

COA- Achilles Tendon Ruptures



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No Disclosures



“I don’t get nothing from
nobody, including my wife.”

-Bill Hamilton



Achilles Rupture



Response to Injury

“...this tendon (Achilles), if
bruised or cut,
causes the most acute fevers, induces choking, deranges the
mind and at length
brings death.”

-Hippocrates



Achilles Anatomy

- Spirals 90 degrees
- Collagen I and Elastin
- Surrounded by paratenon



Achilles Anatomy

Blood Supply

- Musculotendinous junction
- Bone-Tendon junction
- Paratenon
- Anterior vascular bed



Achilles Anatomy

Blood Supply

- Relative avascular zone between 2cm and 6cm proximal to the tendon insertion
- “Watershed Zone”

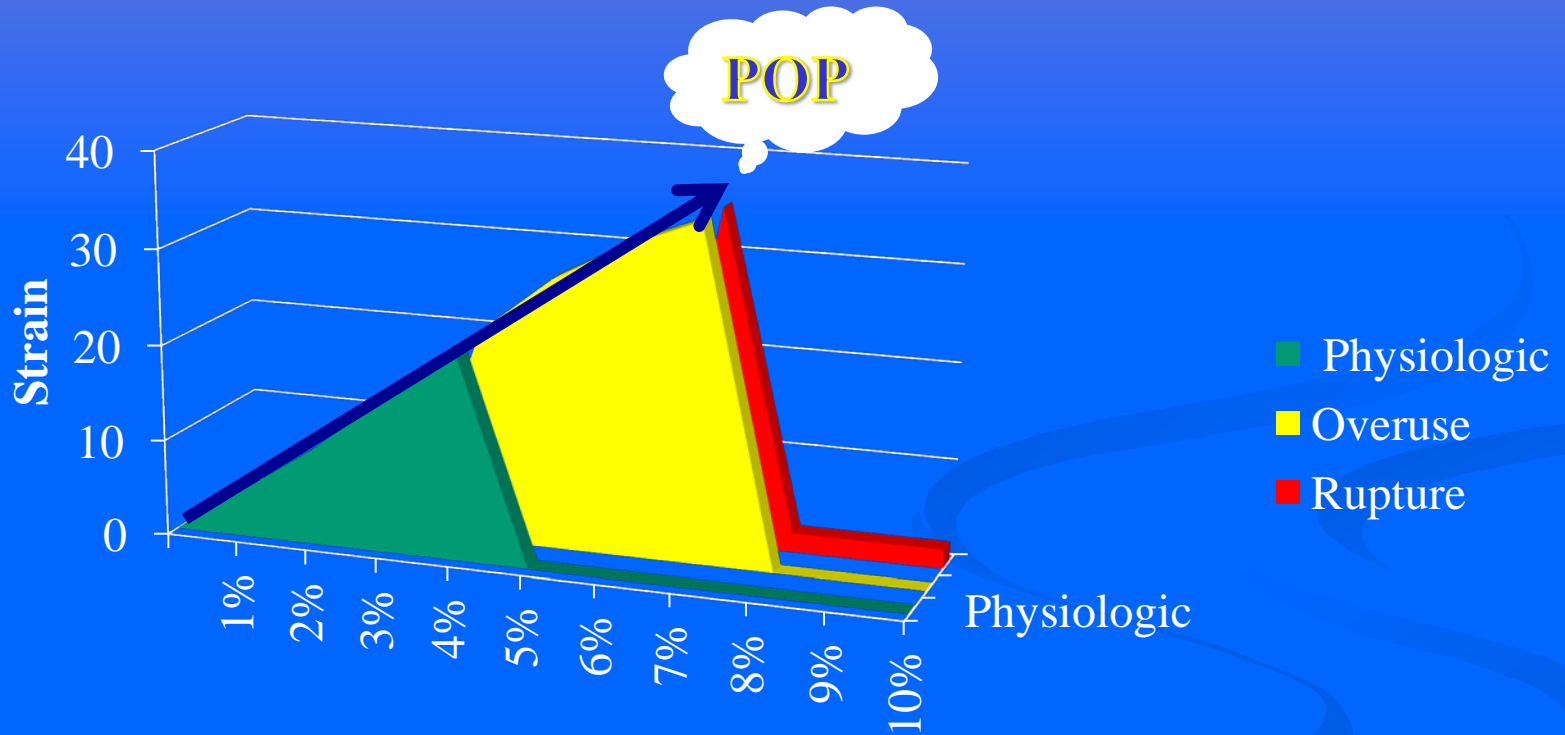


Achilles Peak Forces

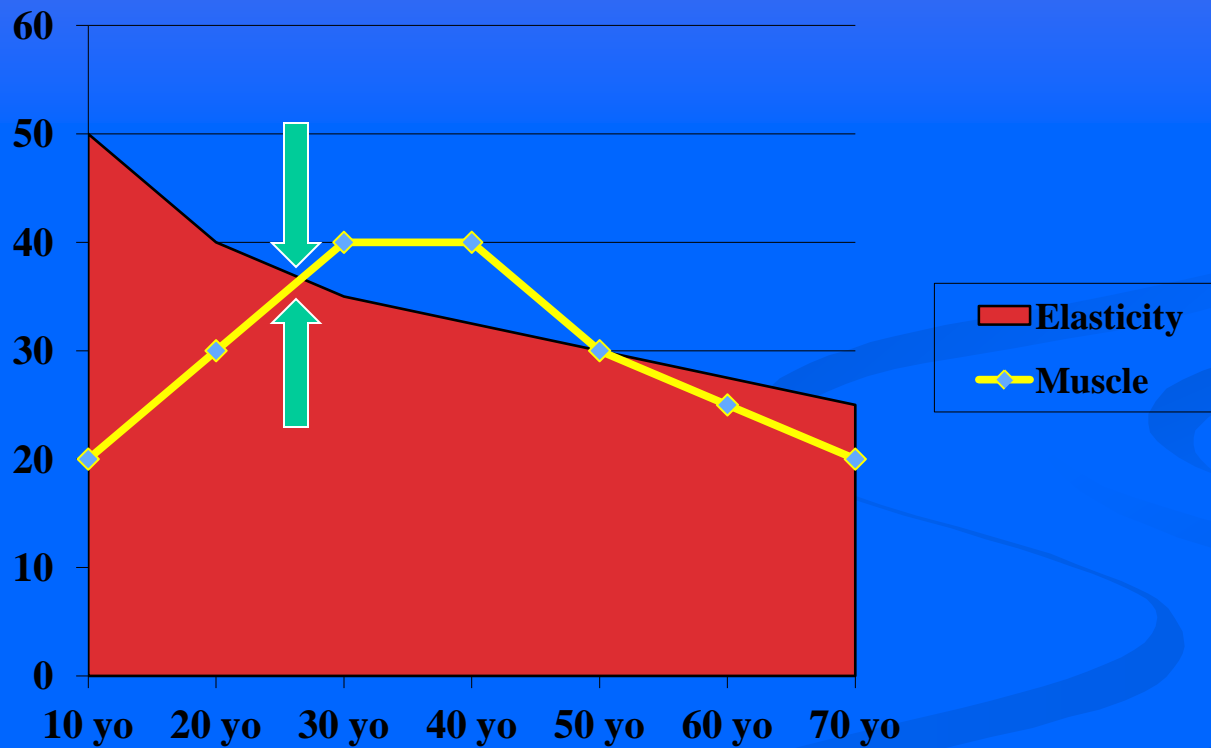
12.5 X body weight



Length and What Happens



Muscle Force / Elasticity Mismatch



Achilles Exam

- Thompson Test
- Palpable Defect
- Contralateral Sag
- STAMP- **S**Tand **A**nd **M**aintain **P**lantarflexion



Achilles Rupture Treatment Goals

- Normal Resting Length
- Minimal Complications
- Get the Ends to Touch and Stay Touching
- Avoid Re-rupture
- Avoid Infection



