Jumpers Knee- Overview

Background Information: Patellar Tendinopathy
- Structure of PT
- Pathophysiology
- Prevalence
- Risk factors
- Imaging

Non Operative Management
- Do they work?
- What is the evidence

Surgery

Jumpers Knee - Overview

Background information: Patellar Tendinopathy

Jumpers Knee

Jumper’s knee

- Jumping athletes – Martin Blazina 1973
- Anterior knee pain and tenderness
- Patellar tendinopathy
- Proximal, central, posterior portion of tendon

Aetiology
- Overuse
- High impact ballistic loading
- Tensile Load
- Patellar Impingement

Lesion is proximal posterior central
Why here—Unknown
Theories
- Posterior impingement
- Greater load
- Fibres here are shorter but with similar elongation under load
- Hamilton - adaptive response to compression loads

 Loads on patellar tendon

Andrew Amis

- Applied 1KN to 10 cadaver knees - strain

<table>
<thead>
<tr>
<th>Load (N)</th>
<th>Anterior Strain (%)</th>
<th>Posterior Strain (%)</th>
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<tr>
<td>10</td>
<td>3.9%</td>
<td>4.9%</td>
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<tr>
<td>60</td>
<td>2.7%</td>
<td>4.6%</td>
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<tr>
<td>90</td>
<td>1.7%</td>
<td>3.2%</td>
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Pathophysiology

Repetitive overload

- Microscopic tears
- Mucoid degeneration
- Fibrinoid necrosis
- Collagen separation / collagen degeneration
- Regional variation in vascularity / neovascularity
- Pain mediated by glutamate and other non-prostaglandin pathways


Prevalence

Prevalence of Jumper’s Knee Among Elite Athletes From Different Sports: A Cross-sectional Study


613 Norwegian national elite athletes
Oslo, Norway

Overall prevalence
14%

Previous symptoms
8%

Career prevalence
22%

Male
2:1 Female

Variations between sports

Duration of symptoms
32 ± 25 months

Risk Factors

Risk factors for patellar tendinopathy: a systematic review of the literature


- Weight
- Height
- Weight training
- Jump training
- Waist-to-hip ratio
- Leg length difference
- Arch height of foot
- Quad strength
- Hamstring flexibility
- Quadriceps

Jumping Sports

Comparative Accuracy of Magnetic Resonance Imaging and Ultrasonography in Confirming Clinically Diagnosed Patellar Tendinopathy


- Age
- Gender
- Weight
- Height
- Weight training
- Jump training
- Waist-to-hip ratio
- Leg length difference
- Arch height of foot
- Quad strength
- Hamstring flexibility
- Quads

MRI V Ultrasound

- Level 2 evidence – Cohort Study
- 30 clinical patellar tendinopathy
- 33 asymptomatic, activity matched
- MRI
- GS-US Grayscale Ultrasound
- CD-US Colour Doppler Ultrasound

MRI V Ultrasound

- Ultrasound more accurate than MRI to confirm clinically diagnosed patellar tendinopathy
- GS-US greatest sensitivity
- CD-US indicated likelihood of being symptomatic

Clinical scoring system

- Victorian Institute of Sport Assessment (VISA) Score

\[\text{The VISA Score: An Index of Severity of Symptoms In Patients with Jumper's Knee (Patellar Tendinopathy)}\]

Paul J Valicenti, Karen M Kita, T. J. L. Cook, Zbys Klay, 
Peter J Marsh & John D Wark

for the Victorian Institute of Sport Tendon Study Group

1 The University of Melbourne (Department of Medicine-Melb., Parkville)
2 The University of British Columbia, Vancouver, Canada School of Human Kinetics,
3 University of Western Australia, School of Medicine, Perth, Australia
4 East Melbourne Radiology, Melbourne, Victoria
5 Victorian Institute of Sport, South Melbourne, Victoria, Australia

Management

Universal agreement

- First 6 months
- Non operative treatment
Non Operative Management

- Avoidance of painful activities
- Physiotherapy
- NSAIDS
- Extra corporeal shock wave
- Low level laser
- Injections

Non Operative Management

Physiotherapy

- Eccentric strengthening program
- Therapeutic Ultrasound
- Iontophoresis-electricity deliver
- Phonophoresis-US deliver
- Topical nitroglycerine

Surgical Treatment Compared with Eccentric Training for Patellar Tendinopathy (Jumper's Knee)

