

Effect of Meniscal Treatment on Functional Outcomes 6 Months After Anterior Cruciate Ligament Reconstruction

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Background: Meniscal injuries are commonly associated with anterior cruciate ligament (ACL) tears. Treatment of meniscal injuries can impart delayed weightbearing and range of motion restrictions, which can affect the rehabilitation protocol. The effect of meniscal treatment and subsequent restrictions on strength recovery after ACL reconstruction is unclear.

Purpose/Hypothesis: The purpose of this study was to compare strength, jumping performance, and patient-reported outcomes between patients who underwent isolated ACL reconstruction (ACLR) and those who underwent surgical intervention for meniscal pathology at the time of ACLR. Our hypothesis was that patients who underwent concurrent meniscal repair (MR) would have lower strength recovery owing to postoperative restrictions.

Study Design: Cohort study; Level of evidence, 3.

Methods: Patients with ACLR were stratified into isolated ACLR, ACLR and meniscectomy (ACLR-MS), or ACLR-MR groups and were compared with healthy controls. The ACLR-MR group was restricted to partial weightbearing and to 90° of knee flexion for the first 6 weeks postoperatively. All participants completed patient-reported outcomes (International Knee Documentation Committee [IKDC] and Knee injury and Osteoarthritis Outcome Score [KOOS]) and underwent bilateral isokinetic and isometric strength tests of the knee extensor and flexor groups as part of a return-to-sports test battery at 5 to 7 months postoperatively.

Results: A total of 165 patients with ACLR (50 with isolated ACLR, 44 with ACLR-MS, and 71 with ACLR-MR) and 140 healthy controls were included in the study. Follow-up occurred at a mean of 5.96 ± 0.47 months postoperatively. The control group demonstrated higher subjective knee function, unilateral peak extensor torque, and limb symmetry than did the ACLR-MS and ACLR-MR groups combined ($P < .001$ for all). There were no differences in IKDC, KOOS subscales, or unilateral or limb symmetry measures of peak knee extensor or flexor torque among the isolated ACLR, ACLR-MS, and ACLR-MR groups.

Conclusion: Persistent weakness, asymmetry, and reduced subjective outcome scores at 6-month follow-up after ACLR were not influenced by meniscal treatment. These findings suggested that the weightbearing and range of motion restrictions associated with meniscal repair recovery do not result in loss of early strength or worse patient-reported outcomes.

Keywords: ACL reconstruction; meniscal repair; rehabilitation after ACL reconstruction; return-to-sport testing

The incidence of anterior cruciate ligament (ACL) injuries continues to rise in the United States especially among younger and active patients, with some estimates between 60,000 and 200,000 annually.^{4,6,12,15,17,18} It is common for multiple coinciding structures in the knee to be injured at the time of an ACL tear. Prior research has reported the prevalence of concomitant chondral and meniscal injuries to be as high as 50% in primary ACL injury and significantly higher with recurrent ACL injuries.^{7,13,19,26} The

frequency with which concomitant meniscal injury is encountered with ACL injury has made this a topic of study because of the altered course of treatment over time and potential long-term consequences such as osteoarthritis.

Meniscal injury is most frequently treated at the time of ACL reconstruction (ACLR) because meniscal integrity is important for the longevity of the graft and is a strong determinant for the development of arthritis.²³ Although partial meniscectomy is frequently performed at the time of ACLR, meniscal repair is becoming a more commonly performed procedure.⁹ Prior literature has shown that radiographic and subjective patient-reported outcomes after isolated meniscal repair are better than those after

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meniscectomy^{2,11,16}; however, this procedure is not without its own associated costs when combined with an ACLR. The specific type of meniscal treatment at the time of ACLR can have large effects on postoperative rehabilitation, as meniscal repair protocols often mandate weightbearing or range of motion (ROM) restrictions for a prolonged period during the early phase of postoperative rehabilitation.^{24,27}

Restricted ROM and weightbearing may be of concern to the treating physician or rehabilitation specialist because of the potential for persistent atrophy and muscular weakness and difficulty meeting rehabilitation benchmarks. Often patients complete strength testing and patient-reported outcomes as a means to gauge progress through postoperative rehabilitation. The postoperative functional weightbearing and ROM restrictions after a meniscal repair could change how patients are managed and counseled after ACLR with concomitant meniscal treatments. The effect of meniscal treatment on objective functional assessment outcomes around the time of readiness to progress toward sport-specific activities is currently unclear.

