

Evidence Based Approach to the Treatment of Lower Extremity Tendinopathy

Cage SA, Gallegos DM, Eilers MA, Warner BJ

**The University of Texas at
★ TYLER**

Thank you



PICO Question

- **Patients** – Subjects suffering from lower extremity tendinopathy
- **Intervention** – Eccentric exercises
- **Control** – Conventional treatment
- **Outcome** – Reduction in pain and disability

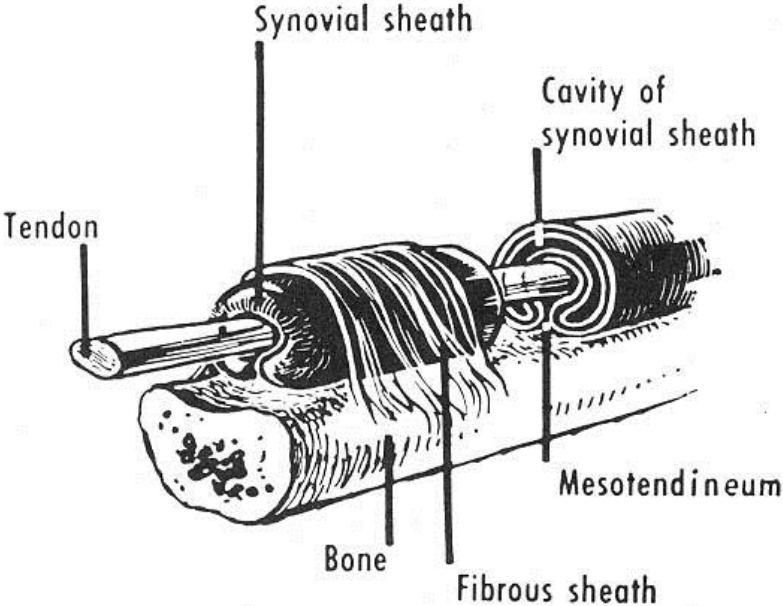


Outline

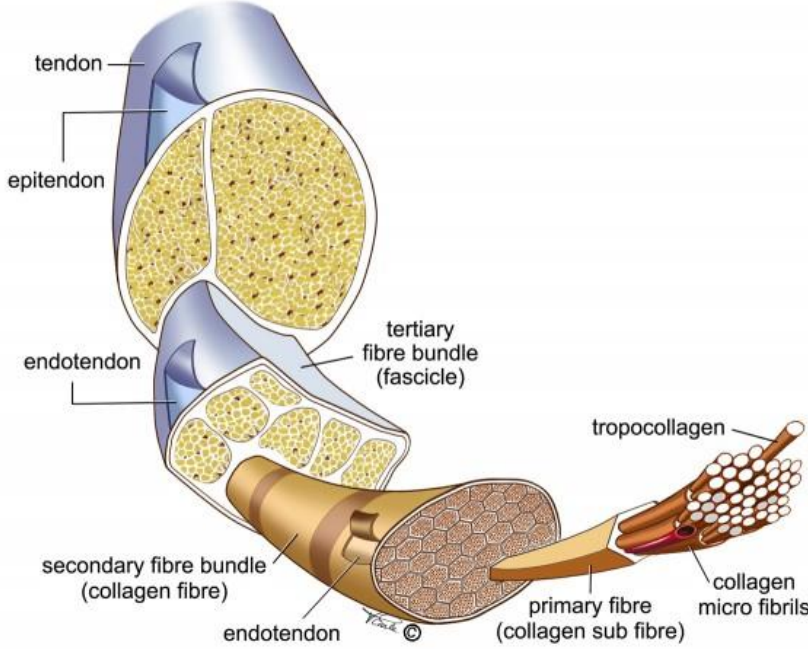
- Relevant anatomy
- Common sites
- Risk Factors
- Common treatments
- Eccentric exercise
- Experiential and anecdotal treatments
- Conclusions



