Billedanatomi: Truncus

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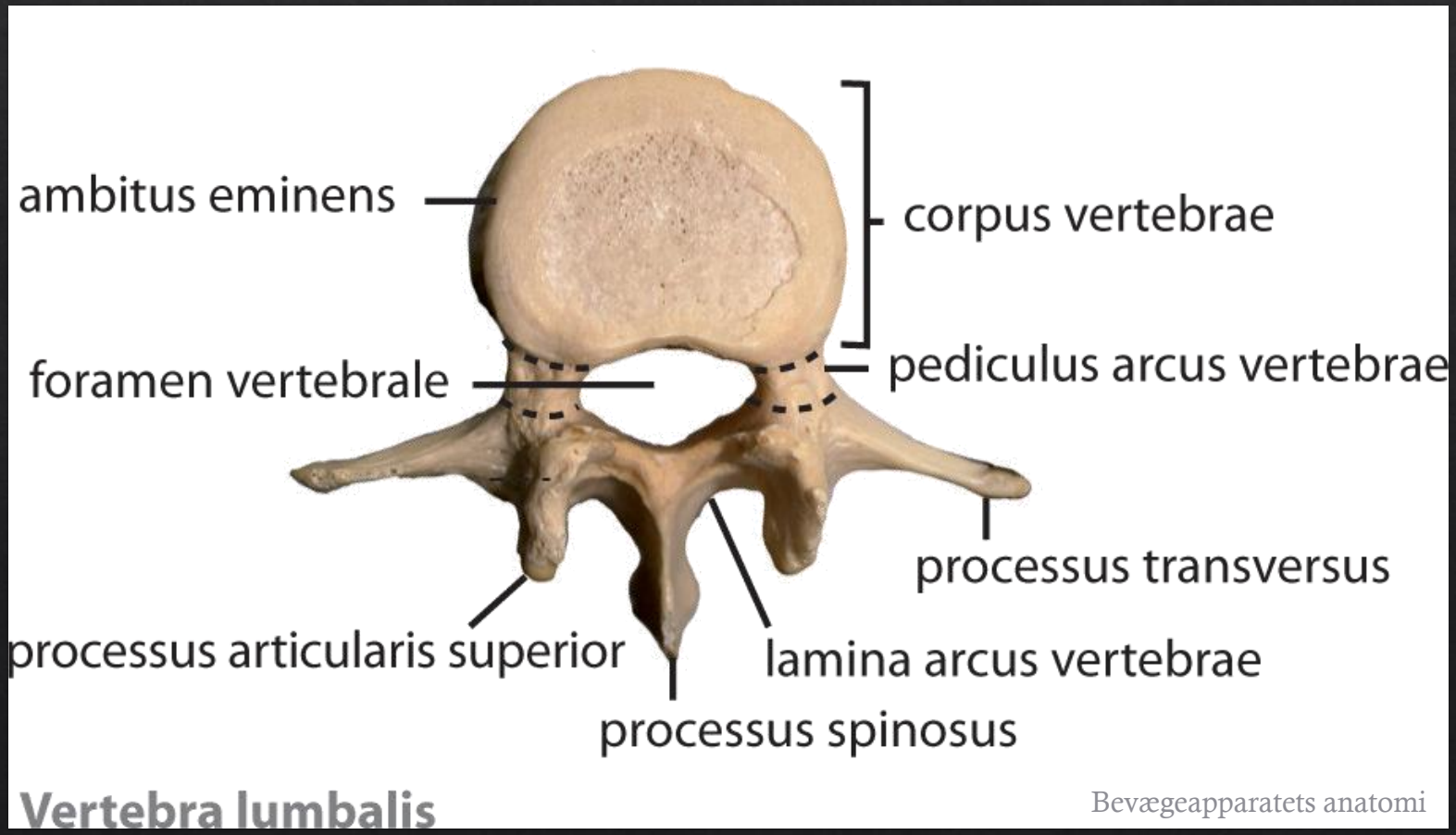
Overlæge

Røntgen og Skanning, Aarhus Universitetshospital

Introduktion til columna
Columna cervicalis – artrose og prolaps
MBH

Hvirvlen

Hvirvlens opbygning



CT skanning af columna lumbalis

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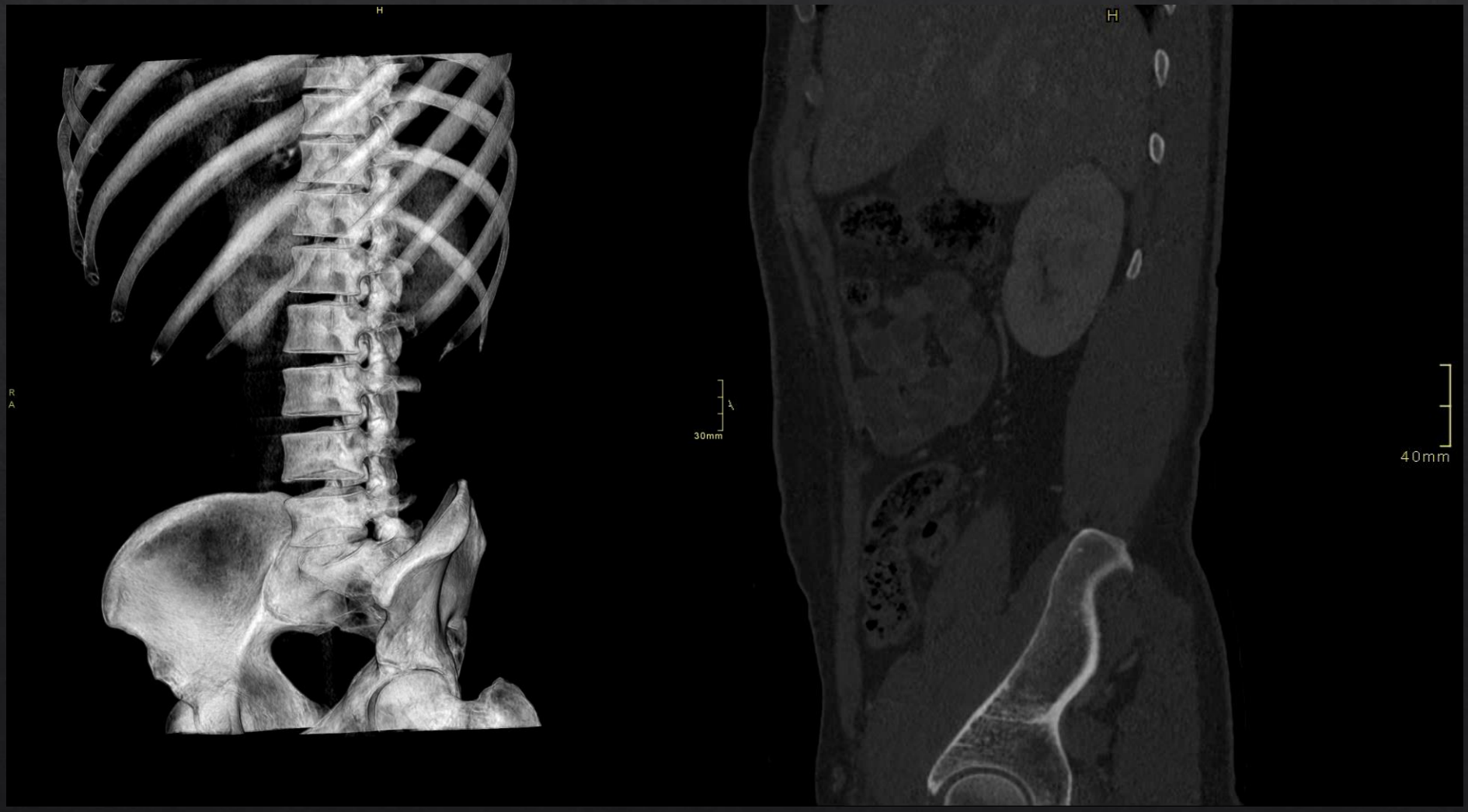
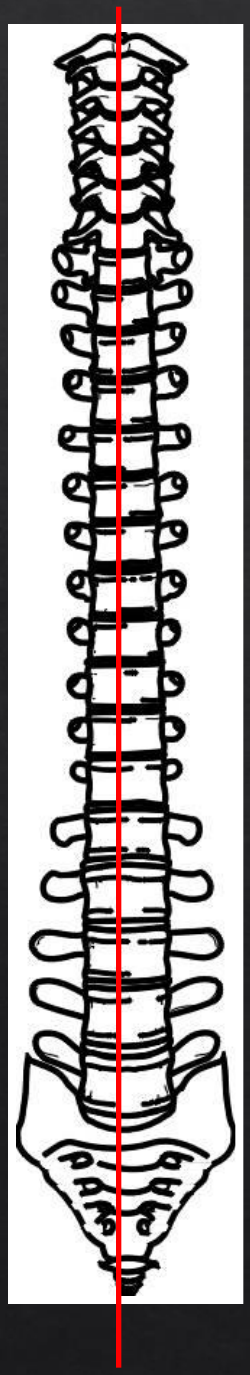


Columna vertebralis krumninger

Udvikling



Frontalt ses ingen krumning

Thorakal kyfose

(Primær)

Sakral kyfose

(Primær)

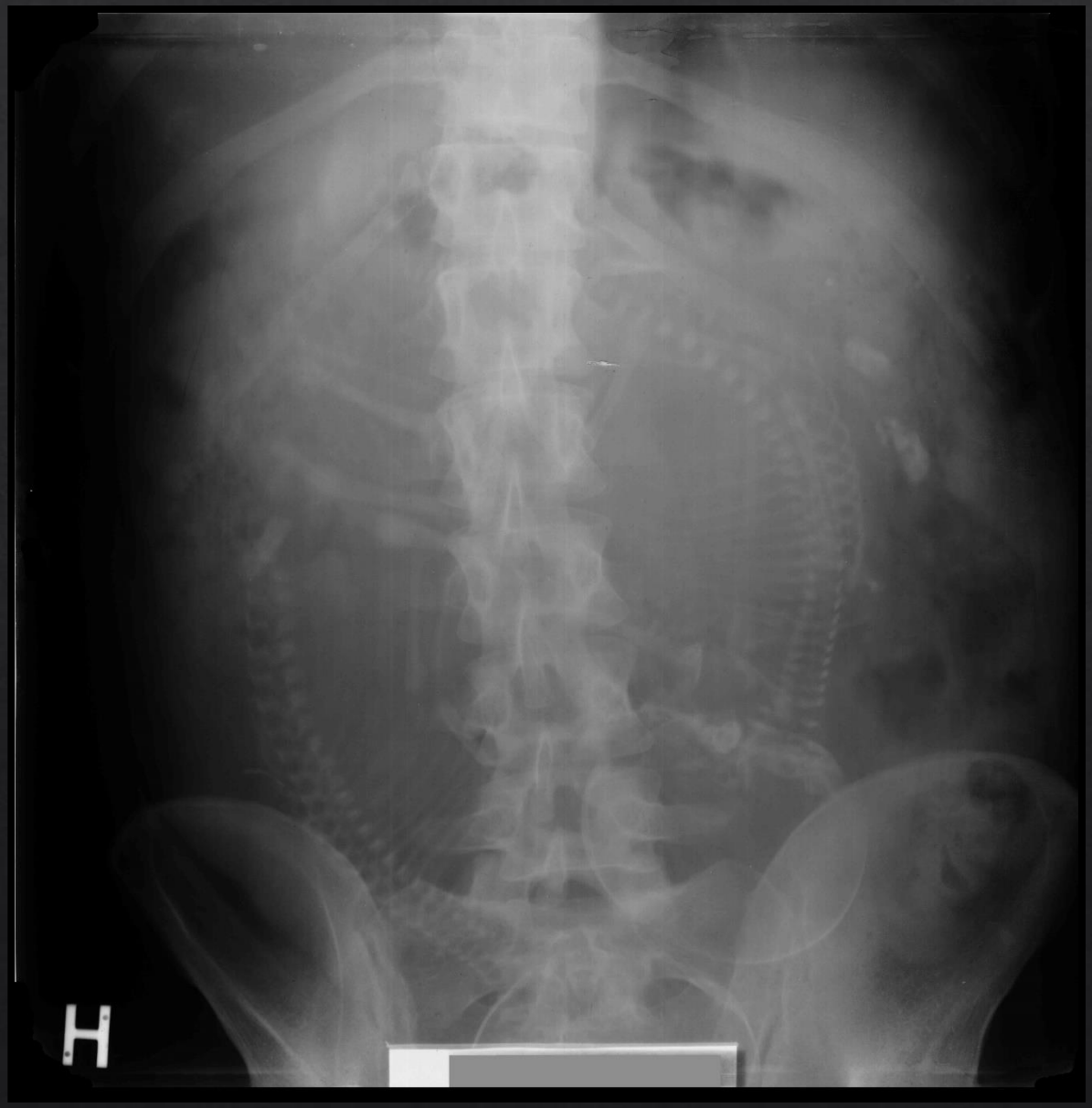
Cervikal lordose

(Sekundær)

Lænde lordose

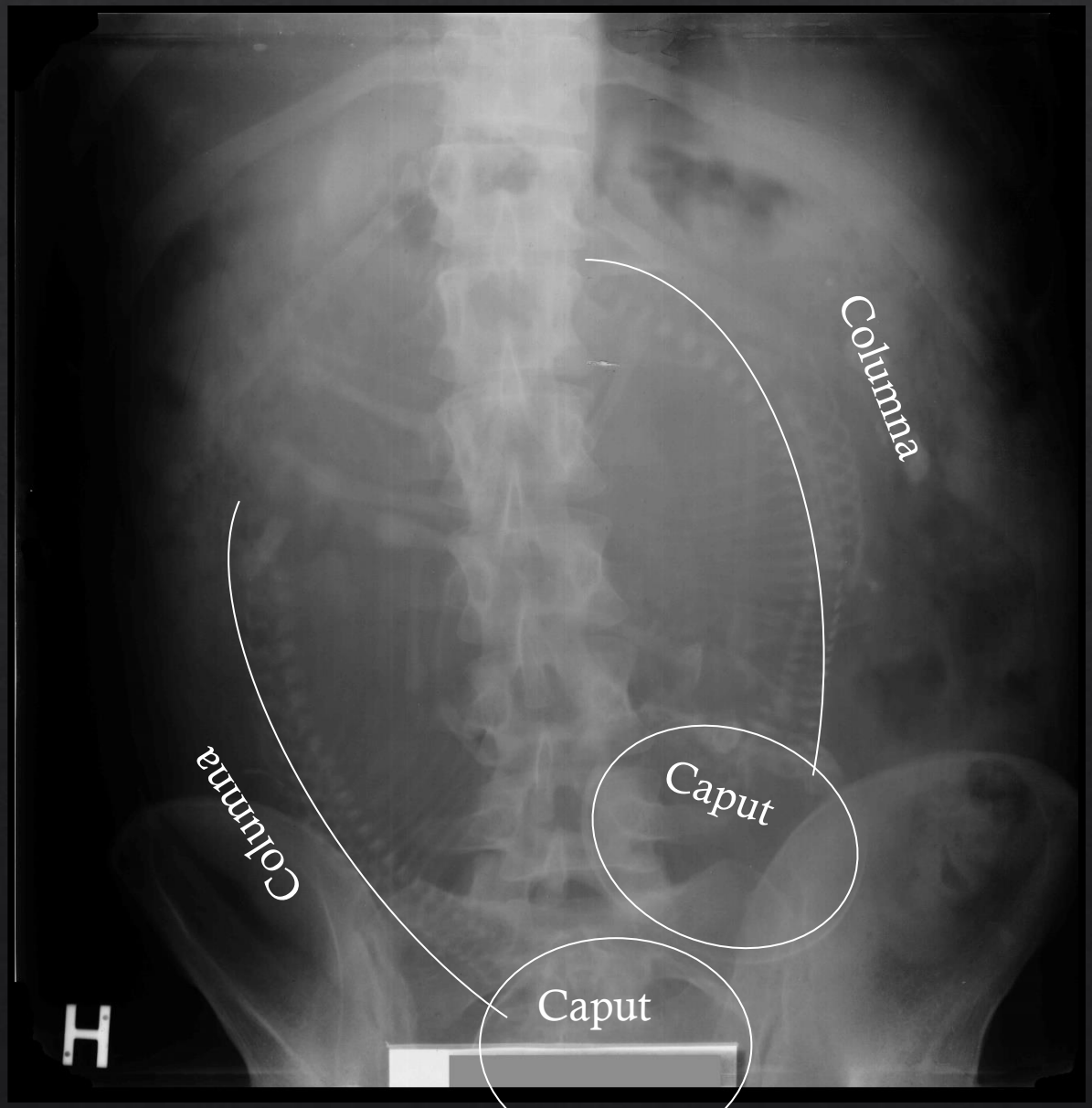
(Sekundær)

Oversigt over abdomen, kvinde 32 år med gemelli



Kyfoser:
Primære

Oversigt over abdomen, kvinde 32 år med gemelli



Kyfoserne er primære, idet fosteret i livmoderen ligger rullet sammen, således columna udgør en lang kyfose.
På billedet til venstre ses tvillinger (gemelli), med markering af hovedet og columna.
Knoglerne i arme og ben kan også ses.
Røntgenbilledet er fra før ultralyd var tilgængelig, denne undersøgelse udføres ikke længere hos gravide.

7 mdr. gammel pige.

6 uger: Barnet smiler

9-10 uger: Ruller fra siden til ryggen

3-4 måneder: Løfter hovedet og skuldrene, når det ligger på maven

6 måneder: Sidder med støtte

9 måneder: Kan sætte sig op

9-10 måneder: Siger enkle tostavelsesord som "mor" og "far"

12 måneder: Forstår enkle kommandoer

12 måneder: Kan stå uden støtte i et sekund eller to

18 måneder: Forsøger at spise med ske

18 måneder: Går uden hjælp

18 måneder :Kan stable 3-4 klodser

2-3 år: Kan have kontrol over urin og afføring

3 år: Taler i enkle sætninger

3 år: Klæder sig af og på med lidt hjælp

5 år: Kan tegne en figur med hoved, krop, arme og ben

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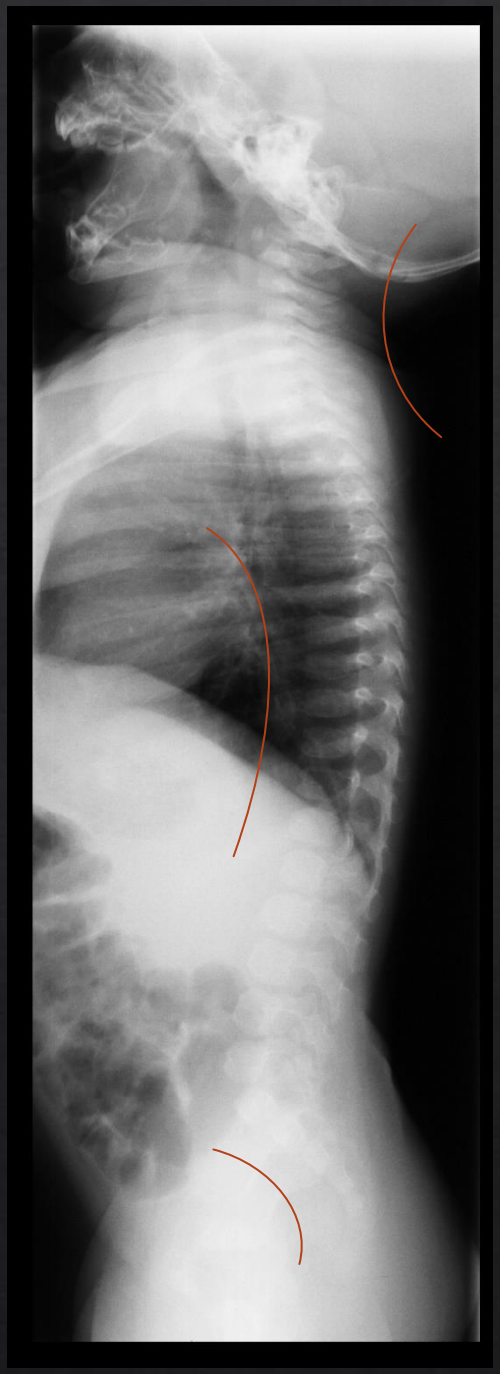
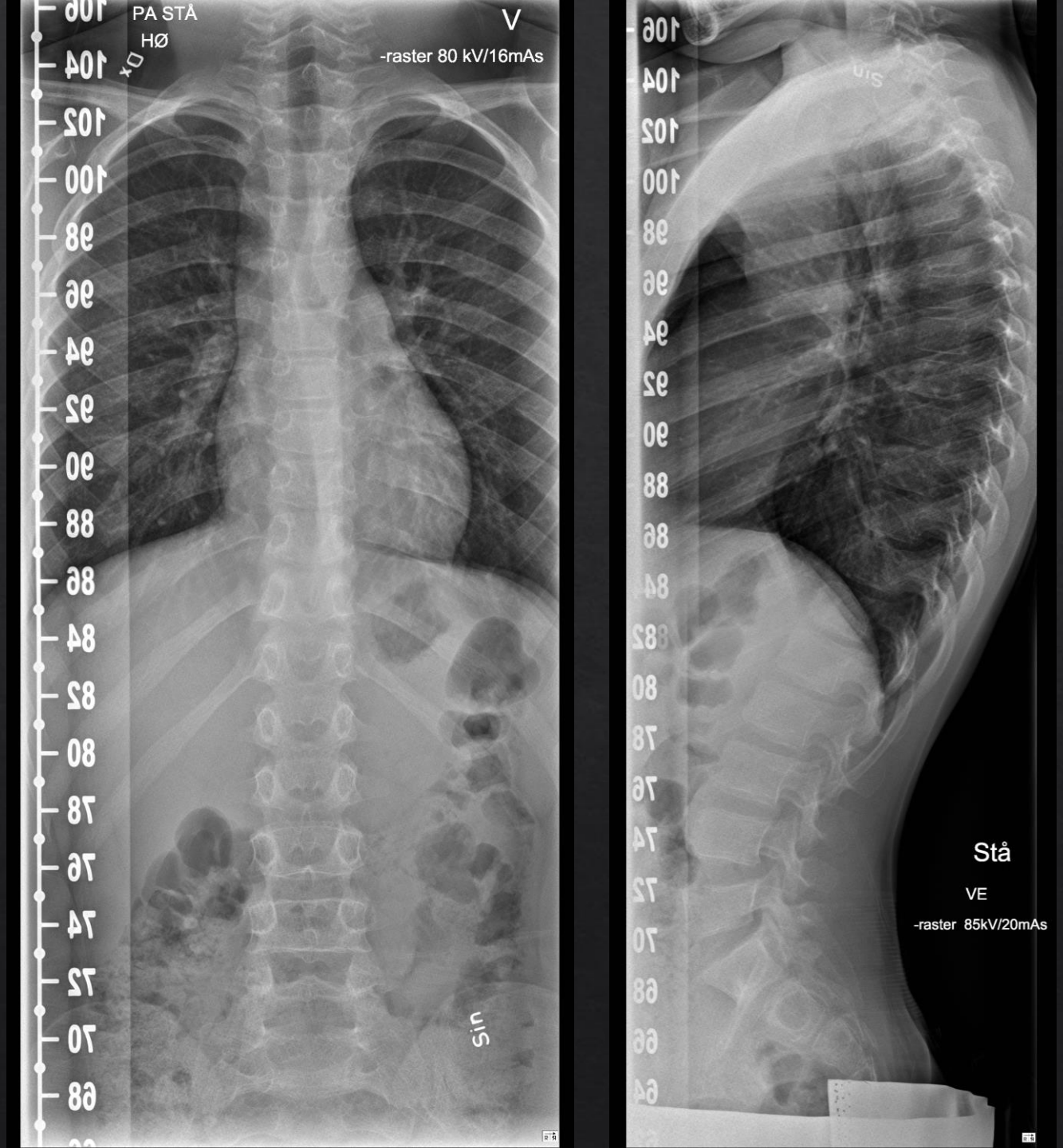


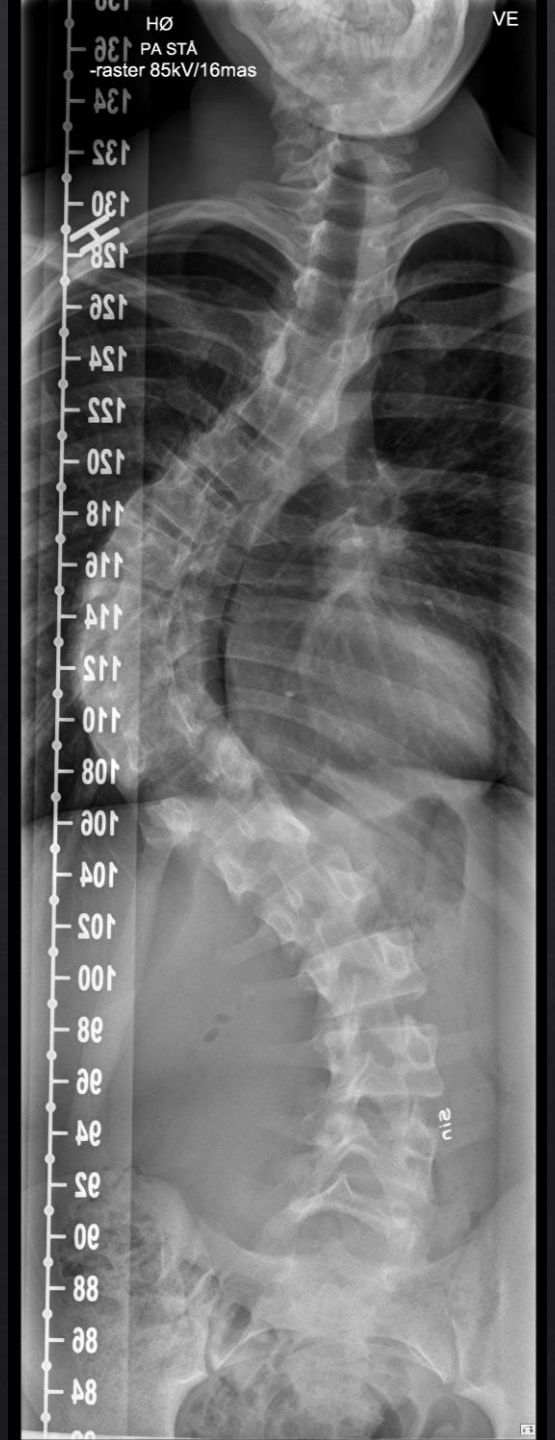
7 mdr. gammel pige.

Her ses cervical lordose.
Der er vinkling mellem
columna lumbalis og
os sacrum, men fortsat
langstrakt torakolumbal kyfose.



16-årig dreng

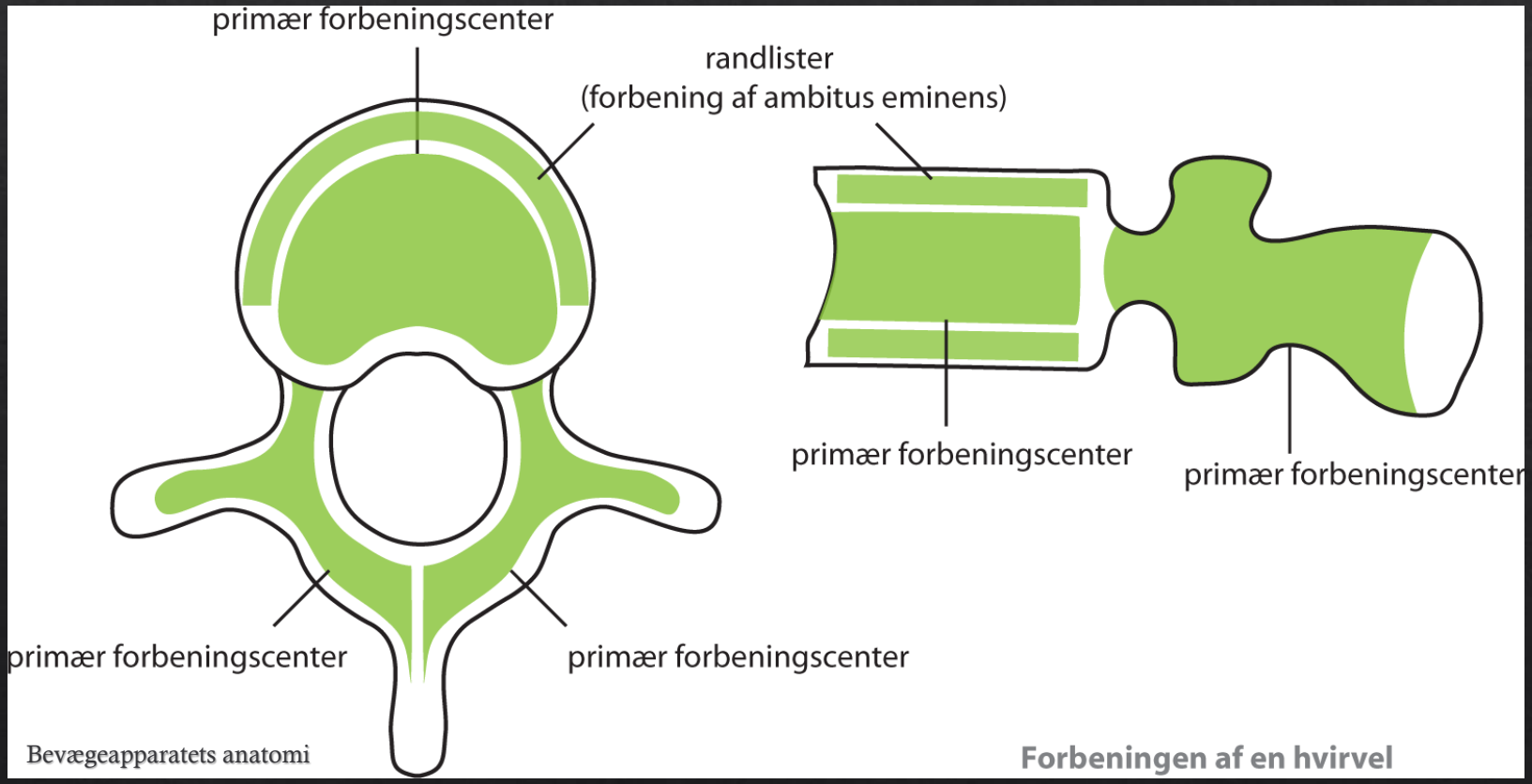
HØ
VE
PA STÅ
-raster 85kV/16mas



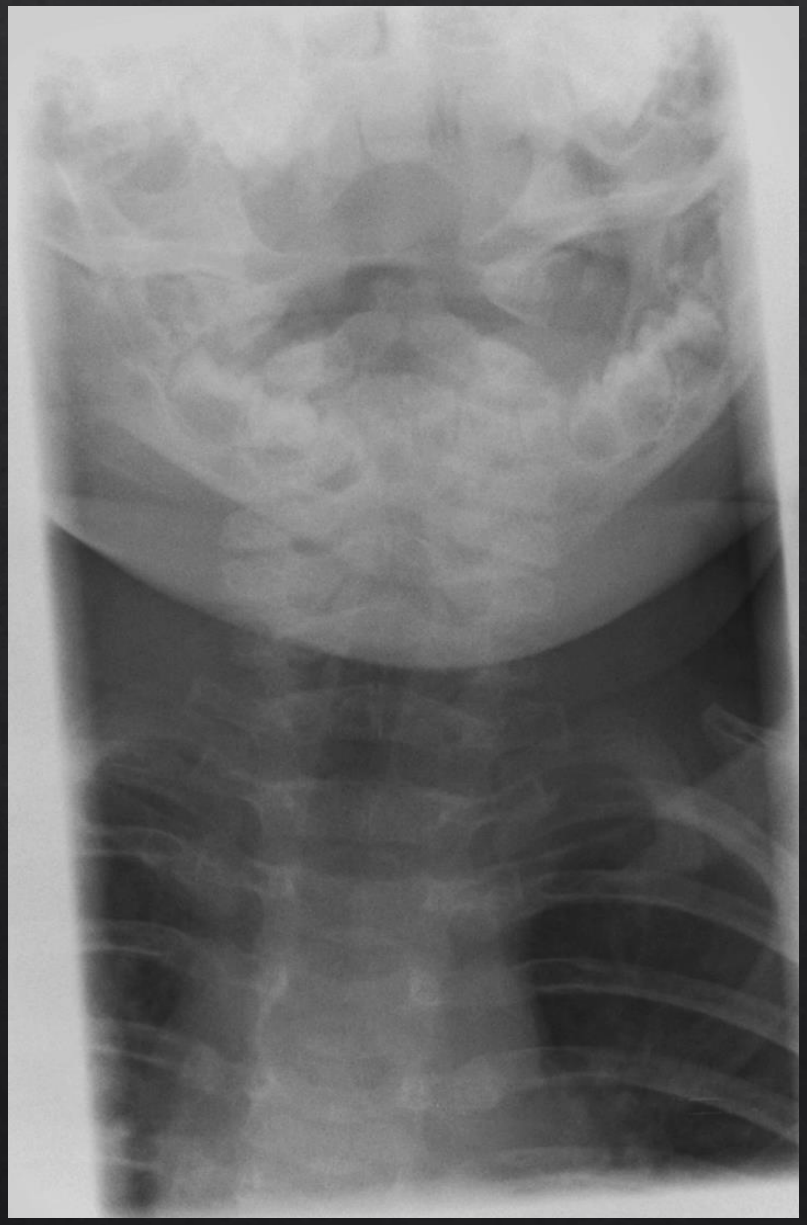
Større afvigelser fra den lige columna i frontal plan kaldes skoliose.
Selve vinklen måles som vist fra de hvirvler der vender ind i konkaviteten.
Kan man ikke sikkert se dækpladerne benyttes pediklerne.
Denne skoliose kaldes dextrokonveks, da den er konveks mod højre.

Columna vertebralis

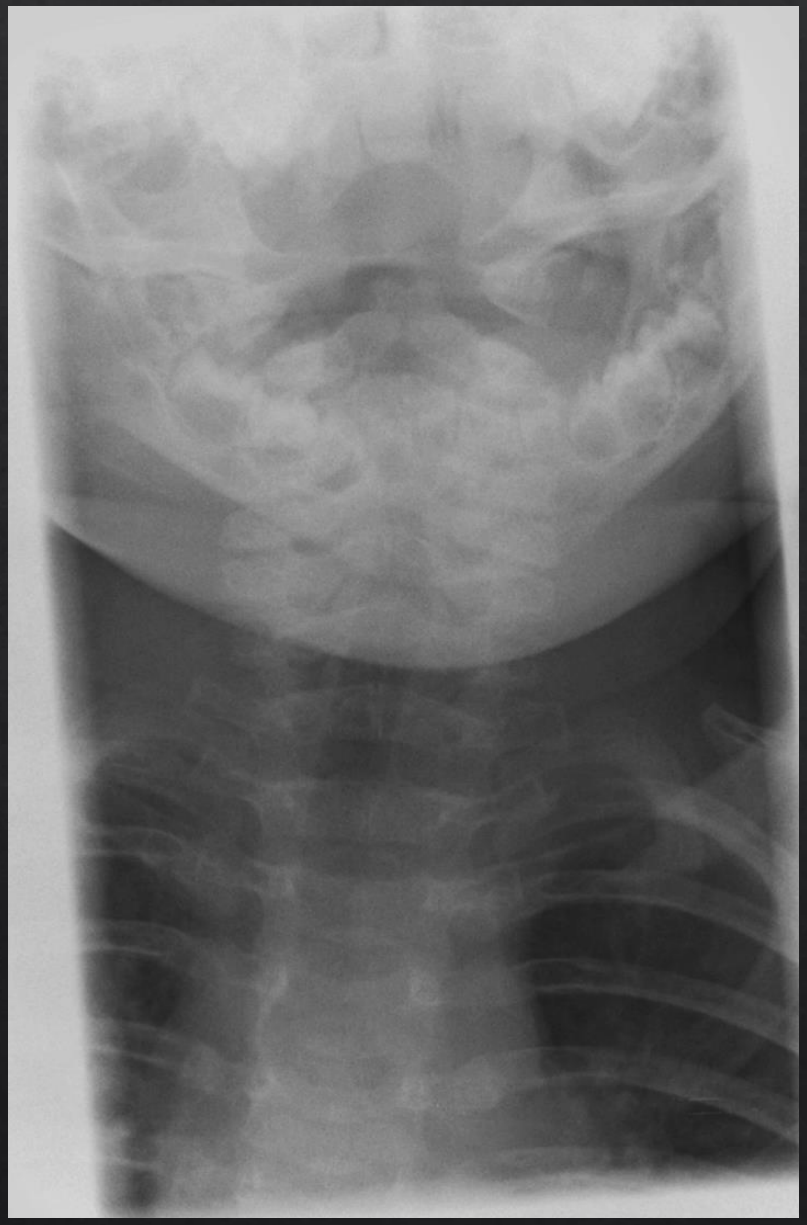
Hvivlernes udvikling



Forbeningen af en hvirvel




6 mdr. gammel pige.



6 mdr. gammel pige.

Arcus anterior atlantis er endnu ikke ossificeret hos dette barn. Det er den hos 20% ved fødslen og hos resten sker det i løbet af det første leveår

C1

C2

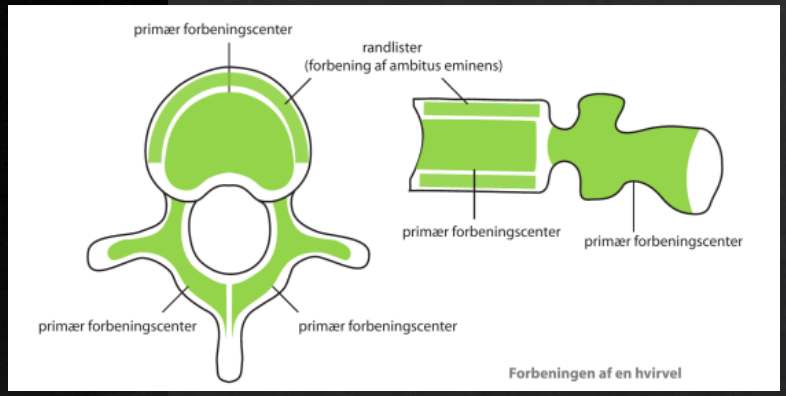
C3

C4

C5

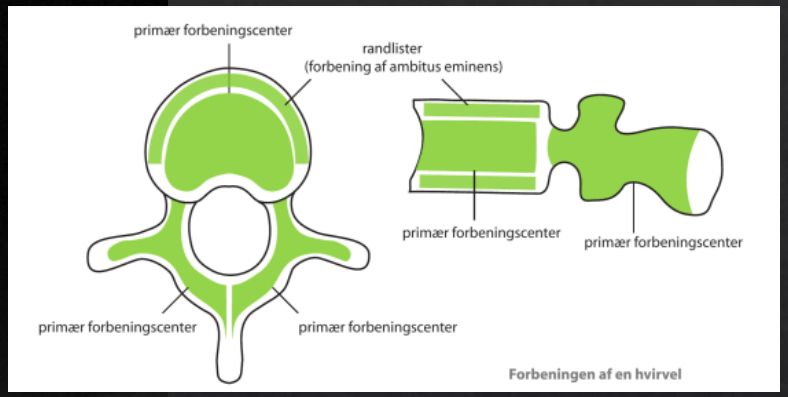
Dens axis endnu ikke fusioneret med corpus af C2

7 mdr. gammel pige.



Bevægeapparatets anatomi, 13. udg.

7 mdr. gammel pige.



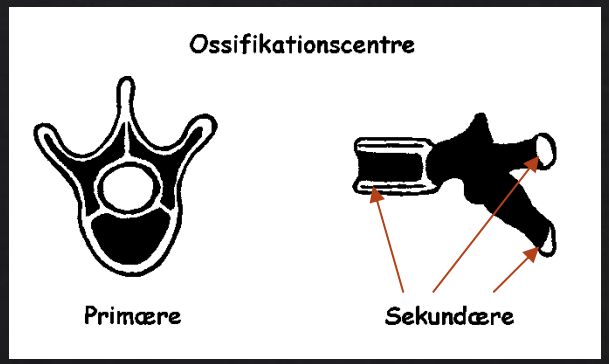
Bevægeapparatets anatomi, 13. udg.

Der er endnu en synchondrose mellem de primære ossifikations centre. Denne er af brusk, og kan ikke ses på røntgenbilleder.

