



## Case Report

DOI: 10.36959/987/249

# Rapid and Successful Rehabilitation and Return to Play for a Division 1 Gymnast after Treatment for Recalcitrant Lateral Epicondylitis with Ultrasound Guided Percutaneous Tenotomy

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## Abstract

We present a novel case of an 18-year-old Division 1 college gymnast with recalcitrant lateral elbow pain. His symptoms were refractory to conservative care including NSAIDs, bracing and formal rehabilitation. This athlete had a percutaneous tenotomy performed. After a specific rehabilitation protocol, he was able to return to full Division 1 athletics two months after the procedure. This case is unique secondary to the patient being an elite athlete and his rapid return to the intensity and requirements of competing in Division 1 sports. We also define the rehabilitation protocol that we employed as this may have also influenced his rapid and complete return. This specific rehabilitation protocol may potentially guide future rehabilitation protocols after the Tenex procedure for recalcitrant lateral epicondylitis.

## Keywords

Tenex, Lateral epicondylitis, Exercise protocol

## Key Points

There are no established guidelines for rehabilitation after percutaneous tenotomy for chronic tendinopathies.

Successful return to play for elite level athlete 8 weeks after procedure.

Rehabilitation protocols may serve as a guide for future patients.

## Introduction

Lateral epicondylitis is a common chronic condition affecting the extensor carpi radialis brevis and common wrist extensor tendons. It has been noted in both occupational and sporting activities. While this condition is often referred to lateral epicondylitis and tendinitis, histological examination would support the terms lateral epicondylitis and tendinosis. Findings of angiofibroblastic hyperplasia and collagen disarray indicate a poorly healing process rather than an acutely inflamed process of the tendon [1]. Secondary to this, alternative treatments to cortisone have been explored. In fact, there are a multitude of treatments proposed for this condition including but not limited to pro-inflammatory injections, bracing, rehabilitation, shock wave therapy and surgery. There are varying degrees of success of these treatments with no “gold standard” being identified. Sonographic guided percutaneous ultrasonic tenotomy and debridement (Tenex) has emerged as a viable treatment option for this chronic condition. This pro-

cedure emulsifies the tendinotic/pathologic tissue with a continuous slow saline inflow and then the tissue is selectively suctioned out in a closed collecting system. Tenex is an outpatient procedure and is minimally invasive, requiring little downtime. Prospective and retrospective studies and case reports have been published on this procedure demonstrating positive outcomes [2-5]. There are no established rehabilitation protocols after the Tenex procedure. Thus, we illustrate the rehabilitation protocol that we employed in our athlete that permitted complete return to the rigors of Division 1 athletic competition in just 8 weeks after this intervention.

## Patient Information

L. A. is an 18-year-old male freshman varsity gymnast with lateral elbow pain for 7 months. He was seen for his pre-participation physical examination in July 2018 and reported

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**Accepted:** April 15, 2020

**Published online:** April 17, 2020

**Citation:** Walrod B (2020) Rapid and Successful Rehabilitation and Return to Play for a Division 1 Gymnast after Treatment for Recalcitrant Lateral Epicondylitis with Ultrasound Guided Percutaneous Tenotomy. Arch Sports Med 4(1):184-186

**Table 1:** Rehabilitation protocol.

	Week 1 (0-7 days)	Week 2 (7-14 days)	Week 3 (14-21 days)	Week 4 (21-28 days)	Week 5 (28-35 days)	Week 6 (35-42 days)
<b>Passive ROM</b>	Elbow flexion & Extension - 3' each Wrist Flexion & Extension - 3' each	Same as week 1, add forearm pronation and supination	Same as week 2	Same as week 2	Same as week 2	Same as week 2
<b>Active ROM</b>	On day 4- Introduce Elbow/ Wrist flexion & extension - 3' each	Same as week 1, add forearm pronation and supination	Same as week 2	Same as week 2	Same as week 2	Same as week 2
<b>Exercises</b>	None	Isometric wrist and elbow flexion and extension	Isometric, Isotonic, Eccentric wrist and elbow extension	Isometric, Isotonic, Eccentric wrist and elbow extension	Begin to incorporate joint integrated movements.	Progress joint integrated movements. Begin to incorporate sport specific training
<b>Avoid</b>	Sustained gripping	Sustained gripping	Exercises that force non-neutral grip	Exercises that force non-neutral grip	Exercises that force non-neutral grip	None.
<b>Manual Therapies</b>	None	None	None	Soft tissue manipulation or Graston Technique	Soft tissue manipulation or Graston Technique	Soft tissue manipulation or Graston Technique
<b>Post Activity</b>	Ice 20'	Ice 20'	Ice 20'	Ice as needed	Ice as needed	Ice as needed

these chronic symptoms. His symptoms were refractory to rest, activity modification, formal physical therapy, acupuncture and an elbow sleeve.

