography showed a functional anterior communicating artery.

Cerebral fat embolism is a rare cause of stroke, and it is usually part of fat embolism syndrome, a complication of fracture of the long bones.<sup>1</sup>

Autologous fat injection is a procedure aimed at eliminating deep defects in the skin surface with subcutaneous injections of the patient's own fatty tissue.<sup>2</sup> Because facial tissue is well vascularized, and because the injection induces a local increase in pressure, the fat particles can reach ophthalmic and internal carotid arteries by reversed flow, with subsequent distal movement of the emboli into retinal and cerebral arteries.<sup>3-6</sup> To prevent complications, fat injections should be performed slowly, at the lowest pressure, and with control of the absence of blood reflux in the delivering syringe. Injection into traumatized soft tissue has been argued, as the risk of intravasation of fat particles may be higher.<sup>7</sup>

Brain magnetic resonance imaging has proven to be more sensitive than computed tomography in the diagnosis and evaluation of posttraumatic cerebral fat embolism,<sup>8</sup> showing spotty high signal intensity lesions on T2-weighted images and iso-

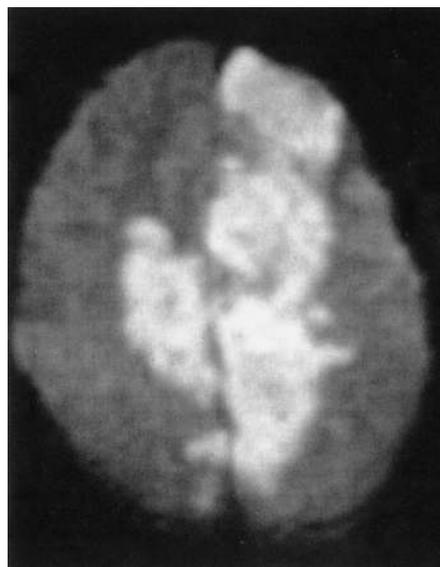


FIG. 1. Diffusion-weighted magnetic resonance imaging scan performed 48 hours after the onset of symptoms revealed recent ischemic lesions in the region of the two anterior cerebral arteries.

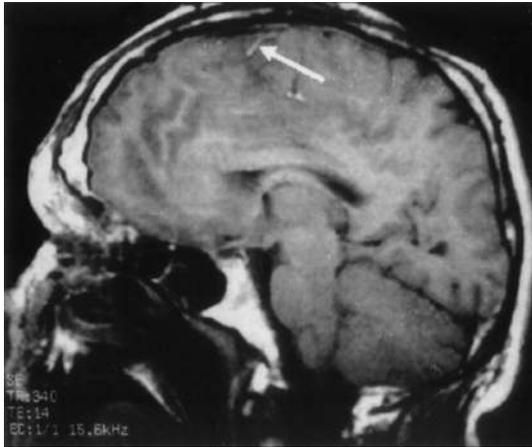


FIG. 2. T1-weighted magnetic resonance imaging scan performed 48 hours after the onset of symptoms shows fat emboli in the brain arteries as spontaneous high signal intensity. The *white arrow* points to a fat embolus in a pericallosal branch of the left anterior cerebral artery.

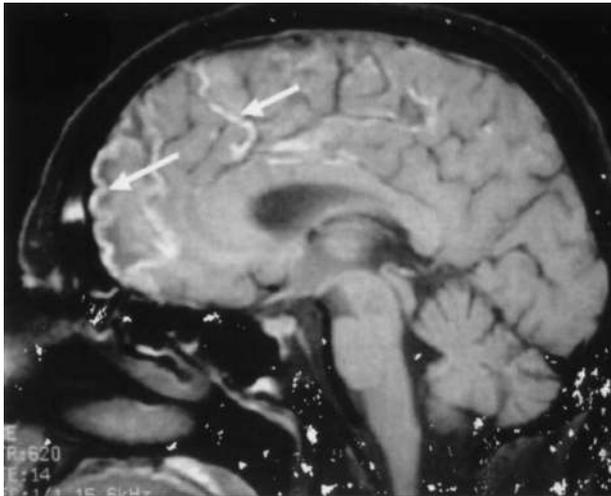


FIG. 3. T1-weighted magnetic resonance imaging scan revealed hyperintense signal of the cortex in the region of the left anterior cerebral artery (*white arrows*). This feature corresponds to cortical lamellar necrosis.