Achilles Rupture Treatment Options

- Open Treatment
- Cast / Dynamic Brace
- Percutaneous
- Minimally invasive



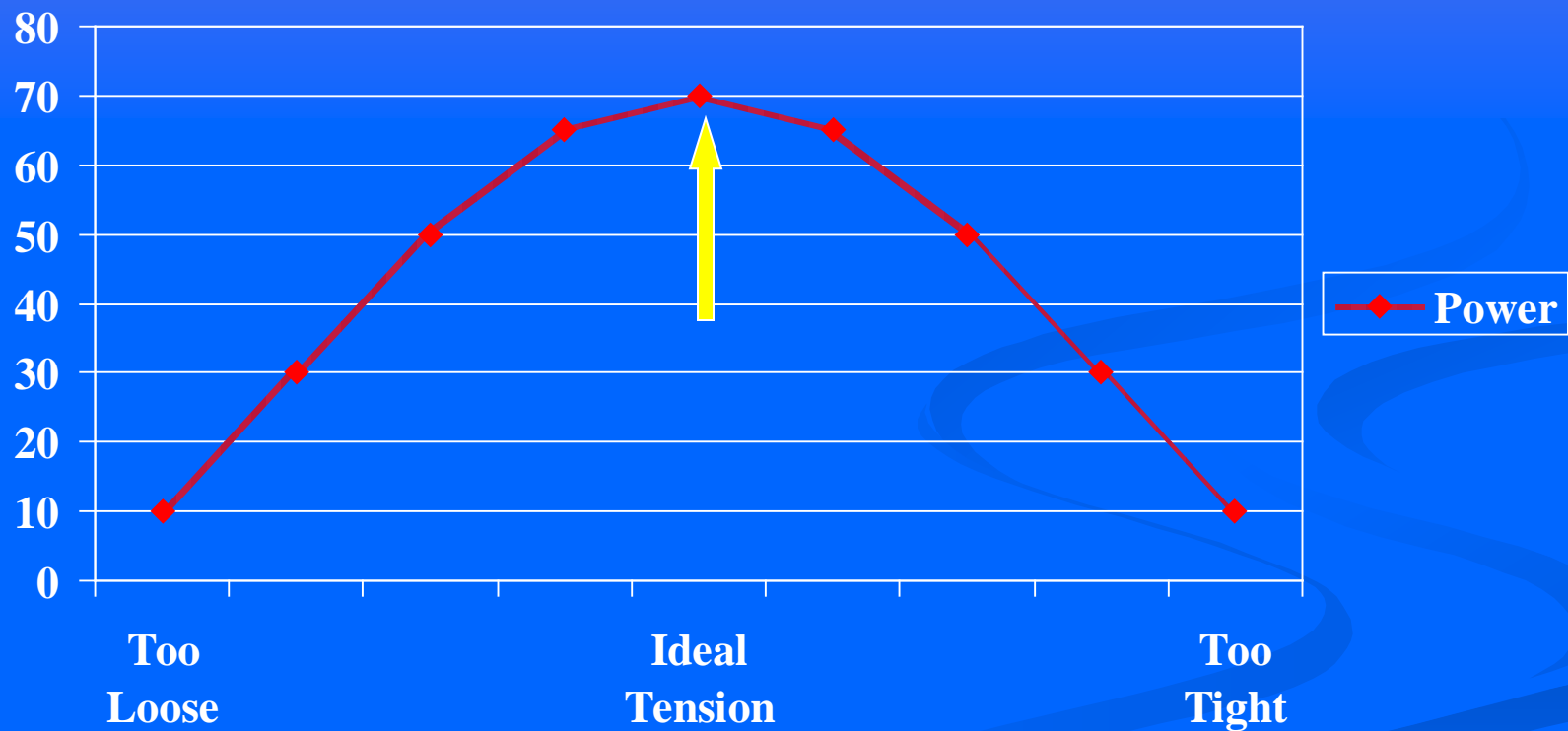
Achilles Tendon Infection is a LIFE changing event

