

ASSH/AAHS Specialty Day
11 February 2012

*"Make My Day" in Hand Surgery: Management of
Upper Extremity Trauma
and Arthritis*

Amy L Ladd MD
COA Annual Meeting 21 February 2012

Dawn Laporte MD and John Lubahn MD
Co-chairs Specialty Day

The Day in Pictures

Selected pictures from hand arthritis and trauma talks

Objectives

- Update the practicing orthopaedic surgeon on traumatic and arthritic conditions of the upper extremity.
- Distill the current literature surrounding the treatment of these disorders into clinically relevant and useful data.
- Identify recent innovations and emerging concepts in treatment of disorders and injuries of the upper limb.
- Define the principles of acute and chronic treatment of hand and wrist injuries, including tendon and bone.
- Present the principles of evaluation and management of pediatric upper extremity trauma.
- Provide clinical pearls from experienced surgeons which will improve patient outcomes and aid in avoiding complications.

Today's goal

Avoid MEGO

My Eyes Glaze Over



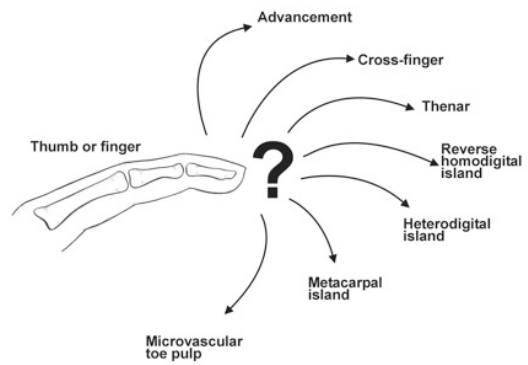
The goal

Provide take home lessons through pictures
Geared toward MOC

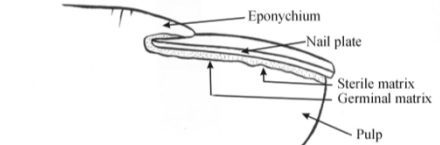
**Fingertip Injuries:
Classification and Treatment of Acute
Injuries**

David T. Netscher, MD

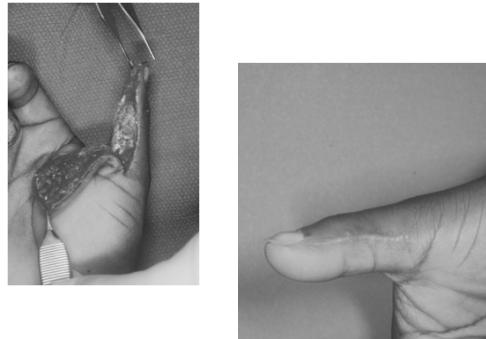
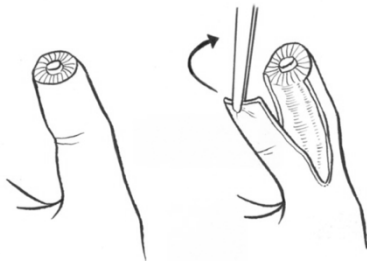
When do I toss or keep?



Nail



Thumb advancement flap
"Moberg"



When do I toss or keep?

- Patient age
- Occupation and hobbies
- Urgency to return to work
- Other medical illnesses and tobacco use
- Willingness to comply with treatment
- Mechanism of injury

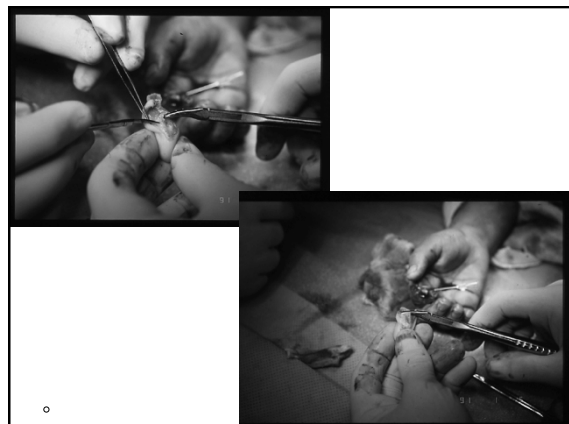
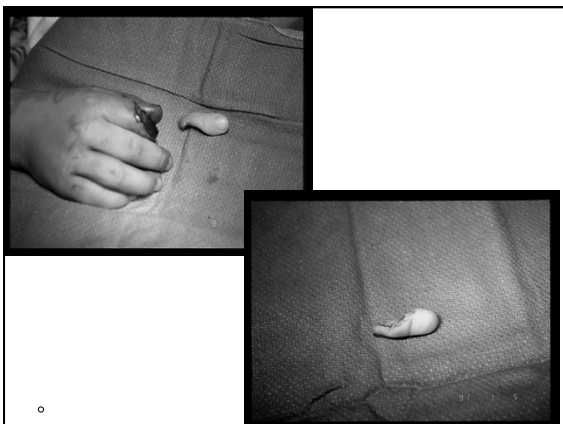
Fingertip Injuries Reconstruction

