Two stage tendon reconstruction

The hand to Shoulder center
The Hand to Shoulder center

LADDER OF RECONSTRUCTION

- Two-stage tendon graft
- Primary tendon graft
- Tendon transfer
- Tenolysis
- Do nothing

Simple

Complex
Single-Stage Flexor Tendon Grafting: FDP and FDS Tendons Disrupted

- **Indications:**
  1. Injuries resulting in segmental tendon loss.
  2. Neglected >3 to 6 weeks with tendon degeneration and scar within the tendon sheath.
  3. Large section of tendon has been damaged in zone 2 injury
  4. Delayed presentation of FDP avulsion injuries associated with significant tendon retraction.
Surgical principles

One graft in each finger.
Never sacrifice intact flexor digitorum superficialis (FDS).
Graft of small caliber.
Perform the junctions outside of the tendon sheath.
Ensure adequate graft tension.
Graft choices

- **Palmaris longus**[1] tendon present in approximately 85% of all individuals of sufficient length and size.
- **Plantaris**[2] when graft length is important. Present in about 93% of population.
- **EDL**[3]
- **EI**[3]
- **EDM**[3]
- **FDS of unaffected finger**[4]

References:
Proximal anchoring

- Tendon weave in any area outside the flexor sheath
- Stronger than the end-to-end suture techniques
- Allow to modulate graft tension

Distal anchoring

- Profundus stump not available:
- Profundus stump available:
The Hand to Shoulder center

- In patients with DIP joint hyperextension, tenodesis or arthrodesis can be offered.

- Postoperative Care
  - Static dorsal blocking splint (4 to 6 weeks) with the wrist neutral, MP joints at 45 degrees, and IP joints neutral.
  - Treat flexion contractures with passive stretching and splinting (6 to 8 weeks).
TWO-STAGE FLEXOR TENDON RECONSTRUCTION:
STAGE I

- Passive tendon implants at first surgery, placement of tendon graft at second surgery

- Indications: Crushing injuries a/w # or skin damage
  - Damaged pulley system
  - Excessive scarring of the tendon bed
  - Failure of previous operations
  - Contracted joints
Technical Points

- 1-cm FDP stump kept & proximal FDP tendon transected at the level of the lumbrical origin.
- Through distal forearm incision identify the involved FDS tendon, draw it into the wound, and transect it near the musculotendinous junction.
- Appropriate size of the silicone implant.
- Assess pulley system.
The Hand to Shoulder center

- Pass implant from proximal palm to distal forearm between the FDP and FDS
- Distal juncture suture applied
- ROM checked

- If implant assumes bowstring posture, pulley reconstruction done by Bunnell encircling method/ Kleinert technique
Postoperative Care: Splint with wrist in 35 degrees of flexion, MP joints at 60 to 70 degrees of flexion, and IP joints extended.

- Start passive motion on first postoperative visit
- Contracture releases may benefit from dynamic splinting (6 to 8 weeks).
TWO-STAGE FLEXOR TENDON RECONSTRUCTION: STAGE II

- **Indication:** Patient who underwent stage I of flexor reconstruction process
- Interval between stages I and II: 2-3 months.
- Hand must be soft, and joints well mobilized.
Surgical principles:
- Implant distal and proximal ends located
- Tendon graft obtained
- Graft sutured to proximal end of implant, and pull it distally through sheath.
- Fix distal juncture and proximal juncture (in palm or distal forearm)
The Hand to Shoulder center