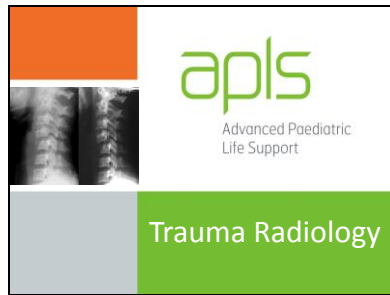


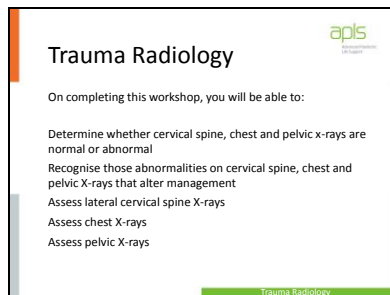
Slide 1



Please read the notes under the slides

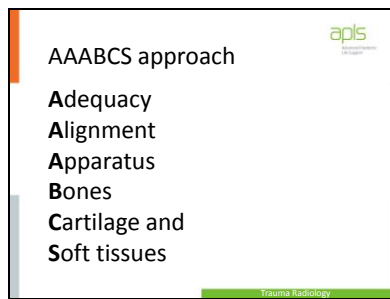
For use with APLS ANZ 5e manual, March 2013. V1

Slide 2

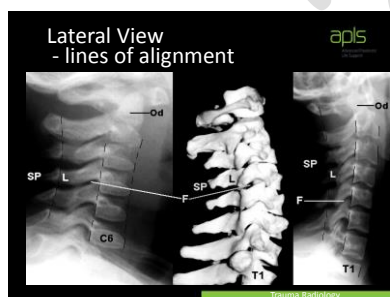


Lateral Cx Spine X-rays are still important as the use of CT for Cx spine imaging is not as universal as with adults (because of the radiation risk, particularly to the thyroid), and in many cases MRI is the preferred imaging modality if the plain X-ray is abnormal.

Slide 3



Slide 4



The contour lines of alignment

Anterior vertebral line
Posterior vertebral line
Facet line (not shown)
Spino-laminar line

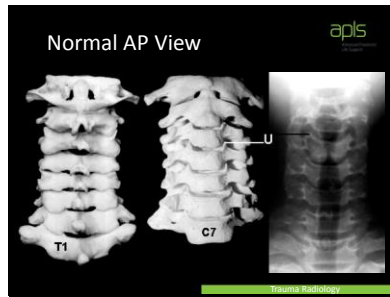
Bony landmarks

F - facet joint
SP - spinous process
L - lamina
Od - odontoid - distance from odontoid to anterior arch of C2 should be < 3mm in a child

Soft tissues

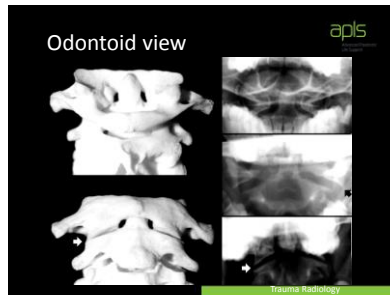
Above the larynx - less than 1/3 of vertebral body width
Below the larynx - not more than 1 vertebral body width

Slide 5



Not part of initial trauma series. Assess using same system.
5 lines of alignment.

Slide 6



Not part of initial trauma series

Slide 7



DIAGNOSIS - C2 pedicle fracture (Hangman's fracture) Cx1

KEY FEATURES

A

- Adequate film
- Abnormal alignment at C2/3 spino-laminar line

B

- Both pedicles are fractured (unstable)

The hangman's fracture is an unstable fracture of the C2 pedicles, with forward displacement of C1 and the body of C2 on C3. This is the result of hyperextension of the head relative to the neck.

