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## Quantitative Texture Analysis of Cirrhotic Liver in Abdominal SPIO-3D MR Imaging

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**Purpose:** Cirrhosis of liver may cause structural distortion of entire liver by fibrosis and parenchymal nodules. These image findings in MR images can be interpreted by texture analysis. However, such procedure is often subjective in clinical practice. This work is to quantify the analysis and provide decision aid in diagnosis of Cirrhosis. **METHOD AND MATERIALS :** Sixty two magnetic resonance (MR) images (two images per subject) from 31 people (age 18–75 years, mean 41 years) were studied. From the abdominal MR portal venous images, 12 cases without liver disease and 50 cases with Cirrhosis are selected in our study. Two abdominal liver imaging radiologists participated in an observer performance study and were asked to grade, on a scale of 5, internal texture (0: normal, 4: hyperintense reticulations), The liver rectangular region of interest (ROIs) of 32\*32 pixels is firstly manually segmented by our program. Secondly, forty factor are quantified by using gray-level difference method (GLDM) within the small ROIs selected in the liver region as the texture features, which are mean gray value, standard deviation, contrast, angular second moment, entropy, mean, inverse difference, fractal dimension, autocorrelation respectively. Correlations between the radiologists and the computerized scheme for assessing parameters in corresponding categories were computed. **RESULTS :** Good agreement was seen in GLCM Inertial difference moment (IDM) ( $r=0.638$ ,  $p<0.001$ ), GLCM Contrast ( $r=0.632$ ,  $p<0.001$ ), GLCM entropy ( $r=0.596$ ,  $p<0.001$ ), GLCM angular second moment (ASM) ( $r=0.593$ ,  $p<0.001$ ), but fractal dimension and autocorrelation feature were respectably. In testing of the square liver region, According to the ROC analysis, Az value is improved from 0.92 by integrating the GLCM features into ANN inputs. **CONCLUSION:** The radiologists and the computerized scheme correlated best in analysis of GLCM IDM and GLCM contrast of Cirrhosis on MR imaging). A computerized scheme may hold promise in facilitating classify of cirrhosis liver at MR.

**Keywords :** Liver, Cirrhosis, Magnetic Resonance Imaging