Invasive fungal sinusitis

Sir:

Invasive fungal sinus infection is a potentially fatal condition that presents a diagnostic and therapeutic challenge to the physician. Aspergillosis, mucormycosis, candidiasis, and some other opportunistic fungal infections have been reported among the causative agents. Despite the fact that invasive fungal sinusitis is relatively rare, it is significant because of its rapid progression and lethal nature. Immunodeficiency and local tissue conditions, such as allergic mucosal hypertrophy and chronic bacterial sinusitis, can create an obstruction of the osteomeatal unit and provide favorable conditions that allow the fungus to proliferate and invade. Invasive forms of fungal sinusitis are characterized by invasion of the mucosa, which leads to local tissue ischemia and necrosis. Fungal extension from the paranasal sinuses into adjacent structures such as the orbit and the intracranial cavity can occur with direct local extension or hematogenous spread.

In this letter, we report a case of fulminant invasive fungal sinusitis in an apparently normal host and emphasize the importance of early diagnosis and treatment.

A 36-year-old woman presented to our clinic because of proptosis and ophthalmoplegia of 2 days’ duration. It was learned from her history that she was otherwise healthy until she underwent a left endoscopic maxillary operation for presumed sinusitis 2 months earlier. However, she experienced periorbital pain after the operation, and her symptoms did not resolve. One month after the operation she developed fever and leukocytosis. Diagnostic endonasal biopsy results suggested fungal infection, and antifungal treatment (amphotericin B, 1 mg/ml) was begun. Despite extensive antifungal treatment for nearly a month, the patient’s condition deteriorated, and she lost consciousness 1 week before she presented to us.

On physical examination, she was in a semicomatose state and had left facial swelling, extensive proptosis, conjunctival chemosis, complete ophthalmoplegia, and left optic disc edema (Fig. 1). Radiologic imaging confirmed the clinical findings of maxillary sinus inflammation and cavernous sinus thrombosis (Figs. 2 and 3). Results of repeated additional biopsies also were suggestive of a fungal infection, but we were unable to identify the causative agent because fungal cultures revealed no organisms. Wide surgical debridement and extenteration were offered, but the patient died before the operation.

Aspergillosis, mucormycosis, candidiasis, and some other opportunistic fungal infections have been reported among the causative agents of invasive fungal sinusitis. Our patient’s clinical condition is a rare entity and is suggestive of mucormycosis or aspergillosis in many ways. Although rhinocerebral forms of aspergillosis or mucormycosis are usually seen in immunocompromised patients, they have also been reported in healthy hosts like our patient. However, they appear to be very serious, rapidly extending diseases with high mortality rates. Our patient was immunocompetent and had cavernous sinus thrombosis with rapidly progressive proptosis, complete ophthalmoplegia, and optic disc edema. Cavernous sinus thrombosis can develop in rhinocerebral infections of both organisms. However, more fulminant proptosis is caused by mucormycosis, whereas proptosis secondary to aspergillosis progresses slowly. Overall, the clinical picture is similar in both infections. Although pathologic investigation results revealed a fungal infection, we were unable to identify the causative agent in our patient because she had experienced repeated surgical biopsies before, and very little material was obtained from her last biopsy. In addition,
she had been receiving antifungal treatment for a long period.

Whatever the cause of invasive fungal sinusitis is, the most important points we want to emphasize are the treatment strategy—which should include aggressive surgical débridement and the use of systemic antifungal agents—and the timing of treatment.

Surgical débridement is the key feature of management, as it is very difficult to eradicate fungus (with amphotericin) from the necrotic tissue areas so characteristic of the disease.\textsuperscript{1,2,5} The amount of surgical débridement is guided by the extent of invasion.\textsuperscript{2,5} Orbital exenteration is not always mandatory in all patients with evidence of orbital disease. Depending on the aggressiveness of the disease, exenteration may be necessary to maximize the chance of survival, but in less aggressive disease presentations, it may be possible to spare the orbit.\textsuperscript{5}

Factors that appear to be associated with a poor outcome include orbital involvement and medical management alone. It has been reported that surgical management can be performed within 1 week of amphotericin B therapy after medical stabilization.\textsuperscript{5}

Our patient was treated with amphotericin B alone for 1 month, and she was in the terminal stage when we planned wide surgical débridement. Early diagnosis and combined medical and surgical treatment are lifesaving in invasive fungal sinusitis, as overall mortality rates approach 90 percent.\textsuperscript{2}

Because of this, invasive forms of fungal sinusitis must be considered in the differential diagnosis in patients with rapidly progressive proptosis and ophthalmoplegia, and early surgical débridement must be considered in combination with antifungal chemotherapeutic agents.

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Sebnem Kargi, M.D.
Ankara SSK Eye Hospital
Ankara, Turkey
A. Eksal Kargi, M.D.
Deniz Akduman, M.D.
Departments of Plastic and Reconstructive Surgery and Infectious Diseases
Zonguldak Kavaanmas University
Zonguldak, Turkey
S. Serdar Hanioglu, M.D.
Department of Radiology
Ankara University
Ankara, Turkey

Correspondence to Dr. Sebnem Kargi
Halide Nazvet Zorlutuna Sk. 5/6
06550 Y. Ayrancı, Turkey
sebnemkargi@yahoo.com

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Sir:

A multitude of techniques have been described to maintain the position of the elevated forehead in an endoscopic brow lift. Among these, sutures passed through bone tunnels are perceived by many to be advantageous because they provide a longer-lasting suspension while minimizing the risk of alopecia often associated with other techniques. A burr is used to create the tunnel in the outer table of the calvaria, to connect two holes approximately 5 mm apart. The roof of the tunnel is frequently sharp. Tension on the suture against this edge may cause it to rupture during tying or early in the postoperative period.

We suggest a simple method to avoid this. From the temporal port on each side, a square of temporal fascia (superficial part of the deep temporal fascia) is harvested, measuring approximately 2 × 2 cm. The tissue is then folded upon itself and transfixed by the same suture that passes through the bone tunnel. The needle is then reversed through the tunnel and passed through the galeofrontal layer of the forehead. As the suture is tied, the fascial plug comes to abut against the sharp bony edge and softens its contour. A firm tie may then be made (Fig. 1). Another theoretical advantage of this technical modification is the zone of adherence created over the temporalis muscle at the site of fascial harvest.

We now use this technique routinely in endoscopic forehead lifts, with a high rate of satisfaction and no incidence of ruptured sutures. We recommend it as a useful tip for any surgeon who is fond of using bone tunnels for forehead fixation.

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S. Witham, M.S., F.R.C.S.(Plast.)
M. H. Kelly, F.R.C.S.(Plast.)
Department of Plastic and Craniofacial Surgery
Chelsea and Westminster Hospital
London, United Kingdom

Correspondence to Dr. MacKenzie
Department of Plastic and Craniofacial Surgery
Chelsea and Westminster Hospital
369 Fulham Road
London SW10 9NH, United Kingdom

REFERENCES


ACQUIRED STRABISMUS FOLLOWING COSMETIC BLEPHAROPLASTY

Sir:

In their recent article, “Acquired Strabismus after Cosmetic Blepharoplasty,” Syniuta et al. reported on 12 patients and suggested that the acquired strabismus was due to ex-
traocular muscle damage resulting in superior oblique palsy or inferior rectus paresis.

Another possible cause of strabismus following cosmetic blepharoplasty is restrictive changes in the movement of the eye secondary to scar tissue formation. Diplopia developed after cosmetic blepharoplasty in four of my patients. Each of these patients denied diplopia during the first 1 to 2 weeks after the operation but then began experiencing progressive diplopia. The cases all involved lower cosmetic blepharoplasty, in which either there was a previous history of blepharoplasty with secondary removal of temporal lower eyelid fat or a tarsal strip procedure was performed in an attempt to free the inferior temporal septal attachments for elevation of the temporal lower eyelid. All four patients had difficulty in adducting and elevating the eye, and there was a positive forced duction test when I attempted to move the globe into this position (Fig. 1 and Fig. 2, above). Some of these patients underwent magnetic resonance imaging, which demonstrated fibrous adhesions between the temporal inferior orbital fat and the lateral rectus muscle (Fig. 2, below). The cause was believed to be scar tissue formation from coagulation of temporal inferior posterior orbital fat or severing of the temporal inferior orbital septal attachments. When these patients attempted to look inward and upward, it was possible to palpate deep fibrous bands in the temporal inferior anterior orbit.

The patients were treated with a combination of systemic steroids and injection of triamcinolone acetonide (Kenalog; Bristol-Myers Squibb, New York, N.Y.), 40 mg/ml (0.5 ml), into the temporal inferior orbit at the site of the palpable scar at least once and sometimes on two occasions. Patients also were instructed to exercise their affected eye by attempting to look in the position of the restriction multiple times daily. One patient needed surgical release of these attachments. All the others had spontaneous resolution of their diplopia to the point that it either completely resolved or was nonbothersome.

Since encountering these problems, I have been more conservative in coagulation of the deep temporal orbital fat during cosmetic blepharoplasty, especially in repeated operations, and have performed tarsal strip procedures only by release of the lateral canthal tendon, without releasing the temporal inferior orbital septum. Should this problem occur postoperatively, I believe that it can be verified by a forced duction test, by palpation of the scar tissue in the temporal inferior anterior orbit, and by magnetic resonance imaging. It can be treated with orbital steroid injection at the site of the scar tissue and with systemic steroids and eye exercises.

The complication of strabismus after cosmetic blepharoplasty may be common. In an informal, unpublished survey I conducted in the 1990s of the members of the American Society of Ophthalmic Plastic Reconstructive Surgery, 11 of 36 respondents (31 percent) reported that they had had 15 cases of strabismus or diplopia following tarsal strip procedures or cosmetic blepharoplasty.

I congratulate the authors for bringing this complication to our attention.

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Allen M. Putterman, M.D.
111 N. Wabash
Suite 1722
Chicago, Ill. 60612

REFERENCE

REPLY

Sir:

We were very interested to read Dr. Putterman’s letter concerning our article, “Acquired Strabismus after Cosmetic Blepharoplasty,” and his personal experience. Actually, our experience is similar.
Seven of our 12 patients developed diplopia related to inferior rectus paresis, which was combined with mechanical restriction to upward rotation of the globe in five of these seven patients. All of these patients had undergone either four-lid or lower-lid blepharoplasty. The restrictive component of the strabismus was associated with regional scarring and fat adherence inferiорly. Restrictions were noted to upward rotation of the globe by forced duction testing. All cases of inferior rectus injury had been performed using a fornix incision. Twenty-five percent of our cases occurred following repeated blepharoplasty procedures. In our Discussion, we mentioned the possibility of damage to the capsular palpebral fascia and inferior tarsal muscle as well as the possible problem of excessive fat removal, as elaborated on by Dr. Putterman.

Our patients usually presented to a strabismus surgeon many months following the blepharoplasty. The postoperative inflammatory response had subsided. It seems as if Dr. Putterman was aware of the patients’ problems much earlier and was successful in relieving the restriction to upward rotation by utilizing systemic and local injection of steroids into the inferior temporal orbit.

Our article and his letter emphasize the importance of this complication and suggest surgical technique modifications, which may reduce the incidence of inferior rectus injury and inferior orbital restriction. Strabismus surgery may be successful in correcting the problem. However, two of our patients were left with residual vertical deviations in the primary position and persistent limitations to elevation.

We appreciate Dr. Putterman’s interest in this topic and his important suggestions.

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Arthur L. Rosenbaum, M.D.
Robert A. Goldberg, M.D.
Laura Syniuta, M.D.
Neepa Thacker, M.D.
Jules Stein Eye Institute
University of California, Los Angeles
Los Angeles, Calif.

Correspondence to Dr. Rosenbaum
Jules Stein Eye Institute
University of California, Los Angeles
100 Stein Plaza, Box 957001
Los Angeles, Calif. 90095-7001

REFERENCE

INTERRUPTED “WAVED ROUND BLOCK SUTURE” TO SECURE SKIN GRAFTS ON THE SCALP

Sir:

Several methods of securing skin grafts to the recipient bed have been described.1-10 Simplicity, cost effectiveness, and speed of application are desired properties. The scalp itself represents a challenging area for bleeding control, poor skin extension, and alopecia. Therefore, careful hemostasis and large skin grafts are often required, thereby extending the surgical time. Hemostasis and reducing the size of the defect with sutures have been previously reported for direct closure of scalp wounds.11,12 We present a simple, rapid, and nonbleeding method for excising hairy scalp lesions and securing the skin graft.

After marking the intended excision, three waved round block stitches are applied 1 cm away from the excision margins to achieve hemostasis (Fig. 1). The ends of the stitches are left long so they can be used to secure the skin graft. The skin lesion is excised, and the size of the defect is reduced by the round block suture; therefore, a smaller graft is required (Fig. 2). Four additional stitches are used to fix the graft to

Fig. 1. The interrupted waved round block suture is used to achieve hemostasis and reduce the size of the defect.

Fig. 2. A small skin graft is applied.
the defect margins, and the dressing is secured to immobilize
the underlying graft. The sutures are removed after 5 days
and used for further compression if required.

The interrupted waved round block suture has many
advantages:

- It is a simple, inexpensive, and rapid technique to achieve
  hemostasis, shorten surgical time, and prevent alopecia
due to hemostasis.
- It stretches the surrounding skin, producing an intraop-
 erative tissue expansion.
- It reduces the size of the defect so that a smaller skin graft
  is required, which results in less scarring (Fig. 3).

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Francesco Gargano, M.D.
Via Stresa 137
00135 Rome, Italy
francescogargano@hotmail.com

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DERMATOPHYTIC PSEUDOMYCETOMA OF THE
SCALP

Sir:

Dermatophytic pseudomycetoma is a rare recurring fungal
infection of the dermis and subcutaneous tissues.1–3 We
excised a dermatophytic pseudomycetoma secondary to Mi-
icrosporum canis in an otherwise healthy young woman with
recurrent scalp lesions since infancy who did not respond to
medical therapy.

