Isolated Medial Patellofemoral Ligament Reconstruction for Patellar Instability Regardless of Tibial Tubercle–Trochlear Groove Distance and Patellar Height

Outcomes at 1 and 2 Years

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Background: It is unclear which patients with recurrent patellar instability require a bony procedure in addition to medial patellofemoral ligament (MPFL) reconstruction.

Purpose: To report 1- and 2-year outcomes of patients after isolated MPFL reconstruction performed for patellar instability regardless of patellar height, tibial tubercle–trochlear groove (TT-TG) distance, or trochlear dysplasia.

Study Design: Case series; Level of evidence, 4.

Methods: All patients with recurrent patellar instability and without significant unloadable chondral defects (Outerbridge grade IV), cartilage defects (especially inferior/lateral patella), previous failed surgery, or pain >50% as their chief complaint were prospectively enrolled beginning March 2014. All patients underwent primary, unilateral, isolated MPFL reconstruction regardless of concomitant bony pathology for treatment of recurrent patellar instability. Information on recurrent subjective instability, dislocations, ability to return to sport (RTS), and outcome scores was recorded at 1 and 2 years. TT-TG distance, patellar height (with the Caton-Deschamps index), and trochlear depth were measured.

Results: Ninety patients (77% female; mean ± SD age, 19.4 ± 5.6 years) underwent MPFL reconstruction between March 2014 and August 2017: 72 (80%) reached 1-year follow-up, and 47 (52.2%) reached 2-year follow-up (mean follow-up, 2.2 years). Mean TT-TG distance was 14.7 ± 5.4 mm (range, –2.2 to 26.8 mm); mean patellar height, 1.2 ± 0.11 mm (range, 0.89-1.45 mm); and mean trochlear depth, 1.8 ± 1.4 mm (range, 0.05-6.85 mm). Ninety-six percent of patients at 1 year and 100% at 2 years had no self-reported patellofemoral instability; 1 patient experienced a redislocation at 3.5 years. RTS rates at 1 and 2 years were 90% and 88%, respectively. Mean time to RTS was 8.8 months. All patients had clinically and statistically significant improvement in mean Knee injury and Osteoarthritis Outcome Score–Quality of Life (32.7 to 72.0, $P < .001$), mean International Knee Documentation Committee subjective form (51.4 to 82.6, $P < .001$), and mean Kujala score (62.2 to 89.5, $P < .001$). No difference existed between 1- and 2-year outcome scores (all $P > .05$).

Conclusion: At early follow-up of 1 and 2 years, isolated MPFL reconstruction is an effective treatment for patellar instability and provides significant improvements in outcome scores with a low redislocation/instability rate regardless of bony pathologies, including TT-TG distance, Caton-Deschamps index, and trochlear dysplasia. Future data from this cohort will be used to assess long-term outcomes.

Keywords: medial patellofemoral ligament reconstruction (MPFL); patellar instability; knee; tibial tubercle–trochlear groove (TT-TG) distance; outcome; surgery

Lateral patellar instability is a common problem affecting patients between the ages of 10 and 25 years.[1,3,26] A recent US population–based study found that the annual incidence of patellar dislocations is 23.2 per 100,000 person-years, that dislocations most commonly occur among patients aged 14 to 18 years, and that there was no difference between males and females in the number of dislocations sustained.[26] Current standard of care for the majority of patients without a significant osteochondral injury or loose body who sustain a first-time lateral patellar dislocation is nonoperative treatment focused on rest as well as patellar stabilization rehabilitation.[12,15,30] Success rates in nonoperative treatment of first-time patellar dislocations vary: a recent meta-analysis found a mean redislocation rate of 34.6% and recurrent

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instability of 32.8% among patients treated nonoperatively. Other studies identified a high-risk subset of patients <25 years old with trochlea dysplasia, with up to a 69% risk of recurrent dislocation at 5 years.[18] Similarly, an economic decision model found nonoperative treatment to be the least costly but also least effective treatment option.[13,22]

