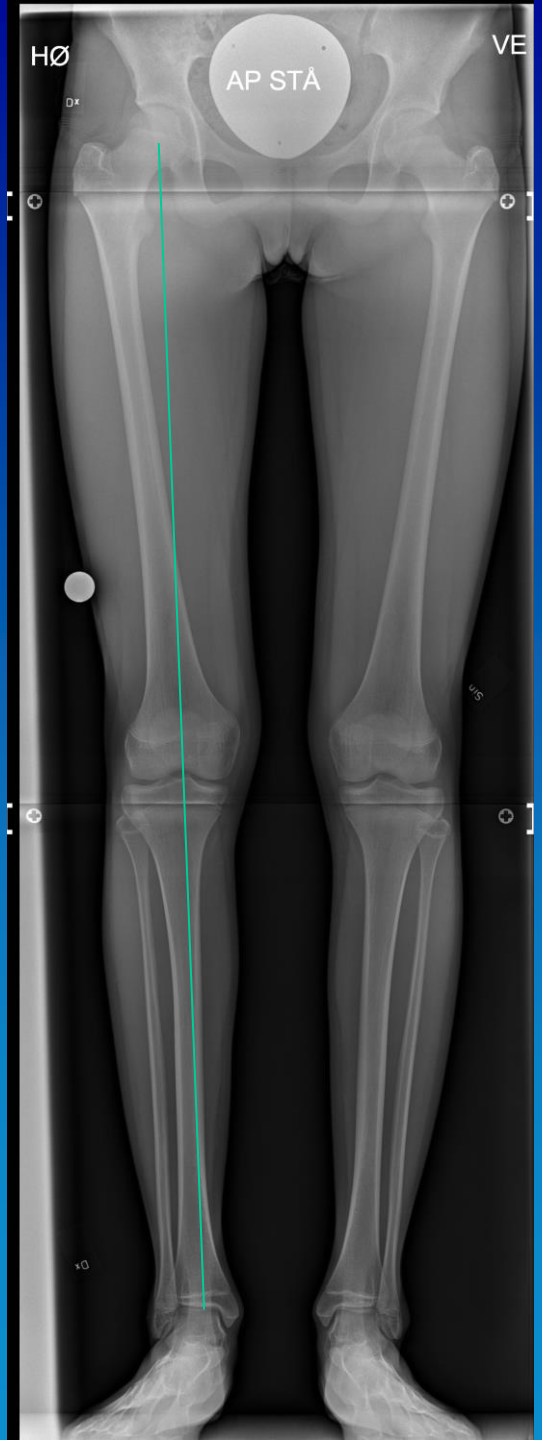
Underekstremiteten

Michel Bach Hellfritzsch



Bækkenet: Os coxae og os sacrum

Articulatio coxae

Femur

Articulatio genus

Crus

Articulatio talocruralis

Foden

HKA optagelse (Hip/knee/ankle eller hofte/knæ ankel optagelse), giver et godt overblik over underekstremiteterne. Vanligvis er dosis reduceret, således at knoglestrukturen ikke ses optimalt, da undersøgelsen bruges til at vurdere benlængdeforskel (anisomeli) samt akser (valgus/varus fejlstilling).

Bækkenet

Ossifikationens start angivet i føtaluge for hoftebenet: Os coxae

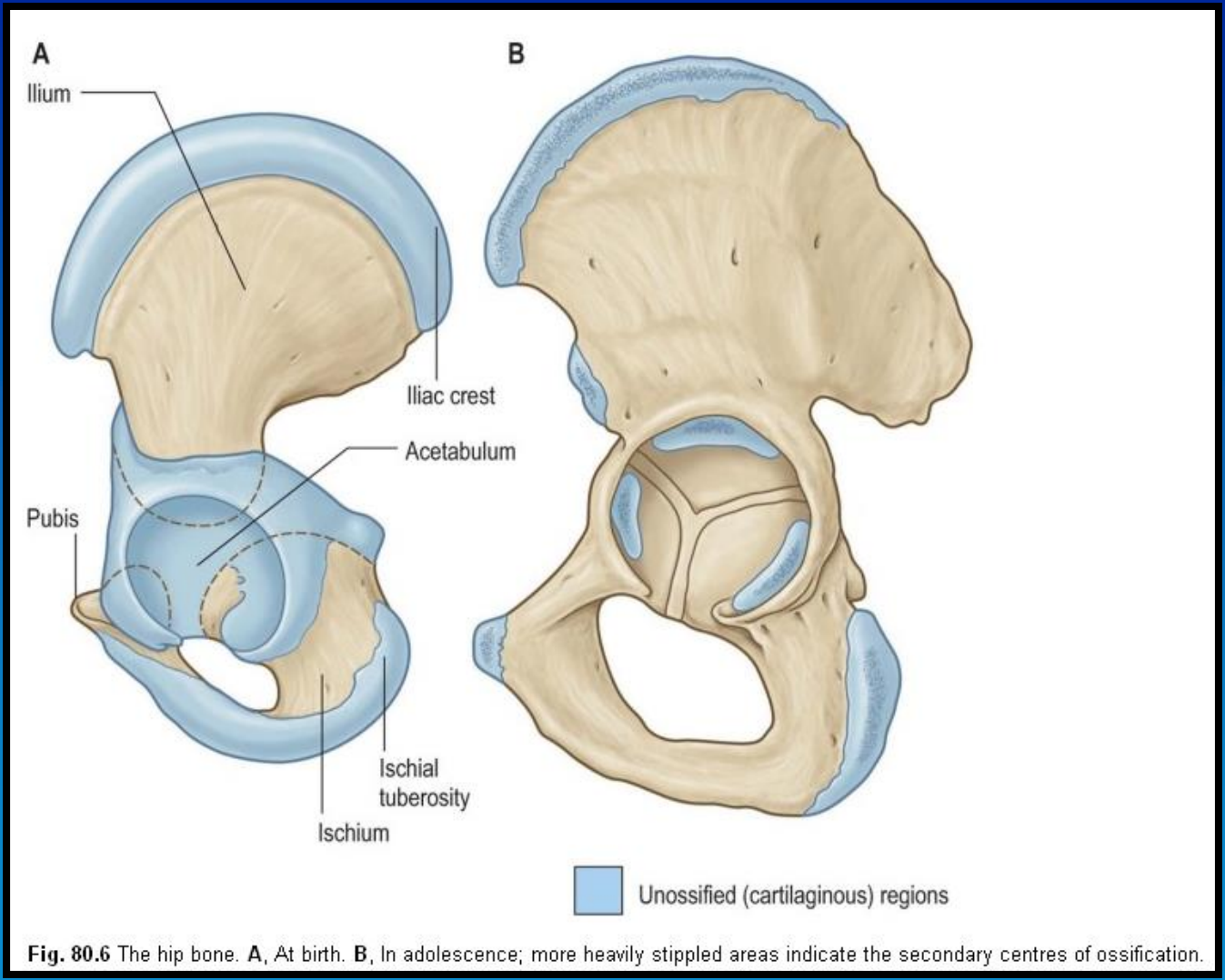
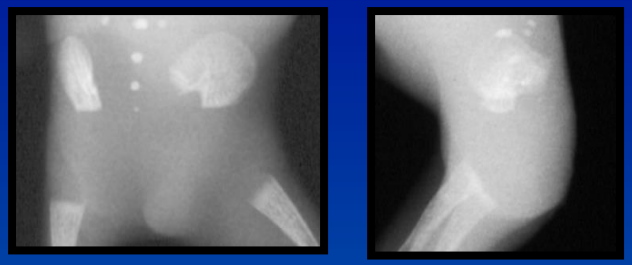


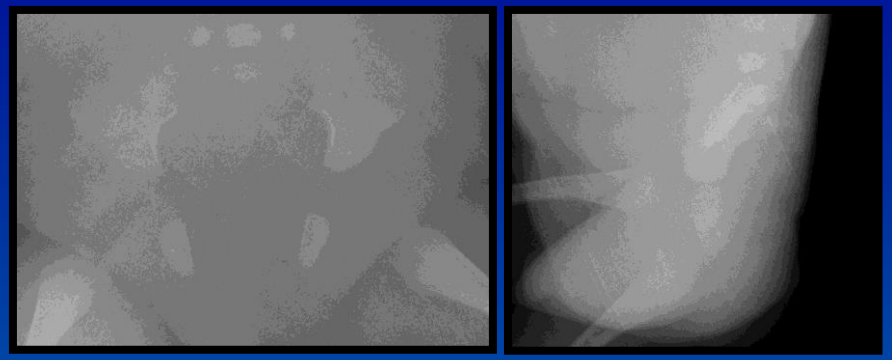
Fig. 80.6 The hip bone. **A**, At birth. **B**, In adolescence; more heavily stippled areas indicate the secondary centres of ossification.

Gray 40th ed.

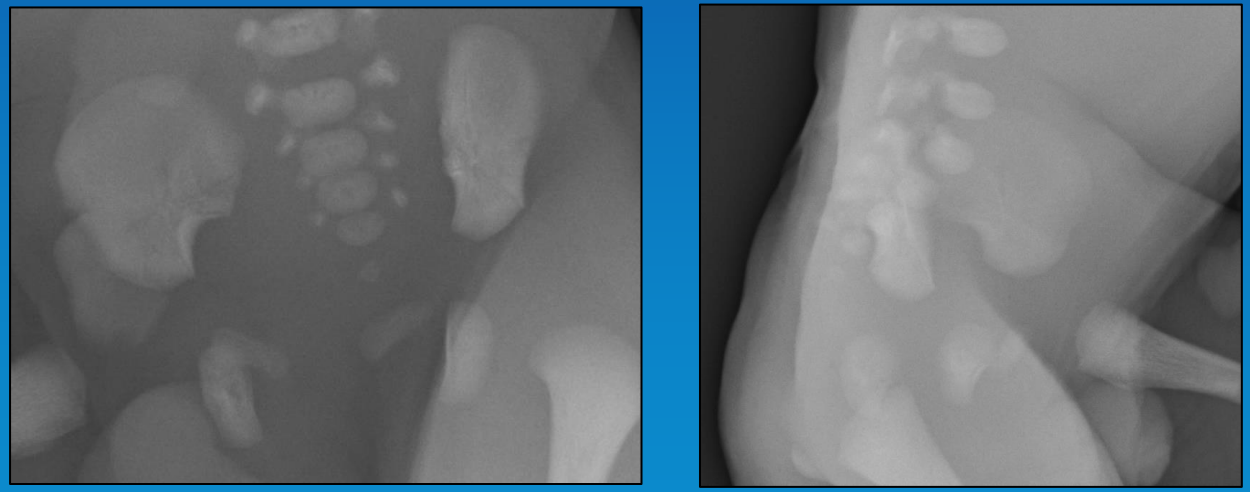
- Os ilium
- 9 uger
- Os ischium
- 17-18 uger
- Os pubis
- 21-28 uger



Gestationsalder 12-13 uger

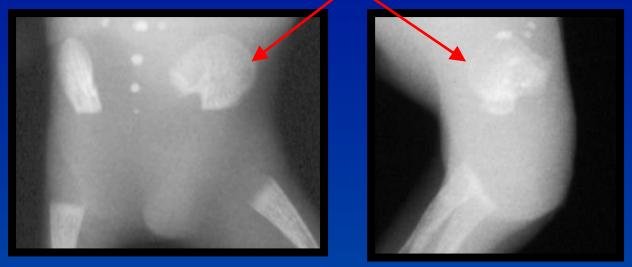


Gestationsalder 26-28 uger



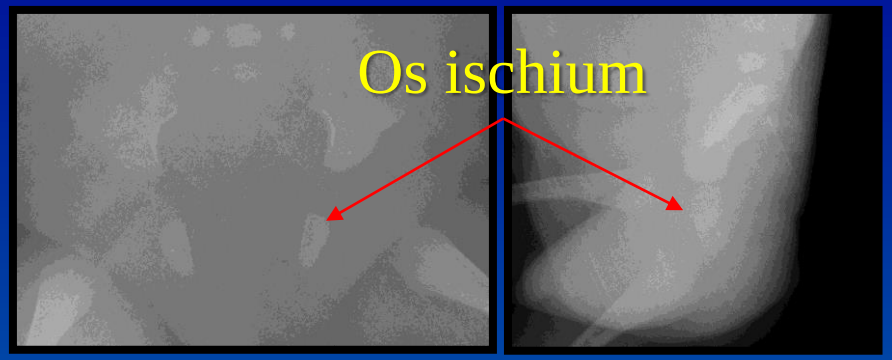
Gestationsalder 31 uger

Os ilium



Gestationsalder 12-13 uger

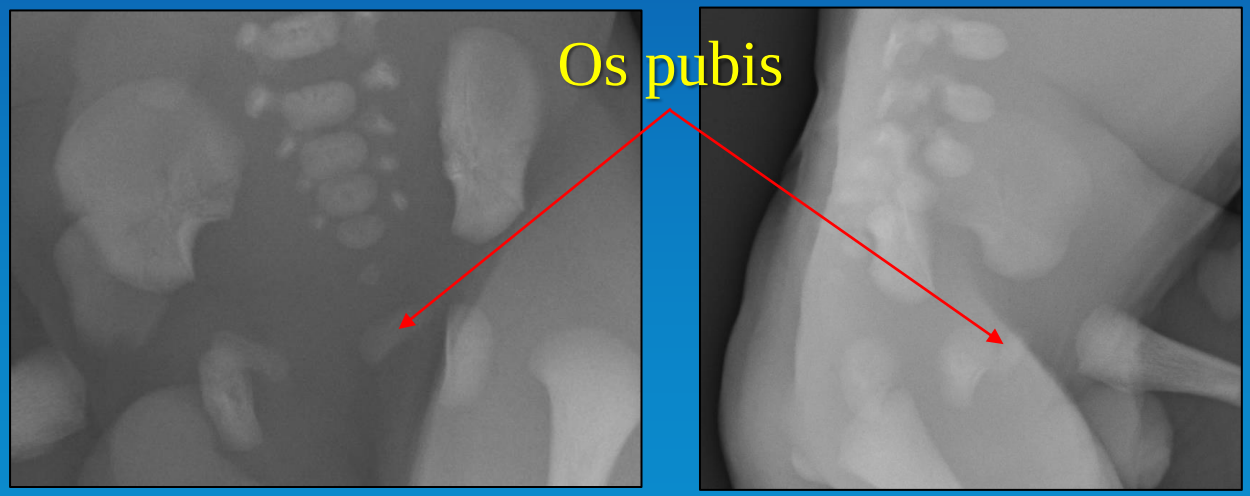
Os ischium



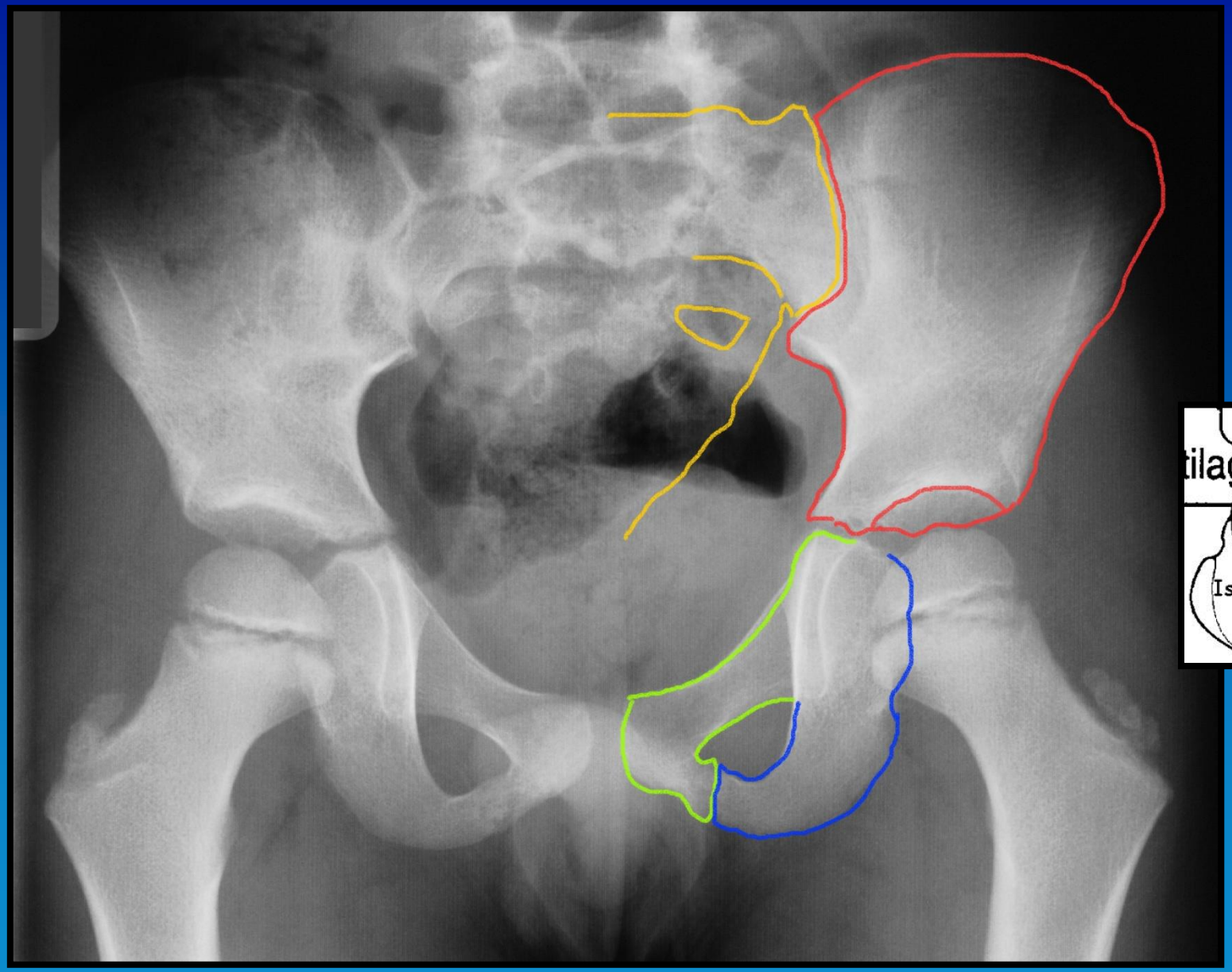
Gestationsalder 26-28 uger

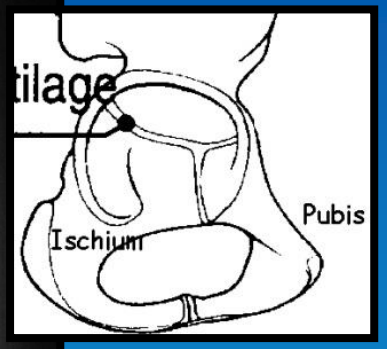
De forskellige knogler i bækkenet forbener (ossificerer) i forskellig alder, hvilket kan benyttes til aldersbestemmelse af fostre. Fosterets knogler kan også vurderes med ultralyd, billederne her er røntgenbilleder.

Os pubis



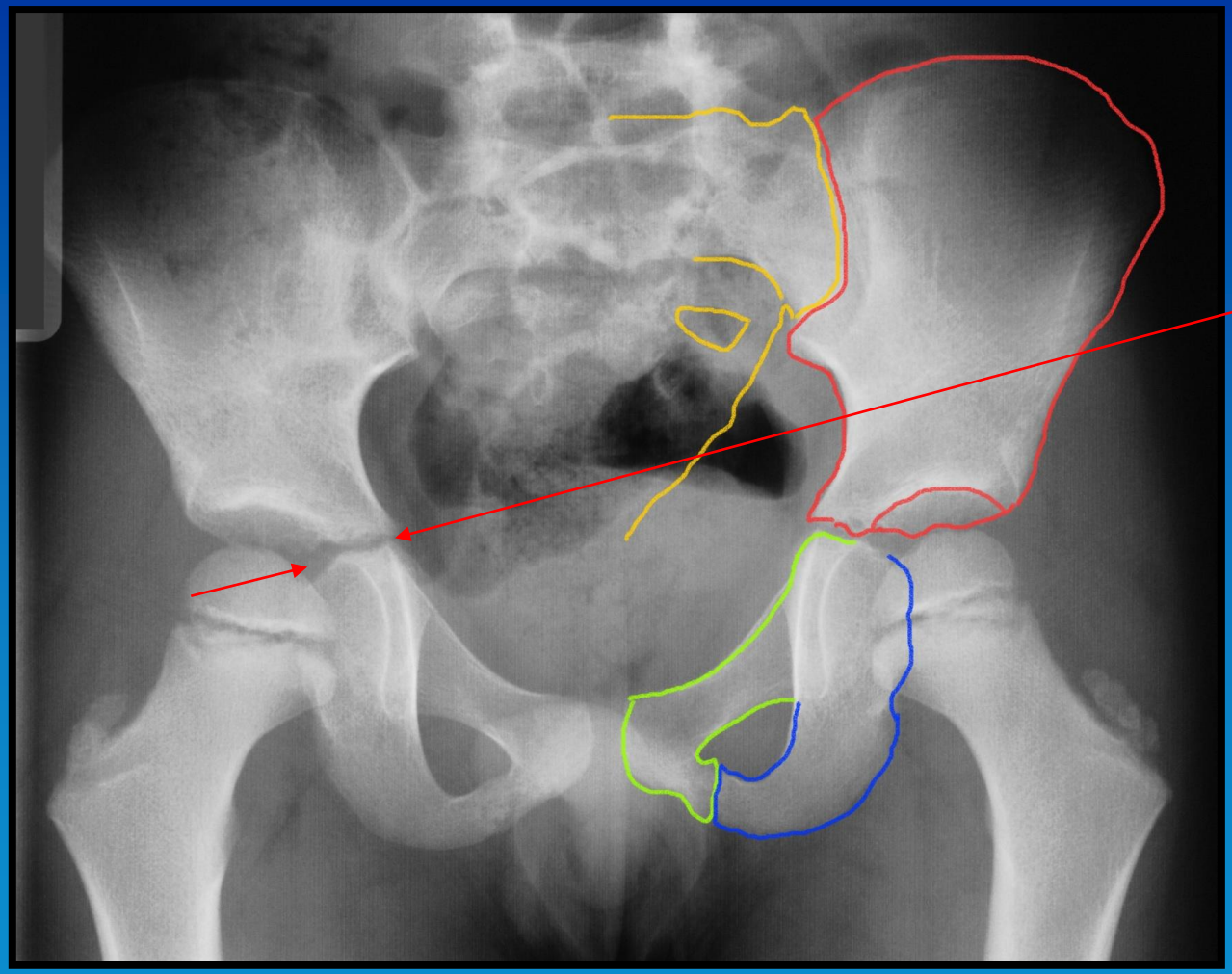
Gestationsalder 31 uger

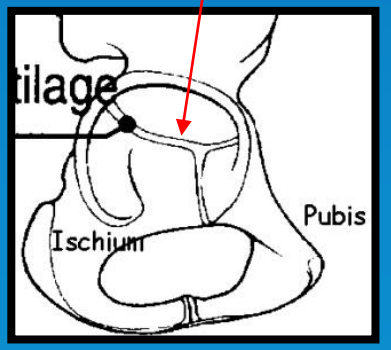




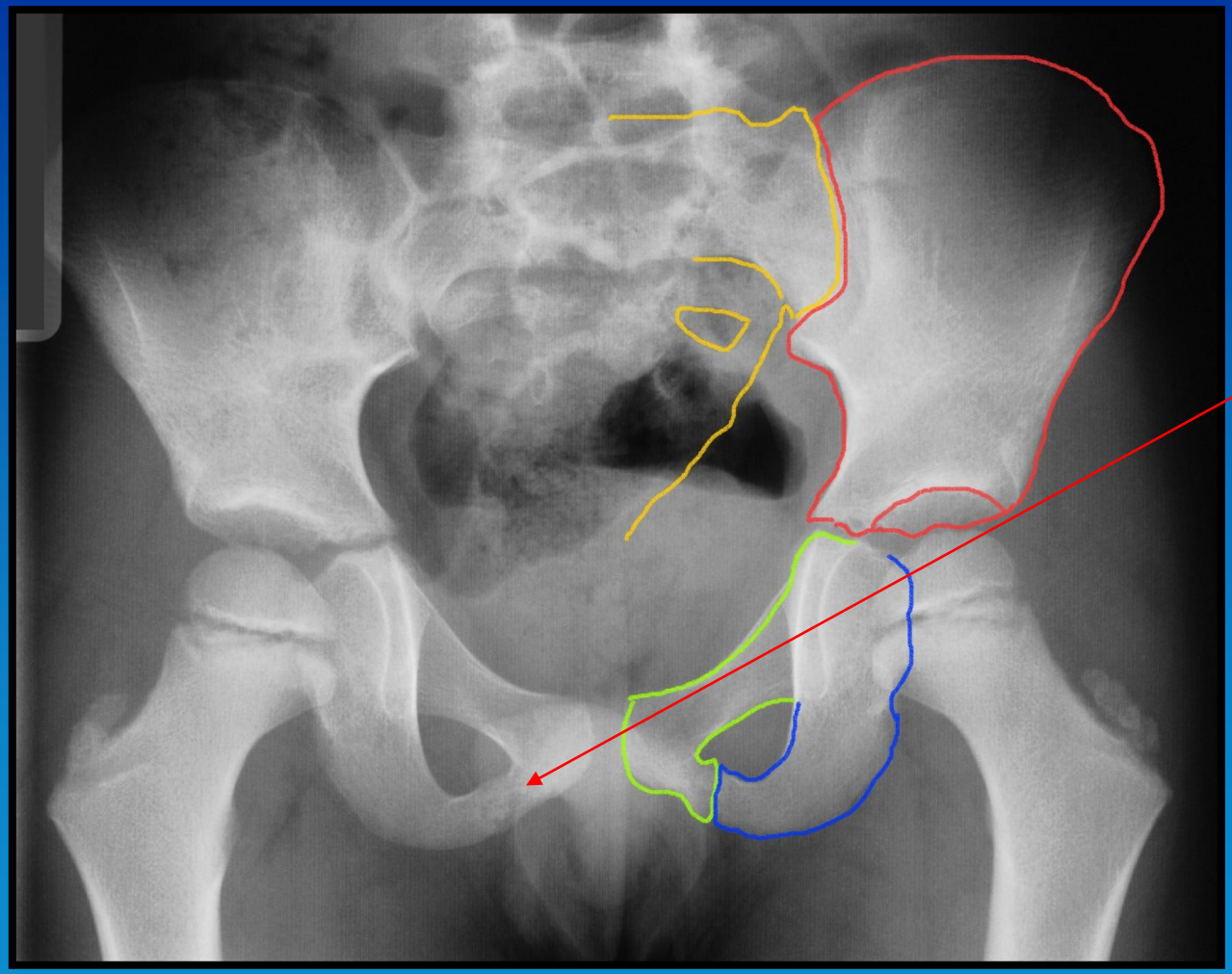
Dreng
7 år

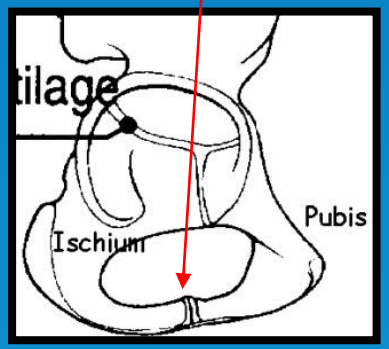
I bunden af acetabulum ligger den triradiate brusk eller Y-brusken, hvor væskten i acetabulum foregår. Den svarer i princippet til epifyselinien i proximale femur. På røntgenoptagelsen ses kun den horisontelle del

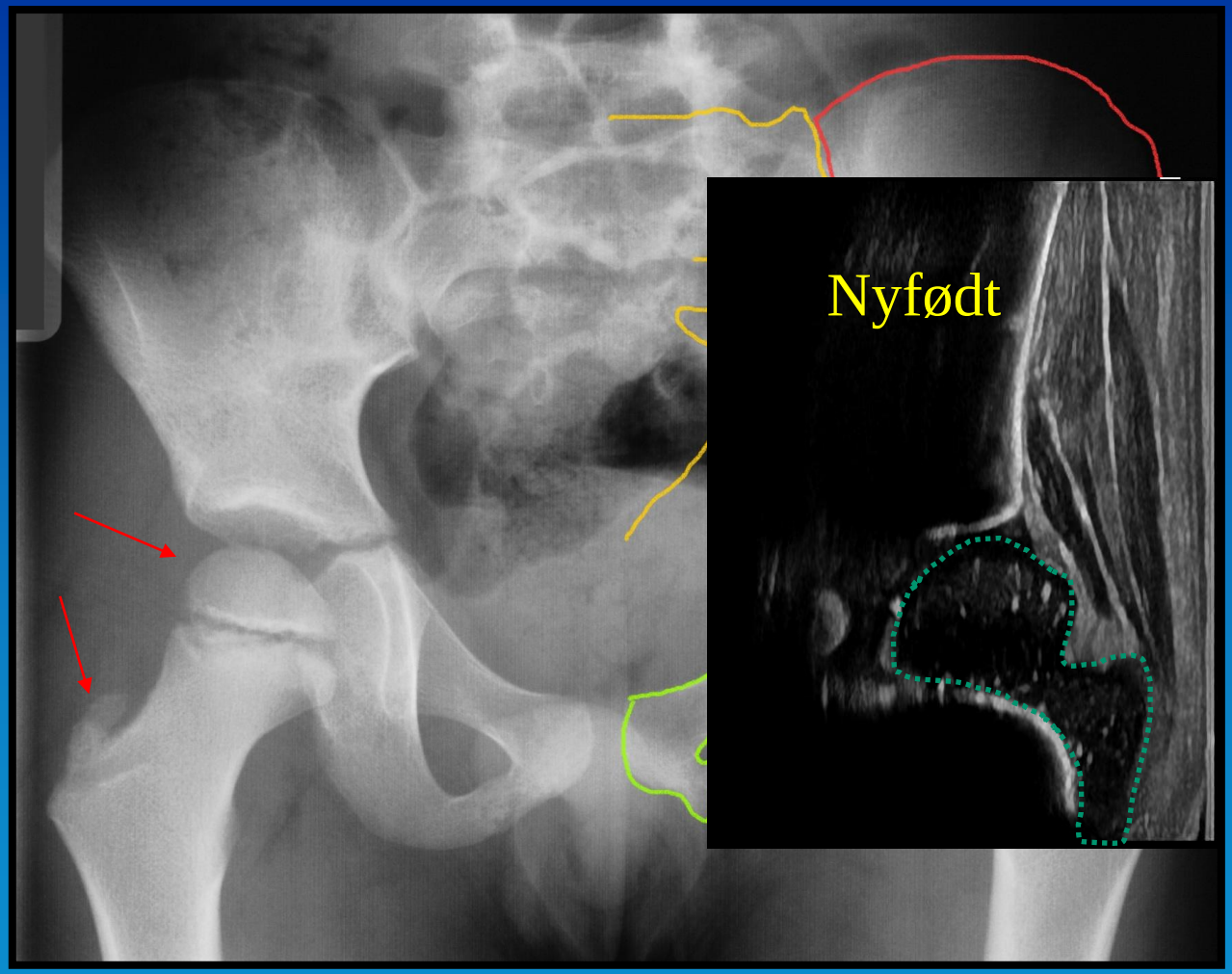




Synchondrosen mellem ramus inferior ossis pubis og ramus ossis ischii er hos dette barn fusioneret, der erkendes blot en mindre uregelmæssighed. Ofte er der tale om forskellig tidspunkt for fusionen på de to sider.



