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ACCEPTABLE CLINICAL OUTCOMES DESPITE HIGH REOPERATION RATE AT MINIMUM 12-MONTH FOLLOW-UP AFTER CONCOMITANT ARTHROSCOPICALLY ASSISTED ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION AND MEDIAL MENISCAL ALLOGRAFT TRANSPLANTATION

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Disclosures

- Eric J. Strauss: American Academy of Orthopaedic Surgeons, American Orthopaedic Association, Arthrex, Inc, Arthroscopy Association of North America, Better PT, Cartiheal, Cartilage, Fidia, Flexion Therapeutics, Jaypee Publishing, Joint Restoration Foundation, Organogenesis, Smith & Nephew, Springer, Subchondral Solutions, Vericel, and Bulletin of the Hospital for Joint Diseases
- Kirk A. Campbell: American Academy of Orthopaedic Surgeons, Arthroscopy Association of North America, Mitek, and Stryker
- Michael J. Alaia: American Academy of Orthopaedic Surgeons, Arthrex, Inc, Arthroscopy Journal, Arthroscopy Association of North America, Journal of Cartilage and Joint Preservation, JRF Ortho, Mitek, Orcosa, Inc, and Springer
- Laith M. Jazrawi: Arthrex, Inc, Bulletin of the Hospital for Joint Diseases, JBJS Reviews, Mitek, Smith & Nephew, and Wolters Kluwer Health - Lippincott Williams & Wilkins

Background

- Single-stage medial meniscus allograft transplantation (MAT) with concomitant anterior cruciate ligament reconstruction (ACLR) is a technically-challenging procedure for management of knee pain and instability in younger patients.
- Clinical and functional outcomes data on the concomitant procedure is limited to case series, and few of these studies have used patient-reported outcome (PRO) instruments that are standardized to the U.S. population at large.

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Objective

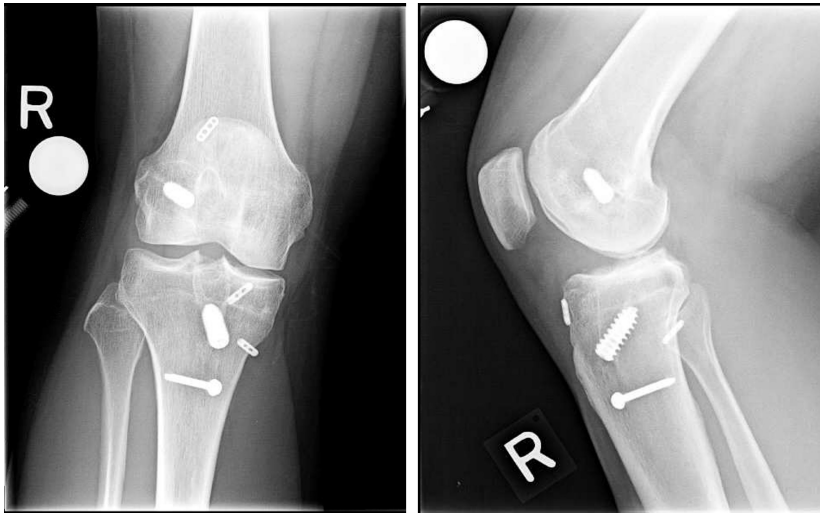
- The aims of our study were to:
  - (1) characterize rates of complications and adverse events following concomitant ACLR and medial MAT
  - (2) assess knee pain, function, and other clinical outcomes following this procedure
  - (3) assess return to sport and return to work outcomes
  - (4) identify associations between Patient-Reported Outcome Information System (PROMIS) scores and other patient-reported outcomes in this population

Methods – Cohort Selection

- Multi-surgeon, single-center retrospective case series
- Inclusion criteria: (1) primary or revision ACLR with MAT of the medial meniscus, (2) at least 18 years of age, and (3) minimum 12 months of follow-up
- Exclusion criteria:
  - (1) ACLR and medial MAT performed as separate procedures on different dates
  - (2) lateral MAT
  - (3) revision MAT
  - (4) concomitant realignment procedure such as high tibial osteotomy (HTO)
  - (5) medial meniscus procedures besides MAT such as meniscus repair or meniscectomy
- Concomitant procedures included osteochondral allograft (OCA)

Methods – Surgical Technique

- Double bone plug meniscal allografts size matched using MRI
- ACL grafts prepared from bone-patellar tendon-bone, tibialis anterior, or hamstring (for revision cases)
- Femoral and tibial tunnels drilled under arthroscopic guidance
- Meniscal graft secured with suture buttons, FasT-Fix all-inside sutures, and inside-out suture tapes
- ACL graft secured using metal interference screw



Methods – Outcomes Measured

- Outcomes assessed via email survey
- Primary outcomes:
  - Visual Analog Scale (VAS) current knee pain
  - Overall satisfaction (0-100)
  - Lysholm score
  - Tegner scores pre-injury, post-injury, post-surgery
- Secondary outcomes: return to sport, return to work, PROMIS scores (Pain Interference, Pain Intensity, Physical Function)
- Subgroup analysis performed comparing primary and revision cases

Table 1. Demographics information.

