SS 05 NR-01 09:40 English

Acute stroke patients: direct thrombus visualization at three-dimensional proton density-weighted MR imaging

Jae Sung Yun, Hyo Sung Kwak, Gyoung Ho Chung, Seung Bae Hwang
Chonbuk National University Hospital, Korea.
kwak8140@jbnu.ac.kr

PURPOSE: To evaluate the accuracy of three-dimensional (3D) proton density (PD)-weighted magnetic resonance (MR) sequences in detection of intra-arterial thrombus in patients with acute symptomatic stroke.
MATERIALS AND METHODS: Twenty patients with stroke involving the anterior circulation territory underwent MR imaging within 6 hours after initial clinical onset. MR examination include echo-planer T2*-weighted, 3D PD-weighted with flow suppression, diffusion-weighted (DW), perfusion-weighted (PW), and time-of-flight (TOF) MR angiography. MR angiography and/or cerebral angiography were used as the reference standard to establish the diagnosis on occlusion of intracranial artery. Two neuroradiologists were requested to interpret in a blind study eachecho-planar T2*-weighted MR imaging and 3D PD-weighted MR imaging. The diagnostic accuracy of both sequences was evaluated using the receiver operating characteristic (ROC) analysis. Both sequences were also analyzed for image quality.
RESULTS: A totalof 19 thrombus in 20 patients were includedin this study. The mean area under curve value (Az) of the 3D PD-weighted MR imaging (mean, Az = 0.954) was significantly higher than the echo-planer T2*-weighted MR imaging (mean, Az = 0.671) ($p < 0.0001$). The mean sensitivity of the 3D PD-weighted MR imaging was significantly higher than the echo-planer T2*-weighted MR imaging (mean, 92.11 versus 36.85, $p < 0.0001$). The image quality score of the 3D PD-weighted MR imaging was significantly higher than that the echo-planer T2*-weighted MR imaging (mean, 2.90 ± 0.30 versus 2.18 ± 0.38, $p < 0.0001$).
CONCLUSION: Direct visualization of thrombus using 3D PD-weighted MR imaging with flow suppression provides accurate detection of thrombus in patients with suspected acute stroke.
CLINICAL APPLICATION: The information regarding the detection ofintra-arterial thrombus using 3D PD-weighted MR imaging may be useful in planning various treatment options and may help in assessing the extent of infarct and prognosis.