Jumper’s knee: etiology, diagnosis, classification

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Jumper’s knee ?
Definition

• Blazina et al : 1973
used the term jumper’s knee used
(patellar « tendinopathy », patellar « tendinosis », patellar « tendinitis »)
• insertion tendinopathy seen in
skeletally mature athletes

Jumper’s knee: etiology

• the most common overuse injury
• volleyball (28%)
• 40% of professional players have experienced
symptoms of jumper’s knee during their careers

Jumper’s knee: etiology

• Repetitive stress on the patellar or
quadiceps tendon during jumping
• an injury specific to athletes
participating in jumping sports
(basketball, volleyball, or high or long
jumping)

Jumper’s knee: etiology

• Functional overload
• Repetitive load on the extensor tendon
apparatus, during takeoff and landing

Jumper’s knee: etiology

• Jumping sports
• Volleyball, Basketball, High jump, long jump and triple
jump
• Running, Handball, Soccer, Climbing
• Tennis
• Gymnastics
• Weight-lifting
• Cycling
• Skiing, Ballet dancing

Intrinsic § Extrinsic risk factors

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Jumper’s knee:
Intrinsic risk factor

• inflexibility of the hamstrings and quadriceps
• morphotype
• increased Q angle
• patella alta/baja
• limb-length discrepancy

Jumper’s knee:
Extrinsic risk factor

• Hard court surfaces
  (Beach volley/“indoor” volleyball)
• excessive training volume, overtraining

Jumper’s knee:
Intrinsic risk factor

• Patellar hypermobility, Abnormal patella tracking, Increased length of the patella, Impingement of the inferior pole of the patella, Long patellar tendon
• Hyperlaxity syndrome
• Reduced ankle dorsiflexion range, Hyperpronation of the foot
• Iliotibial band tightening
• Knee instability
• Pelvis and hip disease
• Muscular imbalance or insufficiency
• Increased rotation of femur and tibia

Jumper’s knee:
Extrinsic risk factor

• Hard Playing on hard surface
• More than four training sessions per week
• Height and weight: Increased height, increased weight, increased BMI
• Excessive load on the body (type of movement, speed of movement, number of repetitions, footwear)
• Training errors: too long distance, too high intensity, too fast progression, and too much hill work
• Monotonous, asymmetric and specialized training only

Diagnosis
Physical Examination

• tenderness at the inferior patellar pole
• Functional strength examination subtle weakness
• Pain (during active quadriceps contraction): extension of the knee against resistance

Diagnosis
Physical Examination

• Hamstring and quadriceps tightness
• Normal ligamentous stability of the knee during testing
• Normal knee range of motion
• Normal hip and ankle examination
Differential Diagnosis

- Sinding-Larsen-Johansson’s disease
- Osgood-Schlatter’s disease
- Chondromalacia patella
- Prepatellar or infrapatellar bursitis
- Synovial plicae

Diagnosis

Imaging is not necessary to make the diagnosis

- Plain x-ray
- Colour Doppler US
- Ultrasonography
- MRI

Radiological signs

Profile view: non-specific abnormalities
- Soft-tissue swelling
- Periosteal reaction
- Calcification in the patellar tendon
- Elongation of the inferior pole of the patella

Diagnosis

- Colour Doppler US: signs of hypervascularity
- Ultrasonography: tendon abnormalities in both symptomatic and asymptomatic athletes


US § PD

- Ultrasonography (US) is a good method to study the tendon structure
- Power Doppler (PD) and colour Doppler techniques can be used to study blood flow in the tendon

Jumper’s knee: tendonitis

Neovascularisation in the area with structural tendon changes.
Neovessels = deterioration of the condition?
The MRI signs

- signs of patellar tendinitis abnormalities

Abnormal signal +++

Classification

- Depending on the duration of symptoms
- 4 Stages
- Blazina / Leadbetter

Blazina Classification

Classification of patellar tendinitis according to Blazina et al (1973)
- Stage 1: Pain only after sports
- Stage 2: Pain at the beginning of sports disappearing after a warm-up but reappearing with fatigue
- Stage 3: Constant pain at rest and with activity
- Stage 4: Complete rupture of the patellar tendon

Blazina’s classification modified by Lian et al.
- Stage I – Pain at the infrapatellar or suprapatellar region after practice or after an event.
- Stage II – Pain at the beginning of the activity, disappearing after warm-up and reappearing after completion of activity
- Stage IIIa – Pain during and after activity, but the patient is able to participate in sports at the same level
- Stage IIIb – Pain during and after activity and the patient is unable to participate in sports at the same level
- Stage IV – Complete rupture of the tendon

Leadbetter’s Classification

- Stage 1 – Pain occurs more than activity, spontaneously regresses within several hours, present for less than 2 weeks, normal activity, normal tests results
- Stage 2 – Pain during and after activity which does not regress, present for 2 to 6 W, localized pain, few or no signs of inflammation
- Stage 3 – Persistent pain several days after activity stops, reoccurs rapidly when activity begins again, seriously limiting functional capacities and present for more than 6 W with signs of inflammation
- Stage 4 – Constant pain affecting daily activities, preventing all athletic activity

Conclusion

Prevention
Athlete’s education
Diagnosis is clinical