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Recurrent Patellar Instability: Assessment and Decision Making

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Planning the management for a patient with recurrent patellar instability should be based on information gained from a thorough history and physical examination and supplemented with relevant radiological investigations.

In taking the history it is important to distinguish between pain and instability and an open mind should be kept regarding the source of instability symptoms. Recurrent episodes should be distinguished from a single event and the initial episode should be well understood, particularly in relation to the degree of trauma involved and the response of the knee. Symptoms in the other knee and in other family members suggest the presence of predisposing factors.

Important components of the physical examination include static and dynamic alignment, a general knee examination, and assessment of patellar height, mobility, and apprehension, as well as patellar tracking. An assessment of femoral version and tibial torsion should be made.

The radiological assessment of patellar instability continues to evolve. Although plain radiographs, computerized tomography, and magnetic resonance imaging are all used, a good-quality lateral radiograph with the knee in 20°-30° flexion provides information about the 2 most important factors—patellar height and trochlear dysplasia. The importance and role of the tibial tuberosity-trochlear groove distance has been questioned in recent research. If surgery is undertaken it should be tailored to the specific needs of the individual patient. No universally accepted algorithm exists for the planning of surgery. There appears to be a trend to use medial patellofemoral ligament reconstruction as the mainstay of surgery with an apparent reduction in the use of medial tibial tuberosity transfer. Additional procedures, particularly tibial tuberosity distalization and—in some centers—trochleoplasty, can be used to address predisposing factors that are felt to be significant contributors to the patient's problem. Procedures may need to be modified in the skeletally immature or individuals with hyperlaxity. Femoral and tibial osteotomies may have a role in habitual and permanent patellar dislocation.

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Overview

The past decade has seen a change in many centers' surgical approaches to the management of patellar instability. This is in part due to an increased exchange in ideas among surgeons from different continents,[1] particularly through groups such as the International Patellofemoral Study Group. It also reflects the increasing recognition of the role of the medial patellofemoral ligament (MPFL) in maintaining patellar stability and the generally successful results of MPFL reconstruction.[2] In addition there has been, at least in some centers, increased confidence in and more frequent use of trochleoplasty. These changes have occurred on a background of a move toward tailoring surgery to the specific needs of the individual patient, the so-called *à la carte* approach as originally popularized by the Lyonnaise group.

This article will address the contemporary issues in surgical assessment and decision making when treating patients with recurrent patellar instability. Some of the questions to be addressed are as follows:

- If MPFL reconstruction has become the mainstay of surgery to stabilize the patella, when is additional surgery required?

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- If one uses an *à la carte* approach, how does one define thresholds for predisposing factors, how many of these factors need to be corrected, and to what extent should they be corrected?
- Is it in fact more a matter of shifting the overall "balance" of the patellofemoral joint toward stability, rather than restoring anatomical "normality"? *If it were, then this would explain why such varied approaches over the years and around the world have been met with reasonable results.*

As yet there is no universally accepted algorithm for deciding when and how to intervene surgically for a patient with recurrent patellar instability. However, just as for all knee conditions, a full history should be obtained and a complete knee examination should be undertaken, including specific information relevant to the patellofemoral compartment. This should then be supplemented by relevant radiological investigations. The aim of this article is to provide a background for the general orthopaedic surgeon to use this information within a framework of concepts and options to develop a surgical plan.

History

Pain vs Instability

A fundamental, yet deceptively simple question is the following: "does the patient actually have recurrent patellar instability?" In this regard, it is important to distinguish between pain and instability. Episodes of patellar subluxation or dislocation may be associated with pain, which may persist between episodes. Pain without patellar instability may result in a feeling of insecurity, possibly due to pain-induced quadriceps inhibition particularly when descending stairs or inclines. Such pain may or may not be associated with chondral damage.

In general terms, pain that is thought to arise from the patellofemoral joint and that is not associated with chondral damage, is best treated nonoperatively, at least in the first instance. Pain arising from chondral damage (understanding that this is a diagnosis of exclusion, as chondral tissue is aneural) in the patellofemoral joint should be considered on its own merits and not necessarily treated in the same way as patellar instability. When both coexist, decision making may need to be modified. For instance, one needs to be careful not to increase forces across damaged articular surfaces by realignment procedures that are designed to restore patellar stability.

An Open-Minded Approach

Other conditions such as anterior cruciate ligament rupture, unstable meniscal tears, and loose bodies should also be considered as potential causes of the instability of which a patient complains. Once a diagnostic label has been applied to a patient, there is a not unreasonable tendency for the patient and even their health care practitioners to assume that all further episodes of instability are due to this diagnosis. In evaluating a patient for the first time, it is important to keep an open mind and take a thorough history.

Isolated vs Recurrent Event

Regarding patellar instability, it is important to understand whether one is dealing with the first episode or a recurrent episode. Details of the first episode are important, particularly the degree of trauma. A subluxation with no swelling, minimal pain, and disability suggests significant predisposing factors such as trochlear dysplasia, patella alta, and generalized ligamentous laxity. On the contrary, a direct blow to the medial aspect of the patella resulting in a dislocation with difficulty in achieving reduction and which is associated with significant pain, swelling, and disability, is suggestive of significant trauma being required to dislodge the patella with no predisposing factors for instability. Similarly, a combined valgus and external rotation force to the knee may also dislodge an otherwise stable patella.

If the problem is recurrent, the number of episodes of instability and the interval between them provide a measure of the clinical effect and the relative indication for surgical intervention. An indication for further nonoperative management may be 2 episodes some years apart, whereas 3 episodes over 12 months suggest an ongoing problem that warrants consideration for surgery.

Predisposing Factors

Patellar instability in the contralateral knee or in other family members points to underlying anatomical factors that predispose to the problem and may be a relative indication for surgery; although, if there is a positive family history, there may be a tendency to downplay the significance of the symptoms.[3] Conversely, a stable patella in the opposite knee that has underlying anatomical predisposing factors may suggest that correction of the same factors in the affected knee may not be required and that restoration of the MPFL alone will be adequate.

History—Key Points

- Pain vs instability
- Open-minded approach—consider other diagnoses
- Isolated vs recurrent event
- Predisposing factors

Physical Examination

For most of the patients being considered for patellar stabilization surgery there are a relatively small number of pertinent findings on examination. However, care needs to be taken to undertake an adequate examination that might reveal unusual factors contributing to the patient's problem. A fundamental principle in physical examination of the knee is the comparative nature of the study. Both legs should be examined in sequence to highlight deficiencies if the condition is unilateral or to investigate for bilateral predisposing factors.