Neuroimaging Findings in Intracranial Sarcoid Phlebitis: A Case Report

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Introduction: Venous phlebitis in Neurosarcoidosis (NS) is rare but is often associated with intracranial hemorrhage (ICH). Imaging findings in such cases have been recently described on susceptibility weighted imaging (SWI). *Case Presentation and Outcome:* We report a patient who presented with ICH. Magnetic resonance imaging provided evidence for parenchymal and leptomeningeal involvement while SWI and vessel wall imaging (VWI) helped confirmed NS associated intracranial phlebitis. The patient was subsequently diagnosed with systemic sarcoidosis. *Discussion:* The emerging role of VWI and SWI in the diagnosis of this rare entity is discussed.

Key Words: Neurosarcoidosis−vessel-wall imaging−MRI−phlebitis

Introduction

Vasculitis and cerebrovascular events in patients with Neurosarcoidosis (NS) were previously considered rare but are increasingly being recognized.[1,2] Unlike some of the other vasculitides, NS-associated vasculitis can have both arterial and venous involvement.[3] The authors present a case report of intracranial NS phlebitis, diagnosed using vessel wall imaging (VWI). The case highlights the importance of VWI imaging in NS and improves our understanding of the NS imaging spectrum.

Case Report

A 34-year-old male with a past medical history only significant for Crohn disease presented with acute onset of headache and nausea. Noncontrast computerized tomography demonstrated a left cerebellar hemorrhage. Patient had mildly elevated erythrocyte sedimentation rate (62) and C-reactive protein (1.2) but the labs were otherwise unremarkable. Magnetic resonance imaging (MRI) of the brain redemonstrated the intracranial hemorrhage (ICH) and noted multiple prominent venous vessels on susceptibility weighted imaging (SWI) sequence along with enhancement along paraventricular veins in the supratentorial brain. CT, MR, and conventional angiogram were negative for underlying vascular malformation.

Subsequent VWI demonstrated wall enhancement along the cerebral veins bilaterally, more prominent over left frontal convexity, similar to the findings on SWI (Fig 1). MRI also demonstrated tiny foci of nodular parenchymal enhancement, consistent with granulomatous inflammation, and a diagnosis of NS was suggested. Whole body positron emission tomography-computed tomography showed hypermetabolic mediastinal and abdominal lymphnodes. Endoscopic needle aspiration of a peripancreatic node subsequently confirmed granulomatous inflammation consistent with Sarcoidosis.

Discussion

The authors present a case of venous phlebitis in NS diagnosed using VWI. ICH in NS often tends to be small and present in atypical locations, a finding felt to reflect both arterial and venous involvement.[4-6] Bathla et al recently reported imaging findings in 4 patients with NS phlebitis, with all patients showing evidence of ICH. They noted perivascular enhancement in 50% of patients and

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Received August 22, 2018; revision received October 2, 2018; accepted October 6, 2018.

Funding: None.

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1052-3057/$ - see front matter

https://doi.org/10.1016/j.jstrokecerebrovasdis.2018.10.003

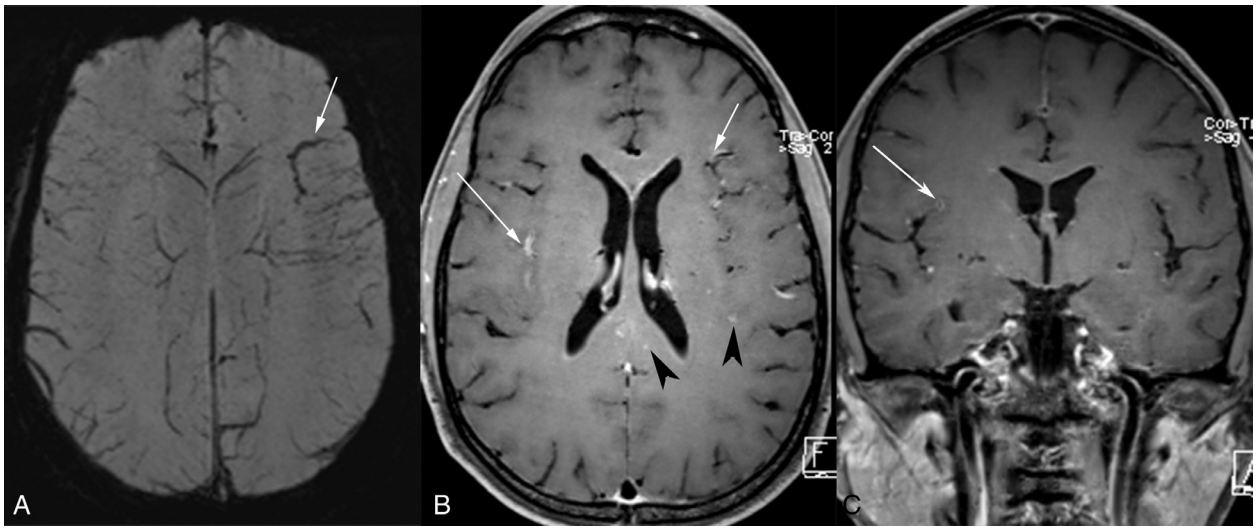

Figure 1. *(A-C): Axial SWI MIP image shows prominent left cortical vein (arrow) along with few asymmetrically prominent paraventricular veins. Axial (B) and coronal (C) post contrast images reveal circumferential enhancement along the cortical veins (arrows) bilaterally. The shorter arrow in 'B' reflects the same vein as highlighted in 'A' Also noted are scattered parenchymal granulomas (arrowheads in B).*

positive SWI findings in all cases.[3] However, the perivascular enhancement findings were based on review of routine, thick-section clinical scans. It is likely that using higher resolution imaging will improve the yield of vascular inflammation in such cases, which is currently both under-recognized and under-reported.

Even though both SWI and VWI demonstrate the extent and distribution of phlebitis, findings on SWI likely reflect congestion and slow flow while findings on VWI reflect direct vascular inflammation. Also, the latter are more likely to resolve with immunosuppressive therapy and may help monitor therapy response. Based on authors' experience, the SWI findings often improve but do not always resolve after immunesuppressive therapy. Therefore, it is unlikely that SWI can be substituted for VWI.

Conclusion

The authors present a case of NS phlebitis diagnosed using VWI. To the best of our knowledge, this has not been previously reported. High-resolution imaging expands our understanding of NS imaging spectrum and emphasizes the utility of VWI in NS.

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