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Meniscal Extrusion in Ultrasound as a New Diagnostic Tool for Evaluation of Medial Meniscus Function Drks: 00010963

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Summary:
The subject of meniscal extrusion assessed on MRI scans is well known from the pathologic findings on MRI of meniscal root tears. In these cases meniscus extrusion is associated with a loss of function of the affected meniscus. In the present study we hypothesized that in healthy knees there is also physiological meniscal extrusion as a functional adjustment on various load bearing condition.

Abstract:
Purpose: Meniscal extrusion in MRI is normally described as pathologic finding and associated with a loss of function of the affected meniscus. We hypothesize that in healthy knees there is also physiological meniscal extrusion as a functional adjustment on various load bearing condition. Therefore meniscal extrusion is described as the difference in extrusion between standing and lying position in ultrasound as a new diagnostic tool to evaluate the function of a meniscus.
Methods: We analysed voluntary test persons with non-symptomatic knee and without any operation to the knee in the past and age >18 years. Knee malalignment and ligament instability were excluded by clinical examination. All test persons underwent standardized ultrasound examination of the meniscus in a lying position and in 20° of Flexion under weight bearing in a standing position. Afterwards measurements of lying ultrasound were compared with the current gold standard (MRI), to assess the extrusion of the meniscus. Patients were subsequent excluded if the MRI shows osteoarthritis or meniscus lesions.
Results: At this time point, 15 patients meet the inclusion criteria with medium age of 37 years (range, 30-47). The average medial meniscus extrusion in ultrasound for the lying position was 0.26 mm (range, 0.13-0.35) and for the weight bearing position 0.36 mm (range 0.23 – 0.5). The determined meniscus extrusion of the medial meniscus in 15 healthy knees was 0.1 mm in the dynamic ultrasound examination.
Conclusion: Based on our results we conclude, that there is a physiological functional medial meniscal extrusion in healthy knees as an adjustment reaction on various loadbearing conditions. In contrast to MRI scans, ultrasound examination allows a dynamic examination of the meniscus with various load bearing conditions. Therefore ultrasound examination of the meniscus represents a useful tool to proof the function of a meniscus.
Key-Words: Meniscal extrusion – ultrasound – MRI- weight bearing- healthy knee