

Meniscus tears: Treatment considerations in the aging athlete

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Disclosures

- None

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Objectives

- Overview anatomy and biomechanics
- Review classification of meniscus tears
- Discuss types of meniscus tears most commonly treated in “the aging athlete”
 - Case based approach
- Discuss treatment options

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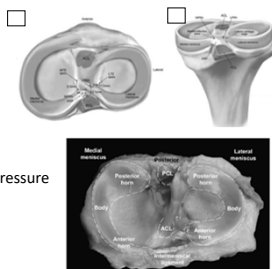
Introduction

- Meniscus tears are one of the most common conditions treated by orthopedic surgeons
- Partial meniscectomy is one of the most common orthopedic surgeries however there has been a shift in treatment strategy
 - Number of partial meniscectomies is decreasing and the number of meniscus repairs is increasing
 - “save the meniscus”
- As we age, meniscus tears are more prevalent making it an important topic when thinking about “older” athletes

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Anatomy and Biomechanics

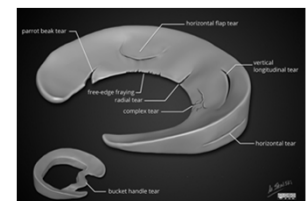
- Type I Cartilage
- Medial meniscus
 - C-shaped
- Lateral meniscus
 - More circular
 - Covers more articular surface
- Decreases contact area and contact pressure
 - Protects cartilage
- Secondary stabilizer



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Classification

- Location
 - Red-red
 - Red-white
 - White-white
- Pattern
 - Acute
 - Several types
 - Degenerative
 - Root tears



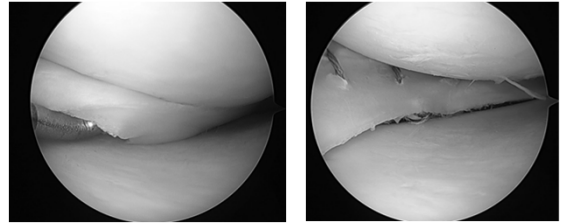
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Case #1

- 42yo M had a twisting injury to the knee while lifting 40lb bags of salt at work
- Felt a pop, had immediate pain and inability to fully extend the knee
- Exam
 - Medial joint line tenderness
 - ROM 15-110
 - Mild effusion

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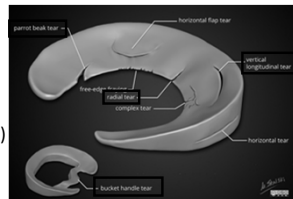
Case #1



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Acute Meniscus Tears

- Acute onset of symptoms caused by a sufficient trauma
- Patterns
 - Vertical
 - Oblique
 - Bucket-handle
 - Radial
 - Root avulsion (can be acute)
 - Complex
 - Ramp



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Acute Meniscus Tears

- History
 - Typically have an injury
 - May feel a pop
- Symptoms
 - Medial or lateral joint line pain
 - Swelling
 - Catching/locking
 - Decreased ROM
- Exam
 - Effusion
 - Joint line tenderness
 - + McMurray

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Acute Meniscus Tears

- Treatment options
- Non-operative
 - Small, stable tears
 - Better for certain types of tears
 - Peripheral, horizontal
- Partial meniscectomy
 - If irreparable
- Repair
 - Shift towards meniscus preservation

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Acute Meniscus Tears

Repair vs. partial meniscectomy

- Outcomes
 - Repair has significantly better long-term clinical outcome scores and decreased OA on radiographs compared to partial meniscectomy^{1,2}
 - At 10 years 78% of repairs showed no OA on radiographs
 - Compared to 64% of partial meniscectomies
 - Repair has higher revision rate than partial meniscectomy
 - 16.5% vs 1.4% up to 4 years after surgery
 - 30.1% vs 4.7% up to 10 years after surgery

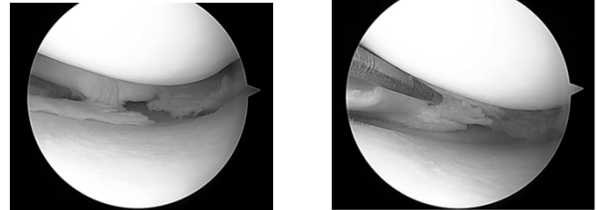
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Case #2

- 47yo M with 3 months of left knee pain
- No injury but had been increasing his activity level recently including jogging
- Symptoms included medial knee pain, intermittent swelling, catching, pain with squatting
- Exam
 - Medial joint line tenderness
 - No effusion
 - ROM 0-140 degrees
 - + McMurray

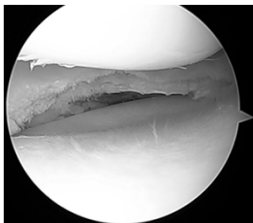
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Case #2



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Case #2



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Degenerative Tears

- History
 - Often no history of acute injury, but slowly progressing symptoms
- Symptoms
 - Medial or lateral joint line pain
 - Pain with weightbearing
 - +/- mechanical symptoms
- Exam
 - Joint line tenderness
 - +/- swelling
 - + McMurray
- Typically complex or horizontal cleavage in nature
- 35% of patients older than 50 have a meniscus tear with approximately 2/3 being symptomatic³
 - Increases to 60% in those with OA

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Degenerative Tears

Treatment options

- Non-operative
 - Activity modification
 - NSAIDs
 - Physical Therapy
 - Injections
- Operative
 - Arthroscopic partial meniscectomy
- Several RCTs have shown no difference between non-operative (physical therapy) or sham surgery and operative treatment (partial meniscectomy) for degenerative meniscus tears
 - Studies had ~30% crossover rate
 - Similar progression in OA on radiographs

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Degenerative Tears

JAMA Network Open.