A 19-year-old black woman from the Dominican Republic
presented with recurrent painful scalp lesions beginning in
infancy. The hard, reddish nodules would enlarge in time and
become fleshy, painful masses. The lesions had been excited
in her home country several times. The most recent culture
grew M. canis, and the lesion was superinfected by Staphylo-
coccus aureus, Escherichia coli, and Acinetobacter calcoaceticus-bau-
mannii complex. Griseofulvin was prescribed, but the patient
was noncompliant in taking the medication. She now sought
consultation for a 4 × 3-cm lesion on her occiput. Magnetic
resonance imaging showed bony involvement. Despite
treatment with griseofulvin, the lesion persisted. In the oper-
ating room, the lesion was excised. Histopathologic analysis
revealed numerous fungal granules associated with abscess
formation. Silver stain confirmed the presence of fungal or-
organisms (Fig. 1). At her 2-week follow-up, the incision was
healing well without evidence of recurrence, and she was
compliant in taking griseofulvin.

Superficial fungal scalp infections, otherwise known as tinea
capitis, are predominantly caused by two genera of dermato-
phytes: Trichophyton and Microsporum.1 In North America, the
most common etiologic organism for tinea capitis is Trichophyton
tonsurans, while in Europe M. canis prevails.8,10 The clinical
presentation varies and includes a seborrheic scaling form, a
pustular crusted pattern, an inflammatory kerion, and a black
and mycotic granules.1

In contradistinction to eumycotic mycetomas, there are no draining sinus tracts. It has been
postulated that hyphae invading a hair follicle escape into surrounding tissue, aggregate, and induce a marked immu-
nologic reaction.3

Clinical examination of the pseudomycetoma reveals a
large firm to fluctuant mass or a confluence of masses.1–8 On
occasion, the unwary surgeon may be surprised to find fungal
granules while attempting to excise a presumed epidermal

Fig. 3. Five-day postoperative view of the patient oper-
ated on using the interrupted waved round block suture.
inclusion cyst, lipoma, or abscess. Definitive diagnosis relies on culture and histopathological findings from scrapings or biopsy specimens. It should be noted that these lesions can become superinfected by bacteria, as in our patient. Periodic acid–Schiff and Gomori methenamine-silver nitrate stains highlight the fungal elements, and mycology cultures identify the fungal pathogen. Radiographic imaging may be useful if bony involvement is suspected.

The standard of care in pharmacologic treatment of dermatophyte scalp infections is griseofulvin. This drug interferes with fungal replication and is effective against all dermatophyte genera. The safety profile is excellent, as is its tolerability by patients. However, the long duration of treatment (a minimum of 6 weeks) has led to investigation of alternative drug regimens. Itraconazole and fluconazole have been yet approved by the U.S. Food and Drug Administration for this indication, both itraconazole and fluconazole have been used with success for tinea capitis and should be considered as alternatives for the patient who cannot tolerate griseofulvin. Unfortunately, medical therapy alone often fails to eradicate the pseudomycetomas. Therefore, surgical excision or débridement is advocated.

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Amy S. Colwell, M.D.
Mary R. Kwaan, M.D.
Dennis P. Orgill, M.D., Ph.D.
Departments of Surgery and Pathology
Brigham and Women’s Hospital
Boston, Mass.

Correspondence to Dr. Orgill
Division of Plastic Surgery
Brigham and Women’s Hospital
75 Francis Street
Boston, Mass. 02115
dorgill@partners.org

REFERENCES


CORRECTION OF FULL-THICKNESS DEFECTS OF THE AURICULAR SCAPHA FOLLOWING MOHS SURGERY

Sir:

Reconstruction of nonmarginal defects of the ear has been sparsely addressed in the literature. This topic is of importance because the structural integrity of the ear may be affected not only by the defect but also by its reconstruction. We present a patient with a large full-thickness defect of the scapha of the ear and describe a one-stage, simple, and reliable method of repair.

A 73-year-old man with a history of hypertension, coronary artery disease status following angioplasty and three-vessel coronary artery bypass, and gastroesophageal reflux disease underwent Mohs surgery on his left ear for excision of a 6-mm basal cell carcinoma. His initial defect measured 1.5 × 1.3 cm with exposure of the perichondrium. Postoperatively, his wound became infected, which resulted in full-thickness necrosis of a 1.5-cm-diameter region in his scaphoid fossa (Fig. 1). The patient was treated with antibiotics and referred for reconstruction. Although the wound consisted of a full-thickness defect of both cartilage and skin, only skin coverage was...
necessary because the structural integrity of the ear had not been compromised. We were nonetheless constrained in the choice of technique, because wedge resection alone with primary closure would produce cupping of the ear given the size of the defect. In addition, the patient’s medical history mandated a simple and efficient procedure.

To perform our technique, a flap of the same size and shape as the defect was marked on the posterior auricular surface, with one side adjacent to the defect in the superolateral direction. The flap was elevated on all sides except for that situated on the rim of the defect. The posterior ear skin and subcutaneous tissue were then rotated through the defect and sutured into place anteriorly, leaving exposed subcutaneous tissue on the posterior aspect of the ear at both the graft and the donor sites. A full-thickness skin graft was harvested from the retroauricular space for coverage of this defect, and the donor site was closed primarily (Figs. 2 and 3). At 3-month follow-up, the repair was intact and viable, with an excellent cosmetic result (Fig. 4).

Several authors have described methods in which both skin and cartilage can be locally recruited using composite grafts or chondrocutaneous advancement flaps.\(^1\)\(^-\)\(^3\) The tubed pedicle flap has the advantage of providing well-vascularized tissue, but it requires a second procedure for pedicle division. In addition, it may result in the transfer of hair-bearing skin to the ear with larger defects.\(^2\) The postauricular pull-through flap of Gingrass uses postauricular skin brought anteriorly through an incision in cartilage. Although this reconstruction may be used for large defects, it also requires flap delay.\(^1\)

One-stage procedures include the postauricular “revolving door” island flap, in which partial-thickness anterior defects of the helix and concha are repaired with a posterior incision directly behind the defect. The surrounding skin is undermined and advanced through the incision into the defect, and the donor site is closed primarily.\(^5\) Humphreys et al.\(^6\) revisited this technique, reporting its successful use with up to 4.5-cm defects of the anterior helix, antihelix, and scapha.

Although this repair provides a large amount of soft tissue, it may distort the ear by pinning it back toward the scalp, especially when used for larger reconstructions. Sawada et al.\(^7\) described a flap that they used to close donor sites of the scapha after anterior harvest of skin and cartilage for nasal defects. As in previous repairs, postauricular skin was elevated.
and passed through the defect with the epidermal side lying anteriorly. The posterior wound was then closed primarily without tension.

Ramírez and Heckler used chondrocutaneous advancement flaps for reconstruction of partial and full-thickness nonmarginal defects of up to 2.5 cm, with superior rotation of an inner central flap and inferior rotation of an outer flap. Although this method provides both structural support and skin closure for even full-thickness defects, it is somewhat time-consuming and is unnecessary in cases in which structural support is adequate. Finally, Elsahy reported a one-stage method of closure of full-thickness defects of the triangular fossa. Because his patient was also missing a segment of his antihelical cartilage, cartilage reconstruction was required. A proximally based flap of the antihelix was designed and elevated, with rotation and advancement providing complete closure of the defect.

One criticism of our repair might be that the retroauricular skin was used as the skin graft donor site. Had the flap become necrotic, we would have obviated the use of a postauricular flap. In retrospect, the supraclavicular region or the postauricular region of the opposite ear would have provided a better donor site for the skin graft. In addition, although we based our flap on the superolateral border of the defect, the inferomedial border would have provided a superior blood supply. Certainly, either flap could have been used in our case. Finally, although our follow-up to date is only 3 months, we do not anticipate significant contracture of our repair.

In summary, reconstruction of full-thickness scapha defects without a loss of structural integrity may be managed with simple anterior rotation of a postauricular skin flap and skin grafting of the posterior surface. This method of closure is efficient, minimally morbid, and cosmetically acceptable.

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REFERENCES


EARLOBE MORPHOLOGY DELINEATED BY TWO COMPONENTS: THE ATTACHED CEPHALIC SEGMENT AND THE FREE CAUDAL SEGMENT

Sir:

We applaud Azaria et al.’s efforts to analyze earlobe morphology using a large number of subjects in “Morphometry of the Adult Human Earlobe: A Study of 547 Subjects and Clinical Application.”1 We agree with their observations, including the propensity for increased total earlobe height with increasing age and the correlation of pendulous earlobes and increased total earlobe heights. However, we would like to offer a different interpretation regarding the authors’ conclusion that pendulous earlobes are more likely to elongate and should thus be avoided in loboplasty procedures. Our interpretations were developed only after acknowledging that the earlobe is divided into two segments: the attached cephalic segment (the intertragal to otobasion inferius distance) and the free caudal segment (the otobasion inferius to subaurale distance) (Fig. 1).2

Thus, what the authors label
as “pendulous” can be described by an otobasion inferius to subaurale distance greater than 0 mm, and their “nonpendulous” can be described by an otobasion inferius to subaurale distance equal to 0 mm.

The authors establish increased total earlobe length (intertragal to subaurale distance) with increasing subject age. Further, they report the association of pendulous ears with increased total earlobe lengths. However, we disagree with their conclusion that pendulous earlobes are associated with propensity for elongation and thus should be avoided in loboplasty. First, a nonpendulous earlobe is not the preferred, ideal aesthetic earlobe morphology described by an otobasion inferius to subaurale distance equal to 0 mm. In fact, we have analyzed earlobe heights in 44 patients seeking facial rejuvenation operations and observed similar effects of increasing age with increasing earlobe lengths. Specifically, we have observed that aging changes result in elongation of the free caudal segment and not the attached cephalic segment. Yet, we cannot conclude with certainty that it is a pendulous earlobe type that maintains a higher propensity for elongation in comparison to a nonpendulous earlobe. In fact, it is feasible that age-related changes could be transforming a nonpendulous earlobe with a free caudal segment (otobasion inferius to subaurale distance) equal to 0 mm into a pendulous earlobe with a free caudal segment (otobasion inferius to subaurale distance) greater than 0 mm.

We would like to caution against the authors’ recommendations that clinicians should strive toward creating nonpendulous earlobes. In fact, a nonpendulous earlobe maintains many of the characteristics of the “pixie” ear deformity, which is an undesirable complication of a face lift operation. Finally, we encourage independent consideration of both the cephalic attached segment and the caudal free segment for complete earlobe morphology analysis.

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Arian Mowlavi, M.D.
D. Garth Meldrum, M.D.
Bradon J. Wilhelmi, M.D.
Plastic Surgery Institute
Southern Illinois University School of Medicine
Springfield, Ill.

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
amowlavi@hotmail.com

REFERENCES

REPLY

Sir:

We read with interest the letter by Mowlavi et al. that was written in response to our study, entitled “Morphometry of the Adult Human Earlobe: A Study of 547 Subjects and Clinical Application,” published in a recent issue.1 We were surprised to discover the significance of this issue as demonstrated by the many comments we received following publication of the article. We hope this study will draw all plastic surgeons’ attention to the importance of the earlobe in the integrity of the human ear.

As mentioned in our study, the anatomical classification of the earlobe appearance as pendulous or nonpendulous was formed primarily for expediency. There are many earlobe types, as described by Tolleth,2 but the main factor on which our classification was based is that the pendulous earlobe consists mainly of a free caudal segment, whereas in the nonpendulous earlobe, the attached cephalic segment is the main part.

We do not oppose the assumption that the pendulous earlobe has a more favorable aesthetic appearance than the nonpendulous earlobe; hence, there is no need to withhold the creation of such. As noted in our study, the lowest rate of progression in earlobe length (less than 10 percent over

Fig. 1. The anatomical landmarks of the intertragal notch, otobasion inferius, and subaurale are illustrated. Earlobe height parameters are defined with respect to the attached cephalic segment (intertragal to otobasion inferius distance) and the free caudal segment (otobasion inferius to subaurale distance). L, intertragal notch; O, otobasion inferius; S, subaurale.
time) was found in the older female group (above age 40 years). Therefore, at the time of the facial rejuvenation operation, most women will benefit from earlobe reduction regardless of which loboplasty procedure is favored by the surgeon. At the same time, however, we emphasized the advantage of creating a nonpendulous earlobe to avoid further small (and maybe negligible) elongation.

The hypothesis of Mowlavi et al. that age-related changes might cause transformation of a nonpendulous earlobe is not well supported, and a prospective follow-up study to record the changes of the nonpendulous earlobe over time is still needed. We are not familiar with such cases, and in fact, few subjects in our older group have a nonpendulous earlobe despite their age.

Therefore, presuming a slower earlobe elongation rate in women over age 40 (match for a facial rejuvenation operation) and a more aesthetic appearance for the pendulous earlobe, there is no indication against earlobe reduction to the preferable length (Table I in our study) and creation of a pendulous earlobe for favorable aesthetic results.

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Ron Azaria, M.D.
Department of Plastic Surgery
Rabin Medical Center
Beilinson Campus
Petah Tiqva 49100, Israel
rongulu@hotmail.co.il

REFERENCES

NASAL HERPES AFTER RHINOPLASTY

Sir:

Herpes labialis and genital herpes caused by herpes simplex virus (herpes simplex virus-1 and herpes simplex virus-2) are frequent diseases in the general population, and the duration of symptoms and mucocutaneous lesions are shortened with antiviral agents.1 When we perform laser skin resurfacing, we actually try to be ahead of the herpetical infection and use a prophylactic medication such as famciclovir in all individuals, even if a prior history of cold sores cannot be elicited.2,3 The same is true for patients who will be submitted for a chemical peel or dermabrasion.4,5 But when we come to an aesthetic rhinoplasty, not too much attention is given to the possibility of a dermal invasion of the nose by this virus.

A 25-year-old woman presented for a rhinoseptoplasty. This operation is usually performed under intravenous sedation and involves reduction of the bony and cartilaginous dorsum, correction of the septal deviation, a septal cartilaginous graft according to Sheen’s technique on the nasal tip,6 and osteotomy. On the third postoperative day, some whitish vesicles in the skin of the nasal tip were noticed on an erythematous base (Fig. 1), together with ulcers with a white layer on the oral mucosa (Fig. 2). At first sight, it was thought to be a fungus or bacterial infection and/or an impaired blood supply of the skin because of a wrong plane of dissection (even though this technique has been performed by the senior author, Arriola, for more than 11 years). The plastic splint (WFR/Aquaplast Corp., Wyckoff, N.J.) was changed for another one not so tight.

