Medial Patellofemoral Ligament Reconstruction Following Total Knee Arthroplasty: A Case Report

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Abstract

Patella instability is a rare but serious complication seen following total knee arthroplasty. The typical cause of patella instability in this setting is malpositioned components. While the mainstay of treatment is recognizing and correcting any malpositioning of the components, continued instability can remain and be a difficult problem to treat. Medial patellofemoral ligament (MPFL) reconstruction can be a helpful adjunct for the surgeon when faced with cases of continued instability. In this case report, we describe the successful use of MPFL reconstruction in conjunction with component revision for the treatment of postarthroplasty patella instability.

Keywords

► patella instability
► arthroplasty
► medial patellofemoral ligament

Case Report

A 65-year-old male presented to the clinic with left knee pain. He denied any episodes of trauma and described his pain as being located mostly at his medial compartment. His clinical examination revealed a small effusion and a range of motion from 10 to 115 degrees. He had a negative Lachman test and posterior drawer test and was stable to varus and valgus stress at 0 and 30 degrees. His patella tracked normally with some crepitus. There was no J sign and no lateral tilt of his patella on examination. His patella was neither subluxable nor dislocatable on examination and had a firm end point to lateral push. His radiographs were consistent with tricompartmental osteoarthritis (► Fig. 1). After failing conservative treatment options, he elected to proceed with a TKA.

The patient was taken to the operating room and a cruciate retaining TKA (Biomet, Warsaw, IN) was performed without complication. A subvastus approach was used and the patella resurfaced. The patient had a routine postoperative course until 6 weeks postoperatively when he began to complain of patella maltracking and pain after a fall. Clinical examination and radiographs revealed a laterally dislocated patella. The tibial and femoral components were carefully examined for evidence of malrotation, but no obvious malrotation was identified. A computed tomography scan was also used to evaluate the rotational alignment of the components and revealed no evidence of malrotation. Treatment options were discussed and a release of the lateral retinaculum and medial reefing was performed. These were performed in a limited open fashion. The patient was placed in a knee immobilizer for 2 weeks following surgery and then began standard postarthroplasty physical therapy consisting of range of motion exercises, strengthening, and gait training. Upon discontinuation of the knee immobilizer, he was again found to have recurrent lateral patellar dislocations. Treatment options were again discussed and the patient decided to proceed with exploration of his knee arthroplasty with likely revision if malrotated components were found.
addition, the decision was made to perform an MPFL recon-
struction using a semitendinosus autograft, if deemed nec-
essary, at the time of surgery.

The patient was taken back to the operating room and the
arthroplasty was explored. The femoral component was
examined in relation to the posterior condylar line and trans-
epicondylar axis and found to be in neutral rotation. The
component was revised to 3 degrees of external rotation and
the knee taken through a range of motion. The tibial compo-
ment was also evaluated and found to be positioned correctly
with acceptable rotation using the tibial tubercle, the trans-
malleolar axis, and the second metatarsal as reference points.
The patellar component itself was also evaluated and found to
be well positioned on the medial aspect of the patella. Patella
tracking was now evaluated by reapproximating the extensor
mechanism and applying proximal tension through a flexion/
extension cycle. The patella continued to track laterally with
every flexion/extension cycle. The medial retinacular tissue
was found to be stretched and there was significant lateral
retinacular tightness found. At this point, a lateral release was
performed and the patella now remained in the trochlear
groove throughout the flexion/extension cycle. However, the
patella was easily dislocated with lateral push in the extended
or near extended position. The decision was made to perform
an MPFL reconstruction. This was done using a technique as
described by Csintalan et al.\textsuperscript{15} The semitendinosus was iden-
tified at its insertion to the pes anserine. A closed ended
tendon stripper was used to harvest it back to the muscu-
lotendinous junction. The tendon was doubled over and
secured to the anatomic attachment of the MPFL adjacent
to the medial epicondyle with a 7 × 23 mm Bio-Tenodesis
Screw System (Arthrex, Naples, FL). The two free limbs of
the graft were shuttled between layers 2 and 3 of the retinaculum.
A 4.5-mm drill bit was used to make two drill holes in the
superomedial aspect of the patella. The two free limbs of the
graft were then brought through the drill holes, tensioned
appropriately, and were sewn back to themselves securing the
MPFL reconstruction (\textsuperscript{Fig. 2}). This was performed with the
knee in 15 degrees of flexion. The patella was tensioned to
allow it to enter the trochlea smoothly during early flexion
and also to provide a “check rein” to lateral dislocation. After
the MPFL reconstruction and lateral release, the patella tracking
was found to be greatly improved and the patella was no
longer easily dislocated. Routine closure was performed and
postoperative rehabilitation again consisted of immobiliza-
tion in extension in a knee immobilizer for 2 weeks followed
by routine postarthroplasty physical therapy.

The patient has had a routine postoperative course since
his revision TKA and MPFL reconstruction. Postoperative
radiographs reveal good tracking of his patellar component
(\textsuperscript{Fig. 3}). He has had no further complaint of patellar
maltracking or pain.

\textbf{Discussion}

Patellofemoral instability after TKA can be a very difficult
problem to treat. It is often secondary to malposition of the
components; therefore, revision surgery is usually
necessary.\textsuperscript{11,16,17} When the components are correctly positioned, an attempt at lateral release with or without proximal realignment may be considered. This technique has been previously described and good results have been reported by several authors.\textsuperscript{18,19} Distal realignment techniques have also been described with satisfactory results. These techniques involve a medial tibial tubercle osteotomy to change the Q-angle of the patella and force it to track more medially.\textsuperscript{20} The exact role of MPFL reconstruction in the treatment pathways of postarthroplasty patellar instability remains to be defined. It seems reasonable to perform MPFL reconstruction as an adjunct or in addition to the previously mentioned realignment procedures. Most of the time, patella instability is secondary to component malposition. In cases of significant malposition, attempts to address only the soft tissue imbalances will likely fail. In these situations, careful and critical examination of the femoral, tibial, and patellar components is necessary. Revision surgery to return these components to the correct orientation will usually solve the problem. After the components have been restored to the correct orientation, there may still be a component of residual instability as a result of the previous patella dislocations. This is true in the case we have reported where we believe that there was likely a small component of femoral malrotation. After revising the femoral component, we chose to perform an MPFL reconstruction to reestablish the normal “check reign” to lateral patellar dislocation.

Conclusion

We demonstrate that an MPFL reconstruction may be a successful adjunct in managing patellar instability following TKA. We believe that this should be part of the armamentarium of the knee arthroplasty surgeon when encountering a patella that remains unstable or potentially unstable following treatment of any version or alignment issues. There are few reports in the literature regarding MPFL reconstruction in conjunction with TKA.\textsuperscript{13} We report the successful treatment of postarthroplasty patella dislocation with component revision and MPFL reconstruction.

References

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