Combined Reconstruction of the Medial Patellofemoral Ligament (MPFL) and Medial Quadriceps Tendon-Femoral Ligament (MQTFL) for Patellar Instability in Children and Adolescents: Surgical Technique and Outcomes

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Background & Purpose

Recurrent patellar instability, particularly in the skeletally immature patient, presents a challenging problem. MPFL reconstruction has become the standard of care. The current study describes a hamstring allograft combined reconstruction technique of the medial patellofemoral ligament (MPFL) and the medial quadriceps tendon-femoral ligament (MQTFL), recreating the medial patellofemoral complex (MPFC), and reports patient outcomes of a single-surgeon series.

Methods

- Description of surgical technique & case series from Feb 2012-Jan 2015
- Inclusion Criteria: ≤ 18yo, MPFL + MQTFL Technique, >1 year follow-up
- Medical review: demographic, clinical, surgical, and complications data
- Imaging review (pre-operative X and MRI):
  - Tibial TuberoneTrochlear Groove (TT-TG) Distance
  - Caton-Deschamps Index (CDI)
  - Dejour Classification (A/B vs. C/D)
- Patient Reported Outcomes (PROs): Kujala, Pedi-IKDC, Lysholm

Results

- 25 patients (60% female), mean age of 15 ± 2.2 yrs (range 10-18 yrs old)
- 6/25 patients (24%) had undergone prior ipsilateral patellofemoral surgery
- Preop mean TT-TG 17.2 mm ± 3.8; Caton-Deschamps Index 1.13 ± 0.16; Dejour A/B (22/26, 85%) or C/D (4/26, 15%)
- 5/25 (20%) underwent simultaneous implant-mediated guided growth via hemiepiphysiodesis for valgus deformity
- 2/25 (8%) later required revision procedures (tibial tubercle osteotomy) for recurrent patellar instability
- 1/25 (4%) had a single subluxation episode 1.4 years post-op, no revision
- 19/25 (77%) returned to sports at mean of 5.8 months ± 3.9 months
- No patellar fractures, arthrofibrosis, or infection
- 18/25 (72%) completed PROs at a mean 2.0 ± 0.5 years after surgery (min 1 yr)
  - Kujala 85.9 ± 13.9 (range 59-100)
  - Pedi-IKDC 81.5 ± 15.2 (range 58.7-100)
  - Lysholm 84.3 ± 13.5 (range 57-100)
- MPFL reconstruction is the standard of care for recurrent patellar instability
- Complications are a major concern, particularly in the pediatric population
  - Parikh et al.: 179 pts., 16.2% overall complication rate. 8/29 recurrent instability
  - Enderlein et al.: 224 pts. 2.8% revision rate
- Overall outcomes were favorable, with high mean Kujala, Pedi-IKDC, and Lysholm scores compared to previously-reported results in the adult population.
- Benefits of surgical technique described here:
  - Restoring MPFL and MQTFL (MPFC) anatomy while minimizing the risk of patellar fracture
  - Physial-sparing: avoidance of femoral tunnel drilling with use of suture anchor fixation
- Potential for use in revision setting, particularly when patellar drill holes have compromised bone stock: employing single suture anchor fixation for patella-sided fixation

Discussion

- Potential concerns to keep in mind when using this technique:
  a. Use of allograft
  b. Strength of fixation
  c. Overconstraint

Conclusion

- Anatomically-validated technique of combined MPFL-MQTFL reconstruction with favorable short-term results.
- Particularly useful in the skeletally immature patient when tibial tubercle osteotomy should be avoided and patellar and femoral (peri-physal) fixation minimized, but may potentially be appropriate for older patients with patellofemoral instability as well.
- Described technique more closely recreates the native anatomy of the MPFL-MQTFL (MPFC), may decrease the risk of patellar fracture, safely avoids injury to the distal femoral physe, and can be useful in the revision setting.