Ligaments and plicae of the elbow: normal MR imaging variability in 60 asymptomatic subjects

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PURPOSE
To prospectively evaluate the normal variability of ligaments, plicae, and the posterior capitellum on conventional magnetic resonance (MR) images of the elbow in asymptomatic volunteers.

MATERIALS AND METHODS
The study was approved by the institutional ethics board, and informed consent was obtained from all subjects. MR imaging was performed at 1.5 T in 60 asymptomatic volunteers (30 women, 30 men; age range, 22-51 years; median age, 32.8 years) by using the following five pulse sequences: transverse T1-weighted spin-echo, sagittal T2-weighted fast spin-echo, coronal fast spin-echo short-inversion-time inversion recovery, transverse intermediate-weighted with fat saturation, and coronal three-dimensional water-excitation true fast imaging with steady-state precession. The visibility (completely visible over the entire course, partially visible, or not visible) and signal intensity characteristics (hypointense or hyperintense to muscle, homogeneous signal intensity vs striation) of the elbow ligaments and plicae were evaluated by three independent readers. The presence of pseudodefects at the posterior capitellum was determined. The dimensions of all structures were measured by two independent readers.

RESULTS
The anterior ulnar collateral ligament (UCL) and radial collateral ligament (RCL) were visible over their entire course in all 60 subjects (100%). The posterior UCL, lateral UCL, and annular ligament (AL) were completely visible in 58 (97%), 51 (85%), and 59 (98%) of the 60 subjects, respectively, and partially visible in the remaining subjects. Increased signal intensity with fluid-sensitive sequences was found in the anterior UCL in nine of the 60 subjects (15%), posterior UCL in four subjects (7%), RCL in one subject (2%), lateral UCL in six subjects (10%), and AL in one subject (2%). The median thickness and 90th percentile were 2.5 and 3.5 mm, respectively, for the anterior UCL, 1.0 and 1.7 mm for the posterior UCL, 1.9 and 2.8 mm for the RCL, 2.3 and 3.8 mm for the lateral UCL, and 1.0 and 1.3 mm for the AL. A posterolateral plica (median dimension, $4.3 \times 1.9 \times 3.9$ mm) was found in 59 of the 60 subjects (98%),
whereas a posterior plica (median dimension, 1.8 × 1.4 mm) could be detected in only 20 (33%). A pseudodefect of the capitellum was noted in 51 of the 60 subjects (85%).

CONCLUSION
The elbow ligaments and the posterolateral plica are consistently visible on conventional MR images of asymptomatic subjects. Most normal ligaments are thinner than 4 mm, and most plicae are thinner than 3 mm.