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Paper #40

The Risk of Extrusion: Insights on Meniscus Tear Patterns from the Osteoarthritis Initiative

David C. Flanigan, MD, UNITED STATES
Joshua Everhart, MD, MPH, UNITED STATES
Alex C. Dibartola, MD, MPH, UNITED STATES
Robert A. Magnussen, MD, MPH, UNITED STATES
Christopher C. Kaeding, MD, UNITED STATES

Ohio State University
Columbus, OH, UNITED STATES

Summary:
Both medial and lateral tears accelerate joint space loss in middle age adults; meniscal extrusion further accelerates joint space loss and increases risk of progression to TKA within 9 years

Abstract:

Background

Meniscus tears can result in abnormal joint surface loading. Middle age adults are more likely to sustain tear patterns with associated meniscus extrusion, indicating a loss of ability to resist hoop stresses. It is unclear whether untreated meniscal tears or meniscal extrusion recognized on MRI result in accelerated joint space loss or increase the likelihood of knee arthroplasty.

Purpose

To determine the rate of joint space loss and likelihood of knee arthroplasty due to MRI-diagnosed meniscal tears or meniscal extrusion in middle age adults with no to mild knee OA.

Methods

2199 adults (mean 60.2 years SD 8.9) with Kellgren-Lawrence osteoarthritis grades 2 (mild) (48.7%), or 0-1 (none) (51.3%) and OARSI grades 0 (none) or 1 (mild) for joint space narrowing underwent knee MRI's at enrollment and followed serially with weight bearing flexion PA radiographs for 8 years and for TKA for 9 years. The rate of joint space loss and risk of arthroplasty due to meniscal tears and/or meniscal extrusion were determined by multivariate modeling, adjusting for demographics, body mass index, coronal alignment, baseline OA grade and joint space width, MOAKS cartilage score, and baseline WOMAC symptom score.

Results

Medial tears were visualized on MRI in 21.3% of participants and lateral tears in 12.3%. Medial meniscus extrusion was seen in 26.9% and lateral extrusion in 5.4%. Medial tears (beta = 0.46 SE 0.14; p=0.001) regardless of extrusion (p=0.44) were associated with accelerated medial joint space loss. Lateral tears were associated with accelerated lateral joint space loss (beta = 0.86 SE 0.16; p<0.001), as was lateral extrusion (beta 0.97 SE 0.16; <0.001). Risk of arthroplasty was not associated with medial tears (p=0.42), medial extrusion (p=0.10) or lateral tears without extrusion (p=0.59) but significantly increased with lateral extrusion (HR 1.85 CI 1.26, 2.71; p=0.002). The yearly incidence of TKA was 0.48% (95% CI 0.39%, 0.60%) with lateral extrusion <2 mm, 1.53% (CI 0.85%, 2.77%) with

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extrusion 2-2.9 mm, and 3.73% (CI 1.87%, 7.46%) with extrusion 3.0-4.9 mm.

Conclusions

Both medial and lateral tears accelerate joint space loss in middle age adults. Lateral meniscal extrusion further accelerates joint space loss and increases risk of progression to TKA within 9 years.