

Lectured on normal anatomy

Cervical Series: medicare series

A P,
APOM
Neut. Lateral,

for 5 view add obliques; (Rt. and Lft.)

for **Davis Series** add flex and ext. views

post traumatic most prevalent
reason for flexion and extension

Neutral Ray Target

Neutral should include the base of the occiput to C7

with a loss of detail in the transition segment

C7 is hazy due to the musculature
injuries often occur in transition zones

Repeat the film if need be.

Need to be able to see
pharynx and trachea

look for

hematoma,
infection and
tumor

imaging protocols

CT scan is next
due to availability and cost,
still the dominant method with injury

Seven view Davis series

accesses mobility and stability.
the lumbar spine napsacks to force
displacement to access stability.
Look at everything. Look at intended
observations last

What's a quality film?

Anatomy should be enclosed in the
examination
with the segment above and below;
The transitions of any spinal segment are
the danger zones;

Must be able to see **cortical medullary
contrast** - big white line which is the

cortex and white mesh of trabecular
bone;

This standard is the legal one.

Have to be able to see soft tissues.

If can't see look under the hot light -
variable amplitude light source.

Failing the hot light test -film must be
repeated.

If you can only see with a hot light - must
document

Trachea is beneath the pharynx (?)

C2 7 - 9 mm is normal,

retrotracheal space

up to 22 mm

cervical curve reversed

hallmark of anatomy,
spasm due to injury

Spasm- can be caused from herniation

Torticollis

scoliosis in the coronal plane.

They respond quickly.

You can see a spasm by referral.

straight cervical curve (loss of lordosis)

18% of the population has had no trauma,
No c- curve vical curve - body must
counterbalance this,

Uses the lumbar spine and the pelvis
this torque prevents your posture from
falling too far forward.

15 degrees when doing the cervical A - P (check this)

Need to tilt up 15 degrees when doing
the A - P,

b/c disks are oriented in this plane

When the nodes calcify (common)

don't know if it is a blood vessel

vertebral artery calcified

can't see the vertebral artery calcified on
the plain

2 things in the A - P

apex and
paraspinal soft tissues

pancoast tumor

Pulmonary origin
it is pathologically bronchiogenic carcinoma 15% are in the apex,
causes sympathetic system ablation
eg. no sweating,
lip droops,
myosis (pupil constricted)
assoc. w/ enostosis

enostosis def.

Morbid bony growth developed with in the cavity of a bone or in the internal surface of the bone index

APOM

angle of the jaw
the gonion should be
parallel to the corner of the mouth.

Dens

Tip type 1,
base type 2,
type 3 intrabody,

Mock lines

watch out for Mock lines
lateral retinal inhibition (brain plays trick on you)

C1 lateral mass

should not extend more than 2 mm off to the side
if it does suspect fracture.

C1 burst fractures

Canal gets bigger thereby sparing the cord.

Transverse ligament

most important ligament in the body

RA - is a morning problem

OA - is a night problem

Taumatize a joint - you diminish its proprioceptive capabilities

Flexion Cervial view

Tuck the chin kdkdkd

don't tuck the chin - will only stress C5-C6

penny method

Done In health centers
when ever a seven series is ordered the penny method is ordered

Extension Cervical View (look up)

Oblique Cervical Views

Good to view through the IVF
chiropractic adjustment is primarily through the facet
IVFs that you are viewing are 45 degrees off midline,
15 degrees in declination

Oblique Cervical Views

45 off midline and 15 down to see the IVFs
tilt the tube up
side against the IVF is the side that you will receive
IVF is always pointed down
look up in Yochum

C1 and C2

first 15 degrees of rotation is at C1 and C2

3 causes of IVF stenosis

degeneration of uncoverbral or apophyseal joint (AP),
disc degeneration (Verticle)
congenital stenosis occurs in 5% of patients
(?)

Neuronal Plasticity

neuroinflammatory insults -can result in the radiculitis

pedicles

should be lined up and on the anterior side of the body

Pain intensity

does not match the degree of degeneration

Lateral Swimmers View

if you can't get see C7 on the lateral

look this up for positioning
 mets hangs around at transitions
 can't clear a C spine if can't see C7

pillar

part of the apophyseal joint
 is that arc of bone adjacent to the bone above and below

Right and left pillar views (cervical)

8X10,
 FFD 40 inches
 bucky grid
 patient back flat against bucky
 head turned fully to right or left and slightly flexed.
 C.R. through C4 at a 30 - 40 degree caudad tube tilt.
 (Requires 3X the mAs as other cervical views).
 Place marker on side the patient is facing.
 2 sets of pillars to look at
 Order a Philadelphia collar for the first day of your clinic opening.

Thoracic Study

A P
 Lateral and
 PA chest

Lumbar Spine Series

Routine A - P lumbosacral spot
 Lateral Lumbosacral Spot
 Right and Left Posterior Oblique
 Lateral Lumbar-convexity next to the film
 to do this you must look at the AP first

abdominal aneurysm

aorta - deminsion is 3.8 cm at the widest point
 Larger indicates aneurysm

ectatic vessel - vessel enlarged but not aneurysmal

atherosclerosis - injury to the interna and the media

Bifurcation of the common iliacs

around L4
 can also become aneurysmal

Annulus

outer posterior fibers are innervated

thoracic cage

limits sagittal motion as compared with the L1

lumbar lateral spine

allows you to see IVFs

sacral base angle

the sacral base angle is 41.7 + or - 7.7
 (In the erect posture)
 supine approx. 35

Bisection of L5 vertebral - anterior 1/3 of the sacral plain

Dens wt. Bearing line - likely to hit the anterior 2/3 of the sacrum

Bone when stressed - will proliferate

weight bearing line of the dens

drop weight bearing line of the dens
 likely to hit the anterior 2/3 of the sacrum

Degenerative retrolisthesis -L3 - L4 is most common

sacroiliac ligament - the most powerful the body

facet tropism

no sensitivity on plain film
 can't be looked for reliably

corticocorticoids

moderate dose steroids -bone reduction in one year
 depresses immune system,

If present with a fever- read handout

Radiology- involves histopahtological and biochemical components

neurogenic vs. Noneurogenic

Muscle spasms alter the geometry of the spinal column

pleuripotential fibroblasts

Proliferation of cartilage-comes from
 can later form osteophytes

curve reverse in a lumbar spine

goes straight in the lumbar spine
doesn't form the reversal that occurs in
the C - spine

instability

radiographic term assoc with
measurements ie. disc, etc.