The purpose of this study was to compare strength and patient-reported outcomes between patients with isolated ACLR and those undergoing surgical intervention for meniscal pathology at the time of ACLR surgery. Our hypothesis was that the patients who underwent concomitant meniscal repair would have significantly less strength than patients undergoing isolated ACLR or ACLR with meniscectomy owing to the weightbearing and ROM restrictions imposed on them early in the recovery period.

METHODS

This was an institutional review board–approved, retrospective cohort study. The independent variable was group based on type of surgical meniscal treatment (isolated ACLR, ACLR and meniscectomy [ACLR-MS], or ACLR and meniscal repair [ACLR-MR]). Dependent variables were the International Knee Documentation Committee (IKDC) scores, Knee injury and Osteoarthritis Outcome Scores (KOOS), mass-normalized isokinetic knee extensor and flexor peak torque, and knee extensor and flexor limb symmetry. Patient-reported outcome measures and strength functional assessments were collected prospectively, with review of the patient's operative details available in the medical record.

Participants

All patients who underwent ACLR at a single academic orthopaedic clinic were referred to perform the Lower Extremity Assessment Protocol between 5 and 7 months post-ACLR. We included patients who had a primary ACLR with no surgical complications and no history of prior ACLR or contralateral ACL injury. Patients with concomitant surgical ligamentous injuries or full-thickness chondral injuries were excluded as confounding. Chondral fraying requiring only mechanical shaving chondroplasty was not excluded from the analysis.

Surgery was performed only after patients had achieved full ROM, and all patients in this study underwent surgery within 28 days of the original acute injury. The arthroscopically assisted ACLR was performed by 1 of 5 fellowship-trained orthopaedic sports medicine surgeons (F.W.G., B.C.W., D.R.D., M.D.M., S.F.B.), and graft choice was varied based on surgeon preference and patient need. The ACL graft was either bone–patellar tendon–bone autograft (BPTB) or hamstring autograft (HS). Fixation method was with interference fixation for BPTB and either interference or hybrid fixation (interference for tibia, suspensory for femur) for HS.

The ACLR was performed using either the accessory anteromedial portal in hyperflexion or flexible reamers for the femoral tunnel. Visualization of both the ACL tear and any meniscal pathology was achieved using preoperative magnetic resonance imaging on all patients. The decision to perform meniscal repair or partial meniscectomy was made intraoperatively based on arthroscopic findings and surgeon preference. In general, repairs were performed for longitudinal vertical or bucket-handle tears in the red-red or red-white zone of the meniscus, taking into account the potential for healing as well as patient functional level and best intended outcome. The quality of the tissue and robustness of potential repair were part of the algorithm, as devitalized or macerated tissues may have been deemed irreparable even if they were bucket-handle in morphology. The meniscal repair was performed via either the all-inside or the inside-out technique, dictated by location and size of the tear at the surgeon's discretion. The partial meniscectomies were performed for loose meniscal flaps, small radial tears, horizontal tears, and parrot-beak tears of the meniscus that were deemed irreparable by the operative surgeon using an arthroscopic shaver.

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Ethical approval for this study was obtained from the University of Virginia (reference No. 17399).

Patients were stratified into the ACLR groups depending on meniscal involvement at the time of ACLR. In addition to the isolated ACLR, ACLR-MS, and ACLR-MR groups, a group of healthy controls was recruited as volunteers from a university setting. Criteria for the healthy controls were no previous surgery to their knees and no injury within the 6 months before study inclusion.

