Prediction of Contralateral Patellar Instability after Ipsilateral Medial Patellofemoral Ligament Reconstruction

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INTRODUCTION:

About 10-16% of patients with patellar instability have bilateral involvement. The risk factors to predict future contralateral patellar instability in patients who present with ipsilateral patellar instability are not known. Knowledge related to the future possibility of contralateral patellar instability would be helpful as previous studies have shown suboptimal outcomes and increased complication rates in patients with bilateral patellar instability. The purpose of the current study was to identify the risk factors for future contralateral patellar instability and develop a prediction model for contralateral patellar instability.

METHODS:

Using a hospital-based surgery database from 2012-2022, all patients who underwent MPFL reconstruction were identified. Age, gender, skeletal maturity, Body Mass Index (BMI), Ehlers-Danlos syndrome (EDS) diagnosis (Beighton score ≥5), and first-time vs recurrent ipsilateral patellar dislocation were noted. Four anatomic risk factors - trochlear depth, Caton-Deschamps Index (CDI), the tibial tubercle to trochlear groove (TT-TG) distance and patellar tilt, were assessed on MRI of the ipsilateral knee**.** Multivariable backward conditional logistic regression analysis was performed to identify risk factors for contralateral patellar instability. A simplified prediction model for contralateral patellar instability was developed based on number of risk factors.

RESULTS:

During the study period, 380 knees in 293 patients had MPFL reconstruction and formed the study cohort. The average age at surgery was 14.7 (±2.7) years. 63.9% were female. 168(44.2%) were skeletally immature. 83 knees (21.8%) had first-time dislocation, and 297 knees (78.2%) had recurrent dislocation. Of these 380 knees, 130 knees (34.2%) had future contralateral instability. Based on multiple regression analysis, skeletal immaturity (OR= 1.9), EDS diagnosis (OR= 2.9), recurrent patellar instability in the ipsilateral knee (OR = 2), trochlear dysplasia in ipsilateral knee (OR=1.9) and patella alta in ipsilateral knee (OR= 1.8) formed the final model to predict contralateral patellar dislocation. As per prediction model (Figure 1), the risk of future contralateral instability would be 9% when there was no risk factor present and 78% when all 5 risk factors were present.

DISCUSSION AND CONCLUSION:

Skeletal immaturity, recurrent ipsilateral patellar instability, EDS diagnosis (Beighton ≥5), trochlear dysplasia in involved knee and patella alta in involved knee can help predict contralateral patellar instability. The knowledge about risk factors and prediction model for contralateral patellar instability can be used to counsel patients and families. It can also have implications for prevention and management of patellar instability.

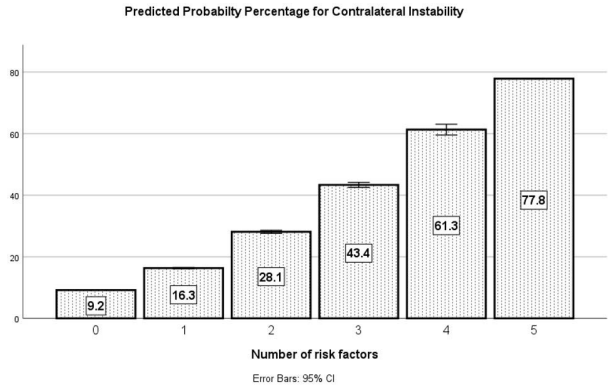

Figure 1- The predicted probability percentage of future contralateral patellar instability based on number of risk factors in ipsilateral knee (the risk factors include skeletal immaturity, EDS diagnosis (Beighton ≥5), recurrent patellar dislocations, trochlear dysplasia and patella alta).