Sterile Technique

Similar To Total Joint Arthroplasty



Blick's Resting Tension Curve



Blick's Resting Tension Curve

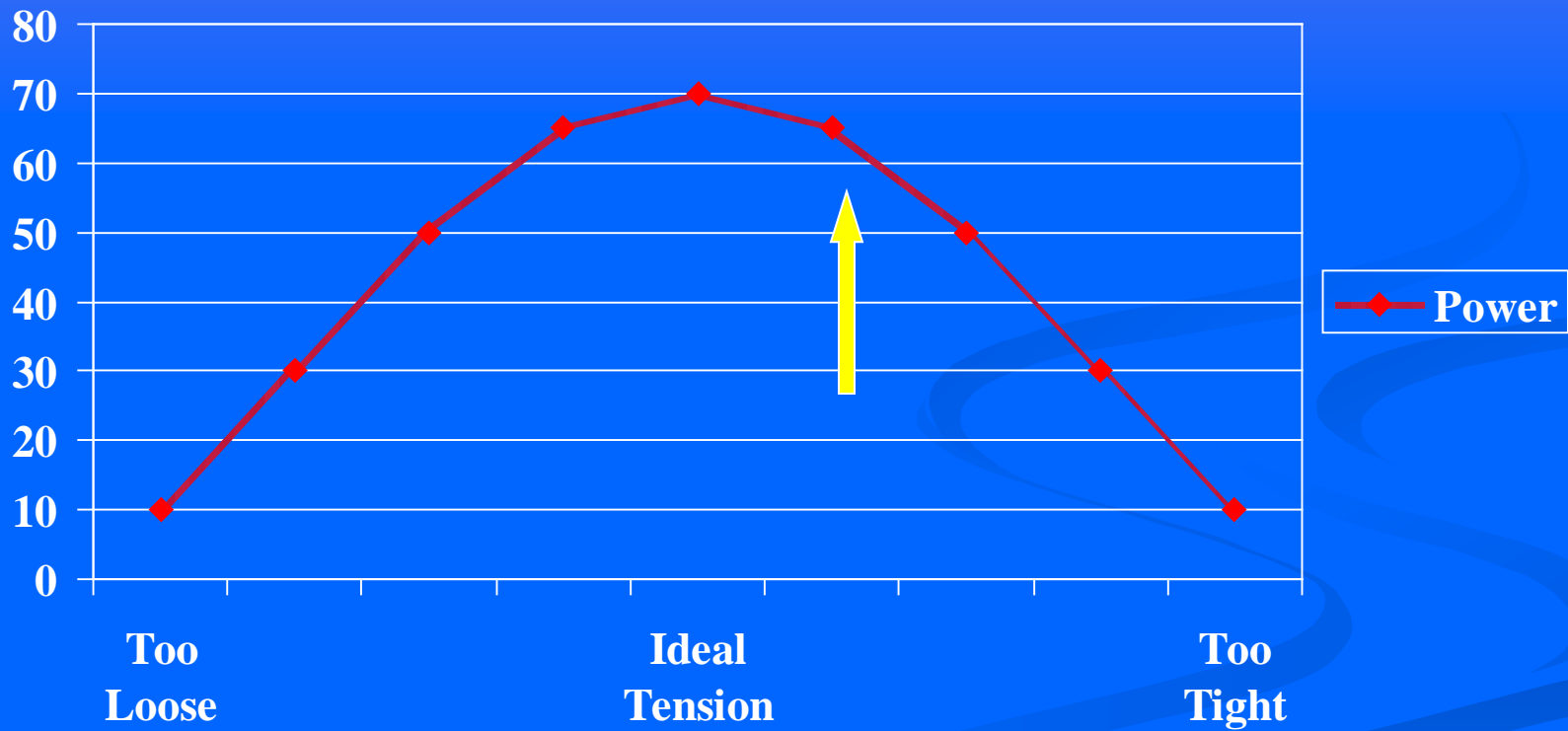
Target Operative Tension





Blick's Resting Tension Curve

Target Operative Tension





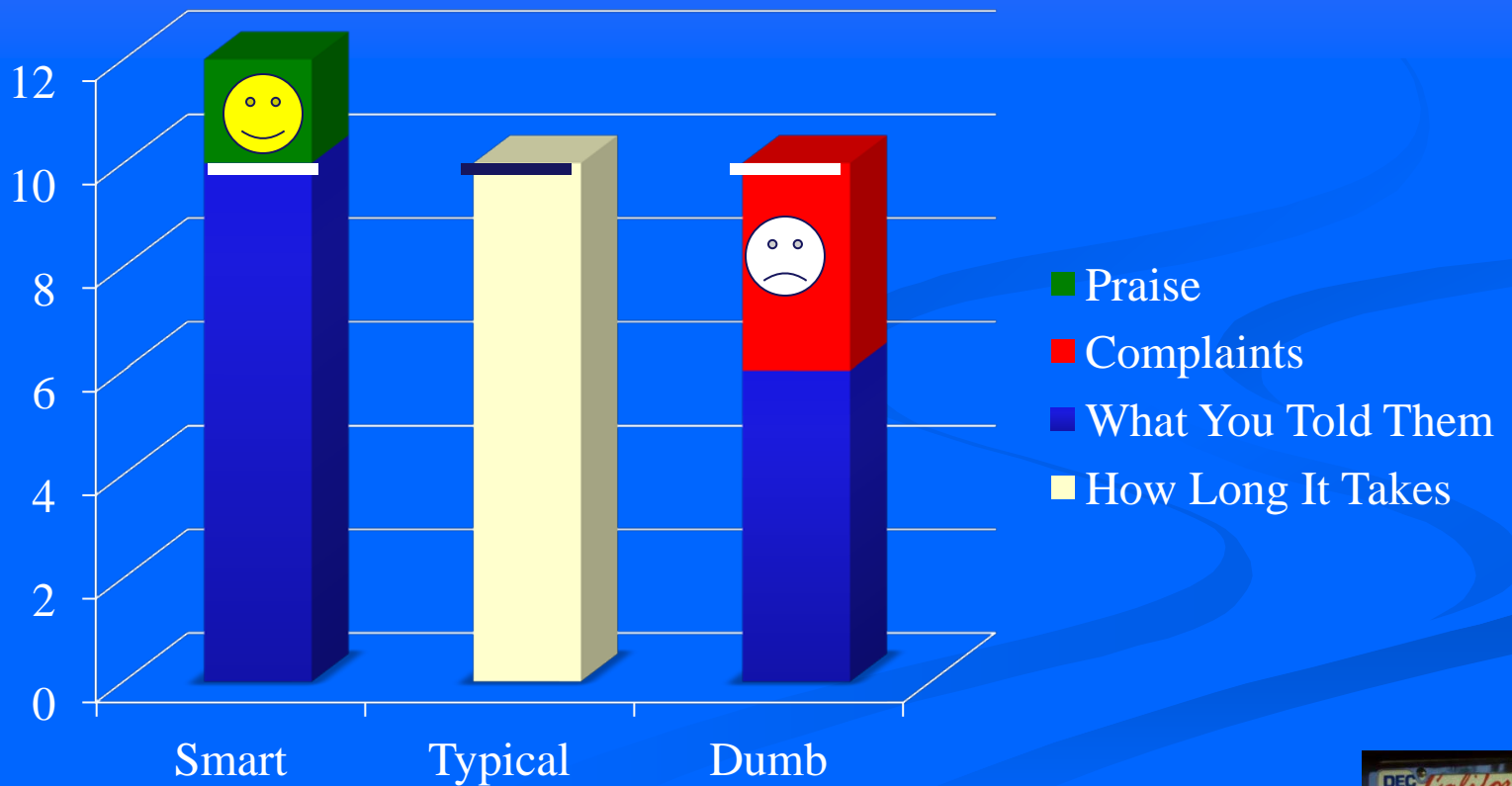
Achilles Rupture Treatment Options

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Expectation Management

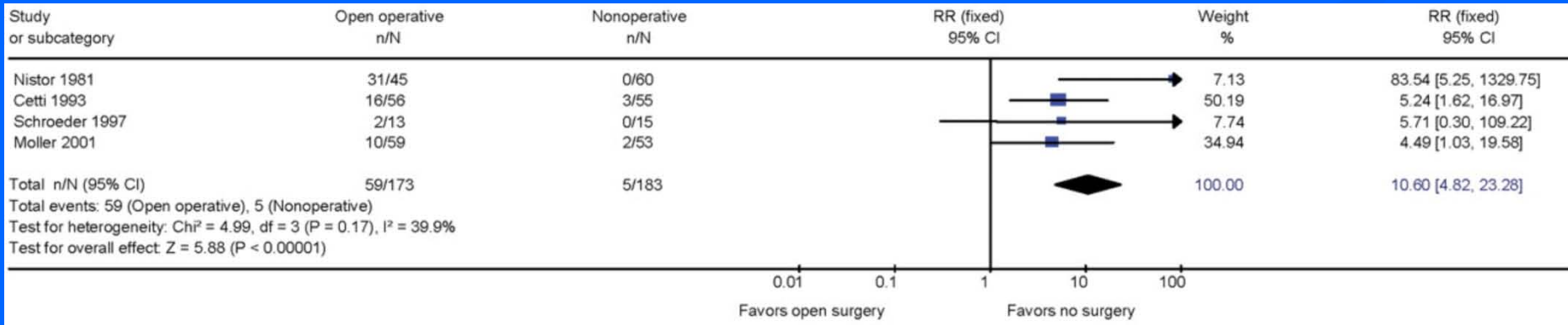
1 Year



From: Treatment of Acute Achilles Tendon Ruptures: A Meta-Analysis of Randomized, Controlled Trials

J Bone Joint Surg Am. 2005;87(10):2202-2210. doi:10.2106/JBJS.D.03049

Open vs. Closed Overall Complications

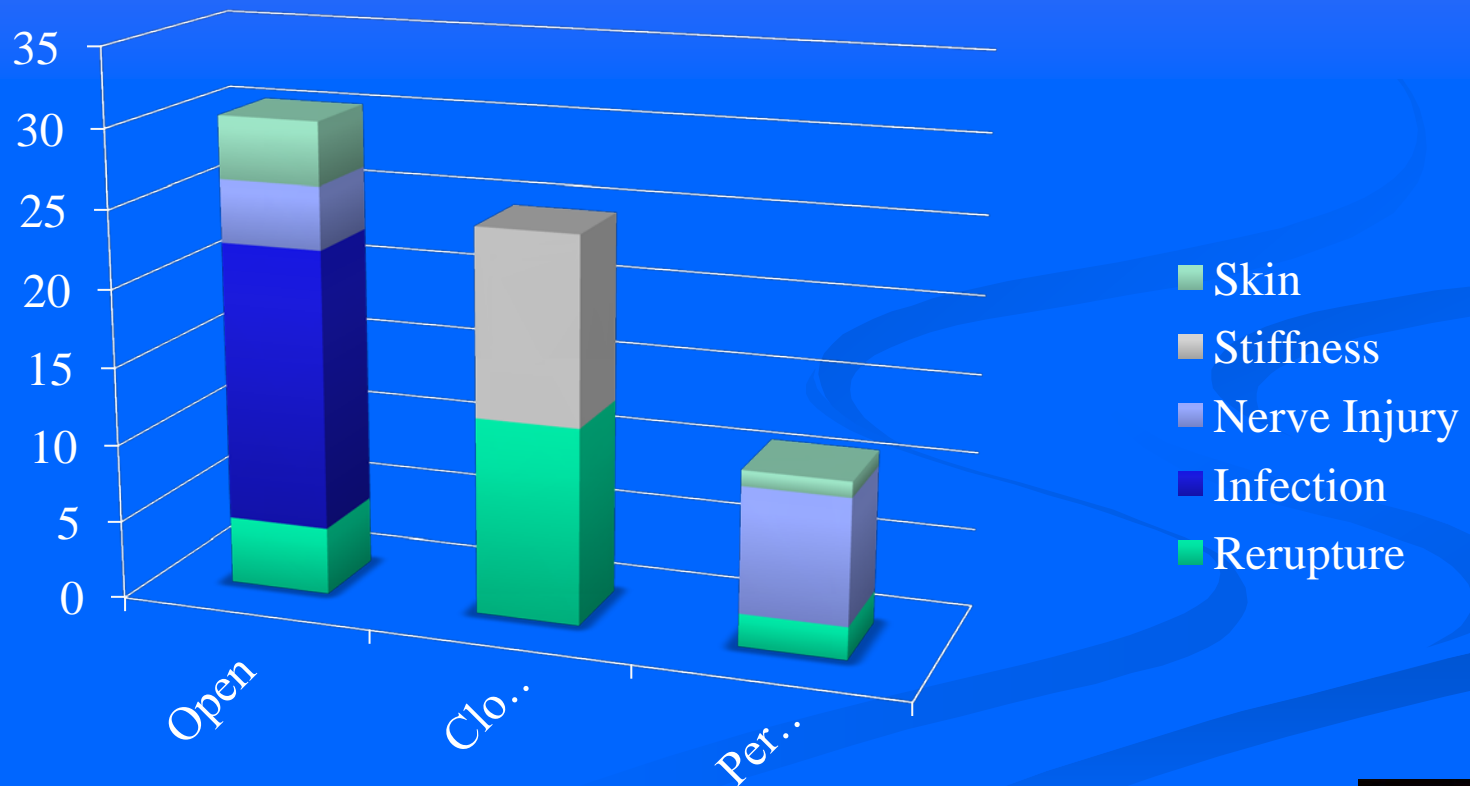


Favors Non Operative



Meta Analysis Achilles Rx

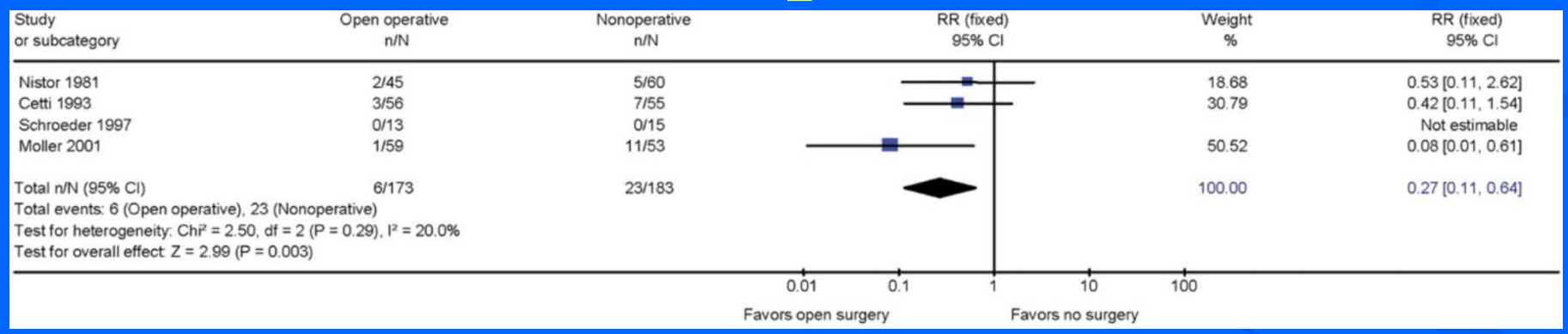
Khan et al, JBJS 2005



From: Treatment of Acute Achilles Tendon Ruptures: A Meta-Analysis of Randomized, Controlled Trials