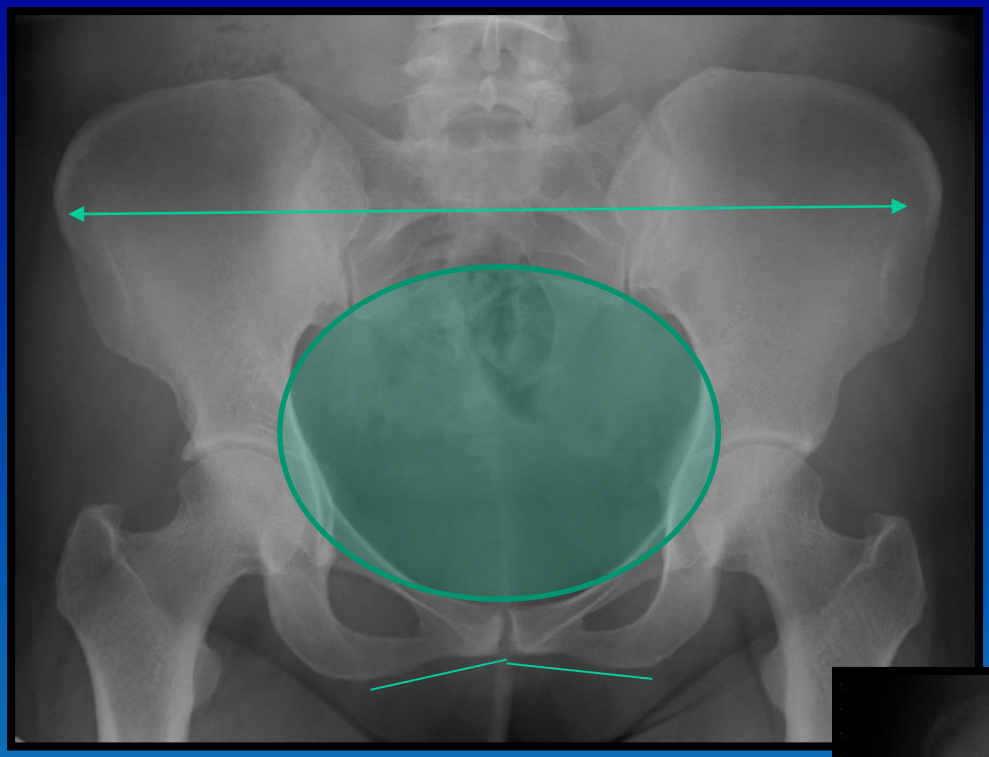




Svarende til trochanter major, ses apofysen anlagt. Bemærk på det indsatte UL billede (fra en nyfødt), at caput kernen og apofysen ossificerer i samme bruskmasse. Caputkernen i 3-6 månedersalderen, apofysen i 3-4 års alderen (disse tider angives dog meget forskelligt i forskellige lærebøger).

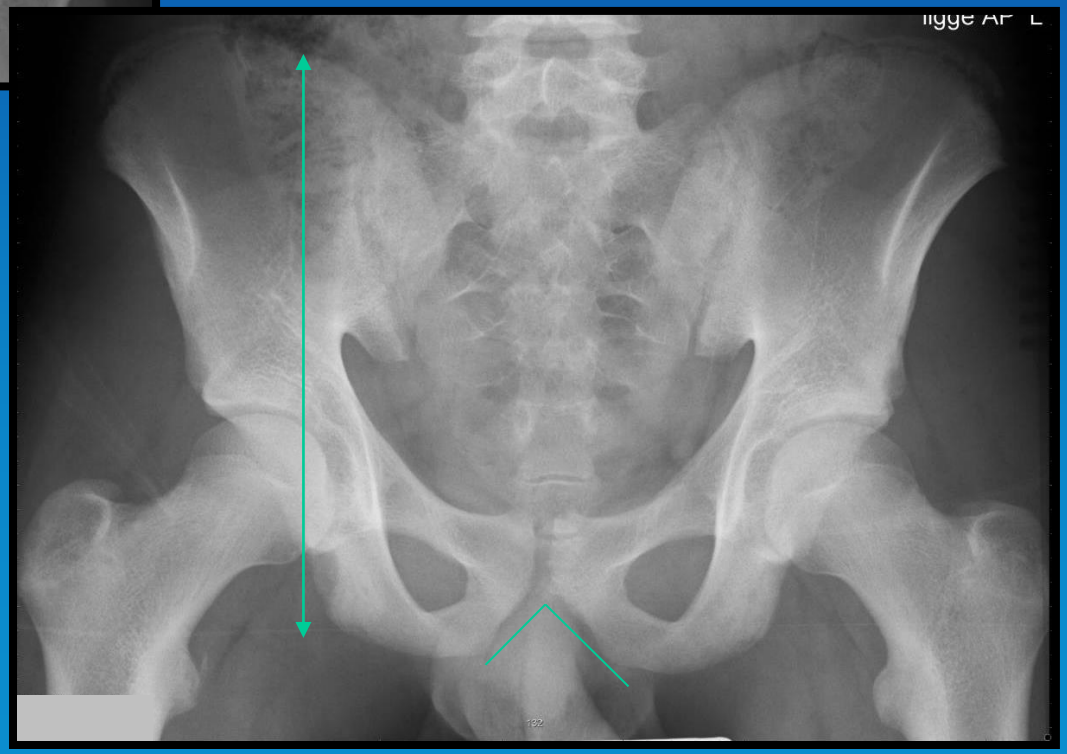
Kvinde 38 år

Mand 17 år

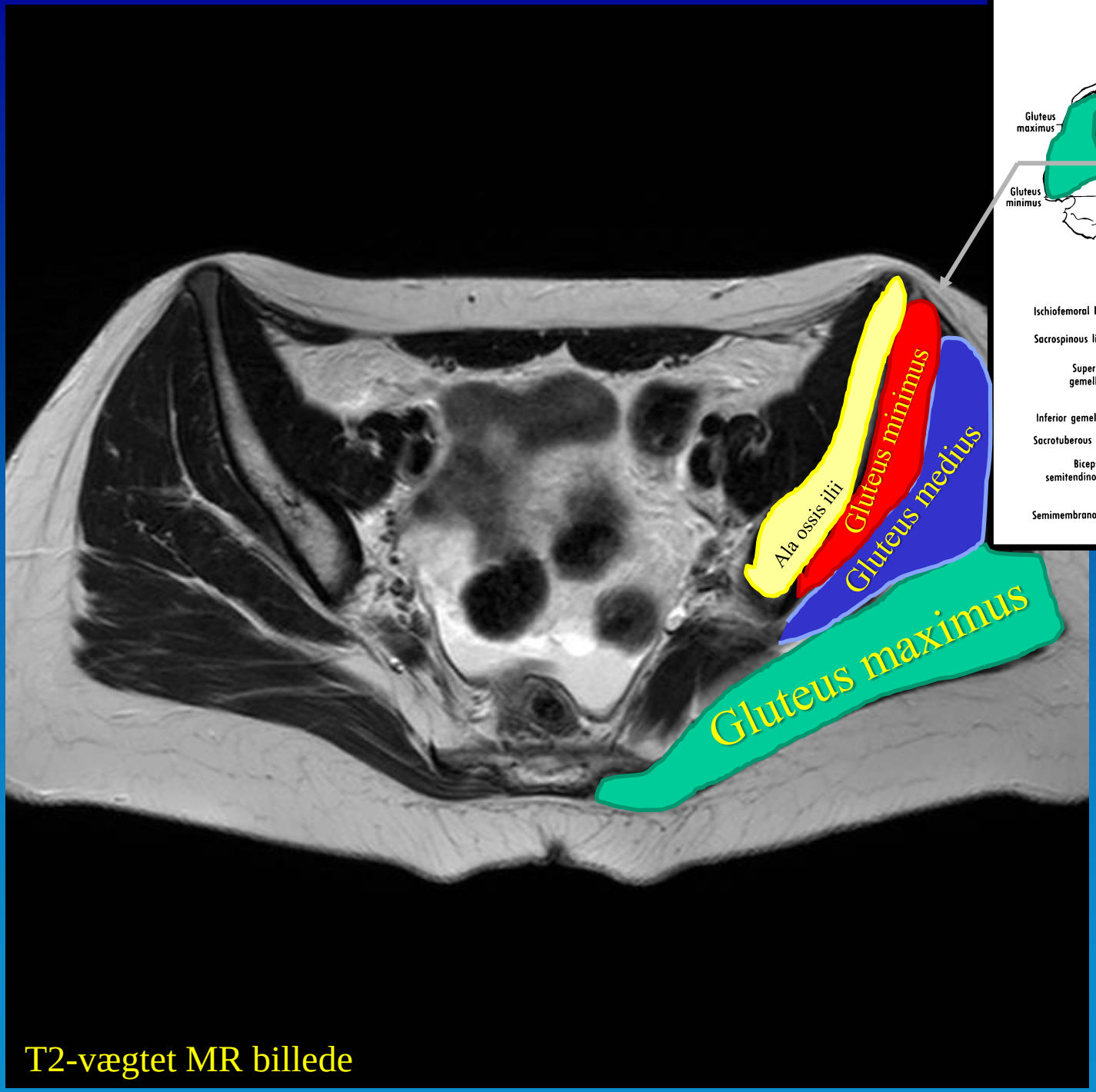


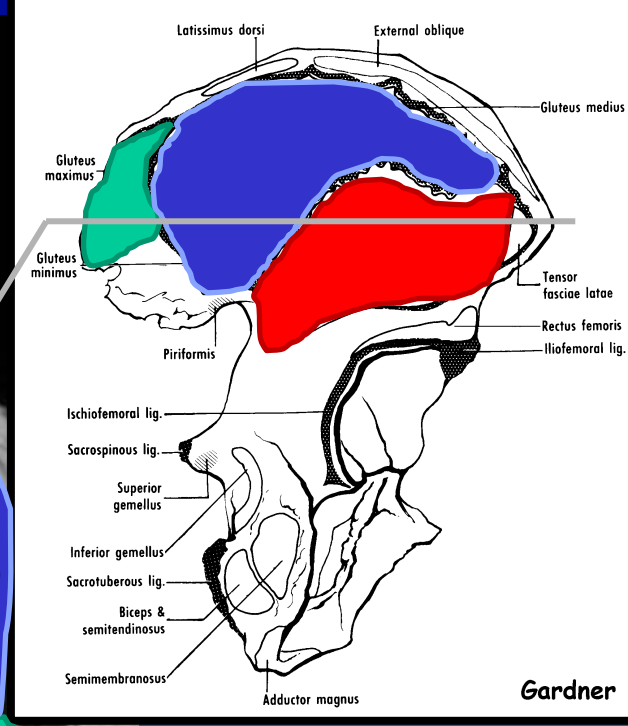
Kvinde 38 år

Kvindens bækken er generelt bredere og lavere. Der er mere plads i lille bækken, og større angulus subpubicus. Forskellene forklares ud fra det kvindelige bækkens funktion som fødselsvej.



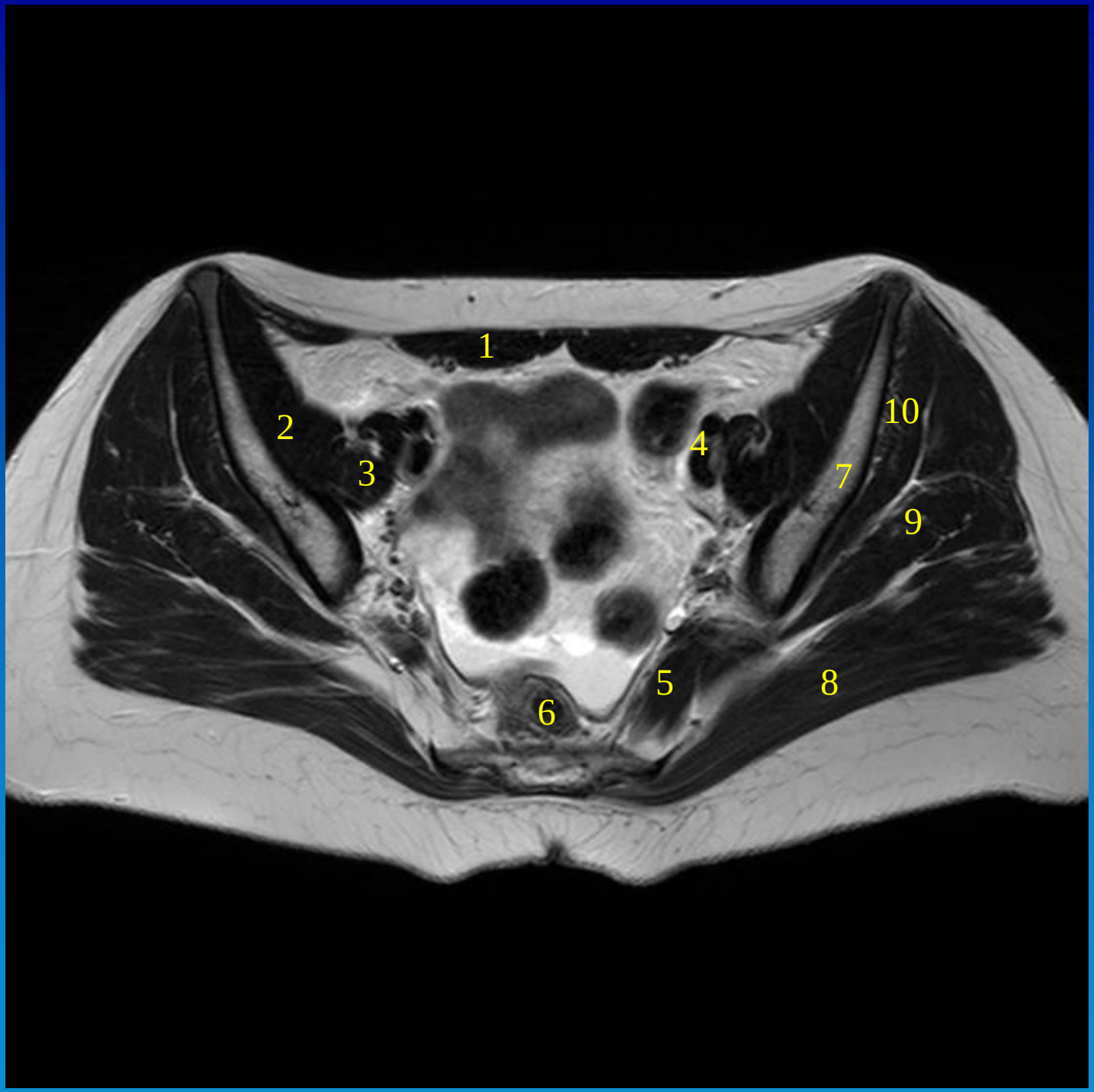
Mand 17 år





Gluteus maximus
Gluteus medius
Gluteus minimus

T2-vægtet MR billede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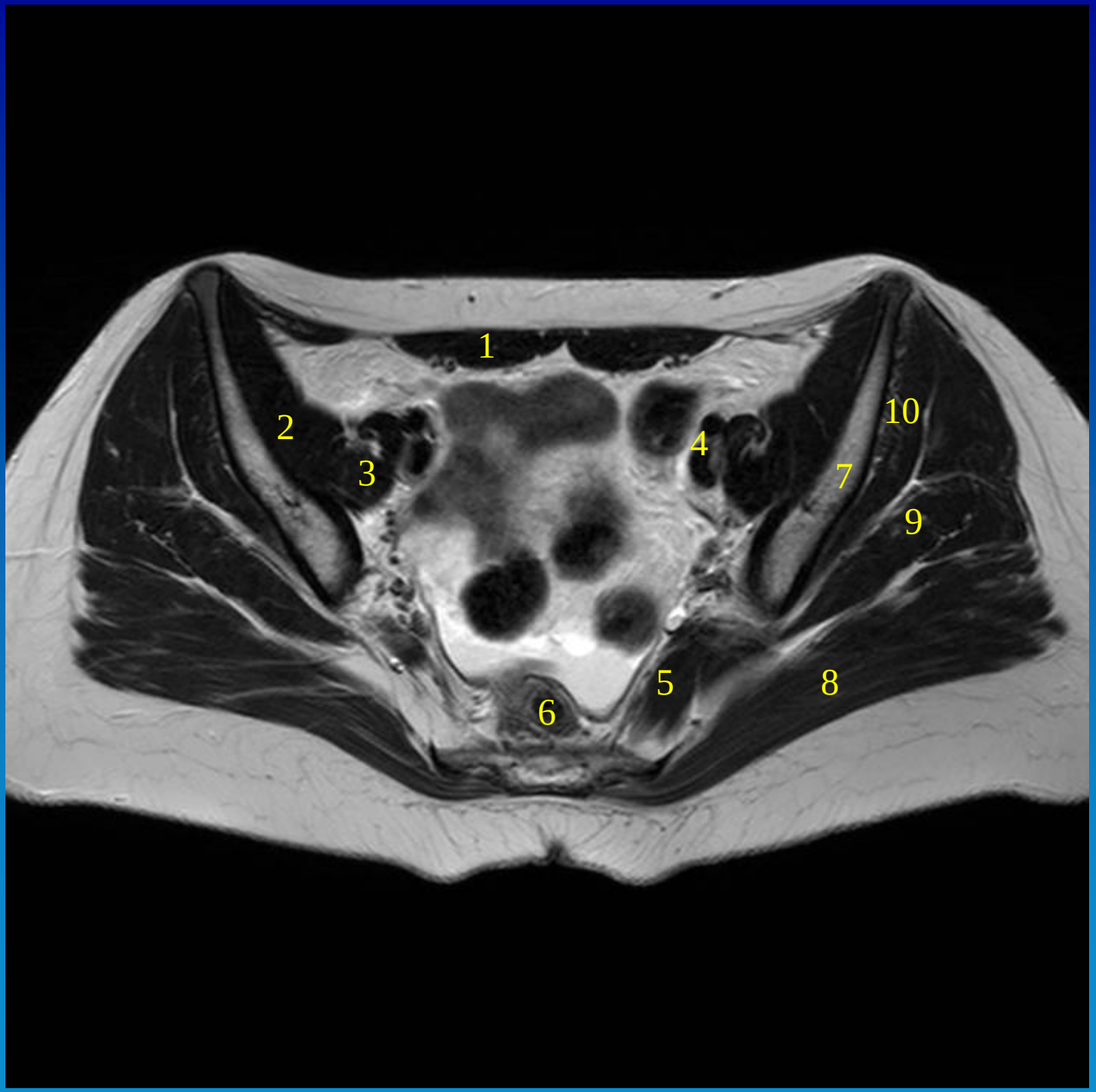
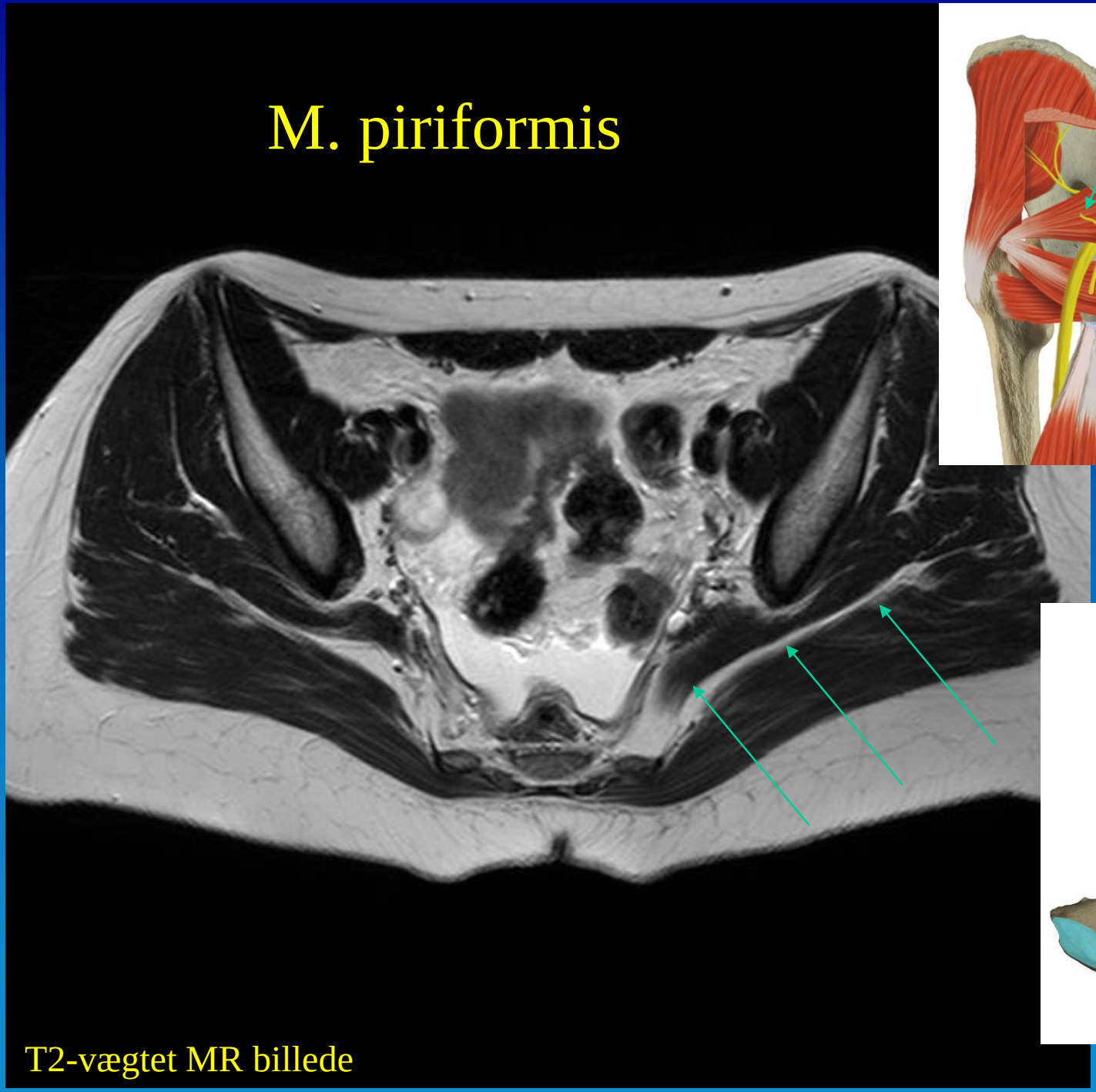
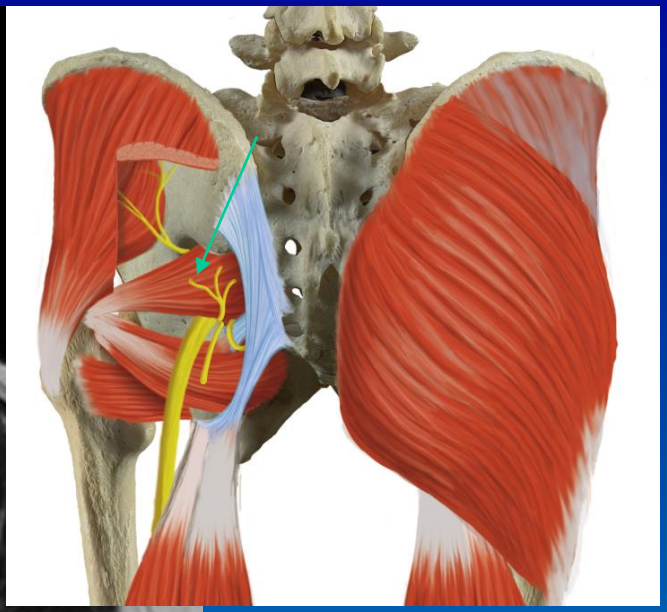
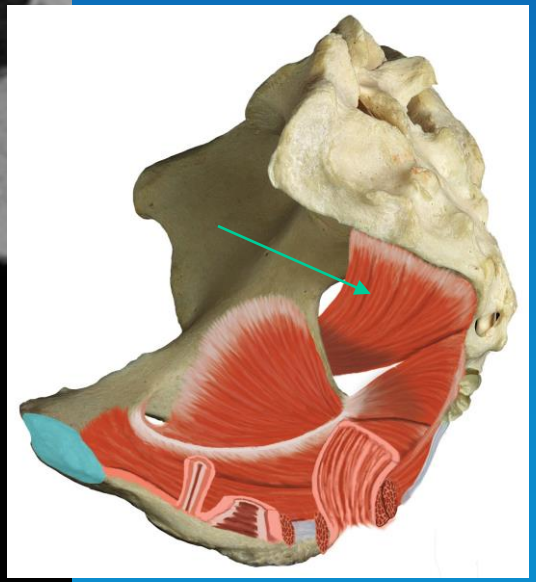


1) M. rectus abdominis
2) M. iliacus
3) M. psoas major
4) Vasa iliaca ext.
5) M. piriformis
6) Rectum
7) Ala ossis ilii
8) M. gluteus maximus
9) M. gluteus medius
10) M. gluteus minimus