Michael S. Murphy, MD, Lutherville, MD
L. Scott Levin, MD, FACS, Philadelphia, PA
John Lubahn MD



MOC answer

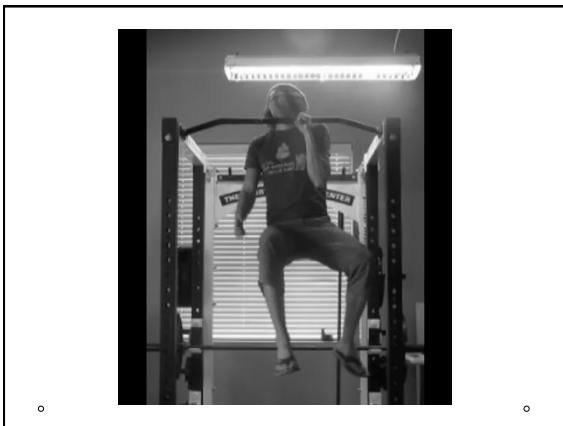
- Kids – always attempt at reconstruction



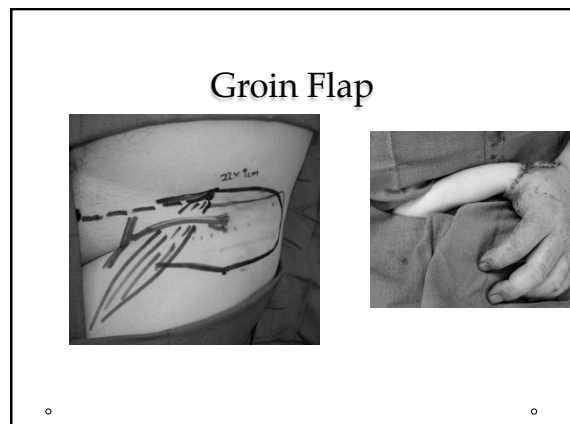
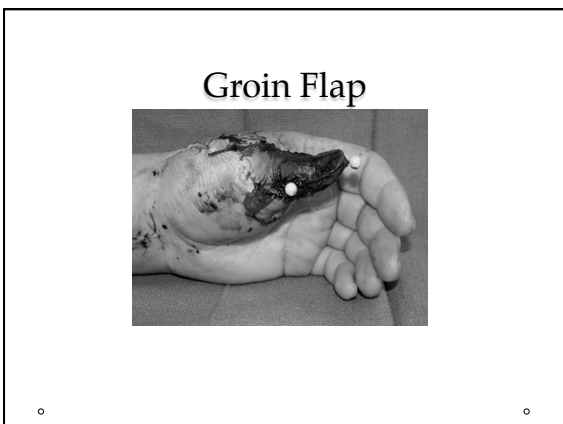


Arm replants – MOC answer

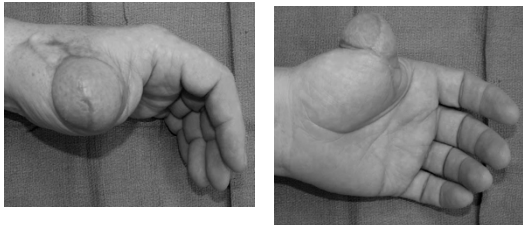
- Right environment
- Right patient



An oldie but a goodie



Groin Flap



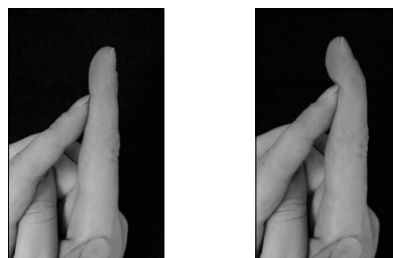
Hand allotransplant

- Very fashionable among reconstructive community
- Ethical dilemma
- Time and money will weigh benefit risk ratio

