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Rehabilitation and Return-to-Play Criteria Following Ulnar Collateral Ligament Reconstruction

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Elbow injuries in overhead athletes, particularly ulnar collateral ligament (UCL) injuries to baseball pitchers, continue to increase in number. The reasons for these injuries are multifactorial but typically result from a combination of severe and repetitive valgus elbow stress from pitching large volumes and throwing at peak velocities. These factors and the severity of medial elbow injuries to the UCL complex make it critical to employ a proper criteria-based rehabilitation program in combination with a well-structured set of return-to-play criteria. Together, the rehabilitation process and return-to-play program provide a set of guidelines that help ensure a safe and effective process to aid in returning a throwing athlete back to unrestricted competition as efficiently as possible. This article provides the reader with a 4-phased, criteria-based rehabilitation program for the athlete following UCL reconstruction and a structured set of return-to-play guidelines. The return-to-play progression is a 3-step process that assists in advancing an athlete back to unrestricted competition via a performance, practice, and play sequence. This program uses specific criteria and activities to progress a throwing athlete from high-level performance training, to controlled practice participation and then finally back to play. The program uses not only specific steps but also a combination of testing parameters both subjective and objective to guide the return through the entire rehabilitation process from UCL reconstruction surgery back to unrestricted symptom-free throwing.

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Introduction

Injuries to the elbow joint in the overhead throwing athlete, and especially the baseball pitcher, continue to increase in frequency.^{1,2} There are numerous proposed and documented causes for this increase in incidence.^{1,2} With the rise in elbow injuries, it is important for the clinician to successfully treat and return the individual back to sports safely and reduce their risk

of reinjury. Thus, a thorough and well-structured return-to-play criteria is imperative to ensure a safe return to play.

Overhead throwing athletes subject their elbows to severe and repetitive valgus stress. The ulnar collateral ligament (UCL), particularly the anterior band of the anterior oblique ligament of the UCL complex, which is the primary soft tissue restraint to valgus stress, is commonly injured during the act of throwing.³ Chronic UCL insufficiency results from microscopic tears and attenuation.⁴ Studies have indicated that the valgus stress at the elbow during the acceleration phase of throwing can be as high as 64 N-m, which exceeds the ultimate tensile strength of the UCL.³ Patients report pain and soreness in the medial elbow with throwing, usually in the late cocking or early acceleration phases or with ball release. Athletes often report an episode of sudden onset of pain and “giving way” during throwing. The most common situation is an acute exacerbation of a chronically injured ligament.

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Table 1 Postoperative Rehabilitation After Ulnar Collateral Ligament Reconstruction Using an Autogenous Palmaris Longus Graft

Phase I: immediate postoperative phase (weeks 0-3)

Goals: Protect healing tissue, reduce pain and inflammation, retard muscle atrophy, and protect graft site to allow healing.

(1) Postoperative week 1

- Brace: posterior splint at 90° elbow flexion
- Range of motion (ROM): wrist active range of motion (AROM) extension/flexion immediately postoperative
- Elbow ROM: day 1
- Elbow postoperative compression dressing: 5-7 days
- Wrist (graft site) compression dressing: 7-10 days as needed
- Exercises:
 - Gripping exercises
 - Wrist ROM
 - Shoulder isometrics (no external rotation [ER] of the shoulder)
 - Biceps isometrics
- Cryotherapy: to elbow joint and to graft site at the wrist

(2) Postoperative week 2

- Brace: elbow ROM 25°-100° (gradually increase ROM by 5° extension/10° flexion per week)
- Exercise:
 - Continue all exercises previously listed
 - Elbow ROM in brace (30°-105°)
 - Initiate elbow extension isometrics
 - Continue wrist ROM exercises
 - Initiate light scar mobilization over distal incision (graft)
- Cryotherapy: continue ice to elbow and graft site

(3) Postoperative week 3

- Brace: elbow ROM 15°-115°
- Exercises:
 - Continue all exercises previously listed
 - Elbow ROM in brace
 - Initiate active ROM for wrist and elbow (no resistance)
 - Initiate light wrist flexion and stretching
 - Initiate active ROM for the shoulder:
 - Full can exercises
 - Lateral raises
 - External rotation/internal rotation (ER/IR) exercises with tubing
 - Elbow flexion/extension
- Initiate light scapular strengthening exercises
- May incorporate bicycle workouts for lower extremity strength and endurance

Phase II: intermediate phase (weeks 4-7)

Goals: gradually advance to full ROM; promote healing of repaired tissue; regain and improve muscle strength; restore full function of graft site.

(1) Week 4

- Brace: elbow ROM 0°-125°
- Exercises:
 - Begin light-resistance exercises for the arm (0.5 kg [1 pound]):
 - Wrist curls, extensions, pronation, and supination
 - Elbow extension/flexion

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