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Diagnostic Radiology and Molecular Imaging

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Vitamin B12 Deficiency in Nitrous Oxide Abuse

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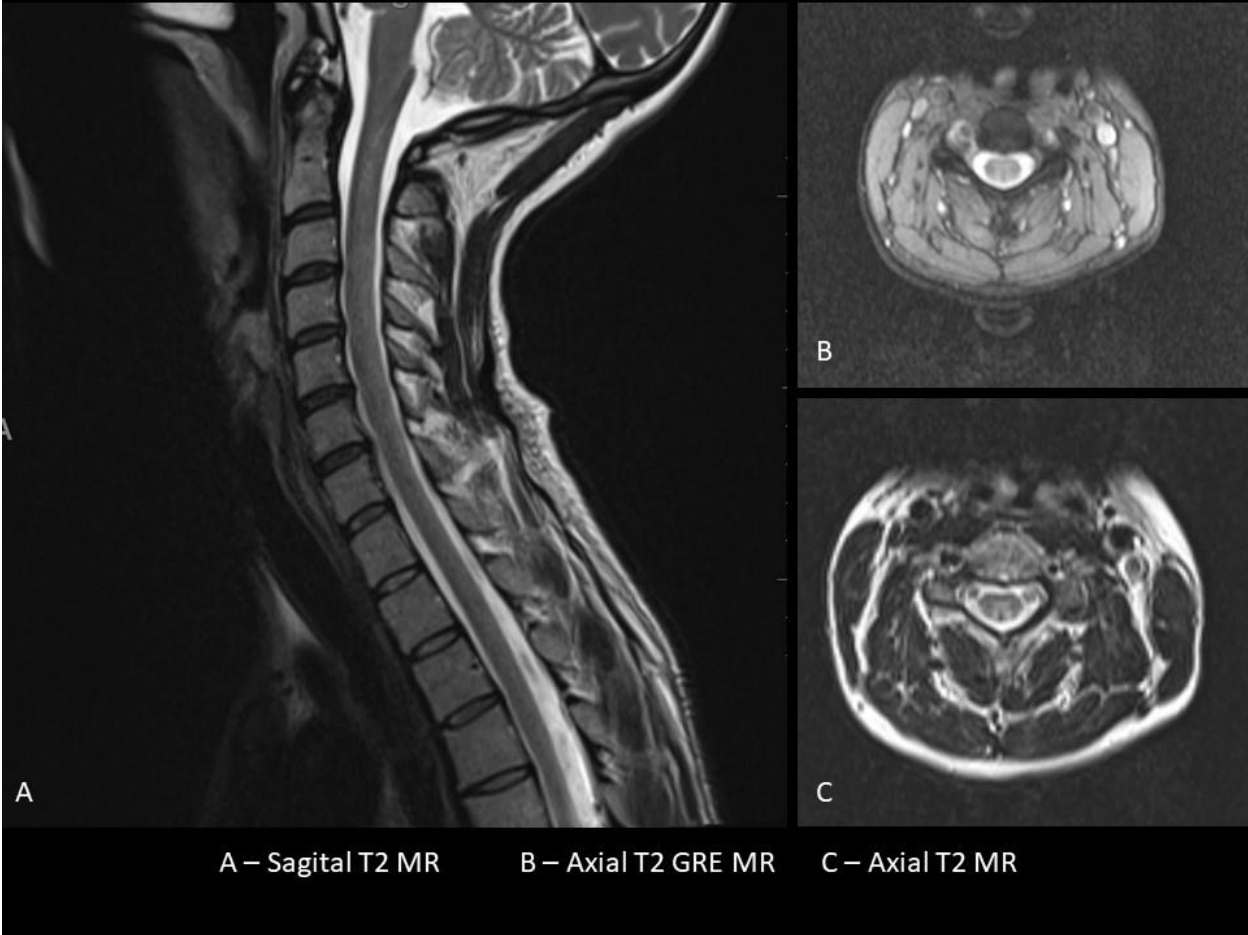
Reehan Ali

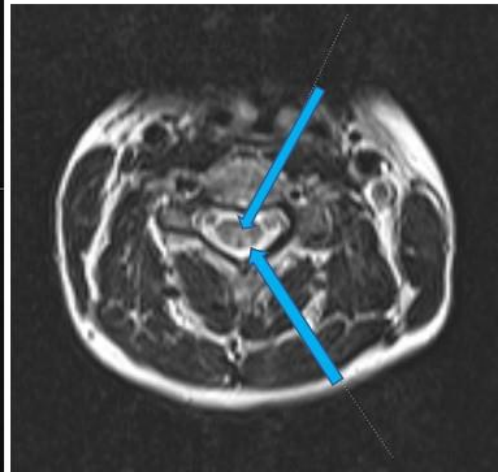
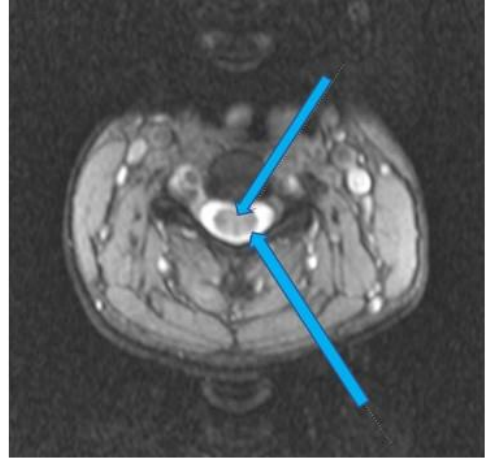
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33yo F presents to ED with numbness & tingling in hands, feet for 10 days. History of recreational drug use, including nitrous oxide 'whippets.' Unremarkable Head CT was obtained.





Vitamin B12 (Cobalamin) Deficiency

Imaging Findings: Symmetric abnormal increased T2 signal noted within the dorsal columns of the spinal cord (**blue arrows**) from the level of C2-C7. Contrast images were not included as they were markedly degraded by artifact, however no appreciable enhancement was identified, in keeping with the diagnosis.

Differential: Infectious Myelitis, Cord Infarction, Acute Disseminated Encephalomyelitis.

Discussion: The most common cause of Vitamin B12 deficiency is due to intrinsic factor (IF) deficiency, a molecule required for intestinal absorption of Vitamin B12 due to pernicious anemia. Other causes include decreased IF production from gastritis or ileal malabsorption syndromes such as infection (tapeworm) or inflammation (Crohn's). Nitrous Oxide use (Whippet) has also been linked to B12 deficiency as was the causative agent in this patient, who had a history of substance abuse. Deficiency, if prolonged, ultimately results in demyelination with progressive neurological deficits, such as numbness and tingling, loss of spinal reflexes, and/or reduced vibrational and proprioceptive sensations. This is characterized by bilateral symmetric T2 hyperintensity in the dorsal spinal columns (+/- spinothalamic tracts) on MR imaging with no associated enhancement. This is known as the "inverted V" or "inverted rabbit ears" sign.

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Case courtesy of Colby Jones, DO, Jordan Verlare, DO & Reehan Ali, DO
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