The Reverse Homodigital Flap Based on the Dorsal Branch of the Digital Artery for Reconstruction of Acquired Clinodactyly

Ricardo Horta¹ Ricardo Nascimento¹ Diana Monteiro¹ Alvaro Silva¹ Jose Manuel Amarante¹

¹ Department of Plastic, Reconstructive and Maxillo-Facial Surgery, and Burn Unity, Centro Hospitalar de São João, Porto Medical School, Porto, Portugal

Address for correspondence Ricardo Horta, MD, PhD, Avenida Menéres, no 234, Bloco 2, 4º Frente Esquerdo, 4450-189, Matosinhos Sul- Porto, Portugal (e-mail: ricardojmhorta@gmail.com).

J Hand Microsurg 2016;8:57–58.

Clinodactyly, the angulation of a digit in the anteroposterior plane, is often due to a longitudinal epiphyseal bracket on the radial side of the middle phalanx of the little finger. The curvature rarely limits function and surgery is usually performed to improve cosmesis. Treatment options include observation, osteotomy, and epiphyseal bar resection.

On the contrary, acquired clinodactyly may be a consequence of trauma or abnormal scarring. Those with functional limitations, typically associated with angulation greater

than 25 degrees, may benefit from surgical correction. The ideal treatment should include scar tissue removal and reconstruction of any secondary soft tissue defect.

Some studies^{1–4} have shown that elevation of a reversed-flow, homodigital dorsal adipofascial turnover flap is possible, because dorsal cutaneous perforator branches from the proper palmar digital artery supply the dorsum of the finger. There are two constant and symmetric (radial and ulnar) branches over both the proximal and middle phalanges

Fig. 1 (A) Acquired clinodactyly after an electric burn with lateral deviation of the middle right finger. (B) The adipofascial flap was dissected over the paratenon including one dorsal perforating branch and was rotated by 180 degrees at the level of the proximal interphalangeal joint. (C) The flap was adapted to the defect and was covered with a split-thickness skin graft. (D) Good aesthetic result after 3 months.

received
November 1, 2015
accepted after revision
January 10, 2016

© 2016 Society of Indian Hand & Microsurgeons

DOI <http://dx.doi.org/10.1055/s-0036-1572535>.
ISSN 0974-3227.

arranged proximal and distal to the proximal interphalangeal (PIP) joint. Flap elevation should include at least one dorsal branch by preserving a length of adipofascial tissue 10 mm proximal or distal to the PIP joint.

A 13-year-old girl presented with lateral deviation of the right middle finger after an electric burn at 6 years of age (►Fig. 1A). A wide laterodigital debridement was performed with exposure of the terminal ulnar neurovascular pedicle. After performing a Z skin incision, two dermoepidermal flaps were raised and an adipofascial turnover flap was dissected from proximal to distal, including all tissue between the dermis and the paratenon. This dissection proceeded until one of the dorsal branches was identified (ulnar branch). The radial flow was then interrupted, and the flap was rotated through 180 degrees to cover the defect (►Fig. 1B); it was fixed with 5.0 absorbable sutures and a full-thickness skin graft was inserted through placed over the flap (►Fig. 1C). Temporary K-wire fixation was inserted through the fingertip and across the distal interphalangeal (DIP) joint for 3 weeks. Postoperatively, a good aesthetic and functional result was seen after 3 months (►Fig. 1D); static two-point discrimination had a mean value of 8 mm.

The presence of numerous and constant dorsal communicating branches of the volar digital arteries enabled us to dissect this

reversed-flow dorsal flap based on a single perforator. This is a technical modification of previous descriptions,^{3,4} and increases the arc of rotation of the flap. The drainage is provided by small venae concomitants that follow the arterial branches. No laterodigital arteries are sacrificed and the sensitivity is similar to any area that had received a partial-thickness skin graft. It can provide adequate coverage of lateral and distal digital defects because of its thinness, pliability, gliding properties, and minimal donor site deformity albeit at the expense of more extensive donor site dissection.

References

- 1 Strauch B, de Moura W. Arterial system of the fingers. *J Hand Surg Am* 1990;15(1):148–154
- 2 Endo T, Kojima T, Hirase Y. Vascular anatomy of the finger dorsum and a new idea for coverage of the finger pulp defect that restores sensation. *J Hand Surg Am* 1992;17(5):927–932
- 3 Braga-Silva J, Kuyven CR, Fallopa F, Albertoni W. An anatomical study of the dorsal cutaneous branches of the digital arteries. *J Hand Surg [Br]* 2002;27(6):577–579
- 4 Cavadas PC, Puertes-Corella L. The subcutaneous turn-over flap in the treatment of difficult wounds of the digits. *J Hand Surg [Br]* 1998;23(4):472–475