



Denver Health Orthopaedics In The News

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The use of a combined rib-lattissimus dorsi flap for elbow arthrodesis and soft-tissue coverage.

Ozer K, Toker S, Morgan S., *J Shoulder Elbow Surg* 2011; 20: e9-13.

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.



Above, pre-operative photo of bone and soft tissue defect. See page 3 for more photos of this case.

Following extensive work up and counseling, authors decided to perform rib-lattissimus dorsi rotational flap for this patient. Vascular connections between the lattissimus 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 lattissimus 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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Case of the Month

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.



Image 1



Image 2



Image 3

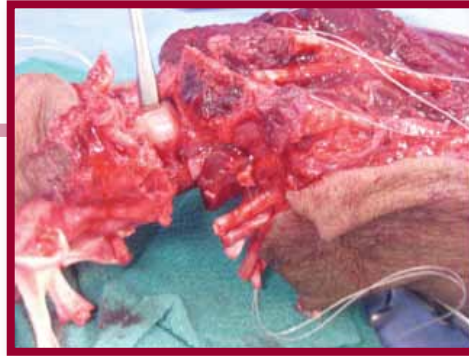


Image 4

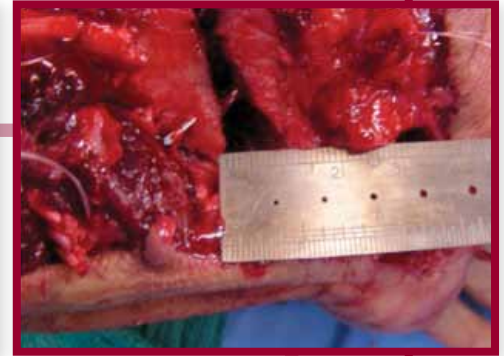


Image 5



Image 6



Image 7



Image 8



Image 9



Image 10

Surgeon Spotlight

Kyros Ipaktchi, M.D.

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.



Kyros Ipaktchi, M.D.

Recent Publications

D. Hak. "Getting the rotation right: techniques for assessing rotation in intramedullary tibial and femoral nailing. *Orthopedics*. 2011 Jan;34(1):33.

D. Hak, K Schulz, B. Khoie, S. Hazelwood, C. Yi, "The effect of Cox-2 specific inhibition on direct fracture healing in the rabbit tibia." *J Orthop Sci*. 2011 Jan;16(1):93-8

Yi, C., Hak, D. "Traumatic spinopelvic dissociation or U-shaped sacral fracture: A review of the literature." *Injury*, 2011 Jan 12.

K. Ozer, S. Toker, S. Morgan. "The use of a combined rib-lattissimus dorsi flap for elbow arthrodesis and soft-tissue coverage." *J Shoulder Elbow Surg*. 2011 Jan;20(1):e9-13

J. Stoneback, D. Hak. "Diagnosis and management of necrotizing fasciitis." *Orthopedics* 2011 Mar;34(3):196-202.

C. Burlew, E. Moore, W. Smith, J. Johnson, W. Biffi, C. Barnett, P. Stahel. "Preperitoneal Pelvic Packing/Extrenal Fixation with Secondary Angioembolization: Optimal Care for Life Threatening Hemorrhage from Unstable Pelvic Fractures." *J Am Coll Surg*. 2011 Apr;212(4):628-35.

T. Muratore, K. Ozer. "Persistent median artery in a pediatric trauma patient: case report." *J Hand Surgery Am*. 2011 Apr;36(4):658-60.

Gillani S, Cao J, Suzuki T, Hak D. "The effect of ischemia reperfusion injury on skeletal muscle." *Injury*. 2011 Apr 7.

Flierl MA, Gaudiani JL, Sabel AL, Long CS, Stahel PF, Mehler PS. "Complement C3 serum levels in anorexia nervosa: a potential biomarker for the severity of disease?" *Ann Gen Psychiatry*. 2011 May 4;10(1):16.

Hasenboehler EA, Stahel PF, Williams A, Smith WR, Newman JT, Symonds DL, Morgan SJ. "Prevalence of sacral dysmorphism in a prospective trauma population: Implications for a 'safe' surgical corridor for sacro-iliac screw placement." *Patient Saf. Surg*. 2011, 5:8.

Agudelo JF, Flierl MA, Smith WR, Moore EE, Williams AE, Eckels PC, Morgan SJ, Stahel PF. "Influence of Preoperative 7.5% Hypertonic Saline on Neutrophil Activation After Reamed Intramedullary Nailing of Femur Shaft Fractures: A Prospective Randomized Pilot Study." *J Orthop Trauma*. 2011 (In press)



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Continued from front cover



Left, photo after bone and soft tissue transfer and internal fixation, prior to skin closure/coverage. Right, follow-up lateral Xray demonstrating solid fusion.



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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.