SS 09 AB-04 16:30 🔊English

Comparison of MR elastography & US elastography in assessment of hepatic fibrosis

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PURPOSE: This study was to compare liver stiffness value in patients who underwent liver fibrosis using mr elastography and us elastography, and to evaluate diagnostic performance between two examinations.

MATERIALS AND METHODS: From 2011 August to 2011 December, 39 patients underwent MR elastography (MRE), US elastography (USE) and they underwent liver operation (n = 37) or percutaneous biopsy (n = 2). 20 patients were donors for liver grafts and normal parenchyma were revealed at intraoperative biopsy. 17 patients were recipients who underwent total hepatectomy and two underwent biopsy for liver function test abnormality. Hepatic fibrosis was graded by using Metavir score (F0-1 (n = 21), F2 (n = 0), F3 (n = 4) and F4 (n = 14)). In a patient, USE was performed 6 times and mean liver stiffness was obtained. Mean liver stiffness value at MRE was an averaged value on 4 consecutive MRE images. For assessment of concordance between USE and MRE, regression model was used and Pearson correlation coefficient was obtained. As for diagnostic performance of each exam, ROC analysis was performed between groups (F0–1 vs. F2–4, F0–3 vs. F4).

RESULTS: At MRE, mean liver stiffness value in F0-1, F3, F4 were 1.76, 4.16 and 5.99, respectively. At USE, mean liver stiffness values were 4.74 in F0-1, 13.0 in F3 and 44.9 in F4; after log transformation, 4.5, 12.2 and 28.7, respectively. Pearson coefficient was 0.69 between two modalities, which showed moderate correlation. According to regression equation, R2 was 0.61 (p < 0.001). Correlation coefficients between MRE or USE and Metavir score were 0.83 and 0.81 (after log transformation). As for differentiation of normal or early fibrosis (F0–1) and late fibrosis (F2–4), mean liver stiffness value at MRE showed 100% sensitivity and 95.2% specificity (Az > 2.17) and mean liver stiffness value at USE also showed 100% sensitivity and 95.2% specificity (Az > 6.84). Regarding to F0-3 vs F4 differentiation, MRE showed 100% sensitivity and 80% specificity (Az > 2.2) and USE showed 92.9% sensitivity and 92% specificity (Az > 10.16).

CONCLUSION: MRE and USE were concordant in assessment of hepatic fibrosis. Mean liver stiffness values at MRE and USE showed good correlation with Metavir score.