M. piriformis



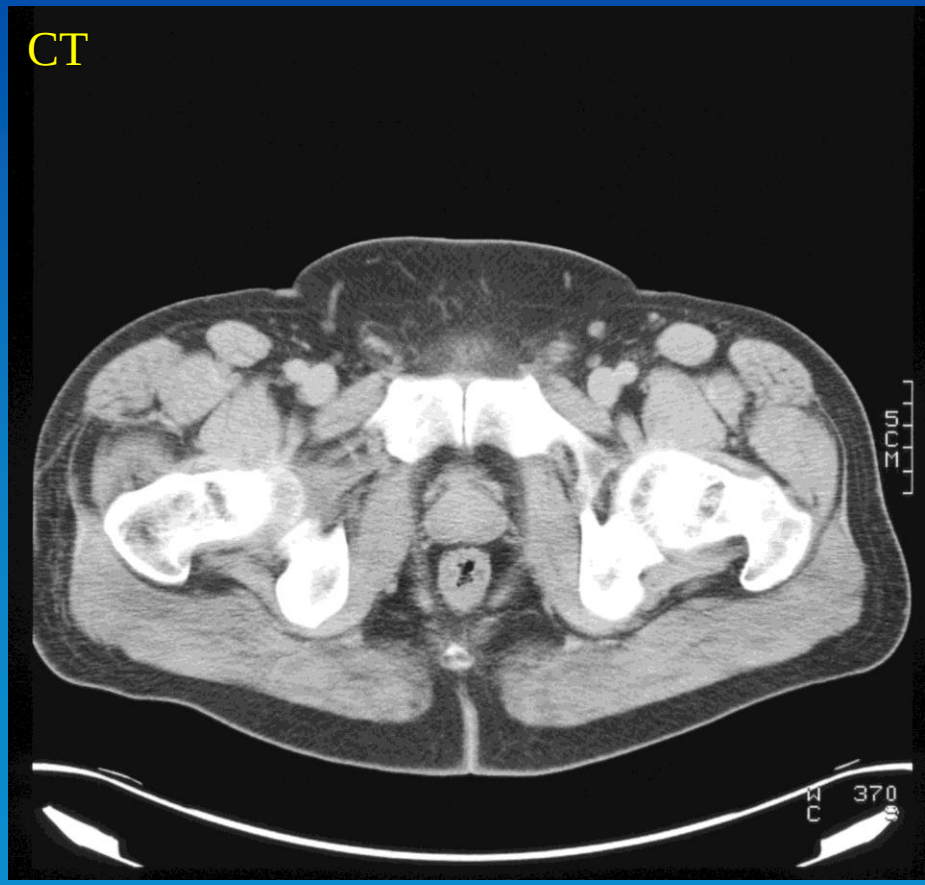


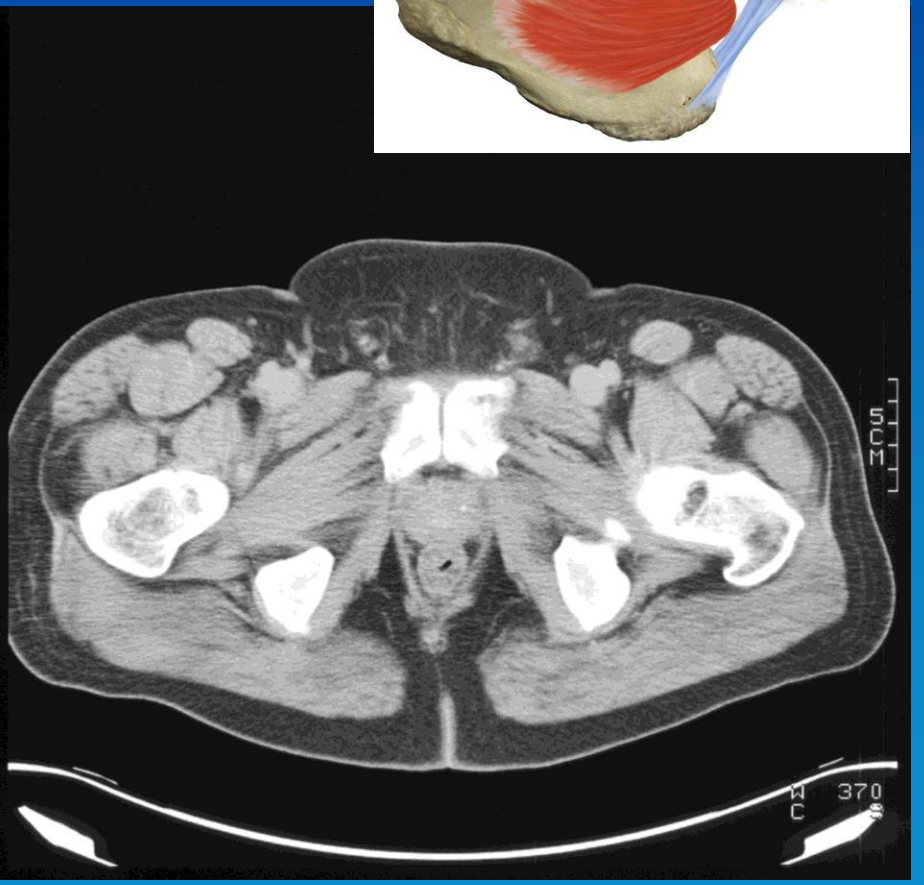


T2-vægtet MR billede

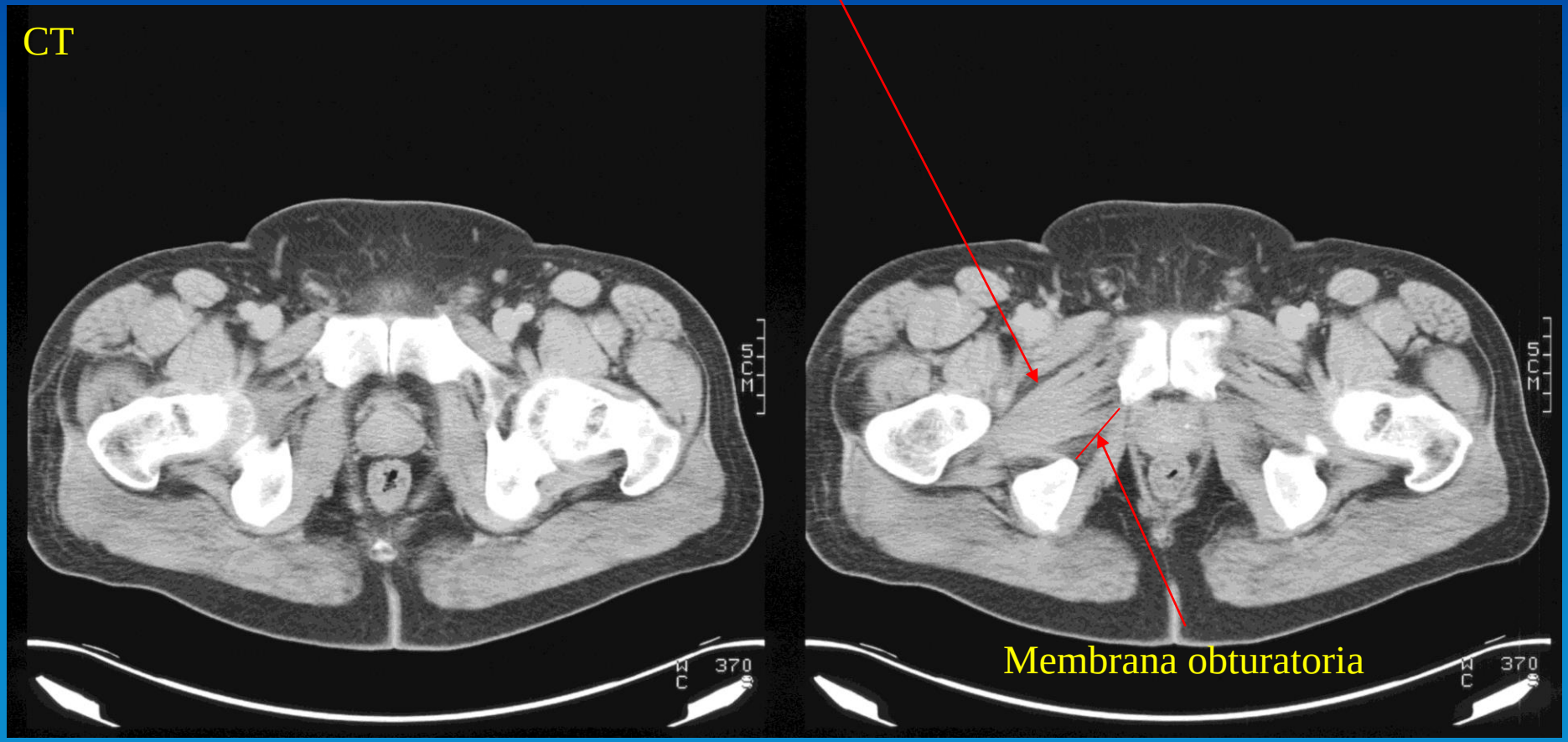
M. obturatorius externus et internus

CT

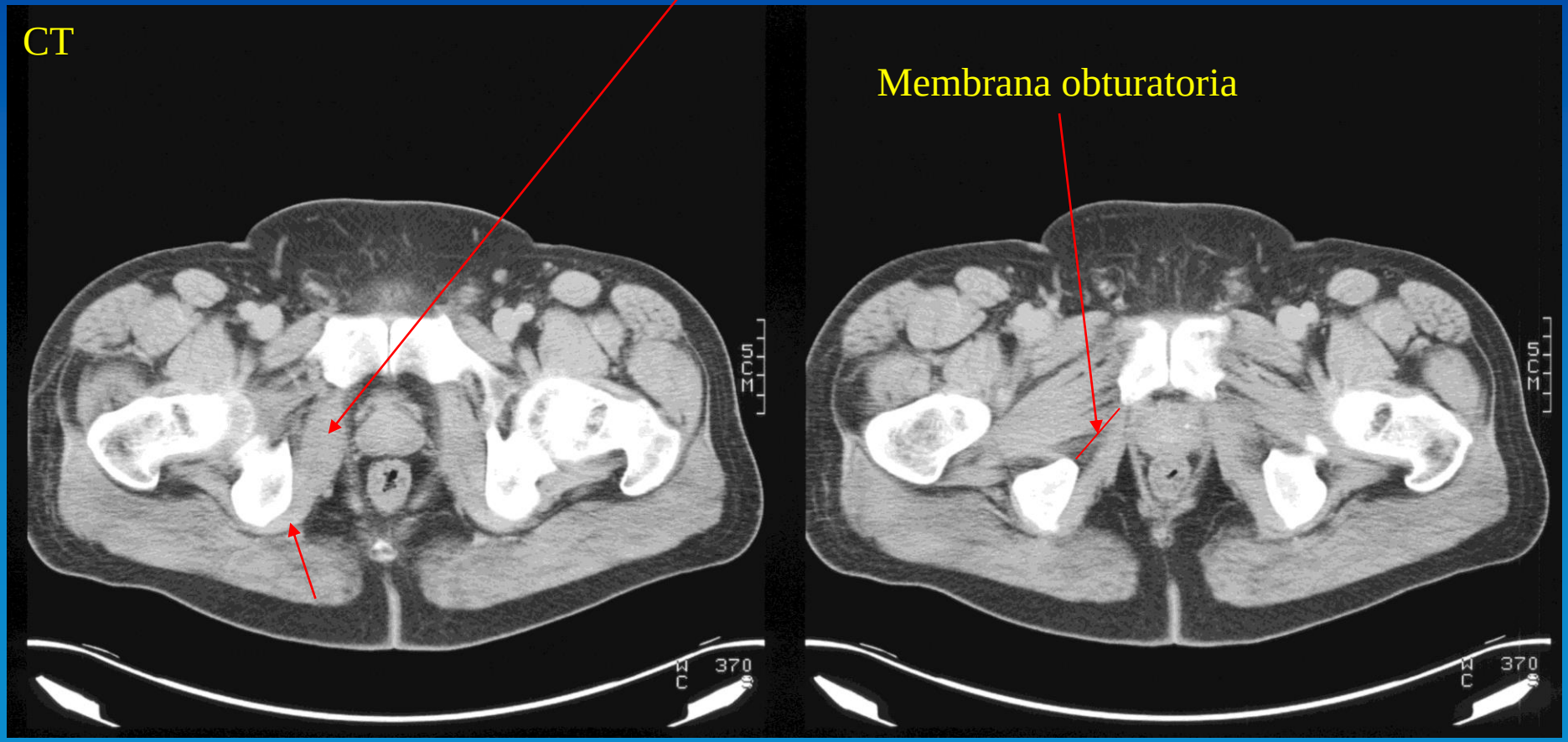




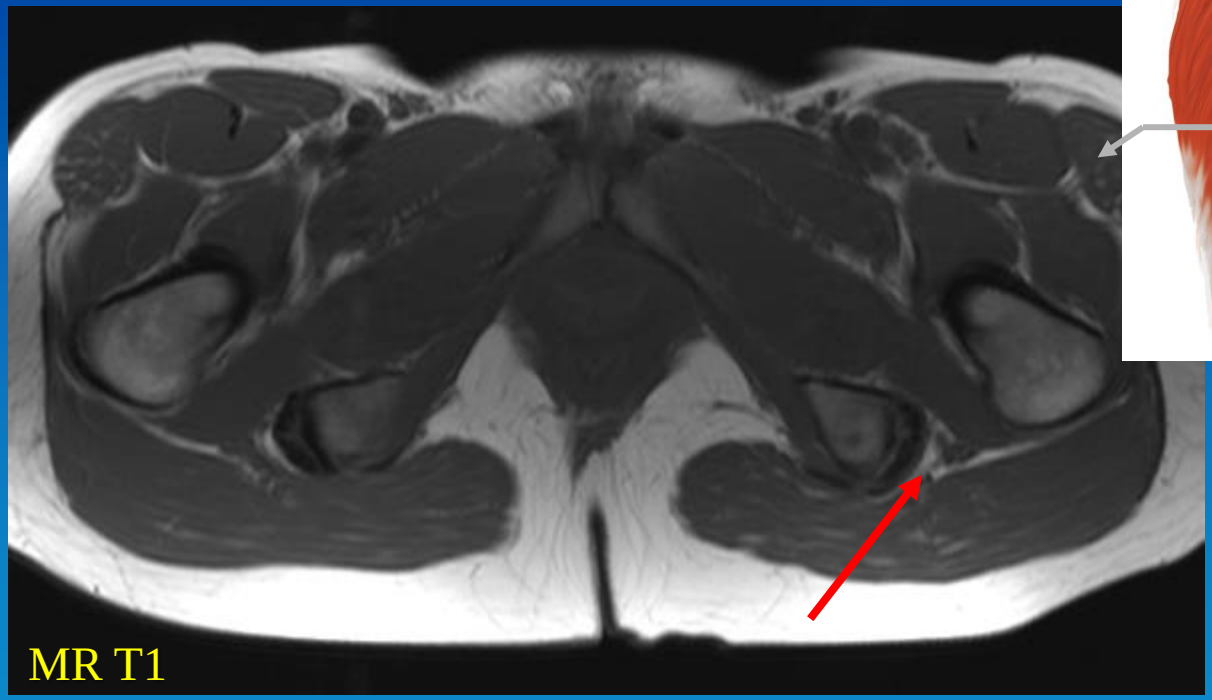
M. obturatorius externus

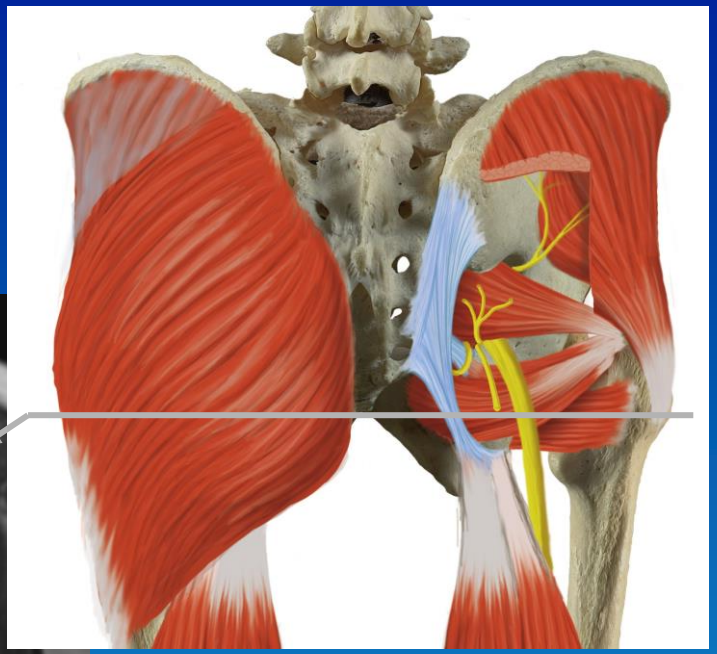


M. obturatorius internus

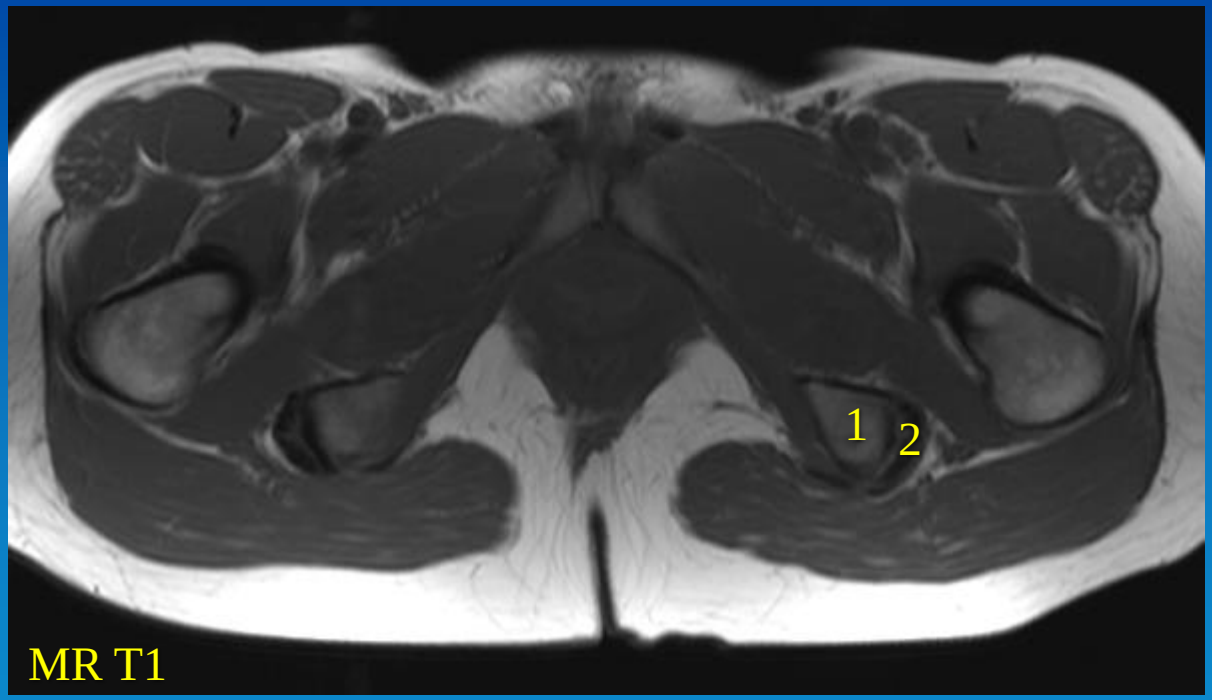


N. ischiadicus





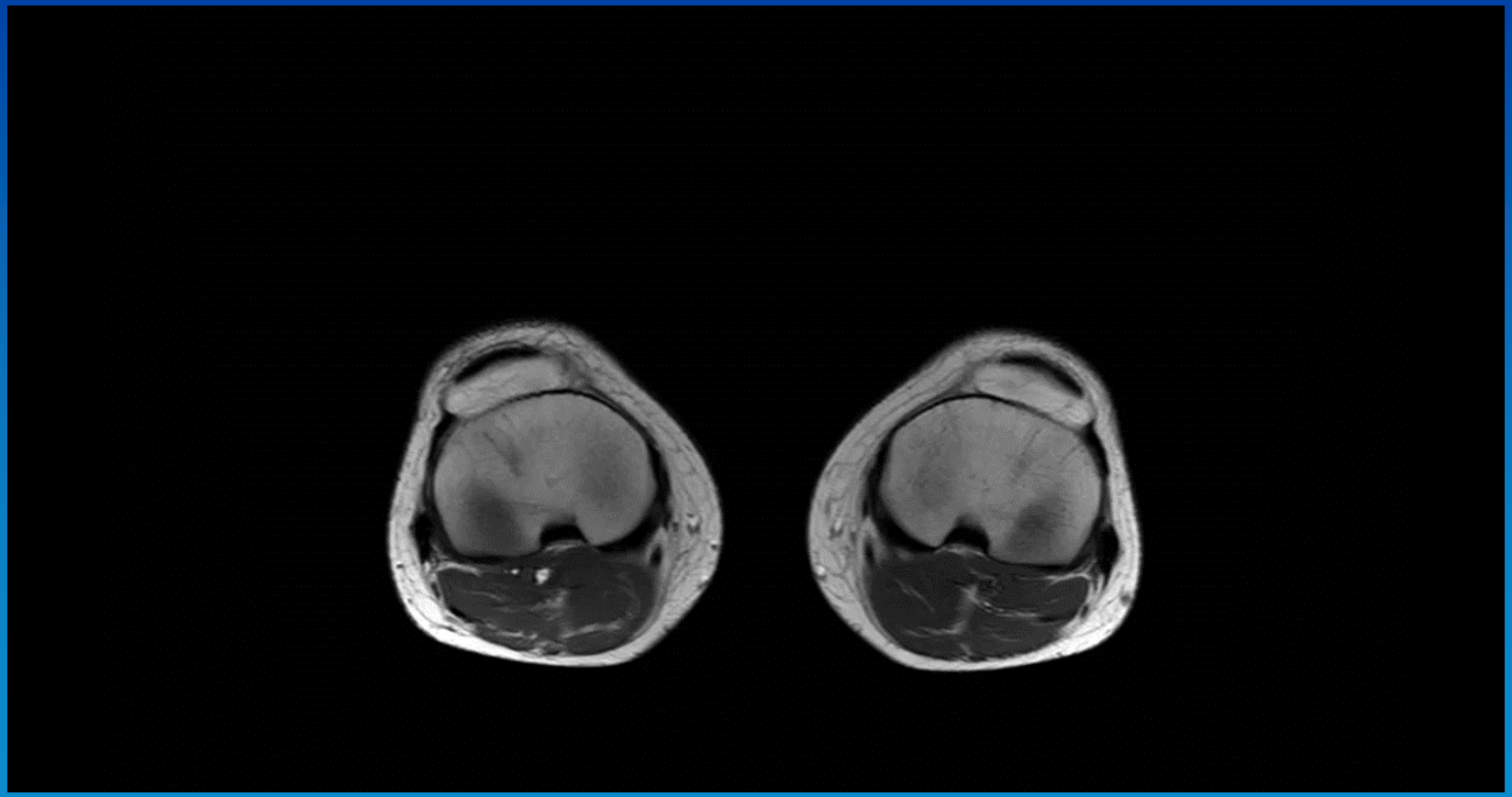
N. ischiadicus



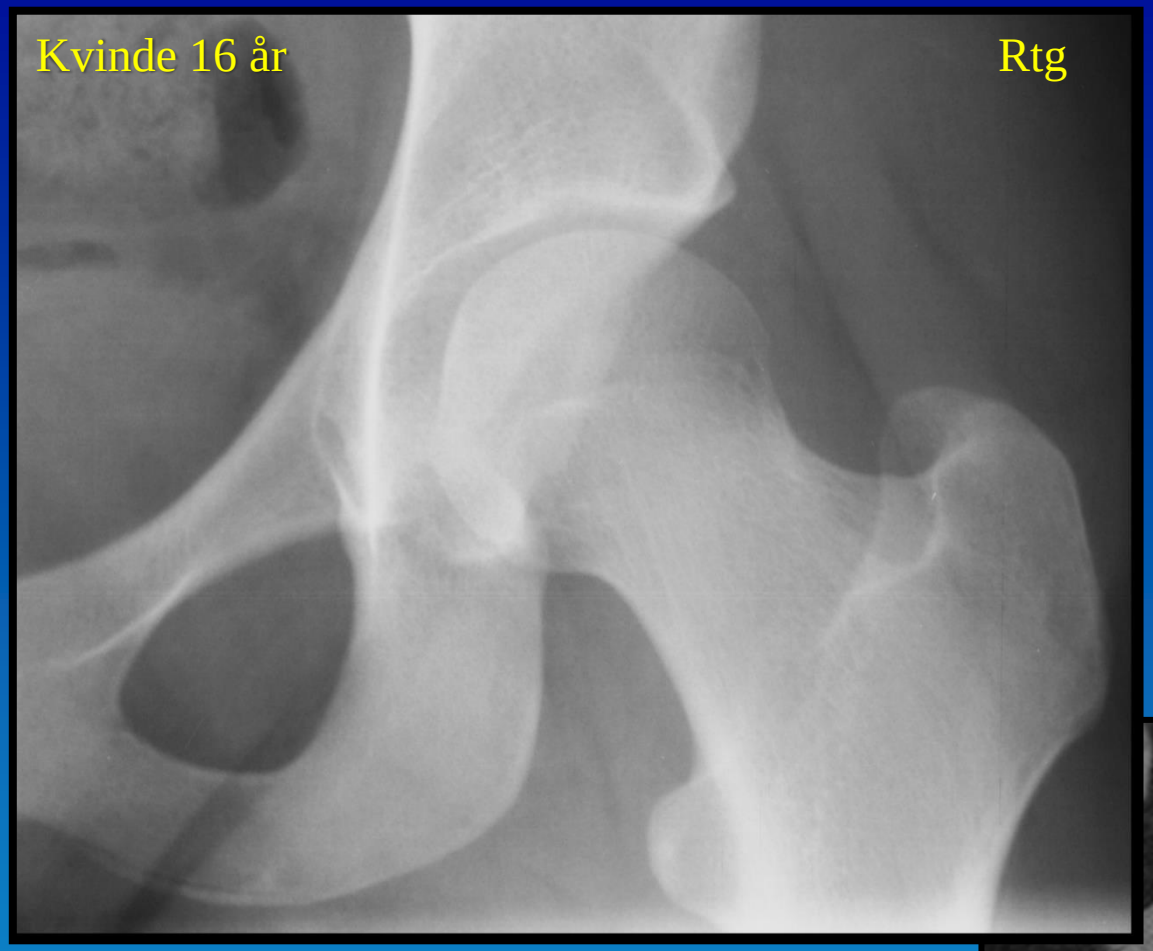
Nerven er beliggende i et lille spatium indeholdende fedtvæv (hvidt på en T1 vægtet sekvens) der kontraster godt mod nerven

1) Tuber ischiadicum
2) Udspringet af den ischiocrurale gruppe: M. semimembranosus, semitendinosus samt caput breve af biceps femoris (senevæv er sort).

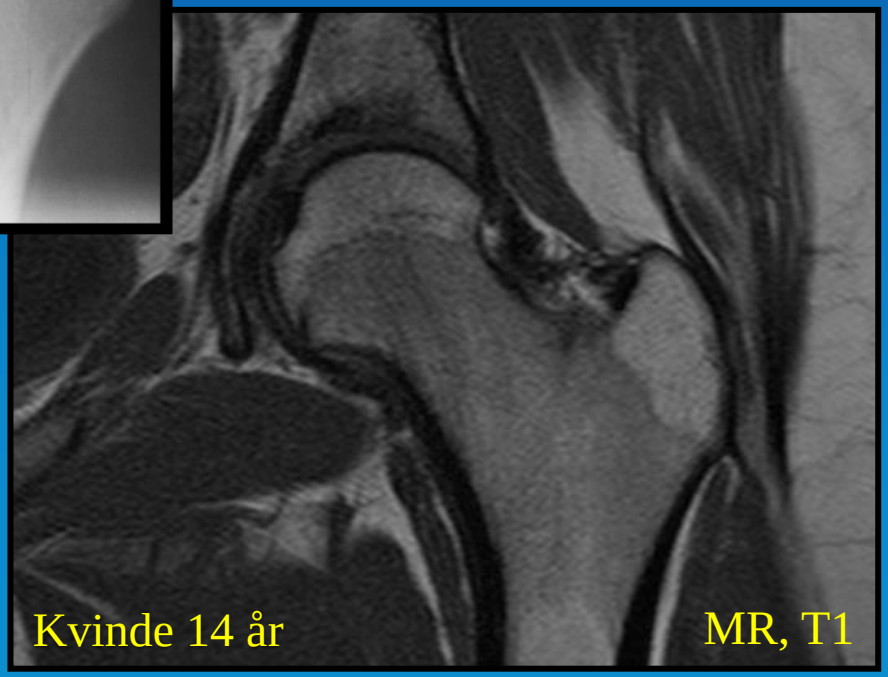
MR: Transvers T1 vægtet sekvens af bækken og femora

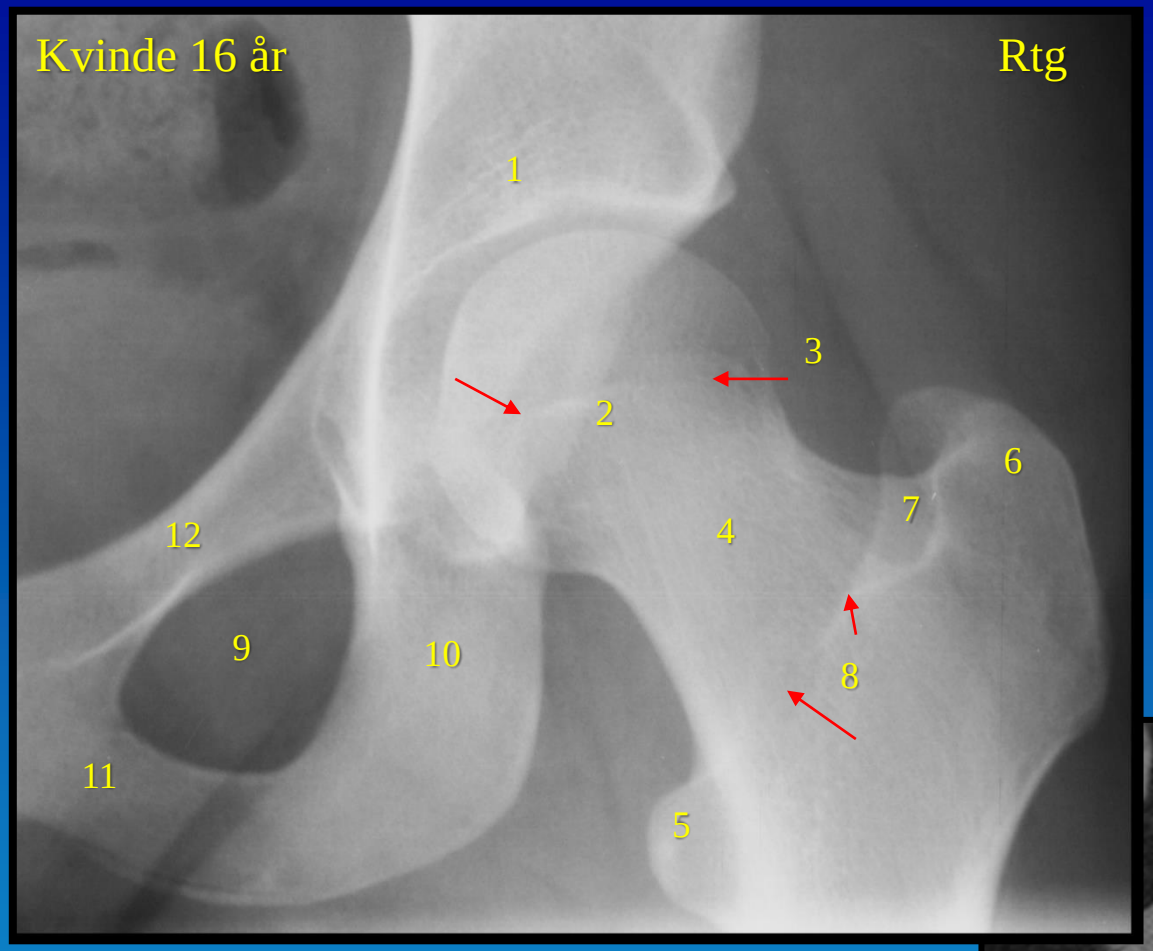


Hofteregionen



Acetabulum
Caput femoris
Epifyse arret
Collum femoris
Trochanter minor
Trochanter major
Fossa trochanterica
Crista intertrochanterica




