

Susceptibility Weighted Imaging: a new tool in detecting hemorrhage in spinal cord injury

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PURPOSE: Susceptibility weighted imaging (SWI) is sensitive in detecting the microbleeds in the brain, which utilizes phase shift due to deoxyhemoglobin in the hematoma. However, there are few studies on SWI of the spine. The purpose of this study was to evaluate the role of SWI in detecting hemorrhage in spinal cord injury (SCI).

METHOD and MATERIALS: Eighteen patients with a history of acute cervical spine trauma and 20 volunteers were scanned on a 3.0-T MR scanner (TrioTim, Siemens) within 3 days of the onset of injury. High-resolution SWI and conventional MRI were performed on all patients. On the basis of the MRI findings the patients were classified in 3 groups: group 1 (normal cord), group 2 (spinal cord edema or contusion), group 3 (spinal cord hemorrhage). All patients were clinically evaluated until the stabilization of neurological recovery.

RESULTS: Out of 18 patients, 16 had SCI in our study. 2 patients showed normal spinal cord on both conventional MRI and SWI; 16 out of 18 patients had SCI in our study; of these 16 patients 12 had only spinal cord edema or contusion on conventional MRI, but SWI showed hemorrhage in 4 of them; 4 had intramedullary hemorrhage, which was proved by SWI and neurosurgery.

CONCLUSIONS: SWI is an invaluable tool for visualizing hemorrhage in SCI compared to conventional MRI methods.

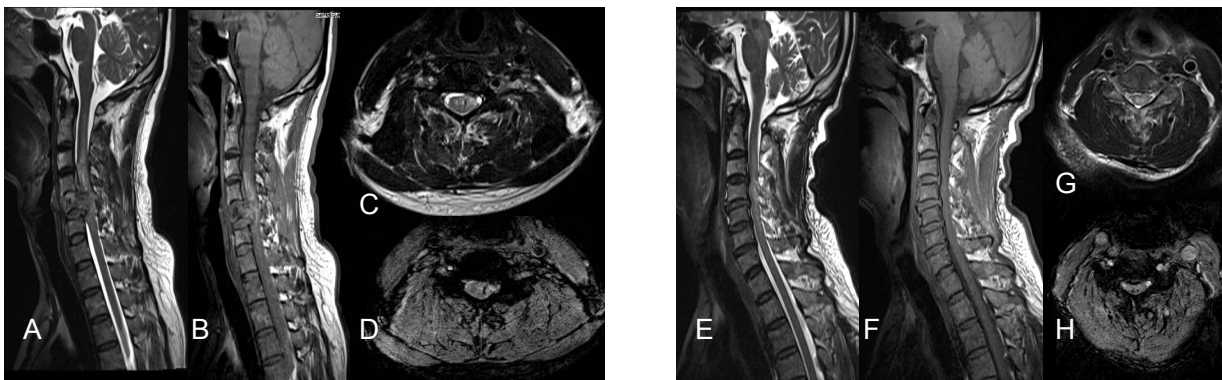


Figure A—D: A 47 years old male with a history of traffic accident. High signal on sagittal T2WI (A) and T1WI (B) indicate spinal cord injury with hemorrhage, which was low signal on axial T2WI (C) and susceptibility weighted imaging (D). E-H: A 34 years old male with a history of traffic accident. High signal on sagittal (E) and axial T2WI (G) and isosignal on T1WI (F) suggest contusion of spinal cord. No hemorrhage is demonstrated on conventional MRI. But low signal on susceptibility weighted imaging (H) indicate hemorrhage of spinal cord.