Comarison of respiratory triggered and breath hold MRCP using 3D FR FSE with an 8 channel phased array coil in combined use of ASSET

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Introduction: Magnetic resonance cholangiopancreatography (MRCP) has been one of the standard techniques for the evaluation of the pancreatobiliary system noninvasively. MRCP using 3D FSE technique can provide high SNR. 3D fast recovery (FR)-FSE sequence with array spatial sensitivity encoding technique (ASSET) may be clinically acceptable regarding imaging time shorter than 3-4 minutes with 3mm thick slices. However, when the breath held technique is used or thinner slices of the images such as 1mm or thinner are used, SNR is not enough to reconstruct MRCP. One of the methods to overcome this problem may be the use of 8 channel phased array coil. The purpose of the study was of the comparison of the abilities of MRCP using ASSET 3D FR-FSE sequence with either repiratory triggered or breath hold technique for visualization of the bile duct and pancreatic ducts.

Materials and Methods: 41 patients underwent both MRCP and ERCP or PTC for the evaluations of pancreatobiliary abnormalities were included in the current study. **MR Imaging** All MR imaging was performed with a 1.5-T system (Excite; GE Medical Systems) using an 8 channel phased array multicoil. 3D FR-FSE sequence was used for MRCP in combined use of ASSET. Resp-triggered 3D FR-FSE sequence: Images for MRCP were acquired in a coronal plane with the following imaging parameters; 3300 - 7800/475 [TR/effective TE]; flip angle, 90°; echo train length, 123; field of view, 30 x 30 cm; matrix, 256 x 224 (with ZIP 512); bandwidth, 31.5 kHz; section thickness, 3 mm; 40-60 sections with ZIP2 resulting in an 60-90-mm-thick volume; chemically selective fat saturation and image time was 1.5-4 minutes. Breath-held 3D FR-FSE sequence: images were obtained with the following imaging parameters identical to those of resp triggered MRCP except TR of 15000ms, TE of 380ms. 24 sections with ZIP2 resulting in a 36mmthick volume. Imaging time was 24 sec. **Imaging process** All source images were transferred to a workstation. Post processing of the source images obtained with MRCP was made by using multiplanar volume reformation (MPVR) with MIP. **Evaluation** Source and MIP images with MPVR were obtained for each sequence. The image quality regarding blurring effects was evaluated. The delineation of the pancreatobiliary ducts was also evaluated regarding the following points: the first-, second-, and third order intrahepatic bile ducts; the extrahepatic bile duct, the gallbladder and cystic duct. **Results;** 1) Image quality: All images with two MRCP sequences were diagnostic. However, regarding image quality and visualization of the pancreatobiliary system, quality of resp triggered MRCP was worse than that of breath hold MRCP in 8 subjection due to unstable respiration. On the other hand, quality of breath hold MRCP was not acceptable due to low SNR in 4 patients. **Summary** Resp triggered and breath hold 3D MRCP using 3D FR-FSE with ASSET were compared. Breath hold MRCP provide less SNR even with 8 channel phased array coil. Resp-triggered 3D MRCP using FR-FSE with ASSET can be routinely used in daily clinical settings and image quality of resp triggered MRCP, as an alternate, breath hold 3D MRCP can be used.