



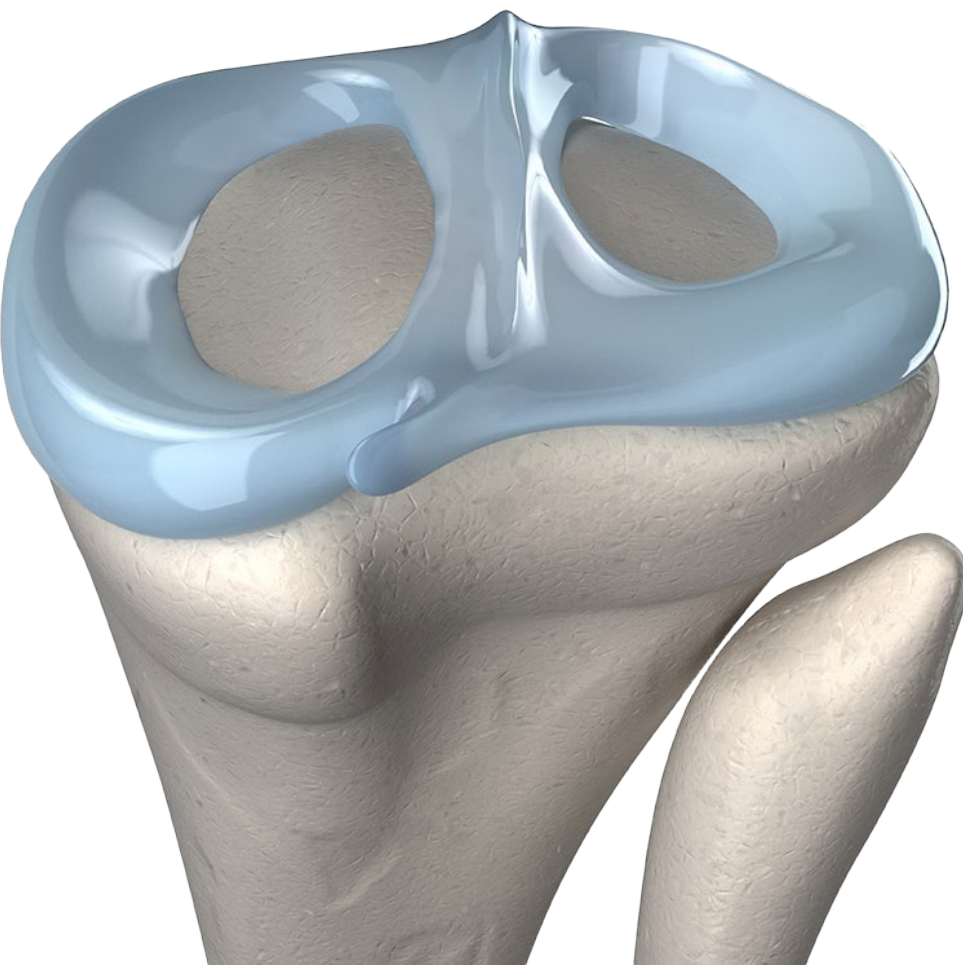
AAOS Conference 2024

Thursday, February 15, 2024

12:30 PM – 2:30 PM Pacific Time

Meniscus Transplantation Study Group Meeting

Sharing the Science and Practice of Meniscus Replacement



Location:

San Francisco Marriott
Marquis Hotel
Room: Pacific C

February 15th, 2024

Virtual Location:

Zoom Meeting ID:
841 2575 7281

Zoom Passcode:
735459

MTSG Mission

The Meniscus Transplantation Study Group (MTSG) was founded in 1986 by a combination of orthopaedic surgeons, veterinary surgeons, and scientists to help promote the science of meniscus cartilage transplantation and to evaluate its transfer from basic science research to clinical practice. The study group meets every year at the American Academy of Orthopaedic Surgeons. Scientists, clinicians, and industry partners are encouraged to share papers, research, and videos at the annual meeting. The 2024 meeting will be held in person and virtually.

