Published online: 2019-07-26

Re: The reverse dorsal metacarpal artery flap in finger reconstruction: A reliable choice

Sir,

We congratulate Balan *et al*., for their work describing the reverse dorsal metacarpal artery flap for cover of finger defects. They have exemplified its utility in a wide spectrum of dorsal finger defects, providing a simple single stage cover with like tissue without any donor site morbidity.[1]

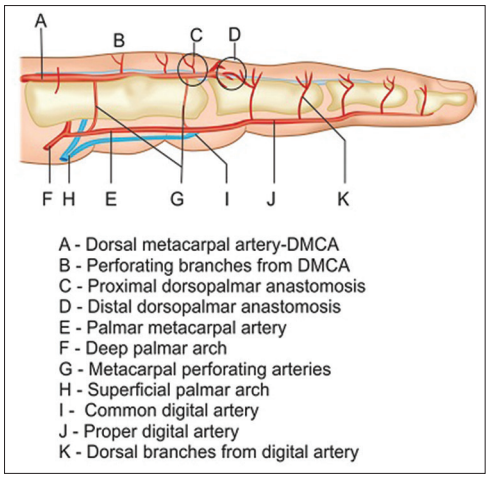

Figure 1: Illustration of vascular anatomy of a ray forming the vascular basis of volar and dorsal flaps

However, the authors describe this flap being based on retrograde flow through the dorsal metacarpal artery (DMA) through communicating perforators, while in the surgical procedure described, they have not mentioned that they have raised the flap with the DMA. That implies that the flap is based on a perforator. With this in mind, we beg to differ in understanding the dynamics of blood flow to the flap- antegrade vis-a-vis retrograde. To clarify the same, we would like to highlight a few anatomical features of dorsal hand circulation [Figure 1] and exemplify with description of two flaps based on DMA- reverse dorsal metacarpal

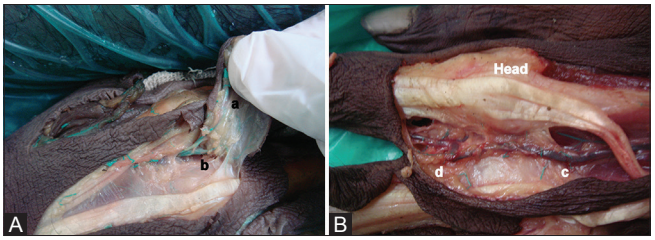

Figure 2: Cadaveric dissection showing the dorsal metacarpal artery based flaps (A) reverse dorsal metacarpal artery flap shows the dorsal metacarpal artery in the flap marked as 'a' and the branch communicating with the palmar metacarpal artery at the level of head of metacarpal marked as 'b'. (B) Dorsal metacarpal artery perforator (DMAP) flap shows DMA *in situ* as 'c' with its dominant cutaneous perforator at the level of web space marked as 'd'. There are small communicating branches passing volarly from this cutaneous perforator

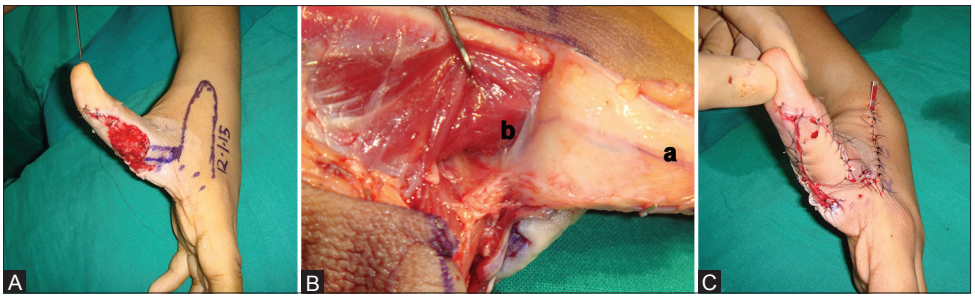

Figure 3: Patient with a volar surface thumb defect resurfaced with a first reverse dorsal metacarpal artery flap (A) volar thumb defect (B) dorsal metacarpal artery seen harvested in the flap marked as 'a'; perforator seen at neck of second metacarpal marked as 'b'. (C) Reverse first dorsal metacarpal artery flap inset into the defect with primary closure of donor site