DJD of the spine or vertebral column

see graph on action note pages 7 - 8

subchondral cyst

results from Erosion of cartilage
enough to herniate synovial fluid in the
bone

**discogenic spondylosis =
spondylosis deformans**

? combination today of handwritten,
computer and action notes
? not a good note day

Facet Joint imaging

flexion view is the easiest way to
evaluate

Know what constitutes the IVF**Entrapment syndrome**

3rd component is the central canal

1. lateral recess
2. foraminal encroachment and
3. Central canal stenosis

recurrent nerve

is nonmyelinated
branch to two levels
when they are stimulated as stretched
as occurs with aging

Sx. = diffuse poorly localized pain

PLL is a very thin ligament

espec at the L5 disc
PLL is mechanically or chemically
activated

**anchoring ligament at the back wall of
the vertebral artery**

these patients are more likely to
experience protracted pain from

the disc problem

described by Hoffman

nuclear material deep in the disc

antigenically unrecog material

posterior annulus - is very vascular
and

this nociceptive activation will result in
extreme pain

Phospholipase A2

found in high content and is found in the
inflamm pathway

Prostaglandin

notorious in producing pain in the
inflamm response

**inflamm steps ignite the
neuroinflamm**

repetitive injury like torsion forces will
exert enough changes and
patient will experience pain

**dozen or so inflamm agents have
been found**

substance P is an example

Substance P

activated in the spinal cord and
activates processing in the spinal cord
acts as a threshold lowe
thalamic and cortical centers interpret
these as pain

Allodynia

Def. Pain resulting from non-noxious
stimuli to normal skin
Receptors in the spinal cord
have had their threshold lowered,
pain itself can activate the pain lowering
process
start with noxious stimulus particularly to
nerve endings

nociception activated substance P
lowering the threshold for pain

Ephapse

Dictionary def. Point of lateralcontact
(other than a synapse) btw. nerve fibers

across which nerve impulses are conducted directly thru the nerve membranes from one fiber to another

Ephaptic

def. Denoting the conduction of the impulse across an ephaps as opposed to the synaps -

Krettner def. short circuit between neurons in the cord
close relationship btw - fibromyalgia and yuppy syndrome

Not only is the disc a source of inflammation the barrier for incoming info can be lowered or raised by either pain or proprioception

Ligaments and bone capsule and skin

have a receptor that constantly feeds into the DRG and there for can participate in the above process

herniation

manipulation does not decrease there herniation

Regarding HVLA- best guess is that the source of the inflamm was degener facet or an entrapment of a meniscus which causes inflamm
Due to this coinnervation-patient feels it arising from the sciatic nerve This is basis of referred pain - is looked at as a misinterpretation of the brain

Apophyseal Joint

capsule is two membranes
inner lining lining is a villous like material
cartilage survives from inhibition

way to trigger is physical activity

Inappropriate vector- hits the articular surface in an uneven matter cracks and fibrillation develops and eventually the cartilage falls off - ergonomics

now that the cartilage is gone -so what do we do with patients ?

oral / nutrients for reconstruction of the cartilage possible but / weak

Meniscoid picture - in Bogduck

knee joint

fibroadipose structure known as a knee joint
if hypermobile - primary problem with a meniscoid needs to be mechanically corrected
resolve the vectors to allow for the release of the meniscus

stenosis def.of

Vertebral canal

IVF

Lateral recess (**Nerve root in the lateral recess**)

neuroinflamm agents

pain syndromes without compression
substance P

Pathomechanics of the spine

because of the avascular way of the nucleus pulposis this substance is designed to fail and its failure is know as

desiccation - the nucleus just starts to dry

after MRI studies were performed it was found that this desiccation already beginning in the teens

Bias distribution - causes annular wear then nucleus pulposis seeps into these cracks

dissect - spreading out the nucleus

disc herniations

rarely seen after the age of 50

60% of the weight bearing through the disc and 40% through the apop. Jt.

nucleus does not change shape during weight bearing argue this squeeze water into the end plate and it moves back during night

patients have pain standing it is due to compression flexion or sitting relieves

extension -tightens the annular margin and bulge along the posterior fibers

instant axis of extension and flexion is the center of the nucleus pulposus is the key to the whole discussion - the instant axis of extension and flexion is the center of the nucleus pulposus
The scatter plot is less concentrated - now it is centered at the facet joint

Water cross links with the glycoprotein

picture of a discogram - this provokes there pain with injection, serves as an anatomical tool

bulge

first level of discal derangement is bulge describes circumferential exaggeration of the annulus

herniation

the size, shape and location of the herniation has no effect on prognosis
annular fragments rupture and nuclear material escapes
L4 or L5 -most commonly herniated disc usually lean away from side of herniation
This root is lifted
bigger the herniation the more rapid its resolution
Herniations patients can resolve over time
some are asymptomatic

Conus Medullaris - the termination of the cord

Filum terminale - is the end

Root syndrome -produces lower motor neuron disturbances
reflex
dermatome and
myotome

Radiculomyopathy - hit the cord and the root at the same time
mixed presentation of upper and lower symptoms

Cauda Equina Syndrome

Massive midline herniation is a problem at L4-5

bladder and bowel symp input - typical with very large herniations

either unable to urinate or are incontinent pain is very nonspecific

Pain - back of both thighs and legs

Numbness - saddle distribution buttocks, back of both thighs, legs, soles of feet

Weakness - paralysis of feet and legs (common)

Reflexes knee jerk active(L4), ankle jerk (S1)absent

Atrophy - both calves

Neurogenic Involvement - anal sphincter incompetence

bladder sphincter dynamic obstruction

36 hours rough window -beyond this is unmanagable for surgery

Nociceptive Irritant -s not only mechanical but also chemical **eg.**

K+, lactic acid

don't have to have trauma

incoming pain messages

nocieption is conducted through C fibers the other pathway is processed by emotional sensors on the brain

temporal lobe contains a memory of pain (**memory**)

limbic system the hurt of pain (**sensation**)

parietal complex is the **localization of pain**

PAG- is where the opiates hang out- drives alcoholism

Accupunture - affects the descending inhibitory pathway (DIP)

3 of joints in the C spine

intervertebral

apophyseal joints

uncovertebral

are the sites of discogenic spondylosis

discogenic spondylosis

a term reserved for the intervertebral disc

3 Signs of Discogenic Spondylosis

disc space narrowing

osteophytosis and
sclerosis
(D.O.S.)

Decreased thickness of the intervertebral disc space of C5-6
lose the disc space you see rotation of C5 on C6 (above on below)

In **C spine**- if lose disc space-the axis of rotation goes anterior

In **lumbar spine** - if lose disc space - axis of rotation goes posterior

Discogenic spondylosis
most common radiographic diagnosis in our practice
segmental, regional and global disturbances due to this
lose the disc space & forces go into the bone and bone
builds up making it more dense on radiographic examination
can cause microfractures

Endplate flattened
due to degenerative remodeling from microfractures
patient will maintain complete range of motion but
intersegmental motion will be abnormal

many times the roof sags (re: endplates)

Osteophyte
an example of tissue changes under forces

Rostral Caudal Subluxation
First joints don't move then ligaments in the zygo joints shorten - which results in rostral caudal subluxation
as the disc size diminishes the vert. above comes down
(looks like the vert. Below is coming up relative to the one above)

Anterior listhesis
problem w? degen. of the zygo joints in the lumbar spine

According to Chuck concentrate on article that he wrote in 1989

Went on to lecture on
Osteoarthritis
Discogenic spondylosis
Degeneration of the fibrocartilage in the disc
Apophyseal arthrosis - degeneration of the hyaline cartilage in the facet jts

End plate - (mentioned above) flatten due to degenerative remodeling from microfractures
patient will maintain complete range of motion, intersegmental motion will be abnormal

Compressive myelopathy
chronic degeneration of the cord

Multisegmental degenerative Anterolisthesis
input out of the C spine is suppose to go to the vestibular apparatus
Age reduction of conduction velocity
instead taking 10 ms it takes 15 ms
elderly patients lose their conduction velocity

Talked about the article that he gave us yesterday.

