



ORTHOPEDICS & SPORTS MEDICINE

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Dr Klika & Dr. Kirkpatrick

Proximal & Middle Phalanx Fracture with CRPP Phase 1- Early Protective Phase (0 - 2 or 3 weeks)

Goals for phase 1

- Protect healing fracture and surgical fixation
- Reduce pain & swelling
- Promote motion in pain-free range

Other considerations

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

Orthosis

- A custom hand-based ulnar or radial gutter orthosis is fabricated with MP joints at 70 degrees of flexion and IP joints in full extension. Orthosis should include at least one adjacent digit for continual wear. The orthosis is fabricated over the pin so there is no pressure on the pin, or a window is cut for the pin and covered with Velcro or gauze piece for protection

ROM

- 1-week post-op unless the MD orders or progress notes state otherwise: Initiate gentle active-assistive motion in a short arc of motion to MP, PIP and DIP joints. All motion should be pain-free and only to soft tissue restriction. Range of motion at this time is to prevent tendon adhesions and joint contractures while protecting the fracture pinning.
- Initiate ROM to wrist and uninvolved digits to prevent stiffness

Pin Care

- Clean skin around pin site with sterile cotton swab and saline water
- Clean pin post with alcohol swab
- Instruct patient to perform pin care every 8 hours if there is drainage and daily if there is no drainage
- See attached patient education on Pin Site Care

Edema Management

- Soft tissue massage and manual edema mobilization (MEM) administered as needed to reduce pain and decrease swelling
- Digital compression sleeves, retrograde Coban wrap, or edema glove can be applied to hand and digits to reduce swelling (do not apply compression sleeves over pin)



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

Goals for phase 2

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

Other considerations

- To prevent pins from shifting, education is vital to prevent patient from being too aggressive when initiating exercises. Emphasis should be on gentle motion in pain-free range. For noncompliant patients, it may be necessary to perform the range of motion only in the clinic setting until pins are removed.
- It is always important to monitor for extensor lags when trying to achieve end-range motion. If an extensor lag develops, it is important to balance flexor and extensor musculature through exercises and splinting. Exercises should emphasize reverse blocking and extension.

Orthosis

Continue gutter orthosis at all times between exercise sessions

ROM

- Continue active range of motion 4-5 times daily in pain-free range. Reduce frequency if pain or swelling increases.
- It is important to view the X-rays to know the severity and location of fracture before initiating end-range motion. Always check MD orders for variations in the protocol.
- Initially begin with isolated MP/PIP/DIP flexion and extension and progress to composite ROM as well as IP joint blocking exercises as tolerated
- Active differential tendon gliding is important for preventing scar adhesions
- Include reverse blocking exercises for IP extension: place the MP joint in gentle passive flexion and ask the patient to extend the IP joints (care should be taken with proximal phalanx fractures to avoid applying force through the fracture site with this exercise)

Scar and Edema Management

- Continue with phase 1 manual edema mobilization, and soft tissue massage to reduce swelling and pain
- After pin removed and pin site fully healed initiate scar massage

Modalities

- Moist heat as needed to maximize motion
- After pin removal and pin site is fully healed: 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 – Restore Strength and Hand Function (6 - 8 weeks)

Goals for phase 3

- Achieve maximal ROM
- Restore pre-operative strength
- Progress patient toward return to work if appropriate.

Other considerations

- Continue to monitor for extensor lags. If an extensor lag develops it may be necessary to splint the digit in extension at night. A daytime relative motion orthosis with the affected digit in relative flexion may also be helpful in strengthening the extensor mechanism. Exercises should emphasize reverse blocking. End range PIP joint flexion and aggressive grip strengthening should be avoided until extensor lag resolves.
- For PIP joint contractures, consider a static nighttime extension orthosis, dynamic or static progressive PIP extension orthosis for 10-minute sessions 4-5x/day, and/or a relative motion orthosis with the affected digit in flexion worn with activity to strengthen the extensor mechanism. Exercises should emphasize blocked active and passive DIP flexion to stretch the ORL and facilitate migration of the lateral bands dorsal to the axis of the PIP joint and reverse blocking exercises to strengthen the digit extensor mechanism. Avoid end range PIP flexion and aggressive grip strengthening until contracture resolved.

Orthosis

- 6 weeks post-op: patient may begin weaning from orthosis decreasing 1-2 hours of wear time per day until discontinued completely.
- For head and neck fractures, the patient may require additional 2 weeks in a digit extension orthosis
- 8 weeks: If needed, a static progressive or dynamic finger splint may be fabricated to obtain end-range motion if normal interventions are unsuccessful.

ROM

- Initiate gentle passive range of motion to achieve full end range motion if fracture is healing per MD and x-rays
- Continue to emphasize tendon gliding to prevent scar adhesions, reverse blocking, and blocked DIP flexion to help reduce PIP flexion contractures

Continue scar and edema management as needed

Modalities

- Continue with modalities as needed from phase 2

Strengthening

- 7-8 weeks: Gentle progressive strengthening can be initiated 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 and wrist/hand stabilization exercises

Functional Activity

- Slowly progress from light functional activities to normal work and home management tasks
- No weight bearing, sports or use of tools that vibrate until at least 8 weeks post-op
- 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

Cannon, Nancy M. et. al. *Diagnosis and Treatment Manual for Physicians and Therapists*, 5th Ed. The Hand Rehabilitation Center of Indiana. Indianapolis, Indiana. 2021.

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 August 2022.



Pin Site Care Post-Operative Instructions

What you will need:

A new box of Q-tips/swabs

Saline water (or contact lens solution)

Alcohol Swabs

Sterile cup

Instructions:

- 1) Wash your non-operative hand, or if someone is assisting you, have them wash their hands with soap and water.
- 2) Pour some saline into the sterile cup
- 3) Dip a clean swab into the saline water. Never double dip with the same swab once it has touched the pin or skin – this can contaminate the solution.
- 3) Start at the pin site and clean your skin by moving the swab away from the pin (to always move any germs away from the pin site) Remove any dried drainage or debris away from the pin site and off the skin using your swab
- 5) Dip another swab into the water and sweep the next section/side of the pin. You will likely use 3-4 swabs to clean one pin
- 6) Open an alcohol swab and if able clean the post of the pin to the level of the skin but avoiding rubbing alcohol directly on skin.

Repeat this process every 8 hours if there is drainage or daily with no drainage. Do not provide additional products to your pin site unless directed by your provider. Your pin site will likely be wrapped in a Xeroform dressing and gauze while it heals.

Signs/Symptoms of Infection

Please contact the physician's office right away if you experience:

- 1) Increased pus drainage (yellow/green and thick) or drainage with an odor
- 2) Increased pain at pin site
- 3) Body fever over 100 F
- 4) Increased redness at pin site or red lines in the skin streaking out from the pin site

**Also contact the physician's office right away if you feel that your pin has become loose, or you notice any movement.