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Technical note

Lightweight cast to support the upper limb after harvest of an osteocutaneous free flap from the radial forearm: a technical modification

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Fig. 1. The cast, constructed and sectioned entirely into two pieces, as described by Whitley et al.[1]

The osteocutaneous radial forearm free flap remains a valuable option in reconstructive surgery in the head and neck, and in Class VI midface or segmental mandibular reconstructions, particularly in older patients with multiple comorbidities.[1,2]

The earliest reports of fracture of the radius at the donor-site placed its incidence at 28%-43%.[3] More contemporary studies find it to be under 1%,[4] and this is likely to be a result of better management of the donor site.[4]

We present a modification of the technique described by Whitley et al (Fig. 1).[5] A cast that has been prefabricated to support the upper limb after harvest of the flap allows for quick application in the operating theatre and easy inspection of the donor site. Our modification produces a removable cast with a bivalve design that is hinged at the thumb, which makes accurate application and removal considerably easier.

Fig. 2. The cast closed over the donor site.

The cast takes 30 minutes to construct. The donor limb is bandaged preoperatively as it would be in theatre, with two rolls of undercast padding bandage (Formflex Natural, Lantor UK), followed by a single roll of conforming and retention bandage (K-Form; Urgo Medical). Tubular padding

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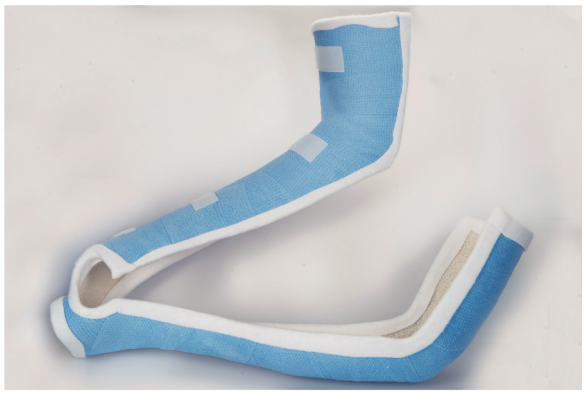

Fig. 3. The cast left open to show the hinged, bivalve design.

(Provectus Medical Ltd.) is applied over this and forms the inner lining of the cast.

The upper limb is positioned with the elbow flexed at just over 90º, wrist dorsiflexion of 30º and abduction of the thumb. Polyester cast tape (Delta-Cast Elite®, BSN Medical) is used to form the cast, which is then cut along the ulnar side but preserved at the space between the thumb and index finger (Figs. 2 and 3). Cast edge tape (Delta® Terry-Net, BSN Medical) is applied and Velcro® glued on to enable removal and reapplication.

After the harvest of the flap, the upper limb is dressed as described to allow for a close and accurate fit. We have found that fabricating the cast preoperatively allows for a more efficient use of operating time.

The cast extends above the elbow because rotation of the forearm is thought to be implicated in fracture of the radius.[5] It is initially worn full-time for four weeks, then shortened to a below elbow cast for a further two weeks. We understand that views may vary on the need to extend the cast proximally to the elbow joint,[6] but this regimen has been used by the senior author (MH), in combination with prophylactic plating of the radial donor site, with no incidence of iatrogenic fracture, and it has been tolerated well by patients.

Our modification keeps the cast as a single piece (Fig. 3). Easy and accurate relocation is achieved by simply placing the thumb through the prelocated groove. It is preferable to a backslab because it affords greater immobilisation, and may be removed and reapplied as often as necessary. The cast is sufficiently rigid to support the upper limb and, in conjunction with prophylactic internal fixation, helps to reduce the incidence of radial fracture, which we advocate for this particular donor site.

Conflict of interest

We have no conflicts of interest.

Financial disclosure statement

There are no financial conflicts of interest to disclose.

Ethics statement/confirmation of patients' permission

None required.

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