

“Image-Guided” Perforator Flaps versus “Free-Style” Perforator Flaps: Where Is the Evidence?

Sir:

We read with great interest the article on pedicled perforator flaps by Rozen et al., in which the authors report their experience with preoperative imaging of the perforator course in the subcutaneous plane using computed tomographic angiography.¹ Based on their experience of “over 1000 image-guided perforator flaps,” the authors have classified perforators into those with unidirectional or stellate subcutaneous courses. The authors suggest that placing the suprafascial portion of the perforator along the “axis” of the flap will ensure complete flap survival. We would like to comment on certain aspects of the authors’ proposal.

First, the concept of axial flaps propounded by McGregor and Morgan states that an axial flap is “a single pedicled flap which has an anatomically recognized arterio-venous system running along its long axis” in the subcutaneous plane.² The authors do not elaborate on how a stellate pattern perforator may be placed along an axis of a flap, unlike a unidirectional perforator.

Moreover, the dimensions of an “axial pattern” perforator flap with respect to dimensions of the selected perforator have not been elucidated completely. The capture of the adjacent perforasome territory (“ran-

dom” territory) by an “axial pattern” perforator by means of linking vessels may increase flap dimensions.³

Second, a randomized controlled trial using objective endpoint measures would be required to prove the added advantage gained from use of image-guidance during perforator flap harvest. The simplicity of flap design and the surgeon’s stress level during perforator dissection in patients undergoing an image-guided perforator flap versus a free-style perforator flap harvest may be studied using an objective scoring system. The surgeon’s stress level may be graded from 1 through 4 (none, mild, moderate, and severe levels), with more difficult dissections being assigned a higher score. The simplicity of flap design can also be graded 1 through 4, with more complex designs, depending on perforator suitability, being assigned a higher score.

Third, using image guidance for perforator flap harvest is expensive and requires advanced equipment and personnel trained in perforator imaging. In conclusion, “image-guided” perforator flaps may have certain advantages, but the evidence toward the same is inconclusive.⁴ Further randomized controlled studies (using objective scoring systems) need to be performed before the supremacy of image-guided perforator flaps is established over free-style perforator flaps.

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DISCLOSURE

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Reply: “Image-Guided” Perforator Flaps versus “Free-Style” Perforator Flaps: Where Is the Evidence?

Sir:

Drs. Basu and Sharma make some interesting points in relation to the anatomy and planning of perforator flaps and in terms of studies exploring their incorporation into clinical practice.¹ We recently reported our experience with the use of preoperative imaging to plan locoregional perforator flaps, and highlighted the benefits we subjectively obtained with this planning.²

In the past, we have undertaken such flaps without imaging, basing the central location of the flaps on the fascial penetration pattern of perforators alone and basing flap dimensions on long-held concepts of length-to-width ratios. We have since found that the use of new imaging technologies that can map subcutaneous branching patterns can improve the survival of the tips of the flaps by converting “random” intrinsic vasculature into “axial” intrinsic vasculature. It is unclear from the letter by Drs. Basu and Sharma whether this was made clear to the authors in our original article. We feel that axial pattern and random pattern extensions of the perforator flap concept can facilitate improved design for improved survival. To answer the first point of the authors, a stellate pattern perforator planned in this fashion can have a design that extends from the central perforator in multiple directions—which can enable a flap to be designed in a range of single directions, a bilobed pattern along two branches, or any number of patterns along the course of such branches.

The authors also suggest randomized trials or higher level studies to improve the evidence attributable to such techniques. Although this is true, and evident throughout research in surgery, we made it clear from the outset that this was a cohort study and designated the study a “Diagnostic III” level study, according to the guidelines of all *Plastic and Reconstructive Surgery* submissions. Lastly, although the suggestion that preoperative imaging is expensive is relatively true, we feel that cost alone should not preclude the use of such advances in surgery from use either clinically or in research. Individual surgeons and institutions can then incorporate such techniques into their practice according to their resources.

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