Arcus

Corpus

Pige 8 år




Pige 8 år
?
?
?
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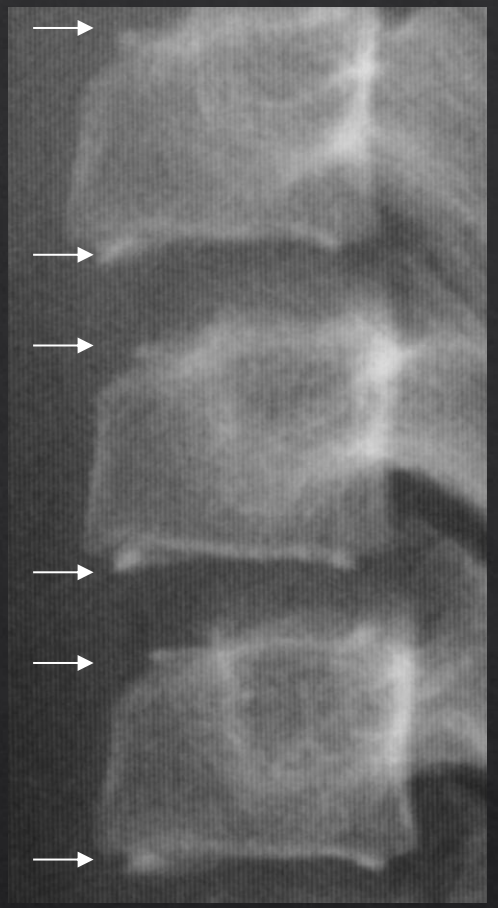
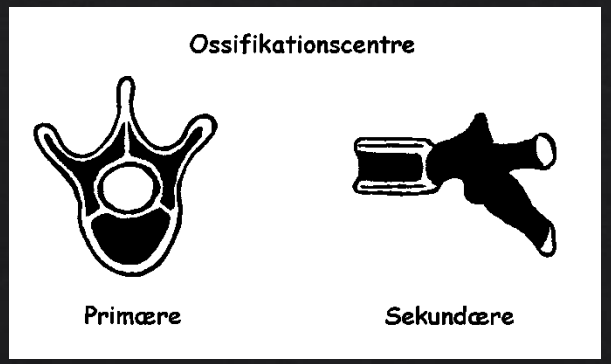



Ossifikationscentre
Primære
Sekundære

Pige 8 år

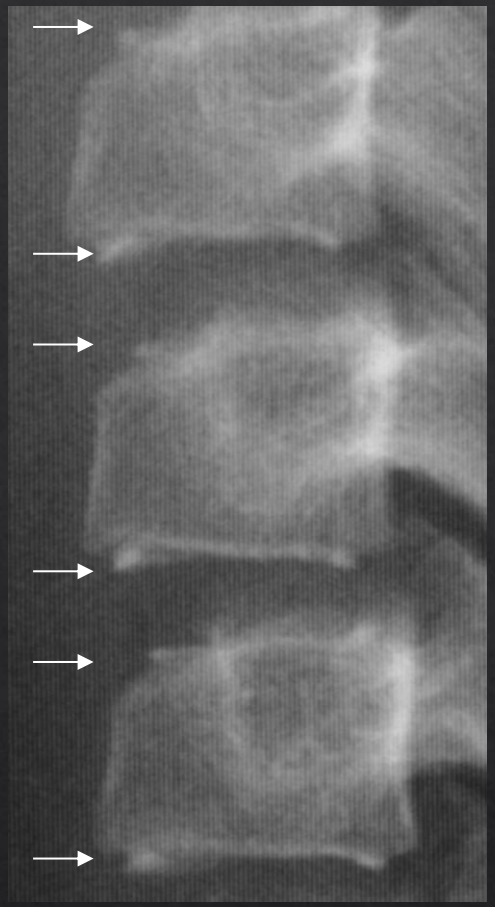
Arcus posterior atlantis

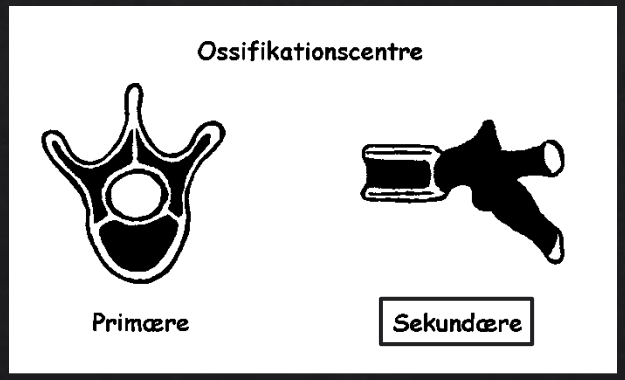
Os hyoideum

Processus spinosus

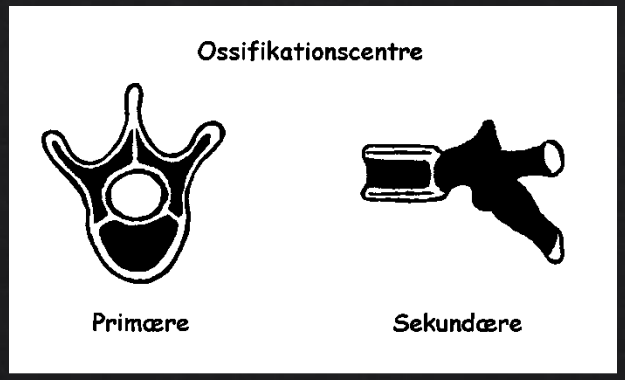
Processus articularis sup. et inf. C5

Trachea

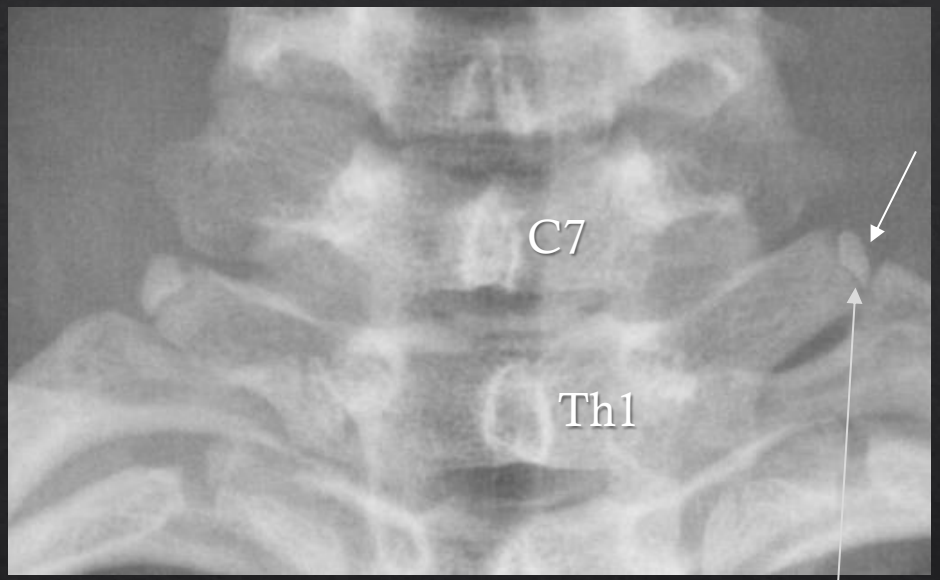


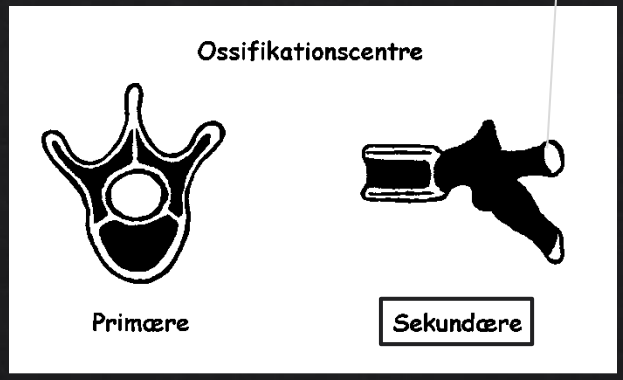


Dreng 16 år

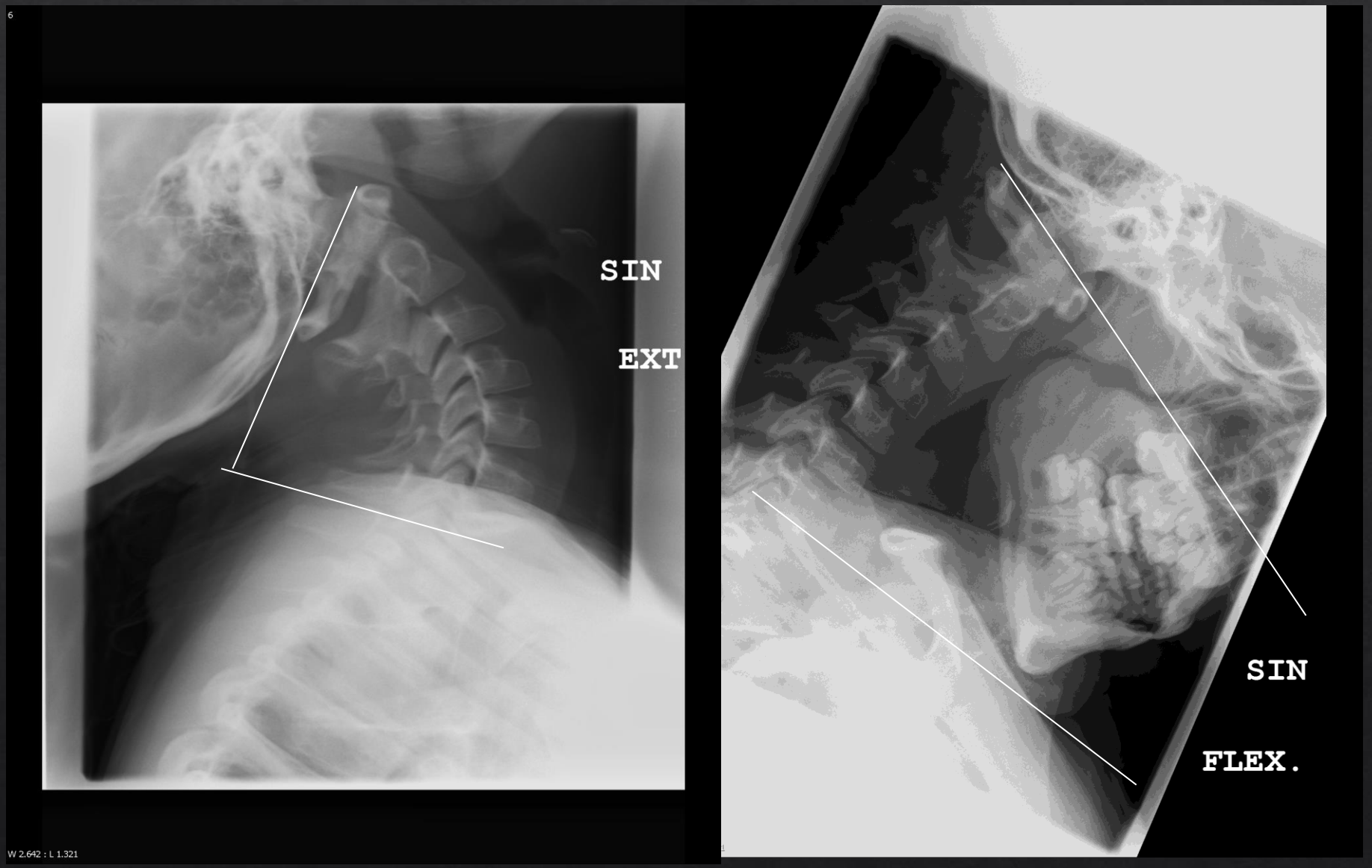


Dreng 16 år





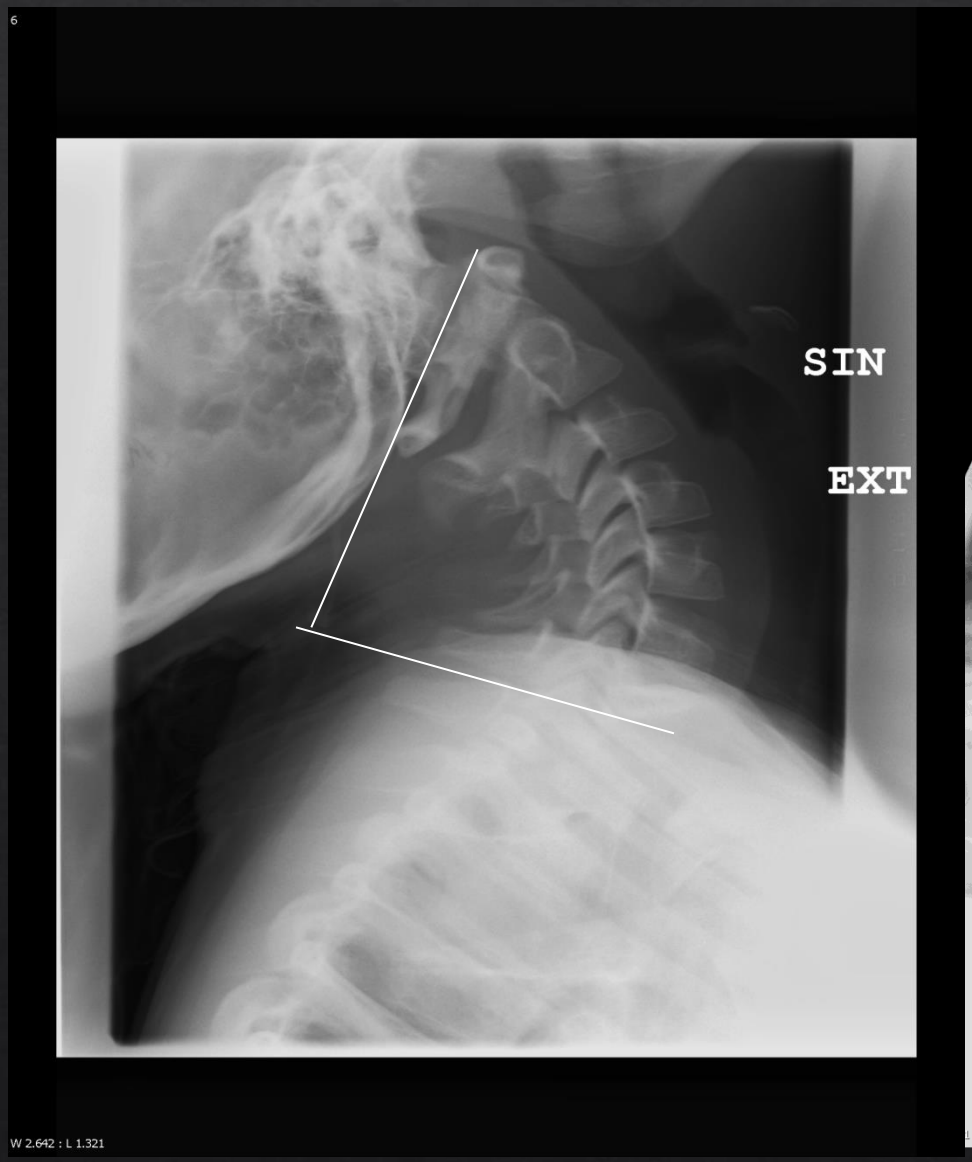
Columna cervicalis



Pige, 8 år

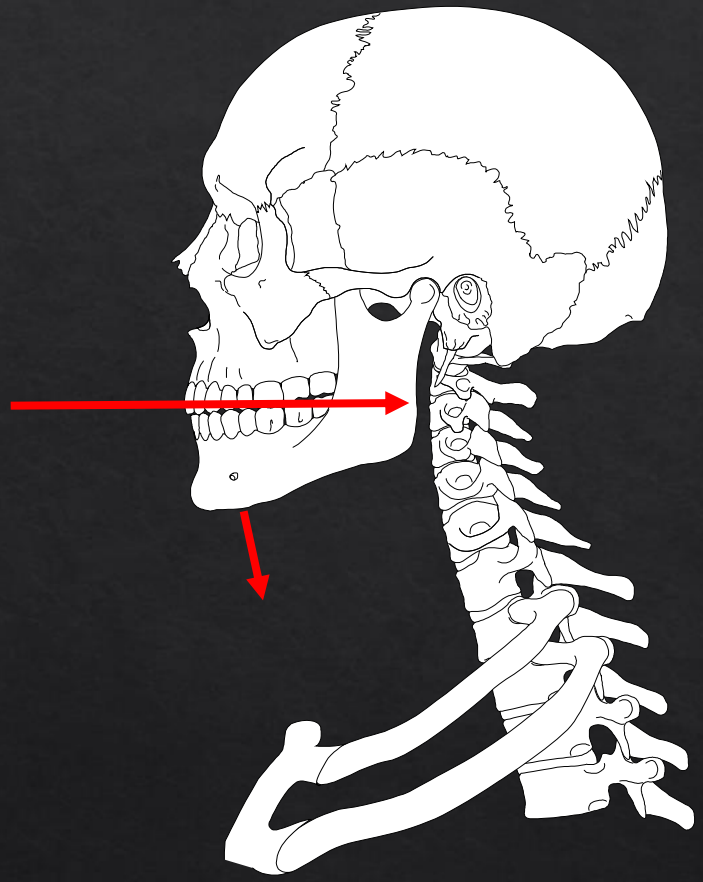
Extension

Flexion

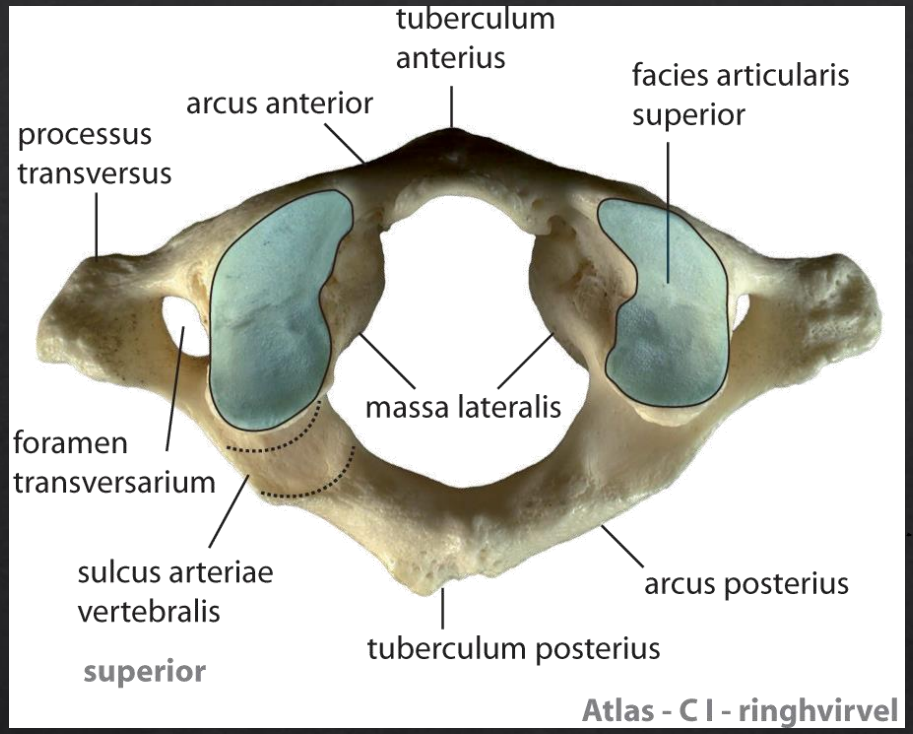


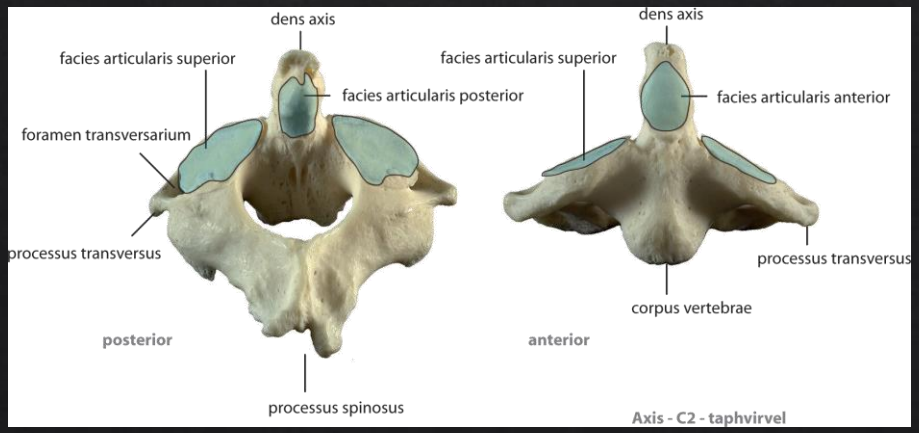
Pige, 8 år

Atlas og axis

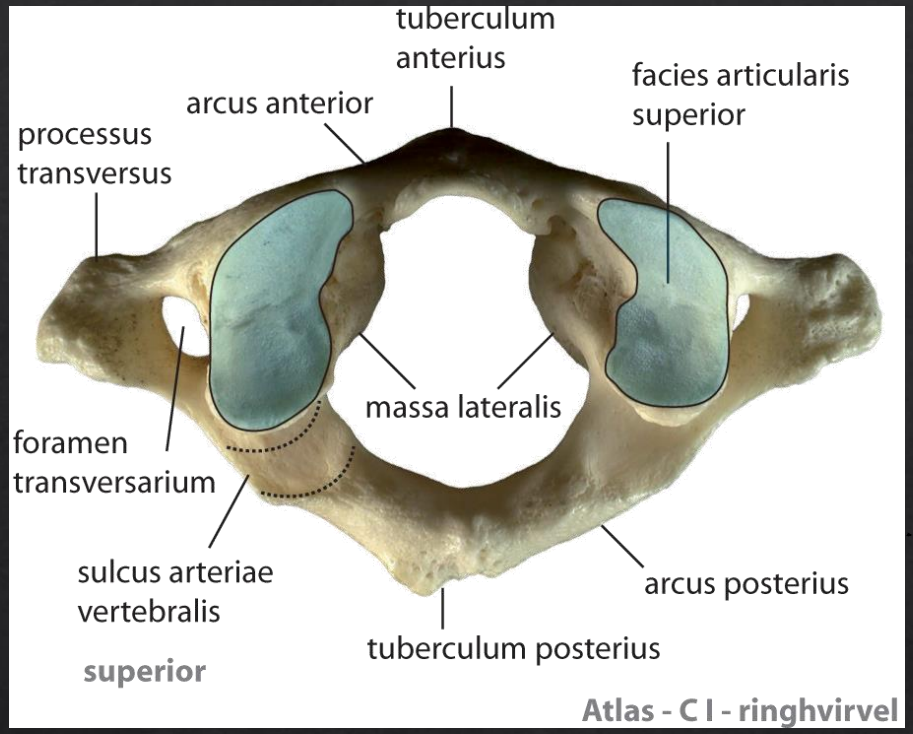


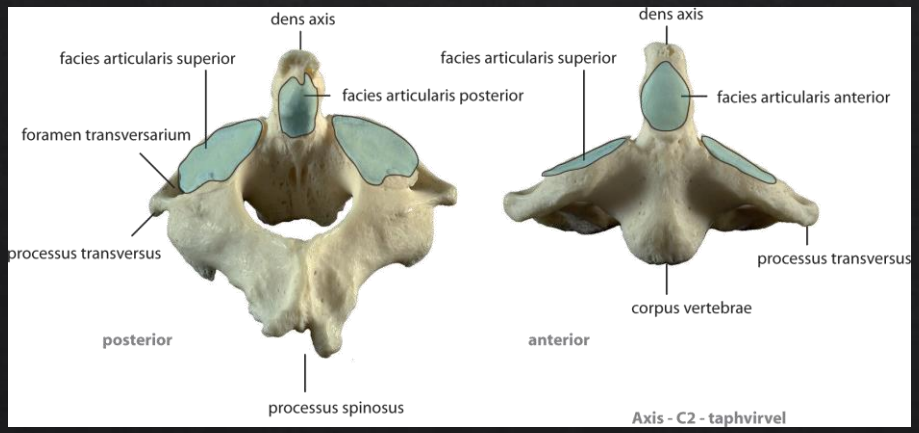
Atlas og axis

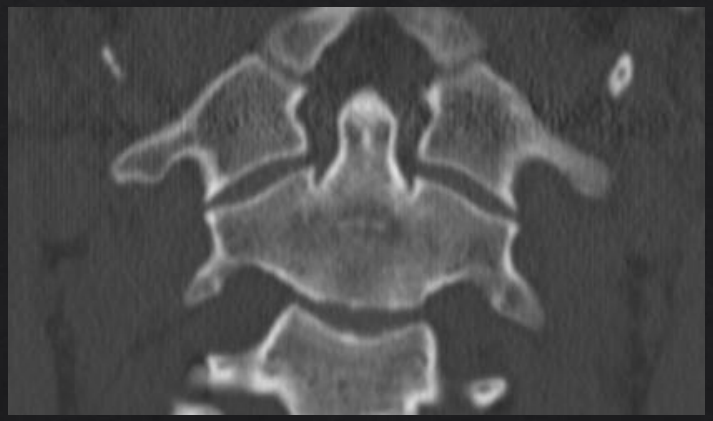




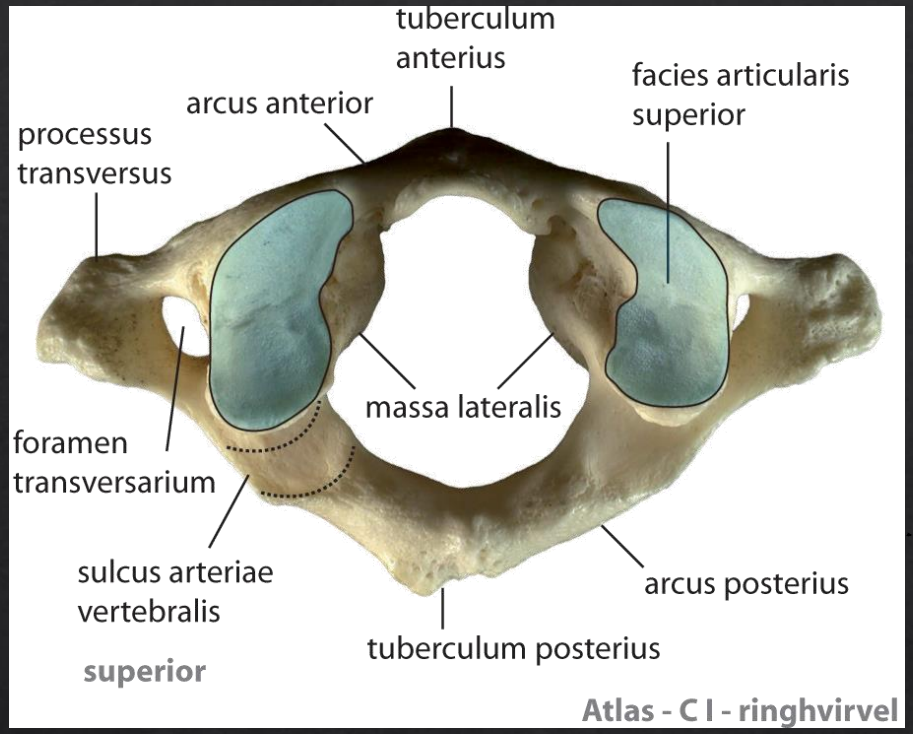
Atlas og axis

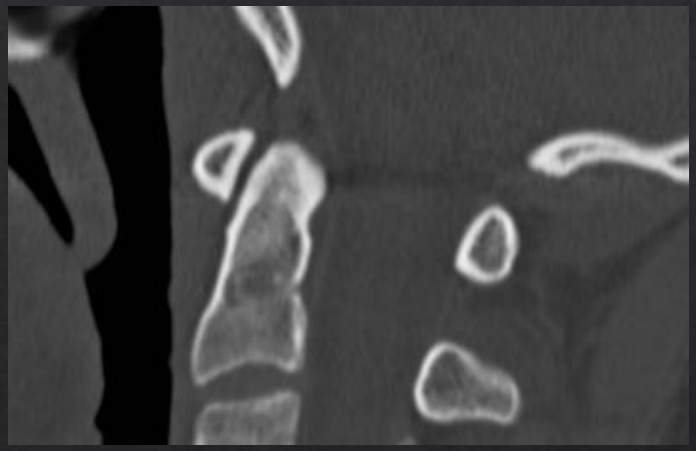


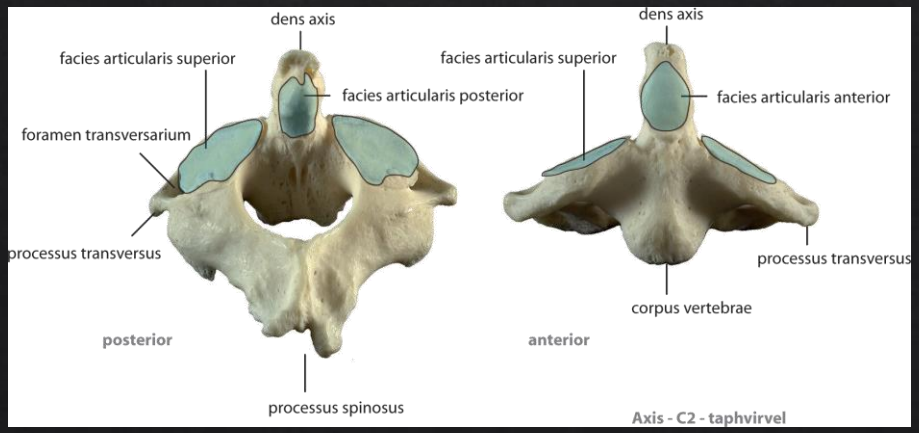




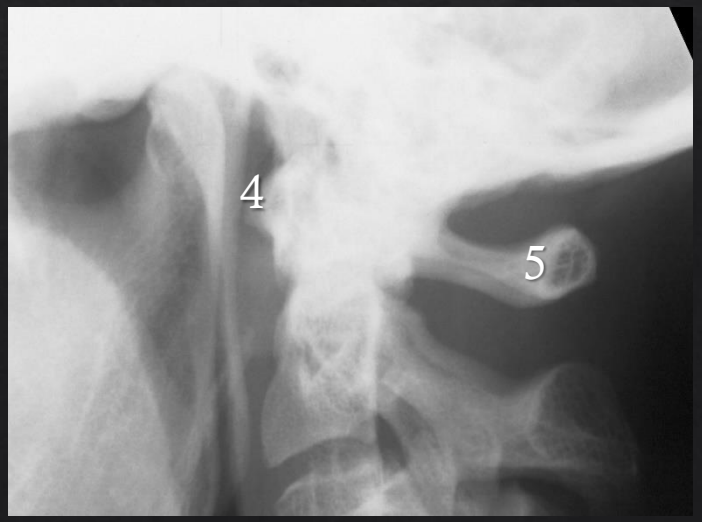
Atlas og axis



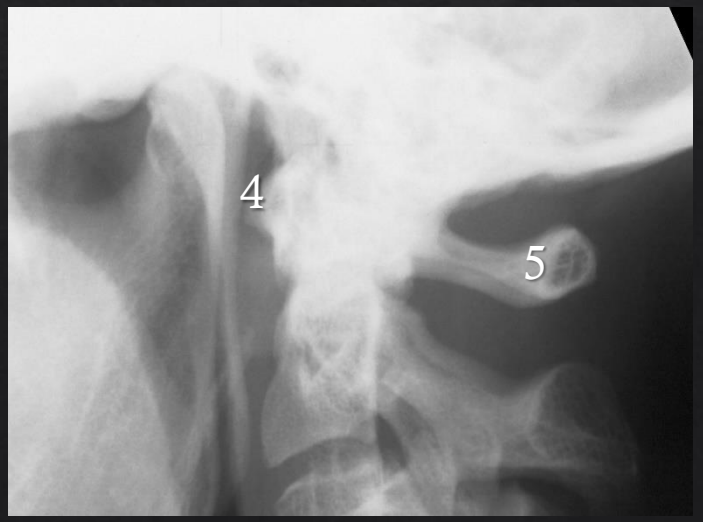




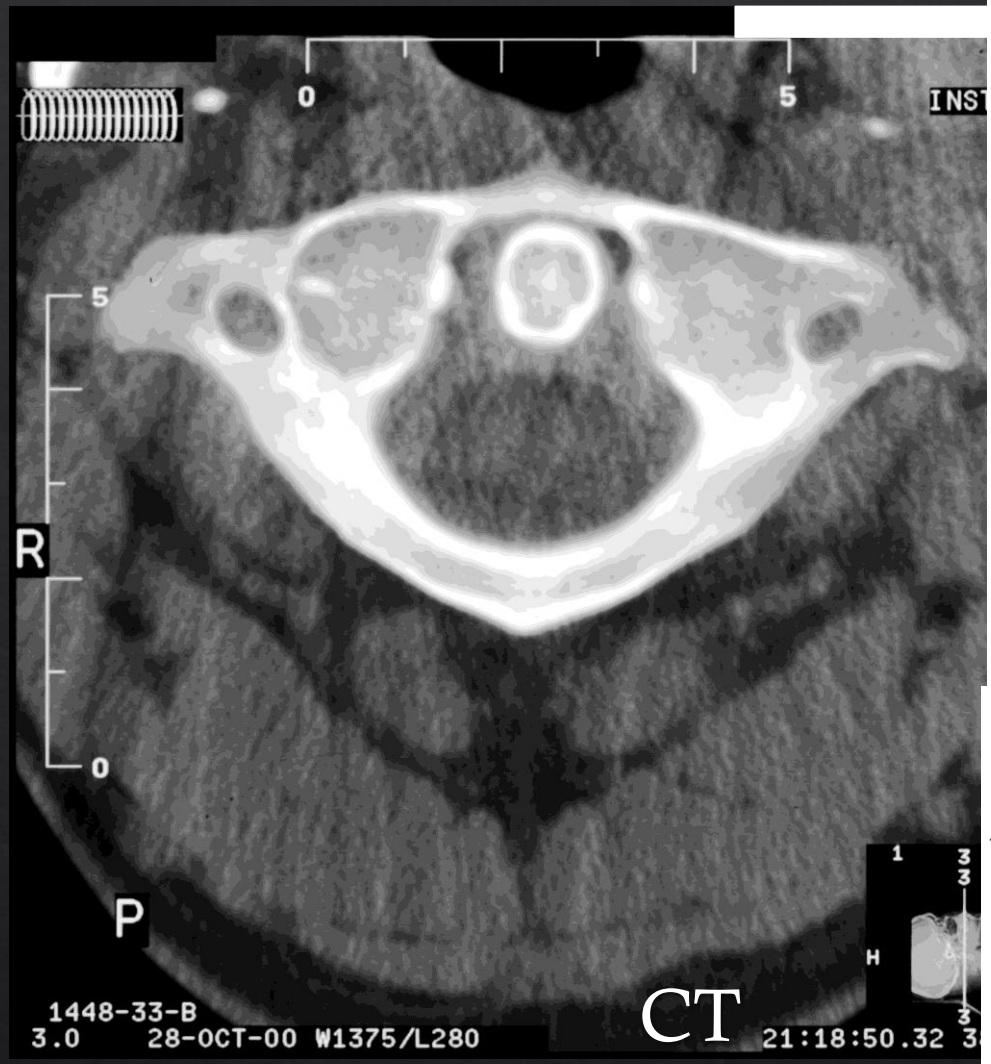
Atlas og axis



Atlas og axis



1) Dens axis
2) Massa lateralis atlantis
3) Processus transversus CI
4) Arcus anterior atlantis
5) Arcus posterior atlantis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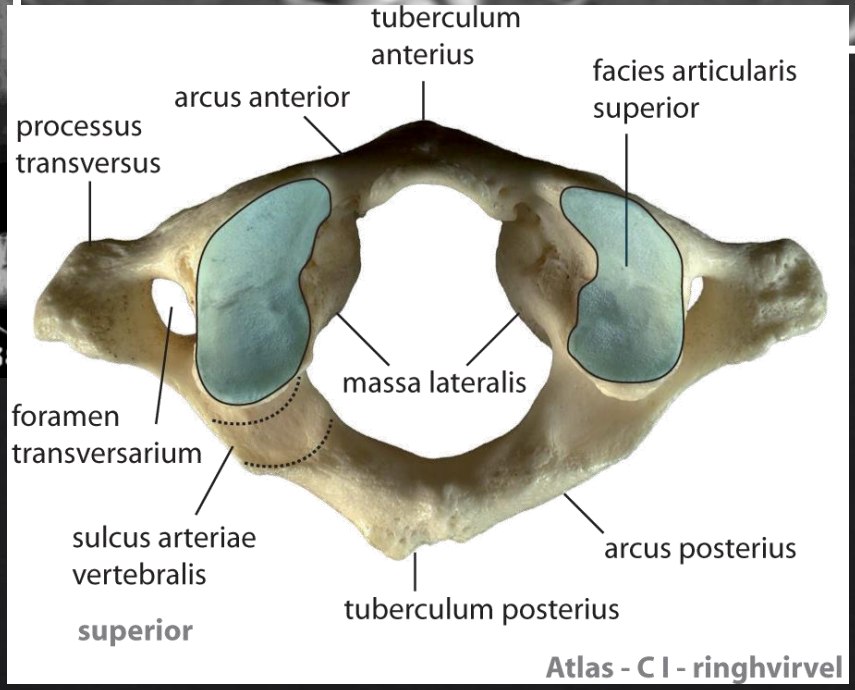
CT
21:18:50.32


MR (T2)


tuberculum anterius
arcus anterior
facies articularis superior
processus transversus
massa lateralis
foramen transversarium
sulcus arteriae vertebralis
arcus posterius
tuberculum posterius
superior
Atlas - C I - ringhvirvel

