



Spinal Cord Infarct

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Figure 1: Sagittal T1 (First Image), Sagittal T2 (Second Image), Sagittal T2 STIR (Third Image), DWI (Fourth Image), ADC (Fifth Image). Multilevel low T1 signal intensity (not easily seen) and T2/STIR hyperintensity throughout the thoracic spinal cord, with mild spinal cord expansion. Corresponding hyperintense signal on DWI and low signal on ADC indicating acute infarct of the cord. Please note that even in a normal patient, the spinal cord may appear artifactually hyperintense on DWI, which is easily misinterpreted as infarct. The T1 hyperintense posterior epidural fat is incidentally mildly thickened in this patient (First Image)).

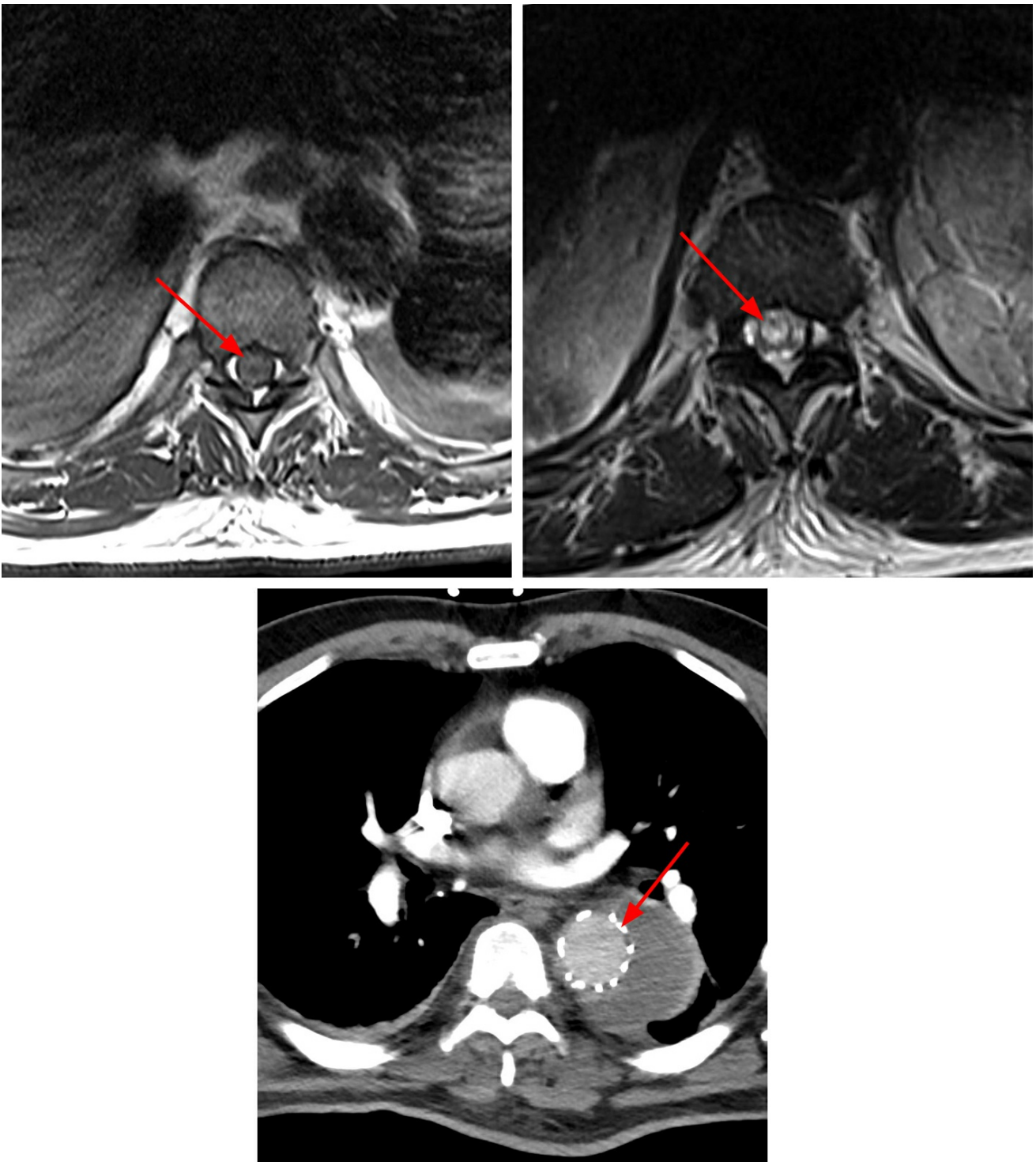


Figure 2: Low signal T1 spinal cord signal (Top Row Left) - difficult to appreciate- and owl's eye appearance of hyperintensity in the central spinal cord on T2-weighted image (Top Row Right). The patient had recently undergone aortic stent graft placement for aortic aneurysm, visible on CT angiogram (Bottom Row).

Clinical Features

- Severe back pain, abrupt weakness, loss of sensation
- Rapid progression with maximum deficits within hours.
- No gender predilection
- Any age, but typically greater than age 50

Anterior Spinal Artery Syndrome

- Bilateral – due to 1 single anterior spinal artery
- Paralysis below affected level
- Pain and temperature sensory loss
- Sparing of dorsal columns (intact proprioception and vibration)
- Cervical lesion causes bilateral brachial diplegia (man-in-the-barrel syndrome)

Posterior Spinal Artery Syndrome

- Unilateral – due to involvement of 1 out of 2 posterior spinal arteries
- Complete sensory loss at the level of injury
- Loss of proprioception and vibration below the level of injury
- Transient motor symptoms

Etiology

- Idiopathic – 50% of cases

- Aortic pathology
 - Atherosclerosis
 - Thoracolumbar aneurysm
 - Aortic surgery
- Trauma
- Iatrogenic – selective nerve root blocks, transforaminal steroid injections
- Fibrocartilaginous embolism
- Hypotension (due to septicemia)
- Dural arteriovenous fistula

Imaging

Modality specific

CT

- Not helpful for evaluating spinal cord pathology