low intensity on T1-weighted images. These spotty lesions take a few days to develop and gradually disappear in a few weeks. They are distributed along the boundary zones of the major vascular territories in both the white and the gray matter.<sup>9</sup>

The localization, aspect, and evolution of the magnetic resonance imaging lesions in our case of post-autologous fat injection cerebral fat embolism do not fit with the classic findings. First, the lesions were confined to the region of the two anterior cerebral arteries instead of the whole brain. The limitation in the fat dissemination is explained by the mechanism of the embolization, that is, reversed flow from the ophthalmic artery ipsilateral to the injection instead of distal movement from the aorta. In our patient, the lesions were bilateral because of the functional anterior communicating artery. The fact that the lesions were much more intense than in posttraumatic cerebral fat embolism, and that their evolution was unfavorable, might be explained by the differences in the nature and volume of the emboli: injected semi-liquid abdominal fat reaches the brain

directly as compared with bone marrow passed through the pulmonary vasculature filter after a trauma.  
DOI: 10.1097/01.PRS.0000123627.33690.9E

Olivier Thauvat, M.D.

François Thaler, M.D.

Philippe Loirat, M.D.

Jean-Pierre Decroix, M.D.

Anne Boulin, M.D.

Services de Réanimation, Neurologie, et Radiologie  
Hôpital Foch  
Suresnes, France

Correspondence to Dr. Thauvat

81 Rue de l'Amiral Roussin

75015 Paris, France

olivier.thauvatpastu@free.fr

#### REFERENCES

1. Müller, C., Rahn, B. A., Pfister, U., et al. The incidence, pathogenesis, diagnosis, and treatment of fat embolism. *Orthop. Rev.* 23: 107, 1994.
2. Chajchir, A. Fat injection: Long-term follow-up. *Aesthetic Plast. Surg.* 20: 291, 1996.
3. Dreizen, N. G., and Framm, L. Sudden unilateral visual loss after autologous fat injection into the glabellar area. *Am. J. Ophthalmol.* 107: 85, 1989.
4. Egido, J. A., Arroyo, R., Marcos, A., et al. Middle cerebral artery embolism and unilateral visual loss after autologous fat injection into the glabellar area. *Stroke* 24: 615, 1993.
5. Feinendegen, D. L., Baumgartner, R. W., Schroth, G., et al. Middle cerebral artery occlusion and ocular fat embolism after autologous fat injection in the face. *J. Neurol.* 245: 53, 1998.
6. Lee, D. H., Yang, H. N., Kim, J. C., et al. Sudden unilateral visual loss and brain infarction after autologous fat injection into nasolabial groove. *Br. J. Ophthalmol.* 80: 1026, 1996.
7. Feinendegen, D. L., Baumgartner, R. W., Vuadens, P., et al. Autologous fat injection for soft tissue augmentation in the face: A safe procedure? *Aesthetic Plast. Surg.* 22: 163, 1998.
8. Parizel, P. M., Demey, H. E., Veeckmans, G., et al. Early diagnosis of cerebral fat embolism syndrome by diffusion-weighted MRI (starfield pattern). *Stroke* 32: 2942, 2001.
9. David, H., Rouquette, I., Dubayle, P., Goasdoué, P., Boyer, B., and Pats, B. MRI in post-traumatic cerebral fat embolism [in French]. *J. Radiol.* 79: 427, 1998.

#### THE CUT-AND-SLIDE CONCHAL TREATMENT

Sir:

For many years I had some trouble with the lop-ear surgery. Sometimes there was recurrence, sometimes there was post-operative pain, and sometimes there was inconvenience with the postsurgical dressing.

For the last 3 years, I have been performing the surgical technique of removal of the retroauricular muscle and an elliptical part of the conchal cartilage (Fig. 1). I then undermine the distal skin and look for the best position for the ear, sliding the remaining distal conchal cartilage over the proximal one (Fig. 2). This allows me to choose the way I want to maintain the ear without any tension and good support (cartilage with cartilage). In addition, it is a painless procedure and compressive dressings are not required for more than 3 days.



