

Eur J Plast Surg (2011) 34:211–213
DOI 10.1007/s00238-010-0454-0

CASE REPORT

The turbocharged Becker flap: a simple variation that allows coverage of most of the dorsum of the hand

Manuel M. Gomez · Diogo B. Casal

Received: 3 November 2009 / Accepted: 6 May 2010 / Published online: 25 May 2010
© Springer-Verlag 2010

Abstract Cover of medium and large defects of the dorsum of the hand remains a substantial surgical challenge that often requires free tissue transfer. We report the case of a 28-year-old male who presented with necrosis of most of the dorsum of his dominant hand after an iatrogenic injury. A large Becker flap was raised to cover the entire defect. However, venous insufficiency was noted intraoperatively. The flap was turbocharged by performing a venous anastomosis between the flap and the recipient site, resulting in complete survival of the flap. The authors conclude that the turbocharged Becker flap can be a good alternative for expeditiously covering large defects of the dorsum of the hand without having to resort to free tissue transfer.

Keywords Becker flap · Dorsal ulnar artery flap · Fasciocutaneous flap · Turbocharged flap · Hand defects · Venous anastomosis

The reconstruction of medium to large defects of the dorsal aspect of the hand has always been difficult and challenging. The most common local surgical options to cover this kind of defect are the reverse radial forearm flap, the reverse ulnar forearm flap, the reverse posterior interosseous flap, and the dorsal ulnar artery fasciocutaneous flap described by Becker and Gilbert in 1988 [1, 2]. The last two options have the significant advantage of not depriving the hand of one of its major vascular axis. The posterior interosseous flap has, however, some drawbacks, namely being considered less reliable than other surgical options. It is also smaller than the radial and ulnar forearm fasciocutaneous flaps and has limited reach to the more distal areas of the hand [3].

Most authors state that the Becker flap cannot exceed 15 cm in length and 5 to 9 cm in width, due to the risk of partial flap necrosis occurring with larger flaps [4]. This precludes the use of the Becker flap in most large defects of the hand.

In July 2003, a 28-year-old right-handed man suffering from familial amyloidotic polyneuropathy was subjected to a liver transplantation. In the intraoperative period it was necessary to use norepinephrine for haemodynamic stabilization. The peripheral venous access in the dorsum of his right hand was inadvertently shifted during surgery, and necrosis of the dorsum of the hand ensued. After debridement, the defect involved most of the dorsum of the hand with exposure of extensor apparatus of the second to the fifth fingers (Fig. 1).

A large Becker flap approximately 20 and 10 cm of maximum length and width, respectively, was elevated (Fig. 2). Soon after the flap was raised, venous insufficiency was noted. To boost the venous drainage, a termino-terminal

This paper has not been published at any meeting or journal.

M. M. Gomez
Curry Cabral Hospital,
Lisbon, Portugal

D. B. Casal
Plastic and Reconstructive Surgery Department,
São José Hospital,
Lisbon, Portugal

D. B. Casal (✉)
Rua Luís Pastor de Macedo,
N 32, 5D,
1750-159 Lisbon, Portugal
e-mail: diogo_bogalhao@yahoo.co.uk



Fig. 1 The defect in the dorsal aspect of the right hand, after careful debridement, showing exposition of the extensor apparatus of the second to the fifth fingers



Fig. 3 The termino-terminal anastomosis between one of the subcutaneous veins of the flap and one subcutaneous vein in the dorsum of the hand

anastomosis was performed between one of the largest subcutaneous veins of the flap and one of the subcutaneous veins on the dorsum of the hand (Fig. 3). The donor zone defect was covered with a partial thickness skin graft taken from the inner aspect of his right thigh. Operative time was approximately 90 min. The turbocharged Becker flap survived uneventfully. Three months after surgery, the patient showed good function of his dominant hand and an aesthetically acceptable result (Fig. 4).

The performance of a venous anastomosis in large pedicled flaps with a significant risk of necrosis due to venous congestion has been described, namely in distally

based sural flaps [5]. As far as we know, this has not yet been described for the Becker flap. This variation of the Becker flap does not significantly prolong the duration of the procedure. In addition, it can be used even in small centers lacking complex microsurgical expertise, allowing the mobilization of a substantial amount of tissue and, thus, permitting the coverage of most of the dorsum of the hand. We fully understand that it could be argued that, since a microvenous anastomosis was necessary, a free tissue transfer could be entertained in the first place. However, this last option would require more advanced microsurgical skills, it would be more time consuming, and it would



Fig. 2 The raising of a large Becker flap



Fig. 4 Appearance of the flap 3 months after surgery, with an acceptable functional and aesthetic result

probably result in a poorer reconstructive result in terms of colour and texture match.

It seems, therefore, that the turbocharged Becker flap can be a good alternative for expeditiously covering large defects of the dorsum of the hand without having to resort to free tissue transfer.

References

1. Becker C, Gilbert A (1988) Le lambeau cubital (The ulnar flap). *Ann Chir Main* 7:136–142
2. Antonopoulos D, Kang NV, Debono R (1997) Our experience with the use of the dorsal ulnar artery flap in hand and wrist tissue cover. *J Hand Surg Br* 22:739–744
3. Vergara-Amador E (2008) Anatomical study of the ulnar dorsal artery and design of a new retrograde ulnar dorsal flap. *Plast Reconstr Surg* 12:1716–1723
4. Choupina M, Malheiro E, Guimarães I et al (2004) Osteofasciocutaneous flap based on the dorsal ulnar artery. A new option for reconstruction of composite hand defects. *Br J Plast Surg* 57:465–468
5. Dragu A, Bach AD, Horch RE (2008) Two easy and simple modifications when using a distally based sural flap to reduce the risk of venous congestion. *Plast Reconstr Surg* 122:683–684