

HAND DEFORMITY

Simple to Complex

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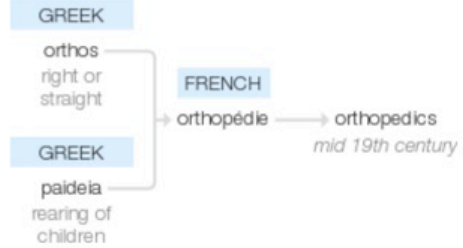




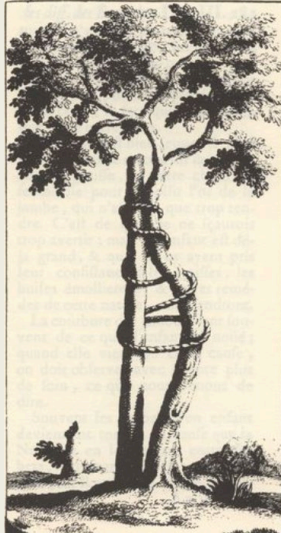
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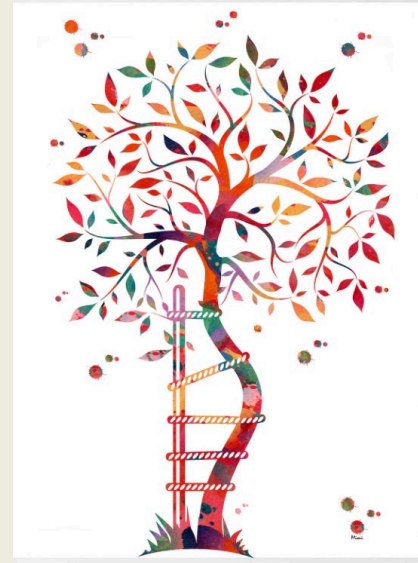
Origin



mid 19th century (originally relating specifically to children): from French *orthopédie*, from Greek *orthos* 'right or straight' + *paideia* 'rearing of children'.



Nicholas Andry



Etsy

Early years of Orthopaedics

Trauma, Infection (TB),
Neuromuscular (**Polio**)





Full leg caliper with



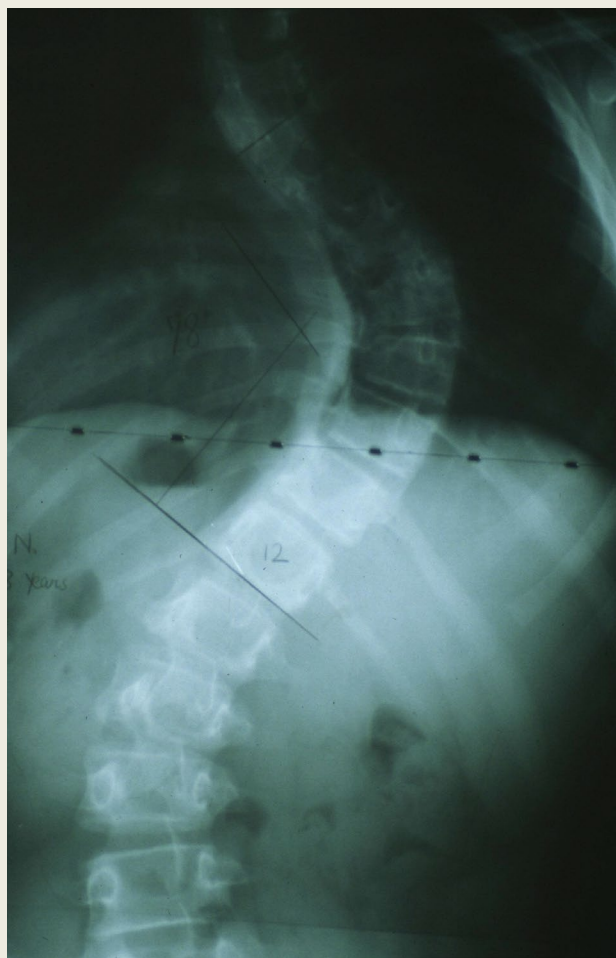
Principles of deformity correction

- Physical exam: Thomas, Phelps-Baker, Ober etc
- Pelvic Obliquity, Limb length discrepancy
- Extra or intra articular deformity
- Extra or intra articular adhesions
- Neuromuscular-Spastic or paralytic
- Skin, muscle-tendon, ligament, bone, joint

Modern Day Orthopaedics

- Total Joint-Osteoarthritis-Pain and loss of function
- Sports Injuries: Pain and loss of function
- Spine: Pain and loss of function
- Deformity correction is not the main focus of treatment

Pediatric, Hand and Foot Surgery



Deformity

- Deformity, stiffness, contracture can all mean the same or similar thing
- Inability to place a part in neutral anatomic position – joint
- Loss of full ROM
- Loss of normal anatomic alignment

Deformity in Hand and Foot

- Hand: Skin, tendon, joint capsule and ligaments, rarely NV structures
- Restore position, alignment, stability, ROM and relief of pain