Patients who do not improve with a trial of nonoperative treatment and continue to experience patellar instability are offered the option of surgical intervention.[12] There are several described procedures to treat patellar instability, including medial patellofemoral ligament (MPFL) repair, MPFL reconstruction, tibial tubercle osteotomy (TTO), trochleoplasty, or a combination of these procedures.[28] It is currently not well understood when a patient who presents with recurrent patellar instability should undergo an isolated MPFL reconstruction or an MPFL reconstruction with a concomitant TTO, as results after MPFL reconstruction have been encouraging.[29] Several studies have attempted to determine the patients who would benefit from a concomitant TTO based on anatomic patellar instability risk factors, including patella alta, tibial tubercle–trochlear groove (TT-TG) or tibial tubercle–posterior cruciate ligament (TT-PCL) distance, trochlear dysplasia, and abnormal lateral patellar tilt.[5,10,19,27] Studies have cited trochlear dysplasia as the main anatomic risk factor for lateral patellar dislocation, followed by lateral patellar tilt ($\geq$20°).[5,9,26] In regard to TT-TG or TT-PCL distance, however, there have been mixed results, with some authors recommending a concomitant TTO when the TT-TG or TT-PCL distance is >20 mm or >24 mm, respectively, while others report that the normal TT-PCL distance of patients without instability is 19.9 mm.[9,10,27] Hence, patients with patellar instability may benefit from an isolated MPFL reconstruction regardless of bony anatomy.

Therefore, the purpose of this study was to report the instability recurrence rate, patient-reported outcome scores, and return-to-sport (RTS) rate at 1- and 2-year follow-up for patients who underwent an isolated MPFL reconstruction for recurrent patellar instability regardless of their TT-TG distance, patellar height, or trochlear dysplasia. We hypothesized that patients will have a <5% redislocation rate and >80% RTS rate after isolated MPFL reconstruction, with significant improvement seen in all patient-reported outcome scores.

METHODS

An institutional patient registry was created by the senior author (B.E.S.S.) following approval from the Hospital for Special Surgery Institutional Review Board (2013-112-CR4) to prospectively evaluate all patients who had recurrent patellar instability beginning March 2014. All patients with a history of a recurrent patellar dislocation or multiple subluxation events (>3) were eligible for inclusion. Subluxation and dislocation events were based on description of events by the patient. Exclusion criteria were a history of a patellar stabilization procedure, a severe cartilage defect (Outerbridge grade IV; especially in the inferior or lateral patella, as studies showed significant improvements after TTO for lesions in these locations), patients whose patella had to dislocate to extend the knee completely (obligatory dislocation), and daily anterior pain as >50% of the chief complaint.[23] Regarding the last exclusion criterion, each patient was asked if pain or instability was his or her primary complaint—specifically, if it made up >50% of the symptoms. If the answer was pain, the patient was excluded. All patients with recurrent patellar instability who did not meet the exclusion criteria were offered an isolated MPFL reconstruction and prospectively enrolled in this study regardless of TT-TG distance, trochlear morphology, trochlear depth, and patellar height. Magnetic resonance imaging was obtained for all patients.

With regard to enrollment, no patients refused to participate in this study. During the study period, 60 patients were excluded: 58 who underwent MPFL and TTO with or without a cartilage procedure, as they had pain as >50% of their chief complaint or an unloadable cartilage defect (Outerbridge grade IV), and 2 who had obligatory dislocations. The 2 patients with obligatory dislocations could not completely extend the knee from a bent position but rather had to use the opposite foot to passively straighten the knee past 30° to achieve full extension. Similarly, they could hold the knee completely straight once it was extended, but they could not control the knee enough to let it bend slowly. Rather, the patella would jump medially when they attempted to bend the knee, which would drop to 30° until they could regain control. It was thought that a soft tissue procedure would not provide sufficient stability for these 2 patients, and as such they were excluded.

Patient data were collected at the time of enrollment into the patient registry. Patient-reported outcome measures (PROMs) were collected preoperatively and at 1 and 2 years postoperatively. Knee-specific PROMs included collection of the Knee injury and Osteoarthritis Outcome Score–Quality of Life (KOOS-QoL), KOOS–Physical Function Short Form (KOOS-PS), International Knee Documentation Committee (IKDC) subjective knee form, Kujala Knee Score, and Pediatric Functional Activity Brief

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Scale.[4,15] Collection of general health PROMs included VR-12 (Veterans RAND 12-Item Health Survey) Physical Component Summary (PCS) and Mental Component Summary (MCS) scores. Patient satisfaction was collected after surgery at yearly visits. Information on recurrent subjective instability, dislocations, and ability to RTS was recorded at each patient visit beginning at 12 weeks until final follow-up. Radiographic measures of TT-TG distance, patellar height (with the Caton-Deschamps index [CDI]), trochlear depth, and trochlear dysplasia were measured on magnetic resonance images by 2 study authors (B.E.S.S., B.J.E.), one of whom was the senior author and the other a sports medicine fellow.[4,5]

