

Microsurgical Reconstruction of the Burned Hand and Upper Extremity



Mauricio De la Garza, MD^{a,*},
Michael Sauerbier, MD, PhD^{b,c}, Germann Günter, MD, PhD^c,
Curtis L. Cetrulo Jr, MD^d, Reuben A. Bueno Jr, MD^e,
Robert C. Russell, MD^f, Michael W. Neumeister, MD^a

KEYWORDS

• Microsurgery • Hand • Burn • Reconstruction • Free flap • Contracture

KEY POINTS

- Although the majority of burned hand wounds can be covered with skin grafts, many of these wounds require complex microsurgical reconstruction.
- Special considerations must be taken when planning for microsurgical reconstruction of the burned hand and upper extremity.
- Early excision has been shown to improve outcomes, and one must ensure that the recipient site is free of any remaining burned tissues prior to reconstruction.
- Timing of the microsurgical reconstruction of the burned hand requires careful planning.
- With adequate early management, careful planning, and selection of the reconstructive technique, microsurgical reconstruction of the burned hand is safely performed with good functional and aesthetic outcomes.

INTRODUCTION

The improvements in critical care and burn victim resuscitation have led to increased survival of severely burned patients. Initial resuscitation, early excision of burned tissues, prevention of burn wound sepsis, and wound coverage remain

mainstays of care. Although the majority of burn wounds can be covered with skin grafts, many of these wounds require complex reconstruction.¹ This is particularly important in the hand, where a small cross-sectional area contains multiple specialized structures that when burned lead to devastating injuries, resulting in loss of hand

Disclosure Statement: The authors have nothing to disclose.

^a The Institute for Plastic Surgery, Southern Illinois University, 747 North Rutledge Street, Springfield, IL 62702-6700, USA; ^b Department for Plastic, Hand and Reconstructive Surgery, BG Trauma Center, Friedberger Landstrasse 430, Frankfurt am Main 60389, Germany; ^c Department for Plastic, Hand and Reconstructive Surgery, Burn Center, BG Trauma Center Ludwigshafen, University of Heidelberg, Ludwig Guttman Street 13, Ludwigshafen 67071, Germany; ^d Department of Surgery, Division of Plastic Surgery, Massachusetts General Hospital, 55 Fruit Street, Boston, MA 02114-2621, USA; ^e Department of Plastic Surgery, Monroe Carell, Jr Children's Hospital, Vanderbilt University Medical Center, D-4207 Medical Center North, Nashville, TN 37232-2345, USA; ^f Heartland Plastic Surgery Center, 320 East Carpenter, Spfingfield, IL 62702-5185

* Corresponding author.

E-mail address: mdelagarza@siumed.edu

Hand Clin 33 (2017) 347–361

<http://dx.doi.org/10.1016/j.hcl.2016.12.007>

0749-0712/17/Published by Elsevier Inc.

function and permanent disability. Coverage of tendons, ligaments, joints, vessels, nerves, and bones of the hand requires healthy vascularized tissue to maintain viability and function. Local flaps or regional flaps, such as reverse radial forearm flaps or posterior interosseous artery flaps, may be within the burn zone of injury and therefore not available for pedicled transfer. Refined microvascular free tissue transfer techniques along with the growing availability of microsurgical instrumentation and increased experience in

microsurgery of the burned patient offer free tissue transfer as a procedure that can be safely performed with good functional and aesthetic outcomes.

PREPARING FOR MICROSURGERY

Special considerations must be taken when planning for microsurgical reconstruction of the burned hand and upper extremity (Table 1). Particular attention is placed on hemodynamic stability of

Table 1
Special considerations prior to free tissue transfer in the acutely burned patient

Resuscitation	Acutely burned patients lose an enormous amount of fluid through insensible losses. Adequate fluid resuscitation means the patient is hemodynamically stable with appropriate urine output, normal vital signs, and homeostatic in pH, lactate, and electrolyte status.
Escharotomies and Fasciotomies	All decompressive procedures are complete before the free tissue transfer. Late releases may lead to flap loss, muscle necrosis, lack of functional recovery of the limb, increased chance of infection, and the need for further free tissue transfer to cover newly exposed vital structures.
Debridement	All devitalized tissue must be excised. An adequate debridement treats the wound like a pseudo-tumor. Take a second or third look after 24 or 48 hours to further debride the wound. Electrical and friction burns are notorious for progressive tissue necrosis. Large vessels may be patent; therefore the tissues bleed, but capillary beds have coagulated, resulting in tissue death.
Temporary Dressings	The patient's condition must be optimized before the free tissue transfer surgery. The wounds can be temporized with opsite, allograft, xenograft, negative pressure wound therapy, or moist dressings. The goal is to keep tissues and vital structures from desiccation.
Donor Sites	Larger TBSA burns require ample skin graft donor sites. The same donor sites may be the site of flap harvest. Wait for the skin graft donor site to heal to minimize the infection rates.
Bone Stabilization	It is preferable to have the skeletal foundation stable prior to performing the free tissue transfer. Internal fixation is usually preferable to minimize infection rates and improve logistics of the free tissue transfer. The acutely burned patient is at higher risk for many insults including hemodynamic instability, hypothermia, coagulopathy, infection, malnutrition, electrolyte disturbances, blood product reactions, and organ failure. Minimizing surgery duration and complexity will minimize risk to the patient.
Multidisciplinary Team Participation	The acutely burned patient may be very ill or in critical condition. All services looking after the patient should be aware of any pending free tissue transfer surgery. The team may include burn surgeons, critical care intensivists, nurses, anesthesiologists, infectious disease specialists, nephrologists, cardiologists, pulmonologists, nutritionists, and other health professionals. Optimization by all specialists includes resolving organ failure, being off pressors, hemodynamically stable, and an informed consent. The informed consent is particularly important when patients are sedated, medicated, or on the ventilator. The power of attorney (POA) must be fully aware of all risks of the free tissue transfer in these patients.
Vascular Status	Vessel compromise may be present despite a well-vascularized limb in the acutely burned patient. Angiograms remain a gold standard for vessel visualization, but computed tomography angiography (CTA) is often acceptable

Download English Version:

<https://daneshyari.com/en/article/5708175>

Download Persian Version:

<https://daneshyari.com/article/5708175>

[Daneshyari.com](https://daneshyari.com)