Preoperative Apparent Diffusion Coefficient Value of Gastric Cancer by Diffusion-Weighted Imaging: Correlations with Postoperative TNM Staging

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Purpose

The purpose of this study was to evaluate whether postoperative TNM staging of gastric cancer does show correlations with apparent diffusion coefficient (ADC) value of the lesion on preoperative diffusion weighted imaging (DWI).

Methods

Seventy patients with 70 gastric cancer lesions underwent preoperative magnetic resonance imaging (MRI) (3.0T) and then surgical resection. DWI was obtained with a single-shot, echo-planar imaging sequence in the axial plane (b values: 0 and 1,000 sec/mm^2). Mean and min ADC values of each gastric cancer were obtained by two radiologists, who were blind to the histological findings. Postoperative TNM staging of each patient was determined by one pathologist. Mean and min ADC values of gastric cancers with different TNM staging were compared. Correlations between ADC values and TNM staging were analyzed by using Spearman correlation test. Correlations between ADC values and the lesions' area and depth were analyzed by using Pearson correlation test.

Results

Both mean and min ADC values of gastric cancers correlated with postoperative T staging (r = - 0.464, - 0.476, both p < 0.001), N staging (r = - 0.402, - 0.397, p = 0.001, 0.002) and TNM staging (r = - 0.446, - 0.437, both p < 0.001). Both mean and min ADC values of gastric cancers correlated with the area (r = - 0.417, - 0.427, both p = 0.001) and depth (r = - 0.443, - 0.438, both p = 0.001) of the lesions. The areas under the receiver operating characteristic (ROC) curves (AUC) for differentiating lymph node metastasis were 0.788 and 0.778 for mean and min ADC values (both p = 0.001).

Conclusion

The preoperative ADC values of gastric cancers can provide valuable information to predict postoperative TNM staging, especially T and N staging of the patients.

References

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