AMSER Case of the Month August 2023

71-year-old male presenting with neck and back pain from MVC

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Patient Presentation

HPI: 71-year-old male with PMHx of atrial fibrillation on Eliquis and HTN, presents to the ED after MVC. Complaining of back pain, neck pain, and chest pain. No loss of consciousness.

Vitals: BP 185/75, HR 60, RR 16, SaO2 93% on RA

PE: GCS 15. Inferior cervical and thoracic tenderness to palpation. No neurologic deficits noted.

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 2: **Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Imaging indicated by NEXUS or CCR clinical criteria. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
CT cervical spine without IV contrast	Usually Appropriate	☢☢☢
Radiography cervical spine	May Be Appropriate	☢☢
Arteriography cervicocerebral	Usually Not Appropriate	☢☢☢
CT cervical spine with IV contrast	Usually Not Appropriate	☢☢☢
CT cervical spine without and with IV contrast	Usually Not Appropriate	☢☢☢
CT myelography cervical spine	Usually Not Appropriate	☢☢☢☢
CTA head and neck with IV contrast	Usually Not Appropriate	☢☢☢
MRA neck without and with IV contrast	Usually Not Appropriate	O
MRA neck without IV contrast	Usually Not Appropriate	O
MRI cervical spine without and with IV contrast	Usually Not Appropriate	O
MRI cervical spine without IV contrast	Usually Not Appropriate	O

This imaging modality was ordered by the ER physician

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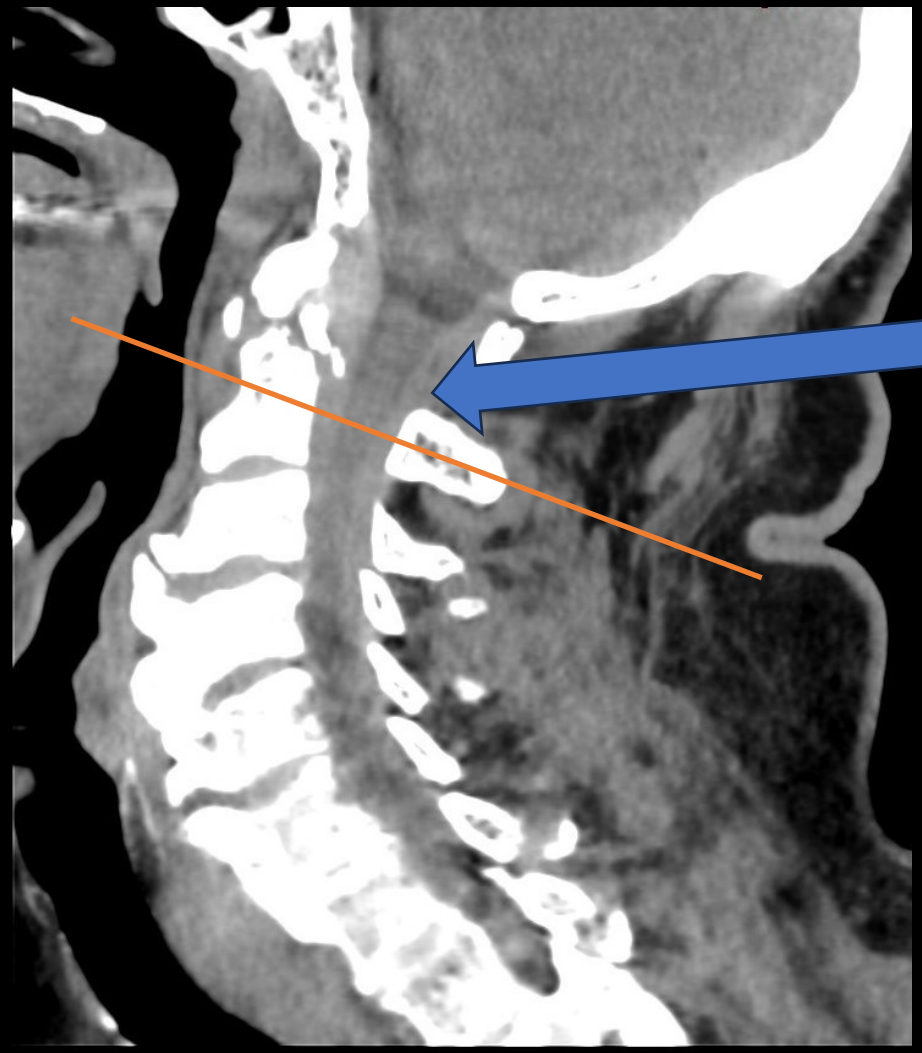
Findings (unlabeled)