Principles of correction

- Define the deficit anatomic and functional
- Can it be corrected in one or multiple stages
- Motion v/s stability
- Extension or flexion?
- Surgery is easy, the aftercare is the challenge

Deformity comes in Many
Flavors

Simple-one level, one
structure

Multiple levels-one structure

Multiple levels-multiple
structures







contrast tool selected



Mallet deformity-gout

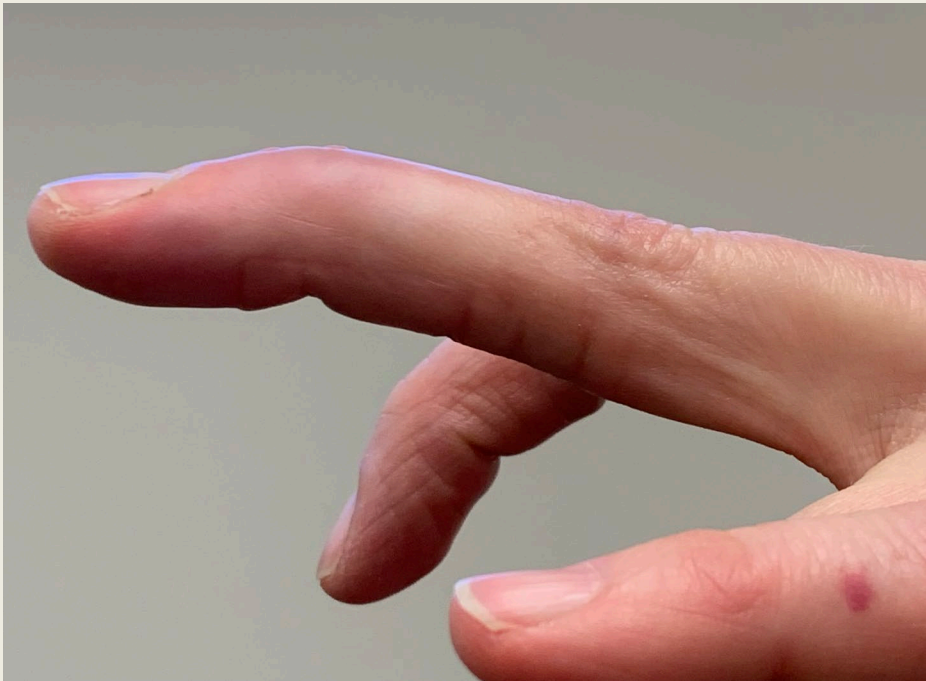
Pain, Deformity and loss of active motion



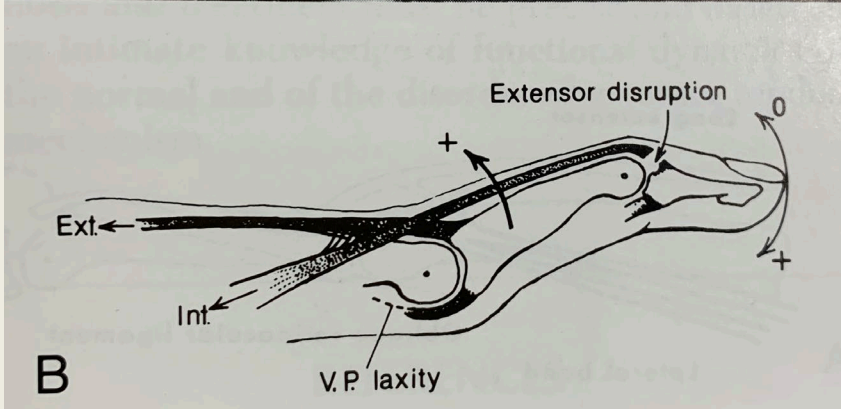
Distal joint arthrodesis



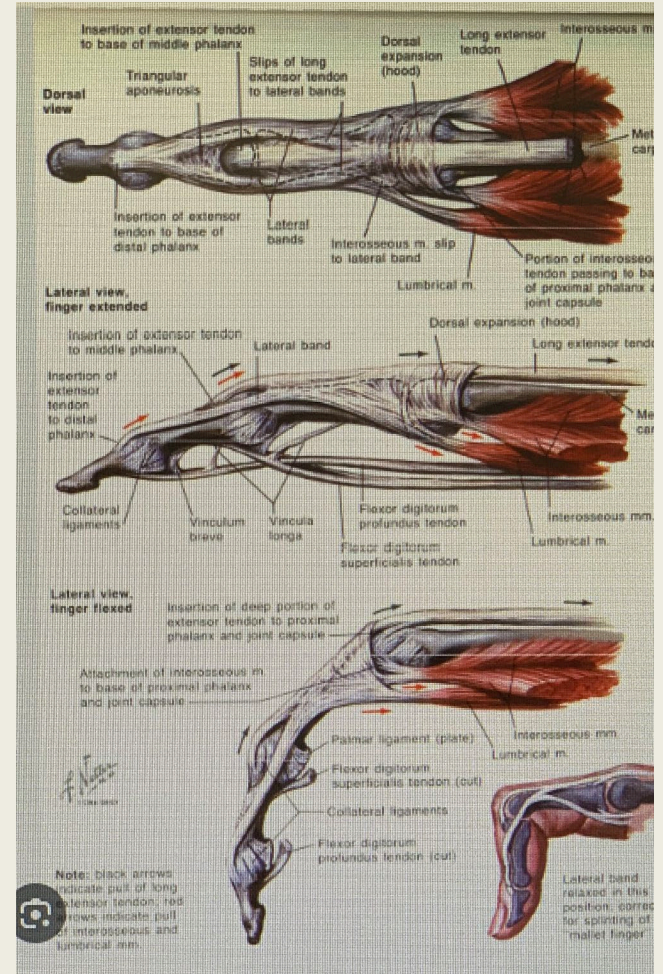
Mallet finger-extensor tendon rupture/avulsion fx