Kvinde 16 år
Rtg
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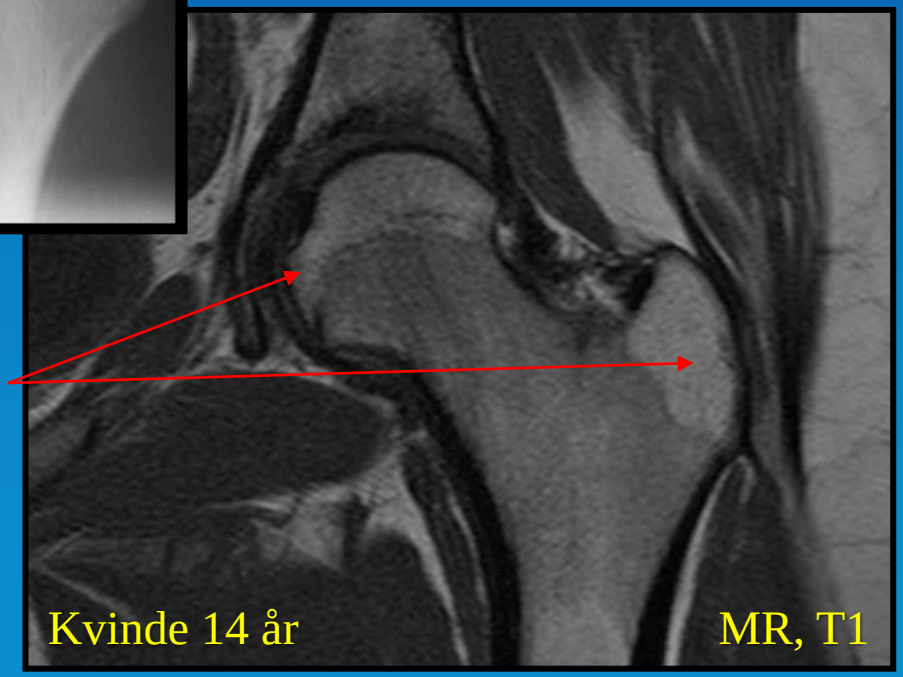
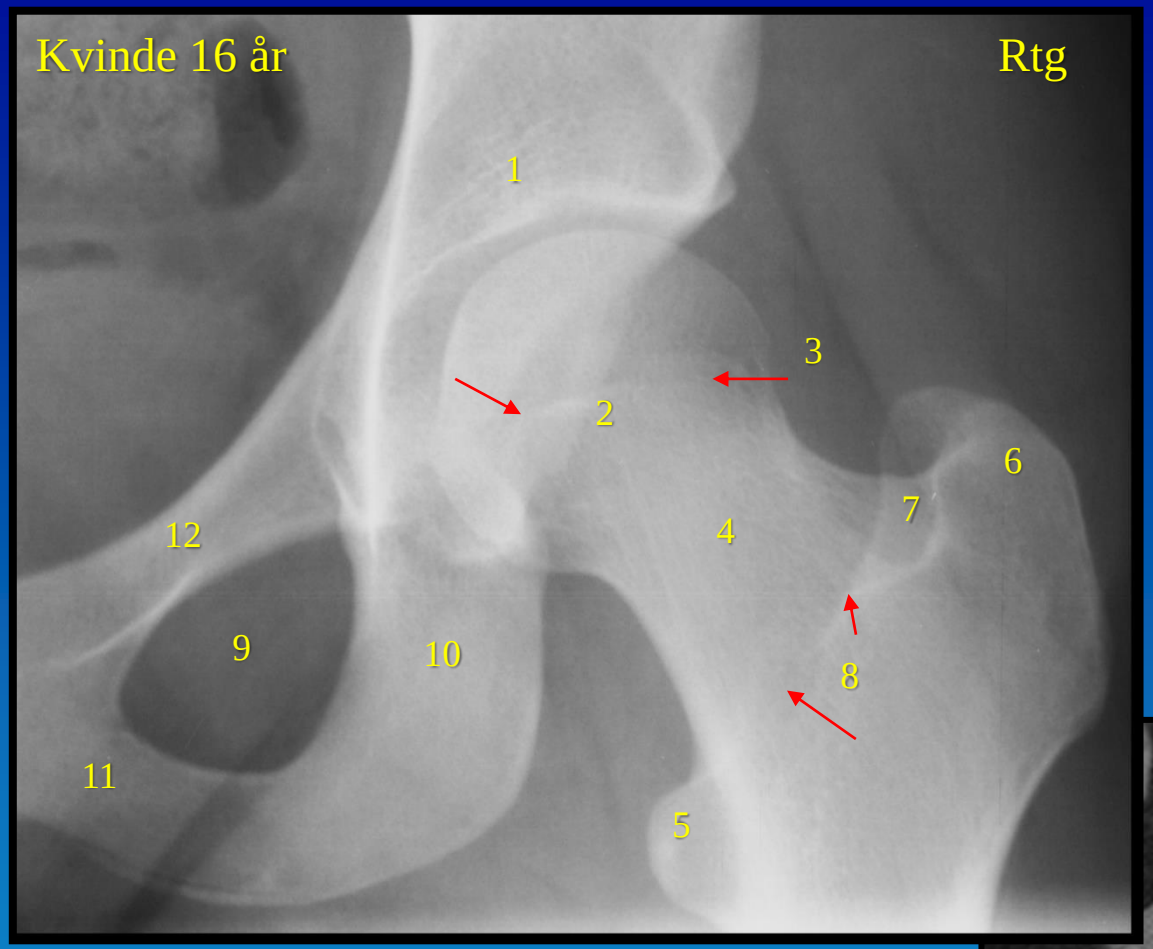
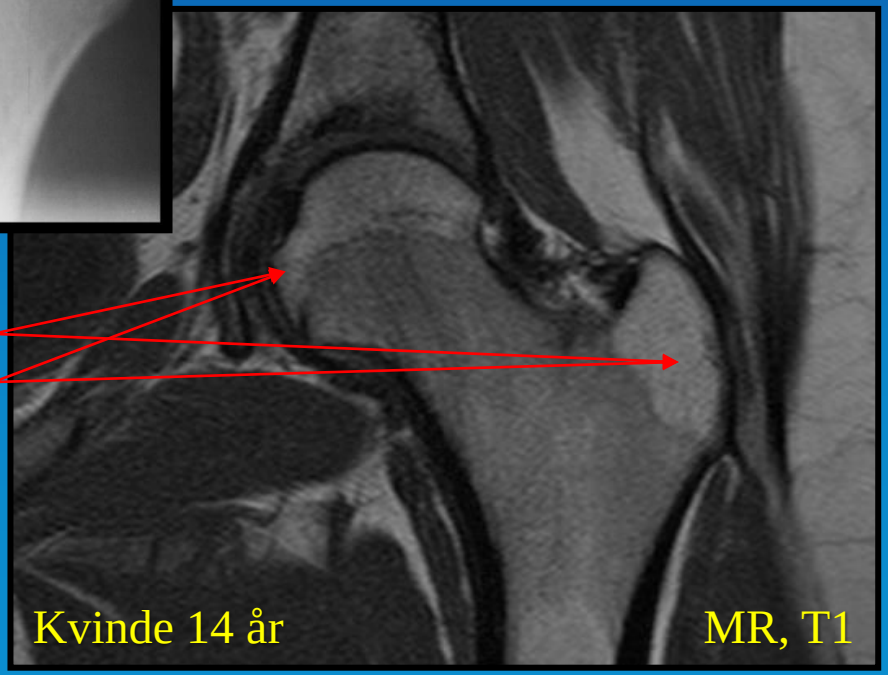

Kvinde 14 år
MR, T1



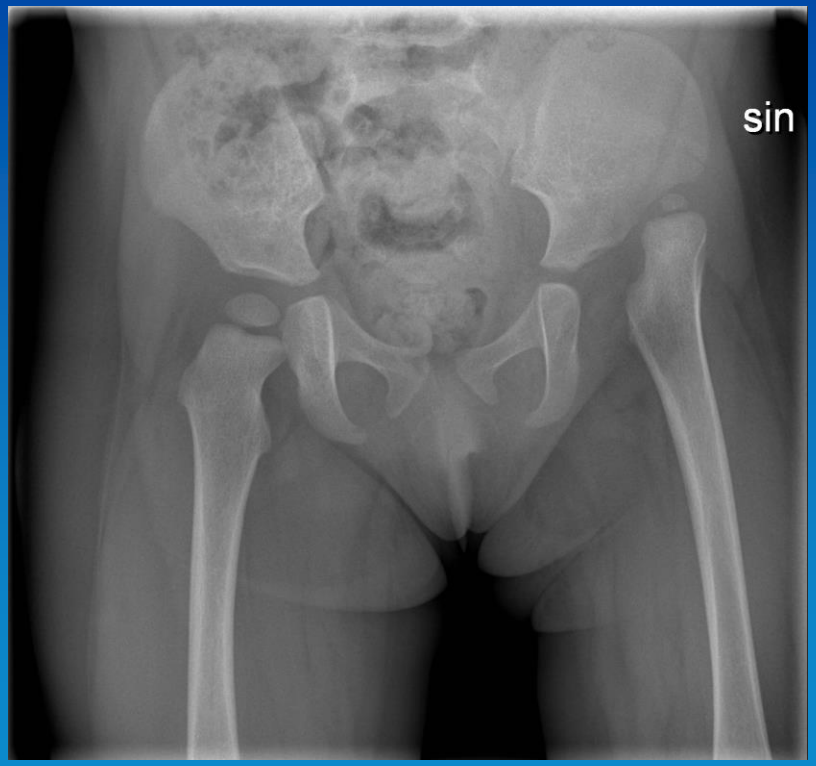
Acetabulum (1)
Caput femoris (2)
Epifyse arret (3)
Collum femoris (4)
Trochanter minor (5)
Trochanter major (6)
Fossa trochanterica (7)
Crista intertrochanterica (8)
Foramen obturatum (9)
Ramus ossis ischii (10)
Ramus inf. ossis pubis (11)
Ramus sup. Ossis pubis (12)

Bemærk at knoglemarven i såvel caput kernen som trochanter major er med højere signal (mere hvid), og således med større fedtindhold (gul knoglemarv) end øvrige proximale femur.

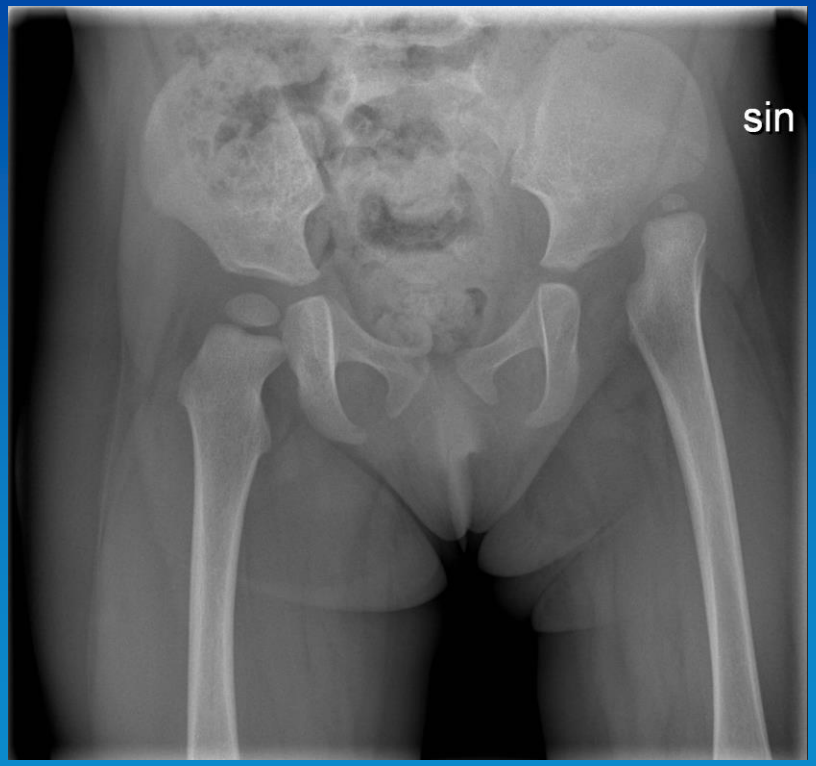


Medfødt hofteledskred (Medfødt hofteledsluksation)

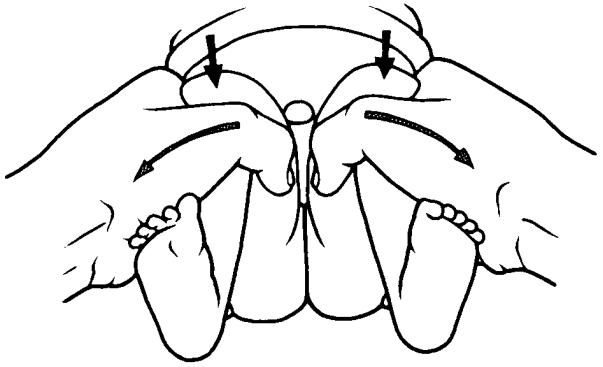
Medfødt hofteledskred



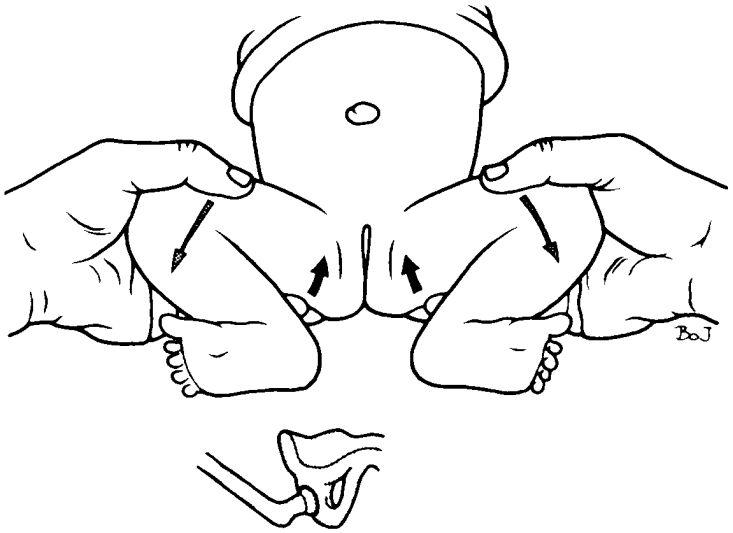
Medfødt hofteledskred



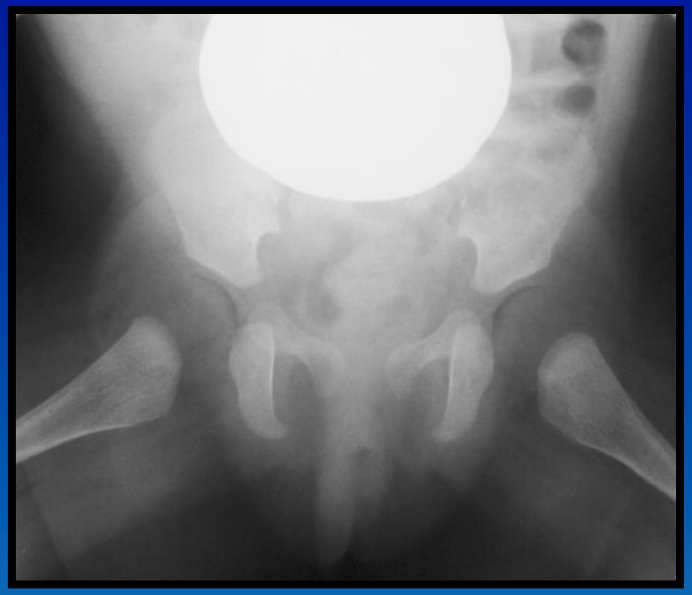
Normal højre hofte, ledskred på venstre side. Dette er ikke medfødt i alle tilfælde, og kaldes mere præcist DDH (developmental dysplasia of the hip).