Findings: (labeled)



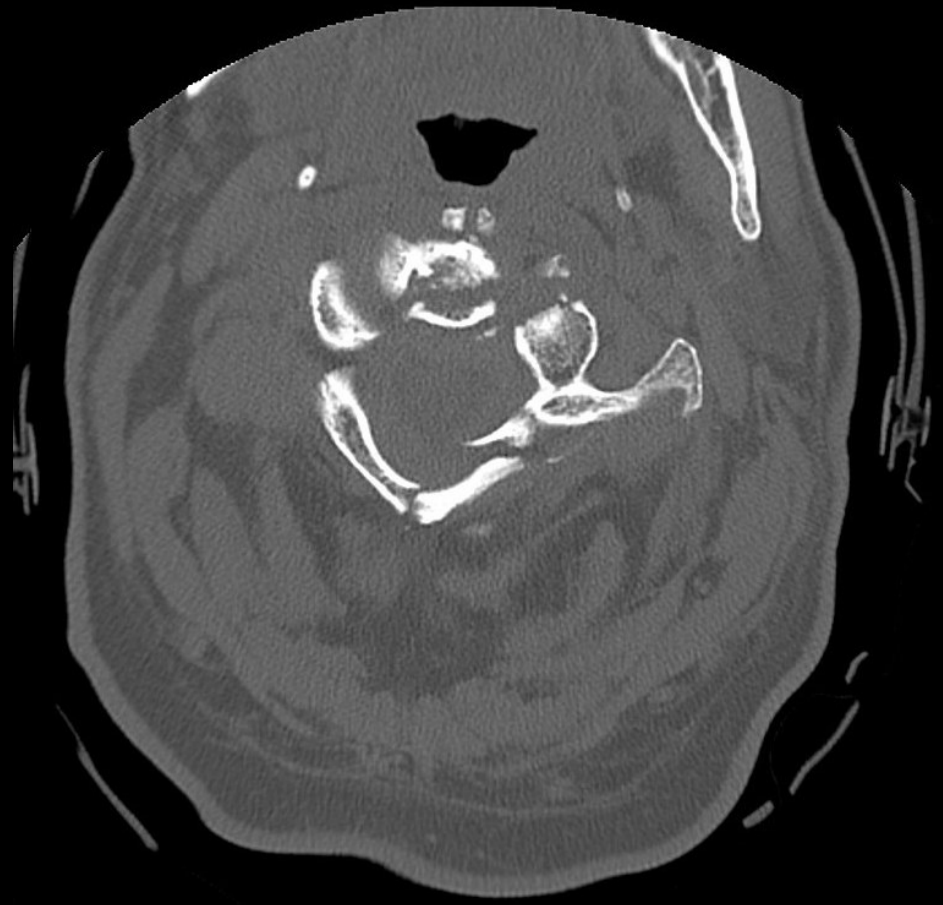
Hyperdense material dorsally and ventrally within spinal canal resulting in thecal sac narrowing

Sagittal Non-contrast CT

Circumferential high-density material in spinal canal concerning for epidural hematoma

