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<p>Patellofemoral pain is one of the most common symptoms of patients presenting to sports medicine clinics. Obtaining a pertinent history and performing a thorough examination is crucial to identifying the subset of patients with instability who are most likely to benefit from surgical stabilization. A comprehensive radiographic work-up that includes standard radiographs and advanced imaging helps elucidate the diagnosis and provides crucial information for preoperative planning. This article reviews the evaluation, physical examination, and interpretation of radiographic imaging of patients with patellofemoral pain as an introduction to subsequent articles in this issue discussing surgical interventions.</p>	
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<p>Coronal malalignment of the patellofemoral joint may contribute to both instability as well as pain and joint overload. The use of distal realignment procedures has evolved to include uniplanar and multiplanar osteotomies, which allows patient-specific treatment. With a careful understanding of the complex pathoanatomy, including osseous, soft tissue, and dynamic muscular factors, an appropriately designed tibial tubercle osteotomy (TTO) is an invaluable tool for the orthopedic surgeon to improve joint biomechanics and off-load articular injuries. Current techniques have improved TTO surgery to limit complications and produce reliably good results.</p>	
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<p>Rotational deformity is a less common cause of patellar instability than trochlear dysplasia and patella alta. In some cases, rotational deformity is the primary bony factor producing the instability and should be corrected surgically. More research is needed on what are normal values for femoral version and tibial torsion, as well as when the axial plane alignment needs to be corrected. Many tools can be used to evaluate the axial</p>	

plane and surgeons should be familiar with each of them. Understanding the advantages and disadvantages of each site for osteotomy will help the surgeon choose the most appropriate osteotomy.

Genu Valgum Correction and Biplanar Osteotomies 47

Scott Taylor and Alan Getgood

Valgus malalignment is an important risk factor in recurrent patella instability. This article explores the role of corrective osteotomy and discusses the various described methods both on the femoral and tibial sides of the joint. A detailed operative technique of medial closing wedge distal femoral osteotomy is included.

Patella Alta: When to Correct and Impact on Other Anatomic Risk Factors for Patellofemoral Instability 65

Roland M. Biedert

Patella alta is described as abnormally high-riding patella in relation to the femur, the trochlear groove, or the tibia with decreased bony stability. Patella alta represents an important predisposing factor for patellofemoral instability. Different measurement methods are used to define patella alta. Despite the clinical importance of patella alta, there is only limited consensus on cutoff values, indications for treatment, and ideal correction. In addition, the impact of patella alta on other risk factors for lateral patellar instability is significant. This must be considered when assessing clinical complaints and choosing the best individual treatment. Combined surgical interventions may be necessary.

Trochlear Dysplasia: When and How to Correct 77

Edoardo Giovannetti de Sanctis, Guillaume Mesnard, and David H. Dejour

When? Only patients with high-grade trochlear dysplasia types B and D, in which the prominence of the trochlea (supratrochlear spur) is over 5 mm, recurrent patellar dislocation, and maltracking. How? Sulcus deepening trochleoplasty: modifies the trochlear shape with a central groove and oblique medial and lateral facets; decreases the patellofemoral joint reaction force by reducing the trochlear prominence (spur); and reduces the tibial tubercle and the trochlear groove value by a proximal realignment. Pros: This procedure is highly effective in restoring patellofemoral stability and satisfying the patients. Cons: The patients must be aware of the risk of continuing residual pain and range-of-motion limitation and that the development of patellofemoral osteoarthritis is not predictable.

Medial Patellofemoral Ligament Reconstruction: Tips and Tricks to Get It Right 89

Gregory Anderson and David R. Diduch

Medial patellofemoral ligament reconstruction is used increasingly to treat patellar instability. A number of different techniques have been described to perform this procedure. In this article, we review common pearls and pitfalls to medial patellofemoral ligament reconstruction, as well as tips for troubleshooting the procedure. A special emphasis is placed on

femoral tunnel position and intraoperative adjustments that can be made to improve outcomes.

