



## Correspondence and Communications

# Shopping in the reconstructive supermarket of pedicled perforator flaps



Dear Sir,

We read with great interest the article by Venkatramani et al.<sup>1</sup> in which the authors compare reconstructive surgery to a supermarket where the aisles represent the anatomical regions and, in each aisle, many reconstructive techniques of different degrees of complexity can be found. According to the authors, surgeons can choose one or more techniques within one or more aisles of this conceptual supermarket according to their familiarity with the reconstructive techniques and the characteristics of the defect to be reconstructed. We compliment the authors for revisiting the reconstruction framework in this key; we believe that it represents very well the state of the art of reconstructive surgery, with its new and continuously evolving techniques.

In our practice, when approaching a defect to reconstruct, we follow the reconstructive elevator principle because we believe that the simplest option is not always the best to reconstruct form and function while guaranteeing satisfactory aesthetic results.

Free style pedicled perforator flaps are our gold standard for skin and soft tissue reconstruction at different anatomical sites; we tend to prefer them even when vital or prosthetic structures are not exposed and the defect might be repaired with a skin graft because we observed that the latter option would not guarantee comparable aesthetic and functional results. This approach instructs us to limit as much as possible even minor complications such as partial flap necrosis that implies failure of the reconstructive strategy. With this purpose, we shop in our supermarket choosing for each anatomical region the fastest and safest approach according to perforasomes and localization of dominant perforator vessels and apply the systematic reconstructive ladder approach to local perforator flaps planning,<sup>2</sup> starting from simpler options (V-Y advancement perforator flaps,<sup>3</sup> propeller flaps with reduced rotational angles)<sup>4</sup> and increasing the level of technical difficulty (180° propeller flaps) only when the clinical situation requires it.

The V-Y advancement design represents the beginners' level as it requires a relatively simple dissection paired with an increased vascular safety as more than one perforator can be included in the flap. The downsides of this

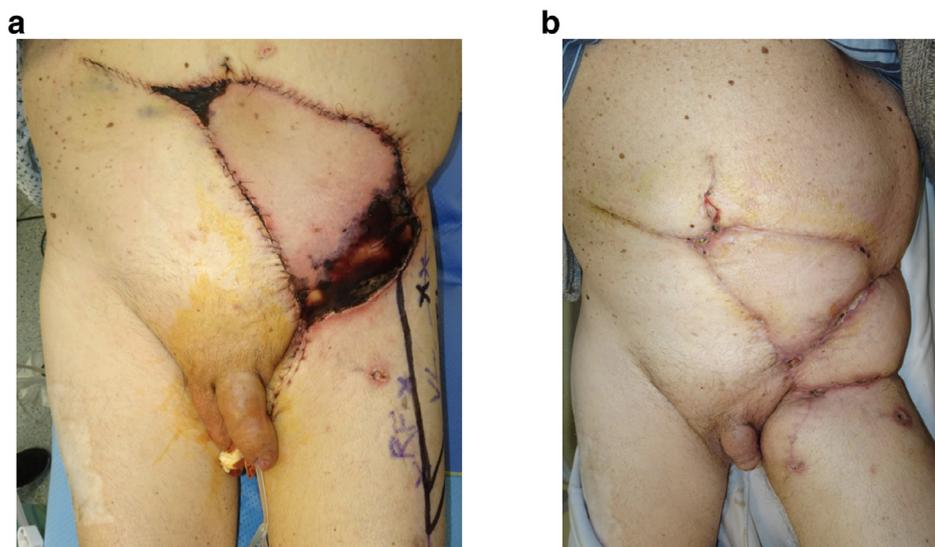
approach include a limited advancement and a more difficult inseting.

If perforators are known to be short (e.g. intercostal or posterior tibial/peroneal artery perforators), bony prominences are to be overstepped and/or perforators are located in close proximity to the defect, we adopt the propeller design as it guarantees a wider arc of rotation. When a propeller flap is needed, we tend to adopt as a first line strategy propeller flaps with reduced rotational angles because even if the degree of rotation does not seem to be related to complications rate,<sup>5</sup> according to our experience, they are as simple to perform and present similar complication rates when compared to advancement flaps.<sup>4</sup> Hence, they combine the propeller flaps' wide arc of rotation with the advancement flaps' high vascular reliability.

The last step of our ladder is represented by 180° propeller flaps. These flaps require a microsurgical dissection with complete release of the perforator vessel from its muscular, septal or fascial adhesions to accommodate rotation without applying tension to the pedicle. We usually obtain a pedicle length of minimum 2-3 cm to reduce the risk of venous insufficiency. Since the surgical technique and perioperative management of 180° propeller flaps can be laborious, we tend to use this technique only if V-Y advancement flaps and propeller flaps with a reduced rotational angle are not feasible.

