Reconstruct soft tissue constraint to correct lateral patellar dislocation

Part 1 of a two-part series on patellofemoral instability looks at the soft-tissue approach.

By Susan M. Rapp
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Orthopedic surgeons traditionally resolve joint instability problems by trying to reconstruct the anatomy of the torn structure. Extending this approach to the patellofemoral joint, reconstruction of the medial patellofemoral ligament (MPFL), or a soft tissue approach is the surgical procedure of choice.

This differs from the approach advocated by the "Lyon school" in which specific elements of bony anatomy are surgically corrected.

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A proponent of each approach presented their preferred surgical treatment in combined lectures at the 2007 International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine Congress.

In this two-part series we will present both sides of the issue, starting off this month with the “soft-tissue” rationale.

Elizabeth A. Arendt, MD, an *Orthopedics Today* Editorial Board member, feels that the MPFL is the essential ligament that restricts lateral patella translation, and reconstruction of this ligament is an important step in most cases of surgical stabilization.

She said MPFL reconstruction surgery is a viable solution to patellar instability and is effective for preventing patellar re-dislocations.


Elizabeth A. Arendt

“In my first 57 reconstructions I’ve had only one failure,” she said. However, Arendt told *Orthopedics Today* it is still early in the life cycle of MPFL reconstruction to tell if such treatments will supplant the bony approach associated with Lyon, France.

The Lyon proponents base surgical strategy on radiographic imaging criteria from lateral X-rays and computed tomography (CT) scans. “Using these images, compared to a normal population, surgeons established threshold measurements that distinguish certain factors for lateral patella dislocation,” she said. “When these measurements are above the threshold, they are surgically corrected. These included: a TT-TG measurement based on CT images above 20 mm, patella tilt measurement based on CT images above 20°, trochlear dysplasia and patella alta based on a true lateral radiograph.”

Combined approaches

Arendt has started incorporating components of the Lyon approach in her surgical planning; correcting instability factors as judged by imaging method, in particular patella alta. She believes both schools of thought will eventually meet somewhere in the middle.

“Re-establishing the check rein against lateral patella translation by MPFL reconstruction, to me, is the most important surgical element,” she said. “I don’t correct other factors unless I believe that they are excessively outside the norm. Of the objective instability factors described by the Lyon school, I believe that excessive patellar alta is the most important to correct to control patellofemoral instability symptoms.”

She defined four standard deviations above the norm (Insall-Salvati ratios > 1.4) as representing a surgical indication.

More data needed

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— Elizabeth A. Arendt, MD

Meanwhile, it will take more research to determine the strong points of MPFL reconstruction. “I don’t think we have enough outcomes data on the results of MPFL reconstruction,” Arendt said. “Even in my own experience — I have been doing this procedure for exactly 4 years — I’m just now getting 2- and 3-year data out from those patients.”

Furthermore, how well each technique prevents dislocation is not an appropriate way to assess their overall efficacy, Arendt said.

Post-reconstruction return to function after MPFL surgery must also be assessed objectively, she said.

Investigators must consider range of motion, any signs of pain and crepitus and whether reconstruction has changed the cartilage status of the knee over time.

“Through collaboration, particularly through mutual discussions and the leadership of the International Patellofemoral Study Group, these two schools of thought are coming together or are closer in agreement with how we approach solving the problem surgically,” she said.

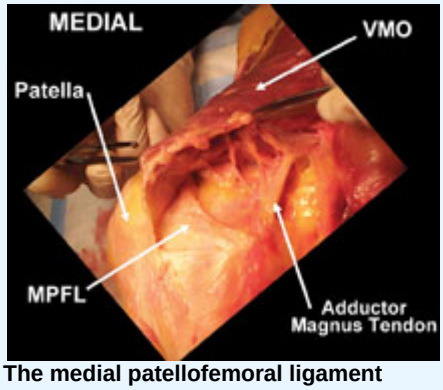
“Over the last 10 years in the United States we have evolved to have a better appreciation for the MPFL. The current approach for many Americans is to restore the passive check rein — that is the main stabilizer of the patella — against lateral patella translation. Therefore, with this philosophy, we would reconstruct the MPFL,” Arendt said.

In her presentation Arendt also discussed the anatomy and biomechanics of patellofemoral restraints, focusing mostly on the medial side. Graft strength, stiffness and attachments are all critical to MPFL reconstruction success.

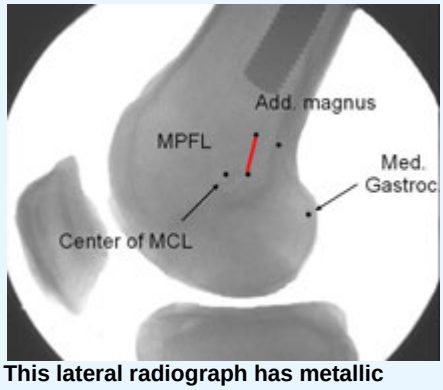
“The ideal graft would have similar stiffness but be stronger than the native MPFL. Our current graft choices depend on tissue that is stronger but also much stiffer than the native MPFL, making surgical fixation landmarks critical to the overall success of the procedure,” she said.

In Part 2

Next month, we will focus on David DeJour, MD, of Lyon, France, and how he surgically manages patellofemoral instability with the bony approach.



The medial patellofemoral ligament (MPFL) attaches to the femur 10 mm proximal and 2 mm posterior to the medial epicondyle, in the saddle between the medial epicondyle and the adductor tubercle (VMO: vastus medialis obliquus).



This lateral radiograph has metallic beads marking tendon and ligament insertion points. The insertion of the MPFL is illustrated by the red line (MCL: medial collateral ligament).

Images: Arendt EA

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Reference:

- Arendt EA. Lecture: How I treat patellar instability in a patient with patella alta, femoral dysplasia and knee pain. Presented at the 2007 International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine Congress. May 27-31, 2007. Florence.