Slide 8



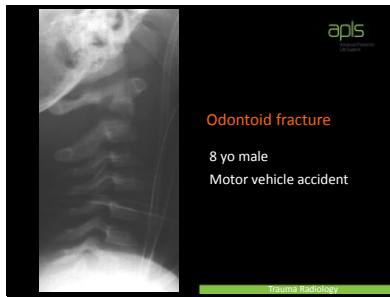
DIAGNOSIS - C2 pedicle fracture (Hangman's fracture) Cx1

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Slide 9



DIAGNOSIS - Odontoid fracture

Cx3

KEY FEATURES

A

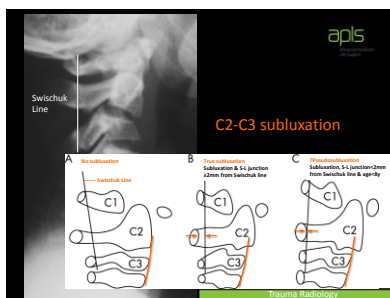
- Inadequate film
- C1 and skull displaced anteriorly

B

- Fracture line through base of odontoid process
- Anterior displacement of the odontoid process with anterior angulation with respect to the vertebral body
- Unstable fracture

C/S- can't see the soft tissues clearly enough to comment on them

Slide 10



DIAGNOSIS - C2 - C3 subluxation

Cx4

KEY FEATURES

A

- Adequate film
- Abnormal alignment at C2/3 with anterior angulation with respect to the vertebral bodies

B

- No fracture seen

C/S

- Narrowing of intervertebral disc between C2 and C3
- Normal soft tissues

*Important to differentiate from pseudosubluxation

Slide 11



Cx5

DIAGNOSIS - C4 fracture

KEY FEATURES

A

- abnormal alignment at C4/5

B

- abnormal shape to C4 vertebral body with breach in cortex of upper edge

C

- extensive prevertebral soft tissue swelling

Slide
12

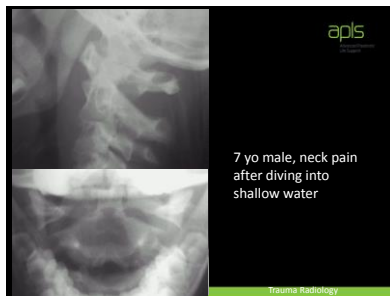


DIAGNOSIS - Distraction at C6/7
Cx9

KEY FEATURES

- Grossly widened intervertebral disc space and interspinous distance at C6/7
- Prevertebral soft tissue swelling

Slide
13



DIAGNOSIS: C1 burst fracture (Jefferson fracture)
Cx10

KEY FEATURES:

- Normal alignment
- Fractures of anterior and posterior arches - increased space between anterior part of odontoid process and anterior arch of C1 (atlantodens interval)
- Prevertebral soft tissue swelling
- On the Odontoid view there is lateral displacement of the lateral masses of C2

A Jefferson fracture is a compression and/or bursting fracture of C1. This unstable fracture is the result of a direct blow to the vertex of the head (axial compression load), either from a fall or from an object striking the vertex of the head.

The lateral margins of the lateral masses (inferior articular facets of C1) should align with the lateral margins of the structures below it (superior articular facets of C2). The space between these two facets is the atlanto-axial joint. In this radiograph, the lateral masses of C1 are displaced outward, indicating a "bursting" of the ring of C1.

Slide
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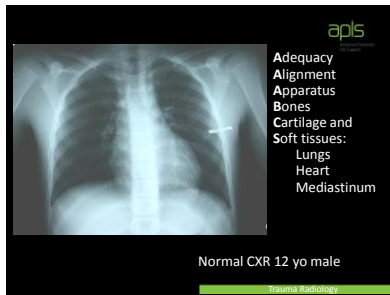


DIAGNOSIS - Retropharyngeal abscess
Cx11

KEY FEATURES

- Prevertebral soft tissue swelling
- No fracture identified ; no abnormality of alignment
- CT confirmed abscess

Slide
15



Ch1

TYPE - PA vs AP

AP- patient ill

- pitfalls - enlarged heart, enlarged

mediastinum, high diaphragms

supine - seriously ill +

- pitfalls - upper lobe blood diversion:

may miss

pneumothorax (as sits

anteriorly): may miss pleural fluid (as sits posteriorly)

