

**Dr. Schmidt**  
**CMC Arthroplasty**

When conservative treatment of thumb osteoarthritis fails to control pain surgical treatment may be indicated. The most common surgical technique involves complete resection of the trapezium. To stabilize the thumb base and address the trapezial void, a ligament reconstruction and tendon interposition (LRTI), also called suspension arthroplasty, is indicated.

In this procedure, the FCR tendon is partially resected and used to reconstruct the beak ligament, restore transverse stability, and interposed in the trapezial void to reduce proximal migration of the thumb column.

**Phase 1 – Maximum Protection 0-4 Weeks**

**Goals for phase 1**

- Immobilize and protect reconstruction
- Pain and edema control
- Educate patient in home program and importance of wearing splint at all times except hand hygiene

**Other considerations**

Patient will most often be referred to therapy for initial therapy visit after his/her 2-week follow-up with surgeon. Patient is usually only seen for one appointment during this initial immobilization phase. This appointment consists of splint fabrication and patient education in ROM of uninvolved joints, edema and scar management.

Patient begins therapy 2-3 visits per week at 4 weeks post-op phase 2.

**Splint**

Forearm-based thumb spica orthosis is fitted for continual wear in the following position:

- Wrist 20 degrees extension, CMC joint midway between palmar abduction and extension, MP joint neutral to slight flexion, IP joint free (allow functional pinch to index finger)
- Do not position thumb in radial abduction.
- Avoid pressure at base of thumb to prevent irritation of dorsal radial sensory nerve (DRSN)

**Edema Management**

- Light compression with edema glove as needed
  - **Do not use tubular digital compression sleeves**
- Elevation
- Manual Edema Mobilization (MEM)

**Scar Management**

- Begin scar massage no sooner than 2 days after suture removal after scar is fully closed with no scabbing present. Begin with light massage using lotion.
- Educate patient in scar management
- Apply scar remodeling products as needed

**AROM**

Initiate AROM to uninvolved joints with splint on 4x/day

- digit ROM (flexor tendon glides, digit abduction/adduction, intrinsic plus)
- thumb IP joint flexion/extension
- elbow and shoulder ROM as needed to prevent stiffness

## Phase 2 –Protect Repair with Controlled ROM 4 - 6 weeks

### Goals for phase 2

- Continue to protect healing repair while restoring pain-free AROM
- Continue scar and edema control

### Other Considerations

Do not allow excessive composite thumb CMC flexion and adduction during this phase as it places stress on the reconstruction.

### Splint

- Continue thumb spica splint between exercise sessions and at night

### ROM

Active ROM is initiated to the wrist and thumb 4x/day

- Wrist all planes of motion
- Thumb CMC palmar and radial abduction, opposition to index finger and middle finger, thumb extension, MP flexion/extension.
- Slowly work from opposition to index and middle fingers toward opposition to ring and small fingers if pain-free. No opposition to base of small finger during this phase.
- If IP joint flexion is limited, may initiate passive IP flexion while supporting CMC joint (instruct patient on PROM to IP joint with splint on to ensure CMC is well-supported)

### Manual Therapy

- Continue phase 1 scar and edema management
- Desensitization if complaints of hypersensitivity in region of radial scar and DRSN

### Modalities

- Fluidotherapy for heat, ROM and desensitization
- Paraffin may be used for deep heat prior to ROM
- Ultrasound for scar management

### **Phase 3 –Maximize Active Range of Motion 6 - 8 weeks**

#### **Goals for phase**

- Restore functional pain-free range of motion
- Continue to control edema and minimize scar adhesions

#### **Other Consideration:**

Although PROM is indicated for joint and soft tissue restrictions, avoid painful ROM and stretching beyond a functional range of motion. The end goal of surgery is to stabilize the thumb for pain-free function.

#### **Splint**

- Continue thumb spica splint between exercise sessions and at night
- During this phase, if patient is compliant and pain-free, the patient may begin to remove the splint for short periods of time for very light functional tasks such as self-cares, folding laundry, and computer work.