## Clinical Findings

Physical examination revealed full ROM of the elbow and wrist. He had pain at the lateral epicondyle and this was worse with resisted wrist extension, third finger extension and supination. He was neurovascularly intact. The athlete was recommended formal rehabilitation under the guidance of the Athletic Training team at the University. He was also given Naproxen 500 mg twice daily for 2 weeks. He had negative X-rays at this time as well.

## Time line

The student-athlete was compliant with supervised rehabilitation for 8 weeks but his symptoms persisted.

## Diagnostic assessment

An MRI was obtained which revealed thickened and intermediate signal within the common tendon of the forearm extensor muscles compatible with tendinosis. A superimposed partial-thickness tear of the origin of the common forearm extensor was also evident at the posterior margin. Additional treatment options were reviewed with the student athlete including continued rehabilitation, activity modification, autologous blood injection, Platelet Rich Plasma (PRP) injection, and percutaneous tenotomy (Tenex).

## Therapeutic intervention

After a detailed discussion of the treatment options and

anticipated rehabilitation and time off of gymnastics, the patient wanted to proceed with Tenex. He underwent the procedure on 09/28/2018. His rehabilitation protocol was as follows:

**Rehabilitation protocol:** The protocol is summarized in Table 1. Day one of the rehabilitation protocol involved changing bandages and passive range of motion (PROM) of elbow flexion and extension. Day four of the program started active range of motion (AROM) of elbow flexion and extension to compliment the PROM. On day seven status- post-procedure the patient began to incorporate wrist flexion and extension as well as forearm pronation and supination to stretching regimen. The patient began isometric strengthening exercises for wrist and elbow flexion and extension on day 10. Exercises were started at low sets (1-2) and repetitions (8-10) with 3 second contraction holds. Rest was encouraged as needed before beginning next repetition or set. On day 16 the patient was instructed to begin adding eccentric and isotonic wrist extension and flexion exercises with the primary goal of building muscle endurance. The patient completed moderate sets (2-4) and high repetitions (10-15). These various types of contractions and exercises were continued for two weeks as weights and frequency progressed slowly.

Once all exercises could be performed in a pain free manner the patient was then introduced to joint integrated movements such as bicep curls, chest press, rows, pull ups and push-ups beginning at five weeks status- post-procedure. All of these movements were completed with a neutral grip of the wrist to avoid stressing the wrist extensors. The patient was also introduced to an endurance type exercises utilizing a five gallon bucket filled with dry rice grains. The exercise

focused on all aspects of wrist range of motion (ROM) and strengthening with 1 minute intervals of turning the rice. The final step of return to sport and activity was to complete handstand progressions and holds. The patient began on the floor with a flattened wrist position for the first few days before he could progress to utilizing the parallettes which would allow for more extension of the wrist in the handstand position. At week 4, soft tissue mobilization techniques were incorporated including the Graston Technique and massage therapies.

The student athlete progressed well. In follow-up on 12/05/2018 he reported no pain at rest or with full activity and his strength and ROM were normal. He was able to return to full Division 1 athletic gymnastic practice on 12/05/2018 and then competed in the season opening competition on 01/12/2019. He continues to participate in Division 1 gymnastics through the 2020 season with no limitations from this lateral elbow pain.

## Discussion

This case illustrating percutaneous tenotomy for chronic lateral epicondylitis is unique for 2 reasons. First, we describe successful return to high level competition in the form of Division 1 Athletics for chronic and refractory lateral elbow pain. Second, we describe a specific rehabilitation protocol that allowed for rapid return to full practice in 2 months. Typically, patients are given activity and lifting restrictions for about 6 weeks following this procedure but these can vary depending upon physician preference. Often, no formal rehabilitation guidelines are provided. When given, recommendations are often vague with no strong recommendation of when the patient can safely return to activities such as ADLs. There are no specific guidelines with respect to return to high level activities like Division 1 athletics. There are no published standard of care guidelines on specific rehabilitation protocols after the Tenex procedure from the manufacturer nor has such recommendations appeared in the literature.

In addition, often the outcomes measures in the published studies on Tenex for lateral epicondylitis are VAS and Q-DASH scores and patient satisfaction. Published studies on the Tenex procedure have not reported on outcomes measuring return to high level activity such as Division 1 athletics.

Secondary to our successful and rapid treatment success to high level activities, clinicians should consider employing the treatment and rehabilitation protocols illustrated above after percutaneous tenotomy for recalcitrant lateral epicondylitis. Further studies will be needed to determine if similar treatment protocols will be applicable to additional indications for the Tenex procedure such as medial epicondylitis, patella tendinosis, gluteal tendinosis and achilles tendinosis.

## Clinical Bottom Line

There are no established guidelines or protocols to guide clinicians or patients after undergoing a percutaneous tenotomy. In this case report, we outline a specific rehabilitation protocol that resulted in rapid and complete return to high level sporting activities.

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**DOI: 10.36959/987/249**