The Mangled Hand
Management, Therapy and Return to Work

Introduction
- One of the greatest challenges to hand surgeons
- Variable tissue injured and lost
- Requirement for complex reconstruction to restore/salvage hand function

- Many aspects of care
  - Initial on-site
  - Emergency Room
  - Appropriate Transport of amputated fingers/hands
  - Initial surgical management
  - Hand Therapy
  - Patient factors/compliance
  - Return to function and work

Definitions
- Mangling/mutilating are imprecise terms

  - "Cut to pieces", "to cut or lop off", "maimed"

- Injury with significant loss/damage to tissue and loss of function

- Anything resulting in less than an “acceptable” hand

  - ? Three decent fingers + thumb?
Initial Management – On Site
- Many factors involved

- Call 9-1-1, or plan to bring quickly to hospital

- Clean, slightly moist bandage
  - Some type of rigid frame if possible/necessary

- If massive and uncontrollable bleeding, apply some type of tourniquet

Initial Management – Transport of Body Parts
- Not directly submerged in ice water

- Wrap with damp (not soaked) towel/gauze
  - Put in plastic bag, and then plastic bag on/in ice

Initial Management – In the Emergency Room
- Often a primary cleaning is done prior to surgery

- Try to avoid covering, uncovering, etc

- Antibiotics

- Obtain a thorough history including time, mechanism, witnesses

- Pain medication

- Tetanus update

- Take Photographs
Patients can be taken to any hospital, but mangled hand injuries need to go to a level 1 trauma center whenever possible, and quickly.

**In the operating room**
- Many factors/variables

- **Do not** initially discard tissue
  - Can use for spare parts

- Start working on amputated parts *before* the patient arrives in O.R.

- Clean, clean, clean!!!

- Keep thumb whenever possible

- Single fingers generally don’t get “reattached”

- Multiple finger amputations – reattach as many as possible
  - If crushed/mangled, then not possible

- Sensation preservation is absolutely critical (more than length)

- Fix bones, vessels, nerves, tendons, skin

- Soft tissue/skin coverage is crucial
  - Often, there’s not enough native skin
  - Surgeons need to be ready to be creative with flaps/grafts
- Priorities
  - A stable and opposable thumb (of adequate length)
  - At least 1 (preferably 2) digits for pinch with thumb
  - Good sensation of the reconstructed hand
  - Good skin and soft tissue coverage

Secondary Procedures
- The need for secondary procedures is extremely high
- I tell the patient this from the very start – set reasonable expectations
- MMI very difficult to determine initially
- Types of surgeries
  - Skin coverage, finger lengthenings, tendon reconstruction, nerve grafting
  - “There will be complications”

Importance of Therapy
- As important as the surgery
- Hand surgeons need to have a close relationship with hand therapists
- Referral is made usually after 1st surgery
- Early mobilization of the *uninjured* joints and body parts
- Therapist sees the patient much more frequently than MD/PA/NP

- Therapist = Counselor, motivation coach, wound monitor, advisor to surgeon, problem detector

- 2-5x/week

- A general physical therapist or occupational therapist is NOT appropriate
  - This can, and has, led to severe consequences and complications
  - MUST be a CHT (certified hand therapist), or the equivalent
  - Preferably a therapist with whom the surgeon is affiliated, or knows well
    - All of the therapists that I work with have my cell phone number, and they are encouraged to use it
  - I don’t hesitate to switch therapists if I feel the patient is getting sub-adequate treatment – it’s SO important to patient care

**Mental Health**
- Adjustment disorders, depression, PTSD

- Important to recognize/identify

- A critical factor in patient recovery and outcome – both short and long-term

- Men have more difficulty expressing these concerns than women (in my experience)

- Referral to mental health professional when appropriate
  - This is part of the overall care of the injured patient
Prostheses

- Important and often overlooked

- Can help to restore grip/grasp, help restore patient’s body image

- Studies suggest that fitting sooner than later is important to outcome
  
  o I like having prosthetist visit patient in hospital within 1-2 days

  o Gives the patient an idea of future options

  o Provides hope, sense of direction

- Many, many options

- Acceptance by the patient is important for sustained use

- Costly to make and require expertise to design and fit

- Wear and tear, need to replace them over time

Return to Work

- Generally no work until acute swelling subsided, pain managed, and wounds have gone through initial healing

- “Deskwork” often allows for upper extremity elevation, which is CRUCIAL early on

- I advocate as early a return to work as possible (modified duty)

- Start adjusting/framing the patient’s mindset – gradual and progressive return to work

- I explain EARLY in treatment the difference between “restrictions” and “ability”
- I explain EARLY that return to work may be interrupted by secondary surgeries or setbacks or complications

- Depends on the job, and availability of modified work

- Compliance with modified work is important
  
  o I struggle with this – patients often report that “boss forces me to do more…”

**Outcomes**

- Multiple factors – injury related, patient, treatment related (including therapy)

- The patient is a HUGE factor
  
  o Age, health, hand dominance, occupation

  o *Psychological makeup and motivation*

- There is no good standardized assessment system

- The severity of the original injury plays a major role in predicting the outcome

- An experienced reconstructive hand surgeon is essential