

Differentiation between Chronic Focal Pancreatitis and Pancreatic Cancer of by Proton MR Spectroscopy: Correlation with Pathologic Results

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Purpose: To know the differences of proton MR spectroscopic features between chronic focal pancreatitis and pancreatic cancer, and to evaluate the possibility to discriminate chronic focal pancreatitis from pancreatic cancer by analysis of the proton MR spectra.

Methods and Materials: We evaluated the proton MR spectra from 30 human pancreases. Our series included chronic focal pancreatitis and pancreatic cancer with 15 cases in each group. Nineteen men and 11 women were included in our series. All cases of chronic focal pancreatitis and pancreatic cancer were confirmed by histopathology after surgical resection. Proton MR spectroscopy (^1H -MRS) was performed at 1.5T GE Signa Horizon (GE Medical System, Milwaukee, USA) system using localized proton STEAM sequence and body coil in all cases with subjects were located in supine position. No respiratory interruption was required during the spectroscopic signal acquisition. Parameters using in MRS were: TR = over 3000 ms, TE = 30 ms, number of scans = 128, voxel size = 8 (2x2x2) cm³, and one NEX. We evaluated the spectra with an attention to the differences of pattern of the curves between chronic focal pancreatitis and pancreatic cancer. The ratio of peak area of all peaks at 1.6-4.1ppm to lipid (0.9-1.6ppm) [$P(1.6-4.1\text{ppm})/P(0.9-1.6\text{ppm})$] was calculated in chronic focal pancreatitis and pancreatic cancer group, and compared the results between these groups. We also evaluated the sensitivity and specificity for discriminating chronic focal pancreatitis from pancreatic cancer by analysis of ^1H -MRS.

Results: Proton MR spectra of chronic focal pancreatitis showed significantly diminished amount of lipids as compared with that of pancreatic cancer. The ratio of $P(1.6-4.1\text{ppm})/P(0.9-1.6\text{ppm})$ in chronic focal pancreatitis was much higher than that of pancreatic cancer with a statistical significance ($p < 0.05$) due to decreased peak area of lipids. Mean standard deviation of $P(1.6-4.1\text{ppm})/P(0.9-1.6\text{ppm})$ in chronic focal pancreatitis and pancreatic cancer

group were 2.78 1.67 and 0.35 0.02, respectively. With a cut-off value of 0.6 for discriminating chronic focal pancreatitis from pancreatic cancer, both the sensitivity and specificity were 100% (15/15).

Conclusion: Chronic focal pancreatitis and pancreatic cancer can be distinguished from each other by analysis of proton MR spectroscopic features, and ¹H-MRS can be a new method for differential diagnosis between chronic focal pancreatitis and pancreatic cancer.