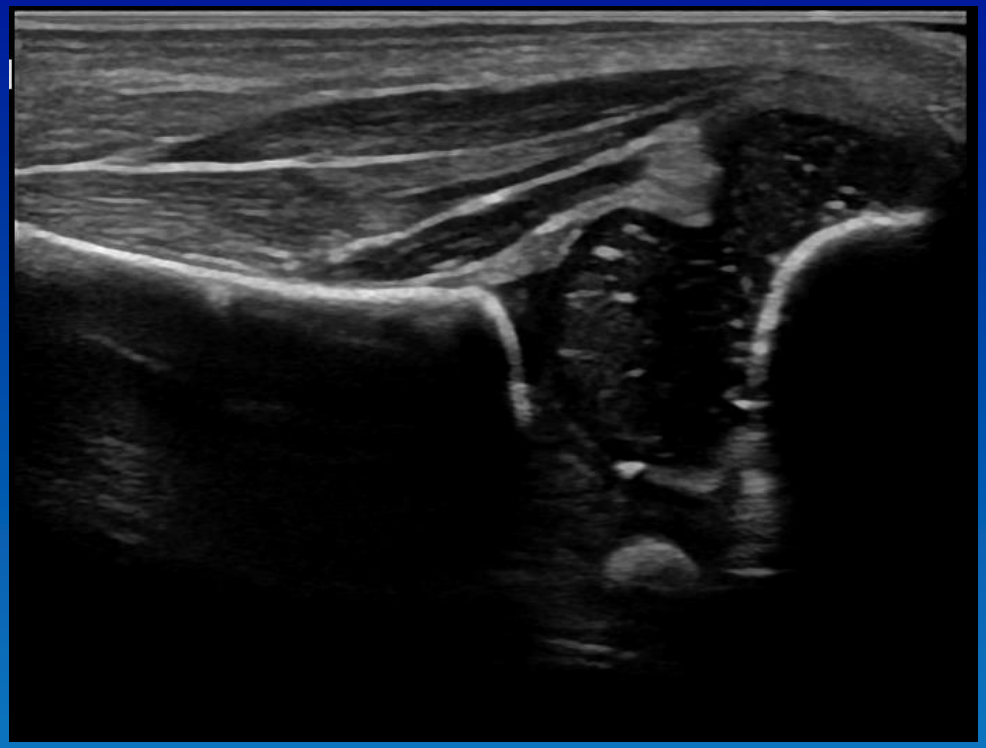


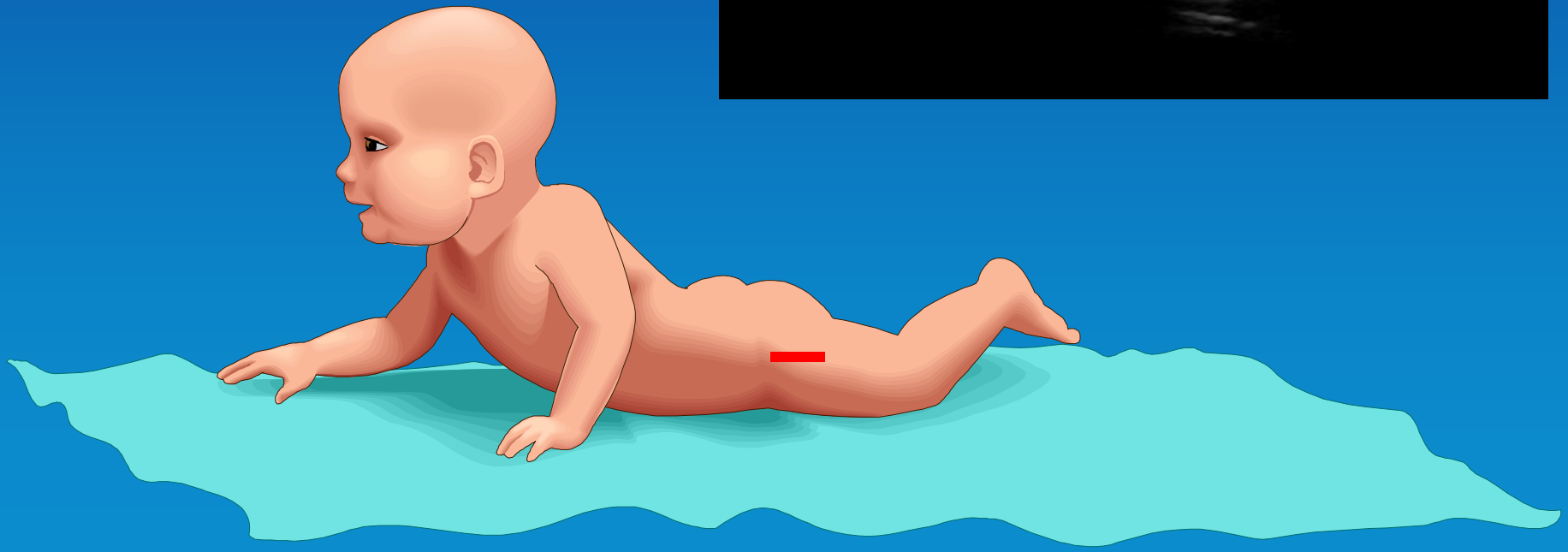
Ortolanis undersøgelse

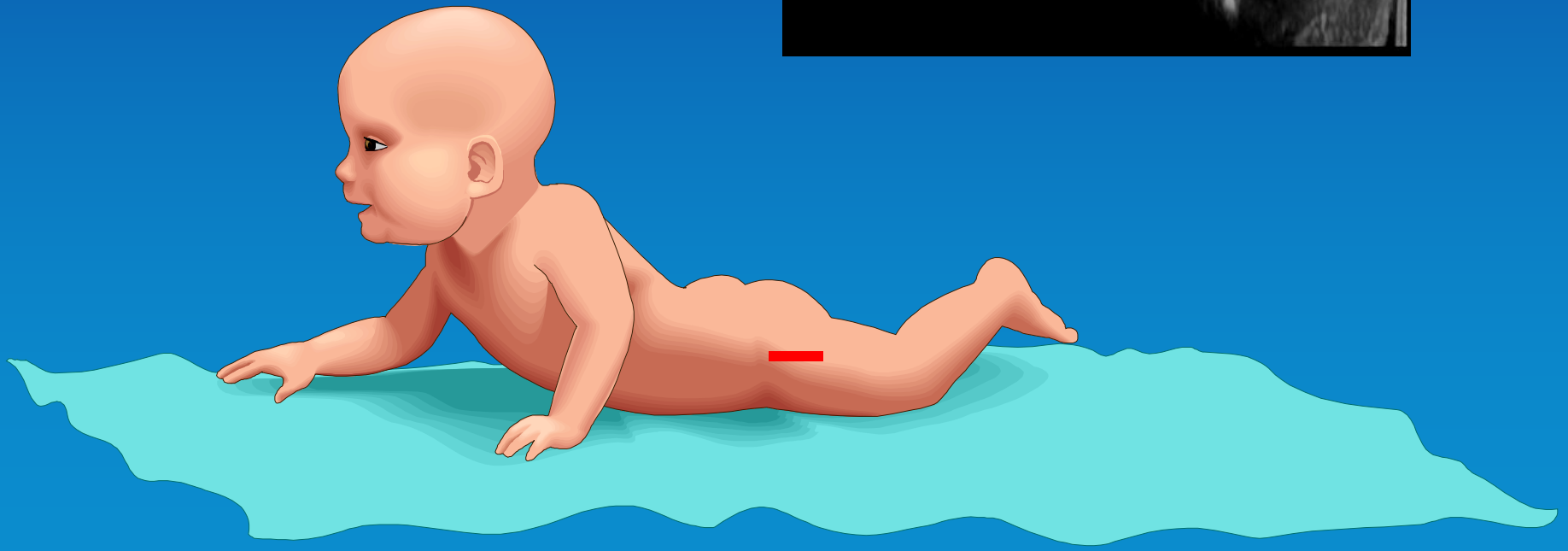


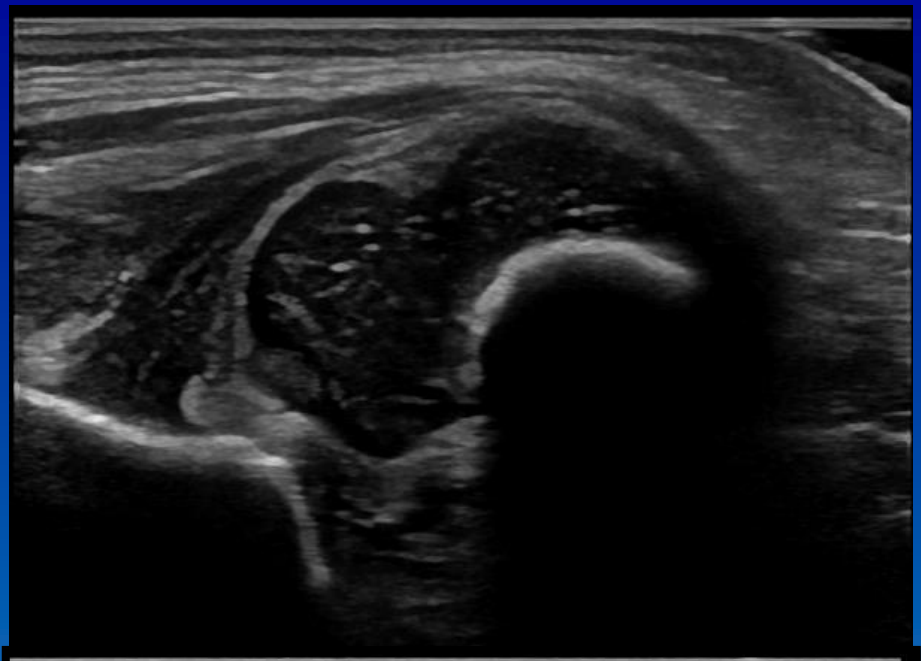
Sneppen 1986

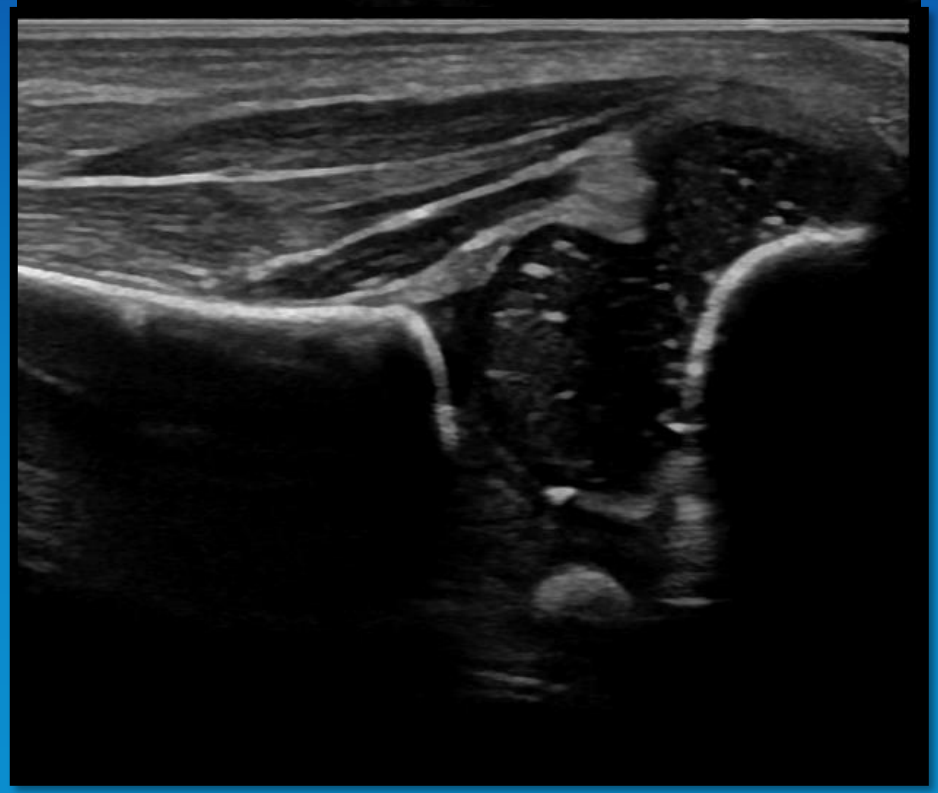


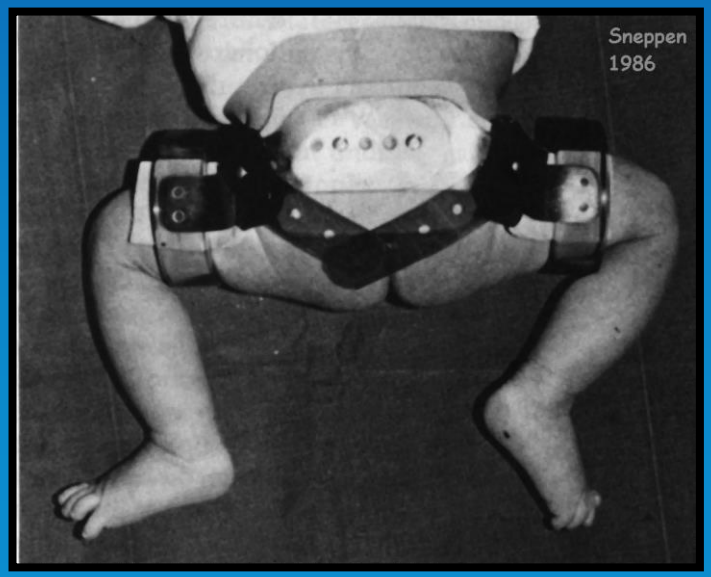




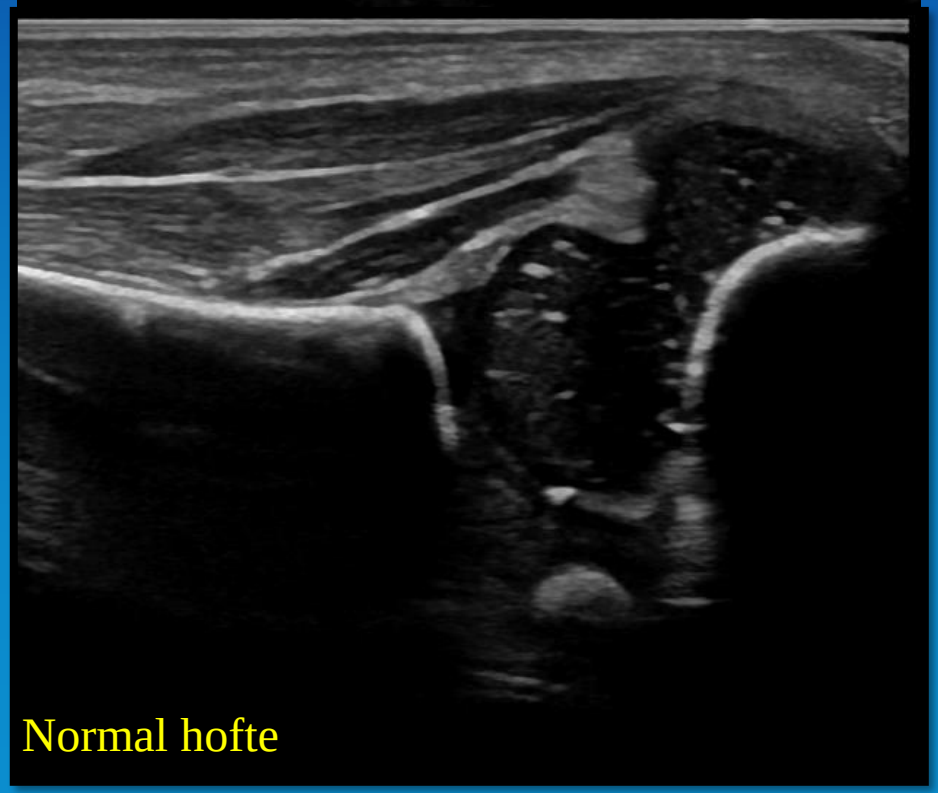




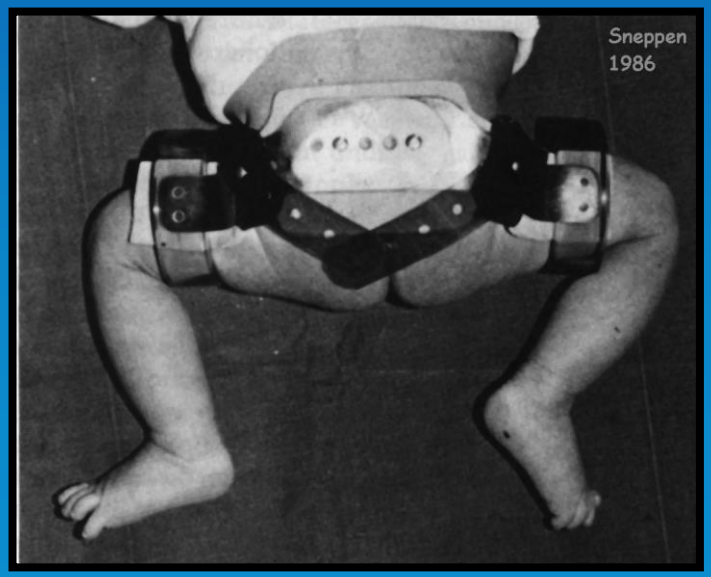



Sneppen
1986

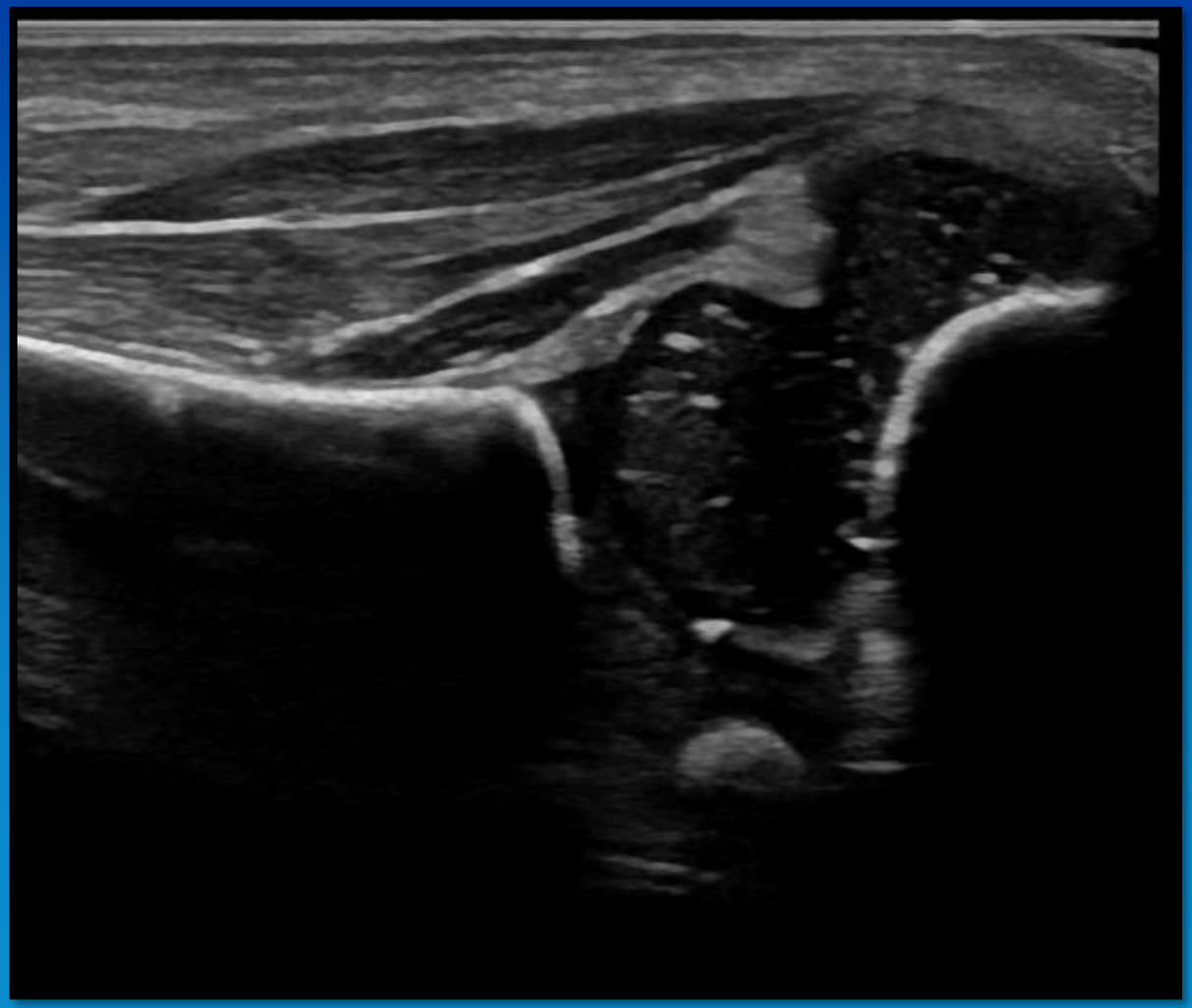
Lukseret hofte



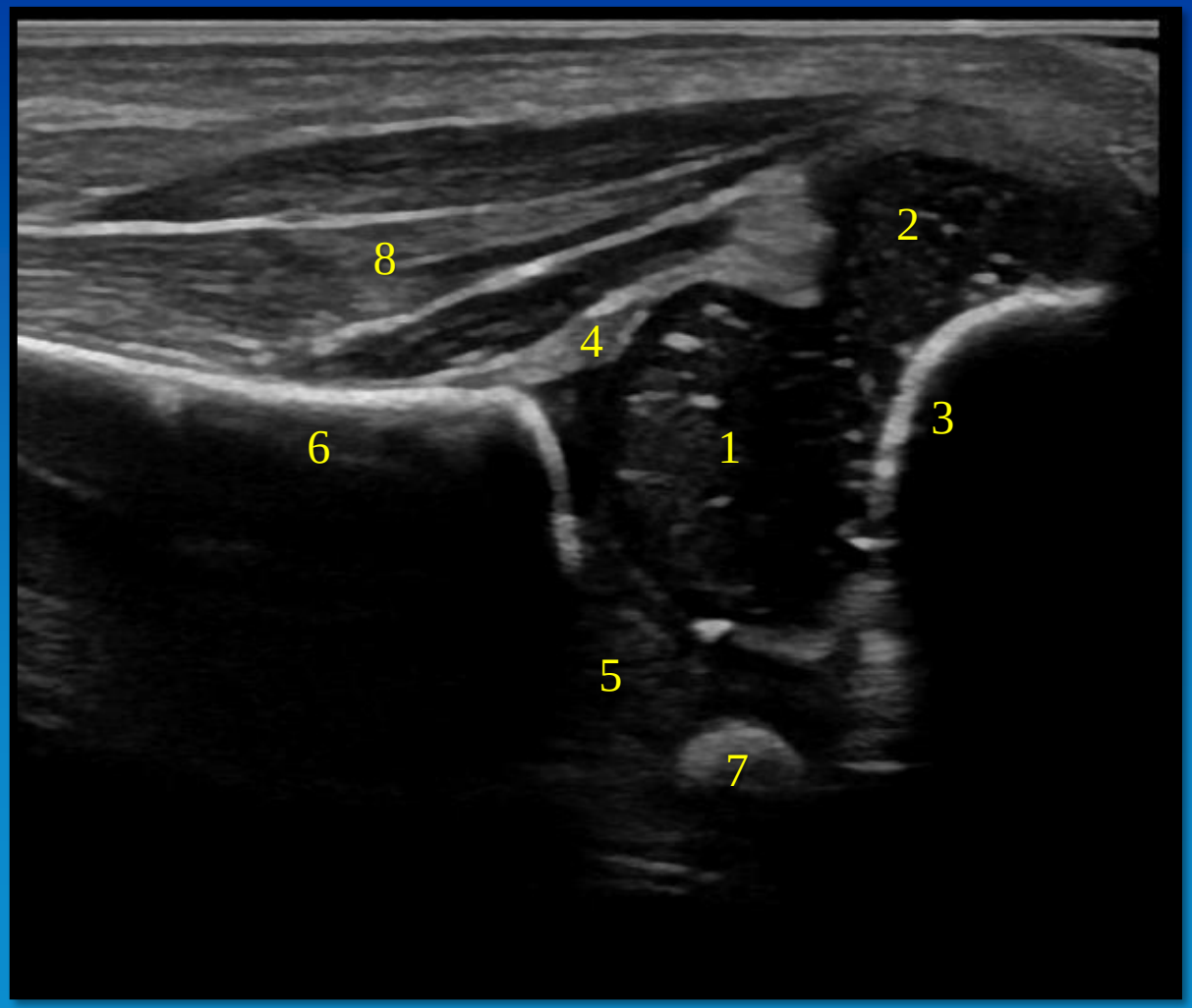
Normal hofte



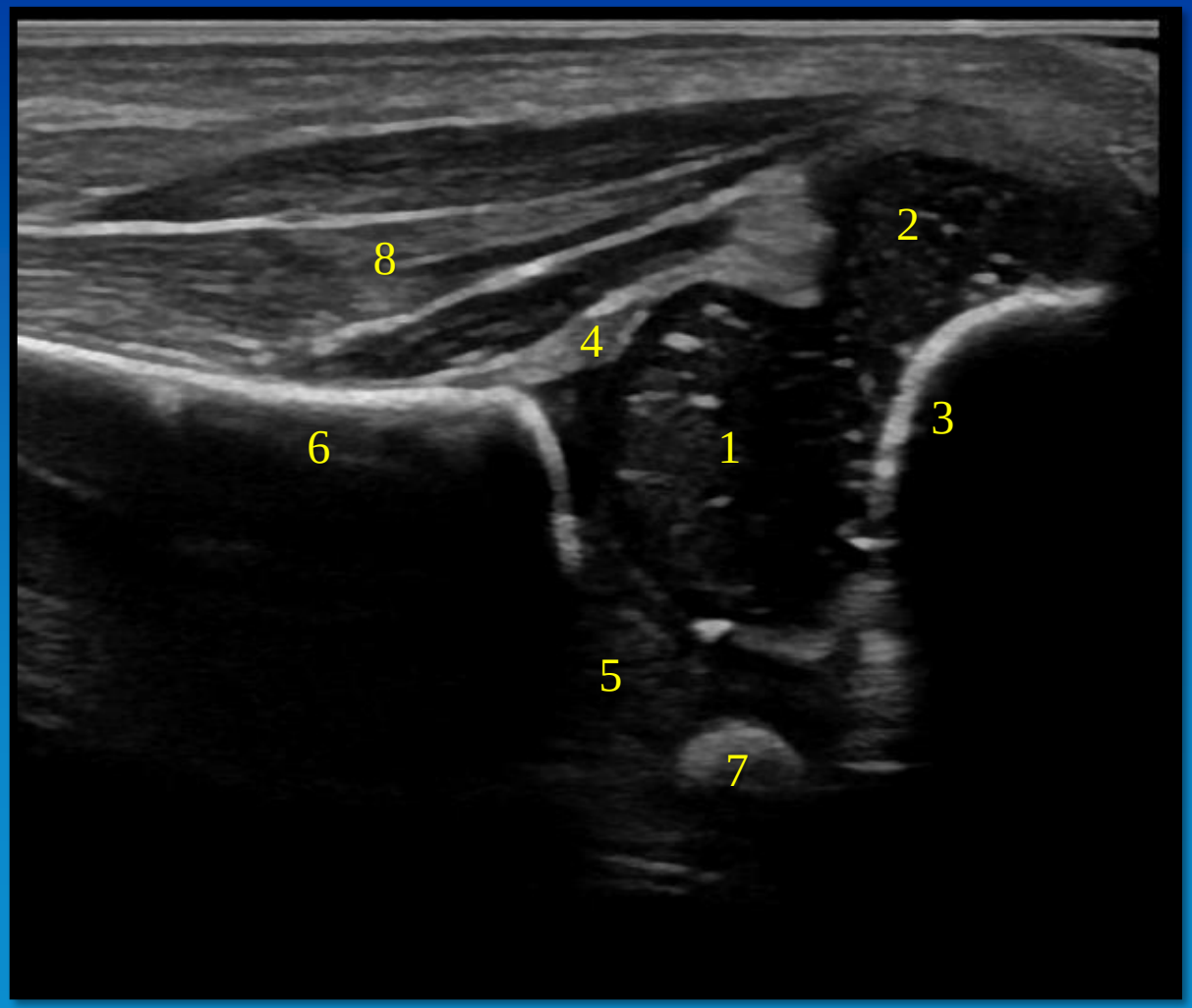
Ultralydskanning af en nyfødts hofte.



Ultralydskanning af en nyfødts hofte.



Ultralydskanning af en nyfødts hofte.



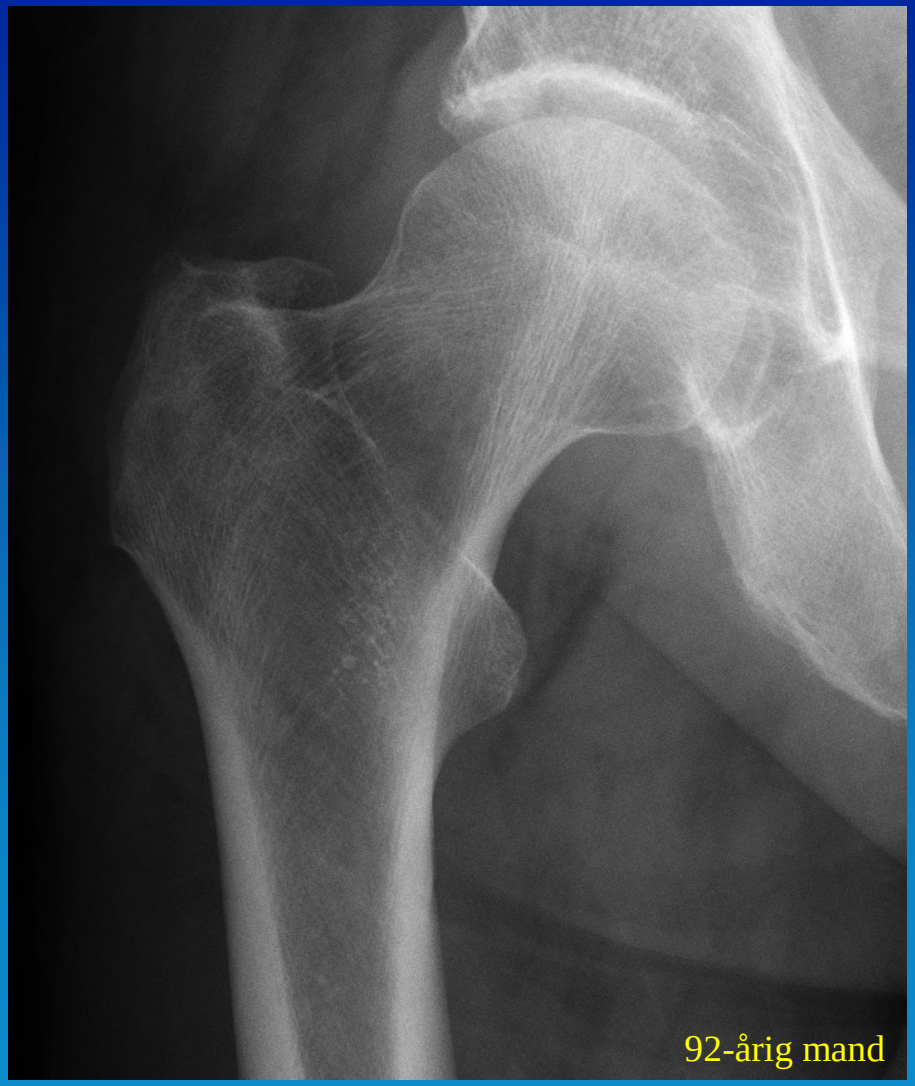
1) Caput femoris
2) Trochanter major
3) Femur metafysen

Acetabulum:

- 4) Labrum
- 5) Synchondrosen

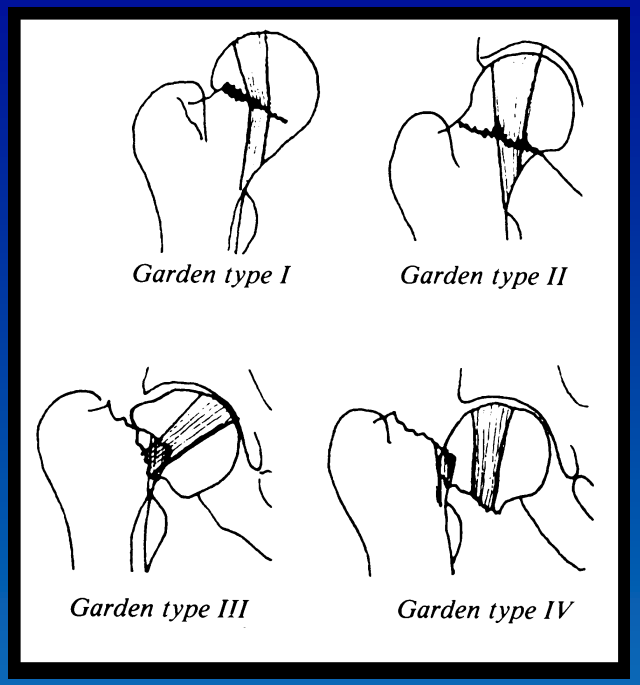
6) Os ilium (lateralt)
7) Os pubis (ossifikationscenter)
8) Gluteal muskulaturen

