ALL THAT GLITTERS IS NOT GOLD: INCREASED SIGNAL IN THE SUBARACHNOID SPACE ON FLUID-ATTENUATED INVERSION RECOVERY IMAGING AFTER GADOLINIUM INJECTION

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A 61-year-old woman arrived at the emergency department of the Hospital Nossa Senhora das Graças, Canoas, southern Brazil, with suspected ischemic stroke. After clinical and laboratory examination, the clinical diagnosis of ischemic stroke was made, without fulfilling criteria for thrombolysis. The patient had no history of renal failure. Three days later, she performed a magnetic resonance imaging (MRI) examination that confirmed the suspected diagnosis. This examination was performed without sedation or supplemental oxygen. Brain MRI was performed after gadolinium injection, using fluid-attenuated inversion recovery (FLAIR) imaging, T1-weighted image, diffusion-weighted imaging, and T2-weighted image sequences that revealed signs of subacute watershed stroke in the left cerebral hemisphere (Figures 1, 2 and 3). There was a hyperintense cerebrospinal fluid (CSF) in the subarachnoid space (SAS) on FLAIR imaging, a finding that has been reported in many pathologic conditions¹ such as superior sagittal thrombosis, subarachnoid hemorrhage², meningitis, meningeal carcinomatosis, next to tumors, status epilepticus and stroke³⁻⁷. It has also been reported in otherwise healthy patients undergoing anesthesia with supplemental oxygen⁸. The exact mechanism by which CSF diffuses into the SAS in patients with or without renal insufficiency is not completely explained. Some authors have suggested that in patients with renal failure, the gadolinium may shift across an osmotic gradient at the circumventricular organs in the setting of protracted elevation of plasma concentrations⁹. We believe that the cause of this imaging phenomenon of hyperintense signal of the CSF in the SAS which has already been noted in patients with compromised cerebral perfusion, including cases of acute ischemic stroke, was due to the recent stroke^{10,11}.

Figure 1: Axial Flair WI sequence demonstrates the hyperintensity on SAS on the left brain hemisphere.

Figure 2: Axial T2* sequence without low signal on SA ruled out hemorrhage.

Figure 3: Axial DWI sequence showed restricted diffusion on watershed infarcts.

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