Rehabilitation Protocol

All patients followed a standardized rehabilitation protocol based on the meniscal treatment they received. Isolated ACLR and ACLR-MS groups were weightbearing as tolerated with work on active ROM over the first 4 weeks with no brace. The ACLR-MR rehabilitation protocol differed in that these patients were toe-touch weightbearing (25%) for 2 weeks, then were 50% weightbearing until 6 weeks postoperatively, and then advanced to full weightbearing. This subset of patients was also placed in a T Scope Premier Post-Op hinged knee brace (Breg Inc) to prevent knee flexion beyond 90° until 6 weeks and instructed to avoid squatting beyond 90° until 4 months postoperatively. These ROM restrictions during the first phase of rehabilitation applied only to weightbearing and activities of daily living. The patients were permitted full, unrestricted flexion when performing their rehabilitation exercises with the physical therapist to avoid flexion loss.

The rehabilitation protocol was based on phases, and graduation to the next phase required all criteria from the previous one to have been met. The first phase encompassed weeks 0 to 4; progression past this phase required full passive ROM. Closed kinetic chain quadriceps exercises were introduced at 4 weeks with the isolated ACLR group and after the weightbearing restrictions were lifted at 6 weeks for the ACLR-MR group. The patients progressed to normal running mechanics between 12 and 16 weeks. The final phase of the protocol encompassed months 4 to 6 and introduced lateral movement drills as well as pivoting and cutting maneuvers.

The major rehabilitation difference was that patients in the ACLR-MR group had limited weightbearing, limited knee flexion, and hinged knee brace limited from 0° to 90° of flexion for the first 6 weeks.

The patients were referred by their treating physical therapist or athletic trainer as early as 6 months postsurgery to provide objective information to guide return to activity decision making. As such, patients at the time of this study were not yet cleared for unrestricted activity but were within the return to activity progression. To progress through the rehabilitation protocol, they must have met the milestones required by each phase, including full ROM.

Patient-Reported Outcome Measures

After enrollment, all participants completed the IKDC and the KOOS. These measures have been shown to be valid and reliable in individuals after ACLR.^{10,22,29} Physical activity was quantified using the Tegner activity scale.

Knee Extension and Flexion Strength Measurements

Isokinetic, concentric knee extension, and flexion strength were measured bilaterally using a Biodex Systems IV dynamometer (Biodex Medical Systems) at a speed of 90°/s. All testing was performed on the uninvolved limb, followed by testing of the involved limb. The participants completed practice trials on each limb for practice and familiarization. The participants provided maximal effort through their full ROM for 8 trials. Measures of average peak torque for knee extension and flexion were exported from the multimode dynamometer (Biodex System IV).

Single-Leg Hop Measurements

Single-leg hop performance was measured bilaterally using a battery of 3 separate hopping tasks: the single hop for distance, the triple hop for distance, and the 6-m timed hop. Participants were given practice trials until they were comfortable completing the task. All testing was performed on the uninvolved limb, followed by testing of the involved limb. All hopping tasks required the participant to maintain single-leg balance at the conclusion of each hop. All tasks for distance were measured from the toe at start to the heel at landing. The 6-m timed hop was implemented using timing gates (FitLight Trainer; FitLight Corp) that were placed 1 m from the ground.

Data Processing

Unilateral measures of peak torque were normalized to the participant's body weight (N·m/kg). All unilateral measures for the single-leg hop for distance tasks were normalized to the participant's body height (m/m). The 6-m timed hop was not normalized. Symmetry measures were calculated as a limb symmetry index (LSI): $\frac{\text{Involvedlimb}}{\text{Uninvolvedlimb}}$. For healthy participants, the involved limb was the nondominant limb (as determined by the participant), and the uninvolved limb was the dominant limb.

Statistical Analysis

Descriptive variables were compared among the groups (control, isolated ACLR, ACLR-MS, ACLR-MR) using 1-way analysis of variance (ANOVA) with post hoc Tukey least significant difference for continuous data and the chi-square test for categorical variables. ANOVA was used to compare IKDC scores, KOOS subscales, knee extensor and flexor peak torque, and symmetry between the healthy participants and the average across all 3 ACLR groups. A separate ANOVA was used to compare IKDC scores and KOOS subscales among the ACLR groups. Finally, we used an analysis of covariance controlling for the graft type used to compare the ACLR subgroups for all strength, jumping, and LSI measures. For all analyses, statistical significance was defined as *P* values of $\leq .05$, and all statistical analyses were performed using SPSS Version 26 (IBM Corp).