Knogletrabekler

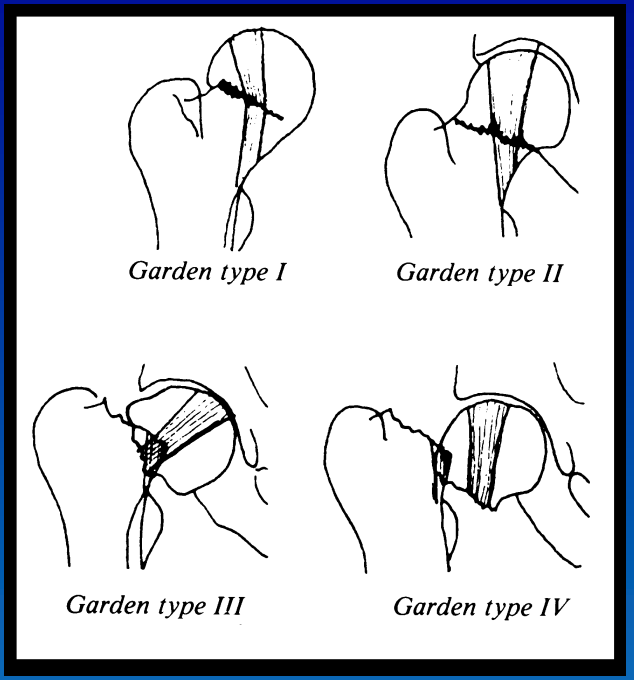

92-årig mand

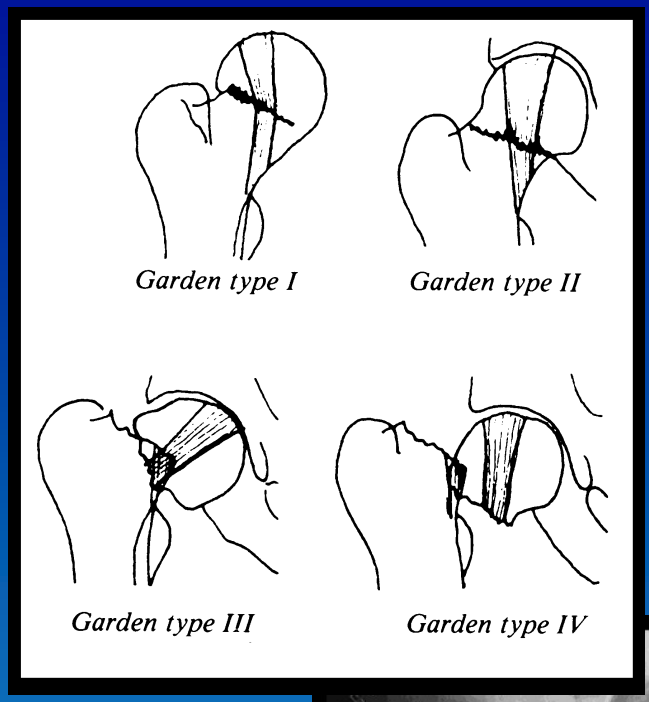

34-årig kvinde

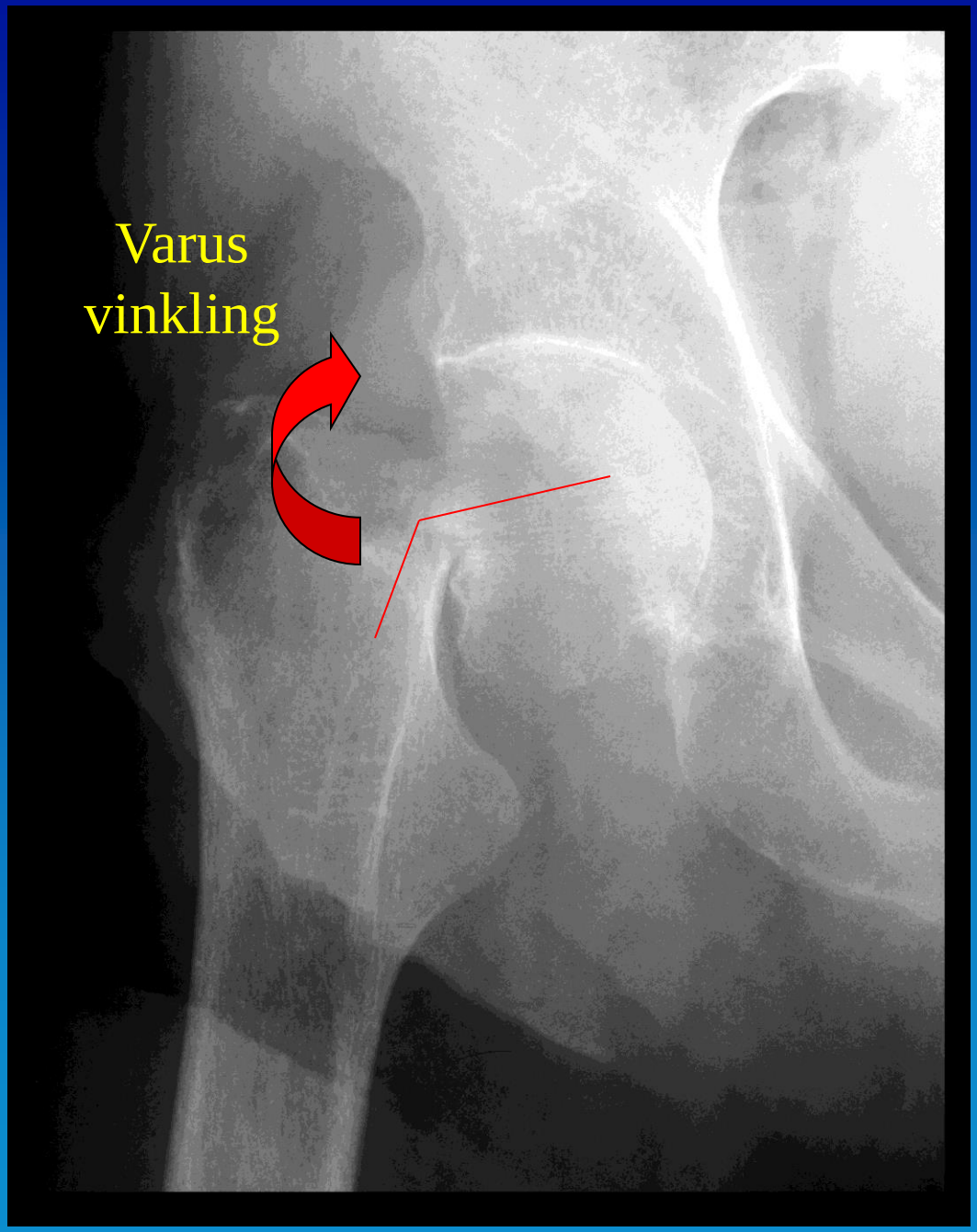
Fractura collum femoris

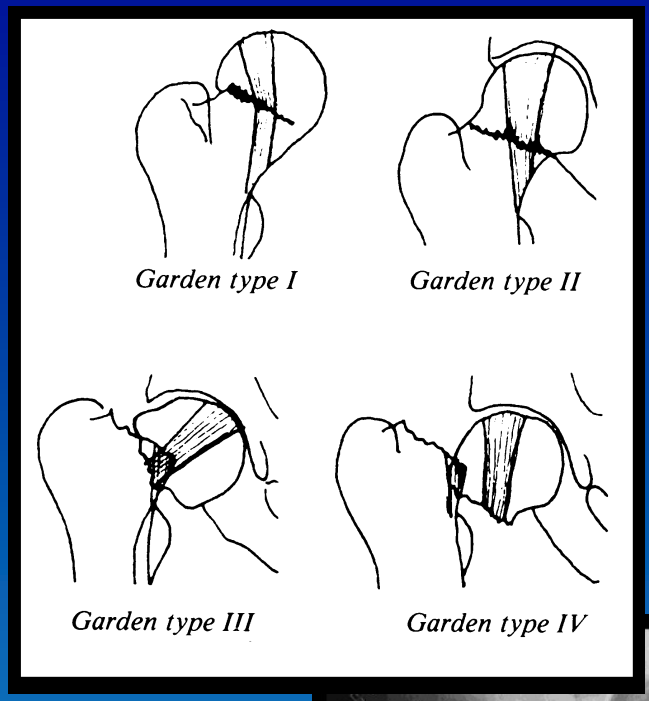

Garden type I
Garden type II
Garden type III
Garden type IV

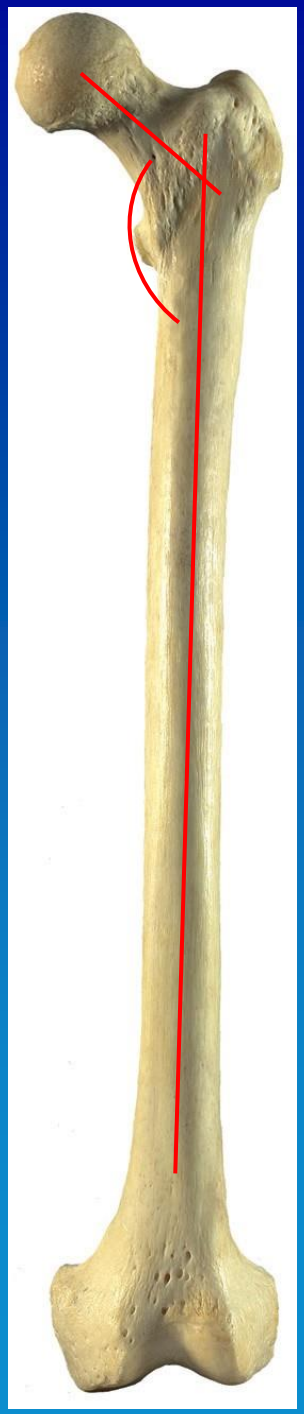
Valgus vinkling




Garden type I
Garden type II
Garden type III
Garden type IV

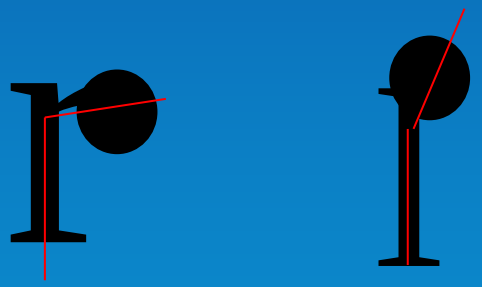

Varus
vinkling

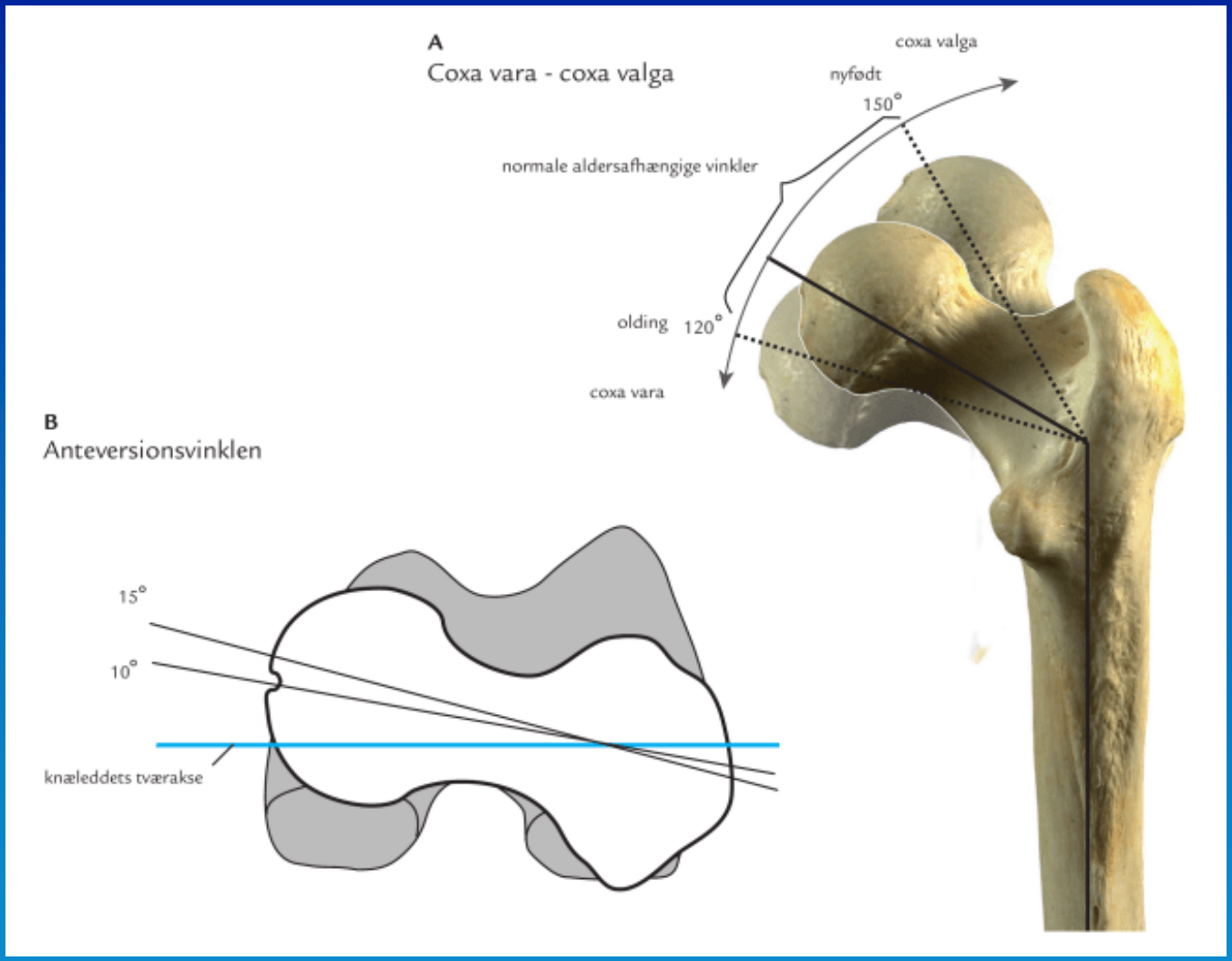

Garden type I
Garden type II
Garden type III
Garden type IV

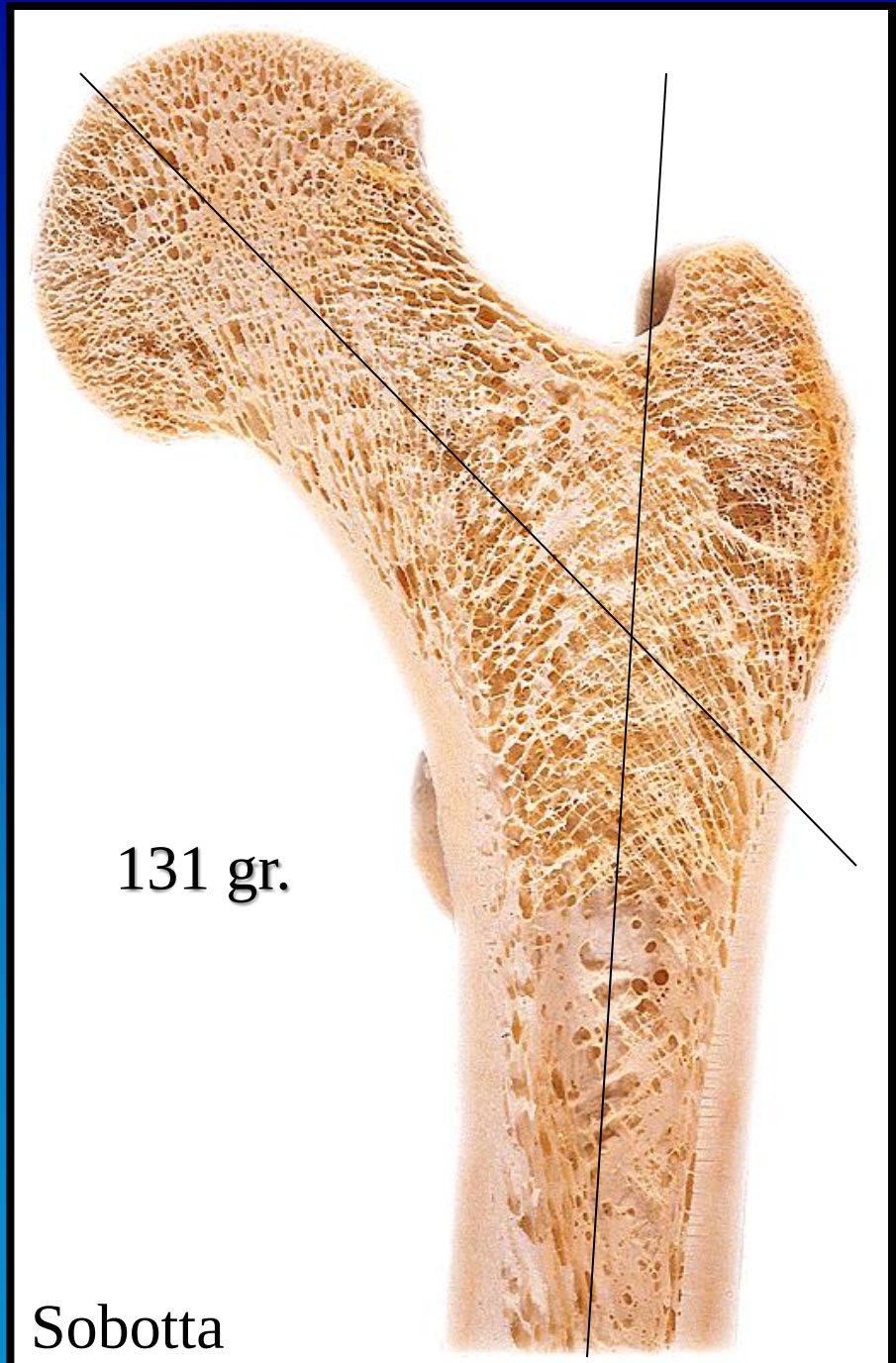


Nyfødt: 150 gr.
Voksen: 125 (120-130) gr.
Gammel: 120 gr.

Coxa vara (reduceret vinkel)
Coxa valga (øget vinkel)




A
Coxa vara - coxa valga
coxa valga
nyfødt
150°
normale aldersafhængige vinkler
olding
120°
coxa vara
B
Anteversionsvinklen
15°
10°
knæleddets tværakse

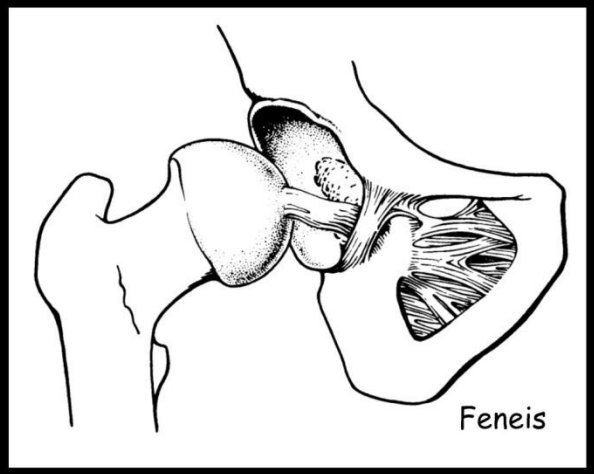


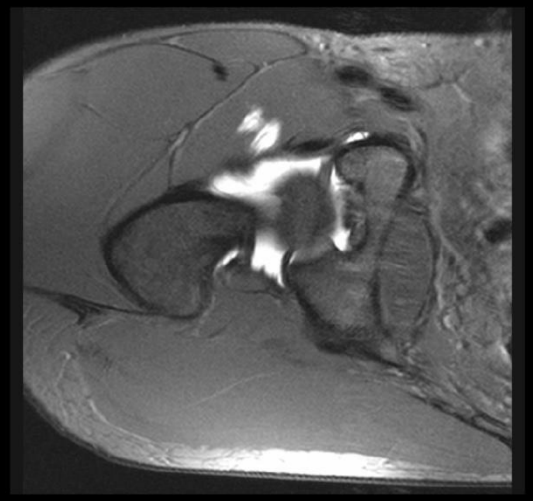
131 gr.

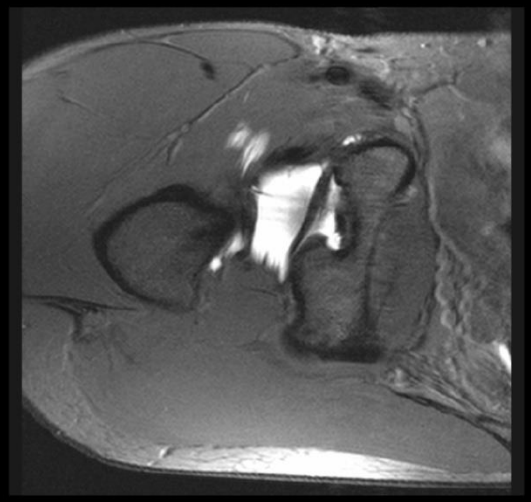
112 gr.

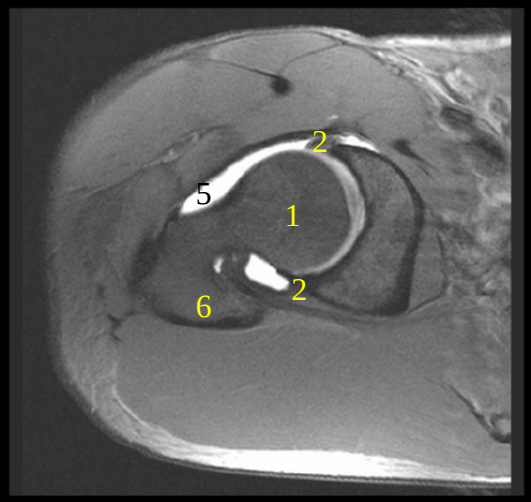
Sobotta

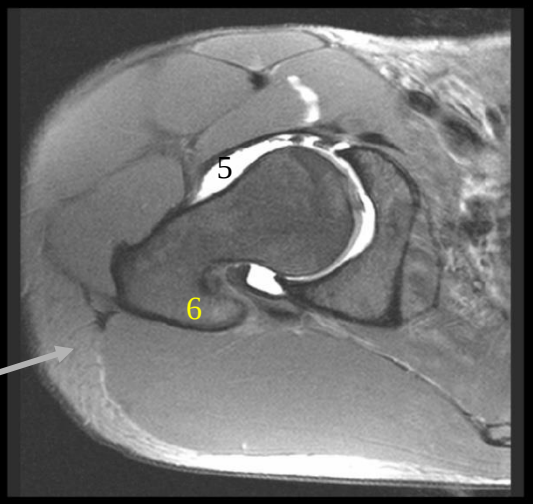
Hofteleds MR-artrografi

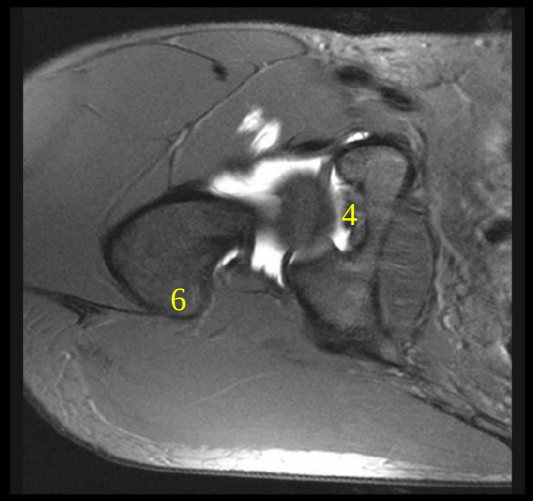

Feneis

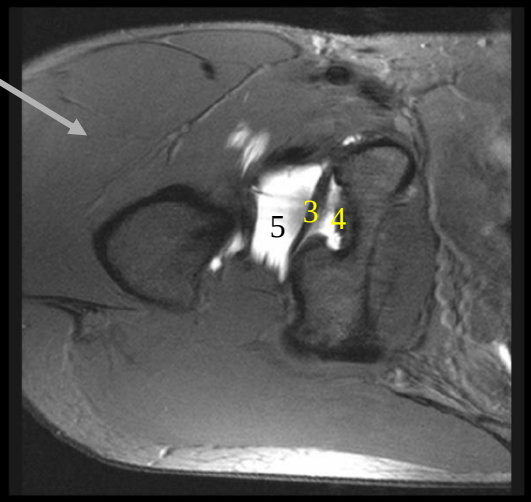


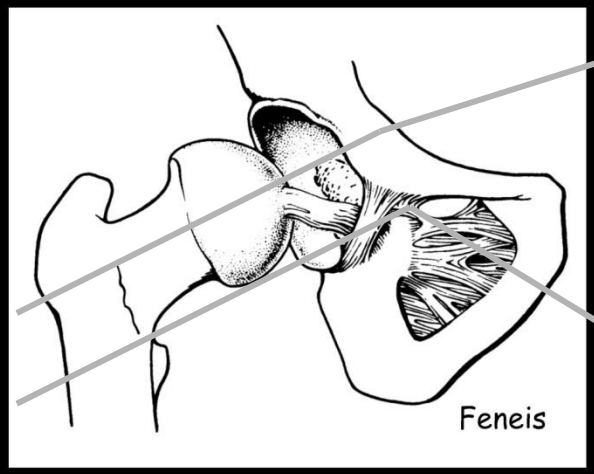



2
5
1
2
6

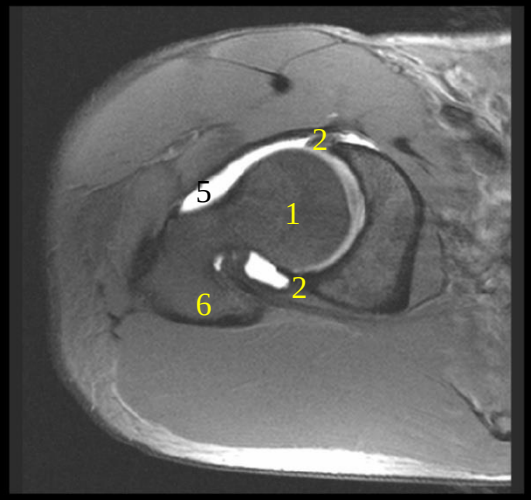

5
6

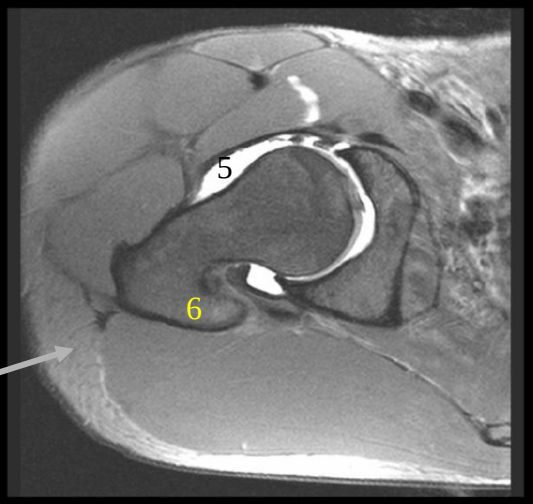

4
6

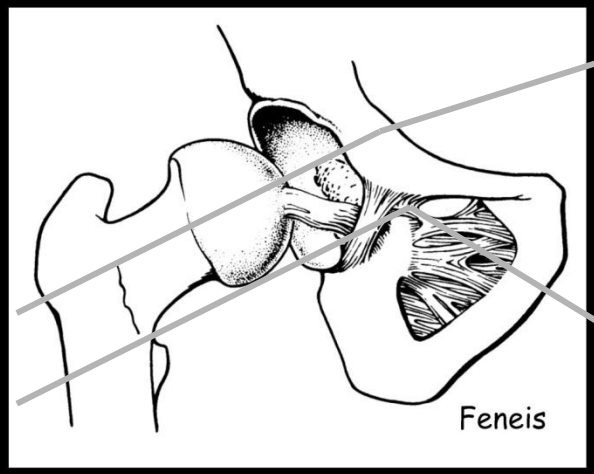

5
3
4

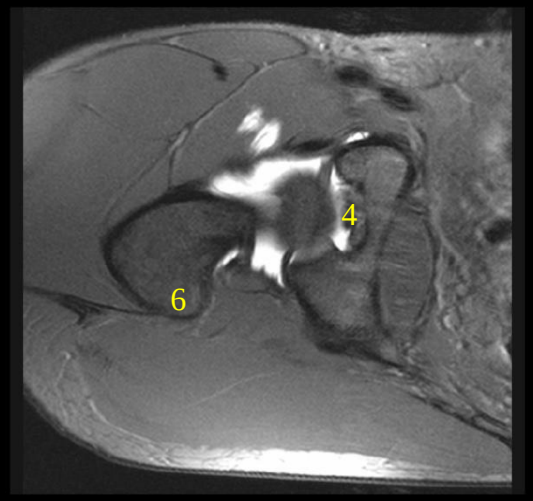

Feneis

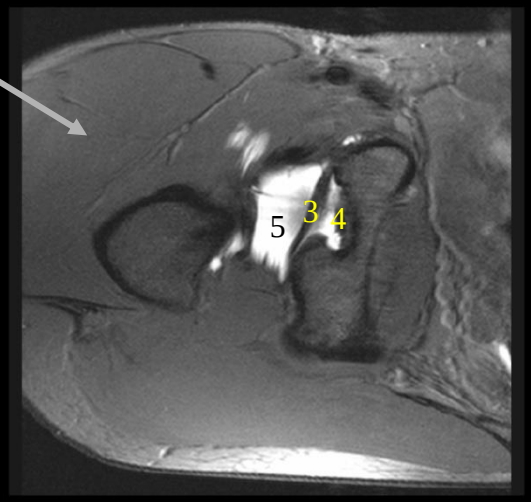
1. Caput femoris
2. Labrum acetabulare
3. Lig. transversum actabuli
4. Fossa acetabuli
5. MR kontrast i hofteled
6. Trochanter major