T1 and T2
The magnetization property is called T1 and T2
The T2 property is the magn relaxation property
T2 is a magnetic interaction of the protons in the tissue itself
impact on body-don't chop the bones- we bend the bonds -no damage
fat is white on T1 and T2 on MRI *

water bright on T2 (CSF is almost pure water) therefor
CSF is brightest on T2
fat on T2 gets a little darker as compared to T1

T2 (if)
Time relaxation - (TR) is less than 1000
Time echo (TE) is greater than 75

TE >75
TR < 1000

therefor CSF bright white (check this)
fat bright white (check this)

GRE - will always tell you that this is a fast scan
(not sure what study this is assoc. w/)

CT - soft tissue window

Fat is black *

By controlling the magnet and the radio waves

you can identify different tissue types

Radio signals - emitted from the patient

Advanced images of CT scan

fat is black on CT
(fat is white on MRI in both T1 and T2)

Nerve root in the lateral recess

Myelogram (showed us)
(saw) extradural defect eg.
osteophyte (stenosis, and herniation due to a degenerative disease)

Intradural but extramedullary-nerve root lesions in the form of neurofibroma and meningoma

2 Intradural Ddx.

neurofibroma and meningoma
(N.M.)

neurofibroma

always in cerebellar pontine angle
affect cn.s 5,6,7,8
vertigo, nyst, & ataxia
seen on mri
usu. Adult onset except w/ those have neurofibromatosis dz
falx & petrosal area

meningoma

always hyperintense on mri
varied clinical presentation
usu. Adult but not always
falx & petrosal area

Intradural Intramedullary

glioma
syrinx (fluid cavity)
epididymoma (grows off the filum terminale)

myelograms- are decreasing in number
done in conjunction with CT(aka ?)
MRI is taking its place

Neurofibromatosis

mesenchymal problem
all have the potential to undergo malignant degeneration

Huge IVF Ddx.

neurofibroma or hemorrhage

T2 normal water bright, fat on T2 gets a little darker as compared to T1

CSF0 - almost pure water
desiccation -decrease in the normal content of water in the disc
black - right next to the disc - iliac artery right next to the body

In big vessels MRI acts like an angiogram

Low signal intensity on T1 is cortex - it merges with the low signal of CSF

We don't have a lateral recess in the spine

The superior facet margins the IVF

How does a 45 degree facet come to angle negatively ?

crunch on a pillar in extension
Over 2/3 of the pillar fractures are missed on plain film
i.e pillar fract. Most frequently missed
see them on obliques
make sure you understand intra and extra dural differentials

Extradural - know differentials (?)

MRI

no matter what the pulse cortical bone = black

Tree foil configuration is replaced by a v shaped pattern

suspect pedicles are too short (these were my words)

can be totally asymptomatic until the cord is bumped

Canal stenosis (ratio method for determination)

if the ratio is not one suspect canal stenosis

procedure: measure anterior to superior on the vertebral body then

from the posterior aspect of the vertebral body to the neural arch

Canal stenosis (prevalence)

Congenital canal stenosis (more common)

high instance football players

cord elongation

occurs during flexion

about 2 mm in the lower C/S

Japanese first to see

DISH

must include 4 segments and synovial component must be normal ie disc space is preserved

DISH and PLL ossification associated

SI joints

not appreciable on AP spine radiograph degenerative changes result in narrowing

Trauma and arthritis - become the same thing after a while

Ostitis Condensans illi (OCI)

common in multiparus females (also seen in males)

osteoblastic activity away from the margin hip joint incompacitates patients-causes heart and lung dz due to inactivity

55 or 60 yoa people start to cut down activities

radiographic does not indicate treatment as far as the hip function does

medial compartment of the knee

makes a varus deformity of the leg

What s.t. structures would this be)

1.01 **Patellar to insertion** patella body should be the same

patellar alta

if the patellar tendon measures longer than the patella you probably have patellar alta

patella has the thickest cartilage in the body

Gave us 2 handouts

Pathophysiology of stress fracture after fracture there is a healing response bone healing appears on X-rays as an area of sclerosis

spondylolysis

most common stress fracture

price to pay for the athlete that does doesn't comply

Osteoporotic Fracture

doesn't call it a fracture because

is normal part of the aging process

can't find someone of age with out this problem (check this)

Not a normal fracture but at the same time it is

Not pathological

Known as a universal disease.

32 yof w/ osteoporotic fracture of the hip

considered pathological

Page 3 radiographic evaluation of fractures

Listing C3 on C4

you list the distal to the proximal

if fracture radiates everything distal to this is considered to be fragment

Angulation - convex or concavely-fracture with 20 degrees of angulation

Overriding fragment

sometimes fracture fragments override ie. where one comes next to the other

pediatric population - is no big deal

Shortening and abnormal rotation of limb

are strongly specific for pain

more the deformity the higher the poss for fracture or dislocation

Reduction fracture

over one half to one third bones must be pushed together
Complication of healing fracture with cast
 got to be immobilized - if reduction good and stabilization

In a 5-6 wk.s- callus formation (bony growth around a fracture site)

suspect nonunion

If callus not there suspect nonunion (not healing union)
 means the fracture has stabilized and begun to heal

Ribs are never - immobilized- usu. 6- 8 wks to heal but hurt long time

Clinical significance of a rib fracture

no problem unless there is a complication like pneumothorax

What is reontgen evidence?

on the inside of the cortex is osteal membrane known as the endosteum
 on outside the other one is called periosteum
 In delayed union or nonunion the fracture line may be unioned

pseudoarthrosis

should not be there
 results from the nonunion of the fragments

ways to interrupt fracture healing

alcoholism
 malnutrition

Bone atrophy

also known as osteoporosis - immobilization osteopenia (disuse), prompts calcium and phosphorus under the influence of parathormone

avasular necrosis

eg in scaphoid bone fracture due to a fall on the outstretched hand, ischemia leads to osteonecrosis

angiogenesis

new vascular supply

head of the humerus

has 3 main blood supplies
effusion in a joint tamponade and end up with deprivation of blood flow and leads to osteonecrosis

area of the impact is undergoing induration

(induration def. The process of becoming hard) soft tissue trauma maybe by the end of the 3 or 4 week, can see it on radiography

aka myosistis ossificans traumatica

myosistis ossificans traumatica

discontinue ultrasound or massage because it causes further bleeding
use the rice method

ideopathic - why these bone cells are out in the soft tissues

DDX.for bone growing in soft tissue

metastases or sports injury postinjury

stress fracture

produces bone in bone

Fat embolism - if fracture a big bone eg.

fracture of the femur
 marrow comes out into circulation
 can get caught in the pulmonary artery

open fracture

handout on "Healing of Bone, Tendon and Ligament"

Hematoma

first phase of the healing process
 if you don't clot or form hematoma you don't have the adequate framework to heal it (watch out for anticoag. Q.ustion)