Atlas


0
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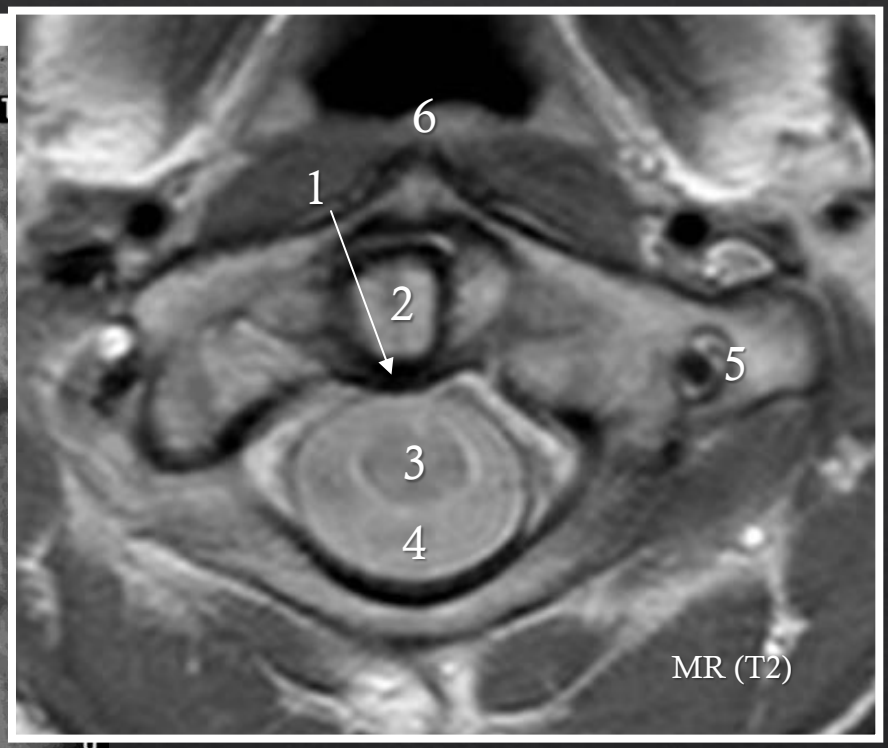
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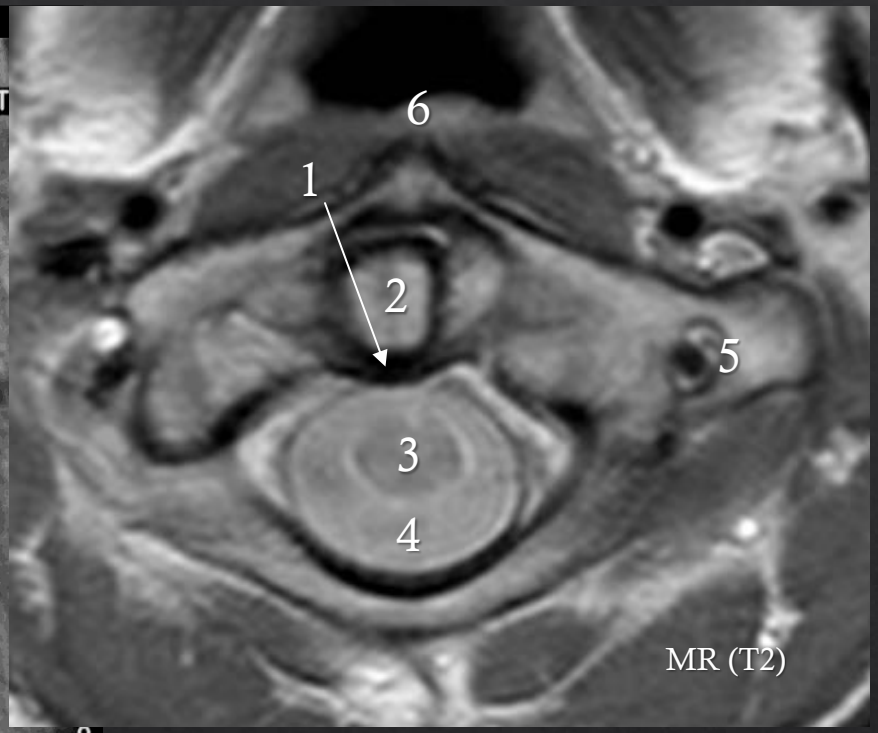
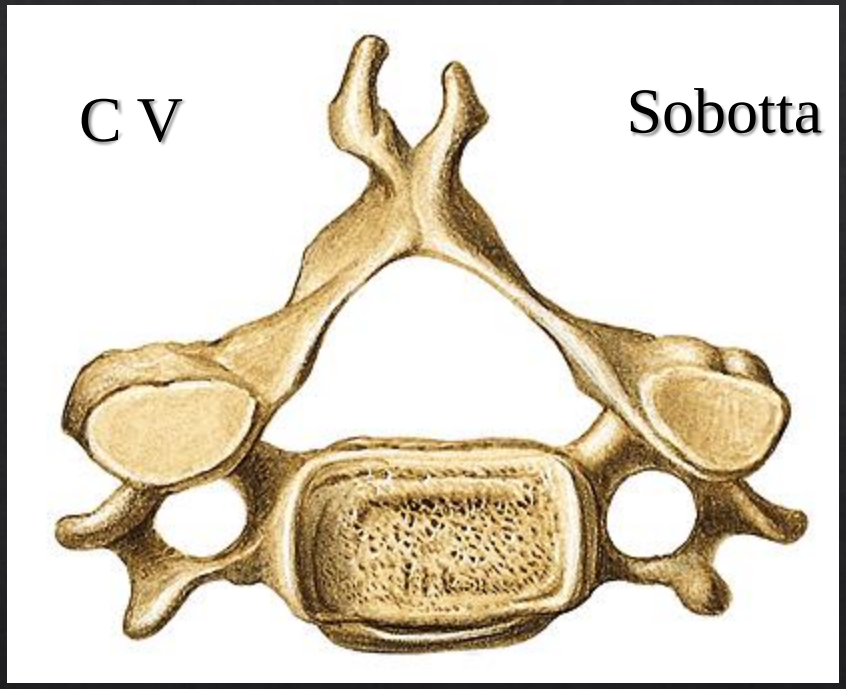
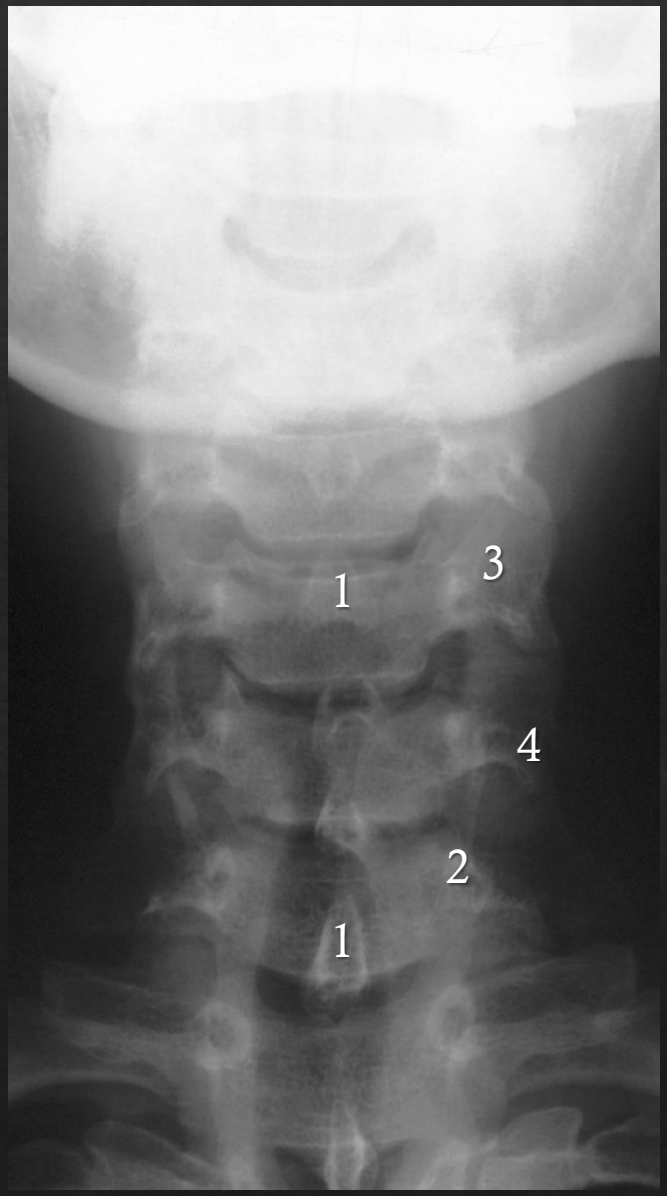
MR (T2)



1) Ligamentum transversum atlantis
2) Dens axis
3) Medulla spinalis
4) Liquor cerebrospinalis
5) Foramen transversarium (med a. vertebralis – sort på MR billedet)
6) Tuberculum anterius
7) Tuberculum posterius


C V
Sobotta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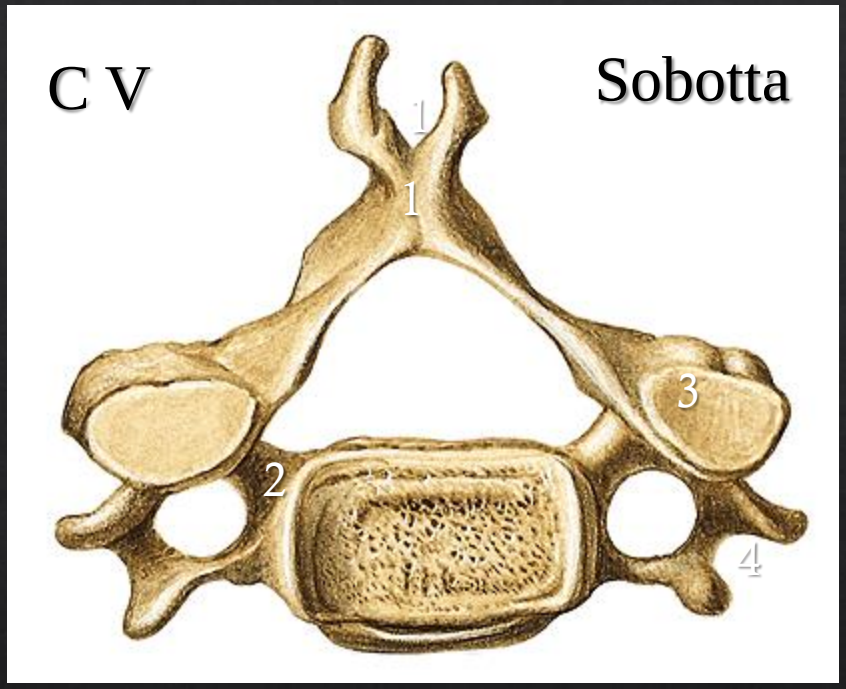
C V
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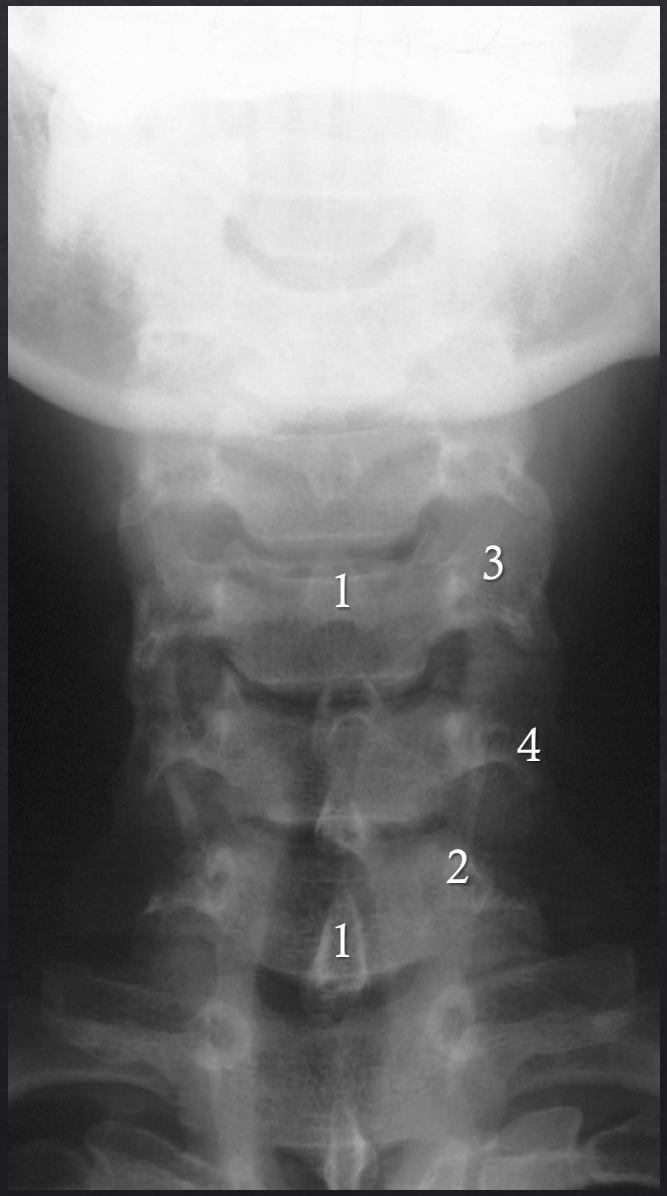
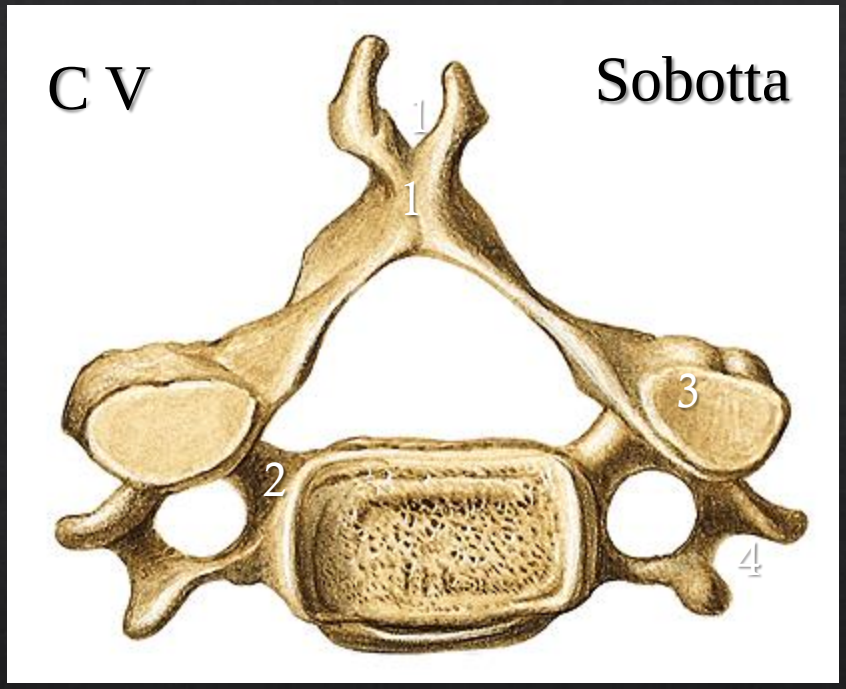
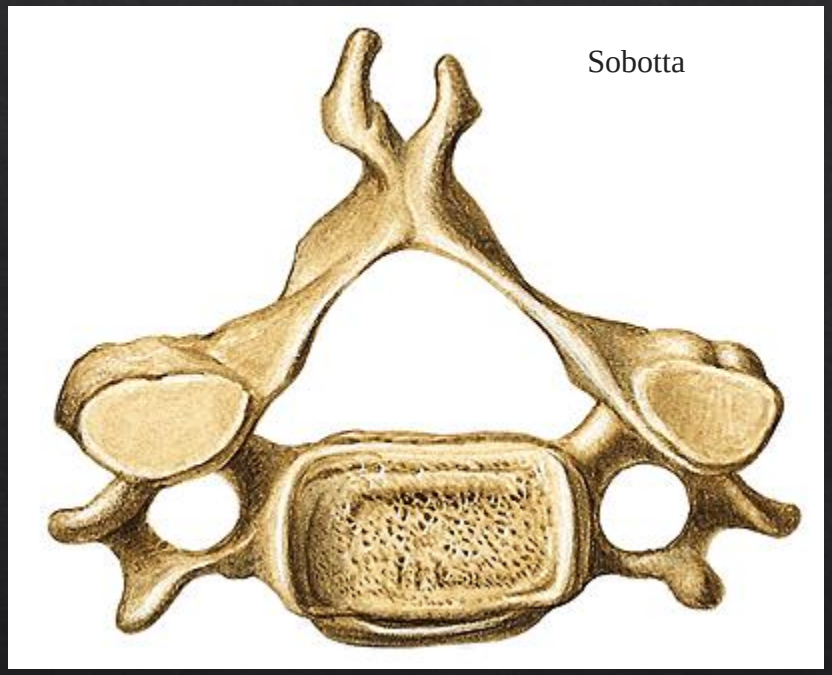




1) Processus spinosus
2) Pediculus
3) Processus articularis (inf. et sup.)
4) Processus transversus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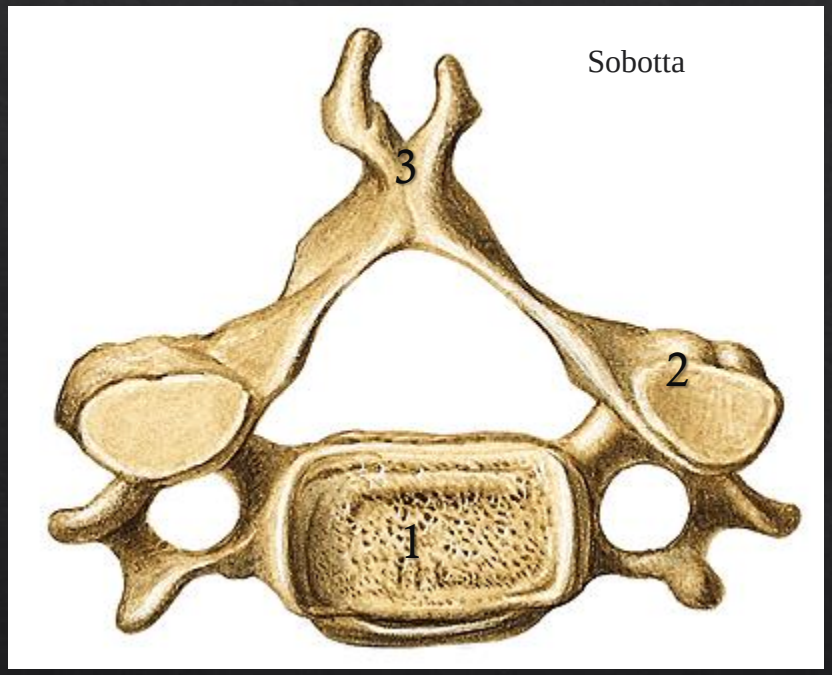
Sobotta
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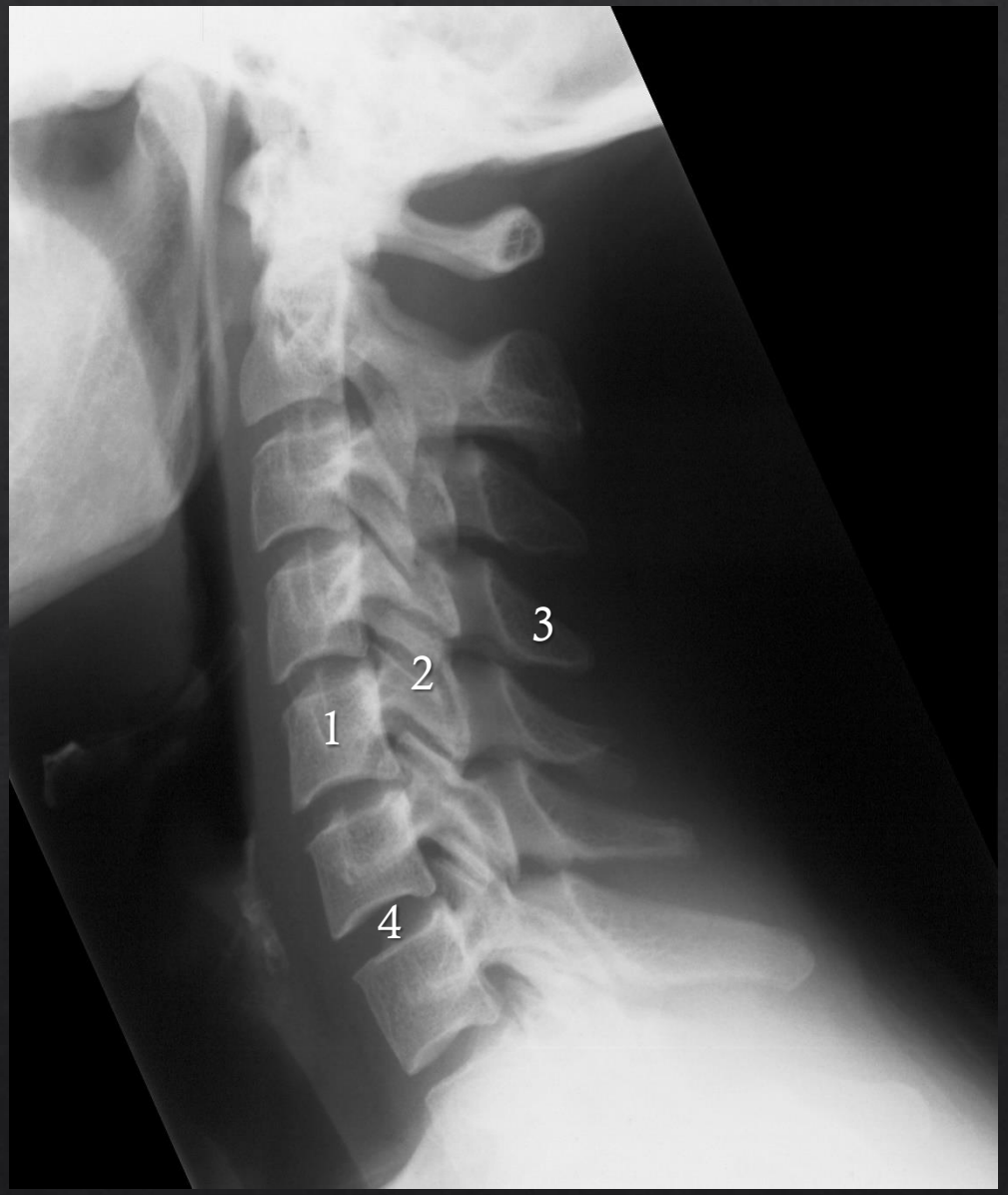
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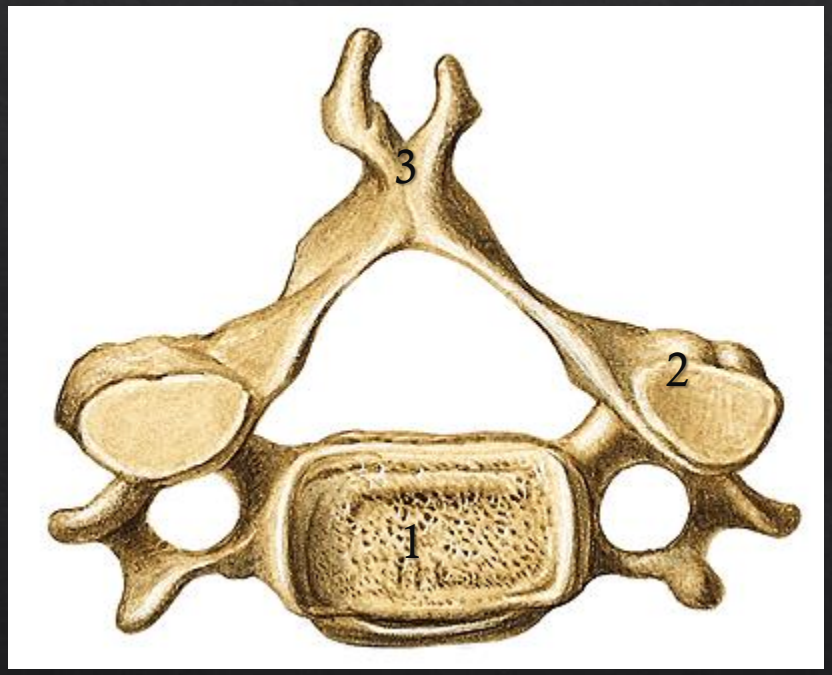

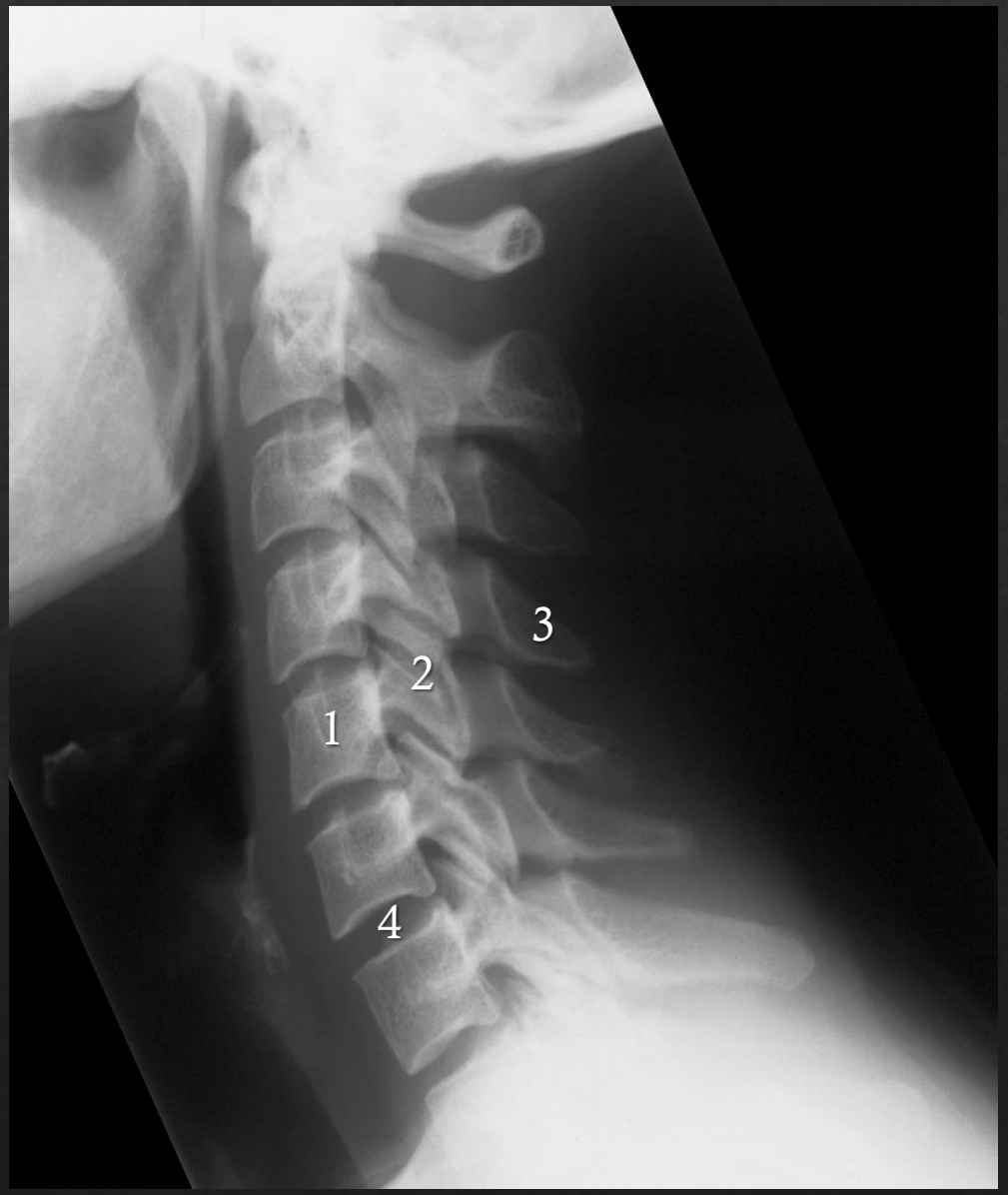

1) Corpus vertebrae C V
2) Articulatio zygapophysialis (Facetled) CIV/CV
3) Processus spinosus vertebrae C IV
4) Discus intervertebralis C VI/VII

CT 3D

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Skråoptagelse af columna cervicalis

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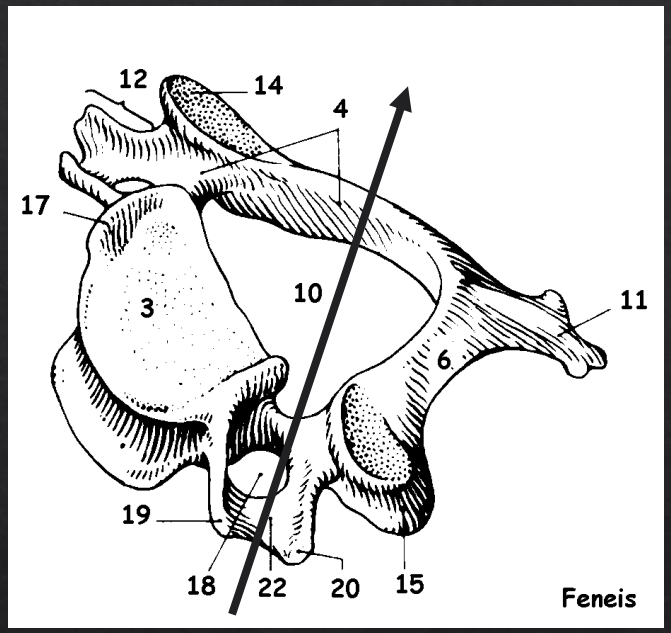
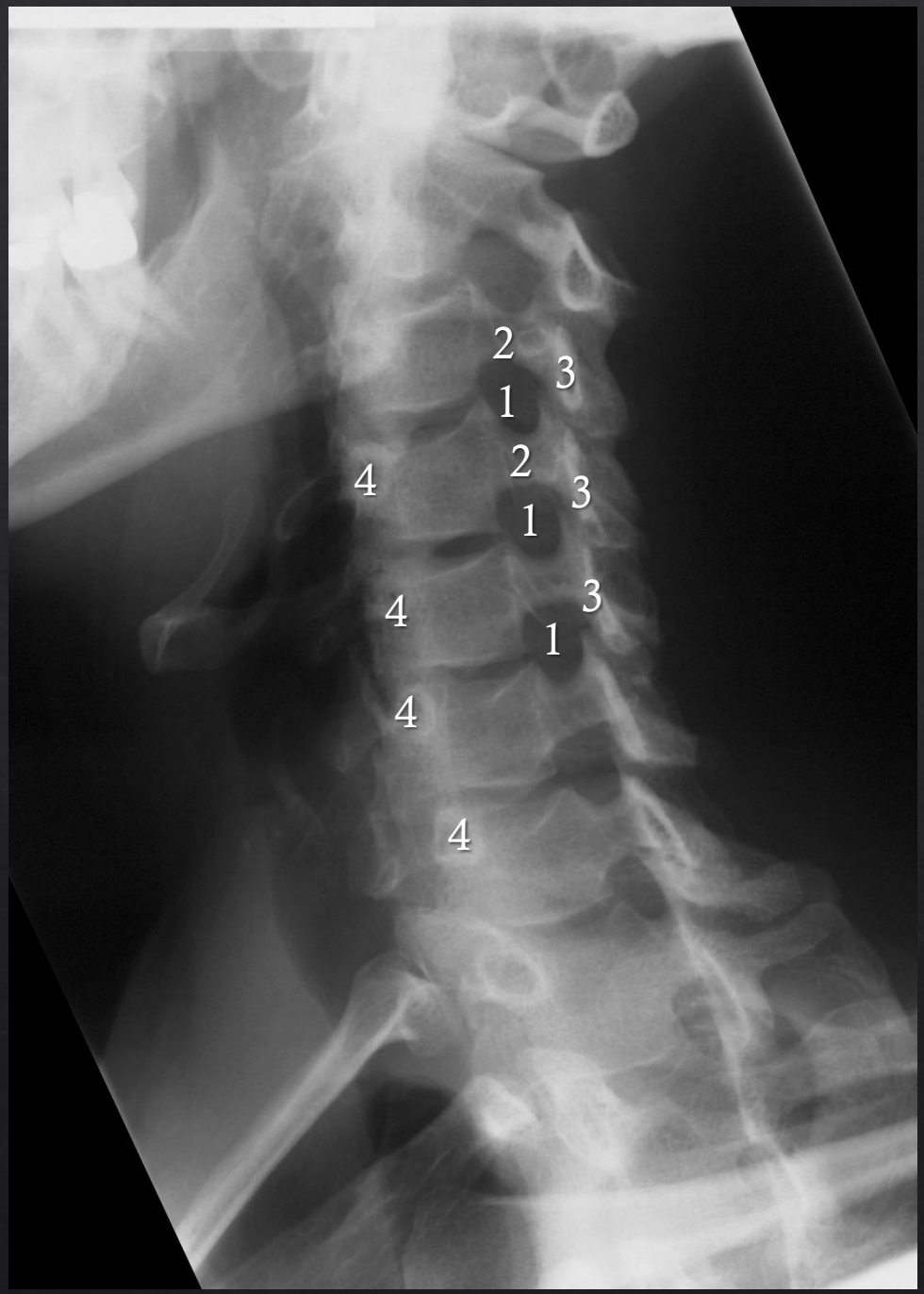
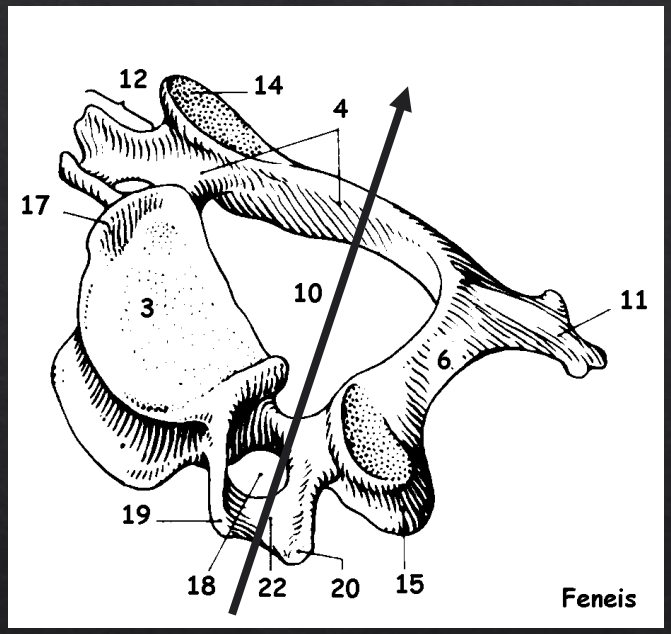
Skråoptagelse af columna cervicalis

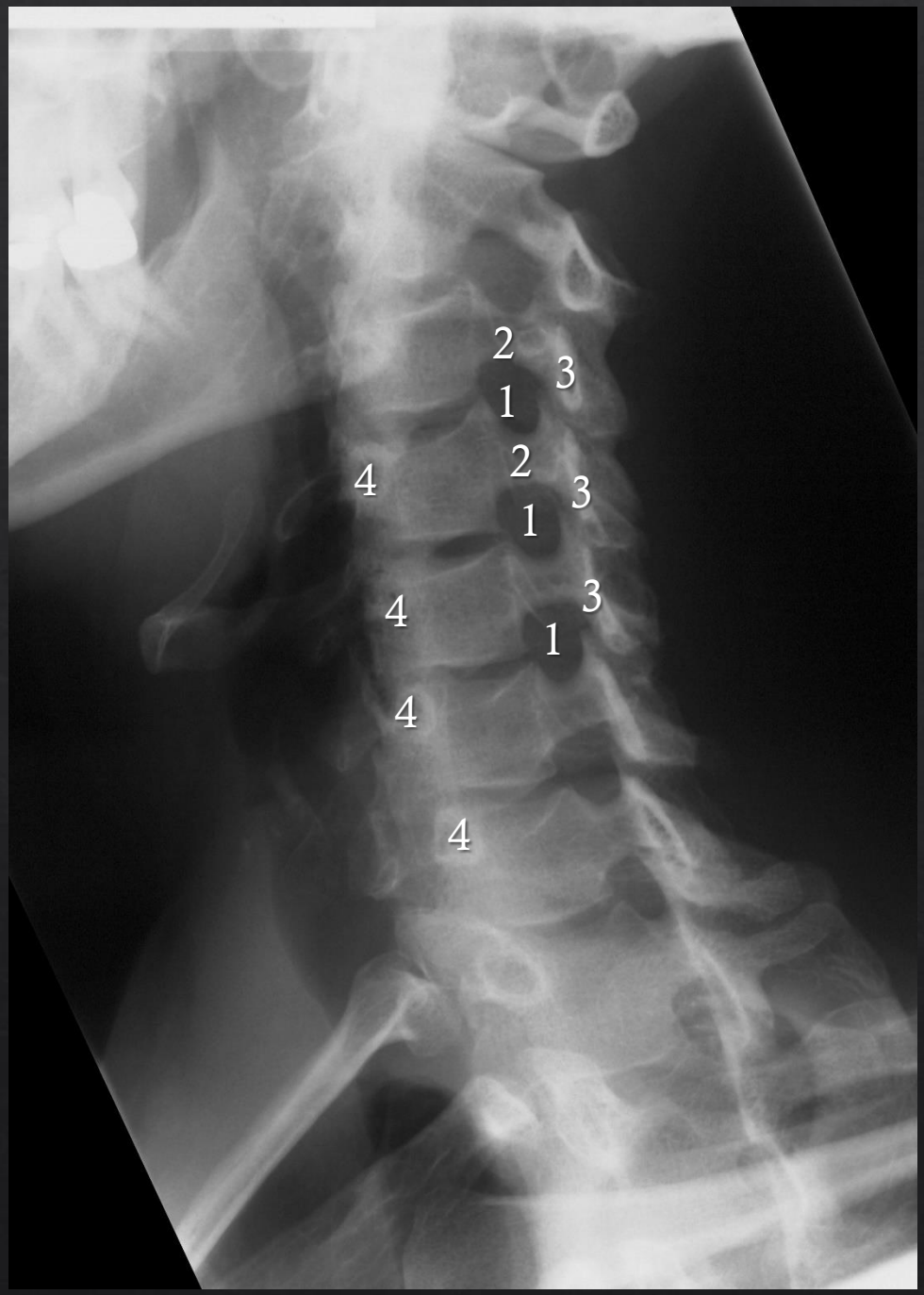


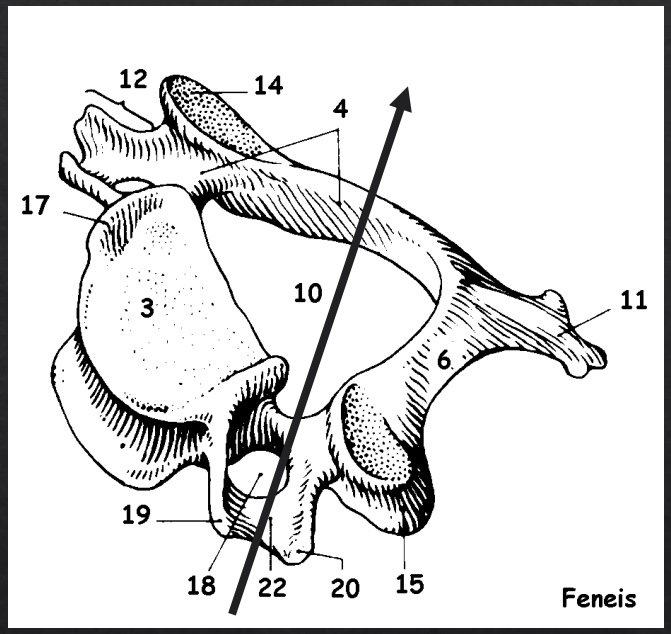


Skråoptagelse af columna cervicalis



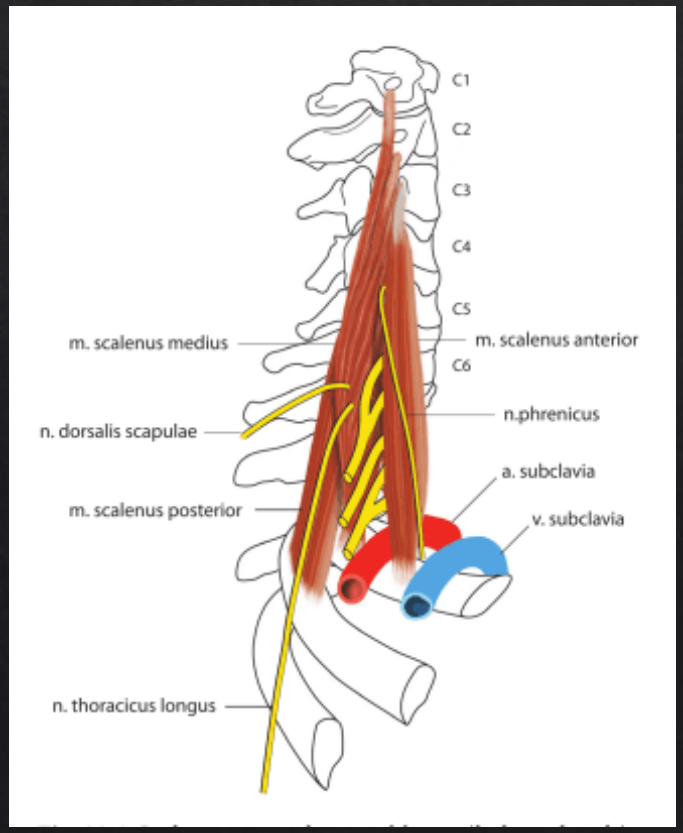
Skråoptagelse af columna cervicalis

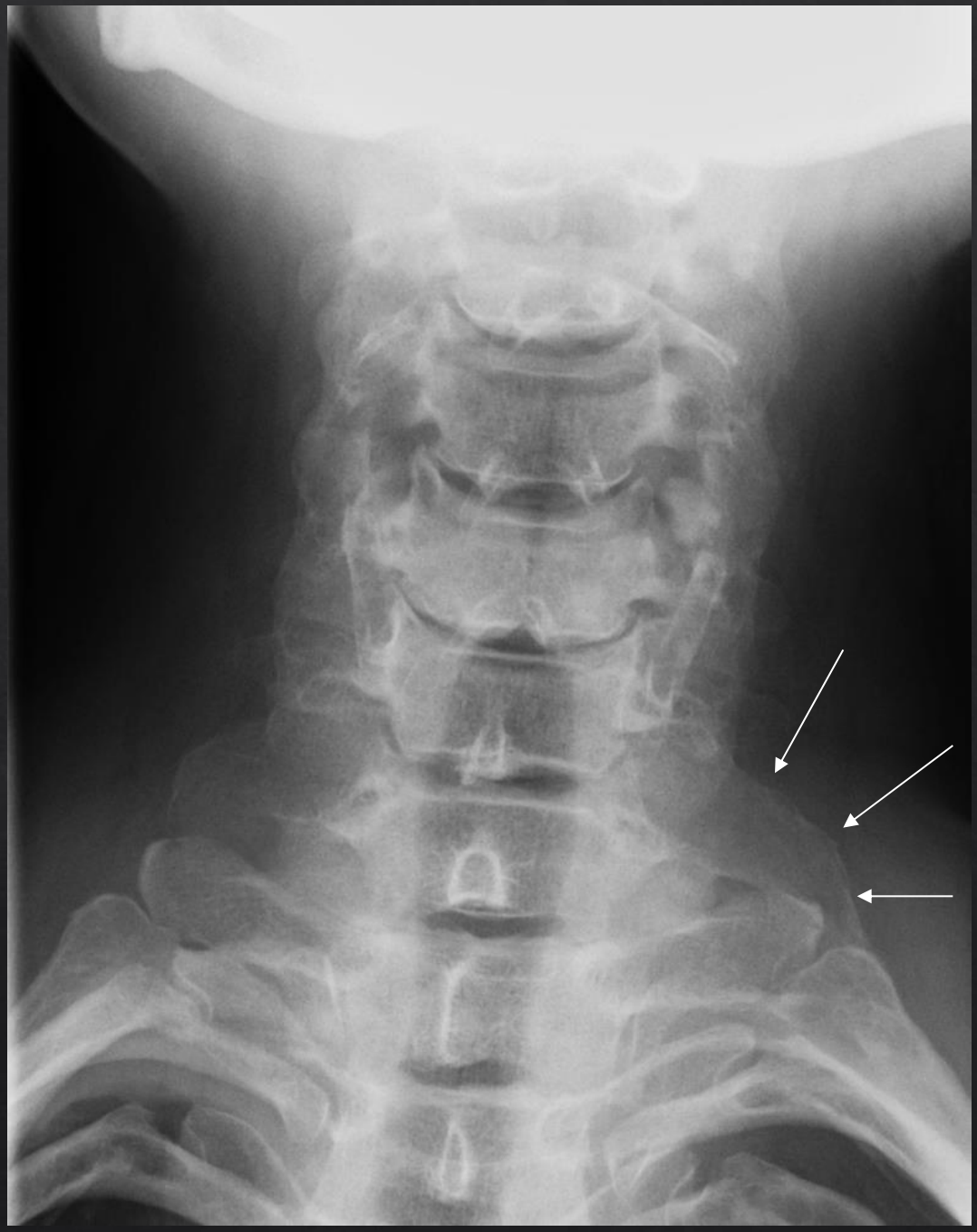




1) Foramen intervertebrale sin.
2) Pediculis arcus vertebrae sin.
3) Lamina arcus vertebrae sin
4) Pediculus arcus vertebrae dx. (set en face)