FIG. 1. (Left) Preoperative view of a 19-year-old male patient. (Right) Postoperative view at 6 months.



FIG. 2. The arrow shows how the distal cartilage slides over the proximal flap.

With regard to recurrence, I have not had them anymore, at least none concerning the cephaloauricular angle.

DOI: 10.1097/01.PRS.0000123628.00132.52

*Ithamar Nogueira Stocchero, M.D.*  
*Centro Médico Viver Melhor*  
*Rua Abílio Soares, 1337*  
*04005-005 São Paulo SP, Brazil*  
*dr.ithamar@uol.com.br*

#### A GREAT TIME FOR PIONEERS OF SUPERIOR EXTREMITY AESTHETIC SURGERY

*Sir:*

New cosmetic surgical procedures of the superior extremity have recently been described and more will be developed in the near future. An article I wrote<sup>1</sup> was referenced with the statement that “excision of an ellipse of dorsal hand skin . . . can make the dorsal hand look older.”<sup>2</sup> This statement has been false in my experience in all patients. The procedure, distal dorsal superior extremity plasty, as described reduces wrinkled dorsal wrist skin. The skin of patients with wrinkles in the distal forearm can also be markedly improved. The proximal dorsal hand is improved to a lesser extent. The statement made in the same article that tightening skin in the aging hand by performing a distal dorsal superior extremity plasty “will accentuate the veins and tendons” has also been false in my experience in all the patients I have treated. There is a statement in the same article that “youthful skin is not just tight but also has subcutaneous fullness.” It should not be inferred from this statement that all aged skin does not have “subcutaneous fullness” or that the best and only treatment for aged skin is increasing subcutaneous tissue. There is a considerable amount of biological variation in the aging of the superior extremity, just as there is in the face and other sites. Genetic makeup and environmental factors are major determinants of skin and other soft-tissue aging. All patients who have had a distal dorsal superior extremity plasty performed have been extremely satisfied with the results, as have I. For a good surgeon, this is a relatively simple procedure that can be easily learned and performed with local anesthesia, with consistently good to excellent results and with very few complications. There should be a high patient satisfaction rate for properly selected patients.

The ideal patient for distal dorsal superior extremity plasty has multiple deep wrinkles on the dorsal wrist and redundant skin on the dorsal hand, wrist, and distal forearm (Fig. 1).



FIG. 1. A 39-year-old healthy woman's hands demonstrate aging of the skin, with multiple dorsal wrist wrinkles without atrophy of the muscles or subcutaneous tissue.

Injection of a filler substance is not a good solution for many of these patients because the problem is wrinkled, inelastic skin, and many patients do not want a fatter-appearing wrist. Injection of fat or other filler substances into different sites in the superior extremity is not the solution to all aesthetic problems in the superior extremity, just as it is not in the face and other aged areas.

Hand veins and tendons are not aesthetic problems for many of these patients. Ideas of beauty of the superior extremity are individual. Superior extremity veins are beautiful to some and not aesthetically pleasing to others. Many people do not see normal dorsal hand and other superior extremity veins as aesthetically pleasing or displeasing.

Procedures that produce prolonged hand edema or that require prolonged immobilization have the potential to produce permanent stiffness of the small joints of the hand. For aesthetic operations of the superior extremity to be successful, long-term function should remain normal or very near normal.

Aging changes in the hand can be classified as early, moderate, or severe. Frequently, an early sign of aging is wrinkle formation over the dorsal hand and wrist. As an individual ages, a variety of hand changes develop and become more prominent with time. The severely aged hand may have prominent tendons, atrophied dorsal interosseus, and prominent veins. The skin may become thin, wrinkled, inelastic, redundant, transparent, and pigmented.

Surgeons with the most advantage in developing and performing superior extremity cosmetic surgery procedures are individuals who have aesthetic surgery experience, knowledge of superior extremity anatomy, and the special care necessary for surgical treatment of the superior extremity. As more effective procedures are developed and as patients become more knowledgeable about these procedures, cosmetic

surgery of the superior extremity will be performed more frequently.

