

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

Definitions

- Mangling/mutilating are imprecise terms
 - o “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
 - o ? 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
 - o 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
 - o 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 mangling 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
 - o 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
 - o 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
 - o Often, there's not enough native skin
 - o 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
 - I like having prosthetist visit patient in hospital within 1-2 days
 - Gives the patient an idea of future options
 - 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
 - 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
 - Age, health, hand dominance, occupation
 - *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