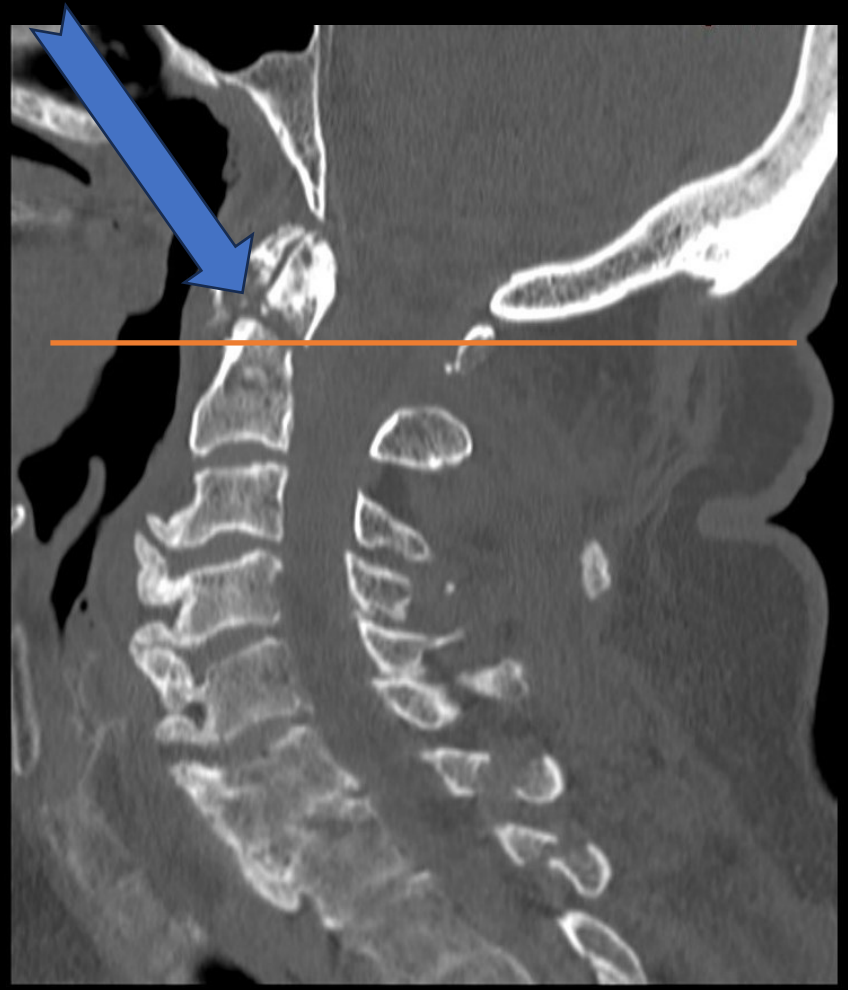
Axial Non-contrast CT

Findings (unlabeled)



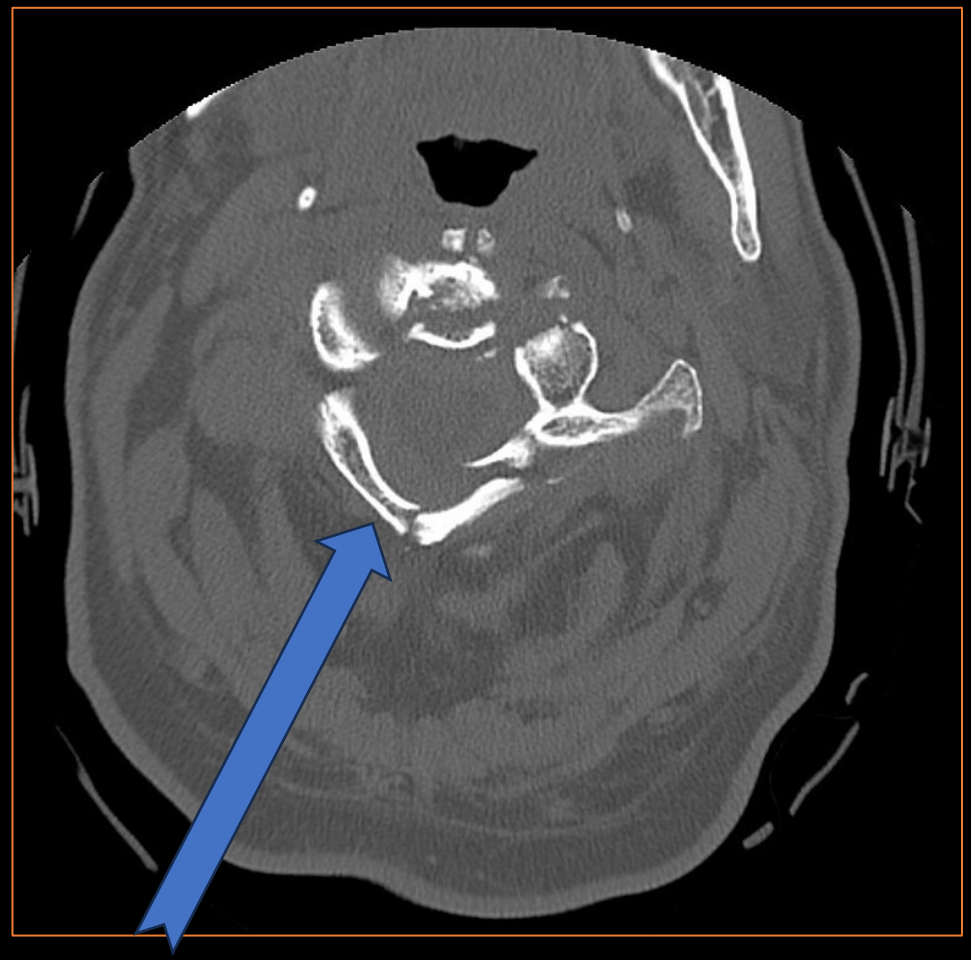
Findings: (labled)