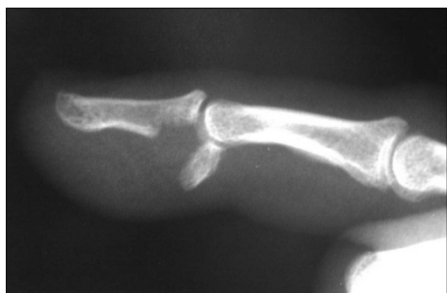
Intra-Articular Fractures and Dislocations of the DIPJ

- Fraser J. Leversedge, MD, Durham, NC
- David S. Zelouf, MD, Philadelphia, PA

Goal of Treatment

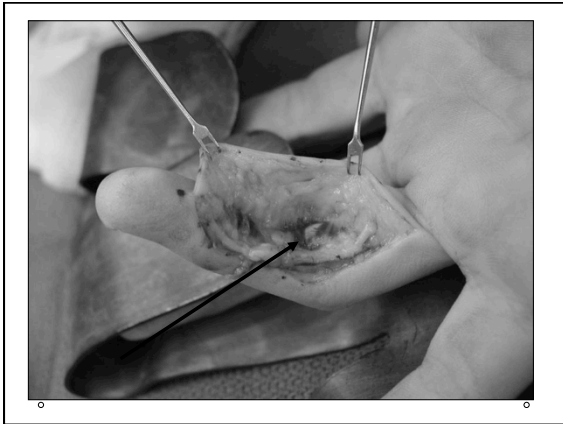


Volar - Jersey Finger



Volar - Jersey Finger





Dorsal: Mallet Injury

Critical Assessment

- articular involvement
- joint reduction

A lateral radiograph of the hand showing a mallet injury to the distal interphalangeal joint. A black arrow points to the fracture line at the base of the distal phalanx.

MC
16 y/o wrestler

Two side-by-side images: on the left, a clinical photograph of the hand showing a deformity; on the right, a lateral radiograph of the hand showing a fracture of the distal radius.

Courtesy of Lawrence H. Schneider, MD

**8 days post op,
returned to wrestling**

Two radiographs: on the left, a lateral view of the hand showing surgical hardware (wires) across the distal radius; on the right, a dorsal view of the hand showing the same hardware.

MC 3 years later...

Three images: top left, a clinical photograph of the hand; top right, a photograph of a clenched fist; bottom center, a lateral radiograph of the hand showing the long-term result of the surgery.

A collection of radiographs showing the hand from multiple perspectives: a lateral view at the top, and two views (likely lateral and dorsal) at the bottom, illustrating the long-term stability and alignment of the hand after surgery.

MOC answer (Larry Schneider rules)



- The distal phalanx base has a remarkable ability to remodel
- Schneider's rules:
 - 1) Mallet fractures can be treated in a splint
 - 2) In cases with displacement see rule 1
 - 3) If more than 1/3 articular surface see rule 1
 - 4) In cases with subluxation see rule 1!

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Middle Phalangeal Fractures, Classification and Treatment

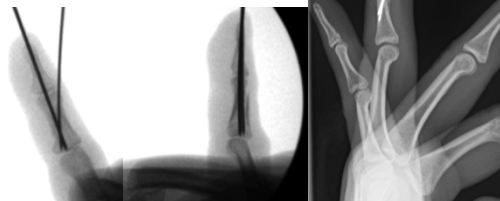
- Tamara D. Rozental, MD, Boston, MA

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Non-articular: shaft

- Closed Reduction Percutaneous Pinning (CRPP)
 - o Useful for transverse or oblique
 - o Many pin configurations
 - o Can go through IP or PIP joint
 - o Limits mobilization



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Treatment algorithm

- Shaft: spiral or oblique
 - CRPP vs. ORIF with lag screws
 - ORIF with plates for more comminuted injuries
- Articular
 - Dorsal: CRPP vs. lag screws
 - Volar: ORIF vs. hinged external fixation



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Articular: condylar



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Articular: dorsal base

- Detachment of central extensor tendon
 - Result of PIP dislocation
- Treatment
 - Splint in extension if joint is congruent
 - Reduce if >2mm displacement
 - K-wires vs. lag screws if large fragment