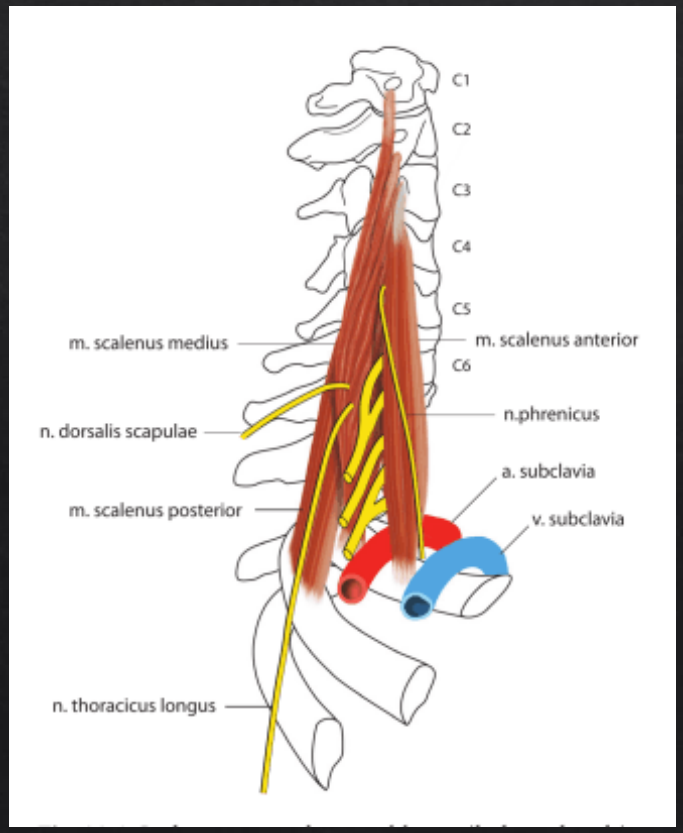
Costa cervicalis

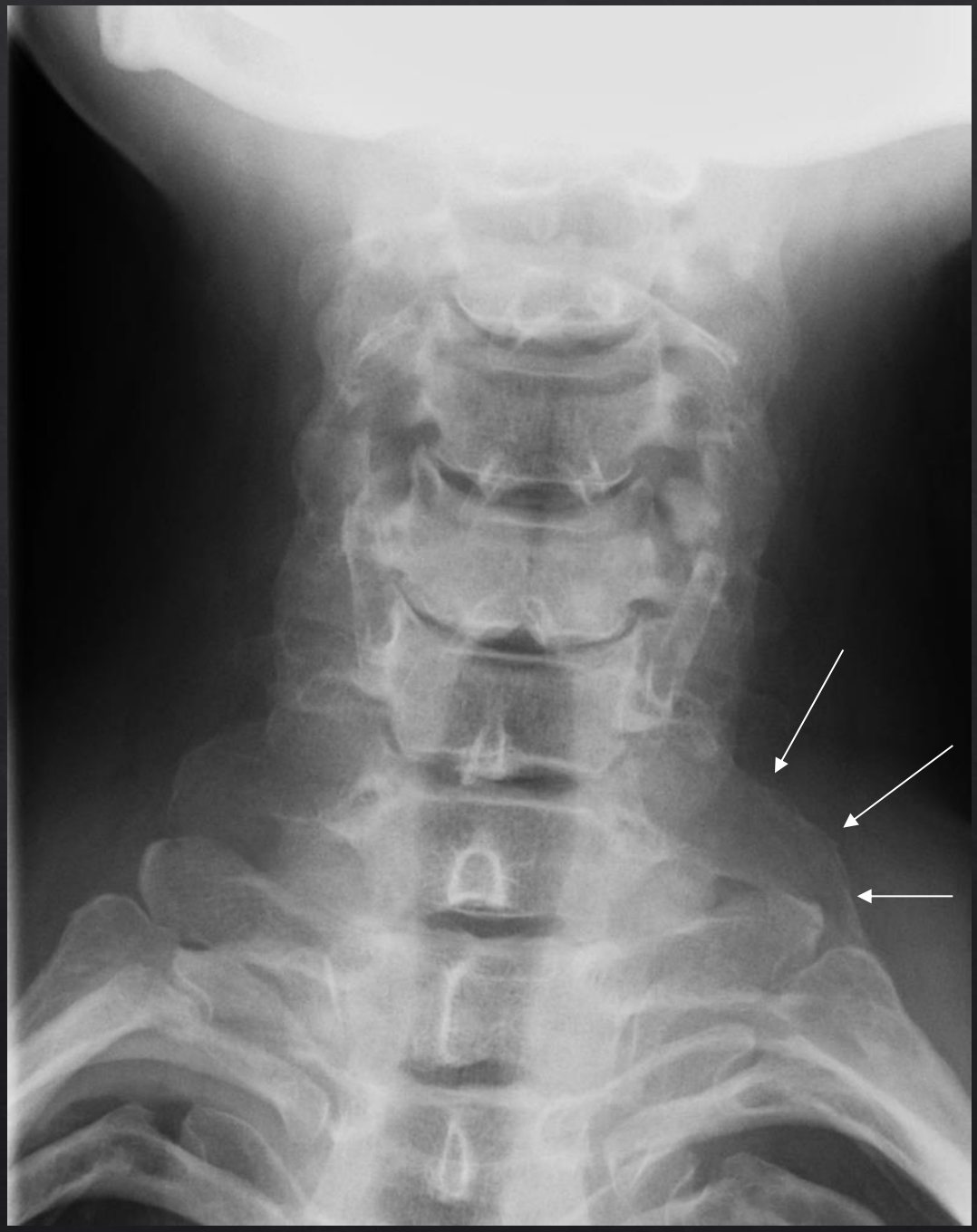




Costa cervicalis

Et langt costa cervicalis kan give tryk på nabostrukturerne, eksempelvis a. subclavia.





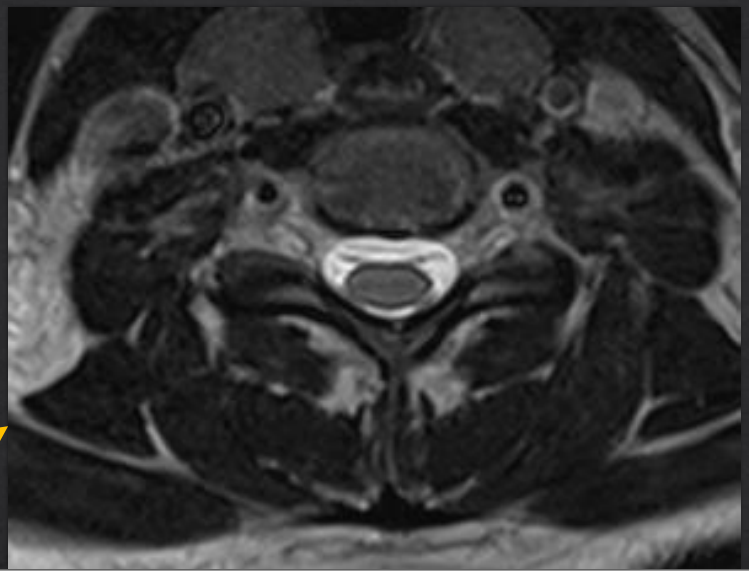
73-årig mand med slidforandringer i cervikal columna

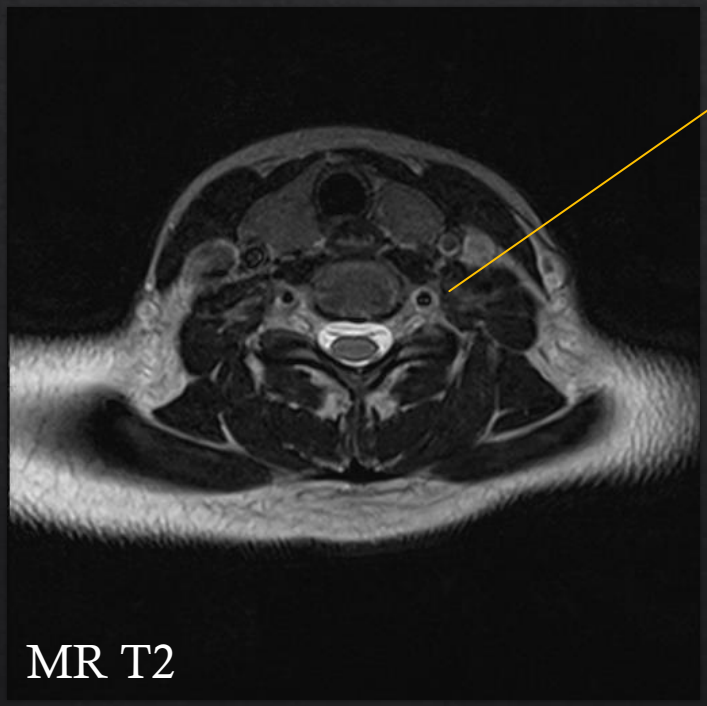
Yngre til sammenligning

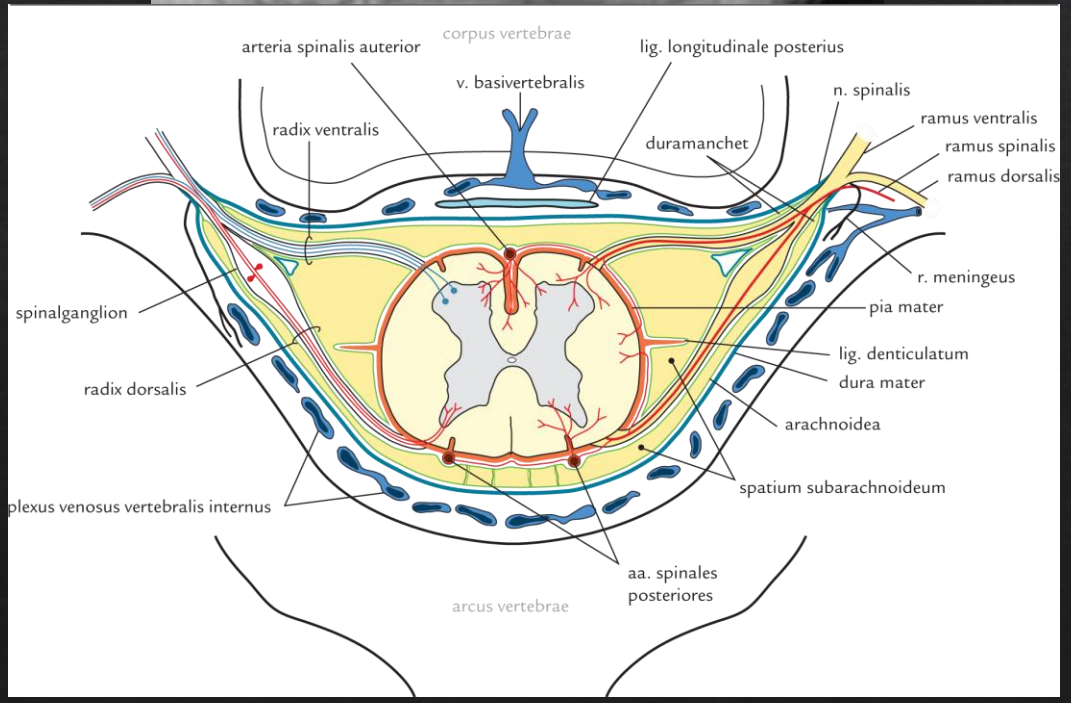
Yngre til sammenligning

Yngre person til sammenligning

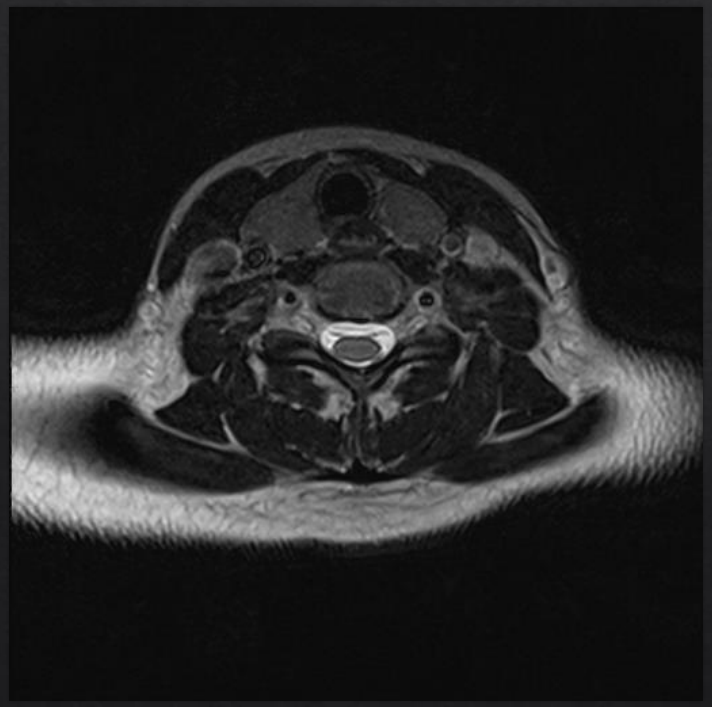
Spinalkanalen

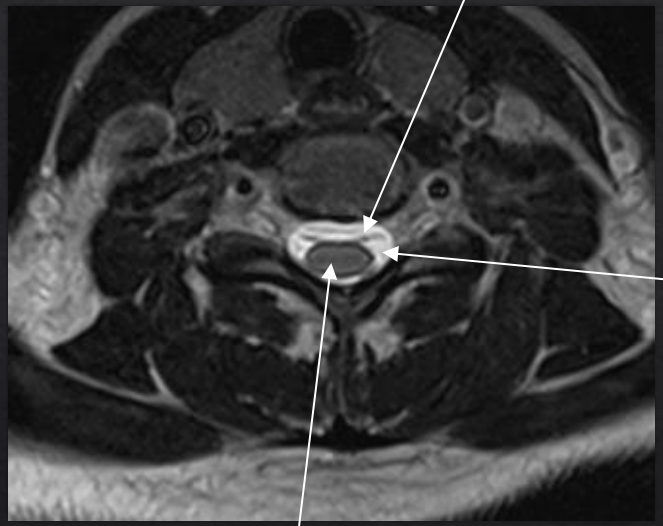




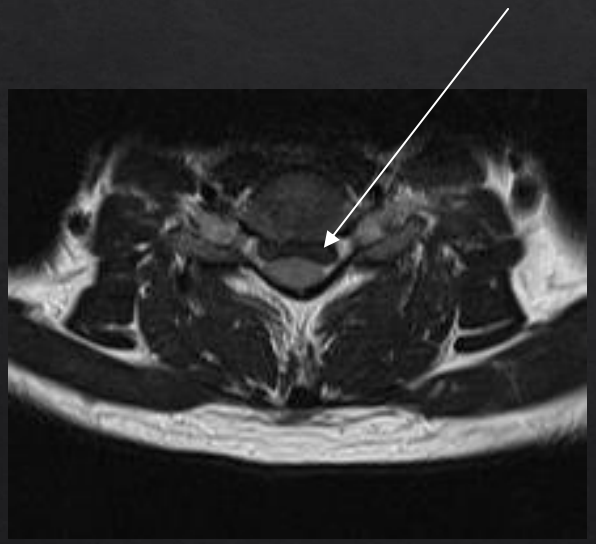


MR af columna cervicalis



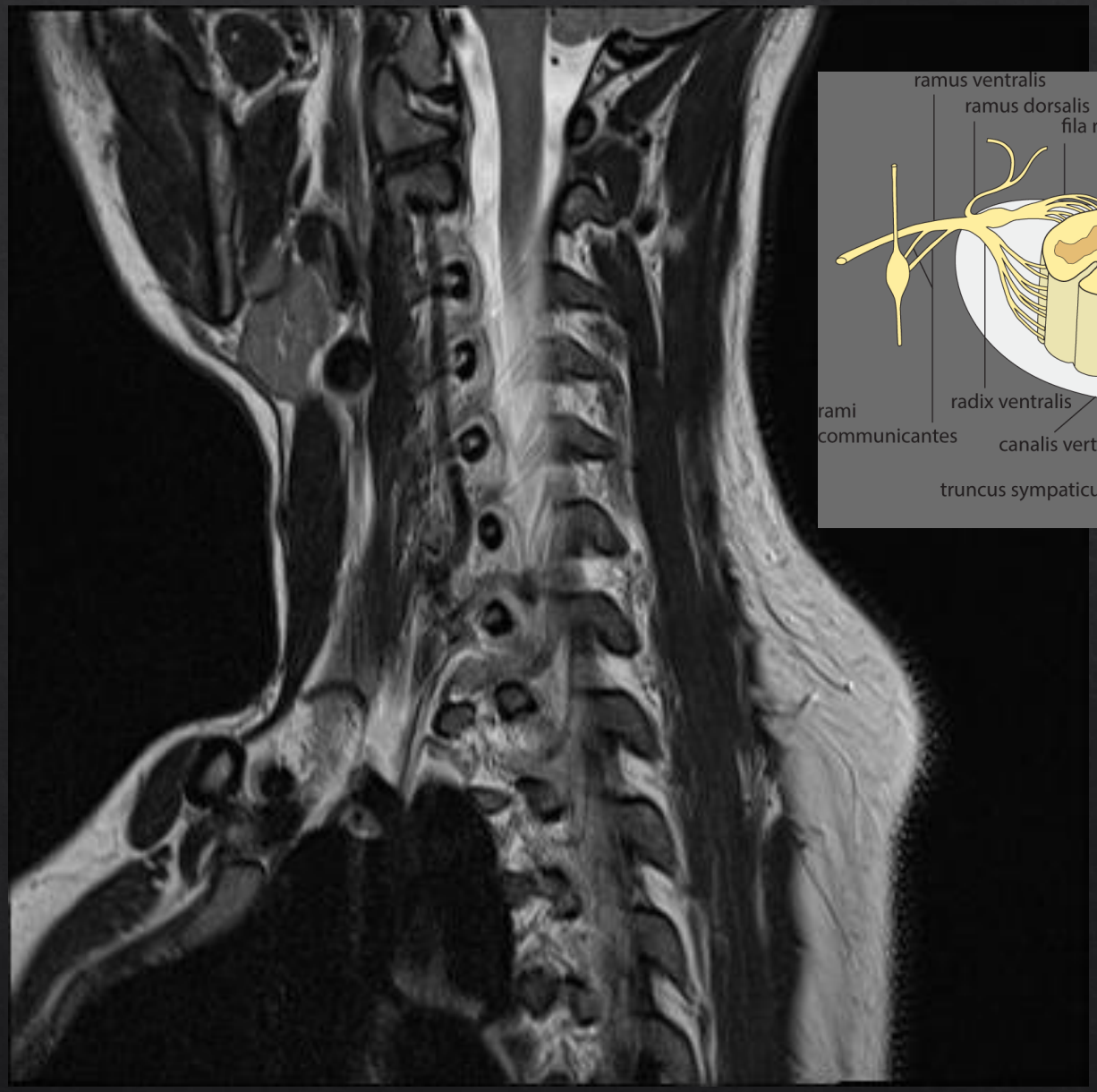


Cervical discus prolaps



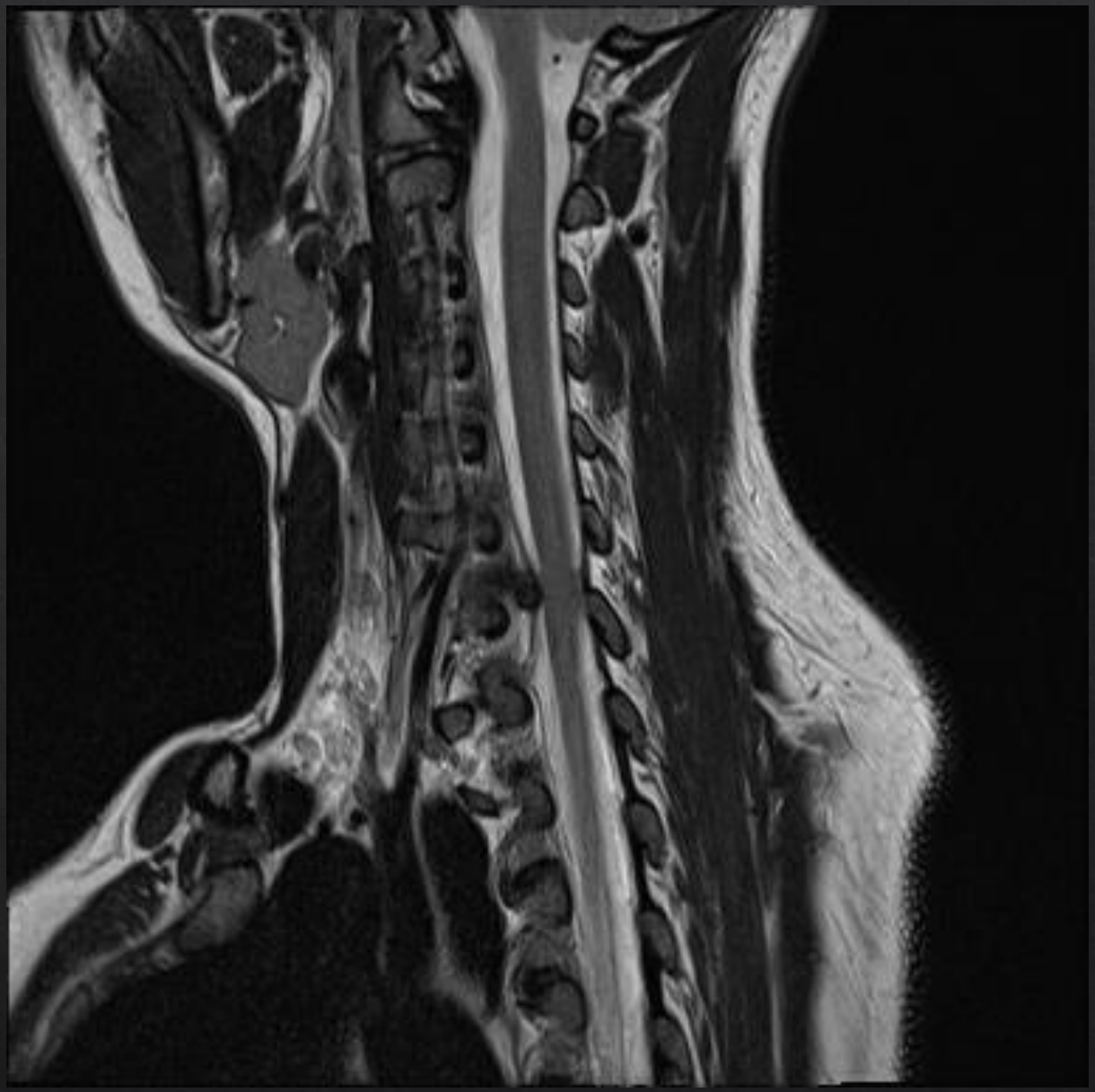
Cervical discus prolaps

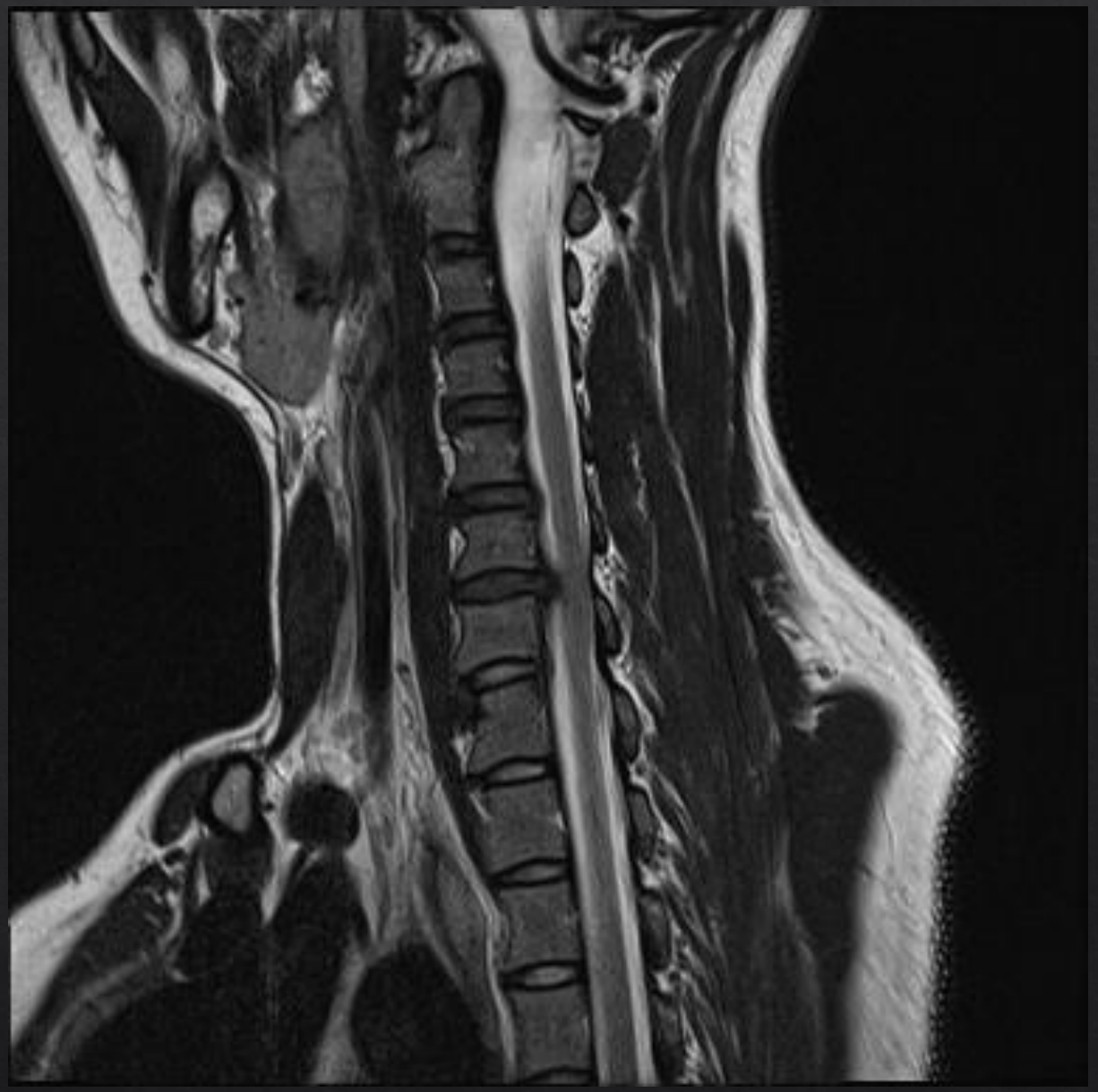
De følgende MR snit er lavet som skrå frontale snit, se billedet til højre.


ramus ventralis
ramus dorsalis
fila radicularia
ganglion spinale
foramen intervertebrale
radix ventralis
rami communicantes
canalis vertebralis
truncus sympaticus

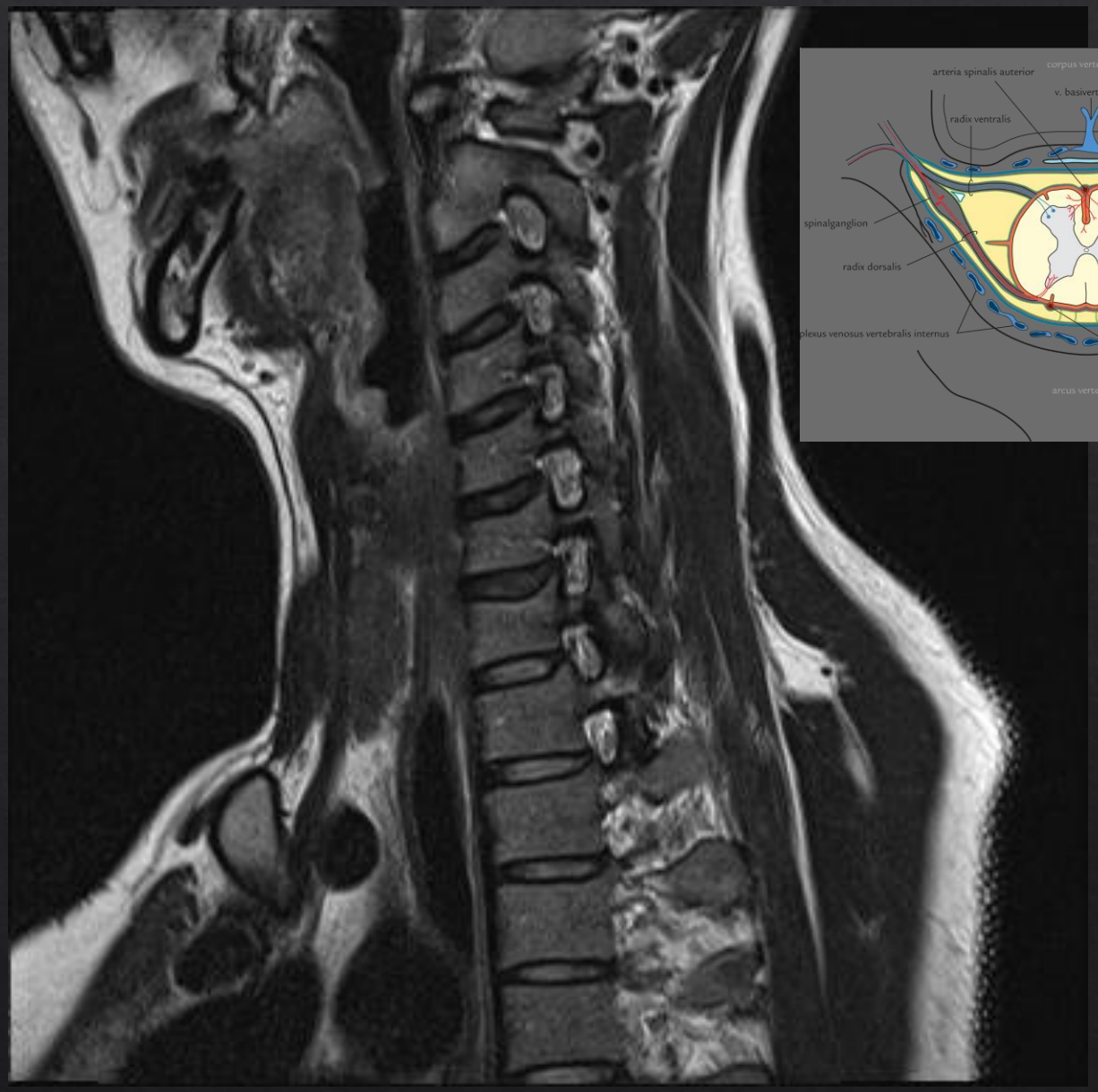

1
2
3
4
5

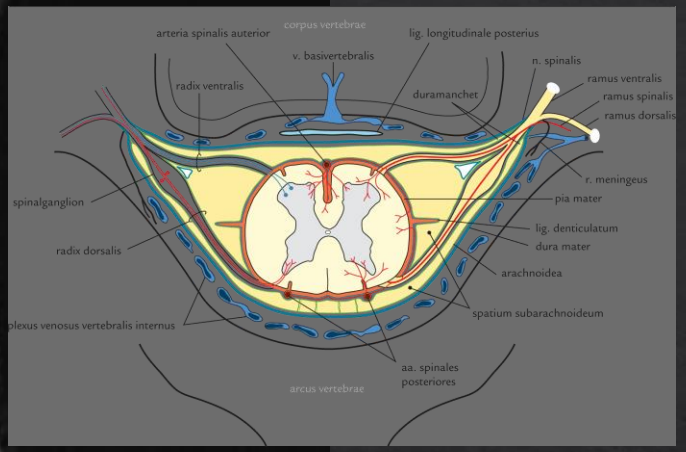
1. Cerebellum
2. Medulla spinalis
3. Liquor cerebrospinalis
4. Fila radicularia
5. A. vertebralis



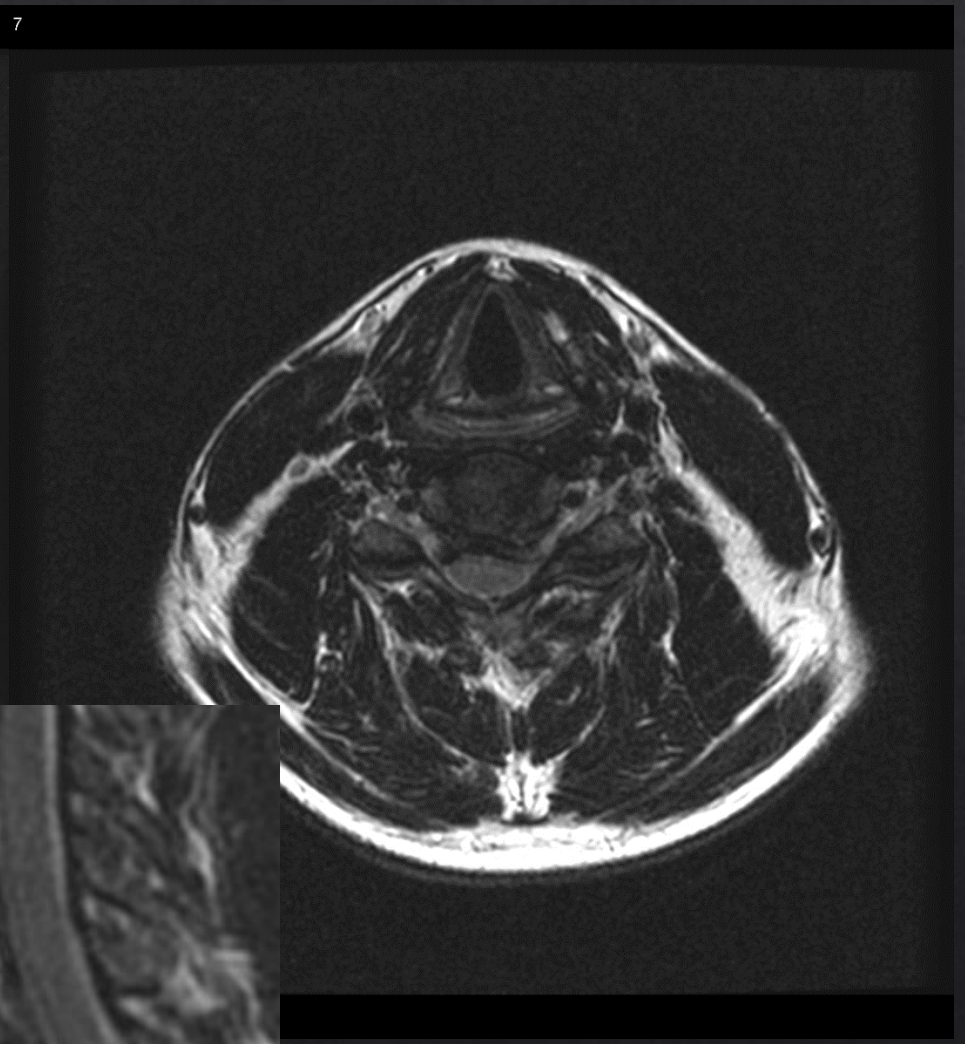



Discus prolaps

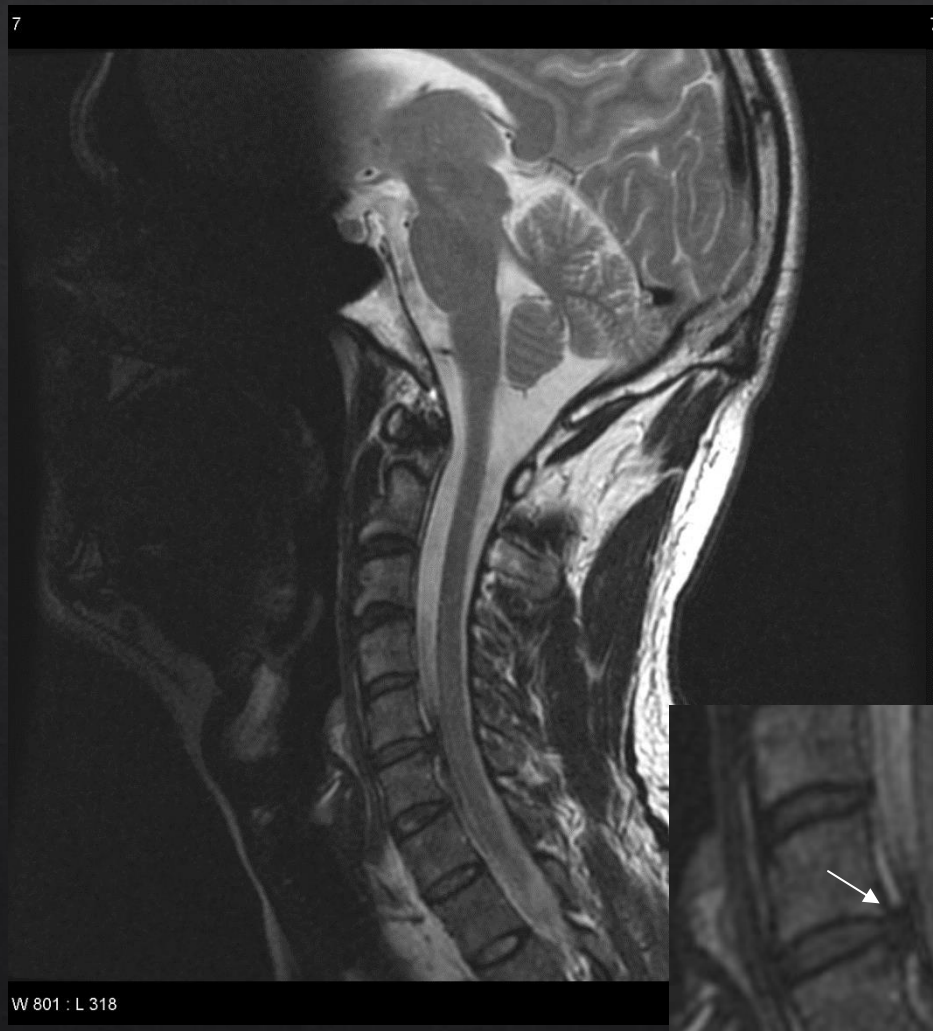


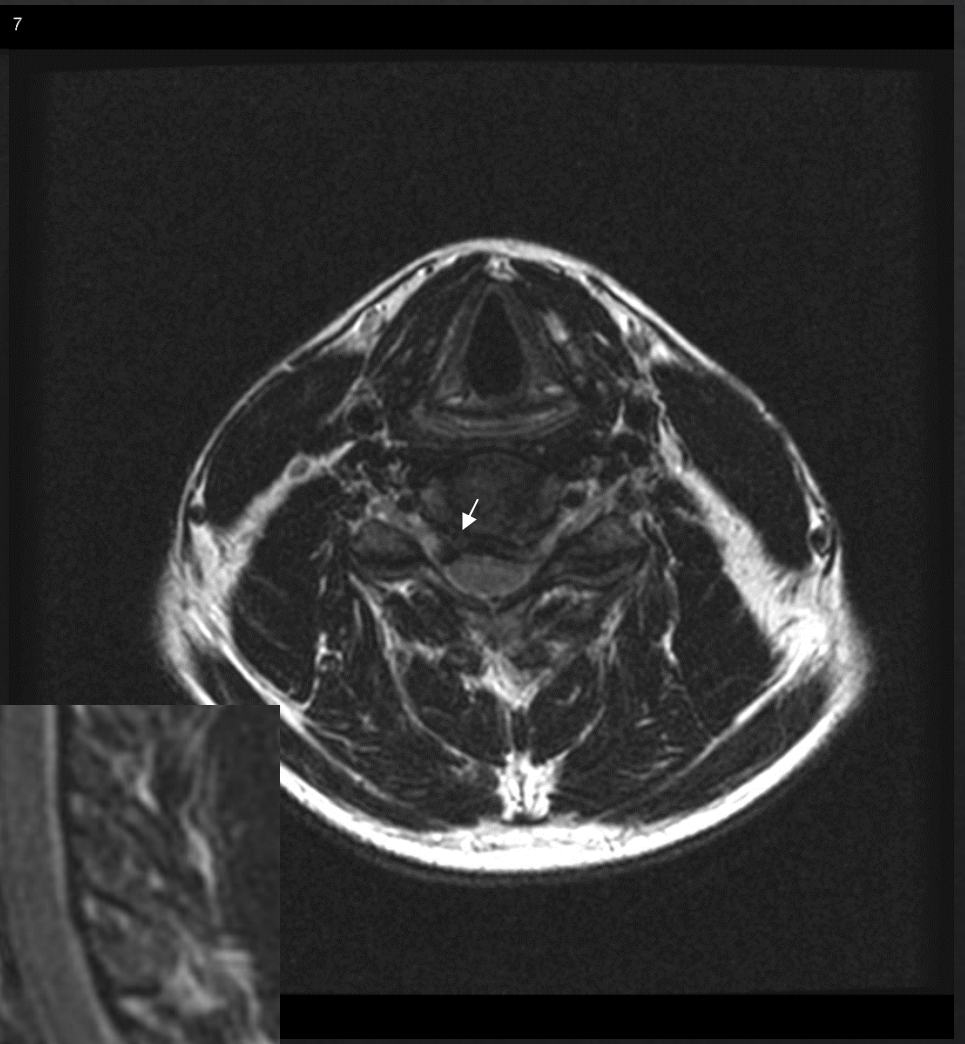

corpus vertebrae
arteria spinalis auterior
lig. longitudinale posterius
v. basivertebralis
n. spinalis
ramus ventralis
ramus spinalis
ramus dorsalis
radix ventralis
duramanchet
r. meningeus
spinalganglion
pia mater
lig. denticulatum
radix dorsalis
dura mater
arachnoidea
spatium subarachnoideum
plexus venosus vertebralis internus
aa. spinales posteriores
arcus vertebrae

