with a “blade” rather than a “serrated” shaver tip. Drains are routinely used, and in fact, small perforations produce an additional pathway for the egress of fluid.

3. A majority of North American plastic surgeons work in multispecialty hospital operating rooms or day-surgery centers. I extrapolate the use of an orthopedic arthroscopic shaver with standard blade tip, routinely utilized for joint surgery; this equipment can be borrowed from our orthopedic colleagues. Certainly, liposuction and curettage tools are also readily available equipment and can produce acceptable results; however, this technique combines these two separate modalities with a single, readily available device, allowing for a definitive endpoint to therapy via palpation of the axillary flap. In addition, resource utilization was at a minimum, with only 46 minutes of surgical time required.

In conclusion, my coauthors and I view our technique as minimally invasive, with excellent subjectively measured treatment outcomes. It should be considered as a preferred surgical option for treating primary hyperhidrosis of the axilla.

DOI: 10.1097/01.prs.0000291614.29714.54

Jugpal S. Arneja, M.D.
Section of Plastic Surgery
Children’s Hospital of Michigan
Wayne State University
3rd Floor Carls Building
Detroit, Mich. 48201
arneja@med.wayne.edu

DISCLOSURE
The author has no conflict of interest associated with the preparation or submission of this communication.

REFERENCES

Perforator-Plus Flaps or Perforator-Sparing Flaps: Different Names, Same Concept

Sir:

We congratulate Dr. Mehrotra on his thoughtful article (Plast. Reconstr. Surg. 119: 590, 2007). We have independently described a flap of very similar design that we call the perforator-sparing flap,1,2 and we would like to share our experience in light of this article.

The first issue pertains to that of terminology, which has caused considerable confusion in the era of perforator flaps.3 Calling these flaps perforator-plus flaps has the advantage of stressing their additional blood supply from the preserved perforator. However, it may potentially add to the current terminological confusion. We have called our flaps perforator-sparing flaps because this is essentially what they do, spare the perforator encountered at the tip of the flap and mobilize it to its origins to allow it to move freely with transposition or rotation of the flap. Terminology aside, our philosophy for this flap design is in line with that proposed in this article: the sacrifice of muscle such as the soleus in the lower limb is associated with definite functional impairment. For this reason, use of the fasciocutaneous flap is preferable. However, the vascularity of the fasciocutaneous flap in the leg is unreliable. Thus, the perforator-sparing flap is the logical solution (Fig. 1).1

In cadaveric specimens and clinical cases, we found that it is technically feasible to raise such flaps in most instances, except in some areas, such as the distal third of the leg. It has better vascularity com-
pared with conventional flaps of similar design without the “extra” perforator. The concept of favorable, neutral, and unfavorable configurations pertains to the ease of transposing the flap without tension on the preserved perforator and should be borne in mind when using this flap. Some maneuvers can be used to increase success, such as full mobilization of the perforator to its origin to maximize length. If necessary, one can also create a more direct path from the vessel’s origin to the flap by cutting a trough in the muscle. In rare cases, however, this design cannot be used successfully and one can either divide the perforator or island the flap to convert it into a pure perforator flap.

We agree that one of the main problems with island perforator flaps in the lower limb, particularly in the setting of trauma, is venous congestion. Doppler ultrasonography can reliably locate the position of sizable perforators but gives little information about the adequacy and even the integrity of the venae comitantes that accompany the perforator. The perforator-sparing flap is a safer flap in this respect. Furthermore, its better vascularity also has the advantage of better promoting healing and fighting infection in infected wounds.

Mehrotra has successfully extended this concept to muscle flaps. However, one important anatomical feature distinguishes skin from muscle flaps. The subdermal plexus, which is a significant component of the “duality” of the blood supply in skin flaps, is absent in muscle flaps. The soleus flap described in the article should perhaps be more appropriately described as simply a muscle perforator flap.

DOI: 10.1097/01.prs.0000291615.67831.b3

Chin-Ho Wong, M.R.C.S.(Ed.)
Bien-Keem Tan, F.R.C.S.(Ed.)
Department of Plastic, Reconstructive, and Aesthetic Surgery
Singapore General Hospital
Singapore
Correspondence to Dr. Wong
Department of Plastic, Reconstructive, and Aesthetic Surgery
Singapore General Hospital
Outram Road
Singapore 169608
wchinho@hotmail.com

DISCLOSURE
The authors did not receive any funding for this work and declare no conflict of interest in the work presented.

REFERENCES
Reply

Sir:

I appreciate the comments and observations of Drs. Wong and Tan. It appears that their approach has its beginnings in raising random flaps with perforator sparing contributing an additional source of blood supply. My approach, however, was conversely developed from raising islanded perforator flaps in lower extremity trauma. Utilizing the “cut as you go” approach for flap margins, I spared part of the flap base if insetting was possible after perforator dissection and flap mobilization. In most cases, it is possible to retain a flap base of varying length. The flap is primarily surviving on the perforator in most cases, and the retained base is the additional and secondary supply. Hence the term perforator plus would emphasize that the perforator is the primary source of blood supply.

The flaps raised by the perforator-plus approach would be reasonably assumed to undergo significant necrosis if based only on the random blood supply from the base. Completely islanding the flap would still ensure survival, albeit with venous congestion and edema. The base possibly acts not so much as an important source of arterial input but rather as a source for venous and lymphatic drainage. The relative contribution of the perforator and the retained base to the overall vascular input of the flap is based on flap design, axiality along the vascular source, the retained flap base, and perforator dimensions and is a contentious issue. However, it is the concept of raising flaps with preservation of dual or maximum possible vascular inputs that is important and the key to a successful outcome.

I fully agree with the philosophy of preserving muscle in lower extremity trauma. In an already traumatized limb, all attempts should be made to retain residual functional tissue. I used the soleus perforator-plus flap because no other regional option was available. A hemisoleus perforator-plus flap was raised after available regional and free tissue transfers were considered and the perforator-plus flap appeared to be relatively less morbid. With circumferential degloving, a fasciocutaneous free flap would have been impractical. A free muscle flap would also have resulted in sacrifice of a functioning muscle elsewhere. The use of islanded soleus flaps is well described. Since the tibial fracture in the lower third could be covered by rotating the soleus based on its available perforator without detaching the distal insertion, the term muscle perforator-plus flap was used.

The concept of favorable, neutral, and unfavorable options in perforator-“sparing” flaps would be a practical addition to developing these flaps. A nomenclature for perforator-plus flaps has been proposed. As it was true then, even now it would require a concerted effort to have a holistic classification. It may be pertinent to let the froth settle on the issue.

Sandeep Mehrotra, M.S., D.N.B., M.Ch.
Reconstructive Surgery Centre
Command Hospital (Eastern Command)
Alipore, Kolkata
West Bengal, India
smehrotra@sify.com

DISCLOSURE

The author declares that there is no potential or actual personal, financial, or political interest in the communication being submitted.

REFERENCES