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Echo Planar Imaging in the Abdomen: Comparison with Breath-Hold T2-weighted Fast Spin-Echo Sequence

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Purpose: To compare 8-shot echo planar imaging (EPI) with breath-hold T2-weighted fast spin-echo (FSE) imaging for abdominal MR imaging.

Materials and Methods: Eight-shot EPI sequence (18 sec) of the abdomen was evaluated at 1.5 T in seventeen volunteers. Results were compared with breath-hold T2-weighted FSE images (20 sec). The phased-array torso coil and fat-suppression technique were used in each sequence. Images were quantitatively analyzed for signal-to-noise ratio (SNR) of liver, spleen, pancreas and kidney, and for signal-difference-to-noise ratios (SD/Ns) of spleen-to-liver, and qualitatively analyzed for defining abdominal structures and overall image quality.

Results: Eight-shot T2-weighted EPI increased SNR in the liver (4.65 ± 1.75 vs 3.12 ± 1.15, $p<0.01$), spleen (8.86 ± 3.12 vs 6.91 ± 1.98, $p<0.05$), and pancreas (5.39 ± 1.95 vs 3.36 ± 1.19, $p<0.005$) significantly compared to breath-hold T2-weighted FSE imaging, but showed similar SNR in the kidney (8.14 ± 3.00 vs 7.31 ± 2.43, $p=0.3965$), and revealed similar SD/Ns of spleen-to-liver (4.21 ± 1.97 vs 3.79 ± 1.07, $p=0.4619$). Eight-shot EPI was excellent in defining of abdominal structures, and had no obvious respiratory artifact, but had variable susceptibility artifact arising from bowel gas.

Conclusions: Eight-shot T2-weighted EPI of the abdomen can provide diagnostically high resolution images compared with breath-hold T2-weighted FSE imaging, and this technique may be useful in clinical application of abdominal MR imaging.