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Open Vs. Closed Rerupture



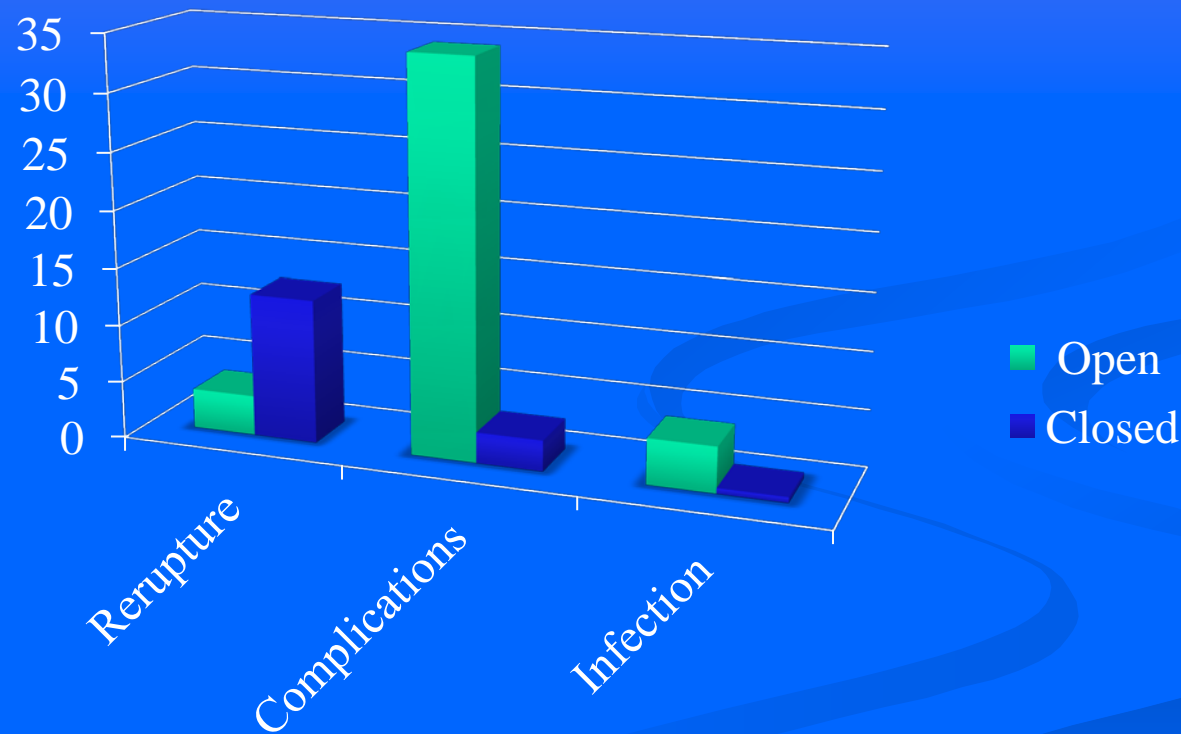
Favors Surgery



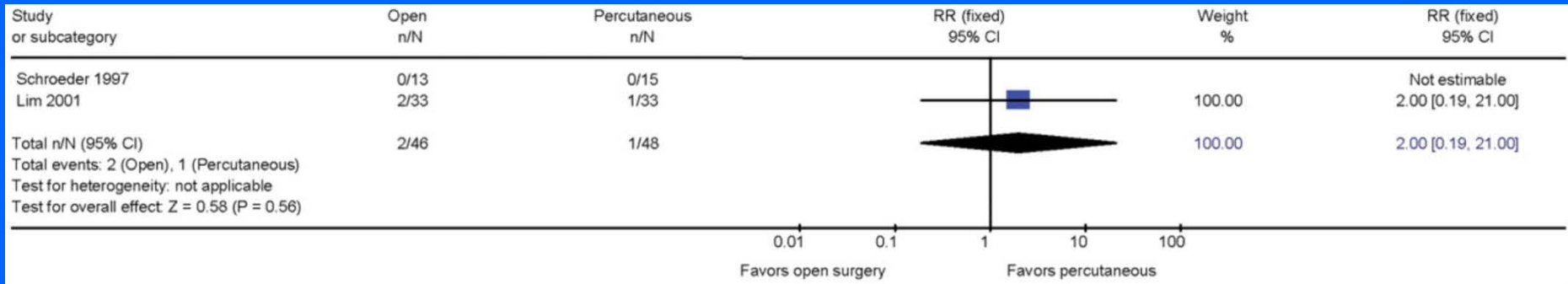
Open vs. Closed Achilles Rx

Meta-Analysis

Khan et al, JBJS 2005



Open vs. Perc Reruptures



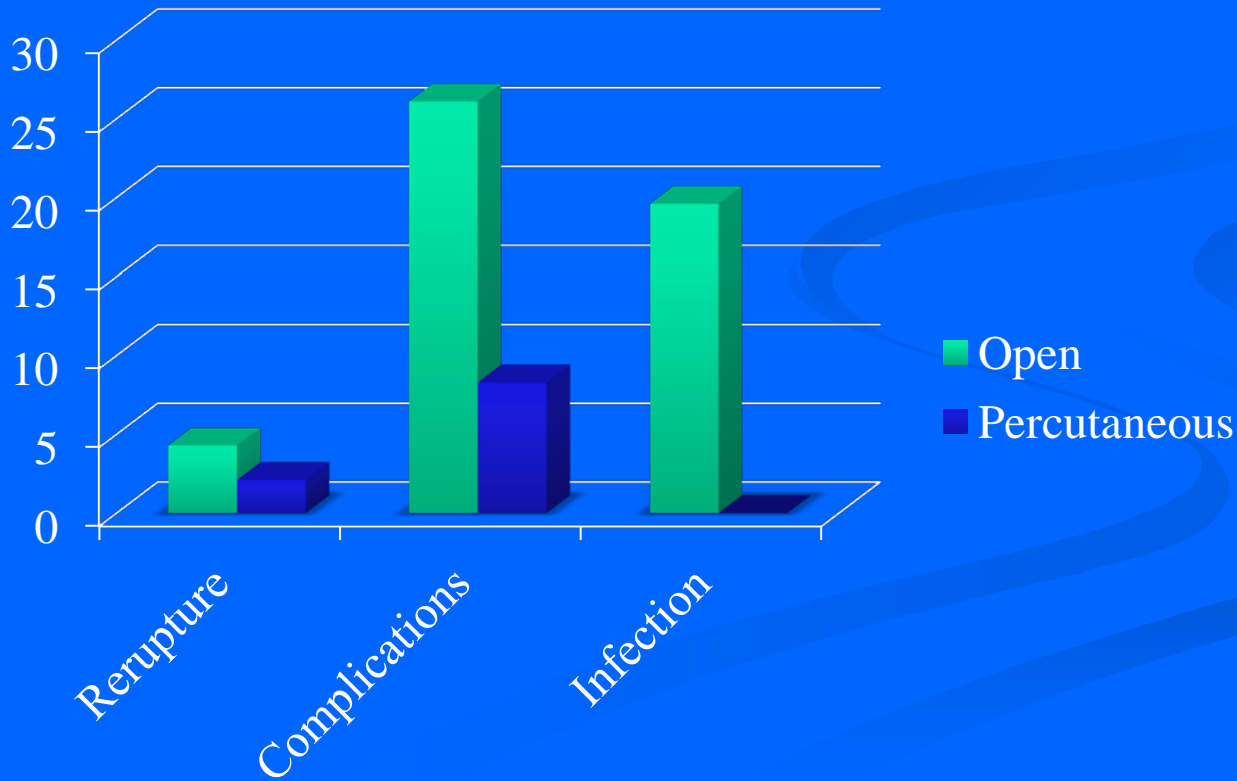
Favors Percutaneous



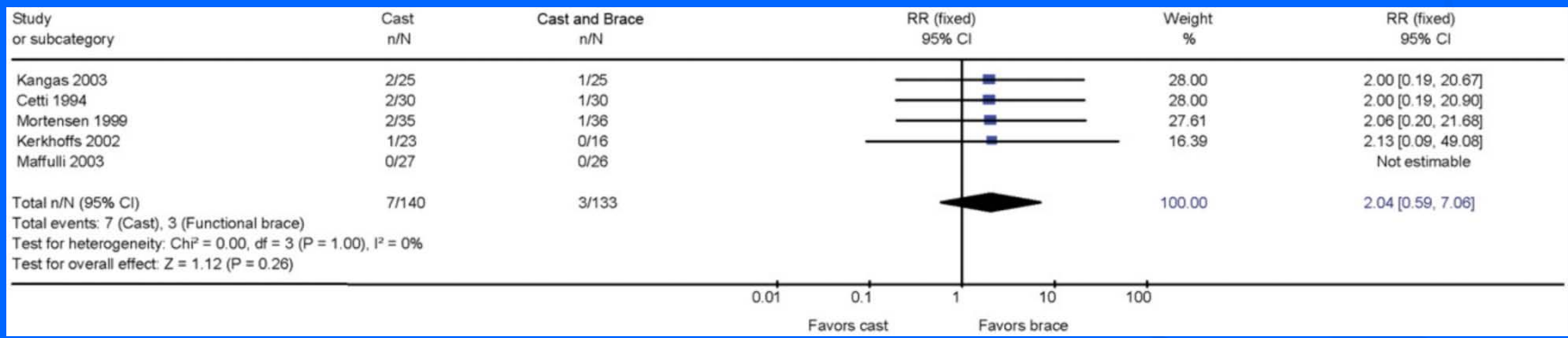
Open vs. Percutaneous Achilles Rx

Meta-Analysis

Khan et al, JBJS 2005



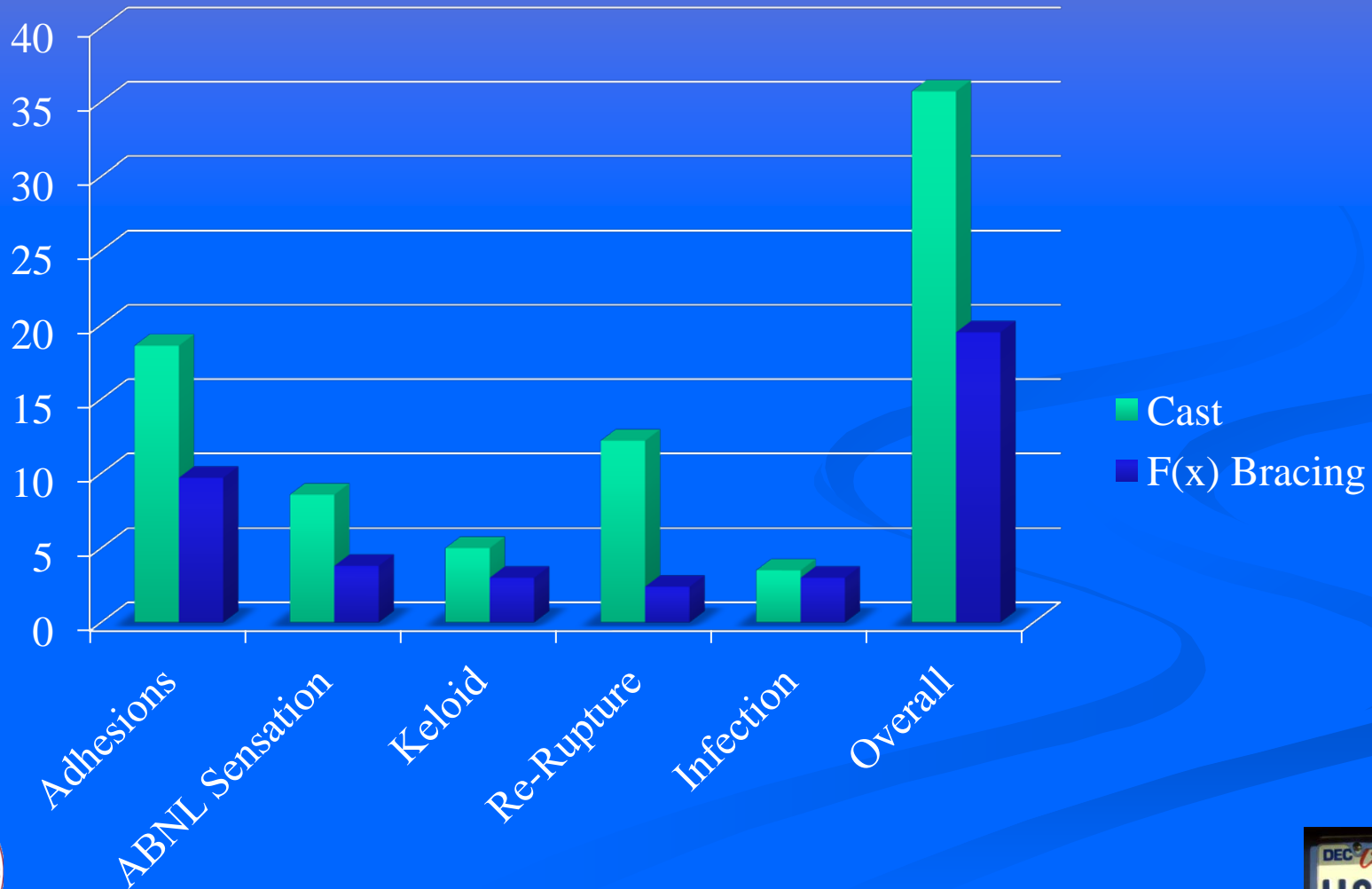
Cast vs. Functional Bracing



Favors Bracing



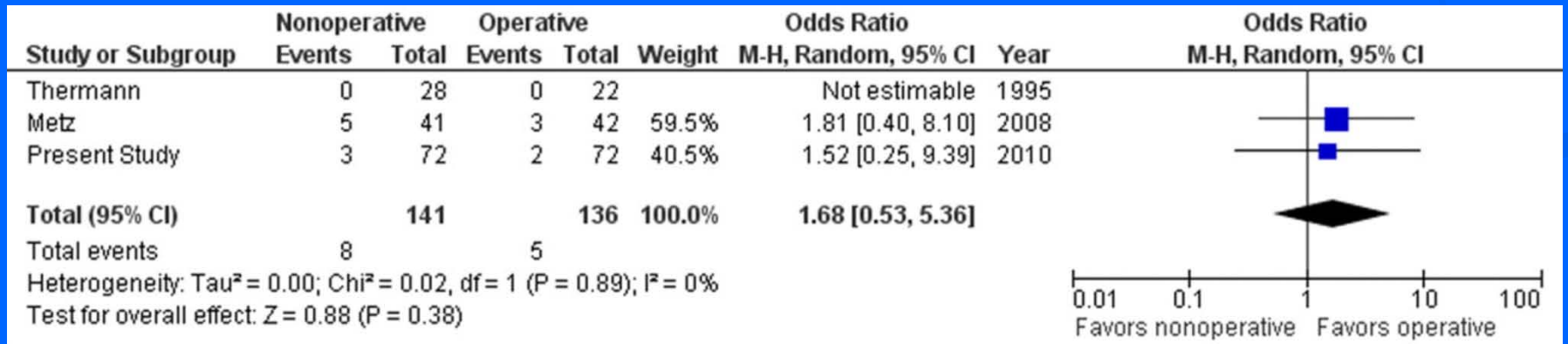
Post-Operative Casting vs. Bracing Achilles Rx Meta-Analysis Khan et al, JBJS 2005



From: Operative versus Nonoperative Treatment of Acute Achilles Tendon Ruptures: A Multicenter Randomized Trial Using Accelerated Functional Rehabilitation

J Bone Joint Surg Am. 2010;92(17):2767-2775. doi:10.2106/JBJS.I.01401

Open Vs. Closed



Favors Operative