Cervikal discusprolaps på niveau C5/6



Cervikal discusprolaps på niveau C5/6



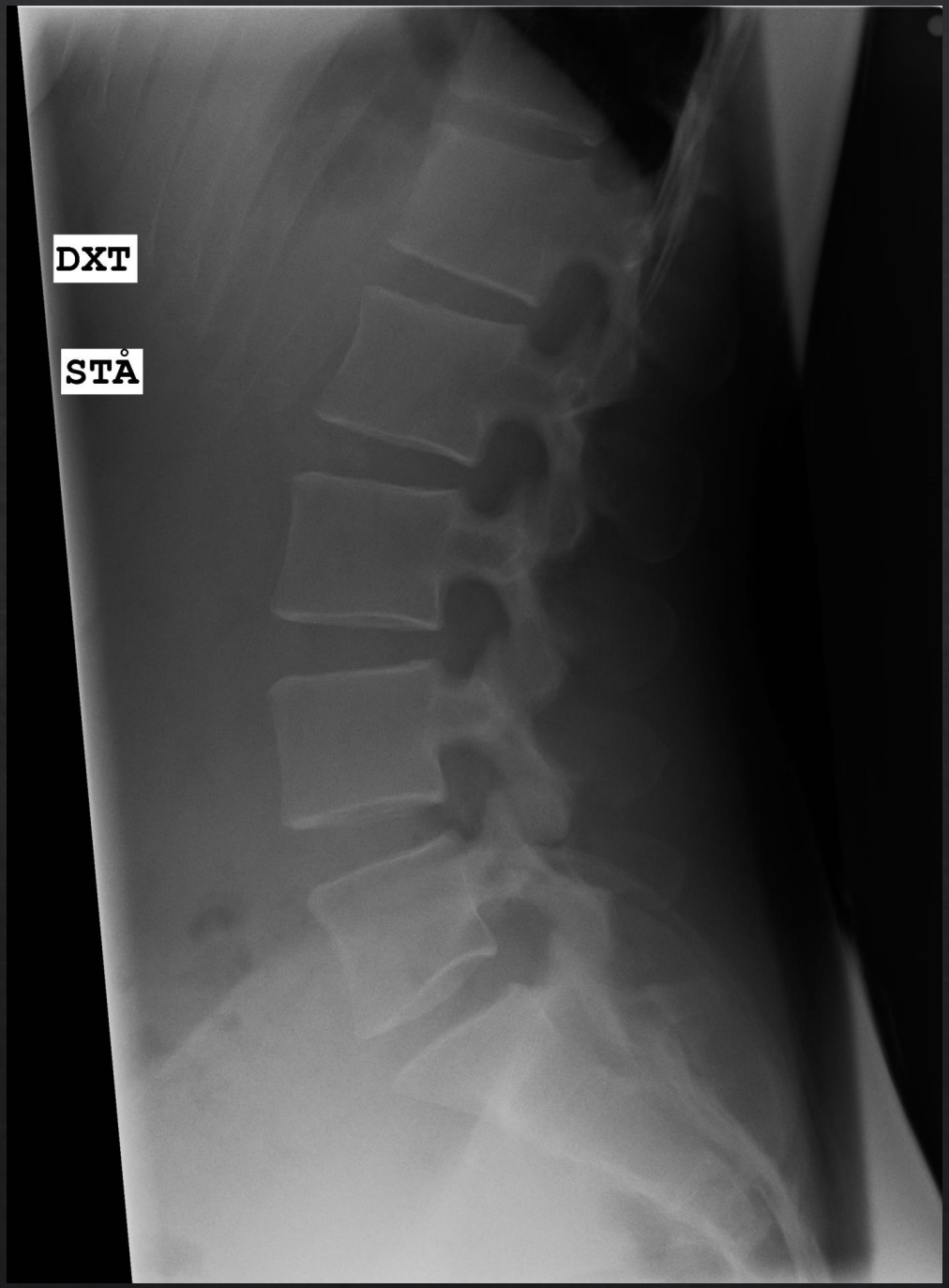


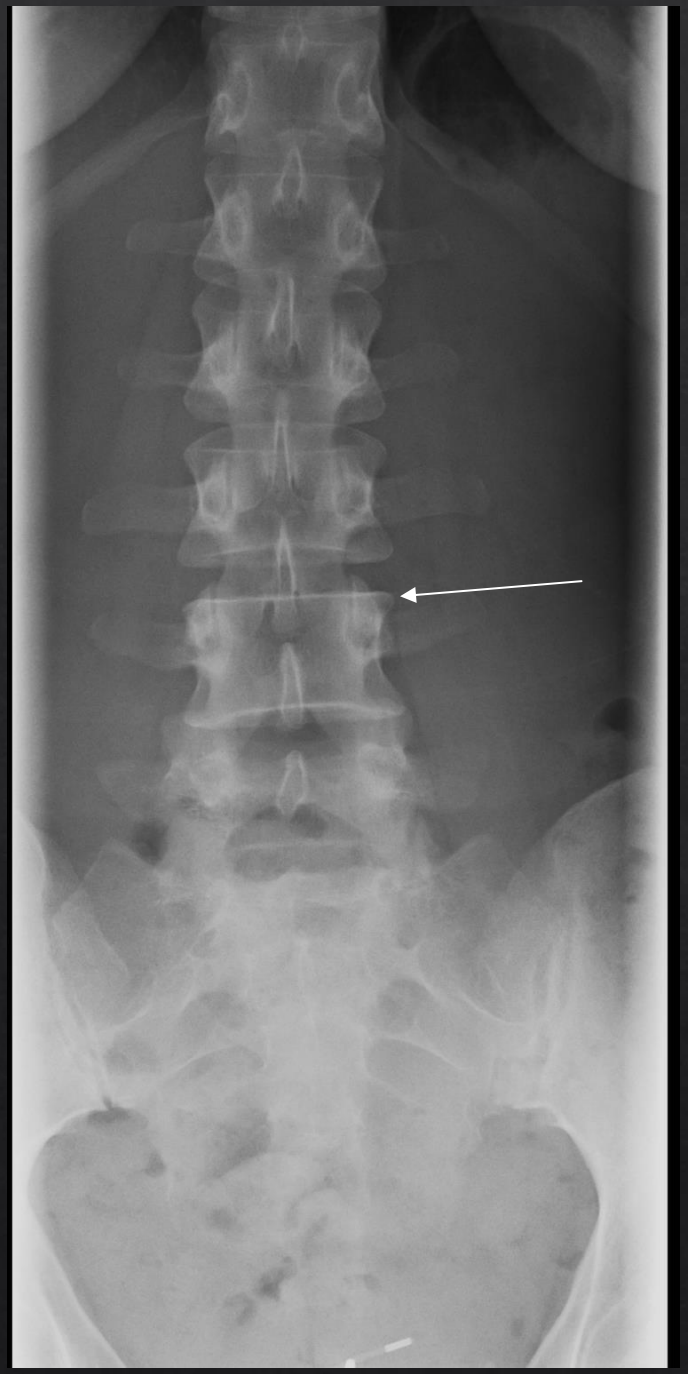
Truncus

Del 2:

Columna lumbalis

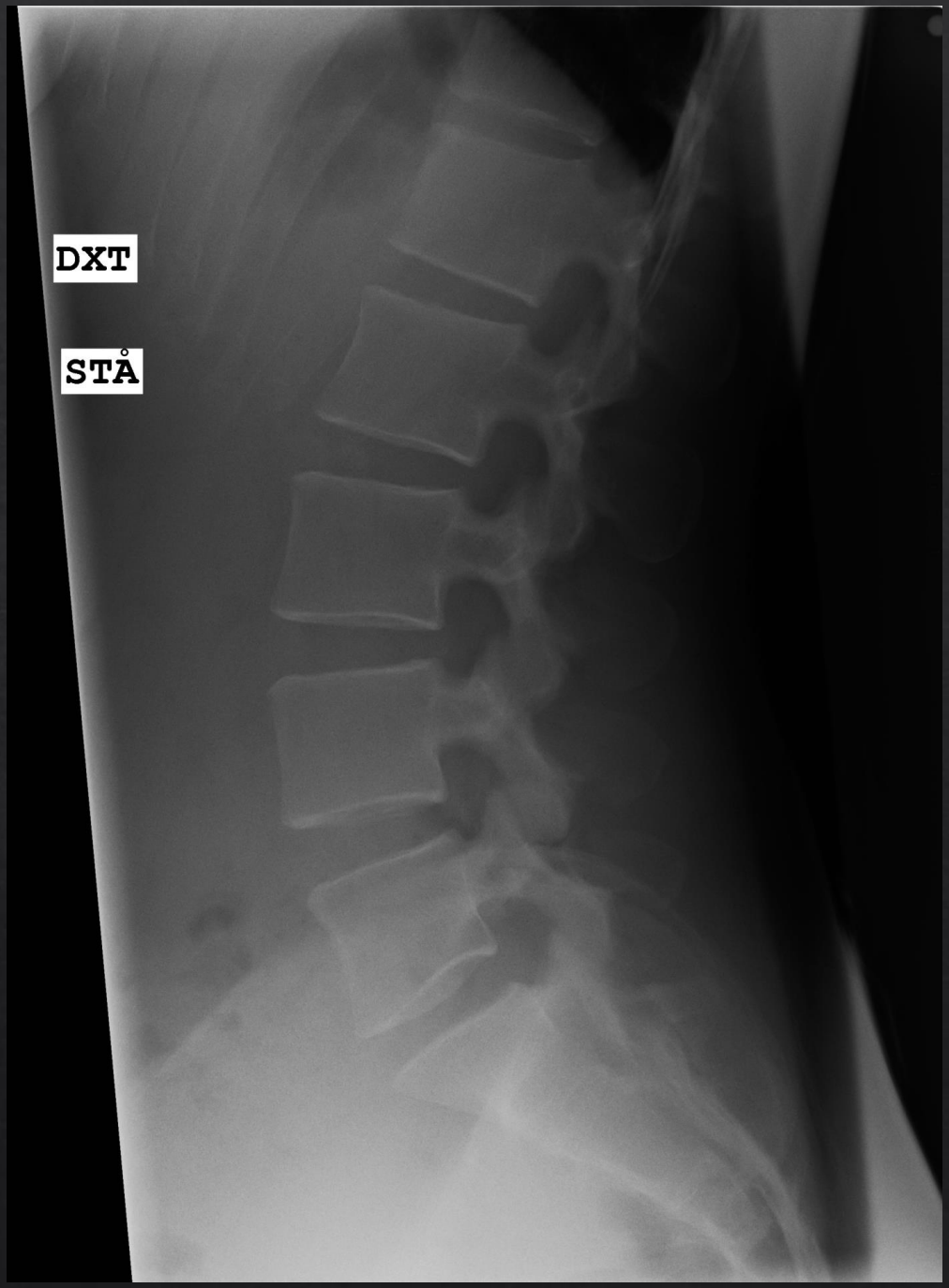
Knoglemarv


DXT
STÅ

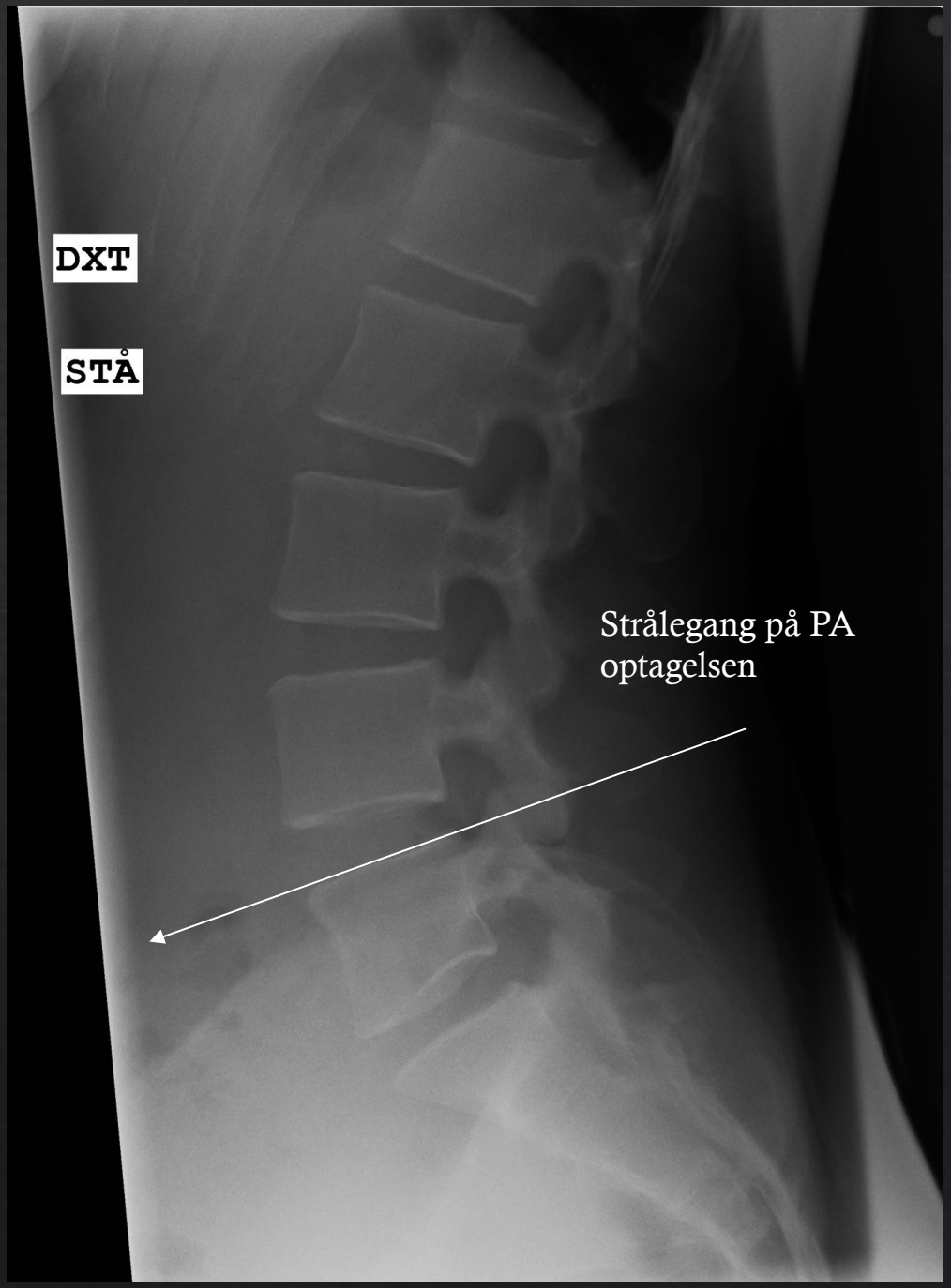



DXT
STÅ
Strålegang på PA optagelsen


DXT
STÅ

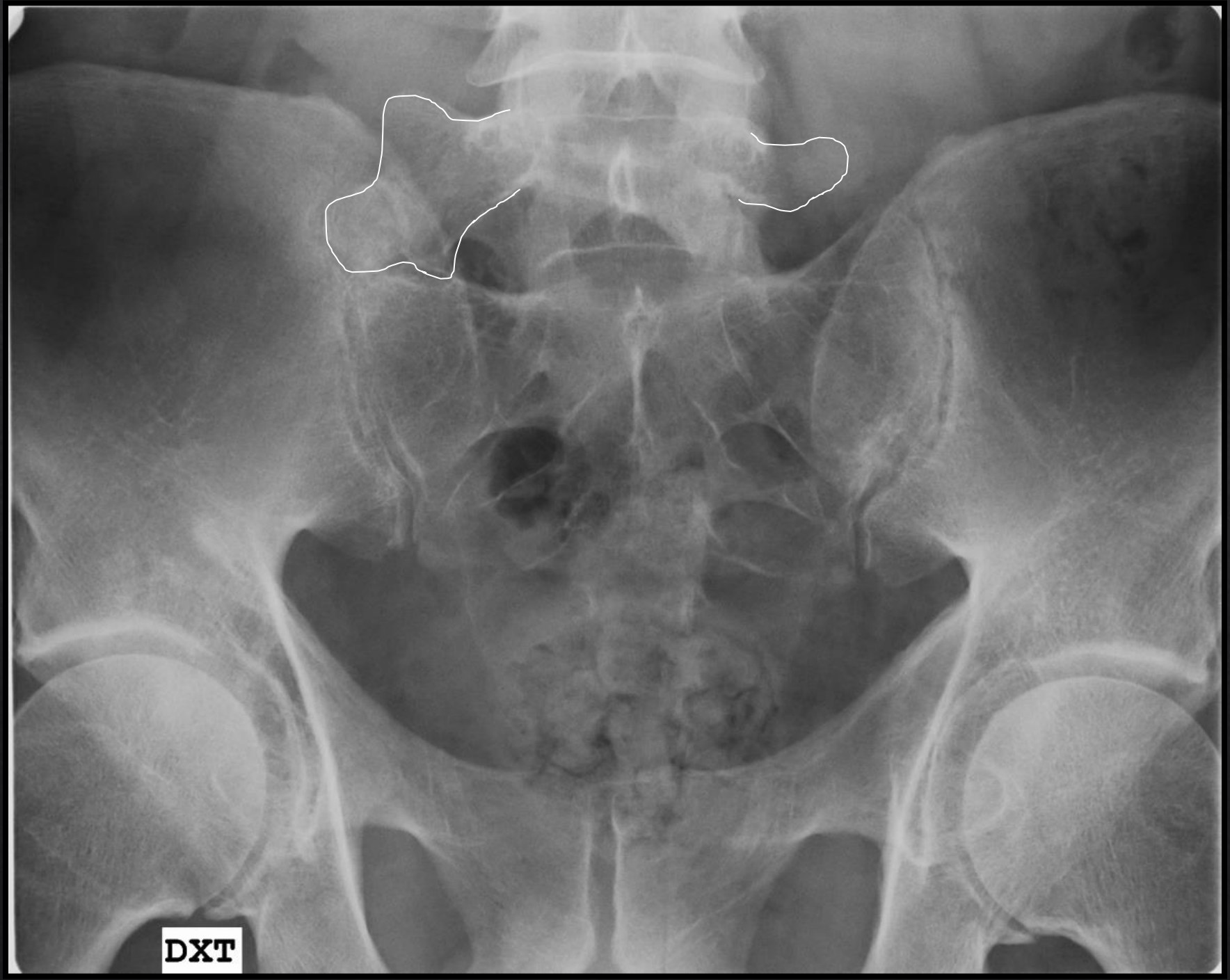

DXT
STÅ


DXT
STÅ

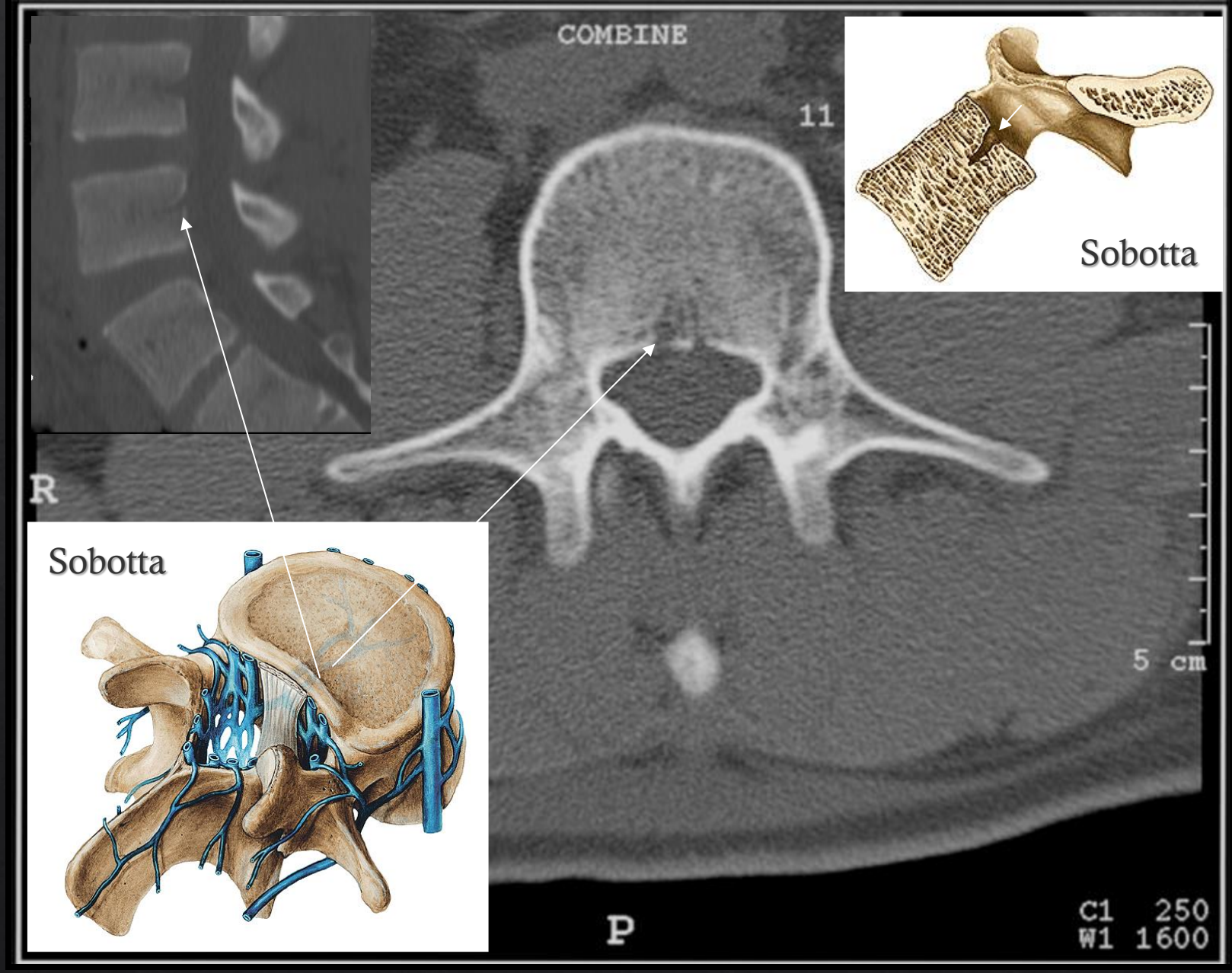

DXT
STÅ
Strålegang på PA optagelsen

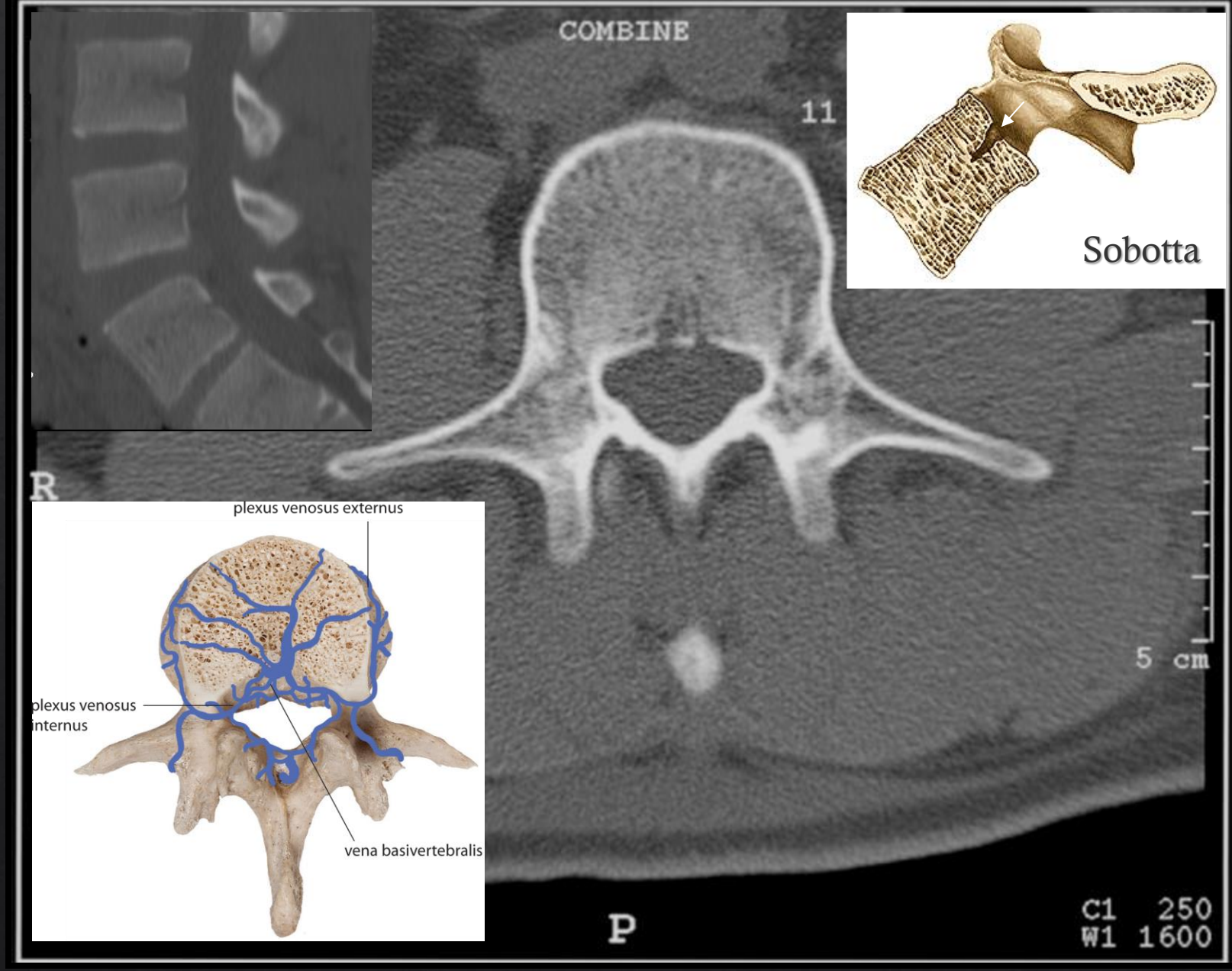
Lumbosakral overgangshvirvel


DXT


DXT

Columnas blodforsyning


COMBINE
11
R
P
5 cm
C1 250
W1 1600
Sobotta
Sobotta

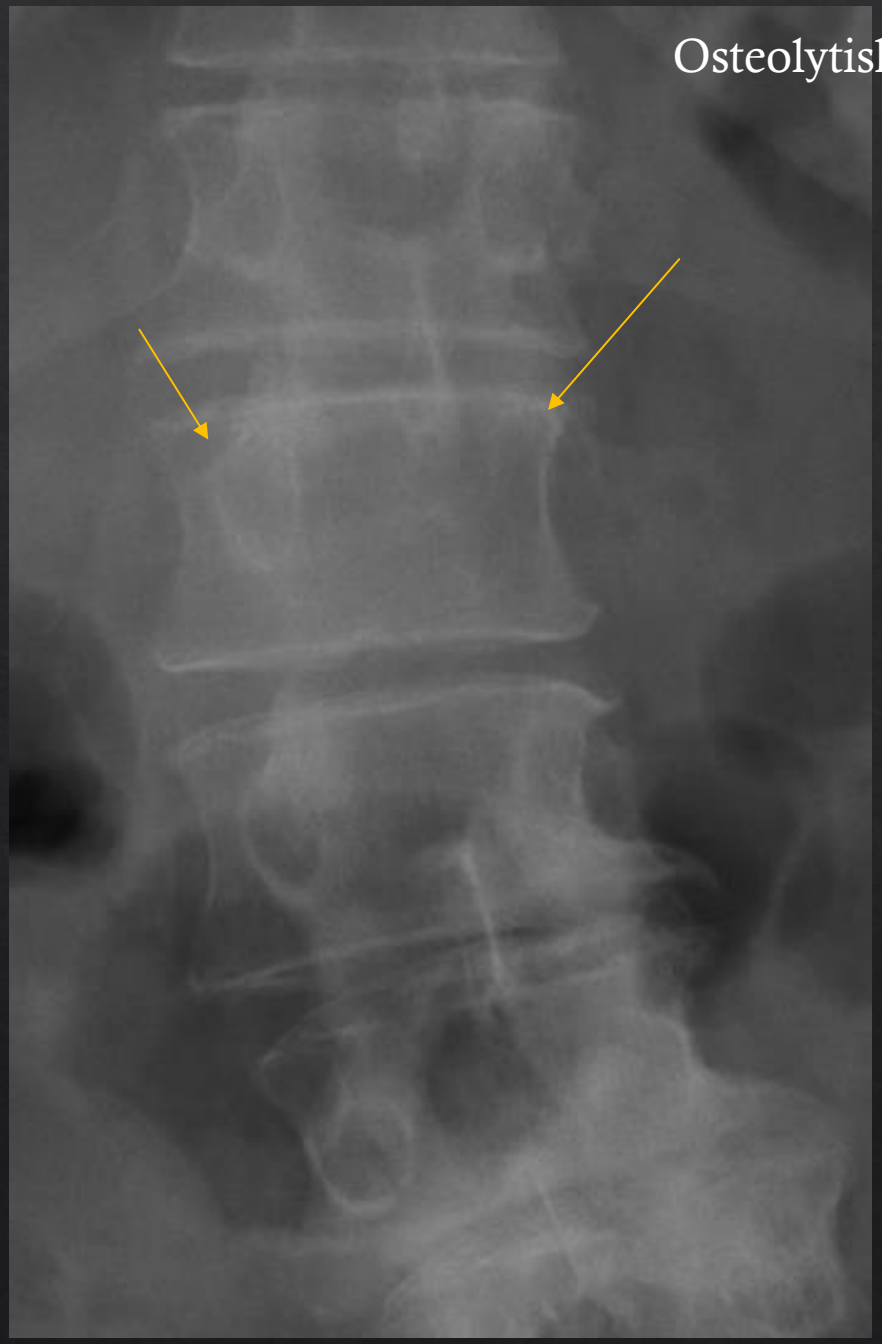

COMBINE
11
R
P
5 cm
C1 250
W1 1600
Sobotta
plexus venosus externus
plexus venosus internus
vena basivertebralis

Ældre kvinde med smerter på thorakolumbale overgang.


SIN
AP
STÅ


DXT
STÅ


Osteolytisk metastase



Knoglemarven

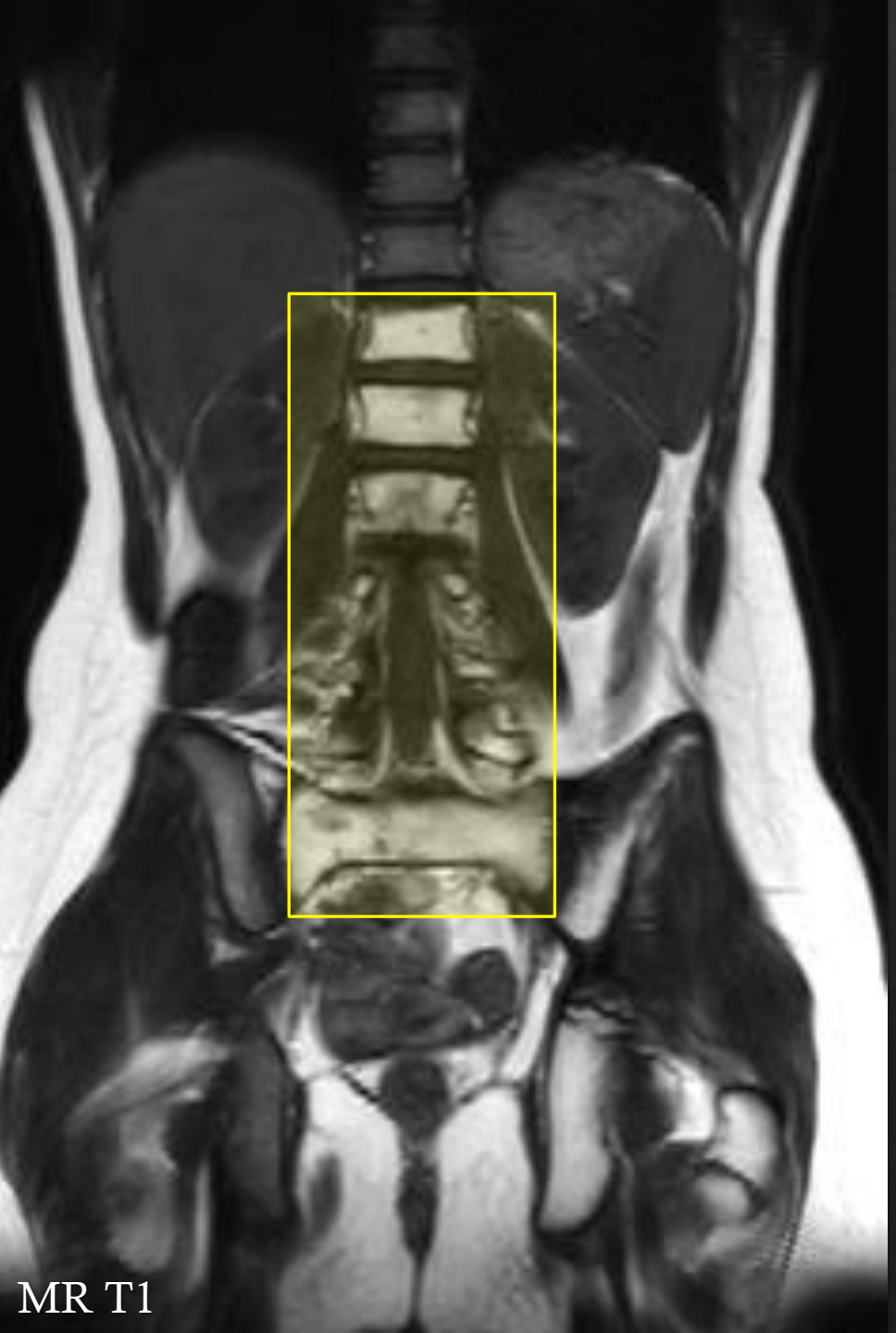
Knoglemarv hos en voksen

T1: TR og TE kort

T2: TR og TE lang

STIR: Fedt suppression

Yngre barn



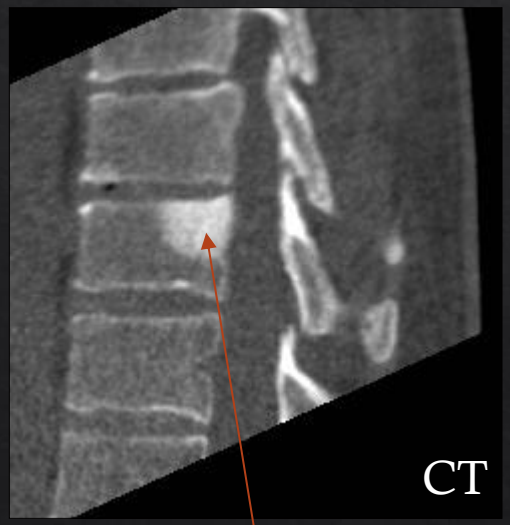
Yngre barn

- Følger efter strålebehandling, med konvertering af rød knoglemarv til gul knoglemarv. (Det hæmopoietiske væv går til grunde).