Presentations

The presentations at the annual meeting of the Meniscus Transplantation Study Group (MTSG) are a mixture of basic science and clinical evaluations. Topics have ranged from cellular behavior, biomechanics of meniscus cartilage, growth factors, and DNA research, to animal and human studies using allograft meniscus cartilage and meniscus scaffolds.

Hosted By



SRF Mission

Our mission is to pioneer new orthopaedic treatments that accelerate healing, enabling people to stay active through research, development, innovation, and education.



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2024 Meeting Agenda

12:30 Welcome and Introduction

Mani Vessal, PhD

Presentations

12:40 Combined Medial Meniscus Allograft Transplantation and Open-Wedge High Tibial Osteotomy Using a Patient-Specific Instrumentation Guide

Eric Choudja Ouabo, MD

12:50 MENISCUS SCAFFOLDS UPDATE: Indication, longer term results in literature and future directions

Rene Verdonk, MD

1:00 Prospective Assessment of Outcomes after Femoral Condyle Osteochondral Allograft Transplantation with Concurrent Meniscus Allograft Transplantation

Jarod A. Richards, MD

1:10 Save The Meniscus, Save The Cartilage

Mohd Firdaus Bin Abdullah, MS

1:20 Functional Outcomes for Meniscal Allograft Interposition Arthroplasty of the Hand

Meghan McCullough, MD

1:40 Bicompartamental Meniscus Transplantation

Kevin R. Stone, MD

1:50 Meniscus Anatomy and Vascularisation

Robert Smigielski, MD, PhD

2:00 Discussion

Suggested Topics for Discussion

Moderator: Kevin R. Stone, MD

- Biologics for MAT
- Imaging of MAT
- Tissue processing and preparation of MAT
- Preventing MAT extrusion
- Prophylactic MAT
- Return to play after MAT
- MAT + concomitant procedures (cartilage + MAT, ligament + MAT, multiple MATs, osteotomy)

Combined Medial Meniscus Allograft Transplantation and Open-Wedge High Tibial Osteotomy Using a Patient-Specific Instrumentation Guide

Eric Choudja Ouabo², M.D. Sylvain Aubret¹, M.D., Cédric Ngbilo², M.D., Michaela Winkler², M.D., and Brigitte Neyret², O.R.N.,

From the 1) Orthopaedics Department, Hôpital Privé la Châtaigneraie (S.A.), Clermont-Ferrand, France; and 2) Clinique Bois-Cerf, Hirslanden (C.N., M.W., B.N., E.C.O.), Lausanne, Switzerland.

Abstract:

Despite technical advances in meniscus allograft transplantation, there remains a need to improve post-operative outcomes. The bone plugs technique using osseous fixation of the anterior and posterior roots has demonstrated increased stability and long-term survival. Recently, the importance of limb alignment has been demonstrated for this procedure. In case of malalignment, osteotomy is essential to improve the long-term viability of both meniscus allograft and cartilage. The recent introduction of patient-specific instrumentation has raised the possibility of making instrumentation specific to each patient achieving an optimal correction in a safe and reliable manner. This Technical Note describes the use of a combined medial meniscus allograft transplantation and open wedge high tibial osteotomy using a patient-specific instrumentation guide.

MENISCUS SCAFFOLDS UPDATE: Indication , longer term results in literature and future directions

R Verdonk, M Schurhoff, T Kyriakidis, S Griffin, P Verdonk

Abstract:

Meniscal tears are some of the most frequently encountered knee injuries in orthopaedic practice and their surgical management results in one of the highest procedure volumes in orthopaedic surgery. Primary repair has been advocated by international consensus as imperative, however, partial meniscectomy and associated meniscal tissue loss remains a global challenge in patients, who develop symptoms from meniscal insufficiency.

The risk of degenerative consequences remains and meniscus restoration constitutes a treatment goal for long-term knee health.

Meniscal scaffolds have shown promising results with short-, mid-, and long-term benefits reported in a significant body of evidence.