DOI: 10.1097/01.PRS.0000123629.21806.A8

James Robert Wendt, M.D.  
351 Hospital Road  
Suite 601  
Newport Beach, Calif. 92663

#### REFERENCES

1. Wendt, J. R. Distal dorsal extremity plasty. *Plast. Reconstr. Surg.* 106: 210, 2000.
2. Coleman, S. R. Hand rejuvenation with structural fat grafting. *Plast. Reconstr. Surg.* 110: 1731, 2002.

#### RESPONSIBILITIES OF OUR JOURNAL EDITORS AND REVIEWERS

Sir:

I read the articles by Dr. John Tebbetts entitled "Achieving a Predictable 24-Hour Return to Normal Activities after Breast Augmentation: Part I. Refining Practices by Using Motion and Time Study Principles" (*Plast. Reconstr. Surg.* 109: 273, 2002) and "Part II. Patient Preparation, Refined Surgical Techniques, and Instrumentation" (*Plast. Reconstr. Surg.* 109: 293, 2002). Having also read the published discussions on the subject in the same issue and critical opinions in subsequent ones, I realized that only Dr. Tebbetts was blamed for writing such long articles. No one was critical of the *Journal* editors and reviewers for allowing the articles to be published. There is a system of checks and balances that governs articles to be considered for publication in our *Journal*. Initially, it is the responsibility of the authors to adhere to the rules and regulations, including restrictions on the length of articles. Unfortunately, some authors, including Dr. Tebbetts, ignored such responsibility and tried to circumvent the rules by dividing the article into parts. Then it was, in my opinion, the fiduciary responsibility of the editors and reviewers to have refused to accept such lengthy articles for publication. In this instance, unfortunately, they too ignored their responsibility. With proper oversight, these two articles could have been summarized in a few concise pages.

DOI: 10.1097/01.PRS.0000123631.63886.9F

Iraj Zandi, M.D.  
2557 Mowry Avenue  
Suite 20  
Fremont, Calif. 94538  
zandi@worldnet.att.net

#### MORE SATISFACTION IN ADVANCED BALDNESS

Sir:

I read with great interest the article by Epstein entitled "Hair Transplantation for Men with Advanced Degrees of Hair Loss" (*Plast. Reconstr. Surg.* 111: 414, 2003) and the discussion by Barrera (*Plast. Reconstr. Surg.* 111: 422, 2003). This excellent article evaluates the importance of patient education, realistic expectations, and good planning in hair-line, forelock, and face frame reconstruction (i.e., logical placement of follicular units). We cannot turn back time for

