Steady-state coherent imaging as a pitfall-shooter for MR-cholangiography

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INTRODUCTION

Various diagnostic pitfalls in MRCP, such as pseudostenosis of extrahepatic bile duct caused by hepatic arteries and pseudodefect caused by bile flow, have been reported to simulate various pathology of the extrahepatic biliary system. In some cases, it may be difficult to differentiate polypoid tumor from a gallstone. Steady-state coherent imaging shows both flowing and static fluid showed high signal intensities, which can allow to accurately diagnose such pitfalls as pseudostenosis and pseudodefect and to remedy difficulties in differentiating between gallstone and polypoid tumor.

PURPOSE

To investigate the feasibility of steady-state coherent imaging as a remedy of diagnostic pitfalls on MR cholangiography.

MAERIALS and METHODS

Twenty-three patients with diagnostic pitfalls on MR cholangiography (8 with gallstone, 4 with gallbladder polyp, 6 with cancer of bile duct or ampulla, 2 with choledochal cyst, 4 with pseudostenosis of extrahepatic bile duct) underwent steady state coherent imaging with fat suppression technique. Source images of steady-state coherent imaging were obtained in the coronal plane with respiratory triggering triggering in about 2 minutes. The phase cycling on performing two signal acquisition was used to suppress fat signal. Multiple 20mm-thick reconstructed sections with 15mm overlap were reconstructed with partial maximum-intensity-projection technique and observed with paging view on a workstation. Images were evaluated to diagnose diagnostic pitfalls such as pseudostenosis or pseudodefect and to differentiate polypoid tumor from a gallstone.

RESULTS

1. In all the four patients with pseudostenosis of extrahepatic duct due to vascular compression, steady-state coherent imaging revealed causative vessels compressing extrahepatic duct.
2. In none of the two patients with pseudodefects by bile flow artifacts, steady-state coherent imaging showed any defect in the gallbladder or extrahepatic duct where bile flow artifact was seen.
3. In all the 8 cases with gallstone and the ten cases with gallbladder polyp or CBD-ampullary cancer, steady-state coherent imaging allowed for accurate differentiation of polypoid tumor from gallstone.

CONCLUSION

Steady-state coherent imaging can be a good pitfall-shooter of the diagnostic pitfalls in MR cholangiography.

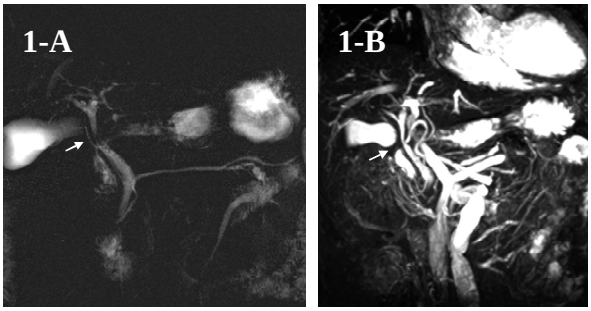

Fig. 1 Pseudostenosis of common hepatic duct caused by compression of right hepatic artery.
A) single-slice MR cholangiography,
B) steady state coherent imaging.

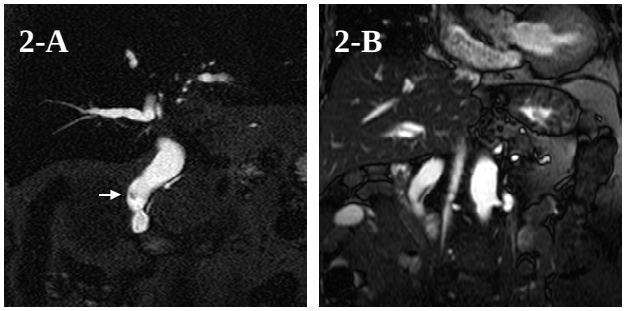

Fig. 2 Pseudodefect of common bile duct caused by bile flow artifact
A) source image of multi-slice MRCP,
B) B) steady state coherent imaging.

Fig. 3 Small polypoid lesion (CBD cancer) resembling CBD stone.
A) single-slice MR cholangiography,
B) source image of multi-slice MRCP,
C) steady state coherent imaging