From POCKET GUIDE TO MUSCULOSKELETAL DIAGNOSIS

Grant Cooper, MD (2006). Chapter 6: Knee Pain, pp. 91-109.

First Thoughts

When your patient complains of "knee pain" without hearing another word, your differential diagnosis includes some basic etiologies:

- 1. Osteoarthritis.
- 2. Ligament damage (injury).
- 3. Meniscus damage.
- 4. Arthritis
- 5. Patellofemoral disorder
- 6. Tendinopathy

History

Ask the following questions:

1. Where is your pain?

This is a very high-yield question. Have your patient point to the most painful point, if possible. Pain at the joint line is the result of a collateral ligament or meniscus problem (or both) until proven otherwise. Pain at the tibial tuberosity in a young patient is Osgood-Schlatter's syndrome until proven otherwise; anterior knee pain may be a patellofemoral disorder or tendinopathy; pain over the medial tibial plateau, approximately 2 inches below the joint line, may be pes anserinus bursitis; and pain and swelling in the posterior knee may be a Baker's cyst.

2. When did your pain begin, what were you doing at the time, and what were the initial symptoms?

This is another high-yield question. In fact, having already ascertained the location of pain, knowing the mechanism of injury and initial symptoms will give you the diagnosis in more than half of all cases of knee pain. Patients with osteoarthritis, patellofemoral syndrome, tendinopathy and Osgood-Schlatter's syndrome have a more chronic onset of symptoms.

3. Do you experience any grinding, locking, catching, or giving way of the knee?

This question is the last general high-yield question for most cases of knee pain. Grinding is characteristic of osteoarthritis; locking and catching are characteristic of meniscus injuries and osteochondritis dissecans (meniscus injuries are much more common than osteochondritis dissecans); and giving way is more characteristic of ligamentous injuries.

4. Are there any positions that make your knee more or less comfortable?

This question is specifically targeting the diagnosis of patellofemoral syndrome. Patients with patellofemoral disorders classically report pain with prolonged knee flexion, and pain relief with knee extension. The "movie theater sign"—in which the patient complains of aching knee pain while sitting with the knees flexed in the theater for a prolonged period of time—is classic for patellofemoral syndrome. Often, to relieve the pain, the patient will report extending the leg into the aisle.

5. What is the quality of your pain (sharp, shooting, dull, etc.)?

The answer to this question is most useful for gathering a general gestalt for the patient's complaint. It may not add any specific diagnostic utility, but it will give a better overall picture for the patient's problem.

6. Have you tried anything to help the pain and, if yes, has that been successful?

This question is more useful for when you are contemplating diagnostic tests and treatment strategies.

7. Other important questions to remember to ask include: Have you ever had surgery on your knee? Do you have any hip or ankle pain (both hip and ankle pain can refer pain to the knee, and vice versa)?

From HOSPITAL PHYSICIAN

ORTHOPAEDIC SURGERY BOARD REVIEW MANUAL

Pedro K. Beredjiklian, MD. Patellar Tendinopathy

INTRODUCTION

Tendinopathy of the patellar tendon—often designated commonly, but not quite accurately, as "patellar tendinitis"—is a common source of anterior knee pain in both professional and recreational athletes.

Children and Adolescents	Adults	Older Adults
Sinding-Larsen-Johanssen syndrome Tibial apophysitis (Osgood-Schlatter) Patellar subluxation or dislocation Osteochondritis dissecans Referred pain: slipped capital femoral epiphysis, others	Patellofemoral pain syndrome (chondromalacia patellae) Osteoarthritis Patellar subluxation or dislocation Osteochondritis dissecans Meniscal tears	Osteoarthritis Crystal-induced inflammatory arthropathy: gout, pseudogout

DIAGNOSIS

History:

With all types of pain, it is beneficial to follow a systematic approach to gathering details. The onset, severity, location, quality, presence of radiation of the pain, and exacerbating and/or alleviating factors should all be identified. In patients with patellar tendinopathy, the onset is generally insidious, described as an aching quality, and usually located at the inferior pole of the patella. Pain is usually worsened with activity, particularly move-ments that place significant force on the patella and patellar tendon (eg, jumping, climbing stairs, rising from a seated position).

