

Medial Meniscal Extrusion Relates to Cartilage Loss in Specific Femorotibial Subregions- Data from the Osteoarthritis Initiative

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Objective: Medial meniscal extrusion is known to be related to structural progression of knee OA. However, it is unclear whether medial meniscal extrusion is more strongly associated with cartilage loss in certain medial femorotibial subregions than to others.

Methods: Segmentation of the medial tibial and femoral cartilage (baseline; 1-year follow-up) and the medial meniscus (baseline) was performed in 60 participants with frequent knee pain (age 61.3±9.2y, BMI 31.3±3.9 kg/m²) and with unilateral medial radiographic joint space narrowing (JSN) grade 1-3, using double echo steady state MR-images. Medial meniscal extrusion distance and extrusion area (%) between the external meniscal and tibial margin at baseline, and longitudinal medial cartilage loss in eight anatomical subregions were determined.

Results: A significant association (Pearson correlation coefficient) was seen between medial meniscus extrusion area in JSN knees and cartilage loss over one year throughout the entire medial femorotibial compartment. The strongest correlation was with cartilage loss in the external medial tibia ($r=-0.34$ [$p<0.01$] in JSN, and $r=-0.30$ [$p=0.02$] in noJSN knees).

Conclusion: Medial meniscus extrusion was associated with subsequent medial cartilage loss. The external medial tibial cartilage may be particularly vulnerable to thinning once the meniscus extrudes and its surface is “exposed” to direct, non-physiological, cartilage-cartilage contact.