Systematic Review

Widespread Implementation of Medial Patellofemoral Ligament Reconstruction for Recurrent Patellar Instability Maintains Functional Outcomes at Midterm to Long-Term Follow-up While Decreasing Complication Rates: A Systematic Review

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Purpose: Our primary purpose was to evaluate whether complications have increased or functional outcomes have changed as medial patellofemoral ligament (MPFL) reconstruction has been adopted by more surgeons at more institutions over recent years. Our secondary purpose was to further define the complication profile of MPFL reconstruction. **Methods:** A systematic review of the literature was performed on January 12, 2014, using the keywords "medial patellofemoral ligament reconstruction," "patellar instability reconstruction," "patellofemoral ligament reconstruction," and "MPFL." Articles meeting our inclusion criteria were reviewed. Outcome measures, functional failures, complications, graft choice, and surgical technique were recorded and analyzed. **Results:** Thirty-four articles met our exclusion and inclusion criteria and were reviewed. Nineteen articles were "new" additions to the literature, whereas 15 had previously been reported on in prior analyses ("old"). The 19 new articles reported a statistically significant decrease in functional failure rates, from 9.55% in older studies to 4.77% in more recent studies ($P < .001$). The major complication rate dropped from 2.01% to 0.46% in the newer studies ($P = .005$), and the minor complication rate decreased from 6.53% to 4.00% ($P = .06$). Postoperative Kujala scores did not show a statistically significant change between newer and older publications (89.0 [SD, 3.7] and 89.4 [SD, 4.9], respectively; $P = .55$). Comparing results by fixation type, as well as by graft choice, showed no statistically significant differences in terms of outcomes or complication profile. **Conclusions:** With nearly twice the number of medical centers performing reconstruction of the MPFL and outcomes reported on nearly double the number of patients in recent years, functional outcomes remain favorable as complication and failure profiles are improving. Furthermore, despite a wide array of fixation techniques, as well as multiple options for graft constructs, there are no statistically or clinically significant differences in functional outcomes over time. This finding highlights the efficacy and adoptability of MPFL reconstruction for the treatment of recurrent patellar instability. **Level of Evidence:** Level IV, systematic review of mixed-level studies.

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Recurrent patellar instability is a disabling condition that primarily affects young patients and often leads to cartilage injury, limiting patients' participation in sports and potentially compromising their ability to carry out daily activities.[1-4] Furthermore, it is a particularly challenging problem for both the patient and the orthopaedic surgeon because of its multifactorial etiology. The most common contributing factors to recurrent patellar instability include bony variants, such as trochlear dysplasia, patella alta,[5] and increased tibial tubercle–trochlear groove distance, as well as alignment issues, such as excessive genu valgum or tibial torsion.[6] In addition to these predisposing bony conditions, incompetent soft-tissue stabilizers are implicated in the loss of patellar stability and can place the patient at high risk of recurrent dislocation.[7]

The reported overall recurrence rates after primary patellar dislocation range from 17%[8] to more than

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40%.[9,10] After a second episode of instability, the recurrence rate rises to 50% or greater in some studies. Most investigators agree that this is the group in which surgical intervention should be considered[11] to minimize the risk of cartilage injury with subsequent dislocations. Surgical treatments for patellar instability are numerous and include both those aimed at reconstruction of the soft-tissue stabilizers (predominantly the medial patellofemoral ligament [MPFL]) and those that seek to correct malalignment and dysplasia through bony modifications, such as trochleoplasty or transfer of the tibial tubercle. In the past decade, there has been increased interest in ligamentous reconstructions to address soft tissues as an adjunct or alternative to bony corrections.

The primary soft-tissue restraint to lateral translation of the patella is the MPFL.[12-15] The MPFL, which arises in the sulcus between the medial epicondyle and the adductor tubercle, runs deep and slightly distal to the vastus medialis and attaches to the proximal half of the medial aspect of the patella. Because of its limited ability to stretch, the MPFL is disrupted in most primary patellar dislocations and constitutes the dominant pathoanatomy associated with lateral patellar instability.[7,14,16] In 1992 Ellera Gomes[17] was the first author to propose that MPFL reconstruction was preferred over surgical correction of other predisposing conditions for treatment of recurrent patellar instability. This procedure has since been reported many times in the literature with good results, and it continues to gain popularity both as an isolated treatment and in combination with bony modifications for stabilization of the chronically dislocating patella.

