Evidence Based Approach to the Treatment of Lower Extremity Tendinopathy

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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?

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

• 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?
Stasinopoulos, 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
Question 1

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


Questions