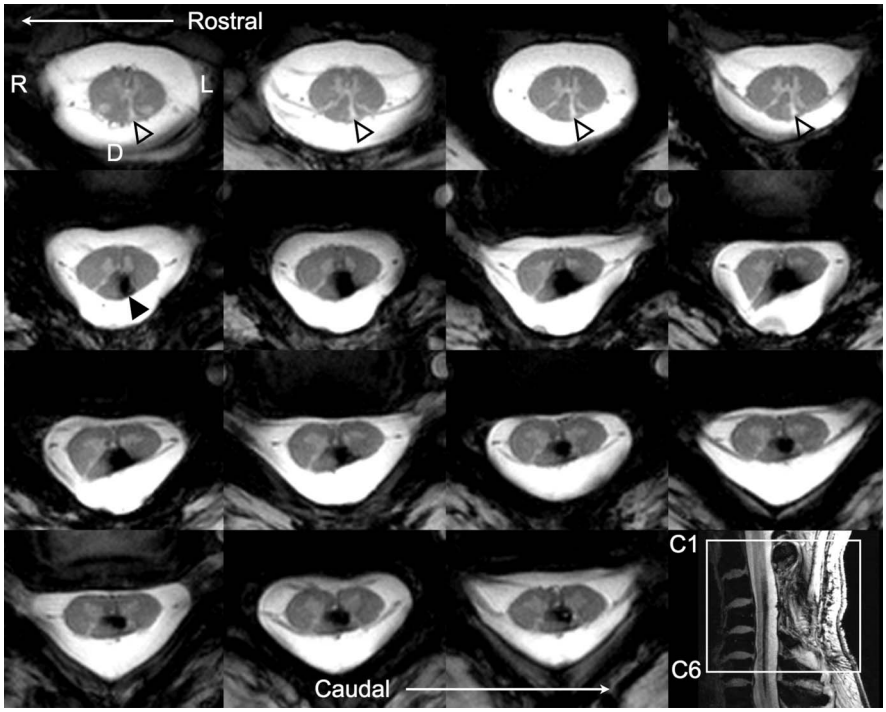
7T MRI of spinal cord injury

Figure 7T MRI



7T MRI with custom-made 19-channel coil (W. Zhao et al., Proceedings of the International Society for Magnetic Resonance in Medicine, 2012;310). Dual-echo T2*-weighted FLASH, repetition time = 514 milliseconds, 534 × 480 matrix, 0.37 × 0.37 × 3 mm^3, R = 2 acceleration, 4:24 minutes acquisition. At-level hyposignal (filled arrow) indicates hemosiderin whereas above-level hypersignal (empty arrows) suggests dorsal-column wallerian degeneration. Ultra-high resolution enables exquisite details of spinal cord anatomy including visualization of individual ventral/dorsal nerve roots.

A man with 25 years of mild left neck, arm, and leg paresthesias had initial MRI in 1996 identifying a left C3-4 dorsal horn cavernous hemangioma. In 1997, hemorrhage (C3-7) and resection induced left arm > leg proprioceptive loss and clumsiness. Three months after surgical resection, left upper-body pain recurred; 2 years later, disabling colocalizing itch recurred.[1] In 2012, ultra-high-resolution 7T MRI (figure) localized hemosiderin to specific dorsal horn laminae and detected rostral (C1-3) hypersignal invisible on conventional MRIs, most likely representing wallerian degeneration.[2] These new imaging findings demonstrate the benefit of high-field spinal cord MRI and generate the hypothesis that his late-onset central itch might be related to delayed white matter degeneration.

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