JB&JS

The Journal of Bone & Joint Surgery

this article.

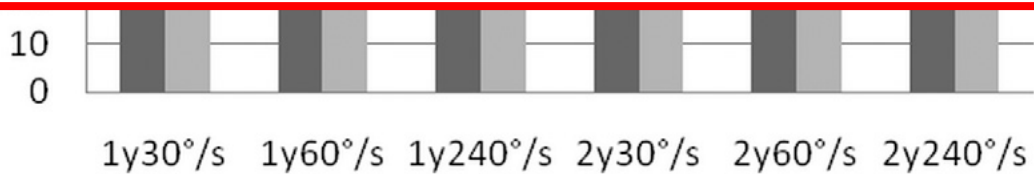
Operative versus Nonoperative Treatment of Acute Achilles Tendon Ruptures

A Multicenter Randomized Trial Using Accelerated Functional Rehabilitation

By Kevin Willits, MA, MD, FRCSC, Annunziato Amendola, MD, FRCSC, Dianne Bryant, MSc, PhD, Nicholas G. Mohtadi, MD, MSc, FRCSC, J. Robert Giffin, MD, FRCSC, Peter Fowler, MD, FRCSC, Crystal O. Kean, MSc, PhD, and Alexandra Kirkley, MD, MSc, FRCSC

Investigation performed at the Fowler Kennedy Sport Medicine Clinic, London, Ontario, and the University of Calgary Sport Medicine Centre, Calgary, Alberta, Canada

Affected Side Strength (N/m)



Time and Speed



AOFAS Specialty Day 2013

Baumhauer et al

- 26,000 surgery in ABOS Oral Exam
- Foot and Ankle Surgery had higher risk of complications vs other body parts
- 8.41% infection rate Achilles tendon



“And the Survey Says?”



