

Meniscus Allograft Transplantation
AOSSM 2021 Annual Meeting / Instructional Course 201
A Case-based Approach for Meniscus Repair and Transplantation:
Reconsidering Indications, Techniques, and Biologic Augmentation
July 9, 2021 (Friday); 7:00 AM to 8:30 AM

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I. Evaluate patient and individualize care

- A. Review patient demographics -- ideally an active person between ages of 15 to 50
- B. Listen to patient history -- prior partial meniscectomy; persistent pain, especially with impact
- C. Perform a physical examination -- joint line tenderness and possibly an effusion
Assess ligaments, especially rotational stability provided by ACL grafts
- D. View weight-bearing x-rays -- preservation of joint space
- E. Examine the MRI -- diminutive meniscus and possibly increased signal in subchondral bone
Assess integrity of articular cartilage
- F. Acquire full-length alignment imaging from hip to ankle -- normal alignment
Assess mechanical axis
- G. Perform arthroscopy (optional) -- confirm meniscal deficiency and assess knee

II. Concomitant procedure planning

- A. ACL deficiency requires ACL reconstruction
- B. Focal articular cartilage defect requires cartilage repair
- C. Unfavorable malalignment requires osteotomy

III. Contra-indications

- A. Compartment receiving meniscus has regional loss of articular cartilage (arthritis)
- B. Patient is unable to comply with post-operative rehabilitation

IV. Review expectation with patient

- A. Immediate post-operative period includes weeks of motion limits and weight bearing precautions
- B. Physical therapy and rehabilitation last 18 weeks or so
- C. Healing rate and long-term survivorship are not greater than 85%

V. Perform meniscus allograft transplantation -- Technique

- A. Different techniques have been described and detailed
 - 1. Systematic review (Rosso AJSM 2015) -- “no proven superiority of one method”

2. Expert consensus (Getgood AJSM 2017) -- “based on current evidence, IMREF [International Meniscus Reconstruction Experts Forum] accepts that there is no superiority of one surgical technique over another (bone vs soft tissue)”
- B. One option for a technique follows
1. Arthroscopically assess knee
 2. Prepare native meniscus, leaving about a 1-mm rim peripherally
Tip: The anterior horn can be more easily trimmed using 90-degree biters from the far portal of backwards (reverse) biters from the near portal.
 3. Prepare the allograft meniscus by trimming peripheral 1-mm rim and placing sutures
 4. Pass one loop of shuttle suture to draw in posterior horn
Tip: To prepare posterior horn attachment site, first use an angled curette to expose the bone. Then, place a guide pin using a low-profile tibial ACL targeting guide.
 5. Pass two loops of shuttle sutures to draw in body of the allograft
 6. Increase portal size and draw meniscus allograft into knee
 7. Secure the meniscus
 - a. Tie posterior root suture over button (1 fixation point)
 - b. Repair posterior horn with all-inside devices (2 fixation points)
 - c. Repair body using outside-in or inside-out technique (2 fixation points)
 - d. Place anchor for anterior horn (1 fixation point)
 - e. Repair anterior horn using outside-in technique (1 fixation point)
- C. Technical pearls
1. Flex knee 90 degrees and make sure that the popliteal fossa is free when working about posterior horn
 2. Fixation with too many fixation points may lead to “postage stamp” tearing of functional perforation -- like a workbook page
 3. Oblique (more vertical than horizontal) suture patterns seem to work well

VI. Evaluate outcomes

- A. Evaluate structure (MRI and second-look arthroscopy) whenever possible and appropriate
- B. Evaluate patient-oriented outcome measures at long-term time points

VII. References

Rosso F, Bisicchia S, Bonasia DE, Amendola A. Meniscus allograft transplantation: a systematic review. *Am J Sports Med.* 2015;43:998-1007.

Getgood A, LaPrade RF, Verdonk P, Gersoff W, Cole B, Spalding T, IMREF Group. International Meniscus Reconstruction Experts Forum (IMREF) 2015 consensus statement on the practice of meniscal allograft transplantation. *Am J Sports Med.* 2017;45:1195-1205.