

Rehabilitation s/p UCL Repair with Internal Brace

Saint Louis University- SSM Health Physical Therapy Orthopedic Residency
in Collaboration with SLUCare Physicians



SLUCare[®]
Physician Group

Physician Referral for Physical Therapy	
Patients Name:	Date:
Referring DX: s/p Ulnar Collateral Repair with Internal Brace	
Recommended Frequency: 2 visits/week	Total Duration
Return to throwing no earlier than:	

These guidelines, treatments, and milestones have been established to assist in guiding rehabilitation based on the most current available evidence. They are not intended to be a substitute for sound clinical judgement with consideration of the individual contextual features of the patient and the demands of various functions/ sports

Overview:

The ulnar collateral ligament (UCL) does not play a large role in elbow stability for most activities of daily living, but it does undergo tremendous stresses with overhead throwing and is susceptible to injury in overhead athletes.¹⁻³ Candidates for repair are most commonly younger (pre-professional) and present with either a proximal or distal UCL tear with minimal mid-substance damage.^{4,5} As compared to a UCL reconstruction, the UCL repair with internal bracing allows for expedited rehabilitation and quicker return to throwing while maintaining the integrity of the repair.⁵⁻⁷

Guideline

Timeline	Goals	Treatment Recommendations
Phase 1 (Week 0-1)	<ul style="list-style-type: none"> ➤ Protect integrity of surgical repair ➤ Reduce pain and inflammation ➤ Maintain/ achieve full wrist ROM ➤ Minimize atrophy of upper quarter 	<ul style="list-style-type: none"> • Use of Brace <ul style="list-style-type: none"> ○ Adjustable brace fixed at 90°^{5,7} ○ Remove brace as needed during therapy • Manual Therapy <ul style="list-style-type: none"> ○ Stretching of wrist flexors⁷ ○ Stretching of wrist extensor⁷ ○ Grade I & II mobilizations of the elbow (avoid valgus stress)^{6,7} • Therapeutic Exercise <ul style="list-style-type: none"> ○ Pain free submaximal isometrics for wrist and shoulder (arm at side, neutral rotation, avoid IR for 1st week)⁷ ○ Postural exercises as indicated

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		<ul style="list-style-type: none"> ○ Scapular training with manual resistance⁷ ● Modalities as needed
Timeline	Goals	Treatment Recommendations
Phase 2 <i>(Week 2 –5)</i>	<ul style="list-style-type: none"> ➤ Progress to full elbow ROM with minimum goal of 10°-125°. ➤ Minimal pain and tenderness ➤ Good isometric strength testing with the wrist, elbow, and shoulder ➤ Maintain aerobic fitness ➤ Address and develop any core, balance and kinetic chain deficits that can attribute to undue stress to the elbow 	<ul style="list-style-type: none"> ● Use of Brace <ul style="list-style-type: none"> ○ Brace may be removed during therapy, for hygiene and for home exercise program ○ Week 2: Set to allow 30°-110° of flexion^{5,7} ○ Week 3: Set to allow 10°-125 flexion^{5,7} ○ Week 4: Set to allow unrestricted ROM^{5,7} ● Manual Therapy <ul style="list-style-type: none"> ○ Scar and soft tissue mobilization as needed⁷ ○ PROM/ AAROM for elbow and wrist⁷ ○ Mobilizations as indicated⁷ ● Therapeutic Exercise <ul style="list-style-type: none"> ○ Core and lower extremity training ○ Aerobic activity (including upper bicycle ergometer) ○ Active (light) concentrics for periscapular muscles, muscles of the GH joint, elbow, wrist flexors and pronators. Introduce 10 days postoperatively^{5,7} ○ Throwers Ten for comprehensive strengthening of shoulder complex. Introduced week 3 or later for tissue healing^{5,7} ○ When full elbow range of motion is achieved and the patient can complete the entire Throwers Ten series, consider progressive closed chain strengthening^{9,10} prior to initiation of plyometrics in Phase 3 ○ Long duration stretching for up to 15 minutes per session (60 total minutes per day) and/or functional splinting if having difficulty regaining elbow extension⁷
Timeline	Goals	Treatment Recommendations
Phase 3 <i>(Week 6-8)</i>	<ul style="list-style-type: none"> ➤ Full, nonpainful elbow AROM outside of the brace ➤ No pain or tenderness to palpation 	<ul style="list-style-type: none"> ● Brace <ul style="list-style-type: none"> ○ Discharge elbow brace at week 6 or once all goals from phase 2 are met (whichever is later)⁷ ● Manual Therapy