Surgical Technique

Among the 72 patients with 1-year follow-up, all underwent an isolated MPFL reconstruction with a semitendinosus autograft (59 patients) or allograft (13 patients) per patient preference. Patients were placed supine, and regional anesthesia (spinal) was utilized in all cases. A nonsterile tourniquet was placed high on the thigh. Once the patients were prepared and draped in the usual sterile fashion and preoperative antibiotics were administered, a diagnostic knee arthroscopy was performed to evaluate the patellar and trochlear chondral surfaces, remove loose bodies, and inspect the knee. Upon completion, the arthroscope was removed, and the tourniquet was inflated. The semitendinosus tendon was harvested through a 2-cm incision centered over the pes anserine insertion with an open-ended tendon stripper. The graft was trimmed of any muscle, and a mark was placed at the midpoint of the graft. Next, a 3-cm incision was made approximately 1 cm off the medial edge of the patella, beginning at the level of the superior pole of the patella. Sharp dissection was taken down to the layer between the retinaculum (superficial) and the capsule (deep).[6] The plane between layers 2 and 3 was developed with Metzenbaum scissors. An absorbable suture was used to tag the medial and lateral flaps of the retinaculum for later closure. Once the layer was defined, an electrocautery device was used to expose the proximal half of the medial patella, just anterior to the cartilage. A curette was used to abrade the bone, and 2 suture anchors were placed such that the midpoint between them was at the juncture of the proximal third and distal two-thirds of the patella. The anchors were separated by 8 to 10 mm of bone to allow for a broad surface for tendon-bone healing. The graft was then secured to the patella with these anchors by placing the previously marked spot on the graft between the anchors and lassoing the graft with the sutures.

The medial epicondyle, adductor tubercle, and sulcus between were then sharply exposed through a 2-cm incision. A guide pin was placed in the sulcus, slightly proximal and posterior to the medial epicondyle and slightly anterior and distal to the adductor tubercle. Graft isometry was checked to ensure that the graft remained isometric through a range of motion between approximately 20° and 70° of flexion when the patella was stabilized by the bony constraints of the trochlea. Fluoroscopic image was then used to confirm pin placement at the anatomic insertion of the MPFL. The guide pin was overreamed and the graft passed between layers 2 and 3, which were previously identified. The graft ends were whipstitched together, and with the knee flexed to approximately 30°, where the patella is centered in the trochlea, a tenodesis screw was used to secure 20 mm of graft into the femur. Patellar mobility was examined to ensure that the graft was not tight, and knee range of motion was checked to ensure that the patient could achieve full flexion and extension (Figure 1). The incisions were irrigated and closed in layered fashion. The leg was then placed into a hinged knee brace locked in extension for ambulation for 6 weeks. Patients were permitted to ambulate weightbearing as tolerated and to perform range of motion exercises from 0° to 90° beginning the first day after surgery. The brace was removed at 6 weeks if the patient could perform a straight-leg raise without a lag.

Figure 1. Final medial patellofemoral ligament reconstruction construct.

Statistics

Descriptive statistics are reported as means and SDs for continuous variables. Frequencies and percentages are used to describe categorical variables. Reliability statistics indicate interclass correlations between radiographic measures. Intraclass correlation coefficients describe the reliability of continuous variables, while kappa statistics evaluate the reliability of discrete Dejour classification. Longitudinal analysis of PROMs was done with generalized linear modeling. This modeling technique was used to adjust for any potential data attrition. Maximum likelihood estimates were used to provide the parameter

TABLE 1
Changes in PROMs From Baseline to 1 and 2 Years Postoperatively[a]

	Baseline		1 y		2 y		
PROM	Mean	SE	Mean	SE	Mean	SE	*P* Value
KOOS-QoL	32.7	2.7	72	3.4	77.5	3.9	<.001
Pedi-FABS	13.9	1.2	13.3	1.5	16.7	1.8	.292
IKDC	51.4	1.8	82.6	2.6	83.2	3.1	<.001
KOOS-PS	32.3	1.7	12.5	2.1	10.2	2.5	<.001
Kujala	62.2	1.7	89.5	2.6	91.6	3	<.001
VR-12							
PCS	41.6	0.9	55.8	1.1	56.4	1.3	<.001
MCS	48.1	1.2	58.4	1.5	59.8	1.8	<.001

[a]IKDC, International Knee Documentation Committee; KOOS-PS, Knee injury and Osteoarthritis Outcome Score–Physical Function Short Form; KOOS-QoL, Knee injury and Osteoarthritis Outcome Score–Quality of Life; MCS, Mental Component Summary; PCS, Physical Component Summary; Pedi-FABS, Pediatric Functional Activity Brief Scale; PROM, patient-reported outcome measure; VR-12, Veterans RAND 12-Item Health Survey.

estimates at each time point. Bonferroni correction was performed to adjust for multiple comparisons between time points. Statistical significance was defined as P values $\leq$.05. All analyses were performed with SPSS (v 23.0; IBM Corp).