ROTATION

DEGREE OF INSPIRATION

MEDICAL EQUIPMENT

MEDIASTINUM

HEART SIZE - should be less than half of internal

thoracic diameter

DIAPHRAGM - outline

LUNG FIELDS - airspace opacity

- pneumothorax:

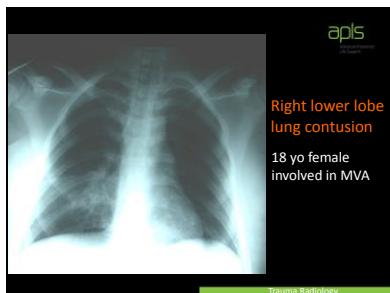
pneumomediastinum

BONES - esp ribs, clavicle, spine, sternum

SOFT TISSUE - S/C emphysema

- under diaphragm

Slide
16



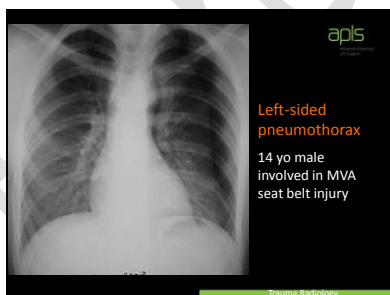
DIAGNOSIS - right lower lobe lung contusion

Ch2

KEY FEATURES

- air space opacity within the right lower lobe
- no further abnormality

Slide
17



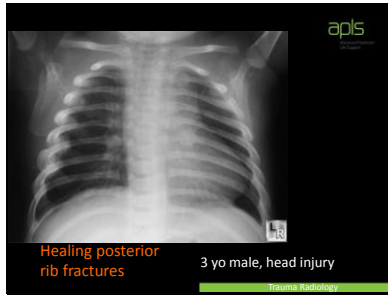
DIAGNOSIS - left sided pneumothorax

Ch3

KEY FEATURES

- loss of lung markings towards the periphery of the hemithorax
- edge of lung seen
- no underlying rib fracture

Slide
18



DIAGNOSIS - NAI

Ch4

KEY FEATURES

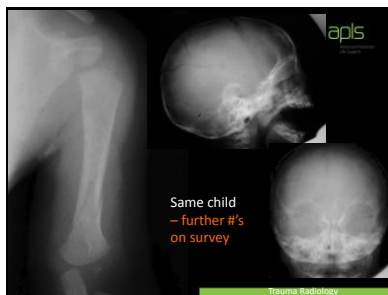
If candidate is stuck ask group why you would do a CXR in a child this age with a head injury?- “they will usually come up with screening for NAI “as the answer

- left sided posterior healing ribs fractures

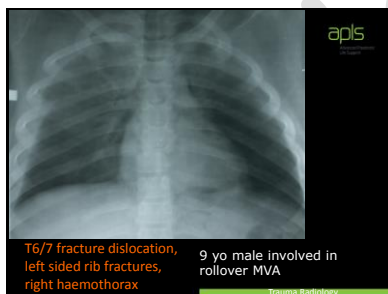
NEXT PAGE

- skeletal survey demonstrates skull fracture and long bone fracture of humerus

Slide
19



Slide
20



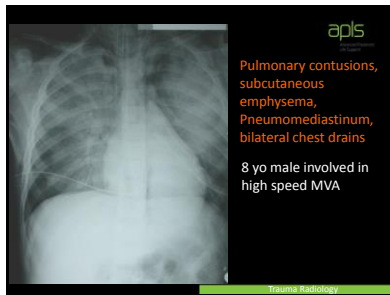
DIAGNOSIS - T6/7 fracture dislocation
- left sided rib fractures
- right haemothorax

Ch5

KEY FEATURES

- posterior rib fractures on left
- large right haemothorax- absence of air-fluid level as patient is supine.
- air space opacity in both upper zones - lung contusions
- displacement of pedicles with relation to the vertebral body at the T6/7 level

Slide
21



DIAGNOSIS - pulmonary contusions
- subcutaneous emphysema
- pneumomediastinum
- bilateral chest drains