Hematoma becomes organized

means that the fracture gap has started to decalcify

Repair phase - see interdigitating fragment

many people argue that reorganization is over and that over attempts to repair ie,

excessive proliferation of cells to repair which this is one concern of bone repair

Vascular supply brings in the fibroblasts

cartilage cells make cartilage and the fibroblast is pleuripotential

can make the matrix for bone cells
makes of osteoid and chondroid matrix
they stay as fibroblasts to produce collagen

this is the reference in **C** for of Mesenchymal in origin

Letter E - this invasion is known as callus - underline the term

now get immature form of stabilizing tissue

Next page letter H -

massive callus and now at the reparative phase

the remodeling phase

Increase activity in a fracture on x-ray for about 2 years in an extremity

Osteoblastic activity is stress mediated it is a piezoelectric phenomenon put strain on bone and it will produce an electrical potential

either osteoclasts or osteoblasts - depends on concave or convex bump

Polarity of the fields mediate the activity of the neighboring cells

Biopotentials or strain potentials -

Fukada and Yasuda, Becker; concept of the body as a conductor

PMFs or DC current

activates the forces recognized by the above Researchers

Twelve Significant Signs of Trauma

Abnormal Soft Tissues:

- Widened retropharyngeal space 7-9
- Widened retrotracheal space to an outside limit of 22
- Displacement of prevertebral fat stripe
- Tracheal deviation and laryngeal dislocation

7 - 9mm at C2 is significant of dislocation

respiratory problems result from this

fat stripe - anterior to vertebral column called the fat stripe

very hard to see

If a and b abnormal then c abnormal *

Blood like water will not stay in one place

If it can find away to move it will

If stay a long time it will eventually put a whole in them

Tracheal Deviation Case: athlete struck in trachea can → hemotoma
be very aware of tracheal deviation and related respiratory problems

Entubation Tube (ET) tube has to be placed until the hemotoma has resolved - called etubation

ET is not the same as ventilation

Abnormal Vertebral Alignment:

- Loss of Lordosis
- Acute kyphotic hyperangulation
- widened interspinous space
- torticollis
- Rotation of vertebral bodies

Just say the curve is increased or decreased or reversed

the abnormal finding in misalignment is an abnormal ligament

torticollis

is the equivalent of scoliosis in the C spine,

is an involuntary response

rotation of vertebral bodies

best stated as isolated vertebral rotation

segmental rotation of a vertebral body - can't rotate in isolation

must alter the segments above and below

continued segmental rotation will lead to rotatory dislocation (check)

Abnormal Joints:

- a. Abnormal middle atlantoaxial joints
- b.
- c. widening of the apop. jts
the first 15 degrees of rotation are C1,2

Abnormal middle atlantoaxial joints

The physiological conseq - is the fastest way to get input into the brain
the fastest way to disrupt this is in reference to the transverse ligament
RA is most common source- never consider this without radiography to confirm stability
20 % of Down's Kids will have this

abnormal IVD

refers to disc and disc space specifically widening of the IVD
The target of that particular mechanic we can predict the possible outcomes

What would happen with extension and rotation of the articular surface ?

Looked at slides - The trachea is always below the cartilage

Bursting comminuted fracture

can cause bleeding due to an automobile accident

following radiographic examination by a chiro the person was sent to the hospital by ambulance

Fat on T2 gets a little darker (check this seems to conflict w/ above)

Longest syrinx ever reported was 22 segments

Pulse rate of CSF- is the cardiac pulse rate

only accept 3 mm above and below

if greater tornuchal first,
then interspinous and
then flavum

Rust Sign

Do not flex a rust sign

hard collar and transport

Gradel Interspinous Pain on flexion

put the neck in flexion and when palpate find tenderness

Grade II - hyperflexion - increased interspinous space

(check this section carefully);

hyperflexion - with

nuchal injury and

flaval injury

steep angulation

the limiting translation injury is 3.5

unstable configuration - greater than a 11

hard collar this person and transport

unstable -what is holding the head on

without any movement spontaneously dislocate

fatalities have been reported with no movement

spine boards are used to transport

assume a spinal injury - until proven otherwise

w/o tx. → is progressive kyphosis

eventually become goose neck

HVLA adjusting contraindication

Untreated neck → fatality or perm disability

muscle tone resists unstable configuration until it is no longer sufficient

more than 2 is from a segment above to below is abnormal

never ever move a neck until you have done a neutral lateral

C2 and 3 facets angle downward

unlike the rest of the C spine

acute anterior herniation - when the **ALL rips off the annular fibers** which are delicate - the real problem is

sympathetic chain ablation

due to the fact they run up along the margin

goiterous mass enlargement

can cause the trachea to deviate

rotation is to the convexity

AP open mouth exam. Pt. cannot rotate to one side ie.

cock Robin appearance

Atlantoaxial dislocation

may present as non resolving torticollis

can lead to destabilization of the atlantooccipital joint

other etiology for torticollis

a form of dystonia
neuro-disorder
infantile form of torticollis

If see an IVF AP film

then the vertebrae has rotated a bunch to allow this
this pt. has a wrung c- spine & an IVF is looking at you

apophyseal joint arthrosis

could cause an anterolisthesis

Bowties sign (?)

dislocation (Goes w/apop. Arthrosis. I think)

locked facet

zero range of motion active or passive
think dislocation
this is a surgical reduction,
is an unstable segment and its management will be stabilization

atlantodental interval

5 mm in adults
3 mm in children
more important is the spinolaminar alignment

Grade III* - spinous widened & jt space uncovers

this is an unstable neck,
stay partially intact but they pull apart
the capsule has been compromised

Grade IV and dislocation

can occur unilaterally or bilaterally
may occur with rotation and flexion
forward projection of the angulation
should not exceed 11 degree angle
11 degrees is a very steep angle
3.5 mm of translation - in order for it to
advance 3 mm on the line above
there must be a dural compression *

RULE OF THREE

the cord is 7 mm in diameter

the DENS is approx 7 mm from front to back
leaving 7 mm of space 3.5 in front and 3.5 behind
a 6 mm ADI guarantees that the patient will have cord compression
the compensatory system of the cord is asymptomatic

The odds of only 1 injury from a motor vehicle is 1 out of 3
the average number of injuries is 2.3

This was all on a table on an overhead.