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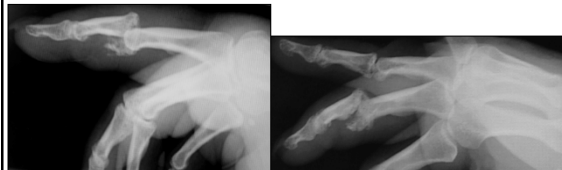

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PIPJ Dislocation - Diagnosis and Treatment

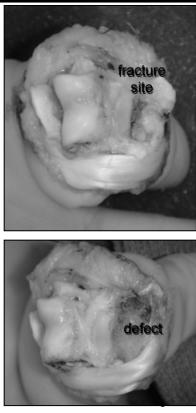

- Dean G. Sotereanos, MD, Pittsburgh, PA

Unstable Fracture/Dislocation

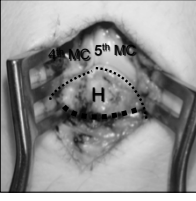

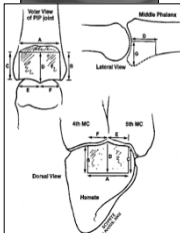
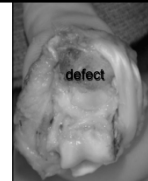
- Forces at rest favor dislocation
- Treatment is Operative




Hamate Hemiarthroplasty



Hamate Hemiarthroplasty



Hamate Hemiarthroplasty



1m post

2m post

Metacarpal Fractures - Closed vs. Open Treatment

- Thomas J. Fischer, MD, Indianapolis, IN

The Platform

Proximal metacarpal arch
Distal metacarpal arch
Scaphoid metacarpal arch

Distal metacarpal arch
Proximal metacarpal arch

K-wires – not without complication

- Kirschner Wires Can:
 - Alan Freeland, Jackson MS
 - *Penetrate* – Gliding tissue structures
 - *Incinerate* – Drilling can superheat bone
 - *Irritate* – Stick out, impede hand function
 - *Suppurate* – infection with all techniques

