Meniscal Allograft Transplantation: Indications, Techniques, Outcomes

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Abstract: Meniscal allograft transplantation (MAT) has become an acceptable surgical treatment for select symptomatic and relatively young (<50 years of age) patients with a meniscal deficiency. MAT may also be considered in meniscal-deficient patients undergoing anterior cruciate ligament reconstruction and/or articular cartilage repair procedure in the ipsilateral compartment. Contraindications to MAT include asymptomatic patients, severe osteoarthritis, uncorrectable malalignment or instability, irreparable chondral damage, active infection, or inflammatory arthropathy. Most institutions prefer the use of fresh-frozen allografts, whereas the use of fresh-viable grafts is limited by their availability, and the use of cryopreserved and lyophilized grafts has gone out of favor. Donor allografts are size-matched to the recipient using x-rays or magnetic resonance imaging measurements. To date, no particular surgical technique has demonstrated superiority. Therefore, there are several used approaches (mini-open or arthroscopic), horns-fixation techniques (soft-tissue, bone-plugs, or bone-bridge), and peripheral suture techniques (inside-out or all-inside). Ipsilateral malalignment, instability, and/or chondral defects should be corrected or repaired if MAT is being performed. MAT survival rates are estimated at 73.5% at 10 years and 60.3% at 15 years. Mean time-to-failure is ~8.2 and ~7.6 years for a medial and lateral meniscus transplant, respectively. Significant improvement in patient-reported outcomes is expected following MAT, and 90% of patients will attest they will undergo the procedure again. Reoperation rates are estimated at 32%, with the most common complication being a tear of the meniscal allograft. Many studies reporting on outcomes of MAT are flawed because of low-quality, the use of non-fresh-frozen preservation techniques, and heterogeneity of patients and concomitant procedures. As our knowledge regarding patient selection, graft preparation, and techniques continue to develop, we expect MAT outcomes to improve much further.

Bibliography


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The authors report the following potential conflicts of interest or sources of funding: B.J.C. reports support in the form of IP royalties, consultant fees, and research support from Arthrex, outside the submitted work; research support from Asaculap, outside the submitted work; other financial or material support from Athletico, outside the submitted work; IP royalties from Elsevier, outside the submitted work; other financial or material support from JRF Ortho, outside the submitted work; research support from NIH, outside the submitted work; publishing royalties and financial or material support from Ossio, outside the submitted work; stock options from Osio, outside the submitted work; consultant fees, research support, and stock or stock options from Regenis, outside the submitted work; other financial or material support from Smith and Nephew, outside the submitted work. Full ICMJE author disclosure forms are available for this article online, as supplementary material.

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© 2020 by the Arthroscopy Association of North America 0749-8063/2019/$36.00 https://doi.org/10.1016/j.arthro.2020.01.025
Meniscal Allograft Transplantation (MAT)

**INDICATIONS**
- Meniscal deficiency
- Ipsilateral pain with or without swelling
- <50 years of age
- Correction of comorbidities
  - Ligament tears
  - Focal cartilage loss
  - Malalignment

**CONTRAINDICATIONS**
- Asymptomatic
- Kellgren-Lawrence grade 3–4 arthritis
- Uncorrected instability or malalignment
- Irreparable chondral lesion
- Inflammatory disease

**LATERAL MENISCUS (LM)**

**MEDIAL MENISCUS (MM)**

**PATIENT SELECTION IS KEY!**

**SURGICAL TECHNIQUES**
- Soft tissue
- Bone plugs
- Bone bridge

**OUTCOMES**
- Transplant survival rates
  - LM: 73.5%
  - MM: 60.3%
- Mean time to failure
  - LM: 7.6 years
  - MM: 8.2 years
- Significant improvement in patient-reported outcomes
- 32% reoperation rate

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