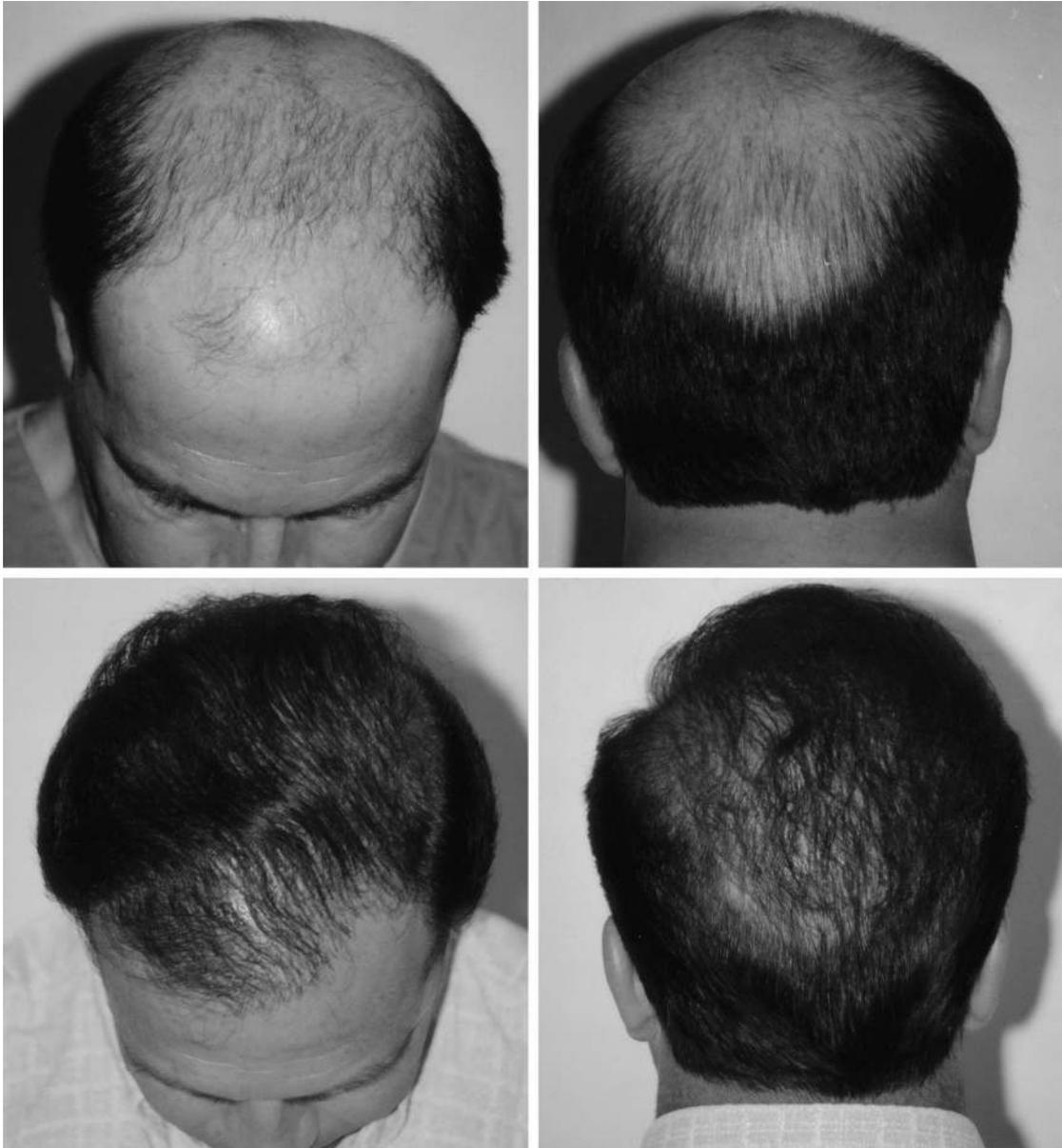


FIG. 1. (Above) Preoperative views of a patient with class VII baldness. (Below) Postoperative views after two sessions of transplantation with 4400 follicular unit grafts.

the patient, but we can plan a future appearance of good quality. I totally agree with the authors' philosophy. However, in patients who have good-quality donor hair, more creative efforts can be performed in just two sessions (Fig. 1). In the first session, a large number of grafts (more than 2000) are implanted from the frontal hairline to the crown region. We use follicular unit grafts that contain one to four hair roots in each graft. As Figure 1 shows, out of each pore, up to four hairs seem to have sprouted. These grafts are prepared by an experienced nurse using 2× magnifying loops. When a good result is achieved in the first session, we can treat the back of the head in a second session.

A lot of people desire to have all of their bald areas treated with hair transplantation. They force us to restore the crown and even rear bald areas.

DOI: 10.1097/01.PRS.0000123630.32666.DD

*Erdal Tugsel, M.D.  
Ali Cetinkaya Bulu. 31/1  
K4, D17, Alsancak  
Izmir, Turkey  
etugsel@superonline.com*

#### **IS THE STAGING OF MELANOMA THE PRINCIPAL OBJECTIVE OF ITS TREATMENT?**

*Sir:*

We have read with great interest the article "Pattern of Initial Recurrence and Prognosis after Sentinel Lymph