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	<ul style="list-style-type: none"> ➤ 70% strength of the involved shoulder (suggest 10 rep max testing) ➤ Maintain full UE mobility ➤ Coordinated kinetic chain involvement during single arm training 	<ul style="list-style-type: none"> ○ Scar and soft tissue mobilization as needed ○ Mobilizations as indicated ● Therapeutic Exercise <ul style="list-style-type: none"> ○ Introduce challenges to the trunk/ hip while training the involved arm <ul style="list-style-type: none"> ▪ Stability of surface, single leg, contralateral extremity sustained holds, etc. ○ Initiate Advanced Thrower's Ten⁷ ● Plyometrics^{5,7} <ul style="list-style-type: none"> ○ Two hand plyometrics starting week 6, progress to one handed at week 8 <ul style="list-style-type: none"> ▪ (chest passes, side throws, soccer throws, wall dribbles, rebounder throws)
Timeline	Goals	Treatment Recommendations
Phase 4 (Week 9-14)	<ul style="list-style-type: none"> ➤ Advanced strengthening, power training, endurance training and neuromuscular control ➤ Introduction to interval throwing program pending satisfactory strength & clinical exam 	<ul style="list-style-type: none"> ● Therapeutic exercise <ul style="list-style-type: none"> ○ Aggressive eccentric & plyometric training⁷ ○ May begin machine-based resistance training at week 10⁷ <ul style="list-style-type: none"> ▪ (chest press, rows (horizontal and vertical), throwers 10 exercises) ● Baseball consideration <ul style="list-style-type: none"> ○ May begin interval hitting as early as week 10 and interval throwing by week 11 pending that criteria to begin long toss has been met (see below)^{5,7} <ul style="list-style-type: none"> ▪ Intention of interval throwing program is to systematically introduce greater intensity and workload to allow for safe return to sport¹¹

Precautions/ Additional Information

- Reported complications in the literature include ulnar nerve neuropraxia (most common), stich abscess, infection, elbow flexion contracture and repair failure.^{2,5,7}
- Muscle tendon forces of radialis longus, radialis brevis and digitorum superficialis decreases forces to the UCL.^{7,12}
- Full elbow extension, pronation, shoulder flexion and IR/ER are required for throwing athletes prior to returning to sport to minimize stresses to the UCL.⁷
- Due to the relationship of lower extremity kinematics to the upper extremity
 - Consider Y balance testing and subsequent balance retraining if indicated.¹³

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- Example exercises: single leg lawn mower, single leg body blade, single leg wall exercises.
- Impairments throughout the kinetic chain need to be addressed prior to return to throwing, as limitations proximally and in the lower extremity will result in excessive forces on the newly repaired ligament when return to throwing is initiated. ¹⁴⁻¹⁶
- Pitchers will typically take longer than positional players for return to sport ¹

Treatment Progression

- Outcome tools
 - Suggested minimum score of 85 on the Kerlan-Jobe Orthopedic Clinic (KJOC) prior to return to throwing. ^{7,17}
- Return to Throwing Consideration
 - Pitchers typically generate greater than intended forces when throwing at perceived workloads, use of a radar gun may help to mitigate this. ¹⁸
 - Return to play may be able to occur sooner (tennis, volleyball) or later (Javelin) than traditional baseball timeframes due to variations in physiologic demands. ¹
 - Considerations for wearable technology if available to monitor for workload. ¹¹