Relevant Anatomy

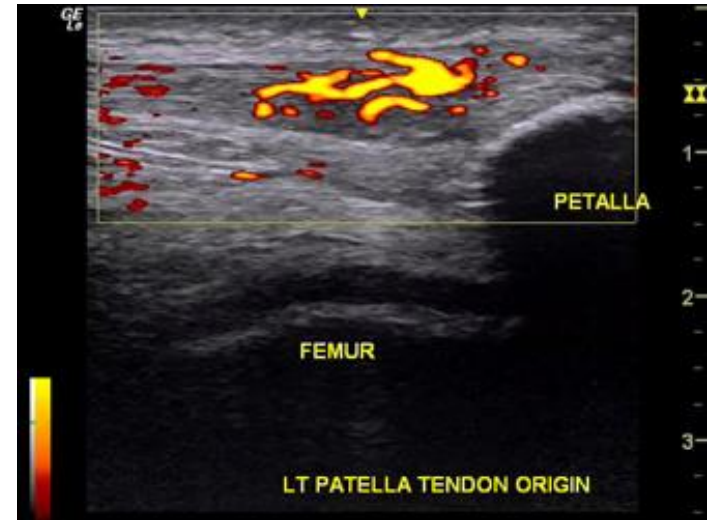


Relevant Anatomy



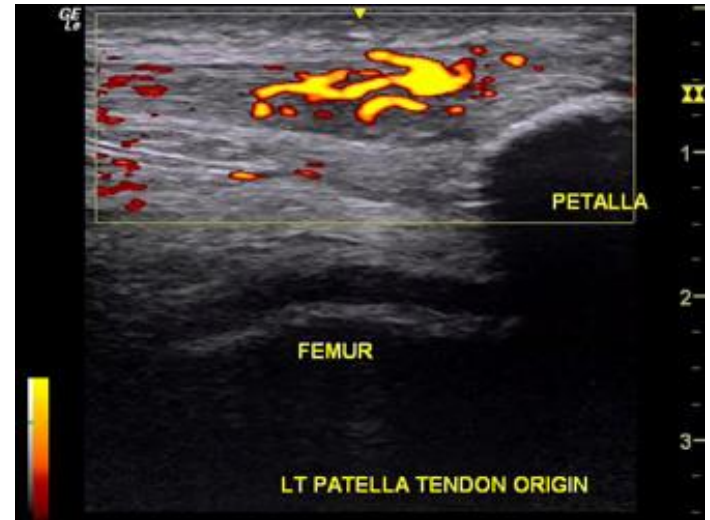
Relevant Anatomy & Physiology

- Failed healing process:
 - Degenerative changes of the hierarchal tendon structure
 - Neovascularization
 - Nerve growth



Relevant Anatomy & Physiology

- Also leads to:
 - Discontinuous collagen fibers
 - Disorganization in blood vessel distribution



Common Sites

- Achilles Tendon
- Patellar Tendon
- Quadriceps Tendon
- Peroneal Tendons



Risk Factors

- Age
- Gender
- Obesity
- Excessive Training



Risk Factors

- Genetic factors
 - Siblings of rotator cuff injury patients are five times more likely to sustain a rotator cuff injury than healthy controls
 - Blood type O
 - No significant causative gene



Risk Factors

- Achilles Tendinopathy
 - Over pronation
 - High arches
 - Under developed hamstrings
 - Changes in footwear



Risk Factors

- Patellar Tendinopathy
 - Knee range of motion
 - Quadriceps strength
 - Muscle length



Common Treatments

- Very little high level evidence to support any treatments
- Reducing load on the tendon has been shown to slow the progression of tendinopathy
 - NOT ELIMINATION
- No evidence to support OR refute the use of cryotherapy



Common Treatments

- Taping
- NSAIDs
- Heel lift



Common Treatments

- **Corticosteroid Injections**
 - Shown to reduce pain
 - Concerns over effects on tendon integrity
 - Dexamethasone show to have a paradoxical effect on tendon stem cells



Common Treatments

- Platelet rich plasma
 - Key components of PRP are the platelets
 - Platelets have long been recognized to maintain tissue hemostasis
 - May release a wide range of bioactive growth factors



Common Treatments

- Platelet rich plasma
 - Advantages:
 - No known adverse effects
 - Simple to prepare
 - Simple to administer
 - Reported to induce proliferation of tendon stem cells



Common Treatments

- Platelet rich plasma
 - MUST be prepared properly
 - PRP containing leukocytes can induce scar tissue formation



Eccentric Exercises

- Becoming the principal non-surgical treatment for tendon injuries



Bayer, et al, 2015

- Achilles tendinopathy patients
- Measured VAS and Level of Function
- 3x15 repetitions of unilateral exercises while standing on a step
 - Bent knee
 - Straight knee
- Performed 2x daily for 12 weeks



Bayer, et al, 2015

- Significant improvements for both pain and function
- Is 12 weeks practical for our population?
- How long do we need to perform these exercises to achieve the effects we are seeking?



