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Titel des Beitrags: Morphometric Differences between the Medial and Lateral Meniscus in Healthy Men -- A Three-Dimensional Analysis Using Magnetic Resonance Imaging

Abstract: The objective of this work was to characterize tibial plateau coverage and morphometric differences of the medial (MM) and lateral meniscus (LM) in a male reference cohort using three-dimensional imaging. Coronal multiplanar reconstructions of a sagittal double-echo steady state with water excitation magnetic resonance sequence (slice thickness: 1.5 mm, and in-plane resolution: 0.37 × 0.70 mm) were analyzed in 47 male participants without symptoms, signs or risk factors of knee osteoarthritis of the reference cohort of the Osteoarthritis Initiative. The medial and lateral tibial (LT) plateau cartilage area and the tibial, femoral and external surfaces of the MM and LM were manually segmented throughout the entire knee. This process was assisted by parallel inspection of a coronal intermediately weighted turbo spin echo sequence. Measures of tibial coverage, meniscus size, and meniscus position were computed three-dimensionally for the total menisci, the body, and the anterior and the posterior horn. The LM was found to cover a significantly greater (p < 0.001) proportion of the LT plateau (59 ± 6.8%) than the MM of the medial plateau (50 ± 5.5%). Whereas the volume of both menisci was similar (2.444 vs. 2.438 ml; p = 0.92), the LM displayed larger tibial and femoral surface areas (p < 0.05) and a smaller maximal (7.2 ± 1.0 vs. 7.7 ± 1.1 mm; p < 0.01) and mean thickness (2.7 ± 0.3 vs. 2.8 ± 0.3 mm; p < 0.001) than the medial one. Also,
the LM displayed less (physiological) extrusion than the medial one. These data may guide strategies for meniscal tissue engineering and transplantation aiming to restore normal joint conditions.

Stichworte: Knee joint; Magnetic resonance imaging; Meniscus; Morphometry

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