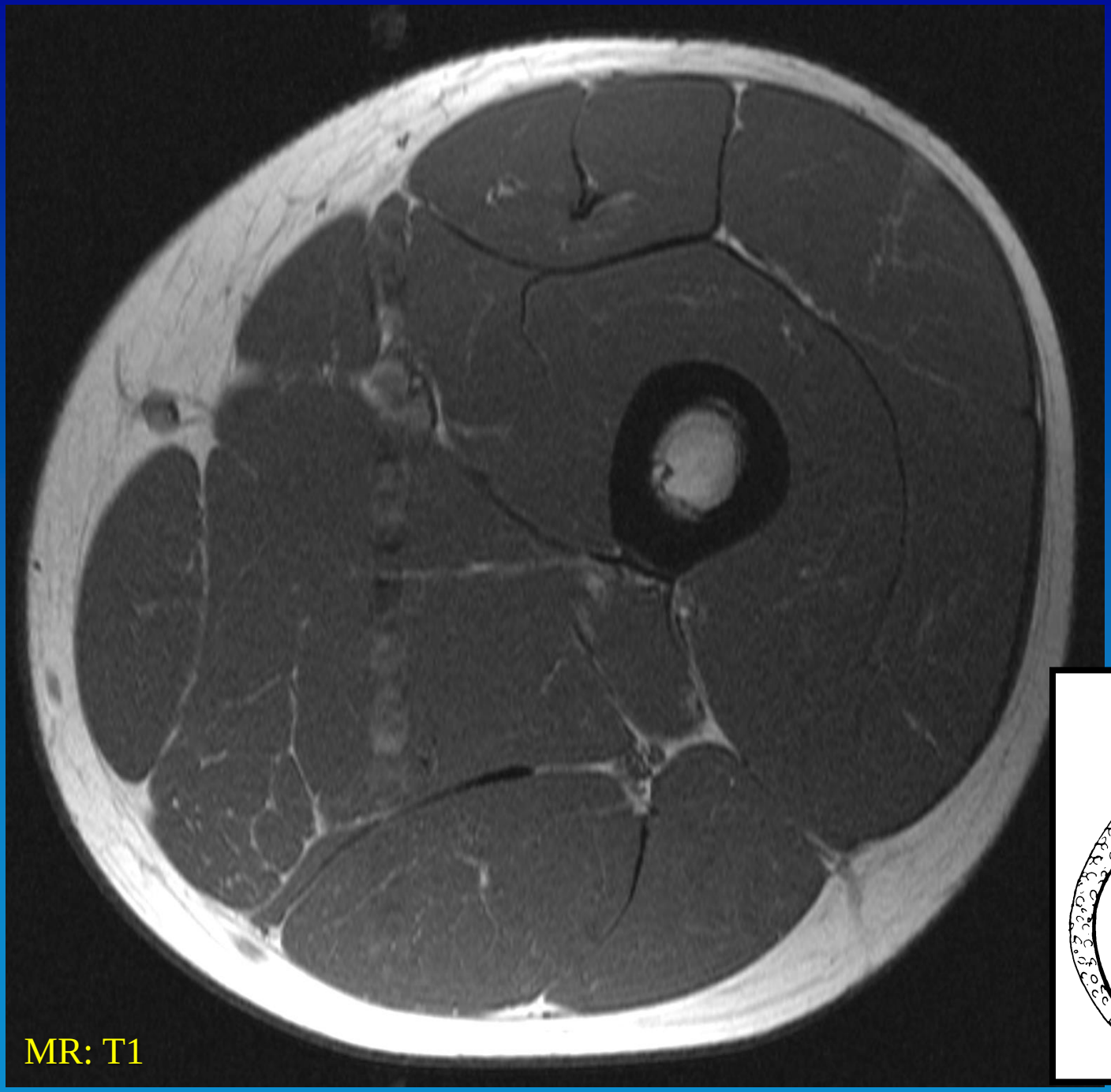


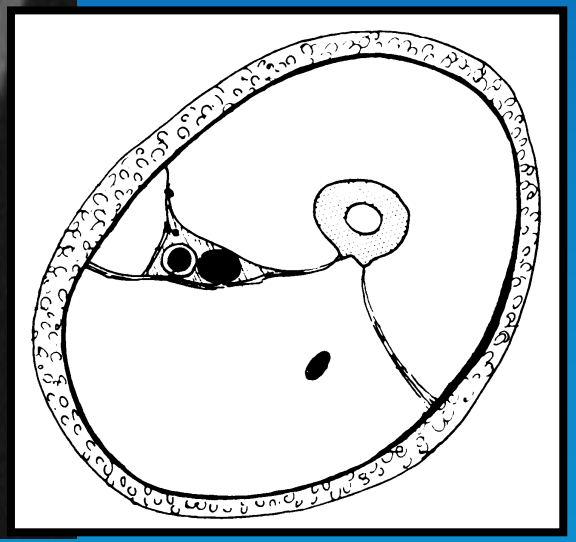




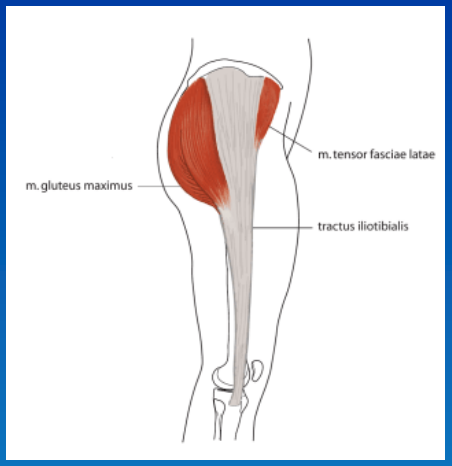


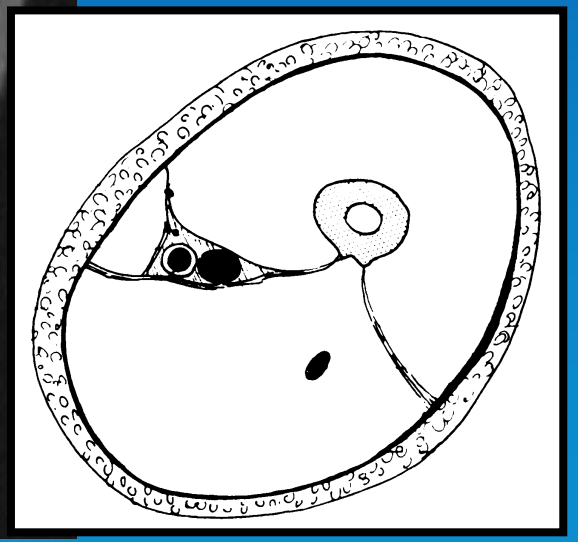
Femurs bløddele


MR: T1

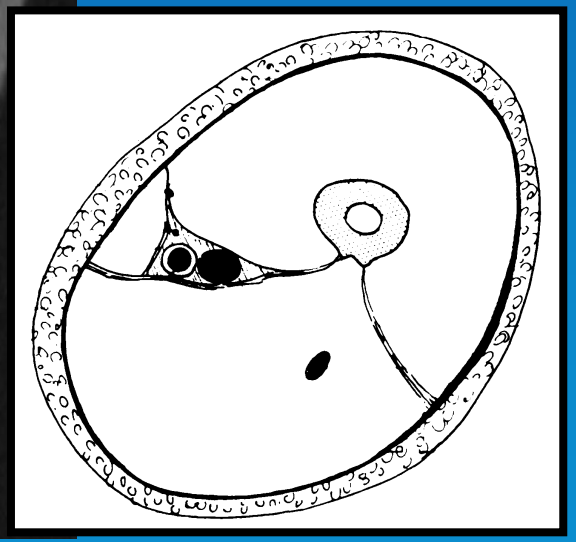


Fascia lata
•Tractus iliotibialis





Ekstensorloge
Fleksorloge
Adduktorloge

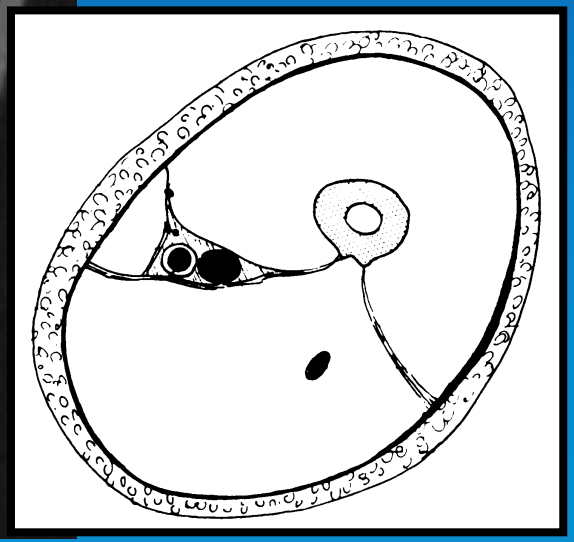


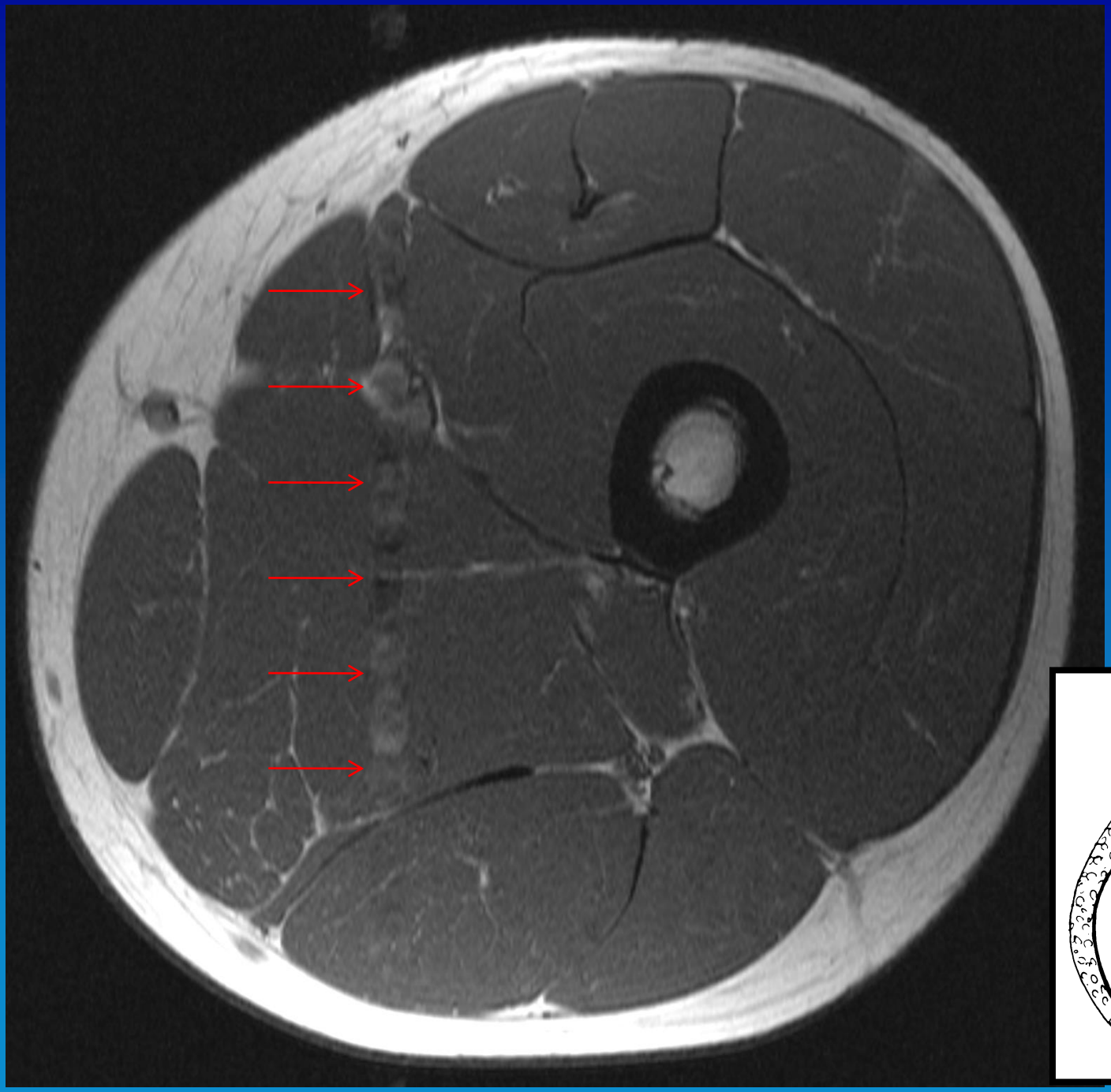
•Ekstensorer

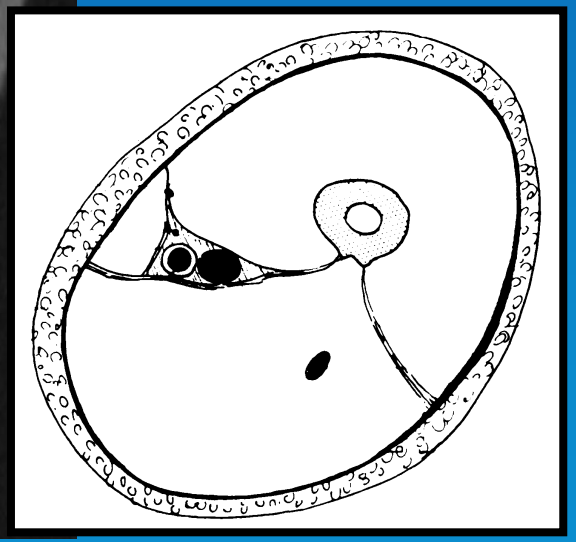
•Adduktorer

•Fleksorer

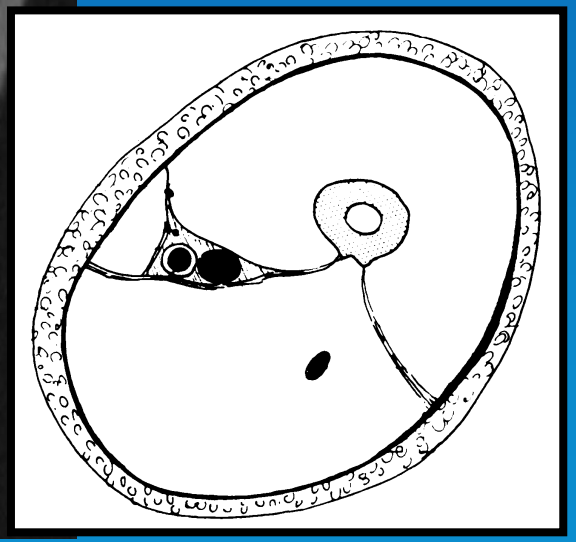
Ekstensorloge
Fleksorloge
Adduktorloge



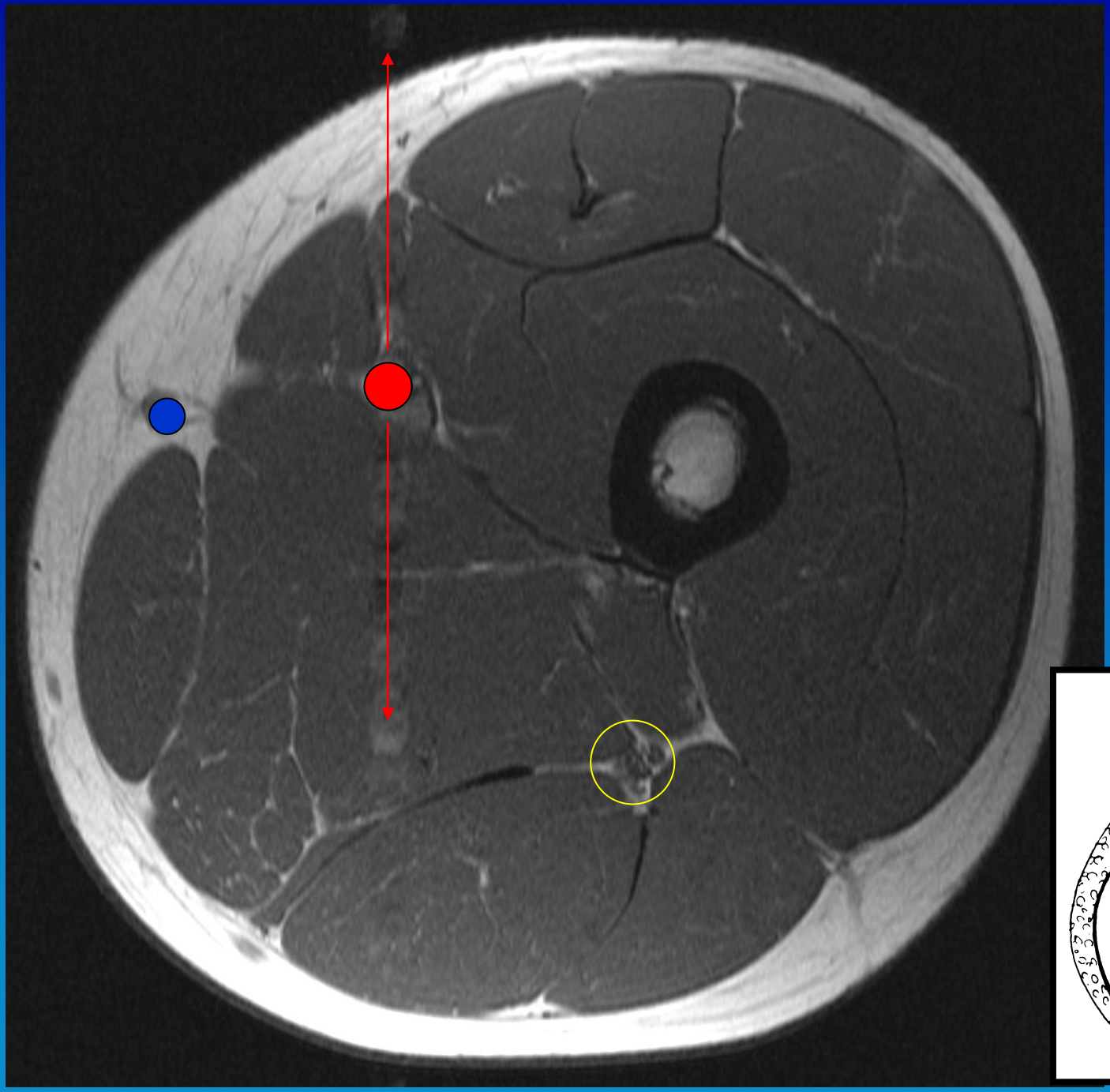


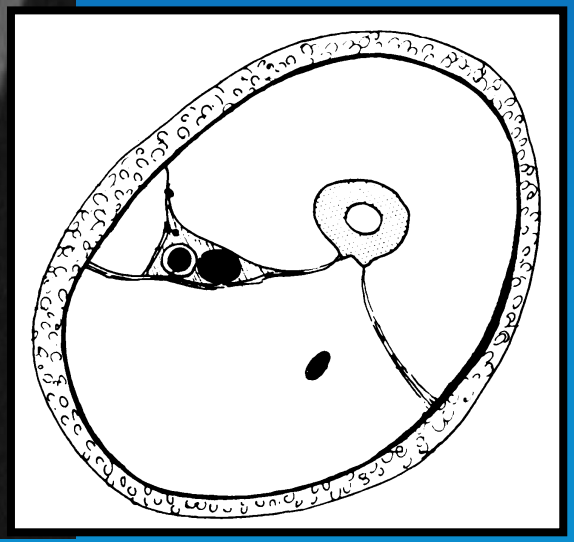


Pulsations artefakter fra a. femoralis

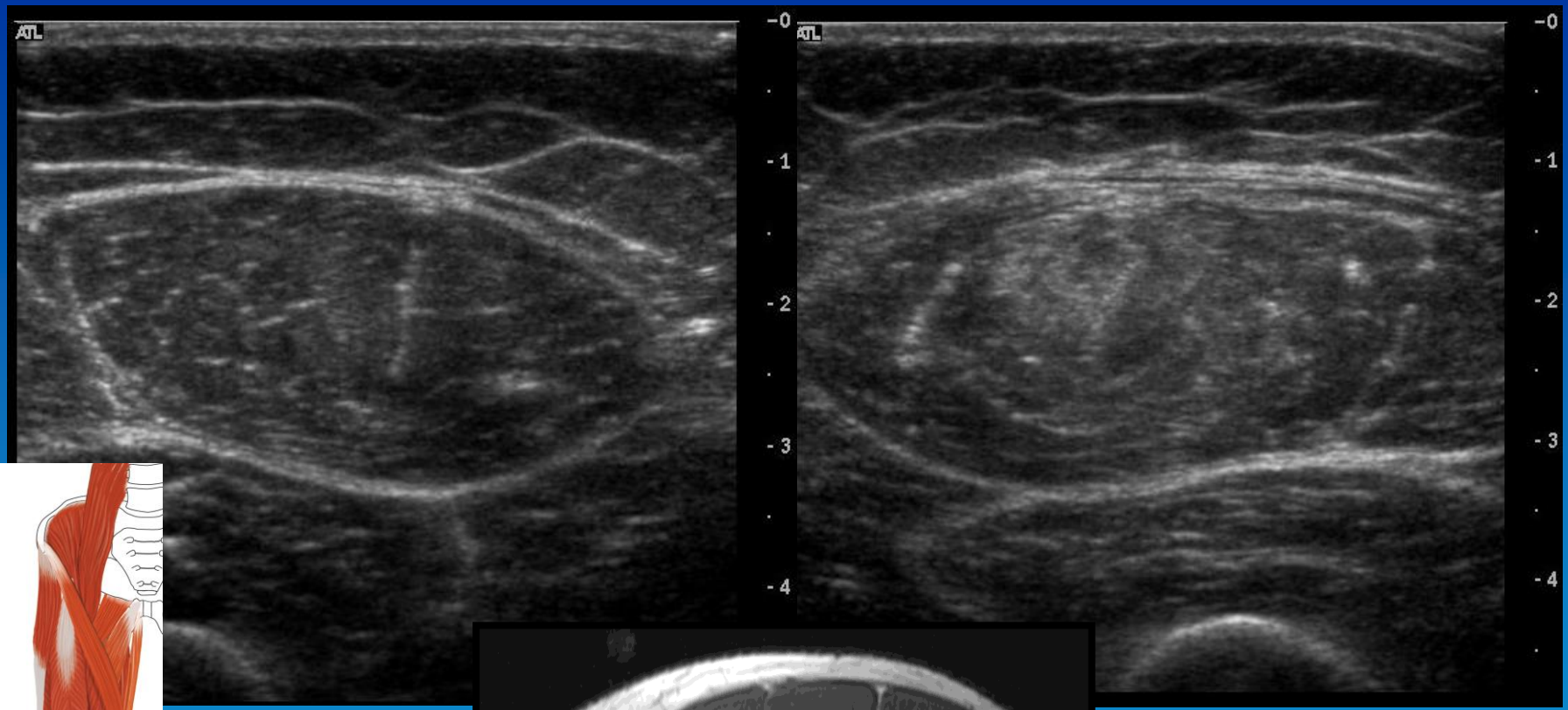


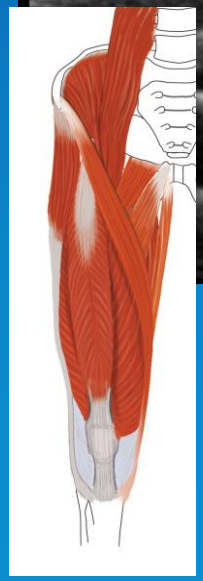
Kar og nerver

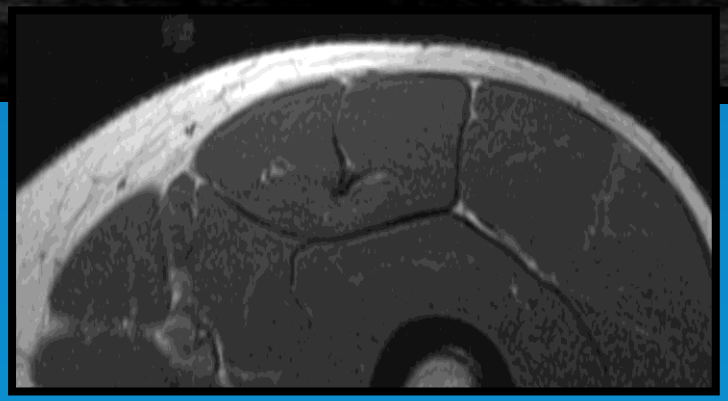




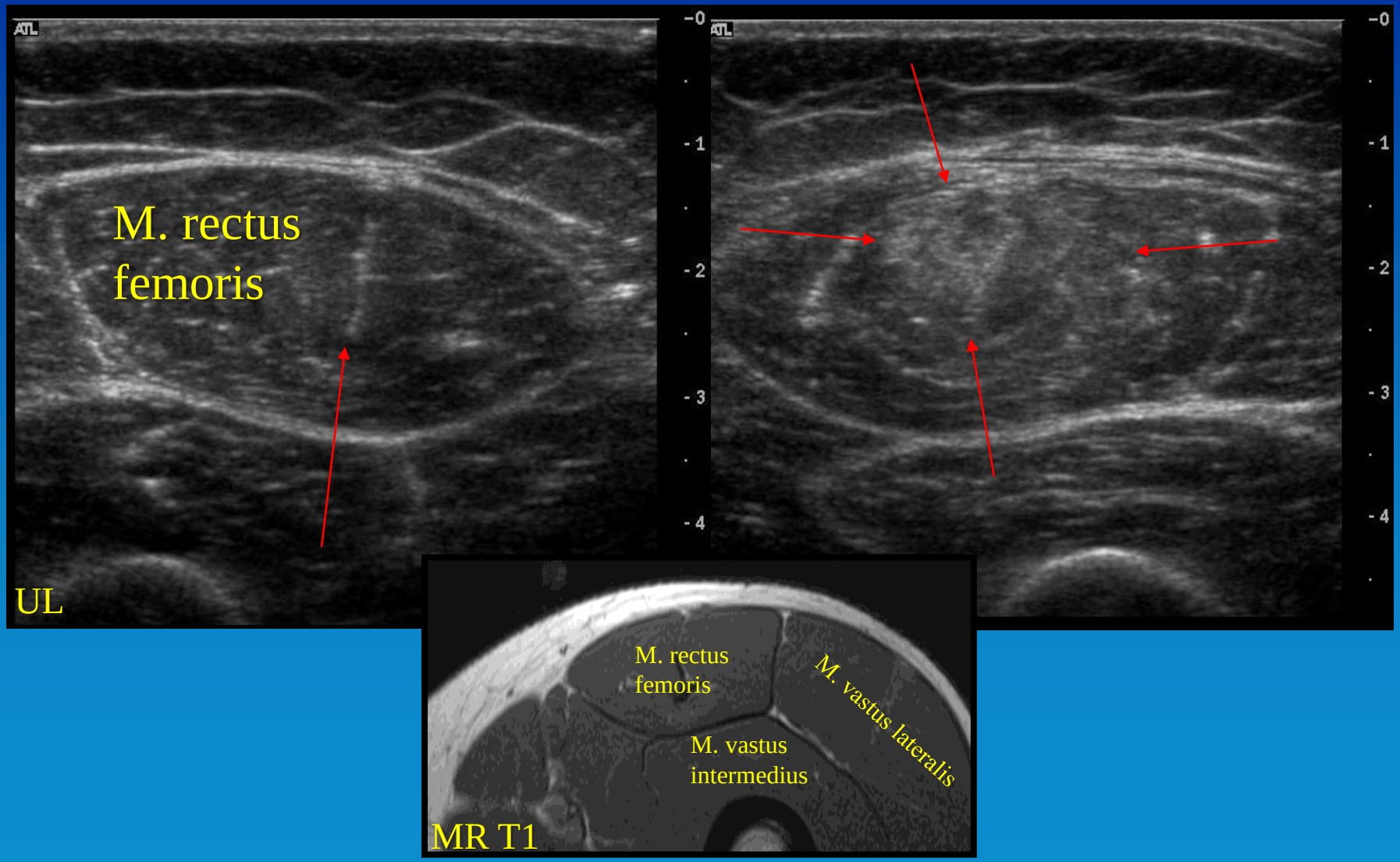
21-årig mand, der har følt smæld i låret under løb





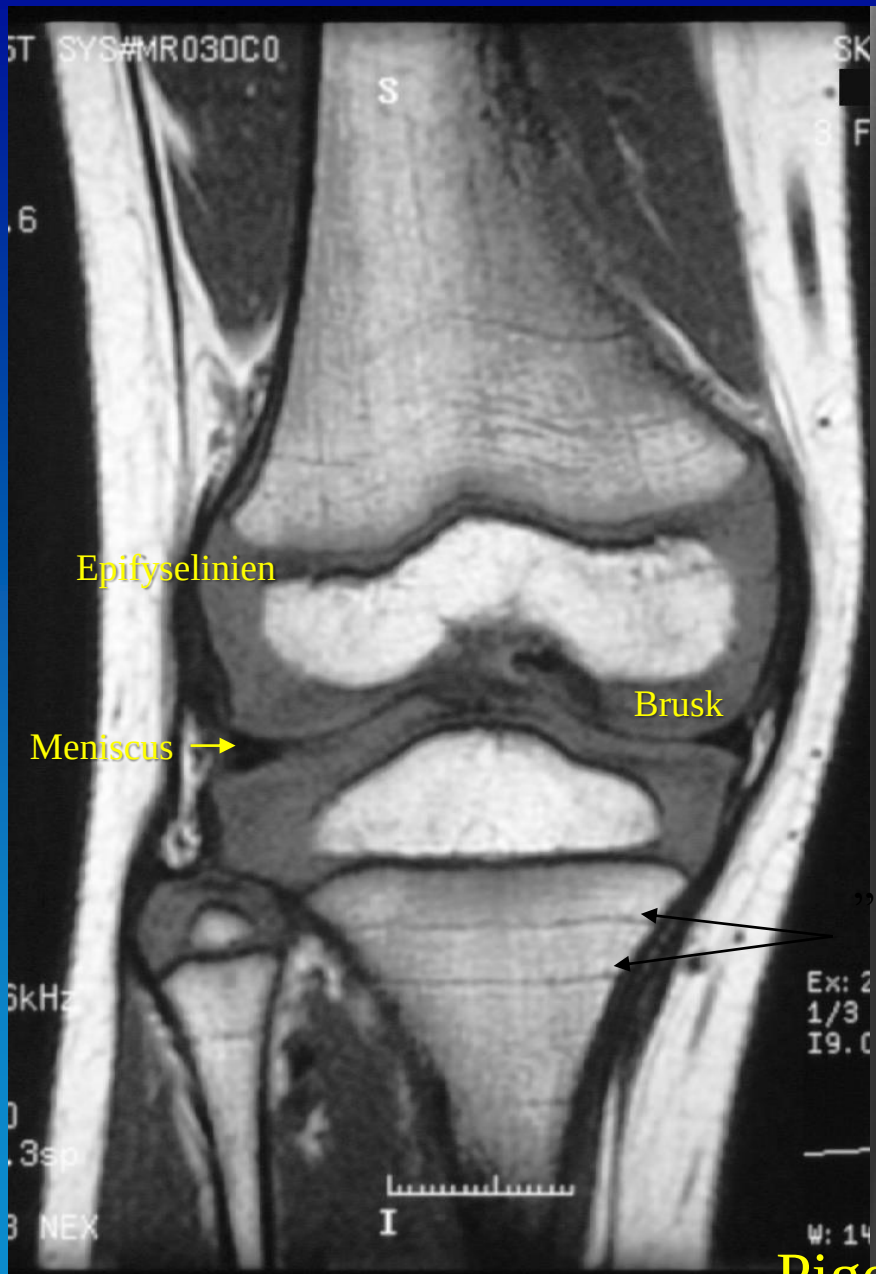


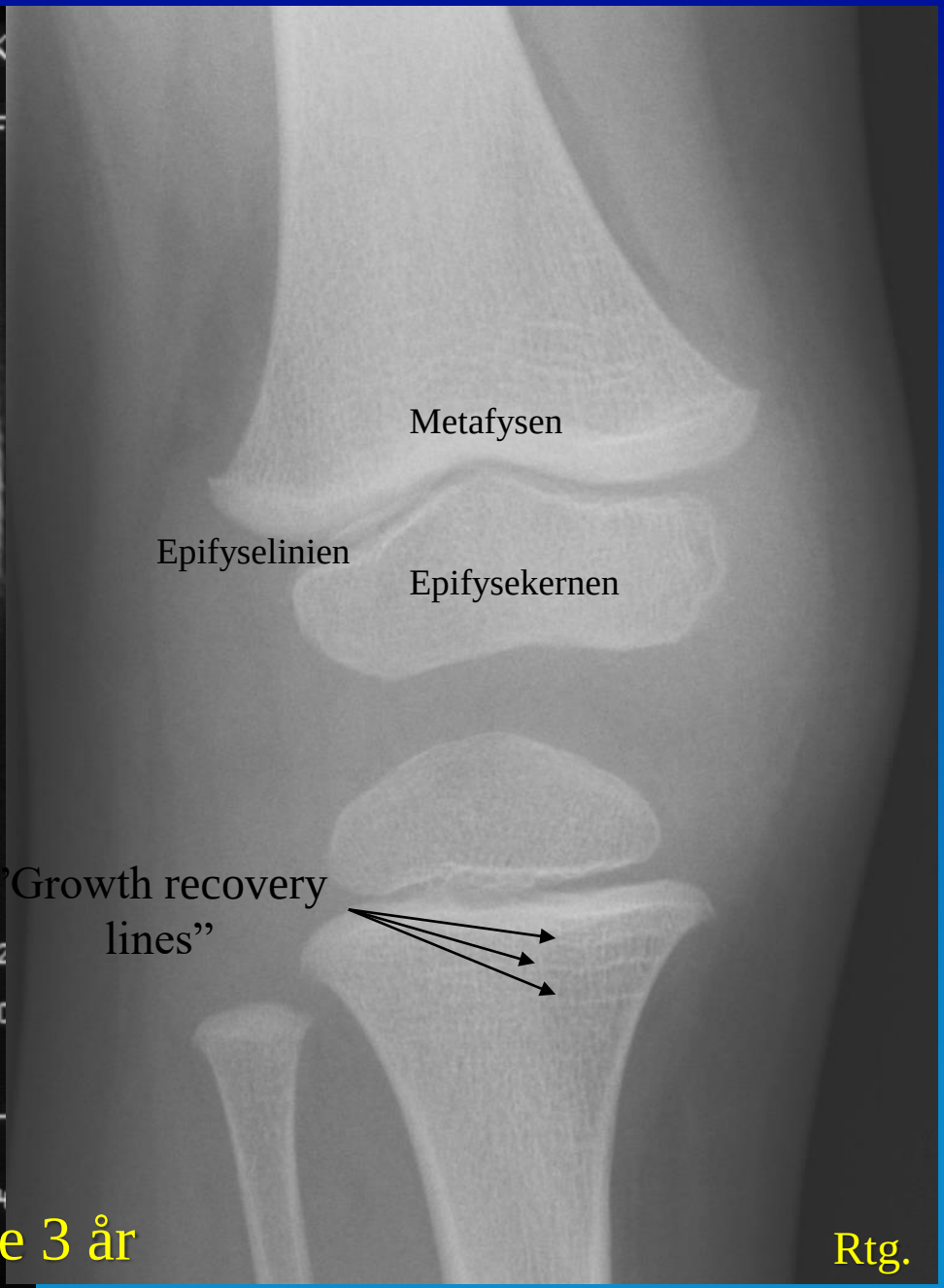
21-årig mand, der har følt smæld i låret under løb



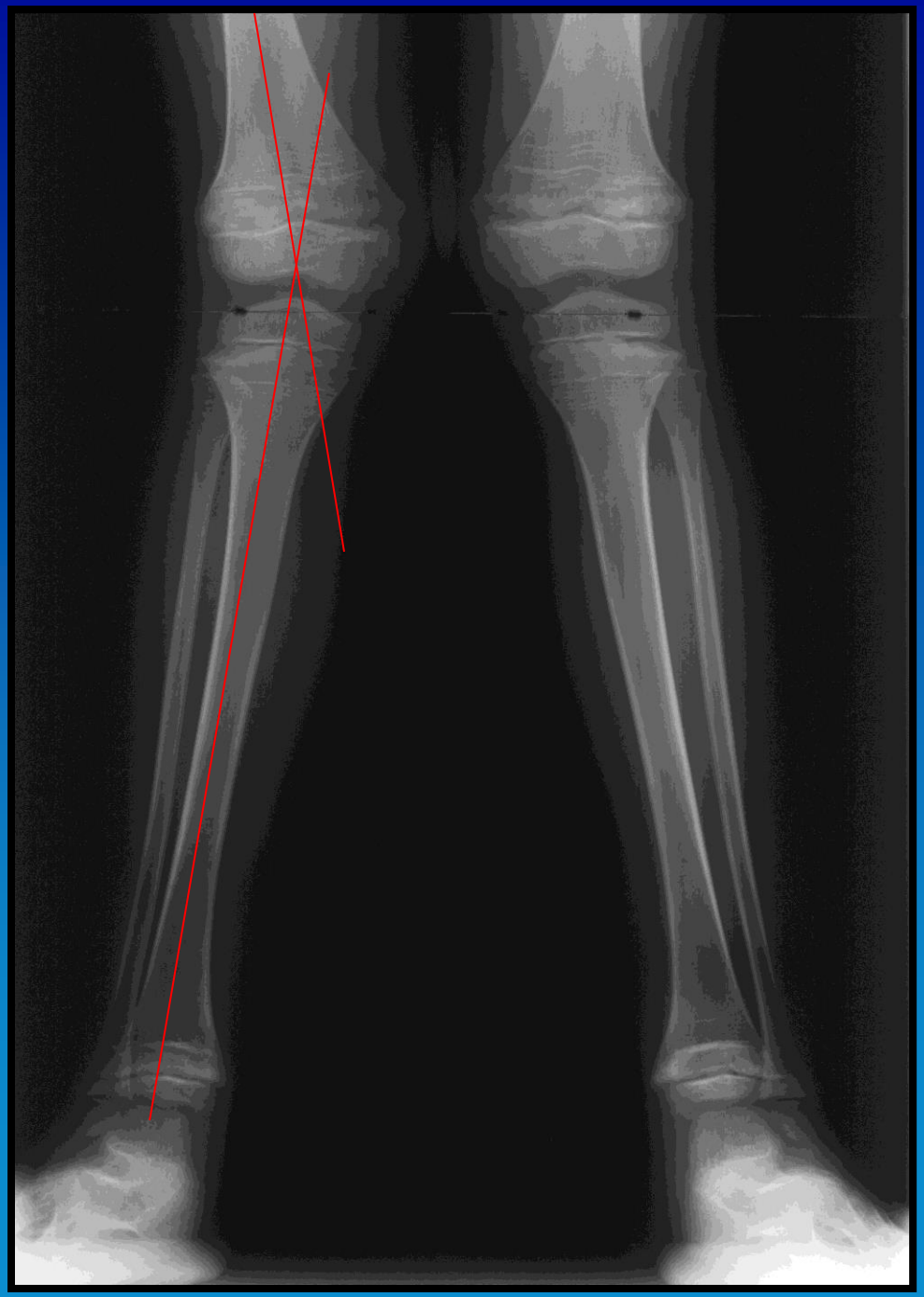
Knæregionen og crus

Pige 3 år


Epifyselinien
Brusk
Meniscus
MR T1


Metafysen
Epifyselinien
Epifysekernen
”Growth recovery lines”
Rtg.

