



ORTHOPEDICS & SPORTS MEDICINE

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Dr. Klika & Dr. Kirkpatrick Metacarpal Fracture with ORIF

Phase 1- Early Protective Phase (0 weeks - 2 or 3 weeks)

Goals for phase 1

- Protect healing fracture and surgical fixation
- Reduce pain & edema

Other considerations

- If multiple digits are involved, a forearm-based safe position splint including all digits may be appropriate

Orthosis

- Forearm-based ulnar or radial gutter orthosis fabricated to immobilize desired metacarpal in intrinsic plus position: wrist 20-30 degrees of extension, MP joints 70 degrees flexion and IP joints full extension
- Orthosis should incorporate injured metacarpal as well as one adjacent finger on both radial and ulnar sides of injured finger.
- IP joints may be kept out of orthosis to promote free IP motion per MD request and as long as there is no evidence of PIP joint extensor lag

ROM

- 1 week: Begin gentle active motion to MP, PIP and DIP joints. All range of motion should be pain-free with focus on tendon glides to prevent adhesions, isolated EDC, and intrinsic exercises
- Initiate gentle ROM to wrist to prevent stiffness

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.
- Silicon and/or elastomer can be applied to incision after suture removal to reduce scar tissue formation
- Micropore or paper tape may be applied longitudinally along scar to reduce and prevent the formation of hypertrophic scarring

Edema Management

- Edema glove or compression sleeves can be applied to hand and digits as needed to reduce swelling
- Soft tissue massage and manual edema mobilization (MEM) administered as needed to reduce pain and decrease swelling respectively.



Phase 2 – Restore Full Range of Motion (2 or 3 weeks - 6 weeks)

Goals for phase 2

- Initiate gentle range of motion while protecting healing fracture fixation
- Continue to resolve pain and edema

Other considerations

- While initiating range of motion, education is vital to prevent patient from over-stretching and increasing edema.

Orthosis

Continue safe position gutter orthosis at all times between exercise sessions

ROM

- Continue phase 1 active motion exercises
- Isolated EDC exercises can be performed with IP joints taped or strapped in composite flexion
- 4 weeks: initiate gentle passive motion to achieve end-range motion, blocked IP joint flexion, reverse blocking and ORL stretching to reduce PIP flexion contractures

Scar and Edema Management

Continue with phase 1 scar massage, manual edema management, and soft tissue massage to reduce scar tissue formation, swelling, and pain

Modalities

- Paraffin bath and fluidotherapy may be utilized to increase tissue elasticity to maximize motion and to desensitize incision site if hypersensitivity is present



Phase 3 – Strengthening Phase (6 - 8+ weeks)

Goals for phase 3

- Restore range of motion
- Initiate progressive strengthening
- Progress patient toward full functional use of the involved hand and return to work if appropriate

Other considerations

- It is always important to monitor for extensor lags when trying to achieve end-range motion.
- If an extensor lag occurs that is greater than 15 degrees, it is important to balance flexor and extensor musculature through exercises and splinting. A forearm-based MP extension orthosis worn at night may reduce the extensor lag. A relative motion orthosis with the affected digit in relative extension worn during the day may also help reduce extensor lag. Exercises should emphasize isolated EDC strengthening, composite digit extension and passive end range MP flexion and aggressive grip strengthening should be avoided.
- Patient may find gel gloves to improve comfort and absorb shock through the hand with activities like using tools that vibrate, racquet sports and bicycling

Orthosis

- Patient may begin to wean from orthosis decreasing 1-2 hours of wear time per day until discontinued completely.
- 7-8 weeks: If needed, a static progressive MP flexion splint may be fabricated to obtain end-range motion if normal interventions are unsuccessful

ROM

- Continue phase 2 active exercises emphasizing isolated EDC exercises and MP flexion
- Gentle passive range of motion may be initiated to achieve full end range motion

Manual Therapy

- Continue with manual therapy techniques from phase 2 if necessary, to maximize range of motion

Strengthening

- Gentle progressive strengthening can be initiated as early as 7 weeks if fracture is healed, and exercises do not increase pain or swelling
- Begin with forearm, wrist and hand isometrics and progress to isotonic strengthening using free weights and resistive putty or hand exercisers

Functional Activity

- Slowly progress from light functional activities to normal work and home management tasks
- After 8 weeks the patient may return to weight bearing, sports and use of tools that vibrate

Work Conditioning

- After 8-10 weeks and with MD consent a comprehensive work conditioning program for patients with high demand / heavy manual labor occupations may be appropriate



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References

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Skirven, T. M., Ostermans, A. L., Fedorczyk, J. M., & Amadio, P. C. (2011). *Rehabilitation of the Hand and Upper Extremity* (Vol. 1). Philadelphia, PA: Elsevier.

This protocol was reviewed and updated by Brian Klika, MD, Lacey Jandrin, PA, Andrew Kirkpatrick, MD, Tiffany Terp, PA, and the Hand Therapy Committee 8/9/2021.