

The Efficacy of SPIO-Enhanced MRI in Evaluating Inflammatory Pseudotumors: Imaging and Histopathological Correlation

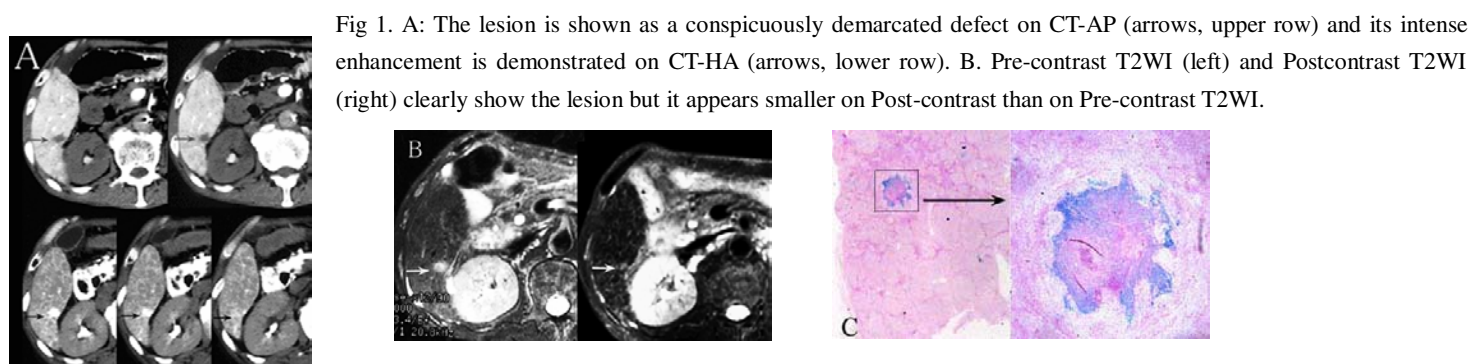
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Purpose: SPIO-enhanced MRI has been approved to be useful and widely applied for detecting liver tumors, however, in tissue characterization it has limitation since most lesions appear bright against the normal liver tissue regardless the vascularity, pathology and viability of the lesion. Inflammatory pseudotumors are shown as variously enhancing nodules on contrast enhanced CT and MRI and the correct diagnosis of these lesions is often difficult without appropriate clinical information. In this study, we particularly focus on inflammatory pseudotumors and small lesions less than 1cm in diameter of the liver examined on both CT and MRI to demonstrate the diagnostic usefulness of SPIO-enhanced MRI.

Subjects and Methods: Out of 48 patients who underwent CT and MRI for screening liver tumors, 24 patients were revealed to have focal liver lesions including 5 patients with inflammatory nodules. The other lesions included 9 patients with liver cysts, 7 with liver metastases, 5 with hemangiomas and 3 with hepatocellular carcinomas; some lesions overlapped in certain patients. CT was performed with multidetector-row CT (16-rows, GE) and CT during arteriportography (CT-AP) and CT during hepatic arteriography (CT-HA) were obtained in selected cases. MRI was performed on 1.5-T System (GE EchoSpeed). T1 weighed spin echo images (T1-WI; TR=202-230, TE=4.9 in-phase images and TE=2.3 for out-of-phase images), T2 weighted fast spin echo images (T2-WI; TR=1300-2300, TE=70-80) were obtained before intravenous injection of 8 micromole Fe/kg of ferucarbotran (Nihon Schering). Post-contrast T2 weighted images and single-shot EPI DWI (TR=2150-2365, TE=44-39, B-value of 100) were obtained with parallel imaging technique. Diagnoses were confirmed either surgically (11 patients but pathological studies were available in 5 patients) or by clinical follow-up with angiography, CT, MRI and abdominal ultrasound examination as well as tumor marker tests such as AFP and CEA.

Results: Total seventy-one nodules (28 cysts, 22 metastases, 8 hemangiomas, 7 HCC and 6 inflammatory pseudotumors) were disclosed on this study. Post-contrast T2-WI and EPI showed all lesions larger than 1 cm in diameter (5 cysts, 4 metastases, 4 hemangiomas, 3 HCC and 3 pseudotumors). For 48 lesions less than 1cm, pre-contrast T2-WIs and EPIs, and post-contrast T2-WIs and EPIs showed 28, 36, 37, 38 lesions, respectively. False-positive results were counted as five on pre-contrast T2-WI and eleven on post-contrast T2-WI. There was no false-positive call on EPI images. All six pseudotumors were clearly demonstrated on post-contrast T2-WIs and EPIs, however, four nodules revealed somewhat extent of SPIO uptake and were shown smaller (Case 1, 3 and 4) and of less high intensity (Case 1 and 2) than shown on pre-contrast images. This uptake of SPIO was confirmed on pathological slide with iron stain, correlating well to post-contrast images.



C. Pathological specimen with Prussian-Blue Iron Stain shows excellent radiological and pathological correlation.

Discussion/Conclusion: Our results indicated that applying additional diffusion weighted images after SPIO administration could be useful in detecting small liver tumors. Although SPIO-enhanced MRI has little value in tissue characterization, careful interpretation of SPIO uptake within lesions could provide valuable information in differentiating pseudotumors from other neoplastic lesions.