

Phalangeal Fillet Technique for Digital Pad Transfer

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Footpads, which are highly specialized epithelial and stromal tissue structures, consist of a shock-absorbing, fatty, elastic, collagenous cushion covered by a tough, antiskid, epithelial surface. When injured, footpads heal slowly because they are under shear and tension stress during ambulation.

Footpad Loss

Loss of the major weight-bearing footpads—metatarsal (MT) and metacarpal (MC)—may result in permanent lameness, especially in large dogs. Partial or complete loss can result from extensive traumatic tissue damage or tumor resection (**Figure 1**). No other cutaneous tissue can completely serve as a substitute for this highly specialized, weight-bearing surface.

With extensive MC or MT footpad loss, healthy digital pads, with a surface identical to the original pad tissue, can be transferred for reconstruction. The phalangeal fillet technique involves transferring one or two digital pads on a vascularized cutaneous pedicle to the area of the missing MC or MT footpad.¹

The outer digits (phalange [P]2 and/or P5) are most commonly used, but any of the 4 can be used (**Figure 2**). If a second digital pad is needed for additional weight-bearing surface, the procedure can be repeated on an additional digit. The opposing edges of adjacent pads should be trimmed to provide fresh edges for appositional healing.

Postprocedural Healing

After the procedure, a heavily padded bandage and external support (eg, Mason Meta Splint, jorvet.com) must be applied to the limb. The bandage should be changed q3–4d for 3 weeks until healing is complete. Exercise should be restricted for 4 weeks for optimal healing.

Some rigid support to the bandage is essential to transmit the weight-bearing forces through the splint and not onto the digital

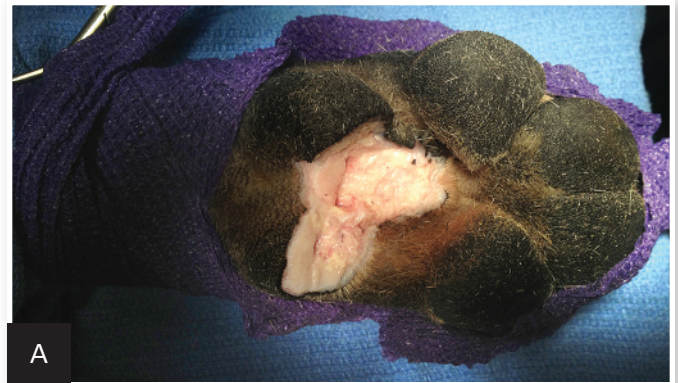
MC = metacarpal, MT = metatarsal, P = phalange

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Large metacarpal pad melanoma in which extensive resection would be necessary to achieve adequate tumor control. The phalangeal fillet technique could be used to reconstruct the metacarpal pad in this case.

2 Before (A) and after (B) digital pad transfer in a cadaver limb from a 70-kg mastiff with partial metacarpal pad resection.



pads. The rigid support should be on the palmar or plantar surface and extend just beyond the digits so the splint (ie, not the digits) hits the ground during ambulation. If the paw contacts the ground, then the forces transmitted during weight bearing can inhibit healing or lead to flap failure.

Complications & Outcome

Partial dehiscence of the digital pad is not uncommon, especially if patient activity is unrestricted or the owners are noncompliant with bandage changes. If partial dehiscence occurs, sutures may be replaced after gentle cleansing and debridement. Exercise restriction should be maintained and splinted bandages worn for longer than 4 weeks, if needed. With patience, the paw pads usually heal following this procedure, and patient function is typically good.