C2 and C6 - area has the most injury

Rules

likely to have more than 1 injury
most likely 2 and 6
the vertebral arch is the one most often hit
most are extension injuries

Clay Shovels fracture- Avulsion of the spinous process of C7

What fracture in the vertebral end plate?

avulsion and compression

compress the vertebral body

Flexion & extension (check) if then in flexion
when neck goes into flexion violently decelerating
what part of the spine undergoes ddkdkd as a rule posterior tensile, and compress thing in front like vertebral arteries

opposite in the opposite

PLL more likely injured - in flexion

patterns of dens fractures

tip
base
and into the body

Locked facet is a dislocated spine

ALL can be injured -in extension

target of injury based on mechanism

arch

most likely If multiple energies
site of injuries is usu C6 & 7

differential in the ROM is responsible
every time you see changes in the plane
of biomechanics

start to see osteophytes at T12
The transitional forces change quickly

Degenerative disease
how often do you get C7, you have to
have this, fractures hide here

Of the vertebral arch fractures number 1
in prevalence

most common target zone is 2 and 6

The arch has the highest likelihood

Most commonly injured is facet (this is
the part of the arch that breaks most
often)

Jumping facet means dislocation

**Most likely to see hyperflexion at C5
and 6**

Spinous on flexion is greater than 2 -
indicates damage to the ligaments

See dislocation as a soft tissue injury
- may have death as a outcome very
serious

Grade III facet unstable
that is greater than 3.5 mm with 11
degrees being the angle

**Soft tissue complications of
musculoskeletal injury**
See **Table 9.9**

He will submit 3 questions from the
lecture today
one from the neck
one from the pelvis or knee or shoulder
This is all in Yochum **page 681 or
684 he is now to sure**

Lateral cervical is the first thing we take

look at:

retropharyngeal interspace - C4 to 5 - 20
is allowable and the retrotracheal space -
larger than 20 blood, pus or cells (check
these)

**asymmetrical tearing that can be
viewed on the AP lower cervical**
set belts can make

Wide interspinous space - the interval
is the one above and the one below
greater than a 2 mm variance

Abnormal joints

best see differences btw flexion and
extension
may want to stop the exam

widened intervertebral disk

In the adult the endplate stays with the
body during a shearing injury

Bookend fracture of the pelvis

usually have to separate one or both SI
joints
intrapelvis hemorrhage is the most
common complication due to laceration
of a blood vessel, there can also be
bladder complications usually do to
bony injury, laceration at the rectum

Knee injuries

simple to biomechanical injuries
medial joint instability

Salter Harris Fracture of the Knee

MRI - is very sensitive to edema, very
bright on T1 and T2 weighted images

MRI has taken over imaging of the knee

Irregular signal intensity within the
proximal tibia is indicative of a tear of the
anterior tubercle with tearing of
trabecular bone
Facet uncapping or facet perching
demonstrated in a flexion view dkkdkdk
in T1 if you see bright white this is
indicative of cord bruising and hemotoma
complication this could resolve,

common sequelae to cord trauma is a syrinx
 spinal canal is really in the cord in trauma this has been known to herniate they can get a shaw pattern

MRI is great for determining a syrinx

One out of 100 people end up with headaches for life due to sensitivity to the contrast agent

Diastasis of a suture skull fracture complications headaches due to pressure from hematoma, you would want to order a T2 weighted MRI
 Why does the humerus go superior =

Wednesday, October 30, 1996

you do not view syndesmophytes in degenerative processes ??????
 know the difference between the syndesmophyte and osteophyte

The disc space is affected in DISH, by definition the SI joint must be okay but some patients do not read the textbook

The only way to tip a dens is fracture it now the different types of dens fractures the tilt should not be more than 3

advise CT
 definite if it is 5

If base is fractured type I, most common at 65% look up type III
 Reformation or reforming is the process of lifting up a view and placing it by itself

You fracture bones before you take out the transverse ligament

The more the listhesis the more likely the injury

Thursday, October 31, 1996

study trauma it is the core of the exam

Table 4 "Fingerprints" of vertebral injury

- 1. Flexion**
 1. compression, fragmentation, burst vertebral bodies
 2. Teardrop fracture
 3. Wide interspinous spaces
 4. anterolistheses
 5. locked facets
 6. narrow disc space this

is acute

Would you expect disc herniation to anterior or posterior in flexion injuries
posterior

II. Extension

1. Wide disc space
2. triangular avulsion fracture- can occur in flexion or extension
3. retrolisthesis water seed example- if extend enough it will drive the dislocation posterior question wording
4. neural arch fracture-**50% this is the most common fracture of C1**

anterolisthesis with normal interspinous space and spinolaminar line done through a neural arch fracture or unilateral facet dislocation

III. Shear

1. Lateral distraction - distraction means you have torn enough to have a grade III -the facets can be next to one another

2. lateral dislocation -Transverse process fractures

IV. Rotational

1. Rotation
2. Dislocation

Facet/pillar fractures

the neck cannot sustain rotational forces

most victims of air crashes are killed by facet dislocation due to abrupt impact

patients who have cervical spine injury
pillar angles should be at 45 degrees look up a pillar view

Locked Facet, dislocation grade III
 dislocation - facet unilateral

In an acute setting the cord bleeds very easily

Next slide multilevel congenital stenosis the person doesn't have a lamina, no spinolaminar junction
Called **Congenital Spinal Canal Stenosis**

achondroplasia

The cord in this patient is always compressed - ever since birth

Discussion went to **achondroplasia**

no extension moves with these patients never be able to determine this w/a clinical exam alone
not that the lamina is not there but it is too short

Rugby and Football players

this was reported early on in Rugby and Football players

5% of general population and up to 30% in these individuals

this cord looked like the oscar miar wenor sausage

cortex is very dense crystal & water doesn't move around well

Next slide **high signal intensity in the cord**

chordoma - nothing to do with the cord
t is a tumor of the nucleus pulposus
this slide was hemorrhage or contusion in a week her leg stopped working, how do you determine the difference from a syrinx

chordoma vs. Syrinx DDX

typically a cervical spinal injury flexion and extension

syrinx can develop 18 to twenty months after the injury

contusion is only edema in the cord sense

is occurs almost instantly

which has a better prognosis -contusion or hemorrhage - the bigger the loss of blood to cord or brain the greater the injury

would know something 48 hours

the bigger the herniation -the faster they usually resolve-

if neural signs are unrelently worsening

there is zero prognosis and the outcome of the case

know there is a herniation and there is a soft tissue case

more complex requires higher frequency of care

Friday, November 01, 1996

Criteria for joint injury

secondary ossification centers are not present in a 10 year old

understand pseudosubluxation of childhood

The base of C2 can still be fractured while it is cartilaginous

Because of the high range of motion in the children in the upper C/S they get hurt

AAP Recommendations

Down's Syndrome

If atlantodental interspace is 4.5 no sports and if they have neurological signs this is even worse

Role of radiography in ruling out instability

it is not very sensitive

Fusion - interwire stabilization is not always effective

any patient undergoing HVLA

should have same studies

Angiogram - showed us a digitally subtracted angiogram

This is the normal caliber of the vertebral artery

segmental narrowing of the vertebral artery atherosclerosis, dissecting aneurysm, or spasm

The cord has a period of 72 hours

This vessel recovers without complication

The sooner the patient is treated with thrombogenics the better the outcome

omen under 40 with hypertension and on birth control are in danger of having a problem especially those who are dizzy

Cerviogenic dizziness

look for the risk factors in young not old people

T/S compression fractures can occur in flexion

severe cord injury can result from thoracic spine fracture

Scheuermann's Disease anterior vertebral wedging of 5 degrees or more between three contiguous bodies in worst case scenario it produces a permanent kyphosis

increased growth hormone defective
dkdkdkdk

Your posture and your attitudes are linked

you see Schmorl's herniations this is the most common herniation it goes through the growth plate