Charlton's Way

- Achillon
- Bilateral drape / prone position
- Cheat 5 to 10 degrees too tight
- Judge at 45 knee flexion



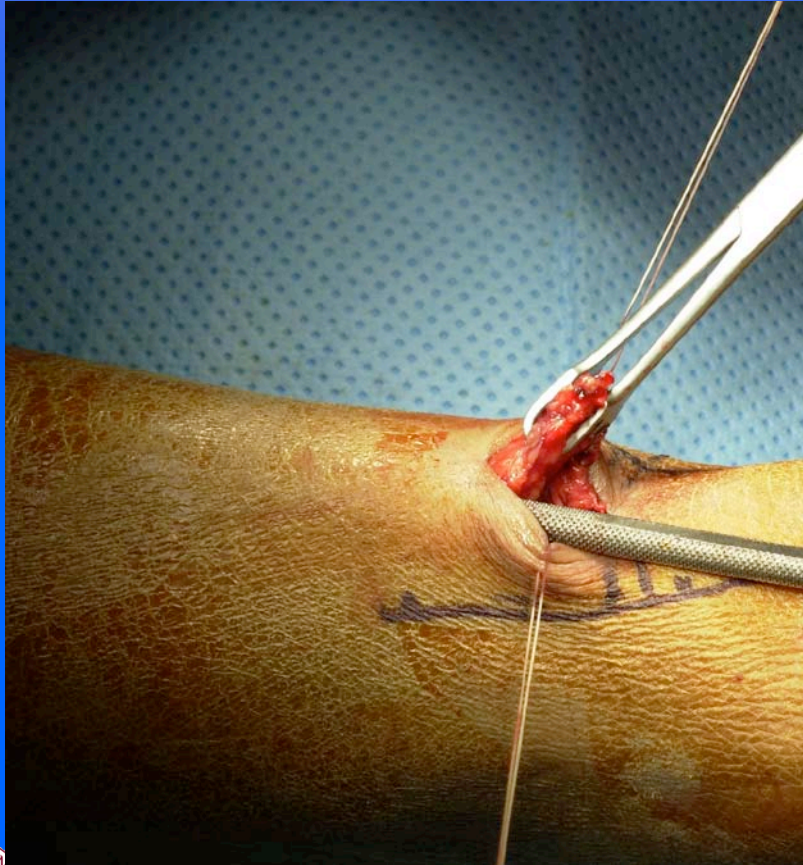
Achilles Rupture

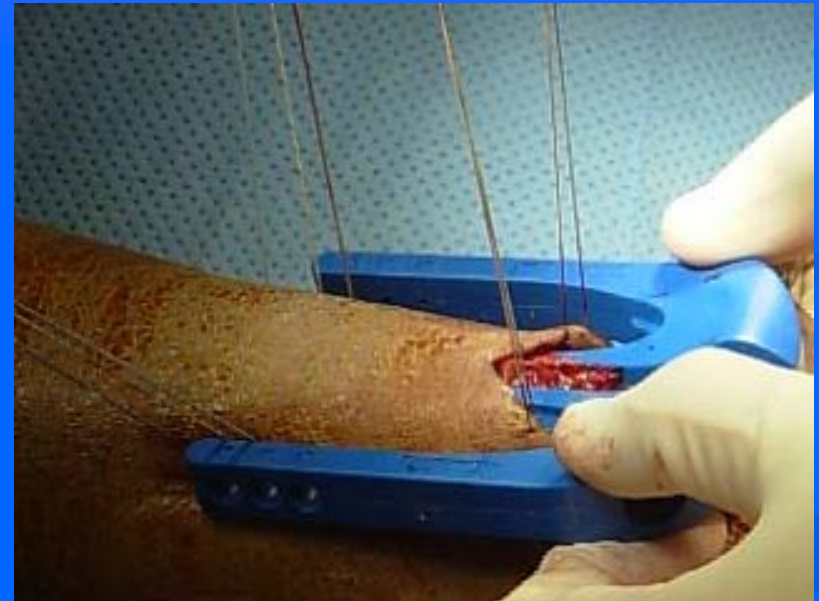
Sign the **BACK** of the Leg

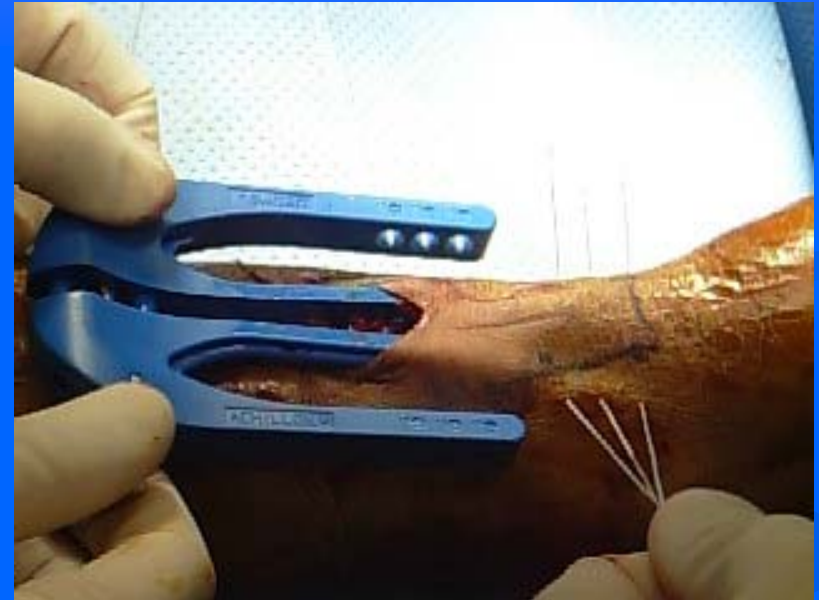
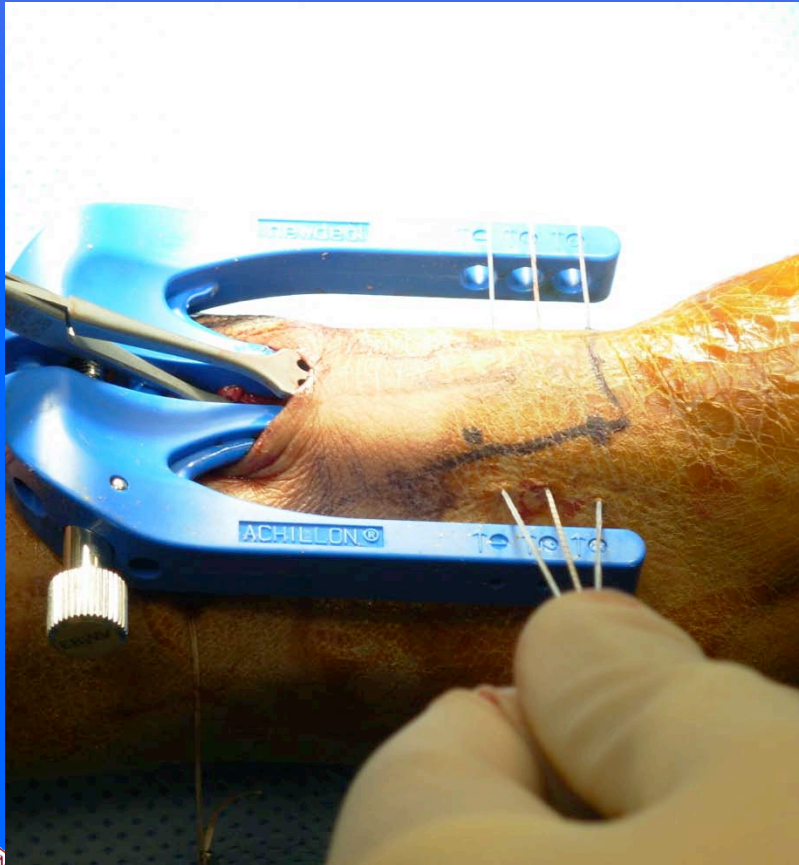
Put the tourniquet on before you flip

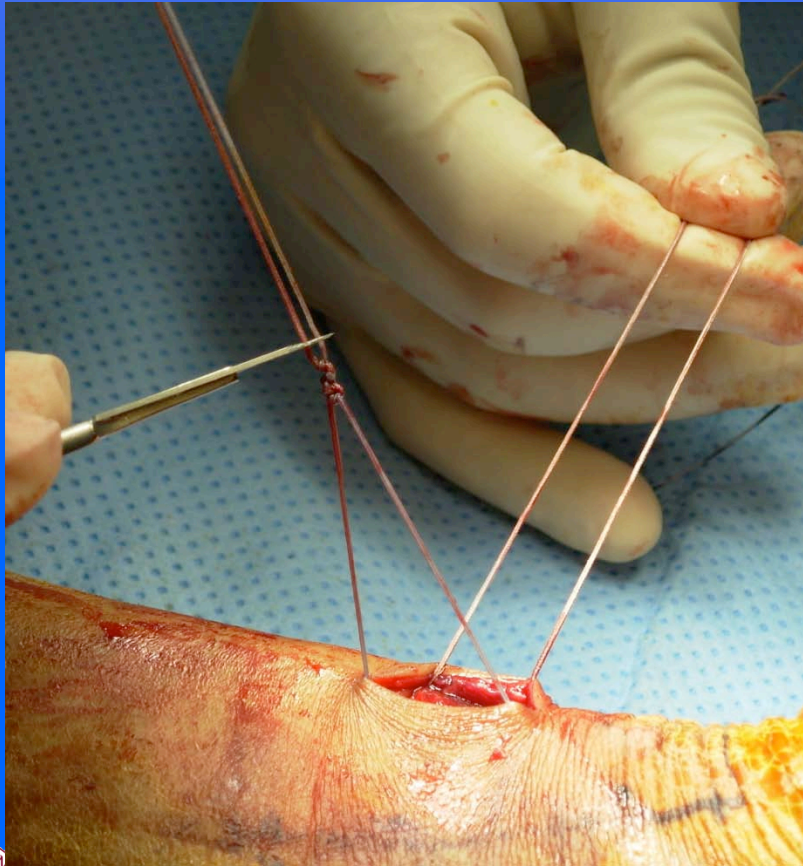














Achilles Rehab

Thordarson Open

- Plantar Flexion Cast
- NWB 2 weeks
- Passive to Neutral on Week #3
- WBAT w/ heel lift in cam walker up to week #6
- Felt heel lift in a shoe on week #6