What You Will Need

- Standard surgical instrument pack
- Esmarch bandage (tourniquet)
- #15 scalpel blade
- Sterile self-adhering elastic support wrap (eg, Vetrap or Coban, 3m.com)
- Bandage material
- Splint material

Step-by-Step ■ Phalangeal Fillet Technique for Digital Pad Transfer

Step 1

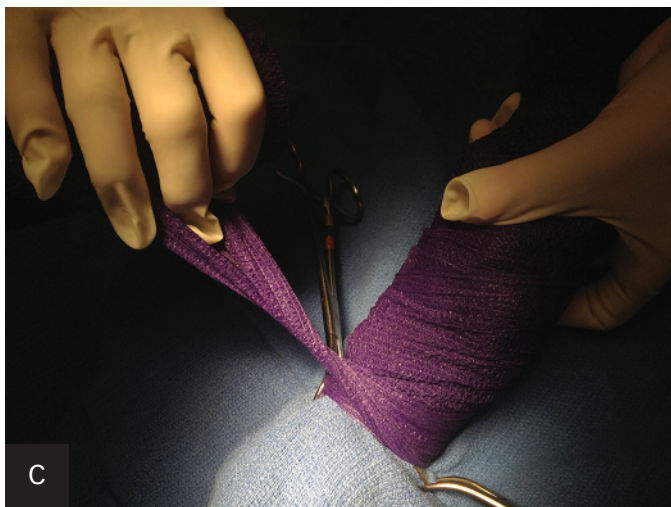
Clip the fur from the distal limb and prepare the affected foot for surgery. To diminish the bacterial load on the skin, soak the paw for 5 minutes in an examination glove filled with 0.12% chlorhexidine diacetate surgical preparation solution diluted with tap water (A, B) before standard surgical skin preparation.



Step 2

After draping the limb, prepare an Esmarch bandage to temporarily evacuate blood from the surgical area, providing a nearly bloodless field and improving visualization during the procedure. Firmly apply sterile self-adhering elastic support wrap around the foot, starting at the toe tips and working proxi-

mally to the level of the carpus (A, B). Create a constricting band at the most proximal part of the bandage to provide a tourniquet effect (C). With the bandage in place, cut the bandage material directly over the area where the incision will be made (D).

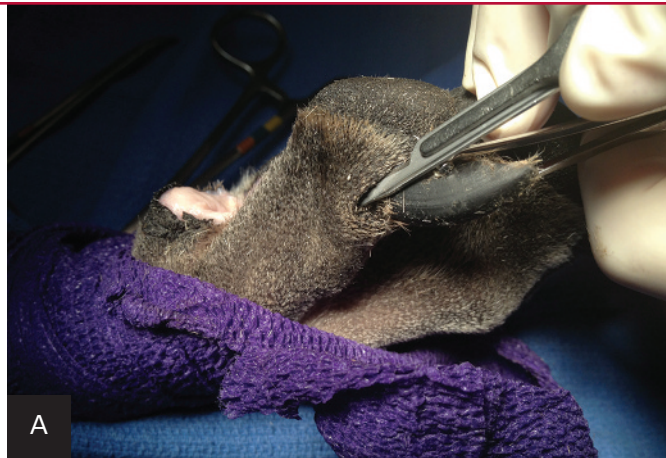


Author Insight It is important to remove the Esmarch bandage as soon as the skin sutures are complete. It can usually remain in place for up to 3.5 hours with minimal risk for tissue damage; however, this is dependent on the degree of trauma and whether blood flow is normal. There is no set time that is safe for every patient.

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Step 3

After wound care or tumor excision, a #15 scalpel blade should be used to incise around the nail bed circumference of the donor digit (A).¹ Remove the nail (B).

**Author Insight**

Alternatively, P3 and its associated nail can be removed at step 5.

Step 4

Make an incision on the ventral midline of digit 2 or 5 overlying P1 and P2. End the incision at the proximal aspect of the digital pad.