The Window Frame or The Platform of the Hand

- Doug Campbell, Leeds, UK

MOC alert

- Why I need to stabilize some of the metacarpal arch

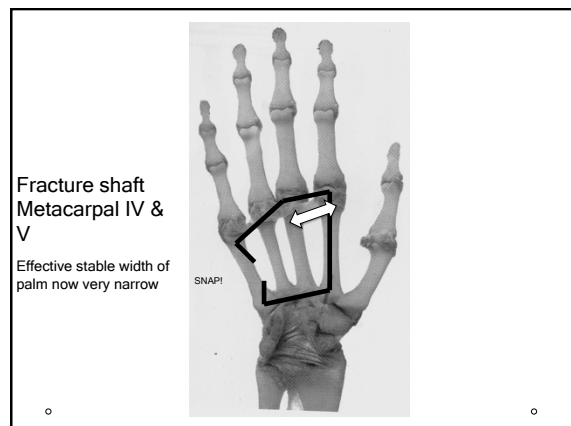
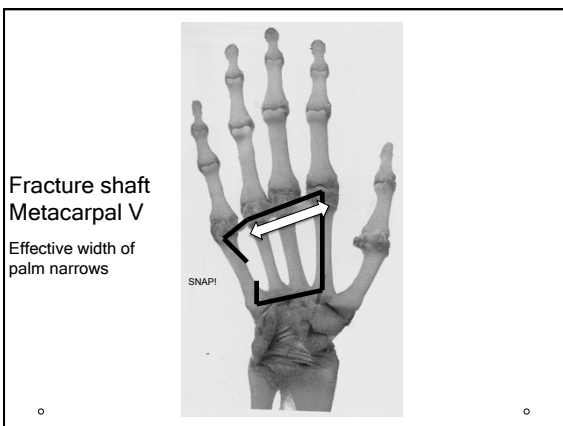
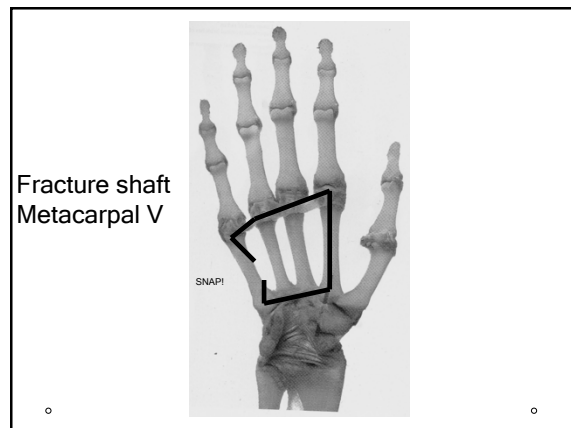
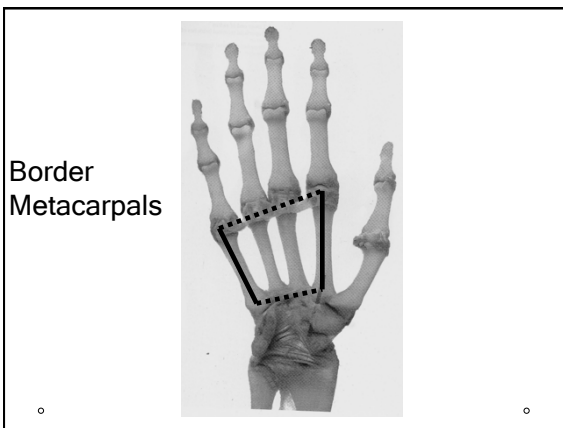
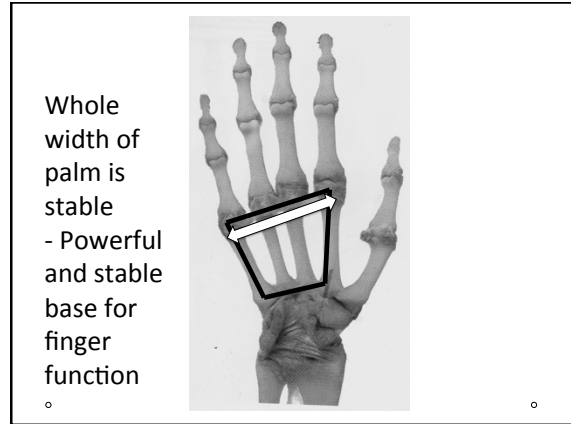
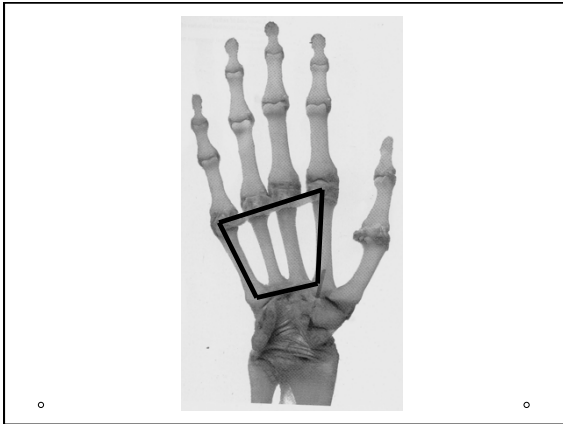
Anatomy

Strong basal ligaments

Anatomy


Looser intermetacarpal ligaments

Strong basal ligaments



Constructs Available

- Plates
 - Locking
 - Fixed angle
 - Hybrid constructs
- External fixators
- Screws
- Intrafocal wires (Kapandji)
- K-wires
- Casts
- Braces and splints



Hand Surgery Rehab Timeline

PHASES OF REHABILITATION

INJURY ——— BIOLOGY ———> FINALLY HEALED
TIME

TYPICAL: SKIN HEALED, BONE, JOINT, TENDON, LIGAMENT INTEGRITY, MOTION, STRENGTH

COMPLICATION: (Two overlapping circles)

IDEAL: (Three overlapping circles)


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Acute Scaphoid Fractures: Classification and Treatment

