Case: Musculocutaneous Nerve injury

- 46yo man who underwent surgery for a triceps insertional rupture using a brachial plexus block Presented nearly 7 months later with no active elbow flexion, no signs of reinnervation on testing

Musculocutaneous Nerve injury

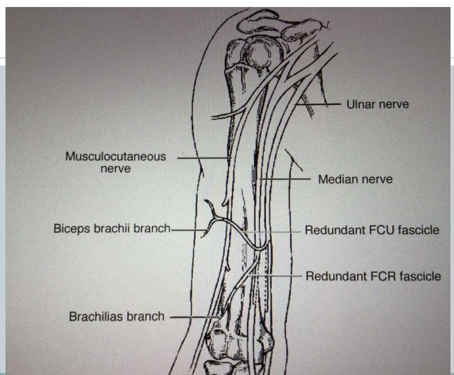
- Goal: biceps and brachialis (elbow flexion)
  - Double fascicular transfer – ulnar and median nerve fascicles to FCU and FCR/FDS/PL to biceps and brachialis branches of musculocutaneous nerve (MCN)
  - Ulnar nerve fascicles to FCU to biceps branch of MCN (Oberlin)
  - Medial pectoral nerve to MCN
  - Thoracodorsal nerve to MCN
  - Distal accessory nerve to MCN
  - Intercostal nerves to MCN

Musculocutaneous Nerve injury

- Goal: biceps and brachialis (elbow flexion)
  - Double fascicular transfer – ulnar and median nerve fascicles to FCU and FCR/FDS/PL to biceps and brachialis branches of musculocutaneous nerve (MCN)
  - Ulnar nerve fascicles to FCU to biceps branch of MCN (Oberlin)
  - Medial pectoral nerve to MCN
  - Thoracodorsal nerve to MCN
  - Distal accessory nerve to MCN
  - Intercostal nerves to MCN

Musculocutaneous Nerve injury

- Supine, arm abducted
- Longitudinal incision along medial arm
- Identify MCN on deep medial aspect biceps, median nerve just lateral to brachial artery, and ulnar nerve medially
- Identify biceps and brachialis branches of MCN and divide at branching from MCN (keep length)
- Internal neurolysis performed at level to allow adequate length of donor
- Isolate redundant fascicles to FCU and FCR
  - Often lateral/central in ulnar nerve
  - Often medial in median nerve
- Fascicles are divided and repairs performed
  - Can be median to brachialis and ulnar to biceps or vice versa



Pictures from Dr. Susan MacKinnon published work.

Musculocutaneous Nerve injury

Picture courtesy of my partner, Dr. Donald Bae

Case: Musculocutaneous Nerve injury

Underwent double fascicular repair

Musculocutaneous Nerve injury- 7 years later

Musculocutaneous Nerve injury- 7 years later

Musculocutaneous Nerve injury- 7 years later

Musculocutaneous Nerve - Outcomes

1. Mackinnon et al. (2005):

6 patients, DFT. Mean elbow flexion M4+

2. Liverneaux, Oberlin et al. (2006):

10 patients, DFT. All with M4. ("especially useful in cases of C5-7, elderly patients, long preop delay")

3. Ray, Mackinnon et al. (2011):

29 patients, DFT. 23 with M4 or greater. 4 with M3.

Case – Proximal Ulnar Nerve Laceration

- 18 year old RHD male presents with lacerations to his right upper extremity
  - medial upper arm
  - volar forearm
- Trauma sustained when the patient was attempting to catch a frisbee and inadvertently crashed into a window
- Had initial arterial repair and proximal nerve repair
- Presents 6 weeks later

Case courtesy of my partner, Dr. Phil Blazar

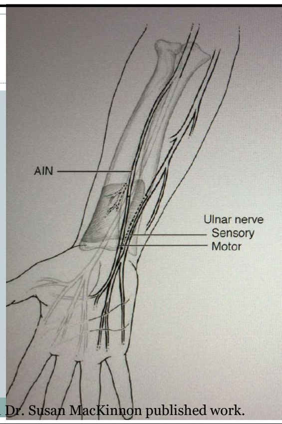
Ulnar nerve injury

Ulnar nerve injury

- Goal: ulnar intrinsic hand function- improve pinch and prevent clawing
  - Terminal AIN nerve branch (from pronator quadratus) to deep motor branch fascicle of ulnar nerve
  - Can also be done end-to-side to "super-charge" the motor fascicle of a recovering proximal ulnar nerve injury

Ulnar nerve injury

- Volar approach
- Identify ulnar nerve
- Identify AIN nerve entering the pronator
- Determine where the transfer can be performed without tension
- Internal neurolysis to isolate the motor division of the ulnar nerve
- Motor division is divided proximally and AIN divided distally and repair performed



Pictures from Dr. Susan MacKinnon published work.

Healed Axillary Wound

Picture courtesy of my partner, Dr. Phil Blazar

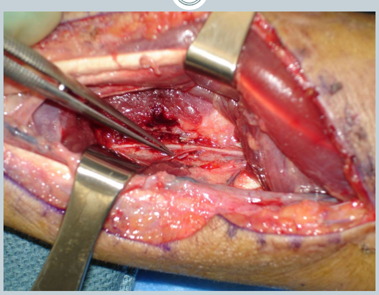
Intra-operative

Picture courtesy of my partner, Dr. Phil Blazar

Ulnar nerve

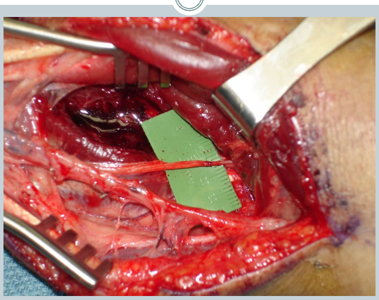
Picture courtesy of my partner, Dr. Phil Blazar

Anterior Interosseous Nerve



Picture courtesy of my partner, Dr. Phil Blazar

AIN transfer



Picture courtesy of my partner, Dr. Phil Blazar

AIN transfer Outcomes

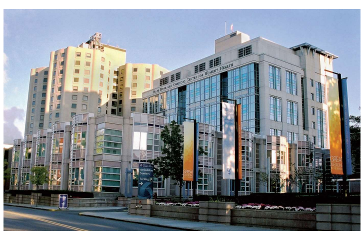
- Novak, MacKinnon, J of Recon Microsurg, 2002

- 8 patients, avg 3 mo from injury
- Mean FU= 18 mo. • Avg age= 38 years
- Lateral pinch improved from 2.2-13.8 lbs
- Grip improved from 8.8-61.2 lbs.

- Hasse, Chung, Ann Plast Surg, 2002

- EMG evidence of reinnervation at 11 mo. to intrinsic muscles

BRIGHAM AND WOMEN'S HOSPITAL



HARVARD MEDICAL SCHOOL
TEACHING AFFILATE