Medial Patellofemoral Ligament Reconstruction with Open Physes 97

Sofia Hidalgo Perea, Sara R. Shannon, and Daniel W. Green

Through this article, the authors aim to summarize the techniques performed on both first time and recurrent skeletally immature patients experiencing patellar dislocation. This article focuses on several key points, such as the importance of medial patellofemoral ligament femoral insertions being distal to the growth plate and performing extensive lateral release and quadriceps tendon lengthening in cases of obligatory dislocation. Although acknowledging the procedures discussed cannot be considered for all patients, as individuals with open growth plates may *require additional operative time, in many cases these techniques yield high rates of success.*

Putting it all Together: Evaluating Patellar Instability Risk Factors and Revisiting the “Menu” 109

Michaela I. McCarthy, Betina B. Hinckel, Elizabeth A. Arendt, and Caitlin C. Chambers

Management of the patient with multiple risk factors for recurrent patellar instability is complex. Surgeons must possess familiarity with the anatomic risk factors that are associated with first time and recurrent instability events and weigh them in the patient’s individualized surgical “menu” options for surgical patellar stabilization. Addressing individual risk factors, pairing imaging findings with physical examination, and thoughts on prioritizing risk factors to determine which should be prioritized for surgical correction are discussed.

Fixed (Congenital) Patellar Dislocation 123

Phillip T. Grisdela, Nikolaos Paschos, and Miho J. Tanaka

Congenital dislocation of the patella is a rare condition characterized by lateral dislocation of the patella that is irreducible without surgical correction. Although there is no clear inheritance pattern, it is associated with several congenital syndromes. Patients often demonstrate flexion contracture, loss of active knee extension, increased tibial external rotation, and absent patella in the trochlea. Treatment requires surgical management and is comprised of lateral release, medial stabilization, quadriceps lengthening, and distal realignment. Results are generally favorable after treatment; persistent flexion contracture and redislocation are the most common complications. Further study is needed to define the optimal timing and treatment strategy for this uncommon condition.

Management of Chondral Defects Associated with Patella Instability 137

Mark T. Langhans, Sabrina M. Strickland, and Andreas H. Gomoll

Cartilage defects of the patellofemoral joint are commonly found in association with patellar instability owing to abnormal biomechanics. Strategies to address chondral defects of the patellofemoral joint secondary to

instability should first address causes of recurrent instability. Most patellofemoral chondral defects associated with instability are less than 2 cm² and do not generally require intervention beyond chondroplasty. Larger defects of the patella and/or the trochlea can be repaired with osteochondral or surface cartilage repair.

Medial Patellofemoral Ligament Repair or Medial Advancement: Is There a Role? 157

Iain R. Murray, Christopher M. LaPrade, William Michael Pullen,
and Seth L. Sherman

Patellar instability is one of the most prevalent knee disorders, with dislocations occurring in 5 to 43 cases per 10,000 annually. Traumatic patellar dislocation can result in significant morbidity and is associated with patellofemoral chondral injuries and fractures, medial soft tissue disruption, pain, and reduced function, and can lead to patellofemoral osteoarthritis. Chronic and recurrent instability can lead to deformation and incompetence of the medial soft tissue stabilizers. Despite recent gains in understanding the pathoanatomy of this disorder, the management of patients with this condition is complex and remains enigmatic.

The Lateral Side: When and How to Release, Lengthen, and Reconstruct 171

Navya Dandu, Nicholas A. Trasolini, Steven F. DeFroda, Reem Y. Darwish,
and Adam B. Yanke

The lateral patellofemoral complex is an important stabilizer to medial and lateral displacement of the patella. Soft tissue abnormalities can range from pathologic tightness to laxity, presenting with symptoms related to patellar instability, anterior knee pain, or arthritis. Clinical evaluation should be performed to confirm patellar dislocation, assess the integrity of the lateral and medial soft tissues, and explore other pathoanatomic factors that may need to be addressed. Lateral retinacular lengthening is recommended over lateral release owing to the potential of iatrogenic medial instability with release, and a lateral patellofemoral ligament reconstruction can be performed to effectively treat medial instability.