In vivo Proton Magnetic Resonance Spectroscopy in Focal Hepatic Lesions

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Purpose: To establish the proton MRS features of focal lesions of liver.

Materials and Methods: *In vivo* proton MR spectra of 17 focal hepatic lesions were reviewed. Included were 5 hepatocellular carcinomas(HCCs), 5 metastatic tumors, 1 lymphoma, 2 cholangiocarcinomas, 2 hemangiomas, and 2 abscesses. All lesions were confirmed by surgery. Proton MRS was performed at 1.5T unit using localized proton STEAM sequence. No intensional respiratory control was requested during spectroscopic signal acquisition. Parameters used were: TR > 3000 ms, TE = 30 ms, numbers of scan = 128, voxel size = 8 (2x2x2) cm3, and one NEX. We analyzed proton MR spectra with attention to the presence and location of dominant peaks. The peak area ratios of lipid(peak at 1.3ppm)/water(peak at 4.7ppm) were also calculated in each disease group.

Results: Fourteen of 17 cases showed one(n=12) or two(n=2) dominant peaks in their proton MR spectra. Dominant peak at 1.2-1.6 ppm was most commonly observed(n=14) and seen in cases of HCC(5/5), metastatic tumor(5/5), lymphoma(1/1), cholangiocarcinoma(1/2), hemangioma(1/2), and hepatic abscess(1/2). Dominant peaks at 2.0-2.4 ppm(n=1) and 3.0-3.4 ppm(n=1) were observed in cases of HCC. The remaining 3 cases showed no significant peak, and included cholangiocarcinoma(1/2), hemangioma(1/2), and abscess(1/2). The peak area ratios of lipid/water were obtaind in 10 subjects and the values were: HCC(n=2), 0.0064 and 0.0087; metastatic tumor(n=4), 0.0153, 0.0098, 0.0144, and 0.0132; cholangiocarcinoma(n=2), 0.0115 and 0.0057; hemangioma(n=1), 0.0119; abscess(n=1), 0.81%.

Conclusion: Almost all solid lesions(14/17, 82%) showed dominant peaks at 1.2-1.6 ppm and it may represents abundant lipid contents of lesion. No significant peak pattern was seen in cases of abscess, hemangioma and cholangiocarcinoma, and it probably due to hemorrhage or necrosis within the lesions.