Alexander Y. Shin, MD
Mayo Clinic
Rochester, Minnesota

Classification

Russe Classification

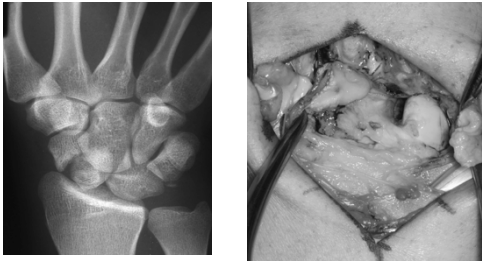


H0 T V0

Russe, JBJS 42A, 1960

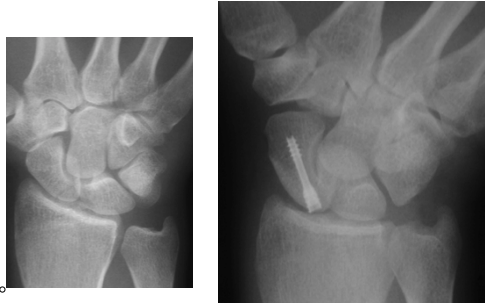
Surgical Fixation

- All unstable fractures



Surgical Fixation

- Proximal pole – both unstable and stable



Surgical Fixation

- Fractures associated with
 - Contralateral extremity fractures
 - Lower extremity fractures with need of ambulation aids
 - Concomitant wrist injuries (trans-scaphoid perilunate)



Surgical Fixation

- Stable fractures with compelling nonbiologic factors



MOC answer

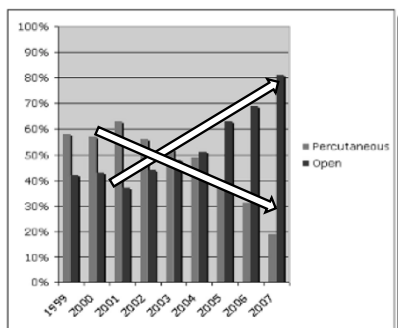
- Stable fractures: immobilization is fine
- Unstable, displaced fractures treat with ORIF

No prospective randomized studies exist to compare cast vs ORIF of unstable scaphoid fxs

Distal Radius Fractures that "Make My Day"

- Jesse B. Jupiter, MD, Boston, MA

Trends



Koval et al, JBJS A 2008

Is there a place for cast treatment any more? ... You Bet

it is recommended and reliable for:

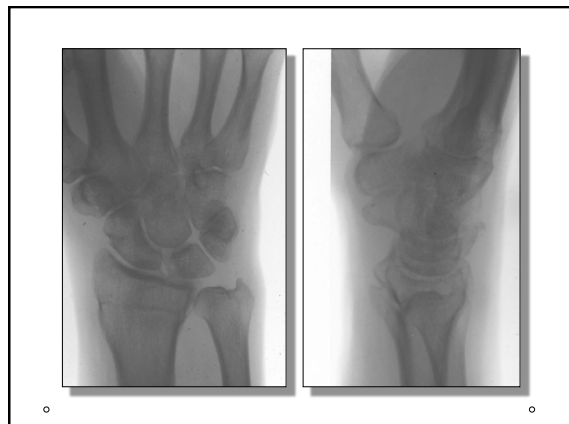
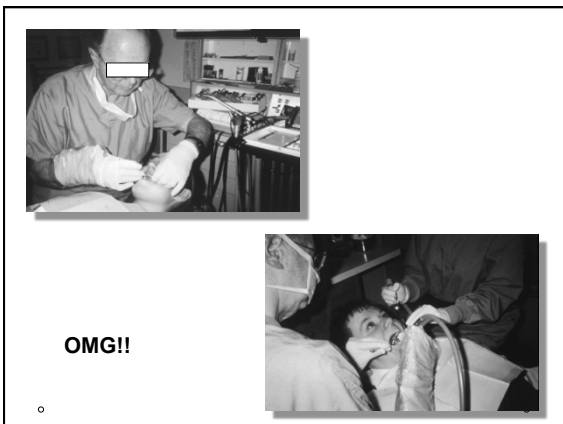
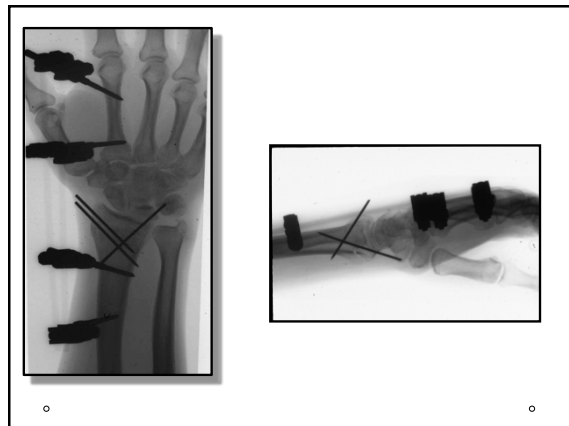
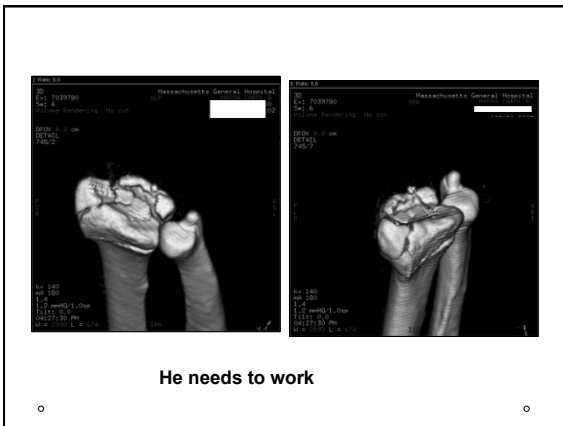
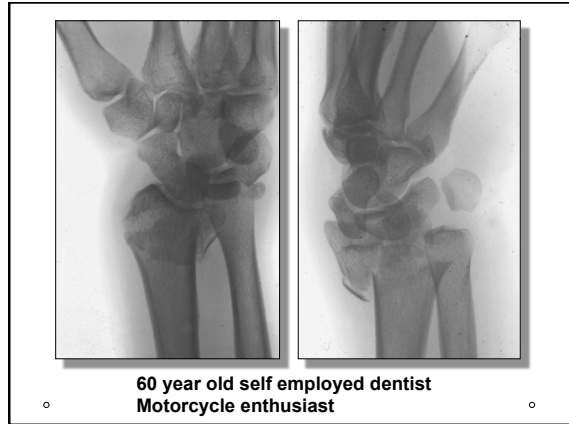
- minimally displaced extra- and intra-articular fractures
- displaced fractures, stable after closed reduction
- *unstable fractures in elderly (asymptomatic malunion)*

