

results at long-term follow-up for surgical versus nonsurgical treatment of initial patellar dislocation.⁴ Not going straight to surgery following initial dislocation may allow for some healing of injured stabilizing structures, making subsequent imbrication, if necessary, more effective. In fact, imbrication was done on just some of the knees in the repair group by Puzzitiello et al.¹ I also wonder if their using a no. 0 suture for imbrication, rather than the no. 2 that I've always used, might have also contributed to a greater failure rate. Although some investigators have reported good results using a no. 0 suture for medial retinacular imbrication,³ others advocate using no. 2.² In addition, Puzzitiello et al.¹ used the same postoperative protocol following repair or reconstruction. However, such accelerated rehabilitation may be better tolerated by tendon grafts firmly fixated compared with sutured soft tissues. Therefore, perhaps a combination of patient selection, surgical technique, and rehabilitation differences may account for the greater failure rate in Puzzitiello et al.'s repair/imbrication group.¹

Although there may be growing consensus about the superiority of MPFL reconstruction over imbrication, consensus can be wrong. Indeed, there have been instances—just during my career—where accepted consensus, at least in North America, was called into question on further analysis. Just 2 such examples are: consensus that extra-articular procedures are of no benefit for anterior cruciate ligament reconstruction and consensus that bone augmentation is of little benefit for surgical treatment of recurrent anterior shoulder dislocations. For restoring patellar stability, it's crucial to separate repair procedures from imbrication, although the 2 are often conflated, leading to confusion in the literature, as well as in the minds of clinicians.

The goals of medial retinacular imbrication are to improve patellar stability while maintaining anatomy—especially attachment points—of the medial static stabilizers, and avoid overly stiffening these stabilizers so as not to unduly increase articular compressive forces. In contrast, reconstruction using hamstring tendon graft, which has been shown to be significantly stiffer than the MPFL itself, can result in patellofemoral joint pressure several times greater than the native state, especially if such grafts are secured to bone on both sides, which is very concerning for the long-term health and longevity of knee joints.⁵⁻⁷ Given that insertion of the MPFL on the extensor mechanism has been shown in cadaveric investigation to be both rather broad and variable, and is not readily ascertainable for any given knee without extensive dissection, approximating native anatomy would appear to be far more likely with medial retinacular imbrication as opposed to MPFL reconstruction.⁸ I look forward to the authors' reply and also future interesting investigations from this well-respected group.

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Author Reply to “Regarding “Primary Medial Patellofemoral Ligament Repair Versus Reconstruction: Rates and Risk Factors for Instability Recurrence in a Young, Active Patient Population”



First and foremost, we would like to thank Dr. Ilahi for his thoughtful commentary on our recent publication.¹ Our referenced study comparatively analyzed the outcomes of 32 medial patellofemoral ligament (MPFL)

reconstructions and 19 MPFL repairs. At an average follow-up of approximately 5 years, there was a 6.3% re-dislocation rate among reconstructions compared with 36.9% among repairs. The follow-up duration for repair and reconstruction was 6.5 years and 3.7 years, respectively.¹

The primary concern mentioned by Dr. Ilahi was the relatively high failure rate, defined as recurrent patellar dislocation, following MPFL repair compared anecdotally with his own surgical experience. He postulates that our inclusion of patients with a single patellar dislocation event could account for this difference. In the current study, there were a significantly greater number of patients with only a single patellar dislocation before surgery in the MPFL repair group (36.9%) compared with the reconstruction group (3.1%). However, previous evidence would suggest that this would actually favor the outcomes of the MPFL repair group. It has previously been observed in the epidemiologic study by Fithian et al.² that only 17% of patients who sustain a first-time patellar dislocation event go on to experience a second dislocation, as opposed to the 49% with a history of previous instability who suffered a subsequent dislocation event. Further, it is also possible for patients with a single patellar dislocation to not respond to nonsurgical management without a second dislocation, such as in patients with provocative apprehension or positional subluxation. Nonetheless, there remains a paucity of high-quality studies that attempt to identify the best treatment option for patients after a single patellar dislocation, and this topic remains controversial.³ Although the inclusion of these patients in our study may have made our study population less homogenous, it is unlikely that this could explain the high failure rate among MPFL repairs.

Dr. Ilahi also suggests that it is possible that the suture size and rehabilitation protocol used for the MPFL repair group in our study also may account for the high failure rate. These are 2 variables that could very well influence outcomes for this procedure, but these are factors that are often highly variable among different surgeons for many orthopaedic procedures. It is unlikely that these 2 factors alone could account for such a significantly greater failure rate. However, it is more likely that additional anatomic features, such as patella alta, could influence the unfavorable outcomes after MPFL repair, and this is supported by recent evidence. In our study, we found the average Caton–Deschamps index of the MPFL failures was 1.30, which was significantly greater than the MPFL non-failure group.¹ It is also possible that the chronic laxity of MPFL tissue among those with repeated dislocations and trochlear dysplasia may contribute to the high failure rate after MPFL repair, as suggested by Arendt et al.⁴

As discussed in our published article, the studies by Camp et al.⁵ and Arendt et al.⁴ corroborate our high reported rate of recurrent lateral patellar dislocation after MPFL repair. The population in the study of Camp et al.⁵ included 7 femoral-sided, 8 patellar-sided, 7 both-side tears, and 7 intrasubstance tears repaired by reefing. The overall failure rate in this study was 28%. The study by Arendt et al.⁴ reported a 46% re-dislocation rate among their MPFL repairs, all of which were initially disrupted at the femoral origin only. There have been several other studies published in recent years that report a wide range of failure rates for MPFL repair,^{1,4-9} and this may perhaps be the result of the conflation of several repair techniques at separate locations along MPFL, as mentioned by Dr. Ilahi, as well as greater variability in tissue quality. The study by Sillanpää et al.,¹⁰ although limited to the small sample size ($n = 35$), indeed shows us that patellar dislocation occurs at varying rates based on location of the tear, with femoral avulsions being most likely to re-dislocate.

In contrast, MPFL reconstruction has been shown in recent literature to demonstrate a very low failure rate at short- and medium-term follow-up, with great reproducibility.¹¹⁻¹³ As to Dr. Ilahi's point that MPFL reconstruction alters patellofemoral joint pressure to be several times greater than the native state, this is a point that is conceptionally possible but has inconsistently been demonstrated in previous biomechanical studies. As mentioned by Dr. Ilahi, Rood et al.¹⁴ found that static reconstruction increased contact pressures, whereas dynamic reconstructions did not. In contrast, Melegari et al.¹⁵ found that MPFL reconstructions did not alter patellofemoral contact area or contact pressures compared with native knees. Further yet, several other biomechanical studies have demonstrated that contact pressures in the patellofemoral joint are only increased in the setting of technical error, such as using nonisometric fixation points,¹⁶ graft overtensioning,¹⁷ and tensioning at the incorrect angle of knee flexion.¹⁸ Nonetheless, it is difficult to extrapolate this laboratory evidence to the clinical setting, as there is not enough long-term evidence to show the effects of MPFL reconstruction on long-term patellofemoral joint health.

In a recent editorial by Dr. Jack Farr, he suggests "If the site of medial restraint injury is discrete, repair may have similar outcomes of reconstruction... [but] Patient-/injury-specific factors and comorbidities must be identified and ranked for risk of recurrent instability."¹⁹ We agree that in the proper setting, MPFL repair may still be a viable option in carefully selected patients with symptomatic lateral patellar instability. However, a large and growing body of evidence currently supports a swing of the pendulum toward MPFL reconstruction for the treatment of patellofemoral instability.

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