Type 2 dens fracture with approximately 2 mm posterior displacement of the dens



Sagittal Non-contrast CT

Axial Non-contrast CT



Acute C1 burst fracture involving the anterior tubercle, anterior arch, left anterior arch and lateral mass, left posterior arch, posterior arch, and right lateral arch

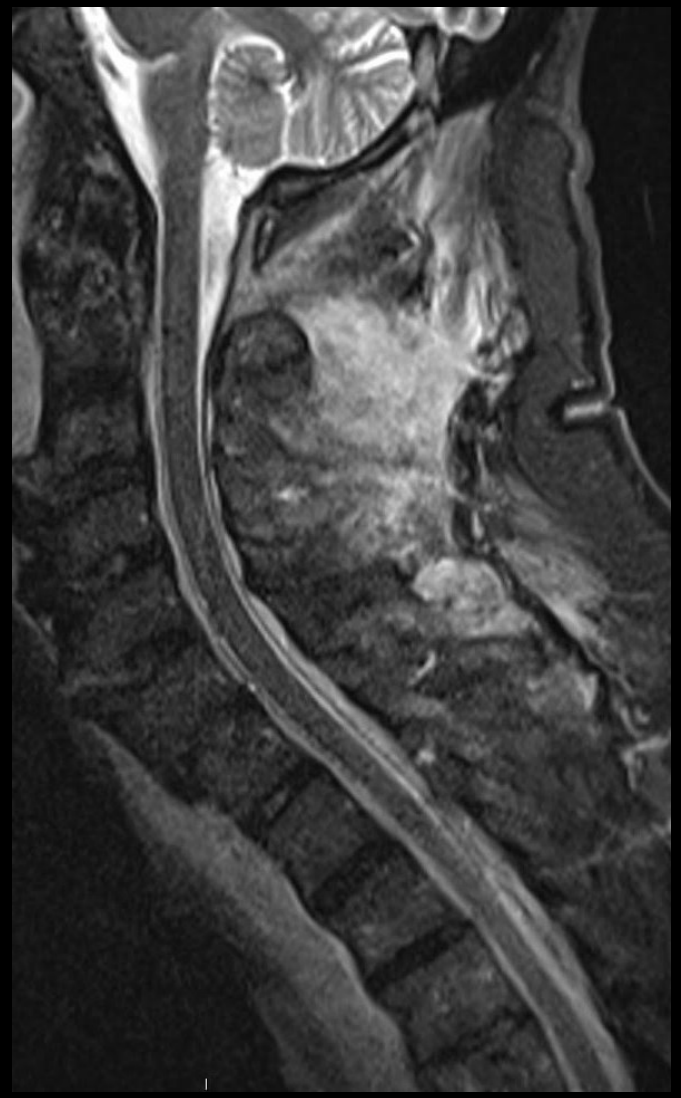
Select the applicable ACR Appropriateness Criteria