Stack splint-60-70%
success rate

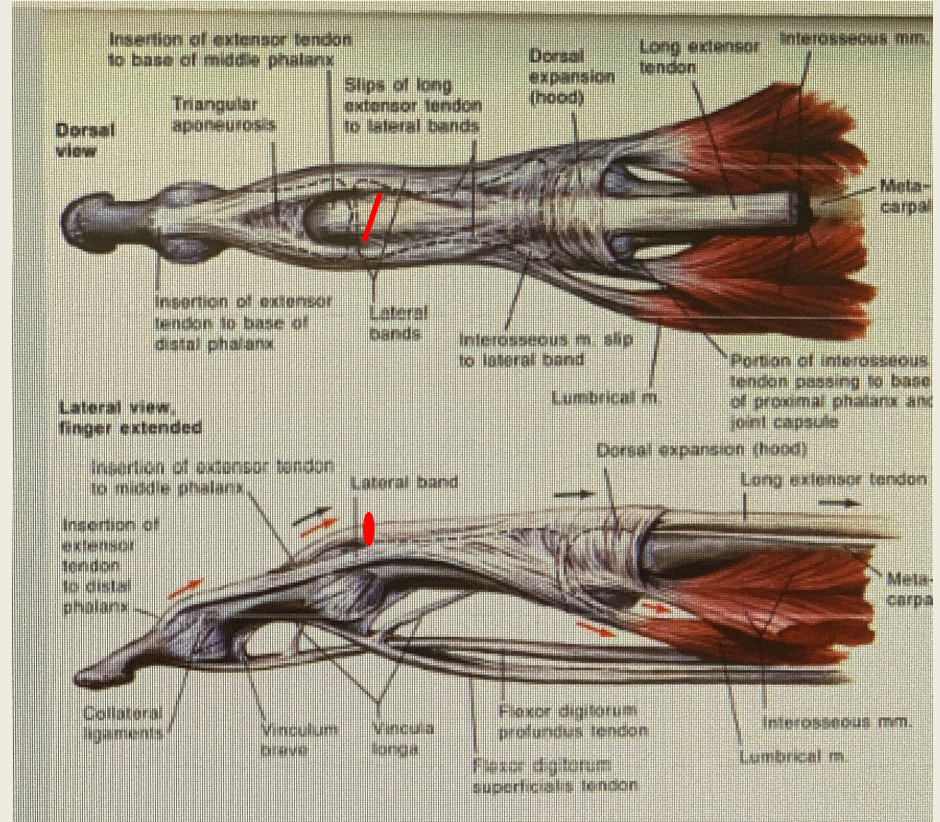
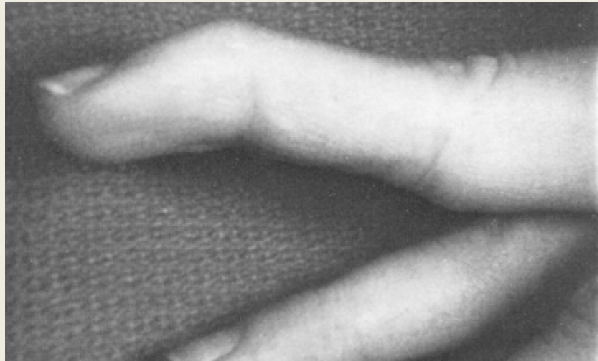


Chronic mallet deformity with secondary swan neck deformity



Extensor mechanism is complex

Central Slip tenotomy (Fowler)