Fig. 1. Patient has broken, whitish vesicles on the skin of the nasal tip on the third postoperative day.

Fig. 2. Ulcers on the oral mucosa with a white layer.
Antibiotic therapy (amoxicillin 500 mg plus clavulanic acid 125 mg three times a day by mouth, topical pseudomonic acid three times a day) and antimycotic therapy (fluconazole 150 mg/day and nystatin mouthwash 600,000 U four times a day) were also begun. At that time, the patient was asked for any history of herpetic infection, and she reported herpes simplex labialis 6 months before the rhinoplasty. The patient was then sent to the clinic’s dermatologist for an evaluation and suggestions. Her clinical diagnosis was herpes simplex, and zinc sulfate plus the already installed therapy was recommended. This was done, and the skin healed uneventfully in the next days with no scars (Fig. 3).

It has to be remembered that a reservoir of viruses exists in nerve ganglia, and no topical or systemic agent destroys this reservoir. Reactivation of herpes simplex virus from the trigeminal ganglia may be associated with asymptomatic virus excretion in the saliva, development of intraoral mucosal ulcerations, or herpetic ulcerations on the vermilion border of the lip on external facial skin. The lesions of herpes simplex virus in the oral cavity are clinically similar to mucosal lesions caused by cytotoxic drug therapy, trauma, or fungal or bacterial infections. A variety of physiologic, psychosocial, and environmentally derived stresses termed “trigger factors” are commonly cited by patients as preceding an outbreak of facial herpes; these factors include the common cold, fever, emotional stress, trauma, exposure to sun, and orofacial surgery, among others. An association between chemical peel or dermabrasion and herpetic infections has been well described by Perkins and Sklarew and by Breiner et al., who even describe it as a devastating event. Erythema multiforme may be associated with herpes simplex virus infections; some evidence suggests that herpes simplex virus infection is the precipitating event in 75 percent of cases of cutaneous erythema multiforme.

To our knowledge, there is no reference in the literature about the association between rhinoplasty and nasal skin herpes. The aim of this letter, therefore, is to share our experience and to suggest that the patient be asked beforehand about the presence of cold sores or other perioral and intraoral herpetic infections. If there is a positive history, acyclovir as a prophylactic in regular doses should be used at 200 mg five times per day for 5 days before and after the procedure, or famciclovir 250 mg/day is sufficient for most patients and should be commenced 24 hours before the procedure. Patients who are suspected of having a herpetic infection should have a Tzanck stain for detection of multinucleated giant cells and/or a viral culture of a skin swab and be started immediately on high doses of antiviral agents.

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Augusto Arriola, M.D.
Arriola Plastic Surgery Clinic
Cieitifica del Sur University
School of Medicine
Lima, Peru
Rosario Torres, M.D.
Department of Dermatology
Instituto de Salud del Niño
Lima, Peru
Veronica Soto, M.D.
Cayetano Heredia Peruvian University
School of Medicine
Lima, Peru

Correspondence to Dr. Arriola
Av. Buena Vista 272
Chacarilla del Estanque, San Borja
Lima, Peru
aarriola@terra.com.pe

REFERENCES


Fig. 3. Postoperative view 4 weeks after the viral infection resolved. The nasal tip healed with no scars.

**CLEFT LIP/NOSE DEFORMITY AND RHINOLITH**

Sir:

Rhinolith is a calcified mass located in the nasal cavity. Rhinoliths are almost always present as solitary unilateral masses in the anterior half of the nasal cavity. Females are more frequently affected. Rhinoliths are easily friable, rough-surfaced, foul-smelling structures that are gray to brown in color. They reside for many years without any symptoms. Symptoms, which subside quickly after removal of the rhinolith, include nasal obstruction, nasal discharge, recurrent epistaxis, oronasal fistula, headache, and maxillary sinusitis. We present two rhinolith cases of cleft lip/nose deformity.

**Case 1.** An 18-year-old man with cleft lip/nose deformity was referred to our clinic because of a nasal deformity. He had left unilateral complete cleft palate for which he had gone through a series of operations. The patient’s history revealed obstruction in the left nasal cavity, an aching sensation in the face for many years, and a recent epistaxis. Physical examination revealed nasal aperture deviation toward the right, notching, and retrusion in the maxillary arch.

![Fig. 1](image1.png)

*Fig. 1.* (Left) Preoperative and (right) postoperative computed tomographic scans for case 1.

![Fig. 2](image2.png)

*Fig. 2.* (Left) Preoperative and (right) postoperative computed tomographic scans for case 2.
Computed tomography imaging demonstrated significant deviation of the bony septum to the left, deviation of the cartilaginous nasal septum and anterior nasal spine to the right, and a calcified mass (Fig. 1). A rhinolith was detected in the lower meatus of the right nasal cavity by nasal endoscopy. The rhinolith was removed by an anterior endoscopic approach under general anesthesia. The dimensions of the removed structure were 1.5 × 1 × 0.7 cm. Chemical analysis revealed calcium oxalate, calcium, magnesium, and magnesium phosphate minerals.

Case 2. An 18-year-old woman was referred to our clinic because of cleft lip/nose deformity. She had unilateral left complete cleft palate and had gone through a series of palatal repair operations. Physical examination showed nasal aperture deviation toward the right. Computed tomography imaging demonstrated significant deviation of the bony septum to the left, deviation of the cartilaginous nasal septum and anterior nasal spine to the right, and a hyperdense mass (Fig. 2).

A rhinolith was detected in the anterior aspect of the left middle meatus by nasal endoscopy. The rhinolith was removed by an anterior endoscopic approach under general anesthesia. The dimensions of the structure were 1.5 × 1 × 1 cm. Chemical analysis revealed calcium carbonate, calcium, and magnesium phosphate minerals.

Despite the fact that foreign bodies are frequent in the nasal cavity, true rhinoliths are rare. The first well documented rhinolith case was reported by Bartholin in 1654. The first chemical analysis was performed by Axmann in 1829. The core substance that gives rise to the formation of a rhinolith can be either exogenous (e.g., buttons, beads, fruit stones) or endogenous (e.g., blood clot, epithelial debris, osseous fragments, teeth) and can be iatrogenic or traumatic in origin. After nasal obstruction, minerals in the nasal and lacrimal secretions settle around these nuclei as salts of ox- idium. After nasal obstruction, minerals in the nasal and lacrimal secretions settle around these nuclei as salts of ox-

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The formation of a rhinolith due to an exogenous cause is related to foreign-body reactions and the subsequent obstruction and suppuration. This was clarified by Allen, who emphasized that a long period of time is mandatory. According to Worgan, choanal atresia causes infection, inflammation, and fibrosis, and an endogenous rhinolith ensues. Bowser noticed that air currents were necessary for concentration and crystallization.

We assume that palatal eruption of teeth and distortion of the nasal cavity floor associated with changes in the maxillary arch and septal deviation cause stasis of secretion. This leads to infection facilitating the formation of blood clots, epithelial debris, and nasal crusts. Thus, an endogenous nucleus is created. The inflammation, fibrosis, atrophy, and preceding hypertrophy cause a vicious cycle. Thus, we propose that nasal septal deviation and distortions in the maxillary arch are important etiopathogenetic mechanisms of rhinolith formation in surgically treated cleft palate patients. Three cases in the literature were similar to our cases. Two of the patients had undergone several palatal repair operations, and one of the patients had traumatic nasal septal deviation.

Rhinoliths, albeit rare, can be encountered in cleft lip/nose patients. A detailed patient history and thorough physical examination with the aid of anterior rhinoscopy, endoscopy, and radiography (especially computed tomography), if necessary, should be performed and are diagnostic. Differential diagnoses include calcified nasal polyps, ossified fibroma, odontoma, osteoma, osteosarcoma, chondroma, chondrosarcoma, and calcified masses in the nasal cavity, such as calcified angiofibroma.

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Ayda Turk, M.D.
Ayda Gözü, M.D.
Bülent Genç, M.D.
Deniz Demiroğlu, M.D.
Zafer Özyay, M.D.
Plastic and Reconstructive Surgery Clinic
Hüseyin Cihan Güner
Plastic and Reconstructive Surgery Clinic
Otohinoaryngology–Head and Neck Surgery Clinic
Emin Sağlar Kilavuz, M.D.
Biochemistry Clinic
SSK Yüksek Sağlık Hizmetleri Hastanesi
Istanbul, Turkey

Correspondence to Dr. Turan
Fatma Sultan Mah.
Şehitlik Mah.
Vali Cihan Çakmaz
Gântıo Blokları No. 22B/9
Fatih, Istanbul, Turkey

REFERENCES


AUGMENTATION RHINOPLASTY WITH DERMAL GRAFT

Sir:


First, I want to congratulate the authors for their interesting report, because I prefer in augmentation rhinoplasties to use autologous grafts as bone, cartilage, fascia, or dermis, and I avoid using foreign materials. I am sure that, with the excellent aesthetic results shown in the article, many young plastic surgeons will be motivated to use the dermal graft to increase nasal dorsum in selected cases. Although my first alternative for increasing the nasal dorsum is cartilage plus...
deep temporalis fascia, on some occasions I have used dermal grafts and obtained acceptable short, medium, and long-term results.

The authors mention in their article that they did not find any previous article on the use of the dermal graft for nasal augmentation. I should mention that I began to use dermal grafts in augmentation rhinoplasty in 1984, after the favorable results that the late Reich showed at the international meetings at that time and later on with his publication. In this article, Reich reviewed the surgical literature and mentioned that in 1920 Eitner used dermal grafts to correct facial depressions. Later, Straatsma reported three cases of minor saddle nose deformity corrected with dermal grafts.

Thompson published another article showing excellent contour improvement in the nasal dorsum, cheeks, and malar region. At the Jalisco Plastic and Reconstructive Surgery Institute, besides nasal augmentation, we have used dermis-fat grafts of no more than 3 mm thick (to avoid absorption and hardening), after the suggestion of Zarem, to increase the volume and contour of the cheeks and temporal areas in patients with severe depressions as sequelae of Parry-Romberg disease; use this approach, we have achieved acceptable long-term results.

As plastic surgeons who have undergone long periods of learning and teaching, we like to thoroughly review the surgical literature, and we refer frequently to the principle of Sir Winston Churchill: “The longer you look back, the further you can look forward.” I think that all of us who enjoy learning read articles with great interest and look for the excellence in surgical technique, and I found that in this article, the authors showed important technical details and included an original maneuver with roll dermal grafts, which gives good aesthetic improvement with a natural anatomical shape for the nasal dorsum. I have used rolls of deep temporal fascia with success for the same purposes.

I want to finish my comments by congratulating the authors again.

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José Guerrerosantos, M.D.
The Jalisco Plastic and Reconstructive Surgery Institute
Jalisco Public Health Service
Graduate School, Medical College
University of Guadalajara
Guadalajara, Mexico

Correspondence to Dr. Guerrerosantos
Garibaldi No. 1793
Guadalajara, Jalisco 44680, México
guerrerosantos@nugared.net.mx

REFERENCES


LATE PRESENTATION OF ALLOPLASTIC IMPLANT EXTRUSION

Sir:

A 43-year-old gentleman with a past history of craniofacial injuries presented with a 3-month history of progressive swelling and pain under his left eye. This had become increasingly severe over the last 48 hours. At presentation, he felt systemically unwell and was unable to fully open his eye. His visual acuity was unaffected.

Twenty-five years previously, he had been the driver of a vehicle involved in a motor vehicle collision and had sustained significant craniofacial injuries. His injuries included fracture of the anterior cranial fossa, a full-thickness facial laceration extending from the left eyebrow down the side of the nose to the upper lip, and a blowout fracture of the left orbital floor.

Initial management at that time involved repair of the soft tissues and repair of the blowout fracture. Silastic (Dow Corning, Midland, Mich.) was used to repair the defect and was placed through an infraorbital incision. Unfortunately, 16 days later the patient went on to develop cerebrospinal fluid rhinorrhea, which failed to settle with conservative measures. Thus, 5 weeks after the injury, he underwent an anterior fossa repair by means of a bifrontal craniotomy. A tear in the dura was located anterior to the cribiform area and was sutured using the falk. Postoperatively, he made a satisfactory recovery and was discharged home after 7 days.

The patient was followed up as an outpatient for 12 months, during which time he made a good recovery with no significant complications. Specifically regarding his orbit, a minor degree of postoperative diplopia and swelling settled after 4 weeks.

Since discharge, there had been no further problems before his reattendance. On direct questioning, he denied any history of orbital/eyelid swelling, pain, or double vision over the last 20 years.

On examination, he was systemically well. The conjunctiva was grossly edematous with chemosis, and the eye was mildly proptosed. Eye movements were restricted due to discomfort, but there was no loss of visual acuity. Just below the left lower eyelid there was a tender indurated swelling, through which clinically the Silastic was palpable. Gentle pressure around the swelling resulted in a purulent discharge from the lower punctual area. Microscopy showed numerous pus cells with a scanty growth of Staphylococcus aureus. An urgent computed tomography scan was requested, which confirmed the clinical suspicion of extrusion of the Silastic implant (Fig. 1).

The patient was subsequently taken to the operating room, and the implant was removed through the previous orbital incision. No further repair was necessary, as the orbital floor was intact and it was felt that there was no clinically significant enophthalmos. Postoperatively, he made an uneventful recovery and was discharged after 48 hours. Globe position has remained satisfactory, and his ocular movements returned fully. Clinically, enophthalmos has not developed, although this has not been measured objectively.
The majority of these complications seem to occur within 31 days. Due to complications can be up to 14 percent; the vast majority occurring 15 years following insertion. Cartilage).

The longest delay we could find reported in the literature was Newnan, Ga.) versus autogenous material (bone or cartilage). One of the arguments against some alloplastic materials is the absence of integration, placing the implant at risk of infection, migration, or extrusion. It is argued, however, that some newer porous implants are now able to support extensive vascular ingrowth. The incidence of implant removal due to complications can be up to 14 percent; the vast majority of these complications seem to occur within 31 days. The longest delay we could find reported in the literature was 15 years following insertion.

