Basics and Beyond: From Chapter 8 The Complex Wrist

Scaphoid Fracture Treatment

- Undisplaced fractures of the tuberosity should be immobilized for 3-6 weeks in a short arm cast
- Most physicians include the thumb in the cast
- Open reduction and internal fixation has become popular since the introduction of the Herbert screw; other screws are also used

- Proximal pole fractures are often difficult to heal due to the precarious vascularity
- Techniques for the proximal pole:
  - Prolonged immobilization – sometimes exceeding 9 months
  - Pulsed electromagnetic stimulation
  - Early ORIF

Nonunions

- Leads to progressive arthritis
- DISI deformity of the wrist
- Weak and painful wrist
- Preiser’s disease (avascular necrosis of the scaphoid)

Treatment

- Osteosynthesis – bone grafting
- Electrical stimulation
- Radioscaphoid arthrodesis
- Osteotomy of the radius
- Proximal row carpectomy
- Allograft denervation
- Arthrodesis
**Therapy intervention**

- Patients are sent to therapy post casting
- Often times splint is fabricated (thumb spica)
- Progressive mobilization programs are used to increase AROM/PROM if scaphoid is healed
- Static progressive splinting
- CPM
- Joint mobilization
- Strength program
- Functional restoration
- Pain control
- Edema management

**Lunate Fractures**

**Facts**

- 80% of the load is borne by the radius (normally)
- 20% by the ulna (normally)
- therefore the load on the lunate depends on the resting ulnar variance
- acute fractures occur due to axially loading the wrist from falls on the outstretched upper extremity

**Kienbock’s disease**

- Avascular disease of the carpal lunate
- Often secondary to traumatic lesions
- May be due to post-traumatic avascular changes due to ligamentous injury from repetitive trauma
- Now theorized that it is not due to a single etiology but is the result of a combination of “risk factors”
- **Risk factors:**
  - Ulnar neg. variance - note the ulnar negative variance below (strong association)
• Vocational and avocational loads
• TFCC compliance
• Underlying congenital or developmental disorders
• Described to be a painful, stiff, swollen wrist

**Treatment for Kienbock’s**

• Delay the inevitable arthritic changes in the wrist by providing correction of the underlying risk factors that exist and restore carpal architecture leading to carpal collapse
• The following are procedures used:
  • Immobilization – for up to 3 months- but this is at best palliative
  • Excision arthroplasty- classically has poor results
  • Lunate decompression- 5 categories
    o Radial shortening or ulnar lengthening
    o Shorten both bones to decrease muscle tension forces
    o The slope at the articular surface can be altered
    o Intercarpal fusion
    o Shorten the capitate
• Wrist denervation – not very popular in the U.S.
• Limited wrist fusion
• Revascularization
• Proximal row carpectomy- salvage procedure
• Complete wrist fusion- alternative for late stage Kienbock’s disease
How does Dupuytren's develop?

- The disease most often begins in the palm of the hand at the base of the ring or little fingers.

- Primary **manifestation** is the **nodule**.
  - Nodules are found in the **anterior aspect of the palmar aponeurosis** and are highly cellular
  - **Nodules** are usually found near the **distal palmar crease**

- A lump or pit may show up months or even years before a cord develops from the palm to the fingers.
  - **Pits** are early manifestation of the disease
  - Associated with nodule formation
  - Corresponding attachment to the overlying skin

- Drawing of the fingers into the hand can occur because of contracture of the fascia near the joints in the fingers.
  - **Bands** form from the palmar and digital fascial structures
    - Bands are "normal," nonpathological
    - Once **pathology** is present the bands are now termed **Cords**
- Cords are pathological
- Cords are **proximal to the neurovascular bundle**
- **Cords** are the sole source of MPJ flexion contracture in the disease process

NOTE: Green explains that the term nodule has become confused and is both in the clinical sense a collection of cells in and as a cord. Green further states that the nodule is not clear and that the nodule is underlying tissue that may bundle up and become a nodule and others are space occupying lesions pushing upward on the skin. Green further states that according to LUCK the nodule is the power house of the contracture which later matures into the cord. So the nodule then the cord according to Green. Green also states that bands are normal and cords are pathological. This is a bit confusing as some of the literature will state bands are nonpathological that develop into cords. However, Callahan, et al states that the bands may or may not cause contracture. According to McFareland, the MPJ is usually contracted due to the bands. Also, McFarlane states that the PIPJ contractures are more difficult to treat because of the fascial bands causing the contracture and that it can be contracted via the bands independent of any other structure or it can contribute to the PIPJ contracture in combination with the cords.

Now with all of that said what should you think. Well, in my (nf) opinion I would say it is well accepted that the CORDS are contributing to PIPJ contracture and the BANDS contribute to MPJ contractures unless GREEN is specifically mentioned.

- The skin may be involved with the disease, but the tendons in the hand are not affected.
- Grayson’s and Cleland’s ligaments are not involved in Dupuytren’s
  - Grayson’s and Cleland’s ligaments hold the skin in position during flexion and extension of the finger
  - Cleland’s ligaments are firm fascial bands
- Having the disease in both hands is not uncommon.
Post Operative Hand Rehabilitation

- Wound Care – Photo below shows extensive surgical intervention. Note the fingers are sutured and the palm is open. Obviously the extent will depend on surgical procedure. We will briefly discuss wound care. For specifics on wound care refer to lesson four.

  - **If a McCash** or open palm technique was used you may want to use the whirlpool for circulation and debridement benefits
  - Caution – do not use too long as it can cause increased circulation and hypergranulation
  - Some facilities may not utilize whirlpools and may use water picks or other hydro debridement
  - Monitor and change wound protocol appropriately
  - **For Dermofasciectomy (FTSG)**
Dressing removed within 72 hours

Active range of motion can be started when graft is strong enough – usually by about day 3 to 5 – always, ask your physician when he feels graft is strong enough to start movement

Skin Graft protected via dressing for roughly 10 days
- When dressing removed may apply moisturizer lotion on graft
- When dressing removed may shower and get hand wet
- Sutures usually removed at 14 to 21 days
- Always keep an eye out for infection (redness and tenderness)

Photo below show a typical dupuytren's release. Note the sutures and note the extensive work performed. Therefore, you must respect the wound, edema, and pain when instructing home exercise program.