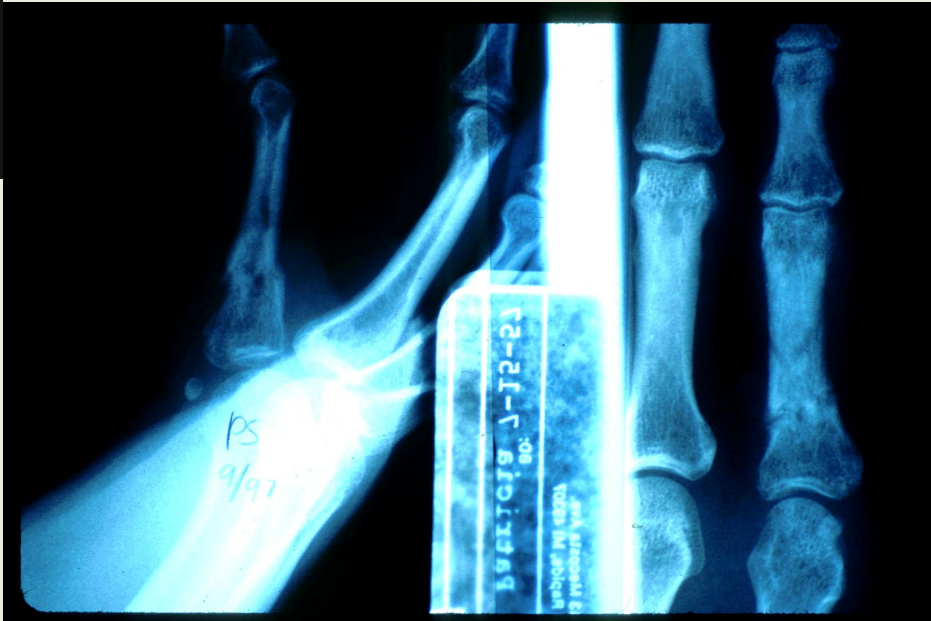


Boxer's fx with rotational deformity





Proximal phalanx fx fixed percutaneously



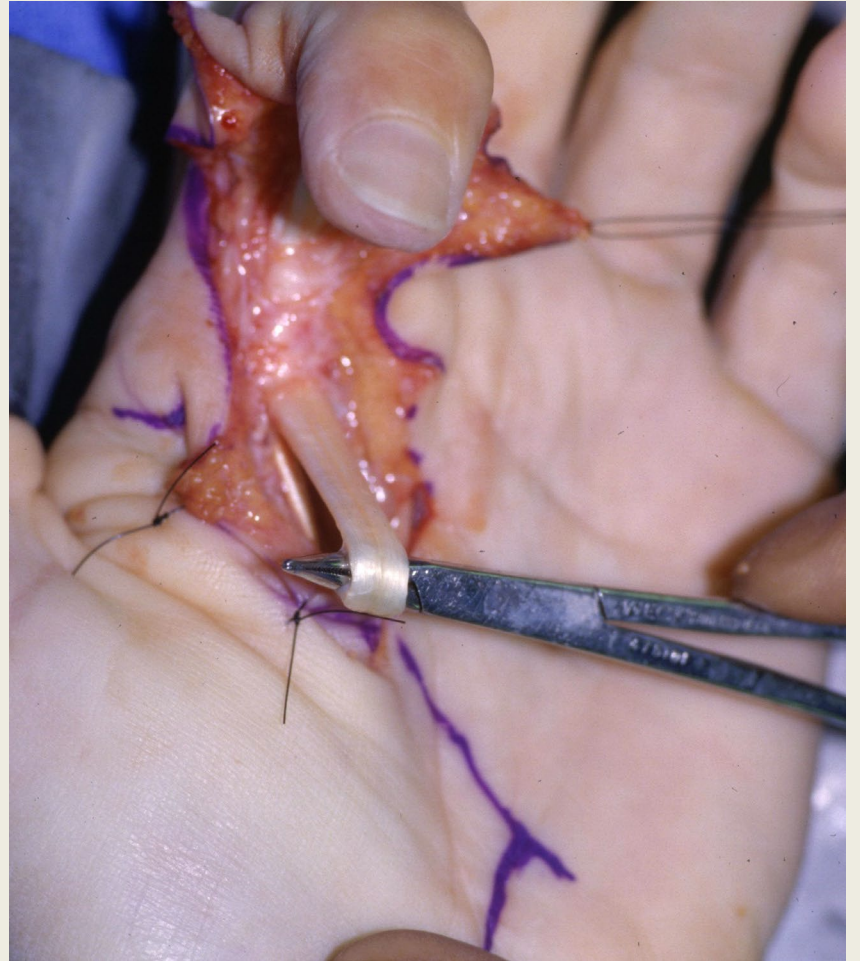
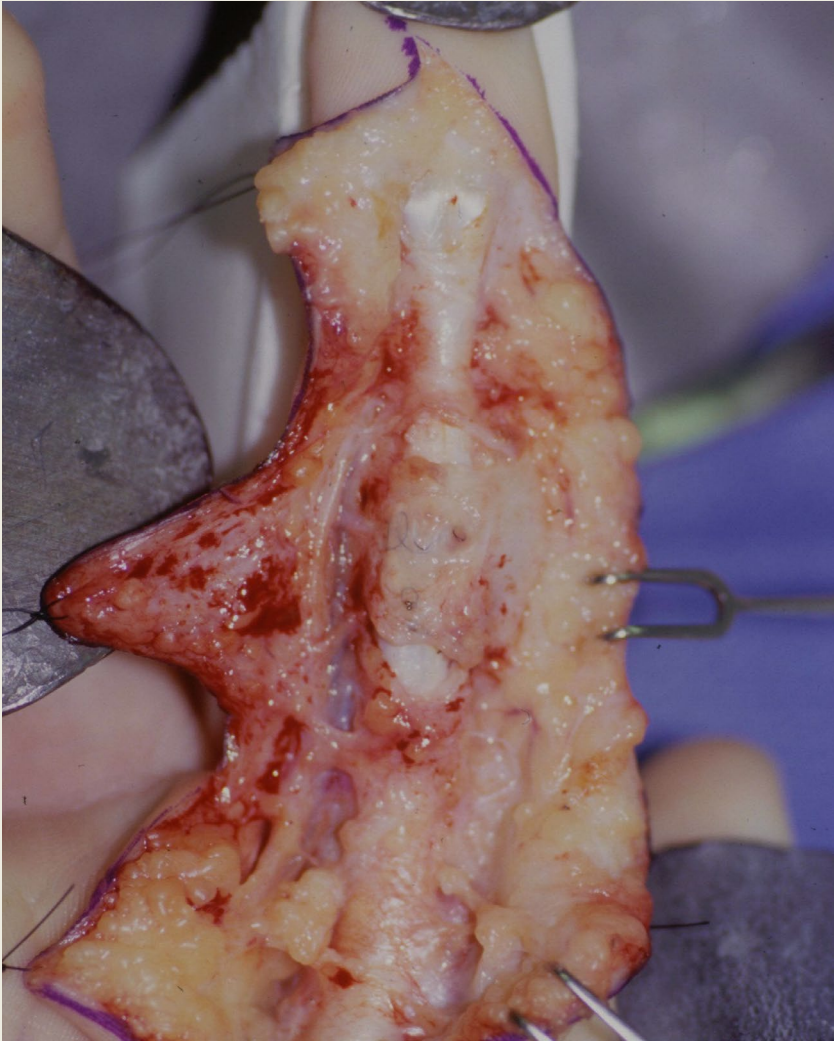
No fixed deformity
Has loss of active motion