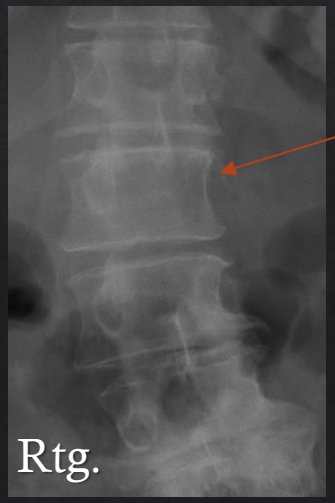
Patologisk knoglemarv

Marvinfiltration

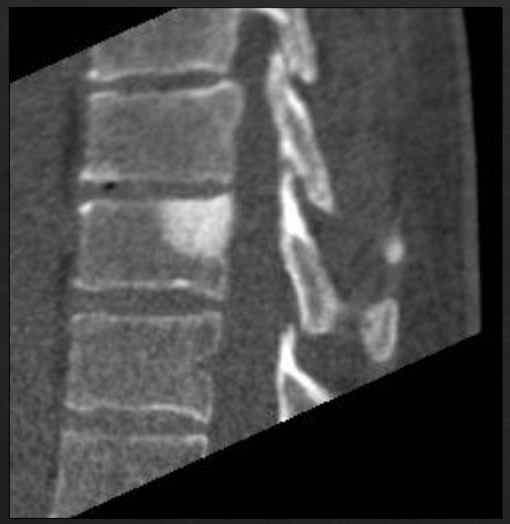
Metastaser (fjern spredning af kræft):
Marvinfiltration (Svulstcellerne ligger fokalt i knoglemarven)
Osteolyse (Påvirkning af knoglevævet der fokalt forsvinder)
Osteosklerose (Påvirkning af knoglevævet, der fokalt øges i tæthed)

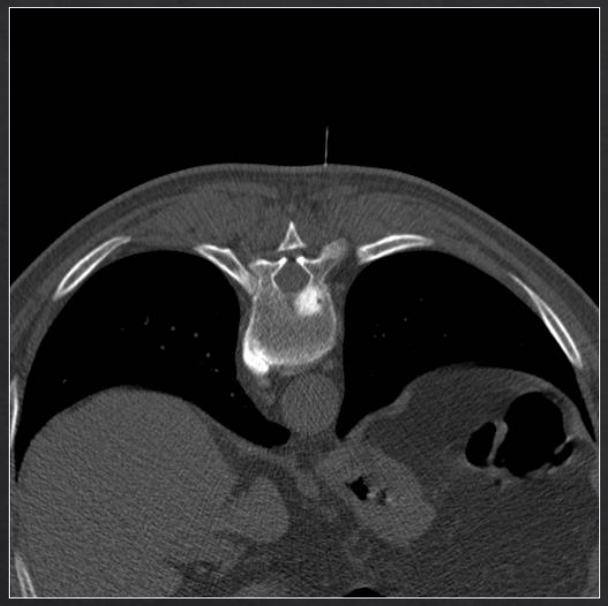
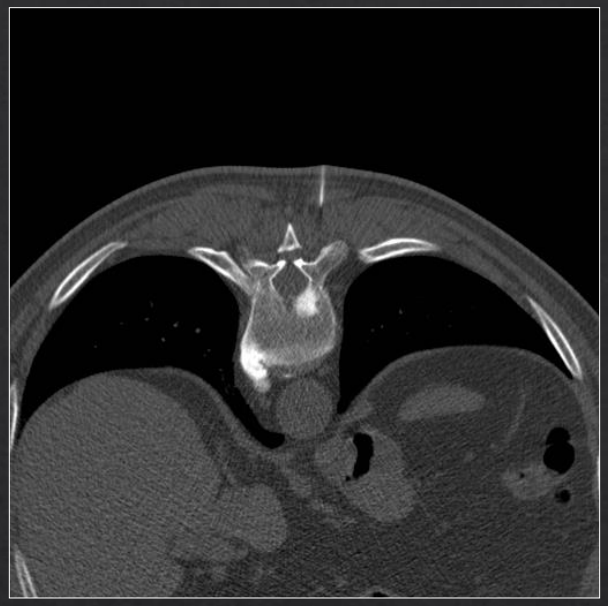
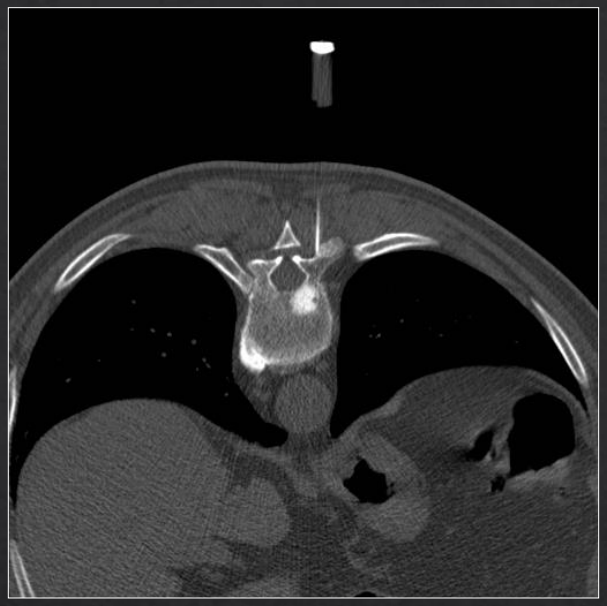


Osteosklerotisk metastase

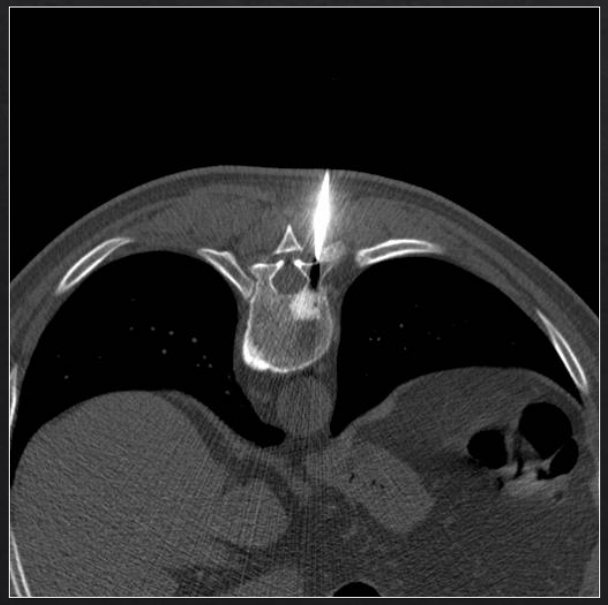
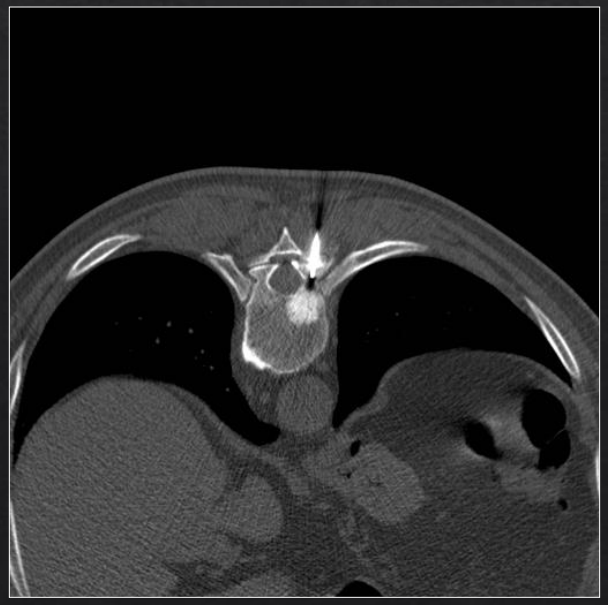
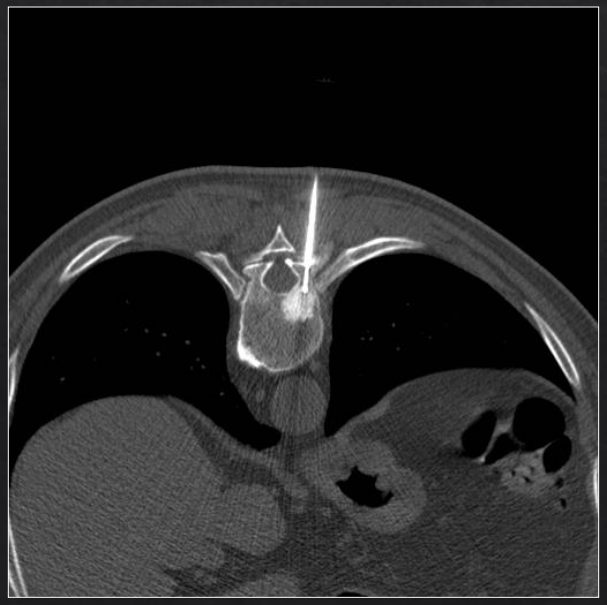


Osteolytisk metastase (pediklet på venstre side er forsvundet)



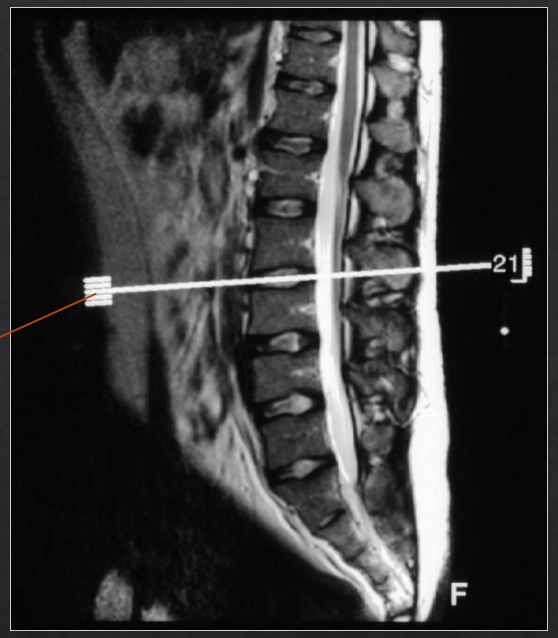
CT-vejledt biopsi

Bløddelene

Medulla, cauda equina, discus intervertebralis, ligamenter

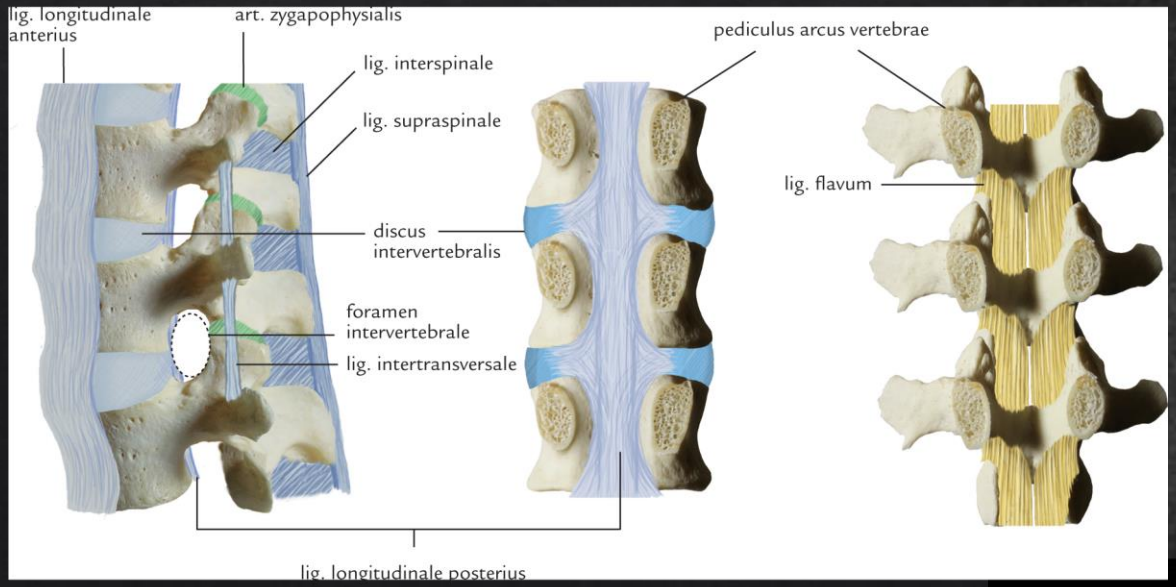
Discus intervertebralis



Snit lige gennem lumbal discus
(MR T2)

Bevægeapparatets anatomi

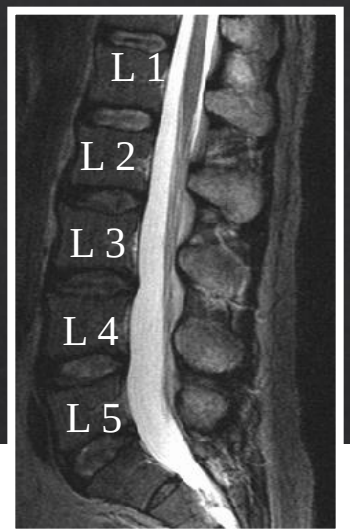
Medulla spinalis
Conus medullaris
Cauda equina
Liquor cerebrospinalis
Ligg. supraspinalia
Ligg. interspinalia
Ligg. flava
Lig. longitudinale ant.
Lig. longitudinale post.
Discus intervertebralis

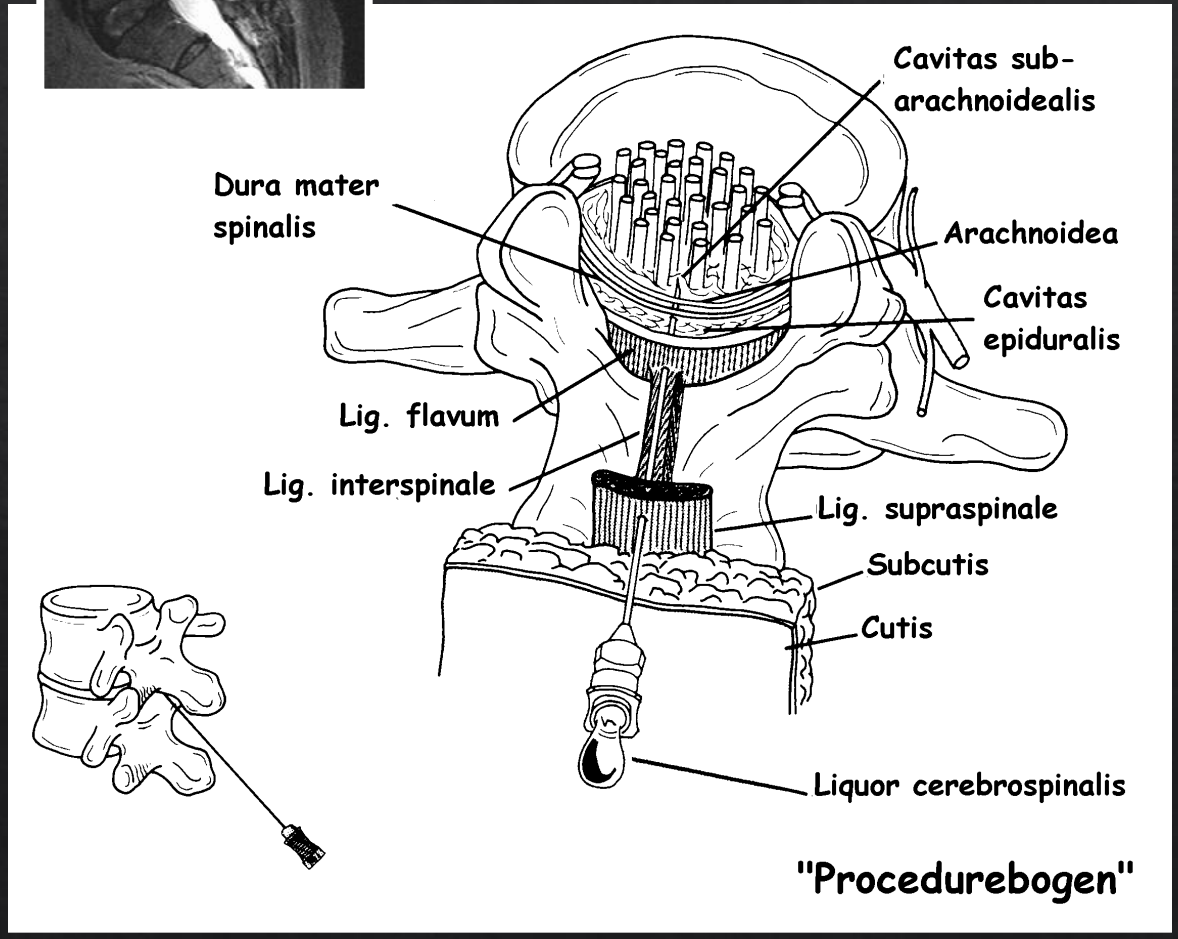


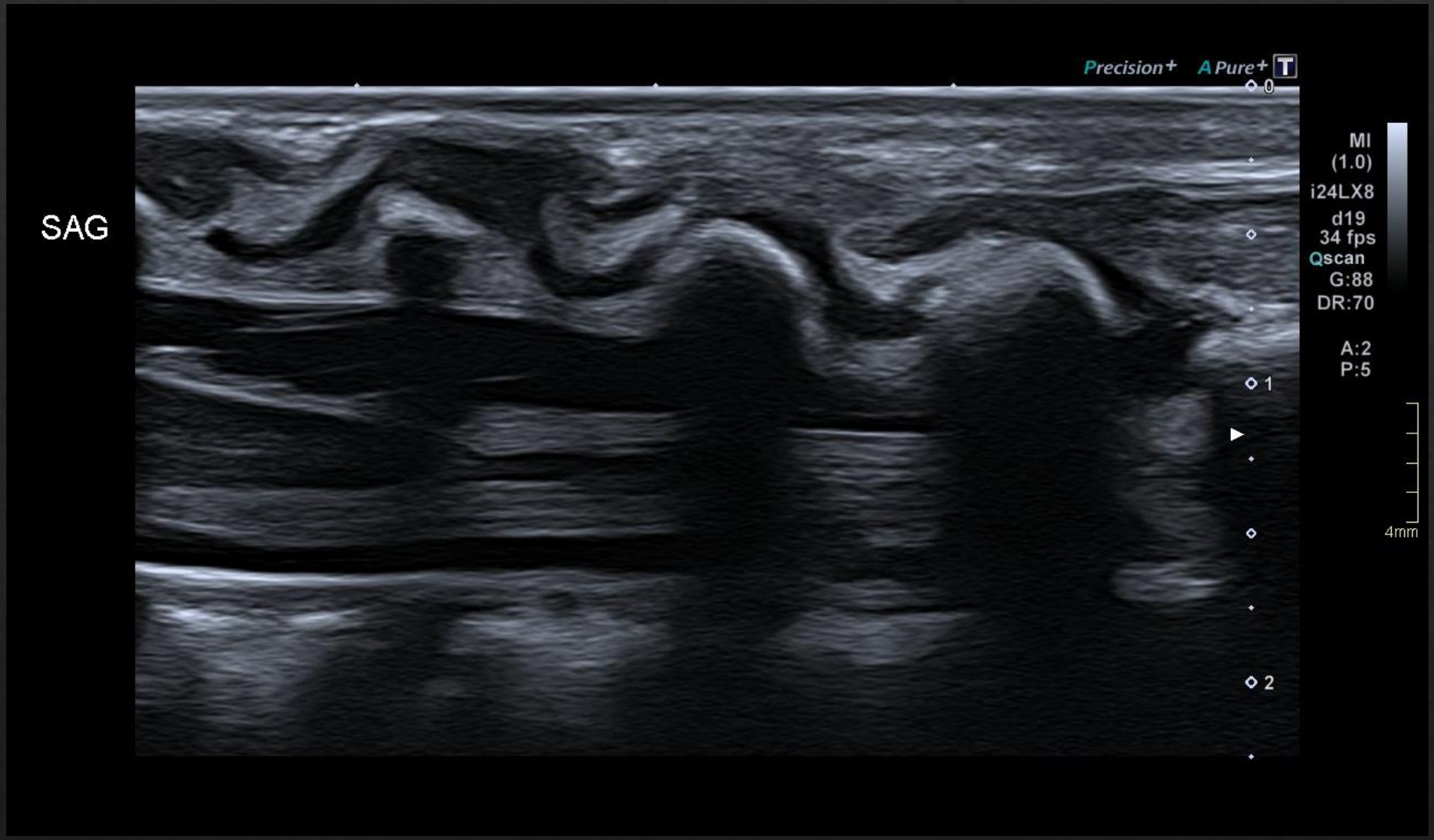

1
10
7
5
2
8
6
5
3
8
9
4

1) Medulla spinalis
2) Conus medullaris
3) Cauda equina
4) Liquor cerebrospinalis
5) Ligg. supraspinalia
6) Ligg. interspinalia
7) Ligg. flava
8) Lig. longitudinale ant.
9) Lig. longitudinale post.
10) Discus intervertebralis

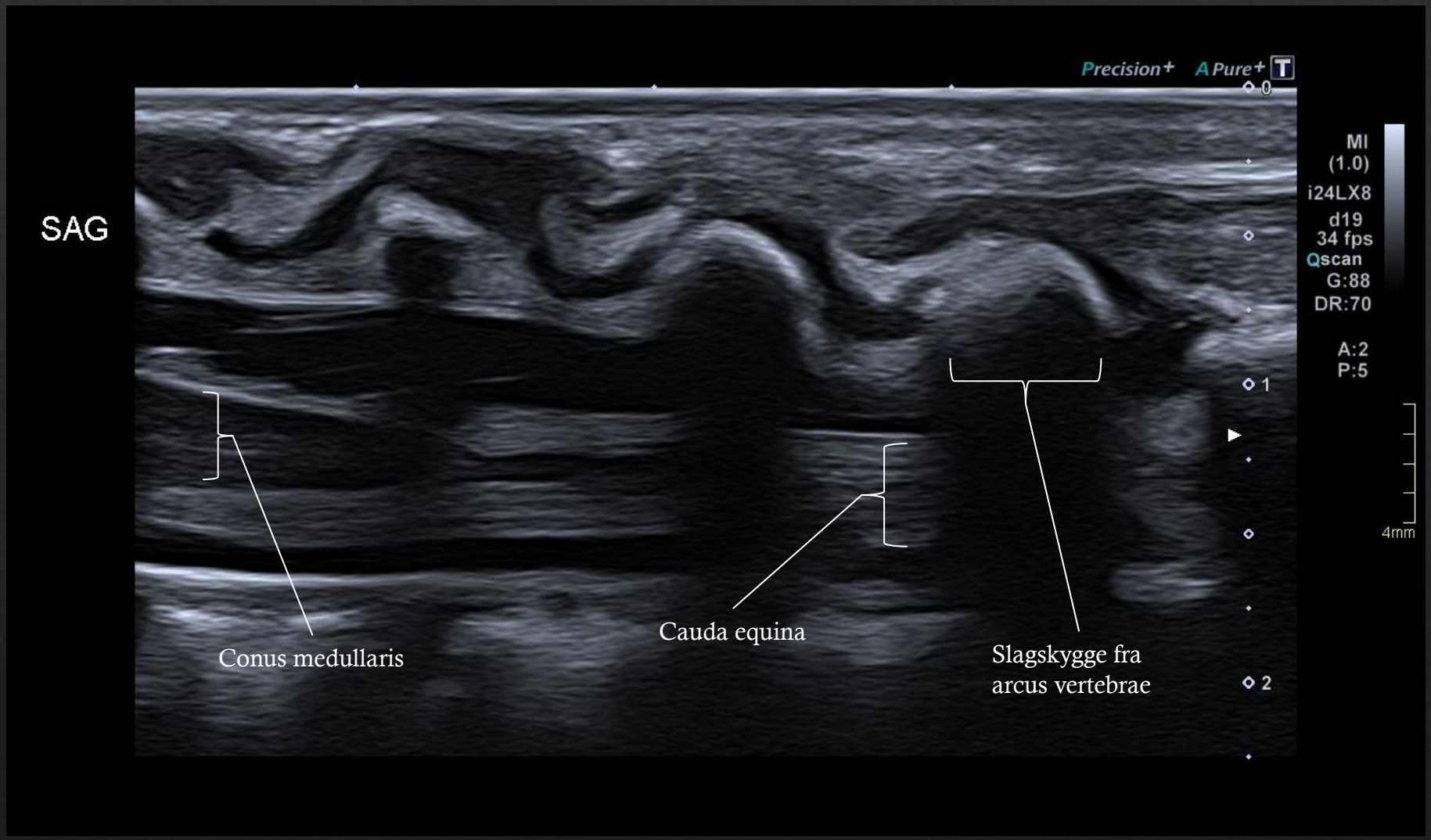
Lumbalpunktur


L 1
L 2
L 3
L 4
L 5


Cavitas sub-
arachnoidealis
Dura mater
spinalis
Arachnoidea
Cavitas
epiduralis
Lig. flavum
Lig. interspinale
Lig. supraspinale
Subcutis
Cutis
Liquor cerebrospinalis
"Procedurebogen"



UL skanning af medulla spinalis og cauda equina hos nyfødt



UL skanning af medulla spinalis og cauda equina hos nyfødt

Truncus

Del 3:

Bugvæggen og diafragma

Hernier

Bughulens afgrænsninger.


Image 26
15:18:30
Scan 26
TP -415
ANTERIOR
RIGHT
TI 2*1
mA 165
kV 120
SL 10
GT 0
ZO 1.6
CE -7
0
AB 7555 oral
W 316
C 6
M -681

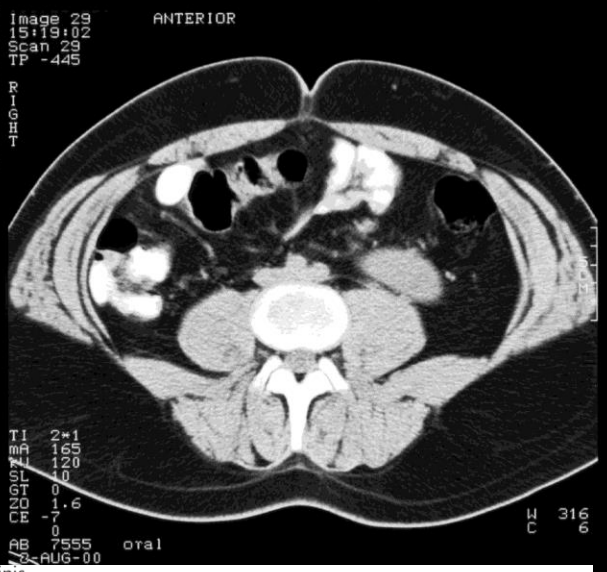
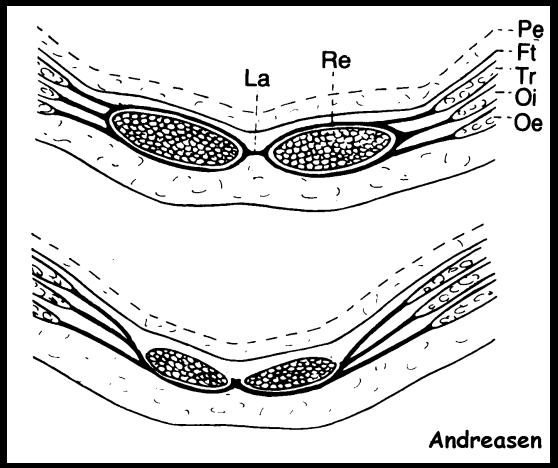


Image 29
15:19:02
Scan 29
TP -445
ANTERIOR
RIGHT
TI 2*1
mA 165
kV 120
SL 10
GT 0
ZO 1.6
CE -7
0
AB 7555 oral
W 316
C 6


Pe
Ft
Tr
Oi
Oe
La
Re
Andreasen

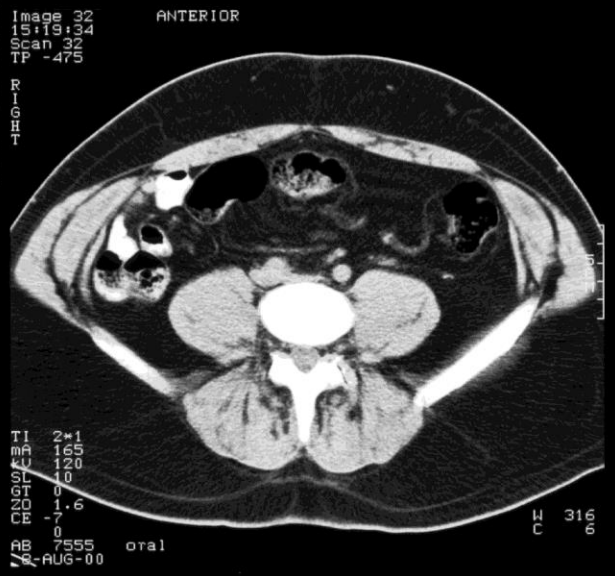
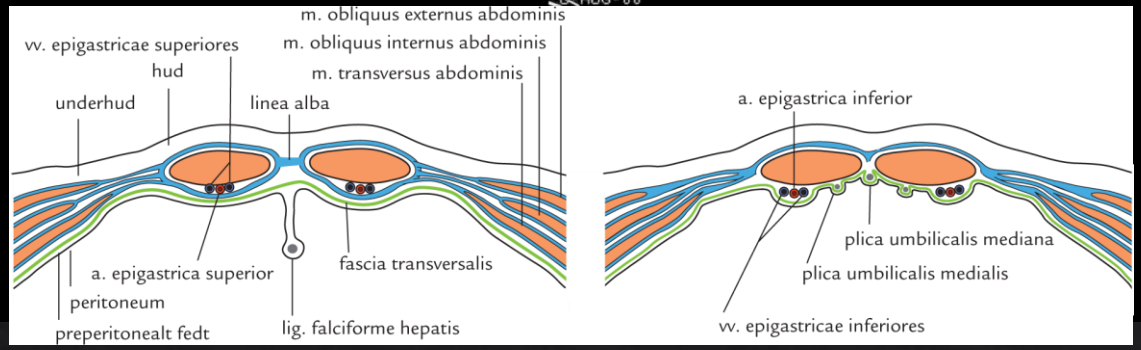
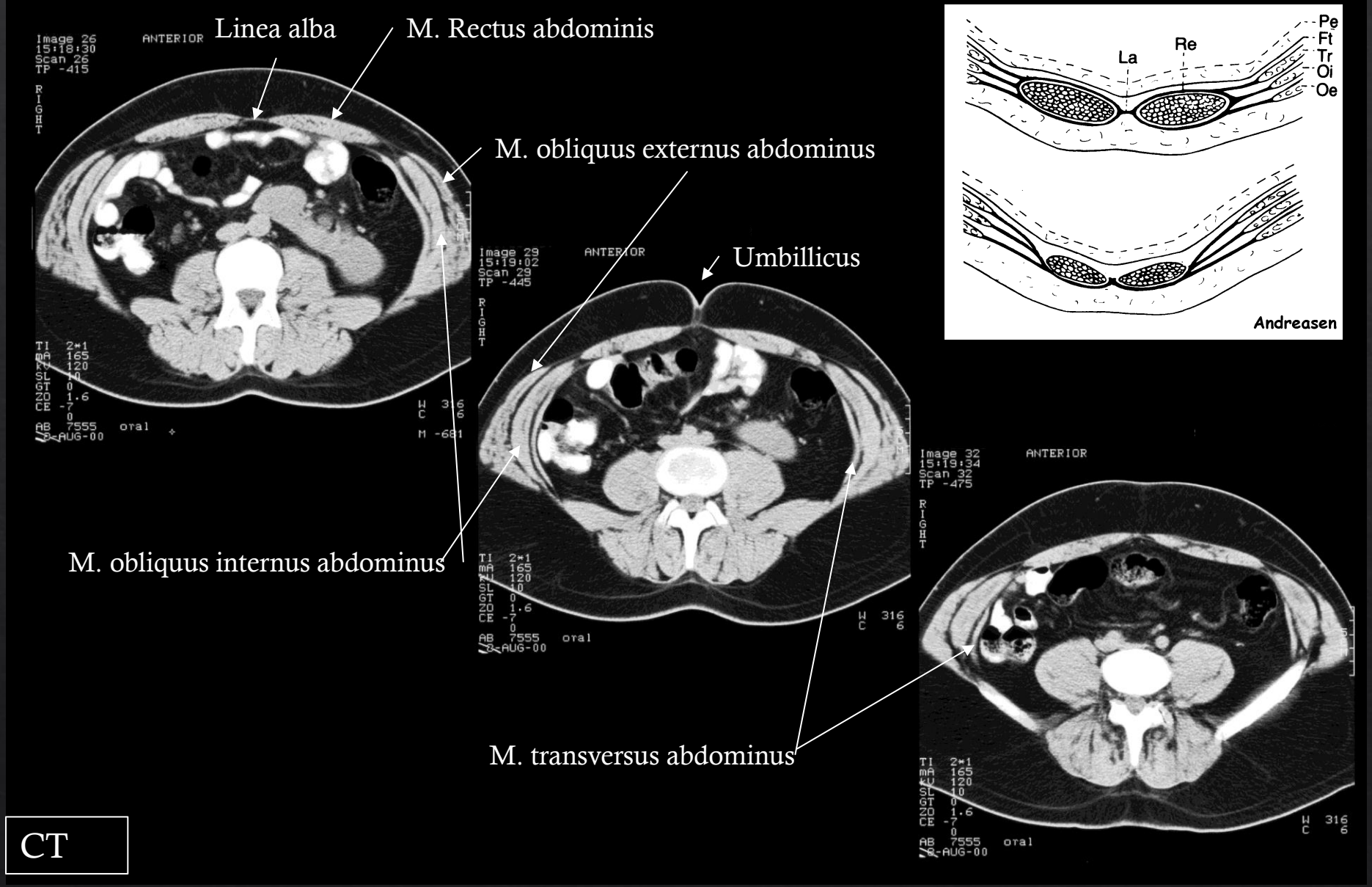
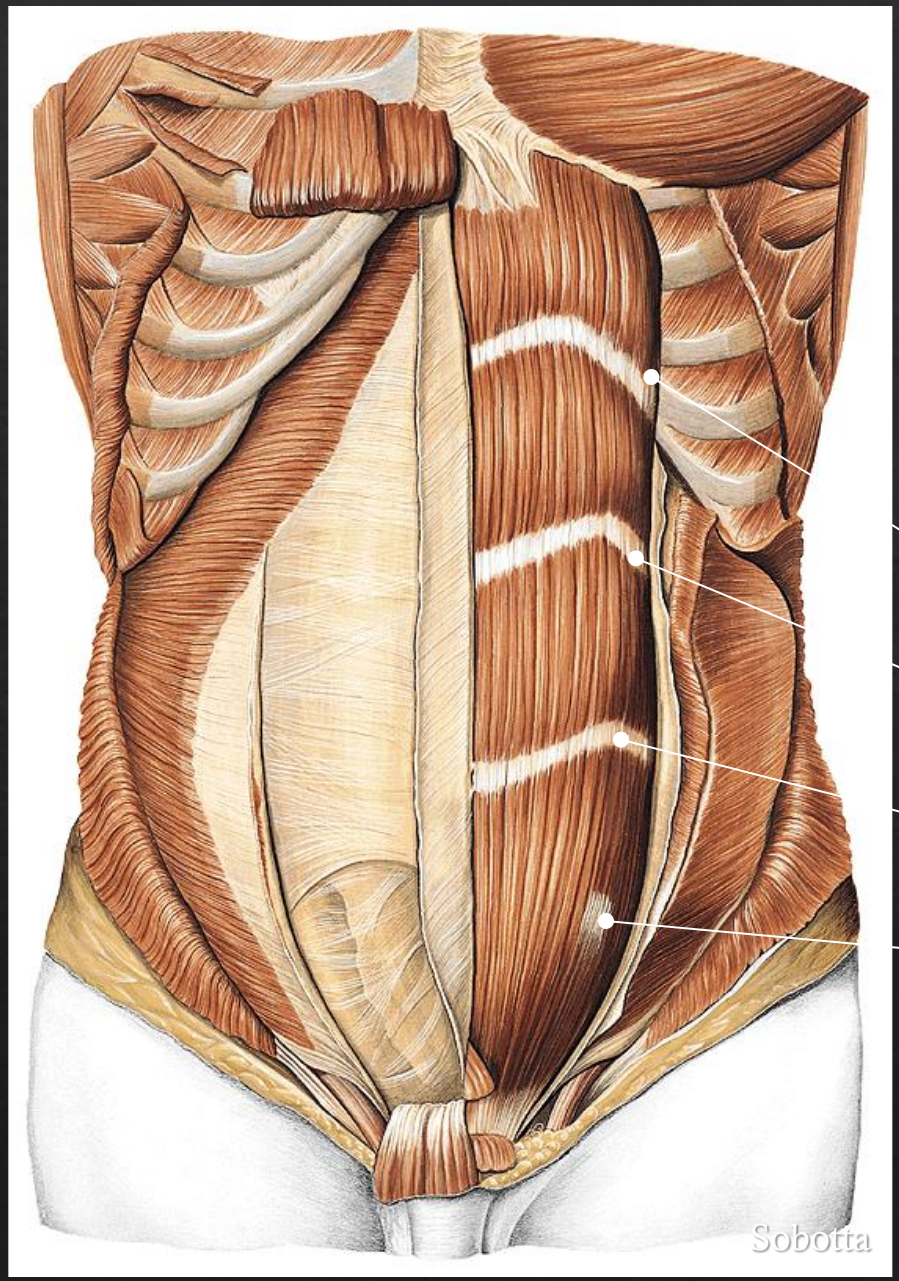


Image 32
15:19:34
Scan 32
TP -475
ANTERIOR
RIGHT
TI 2*1
mA 165
kV 120
SL 10
GT 0
ZO 1.6
CE -7
0
AB 7555 oral
W 316
C 6


m. obliquus externus abdominis
vv. epigastricae superiores
m. obliquus internus abdominis
hud
m. transversus abdominis
underhud
linea alba
a. epigastrica superior
fascia transversalis
peritoneum
preperitonealt fedt
lig. falciforme hepatis
a. epigastrica inferior
plica umbilicalis mediana
plica umbilicalis medialis
vv. epigastricae inferiores

CT


Linea alba
M. Rectus abdominis
M. obliquus externus abdominus
Umbillicus
M. obliquus internus abdominus
M. transversus abdominus
La
Re
Pe
Ft
Tr
Oi
Oe
Andreasen
CT


