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Review Article

Jumper's knee: A Review

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Abstract: Jumper's knee (patellar tendinosis) is a common entity in athletes, who are involved in sports such as basketball and volleyball. Non-athletes with history of rheumatoid arthritis, seronegative arthropathies, and those on steroids treatment are predisposed to this condition. Patient presents with insidious onset anterior knee pain, swelling and feeling of "giving way." In extreme cases, partial or full thickness tear may occur. MRI accurately delineates the extent of soft tissue and bony involvement. Treatment includes conservative management and surgical correction is required in refractory cases**.**

Keywords: Jumper's knee, tendinopathy, patellar tendinitis.

INTRODUCTION

On anterior aspect of thigh, the rectus femoris and three vasti muscles (ie, the vastusmedialis, vastuslateralis, and vastusintermedius muscles) join to form a common quadriceps tendon inserting on the patella. The patella tendon joins patella to the tibial tuberosity. Although Jumper's knee is an overuse injury there are a number of predisposing factors, poor foot biomechanics, weak quadriceps muscles and incorrect training practices. Biomechanics has demonstrated that the posterior fibers of patellar tendon can withstand greater tensile strains before failing, compared with the anterior fibers. With repeated strain, micro-tears as well as collagen degeneration may occur in the tendon leading to patellar tendinopathy or Jumpers Knee. It should be distinguished from patella tendonitis as this condition indicates an acute inflammation of the tendon whereas tendinopathy is more about degeneration of the tendon.

Jumper's knee is a pathology commonly affecting skeletally mature athletes, occurring in as many as 20% of jumping athletes. Inregard to its bilateral affection, males and females are equally predisposed, while in regard to unilateral tendinopathy, the male-to-female ratio is 2:1

DISCUSSION

"Jumper's knee" or patellar tendinitis was first described in an article by Blazina in 1973. [1] Jumpers knee/ patellar tendinosis is chronic tendinopathy most commonly occurring in active, athletic individuals involved in sports associated with jumping such as basketball, volleyball. A majority of patients are athlete by profession seek medical advice with chronic anterior knee pain initially associated with activity and relieved at rest and later, disabling pain affecting performance level of the athlete. Clinical examination elicits tenderness at the inferior pole of the patella, exacerbated by extreme flexion and extension against resistance. Bassett Sign shows tenderness on palpation with the knee at full extension and patellar tendon relaxed. No tenderness is seen with the knee in flexion and patellar tendon taut [2].

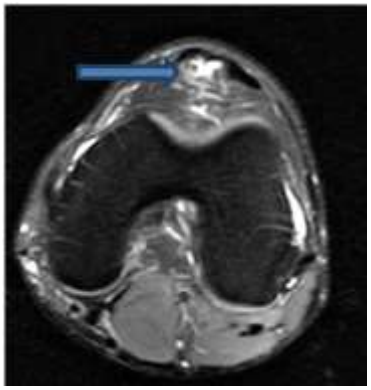

Fig-1: Axial PD images reveal hyperintensity within the patellar tendon, predominantly in medial fibres with mild surrounding inflammation.

Fig-2: T1-weighted sagittal image reveals marked thickening and hyperintensity within the patellar tendon (arrow) with subtle interstitial splits.

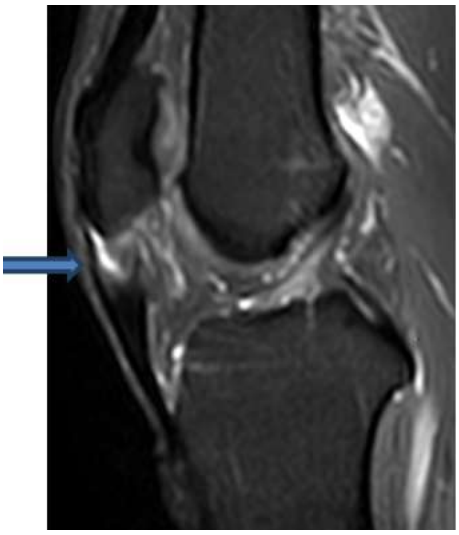

Fig-3: Fat-suppressed proton density weighted sagittal image reveals increased signal intensity within abnormally thickened and edematous tendon (arrow). Mild adjacent edema is seen within infrapatellar (Hoffa's) fat.

Patellar tendinitis may be classified into four stages according to Blazina *et al.* [1]:

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 [2]

Diagnosis may be done with clinical examination followed by imaging, primarily with MRI. Ultrasonography combined with color Doppler may demonstrate peritendinous neovascularization. MRI is safest and most effective and accurate modality to diagnose this condition due to excellent soft tissue contrast, without ionizing radiation. Normally, the patellar tendon shows homogenous hypointensity on T1W images, semilunar shape with anterior convexity, well defined posterior margins and measures less than 7mm in anteroposterior diameter.

In patients with Jumper's Knee, most reliable MRI finding is focal proximal tendon thickening with an associated increase in anteroposterior diameter and intrasubstance T2/PD hyperintensity in the proximal tendon, with sparing of anterior tendon fibres and preferential involvement of medial tendon fibres (full thickness of tendon in severe cases). Hoffitis may be seen with T2/PD hyperintensity in Hoffa's fat pad, along with edema at inferior patellar pole and loss of definition of the posterior border of the tendon. Partial/ full thickness tear may occur in chronic cases. [3, 4]

Jumper's knee can be treated with the conservative method or operative intervention (in refractory cases). Conservative treatment aims at symptomatic relief, reducing inflammation and includes activity modification and cryotherapy (ice therapy for 20-30 minutes, 4-6 times a day), RICE regimen (Rest, ice, compression, and elevation), analgesics, stretching and strengthening exercises, eccentric quadriceps training (recommended for twelve weeks by the Victorian Institute of Sport Assessment). [5]Ultrasonography or phonophoresis may decrease pain symptoms. A patella-femoral brace with a patellar cutout may improve patellar tracking and provide stability through augmentation of proprioception. Arch supports or orthotics help correcting foot malalignments.Eccentric quadriceps training is more effective than concentric exercises[6].

Indications for Surgical Intervention include a professional athlete, failure conservative treatment for six months and tendon rupture. Surgical intervention can be done both arthroscopically and with open repair. In patients with complete patellar rupture, Dall-Miles cable procedure may be done where end-to-end sutures with medial and lateral retinaculum repair are placed, with a cable placed through patella and tibial tubercle [7].

Other therapeutic options include injecting sonography-guided sclerosing agents into the neovascularized patellar tendon [8, 9] Extracorporeal shock wave therapy (ESWT) [10, 11], platelet-rich plasma injections [12-15].

CONCLUSION

Jumper's Knee is among the most common tendon disorders in athletic individuals. The clinical diagnosis may be challenging, as in many cases the physical exam is difficult or confusing due to pain and guarding. In milder cases, patient symptoms may mimic those of meniscal tear, osteochondral injuries, or quadriceps pathology. Fortunately, MRI's multiplanar

capabilities and excellent soft-tissue contrast make it ideally suited for the definitive diagnosis, allowing excellent characterization of patellar tendinosis and related injuries in patients with Jumper's Knee. Early medical attention and treatment can help prevent continued damage to the knee.

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