RESULTS

Overall, 90 patients underwent an isolated MPFL reconstruction from March 2014 to August 2017. The mean age of the study population was 19.4 ± 5.6 years (range, 11-34 years), with 69 females (77%). All patients underwent primary unilateral procedures, with a near-equal distribution of left and right knees (right, 49%; left, 51%). Of these 90 patients, 72 (80%) reached 1-year follow-up; 47 (52%), 2-year follow-up; 29 (40%), 3-year follow-up; and 9 (12.5%), 4-year follow-up. The 72 patients who reached 1-year follow-up were included (mean follow-up, 2.2 years). Of these, 21 (29%) had open growth plates at the time of surgery.

Of the 72 patients with 1-year follow-up, the mean TT-TG distance for all patients included in this study was 14.7 ± 5.4 mm (range, –2.2 to 26.8 mm). There were 11 patients with a TT-TG distance <10 mm; 26 patients, between 10 and 15 mm; 21 patients, between 16 and 20 mm; and 14 patients, >20 mm. The mean patellar height was 1.2 ± 0.11 mm (range, 0.89-1.45 mm). There were 24 patients with a patellar height of 0.9 to 1.1 mm; 23 patients, >1.1 to 1.2 mm; and 25 patients, >1.2 mm. Mean trochlea depth was 1.8 ± 1.4 mm (range, 0.05-6.85 mm).

Interrater reliabilities of the radiographic measurements were substantial or higher between the authors. Intraclass correlation coefficient values of 0.957, 0.939, and 0.697 were found for TT-TG distance, patellar height, and trochlear depth, respectively. However, when the Dejour classification was used to describe trochlear dysplasia, kappa values for classifying trochlea as A, B, C, and D were 0.191, 0.310, 0.327, and 0.148, respectively, indicating slight and fair agreement between the authors (A = 25%, B = 44%, C = 22%, D = 9%).

Longitudinal changes in PROMs are reported in Table 1. Patients demonstrated statistically significant improvement in nearly all PROMs over the course of the study period. For knee-specific outcomes, overall improvement was seen for all outcomes ($P < .001$) except for the Pediatric Functional Activity Brief Scale ($P = .292$). From baseline to 1-year follow-up, patients saw a statistically significant change in KOOS-QoL (32.7 to 72.0, $P < .001$), IKDC (51.4 to 82.6, $P < .001$), KOOS-PS (32.3 to 12.5, $P < .001$), and Kujala (62.2 to 89.5, $P < .001$). From 1- to 2-year follow-up, there was no statistical improvement in any of the knee outcomes scores. KOOS-QoL slightly improved from 72.0 to 77.5 ($P = .279$); IKDC, from 82.6 to 83.2 ($P = .871$); KOOS-PS, from 12.5 to 10.2 ($P = .475$); and Kujala, from 89.5 to 91.6 ($P = .603$).

Scores on general health outcomes had similar trends. Overall scores on the VR-12 PCS and MCS demonstrated significant improvement from baseline to 1-year follow-up ($P < .001$ for both). Scores from 1- to 2-year follow-up did not improve significantly (PCS, $P = .686$; MCS, $P = .549$).

Overall, 96% of patients at 1 year and 100% of patients at 2 years had no self-reported recurrent episode of patellofemoral instability. One patient experienced a redislocation at 3.5 years (her TT-TG distance was 18.2 mm and CDI was 1.16), and 1 patient had the feeling of a subluxation event at 2.5 years, although her magnetic resonance imaging results were normal (her TT-TG was 15.1 mm and CDI was 1.19). Of the 72 included patients who reached 1-year follow-up, 48 (67%) participated in sports before surgery. Most patients participated in recreational level sports (75%), while 25% participated in elite-level sports. The RTS rate for patients with 1-year follow-up was 90%, while it was 88% for those with 2-year follow-up. At 2 years, 82% patients returned to the same level or higher; 6% returned to a lower level; and 12% could not RTS (Tables 2 and 3). The mean time from surgery to RTS was 8.8 months. Mean patient satisfaction ratings were 9.3 and 9.2 (10, most satisfied) at 1- and 2-year follow-up, respectively.

