Postoperative Treatment of Clavicle Open Reduction with Internal Fixation--Dr. Trueblood

**Indications:** Many clavicle fractures may be successfully treated without surgery. Fractures with shortening greater than 2 centimeters are at increased risk for nonunion and, even if they do heal, will often result in chronic anterior shoulder pain and decreased pushing strength due to a fixed scapular protraction deformity. Multiply injured patients may also benefit from operative stabilization of the clavicle to facilitate early motion and optimization of independence.

**Technique:** A transverse incision is made parallel to the clavicle, 1 cm inferior to the clavicle. Full thickness flaps are elevated off of the platysma and the platysma is then incised parallel to the skin incision but at the level of the clavicle. As the platysma is elevated, blunt dissection allows for identification and mobilization of the supraclavicular nerves. These are protected for the duration of the case. Extraperiosteal dissection is used to expose the clavicle and the fracture is mobilized. Butterfly fragments are reduced and fixed with interfragmentary fixation. A contoured plate is then applied dorsally to neutralize the construct. Transverse fractures are repaired with a compression plate. The wounds are irrigated and then closed in layers with special care taken in reapproximating the platysma. Sterile dressings are applied and the patient placed into a sling, extubated, and transferred to the recovery room. This procedure, if an isolated issue, is usually performed as an outpatient.

**Postoperative Limitations:**
- Sling use day and night.
- No lifting, pushing, or pulling with operative extremity.
- No weight-bearing to operative extremity.
- Patient may allow arm to dangle at their side with the elbow extended.
- Patient may remove dressing on postoperative day 3 and may shower. Water runs off the skin and the incision is patted dry with a clean towel. The patient is not to apply antibiotic ointment, lotions, or other emollients to the incision. No scrubbing or irritation of the incision is allowed.

*Physical Therapy starts 5-7 days after surgery--*

**Phase 1 (Protect repair site, regain active and passive ROM)**
PT 1-2x/ week x 6 weeks
- AROM/AAROM with lawnchair progression
- PROM of shoulder with pulley exercises for HEP
- Isometric rotator cuff and periscapular muscle activation
- Modalities prn
- HEP
1st postoperative visit 2 weeks after surgery--
- Wound check.
- Assess pain control. Refill pain medications as needed.
- Review postoperative limitations.
- Work note: No lifting, pushing, or pulling. May drive personal vehicle at 4 weeks after surgery if no longer taking narcotic pain medications. May type and write.
- Renew therapy note (Phase 1)
- Next follow up at 4 weeks after surgery.
- Expected return to work:
  - Sedentary/ Cognitive: 2 weeks
  - Light Labor: 6 weeks
  - Heavy Labor 10 weeks

2nd followup at 6 weeks after surgery--
- X-ray: AP clavicle and serendipity views.
- Pain assessment. Refill pain medications as needed.
- If bone bridges 3+ cortices on x-ray and no tenderness over fracture site, advance to Phase 2 therapy. Next follow-up at 10 weeks after surgery.
- If bone bridges <3 cortices or persistently tender, then continue non-weightbearing and no pushing/pulling and follow up every 2 weeks until union is achieved, then advance to Phase 2 therapy.
- Work Note (Phase 2): No overhead lifting. 20# weightlifting. No contact sports.
- Expected return to work:
  - Sedentary/ Cognitive: 2 weeks
  - Light Labor: 6 weeks
  - Heavy Labor 10 weeks

Phase 2 Therapy (Regain Strength and Normalize Activity)
1-2 x/ week x 6 weeks
Range of Motion: AROM/ PROM of shoulder, elbow, wrist, and hand. Emphasize pec minor stretching and scapular retraction posture.
Strengthening (low resistance and high repetitions):
- Rotator Cuff and Scapular Stabilization Strengthening
  - IR/ER in scapular plane
  - Start in low dynamic positions and advance as tolerated when there are no compensatory/ substitution patterns
    - sidelying ER with towel roll
    - theraband ER at 30° abduction
theraband IR at 0, 45, and 90° of abduction
  ○ Full-can scapular plane raises with good mechanics
  ■ advance to elevation in other planes when full elevation is achieved
    ● flexion/extension/abduction/adduction at increasing angles of elevation
  ○ Prone rowing at 30/45/90 degrees of abduction to neutral arm position
  ○ Pushup plus (wall → counter → knees on floor → floor)
  ○ Forward punch
  ○ Cross body diagonals with theraband
  ○ Rhythmic stabilization drills
  ● Initiate biceps curls with light resistance, progress as tolerated
  ● Initiate resisted supination/pronation
  ● Modalities prn
  ● HEP

Advance to Phase 4 (Strengthening and Return to Vigorous Activity) when:
  ● All phase 3 exercises can be performed without pain and with good coordination.
  ● Chest height lifting, pushing, and pulling performed without limits

**Phase 3 Strengthening (usually 10-12 weeks after surgery):**
AROM/PROM of shoulder, elbow, wrist, and hand as needed.
Strengthening:
  ● Progress isotonic strengthening as tolerated by pain and maintenance of mechanics
  ● Advance strengthening above 90° when strength is 5/5 below 90°
  ● Transition to sport/work specific strength and conditioning program as tolerated. Add upper body weight lifting exercise as tolerated for low resistance and 20 repetitions per set.
    ○ Patients with heavy manual laboring jobs or jobs requiring extensive climbing or overhead lifting may benefit from formal work conditioning/hardening at this time. Please contact Dr. Trueblood’s office via Leslie Hedge, RN at (573)388-3026 to make the appropriate arrangements.
  ● Reassure patient that, with consistent effort, their strength and endurance should continue to improve noticeably for the next 6-8 months.

Modalities prn
HEP

Next clinic visit at 12 weeks after surgery--
  □ Assess ROM and Strength
  □ DASH and ASES Scores
  □ Return to Work: No limitations.
For patients with unusually high demand occupations, advance to work conditioning/hardening as needed. Follow-up visit in 4 weeks if this is ordered.

Follow-up prn for majority of patients.