The goal of MPFL reconstruction is to reconstitute the medial restraint of the patella, thereby resisting lateral dislocation and restoring stability. Many techniques are used to accomplish this, and various graft options have been described, including semitendinosus,[18-29] patellar tendon,[30,31] partial quadriceps tendon,[30,32] adductor magnus,[6,30,33] gracilis,[9,15,34-37] and iliotibial band grafts[38]; allografts[12,30,39]; and synthetic grafts.[17,40,41] Methods for patellar fixation vary as well and include tunnels with interference screws[12,22,39]; single[40,42,43] and double[34,44] through-and-through tunnels with looped, knotted,[17] or soft-tissue suture fixation[6,20,21]; V-shaped converging tunnels[35,45]; double diverging tunnels[24]; anchor fixation[23]; and soft-tissue sutures.[18,38] Fixation on the femoral side is most commonly achieved with a single blind tunnel and interference screw, but other methods include soft-tissue slings (particularly in skeletally immature patients),[19,22] bone staples,[40,43] through-and-through tunnels,[30] soft-tissue sutures,[6,20,38] EndoButton (Smith & Nephew Endoscopy, Andover, MA) fixation,[46] and sutures tied over a bony bridge.[25]

Systematic reviews following earlier outcomes of MPFL reconstruction included evaluation of radiologic outcomes,[47] functional outcomes,[48] rehabilitation and return-to-sports efficacy,[49] and associated complications or failures.[50] The most recent systematic review addressing complications and failures, published by Shah et al.[50] in 2012, found that MPFL reconstruction was associated with a rather significant complication rate of 26.1%. They reported that 26 of the 597 patients included in their review actually had to return to the operating room for complications associated with their reconstruction, and of the 629 knees, 23 (3.7%) were deemed clinical failures at final follow-up. Clearly, despite the reporting of consistently positive clinical outcomes for most patients, the failure rate and complication profile of MPFL reconstruction demand further definition and continued improvement efforts.

In the past 3 years, the literature has seen rapid expansion in the number of studies reporting midterm results after MPFL reconstruction, as well as the number of different surgeons reporting outcomes. The primary purpose of this review was to address the question of whether, with increased adoption of this procedure as a treatment for recurrent instability, clinical outcomes have changed or complications have increased. We secondarily sought to further define the complication profile by asking whether any specific techniques are more prone to complications or poor outcomes.

On the basis of our experience with MPFL reconstruction for the treatment of recurrent patellar instability, we hypothesized that this procedure will continue to show good clinical outcomes as it is more widely used and it is followed up for longer periods. We further hypothesized that as more surgeons gain experience with this procedure and discover the particular surgical technique that works optimally for them and their patients, complications will decrease with time as well.

Methods

A systematic review of the literature was performed using the Medline, Embase, Scopus, and Web of Science databases. The purpose was to identify publications describing results of isolated MPFL reconstruction. The search was performed on January 12, 2014, and included publications that appeared in the literature as far back as 1992. The inclusion criteria were as follows: (1) The study must describe a technique for MPFL reconstruction in patients with chronic patellar instability with or without minor secondary soft-tissue surgery (e.g., release of the lateral retinaculum or advancement of the vastus medialis). (2) The study must require a minimum follow-up of 12 months in all enrolled patients. (3) The study article must be available in the English language. We excluded studies reporting MPFL reconstructions alongside other ligament reconstruction (anterior cruciate ligament, medial patellotibial ligament, and so on) or bony procedures, such as tibial tubercle osteotomies or trochleoplasty, were excluded. We also excluded

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abstracts, animal studies, cadaveric studies, anatomic studies, biomechanical studies, case reports, technical notes, editorials, reviews, letters or comments to journals, and previous systematic reviews.

The databases were searched using the key terms "medial patellofemoral ligament reconstruction," "patellar instability reconstruction," "patellofemoral ligament reconstruction," and "MPFL." In addition, the reference lists of previous English-language systematic reviews addressing MPFL reconstruction were searched for publications that matched our criteria.[47-50] The initial electronic search yielded 554 articles (250 in Medline, 59 in Embase, 166 in Scopus, and 79 in Web of Science). Once all duplicates were removed, there were 434 articles in total available for review. The titles and abstracts were assessed against the selection criteria, resulting in 64 potentially relevant publications. Full-text articles were then examined against the inclusion and exclusion criteria. At that time, 30 of the remaining articles were excluded for the following reasons: reporting a surgical procedure that was performed on patients with prior or concomitant bony modification (trochleoplasty or osteotomy); reporting on patients who did not meet the minimum follow-up of 12 months; reporting results of MPFL repair rather than reconstruction; and addressing the correction of acute, rather than recurrent, patellar dislocation. There were therefore 34 publications eligible for inclusion in this review, detailed in Tables 1 and 2. The search process is summarized in Figure 1.