Sobotta

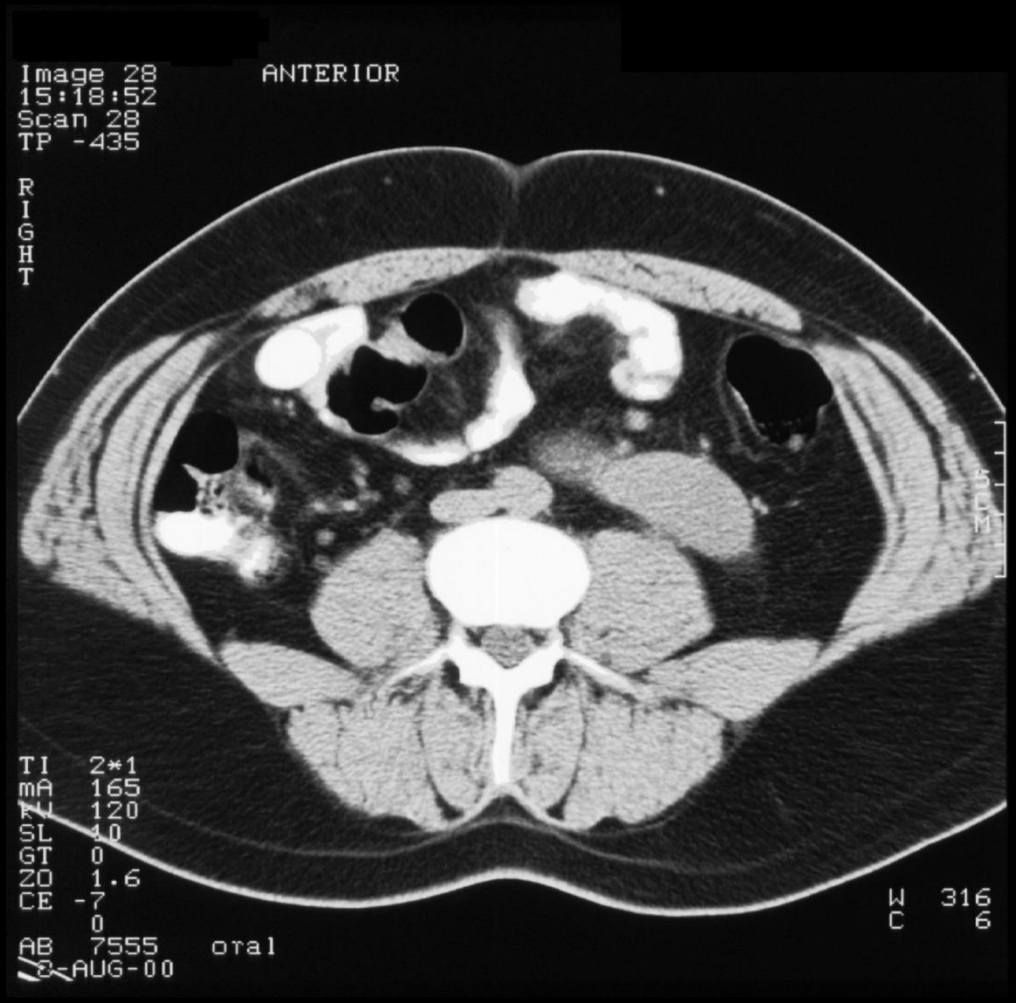
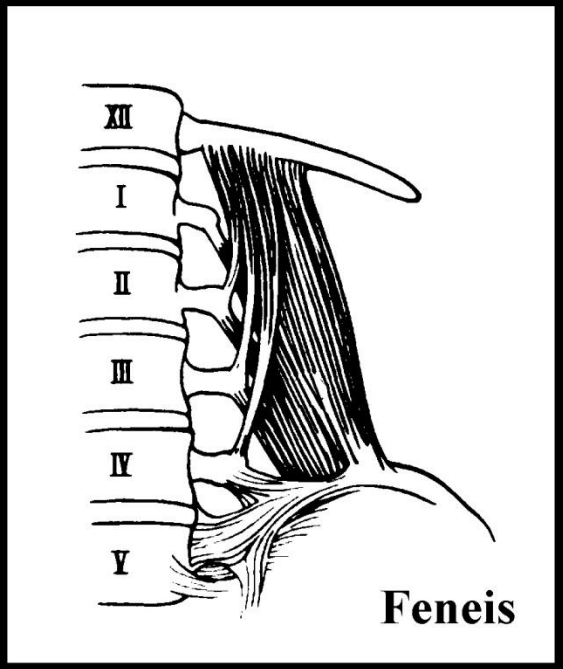
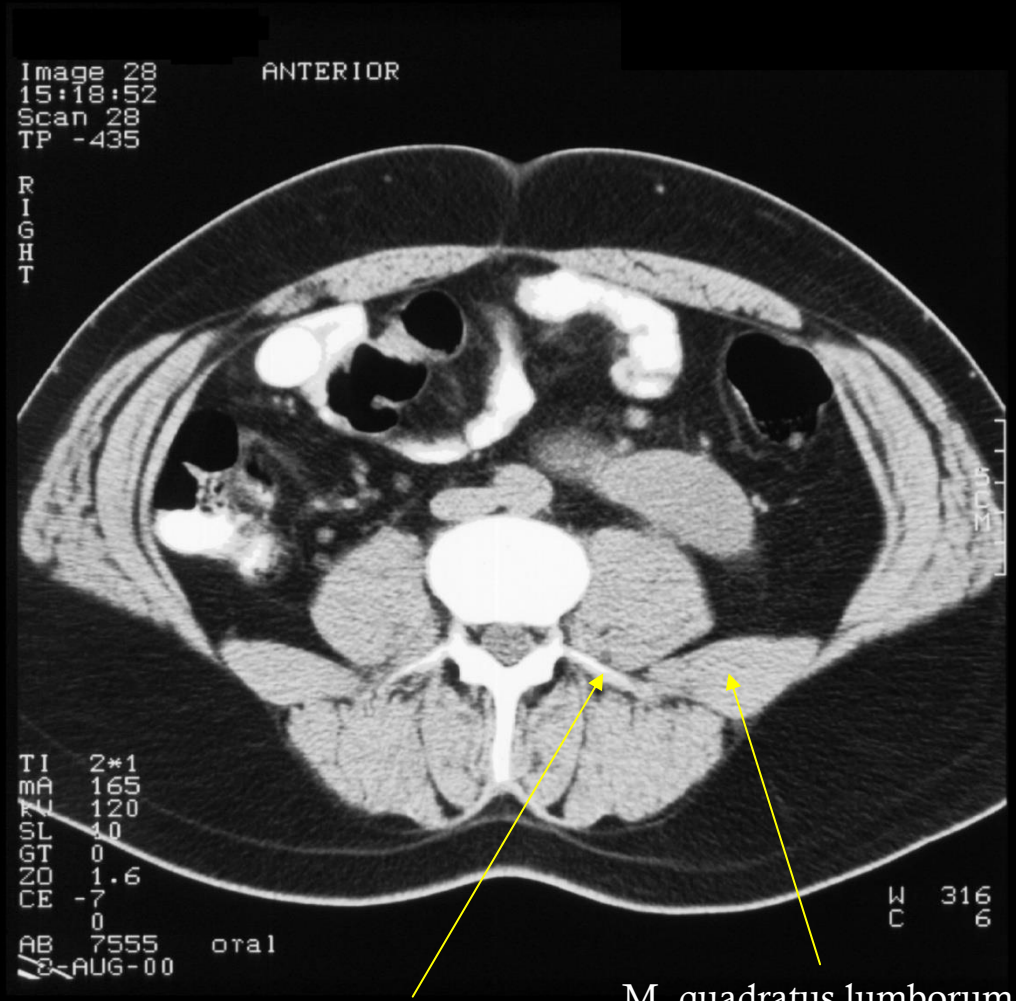


Image 28
15:18:52
Scan 28
TP -435
ANTERIOR
R
I
G
H
T
TI 2*1
mA 165
kV 120
SL 10
GT 0
ZO 1.6
CE -7
0
AB 7555 oral
8-AUG-00
W 316
C 6


XII
I
II
III
IV
V
Feneis

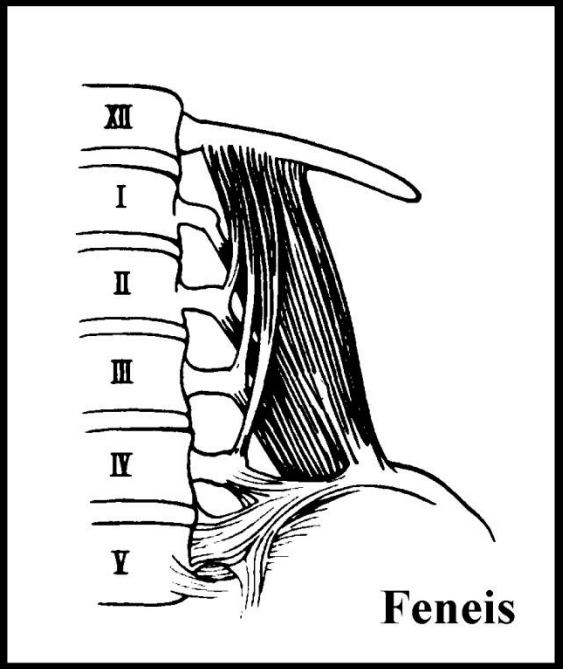
CT



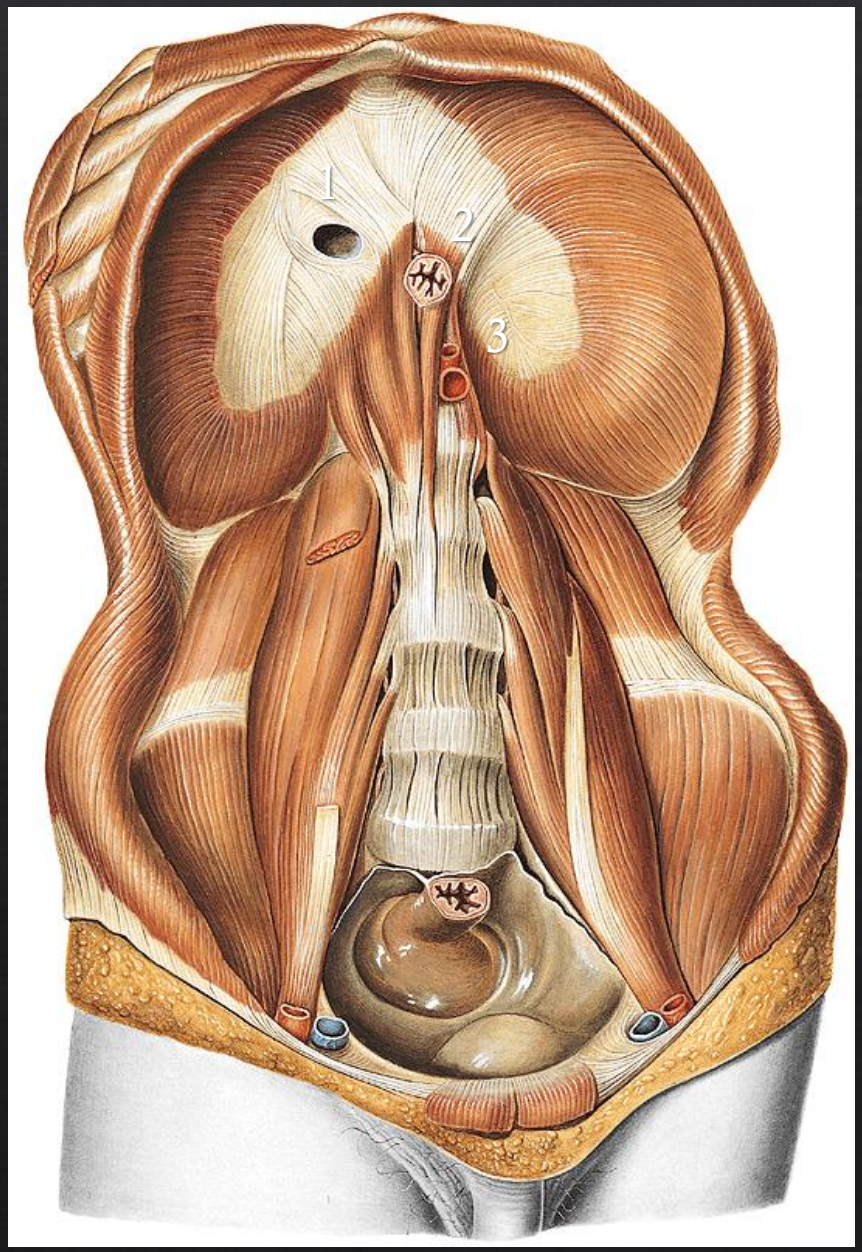
Processus transversus

M. quadratus lumborum

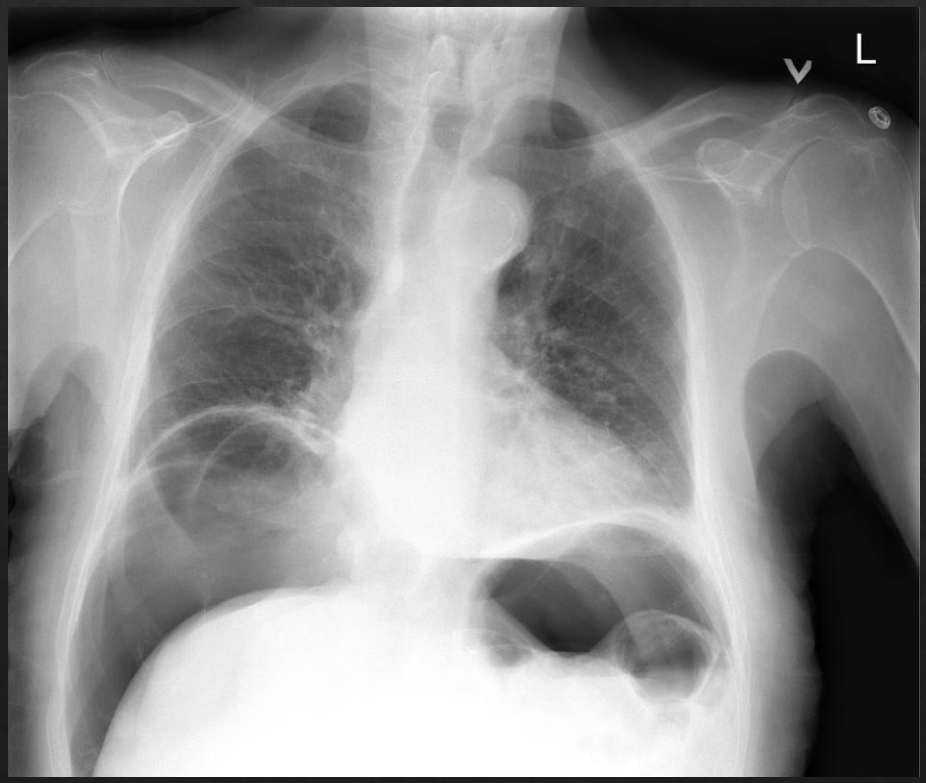
CT



Diaphragma



1) Foramen venae cavae
2) Hiatus esophageus
3) Hiatus aorticus

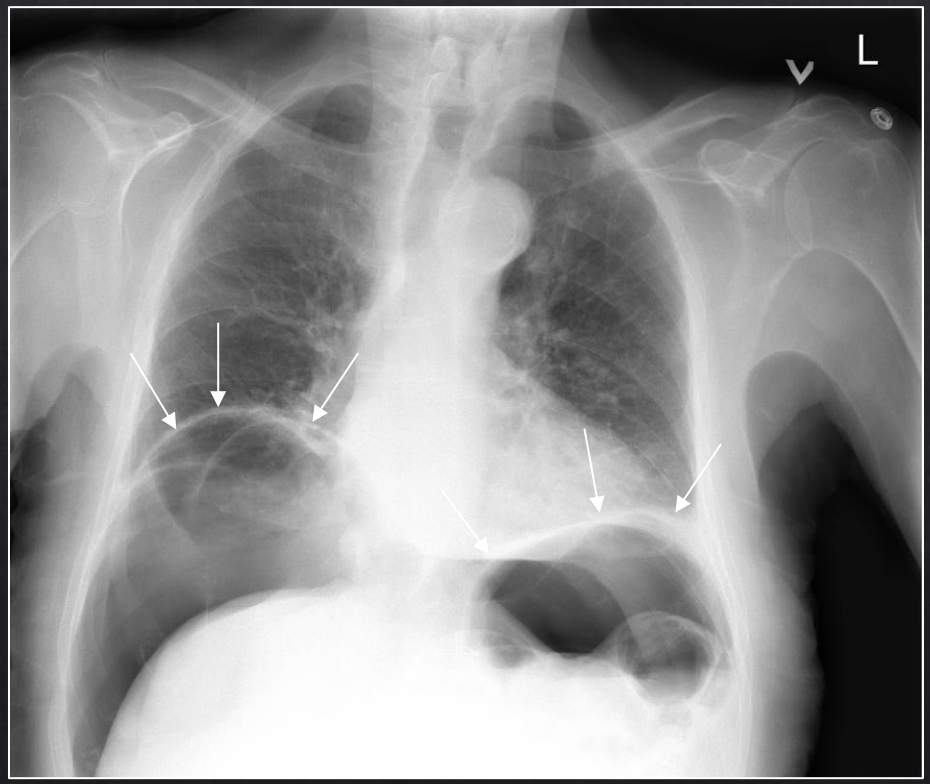


Pneumoperitoneum efter ERCP

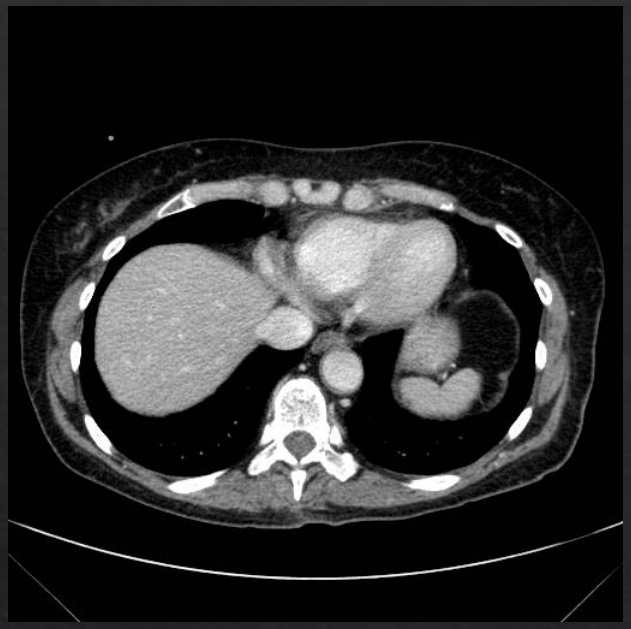
Diaphragma

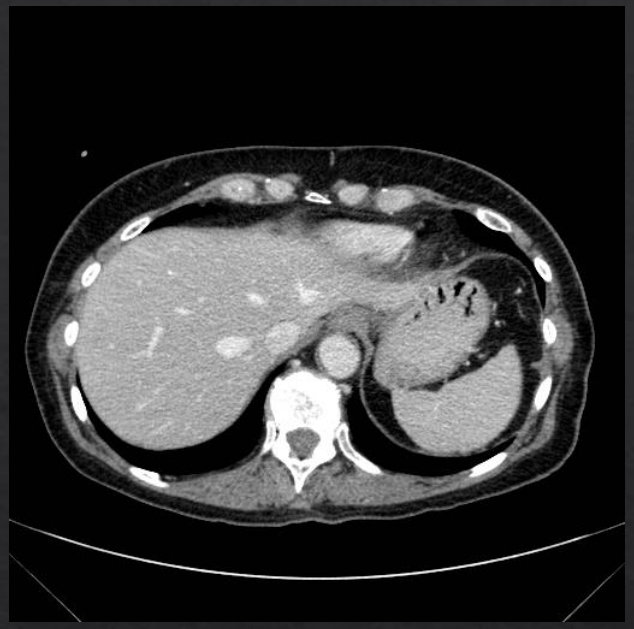
Under normale omstændigheder, ses ikke pneumoperitoneum. Der skal således altid være en god forklaring på fundet, eksempelvis de første dage efter en abdominal operation. Ellers må man mistænke perforation af et hulorgan, (ventrikel, tynd- eller tyktarm). Luften i sig selv vil blive resorberet igen, men der kan også lække tarmindhold med bakterier ud i peritoneum, således der opstår betændelse i bughulen, kaldet peritonit.
På den foreliggende stående røntgenoptagelse af thorax, ses diaphragma kuplerne tydeligt, da der er de luftholdige lunger kranielt og luften i peritoneum kaudalt herfor.

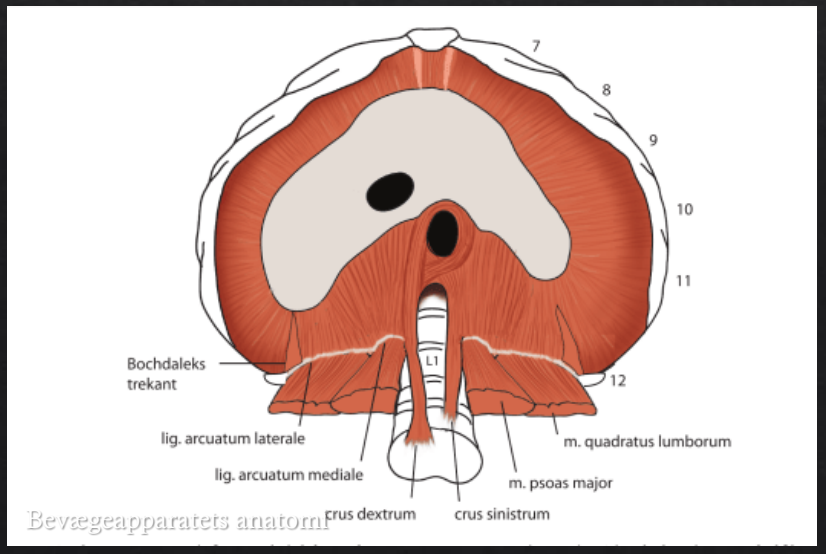
Pneumoperitoneum, luft i bughinden, opstået efter en kikkertundersøgelse af galdevejene og pancreas (Endoskopisk retrograd cholangio-pancreaticoskopi).

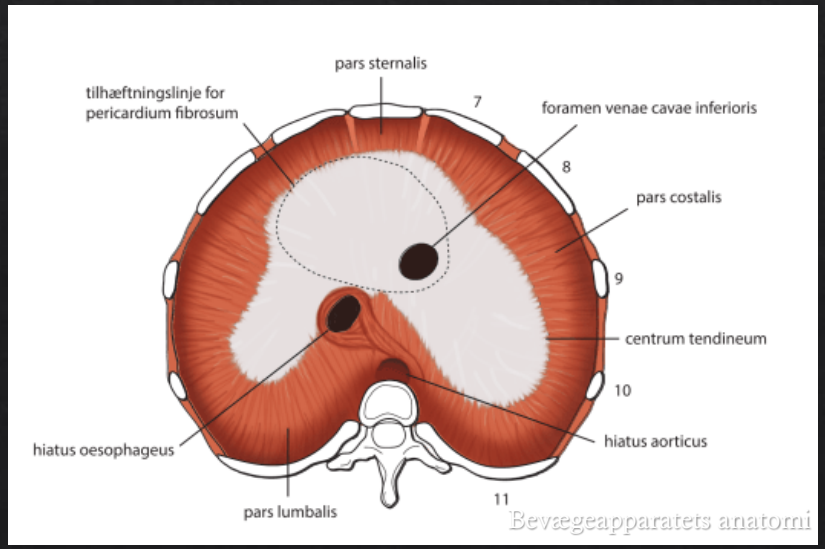


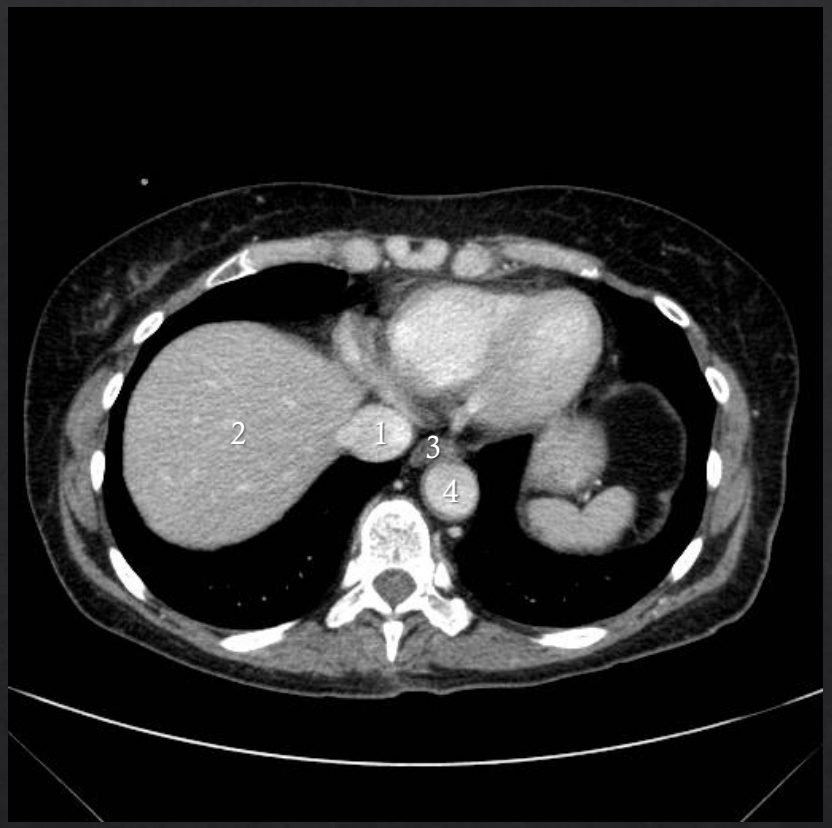
Pneumoperitoneum efter ERCP



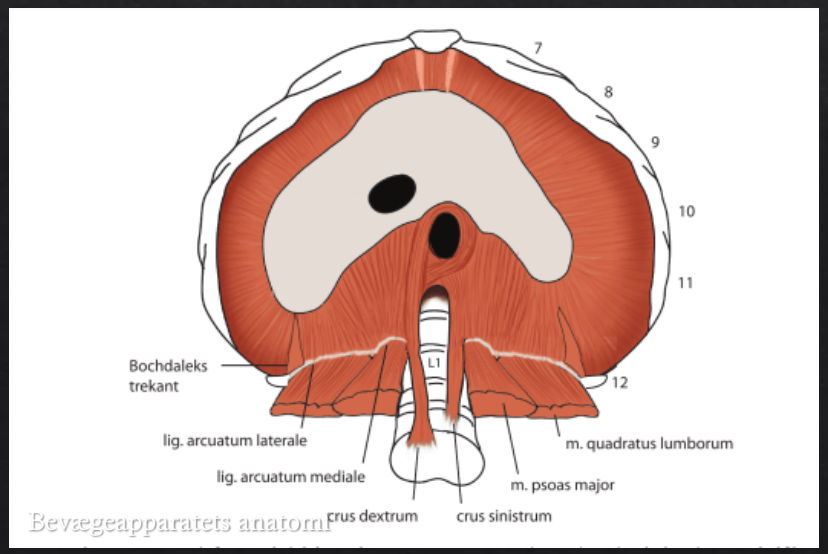


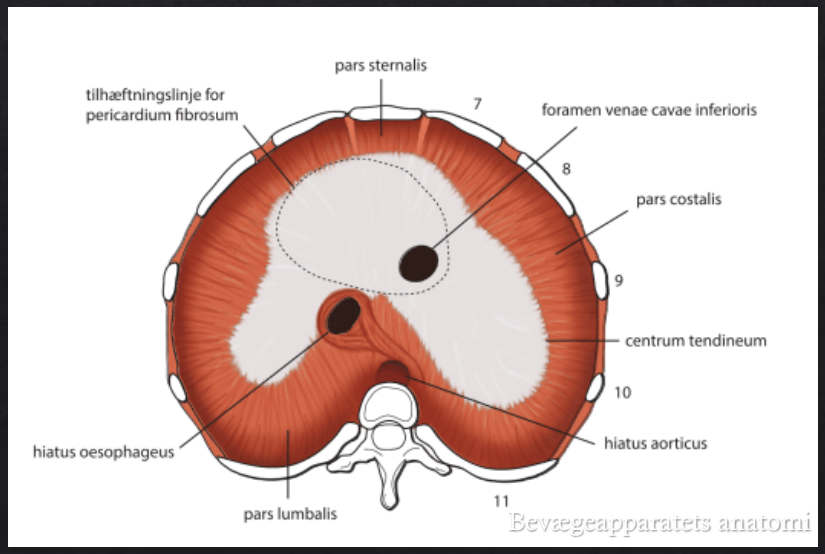

7
8
9
10
11
12
L1
Bochdaleks trekant
lig. arcuatum laterale
lig. arcuatum mediale
crus dextrum
crus sinistrum
m. psoas major
m. quadratus lumborum
Bevægeapparatets anatomi


pars sternalis
tilhæftningslinje for pericardium fibrosum
7
foramen venae cavae inferioris
8
pars costalis
9
centrum tendineum
10
hiatus oesophageus
hiatus aorticus
11
pars lumbalis
Bevægeapparatets anatomi

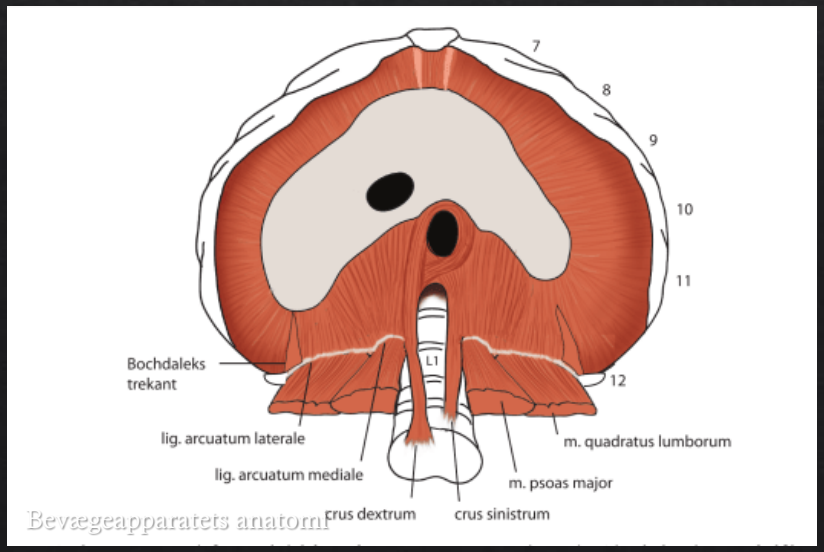


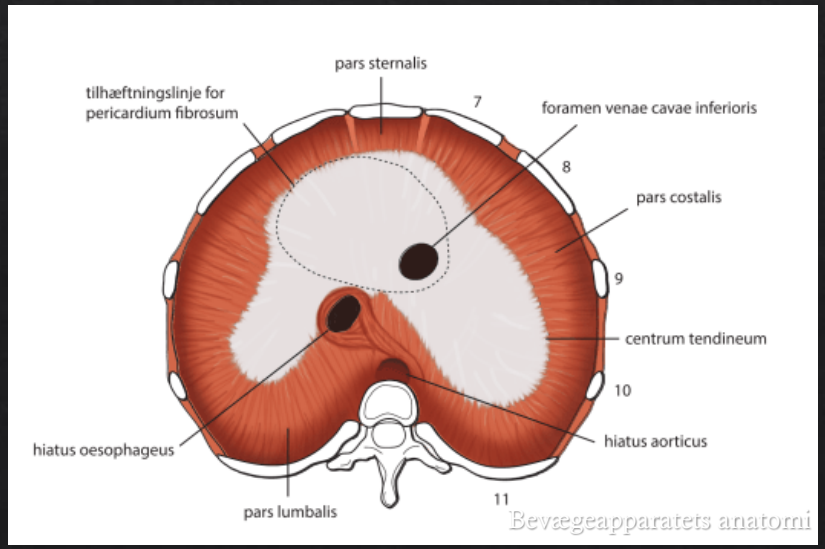
1) V. cava inf.
2) Hepar
3) Esophagus
4) Aorta
5) Crus dextrum
6) Crus sinistrum



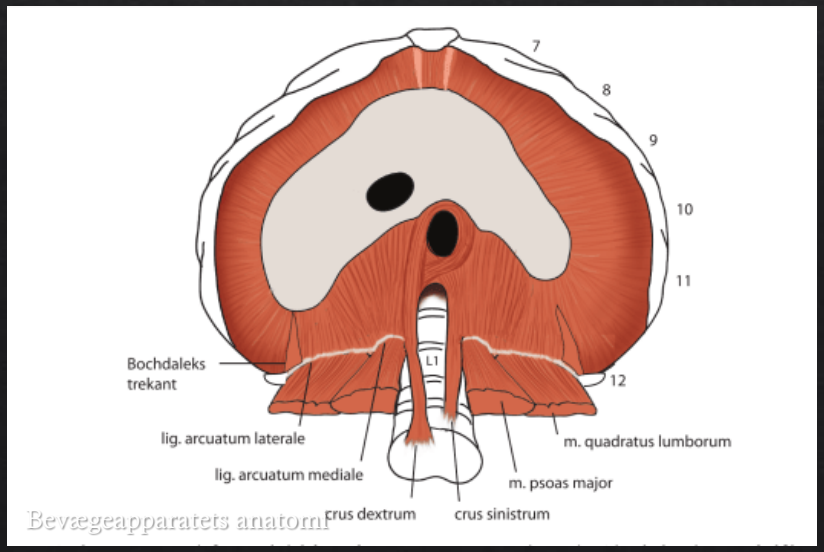


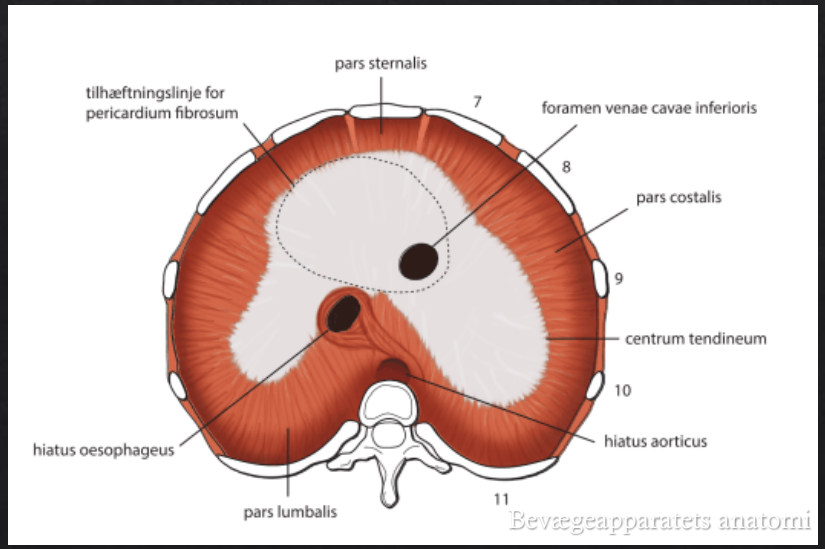
1) V. cava inf.
2) Hepar
3) Esophagus
4) Aorta
5) Crus dextrum
6) Crus sinistrum





1) V. cava inf.
2) Hepar
3) Esophagus
4) Aorta
5) Crus dextrum
6) Crus sinistrum

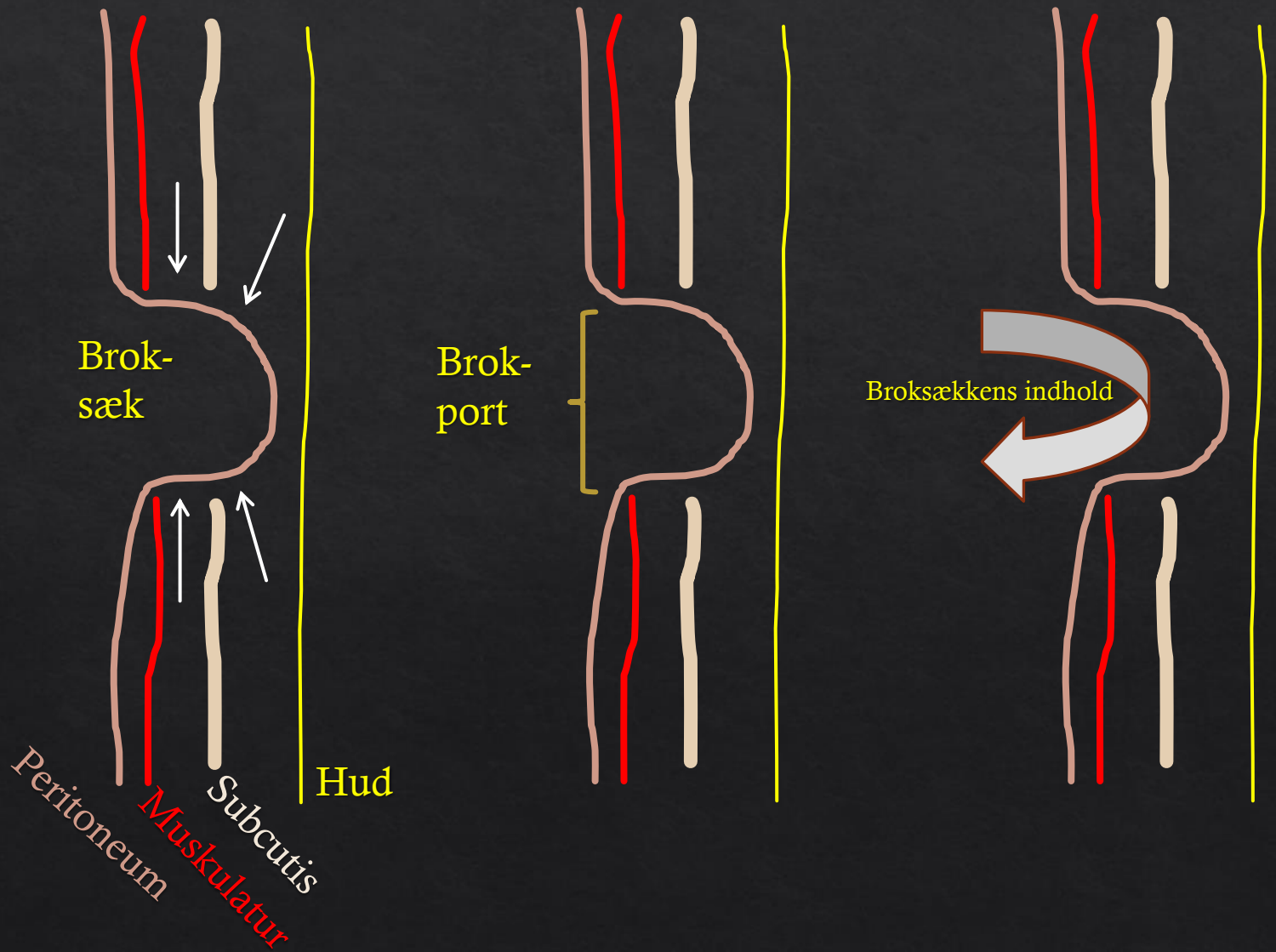




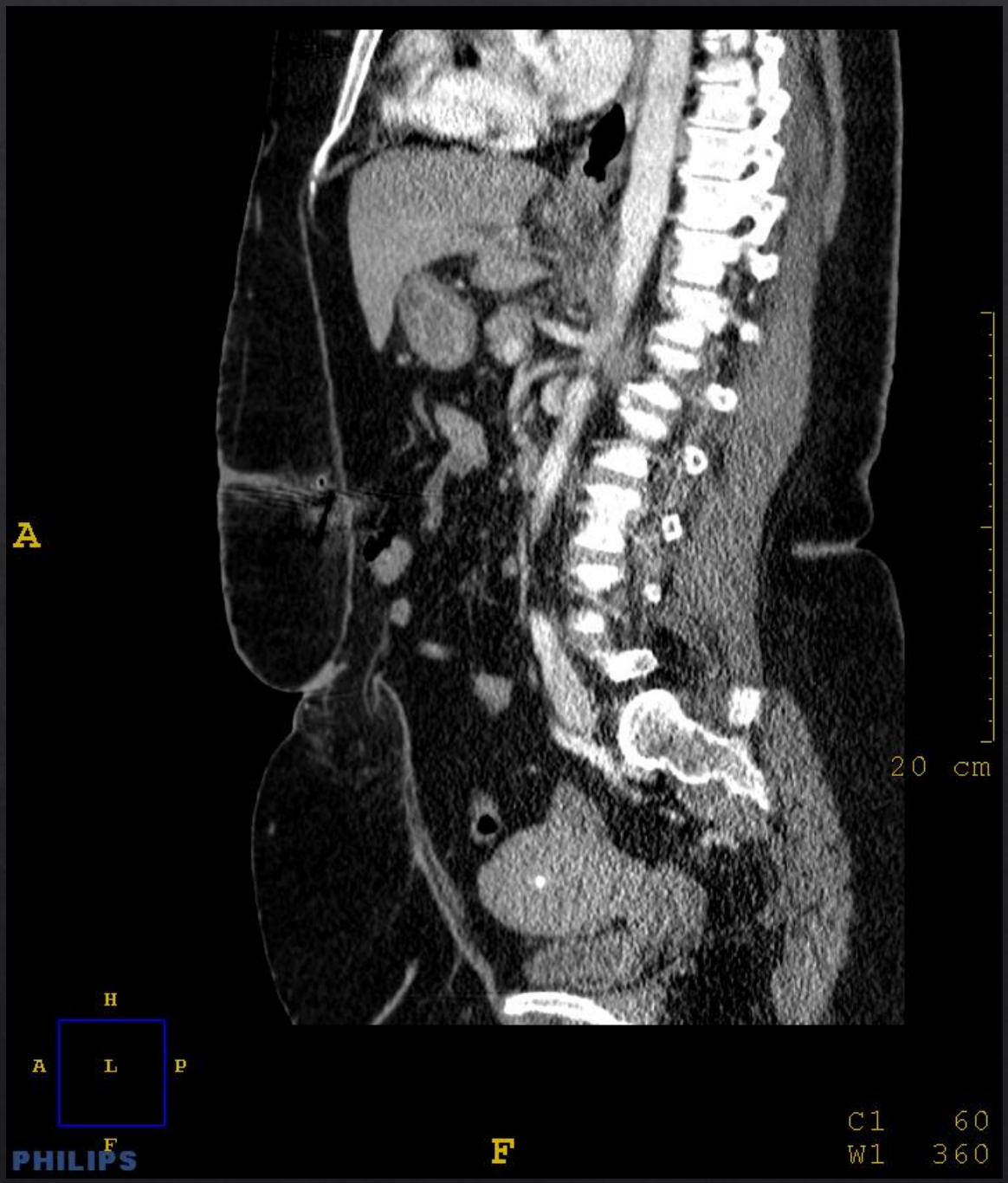
Hernia (Brok)