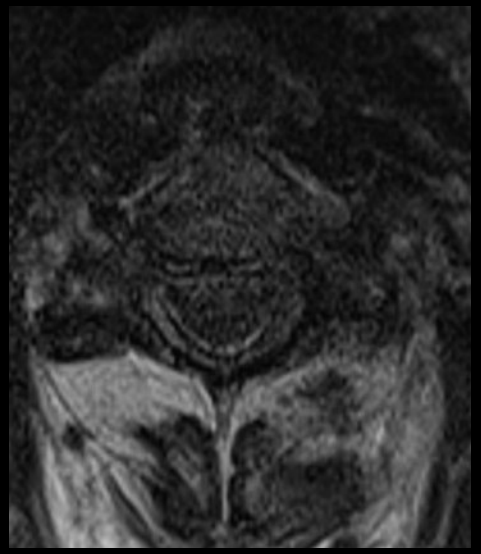
Variant 7: **Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Clinical or imaging findings suggest ligamentous injury. Next imaging study after CT cervical spine without IV contrast.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI cervical spine without IV contrast	Usually Appropriate	O
Arteriography cervicocerebral	Usually Not Appropriate	☢☢☢
CT myelography cervical spine	Usually Not Appropriate	☢☢☢☢
CTA head and neck with IV contrast	Usually Not Appropriate	☢☢☢
MRA neck without and with IV contrast	Usually Not Appropriate	O
MRA neck without IV contrast	Usually Not Appropriate	O
MRI cervical spine without and with IV contrast	Usually Not Appropriate	O
Radiography cervical spine	Usually Not Appropriate	☢☢

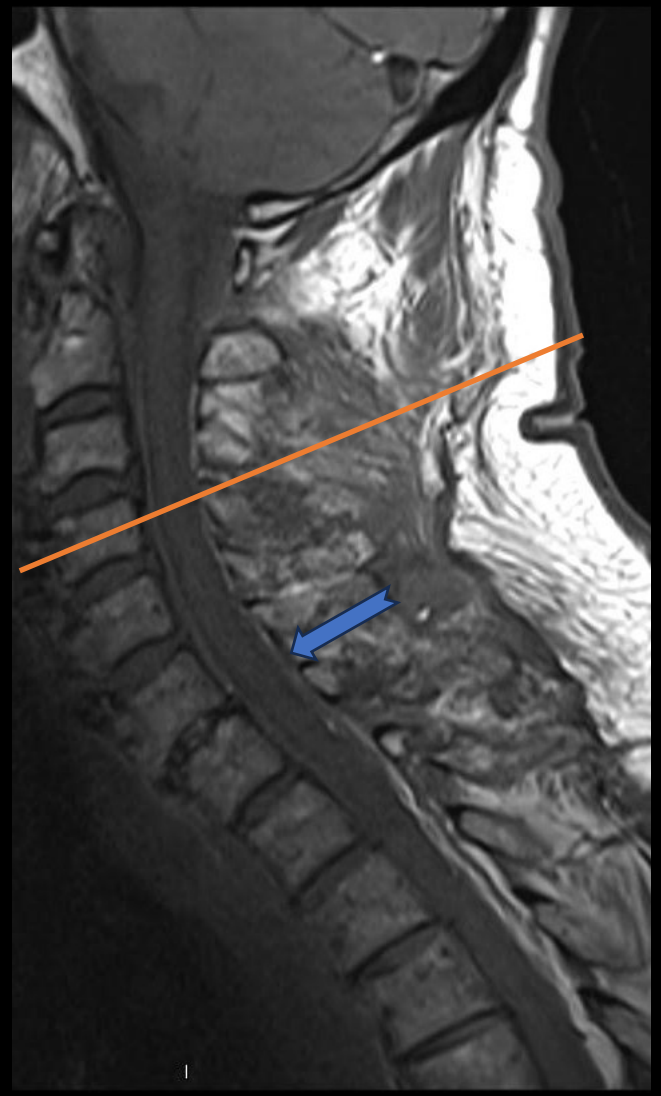
This imaging modality was ordered by the ER physician