**Author Insight**

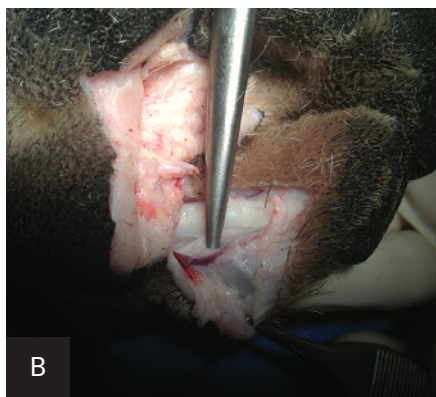
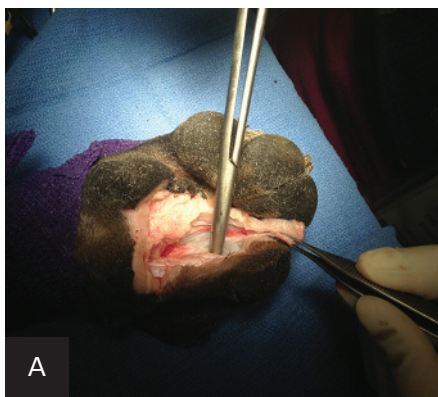
Although the incision can be made on the dorsal midline of the digit, it may be easier to flip the pad into its final position if the incision is made on the ventral midline of the digit.

Step 5

Staying very close to the bone, dissect and remove P1, P2, and P3 (if not previously removed) and all associated ligaments from the surrounding soft tissue (A–C).

To avoid damaging blood supply to the digital pad, stay against the periosteal surface of the bones during dissection (B). Once the bones have been removed

(ie, filleted), only the digital pad and a rectangular skin flap will remain. Using 3-0 absorbable suture, close the circumferential incision made to remove P3.

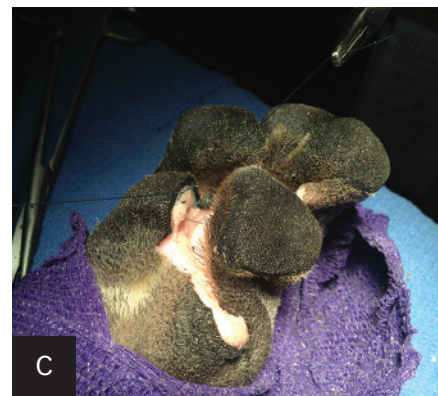
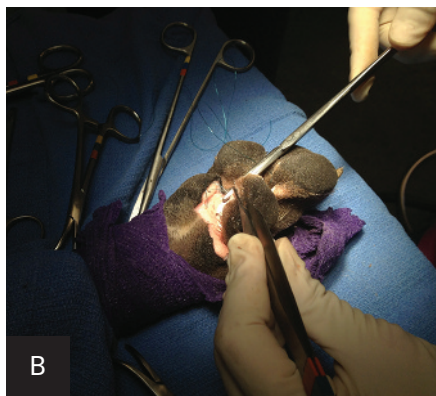
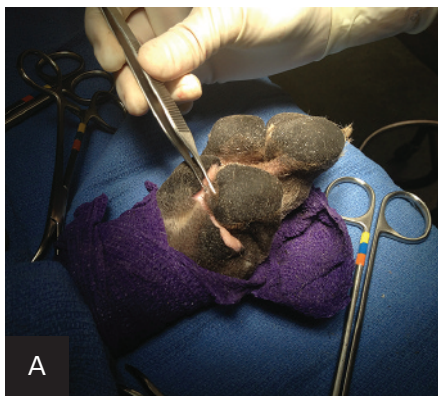


Step 6

Place the digital pad into its new location, taking care to position it where most of the weight bearing occurs during ambu-

lation. Using absorbable 2-0 or 3-0 suture, affix the pad to nearby skin and other connective tissue (A–C). Remove

the Esmarch tourniquet, and apply a heavily padded bandage to the limb, along with external support. ■ **cb**



Author Insight When transposing the flap, it is important to make sure that no tension is being exerted on the base of the flap and the flap itself sits loosely in its new location. Tension can inhibit healing and lead to flap failure.

See **Aids & Resources**, back page, for references & suggested reading.