Postoperative Treatment for Open Repair of Complex Patella Fractures-- Dr. Trueblood

**Indications:** Displaced fractures of the patella result in disruption of the knee’s extensor mechanism, a significant impairment to the leg’s normal function. Articular disruptions greater than 2mm predispose patients to developing patellofemoral osteoarthritis. While non-displaced fractures are usually treated nonoperatively, displaced injuries are almost always treated surgically. Severely comminuted fractures with impaction of the articular surface may be treated with limited internal fixation, partial patellectomy, and advancement of the extensor mechanism into the bony defect.

**Technique:** The patient is positioned supine on an operating table and an anterior incision is made over the patella. Full thickness flaps are elevated and the fracture is exposed. Limited retinacular releases may be used to optimize exposure and the joint is irrigated copiously with normal saline to remove loose fragments of bone and hematoma. The fracture is inspected and any impacted segments of joint surface are elevated and supported with synthetic bone-graft substitute. The dominant fragments are then reduced to one another and secured provisionally with drilled, steel wires. Interfragmentary screw fixation is used to compress fragments together and contoured plates are then placed over the dorsal surface of the patella and secured with locked fixation to neutralize rotational forces around the fracture planes. In some cases, severely comminuted or impacted fractures are not amenable to internal fixation. These fragments are excised and a locked, suture construct is placed within the extensor mechanism. These are then passed through drill holes in the remaining patella and are tied over bone bridges to compress tendon against the bone’s surface. The reduction is assessed and tested with gentle passive motion of the knee and the wound is irrigated copiously with normal saline. The retinaculum is then repaired with non-absorbable stitch and the skin closed in layers. Wounds are cleaned and dried and sterile, gentle compression dressings are applied. The patient is placed into a knee immobilizer with the knee fully extended. Most patients are discharged on the day of surgery.

**RED FLAGS FOR DELAYED/ NONUNION RISK:**
- High energy mechanism.
- Open fracture.
- Tobacco Abuse.

**Postoperative Precautions:**
- PT assessment for gait training/ fall prevention in postoperative recovery.
- Full-time use of knee immobilizer. May weight bear as tolerated in the knee immobilizer.
- Dressing stays on until first follow-up. Keep dressing clean and dry.
- Patients with risk factors for venous thromboembolism (obesity, history of previous DVT,
limited mobility) are started on Lovenox 40mg sq daily for 3 weeks on POD1. Lower risk patients may be managed on Aspirin 325mg po bid starting on POD1.

1st follow-up visit 10-14 days after surgery--
- Wound assessment. Stitches out and steri-strips are applied.
- Pain Assessment. Refill pain medications as needed.
- Work Note: Sedentary work. May not drive. Must wear brace at work.
- Therapy Referral- Start at 4 weeks after surgery.
- Schedule follow-up visit at 6 weeks after surgery.
- Expected Return to Work:
  - Sedentary/Cognitive: 2 weeks
  - Medium Duty: 8 weeks
  - Heavy Manual Labor: 3-4 months.

Phase 1 Therapy (Protect Repair, Prevent Stiffness)
Therapy 1-2 x/ week x 6 weeks, Starting 4 weeks from the day of surgery.
- Immobilization: Knee immobilizer on at all times except when doing ROM exercises.
- ROM:
  - Active/ Active assisted knee flexion to max of 90 degrees
  - Passive extension only (prone positioning or family/ therapist assistance)
- Strengthening:
  - Straight leg raises in knee immobilizer only.
  - Isometric hip abductor exercise.
  - Advance to quad sets in knee immobilizer at 4 weeks after surgery.
- Gait training in knee immobilizer. Fall prevention.
- Scar Massage
- Modalities prn
- HEP

2nd office visit at 6 weeks after surgery--
- X-ray: AP and lateral of knee.
- Pain Assessment. Refill pain medications as needed.
- Therapy Referral
  - If bridging bone seen on lateral and patient nontender over patella, advance to Phase 2
  - If no bridging bone seen and/or patella is still tender to palpation, continue Phase 1 and return to clinic in 2 weeks
- Work Note: Sedentary work. May not drive. Must wear brace at work.
  - Phase 1: Sedentary work. May not drive. Must wear brace at work.
Phase 2: Light duty. No prolonged standing (>1 hour). May wean from brace as tolerated. No lifting, pushing, or pulling.

- Advance to Medium duty at 8 weeks. Lifting up to 50# once, 25# for repetitions.

- Schedule follow-up visit at 12 weeks after surgery.

- Expected Return to Work:
  - Sedentary/Cognitive: 2 weeks
  - Medium Duty: 8 weeks
  - Heavy Manual Labor: 3-4 months.

Phase 2 Therapy
1-2x/ week for 6 weeks

- **Immobлизation:** Wean from knee immobilizer as tolerated

- **Range of Motion**
  - Active/ Active Assisted ROM
  - PROM
    - ITB stretching
    - If knee flexion <60 degrees at 8 weeks after surgery, start static progressive splinting for flexion.
    - If knee flexion contracture >15 degrees at 6 weeks, start serial extension splinting.

- **Strengthening**
  - Continue quad sets/ isometrics with VMO emphasis.
  - Start short arc quadriceps strengthening, closed chain exercise only.
  - Isotonic hip abductor exercise with theraband, ankle weights

- **Gait training.** Wean from knee immobilizer and assistive devices as tolerated.

- **Modalities prn**
  - HEP
  - May d/c to HEP when knee arc of motion is 0-140 degrees and patient is independent with home exercise program.
  - Advance to work conditioning for patients with heavy, manual labor jobs when quad strength is 80% contralateral and arc of motion is 0-140 degrees.

Third office visit at 10-12 weeks--

- X-ray: 3 views of knee (AP, lat, Merchant)
- Functional Assessment: Knee Society Score
- Work note: No restrictions
- Continue therapy if still dependent on therapist for stretching or strengthening. Work conditioning as needed.
- Uncomplicated cases: f/u prn