In analyzing these publications, we were first and foremost interested in comparing functional clinical outcomes, as well as postoperative complications, in "old" versus "new" studies. We established a general cutoff for old and new studies based on the most recently published systematic review on MPFL reconstruction; all studies that were published before the literature search by Shah et al.[50] in October 2010 or that had been included in previous reviews were considered old. Any studies that were published after October 2010 or were not already included in another systematic review were considered new.

Our secondary interest was to look at the functional clinical outcomes and postoperative complications as they related to fixation techniques. A wide variety of surgical techniques were described in these articles. To make meaningful comparisons between groups, we broadly categorized the different reported techniques into the following: (1) femoral fixation technique, (2) patellar fixation technique, and (3) graft choice. Femoral and patellar fixation techniques were further divided between those that used bone tunnels or interference screws and those that used primarily soft-tissue attachments. Graft choices were separated into semitendinosus, gracilis, adductor magnus, patellar tendon, and synthetic ligament substitutes.

Functional clinical outcomes in all categories were compared using the Kujala Anterior Knee Pain Scale because it is a widely used and reliable score specific to knee function after MPFL reconstruction.[58] Postoperative complications were recorded for each publication and divided into (1) functional failures, (2) major complications, and (3) minor complications. Table 3 outlines the complications included in each category.

We made statistical comparisons between groups by comparing weighted outcomes using the Student 2-tailed t test (when comparing continuous outcomes such as Kujala scores). For comparisons of failure or complication rates, a χ^2 test on 2 proportions was used (or a Fisher exact test if the incidence was particularly low).

Results

Of the 34 publications included in this review, 15 had already been cited in prior systematic reviews whereas the remaining 19 represented new contributions to the literature. Of the 19 new studies, 18 were published by medical centers that had not previously reported outcomes with this procedure (31 total centers included) and represented an additional 621 patients and 650 knees (of 1,015 patients and 1,048 knees in total).

A comparison of our results by date of publication is shown in Table 4. The mean Kujala scores were 89.4 (SD, 4.9) for old publications and 89.0 (SD, 3.7) for new publications, which was not statistically significant ($P = .55$). The overall functional failure rate was 9.55% (38 of 398) in older publications and dropped to 4.77% (31 of 650) in the newer series, which was statistically significant ($P < .001$). The major complication rate dropped from 2.01% (8 of 398) in older studies to 0.46% (3 of 650) in newer studies, which was statistically significant ($P = .005$). The minor complication rate also decreased between the older and newer studies (6.53% and 4.00%, respectively); however, this finding was not significant ($P = .06$). These findings are summarized in Table 5.

Comparing results by fixation type showed no statistically significant differences in terms of functional outcomes or complication profile. For patellar fixation, 21 studies used bone tunnels, with a mean Kujala score of 88.6 (SD, 4.7), whereas 10 groups used only soft-tissue attachments, with a mean Kujala score of 90.0 (SD, 3.7), which was not significantly different ($P = .38$). For femoral fixation, 24 studies reported outcomes using bone tunnels whereas 7 used soft-tissue techniques to attach the graft, which was also not significantly different (Kujala scores of 88.5 [SD, 4.0] and 93.8 [SD, 3.2], respectively; $P = .06$). Regarding graft choice, 17 studies used semitendinosus grafts, 3 used gracilis grafts, and 3 used artificial grafts whereas the remaining 11 had heterogeneous graft choices. Kujala scores were similar between semitendinosus and

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Table 1. New Articles, Published After October 2010, or Not Previously Reviewed