Return to Throwing

- Suggested warm up of 1 set of exercises (including Thrower's Ten and neuromuscular control drills) prior to throwing. ^{7,19}
- Criteria to begin a long toss program. ⁷
 - Full nonpainful ROM (within 5° of nonthrowing shoulder, shoulder horizontal adduction of 40° or greater, elbow and wrist ROM WNL)
 - Strength (MMT, handheld dynamometer or iso): ER/ IR of 72%-76%, ER abduction ratio 68% to 73%, Throwing shoulder compared to nonthrowing- IR greater than 115%, ER greater than 95%, elbow flexion/ extension 100%-115%, wrist strength 100%-115%
 - Clinical exam: no pain, tenderness, or effusion. Negative laxity (prone valgus stress and milking maneuver, negative shoulder & elbow special tests)
 - Functional tests:
 - Prone ball drop- 110% (Position-prone, shoulder abducted to 90°, elbow extended, palm facing floor. Athlete instructed to quickly release & catch a 2lb plyometric ball as many times as they can in 30 seconds. Scoring- record total successful catches per arm. Goal to have 110% of the catches in throwing arm compared to nonthrowing. Example if nonthrowing arm is 20, goal for throwing arm is 22)
 - One-arm ball throws against wall with 2lb plyoball for 30 seconds without pain and ability to maintain in 90°/90° position
 - Throws into Plyoback rebounder with 1lb plyometric ball for 30 seconds without pain
 - Single leg step downs for 30 seconds with good pelvic and lower extremity control that is symmetrical between limbs
 - Prone plank for time- Goal time of 90 seconds or greater
- Interval throwing gradually increased from 45 ft to 60 ft and then by 30 ft up to 180 ft. ¹⁹

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- Program indicates throwing at each stage for 2-3 separate practices without pain or symptoms before progressing to the next stage. (13 stage for non-pitchers, 15 stages for pitchers) For details see Reinold 2002.
- Return to sport is typically between 5-7 months post-surgery and is decided upon by ability to complete return to throwing tests, the rehabilitation team's opinion and the physician's opinion.^{5,7}

Appendix

Thrower's Ten

1. Diagonal-pattern D2 Extension & Flexion
2. Shoulder external rotation & internal rotation at 0° of abduction
3. Shoulder scapular abduction, external rotation (full can)
4. Sidelying shoulder external rotation
5. Prone shoulder horizontal abduction
6. Prone shoulder horizontal abduction (full ER 100° abduction)
7. Prone Rowing
8. Prone rowing into external rotation
9. Press-ups
10. Push-ups
11. Elbow Flexion & Extension
12. Wrist: extension, flexion, supination, pronation

Advanced Thrower's Ten⁸

Band Resisted

1. Shoulder ER/ IR at 0° abduction while seated on a stability ball*
2. Shoulder extensions while seated on a stability ball~~
3. Lower trapezius isolation while seated on a stability ball~~
4. High row into shoulder external rotation while seated on a stability ball~~
5. Biceps curls/triceps extensions while seated on a stability ball~~

Dumbbell Resisted

6. Full can while seated on a stability ball~~
7. Lateral raise to 90° while seated on a stability ball~~
8. Prone T's on stability ball~~
9. Prone Y's on stability ball~~
10. Prone row into external rotation on stability ball~~
11. Sidelying shoulder external rotation
12. Wrist flexion/ extension and supination/pronation

Key

* Contralateral sustained hold during exercise

~~ Exercise performed in 3 continuous patterns per set: 1) bilateral active for 10-15 reps, 2) alternating reciprocal 10-15 reps, 3) sustained contralateral hold for 10-15 reps (30-45 total reps per set divided over 3 movement patterns is equal to one set. 2 cycles would be a total of 60-90 reps in volume per exercise)

Goal is to perform 2 cycles of entire program without pain

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<p>For Questions regarding the patient's medical care, new orders, or insurance questions:</p> <p>please contact your physician's office directly</p>	<p>For additional questions, comments, or concerns regarding the implementation of these physical therapy guidelines, please contact</p> <p>Chris Sebelksi, PT, DPT, PhD, OCS, Director of the SLU-SSM Health Physical therapy Residency 314 977 8724 OR chris.sebelksi@health.slu.edu</p>
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