Ch6

KEY FEATURES

- inadequate film - whole of left hemithorax not visualised
- air space opacity seen throughout both lung fields - lung contusion
- chest drains - treatment for pneumothoraces
- streaky gas opacity over the mediastinum - pneumomediastinum

Slide
22



DIAGNOSIS - Chance fracture L2

Ch7

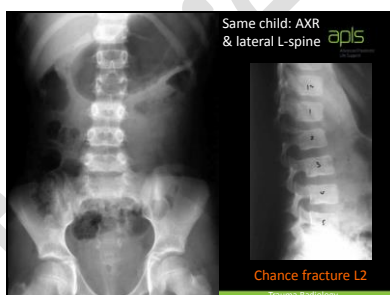
KEY FEATURES

- Check the underlying bones!
- Look under the diaphragm!
- Subtle line seen through the left pedicle of the L2 vertebral body

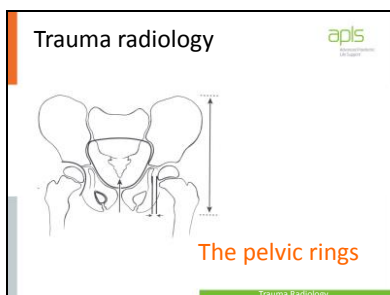
NEXT FILMS

- Fracture line much more obvious on AXR
- Extent of fracture seen clearly on lateral film

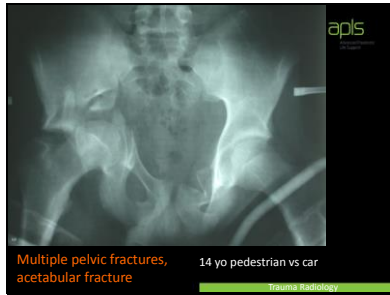
Slide
23



Slide
24



Slide
25



P2

DIAGNOSIS - Multiple pelvic fractures
- Acetabular fracture

KEY FEATURES

- Disruption of right side of pelvic ring - fracture of acetabulum - hip joint involved
- Disruption of left inferior aspect of pelvic ring - fracture of left superior pelvic ramus
- pelvic ring disrupted in two places

Slide
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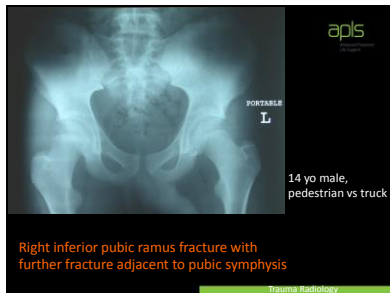
DIAGNOSIS - Pelvic fractures
- Dislocated right hip

P3

KEY FEATURES

- Inadequate film - whole of pelvis and proximal femora are not seen
- Disruption of the right side of the pelvic brim - fracture of ilium and acetabulum
- Widened pubic symphysis - diastasis
- pelvic ring broken in two places ie one bone fracture the other cartilage

Slide
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P4

DIAGNOSIS - right inferior pubic ramus fracture with further fracture adjacent to pubic symphysis

KEY FEATURES

- the right obturator ring is broken in two places - the pelvic brim and left obturator foramen is intact

Slide
28



P5

DIAGNOSIS - Dislocated right hip

KEY FEATURES

- The right femoral head does not articulate with the acetabulum - it is displaced superiorly
- There is no underlying pelvic fracture

Slide
29



P6

DIAGNOSIS - Multiple pelvic ring fractures
- Pubic diastasis

KEY FEATURES

- There are multiple disruptions to the pelvic brim
 - fracture to left side of sacrum
 - fracture to acetabulum
 - gross pubic diastasis
- presacral haematoma
- subcutaneous pelvic gas

Slide
30



Slide
31

Summary

You should now be able to:

- Determine whether cervical spine, chest and pelvic X-rays are normal or abnormal
- Recognise those abnormalities on cervical spine, chest and pelvic X-rays that alter management
- Assess lateral cervical spine X-rays
- Assess chest X-rays
- Assess pelvic X-rays

The 'apls' logo is in the top right corner and 'Trauma Radiology' is at the bottom.