HOSPITAL PHYSICIAN®

ORTHOPAEDIC SPORTS MEDICINE BOARD REVIEW MANUAL

STATEMENT OF EDITORIAL PURPOSE

The *Hospital Physician Orthopaedic Sports Medicine Board Review Manual* is a peer-reviewed study guide for orthopaedic sports medicine fellows and practicing orthopaedic surgeons. Each manual reviews a topic essential to the current practice of orthopaedic sports medicine.

NOTE FROM THE PUBLISHER:
This publication has been developed without involvement of or review by the American Board of Orthopaedic Surgery.

Endorsed by the Association for Hospital Medical Education

Patellofemoral Instability

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INTRODUCTION

Disorders of the patellofemoral joint are common problems encountered by orthopaedic sports medicine specialists. The spectrum of involvement is broad and may present a diagnostic and therapeutic challenge. Among the disorders that must be considered are articular cartilage lesions, osteochondritis dissecans, plicas, patellar tendonitis, quadriceps tendonitis, osteoarthritis, malalignment, and patellar subluxation and dislocation. This review focuses on acute and recurrent patellofemoral instability in the athlete.

Patellofemoral instability is most commonly reported in young, active individuals involved in sports activities. In a prospective study of 74 patients with a first-time acute patellar dislocation, Atkin et al[1] noted that 53 (72%) were injured during sports activity. In a similar study, Fithian et al[2] found that 61% of the study cohort sustained their primary acute dislocation while participating in sports. Traditionally, females were noted to have a greater predisposition for patellofemoral instability than males, with the typical patient being a young, deconditioned female who was not involved in any type of sports activity at the time of the dislocation. Recent literature, however, favors an even distribution between the sexes.[1–3] The study by Atkin et al[1] showed a slightly increased risk in females during the second decade but a higher risk in males during the third decade.

Treatment of patellofemoral instability is influenced by several factors. A key consideration is whether the problem is acute or recurrent. Although many of the surgical and nonoperative treatments are the same, the approach to nonoperative treatment is different in acute versus recurrent instability. In the acute setting, the patient needs a brief period of immobilization and then a gradual initiation of range of motion and strengthening exercises. In the recurrent situation, physical therapy and quadriceps strengthening are begun immediately. Other factors influencing treatment include timing of the injury (eg, if during the playing season, a physician may wait until the end of the season to consider surgery) and the patient's activity level and goals following treatment. Many questions remain unanswered as to the optimal treatment of these injuries and are the focus of ongoing research.

This manual reviews the clinical evaluation of patients who present with acute or recurrent patellofemoral instability as well as the nonoperative and surgical options for treatment of these patients. Knowledge of the normal anatomy and biomechanics of the patellofemoral joint is critical for understanding how to evaluate and treat patellofemoral instability. The review begins with a brief overview of the pertinent structures involved in normal patellofemoral function.

PATELLOFEMORAL ANATOMY AND BIOMECHANICS

The largest sesamoid bone in the body, the patella acts to increase the lever arm of the knee extensor mechanism, reducing the work required to extend the knee and centralizing the converging forces of the quadriceps muscles. The medial and lateral facets of the patella articulate with the medial and lateral facets of the femoral trochlea. The patella has the thickest articular cartilage found in the body, allowing it to tolerate the large joint-reactive forces generated during sports activities.

STABILIZING FORCES

Normal patellofemoral function during strenuous physical activity requires a combination of stabilizing forces afforded by bony, dynamic, and static soft tissue restraints. The bony elements of the generally congruent patellofemoral joint contribute significantly to its stability. The patella is proximal to the femoral trochlea when the knee is in extension and does not enter the sulcus until about 20 to 30 degrees of knee flexion. The lateral trochlear ridge acts as a buttress to help resist lateral translation of the patella. If the lateral ridge is hypoplastic, the restraint to lateral subluxation is decreased.[4]

The quadriceps muscles are the principal dynamic restraint. Of the 4 heads of the quadriceps, the vastus medialis obliquus (VMO) is best positioned to resist lateral subluxation, due to its approximately 60-degree