Variable	All (n = 17)	Primary ACLR (n = 6)	Revision ACLR (n = 11)	P-value
Age	31.9 ± 7.6	34.3 ± 9.2	30.6 ± 6.7	0.36
Sex				0.51
Male	14 (82.4%)	6 (100.0%)	8 (72.7%)	
Female	3 (17.7%)	0 (0.0%)	3 (27.3%)	
BMI	27.9 ± 7.2	30.5 ± 11.5	26.5 ± 3.3	1.00
Prior non-ACLR index knee surgery	13 (76.5%)	4 (66.7%)	9 (81.8%)	0.58
Follow-up time (months)	56.8 ± 31.1	44.2 ± 26.6	63.7 ± 32.4	0.29

Table 2. Procedure information.

Variable	All (n = 17)	Primary ACLR (n = 6)	Revision ACLR (n = 11)	P-value
ACL graft type				
BPTB allograft	10 (58.8%)	4 (66.7%)	6 (54.6%)	
BPTB autograft	5 (29.4%)	1 (16.7%)	4 (36.4%)	0.44
Hamstring autograft	1 (5.8%)	1 (16.7%)	0 (0.0%)	
Tibialis anterior allograft	1 (5.8%)	0 (0.0%)	1 (9.1%)	
Concomitant procedures	12 (70.6%)	4 (66.7%)	8 (72.7%)	1.00
OCA	3 (17.7%)	2 (33.3%)	1 (9.1%)	0.51
Chondroplasty	4 (23.5%)	1 (16.7%)	3 (27.3%)	1.00
Lateral meniscus repair	2 (11.8%)	1 (16.7%)	1 (9.1%)	1.00
Lateral APM	1 (5.9%)	0 (0.0%)	1 (9.1%)	1.00

Table 3. Outcomes.

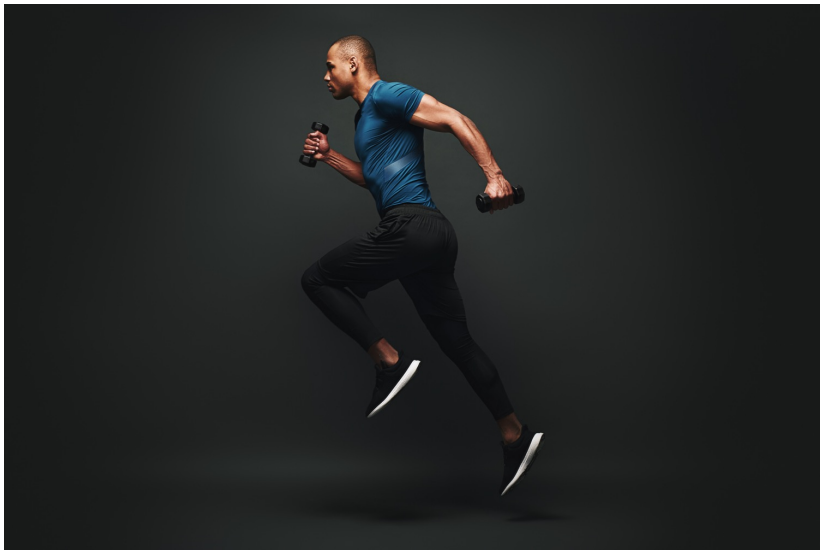
Variable	All (n = 17)	Primary ACLR (n = 6)	Revision ACLR (n = 11)	P-value
VAS pain	2.2 ± 3.3	2.8 ± 4.8	1.9 ± 2.8	0.89
Satisfaction	77.9% ± 35.5%	100.0% ± 0.0%	69.0% ± 38.9%	0.04*
Lysholm score	81.1 ± 18.1	86.5 ± 14.5	78.9 ± 19.7	0.52
Tegner scores				
Pre-injury	7.4 ± 2.5	7.0 ± 3.6	7.5 ± 2.2	1.00
Post-injury	3.9 ± 2.4	4.8 ± 1.5	3.5 ± 2.6	0.32
At present	4.9 ± 2.1	5.0 ± 1.4	4.8 ± 2.4	0.88
Participated in sports prior to injury	14 (100.0%)	4 (100.0%)	10 (100.0%)	1.00
Returned to sport after surgery	6 (42.9%)	2 (50.0%)	4 (40.0%)	1.00
Employed prior to injury	14 (100.0%)	4 (100.0%)	10 (100.0%)	1.00
Returned to work after surgery	13 (92.9%)	4 (100.0%)	9 (90.0%)	1.00

Results

- The one-year reoperation rate was high (23.5%) with two patients (11.8%) tearing their meniscus graft.
- Patient-reported outcomes indicated low VAS pain (mean 2.2), high satisfaction (mean 77.9%), and fair Lysholm score (mean 81.1).
- Return to work rate was high (92.9%) while return to sport rate was low (42.9%).
- Postoperative PROMIS Pain Intensity, Pain Interference, and Physical Function scores were comparable or superior to the national average (>50) and all scores correlated significantly with patient satisfaction ($p < 0.05$).

Conclusions

- The concomitant ACLR and MAT procedure is associated with excellent knee pain and functional outcomes and high rate of return to work after surgery though the one-year reoperation rate is high and rate of return to sport is low.



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