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Titel des Beitrags: Diagnostic architectural and dynamic features at breast MR imaging: multicenter study.

Abstract: PURPOSE: To prospectively determine the prevalence and predictive value of three-dimensional (3D) and dynamic breast magnetic resonance (MR) imaging and contrast material kinetic features alone and as part of predictive diagnostic models.

MATERIALS AND METHODS: The study protocol was approved by the institutional review board or ethics committees of all participating institutions, and informed consent was obtained from all participants. Although study data collection was performed before HIPAA went into effect, standards that would be compliant with HIPAA were adhered to. Data from the International Breast MR Consortium trial 6883 were used in the analysis. Women underwent 3D (minimum spatial resolution, 0.7 x 1.4 x 3 mm; minimal temporal resolution, 4 minutes) and dynamic two-dimensional (temporal resolution, 15 seconds) MR imaging examinations. Readers rated enhancement shape, enhancement distribution, border architecture, enhancement intensity, presence of rim enhancement or internal septations, and the shape of the contrast material kinetic curve. Regression was performed for each feature individually and after adjustment for associated mammographic findings. Multivariate
models were also constructed from multiple architectural and dynamic features. Areas under the receiver operating characteristic curve (Az values) were estimated for all models. RESULTS: There were 995 lesions in 854 women (mean age, 53 years +/- 12 [standard deviation]; range, 18-80 years) for whom pathology data were available. The absence of enhancement was associated with an 88% negative predictive value for cancer. Qualitative characterization of the dynamic enhancement pattern was associated with an Az value of 0.66 across all lesion architectures. Focal mass margins (Az = 0.76) and signal intensity (Az = 0.70) were highly predictive imaging features. Multivariate models were constructed with an Az value of 0.880. CONCLUSION: Architectural and dynamic features are important in breast MR imaging interpretation. Multivariate models involving feature assessment have a diagnostic accuracy superior to that of qualitative characterization of the dynamic enhancement pattern.