Easily **Missed** Findings in Emergency Radiology

**Cervical Spine**

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Handout available online at: www.uth.tmc.edu/radiology/RSNA/2008/

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**Learning Objectives**

1. Detect easily overlooked findings on cervical spine imaging.
2. Distinguish image artifacts from subtle abnormalities on radiography and CT.
3. Discover previously unrecognized soft tissue findings on cervical spine CT.

I have no financial relationships to disclose

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**Case 1**

Which line is abnormal?

1. Anterior vertebral line
2. Posterior vertebral line
3. Spinolaminar line
4. Clival-odontoid line

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Reference:
Concerning rotational injury of the cervical facets, approximately what fraction of patients have pure facet joint dislocation without associated fracture?

1. 5%
2. 25%
3. 50%
4. 75%

What is the best diagnosis?

1. Unilateral facet joint dislocation
2. Articular pillar fracture, displaced
3. Hyperflexion sprain (anterior subluxation)
4. Uncertain

Reference:

Rotational malalignment on transverse images
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Rotation on lateral
Teaching Points – Case 1

- Left C6 articular pillar fracture with associated bilateral laminar fractures and rotational malalignment
- Unilateral facet dislocation look-alike
- Only 25% of rotational injuries have no fracture
- Include spinolaminar line in your search pattern on lateral radiographs
- Assess rotational malalignment on axial CT images

Case 2

On a lateral radiograph made with the neck in slight flexion on a 15-month-old patient, which of the following findings indicates an injury in the upper cervical spine?

1. Oval shape of C3 vertebral body
2. Anterior wedging of C3 vertebral body
3. 3 mm posterior displacement of C2 laminar point relative to C1-C3 posterior cervical line
4. 3 mm anterior displacement of posterior vertebral body cortex of C2 vertebral body relative to posterior vertebral body cortex of C3

Case courtesy of Len Swischuk, MD

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Teaching Points – Case 2
- Real C2-3 subluxation in an infant
- Distinguish from pseudosubluxation
  - Widening of C2-3 disc space by more than 50% (compared to adjacent levels)
  - Malaligned facet joints (difficult to perceive)
  - Avulsion fracture of C2 spinous process

Teaching Points – Case 3
- Current generation MDCT scanners depict soft tissue abnormalities in spinal canal that older scanners did not
- Extradural hematoma, traumatic disc "herniation," and spinal cord compression are now CT diagnoses
- Interpret soft tissue transverse and/or sagittal images on every C-spine CT

Case 3

Summary
- Use 5 lines to assess cervical spine alignment
- Distinguish articular pillar fracture from unilateral facet joint dislocation
- Differentiate C2-3 injury from pseudosubluxation
- Seek extradural soft tissue findings on MDCT
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http://www.uth.tmc.edu/radiology/RSNA/2008/west_easily_missed_cervical_spine.htm

The End