Findings (unlabeled)

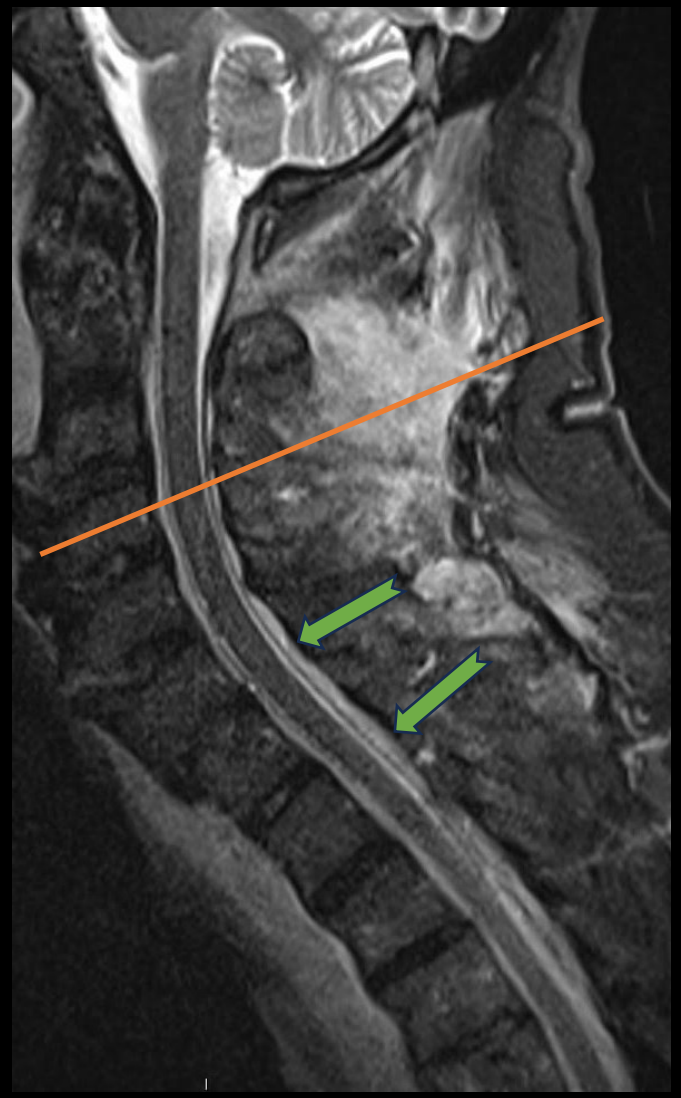




Findings (labeled)

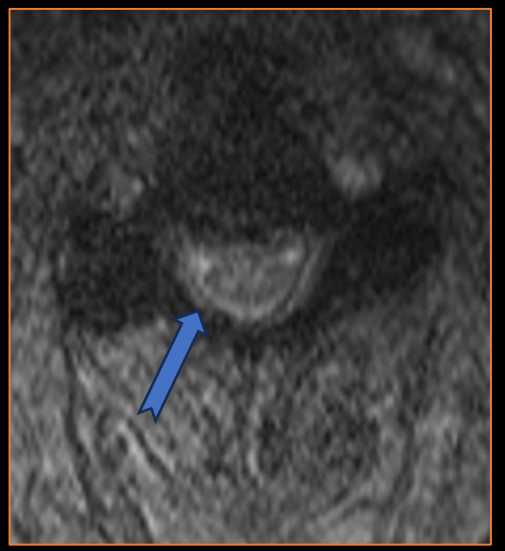


Sagittal T1 MRI



Sagittal T2 STIR

Axial T2 MRI



Axial T2 GRE

Circumferential epidural hematoma (blue arrows) extending from approximately C1-T10 with associated moderate narrowing of the thecal sac within the cervical and thoracic spine.