Node Biopsy and Selective Lymphadenectomy for Melanoma," by J. D. Wagner et al. (*Plast. Reconstr. Surg.* 112: 486, 2003). We were very impressed by the quality and the size of the survey presented in this article; however, we want to discuss several points. With absolutely no information about the postoperative morbidity, this report leads to the suggestion that sentinel lymph node dissection would be an extremely light procedure with no complications. We also had no information about the cost of the procedure (duration of hospitalization, postoperative dressing). We have been performing the procedure in our department for the past 2 years in patients with early-stage cutaneous melanoma with a minimum Breslow thickness of 1 mm. The sentinel lymph node dissection is performed under general anesthesia, and 55 patients have been included in this trial to date. We have noticed a 30 percent rate of complications, with seroma in 13 cases, phlebitis in one case, and infection in two cases. Our results show a mean length of hospitalization of 3 days and a total duration of dressings of usually between 7 days and 1 month; however, when seroma occurred, patients underwent dressings until healing for a median period of 6 weeks. The total duration of inability to work in active patients is about 15 days. These results confirm those reported by Blumenthal et al.<sup>1</sup> in *Swiss Surgery*. All of these results lead to a higher total cost of this procedure compared with the "wait-and-watch" policy.

In addition, psychological follow-up should be seriously considered. Wagner et al. confirmed the results of Rayatt et al.<sup>2</sup> published in the *British Journal of Plastic Surgery*. Sentinel lymph node dissection may decrease the psychological morbidity when the biopsy is negative, but what happens when the biopsy is positive? In these cases, we are probably increasing the psychological morbidity with no valuable adjuvant therapy. Nevertheless, sentinel lymph node dissection is more aggressive compared with single skin excision with safety margins under local anesthesia and without hospitalization, and the psychological reactions and consequences are difficult to evaluate.

Thus, we do not agree with the conclusion of our colleagues that sentinel lymph node has become the standard of care for early-stage melanoma. It is still an option and should only be performed in the clinical trial setting. We also wonder whether there is no need for ethical committee approbation before performing such an invasive procedure with no individual benefit for the patient in terms of survival; in this case, the procedure would constitute an ignorance of Declaration of Helsinki principles about patients' rights and dignity protection in human experimentation. What's more, Dubois et al.<sup>3</sup> concluded in the *Archives of Dermatology* that adjuvant high-dose interferon alfa-2b therapy was deemed appropriate for node-negative patients with primary melanomas deeper than 4 mm, as asserted by Agarwala and Kirkwood<sup>4</sup> in *Oncology*, uncertain in patients with ulcerated intermediate primary tumors, and inappropriate for patients with nonulcerated tumors less than 4 mm. So the adjuvant treatment we propose is uncertain. We conclude that if sentinel lymph node dissection is an interesting technique in cancer with a valuable adjuvant treatment as breast cancer, we are not sure of the benefit to our melanoma patients, in whom even systematic lymph node clearance has not proved any efficacy in terms of survival, according to Starz et al.<sup>5</sup> and Carcoforo et al.<sup>6</sup>

The aim of cancer treatment is not only to provide better staging. Improving survival and comfort must be our obsession.  
DOI: 10.1097/01.PRS.0000123632.80614.C1

Alain M. Danino  
Mourad Mouaffak  
Olivier Trost  
Yves Dutronc  
Sophie Dalac  
Daniel Lambert  
Gabriel Malka  
Departments of Plastic and Reconstructive Surgery and  
Dermatology  
University Hospital  
School of Medicine  
Dijon, France

Correspondence to Dr. Danino  
Department of Plastic and Reconstructive Surgery  
University Hospital  
School of Medicine  
3 Rue du Faubourg Raines  
21033 Dijon, France  
alain.danino@chu-dijon.fr