Active ROM



Passive ROM



Flexor tenolysis



Pulley repair



Full active ROM



Dupuytren's Disease

- Affects skin and palmar fascia (*also flexor tendon sheath and collateral ligaments*)
- Secondary changes cause joint contracture (PIP) and extensor mechanism imbalance
- Correction may be simple-fasciectomy or complex requiring attention to skin, tendon and joint

Challenges

- Maximum correction without causing NV compromise
- Achieve primary skin healing in the digits
- Be prepared for skin graft or local flap
- Maintain correction and ROM in flexion and extension for 3 months



Severe PIP flexion contracture

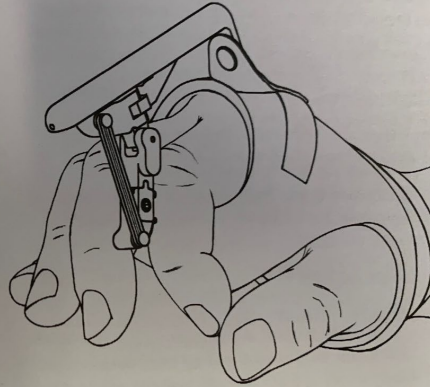
- Volar plate and collateral ligament release
- Skin deficit-z plasty, local flap, Skin graft
- Maintain correction, prevent recurrent contracture and allow motion all at the same time

Agee Digit Widget®

External Fixation System

For treatment of PIP joint flexion contractures.

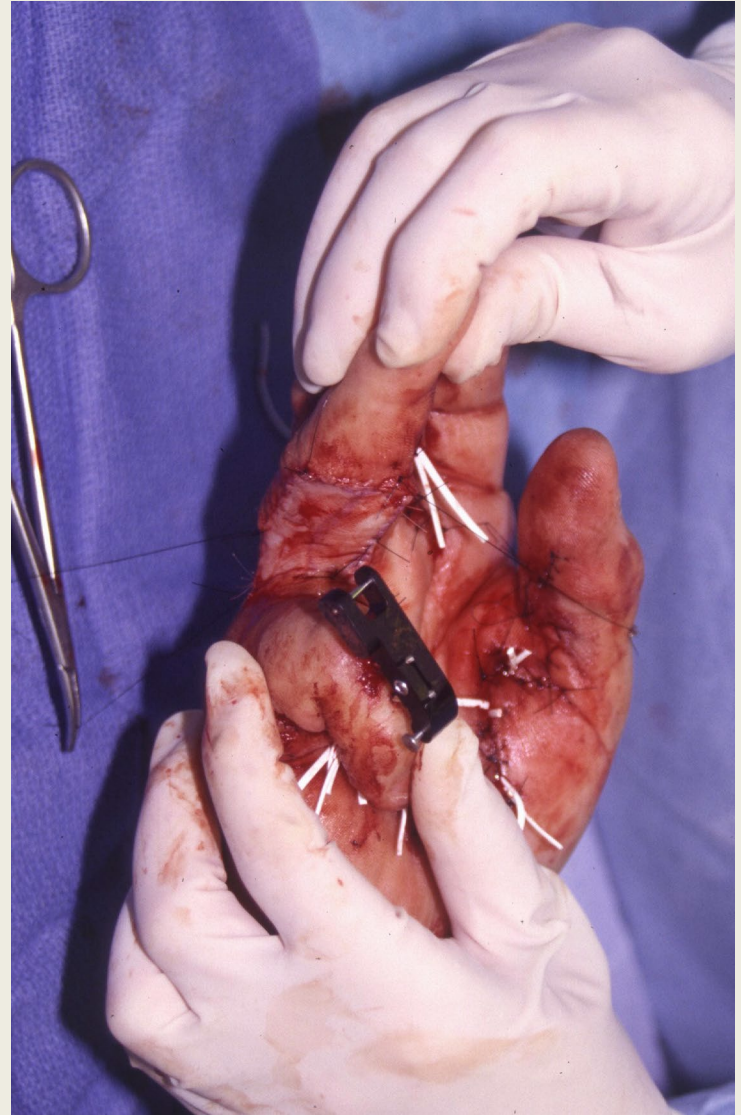
Maintenance of joint extension depends on identification and treatment of force imbalance causing contracture.