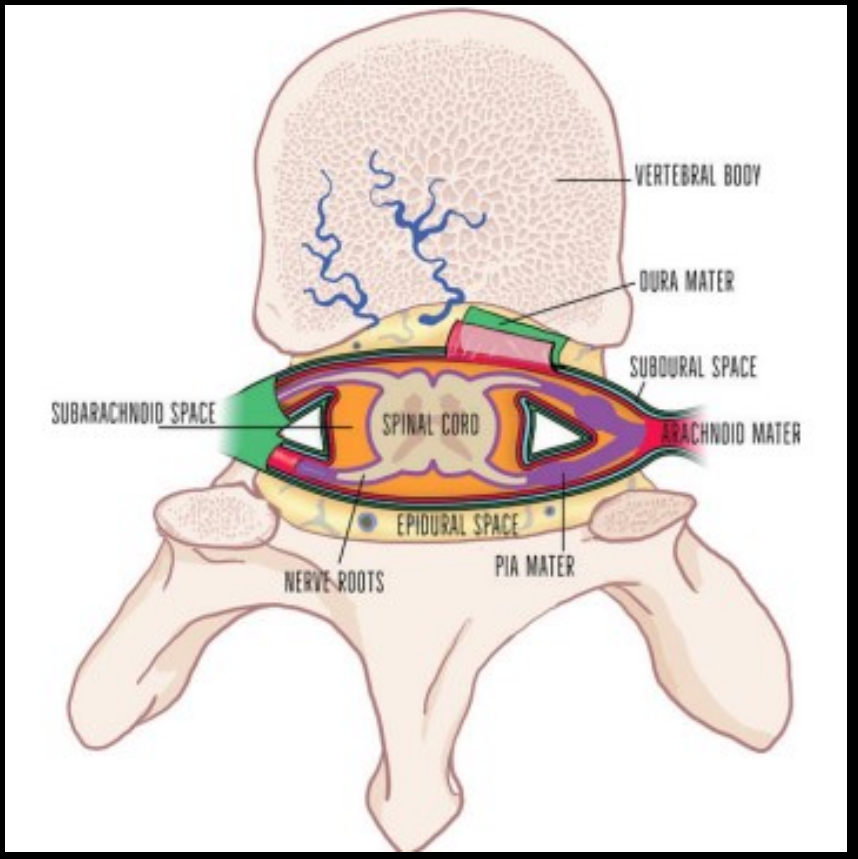
Loss of fat suppression in epidural space due to blood products seen on T2 STIR (green arrows)

Final Dx:

Spinal Epidural Hematoma

Case Discussion

- Incidence of spinal epidural hematoma (SEH) is 1 per 1,000,000 per year
- 75% of spinal hematomas are epidural in origin, most commonly idiopathic (40% of cases)
- Initial clinical manifestation depends on level of spinal involvement however includes:
  - Acute onset back pain
  - Progressive neurologic symptoms (radicular pain, weakness, paraplegia, quadriplegia)



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Imaging Recommendations

- MRI is the modality of choice for patient with acute back pain and concern for SEH
  - Allows for hematoma detection within epidural space
  - Delineation of exact levels
  - Evaluation of spinal cord compression
  - Other soft tissue injury
- CT is often done before MRI, particularly in trauma settings
  - Careful evaluation of the spinal canal on initial CT may lead to early identification, though occasionally a dilated epidural venous plexus may mimic hematoma

Management

- For symptomatic patients who are medically stable:
  - Urgent surgical decompression, most commonly decompressive laminectomy
  - Neurologic prognosis may be a function of degree of impairment at diagnosis
- In absence of neurologic deficit or uncontrollable pain, SEH can be managed conservatively
- In our patient, fractures along the cervical spine with associated SEH were managed non-operatively with halo vest providing stability.

References:

- Pierce JL, Donahue JH, Nacey NC, Quirk CR, Perry MT, Faulconer N, Falkowski GA, Maldonado MD, Shaeffer CA, Shen FH. Spinal Hematomas: What a Radiologist Needs to Know. Radiographics. 2018 Sep-Oct;38(5):1516-1535. doi: 10.1148/rg.2018180099. PMID: 30207937.
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- Holtås S, Heiling M, Lönntoft M. Spontaneous spinal epidural hematoma: findings at MR imaging and clinical correlation. Radiology. 1996 May;199(2):409-13. doi: 10.1148/radiology.199.2.8668786. PMID: 8668786.
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