Results are robust and comparable to other meniscus procedures. The use of synthetic or biologic scaffold widens the treatment spectrum within a meniscus-preservation algorithm and provides solutions for symptomatic mid-substance meniscus tissue loss with the goal to prevent or delay the need for future arthroplasty.

Support is needed from Medical societies and Educational programs that play an important role in clinical adoption, institutional acceptance, regulatory approval and reimbursement.

Prospective Assessment of Outcomes after Femoral Condyle Osteochondral Allograft Transplantation with Concurrent Meniscus Allograft Transplantation

Jarod A. Richards MD^{1,2}; James P. Stannard MD²; Kylee Rucinski PhD, MHA²;
Clayton W. Nuelle MD²; James L. Cook DVM, PhD, OTSC²

Abstract

Objective: To characterize outcomes for femoral condyle osteochondral allograft transplantation with concurrent meniscus allograft transplantation (OCAT+MAT) in the ipsilateral compartment of patients after evidence-based shifts in practice.

Methods: With IRB approval and documented informed consent, patients who underwent primary OCAT+MAT between 2016 and 2020 and enrolled in a lifelong registry for prospective collection of outcomes after OCA transplantation were included. Patients who had minimum 2-year follow-up data regarding complications, failures, adherence, and patient-reported outcome measures (PROMs) were analyzed. Patients who required OCAT and/or MAT revision or conversion to arthroplasty were defined as treatment failures.

Results: 23 consecutive patients (mean age = 37.1 years; mean BMI = 28 kg/m²; 14 male) met inclusion criteria with a mean follow-up of 51 months (range, 24-86 months). Initial treatment success rate was 78% based on 5 initial treatment failures and overall success rate was 83% based on a successful revision OCAT. All failures occurred in the medial compartment. Older patient age (42.2 vs. 32.1 years, p=.046) and nonadherence with postoperative restriction and rehabilitation protocols (p=.033; OR=14) were significant risk factors for treatment failure. All measured PROMs achieved significant improvement (p<0.001) and minimum clinically important differences at a minimum of 2 years postoperatively.

Conclusions: Femoral condyle OCAT with concurrent MAT was associated with successful short- to mid-term outcomes in 83% of cases. Evidence-based shifts in practice were implemented prior to the enrollment of this patient cohort. Older patients and those who are not able to be adherent to postoperative restriction and rehabilitation protocols had a significantly higher risk for treatment failure and subsequent conversion to arthroplasty.

	n	Age		BMI		Compartment		Final Follow Up	Nonadherence	
		Years	P-value*	Kg/m ²	p-value*	Medial	Lateral	Months	Percent	p-value*
All	23	37.1 [15-54]		28 [19-35]		18	5	51 [24-86]	35	
Success	18	32.1 [15-54]	.046	27.5 [19-35]	.578	13	5	45 [24-86]	22	.033
Failure	5	42.2 [24-49]		2.8 [24-34]		5	0	31 [24-72]	80	

Table 1: Mean [range] Values for Patients undergoing Femoral Condyle Osteochondral Allograft

Key - *Reported p-values reflect comparisons of initial success versus failure cohorts with bolded p-values

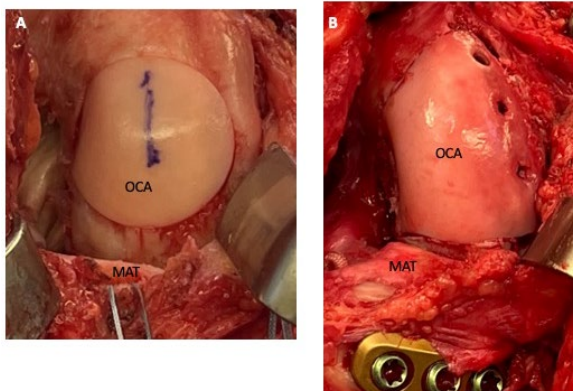


Fig. 1 A,B) Intraoperative images of medial femoral condyle osteochondral and meniscus transplantations indicating statistically significant (p < .05) differences.