Given that our patient was asymptomatic for approximately 25 years, is this a treatment success or failure? We suggest that this case may highlight the considerable persistence of “memory” in Silastic and that avoidance of complications is extremely technique-sensitive. Such implants must be completely passive and preferably fixed when used in orbital reconstruction.

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A. L. Dancey, M.R.C.S.
M. J. Perry, F.R.C.S., F.D.S., B.Sc.
North Staffs Hospital
Stoke-on-Trent, England
Correspondence to Miss Dancey and Mr. Perry
Maxillofacial Unit, COPD
North Staffordshire NHS Trust
Hartshill Road
Stoke-on-Trent ST4 7PA, United Kingdom

REFERENCES

SURGICAL TREATMENT OF A SELDOM-SEEN CRANIOFACIAL DEFORMITY

Sir:

Craniofacial surgery is a complicated procedure that has been developing rapidly in recent years. Our unit treated a patient with a seldom-seen craniofacial deformity whose frontal bone was protruding outside. Her appearance looked like a lion’s face, and we named the condition “cranial bone lion face deformity.” This condition has never been documented in the literature. The patient experienced a satisfactory result after the operation (Figs. 1 and 2). A 6-year-old Chinese girl sustained bulging of the frontal bone and superciliary arches on the outside at birth. As she grew, the deformity became worse. She had seen doctors many times but had not been diagnosed or treated until she visited our hospital. The girl was admitted to our unit in July of 2000. She was fit and well and possessed normal intelligence but had a protruding frontal bone, superciliary arch, and deeply located orbits. This gave her the appearance of having a lion’s face. Computed tomography scans revealed that the frontal bone had become thicker. The thickness of the superciliary was 16 mm. The bone compact substance was normal (Fig. 1). Therefore, the diagnosis was given as cranial bone lion face deformity. We decided to perform a reconstructive operation.

Before the operation, all laboratory test results were found to be normal. The forehead skin was shaved, including the eyebrows. A urethral catheter was inserted before the operation.

The patient, under general anesthesia, lay in the horizontal supine position. A transverse incision of the forehead was made. We dissected under the peristeum of the frontal bone. The border was incised downward to the supraorbital border and then incised into the orbits. The frontal bone was removed. The upper, inner, and external walls of the orbits were removed at the same time. We found that the thicker part of the frontal bone was of normal density. The spongy substance was examined by histology test. The bulging part of the endosteal lamella and the spongy substance were ground and cut off. Titanium alloy plates were used to reconstruct the residual parts of the periosteal lamella of the superciliary arch and orbits. It was drained using negative pressure to prevent blood swelling. The normal appearance of the frontal bone was recovered. The patient was monitored during the 24-hour postoperative period and followed up for 6 months; the frontal bone healed well, and the patient had a normal appearance and intelligence (Fig. 2).

The cranial bone lion face is a seldom-seen deformity. This operation involved the cranial nerves and therefore risked more injury than in other operations. To prevent a critical situation, infection, and disfigurement, we consulted...
with a cranial nerve surgeon, an ophthalmologist, and an ear, nose, and throat surgeon before the operation. During the operation, we removed the upper healthy frontal bone before removing the abnormal frontal bone to provide wide, clear operation fields and to achieve a good cosmetic result.

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Fig. 1. Computed tomography scan revealed that the frontal bone had become thicker. The bone compact substance was normal.

Fig. 2. (Left) Preoperative and (right) 6-month postoperative views of the patient.
AXILLARY NERVE INJURY IN AXILLARY BLOCK

Sir:

We report a case of axillary nerve injury sustained during administration of an axillary block. To our knowledge, this complication has never been reported before. The anatomy of the axillary nerve and its potential injury are highlighted.

A 44-year-old man underwent an elective operation on his right middle finger under an axillary block. The axillary sheath was infiltrated with 20 cc of 2% lignocaine by the transarterial method. The infiltration was uneventful, and a complete block was achieved, allowing for the smooth progression of the operation. The patient was discharged the next day upon satisfactory recovery of sensation in the hand. At 1-week follow-up, he complained of diffuse pain in the arm; however, no sensory deficit was noted in the right hand, and he was treated with nonsteroidal analgesics. At the 6-week follow-up visit, wasting of the right deltoid and weakness of the shoulder joint were noted. Neurologic examination of the rest of the limb was unremarkable.

Electromyography of deltoid muscles performed bilaterally demonstrated a significant denervation on the right side with more pronounced inactivity in the posterior aspect of the muscle. The nerve conduction study led to the diagnosis of the axillary nerve injury. The patient continued to have physiotherapy. Examination after 8 months showed persistent atrophy of the deltoid muscle, but he refused any further treatment and was therefore kept under surveillance only.

Axillary block is the most common regional anesthesia in upper limb operations. Depending predominantly on personal preference, either a transarterial or an extraarterial route is used to infiltrate the axillary sheath. Different instruments, such as nerve stimulators and ultrasound, may be used to facilitate the infiltration and avoid complications.\(^1\) Although various audits have shown the safety of this procedure in experienced hands,\(^7\) many complications, such as vascular and neurologic injuries,\(^3\) incomplete block, and block failure, have also been reported.\(^3\)

Our patient presented with profound paresis and atrophy of the deltoid muscle, along with numbness in the distribution of the axillary nerve. This finding in the presence of unaffected median and ulnar nerves signifies injury to the axillary nerve. Although previously unreported, only the needle inserted for infiltration of the anesthesia during the procedure can account for this type of injury. This finding also conforms to the study performed to provide the anatomic data for selective neurotization of the deltoid muscle in axillary injury.\(^5\) This cadaveric study showed the division of the axillary nerve into the anterior branch supplying anterior and middle fibers and a posterior branch supplying posterior deltoid muscle.

The pattern of neurologic deficit in our case indicates injury to the axillary nerve sparing some fibers to the anterior branch that supply anterior and middle fibers of the deltoid. This case highlights that an injury to the axillary nerve is also a potential complication one should keep in mind while administering an axillary block.

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AN UNUSUAL LIPOMA

Sir:

Lipomas are common soft-tissue tumors that we often come in contact with during operations. In fact, they are benign tumors that do not recur with complete excision. A
plastic surgeon is usually called in to treat this type of pathology so that a benign and normally harmless lesion does not produce a noticeable scar. These tumors are more frequently found in a subcutaneous site and therefore can be removed by means of small incisions in the overlying skin. However, they are sometimes found in submuscular sites and can cause a doubtful diagnosis and greater surgical effort. As far as the retromuscular position is concerned, the limbs are most frequently involved.

What we could define as an atypical site and one that we have not found described in the literature is the lipoma that we encountered in a 44-year-old woman. Two years earlier she had noticed a nonpulsatile, soft, mobile mass in the external quadrants of the right mammary area. It was slightly painful and noticeably increased in volume in the following months. Mammographic and ultrasonographic tests that had been carried out a short time earlier indicated the presence of a formation with characteristic lipomatosis lesions located in a retromuscular site. Palpations revealed a mobile formation whose contours were badly delimited that was located in a retropectoral site. In addition, some enlarged lymph nodes were found in the homolateral part of the armpit. Consequently, because our objective was to remove the lesions without leaving a noticeable scar, we made an incision close to the armpit. After removing some lymph nodes for a histologic examination, we proceeded to lift the margins of the large pectoral muscle, to isolate the tumor, and thus removed a well-circumscribed lipoma located between the large and the small pectoral muscles (Fig. 1). The postoperative course was normal, and the patient was satisfied with the good cosmetic result.

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Fabio Massimo Abenavoli, M.D.
Roberto Corelli, M.S.
Ospedale “San Pietro” Fatebenefratelli
Rome, Italy

Correspondence to Dr. Abenavoli
Via Savoia 72
00198 Rome, Italy
f.abenavoli@mclink.it

LICHEN PLANUS CUTIS AND SQUAMOUS CELL CARCINOMA

Sir:

Lichen planus is most likely a cell-mediated immune response of unknown origin. It is clinically characterized by an itchy, violaceous, papular eruption and is most commonly localized at genitalia, mucous membranes, and flexor surfaces of extremities. Lichen planus can present with several clinical variations, including a hypertrophic, an atrophic, an erosive, a follicular, an annular, and a linear type.¹

Malignant transformation of lichen planus is rare and generally occurs in the oral form.²⁻⁴ However, a squamous cell carcinoma can also develop in the cutaneous form.² Nearly 30 cases of neoplastic transformation of the cutaneous form have been described. In most of them, tumors were associated with the long-standing hypertrophic type of lichen planus, and they were located in the lower extremities.⁵,⁶ In one of these cases, a metastatic squamous cell carcinoma developed within an area of histologically proven hypertrophic lichen planus in the lower leg of a young Caucasian male.⁶

Three months ago, a woman came to our outpatient department with an exophytic tumor in a hyperpigmented area of the left foreleg. This area represented the remnant of a hypertrophic type of lichen planus clinically diagnosed 2 years earlier by a dermatologist and treated with corticosteroid oral therapy (Fig. 1, above). We completely excised the

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tumor and the hyperpigmented area. Histologically, the exophytic neoplasm was a grade 2 squamous cell carcinoma. Peritumoral skin, corresponding to the hyperpigmented area, showed a dense lymphocytic infiltrate localized around the vessels of the superficial plexus and through the papillary dermis, which appeared thickened. This lesion formed a bandlike infiltrate obscuring the dermo-epidermal junction and presented some homogeneous eosinophilic bodies ( Civatte bodies) in the papillary dermis, at the dermo-epidermal surface, and within the epidermis. All these features were consistent with a lichen planus (Fig. 1, below).

This clinical case raises two questions: Is it correct to consider a long-standing hypertrophic lichen planus a premalignant lesion? And consequently, should it be treated by removing not only the squamous cell carcinoma but also the surrounding skin showing the clinical signs of hypertrophic lichen planus?

Molecular studies in oral premalignant lesions developing squamous cell carcinomas have been reported in the literature. Frequent microsatellite alterations have been found, and their value in cancer risk assessment has been demonstrated. 7 It would be interesting to perform molecular analyses in further cases of squamous cell cancers that arise in hypertrophic lichen planus cutis to establish whether the latter lesion could represent a premalignancy. The practical consequence would be improved understanding of the correct oncologic surgical therapy. 7

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Luigi Valdatta, M.D.
Stefania Tuinder, M.D.
Alessandro Thione, M.D.
Mara Buono, M.D.
Benedetta Barbieri, M.D.
Barbara Pozzi, M.D.
Stefano La Rosa, M.D.
Departments of Plastic Surgery and Pathology
Ospedale di Circolo
Varese, Italy

Correspondence to Dr. Valdatta
Ospedale di Circolo–Chirurgia Plastica
Viale Borri 57, 21100 Varese, Italy
chirplus@libero.it

REFERENCES

PLASTIC AND RECONSTRUCTIVE SURGERY, March 2004

GESTATIONAL GIGANTOMASTIA AFTER REDUCTION MAMMAPLASTY

Sir:

In their letter, Ahćan et al. report a case of gestational gigantomastia after reduction mammoplasty and state that to their knowledge, “no such case has previously been reported.” Recently, we published a similar case. 5 In our report, a young woman presented at 32 weeks’ gestation with mirror syndrome and gigantomastia. Two years earlier, she had undergone reduction mammoplasty. After a cesarean delivery, her gigantomastia progressed rapidly, leading to breast necrosis and sepsis. The clinical course was also complicated by acute respiratory distress syndrome and renal failure. Emergent bilateral simple mastectomies were performed, with subsequent clinical improvement.

We would like to point out that our literature search yielded another case of gestational gigantomastia after reduction mammoplasty, published in 1971. 3 Although Ahćan et al.’s claim to precedence cannot be supported, we definitely agree with their interpretation and conclusions. With at least three cases of gestational gigantomastia after reduction mammoplasty already published in the literature, 1–3 clinicians must be aware of this rare but real possibility. We are also in agreement with Ahćan et al.’s position that such severe cases demand “an urgent curative surgical treatment.”

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Alex C. Vidaeff, M.D.
Division of Maternal-Fetal Medicine
Department of Obstetrics, Gynecology, and Reproductive Sciences
Donald H. Parks, M.D.
Division of Plastic Surgery
Department of Surgery
University of Texas Houston Medical School
Houston, Texas

Correspondence to Dr. Vidaeff
Division of Obstetrics, Gynecology, and Reproductive Sciences
University of Texas-Houston Medical School
6431 Fannin Street
Suite 3.604
Houston, Texas 77030
alex.c.vidaeff@uth.tmc.edu

REFERENCES
3. Ship, A. G., and Shulman, J. Virginal and gravid mam-
CONCOMITANT OPEN CHOLECYSTECTOMY AND MAMMARY RECONSTRUCTION WITH BIPEDICLED TRAM FLAP

Sir:

The presence of symptomatic gallstones might be considered a general indication for removal of the gallbladder. There are two procedures for surgical removal of the gallbladder: laparoscopic cholecystectomy and open cholecystectomy. Open cholecystectomy, as the standard procedure for all patients with symptomatic gallstone disease, has been performed in every country in the world. Although laparoscopic cholecystectomy has largely replaced the traditional methods of performing open cholecystectomy, for most patients the open technique continues to be a safe and effective therapy for the treatment of complicated gallstone disease.

On the other hand, during the last several years, both physicians and patients have accepted breast reconstruction following mastectomy for breast cancer as a reconstructive method. Breast reconstruction can be performed in two ways based on the time for reconstruction: immediate reconstruction and delayed reconstruction. There are several methods, but breast reconstruction with the transverse rectus abdominis musculocutaneous (TRAM) flap has some superiority over other methods because it does not require the use of implants.

