Magnetic Susceptibility Effect in Diagnosis of Isolated Cortical Venous Thrombosis


A 22 year female, 3 weeks post-partum presented with acute onset severe headache, vomiting, generalized tonic clonic seizure, and right hemiparesis which progressed over five days. Clinical evaluation revealed a conscious patient with normal vitals, pupil, and fundus with right facial paresis and hemiparesis (2/5 power). The clinical picture was suggestive of cortical venous thrombosis.

Routine investigations revealed anemia (Hb 9.8gm %), with normal total leukocyte counts (8300 N 76 L 22 E 02), PT (13 sec), INR (1.24), D-dimer levels (0.84µg/ml), Bleeding and Clotting time. Anticardiolipin antibody, ANA, dsDNA serum homocystein were within normal limits. The patient’s blood sugar, lipid, renal and hepatic profiles were also normal.

The MRI T1 and T2 images (Figures
1a and 1b) showed large areas of altered signal intensity in left parietal lobe along with focal areas of hemorrhage, edema and mass effect. T2* gradient echo images (Figure 1c) showed a linear hypointensity adjacent to the affected area, consistent with magnetic susceptibility effect (MSE) described in isolated cortical vein thrombosis. All major dural venous sinuses and cortical veins did not show any evidence of thrombosis on magnetic resonance venogram (Figure 2). Due to the suspicion of vascular malformation CT Angiogram with venous phase (Figure 3) was done, which was normal. Considering the clinical profile and presence of MSE, a diagnosis of isolated cortical venous thrombosis was kept. Patient was treated with anticoagulants and supportive measures (anti-edema and anti-epileptics). The patient on follow up after one month had only minimal residual weakness and repeat scan (Figure 4) after 6 months showed significant resolution of earlier lesions.

Isolated cortical venous thrombosis is extremely rare. It is difficult to diagnose either clinically or radiologically as the location and number of these veins is highly variable. In a large series of patients with cortical vein thrombosis, a typical MSE at the site of venous occlusion was reported in almost all patients with a sensitivity of 97% while conventional MRV sequence had a sensitivity of 37% only. MSE was found as early as five days and may persist thereafter.

This emphasizes the diagnostic value of MSE on T2* images in isolated cortical vein thrombosis, especially in the absence of digital subtraction angiography.

References