“Save The Meniscus, Save The Cartilage”

Mohd Firdaus A¹, Muhd Maliki², Ibrahim AF², Zulkifli H¹

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²Department of Sport Medicine Unit, Hospital Sultan Ismail, Johor Bahru, Malaysia.

INTRODUCTION:

Meniscus is a fibrocartilaginous tissue that serve an important role in stabilizing and also efficient load transfer “shock absorber”. Many studies have demonstrated the importance of preserving the meniscus tissue in comparison with meniscectomies to prevent degeneration of the joint cartilage. Here we presented a case of a lady with significant degenerative changes of the knee joint after years of meniscus procedure with ACL reconstruction surgery.

REPORT:

A 35-year-old lady, had history of left knee ACL reconstruction with medial partial meniscectomy and repair in 2018 due to sport-related injury, presented with left knee pain and recurrent swelling. She was adamant about her knee pain as it disturbing her ADL and aggravated during prolonged weight bearing. She denied any form of instability or mechanical symptoms. Examination findings there was tenderness over the medial compartment with ACL laxity grade 2. MRI reported ACL graft disruption, and both menisci injury with degenerative thinning of medial meniscus. There was also evidence of chondromalacia patellae and multifocal defects and irregularities of the femoral condyle cartilage. She underwent diagnostic arthroscopy with meniscus repair. Intraoperatively, we noted there is diffused chondral lesion especially on the medial femoral condyle (Outerbridge grade II-III) with retained red-red zone of medial meniscus tissue (Figure 1).

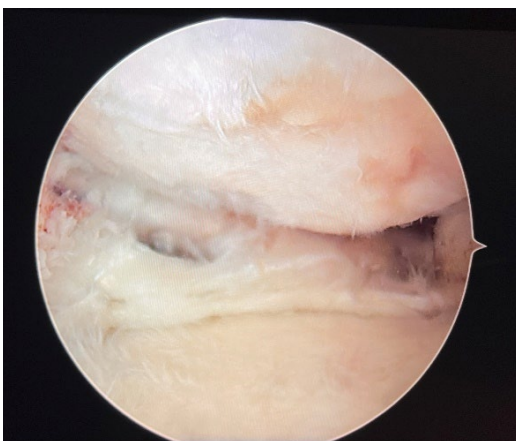


Figure 1: Intraoperative findings of the left knee

Chondroplasty was performed together with posterior horn medial meniscus stabilization (Figure 2). Post operatively, she was put on hinged-knee brace and adhere to post operative meniscus rehabilitation protocol.

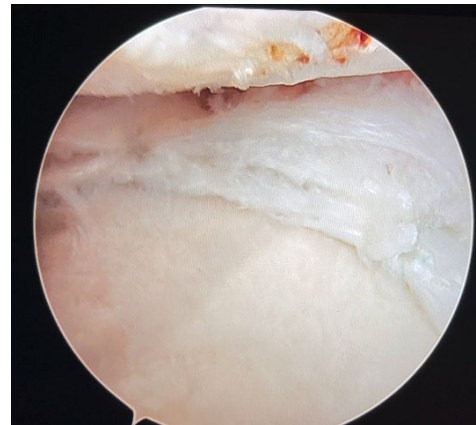


Figure 2: Posterior horn medial meniscus post stabilization

DISCUSSION:

After years following meniscectomy, our patient has showed significant chondral lesion of the knee. This have been proved in the medium to long-term follow up studies in which higher rate of cartilage wear and tear in meniscectomy compared to repair. The amount of remaining meniscal tissue also played a role in development of OA.

CONCLUSION:

Meniscus preservation is utterly important as for chondroprotective function of the knee and also prevention development of osteoarthritis in future.

REFERENCES:

1. Nobutake Ozeki, Tomomasa Nakamura, Yusuke Nakagawa, Ichiro Sekiya, Hideyuki Koga, Meniscus repair and centralization: Preserving meniscus function, Journal of Joint Surgery and Research, Volume 1, Issue 1, 2023, Pages 46-55, ISSN 2949-7051
2. Patil SS, Shekhar A, Tapasvi SR. Meniscal Preservation is Important for the Knee Joint. Indian J Orthop. 2017 Sep-Oct;51(5):576-587. PMID:28966381; PMCID: PMC5609379.