Authors	Year	No. of Knees	Mean Age, yr	Mean Follow-up, mo	Patellar Fixation	Femoral Fixation	Graft	Functional Failures, n	Complications, n		Mean Kujala Score	
									Major	Minor	Preoperative	Postoperative
Csintalan et al.[51]	2014	56	24	51.6	BT	BT	ST	6	0	5	—	—
Deie et al.[18]	2011	31	22.2	38.4	STA	BT	ST	1	0	1	64	94.5
Goyal et al.[52]	2013	32	25	38	STA	BT	QU	0	0	0	49.31	91.25
Hinterwimmer et al.[53]	2013	19	23	16	BT	BT	GR	0	1	2	—	92.7
Kang et al.[21]	2013	82	28.86	14	STA	BT	ST	0	0	0	52.98	93.54
Kumahashi et al.[22]	2012	5	13.6	27.8	BT	STA	ST	0	0	0	67.4	95.4
Ma et al.[23]	2013	32	28.4	40	STA	BT	ST	0	0	0	54	87
Nelitz et al.[35]	2013	21	12.2	33.6	BT	BT	GR	2	0	0	72.9	92.8
Panni et al.[24]	2011	48	28	33	BT	BT	ST	0	1	6	56.7	86.8
Raghuveer et al.[54]	2012	15	29.2	42	Mixed	BT	Mixed	2	0	5	44.8	91.9
Slenker et al.[39]	2013	35	20.6	21	BT	BT	Mixed	3	0	3	49	89.5
Sobhy et al.[25]	2013	29	20.1	32.2	BT	BT	ST	0	1	0	36.6	90.6
Song et al.[26]	2014	20	21	34.5	SA	BT	ST	1	0	0	52.6	—
Wagner et al.[55]	2013	50	19	12	STA	BT	GR	1	0	2	70	87
Wang et al.[37]	2013	70	25	48	SA	BT	ST	3	0	2	48.9	88.25
Wang et al.[27]	2010	69	30.2	42	BT	BT	ST	11	0	0	52.73	82.27
Wang et al.[28]	2012	22	23	37.5	STA	BT	ST	1	0	0	53.9	84.1
Witonski et al.[45]	2013	10	27.2	43	STA*	SA	PT	0	0	0	59.7	84.4
Yercan et al.[29]	2011	4	8.7	17.7	BT	STA	ST	0	0	0	36	89.5

BT, bone tunnel; GR, gracilis; PT, patellar tendon; QU, quadriceps; SA, suture anchor; ST, semitendinosus; STA, soft-tissue attachment.
*Patellar tendon remained at natural insertion.

gracilis grafts (89.0 [SD, 4.9] and 89.6 [SD, 3.3], respectively; $P = .8$). Only one study using artificial grafts reported Kujala scores, so statistical comparisons were not possible. These results are summarized in Table 6.

Discussion

The purpose of this review was to evaluate the midterm to long-term functional outcomes of the various surgical techniques that are in use for reconstruction of the MPFL. Surely, knowledge gained from early studies, refined techniques, and improvements in the rehabilitation process over recent years have affected the outcomes for the better; however, with the adoption of these new techniques across increasingly large physician and patient populations, it is necessary to consider whether the results of the initial pioneers are reproducible in the general orthopaedic community. Therefore we also sought to assess whether the rapid adoption of MPFL reconstruction has altered the success or complication rates that were seen in the earlier literature.

For this review, we identified 34 articles, published between 1992 and January 2014, reporting clinical

Table 2. Old Articles, Published Before October 2010, or Previously Reviewed

Authors	Year	No. of Knees	Mean Age, yr	Mean Follow-up, mo	Patellar Fixation	Femoral Fixation	Graft	Functional Failures, n	Complications, n		Mean Kujala Score	
									Major	Minor	Preoperative	Postoperative
Ahmad et al.[12]	2009	20	23	31	BT	BT	Mixed	0	0	1	49.9	88.2
Deie et al.[19]	2005	46	19.2	114	BT	STA	ST	8	0	0	50	95
Drez et al.[38]	2001	14	22	31.5	STA	STA	Mixed	1	1	2	—	88.6
Ellera Gomes[17]	1992	30	29	39	BT	BT	PLY	1	1	3	—	—
Ellera Gomes et al.[20]	2004	16	26.7	60	BT	BT	ST	1	1	1	—	—
Gomes[6]	2008	24	19.3	53	BT	BT	Mixed	1	0	0	—	—
Han et al.[44]	2011	59	24.3	68.4	BT	BT	ST	0	0	3	41.4	82.6
Nomura et al.[40]	2000	27	21	70.8	BT	STA	PLY	4	0	4	—	—
Nomura and Inoue[42]	2006	12	24.8	50.4	BT	STA	ST	0	0	3	56.3	96
Nomura et al.[43]	2007	24	22.5	142.8	BT	STA	PLY	7	0	1	63.2	94.2
Ronga et al.[56]	2009	28	32.5	37.2	BT	BT	Mixed	3	0	4	45	83
Sillanpää et al.[33]	2008	15	20.2	121.2	STA	—	AM	3	1	0	—	88
Steiner et al.[30]	2006	34	27	66.5	BT	BT	Mixed	0	1	4	53.3	90.7
Toritsuka et al.[46]	2011	20	23	30	BT	BT	ST	1	1	0	—	96
Watanabe et al.[57]	2008	29	19	51.6	STA	EB	Mixed	8	2	0	—	—

AM, adductor magnus; BT, bone tunnel; EB, EndoButton; PLY, polyester; ST, semitendinosus; STA, soft-tissue attachment.

