Teaching NeuroImages: MRI Abnormalities of Spinal Dural Arteriovenous Fistula in the Absence of Flow Voids

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A 66-year-old woman presented with progressive spastic paraplegia and lumbar pain. Physical examination revealed hyperreflexia in lower extremities, reduced pinprick and vibration up to D12, and impaired hallux proprioception. Spinal MRI revealed multilevel centromedullary T2 hyperintensity and diffuse contrast enhancement except for abrupt intralesional segment (missing piece; figure 1).

Unremarkable blood and CSF workup and persistent imaging findings at 6-month follow-up prompted selective angiography, which confirmed a spinal dural arteriovenous fistula (sDAVF) at L1 (figure 2). Successful endovascular embolization improved imaging and functional status. In the appropriate clinical scenario, absence of flow voids does not exclude sDAVFs. The unique missing piece enhancement pattern may expedite differential diagnosis.^{1,2}

Figure 1 MRI Assessment of Progressive Myelopathy

(A) T1-weighted imaging demonstrates isointense conus medullaris. (B) T2-weighted imaging reveals diffuse multi-level hyperintensity from D7-L1 with hypointense signal at D11-D12. No prominent tortuous flow voids are present. (C) Postgadolinium T1-weighted imaging shows diffuse contrast enhancement with abrupt isointense segment (missing piece sign) (arrowhead). (D) Axial T2-weighted imaging shows centromedullary hyperintensity.

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Figure 2 Angiographic Diagnosis of Spinal Dural Arteriovenous Fistula

(A) Magnetic resonance angiography reveals dorsal subarachnoid vascular conglomerate. (B) Selective angiogram shows spinal dural arteriovenous fistula at left L1 level (white arrowhead) and engorged ascending perimedullary vein (black arrowhead). (C, arrowhead) Endovascular embolization was successful. (D) Note decreased spontaneous spinal T2 hyperintensity.

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Appendix (continued)

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