#### REFERENCES

1. Blumenthal, R., Banic, A., Brand, C. U., Ris, H. B., and Lardinois, D. Morbidity and outcome after sentinel lymph node dissection patients with early-stage malignant cutaneous melanoma. *Swiss Surg.* 8: 209, 2002.
2. Rayatt, S. S., Hettiaratchy, S. P., Key, A., and Powell, B. W. Psychological benefits of sentinel lymph node biopsy in the management of cutaneous malignant melanoma. *Br. J. Plast. Surg.* 55: 95, 2002.
3. Dubois, R. W., Swetter, S. M., Atkins, M., et al. Developing indications for the use of sentinel lymph node biopsy and adjuvant high-dose interferon alfa-2b in melanoma. *Arch. Dermatol.* 137: 1217, 2001.
4. Agarwala, S. S., and Kirkwood, J. M. Update on adjuvant interferon therapy for high risk melanoma. *Oncology* 16: 1177, 2002.
5. Starz, H., De Donno, A., and Balda, B. R. The Augsburg experience: Histological aspects and patient outcomes. *Ann. Surg. Oncol.* 8: 48, 2001.
6. Carcoforo, P., Soliani, G., and Bergossi, L. Reliability and accuracy of sentinel node biopsy in cutaneous malignant melanoma. *Tumori* 88: S14, 2002.

#### POSTBURN FLEXION CONTRACTIONS OF THE KNEE

Sir:

With regard to the article entitled "Anterolateral Thigh Flap in the Treatment of Postburn Flexion Contractures of the Knee," by Serkan Yildirim et al. (*Plast. Reconstr. Surg.* 111: 1630, 2003), the authors have done commendable work. However, I would like to make the following comments:

1. In all types of postburn flexion contracture of the knee, a local flap from the same extremity is always available. I have treated 144 cases of postburn knee contracture over the past 13 years and have never required a distant flap.
2. If there is well-settled scar, central segment expansion can be used.<sup>1</sup>

3. If the scar is unstable, a reverse fascial flap can be used.<sup>2</sup>
4. As an alternative, a small fasciocutaneous flap from the same leg based on the principle of flap stretching can be used.<sup>3</sup>

Although the authors have done a good job, they should realize that if a locally available flap can be used, distant flaps are not preferable.

DOI: 10.1097/01.PRS.0000123633.00529.44

Vishwa Prakash, M.D.  
G.1, 1/12, Sector 5  
Rajinder Nagar  
Ghaziabad, India

REFERENCES

1. Prakash, V. A new concept for management of post burn contractures. *Plast. Reconstr. Surg.* 106: 233, 2000.
2. Prakash, V. Management of postburn knee contracture with unstable scar by using posterior calf fascial flap. *Plast. Reconstr. Surg.* (accepted for publication).
3. Prakash, V., and Bajaj, S. P. Flap stretching for management of postburn knee contracture with unstable scar. *Plast. Reconstr. Surg.* 108: 587, 2001.

**THE DIFFERENCE IN ESTROGEN RECEPTOR PROTEIN LEVEL BETWEEN BREAST HYPERTROPHY AND MICROMASTIA**

Sir:

Estrogen plays a very important role in the growth, development, and physiologic functioning of the breast.<sup>1,2</sup> Estrogen's effects are mediated by binding the hormone to the estrogen receptor protein.<sup>3-5</sup> Actually, breast growth and development are different in adult women who have normal estrogen levels in serum. This study aimed to make clear the difference in estrogen receptor levels between breast hypertrophy patients and micromastia patients by examining the estrogen receptor levels in breast tissue and then exploring the possible etiology of mammary hypertrophy and micromastia.

Thirteen patients were selected for each group (breast hypertrophy group and micromastia group). Breast hypertrophy tissue specimens were collected from the gland excised during reduction mammoplasty. In the breast hypertrophy group, the selection criterion was breast weight greater than 600 g before operation, according to Brown et

al.'s formula<sup>6</sup>; in the reduction mammoplasty group, the criterion was weight of the excised breast gland greater than 300 g. Patients were excluded if they had any of the following conditions: mastalgia; tenderness or nodularity of the breast on palpation; irregular menstrual cycle; hormonal treatment within at least 3 months; nipple discharge from either breast; cyst or fluid and milk concentration in the gland; family history of breast cancer; history of unilateral breast cancer; or pathologically atypical hyperplasia. The breast weight in the micromastia group was less than 200 g. The tissue specimens were obtained during the augmentation mammoplasty or correction of ptosis. Patient approval of participation in this study was obtained preoperatively.