If you knock off a piece of cartilage can be termed a limbus former piece of cartilage that looks like a fracture it matures next to a Schmorl's node

hyperextend the T/S they have to use isometric exercises

55 degrees of angulation consider a brace they are developing a point in the T spine

every day cases of Schermmann's doesn't warrant this

Rib fractures hang around the flank Ap compression or blunt injury, if a blow strikes from the lateral aspect you can develop a pneumothorax

Typically impact fractures are the ones you have to worry about

decreased breath sounds and laborous breathing

lung field density in a pneumothorax white line representing the pleura, so a pneumo will produce a visceral pleural line outside which can have hair

impact blows to the chest falls down steps, will give rise to abdominal pain

laceration of spleen and liver

avulsive types are less likely to do that

Afternoon Hours

Gastritis biopsy using an endoscope to guide us in this is the way to have a definite dx

Only 15% of the patients with helicobacter gastritis go on to produce peptic ulcer disease

The H2 inhibitors do not work except for symptomatic

Cytomegalovirus increasing cause of gastritis

includes HIV population

burns develop high incidence of burns

Patients with significant portions of the body burns develop gastritis in very high percentages

the percentage has to be over 15% he thinks

normal tissue, or irritation to normal tissues

3 types of acute gastritis action notes page 21

signs and symptoms of gastritis

these 2 conditions are more likely to produce a positive hemocult

if they vomit might see bright red

anorexia appetite suppressed

Give them food that is easy to digest both foods that won't delay gastric emptying no fat

soup whole vegetable stalk

Chronic Gastritis fibrotic replacement

3 main categories mucosal layer is thick, areas of hemorrhagic tissue showing through

gastric atrophy striking of the whole stomach

complications end stage fibrosis 10% higher incidence of gastric carcinoma

patients with achlorohydia key component to developing pernicious anemia

first start with chronic gastritis with fibrotic replacement eventually leads to pernicious anemia

Chronic gastritis tend to be less symptomatic than acute

We generally have a bleak prognosis in alcoholic patient may get to rock bottom

Giant Hypertrophic Gastritis (Menetrier's Ds)

Hills and valleys thicker hills and smaller valleys

Radiographic appearance ????

much more serious

Tuesday, November 05, 1996

He always asks something on the flow chart

CG plate number 4473

Roughly 2 years you have to translate after the fracture, most cases halt after bone maturation, this does not mean that they cannot become unstable

The reason they go into nonunion is that they are asymptomatic if we catch them we can brace them and they will heal like any other fracture

The spondylo date has nothing to do with automobile accident these happened back when they were a kid

Before the union separates too far one in twenty people have this problem, we can have a tremendous savings

If the spine is unstable it will go back into traction

Loading you can see instability

Thursday, November 07, 1996

3 arches exist across the wrist joint look up

3 the distal aspect of the proximal row

3rd proximal aspect of the distal row

Pisiform can be broken in martial arts, can undergo necrosis

Commet fracture of hand is the scaphoid, most common dislocation is the lunate

The hand and the wrist joint is the second most common radiograph in the US, the chest film is the most common

Sclerosis with a fracture line is called nonunion

TFCC need an MRI to visualize this, it is a little cushion or meniscus

Osteonecrosis fragment with large is collapsing, this is known as SLAC scapholunate advanced collapse

The capitate moves proximal with every flexion of the wrist like a battering ram of a particular ligament I did not catch the name

Negative ulnar variance what happens with ulnar positive variance raises risk for degenerative changes of TFCC

These complications all arise from mechanical impact of ulnar deviation

TFCC triangular fibrocartilage complex

TFCC is stabilizer of the ulnar side
1.2 mm radiographic dx creates a big problem for carpal bones and TFCC

Bayonet weapon which is a cutting edge is a congenital variation or due to posttraumatic injury

major joint injuries of the wrist carpal action with injury

Dorsal Perilunate Dislocation clinical pearl 10 days to surgically help these people or the problem is permanent

We want collinear alignment

Must remember the three arches

When the arches are broken you need consultation right away

There is a ten day window for dx of the wrist

Friday, November 08, 1996

Three lines of mensuration that apply to injury, can't leave wrist pain undiagnosed

Detection or the sensitivity dkkdkd

MRI or CT two camps on this issue

Bone scan very safe dose comparable to a 5 view lumbar series on old screen

osteoblastic activity increases metabolism and blood flow this is why it is hot on the bone scan

What is the agent used technetium 99

How does the isotope tag itself no one knows

In carpal tunnel syndrome you would expect the thenar to be smaller due to atrophy

If you put a manometer spike on flexion and extension

A hypoxia in a nerve triggers inflammatory byproducts

A root inflamm syndrome may produce a double crush syndrome

What ligament stabilizes the thumb The ulnar collateral ligament

The number one ambulatory fracture is that of a phalanx

Showed a picture of a fracture dislocation

More than 10 degrees of articular fracture ortho consultation

cartilage disruption is the basis for delayed osteoarthritis

Showed us a picture of a salter harris fracture I

The most common fracture in the 40-60 age range in the radius is a torus fracture it is a significant fracture

Torus is a type of impaction injury

Carpal injury is spared when the radius fractures

RSD due to a nonunion colle's fracture

Eponym named after Sudeck Sudeck's atrophy for RSD

The repetitive microtrauma avulsion of the medial epicondyl epiphysis

If joint doesn't fit properly uneven wear and tear

This joint can't ever be normal

Tuesday, November 12, 1996

Talked about skull radiography

Most of the time on the internal table skull or the membrane the membrane is going to move the bleeding pressure is 120 mm of mercury brain is moveable jelly

stroke is a parenchymal problem

The malignancies that go to the skull go to the femur think blastic and lytic of the femur

Infection or neoplasm may effect the skull

Both Paget's and Fibrous Dysplasia likes the face

Osteoporosis Circumscripita

1 in 10 patients have Paget's after the age of 60

Stroke is a heart attack of the brain

Sudden loss of postural tone or TIA is an ominous precursor of possible stroke

24 hours is the time period for neurodeficit in TIA

phosphates have a direct impact of calcium uptake

Headache and neural deficit = stroke

Friday, November 15, 1996

Skull X Rays on the overhead

Showed a radiograph of an 8 year old with fibrous dysplasia, with involvement of the ethmoid sinus

Like Paget's Fibrous Dysplasia is also a bone softener

Management is only for complications there is no management of the process.

Next slide Osteoporosis Circumscripita the headaches come from the first stage of Paget's

Bone turn over is abnormally high

Type of dementia assoc with Paget's

Next Phase is blastic or mixed phase

The third phase is the cotton wool appearance occurs around the pelvis also

Problem is basilar invagination.

