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REVIEW

Extended applications of distally based axial adipofascial flaps for hand and digits defects

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Summary Reverse axial adipofascial flaps use subcutaneous tissue of the laterodigital and dorsal metacarpal or digital areas. They are sited on the arterial branches anastomosing the volar and dorsal arterial networks of the fingers. These flaps allow coverage of wide and distal defects. Metacarpal flaps were used for defects on the proximal phalanx, and digital flaps for the defects over the proximal interphalangeal joint (PIPj) and further distally of the thumb and fingers. A series of 18 cases is reviewed. Dissection of the flap is easy, fast and preserves the collateral nerve and artery of the finger. Skin defects were combined with bone, joint or tendon exposure. The flaps we used were reliable, and bone, joint and tendon reconstruction could be performed at the same time. Procedures were performed in an outpatient setting. Patients were allowed to mobilise the hand as early as possible. The results showed partial distal necrosis in one case and partial loss of the overlying skin graft in two cases, who resolved spontaneously. Donor-site morbidity was minimal.

Coverage of soft tissue on the fingers may be difficult due to the size of the defect or the limitation of local flap mobilisation.[1] Moreover, exposure of deep structures (complex defects) such as joint, bone or tendon is an emergency that requires a reliable technique for coverage.[2]

The choice of flap coverage of complex digital defects depends on three main factors: the site of the defect (dorsal vs. volar), the size of the defect and the surgeon's preference. Many flaps for repairing these defects have been described.[1,3]

The adipofascial turnover flap has become an accepted technique of reconstruction since its description by Lai et al in 1991.[4] Adipofascial flaps constitute an excellent option because of their thinness, good pliability, minimal donor-site deformity and the simplicity and rapidity of the procedure.[5,6]

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Table 1 Clinical data

No	Sex/Age	Cause	Site of defect Digit involved	Donor site	Associated injuries and Their management	Outcome
1	M/22	Abrasion	Dorsal/L/III/PP-PIPj	RADMF 3rd space	Segmental extensor tendon loss (Tendon graft)	Flap survived Partially skin graft loss Reduced ROM in PIPj
2	M/28	Avulsion	Dorsal-radial/R/II/PP-PIPj	RADMF 1st space	Open Fracture Extensor tendon injury K-wire to fix the fracture Extensorr tendon repair	Flap survived Secondary extensor tendon tenolysis Reduced ROM in PIPj
3	M/59	Abrasion	Dorsal/R/II/PP	RADMF 2nd space	Segmental extensor tendon loss Snow Plasty	Flap survived Reduced ROM in PIPj
4	M/50	Abrasion	Dorsal-radial/R/III/PP	RADMF 2nd space	Compound fracture K-wire to fix the fracture	Flap survived Reduced ROM in PIPj
5	M/30	Avulsion	Dorsal/L/IV-V/MPj	RADMF 4th space	Partial extensor tendon injury (repair)	Successful
6	F/53	Avulsion	Dorsal-volar/L/III-IV/3rd space	RADMF 3rd space	Segmental digital nerve loss Nerve graft	Successful
7	M/27	Amputation	L/II/Distal MP	RADDF		Successful
8	M/24	Amputation	R/III/Proximal MP	RADDF		Successful
9	M/36	Abrasion	Lateral-radial/R/IV/MP	RADMF 3rd space	Total extensor tendon injury (repair)	Successful
10	F/58	Avulsion	Dorsal/L/II/MP	RADDF	Partial extensor tendon injury (repair)	Successful
11	M/47	Abrasion	Dorsal-radial/L/II/MP-DIPj	RADDF	MP Bone loss Extensor tendon injury Bone graft Tendon repair	Successful
12	M/21	Avulsion	Nail matrix/L/III/DP	RADDF		Flap survived Nail matrix revision surgery at 3rd month
13	M/44	Amputation	Lateral/L/IV/DIPj	RADDF		Successful
14	M/62	Crushing	Dorsal/R/I/DP-DIPj	RADDF		Flap tip loss Amputation FD
15	M/25	Crushing	Lateral-radial/L/I/DP-IPj	RADDF	Compound fracture IPj Arthrodesis	Successful
16	M/50	Avulsion	Nail matrix/R/I/DP	RADDF		Flap survived Mild nail matrix deformity
17	M/42	Abrasion	Lateral-radial/L/I/PP	RADDF	Flexor tendon injury (repair)	Flap survived Secondary flexor tendon tenolysis Reduced ROM PIPj
18	M/30	Abrasion	Lateral-ulnar/R/IV/MP	RADDF		Flap survived Partially skin graft loss

Order of description: loss/side/ray/level. L, left hand; R, right hand; I, thumb; II, index; III, middle; IV, ring finger; V, little finger; MP, middle phalangeal level; PP, proximal phalangeal level; DP, distal phalangeal level; MPj, metacarpo phalangeal joint level; PIPj, proximal inter phalangeal joint level; DIPj, distal inter phalangeal joint level. RADMF, reverse adipofascial dorsal metacarpal flap; RADDF, reverse adipofascial dorsa digitall flap. ROM, range of motion of the involved joint.