Charlton Achillon

- Plantar Flexion Cast for 4 weeks
- Cam Walker in Plantar Flexion for 4 Weeks PWB
- WBAT in Cam Walker at Week #8
- Cowboy Boot for 4 weeks until week #12



Achilles "Birthday"



Oops, Somebody Missed It

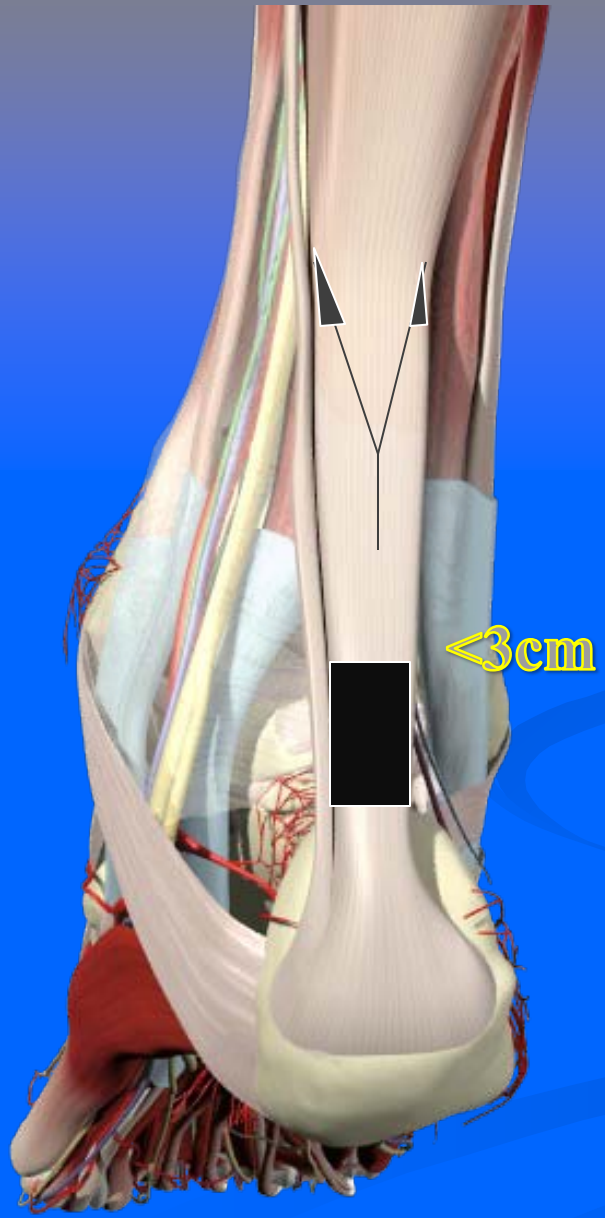
1/6th of Achilles Ruptures Are Missed
By the 1st Physician Who Exams The
Patient

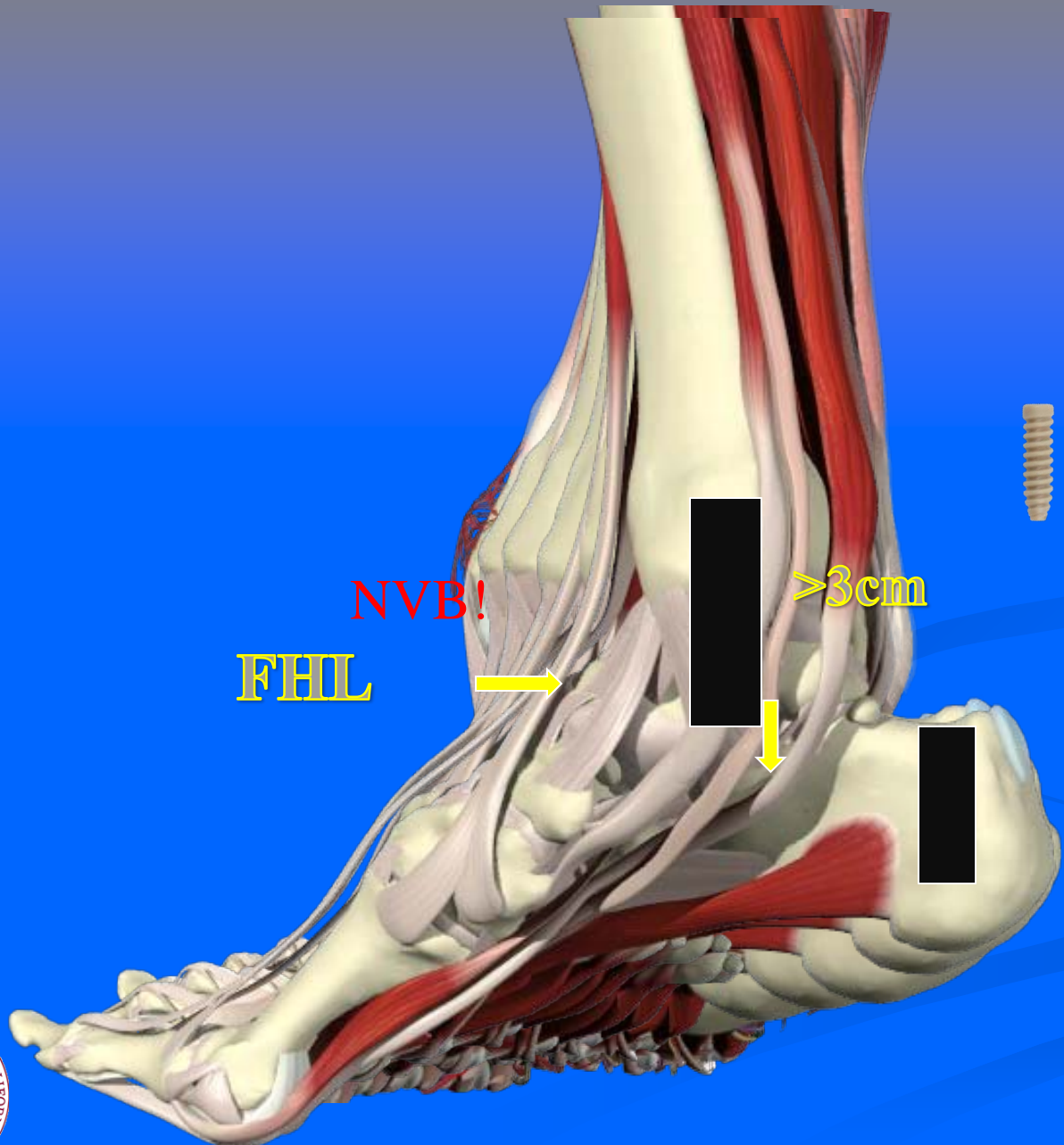


Chronic Rupture

- Small gap- primary repair
- Medium gap- VY lengthening
- Large gap- FHL transfer







NVB!

FHL

>3cm



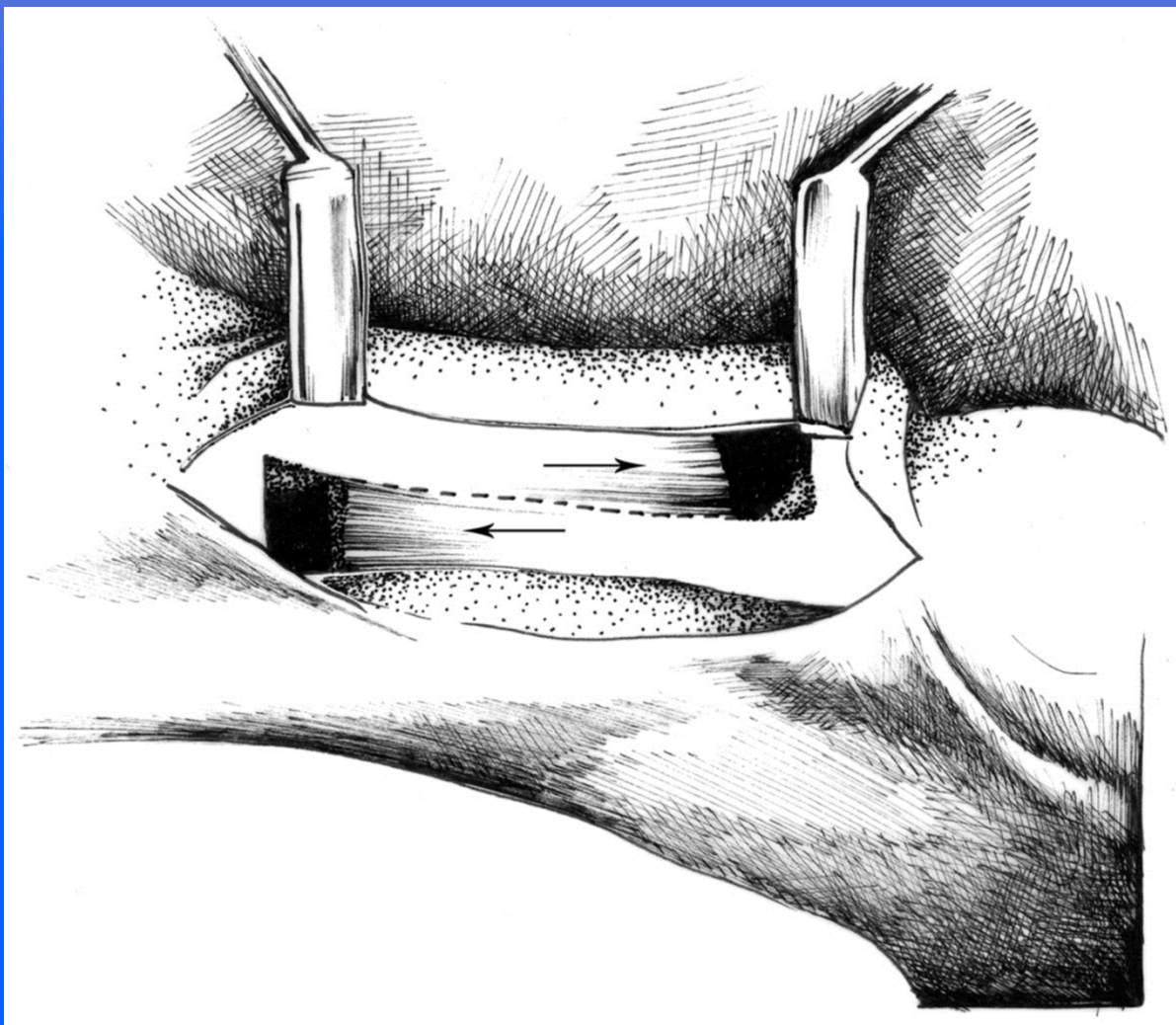
From: Management of Chronic Ruptures of the Achilles Tendon

