Improvements in Kujala at Minimum Two-Years Following Medial Patellofemoral Ligament Reconstruction are Correlated with Intraoperative Instability Measurements: A Multivariate Analysis of Risk Factors

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Disclosures:

Introduction: The purpose of this study is to correlate demographic, anatomical, and clinical risk factors to minimum two-year outcomes following isolated medial patellofemoral ligament reconstruction (MPFLR).

Methods: A retrospective review of patients undergoing isolated MPFLR for recurrent patellar instability at a single institution between December 2015-June 2021 was performed. Patients with concomitant osseous procedures beyond chondroplasty and any ligamentous procedure were excluded. Included patients completed patient reported outcome (PRO) surveys preoperatively then at a minimum of 2 years postoperatively. Demographic, radiographic, surgical, and clinical data was collected. Univariate correlations to minimum 2-year delta-PRO scores were calculated, then those reaching significance were included in a multivariable linear regression analysis.

Results: One hundred and thirteen MPFLR patients were included (77 female, 36 male; age: 21.6 ± 9.1 years). Final Kujala score was 88.44 ± 14.12 at 2.97 ± 1.11 years postoperatively. On univariate testing, final Kujala score was significantly correlated with age at time of surgery (*P*=0.035; r=0.218), body mass index (P=0.035; r=-0.204), and the degree of knee flexion at which the patella can no longer be manually dislocated laterally during an examination under anesthesia (Instability Resolution Angle — IRA; P=0.010; r=-0.318). The delta final Kujala score (mean score 30.72 ± 19.68) was significantly correlated with age at time of surgery (P=0.032; r=-0.207), age at time of first patellar instability event (P=0.001; r=0.364), Caton-Deschamps Index (CDI; P=0.026; r=-0.235), trochlear width (P=0.016; r=0.251), the percentage of trochlear-patellar overlap on sagittal MRI (P=0.031; r=0.227), and the depth of the central trochlear trough from the lateral trochlear peak (P=0.035; r=0.221)(**Table 1**). On multivariable linear regression analysis, a larger IRA remained significantly correlated with worse final Kujala scores (*P*= 0.018) and delta final Kujala (*P*= 0.04).

Discussion: A larger IRA on examination under anesthesia is independently correlated with worse final and delta final Kujala scores at a minimum of two-years after isolated MPFLR.

Significance/Clinical Relevance: This study provides valuable insights into the determinants of successful outcomes in MPFL reconstruction.

Table 1. Significant results from univariate testing of demographic, historical, physical exam, and imaging findings and minimum two-year Kujala scores.

Independent Variable	Dependent Variable	Imaging Modality	Statistical Test	*p*-value	Correlation Coefficient (r)
Age at time of surgery (years)	Final Kujala Score	-	Pearson's Correlation	0.035	0.218
BMI	Final Kujala Score	-	Pearson's Correlation	0.035	-0.204
Instability Resolution Angle on EUA (°, linear scale)	Final Kujala Score	-	Pearson's Correlation	0.010	-0.318
EUA IRA (<60° vs. ≥60°)	Final Kujala Score		Unpaired t-test	0.001	-
Age at time of surgery (years)	Delta Final Kujala Score	-	Pearson's Correlation	0.032	-0.207
Age at Time of First Instability Event (years)	Delta Final Kujala Score	-	Pearson's Correlation	0.001	0.364
CDI (linear scale)	Delta Final Kujala Score	X-ray	Pearson's Correlation	0.026	-0.235
CDI (<1.3 vs ≥1.3)	Delta Final Kujala Score	X-ray	Unpaired t-test	0.001	-
Trochlear Depth (Lateral peak-central trough; mm)	Delta Final Kujala Score	MRI, axial	Pearson's Correlation	0.035	0.221
Trochlear Width (mm)	Delta Final Kujala Score	MRI, axial	Pearson's Correlation	0.016	0.251
Patella-Trochlea Sagittal Overlap (%)	Delta Final Kujala Score	MRI, sagittal	Pearson's Correlation	0.031	0.227