Using free style pedicled perforator flaps allows surgeons to have a reduced donor site morbidity compared to muscular or myocutaneous flaps, that can, however, still be used as a secondary option if complications occur. Furthermore, in case of failure of the primary procedure, the same free style flaps can be re-used or a second free style flap is almost always expendable to save the reconstruction (Figure 1).

Moreover, the versatility of free style pedicled perforator flaps enables us to seek microsurgery only when facing wide defects of the limbs or reconstruction of specific anatomical regions such as head and neck or breast. This translates into reduced operative time, faster patient recovery and reduction in hospital stays.



**Figure 1** 86 years old male with previous excision of basal cell carcinoma of the lumbar region presented 6 years later bilateral inguinal lymph node metastases. Left inguinal lymphadenectomy was performed with partial resection of the sartorius muscle and femoral nerve. The defect was reconstructed with a DIEP perforator flap advanced in a V-Y fashion. (a) Surgery was complicated with partial flap necrosis. (b) Necrosectomy was performed and reconstruction was accomplished with DIEP flap readvancement and TFL perforator propeller flap (kiss DIEP-TFL perforator flaps design). This is a typical example of how it is possible to shop in at least two different aisles for the same defect to reconstruct and that visiting an assorted supermarket can help to manage possible complications.

Current reconstructive surgery presents a very wide range of continuously evolving techniques with different degrees of difficulty. Approaching a defect with the reconstructive elevator philosophy can offer the patient better aesthetic outcomes while reconstructing shape and function. Mastering different techniques means, recalling Venkatramani's framework, visiting a more assorted supermarket, and this is pivotal in order to offer the patient the safest, fastest and best reconstructive option. The reconstructive elevator approach can be burdened with complications that may jeopardize the purpose of the reconstructive procedure. Therefore, having the ability to visit a very assorted supermarket is fundamental in order to manage complications that may occur and a systematic approach represents a precious tool to optimize outcomes and minimize complications rate.

## Funding

None.

## Conflict of interest

None declared.

## Ethical approval

Not required.

## References

1. Venkatramani H, Rodrigues JN, Sabapathy SR. Revisiting the reconstructive surgery framework: the reconstruction supermar-

ket. *J Plast Reconstr Aesthet Surg* 2019;72(4):529-31 Epub 2019 Feb 10. doi:[10.1016/j.bjps.2019.01.022](https://doi.org/10.1016/j.bjps.2019.01.022).

2. Brunetti B, Poccia I, Tenna S, Cassotta G, Persichetti P. Freestyle pedicled perforator flaps: applying the reconstructive ladder to optimize outcomes. *Plast Reconstr Surg* 2017;139(5):1218e-1219e. doi:[10.1097/PRS.0000000000003321](https://doi.org/10.1097/PRS.0000000000003321).
3. Brunetti B, Tenna S, Aveta A, Segreto F, Persichetti P. Free-style local perforator flaps: versatility of the V-Y design to reconstruct soft-tissue defects in the skin cancer population. *Plast Reconstr Surg* 2013;132(2):451-60. doi:[10.1097/PRS.0b013e3182958897](https://doi.org/10.1097/PRS.0b013e3182958897).
4. Brunetti B, Tenna S, Poccia I, Persichetti P. Propeller flaps with reduced rotational angles: clinical experience on 40 consecutive reconstructions performed at different anatomical sites. *Ann Plast Surg* 2017;78(2):202-7. doi:[10.1097/SAP.0000000000000830](https://doi.org/10.1097/SAP.0000000000000830).
5. Bekara F, Herlin C, Mojallal A, et al. A systematic review and meta-analysis of perforator-pedicled propeller flaps in lower extremity defects: identification of risk factors for complications. *Plast Reconstr Surg* 2016;137(1):314-31. doi:[10.1097/PRS.0000000000001891](https://doi.org/10.1097/PRS.0000000000001891).

B. Brunetti

R. Salzillo

E-mail address: [r.salzillo@unicampus.it](mailto:r.salzillo@unicampus.it)

M. Morelli Coppola

S. Tenna

M. Barone

P. Persichetti

Department of Plastic, Reconstructive and Aesthetic Surgery, Campus Bio-Medico University of Rome, Via Alvaro del Portillo, 200, 00128 Rome, Italy

© 2019 British Association of Plastic, Reconstructive and Aesthetic Surgeons. Published by Elsevier Ltd. All rights reserved.

<https://doi.org/10.1016/j.bjps.2019.05.015>