J Bone Joint Surg Am. 2008;90(6):1348-1360. doi:10.2106/JBJS.G.01241



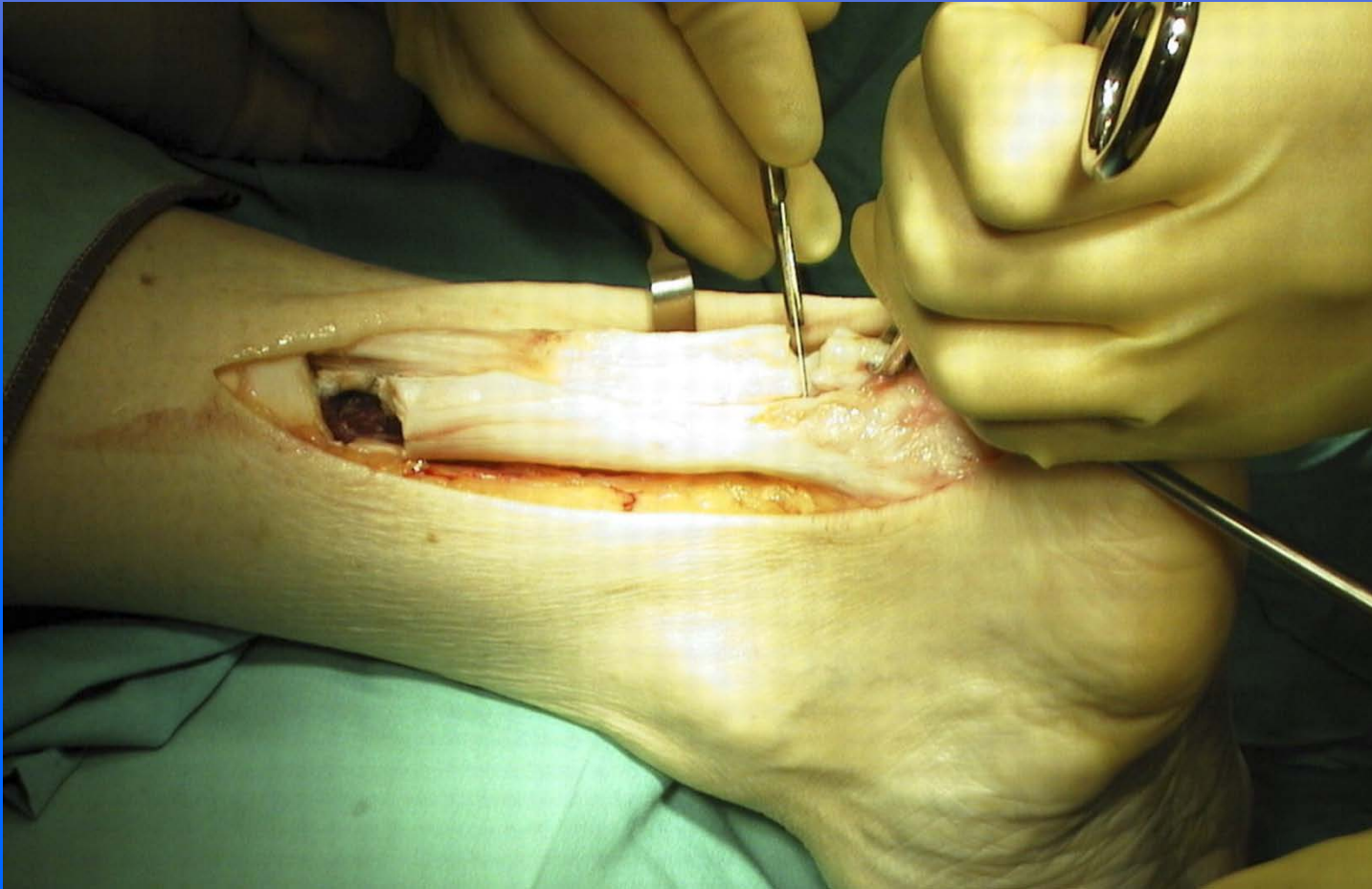
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Conclusion

- Surgery vs Non-operative remains controversial
- Balance the tension
- Avoid the big complications—rerupture and infection
- Get the correct diagnosis



Thank you



Achilles Tendon Ruptures

Exam Questions



A 62-year-old tennis player ruptured his achilles tendon 12 months ago. He initially chose non-operative treatment, but continued to have weakness and difficulty ambulating. During surgery extensive debridement there is a 4cm gap between viable tissue ends. Which of the following surgical techniques most likely will provide the best clinical outcome?

1. Primary repair with the foot in maximal plantarflexion followed by a gradual stretching program
2. Reconstruction with hamstring autograft
3. Achilles repair augmented with transfer of the posterior tibial tendon
4. Achilles repair augmented with transfer of the extensor digitorum longus
5. Achilles repair augmented with transfer of the flexor hallucis longus



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1. Primary repair with the foot in maximal plantarflexion followed by a gradual stretching program 1%
2. Reconstruction with hamstring autograft 6%
3. Achilles repair augmented with transfer of the posterior tibial tendon 4%
4. Achilles repair augmented with transfer of the extensor digitorum longus 3%
- 5. Achilles repair augmented with transfer of the flexor hallucis longus 86%**

- Will RE, Galey SM Outcome of single incision flexor hallucis longus transfer for chronic achilles tendinopathy. . Foot Ankle Int. 2009 Apr;30(4):315-7



What is the biggest advantage of surgical repair of an acute Achilles tendon rupture with early range of motion compared to non-operative treatment with immobilization in a short-leg cast for 6 weeks?

1. Lower rate of infection
2. Lower rate of nerve injury
3. Better skin cosmesis
4. Lower rate of DVT/ VTE
5. Lower rate of re-rupture



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1. Bhandari M, Guyatt GH, Siddiqui F, et al: Treatment of acute Achilles tendon ruptures: A systematic overview and metaanalysis. Clin Orthop Relat Res 2002;400:190-200
2. Khan RJ, Fick D, Keogh A, et al. Treatment of acute Achilles tendon ruptures: A meta-analysis of randomized, controlled trials. J Bone Joint Surg Am 2005;87:2202-2210
3. Willits K, Amendola A, Bryant D, Mohtadi NG, Giffin JR, Fowler P, Kean CO, Kirkley A. Operative versus nonoperative treatment of acute Achilles tendon ruptures: a multicenter randomized trial using accelerated functional rehabilitation. J Bone Joint Surg Am. 2010 Dec 1;92(17):2767-75.
4. Patel A, Ogawa B, Charlton T, Thordarson D Incidence of deep vein thrombosis and pulmonary embolism after Achilles tendon rupture. Clin Orthop Relat Res. 2012 Jan;470(1):270-4.



Which factor increases the chance of wound complications after Achilles tendon repair?

1. increased body mass index
2. immediate surgery
3. male gender
4. age over 40 years old
5. tobacco use



Which factor increases the chance of wound complications after Achilles tendon repair?

1. increased body mass index 5%
2. immediate surgery 3%
3. male gender 1%
4. age over 40 years old 1%
5. tobacco use 91%

1. Bruggeman NB, Turner NS, Dahm DL, Voll AE, Hoskin TL, Jacofsky DJ, Haidukewych GJ. Wound complications after open Achilles tendon repair: an analysis of risk factors. Clin Orthop Relat Res. 2004 Oct;(427):63-6.

Which factor increases the chance of DVT/VTE after Achilles tendon repair?

1. Obesity
2. Non operative treatment
3. Previous history of DVT/VTE
4. Age over 40 years old
5. None of the Above



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