Four complications were reported: 1 dislocation, 1 subluxation, 1 medial collateral ligament sprain, and 1 deep

TABLE 2
Sports in Which Patients Participated Before and After Surgery[a]

Sport	Patients, n	
	Before Surgery	After Surgery
Basketball	16	13
Soccer	9	5
Running	9	11
Tennis	6	4
Dancing	6	5
Lacrosse	2	2
Golf	2	2
Swimming	2	2
Gym	2	4
Field hockey	2	0
Softball	2	1
Hockey	1	0
High jumping	1	1
Spinning	1	1
Cheerleading	1	1
Skiing	1	1
Baseball	1	1
Wrestling	1	1
Judo	1	1
Snowboarding	1	0
Rowing	1	1
CrossFit	0	1
Cross-country	0	1
Total	68	59

[a]Some patients participated in multiple sports before and after surgery, switched sports after surgery, and continued some sports but did not continue others.

TABLE 3
Reasons Why Patients Did Not Return to Sport After Surgery

Reason	Patients, n
Other[a]	4
Pain	1
Instability	1
Surgeon recommendation	0

[a]Other reasons: graduated high school and started college (n = 3), mentally worried about testing the knee (n = 1).

venous thrombus. None required hospitalization or subsequent surgery. Additionally, 2 patients had a reaction to the skin glue used to close their wounds, which resolved without issue.

DISCUSSION

No literature currently exists that helps to determine which patients with recurrent patellar instability necessitate a bony procedure in addition to an MPFL reconstruction. Our hypotheses were confirmed, as only 1 patient experienced a redislocation while all patients had significant improvements in PROMs after isolated MPFL reconstruction, regardless of TT-TG distance or patellar height. Hence, this study shows that, in the short term, isolated MPFL reconstruction for recurrent patellar instability regardless of bony parameters is an effective treatment option with excellent clinical outcomes and a low redislocation rate.

The current literature surrounding surgical treatment of recurrent patellar dislocations is somewhat unclear. The general consensus from the International Patellofemoral Study Group for patients who sustain a first-time patellar dislocation (without loose body or osteochondral fragment) is nonoperative treatment.[20] Askenberger et al[4] recently reported on 74 skeletally immature patients (aged 9-14 years) who were randomized to nonoperative management with a brace and therapy (n = 37) or MPFL repair (n = 37) after a first-time patellar dislocation. The repair group had a lower redislocation rate, but the PROMs were better in the nonoperative group. Hence, at this time, the International Patellofemoral Study Group still recommends initial nonoperative management for this patient cohort. Similarly, the group agreed that for recurrent patellar instability, patients should undergo MPFL reconstruction. However, no consensus was reached regarding when a concomitant bony procedure should be added to augment the MPFL reconstruction. While results after combined MPFL reconstruction and TTO have been good, there is a significant increase in morbidity by adding a TTO to an MPFL reconstruction.[2,14,17] Performing a TTO adds time to the procedure and dramatically changes the postoperative recovery, as patients must protect their weightbearing and run the risk of fracture or nonunion of the osteotomy site.[2] Also, patients undergoing concomitant TTO with their MPFL reconstruction were shown to RTS at a slower rate and have weaker quadriceps strength on isokinetic testing at 6 months.[17] Hence, if a concomitant TTO can be avoided without compromising outcomes, that would be the ideal situation.

However, no study to date has defined which patients would benefit from an isolated MPFL reconstruction and which would require an MPFL reconstruction with a concomitant procedure, such as a TTO or trochleoplasty. One of the more common radiographic measurements used to aid in this decision-making process is the TT-TG or TT-PCL distance. Both measurements are used to evaluate the amount of lateralization of the tibial tubercle. While use of the TT-PCL has grown in popularity in the past several years, a recent study by Brady et al[7] found the TT-TG distance to be a more reliable measurement than the TT-PCL distance for determining lateralization of the tibial tubercle, regardless of trainee level or presence/absence of trochlear dysplasia. Hence, the TT-TG was utilized in this study to assess lateralization of the tibial tubercle. Brady et al[7] also found that patients with a history of patellar instability were more likely to have a TT-TG distance >15 mm when compared with patients without a history of patellar instability, although the authors did not recommend a reflexive concomitant procedure with a MPFL reconstruction based solely on TT-TG distance when operating on a patient with patellar instability.[7]

Furthermore, the patients included in our study had instability as their chief complaint, not pain. Patients with pain as >50% of their chief compliant were excluded from this study. In our opinion, those patients who present with pain as their chief complaint have a different pathologic process and will not achieve the same results as the patients included in this study, who had instability as their chief complaint.