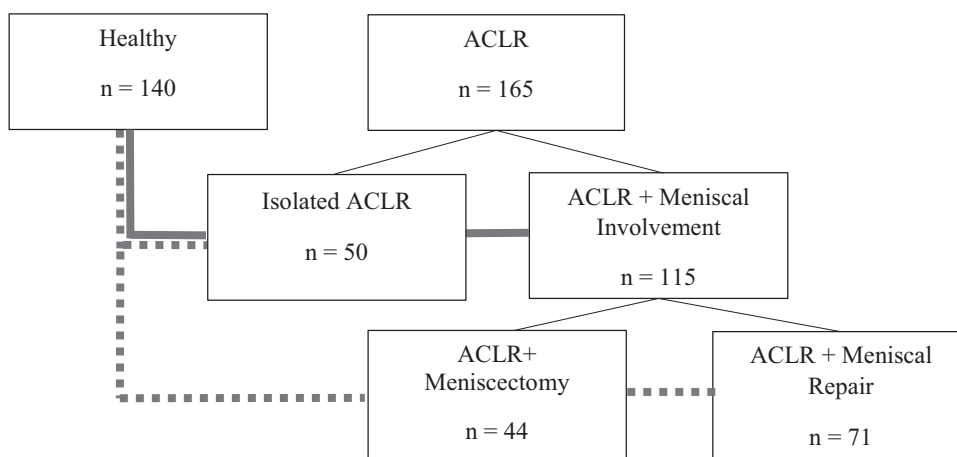


Figure 1. Stratification of patients according to meniscal involvement. The solid gray line represents the initial analysis performed, comparing healthy control participants with those with isolated anterior cruciate ligament reconstruction (ACLR) and ACLR + any meniscal involvement. The dotted gray line represents the second analysis performed, comparing control participants with patients with ACLR stratified by meniscal involvement.

TABLE 1
Patient Characteristics Based on Meniscal Treatment Type^a

	Control (n = 140)	Isolated ACLR (n = 50)	ACLR-MS (n = 44)	ACLR-MR (n = 71)	<i>P</i>
Age, y	21.4 ± 3.5	22.9 ± 10.1	25.0 ± 12.5	20.3 ± 7.0	.008 ^b
Sex, female:male, No.	82:59	31:19	23:21	33:38	NS
Height, cm	171.9 ± 18.0	171.2 ± 10.2	170.4 ± 10.7	173.3 ± 10.2	NS
Mass, kg	70.0 ± 12.5	70.6 ± 15.1	75.7 ± 19.1	77.1 ± 19.3	.008 ^c
Graft type, No.					
BPTB	—	33	25	42	NS
HS	—	17	19	29	NS
Time after surgery, mo	—	6.0 ± 0.42	6.1 ± 0.53	5.9 ± 0.47	NS
Tegner activity level					
Preinjury	—	8.1 ± 1.6	8.4 ± 1.6	8.6 ± 1.2	—
Current	7.8 ± 1.7	5.7 ± 1.8	6.0 ± 1.6	6.0 ± 2.0	<.001 ^d
IKDC, %	97.0 ± 5.0	80.2 ± 12.7	83.4 ± 9.1	78.6 ± 14.8	<.001 ^e

^aData are reported as mean ± SD unless otherwise indicated. Dashes indicate not applicable. ACLR, anterior cruciate ligament reconstruction; ACLR-MR, anterior cruciate ligament reconstruction with meniscal repair; ACLR-MS, anterior cruciate ligament reconstruction with meniscectomy; BPTB, bone–patellar tendon–bone; HS, hamstring autograft; IKDC, International Knee Documentation Committee; NS, nonsignificant.

^bControl participants were significantly younger than ACLR-MS group patients.

^cControl participants had significantly lower mass than ACLR-MR group patients.

^dControl participants had a significantly greater current activity level than all ACLR groups.

^eControl participants had a significantly greater IKDC score than all ACLR groups.

RESULTS

A total of 305 participants were included in this study, including 165 patients with ACLR and 140 healthy control participants. The diagram of patient analyses performed in this study is demonstrated in Figure 1. All patients with ACLR completed the testing at an average time postoperatively of 5.96 ± 0.47 months. The characteristics of all participants are shown in Table 1. There were no differences in the proportion of graft types (BPTB, HS) among the ACLR groups ($\chi^2 = 0.63$) (Table 1). At the time of testing, no

patients had returned to sports, as this testing was part of the criteria to be met before they were allowed to return.