Balius, et al, 2016

- Achilles tendinopathy
- Measured pain and function
- Same protocol as Bayer



Balius, et al, 2016

- Meaningful results by the 12 week mark
- Authors asserted that eccentric exercise was the gold standard for non-operative treatment
- What percentage of your season would 12 weeks be?



Peterson, et al, 2014

- Assessed patients with lateral elbow tendinopathy
- Compared concentric vs. eccentric exercises
 - Upper body disability
- Found that eccentric exercise group had a faster decrease in pain
- Can we transfer this information to the lower extremity?



Stasinopoulous, et al, 2011

- Patellar tendinopathy
- Assessed pain and function
- Found that a combination of eccentric exercises and static stretching began to show significant positive effects on pain and functions at the 4 week mark



PICO Question

- **Patients** – Subjects suffering from lower extremity tendinopathy
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**Do we have more questions than
answers?**



New Questions

- How much of a factor does the location and size of a tendon play?
- What is our threshold for surgical intervention?
- How long is too long for results to begin to show themselves?



New Questions

- How much of a factor does the location and size of a tendon play?
 - Possibly
 - Achilles tendinopathies appear to take long to respond to eccentric exercises than patellar tendinopathies
 - Could be due to tensions placed on tendon?



New Questions

- What is our threshold for surgical intervention?
 - No agreed upon factors for decision making
 - Choice must be patient centered
 - As always, treat surgery as a last result



New Questions

- How long is too long for results to begin to show themselves?
 - Context specific
- Consider:
 - Patient values
 - Time in season
 - Years of participation remaining
 - Age



Experiential and Anecdotal Treatments



Cupping Therapy

- Ancient modality
- Utilizes suction from various means
 - Air
 - Fire



Cupping Therapy

- Shown to:
 - Increase blood flow
 - May help “restart” inflammation process
 - Decrease pain
 - No adverse effects



Cupping Therapy

- Utilized with most of our musculotendinous conditions
- Good results with regards to:
 - Pain
 - Range of motion
 - Spasm
 - Myofascial adhesions



IASTM

- Instrument used to mobilize tissues
- Provides mechanical advantage
 - Deeper penetration
 - Less stress on clinician



IASTM

- Used to treat:
 - Pain
 - Loss of function
 - Myofascial adhesions
 - Scar tissue



IASTM

- May help with “restarting” the inflammation process
 - Could help give tendons another opportunity to heal properly
- May disrupt disorganized collagen
 - Could give collagen another opportunity to align properly
- Has been used to good effect in our clinic



Quiz Time

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Question 1

- Which of the following is NOT a common site of lower extremity tendinopathy?
 - Achilles Tendon
 - Patellar Tendon
 - Psoas Tendon
 - Peroneal Tendon



Question 1

- Which of the following is NOT a common site of lower extremity tendinopathy?
 - Achilles Tendon
 - Patellar Tendon
 - **Psoas Tendon**
 - Peroneal Tendon



Question 2

- True/False: There is evidence to support that changes occur at the histological level in patients suffering from tendinopathy.



Question 2

- **True**/False: There is evidence to support that changes occur at the histological level in patients suffering from tendinopathy.



Question 3

- **True/False: Concentric strengthening exercises have been shown to reduce symptoms of tendinopathy as well as eccentric strengthening exercises.**



Question 3

- True/**False**: Concentric strengthening exercises have been shown to reduce symptoms of tendinopathy as well as eccentric strengthening exercises.



Question 4

- **True/False: Incorporation of cupping therapy as an adjunct treatment has been anecdotally shown to decrease pain and allow for more effective therapeutic exercise in patients suffering from tendinopathy.**



Question 4

- **True**/False: Incorporation of cupping therapy as an adjunct treatment has been anecdotally shown to decrease pain and allow for more effective therapeutic exercise in patients suffering from tendinopathy.



Question 5

- Which of the following is NOT a CONVENTIONAL treatment for lower extremity tendinopathy?
 - Ice/Cryotherapy
 - Therapeutic Exercise
 - Activity Modification
 - Cupping Therapy



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- Which of the following is NOT a CONVENTIONAL treatment for lower extremity tendinopathy?
 - Ice/Cryotherapy
 - Therapeutic Exercise
 - Activity Modification
 - **Cupping Therapy**



References

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Questions

