

Susceptibility Weighted Imaging in Patients with Occlusion of Middle Cerebral Artery

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INTRODUCTION & PURPOSE : Susceptibility weighted imaging (SWI) can be a useful MR sequence in the work-up of stroke patients. Although patient symptoms and clinical examinations may suggest the diagnosis, only brain imaging studies can confirm the diagnosis and differentiate haemorrhage from ischaemia with high accuracy, and this distinction is extremely important as the treatment decisions are dependent on this. The purpose of this study was to describe the imaging findings of SWI at 3T MR in patients with occlusion of middle cerebral artery.

METHODS : From the radiology data base, 12 consecutive patients with occlusion of middle cerebral artery between Mar – Aug, 2009 were included for evaluation of SWI at 3T MR. SWI was performed with T2* weighted gradient echo sequence at following parameters; TR 28 msec, TE 20 msec, flip angle 15°, FOV 210x210, slice thickness 2mm. SWI and minimum intensity projection images were made from the magnitude and phase images, and these 4 image formats which had been transferred to the database server of PACS system for the routine practice were retrospectively analysed. Review of SWI and diffusion weighted imaging (DWI) was done by two radiologists. On DWI, size of infarction was analysed according to the ASPECTS grading system. On SWI, dark blooming of intravascular clot, presence of hemorrhage, loss of bright arterial vessel in sylvian fissure, and distension of medullar vein and cortical vein were evaluated.

RESULTS : Of the 12 patients, NIHSS at initial presentation was available in 11 patients (median 7, range 3-17). ASPECTS on DWI ranged from 0 to 9 (median 6). Imaging findings of SWI in patient with occlusion of middle cerebral artery included total or partial loss of arterial bright signal intensity in ipsilateral sylvian fissure (100%, 12/12), dark blooming of intravascular clot (66.7%, 8/12), prominent hypointense signal of the medullar / cortical vein (58.3%, 7/12), global hemorrhagic transformation (8.3%, 1/12). Of the 12 patients who showed loss of arterial bright signal intensity in ipsilateral sylvian fissure, 5 patients (41.7%) showed partially preserved arterial bright signal intensity, and two of them showed occlusion of M2 segment distal to the MCA bifurcation.

CONCLUSION : In patient with occlusion of MCA, SWI imaging provides valuable information regarding the site of arterial occlusion (by dark blooming of intraarterial clot) and presence of collateral or preserved arterial flow (by preserved arterial bright signal intensity in sylvian fissure), and hemorrhagic transformation. Prominence of venous hypointense signal intensity at cortical and medullary vein is also frequently seen at the territory of occluded MCA.

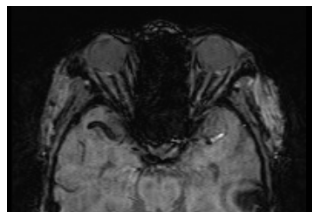


Figure 1. Dark blooming of intraarterial clot in 78-year-old woman.

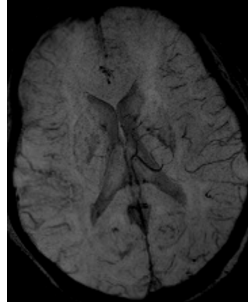


Figure 2. Prominent venous hypointense signal intensity at the territory of left middle cerebral artery in 62-year-old woman.

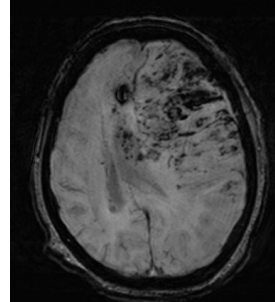


Figure 3. Hemorrhagic dark signal intensity in the territory of left MCA infarction in 83-year-old woman.

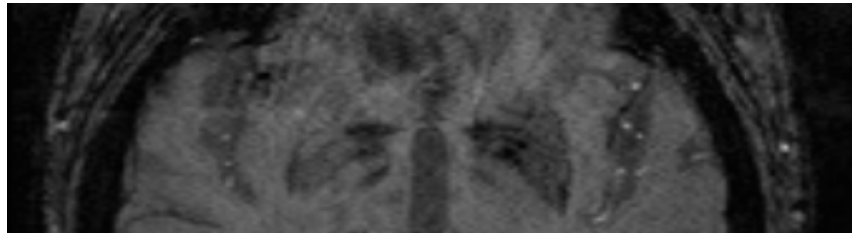


Figure 4. Partial loss of arterial bright signal intensity at the right sylvian fissure in 79-year-old woman with occlusion of M2 segment of right middle cerebral artery

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