Functional Outcomes for Basilar Joint Arthroplasty with Meniscus Allograft Compared with Trapeziectomy Alone

Meghan McCullough, MD, Raquel Minasian, MD, Kylie Tanabe, PA-C, Sandra Rodriguez RN, David Kulber, MD

Background: Advanced thumb carpometacarpal (CMC) joint arthritis is widely treated with trapeziectomy. To obviate the need for autologous tissue, maintain thumb length, and reduce the risk of scaphoid impingement, the senior author developed an interposition arthroplasty technique using meniscal allograft. We hypothesize that the use of meniscus improves outcomes and subsequent functionality compared with trapeziectomy alone.

Methods: Twenty-three patients with Eaton stage III-IV CMC osteoarthritis underwent arthroplasty with meniscal allograft, and 7 patients underwent trapeziectomy alone. Preoperative Disabilities of the Arm, Shoulder, and Hand (DASH), pain, grip and pinch strength, and range of motion scores were compared with postoperative scores at 6 weeks, 6 months, and 1 year.

Results: The study group consisted of 17 women and 6 men, and the control group consisted of 5 women and 2 men. The mean age was similar at 61.4 (48-72) years and 65.7 (56-78) years for the study and control groups, respectively. The DASH scores dropped by 61.8% in the study group compared with 38.8% in the control group (<0.01), whereas pain decreased 86.0% and 69.8%, respectively ($P < .01$). Strength and range of motion improvement was similar between the groups. Subsidence of the joint space was 1% in the study group compared with 18.4% in the control group. There were no surgical complications in either group.

Conclusions: Joint resurfacing with meniscal allograft represents a viable joint salvage option in severe cases of CMC arthritis. Early results suggest that, compared with trapeziectomy alone, the approach results in greater reduction in subjective pain and disability scores, similar improvement in strength measures and range of motion, and less subsidence.

Functional Outcomes for Meniscal Allograft Interposition Arthroplasty of the Hand

Meghan C. McCullough, MD, MS, Raquel Minasian, MD, Kylie Tanabe, PA-C, Sandra Rodriguez, RN,
and David Kulber, MD

Background: Osteochondral defects of the carpometacarpal (CMC), metacarpophalangeal (MCP), and proximal interphalangeal (PIP) joints often necessitate arthrodesis or arthroplasty. Meniscal allograft has been used for large joint resurfacing, but its application to smaller joints is less well understood. We propose its use for hand joint resurfacing as an off-the-shelf alternative to address osteochondral defects and restore articular function.

Methods: Thirty-one patients with osteoarthritis of the CMC, MCP, or PIP joints underwent arthroplasty with meniscal allograft. Patient demographics and operative information were recorded. Preoperative Disability of the Shoulder, Arm, and Hand, Wong Baker pain, grip and pinch strength, and range of motion were compared to postoperative scores at 6 weeks, 6 months, and 1 year.

Results: Twenty-three women and 8 men, mean age 62.8 years, underwent 39 joint reconstructions, including CMC (n = 26), thumb MP (n = 2), thumb IP (n = 2), digit MP (n = 2), and digit PIP (n = 7). At 1 year, mean Disability of the Shoulder, Arm, and Hand scores decreased from 41.3 to 15.6 ($P < 0.001$) and pain scores from 6.9 to 1.0 ($P < 0.001$). Grip strength increased from 38.1 to 42.9 ($P = 0.017$) and radial and palmar abduction from 43.1 to 49.2 ($P = 0.039$) and 43.7 to 51.6 ($P = 0.098$), respectively. There were no complications related to the meniscus.

Conclusions: Meniscal allograft represents an alternative to arthrodesis which obviates the need for a donor site and avoids many of the complications inherent to synthetic alternatives. Our early results demonstrate its successful use to reduce subjective pain and disability scores, improve objective strength measures, and maintain range of motion.

*Thank you all for attending and presenting at
the 2024 MTSG meeting!*



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