Anterior Knee Pain in the Athlete

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KEYWORDS

• Anterior knee pain • Patellofemoral pain • Muscle strength • Quadriceps
• Patellofemoral kinematics

KEY POINTS

- Anterior knee pain has a multifactorial etiology.
- Routine clinical assessment of muscle strength in athletes may not detect deficits, so more challenging functional tests may be required.
- Nonoperative treatment is successful in most cases.
- Strong evidence supports treatment with multimodal physiotherapy.

INTRODUCTION

Anterior knee pain (AKP) is very common, affecting 1 in 4 athletes, 70% of whom are between 16 and 25 years old.[1,2] Considering that the patellofemoral joint is one of the most highly loaded joints in the human body,[3] the prevalence of AKP is not surprising. Athletes with AKP present a significant diagnostic and therapeutic challenge for the sport medicine caregiver. A clear understanding of the etiology of patellofemoral pain in this population is essential in guiding a focused history and physical examination, and achieving appropriate diagnosis and treatment.

The purpose of this clinical review is to provide an assessment framework and a guide for neuromuscular function testing, in addition to an overview of the causes and treatments of AKP in this challenging patient population.

SYMPTOMS

Patients with AKP complain of a variety of symptoms including pain, swelling, weakness, instability, mechanical symptoms, and functional impairment. Pain results from

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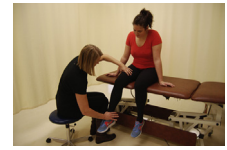
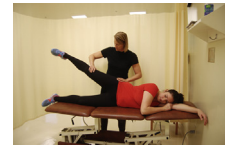
activities that load the patellofemoral joint, such as climbing up or down stairs, squatting, kneeling, and prolonged flexion of the knee joint.[4]

DIAGNOSTIC IMAGING

Diagnostic imaging including anteroposterior, true lateral, and skyline views should be obtained in all patients with refractory AKP. Computed tomography, magnetic resonance imaging (MRI), or ultrasonography should be considered when the history and physical examination determine that further imaging is required.

Table 1
Example clinical screening and advanced functional screening tests to assess neuromuscular control and strength in athletes presenting with AKP

Basic Strength and Muscle Length	Assessment	Example
Knee extensor strength	Assess in sitting with resistance at ankle and palpation of muscle tone. Can also be assessed as resisted straight leg raise in supine Monitor for lateral deviation of thigh, hip flexion, and/or trunk rotation due to muscle weakness or altered activation patterns[6]	
Hip abductor strength	Assess in side-lying with pelvis stabilized in mid-line and resistance above knee Monitor for hip and/or trunk flexion due to weakness or altered muscle activation patterns[7]	
Hip external rotation strength	Assess in supine with both the hip and knee flexed to 90°. Resist rotation at knee and ankle Monitor for hip flexion and/or poor through-range strength	
Quadriceps muscle flexibility	Assess in prone position with pelvis stabilized while examiner flexes knee. Compare heel with buttock distance Monitor for hip flexion, hip or thigh rotation to attain length[7]	

(*continued on next page*)