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Fig 1. Search process. (f/u, follow-up; MPFL, medial patellofemoral ligament; SR, systematic review; Tech, technical; WOS, Web of Science.)

outcomes of MPFL reconstruction for recurrent patellar instability, 19 of which represent new contributions to the literature since October 2010. These 19 newer articles were published by 18 medical centers that had not previously produced literature on MPFL reconstruction and included 621 patients, which represents more than double the total number of patients on whom results were reported in the articles published before October 2010. Our analysis of the data from these 34 publications indicates that MPFL reconstruction has maintained very good functional outcomes since first being published in 1992. The mean postoperative Kujala score for all 1,015 patients included in this review was 89.1, up from a mean preoperative score of 53.1; this was observed alongside a decrease in the failure rate from 9.55% in studies published during or before October 2010 to 4.77% in newer studies. Furthermore, the major postoperative complication rate in the newer studies was significantly lower than that in the older studies. Lastly, we found that soft-tissue fixation techniques did not statistically differ from bone tunnel fixation techniques regarding functional outcomes, nor did the graft choice seem to alter postoperative function of the reconstructed ligament. Thus what we have seen through critical appraisal of the data is encouraging: More physicians in more medical centers are performing this procedure on more patients than before, are doing so with equal functional success, and yet seem to be encountering fewer postoperative failures and complications regardless of fixation technique or graft used.

Existing literature on MPFL reconstruction has come to complementary conclusions. In 2010 Buckens and

Table 3. Postoperative Failures and Complications

Functional Failures	Major Complications	Minor Complications
Clinical apprehension sign	Patellar fracture	ROM deficit >10°, corrected
Patient-reported repeat subluxation	ROM deficit >10°, uncorrected	Stiffness requiring MUA
Patient-reported repeat dislocation	RTOR because of graft complication	Persistent pain
	Unable to run	RTOR for HR
		Superficial wound infection
		Extensor lag
		Wound complications, noninfectious*
		Subcutaneous hematoma

HR, hardware removal; MUA, manipulation under anesthesia; ROM, range of motion; RTOR, return to operating room.
*Dehiscence and trouble healing requiring a return to the operating room.

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Table 4. Postoperative Kujala Scores, Functional Failure Rates, and Complication Rates in Old Versus New Studies

	No. of Studies	No. of Knees	Mean Postoperative Kujala Score	Functional Failures, %	Major Complications, %	Minor Complications, %
New studies	19	650	89.0 (SD, 3.7)	4.77%	0.46%	4.00%
Old studies	15	398	89.4 (SD, 4.9)	9.55%	2.01%	6.53%
P value			.55	< .001	.005	.06

Saris[48] evaluated MPFL reconstruction alongside other realignment and stabilization techniques, such as osteotomy or trochleoplasty. They critically reviewed 21 publications and, although their appraisal did not produce any statistically significant outcomes, were able to show a trend that MPFL reconstruction provided equal, if not superior, functional outcomes to alleviate pain and realign the patella, with lower perioperative morbidity rates and fewer long-term complications as compared with older techniques. Fisher et al.[49] in 2010 asserted that MPFL reconstruction is very likely to improve a patient's ability to perform routine activities of daily living, regardless of the particular reconstruction method or graft construct used to perform the procedure. This finding is consistent with ours and supports the notion that the surgeon may choose whichever graft is best suited for the individual patient, without concern for compromising outcomes. Shah et al.[50] in 2012 took on the task of trying to delineate complication rates associated with the myriad techniques currently in use for reconstruction of the MPFL—namely, tunnel fixation versus soft-tissue and/or suture anchor fixation. They did not identify any clear statistical relation among techniques, suggesting that the different techniques used to fix the reconstructed MPFL are all equally reliable as long as sound mechanical principles are observed. It would therefore seem that when reconstructing the MPFL, the surgeon may choose whichever method of fixation with which he or she is most comfortable. In 2013 Vavken et al.[59] concluded that, in the pediatric and adolescent population, MPFL reconstruction is the most effective treatment option for chronic patellar instability and is safe regarding physis growth and development in the young patient. These findings indicate that MPFL reconstruction can be safely and reliably implemented in any age group, which further supports the use of MPFL reconstruction in an ever-broadening population of patients.