Effect of Physical Therapy vs Arthroscopic Partial Meniscectomy in People With Degenerative Meniscal Tears

Five-Year Follow-up of the ESCAPE Randomized Clinical Trial

Julia C. A. Nussbaum, MD, Victor A. van der Groot, MD, PhD, Noriko W. Willgering, PhD, Gwendolyn C. M. Scholten-Peters, PhD, Esther J. Krol, MD, Roger A. van Ooij, MD, PhD, Rachelle Buitendijk, MD, PhD, Gillian A. Hawker, MD, PhD, Michael W. Coppeniers, PhD, Rudolf W. Postma, MD, PhD, for the ESCAPE Research Group

Ann Intern Med. 2021;174(10):1487-1497.

DOI: 10.1001/anninternmed.2021.0907

Is arthroscopic surgery beneficial in treating non-traumatic, degenerative medial meniscal tears? A five-year follow-up

Julia C. A. Nussbaum, Victor A. van der Groot, Noriko W. Willgering, Gwendolyn C. M. Scholten-Peters, Esther J. Krol, Roger A. van Ooij, Rachelle Buitendijk, Gillian A. Hawker, Michael W. Coppeniers, Rudolf W. Postma, for the ESCAPE Research Group

THE NEW ENGLAND JOURNAL OF MEDICINE

ORIGINAL ARTICLE

Arthroscopic Partial Meniscectomy versus Sham Surgery for a Degenerative Meniscal Tear

Roger A. van Ooij, MD, PhD, Victor A. van der Groot, MD, PhD, Noriko W. Willgering, PhD, Gwendolyn C. M. Scholten-Peters, PhD, Esther J. Krol, MD, PhD, Rachelle Buitendijk, MD, PhD, Gillian A. Hawker, MD, PhD, Michael W. Coppeniers, PhD, Rudolf W. Postma, MD, PhD, for the French Degenerative Meniscal Lesion Study (FIDELITY) Group

ABSTRACT

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Case #3

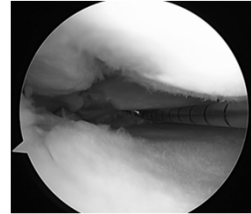
- 54yo M who initially had right knee pain playing pickleball about 6 weeks prior to presentation
- 2 weeks prior to presentation was working in the garage, turned and felt a pop
- Symptoms:
 - Medial and posterior knee pain
 - Swelling
 - A few episodes of locking
 - Pain with flexion and pivoting/twisting
- Exam:

• Tender medial joint line	• Mild effusion
• ROM 5-90	• + McMurray



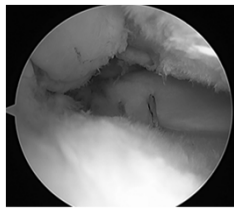
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Case #3



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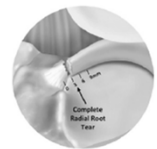
Case #3



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(Posterior) Root Tears

- Definition- avulsion or radial tear within 1cm to root attachment
- Function
 - Anchors meniscus to tibia to maintain proper contact stress, stability and proper joint kinematics
- Roughly 2/3 of root tears are medial and 1/3 lateral
 - Lateral root tears typically seen in ACL tears
- Medial meniscus posterior root tears are commonly degenerative and occur with no or minor trauma (around 70%)
 - Root tears are 10-20% of all medial meniscus tears



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Root Tears

- Why should we care about root tears?
 - Biomechanically equal to a total meniscectomy
 - Leads to increased contact pressures, damages articular cartilage and leads to early osteoarthritis

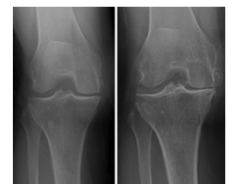


Changes with non-op treatment over 12 months⁴

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Root Tears

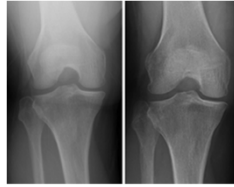
- Symptoms
 - Joint line pain.
 - Mechanical and instability symptoms are often absent
- Exam
 - Joint line tenderness, pain with knee flexion, +McMurray (57%)
- Treatment
 - Non-op
 - Elderly with diffuse OA (Outerbridge 3-4)
 - Up to 28% will undergo a TKA at mean of 3.2 years after diagnosis
 - Partial meniscectomy
 - Those with irreparable tears with persistent mechanical symptoms and pain that failed non-op treatment
 - Symptom relief usually short-term because of OA progression
 - At 5-year follow-up 35% will have TKA⁵



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Root Repair

- **Treatment of choice** with the aim of restoring joint kinematics, contact pressures, and delaying the development of OA
 - Considerations: BMI, activity level, varus malalignment (>5 degrees)
- Out of 37 root repairs, only 14% showed OA progress on radiograph
- Out of 91 root repairs, only 1 underwent TKA after 7 years⁶
- Compared 15 root repairs vs 15 partial meniscectomies vs 15 non operative treatment⁷
 - Treatment failure defined as patient undergoing a TKA
 - After 74 months:
 - 0/15 root repairs had a TKA
 - 9/15 partial meniscectomies
 - 4/15 non operative treatment



94 months after root repair⁶

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Root Repair

- Post-op rehab
- TTWB 6 weeks
 - ROM 0-90 degrees 3 weeks then as tolerated
 - No WB flexion > than 90 degrees for first 3 months
 - RTS 5-6 months

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References

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