In this article, authors point out a rarely seen injury around the elbow with composite bone and soft tissue loss. The subject of this article is a 43-year-old male who was involved in a bomb blast injury and sustained a loss of distal third of his humerus. His options were limited in terms of reconstruction of the joint including prosthetic replacement with a long-stem, allograft placement or fusion. The first two carry a high risk of infection due to longevity of the injury being more than three weeks with a large soft tissue defect. The third option, elbow fusion, was technically difficult to achieve due to substantial soft tissue and bone loss.

Following extensive work up and counseling, authors decided to perform rib-latissimus dorsi rotational flap for this patient. Vascular connections between the latissimus dorsi and ninth rib were preserved. Both tissues were elevated on the same vascular pedicle. The rib was interposed into the defect and fixed using a 20 hole, 4.5 mm locking plate bent at 95 degrees. The latissimus dorsi muscle with a skin graft covered the remaining defect.

At his three year follow-up, the patient had complete fusion with satisfactory return of function.

Learning points: 1 the flap is expendable; 2 the scar is well-hidden in the back; 3 the flap covers a large surface area; 4 the flap is pedicled and thus no microvascular anastomosis is needed; 5 surgery takes less time than free tissue transfer surgery; 6 the muscle length can reach the proximal forearm and can enable reconstruction of most defects above the proximal forearm, and 7 if the flap is elevated with the rib, it provides both soft tissue coverage and bone to fill defects.

The physicians at Denver Health’s Center for Complex Fractures and Limb Restoration are highly specialized and available 24 hours a day to provide orthopaedic trauma and surgery coverage.

Physician consults are also available 24 hours a day, seven days a week.

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A 41-year-old, right-handed arborist was trimming a tree with a chainsaw when the saw reportedly bounced off a branch and struck his left wrist resulting in a near complete amputation of the hand just below the wrist.

The patient lowered himself to the ground and co-workers applied a tourniquet for bleeding control. Emergency Medical Services quickly transferred the patient to the Rocky Mountain Regional Trauma Center at Denver Health. At the hospital, the Operating Room and Emergency Department were already on standby.

Upon arrival, a rapid trauma survey was performed. Radiographs of the left arm showed an oblique transection through the distal radius ending at the ulnar head (Images 1 & 2).

Within minutes of the patient’s arrival, he was taken to the OR for emergent surgery. Wound cleaning and debridement of injured non-viable tissue revealed the ulnar neurovascular bundle together with two tendons (ECU/FCU) intact and a small ulnar skin bridge. Everything radial to this was disrupted (Image 3). A detailed view shows the intact cartilage of the ulnar head (Image 4).

A 13mm defect in the radius was found correlating to a standard 0.050 gauge chainsaw blade width (Image 5). The intact ulna prevented standard bone fixation of the radius, so a step cut shortening of the ulna was performed (Image 6).

This was followed by screw fixation of the ulna and plating of the radius in shortened position. All severed tendons were repaired, nerve grafts were harvested from the lower extremity for microsurgical median nerve repair followed by end-to-end repair of radial artery and dorsal veins and a partial skin closure (Images 7 & 8).

Because of initial upper arm tourniquet ischemia of the whole forearm, the patient was scheduled for a second look operation to verify viability of forearm musculature and for skin graft coverage of remaining open wound areas three days after injury.
Kyros Ipaktchi, M.D., Orthopaedic Trauma Surgeon, trained and obtained Board Certification in General Surgery and Orthopaedic Traumatology at the Charite University Hospital in Berlin, Germany.

Dr. Ipaktchi specializes in hand and upper extremity reconstructive surgery including microvascular tissue transfer and replantation.

He has practiced as an attending surgeon for plastic and reconstructive surgery, and director of the Burn Intensive Care Unit at the Hannover Medical Center, Germany.

Dr. Ipaktchi completed his postdoctoral research and surgical critical care fellowship at the University of Michigan and has been an Associate Professor for Orthopaedic Surgery at the University of Colorado since 2007.

As a member of Denver Health’s Level One Trauma Center, Dr. Ipaktchi is highly trained and capable of treating the most severe and complex injuries.

Recent Publications


Clinical Trial Recruiting Patients

David Hak, M.D., orthopaedic surgeon at Denver Health Medical Center, is currently enrolling patients who have a delayed healing tibial fracture in a Phase III Clinical Trial sponsored by Medtronic.

The purpose of this clinical trial is to evaluate Medtronic’s INFUSE/MASTERGRAFT™ Delayed Healing Device as an alternative to autograft in the treatment of tibial delayed healing.

A patient will be considered to have tibial delayed healing when he/she is at least six months from the date of the most recent surgical intervention and has shown no signs of radiographic healing for at least three months. Medtronic is covering all costs of this study.

The main inclusion criteria for the study are:

- Having delayed healing when patient is at least six months from the date of the most recent surgical intervention and has shown no signs of radiographic healing for at least three months.
- Has pain equal to or greater than four on a ten point scale.

For more information or to refer a patient for enrollment, contact Doug Gibula at 303-602-3800 or Douglas.Gibula@dhha.org.