Limitations

In writing this review, we did encounter some challenges that limit the generalizability of the results. There is a paucity of high-level evidence in the current body of literature on patellar instability; only 2 studies were classified as Level II studies, and we identified no Level I studies. Methodologic deficiencies regarding sample size, follow-up period, and varying adjunctive surgical procedures obscured our ability to draw absolute conclusions from the data collected. We attempted to minimize confounding effects of additional stabilizing procedures by excluding the studies reporting patients who had undergone adjunctive procedures that required bony modifications—such as osteotomy and trochleoplasty—or who had undergone additional

Table 5. Complication Profile in Old Versus New Studies

	No. of Studies	No. of Knees	Major Complications	Minor Complications
New studies	19	650	3 of 650, 0.46% 2 with patellar fracture 1 with ROM deficit >10°, uncorrected	26 of 650, 4.00% 9 with persistent knee pain 4 with ROM deficit >10°, corrected 4 with RTOR for hardware removal 4 with superficial wound infections 2 with extensor lag 2 with wound complications, noninfectious* 1 with stiffness requiring MUA
Old studies	15	398	8 of 398, 2.01% 3 with RTOR for graft complications (fibrous bridge, dislocation, loosening) 1 with patellar fracture 1 unable to run postoperatively	26 of 398, 6.53% 6 with persistent knee pain 4 with stiffness requiring IPT 4 with wound complications, noninfectious 3 with ROM deficit >10°, corrected 3 with stiffness requiring MUA 3 with RTOR for hardware removal 2 with subcutaneous hematoma
P value			*P* = .005	*P* = .06

IPT, intensive physical therapy; MUA, manipulation under anesthesia; ROM, range of motion; RTOR, return to operating room.
*Dehiscence and trouble healing requiring a return to the operating room.

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Table 6. Postoperative Kujala Scores Based on Patellar and Femoral Fixation Technique and Graft Type

	Postoperative Kujala Score
Bone tunnel	
Patellar fixation (n = 21)	88.6 (4.7)
Femoral fixation (n = 24)	88.5 (4.0)
Soft tissue	
Patellar fixation (n = 10)	90.0 (3.7)
Femoral fixation (n = 7)	93.8 (3.2)
Graft type	
Semitendinosus (n = 17)	89.0 (4.9)
Gracilis (n = 3)	89.6 (3.3)

NOTE. Data are presented as mean (standard deviation).

ligament reconstructions. We did not, however, exclude studies whose patients had undergone soft-tissue procedures, such as lateral retinaculum release, chondroplasty, or advancement of the vastus medialis obliquus. Of the 34 studies that we included, 25 included patients who underwent at least 1 of the aforementioned soft-tissue procedures either before or concomitantly with MPFL reconstruction. In addition, we hoped to improve validity by requiring a minimum patient follow-up of 12 months, a requirement that has not been made in prior systematic reviews to this point. Regardless, it is possible that postoperative complications and/or failures were missed as a result of not demanding a longer follow-up period.

We encountered another issue in analyzing the major and minor complication rates as a function of the type of graft fixation used because reporting standards are variable throughout the literature. Because most of these studies are retrospective, they are also associated with the usual issues revolving around recall bias and the like. This problem has been present in previous reviews of MPFL reconstruction literature, and we believe that the literature could benefit from more uniform and transparent reporting of complications, ideally in a prospective manner. Lastly, we excluded 17 articles whose full texts were not available in the English language. Despite these limitations, we believe that meaningful conclusions may still be gleaned from the existing literature.

Conclusions

With nearly twice the number of medical centers performing reconstruction of the MPFL and outcomes reported on nearly double the number of patients in recent years, functional outcomes remain favorable as complication and failure profiles are improving. Furthermore, despite a wide array of fixation techniques, as well as multiple options for graft constructs, there are no statistically or clinically significant differences in functional outcomes over time. This finding highlights the efficacy and adoptability of MPFL reconstruction for the surgical treatment of recurrent patellar instability and bodes well for generalized adoption of this procedure by the orthopaedic community. Still, the treatment of recurrent patellar instability warrants further investigation in the future, with larger, prospective, high-quality trials that include more reliable and uniform reporting of postoperative complications.

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