NON OPERATIVE APPROACH TO THE TORN ACHILLES TENDON: A REHABILITATION PERSPECTIVE

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Outline

• History
• Anatomy
• Diagnosis
• Literature
• Rehab program
History

• Since the beginning of the 20th century, the treatment of Achilles tendon rupture was treated non-operative
  • Various Immobilization and Limited Success
• 1920’s: operative treatment increased (Quenu and Stoianovitch)
• 1953: Christiansen reported better results after surgery but no statistically significant difference vs. non-operative
• 1972: Lea and Smith published data that supported non-operative approach
• 1981: Nistor recommended that a rupture of Achilles tendon should be treated without surgery
Acute Achilles Tendon Rupture Diagnosis

• AAOS guidelines
• The physical examination should include two or more of the following tests to establish the diagnosis of acute Achilles tendon rupture
  • Clinical Thompson test (Simmonds squeeze test)
  • Decreased ankle plantar flexion strength
  • Presence of a palpable gap (defect, loss of contour)
  • Increased passive ankle dorsiflexion with gentle manipulation
Achilles Tendon Total Rupture Score: ATRS (Nilsson-Helander 2007)

• Patient-reported instrument with high reliability, validity, and sensitivity for measuring outcome after treatment in patients with a total Achilles tendon rupture
• Score ranges from 17-100
• Healthy subjects range from 94-100 with mean of 99.8
Surgical vs. Non Surgical (Nistor 1981)

- 105 patients from 1973-1977 in Sweden
- Non-surgical treatment
  - Shorter morbidity, no hospital stay
- The frequency of major complications was about the same in both groups of patients
  - Two re-ruptures in surgical group
  - Five re-ruptures in the conservatively treated patients.
- I concluded that non-surgical treatment offers advantages over surgical treatment.
Operative vs Non-operative treatment (Cetti)

• Study out of Denmark
• 156 patients 1982-1984
• Re-rupture
  • 5.4% in surgical
  • 14.6% non operative
• Prefer surgical treatment but non operative acceptable
Non-operative functional management of tendo Achilles rupture (Wallace)

- 945 patients from 1996-2008
- Mean age 49yo
- Overall rate of re-rupture 2.8%
- All re-ruptures occurred in first 3 months
- 6 patients underwent operative repair and this was related to increased tendon lengthening
Randomized Controlled Trial: Surgical vs. Non Surgical (Nilsson-Helander 2010)

- ATRS at 6 months/12 months
  - 72/88 non surgical group
  - 71/86 surgical group
- Re-ruptures
  - 6 non surgical
  - 2 surgical
- Function of Injured Leg Significantly Decreased vs. Uninjured in both groups at 12 months
- Early mobilization favored better outcome
Surgical vs. Non Surgical (Olsson)

- AJSM 2013; 100 patients, mean age 40yo
- 5 re-ruptures in non surgical group, all happening 5 to 12 weeks after initial injury
- 6 patients in the surgical group had a superficial wound infection
- No statistically significant differences in ATRS scores, FAOS ADL, and QOL measures across the two groups
- Also, no significant difference in drop jump and hopping comparing side to side
Early WB in Non-Operative Achilles Tear

- Ecker AJSM 2016
- Equinus cast and rehab boot for Early WB
- 114 patients followed for 12 months between 1996-2013
- Results
  - 11 re-ruptures, 8 traumatic, 3 non-traumatic
  - All happened 6-12 weeks after injury
  - Inverse correlation between increased tendon length and calf muscle weakness
Early WB with Non-Operative Achilles Rupture (Barfod 2014)

- Randomized Controlled Trial
- Early WB (orthosis/ 3 wedges) in one group and non WB for 6 weeks in second group
- Overall Re-rupture rate 9%
- ATRS @ 12 months
  - Early WB 73%
  - Control 74%
- Heel Rise Work injured vs. uninjured @ 12 months
  - Early WB 53%
  - Control 58%
Achilles Rupture and Trends in Military Population (Renninger)

- Military population Achilles injuries 2001-2014: 57 patients
- Operative vs. Nonoperative
- Operative management patients returned to duty an average 1 ½ months earlier than nonoperative
- 2011 12% managed nonoperatively
- 2012 57% managed nonoperatively
- 2013 84% managed nonoperatively
Incidence of Achilles Tendon Repair (Matilla)

- Finnish study from 1987-2011 on incidence of Achilles tendon repair
- 2007-2011
  - Men 42% Higher incidence of managing Achilles non-operatively
  - Women 55%
  - 18-39yo 35%
  - 40-59yo Almost 50%
Rehabilitation Progression

WHAT DO YOU CALL KEVIN BACON WITH NO ACHILLES TENDON?

FOOTLOOSE
Rehabilitation Progression (Ecker/Olsson)

• 0-2 weeks
  • Ambulation in a boot with wedges
  • Use of two crutches

• 2-6 weeks
  • Continued ambulation in boot, crutches PRN
  • SL Stance
  • Leg Press (Bil/Unil)
  • Stationary Bike

• 6 weeks
  • Ankle ROM (static/ dynamic)
    • Knee in flexion
    • No stretching Achilles for 6 months

• 8 weeks and beyond
  • Shoes with heel lift
  • Seated/ standing heel raise (50% weight bearing) progression
  • PF/ Supination/ Pronation with theraband
  • Squats (fitness ball behind back)
  • Balance exercise: level surface
Rehabilitation Progression

• 10 weeks
  • Continue above program
  • Seated Heel Raises (HR) with weight
  • Standing HR on two legs: progress to one
  • HR in leg press
  • Balance exercises unsteady surface
  • Step, walk slowly
  • Cable machine standing leg lifts
• 12 weeks
  • Continue above program and walk 20min/day

• 16-18 weeks and beyond
  • Start with gentle jogging
  • Start with two-legged jumps and increase gradually
  • Double Leg Heel Raise @ 3 months
  • Single Leg Heel Raise @ 4 months
  • 1 Legged Hop @ 5 months
  • 6 months: patient allowed unrestricted mobilization and participation in all sports and terrains permitted (pending functional testing: ex. hop tests/isokinetic strength tests)
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Considerations

• Re-ruptures all seem to happen in the first three months
• Bracing important during early weight bearing
• Increased tendon length correlates with greater chance of failure
• No stretching 6 months
• Different protocols may produce better outcomes
References

- Wallace RGH et al. The non-operative functional management of patients with a rupture of the tendo Achillis leads to low rates of re-rupture. BJBJS. October 2011: 1362-1366.
References

- Olsson N et al. Stable Surgical Repair With Accelerated Rehabilitation Versus Nonsurgical Treatment for Acute Achilles Tendon Rupture. AJSM. Volume 41 Number 12 2013: 2867-2875.
Thank you!