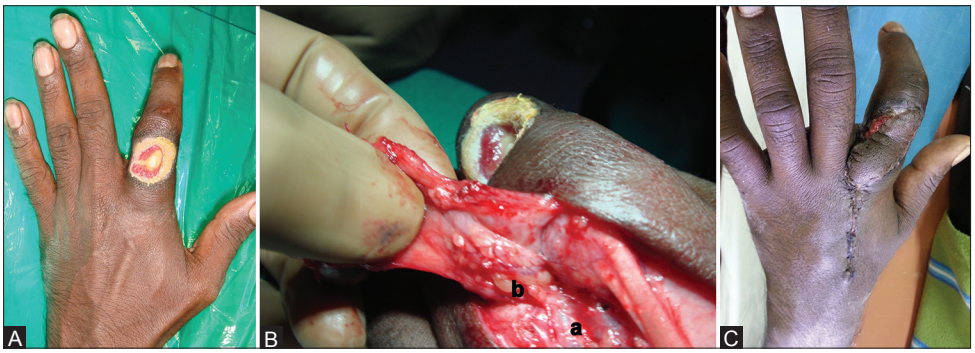

Figure 4: Patient with dorsal finger defect resurfaced with dorsal metacarpal artery perforator flap (A) Dorsum of proximal phalanx defect with exposed bone and loss of extensor tendon (B) dorsal metacarpal artery perforator flap elevated with dorsal metacarpal artery seen in the second interosseous space marked as 'a' and perforator supplying the flap seen at the level of head of metacarpal marked as 'b'. (C) Flap inset completed with primary closure of donor site

artery (RDMA) flap and dorsal metacarpal artery perforator (DMAP) flap [Figure 2].

Distally, the DMA ramifies at the level of the metacarpal heads and its branches can be identified distal to the metacarpophalangeal joint travelling to the dorsal proximal phalangeal skin of the fingers where they anastomose with the dorsal branches of the palmar digital arteries.[2] Quaba and Davison, in 18 cadaveric dissections, described that these branches travelled proximally (recurred) forming longitudinally oriented plexuses. In each of these vascular leashes, a small (0.3–0.5 mm) perforator arising directly from the DMA, or when the latter is absent, a perforator from the volar system was demonstrated.[3] Such perforators connecting the palmar and dorsal metacarpal arteries are seen either proximal to metacarpal head or at the level of the base of proximal phalanx-near the web.

In RDMA flap, superficial veins are interrupted and the proximal end of the vessels (veins and DMA) are ligated at the proximal margin of the flap. Blood flows into and out of the flap through a number of branches and tributaries, contained in a mesentery or a fascial septum. To reach the general circulation, the blood must reverse its flow through the veins. The arterial flow is retrograde in the DMA through the communicating perforators [Figure 3]

The DMAP flap is based on a dominant communicating perforator or a direct cutaneous vessel which enters the flap, anatomically speaking, at its distal end. Although out-flow through superficial veins may be interrupted, venous return through the deep system remains undisturbed [Figure 4]. This is thus based on antegrade flow through the DMA and/or the palmar metacarpal artery through the perforator, and it is a perforator-based flap. Flap based on the proximal perforator at the level of metacarpal head, is called 'DMAP flap' while flap based on the distal perforator at the level of web space, is called 'extended DMAP flap'.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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Access this article online

Quick Response Code:

Website: www.ijps.org

DOI: 10.4103/ijps.IJPS_165_18

How to cite this article: Jain L, Kumta SM, Purohit SK. Re: The reverse dorsal metacarpal artery flap in finger reconstruction: A reliable choice. Indian J Plast Surg 2018;51:340-2.