Poster ME-4

Specimen 1H magnetic resonance spectroscopy of malignant liver tumors using 3.0-T MR scanner

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Purpose: To investigate spectrum of 1H magnetic resonance spectroscopy of ex vivo specimen of liver tumors at 3.0T MRI.

Materials and methods: From June 2005 to May 2006, patients were prospectively selected from those undergoing liver resection for hepatic malignancy. Preoperative liver CT was obtained in all patients. Thirty tumors larger than 1cm and seven normal volunteer were included in the study. Immediately after resection, the specimen were brought in for MRI and a single voxel MRS was obtained using a 3.0T MR whole body system (GE Medical Systems) within 30 minute. MRS data were processed by a home-made MR software package. Choline-to-lipid (cho/lipid) ratio, peak intensity for lipid and choline between the different groups were compared. After the MRI scanning, specimen was sent for pathologic review. Histopathologic diagnosis was made in all specimen.

Results: Technical success rate for MRS was 83.3% (25/30) 71.4% (5/7) for normal volunteer. Choline compound peak was observed at 3.12-3.31 ppm and lipid compounds peak at 1.18-1.37 ppm. Final histopathologic diagnosis for specimen were HCC (n=16), CCC (n=5), liver cirrhosis (n=2), combined HCC and CCC (n=1), adrenal metastasis from HCC (n=1). The mean choline/lipid ratio of HCC, HCC after transcatheter embolization, cholangiocarcinoma and normal was 0.096, 0.062, 0.162 and 0.048 respetively. The difference between the 4 groups were statistically significant (p=0.026).

Conclusion: In this preliminary study ex vivo 1H MRS at 3-T revealed to be useful in diagnosis and possibly monitoring therapeutic effectiveness of HCC even in small tumors. With further development of MRS technology, in vivo MRS at 3-T can aid in diagnosis and treatment responce in small liver tumors.