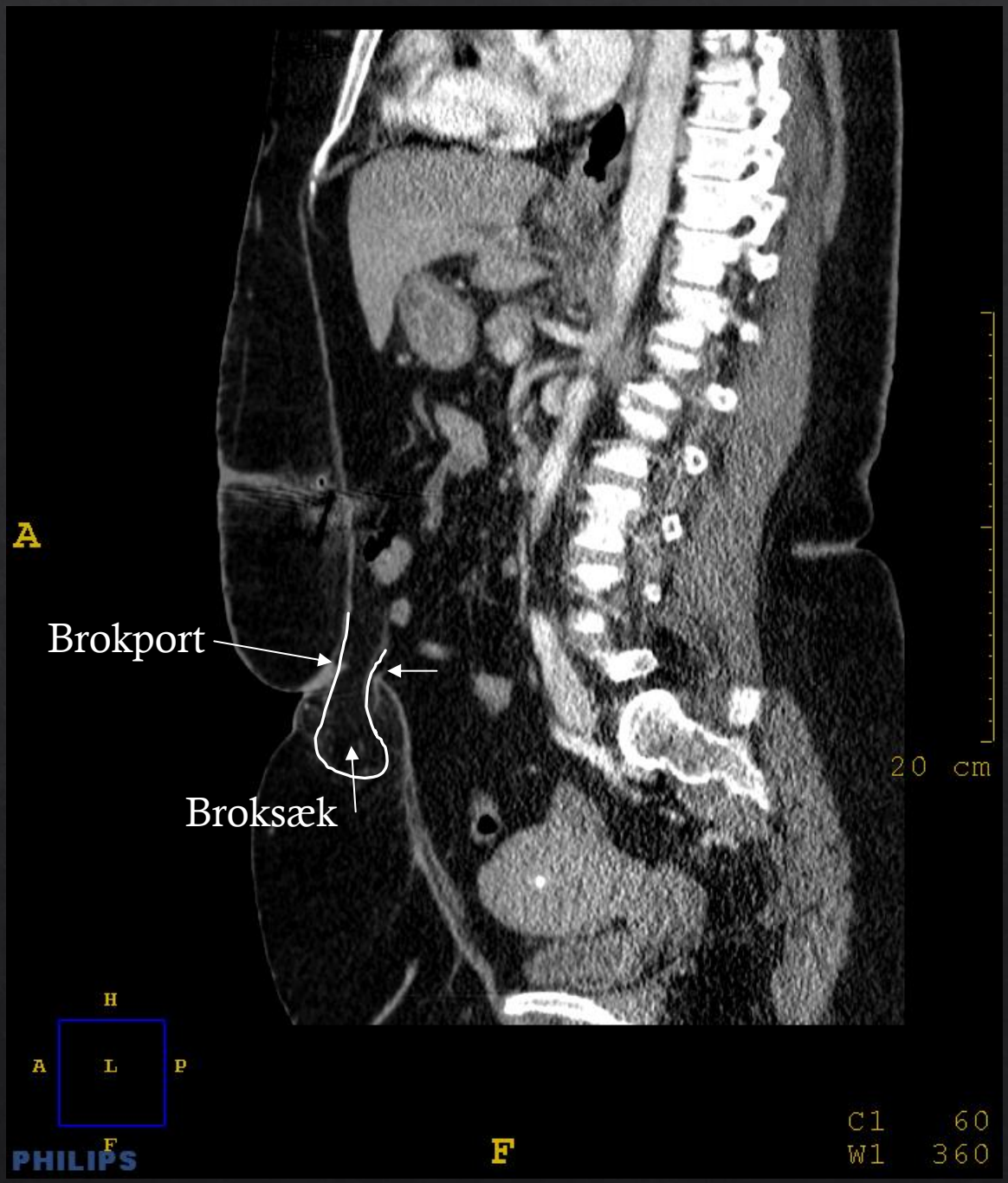
Abnorm fremtrængen af et organ (eller en del deraf) gennem væggen af en legemshule, almindeligvis peritonealhulen

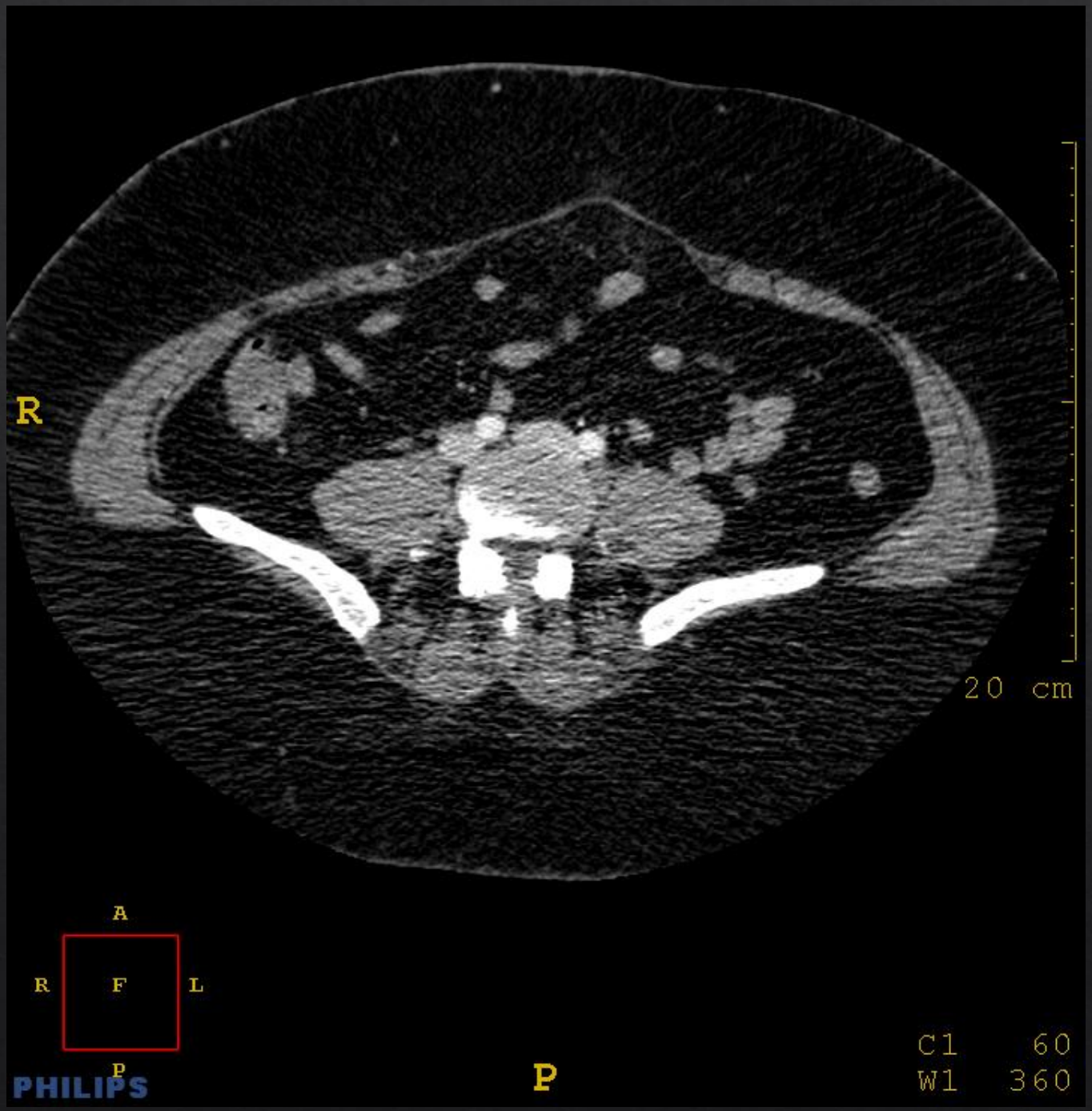
Hernia (Brok)

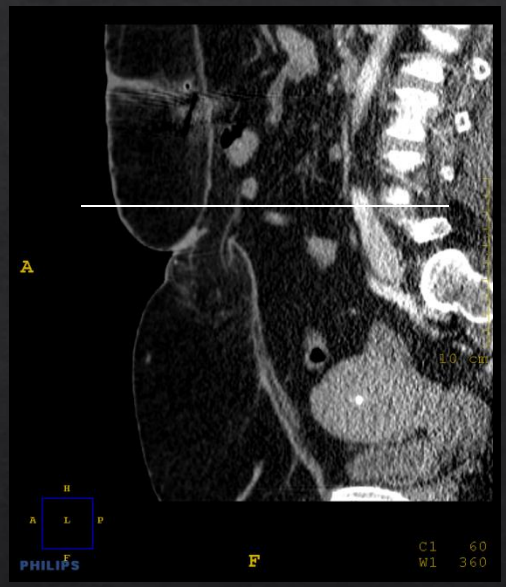

Brok-
sæk
Brok-
port
Broksækkens indhold
Hud
Subcutis
Muskulatur
Peritoneum

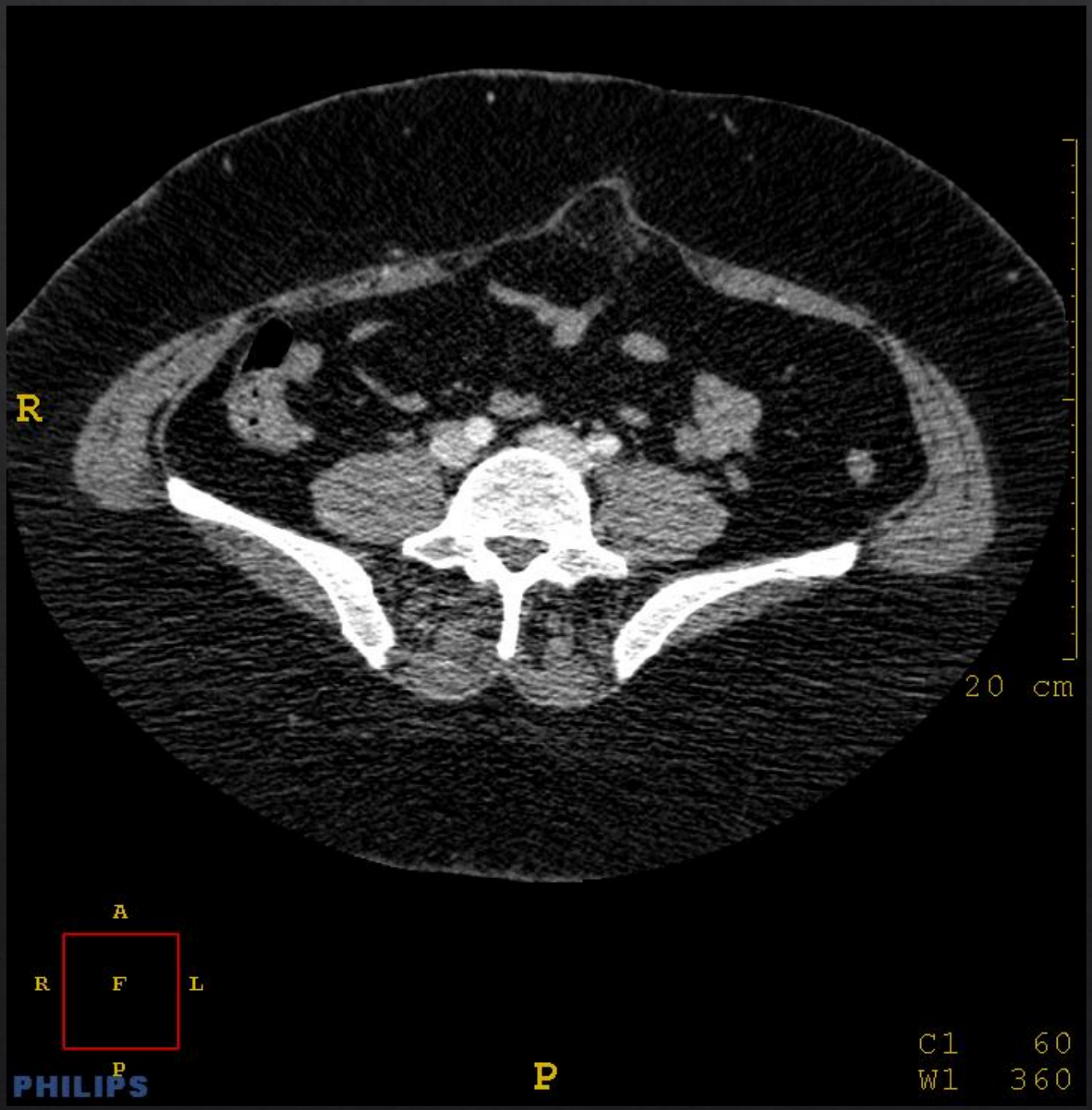
Umbilicalhernie

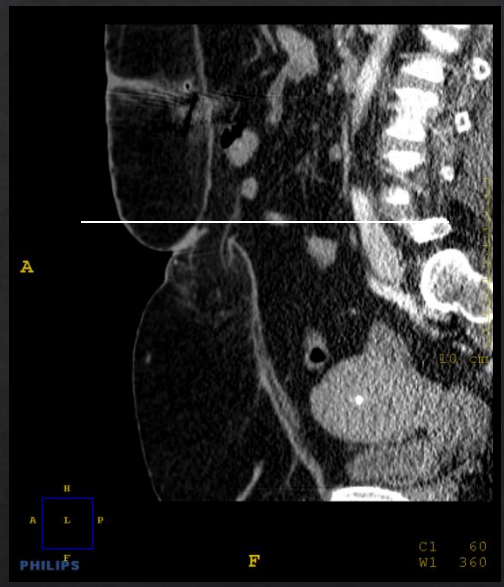

A
20 cm
H
A
L
P
F
PHILIPS
F
C1 60
W1 360


A
Brokport
Broksæk
20 cm
H
A
L
P
F
PHILIPS
F
C1 60
W1 360

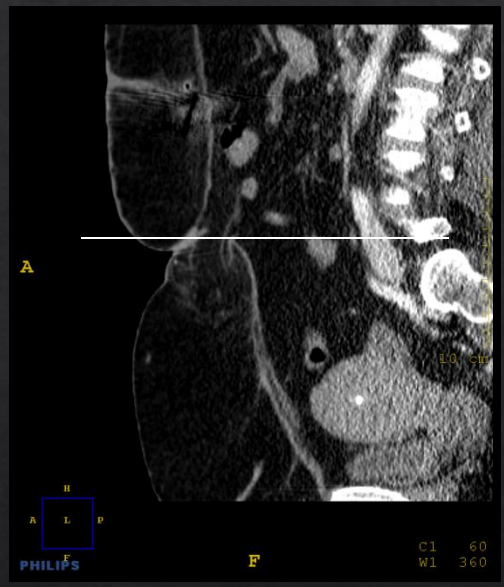

R
20 cm
A
R
F
L
P
PHILIPS
P
C1 60
W1 360

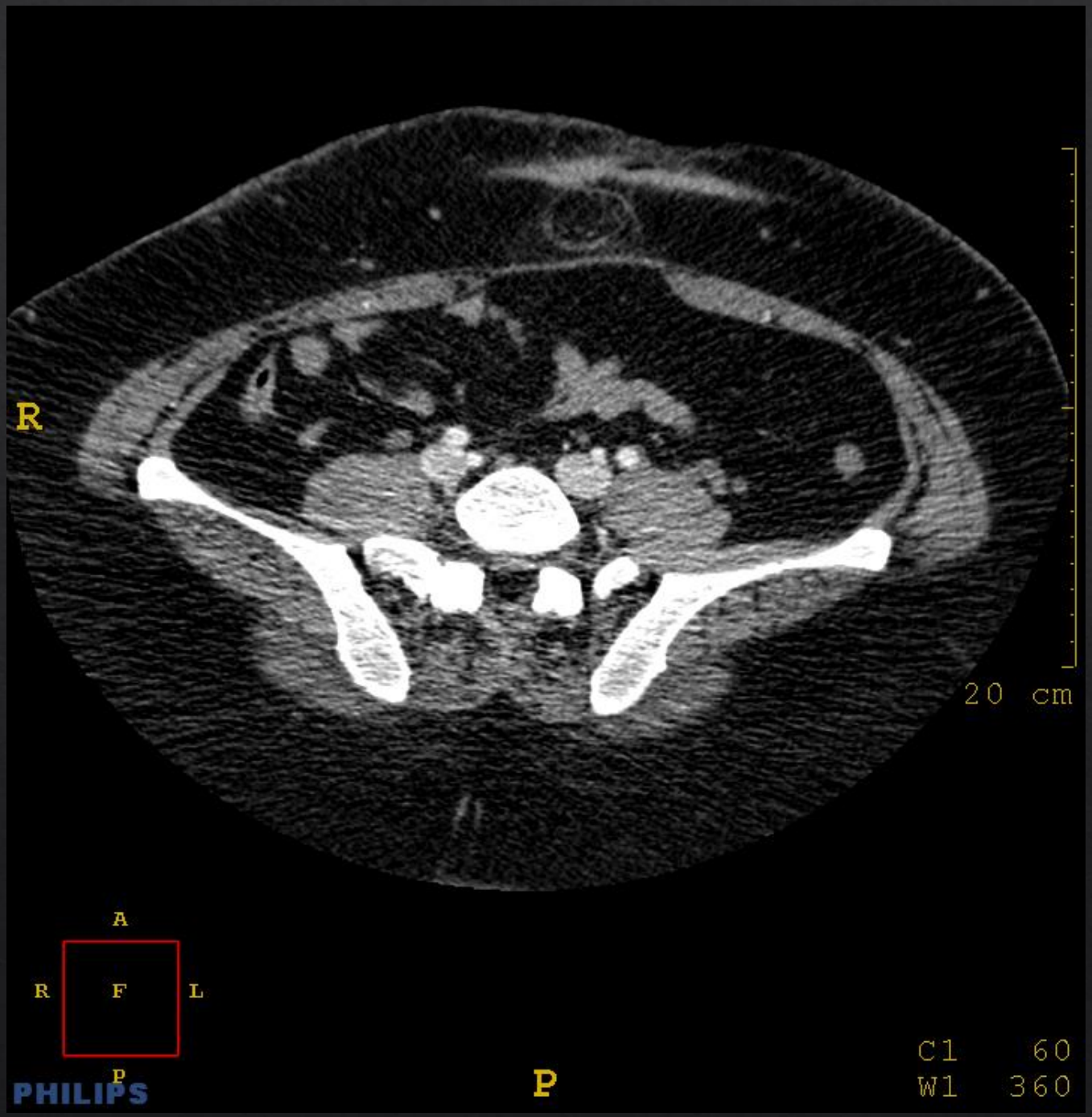

A
PHILIPS
F
C1 60
W1 360

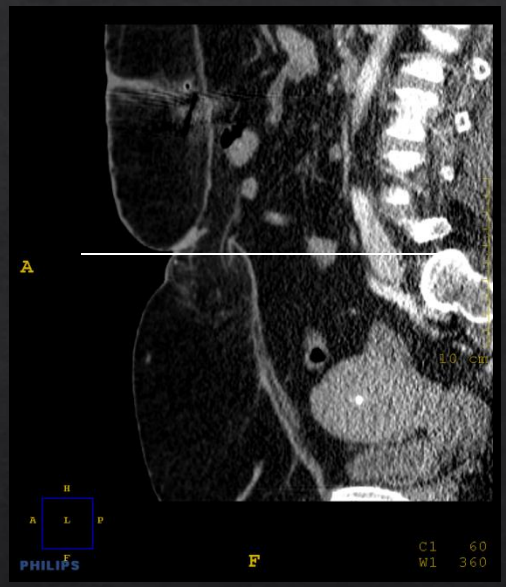

R
20 cm
A
R
F
L
P
PHILIPS
P
C1 60
W1 360


A
PHILIPS
F
C1 60
W1 360


R
20 cm
A
R
F
L
P
PHILIPS
P
C1 60
W1 360

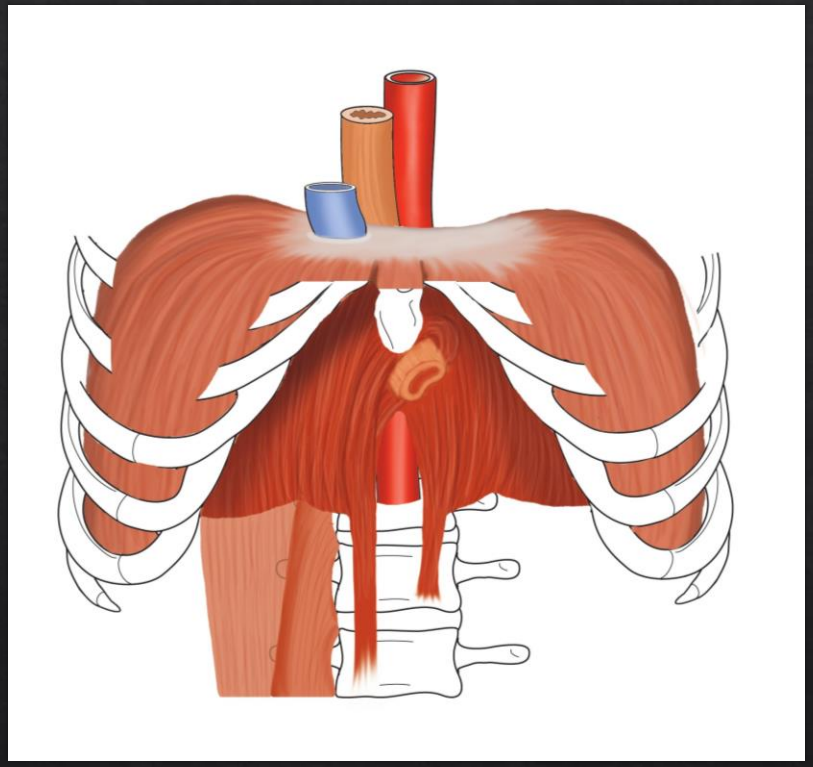

A
PHILIPS
F
C1 60
W1 360

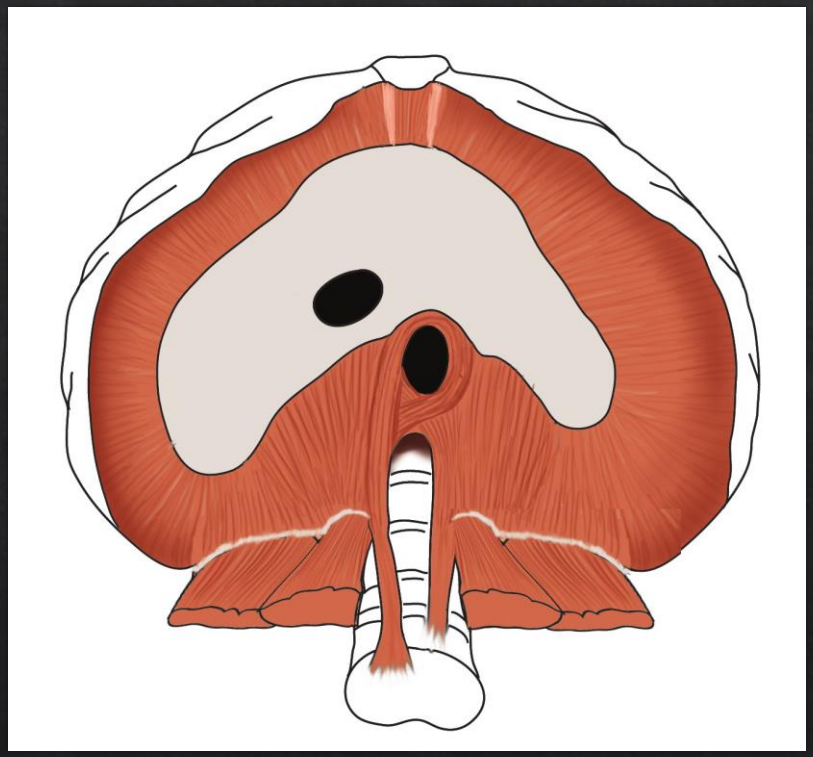

R
20 cm
A
R
F
L
P
PHILIPS
P
C1 60
W1 360

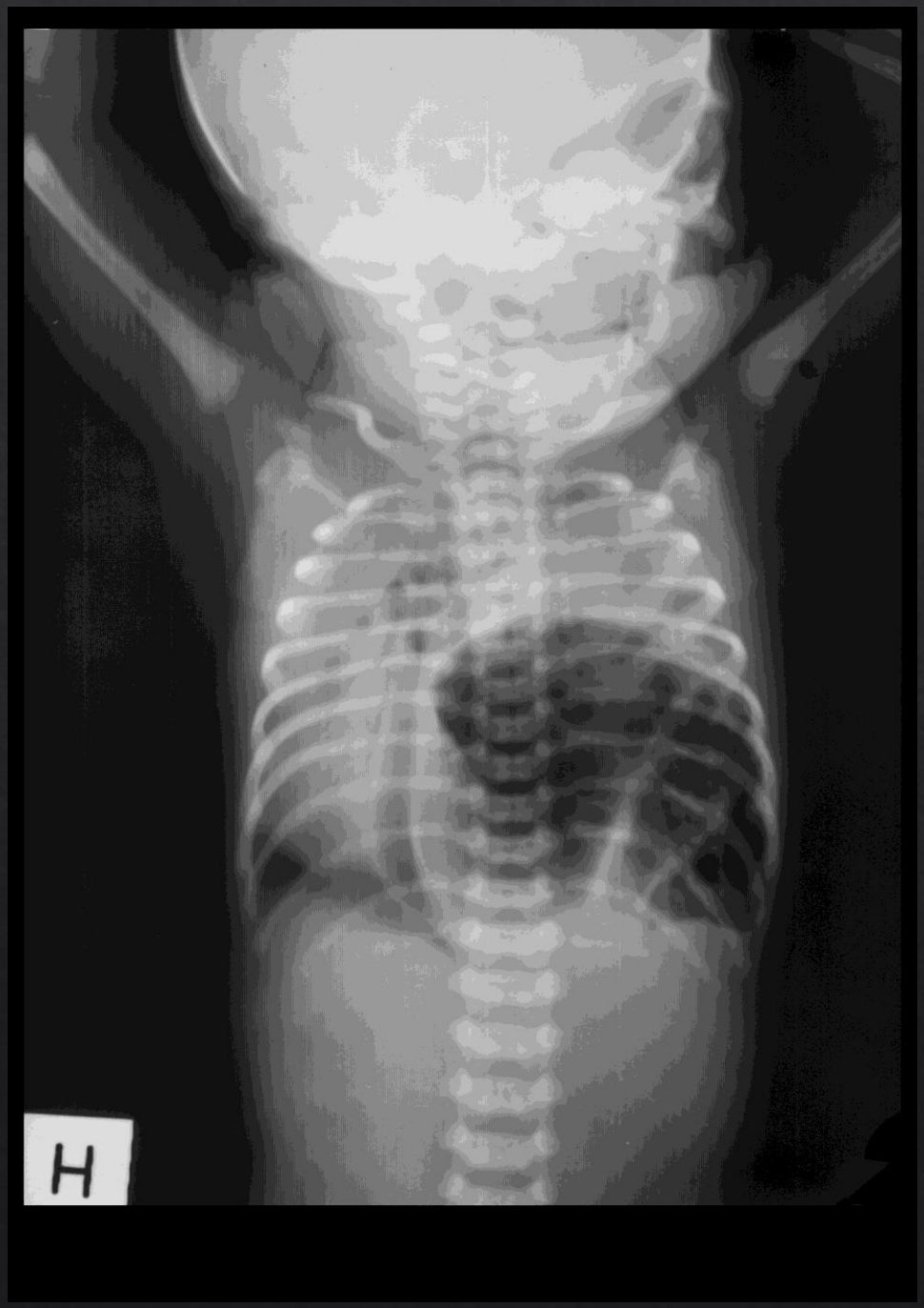

A
PHILIPS
F
C1 60
W1 360

Diaphragma hernie

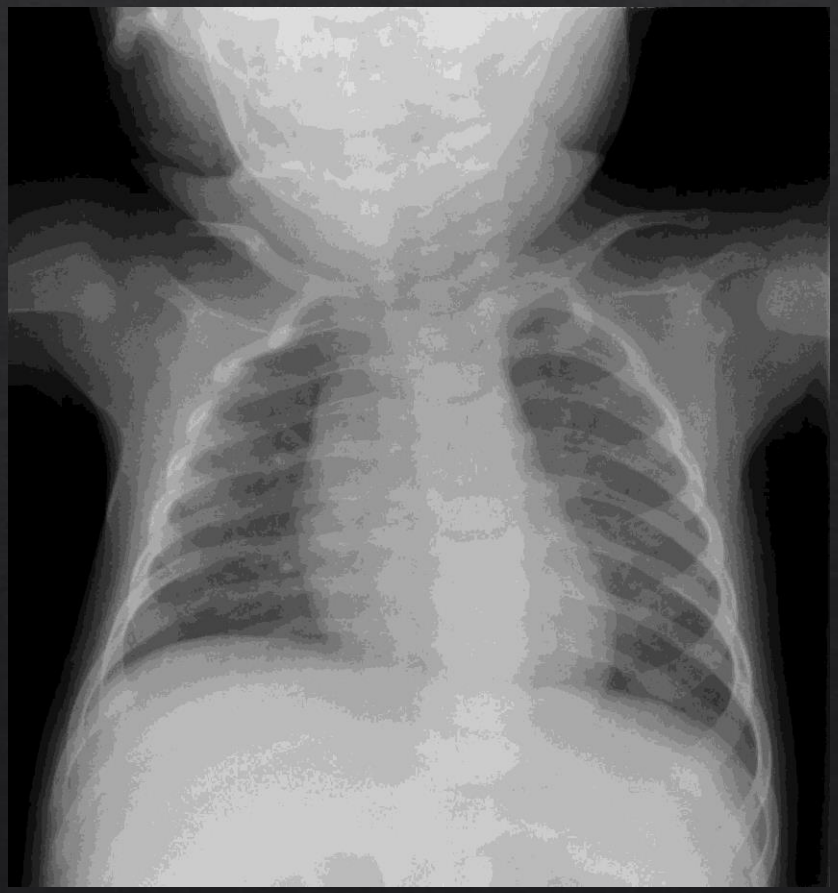
Diaphragma



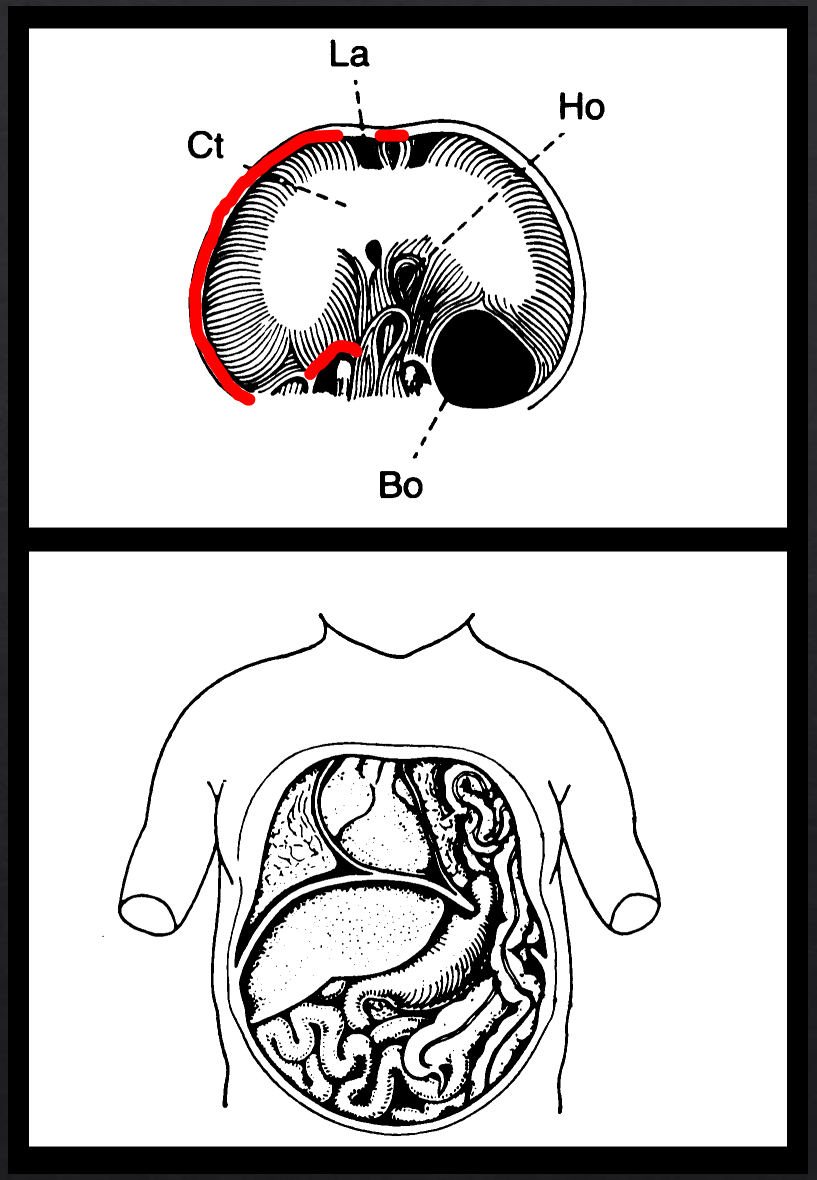




Nyfødt med respiratoriske problemer.
Røntgen af thorax kort tid efter fødslen.

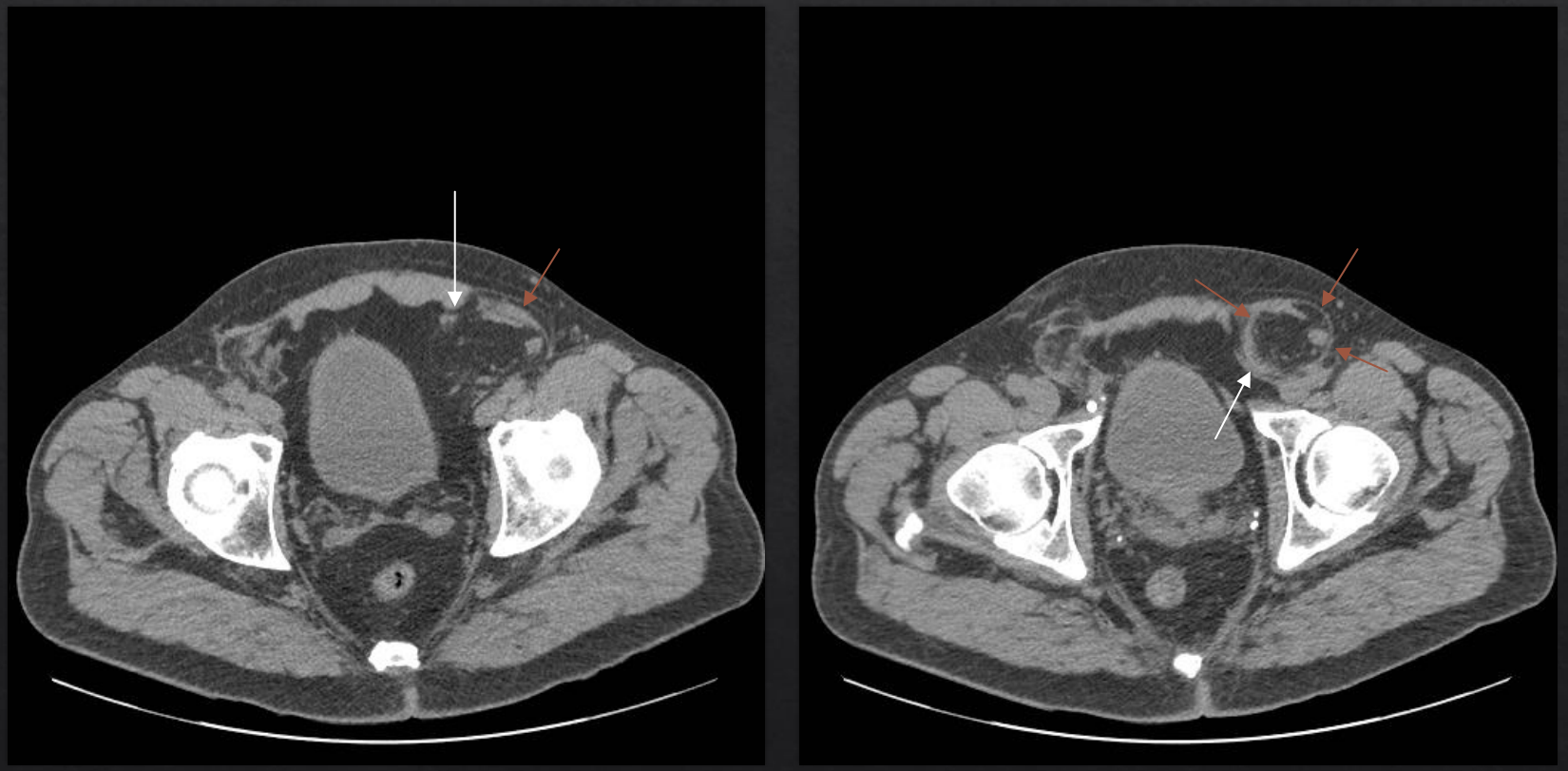


Til sammenligning: Rask, 5 måner gammel.



Kongenit diafragmahernie

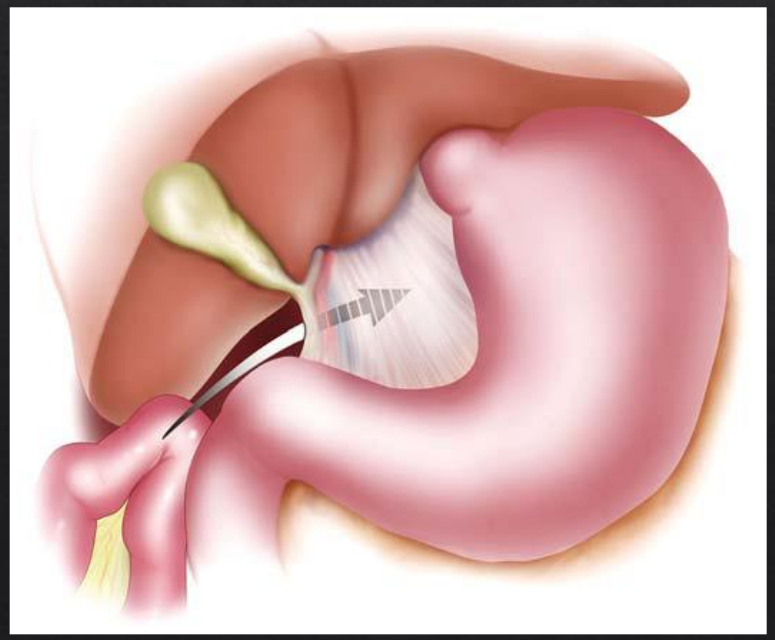
Inguinalhernie

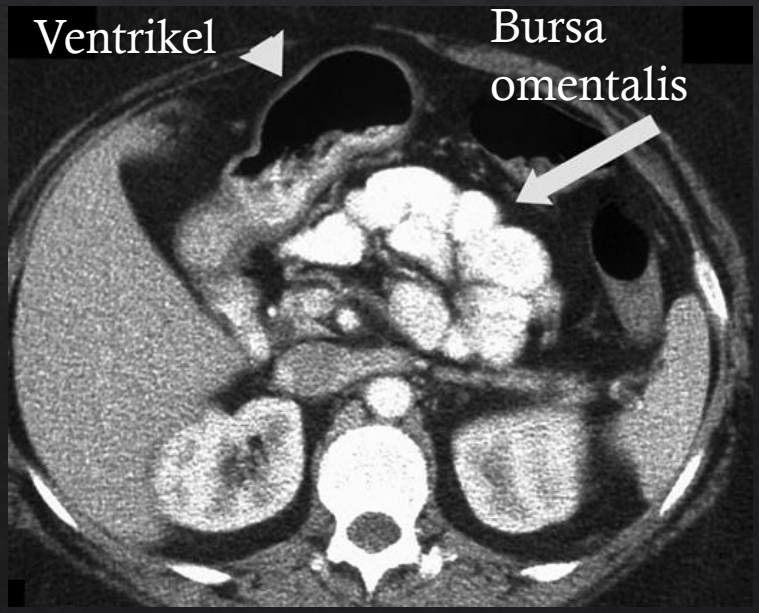


Intern hernie

Interne hernier:

Foramen epiploicum





L. C. Martin et al. AJR:186, March 2006