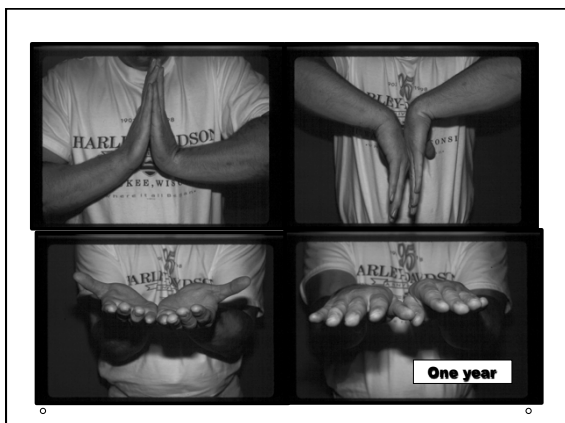
Reality

20 years ago the residents did the closed reductions and put the casts on, while the seniors did the surgery...

now the residents just operate and the seniors (residents 20 years ago) are the only ones around who know how to make a cast work...!!

this may explain (to a certain extent) why statistics on conservative treatment have overall disappointing outcomes....





MOC answer

AAOS guidelines

- Reduce the fracture
- Fix if stable if you have a good reason
- No system or approach currently favored

Neuropraxia After Distal Radius Fractures

Fractures

- Robert M. Szabo, MD, MPH, Sacramento, CA

Differentiate

Acute CTS vs Acute Contusion

GARCIA Y ROBERTSON

Median Nerve Symptoms in DRF

<p>Acute CTS Symptoms ↑ with swelling Sensation is normal at first</p> <p>↓</p> <p>Immediate CTR</p>	<p>Acute Contusion Symptoms are <i>immediate</i> and <i>non-progressive</i></p> <p>↓</p> <p>Observation</p>
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Lack of Available Literature

- AAOS Clinical Practice Guideline Workgroup did not conclusively recommend for or against performing CTR for median nerve dysfunction after distal radius fracture
- *Prophylactic CTR during DRF fixation remains controversial*

That's the MOC answer, too!