Dupuytren's











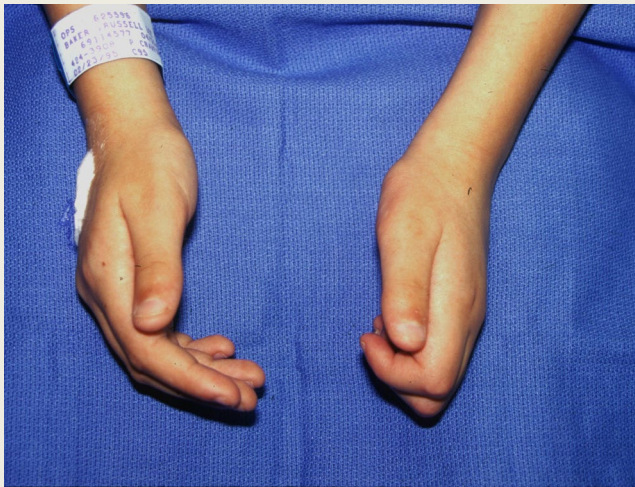
Neurological Hand

(non spastic)

- Loss of muscle tone and active control
- No skin deficit
- Usually supple joints
- Usually no muscle-tendon contractures
- Limited donor units

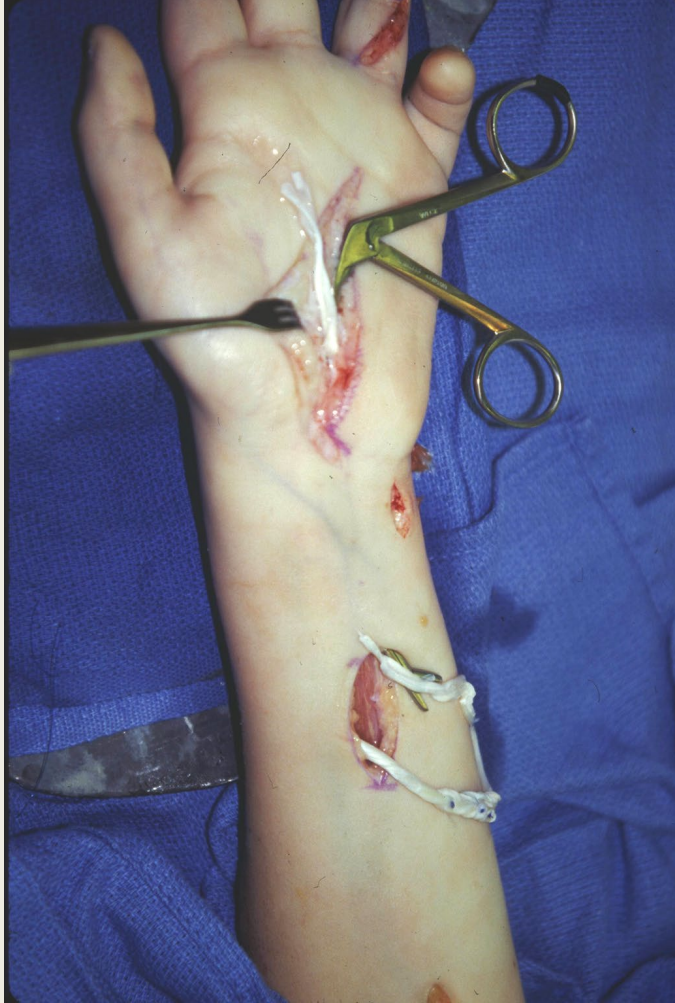