We performed an open cholecystectomy on two patients during the bipedicled TRAM flap breast reconstruction operation. The two patients had been operated on 1 year earlier for left mammary cancer, and they were under control with a disease-free condition (Figs. 1 and 2). During their follow-up period, gallstones were diagnosed by abdominal ultrasonography that was performed for routine controls. At that time, the patients had no complaints, such as biliary colic. However, in the follow-up period, when we advised them to undergo breast reconstruction, they asked us whether the gallstones could be removed during the breast reconstruction operation. We decided to perform the two procedures at the same time. First, we elevated the bipedicled TRAM flap. After the flap was completely elevated, the open cholecystectomy was performed just before the abdominal wound was closed. Both patients required the use of small, rectangular Prolene mesh grafts (5 × 5 cm) to cover the fascial defect over the cholecystectomy area. On the other sites of the TRAM flap donor area, the abdominal wall could be closed primarily, including the fascia. After the open cholecystectomy was completed, no drain was inserted to the area. The TRAM flap was then transferred through an abdominal flap tunnel to the mastectomy defect by removing the skin over the chest wall. Two active drains were inserted under the transferred flap and the abdominal wound, which was closed primarily (Fig. 3).
Because the reconstructed breast did not completely match the other in size, a reduction mammaplasty operation with an inferior dermoglandular technique was performed on the other breast in a second operation (Fig. 4). In that operation, nipple reconstruction with a C-V flap was also performed on the reconstructed breast.

In the literature, there was only one article reporting the cholecystectomy and TRAM flap, and in that article the two operations were not performed concomitantly. The cholecystectomy was performed as a laparoscopic operation 2 years after the TRAM flap reconstruction by stating the feasibility of the second operation even with the presence of polypropylene mesh.

We conclude that open cholecystectomy is feasible and easy to perform during a bipedicled TRAM flap operation for breast reconstruction, when necessary. It will make the TRAM flap operation longer than usual, but it is worth it when a second operation is taken into consideration.

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Meral Şen, M.D.
Aydan İnan, M.D.
Department of Plastic, Reconstructive, and Aesthetic Surgery
Mehmet Oğuz Yenidunya, M.D.
Department of General Surgery
Fatih University Hospital
Ankara, Turkey

Correspondence to Dr. Yenidunya
Fatih Üniversitesi Hastanesi
Alparslan Türkiye Caddesi No. 57
Emek, Ankara, Turkey

REFERENCES

SUBFASCIAL BREAST IMPLANT

Sir:

I read with interest the article by Graf and colleagues about subfascial breast augmentation. I have been using this technique since I read the preliminary report by the same authors in Aesthetic Plastic Surgery. I have performed some cadaveric dissections that demonstrate that the pectoralis fascia can be easily dissected off the muscle. The implant is covered with fascia on its upper two thirds and is subglandular in the lower pole.

The authors report that they use endoscopy for dissection of the pocket. I have not found that it is necessary, although it allows the surgeon to check whether the dissection has been performed in the right plane (Fig. 1). The fascia is bluntly dissected with a finger, and the distal end of the fascia is detached with a breast dissector. The pocket is packed with wet gauze; meanwhile, the contralateral side is operated on. Hemostasis can be checked with a cold light retractor or endoscopy, but I have not found any significant bleeding up to now.

At the time of this writing, I have performed 32 operations using textured silicone gel implants, with no complications. I have not tried the anatomic cohesive implants just to avoid potential rotations and asymmetries (3 percent in the authors’ experience) and because the result is very satisfactory even with round implants.

The subfascial placement has several advantages, in my experience:

• It is an easy way of placing subglandular implants through the axillary approach.
• There are no distortions due to the muscular activity, and the result is very natural.
• Postoperative recovery is faster than with submuscular placement (less pain).

Fig. 1. Endoscopic view. The arrow shows the edge of the detached pectoralis fascia.

Fig. 4. Postoperative view, 6 months after the reconstruction.
There is less risk of damaging the intercostobrachial nerve, because the dissection remains more superficial.

It allows the surgeon to use the axillary approach for patients with gland ptosis and even grade I ptosis (Fig. 2). With a traditional submuscular transaxillary technique, these patients had poor results (double fold or double bubble).

I have to congratulate the authors for sharing their technique with us, and I invite plastic surgeons using the axillary approach to try it. They will not be disappointed.

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Jesus Benito-Ruiz, M.D.
Department of Plastic Surgery
Hospital Clinic, University of Barcelona
C/ Villarroel 170
08036 Barcelona, Spain
drbenito@cirugia-estetica.com

REFERENCES

IS THE UMBILICUS TRULY MIDLINE?

Sir:

It absolutely boggles me to see seven pages of very high-quality paper and print in our illustrious journal devoted to whether or not the umbilicus is truly midline.1 This subject could easily have been adequately explored in one small paragraph in the correspondence section, if it had to be addressed at all. I believe that the editor (Rohrich) has taken some editorial liberties.

Rather than wasting more ink on this subject, I briefly propose that the study is scientifically flawed in that the photographs were judged by the human eye for crookedness in body position, the anterior iliac spines are not necessarily symmetrical, and the umbilicus is not symmetrical to itself. Medically, one would have to dislocate the umbilicus a considerable distance to get into trouble, not just 2 to 4 percent. I defy any surgeon to get all or most of his or her umbilici within the same limits as Mother Nature so nicely does. I have not experienced patients being preoccupied with the horizontal midline position of the operated or unoperated umbilicus.

If this article was just placed as a filler of space, I can understand. Otherwise, I believe it is unbecoming of our very important journal.

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Ruth Graf, M.D., Ph.D.
Rua Solimões, 1184
Curitiba, PR CEP 80810-070
Brazil
Larry D. Florman, M.D.
University of Louisville
School of Medicine
225 Abraham Flexner Way
Louisville, Ky. 40202

REFERENCE

REPLY
Sir:
My coauthors and I appreciate the opportunity to respond to Dr. Florman’s correspondence regarding our article entitled “Is the Umbilicus Truly Midline?” We are boggled by a plastic surgeon and author who has been in private practice for 28 years and has now joined an academic plastic surgery division completely missing the point of our article. In almost every facet of medicine, plastic surgery, and life, one has not only to state but also to study the obvious as it is often the most overlooked aspect. This is true regarding our article on the position of the umbilicus.

As so astutely discussed by Dr. Shestak in the discussion following our article,1 we all know that the human body is rarely symmetrical morphologically. It is an important part of the patient’s preoperative education to describe these asymmetries and anatomic features so that they can accept the existence of the asymmetries postoperatively. Preoperatively, asymmetries are part of the informed consent; postoperatively, they become a complication rather than a sequela. In our group practice, we have seen this time and time again, not only where an asymmetric or displaced umbilicus is concerned but also in breast surgery and facial cosmetic surgery. If one does not discuss it with the patient preoperatively, it can become a real problem postoperatively.

Dr. Florman states on his Web site that his goal is to teach young plastic surgeons to be good doctors. It will greatly behoove him to use this article on the umbilicus as one of his guidelines for teaching this new generation of plastic surgeons how to be physicians first. They must be taught to carefully assess each patient individually preoperatively and articulate all asymmetries, especially if they will be transposing or moving the umbilicus. We want to disseminate the knowledge that the umbilicus is asymmetric and off the midline and that this is normal. It is important to educate our residents, plastic surgeons, and perhaps even the legal profession that asymmetry is normal and that postoperative asymmetry is also part of the norm.

We have dealt with the concerns of our patients in our clinical practice and examined numerous medicolegal professional liability records for the defense where patients were preoccupied with their umbilicus position postoperatively. This consternation resulted in the filing of malpractice action against plastic surgeons. Perhaps Dr. Florman has been very fortunate in his 28-year practice as a plastic surgeon if he has never encountered this concern from one of his patients. We know today it is better to be prepared and knowledgeable about a subject rather than plead ignorance or that it is not important.

Finally, it is important to articulate to our young plastic surgeons that the eyes only see what the mind knows. This is epitomized by other articles recently published in the Journal on chest wall and breast asymmetries that show the incidence of chest wall and breast wall asymmetry in breast augmentation. They state the obvious, that there is significant chest wall asymmetry in every patient undergoing breast augmentation. These are all critical points that need to be observed, delineated, and documented as part of the informed consent to the patient preoperatively.

We are glad that Dr. Florman is reading the Journal and hope that he will incorporate his expertise in plastic surgery into peer-reviewed articles so that he can share his depth of knowledge with all of us. We eagerly await his scientific contributions to Plastic and Reconstructive Surgery.

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REFERENCE

CIRCUMCISION IN UNQUALIFIED HANDS: A SIGNIFICANT RISK OF COMPLICATION
Sir:
Circumcision is one of the most ancient and commonly performed operations for religious and medical reasons. The possible benefits of circumcision are the prevention of penile cancer, urinary tract infection, sexually transmitted disease, and phimosis, as well as lessening of the risk of balanitis.1 When circumcision is performed by an experienced health care professional such as a fully trained surgeon, it is considered a routine and safe surgical procedure. However, despite its advantages, circumcision may become very detrimental if performed by an untrained person.2

During the last 7 years, 15 patients have been admitted to emergency or outpatient clinics at our hospital with complications from circumcisions performed by traditional circumcisers (Table I). Although hemorrhage was the most common complication, we have also seen rare complications such as serious ischemia of the glans penis and concealed penis (Fig. 1).

In Turkey, most boys are circumcised at some time between the neonatal period and the age of puberty.3 However, prepubertal circumcisions are more common than neonatal circumcisions. At that point, it should not be forgotten that

TABLE I
Circumcision Complications

<table>
<thead>
<tr>
<th>Complication</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious hemorrhage</td>
<td>4</td>
</tr>
<tr>
<td>Serious infection</td>
<td>2</td>
</tr>
<tr>
<td>Hematoma</td>
<td>2</td>
</tr>
<tr>
<td>Incomplete circumcision</td>
<td>2</td>
</tr>
<tr>
<td>Circumcision in hypospadias</td>
<td>3</td>
</tr>
<tr>
<td>Serious glandular ischemia</td>
<td>1</td>
</tr>
<tr>
<td>Concealed penis</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Rod J. Rohrich, M.D.
University of Texas Southwestern Medical School
5323 Harry Hines Blvd.
Dallas, Texas 75390-9132

REFERENCE
as a traditional surgical procedure, circumcision is performed by traditional circumcisers rather than by medically trained professionals. Traditional circumcisers are commonly devoid of any medical training and belong to other professions; they include male servants of health institutions, barbers, and traditional drummers. When we searched the literature, we found many case reports stating the same words, such as "unusual" or "rare," to describe circumcision complications from Turkey. Moreover, most of these circumcisions were performed by traditional circumcisers.\textsuperscript{3-9} We suspect that the complications and unpleasant cosmetic appearance of the penis after circumcision are much more common than actually stated and are certainly underreported.

Traditional circumcisers usually perform circumcision with self-made devices, and sometimes they use an electrosurgical monoterminal unit in the cutting mode for both cutting and hemostasis. Therefore, the circumciser can inadvertently catch the glans in the clamp and cause

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig1.png}
\caption{(Above, left) Serious ischemia of the glans penis in an 8-year-old boy caused by the constricting effect of the dressing and hematoma on the base of the glans penis. (Above, right) After decompression and thrombolytic treatment, the glans penis healed completely. (Below, left) View of the concealed penis. (Below, right) When pressed with the digit onto the mons pubis, the trapped position of the concealed penis is easily visible.}
\end{figure}
a burn injury. In addition, penile anomalies may be missed as a complication of circumcision due to lack of training. As very well known, if a penile anomaly is noted, circumcision should be delayed.\textsuperscript{10}

Although urologists see most circumcision complications, plastic surgeons continue to play an effective role in the cases requiring reconstruction. In addition, the treatment of penile deformities retains its particular importance among plastic surgeons’ interests.

We believe that circumcision is an important surgical procedure because the cosmetic appearance and function of the penis affect a male lifelong. Performance of circumcision by untrained paramedical persons should be legally restricted.

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M. Erol Demirseren, M.D.
Department of Plastic and Reconstructive Surgery
Fatih University School of Medicine
Ankara, Turkey
Serdar Gokrem, M.D.
Department of Plastic and Reconstructive Surgery
Ankara Training and Research Hospital
Ankara, Turkey

Correspondence to Dr. Demirseren
Department of Plastic and Reconstructive Surgery
Fatih University School of Medicine
Alparslan T ürk es Cadde, No. 57
Emek, Ankara, Turkey
medemiseren@yahoo.com

REFERENCES

OSTEOCUTANEOUS FOREARM FLAPS: THE ADVANTAGES OF A PREFORMED LIGHTWEIGHT CAST

Sir:

We would like to present a technique of using a prefabricated cast following harvesting of osseocutaneous forearm flaps that offers quick application in the operating room and allows for safer donor-site inspection.

A variety of free flaps can be used to reconstruct bony defects in the head and neck region. Although initially popular, the composite radial forearm flap has been superseded by fibular, deep circumflex iliac artery, and scapular flaps in most units. However, it still has a role in selected cases where other flaps may not be possible (due to peripheral vascular disease and/or high patient comorbidity) and as a salvage flap.

The main disadvantage of the flap is subsequent fracture of the radius, which has been reported to occur in 17 to 42 percent of cases.\textsuperscript{1,2} Fracture is due to a combination of factors, including poor surgical technique and inadequate postoperative immobilization. Many units will use an above-elbow plaster of Paris cast for 6 weeks, as recommended by a survey of orthopedic surgeons in 1999.\textsuperscript{3} It is thought that rotational movement of the arm may be important in the mechanism of fracture.\textsuperscript{3}

Before the operation, the selected arm has an above-elbow cast constructed with the elbow flexed to 90 degrees, and the hand is in a neutral position. A lightweight resin tape (Delta-Cast; Johnson and Johnson, Leeds, United Kingdom) is used according to the manufacturer’s instructions. After the cast is set, it is bivalved. A soft padding (fleecey web) is then applied to the cut edges of the resin cast, and Velcro straps are attached (Fig. 1). The cast is normally made the day before the operation.

After the flap is harvested, it is a simple matter to apply the cast. It is a lot quicker than applying a plaster of Paris cast, and the arm can be very well supported at all times. The patient

Fig. 1. The lightweight resin cast with Velcro straps added.
will find it very comfortable to wear because of its lightweight nature (Fig. 2).

The major advantage of this cast is that wound inspection is very simple. Only one half of the cast has to be removed, allowing the arm to be supported at all times. The wound can be inspected, sutures removed, and the cast reapplied. This cast has been of great benefit to the nursing staff, who are understandably concerned about any unnecessary movements of the forearm during wound inspection.