#### **ROM**

- Initiate pain-free PROM to wrist and thumb to restore functional motion
- Progress slowly to full opposition to base of small finger as long as it is pain-free

#### **Manual Therapy**

- Continue phase 1 scar and edema management
- Desensitization if complaints of hypersensitivity in region of radial scar and DRSN

#### **Modalities**

- Fluidotherapy for heat, ROM and desensitization
- Paraffin may be used for deep heat prior to ROM
- Ultrasound for scar management

#### **Functional Activity**

- Initiate light prehensile activities in therapy sessions and as long as it is pain-free, and patient is compliant, instruct patient in removing splint at home for light functional tasks for short periods of time only

#### **Strengthening**

- Initiate submaximal pain-free isometrics: thumb CMC palmar abduction, adduction and extension, digit abduction for intrinsic strength

## Phase 4 – Progress to Strengthening and Full Function 8 - 12 weeks

### Goals for phase

- Initiate isotonic strengthening and restore functional strength
- Return to ADL and full duty work

### Splint

- Discontinue forearm based thumb spica splint over a period of a week
- A hand-based thumb spica splint may be fabricated if the patient's daily activities or job requires repetitive manual work
- Issue neoprene CMC support for light support during functional activities as needed

### Other considerations

- Ensure patient is flexing the MP joint during pinching activities. Hyperextension of the MP joint during pinch will place stress on and lead to failure of the reconstruction. If patient is unable to maintain a neutral to flexed MP joint during functional pinch, be sure to communicate this to the surgeon and consider a hand-based MP flexion orthosis to be worn with functional pinching activities.
- Educate patient that symptoms and strength will continue to improve for up to a year after surgery.

### ROM

Continue A/PROM for wrist and hand as needed to restore full functional pain-free motion

### Functional Activity

Gradually over a 4 week period of time, progress from light to higher level functional ADL

### Strengthening

- Initiate isotonic strengthening including weighted wrist and forearm exercises and gentle grip and pinch strengthening with putty
- Strengthen radial wrist flexors if a portion of the FCR was harvested for reconstruction

### Work Conditioning

After 10-12 weeks and with MD consent a comprehensive work conditioning program for patients with high demand / heavy manual labor occupations may be appropriate

## References

1. Ataker, Y., Gudemez, E., Ece, S. C., Canbulat, N., & Gulgonen, A. (2012). Rehabilitation Protocol after Suspension Arthroplasty of Thumb Carpometacarpal Joint Osteoarthritis. *Journal of Hand Therapy*, 25(4), 374-383. doi:10.1016/j.jht.2012.06.002
2. Cannon, N. M., & Schnitz, G. (2001). *Diagnosis and treatment manual for physicians and therapists*. Indianapolis, IN: Hand Rehabilitation Center of Indiana.
3. Kapandji A (1986). "Clinical test of apposition and counter-apposition of the thumb". *Ann Chir Main*. 5 (1): 67–73
4. Mcgee, C., O'brien, V., Nortwick, S. V., Adams, J., & Heest, A. V. (2015). First dorsal interosseous muscle contraction results in radiographic reduction of healthy thumb carpometacarpal joint. *Journal of Hand Therapy*, 28(4), 375-381. doi:10.1016/j.jht.2015.06.002
5. Neumann, D. A., & Bielefeld, T. (2003). The Carpometacarpal Joint of the Thumb: Stability, Deformity, and Therapeutic Intervention. *Journal of Orthopaedic & Sports Physical Therapy*, 33(7), 386-399. doi:10.2519/jospt.2003.33.7.386
6. Sillem, H., Backman, C. L., Miller, W. C., & Li, L. C. (2011). Comparison of Two Carpometacarpal Stabilizing Splints for Individuals with Thumb Osteoarthritis. *Journal of Hand Therapy*, 24(3), 216-226. doi:10.1016/j.jht.2010.12.004

This protocol was reviewed and updated by Misty Carriveau, OTR, CHT and Steven C. Schmidt, MD May 2017.