

Reply:

We thank Dr. Palma for the interest in our article about the role of susceptibility-weighted MR phase imaging (SWI) for the evaluation of patients with cerebral cavernous malformation¹ and for the additional comments about the potential false-positives in these patients. Although the clinical information and the careful evaluation of the SWI images reconstructed with the minimum intensity projection (mIP) technique could suggest the diagnosis of pneumoencephalus in the case reported, false-positives are not uncommon on SWI. As stated in the letter and also properly discussed in a previous study,² because SWI has extremely high sensitivity for the detection of magnetic susceptibility effects, many paramagnetic, ferromagnetic, and diamagnetic substances can cause inhomogeneities on the magnetic field and, as a result, loss of signal intensity on SWI. We recently had a 44-year-old female patient who underwent MR imaging for "follow-up of brain tumor." She had multiple extra-axial low signal intensity foci on SWI, similar to the case shown by Dr. Palma. In fact, the review of previous examinations and additional sequences demonstrated that these foci represented fat because of the rupture of an epidermoid tumor (Fig 1). One option to avoid false-positives when evaluating the SWI sequence is to study not only the mIP reconstructed

images, but also the magnitude and phase images. Nowadays, we evaluate these images in all of the patients with positive imaging findings on SWI sequence, and in several instances, they have been useful in doubtful cases.

References

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2. Haacke EM, Mittal S, Wu Z, et al. **Susceptibility-weighted imaging: technical aspects and clinical applications, part 1.** *AJNR Am J Neuroradiol* 2009;1:19–30

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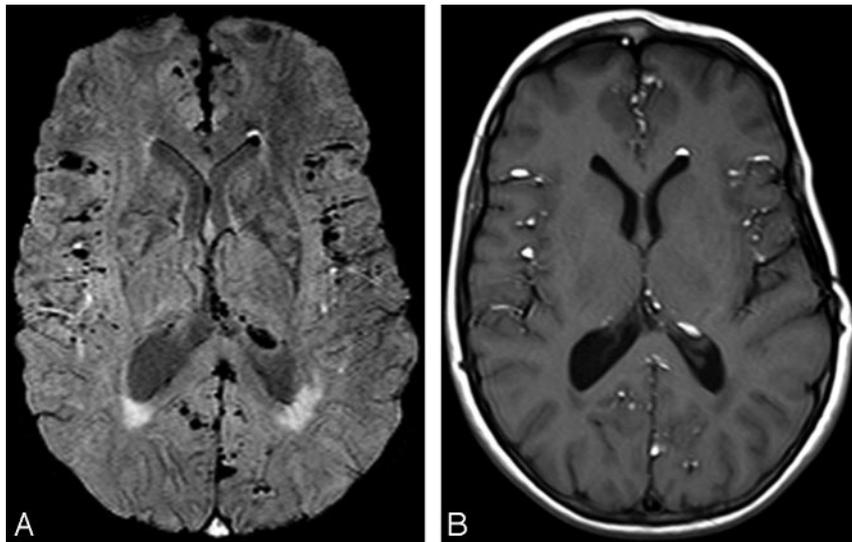


Fig 1. A, SWI sequence (TR, 40 ms; TE, 49 ms) demonstrates multiple extra-axial low signal intensity foci, even inside the ventricles. B, T1-weighted image (TR, 475 ms; TE, 9.4 ms) shows that these foci have high signal intensity, some of them with a halo of low signal intensity (chemical shift artifacts), representing fat. Note the left frontotemporal craniotomy, which was performed for partial resection of an epidermoid tumor. The diagnosis of rupture of an epidermoid tumor was then suggested.