In a 2014 study, Dickens et al[11] evaluated the TT-TG distance of 618 pediatric patients to determine if it evolved as patients approached skeletal maturity and to report TT-TG values for patients who did and who did not have a history of patellar dislocation. The authors found that the TT-TG distance increased with patient age, approaching the "normal" adult value as the patient approached skeletal maturity. The authors also found the mean TT-TG distance of the control group (no patellar dislocation) to be 8.6 mm, as opposed to 12.2 mm in the group with patellar dislocation. Interestingly, the range of TT-TG measurements for patients without a history of patellar dislocation was 0.1 to 20.2 mm, as compared with 0.4 to 21.7 mm for those with a history of patellar dislocation. Hence, while the mean TT-TG distance was lower in the nondislocation group, many patients in that group had an elevated value. Similarly, there were patients in the instability group with a "normal" TT-TG distance. As the number of postoperative dislocations in our study was extremely low, no correlation was found between TT-TG and future instability events among patients after isolated MPFL reconstruction, indicating that more factors come into play than just the TT-TG distance in terms of risk of future instability. While the TT-TG distance is a valuable piece of information when a patient with patellofemoral instability is being evaluated, it is only one piece of the puzzle, and other factors must be taken into consideration when these patients are counseled and treatment strategies are decided.

These other factors that place patients at risk for recurrent dislocations after nonoperative treatment were evaluated closely by Christensen et al[9] and Lewallen et al[18] and include trochlear dysplasia, patella alta, age (<18 or <25 years, respectively) at the time of the first dislocation, sports-related injuries, immature physes, elevated TT-TG distance, and female sex. However, these studies examined nonoperative treatment of patellar dislocations, not operative treatment. Kita et al[16] reported the outcomes of 42 isolated MPFL reconstructions performed for recurrent patellar instability at a mean 3.2-year follow-up. Two (4.5%) of their patients experienced a redislocation after surgery. The authors found severe trochlear dysplasia to be the most important predictor of recurrent patellar instability after isolated MPFL reconstruction. They also found that among patients with a type D trochlea, elevated TT-TG distance affected the outcomes. Hence, it is more likely a combination of risk factors than any single measurement in determining who would benefit from a bony procedure in addition to an MPFL reconstruction.

The most common cause of failure after MPFL reconstruction identified in the literature is improper tunnel placement or overtensioning of the graft.[8,24,25] A poorly placed femoral tunnel can lead to anisometry, lengthening of the graft, graft stretching, and ultimate failure. However, a well-placed tunnel can produce excellent, reliable results.[21] Nelitz et al[21] evaluated clinical outcomes after isolated MPFL reconstruction of 21 patients with open physes and found no recurrent dislocations at a mean follow-up of 2.8 years (range, 2.0-3.6 years) after surgery. Hence, for patients who wish to RTS and reduce their risk of future patellofemoral instability events, an isolated, technically well-done MPFL reconstruction is an effective procedure in the short term, with reliable results as treatment for recurrent patellofemoral instability without an unloadable cartilage defect. Our study will follow this cohort of patients and report medium- and long-term follow-up to determine the durability of an isolated MPFL reconstruction.

Limitations

The data from this study are from a single high-volume surgeon (B.E.S.) with a significant interest in the patellofemoral joint. Hence, the results may not be translatable to all surgeons. Two patients were excluded who had obligatory dislocations. Therefore, these results do not apply to patients with recurrent patellar instability who have also obligatory dislocations. While these results are short term, the goal of this ongoing prospective study is to follow these patients for 5 to 10 years to assess what radiologic and physical examination factors predict failure of isolated MPFL reconstruction. None of these factors were significant at this point, so no conclusion could be drawn regarding the TT-TG distance, patellar height, or trochlear morphology that necessitates a TTO.

CONCLUSION

At early follow-up of 1 and 2 years, isolated MPFL reconstruction is an effective treatment for patellar instability and provides significant improvements in outcome scores, with a low redislocation/instability rate regardless of bony pathologies, including TT-TG distance, CDI, and trochlear dysplasia. Future data from this cohort will be used to assess long-term outcomes.

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