The control participants demonstrated higher subjective knee function than did an average of all ACLR subgroups on patient-reported outcome measures, strength measures, normalized jumping distances, and all LSIs ($P < .001$). However, there were no differences in any of the patient-reported outcomes or any of the strength and jumping measures (while controlling for graft type) among the ACLR subgroups based on meniscal treatment status (all $P > .05$) (Table 2 and Figure 2).

TABLE 2
Patient-Reported Outcome Scores and Strength and Jumping Measures for Healthy Participants and Each ACLR Subgroup^a

	Control	Isolated ACLR	ACLR-MS	ACLR-MR	P	
					Combined ACLR vs Controls ^b	ACLR Subgroups ^c
IKDC	97.02 ± 4.98	80.2 ± 12.74	83.45 ± 9.13	78.4 ± 14.64	<.001	.141
KOOS subscale						
Symptom	96.11 ± 7.09	84.08 ± 14.42	84.22 ± 11.83	84.12 ± 13.87	<.001	.993
Pain	98.58 ± 4.17	90.95 ± 10.1	92.37 ± 6.73	90.45 ± 10.59	<.001	.508
ADL	99.58 ± 1.47	96.63 ± 7.05	97.5 ± 3.5	95.73 ± 8.98	<.001	.413
Sport	97.75 ± 7.23	80.2 ± 16.92	83.95 ± 11.63	80 ± 20.63	<.001	.46
QOL	97.61 ± 7.03	69.29 ± 18.03	70.07 ± 18.63	66.2 ± 22.56	<.001	.565
Knee extension peak torque, N·m/kg	2.08 ± 0.56	1.45 ± 0.46	1.48 ± 0.48	1.58 ± 0.52	<.001	.323
Knee flexion peak torque, N·m/kg	0.96 ± 0.28	0.88 ± 0.31	0.87 ± 0.25	0.86 ± 0.28	<.001	.681
LSI: extension	0.98 ± 0.13	0.68 ± 0.19	0.68 ± 0.21	0.71 ± 0.2	<.001	.654
LSI: flexion	0.99 ± 0.17	0.92 ± 0.17	0.97 ± 0.2	0.92 ± 0.18	<.001	.133
Single-leg hop, m/m	0.79 ± 0.22	0.6 ± 0.19	0.63 ± 0.18	0.64 ± 0.19	<.001	.432
Triple hop, m/m	2.57 ± 0.54	2.19 ± 0.54	2.28 ± 0.51	2.28 ± 0.62	<.001	.569
6-m timed hop	0.01 ± 0	0.02 ± 0	0.02 ± 0	0.02 ± 0.01	<.001	.873
LSI: single hop	1.02 ± 0.29	0.87 ± 0.15	0.87 ± 0.14	0.88 ± 0.14	<.001	.911
LSI triple hop	0.98 ± 0.09	0.91 ± 0.14	0.93 ± 0.09	0.91 ± 0.11	<.001	.489
LSI: 6-m timed hop	0.99 ± 0.07	1.13 ± 0.22	1.05 ± 0.08	1.11 ± 0.37	<.001	.366

^aData are reported as mean ± SD. ACLR, anterior cruciate ligament reconstruction group; ACLR-MR, anterior cruciate ligament reconstruction with meniscal repair; ACLR-MS, anterior cruciate ligament reconstruction with meniscectomy; ADL, Activities of Daily Living; IKDC, International Knee Documentation Committee; KOOS, Knee injury and Osteoarthritis Outcome Score; LSI, limb symmetry index; QOL, Quality of Life.

^bAll outcomes were significantly greater in control participants compared with combined ACLR patients.

^cNo significant differences among ACLR subgroups.

Postoperative clinical examination at the 6-month time period demonstrated symmetric knee ROM, negative McMurray test, and no residual ligamentous laxity including negative Lachman test and negative pivot-shift test. At the time of data analysis, no ACLR-MR group patients had recorded failures or retears.