Basilar invagination is the point of the hard palate taken back to the opisthion

The posterior arch of C1 is occipitalization nonsegmentation of the C1 arch

Occipitalization often has the anomaly assoc with it of basilar invagination

Towne Projection is the forth projection in the Skull series the best view of the foramen magnum

This patient only has half of a formamen magnum due to foramen magnum stenosis

Consider MRI if the patient has invagination to see what degree of compression exists

11 mm of basilar invagination

Alkaline phosphate would be active in this disorder

Poorly fuzzy margin is characteristic of cortical bone

Showed radiographs women had breast cancer, 60% have a skull mets, headache pain

What metastatic carcinoma sites are lytic rather than blastic lung, colon, kidney and thyroid, breast is mixed

Nasopharyngeal carcinoma is common in pipe smokers

Showed another radiograph person had headaches lots of blastic disease these are very painful, prostate cancer was the primary

What are the lucencies those are vessels meningeal middle meningeal impressions on the inner table of the skull, this is a normal radiographic finding

Prognathic mandible the jaw is way in under bit, the mandible with reference to the maxilla is disperic

The brow is very puldgy one of the few disorders that increases the joint space

Osteoarthritis haunts the acromegalic

The pit gland has overgrown has overgrown and the sella is large 14 by 17 mm this is the max for normal

The sella is very sensitive to pressure two things intracranial pressure increase of any kind, or a pit tumor

May occur inside the pit or from a pulse outside

Sellar enlargement or sellar erosion may occur from sites distal

When the CS is performed always take a look at the sella, once a year we will pick up a sella tumor

Tuesday, November 19, 1996

Skull 409 87

pages 1151 and 78

5 sequence soft tissues, skeleton, central shadow, hila and lung fields

soft tissues refers to structures on and not in the chest

region of soft tissue in the cervical spine

everything around both sides of the patient comes into scrutiny

Calcifications are seen in the neck

Axilla calcification nodes calcify due to old infection

soft tissue nodes around the chest and not in the chest

Sometimes after carbonated soft drinks can elevate the left hemidiaphragm

Carbonation is in the fundus of the soft

by definition there will be torque in the spine of a scoliotic

Each of the ribs are examined in succession

every time you do a search pattern you will superimpose the ribs on them

Mediastinum cavity is broken down 3 compartments the anterior media is from the retrosternal space to the pericardium every thing btw the sternum and the heart most fat, vessels and nodes, arteries and nerves in this compartment, middle mediastinum back to the anterior one third of the column remaining two thirds constitutes the posterior mediastinum

middle mediastinum heart, great vessels, esophagus, pulmonary vessels

Look up the structures of the mediastinum

Right side of the heart is right atrium

The right ventricle is really the right side of the heart that ventricle drains into the pulmonary trunk or pulmonary conus showed us branches of these arteries

The left pulmonary artery is higher than the right if right higher than the left it is assumed to be the result of atelectasis pulling the vessels upward

Blood has the same density of water or the heart on a CAT scan the densities are very different

The eye can appreciate 32 shades of grey

The computer can separate out 2000 shades

The ascending aorta gets blood from the left ventricle which receives its blood from an artery or vein peculiar aspect of the dkdk

L4 into the common iliacs this is the order of the aortic posticton and then it goes to the aorta as we age all of these relationships change without evidence dkdkd, increase in BP is compensatory for a decrease in stroke volume

Tortuosity the aorta on the ascending side will acutally swing out before it comes through this is not an aneurysm this is an aging change where the aorta is attempting to straighten like a hose see this on all people depending on there hx

The older the patient gets the more prominent it becomes

The mediastinum should be one half btw 50 55% is the width of the heart shadow in an adult

This pump beats 2 billion in a life time like any muscle in the body it must be conditioned it has extreme benefits for cardiac function the blood supply to the heart comes off the aortic sinus this is due to failure of perfusion this is the basis of the leading cause of death in the US

every 20 seconds some drops dead of a heart attack

collaterals grow and keep the person out of trouble until they become disease

Even stress good news can be a source of problems must get control of the persons life styles

Starving myocardium under the strain hypertrophy until these patients enter cardiac decompensation arises by enlarge from reversilbe events

Cardiac failure without sufficient multiorgan failure

Clavical the more asymmetriy the ribs are in an oblique postition and the ribs are rotated.

Wednesday, November 20, 1996

Continued with the chest x ray search sequence

Second phase is skeletal

Third central shadow

Forth is the hilum

Hilum vessels and nodes, the most common cause of death due to cancer in the US is bronchogenic carcinoma

One of the many phases of bronchogenic carcinom 15% occur in the apex

2-3 cm soft tissue density is located in the lung field, is always an anomalous finding

If nodes lumped together it is called hilar adenopathy

Metastatic disease may produce hilar adenopathy

Bilateral adenopathy is typcially infectious in origin

Bilateral hilar adenopathy of equal size and peritracheal these are structures seen on a T spine exam This is the 1,2,3 sign, indicative of sarcoid look this up

Bilateral asymmetrical lymphoma is in the differential

The presence of sarcoid the enzyme renin angiotensin ACE is elevated in sacroid, but many patients go to biopsy

Hilum gets a lot of attention

If patient has a dense hilum and it is not adenopathic whats left vascular disorder like pulmonary

hypertension causes increase size of the vessels

COPD above is a common finding

The alveolar walls degenerate the capillaries in the interstial walls degenerate

COPD is hard on the heart

Smoking causes a depression of the bodies anti inflamm mechanisms

protein distruction follows in the wake of protein destruction, the heart gets large on this side and will eventually spread to the other side

What is the most common cause of acute kdkd pulmonary emolism the patient has a few hours and then dead they look like they are having heart attacks kills 40,000 people a year

look up the definition of cor pulmonale

The parietal and visceral plura move with breathing

fluid is something similiar to synovial fluid

In the 5 phase we need to cover the entire plural surface along the edges of the ribs and scan across and look at density the density leaves the chest wall

Consolidated Lung the density should be semetrical

the Horizontal fissure is seen in the anterior rib, it is the only fissure seen in t dkdkdkd

If it elevates it becomes visible because fluid raises it up atelctasis keys on the horizontal fissure not seen on the image

When we look on the search look for abnormal decrease look for the presence of a soft tissue density

metastatic disease pulmonary, third is granulamatous disease typically histomplasmosis

the above is the differnetial for a solid pulmonary nodule anywhere in the lung

Pulmonary mass is greater than 3 cm bronchiogenic carcinoma, metastasis and infection this is the big brother of a pulmonary nodule

Threats from the heart arrhythmia , the vasculature to the heart and the valves and muscle to the heart these are

the problems we will all some day face with the heart

Mammography this examination is the only means by which breast cancer may be

palpation skills best skills at this is a gynecologist palpation is still 2 years behind dx by radiography by congressional law these can be performed on demand that is mammograms use to be doctor had to sign a slip but no more

If this trend is maintained breast cancer may be a normal finding

High mass and low kvp on mammography to produce high contrast to the breast tissue

Order of 28 branches in most people from the first branch in the lung asthma blocks a massive volume of lung, tumor tends to block the segmental bronchus right middle lobe 2 segments typically under the 20 25 year mark

The wastes in our environment vessels on a chest film are from pulmonary artery can't see coronary arteries on radiographs without a contrast agent.