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Simon P. Whitley, F.D.S.R.C.P.S., M.R.C.S.
Swairaj Sandhu, F.D.S.R.C.S., F.D.R.C.S.
Brian T. Musgrove, F.D.S.R.C.S., F.R.C.S.
Manchester Royal Infirmary
Manchester, United Kingdom
Manu Patel, F.D.S.R.C.S., F.R.C.S.
Wythenshawe Hospital
Manchester, United Kingdom

Correspondence to Dr. Whitley
Department of Oral and Maxillofacial Surgery
Manchester Royal Infirmary
Oxford Road
Manchester M13 9WL, United Kingdom
spwhitley@btinternet.com

REFERENCES


PROTECTION OF DRESSINGS AND WOUNDS BY CLING FILM

Sir:

The protection of dressings and wounds is a cumbersome exercise for patients and their caregivers postoperatively. The situation is often worse when the dressings involve frequently used areas such as the hands or involve large areas of the body. Plaster of Paris splints must remain dry so that they don’t weaken and break. The most common worry is how to avoid getting the dressing wet, and patients always ask when and how they can shower.

We advocate the use of cling film [e.g., cellophane, Saran Wrap (Dow Chemical, Midland, Mich.)] to cover the wounds and dressings temporarily while showering. By virtue of its nonadhesive and occlusive nature, it offers good protection against water (Fig. 1). The transparency of the film is additionally beneficial in protecting the areas at risk while keeping them visible. Cling film is easy to wrap around the affected part, such as a limb, before showering and easy to remove afterward (Fig. 2). The senior surgeon has advised all of her patients to use it after breast operations for the past 4 years, and the patient feedback has been positive.

Ordinary cling film rolls are inexpensive when compared

Fig. 1. Cling film protects the dressing from water.

Fig. 2. The dressing remained dry after immersion of the hand in water.
with traditional waterproof dressings such as OpSite (Smith and Nephew, London, United Kingdom), and they are readily available in every supermarket and household. Of course, care should be advised in its use in children to avoid suffocation.

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Danish Imran, F.R.C.S.
Elaine Sassoon, A.B., F.R.C.S.(Plast.)
Darren Lewis, M.R.C.S.
Department of Plastic Surgery
Norfolk and Norwich University Hospital
Norwich, United Kingdom

Correspondence to Dr. Imran
8 Eade House
Norfolk and Norwich University Hospital
Colney Lane
Norwich NR4 7UR, United Kingdom
surgeonimran@yahoo.co.uk

REFERENCES

THE SAFETY OF ROLLED PENROSE DIGITAL TOURNIQUETS FOR USE IN LOCAL PROCEDURES

Sir:

I was interested to read the correspondence from Drs. Aslan et al. regarding their use of rolled Penrose drains for producing a bloodless operative field in digital surgery (Plast. Reconstr. Surg. 111: 1758, 2003). The authors presented their method of using various-size Penrose drains rolled in a proximal direction to the base of a digit to exsanguinate and maintain a bloodless field in the digit during procedures from the level of the proximal phalanx to the distal fingertip. Their Figure 1 quite clearly illustrates the efficacy of this method in achieving exsanguination of a digit for an operation.

However, the figure also clearly illustrates the dangerous potential complication related to use of rolled digital tourniquets, namely the possibility of leaving the fairly inconspicuous tourniquet in place following completion of the procedure and application of a concealing dressing. Prolonged digital ischemia and even gangrenous necrosis with digital loss are not inconceivable with this type of easily concealed tourniquet. The Penrose drain wrapped in a barber-pole fashion from the distal fingertip to the base with a hemostat at the base of the finger at the completion of the operation serves as a reminder of the presence of the tourniquet and necessitates its removal before application of the dressing.

Although quite effective, I believe there are safer, equally effective alternatives with minimal risk of prolonged ischemia and the catastrophic consequences that can result. This is not only applicable to digital operations but also to penile operations, as referenced in the authors’ letter.

Certainly, the guiding principle of primum non nocere must prevail in even the simplest procedures performed under our direction.

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Kyle D. Bickel, M.D.
The Hand Center of San Francisco, Inc.
1700 California St., Suite 450
San Francisco, Calif. 94109
sfhanddoc@aol.com

THE HULL HAND TABLE: A COST-EFFECTIVE ALTERNATIVE

Sir:

Various types of hand tables have been described in the past, with some being costly as well as complex. As it is a practical device, its use depends on its convenience and efficacy. In well over 1000 cases, we have used a simple hand

![Fig. 1. The Hull hand table consists of a stamp-shaped steel platform.](image1)

![Fig. 2. Table in use for a flexor tendon repair.](image2)
platform called the Hull hand table that is designed and constructed within our unit.

It consists of a simple rectangular stainless steel plate with circumferential grooves (Fig. 1) into which rubber bands are inserted to hold the hand in various positions (Fig. 2). This may be supplemented with rolled towels to achieve three-dimensional positioning, as shown in Figure 3. Because it is possible to apply the bands from any coordinate on the table, the desired vector can be achieved to maintain the position of the hand.

The rubber bands retain their natural elasticity if and when they are autoclaved for reuse. However, in our experience, we have found that the rubber bands have a limited lifespan and occasionally require replacement. This is a safe, versatile, and effective tool in hand operations, with its predominant strengths being its simplicity and cost-effectiveness. We recommend its use in hand operations and particularly in units where resources are limited, as it costs less than $10 U.S. to manufacture.

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M. S. U. Hassan, F.R.C.S.(Eng.)
V. Mercer, R.G.N.
R. Y. Kannan, M.R.C.S.(Ed.)
N. Rehman, F.R.C.S.(Ed.)
P. R. W. Stanley, F.R.C.S., F.R.C.S.(Plast.)
Department of Plastic Surgery
Castle Hill Hospital
Hull, United Kingdom

Correspondence to Mr. Hassan
Department of Plastic Surgery
Castle Hill Hospital
Hull HU16 5JQ, United Kingdom
msuhassan@hotmail.com

REFERENCE

THE DIGITAL ARTERIES PROPER ARISING FROM THE DORSAL METACARPAL ARTERY WITH A MINOR CONTRIBUTION FROM A PERSISTENT MEDIAN ARTERY: ANATOMICAL VARIATION

Sir:
The median artery has been reported in many surgical exposures of carpal tunnel releases, in color Doppler ultrasound studies, and in a few cadaveric studies, with an incidence ranging from 4.4 percent to 26 percent. It is an anomalous persistence of the axial vessel of the upper limb into adulthood. The presence of a median artery can precipitate carpal tunnel syndrome, but more importantly, it poses danger during primary surgery in hand trauma if this anomalous variation is not considered. Figure 1 shows an anatomical dissection of a cadaver, with identification of a persistent median artery from its origin to terminal branches. We report an anatomical variation in which the proper digital arteries to the index and middle fingers were supplied by both the persistent median artery and the second dorsal metacarpal artery (Figs. 2 and 3).

FIG. 1. Injected cadaveric specimen of volar aspect of forearm and palm showing the origin, course, relations, and termination of the median artery. BA, brachial artery; MA, median artery; MN, median nerve; UA, ulnar artery; RA, radial artery; FR, flexor retinaculum; CDA, common digital artery; II, III, and IV, second, third, and fourth.
The median artery in this dissection was found arising from the ulnar artery 5 cm distal to the brachial artery bifurcation. The diameter was similar to that of both the radial and the ulnar arteries. The median nerve crossed the ulnar artery before accompanying the median artery throughout the forearm and entering the palm through the carpal tunnel. The median artery in the palm terminated as the common digital artery to the index and middle fingers and formed the superficial palmar arch with branches of the radial artery.

The ulnar artery terminated by dividing into two common digital arteries to the long, ring, and little fingers without any contribution to the superficial palmar arch. The radial artery was found dividing into a volar branch and a dorsal branch in the distal forearm. The volar branch was found to give rise to both digital arteries of the thumb and the radial digital artery of the index finger, forming the superficial palmar arch. The dorsal branch was found to give dorsal branches to the thumb and index finger, continuing distally along the second dorsal intermetacarpal space as a large-diameter second dorsal metacarpal artery, which at the web space was found to divide into proper digital arteries to the index and middle fingers.

The proper digital arteries are normally terminal vessels of the common digital arteries on the palmar aspect and provide the dominant supply to the digits. In this case, the dominant supply to the index and middle fingers arose from the dorsum by the bifurcation of the second dorsal metacarpal artery into the proper digital arteries, with only a minor contribution from the common digital artery (Figs. 2 and 3).

Clinically, the presence of the median artery may affect the interpretation of the Allen test. While performing this test, the hand may fail to blanch fully or partially, depending on the median artery contribution, in which case color Doppler ultrasonography may be a worthwhile investigation. The persistent median artery as a cause of or in coexistence with carpal tunnel syndrome is also well established.1,4

During the primary hand operation, it is useful and important to bear these significant variations in mind. The presence of a large persistent median artery may necessitate microanastomosis during replantations and median nerve injuries. In palm amputations, if a common digital artery is found to be smaller in diameter than the proper digital arteries, a search may be required to anastomose the dominant dorsal metacarpal artery.

Acknowledgments: We thank Professor C. Oberlin and Dr. F. Teboul, Hôpital Bichat, Institute D’Anatomie de Paris, Paris, France, for their kind permission, arrangements, encouragement, and guidance in this study.

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Gunasekar Vuppalapati
Deemesh Oudit
Gary Ross
Department of Plastic Surgery
Royal Preston Hospital
Lancashire Teaching Hospitals NHS Trust
Preston, United Kingdom

Correspondence to Mr. Vuppalapati
Department of Plastic Surgery
Royal Preston Hospital
Sharoe Green Lane
Preston PR2 9HT, United Kingdom
guna@doctor.com

REFERENCES
A SEE-THROUGH IN VITRO TENDON REPAIR MODEL

Sir:

Tendon repair is an integral part of the disciplines of plastic and orthopedic surgery. Training on patients has limitations. An animal model may not be available and may have cost implications, including the cost of animal parts and their disposal, and the cost to maintain the license may be prohibitive to many centers. Also, at times, an epidemic like foot-and-mouth disease may lead to training course cancellations.

Training others to perform a tendon repair on the available models does not demonstrate to the trainer and trainee the quality of repair and placement of the sutures.

To overcome the above limitations of the available models, we have designed a novel, in vitro tendon repair model (Fig. 1). The main advantage of this model is the see-through phenomenon for excellent visualization of the quality of repair (Fig. 2). This model is robust, easy to use, and totally synthetic yet highly simulative. Although this model is synthetic, the silicone material is as fragile as tendon and is designed to mimic the texture and configuration of different tendons. This model can be maintained at low cost. The silicone tendon is also inexpensive to replace. Therefore, we highly recommend the use of this model, especially during the induction of entry-level trainees in plastic and orthopedic surgical specialties (Fig. 3), to provide uniform standards and safety. This model is also highly suitable for pioneers to display their new suturing techniques in tendon repair for either publication or presentation.

Acknowledgments: The authors acknowledge Dr. R. McMillan for support and their plastic surgery consultant colleagues at Whiston Hospital NHS Trust, Liverpool, United Kingdom.

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Fig. 1. In vitro tendon repair model kit showing the metal frame, the silicone rods simulating the mounted tendon, and the built-in drawer for the instruments and materials.

Fig. 2. Close-up view of the see-through phenomenon during core suture placement.

Fig. 3. Examples of tendon repair techniques shown with this tendon repair model. (Above) Kessler-Mason core suture; (second row) core and coaptation; (third row) the Bunnell core suture. (Fourth row) The relaxed tendon is shown after core Bunnell and coaptation suture. (Fifth row) The strength of the repair is shown by the traction. (Below) In this Kessler-Mason repair using an opaque silicone rod simulating actual in vivo tendon, the placement and the quality of the core suture cannot be seen, in contrast to the see-through silicone rod used in our tendon repair model.
A SIMPLE SALVAGE TECHNIQUE FOR SINGLE-STAGE, SOFT-TISSUE COVERAGE OF PLANTAR FIRST METATARSAL HEAD ULCERATIONS AND ABLATION OF GREAT TOE OSTEOMYELITIS

Sir:

Treatment of plantar first metatarsal head ulcerations with concomitant osteomyelitis of the great toe, sesamoids, and/or first metatarsal head is a true reconstructive challenge (Fig. 1). The usual treatment consists of irrigation, débridement, and amputation with limited soft-tissue and osseous reconstruction. Unfortunately, the natural history of great toe amputation does not bode well. Murdoch et al. showed that following amputation of the great toe, 36 of 48 patients (75 percent) underwent a more proximal amputation at a mean period of 9.6 months. Similarly, Greteman and Dale showed that following disarticulation of the great toe, 11 of 17 patients (65 percent) developed a new ulceration, and nine of 17 patients (53 percent) underwent a more proximal amputation.

In light of the above, we have developed a simple salvage technique that provides soft-tissue coverage of the plantar first metatarsal ulceration and ablation of the associated osteomyelitis. The procedure consists of the following steps: (1) radical excision of the ulceration and infected soft tissues with removal of the sesamoids; (2) resection of the lateral one half of the distal and proximal phalanges and plantar one third of the first metatarsal head; (3) curettage of the infected cancellous bone but preservation of the remaining cortical bone, which is packed with polymethylmethacrylate vancomycin (4 g) and gentamicin (480 mg) antibiotic-loaded bone cement; and (4) great toe fibular adipofasciocutaneous island flap coverage of the ulceration and primary closure of the donor site over a suction drain (Fig. 2).