Table 2. Classification of Patellar Tendinopathy

Stage	Definition	
1	Pain only after activity, without functional impairment	
2	Pain during and after activity, although the patient is still able to perform satisfactorily in his or her sport	
3	Constant pain at rest and with activity	
4	Complete tendon tear requiring surgical repair	

Adapted with permission from Blazina ME, Kerlan RK, Jobe FW, et al. Jumper's knee. Ortho Clin North Am 1973;4:665–78.

Physical Exam

Bassett sign refers to tenderness to palpation of the insertion of the patellar tendon to the distal pole of the patella in full extension and no tenderness with full flexion. Other clues include quadriceps atrophy, hamstring tightness, patellar hypermobility, and patella alta/baja, however, these findings are relatively nonspecific and little correlation between them and the presence of patellar tendinopathy exists.

IMAGING

Plain films in patellar tendinopathy are often negative but are important to rule out other potential causes of pain.

Ultrasound imaging: evaluate fiber arrangement and look for hypoechoic areas indicating pathology, find the presence of neovascularization.

When compared with magnetic resonance imaging (MRI), ultrasound has been shown to be equally specific yet more sensitive in confirming clinically diagnosed patellar tendinopathy.

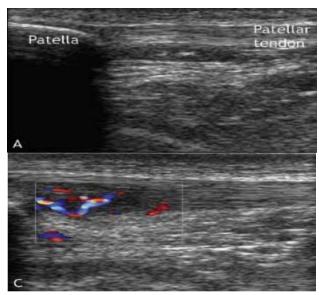
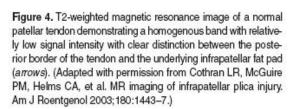




Figure 3. Ultrasonography images of the patellar tendon. (A) Normal appearance of the patellar tendon in the absence of any pathology with no hypoechoic areas or increased vascular flow. (B) A hypoechoic area with associated thickening of the tendon structure. (C) Hypoechoic area with localized thickening as well as increased vascular flow in the affected area. (Adapted with permission from Hoksrud A, Öhberg L, Alfredson H, Bahr R. Color Doppler ultrasound findings in patellar tendinopathy (jumper's knee) Am J Sports Med 2008;36:1813–20.)

MRI: abnormal tendons show increased signal intensity on both T1-weighted and T2-weighted images (**Figure 5**). Furthermore, loss of a clear delineation of the posterior border with the fat pad.





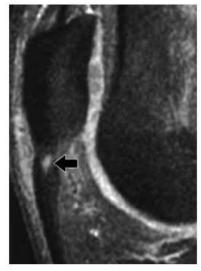


Figure 5. Sagittal fat-suppressed T2-weighted magnetic resonance image of the patellar tendon demonstrating diffuse thickening with a focus of high signal intensity at the insertion of the patellar tendon to the inferior pole of the patella in a patient with patellar tendinopathy. (Adapted with permission from Major NM, Helms CA. MR imaging of the knee: findings in asymptomatic collegiate basketball players. Am J Roentgenol 2002;179:641–4.)

MANAGEMENT

Limit the repetitive stresses to the affected tendon. Overuse injuries should be treated with "underuse." Those with stage 3 symptoms,

pain during and after activity that interferes with competition, should expect to have a longer period of rest (3 months or more) than those with stage 1 symptoms (3 weeks). Complete immobilization of the tendon should be avoided to prevent muscle atrophy.

NSAIDs: for the acute setting and for only a short period of time. The use of NSAIDs might be questioned because inflammation has been shown to be absent in individuals with tendinopathy. Nevertheless, NSAIDs, both oral and topical, are effective in improving pain independent of inflammation for the short term (7 to 14 days); beyond this period, their efficacy is much less.

Eccentric Exercise Program: prevent further degeneration of the tendon by promoting new collagen formation. An eccentric contraction describes the lengthening of a muscle despite maximal contraction (**Figure 6**).





Figure 6. An eccentric contraction describes the lengthening of a muscle despite maximal contraction. In this figure, (A) the entire weight is placed on the injured leg on a 25-degree decline board, and (B) the patient then slowly descends until the knee is flexed 90 degrees. (Adapted with permission from Visnes H, Bahr R. The evolution of eccentric training as treatment for patellar tendinopathy [jumper's knee]: a critical review of exercise programmes. Br J Sports Med 2007;41:217–23.)