TITLE:
Fat-Water Interface on Susceptibility-Weighted Imaging and Gradient-Echo Imaging: Comparison of Phantoms to Intracranial Lipomas(Digest_要約)

AUTHOR(S):
Taha Mohamed M.Mehemed

CITATION:
Taha Mohamed M.Mehemed. Fat-Water Interface on Susceptibility-Weighted Imaging and Gradient-Echo Imaging: Comparison of Phantoms to Intracranial Lipomas. 京都大学, 2014, 博士(医学)

ISSUE DATE:
2014-11-25

URL:
https://doi.org/10.14989/doctor.k18647

RIGHT:
学位規則第9条第2項により要約公開
Fat-Water Interface on Susceptibility Weighted Imaging and Gradient Echo Imaging: Comparison of Phantoms to Intracranial Lipomas

Taha M.Mehemed MBBCh¹, Akira Yamamoto MD, PhD¹, Tomohisa Okada MD PhD¹, Mitsunori Kanagaki MD PhD¹, Yasutaka Fushimi MD PhD¹, Takeshi Sawada MD¹, Kaori Togashi MD PhD¹.

¹) Department of Diagnostic Imaging and Nuclear Medicine, Graduate School of Medicine, Kyoto University, 54 Kawahara-cho, Shogoin, Sakyo-ku, Kyoto-shi, Kyoto 606-8507, Japan

Summary

Objective: In a clinical setting, lipoma can sometime show low signal intensity on SWI mimicking hemorrhage. The purpose of this study is to evaluate the fat-water interface chemical shift artifacts between SWI and T2*WI with a phantom study and evaluate the SWI images in lipoma cases.

Materials and Methods: SWI, magnitude, high-pass filtered phase and T2*WI images of a lard-water phantom were evaluated in the in-phase, out-of-phase and standard partially out-of phase TE settings used for clinical 3T MRI SWI (19.7ms, 20.9 ms and 20.0 ms respectively), to identify the most prominent fat-water interface low signal. SWI of 5 cases of CNS lipoma were retrospectively evaluated by two neuroradiologists.

Results: TE=19.7ms (in-phase) showed the minimum fat-water interface low signal in the phase-encode direction on magnitude, high-pass filtered phase and SWI images. TE=20.9ms (out-of-phase) image showed the maximum fat-water interface in the phase-encode direction on magnitude, high-pass filtered phase and SWI images. TE=20.0ms (partially out-of-phase) image showed more fat-water interface low signal on SWI than T2*WI especially in the phase-encode direction. All lipoma in the 5 patients showed high signal intensity with surrounding peripheral dark rim on SWI.

Conclusion: Fat-water interface is more prominent on standard TE setting used for clinical SWI (TE=20.0ms) than that of T2*WI and shows a characteristic surrounding peripheral low signal rim in lipoma. Knowing the fact of fat-water appearance on SWI is important to avoid misinterpreting intracranial lipomas as hemorrhages.