Use of the traditional great toe fibular neurovascular island flap for soft-tissue coverage of plantar first metatarsal head ulcerations is a well-described procedure with few reported complications. The advantages of this flap include (1) a robust yet malleable flap, (2) a hidden donor site with minimal postoperative donor-site morbidity, and (3) a relatively large potential flap size (up to 2 × 3 cm with direct primary closure of the donor site and 4 × 6 cm if the donor site is covered with a full-thickness skin graft). In our hands, the most common complication for the traditional great toe fibular neurovascular island flap is venous congestion. To avoid venous congestion, we morphed the traditional great toe fibular neurovascular island flap into an adipofasciocutaneous island flap through the elevation of the first web space cutaneous segment at the immediate subdermal layer, as one would do to develop an adipofascial flap; we then based the pedicle of the flap on the entire subcutaneous contents of the first web space surrounding the lateral plantar digital neurovascular bundle. This modification has virtually eliminated venous congestion as a complication and has the added benefit of providing adipose padding to the soft-tissue defect, which aids in filling the voids created during resection of adjacent osseous structures infected with osteomyelitis. In addition, the design and elevation of the great toe fibular adipofasciocutaneous island flap are simple because there is no need to formally identify the neurovascular bundle and reliable due to the greater volume adipose accompanying the neurovascular pedicle.

When performing the great toe fibular adipofasciocutaneous island flap for soft-tissue coverage of isolated plantar first metatarsal head ulcerations, we observed that the flap harvested from the great toe was frequently too large to allow primary closure of the donor site. Rather than cover the area with a full-thickness skin graft, we would routinely perform a partial resection of the lateral one third of the distal and proximal phalanges, which then allowed for direct primary closure of the donor site without any tension or apparent complications. Since this realization, when faced with plantar

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first metatarsal head ulcerations and accompanying osteomyelitis of the great toe, sesamoids, and/or first metatarsal head, we have begun routinely removing the sesamoids, resecting the lateral one half of the distal and proximal phalanges and plantar one third of the first metatarsal head, and preserving the remaining bone segments, which are packed with polymethylmethacrylate vancomycin and gentamicin antibiotic-loaded bone cement. The antibiotic-loaded bone cement is a well-documented surgical technique and has been shown to be safe for permanent implantation and efficacious at delivering high concentration of antibiotics directly to the infection site while avoiding systemic toxicity. It allows for decreased length of parenteral antibiosis with reduced economic costs.10–18

The combination of procedures described above has allowed us to discharge patients from the hospital with a functional and cosmetically appealing intact great toe and first metatarsal that are easily protected in an appropriate extradepth, rocker-soled shoe with soft insoles and frequent clinical follow-up (Fig. 3).

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MASSIVE EXPANDING LIPOMA OF THE TOE

SIR:

Lipoma is among the most common soft-tissue tumors of the human body, which is composed of mature fat. It may be a single tumor or multiple tumors, as well as subcutaneous or deep-seated. Most lipomas become apparent in the fourth and sixth decades, and statistics as to sex incidence vary, but most report a higher incidence in men. Subcutaneous or superficial lipomas are most common in the regions of the upper back, neck, abdomen, and proximal portions of the extremities. They are seldom encountered in the face, hands, lower legs, and feet. Toe lipomas are rare and are represented in only a few articles.

A 35-year-old woman was referred with a massive expanding mass located in her right first toe (Fig. 1, left). The tumor was painless and had been apparent for 1 year. On physical examination, her right first toe had a 13-cm circumference and was approximately 10 times bigger than the second toe. The mass was soft, and the overlying skin was so thin that the color of the mass had a yellowish appearance. The blood cholesterol level and lipid electrophoresis were checked to eliminate the possibility of a xanthoma; the results were reported as normal. Radiographs revealed no osseous invasion. An ultrasonogram of the lesion showed a homogenous mass in lipid density resembling lipoma. Surgical removal of the lesion was performed, and histopathologic assessment was done. The specimen was reported to be a lipoma. After the operation, the right big toe of the patient appeared almost the same compared to the other big toe, and on the tenth postoperative day, the patient began to put on her shoes but was walking on her heel (Fig. 1, right).

Although benign soft-tissue tumors are not uncommon in the proximal portion of the extremities, localization of this kind of tumor in the foot, especially in the toes, is rare. Lipomas are the most common soft-tissue tumors of the human body, and the solitary subcutaneous lipoma alone accounts for one fourth to one half of all soft-tissue tumors. Most lipomas are small subcutaneous lesions that grow slowly, but if not resected, they result in disfigurement of the region. If they occur in the foot, they may infiltrate between the deeper tendons and muscles, particularly if they are in a plantar location. They are more common in males, and there are a few reports of benign lipomas occurring in children.

A systematic approach must be used on patients with an unknown mass in the toe. Duration of the lesion, growth rate, size, location, and associated illnesses must be assessed by the patient's history, and patients and siblings must be asked about a history of any similar lesions to eliminate familial hypercholesterolemia representing with xanthoma tuberosum. Laboratory tests must consist of blood tests and radiographs. Ultrasound, bone scans, computed tomography scans, and magnetic resonance imaging scans must be performed if necessary. Blood tests to analyze blood cholesterol and triglyceride levels and lipid electrophoresis must be performed before surgical management to confirm a xanthoma. Radiographs will reveal if the lesion has invaded the bone. This is important in differential diagnosis and an absolute necessity in surgical management. While neurofibromas are

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Fig. 3. (Left) Three-day and (right) 6-month postoperative follow-up views. Note the maintained normal contour to the great toe and plantar first web space without any atrophy of the adipose tissue interposed deep to the flap itself or pressure- and friction-induced hyperkeratoses of the flap or adjacent native skin.


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associated with bone and soft-tissue hypertrophy, including nerves, lipomas present with macrodactyly but without bone and nerve involvement.

Besides these pathologies, a differential diagnosis of the lipomas from sarcomas must be performed. Patient age, sex, and duration of symptoms are of minor value for clinical differentiation of lipoma and sarcoma. Deep-seated tumors larger than 5 cm are relatively more likely to be sarcomas. This assessment is useful for the selection of patients with soft-tissue lesions who should be referred to a tumor center before any operation.4

While there are some up-to-date reports about isolated toe lipomas,6,7 none of these cases involved the first toe. We present a massive first toe lipoma that affected the patient’s quality of life.

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Naci Karaçal, M.D.
Ercan Yavuz, M.D.
Umut Topal, M.D.
Ömer Ambarescoglu, M.D.
Necmettin Kulu, M.D.
Department of Plastic and Reconstructive Surgery
Karadeniz Technical University
Trabzon, Turkey

Correspondence to Naci Karaçal
Department of Plastic and Reconstructive Surgery
Karadeniz Technical University
KTU Lojmanlar 22/1
61080 Trabzon, Turkey

REFERENCES


PLANTAR VERRUCOUS CARCINOMA CONTINUES TO BE MISTAKEN FOR VERRUCA VULGARIS

Sir:

Verrucous carcinoma is a rare, low-grade, well-differentiated variant of mucocutaneous squamous cell carcinoma that occurs at a variety of anatomical sites.1 The three typical locations are the anogenital region (giant condyloma of Buschke-Lowenstein), the oropharynx (Ackerman tumor), and the plantar surface of the foot (epithelioma cuniculatum plantare). However, other cutaneous sites have been reported.1

Plantar verrucous carcinoma most commonly affects males (5:1 ratio) and occurs in patients with a median age of 60 years. It characteristically presents as a recalcitrant, slow-growing, fungating, and exophytic mass with numerous keratin-filled sinuses, usually on the anterior weight-bearing area of the sole of the foot. The lesion has a propensity to local invasion and recurrence, but metastasis is rare.1,2

We recently treated three cases at the University Hospital of North Durham. Two of these cases had a delayed diagnosis as a result of being treated as verruca vulgaris before referral. Case 1. A 68-year-old man was referred to our hospital with a 6-year history of a warty exophytic lesion on the sole of his left foot. This had been treated as a viral wart in the past without response and had been excised under local anesthetic on two occasions before referral. He gave a history of
local epoxy resin exposure 8 years before the first consultation. On examination, he had a 4-cm exophytic hyperkeratotic lesion on his left foot over the second metatarsal head and no regional lymphadenopathy or evidence of metastasis. The lesion was excised and a split-skin graft was applied. This was confirmed to be verrucous carcinoma histologically. The tumor recurred on three occasions subsequently; it was re-excised and a split-skin graft was applied each time. The recurrences occurred at 6, 7, and 9 months from the date of the last excision. One year after the latest excision, there has been no evidence of recurrence.

Case 2. A 36-year-old man presented with a 2-year history of an enlarging painful lesion on the sole of his right foot. On examination, he had a 3 × 5-cm exophytic hyperkeratotic lesion over the fourth metatarsal head. He had no signs of regional lymphadenopathy or distant metastasis. The lesion was excised and the exposed area was split-skin grafted. Histological analysis of the specimen showed the lesion to be a verrucous carcinoma. At 6 months after excision, there has been no evidence of recurrence.

Case 3. A 64-year-old man presented with a 6-year history of a painful exophytic lesion on the sole of his right foot. The lesion had previously been treated conservatively for 5 years, initially with trimming by a chiropodist and subsequently by topical therapy including 3% formalin soaks. Two biopsies had been performed and results were reported as being consistent with a diagnosis of a viral wart. On examination, he had 6.5 × 5-cm exophytic hyperkeratotic lesion with a malodorous discharge on the sole of the right foot over the first and second metatarsal heads (Fig. 1). There was no evidence of regional lymphadenopathy or metastatic disease. He underwent excision of the tumor with split-skin grafting. Histological examination confirmed that the lesion was a verrucous carcinoma. Two months postoperatively, there has been no evidence of recurrence.

Verrucous carcinoma generally presents in a fairly classic manner when it affects the foot, as described above. The differential diagnoses include verruca vulgaris (viral wart), keratoacanthoma, dermatofibroma, drug eruption, adenexal tumor, verrucous melanoma, and pseudocarcinomatous hyperplasia. However, as illustrated by two of our cases (cases 1 and 3), perhaps due to the rarity of verrucous carcinoma, the significance of it is not always recognized and it is sometimes treated as a viral wart. This can lead to delayed diagnosis and suboptimal management if not identified early enough. Another diagnostic issue that also may lead to a delayed diagnosis arises as a result of the cytologic benignity of the tumor, which may give a confusing histologic report, as demonstrated in case 3. A superficial biopsy may give results reported as being consistent with the appearances of verruca vulgaris due to the lack of anaplasia in this tumor. Therefore, the diagnosis needs to be made with full consideration of the macroscopic and microscopic features as well as the clinical history.

Wide local excision is generally regarded to be the most accepted mode of treatment. The use of Mohs surgery has also been described as a successful method of resection. Radiotherapy is generally not regarded as appropriate. Concern has been raised about the possibility of a radiotherapy-induced anaplastic reaction, although this is rare. Also, there have been no reports of successful radiotherapy without surgery.

Plantar verrucous carcinoma is a rare low-grade neoplasm that can be successfully treated surgically. Wider recognition of the condition is needed among health professionals, including doctors and chiropodists, to prevent delayed diagnosis.

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Ramesh Vidyadharan, M.B., Ch.B., F.R.C.S.
Rajife M. Jose, M.B., Ch.B., F.R.C.S.
Gundabolou S. Rao, M.B., Ch.B., F.R.C.S.(Plast.)
Department of Plastic Surgery
University Hospital of North Durham
Durham, United Kingdom

Correspondence to Mr. Wright
Department of Plastic Surgery
Royal Free Hospital
Pond Street
London NW3 2QG, United Kingdom
paulkingsley001@yahoo.co.uk

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Fig. 1. Exophytic hyperkeratotic exudative plantar verrucous carcinoma in case 3.
RECONSTRUCTION APLASIA CUTIS CONGENITA (GROUP V) OF THE TRUNK IN A NEWBORN

Sir:


The authors reported their experience of covering aplasia cutis congenita of the trunk in a newborn using Apigraf (Novartis, Basel, Switzerland), a bilayered skin construct formed by allogenic foreskin keratinocytes and a dermal layer consisting of type I bovine collagen lattice interspersed with allogenic human skin fibroblasts. On the fifth day of life, a meshed Apigraf sheet was used to cover an 8 × 8-cm defect, and by postoperative day 5, 80 percent of the graft had taken. It is not mentioned how long thereafter dressing changes were needed to achieve complete permanent coverage.

The Apigraf was originally used to treat chronic leg ulcers and was used mainly to obtain temporary coverage of the defect and to accelerate the healing process. Our experience with Apigraf and healed leg ulcers is that the result shows scarring and uneven pigmentation, which is usually acceptable in an elderly population.

When reconstructing aplasia cutis congenita or any other congenital skin defect, the surgeon should consider functional and aesthetic outcomes. The allergenic Apigraf, with its bovine collagen, constitutes a temporary coverage and serves as a template, which will be replaced gradually over a period of months by the patient’s fibroblasts. Until then, a prolonged healing process with sustained inflammation will take place. This will result in an excessive fibroplasia, which leads to contracture. Furthermore, the only source of permanent epithelial coverage in their case was in the wound margins. The allogenic human keratinocytes will be replaced over a period of months by migrating autologous epithelium from the wound margins to the center. Delayed permanent coverage with minimal contracture is achievable in an elderly population.

In our described technique, we reconstructed a larger defect of aplasia cutis congenita of the trunk using AlloDerm (LifeCell Corp., Branchburg, N.J.) as an immunologically inert, acellular dermal substitute containing nonallergenic processed collagen fibers as a template to minimize contracture and cultured epithelial autografts. This achieved rapid and permanent coverage with minimal contracture and more homogenous pigmentation matching the surrounding tissue, as shown in our 27-month follow-up figure.5

We still believe that for the reconstruction of aplasia cutis congenita or any other congenital skin defect, using AlloDerm and cultured epithelial autografts, if available, will achieve better functional and cosmetic results.

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Richard Simman, M.D.
Department of Surgery
Division of Plastic and Reconstructive Surgery
East Tennessee State University
Johnson City, Tenn.

Correspondence to Dr. Simman
263 Main Street Village Drive
Jonesborough, Tenn. 37659

REFERENCES


Traditional cosmetic surgery has achieved excellent results in many defective conditions of the face and body. However, some defects cannot be satisfactorily corrected with these techniques alone. Therefore, physicians have been looking for an injectable substance for soft-tissue augmentation and have used substances such as bees wax, paraffin wax, and mineral oils. Only in the last decade, however, have these attempts achieved the desired result, mainly based on the discovery of new materials suitable for injection into subcutaneous layers.1

An ideal biomaterial must be anallergic, inert, sterile, unpolygenic, non-cancer-producing, stable, incapable of migrating, and, most importantly, biologically compatible with the host tissue.2 The latter requisite is crucial because it influences the ability of the filler to coexist with the surrounding tissues, without either stimulating the immune system or causing persistent inflammatory reactions.3

In the attempt to clarify the biocompatibility of the filler, an electron microscopic analysis was performed on skin biopsy specimens taken from human volunteers subjected to Bio-Alcamid implants (Polymekon, Milan, Italy). This technique is the prerequisite for ultrastructural identification of the fine morpho-functional interactions occurring at the interface between the biomaterial and the adjacent tissue. Bio-Alcamid is an injectable hydrophilic biopolymeric fluid that is 96 percent sterile water and 4 percent polyalkylimide-based gel.