Brachial Plexus tumor

Claw Hand



Loss of synchronous flexion, unable to grasp, pinch and oppose





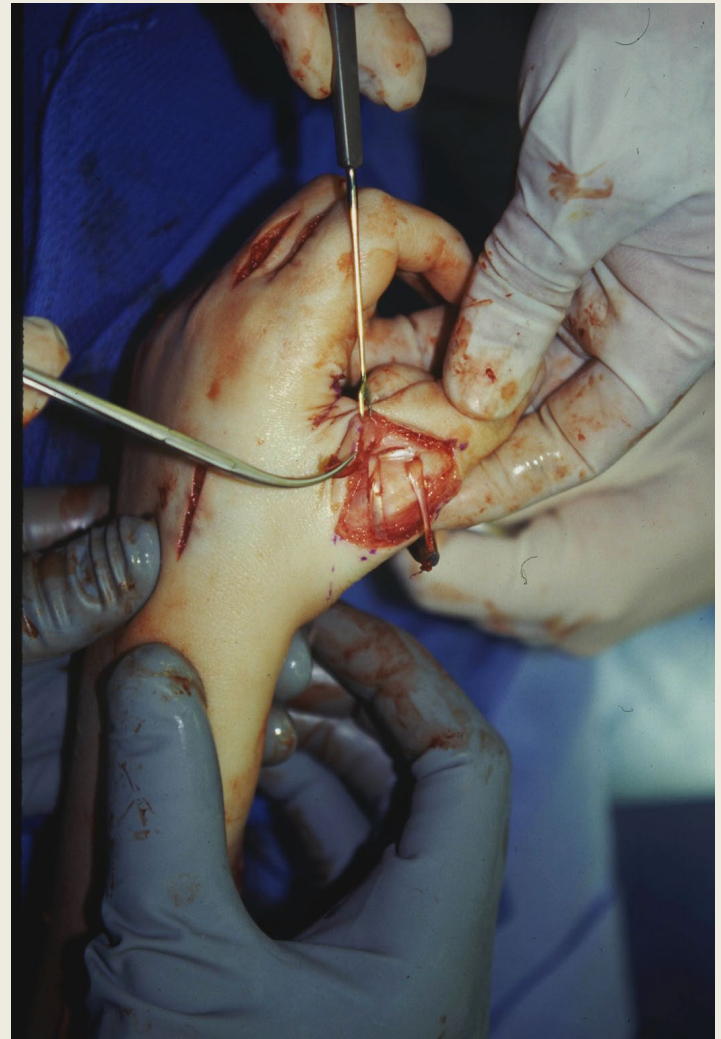
FDS
opponensplasty

ECRL to lateral
band

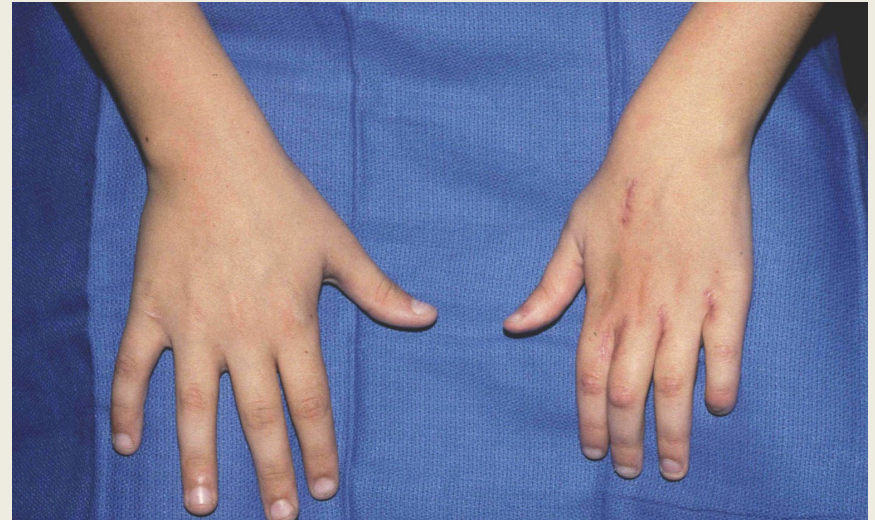
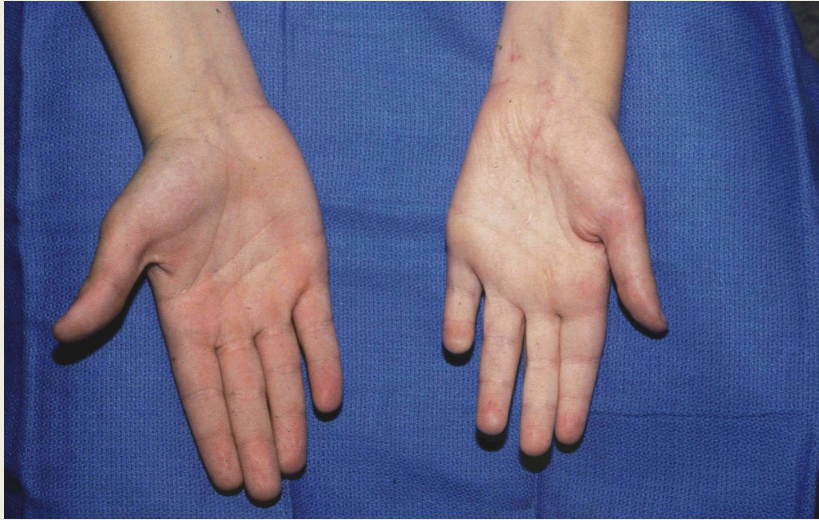
Brand intrinsic transfer