Flexor Tendon Repair Zone II

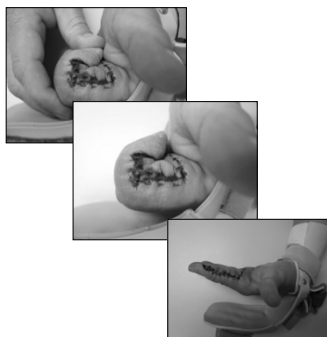
- Martin I. Boyer, MD, FRCS(C), St. Louis, MO

Department of Orthopaedic Surgery, Barne- s- OJewish Hospital

- **Double Modified Kessler** suture is used (Winters, Gelberman et al, JHS(A) 1998, 23(1))
- Locking loops (Hotokezaka and Manske, JHS(A) 1997, 22(6))
- One knot in the repair site

Rehabilitation

- Based on the best available experimental data, **INCREASED** levels of intrasynovial repair site excursion combined with **LOW** levels of repair site load are recommended in 2011



MOC answer

1. In 2011, repair both FDS and FDP
2. At least a 4-strand core suture repair using double stranded 3-0 or 4-0 suture (I prefer the 8-strand Gelberman-Winters core technique – Supramid)
3. Running 6-0 prolene epitendinous suture
4. Flexor tendon sheath repair controversial

Hand Fractures in Children

Donald S. Bae, MD
Children's Hospital Boston
No financial disclosures.

Seymour's fracture

Physeal fracture of distal phalanx with nailbed laceration


- "Open fractures"
- Nailbed incarceration
- High index of suspicion



Seymour's fracture

Complications

- Infection
- Physeal arrest
- Nail deformity




Phalangeal neck fracture

Sports-related or "doorjamb" injuries

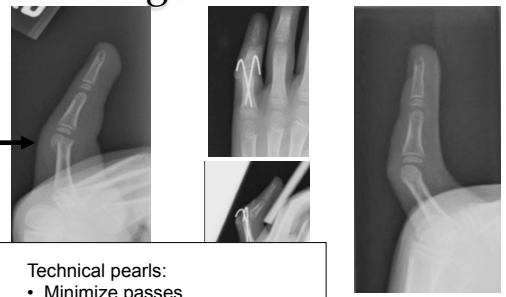
X-rays findings subtle

Closed treatment -> little remodeling, poor flexion

Surgery recommended for displaced fractures



Phalangeal neck fractures



Technical pearls:

- Minimize passes
- Avoid lateral bands

- Risk of postoperative stiffness

Rheumatoid arthritis –thumb

- Amy L. Ladd MD, Palo Alto, CA

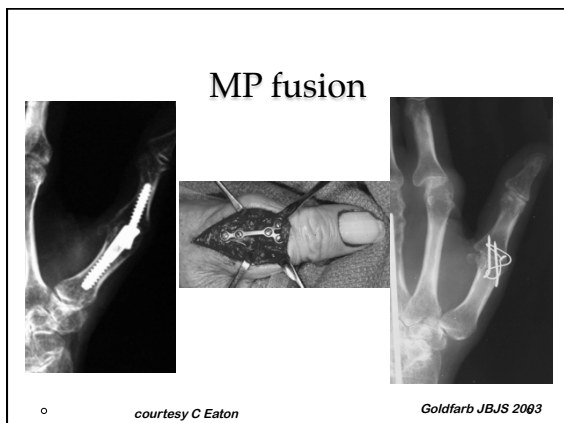
Self-assessment question

- *What is the most common deformity of the thumb in rheumatoid arthritis?*
 - Hyperextension of the metacarpophalangeal (MP) joint – Swan-neck deformity
 - Hyperflexion of the metacarpophalangeal (MP) joint – Boutonnière deformity
 - Thumb carpometacarpal (CMC) arthritis and adduction contracture
 - Hyperflexion of the metacarpophalangeal (MP) joint – Boutonnière deformity with CMC arthritis
 - Arthritis mutilans

MP joint

- *Most common and rewarding surgery*
 - Fusion (*Rizzo*)
 - Rare arthroplasty





Thumb deformity in RA - 2012

- Classic presentation *unusual* unless untreated or unresponsive to treatment
- Presentation (to surgeon) more representative of OA population

Self-assessment question

- What is the most common deformity of the thumb in rheumatoid arthritis?
 - a. Hyperextension of the metacarpophalangeal (MP) joint – Swan-neck deformity
 - b. Hyperflexion of the metacarpophalangeal (MP) joint – Boutonnière deformity
 - c. Thumb carpometacarpal (CMC) arthritis and adduction contracture
 - d. Hyperflexion of the metacarpophalangeal (MP) joint – Boutonnière deformity with CMC arthritis
 - e. Arthritis mutilans

IP joint

- Fusion if MP okay; and for arthritis *mutilans*
- Manipulation and pinning in fixed boutonnière

Courtesy HJCR Belcher

Conclusions

- Pictures of hand surgery - what you need to know
- MOC questions in general is conservative