Estrogen receptor status was determined by a cytochemical technique utilizing dextran-coated charcoal and Tris-EDTA-dithiothreitol buffer. The supernatant, representing receptor-bound hormone, was counted in a liquid scintillation counter (Wallac 1410, General Electric, Fairfield, Conn.). Results were subjected to Scatchard analysis to counter specific binding capacity and dissociation constants.<sup>7</sup> The test was repeated four times in the same specimen. The average result was used as final one. Data are presented as mean ± SEM. Results were analyzed with Mann-Whitney *U* test and are presented in Table I.

Even though estrogens are believed to play a major role in promoting the proliferation of both normal and neoplastic breast epithelium and the development of breasts, the growth and development of breasts are different in women who have normal menstrual cycles and estrogen levels in serum. Some women may have an overdevelopment and form hypertrophic breasts, while others may have low development and form micromastia. The cause of the difference in breast development status is still unclear. Although it was suspected that the hypertrophic breast was caused by increased estrogen receptor capacity in the mammary tissue, results suggest that the estrogen receptor status of breast tissue alone is not directly related to breast hypertrophy.<sup>8</sup> After reviewing these studies, it was found that the patient selection was not strict and the effect of exogenous estrogen was not delimited.

The patients in our study were strictly selected. Their menstrual cycles were normal. The reduction mammoplasty and augmentation mammoplasty procedures were performed during the follicular phase of the menstrual cycle. No patient had received any exogenous estrogen or other steroid hormones within 3 months. Patients with pathological lesions diagnosed by pathologists were excluded from this study. The 13 patients with micromastia were used as a control group.

TABLE I  
Estrogen Receptor Status

	Hypertrophic Breast Group	Micromastia Group	<i>p</i>
No. of patients	13	13	
Age, years			>0.05
Range	16-51	20-44	
Average	33.77 ± 11.01	30.15 ± 7.36	
Breast weight, g			<0.001
Range	432.5-1350.6	30-200	
Average	805.78 ± 64.28	102.31 ± 13.21	
Estrogen receptor status, fmol/mg			<0.05
Range	0.211-17.023	0.206-2.868	
Average	5.33 ± 5.70	1.23 ± 0.24	

These patients also met the conditions mentioned above. Therefore, the possible disturbing factors were excluded from this study.

In conclusion, estrogen receptor status was different between breast hypertrophy patients and micromastia patients. DOI: 10.1097/01.PRS.0000123634.16462.FD

Jiaming Sun, M.D.  
Qun Qiao, M.D.  
Keming Qi, M.D.  
Division of Plastic Surgery  
Union Hospital  
Tongji Medical University  
Huazhong Science and Technique University  
Wuhan, Hubei Province, China

Correspondence to Dr. Sun  
Division of Plastic Surgery  
Union Hospital  
Tongji Medical University  
Huazhong Science and Technique University  
1077 Jiefang Street  
Wuhan, Hubei Province, China 430022  
sunjm1592@sina.com.cn

## REFERENCES

1. Drife, J. O. Breast development in puberty. *Ann. N. Y. Acad. Sci.* 464: 58, 1986.
2. Muldoon, T. G. Steroid hormone receptor regulation by various hormonal factors during mammary development and growth in the normal mouse. *Ann. N. Y. Acad. Sci.* 464: 17, 1986.
3. O'Malley, B. W., and Means, A. R. Female steroid hormones and target cell nuclei. *Science* 183: 610, 1974.
4. Yamamoto, K. Steroid receptor regulated transcription of specific genes and gene networks. *Annu. Rev. Genet.* 19: 209, 1985.
5. King, R. J. B. Oestrogen-receptors: An overview of recent advances in their structure and function. *Proc. R. Soc. Edinb.* 95B: 133, 1989.
6. Brown, R. W., Cheng, Y. C., and Kurlay, M. A formula for surgical modification of the breast. *Plast. Reconstr. Surg.* 106: 1342, 2000.
7. Scatchard, G. The attraction of proteins for small molecules and ions. *Ann. N. Y. Acad. Sci.* 51: 660, 1949.
8. Jabs, A. D., Frantz, A. G., Smith-Vaniz, A., et al. Mammary hypertrophy is not associated with increased estrogen receptors. *Plast. Reconstr. Surg.* 86: 64, 1990.