



UNIVERSITY of
ROCHESTER
MEDICAL CENTER

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DEPARTMENT OF IMAGING SCIENCES

Imaging Sciences Interesting Cases

CASE 15

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CLINICAL PRESENTATION: Patient is a 6-year-old girl status post motor vehicle accident with severe head trauma.

IMAGING FINDINGS:



Figure 1: Sagittal CT image of the cervical spine.

Figure 2: Lateral cervical spine image.

Both images show separation of the occipital bone and C1 with increased basion dens interval.

DIAGNOSIS: Distracted Occipitocranial Dissociation

DISCUSSION: Occipitocranial dissociation refers to abnormal separation of the occipitocranial junction and can include partial (subluxation) or complete (dislocation) of the occipitocranial articulations. This condition is more common in children, since the pediatric occipital condyles are small and almost horizontal and lack inherent stability;

- this injury is usually, but not invariably, fatal secondary to respiratory arrest because of injury to the lower brain stem;
- caused by severe hyperextension injury with distraction;
- in children there is a high incidence of neurologic deficits in survivors.

Normal relationship between the occipital condyles and the superior articular facets of the atlas is main-

tained by the ligamentous structure that extend between the atlas and the occiput (anterior atlantooccipital membrane, cruciform ligament) as well as the axis and the occiput (tectorial membrane, apical dental ligament). Consequently, vector forces that exceed the physiologic tolerance of these ligaments result primarily in ligamentous disruption.

The methods of determining occipitoatlantal dislocation are:

1. The distance between the basion-dental interval (BDI) which should not normally exceed 14 mm in children.
2. The distance between the basion and the rostral extension of the posterior cortical margin of the of the axis body defines the basion-axial interval (BAI) which should not normally exceed 12 mm.
3. Power ratio: ratio of the distance between the basion (B) to the midpoint of spinolaminar line of C1 (C) to the distance between the midpoint of the posterior margin of the anterior tubercle of C1 (A) and the opisthion (o) or BC/AO. The ratio is more than 1 in occipitoatlantal dislocation. Power ratio is usually normal in distracted occipitoatlantal dissociation (as opposed to dislocation) as seen in this patient.

REFERENCES:

1. Harris J, Mirvis E. The Radiology of the Acute Cervical Spine Trauma, 3rd ed. Lippincott Williams & Wilkins, 1996.