- May see aortic dissection or nonspecific aneurysm/atherosclerosis that can support a diagnosis

CTA

- Helpful for defining underlying aortic causes
 - Large diameter of the aorta (aneurysm)
 - Aortic Dissection
 - May demonstrate low density linear dissection flap within the aorta, outlined by bright contrast

- May demonstrate low density non-enhancing false lumen
- Nonspecific atherosclerotic findings
 - High density atherosclerotic calcifications in the aortic periphery
 - Low density non-calcified plaque protruding into the aortic lumen
- Not directly helpful for imaging the spinal cord

MRI

- Gold standard: excellent for cord evaluation
- Sometimes normal in the acute stage
- Location
 - Typically located in the distal ½ of thoracic cord
 - Usually greater than 1 vertebral body height in extent
- Cord volume
 - May be normal in the acute phase
 - Cord expansion progresses over the first 3-4 days
 - Cord atrophy in the chronic phase

Sequences

T1

- Low signal-intensity infarct

T2/STIR

- Hyperintense signal within the cord often involving the central gray matter
- Central “owl’s eye” pattern – typical of anterior spinal cord infarct
- May see black tortuous flow voids in or around the cord in the setting of a vascular lesion

DWI

- Hyperintense restricted diffusion and associated low signal ADC in the corresponding region
- Utility is limited due to CSF-induced flow artifact, patient motion, and distortions of the image

T1 with Contrast

- May help to exclude other enhancing causes of cord abnormality, particularly enhancing tumor, infection, or inflammatory disease such as neurosarcoidosis
- Often not helpful in the subacute stage, when infarct also demonstrates mild to moderate enhancement

MRA + contrast

- Evaluation of spinal arteriovenous fistula
- Any abnormal increased vasculature in or around the cord (AVM, AVF) may brightly enhance

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References

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3. Nogueira RG, Ferreira R, Grant PE, et al. Restricted diffusion in spinal cord infarction demonstrated by magnetic resonance line scan diffusion imaging. *Stroke* 2012;43:532–35.

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