16. Zhong PQ, Zhi FX, Li R, et al. Long-term results of intratumorous bleomycin-A5 injection for head and neck lymphangioma. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998;**86**:139—44.
17. Shou BQ, Shou WD, Yang Z, et al. Intralesional injection of pingyangmycin for treatment of venous-venular malformation in the maxillofacial regions of children: report of 306 cases. *Shanghai Kou Qiang Yi Xue* 2006;**15**:136—9.
18. Roggiani M, Stoehr JA, Leonard BA, et al. Analysis of toxicity of streptococcal pyrogenic exotoxin A mutants. *Infect Immun* 1997;**65**:2868—75.
19. Kullendorff CM. Efficacy of bleomycin treatment for symptomatic hemangiomas in children. *Pediatr Surg Int* 1997;**12**:526—8.
20. Tai KW, Lii CK, Chou MY, et al. Relationship between intracellular glutathione level and the mode of cell death induced by pingyangmycin. *Oral Oncol* 2003;**39**:13—8.
21. Puig S, Casati B, Staudenherz A, et al. Vascular low-flow malformations in children: current concepts for classification, diagnosis and therapy. *Eur J Radiol* 2005;**53**:35—45.
22. Green D. Mechanism of action of sclerotherapy. *Semin Dermatol* 1993;**12**:88—97.

SURGICAL TIP

Choosing the correct sense of rotation in 180° propeller flaps

Medial leg propeller flaps, with a single perforator as vascular pedicle, can be rotated up to 180° around their pivot point to cover defects of the lower third of the leg.[1] The distal reach of this flap has meant that areas previously considered unreachable by a local flap can now be resurfaced.[2]

In the medial region of the lower leg, perforator vessels originate from the posterior tibial artery; these vessels have one, two or more accompanying veins.[3] The 180° arc of rotation of the flap results in a considerable twist of the pedicle: comitantes venae compression plays a major role in causing venous congestion of these flaps.[3]

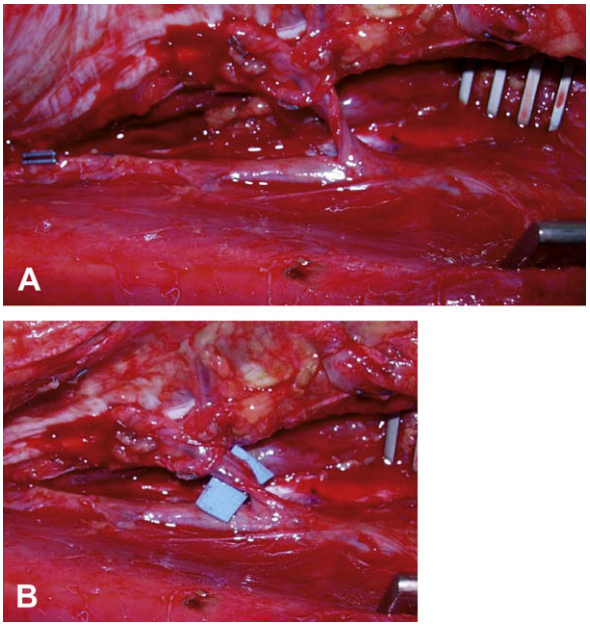

Figure 1 Perforators' origin from the posteror tibial artery. (A) Counter-clockwise sense of rotation with considerable twist of the pedicle. (B) Clockwise sense of rotation with safer positioning of the pedicle.

While transposing a propeller perforator flap with a 180° arc of rotation, turning the flap on its pedicle will cause torsion forces on it that will be worse for one sense of rotation than for the other one. It's mandatory to determine which is the safer sense of rotation (i.e. clockwise or counter-clockwise). By gently rotating the flap first counter-clockwise and then clockwise it is possible to evaluate flap perfusion, prior to beginning the insetting of the flap (Figure 1 A, B).

The alignment of the perforator artery and vein(s) at their origin does not necessarily follow the longitudinal axis (cranio-caudal) of the main vessel (posterior tibial artery) and their three-dimensional position can favour obstruction in one of the two senses of rotation.

This concept can be applied to any 180° propeller flap.

References

1. Shalaby HA, Higazi M, Mandour S, et al. Distally based medial island septocutaneous flap for repair of soft-tissue defects of the lower leg. *Br J Plast Surg* 1991;**44**:175—8.
2. Teo TC. Perforator local flaps in lower limb reconstruction. *Cir Plást Iberlatinamer* [Online] 2006;**32**:287—92.
3. Ghali S, Bowman N, Khan U. The distal medial perforators of the lower leg and their accompanying veins. *Br J Plast Surg* 2005;**58**:1086—9.

Fabrizio Schonauer
Ivan La Rusca
Gianluca Di Monta
Guido Molea
University of Naples 'Federico II', Napoli, Italy
E-mail address: info@ivanlarusca.it

doi:10.1016/j.bjps.2008.04.073