Seven healthy male and female volunteers between the ages of 19 and 37 years were enrolled in this study. After giving written informed consent, each subject was injected with 0.5 to 1.0 ml of Bio-Alcamid in the subcutaneous layer of the anterior abdominal wall. Skin biopsy specimens were obtained 3 months after the Bio-Alcamid implantation.

Light microscopic analyses of the skin specimens taken in the areas of implantation revealed fibroblasts located in the subcutaneous layer. These fibroblasts were arranged around a central amorphous core, representing the injected biomaterial, and were surrounded by normal intercellular matrix showing no signs of inflammation (Fig. 1).

In the treated skin, the epidermis, dermis, and subcutaneous layer revealed ultrastructural features similar to those of the controls. In particular, in the subcutaneous layer, the connective capsule surrounding the central core was composed of quiescent fibroblasts interspersed within an abundant extracellular matrix. The intercellular spaces among fibroblasts contained numerous collagen fibrils and abundant amorphous ground substance, suggesting that previous biosynthetic activity had occurred within the capsular fibroblasts. The central core of amorphous material showed a morphologic pattern similar to that of Bio-Alcamid, as observed before the implantation (Fig. 2, above).

Interestingly, we observed numerous connective fibrils that appeared to anchor the biomaterial to the deeper fibroblastic layer of the capsule that had formed at the capsule/Bio-Alcamid interface (Fig. 2, center and below). Finally, there were no signs of neutrophil or monocyte tissue infiltration around the implant sites.

The findings of this study confirm that Bio-Alcamid is a material that is highly compatible with human skin. Bio-Alcamid has demonstrated permanent stability, absence of toxicity, insolubility in tissue fluids, radiotransparency, and the ability to not alter tissue consistency because it is predominantly made up of water. Though permanent, the com-

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**Fig. 1.** Light microscopic examination of human skin biopsy specimen with implanted Bio-Alcamid. (Left) A fibroblastic capsule surrounds an amorphous core possibly representing the implanted material (total magnification ×350). (Right) Higher magnification shows details of the connective tissue capsule with fibroblasts arranged in several parallel rows encircling the injected material. No signs of inflammation are detectable around the implant (total magnification ×800).
The absence of any inflammatory reaction in the vicinity of the site of implantation and the presence of a connective capsule encircling the injected material are favorable conditions regarding both the stability of the substance as well as its possible removal from the host tissues. Interestingly, at the ultrastructural level, the biomaterial appeared to be tightly anchored to the surrounding capsule located in the subcutaneous layer. Indeed, thin collagen fibers, apparently produced by the fibroblasts composing the capsule, formed loose reticular bridges connecting the implanted biomaterial to the capsule itself. Because the fibrosis was limited to the formation of the capsule around the implant, it is likely that these connective structures may represent normal reactions of the host tissue to foreign bodies. Thus, the findings presented here provide novel findings on the biocompatibility of Bio-Alcamid and reassure investigators about our previous immunohistochemical observations that demonstrated a very slight inflammatory reaction at the perimplantation site, which attenuates with time after the implantation.1,2

Disclaimer: Drs. Carmelo Protopapa and Nazzareno Cammarota belong to the Scientific Department of Polymekon, but no author has a direct financial interest in the product.

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L. Formigli
S. Zecchi
Department of Anatomy, Histology, and Forensic Medicine
University of Florence
Florence, Italy
C. Protopapa
Department of Plastic, Reconstructive, and Aesthetic Surgery
University of Parma
Parma, Italy
D. Caporale
Institute of Thoracic Surgery
Department of Surgical Sciences
University of Parma
Parma, Italy
N. Cammarota
Polymekon Scientific Department
Polymekon Research Center
Brindisi, Italy
T. M. Lotti
Department of Dermosciences
University of Florence
Florence, Italy

Correspondence to Dr. Cammarota
Polymekon Scientific Department
Corso Umberto I, 72
72100 Brindisi, Italy
nazzareno.cammarota@polymekon.it

Fig. 2. Transmission electron microscopic examination of human skin biopsy specimen with implanted Bio-Alcamid. (Above) Ultrastructure of native Bio-Alcamid observed before implantation. Note that it is made up by two components: an electron-dense one, forming a three-dimensional net, and an electron-lucent one, intermingled within the mesh of the net (total magnification ×8000). (Center) Implanted Bio-Alcamid shows a pattern quite similar to the native one. Note the presence of thin fibrils apparently anchoring the material to the deeper fibroelastic layer (total magnification ×6000). (Below) Higher magnification (total magnification ×14,000).
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THE APPLICATION OF STERI-STRIPS

Sir:

Adhesive strips (Steri-Strips; 3M Health Care, St. Paul, Minn.) are often used in primary wound closure or for reinforcement in the immediate postoperative period. They have lower rates of wound infection and also prevent "railroad track" scars when used in place of superficial sutures. The application of Steri-Strips varies with different surgeons. Strip adherence to skin can be increased by using tincture of benzoin, mastic gum, or OpSite spray (Smith and Nephew, London, United Kingdom). Katz et al. showed that application of strips in a parallel, nonoverlapping fashion after the entire application area has been coated with adhesion compounds gives the best results over time on volunteers’ healthy skin.

Steri-Strips are normally applied parallel to each other but perpendicular to the wound edges. In certain areas, such as the back, this method can result in the development of blisters. Closing the wounds may cause some tension when the patient flexes forward, and application of Steri-Strips may result in blister formation. We have found that patients who have had Steri-Strips applied on the back by the above method after harvesting of latissimus dorsi flaps were susceptible to developing blisters because the adhesive strips increased the shearing effect on the skin (Fig. 1). The microporous reinforced tape exhibits a high level of shear adhesion; its resistance to elongation may account for the development of blisters on the underlying healing wound. This can adversely affect the patient’s wound, because it can cause pain and be a potential source of infection.

However, patients who had adhesive strips applied parallel to the wound with or without OpSite spray did not develop blisters and had good strip adherence for 5 to 7 days (Fig. 2). This technique has a lower surface area in contact under the Steri-Strips and, therefore, less shearing effect, which resulted in a lower incidence of blisters. Therefore, we believe that for surgical wounds, especially on the back or following mastectomy reconstruction, application of surgical tape strips parallel to the wound may avoid blisters and still maintain good adherence. This technique is simple, as strips can be applied to all surgical wounds with or without additional adjuvant adhesives and can also be easily removed.

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Sathkur B. Pushpakumar, F.R.C.S.I., F.R.C.S.(Ed.)
Richard P. Hanson, A.F.R.C.S.I.
Sean Carroll, F.R.C.S., F.R.C.S.(Plast.)

Department of Plastic and Reconstructive Surgery
St. Vincent’s University Hospital
Dublin, Ireland

Correspondence to Dr. Pushpakumar
Department of Plastic and Reconstructive Surgery
St. Vincent’s University Hospital
Elm Park
Dublin 4, Ireland
kumarpushpa@hotmail.com

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USE OF FINE FORCEPS AS A SURGICAL MARKER

Sir:

Intraoperative marking of the skin is a very helpful adjunct to surgical planning; thus, skin-marking pens are used almost daily in plastic surgery. There are a multitude of commercially available marking pens that are disposable. They have been evaluated previously, and it was noted that the search for an improved marking device continues. Therefore, various innovative markers have been reported in the literature. The ideal surgical marker should be always available, inexpensive, reusable, and easy to use.

Fine forceps are an essential part of every sterile surgical tray used in cutaneous surgery and, therefore, are always available. They are not disposable, so they can be reused after every sterilization. Additionally, they are not confined to their traditional usage in picking up or holding tissue. We describe a novel method using a fine forceps as a sterile marker in dermatologic surgery.

After the patient is draped in a sterile fashion, surgical ink is poured into a small sterile cup (Fig. 1). Then the closed forceps is dipped in ink, producing a small film between the two distal ends of the forceps (Fig. 2). Now the forceps can be used like a pen for skin marking (Fig. 3). Care has to be taken not to apply too much pressure because this would produce a broad ink line. The forceps method is fast and readily available whenever surgical skin marking is necessary.

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Karin M. Dunst, M.D.
Department of Cardiac Surgery
Christian Rainer, M.D.
Georg M. Huemer, M.D.
Department of Plastic and Reconstructive Surgery
Leopold-Franzens University
Innsbruck, Austria

Correspondence to Dr. Huemer
Department of Plastic and Reconstructive Surgery
Leopold-Franzens University
Anichstrasse 35
A-6020 Innsbruck, Austria
georg.huemer@uibk.ac.at

REFERENCES
TECHNIQUE FOR SKIN GRAFT SIZES

Sir:

I read with great interest the brief communication from Dr. Putterman on how to copy the size and shape of a defect to be covered by a skin graft. I agree that there are many ways to do this and that the one using the cardboard of the sutures is not the best one.

In the past, a colleague and I reported a method similar to that of Dr. Putterman’s description, but instead of a blotter, we use polyurethane foam, which copies the shape and size of the defect by blood staining and also serves as a convenient tie-over dressing.

These little details are quite useful and usually make the procedure faster and even more elegant.

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Isaac J. Peled, M.D.
Department of Plastic Surgery
Rambam Medical Center
Haifa, Israel
i_peled@rambam.health.gov.il

REFERENCES


HOW MANY RATS?

Sir:

I read with interest the article entitled “Improved Dorsal Random-Pattern Skin Flap Survival in Rats with a Topically Applied Combination of Nonivamide and Nicoboxil” by Hue-mer et al. (Plast. Reconstr. Surg. 111: 1207, 2003). The experiment looked at the benefits of a topical agent (combination of nonivamide and nicoboxil) in preventing necrosis of random-pattern skin flaps and has found that it is beneficial. While I do not wish to comment on the efficacy of the drug, I do think that a sample size of 20 rats in each group is perhaps less than ideal for a trial involving the dorsal skin flap in rats. My statement is based on a paragraph that I read in one of the renowned textbooks in plastic surgery.1 It quotes a study by Haeck, Spira, and Divine (1984) that demonstrated that at least 249 rats are necessary per group to show a 10 percent difference with 80 percent confidence. The basis of his statement rests on a study conducted in 1984 by Haeck, Spira, and Divine.

When looking at the recent literature, all scientific studies using this type of flap in rat models rely on a much smaller sample size than 249. Sample size estimations help us ahead of the actual experiment to keep the number of animals as low as possible while getting a statistically significant difference between two groups. Encouraged by Dr. Jose’s letter, we applied a computerized sample size estimation (nQuery Advisor 4.0; Statistical Solutions, Saugus, Mass.) to our experimental data with the following results: a sample size of four rats in each group will have 80 percent power to detect a difference in means of 14,000 (the difference between control group mean of 36,800 and Finalgon group mean of 22,800), assuming that the common standard deviation is 5000 using a two-group t-test with a 0.050 two-sided significance level. Therefore, a sample size of 20 rats in each group is sufficient to give a statistically significant difference between the control group and the Finalgon group with the results from our experimental data.

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Georg M. Huemer, M.D.
Elfriede Ruttman-Ulmer, M.D.
Romed Meirer, M.D.
Department of Plastic and Reconstructive Surgery
Anichstrasse 35
A6020 Innsbruck, Austria

REFERENCES

AS MANY AS ARE NEEDED

Sir:

The article by Huemer et al. clearly demonstrated that the combination of nonivamide and nicoboxil improved the mean percentage of skin flap necrosis. The authors’ experimental design met the criteria that researchers apply to scientific studies, that is, the authors randomly assigned the 40 Wistar rats to the two treatment groups and each group was treated in a similar fashion except for the use of the combined treatment.

The sample size needed in an experiment depends on four things. First, it depends on whether or not one can assume that the observations follow a distribution such as the normal distribution for which tests have been derived. If the distribution of the data is unknown, then nonparametric methods can still be used, but they tend to require slightly larger samples than is the case if you can assume the data are normally distributed. Here the authors assumed a normal distribution, and that appears to be a sensible decision. The test that the authors used is quite robust, and perfect normality has been shown not to be required.

Second, the needed sample size depends on the pooled variance of the observations. If the data are highly variable, then more observations are needed. In this case, the standard deviations (or the square root of the variance) were not large. The authors were able to obtain consistent results in each treatment group. This is sometimes measured by dividing the standard deviation by the mean to obtain the coefficient of variation. In this experiment, the results would be 0.12 for the controls and 0.27 for the treatment group for percent necrosis, indicating that the variation in the data is not large.

Third, the needed sample size depends on how far apart the two means are. If they are far apart, then a smaller sample size can be used. In this case, the control mean percent necrosis was 36.8 and the treatment mean was 22.6. In other words, the control mean was 14.2 percent larger than the treatment mean, a sizable difference.

Finally, the sample size depends on what $p$ value the authors choose to perform their test of significance. Here the authors chose 0.05, the usual $p$ value for medical research. They actually achieved a much smaller $p$ value but simply reported that the results were significant at $p = 0.05$. In the formulas used to obtain the needed sample size before designing the experiment, a term that controls for accepting the null hypothesis of equal means when actually the means are different is also included. Once the data are taken, the test is made, and the conclusion that the means are unequal is made, this becomes irrelevant from a practical viewpoint.

Investigators who wish to determine what sample size to take when designing their study might consider consulting a book by Kraemer and Thiemann entitled How Many Subjects or statistical programs such as nQuery (Statistical Solutions, Saugus, Mass.).

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Virginia Clark, Ph.D.
Plastic and Reconstructive Surgery® Biostatistician
852 Sporseen Road
Sequim, Wash. 98382
clark@olympus.net

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