**DISTAL HUMERUS FRACTURES**

**WHAT I HAVE LEARNED**

- Get adequate imaging – understand what you are getting into!

---

**63 YO WOMAN**

CT – FIXABLE

OSTEOTOMY NOT NEEDED

---

**64 YO WOMAN**

FALL OF LADDER
CT – FIXABLE
OSTEOTOMY NEEDED

74 YO WOMAN
TRIPPED ON RUG

CT – NOT FIXABLE
BAIL TO ARTHROPLASTY

DISTAL HUMERUS FRACTURES
WHAT I HAVE LEARNED
• Get adequate imaging – understand what you are getting into!
• Consider non-operative treatment in select patients

90 Y/O WOMAN
Hx CVA, COPD, DEMENTIA

COLLAR & CUFF - NONUNION
• 53% union
• Fair outcome
• Dash 38

Aitken et al, BJJ 2015
92 Y/O WOMAN
Hx CVA, MI, COUMADIN

CASTED 8 WEEKS - HEALED

UNION ABOUT 80% WITH CAST
• Union more likely if column contact – Desloges (81%)
• Similar to report by Robinson - (83%)

OUTCOMES SIMILAR IN ELDERLY REGARDLESS OF TREATMENT

Measures | TEA | ORIF | NON-OP
---|---|---|---
Mean flexion arc | 101 | 100 | 107
Extension | 25 | 20 | 22
Flexion | 126 | 120 | 128
MEPS | 90 | 88 | 90

• Data from Systematic review and Meta-analysis
  - Twenty-seven studies with 663 patients, > 65 years old
  - Mean follow-up after TEA was 46 months
  - Mean follow-up after ORIF was 43 months

COMPLICATIONS LESS WITH NONOPERATIVE TREATMENT
• Non-operative:
  - One patient cast pressure sore
  - One patient had a TEA for poor outcome
  - No ulnar neuropathy or infection
• Operative:

DISTAL HUMERUS FRACTURES
WHAT I HAVE LEARNED

• Get adequate imaging – understand what you are getting into!
• Consider non-operative treatment in select patients
• Correct surgical approach to address pathology
SURGICAL APPROACH KEY

63 YO WOMAN

CT

PARATRICEPTAL APPROACH
TYPE A AND SIMPLE TYPE C1

PARALLEL PLATES
GOOD FUNCTIONAL OUTCOME

64 YO WOMAN
FALL OF LADDER
CT

OLECRANON OSTEOTOMY
COMMUNUTED TYPE C

PLATE FIXATION OF OSTEOTOMY
PREFERRED

DISTAL HUMERUS FRACTURES
WHAT I HAVE LEARNED

• Get adequate imaging – understand what you are getting into!
• Consider non-operative treatment in select patients
• Correct surgical approach to address pathology
• Transpose ulnar nerve

ULNAR NERVE - NO DIFFERENCE IN OUTCOME
TRANSPOSITION OR IN-SITU RELEASE?

NERVE SCARRING TO PLATE PROBLEMATIC
WITH REVISION SURGERY – I MOVE IT!
DISTAL HUMERUS FRACTURES
WHAT I HAVE LEARNED

- Get adequate imaging – understand what you are getting into!
- Consider non-operative treatment in select patients
- Correct surgical approach to address pathology
- Transpose ulnar nerve
- Flexible approach to ORIF – ensure adequate fixation

PRINCIPLES OF ORIF

- Restore articular congruity
- Maximize fixation in distal fragments
  - At least three screws medially and laterally
  - Screws as long as possible
- Compress supracondylar component of fracture
- Robust plates if shaft extension

21 YO SNOWBOARDING

SPECIAL PLATES NOT NEEDED FOR
SIMPLE FRACTURES WITH GOOD BONE

77 Y/O WOMAN

POST-OP ORIF
PROXIMAL SUPRACONDYLAR #
**Plates Too Weak – Need Thicker Plates for # Above Olec Fossa**

**60 Year Old Man**

Not much done right!

**75 Year Old Farmer**

Fall off tractor – Open #

Humerus smashed

But he’s a farmer – Avoid tea!

Precontoured plates speed surgery

Small plate holds reduction

Add more plates if needed? Locking?

**Plate Position**

- Parallel plates
  - Osteoporosis
  - Risk radial nerve and LCL injury
  - Lateral plate bothersome
PLATE POSITION
- Parallel plates
  - Older patient
  - Risk radial nerve and LCL injury
  - Lateral plate bothersome
- Orthogonal plates
  - Younger patient
  - Coronal shear component

DISTAL HUMERUS FRACTURES
WHAT I HAVE LEARNED
- Get adequate imaging – understand what you are getting into!
- Consider non-operative treatment in select patients
- Correct surgical approach to address pathology
- Transpose ulnar nerve
- Flexible approach to ORIF – ensure adequate fixation
- Consider arthroplasty in older lower demand patients

82 YO WOMAN
CAPITELLUM-TROCHLEA #

CT

14 °INTERNAL ROTATION HC RELATIVE TO POSTERIOR FLAT SPOT

FOUR YEARS POST LINKED TEA
TEA FOR DISTAL HUMERUS FRACTURES

- More rapid return of function than ORIF
- Short-term outcome better than ORIF in elderly
- Complications less common but more severe than ORIF
- Loosening and wear concern at longer follow-up

Kamineni and Murray, JOTJ 2006; Lee et al., J Trauma, 2006; Ego et al., Am J Orthop, 2011; Burkart et al., Clin J Sport Med, 2013; Ahn et al., JSES, 2010; Mansuri et al., JOTJ, 2013; Chent et al., JOTJ, 2013; Antuna et al., Acta Orthop Belg, 2012; Mehrabi et al., JOTJ, 2013.

TEA FOR FRACTURE PEARLS

- Good patient selection
- Discard fractured condyles
- Efficient surgery to reduce infection
- ‘Gentle’ surgery to avoid fractures
- Immobilize elbow until skin heals

74 YO ACTIVE WOMAN TOO YOUNG FOR TEA?

PARATRICEPITAL APPROACH HEMIARTHROPLASTY & LCL REPAIR

HEMIARTHROPLASTY FOR DISTAL HUMERUS FRACTURES

- Insertion of humeral component straight forward
- Must reconstruct columns and/or collateral ligaments
- Elbow stability concern at short-term follow-up
- Ulnar wear concern at longer follow-up

Schultze et al., JSES, 2017; Phadnis et al., ShEll, 2016; Desai et al., JSES, 2016; Nestorson et al., BJJ, 2015; Hohman et al., JSES, 2014; Smith et al., JSES, 2013; Burkart et al., J Trauma, 2011; Street et al., JBJS, 1974.
DISTAL HUMERUS FRACTURES
WHAT I HAVE LEARNED

• Get adequate imaging – understand what you are getting into!
• Consider non-operative treatment in select patients
• Correct surgical approach to address pathology
• Transpose ulnar nerve
• Flexible approach to ORIF – ensure adequate fixation
• Consider arthroplasty in older lower demand patients

Graham JW King MD, MSc, FRCSC

AMERICAN SHOULDER AND ELBOW SURGEONS
ORTHOPAEDIC TRAUMA ASSOCIATION
SPECIALTY DAY
SAN DIEGO, MARCH 2017

ROTH | MCFARLANE
HAND & UPPER LIMB CENTRE
ST. JOSEPH’S HEALTH CARE LONDON