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The apparent diffusion coefficient (ADC) of the uterine leiomyoma for the prediction of the potential response to uterine artery embolization (UAE)

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PURPOSE: To determine the utility of the apparent diffusion coefficient (ADC) for the prediction of the potential response to uterine artery embolization (UAE).
MATERIALS AND METHODS: Our study included 50 patients who underwent diffusion weighted (DW) MRI before UAE between May 2011 and January 2012. All patients underwent 3 months follow-up MRI after UAE. 73 leiomyomas which were the same as or greater than 3 cm were prospectively evaluated with conventional and diffusion weighted (DW) MR imaging sequences. The volume of the uterine leiomyoma was calculated, and quantitative measurement of the ADC was performed for each leiomyoma. Regression analysis was used to evaluate the relationship between the ADC and volumetric response after UAE. Receiver operating characteristic (ROC) curve analysis was performed to determine the sensitivity and specificity of ADC for the prediction of potential response to UAE.
RESULTS: Volume reduction rates of leiomyomas after UAE ranged from 0.2 to 89.1% (mean 44.1%). The ADC ranged from 0.559 to 1.814 $\times$ 10^{-3} mm^2/s (mean 1.170 $\times$ 10^{-3} mm^2/s). The ADC was statistically significantly related to volumetric response of leiomyomas ($p = 0.014$). Using a threshold of 1.092 $\times$ 10^{-3} mm^2/s, the sensitivity and specificity of the ADC for the prediction of > 50% volume reduction of the leiomyoma after UAE were 82.6% and 52.3%, respectively. Using a threshold of 1.023 $\times$ 10^{-3} mm^2/s, the sensitivity and specificity of the ADC for the prediction of < 30% volume reduction of the leiomyoma were 80.8% and 33.3%, respectively.
CONCLUSION: The ADC of uterine leiomyomas was significantly related to the percent change in leiomyoma volume after UAE. The ADC may be useful to predict the potential response to UAE.