DISCUSSION

The primary finding of this study indicated that meniscal treatment does not affect postoperative muscle strength and patient-reported outcomes measured at approximately 6 months after surgery. Operative treatment of concomitant meniscal injury at the time of ACLR and the effect on rehabilitation and recovery is an important part of clinical decision making. This typically includes delayed weightbearing for patients with meniscal repairs to allow adequate time for tissue healing. Clinically this raises concerns about persistent muscle weakness because of the likelihood that weightbearing restrictions will change or delay exercise progression, especially during the early phase of postoperative recovery and rehabilitation. This study found that, even after controlling for graft type, there were no differences in measures of knee muscle strength, jumping performance, or subjective outcomes among the study subgroups.

Many surgeons will limit weightbearing and knee ROM after a meniscal repair, which significantly limits patient rehabilitation when compared with that after a

meniscectomy or isolated ACLR. While there is no consensus on rehabilitation protocols, there is wide variability in the rehabilitation allowed after a meniscal repair. The literature does not appear to demonstrate a higher failure rate with early ROM and weightbearing after meniscal repair.²⁷ Some of the studies involved in that systematic review by Spang et al²⁷ evaluated biomechanical stresses in a cadaveric meniscal repair model, noting that there was no significant gapping with stress.^{5,25} Although a small series has shown that there are no significant differences in outcomes with conservative compared with more accelerated rehabilitation protocols,³⁰ our findings suggested that limiting weightbearing and ROM does not affect strength gains at the 6-month time period after surgery. Therefore, protecting the repair early in the healing process may allow the meniscus to heal and not affect objective strength gains later in the rehabilitative cycle. The effect that the restricted weightbearing has on return to sports or recovery over the short term has not yet been established in the literature.

Coinciding meniscal injury is an important factor in recovery after ACLR, as the meniscal integrity is important for the protection of the reconstructed ACL graft, long-term joint health, and the prevention of arthritis development.²³ These findings have led to an increasing trend in addressing the meniscus, with repair and partial meniscectomy both being performed at the time of ACLR. One national study found that the incidence of meniscal repairs at the time of ACLR increased 73% between 2002 and 2014.⁹ Although partial meniscectomy is more often performed

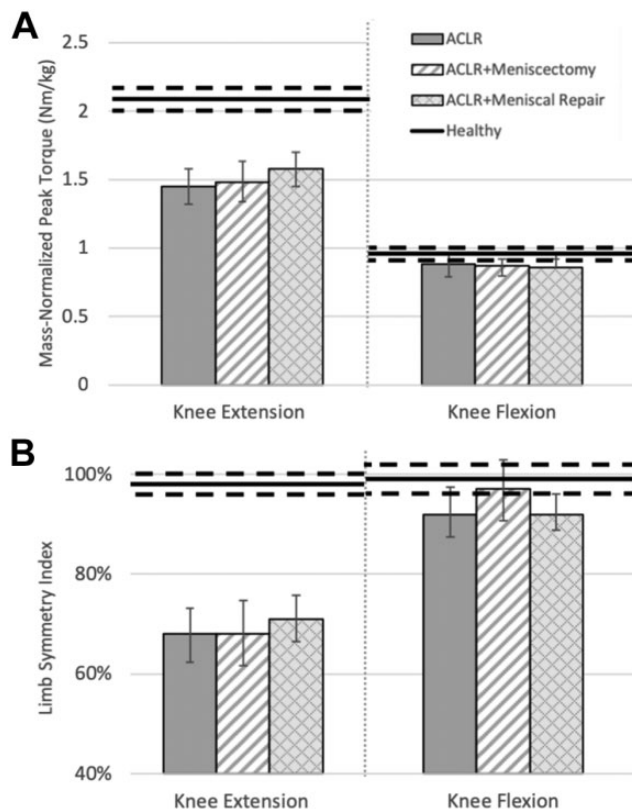


Figure 2. Comparison of knee extensor and flexor (A) strength and (B) limb symmetry between groups. Error bars and dashed lines represent 95% CI. ACLR, anterior cruciate ligament reconstruction.

at the time of ACLR,²³ the rise in meniscal repair is especially important because it may affect postoperative rehabilitation and limit weightbearing or ROM. With this increasing trend, it is important to be aware of the limitations and how the various surgical interventions affect return to activities.

