Coverage of below elbow amputation stump with a soft-tissue periosteal flap

Sir,
Avulsion amputation of an extremity is fortunately rare but a devastating injury. Direct injury to the soft tissues and injury to the tiny perforating vessels supplying skin makes reattachment or procuring usable composite flaps from these avulsed and amputated parts difficult.\[1\] Preserving the function of critical joints and useful length of the stump by providing adequate soft-tissue cover is critical for early rehabilitation and long-term patient comfort.

A young patient presented to us with amputation of hand and degloving of the skin from the upper arm. Replantation was not possible due to the extent of injury and contamination. After sequential debridements, a 'soft tissue periosteal flap' was used for coverage of the below elbow stump. Periosteal flaps from the radius and ulna were raised based on the interosseous membrane. Both bone ends were trimmed and smoothened at the proposed below elbow amputation length, and the flap was used for cover as shown in Figure 1. The flap was composed of the interosseous membrane, with branches of interosseous vessels, the filleted periosteum of radius and ulna [Figures 1 and 2a, b]. Advantages of this proposed local flap were supple tissue with robust circulation, lesser bulk and its maximum availability at the business end so that no flap was lost in transit [Figure 2b]. The stump was later covered with a skin graft and healed well [Figure 2c and d]. Patient has returned to work with alteration of his job profile.

Conventional options for coverage in such defects were either a free flap or distant pedicle flap. Timing of microvascular coverage was a concern as it would have involved anastomosis within the zone of injury. The failure rate in such instances (5\textsuperscript{th} day to 3 weeks) is reported to be higher.\[2,3\] Pedicled flaps from groin or abdomen had potential disadvantages such as:
Letters to Editor

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Use of soft-tissue periosseal flaps has been described
both for the upper and lower limbs, but it is not very
commonly used.[4,5]

Innovative use of available local tissue helps in reducing
donor site morbidity and in turn would lead to quicker
recovery and rehabilitation. This principle can be applied to
similar defects in any amputated limb, especially as a salvage
procedure when other options are not readily available.

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Conflicts of interest
There are no conflicts of interest.

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Sir,
The graft fixation and its stability are a difficult problem after releasing the contracture of the fingers. Various methods have been suggested, but most of them are found to be cumbersome. The authors have designed this device by modifying thin plastic band (commonly used as a hair band). Drill holes are made in a hair band at a gap of about one centimeter with the help of a dental micro motor. Thus, the curved plastic band with multiple holes has been labelled by the authors as 'finger abduction splint'. This hair band splint can be used in the following ways: For using the hair band as a splint, dress hooks can be glued on the finger nails with the help of cyanoacrylate glue, if they are intact. The dress hooks can be fastened to the hair band at an appropriate distance for the abduction of fingers, using 2/0 nylon or prolene [Figure 1a and b]. If the severely deformed fingers are to be splinted with the help of K-wires, the ends of the K-wire can be passed through the holes in a hair band at an appropriate distance so as to keep the fingers in abducted position [Figure 1c]. Proper abduction of the fingers facilitates the application of the skin graft on the raw areas, and it also helps in holding the graft in position to ‘take’ until maturation. The operative work is facilitated on both sides of the hand as the visibility is awesome. Thus, placement of the skin graft on the web space of the fingers becomes very easy. Here, this splint minimises the need of an extra assistant.

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