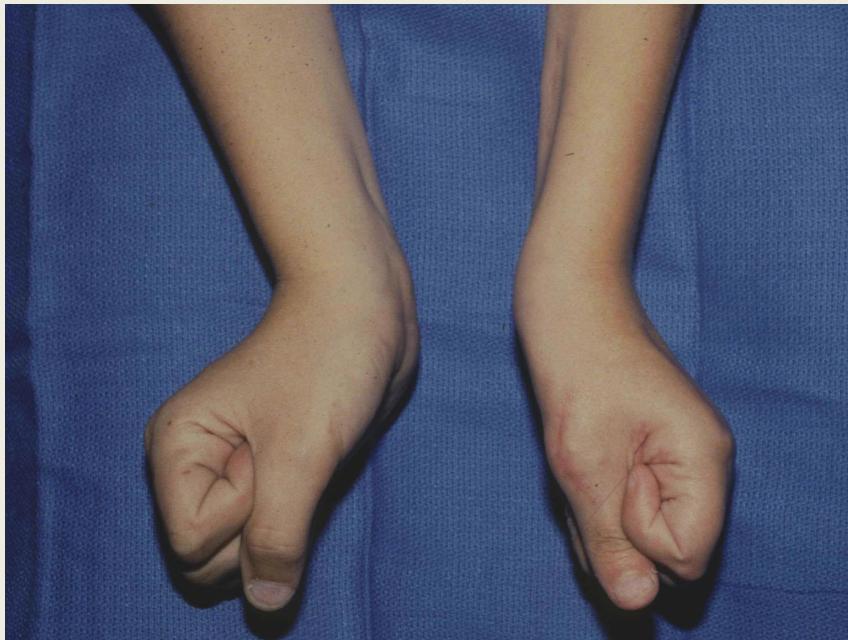
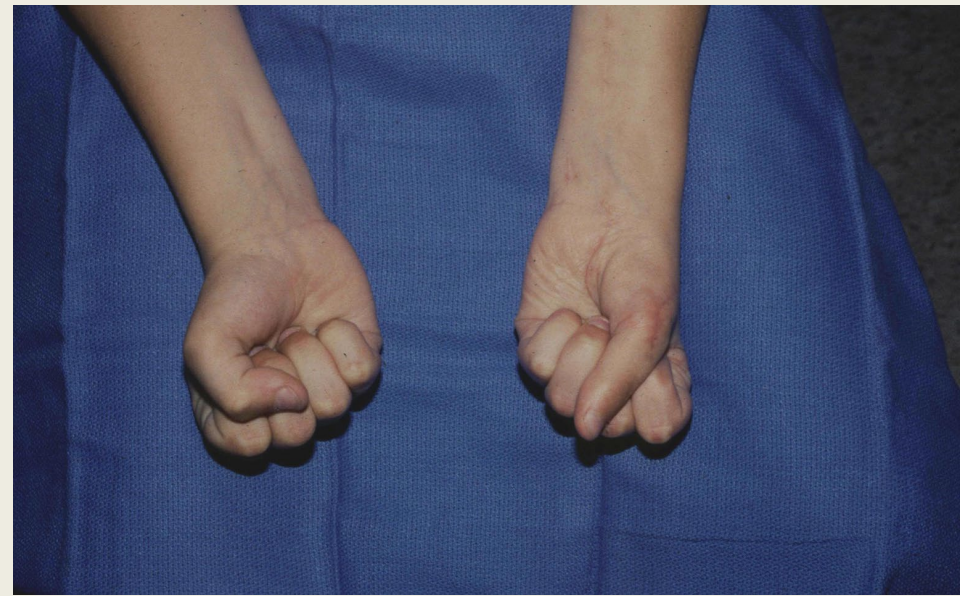
FDS opponensplasty



2 year follow up



Pre op



Pre op

Tissue Loss-Replace with like tissue



Roll over accident, loss of skin and extensor tendon



Rheumatoid Hand

- Complex deformity
- Inflammatory synovitis with cartilage, bone and ligament destruction
- Tenosynovitis with tendon subluxation, rupture
- Progressive deformity, loss of motion, joint subluxation and dislocation, fibrous and bony ankylosis



Surgical Considerations

- Proximal joint Wrist: stable in neutral alignment
- Distal ulna : often the culprit
- Are extensor and flexor tendons intact or ruptured
- MCP joints: Main deformity
- Extensor mechanism disruption
- PIP and DIP joints

Surgery

- Should you operate?
- Single or Multi staged
- Some or all digits
- How aggressive should the surgery be?
- Other joints-shoulder, elbow, hip and knee

Classic RA: 65 y old female



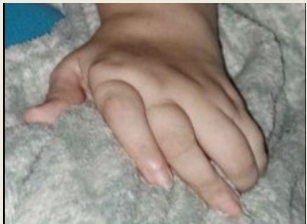


28 year old female with RA

Stage I: wrist, thumb mcp and ip joint arthrodesis

Stage II: Arthroplasty of finger mcp joints





Preop



60 y female neglected contractures prior treatment 15 years ago
Very limited motion



Goals:

Stable and pain free digits in functional position

Staged surgeries
Flexor and extensor tenolysis
PIP release
MCP arthrodesis





Stage I

Stage II



Stage III



Stage II