Thursday, November 21, 1996

The left pulmonary artery chest film from perspective sksksk

Spent alot of time on the vessels around the heart and lungs not sure if they are the arteries of the heart

They branch until they are small capillaries around the vein carries it back to the left atrial appendage

Subclavian artery occlusion just proximal to take off that is high grade stenosis of the subclavian artery, comes down the basilar and then to the vertebral artery backwards and supplies the rest of the subclavian this is known as the subclavian steal

Look up Steele Phenomenon

Pelvic Pain when walking discomfort and dizziness

Posterior left side, and anterior is right side

Ecocardiography is ultrasound of the heart extreme perscision can be viewed in real time uncoordinated movements can be a big problem

Filling of the right side space right behind the sternum

SVC draining into the right side

Angina ecocardiography to assess damage to the wall, and angiocardiography to look at the vessel fo the heart

LAD called the Widow Maker

Many times the first symptom is MI often stress related and triggered Early Monday Morning is the greatest chance of having a heart attack stress is thought to produce emboli when arrives at the LAD you have heart attack

occlusive changes may be spasm and embolism can differentiate the two the patient has serious vascular disease

By the time the patient has occlusion they are 75 percent occluded

Collateralization can be improved with exercise the patients should be evaluated with a stress test before a rehab program

Rib Notching why would it notch due to pulsatile hydrodynamic pressure from a vessel, with beating due pressure erosion

Erosions that are saucer like due to high pressure in the system due to coarctation of the aorta

Like the aorta in or at the arch congenitally, backs up into the intercostal system it takes years to do this

Azygous of AZ this lobe arises when the AZ arises in the lung causing an invagination in the lung the AZ lobe is an example of an anomaly always cuts down in the right apex comes from when goes down the lung rather than the mediastinum

Nothing significant the lung is just anomalous

There are 1 segments on the left side

Right 4 upper and 4 lower

Phase of the search pattern take heart widest on the left and right cardiac ratio if greater than 50 %

Second Hour

How is the chest studies in the mediastinum CT with a contrast agent

What else can do this to a hemidiaphragm atelectasis can draw a

diaphragm up it never depresses it always pulls up

Pulls structures toward the side of atelectasis cancer until proven otherwise in a forty year old and older it is cancer until proven otherwise

infection or spasm can elevate a hemidiaphragm

mass underneath pulls it up unilateral diaphragm

Look through the heart shadow

Fibrous tissue and calcification old inflammation or an old process

Atelectasis means there is incomplete inflation of the lung, because of obstruction of a bronchus

Scar form of atelectasis the air distal to the obstruction will eventually be absorbed, in that circumstance the alveoli collapse resulting in the displacement of structures

The direct sign is fissural displacement these are referred to as direct sign **know the difference btw direct and indirect atelectasis atelectasis is the leading cause of death due to cancer that is bronchiogenic carcinoma most common manifestation is atelectasis**

13 % prognosis for central bronchiogenic carcinoma

Tuesday, November 26, 1996

What is the worry with atelectasis trachea and mediastinum is not where it should be

The basis for atelectasis is obstruction of a bronchiole pathway

What is significance of bronchiogenic carcinoma

Tracheal displacement a hemidiaphragm and the fissure

If this were a C spine examination trachea deviation instead of aeration this would raise consideration for a chest examination

Contrast is an important component to determine vascular from nonvascular

Infection more chronic is tuberculosis may go months with out diagnosis and treatment

AN opaque line vein of azygous circulation this represents the fissure, a little lobe all of its own

Eventually calcific densities represent granulomatous infection common in the region

The absence of a boarder or failure silohhette sign failure or absence of a boarder when air is replaced in substitution of the air

Sil sign loss of a boarder contiguous with a pulmonary infiltrate

This is one of the most important signs in skeletal radiology

Failure to identify a boarder is a sil sign

What does the arrow indicate diaphragm The disparity of the diaphragm from one side to another should not be more than one interspinous space

Diagnostic pneumopertioneum air was insufflated into the diaphragm

Pulmonary mass greater than 3 cm carcinoma, metastasis or abscess

Massive infiltration of the alveolar airspace by tumor

In order for clavicle to be lifted up this is the apical lordotic position by angulation of the tube or by posture of the patient easier to just move the tube

Anytime a shoulder series or Tspine series demonstrates dkdkdk PA and lateral chest should be obtained if you are sure it is there then do chest series

15% of the time bronchiogenic carcinoma hides in the lung apices

If cartilage calcifies it will look more pronounced and it is an incidental finding costochondritis does not have a radiographic finding

The non smoker has a worse prognosis, because the doctor usually does not think it is significant

Solitary bronchiogenic carcinoma, met carcinoma, non calcified granuloma this would be the best news

About 30 % survival rate

5 phase lung search sequence

calcium is the major differentiating feature btw kdkdkdk

There is a way to quantify the doubling time of a lesion the presence of an old radiograph magic number is

2 years greater than 2 years is outside the hx of a growing malignancy

1 year interval is not enough time

If only one X ray you need a CT and a consultation

something on the chest can appear as if it is in the chest something like chewing gum

Mets that go to the chest reproductive, prostate testicle ovary uterus breast cancer, and lung mets to lung

Mets to the lung is what kills children with osteogenic carcinoma

The right hemidiaphragm phrenic nerve irritation only a part of the diaphragm has a hump as a result of pressure in the peritoneal cavity, you know it is congenital when on the lateral it is anterior elevation, it has no clinical significance need to determine if it is moving the phrenic nerve may be impaired

COPD flattens the diaphragm the lung has too much air and forces the diaphragm downwards

Tuesday, December 03, 1996

Dr. Golden came in to lecture today. This lecture has 3 parts chest radiograph pitfalls

Atelectasis is one of his favorite things

Next slide calcification of the azygous vein

Next slide large radiopaque mass in the lung, hard to tell if right hemidiaphragm or mass, the most definitive dx is intraperitoneal gas filling, if it doesn't fill on one side this indicates may be tumor, in this case it was bronchiogenic carcinoma

this was a review of Kettner's stuff

Today's new stuff

Next slide hyperinflation tends to give you a black lung, if take picture with COPD and you think they are over penetrated, this slide was tissue on one side a breast was removed and the other intact side it was giving the look of an infiltrative process

Next slide solitary pulmonary nodule and abscess are cousins ?????? Turned out to be a left nipple, as the tissue density increases it appears on

the film, if overlying a rib it can look just like mets.

a great inspiratory effort will tend to elongate the heart and it will twist, this slide of a nipple

next slide overlap of the same structure, blood pus or cells tumor, this was a subpulmonic effusion it layers out in the bottom portion of the lungs, gives you a false floor for the lung field, this turned out to be a hernia, you would want to take them for fluoscopy to observe there breathing can actually see diaphragmatic motion

diagnostic for hernia of abdominal contents superiorly this can be due to phrenic nerve paralysis we will have paradoxical motion of the diaphragm, if balloons upward and is easily seen with the radiograph

mediastinal mass could take out part of the phrenic nerve

right diaphragm is usually 1 intercostal space higher, if 2 or 3 take and inspiratory and expiratory reserve to look for change

next slide if done well a good lordotic has the clavicle above the apices, this might be a aneurysm of one of the great vessels

great location is a subclavicular location solid pulmonary nodule

three basic bumps of the left heavy shadow aortic nobe, atrial and ventricular

Wednesday, December 04, 1996

systemic hypertension causes widening and uncoiling of the aorta

scoliosis the ribs are wider on the convex side and closer together on the concave side