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MR spectroscopy in the differentiation of benign, borderline and malignant cystic epithelial ovarian tumors

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Purpose: To prospectively investigate the ability of proton magnetic resonance spectroscopy (^{1}H-MRS) in the differentiation of benign, borderline and malignant cystic epithelial ovarian tumors (EOT).

Eighty-six patients with 93 surgically and histologically proven cystic EOT (33 benign, 29 borderline and 31 malignant) underwent conventional MR imaging and 1H-MRS. Multi-voxel 2D-chemical shift imaging (CSI) was performed using the point resolved spectroscopy. Resonance peak integrals of choline (Cho), N-acetyl aspartate (NAA), creatine (Cr), lactate (Lac), and lipid (Lip) were analyzed and the Cho/Cr, NAA/Cr, Lac/Cr and Lip/Cr ratios were compared among three groups using one-way analysis of variance. Receiver operating characteristic (ROC) curves were used to evaluate the diagnostic performance of 1H-MRS in the differentiation of benign, borderline and malignant EOT. The mean Cho/Cr ratios of benign, borderline and malignant tumors were 1.39±0.9, 3.31±1.6 and 5.51±2.3, respectively. There were statistically significant differences between any two groups (P 0.05). The mean NAA/Cr ratios of benign, borderline and malignant tumors were 2.54±2.2, 9.43±5.2 and 2.85±1.7, respectively. Statistically significant differences were found between borderline and benign groups (P 0.05), between borderline and malignant groups (P 0.05). However, there was no statistically significant difference between benign and malignant groups (P 0.05). Area under the curves (AUC) of the Cho/Cr and NAA/Cr ratios were 0.900 and 0.903 for differentiating benign from borderline tumors; 0.816 and 0.888 for differentiating borderline from malignant tumors, respectively.

Conclusion: The ^{1}H-MRS patterns of benign, borderline and malignant cystic EOT are different. The Cho/Cr ratio increases with the higher malignancy and a high Cho peak indicates a malignant tumor. A significantly elevated NAA peak indicates a borderline tumor.

Biography

Feng Hua Ma has completed her MD from Tongji University of Shanghai and Postdoctoral studies from Fudan University. Now, she is an attending physician in the department of Radiology of Obstetrics & Gynecology Hospital, Shanghai Medical College, Fudan University. She has published more than 3 papers in reputed journals of radiology.

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