Although isolated meniscal repairs often have good and excellent clinical and radiographic results,^{2,11,16} meniscal repair coinciding with ACLR has shown evidence of healing more successfully than repair alone.^{14,20,28} The advent of technology, including all-inside repair devices, has allowed this to be a less difficult and technically demanding procedure, and the trend has been to repair more of these injuries.⁹ Furthermore, other factors such as improved understanding of the anatomy and outcomes regarding reparability of meniscal tears, as well as the increased number of adolescents with knee injuries, may also have contributed to increased meniscal repair.^{1,3} As such, it is important to understand the effect that meniscal repair is having on rehabilitation and readiness for return to sports.

The findings in our study are a slight departure from prior literature, in that meniscal injury has previously been demonstrated to decrease ability to return to sport at 1 year⁸ and has been associated with inferior patient-reported outcomes in revision ACL surgery.³¹ However, the

present work stratified by specific meniscal treatment and found no objective strength differences in the short-term return-to-sport battery of testing. This work's objective findings do not fully agree with the subjective return-to-sport outcomes literature, in which all meniscal injuries were grouped together, though our study was not specifically evaluating successful return to sport but rather objective functional and strength test results at the 6-month mark. It is useful to know that the strength gained postoperatively did not appear to be hampered by the limited weightbearing protocol involved in meniscal repair. As all patients in this study were undergoing testing to return to sporting activity and their Tegner scores were high, they were likely on the more active side of the spectrum. As such, their results may differ from those of patients who are less active. Because the study patients were so active, these results may be less applicable to a different population of patients who may be less involved in sporting activities.

The design and inclusion criteria of our study may have favored those ACLR-MR group patients who were doing well. This may have inadvertently excluded those patients who were lagging in their recovery since only those patients who had progressed successfully through their rehabilitation protocol were eligible to have the Lower Extremity Assessment Protocol testing performed. Loss of motion, persistent effusion, and failure to progress through their rehabilitation would have made the patients temporarily ineligible for this functional return-to-activity assessment and therefore may have selected for only those ACLR-MR group patients doing well. However, this would also be true for the isolated ACLR group patients, and those struggling in their rehabilitation progression would have also been ineligible. Unfortunately, we were unable to analyze the different group proportions of patients who were not referred for the testing.

Bracing and delayed weightbearing after isolated ACLR has been shown to decrease functional outcomes, based on IKDC scores,²¹ but how this affects ACLR in conjunction with meniscal treatment has not been evaluated. Although there appeared to be some functional benefit to early motion and early weightbearing or some detriment to limitation at the midterm for isolated ACLR, our study found this did not hold true with concomitant meniscal treatment.

Although strength gains are very dependent on physical therapy, we were unable to control for the specific therapist working with the patients. All surgeons in the study use the same postoperative rehabilitation protocol for each procedure, but patients are free to visit whichever physical therapist is convenient for them. This inserts some inconsistency into the study and appears initially as a weakness, but having variability with respect to therapists may actually strengthen our results. The fact that these results were found despite the variability in therapists suggests the results are not skewed by physical therapy, and the variability eliminates the effect that therapy may have on these results.

This study is not without its weaknesses. We evaluated the functional and strength recovery at 6 months postoperatively, as this is used as part of the return-to-play protocol

after ACLR. We did not, however, evaluate actual return to sports. Although this may be seen as a weakness, the actual purpose of our study was to compare the strength evaluations at the time of the return-to-sports evaluation, not the actual ability to return. Six months postoperatively from ACLR is often several months from successful return to sports, so this functional evaluation took place during return to sport-specific training activities and not full release to sports. This suggests a direction for future study, with the goal of stratifying successful return to sports by the functional test scores at the 6-month mark that were measured in this study.

CONCLUSION

This study demonstrated that meniscal treatment, whether it be partial meniscectomy, meniscal repair, or no intervention, did not affect strength, jumping performance, or subjective knee function scores at the 6-month performance assessment. This is important to know for preoperative counseling or intraoperative decision making when taking into account the ability to gain strength or return to sport after the varied rehabilitation limitations.

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