A RANDOMIZED, CONTROLLED TRIAL

BY ROYAL R. R. MD, FRED DIONNE, P.T., STEVE LIEBER, MD, AND LAW ENGSTROM, MD, PhD

Bahr R et al. Surgical Treatment Compared with Eccentric Training for Patellar Tendinopathy (Jumper’s Knee). JBJS (Am) 2006 88(8) 1689-1698

Non Operative Management

Eccentric Quads V surgery

No advantage of surgical treatment over eccentric exercise program

Trial of eccentric exercises for 12 weeks before considering open tenotomy
Non Operative Management

**NSAIDS**
- Widespread use
- Little evidence of efficacy in chronic tendinopathy
- Associated risks
- GI upset
- Renal damage
- Increased cardiovascular risk

**Injections**
- Corticosteroid injection
- Prolotherapy-injections stimulate collagen
- Plasma Rich Platelet injections

Corticosteroid Injection

- 7 weight lifters over a 2 year period
- Average of 9 steroid injections
- No other risk factors for rupture
- Mean loss of 8% of power of knee extension 2 years after surgical repair

US Guided Sclerosing treatment

**Ultrasound-Guided Sclerosing Treatment in Patients With Patellar Tendinopathy (Jumper’s Knee)**

44-Month Follow-up


US Guided Sclerosing Treatment

**Prolotherapy**
- Polidocanol injected into area of neovascularisation
- VISA score pre, 12, 44 months
- 29 patients
- 12 patients required arthroscopic surgery during f/u
- Effective for a little over half the patients
- Other patients had significant improvement in VISA score

Platelet-Rich Plasma

**Platelet-Rich Plasma Versus Focused Shock Waves in the Treatment of Jumper’s Knee in Athletes**

Platelet Rich Plasma

- 46 consecutive athletes
- Randomized to 2 treatment groups
- 2 autologous PRP injections over 2 weeks
- 3 sessions of ESWT
- Both groups had significant improvement in symptoms
- No difference between groups at 2 months
- PRP group significantly better at 6 and 12 months

*Surgical Management*

- US guided percutaneous tenotomy
- Arthroscopic debridement
- Open debridement
- Combined arthroscopic and open debridement

*Surgical Management*

- Percutaneous Ultrasonic Tenotomy as a Treatment for Chronic Patellar Tendinopathy—Jumper’s Knee

*Percutaneous Ultrasonic Tenotomy as a Treatment for Chronic Patellar Tendinopathy—Jumper’s Knee

- Open or Arthroscopic
  - Longitudinal tenotomy
  - Debride macroscopically abnormal tendon
  - Inferior pole of patella excision
  - Inferior pole of patella drilling / microfracture
  - Paratenon repair / excision / leave open
  - Fat pad excision
  - Synovectomy
  - Associated chondral / meniscal lesions
Surgical Management

Arthroscopic Management of Chronic Patellar Tendinopathy


- 64 patients (73 knees) failed non-operative management
- 27 professional athletes
- Arthroscopic Debridement:
  - Fat pad
  - Patellar tendon
  - Lower pole of patella
- VISA scores improved significantly at 1,3,5 and 10 years.
- Return to sport at 3 months
- 19 of 27 elite athletes returned to same level of sport

Surgical Management


- 64 athletes recalcitrant to conservative management
- Average 22 month follow up
- 82% patients improved
- 62% returned to previous level of sport
- No difference between patellar resection and arthroscopy

Surgical Management


- Paucity of good quality research
- Highest level of evidence – Level IV (case series)
- Systematic Review
- Surgical treatment of inferior pole of patella
- Closure of paratenon
- Immobilization

Inferior Pole of Patella

Excise inferior pole of patella?

- Impinging lesion
- Drill the inferior pole?

More successful outcomes without bone work: 97.1% vs 84.8%

Surgical - Management

Paratenon

Close the paratenon?

- Encourage healing
- Excise the paratenon?
- Remove pain fibres

More successful outcomes without closure: 91.5% vs 84.8% with closure
Surgical Management

Immobilization after surgery
- Utilized in 4 studies
  - Success rate 86.9%
- No immobilization in 4 studies
  - Success rate 91.5%

More successful outcomes without immobilization

Summary - Jumper's Knee

- Common in jumping sports
- Affects deep proximal patellar tendon
- Non operative management for first 6 months
- PRP and sclerosing injections can be effective
- Surgery reserved for failure of non op management
- Paucity of good studies confirming what aspect of surgery helps the patient

Thank you