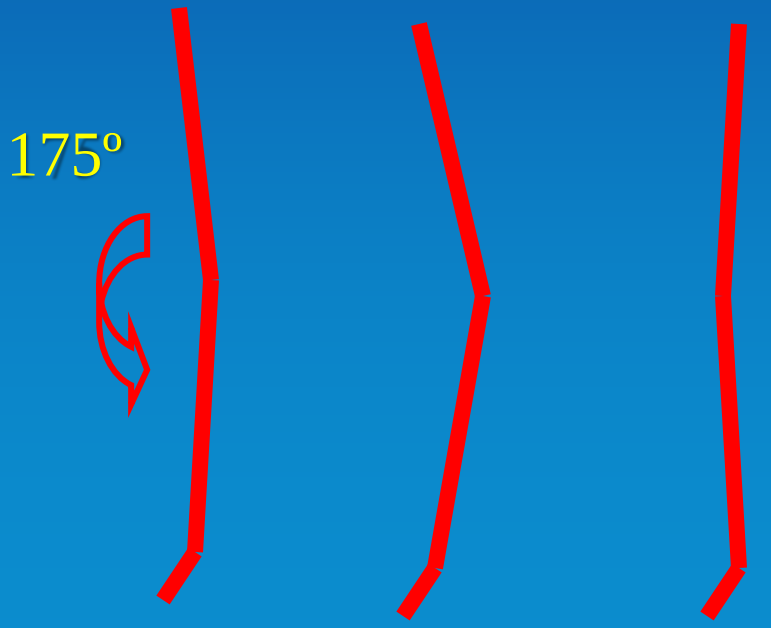
Pige 3 år



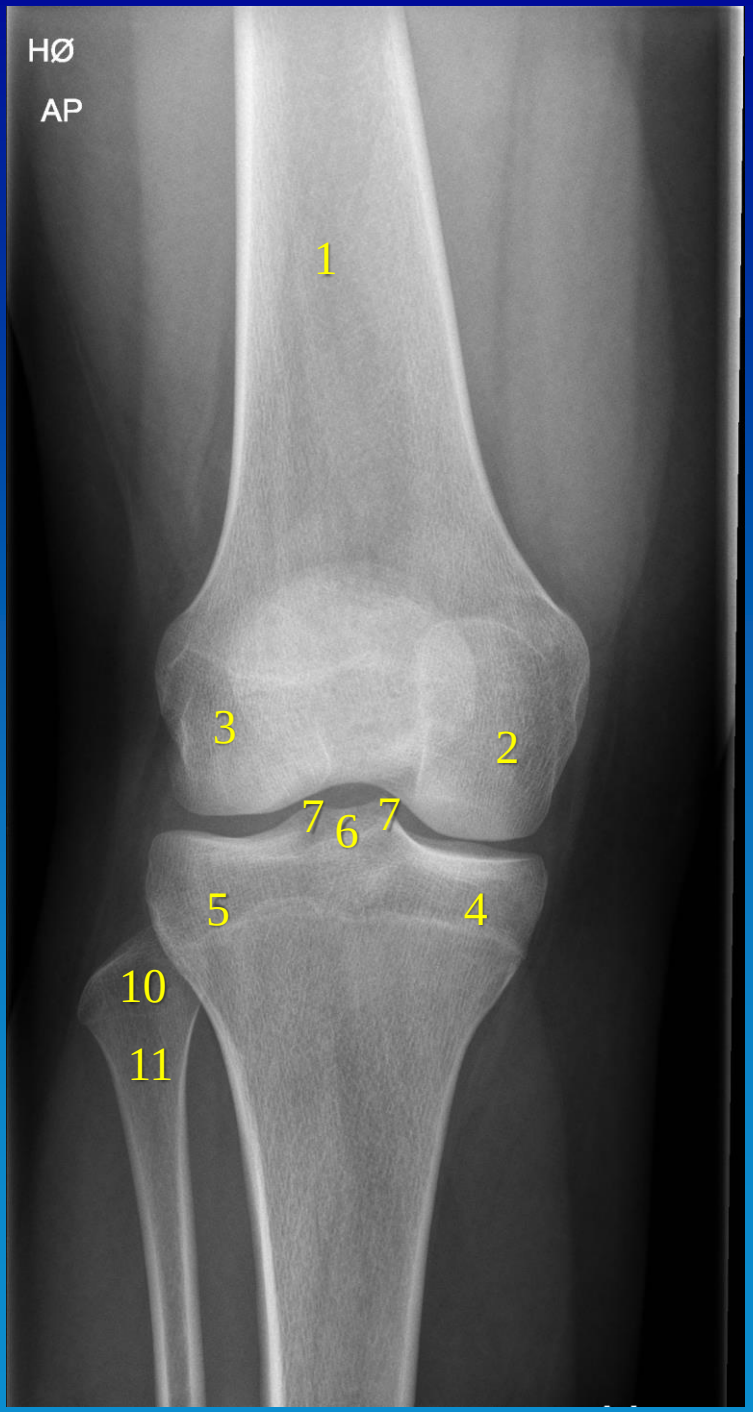
5 årig dreng med genu valgum (Metafysære forandringer skyldes rakit).

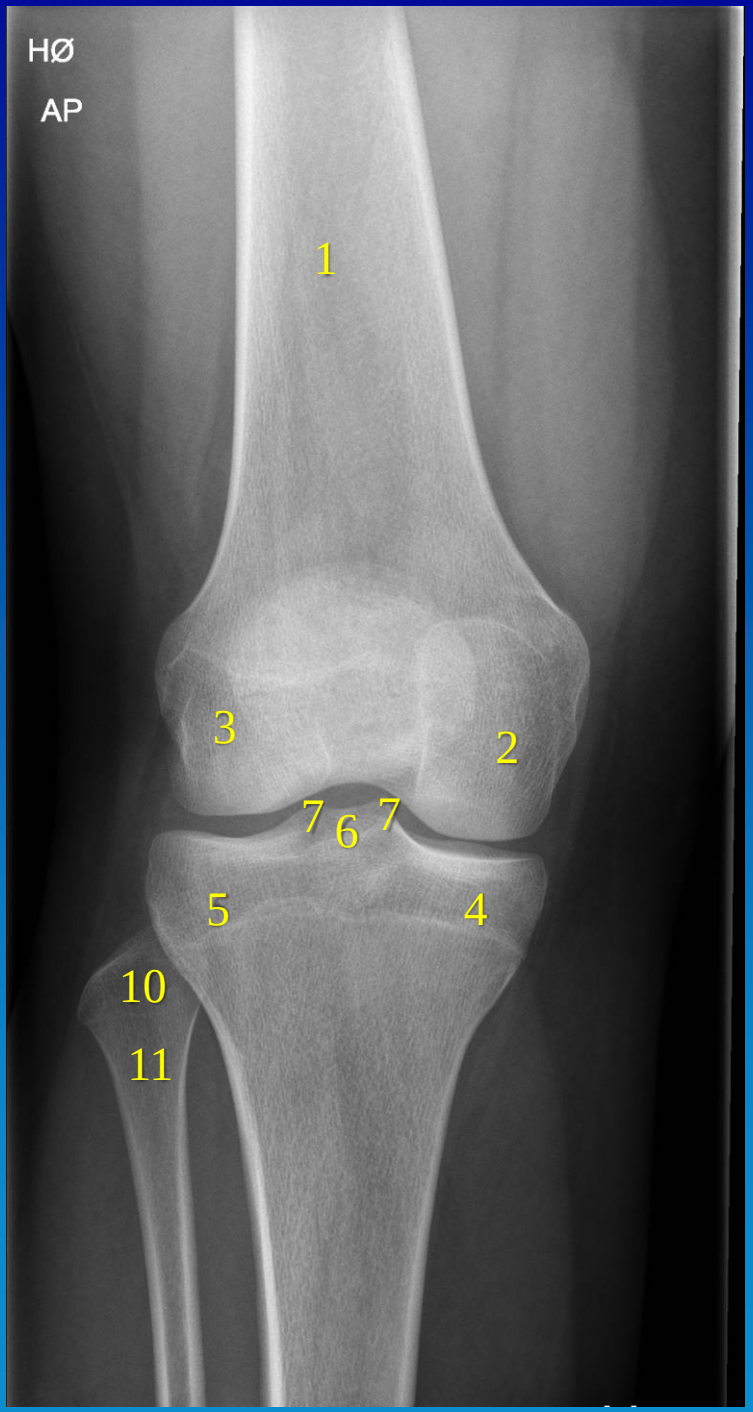
Genu valgum

Genu varum

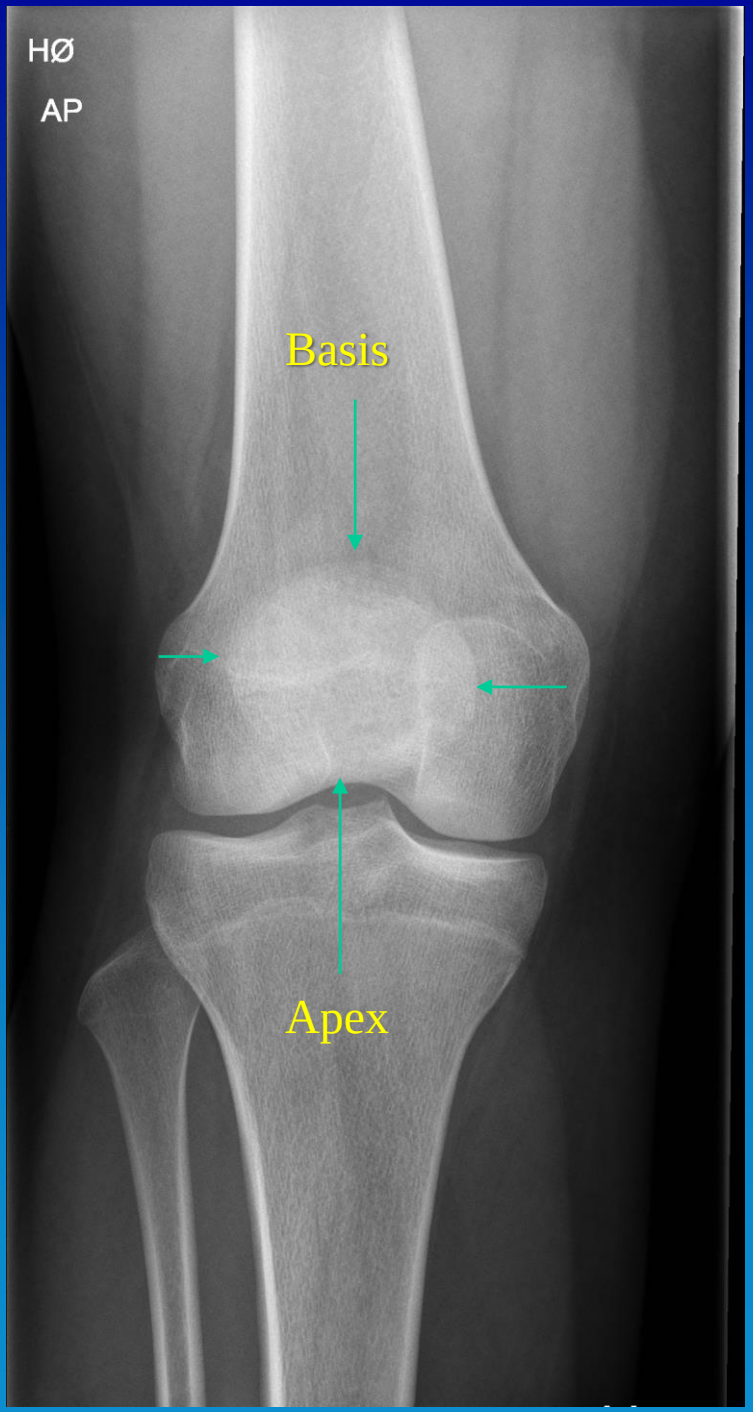


AP røntgenoptagelse af højre knæ


HØ
AP
1
3
2
7
6
7
5
4
10
11



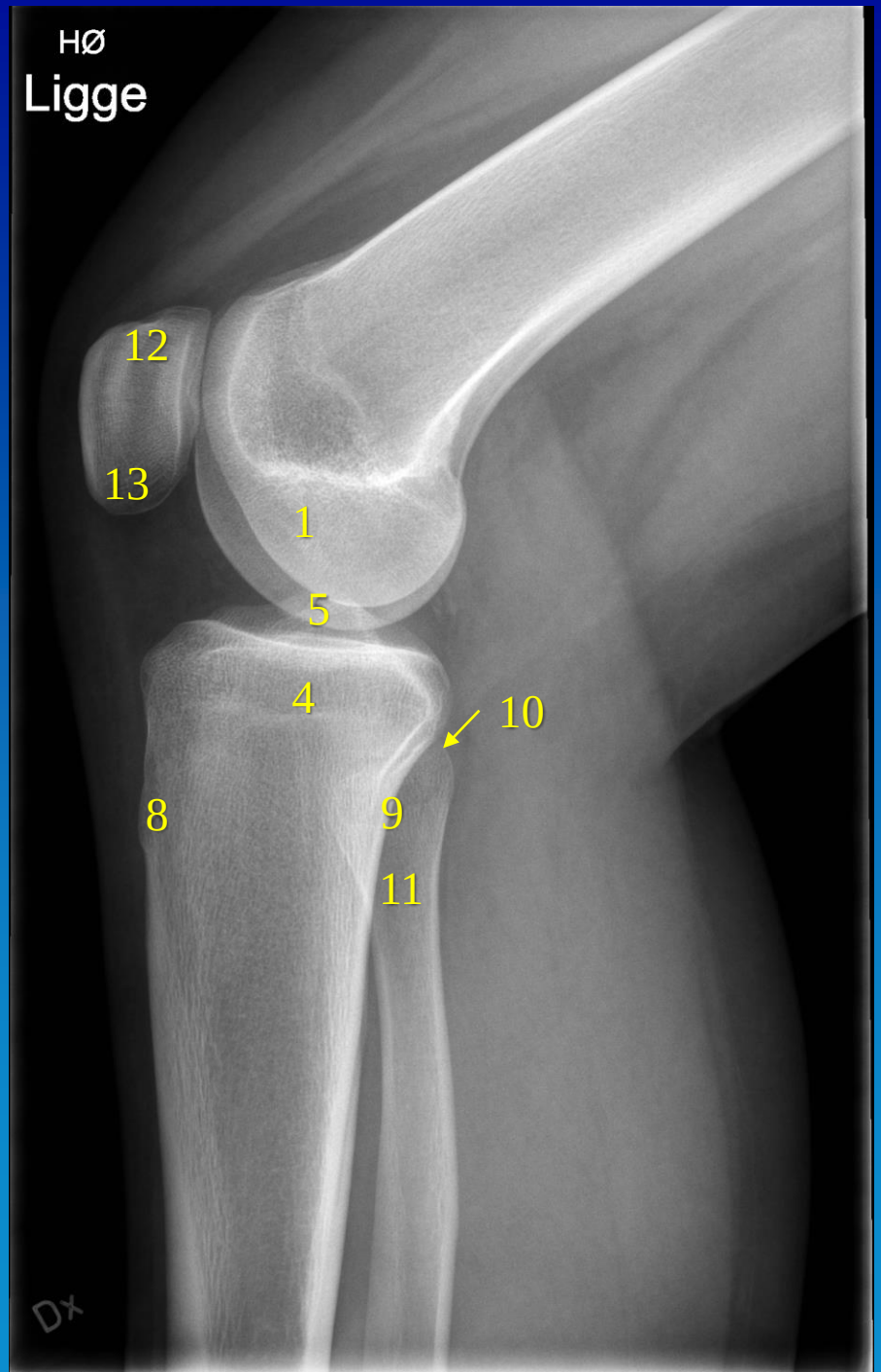
1) Corpus femoris
2) Condylus medialis femoris
3) Condylus lateralis femoris
4) Condylus medialis tibiae
5) Condylus lateralis tibiae
6) Eminentia intercondylaris
7) Tuberculum intercondylare mediale et laterale
8) Area intercondylaris ant. et post. (Ses ej)
9) Tuberositas tibiae (Ses ej)
10) Caput fibulae
11) Collum fibulae

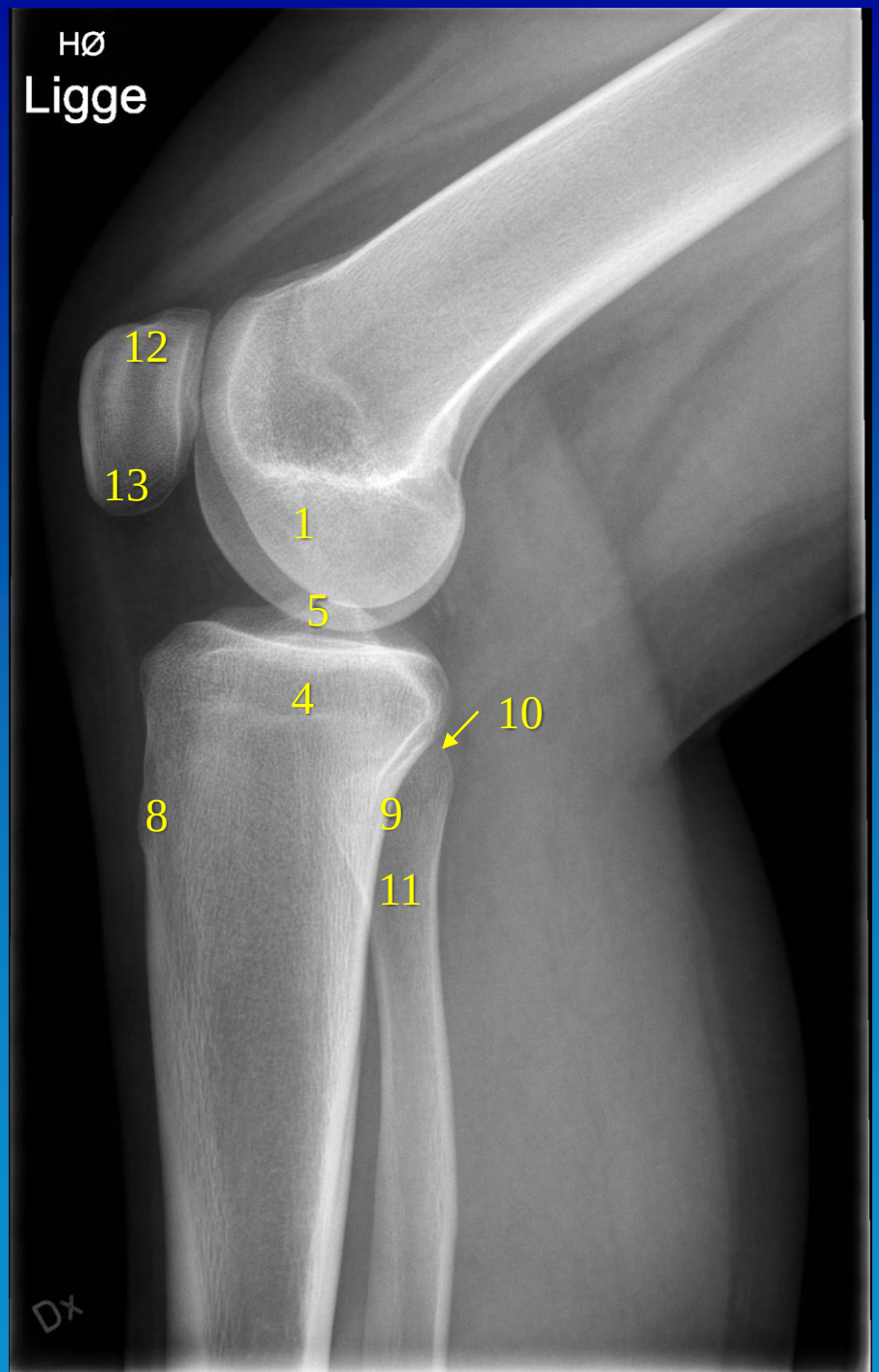


AP røntgenoptagelse af højre knæ:

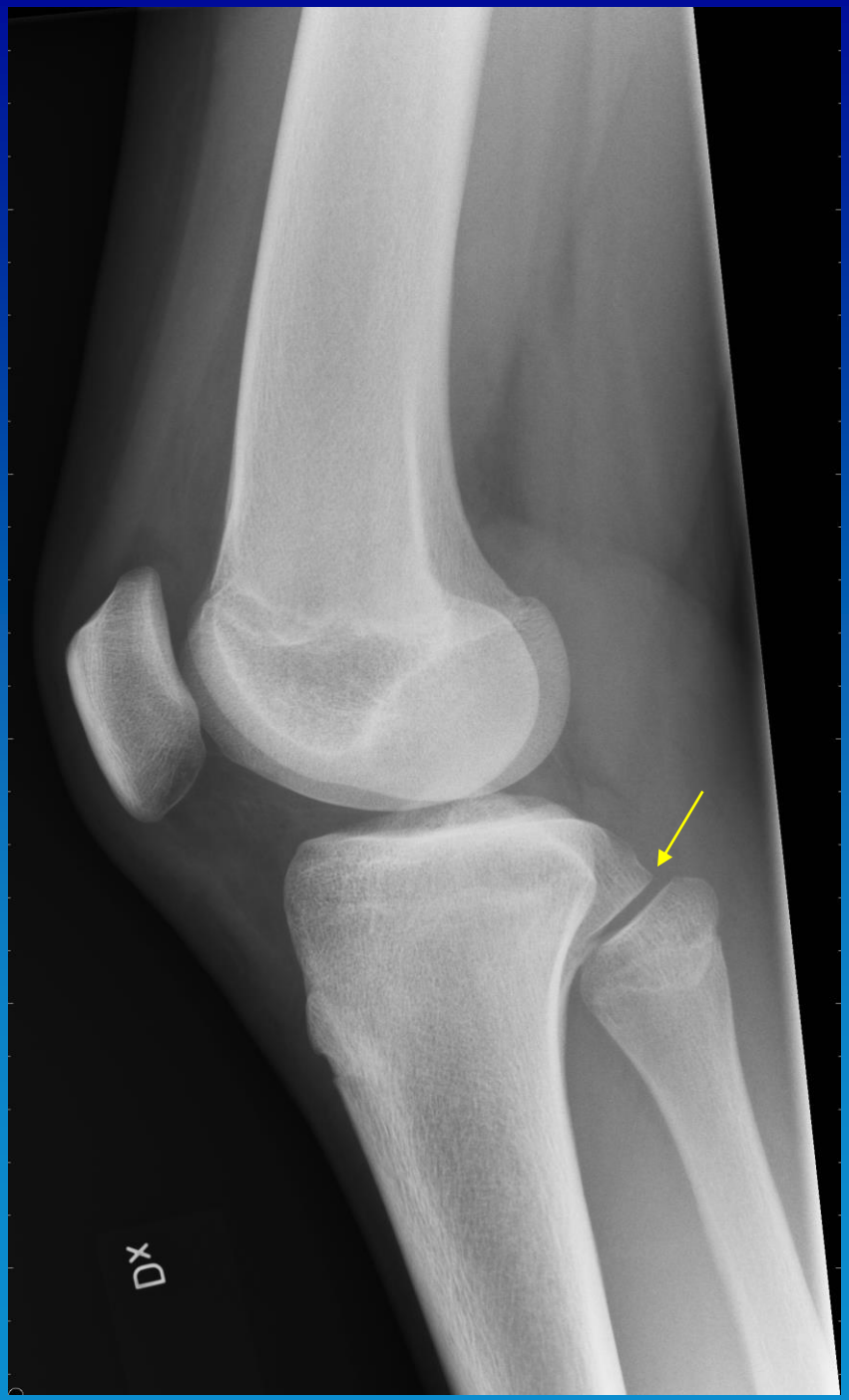
Patella

Side røntgenoptagelse af højre knæ

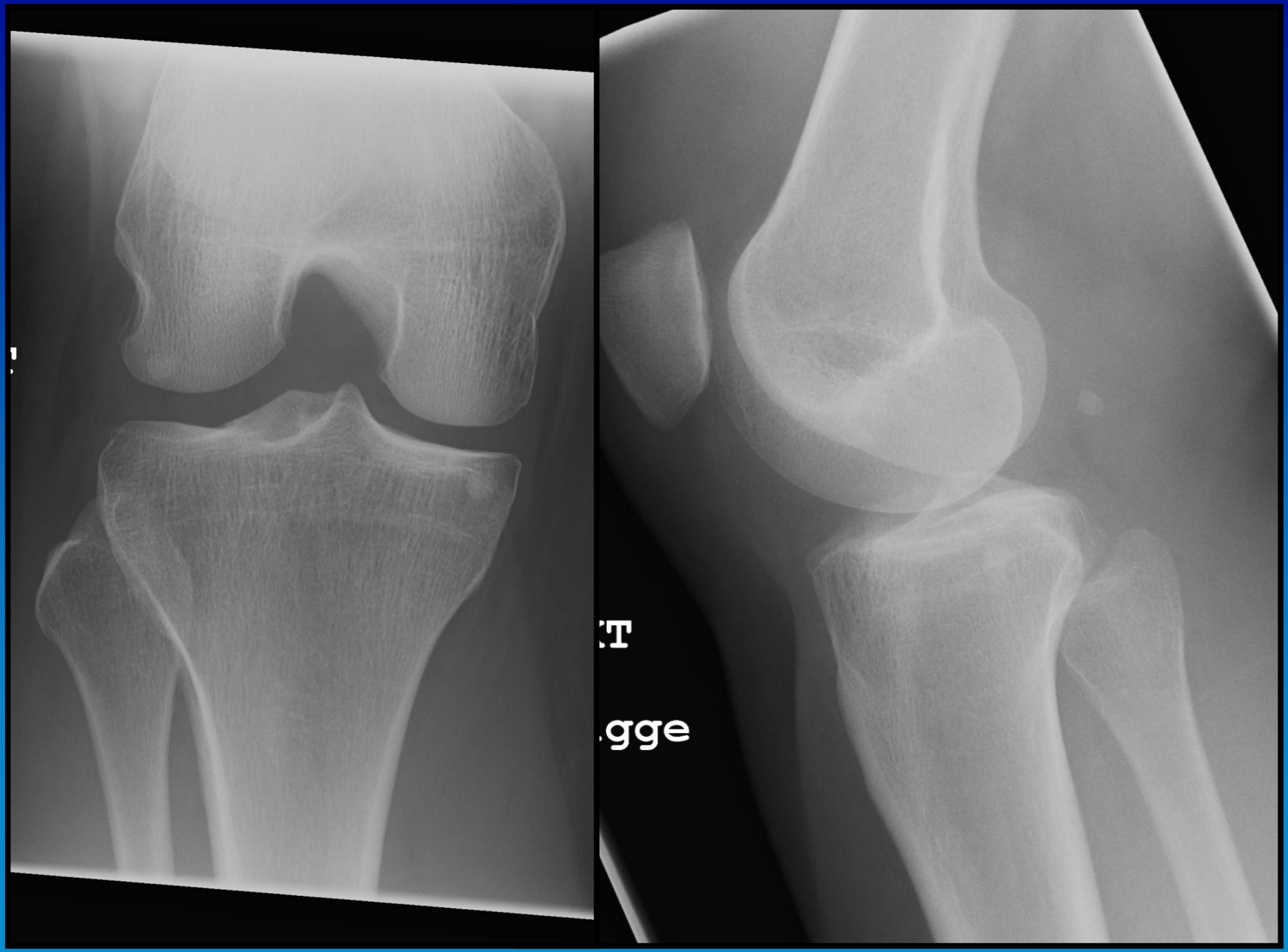

HØ
Ligge
12
13
1
5
4
10
8
9
11
Dx

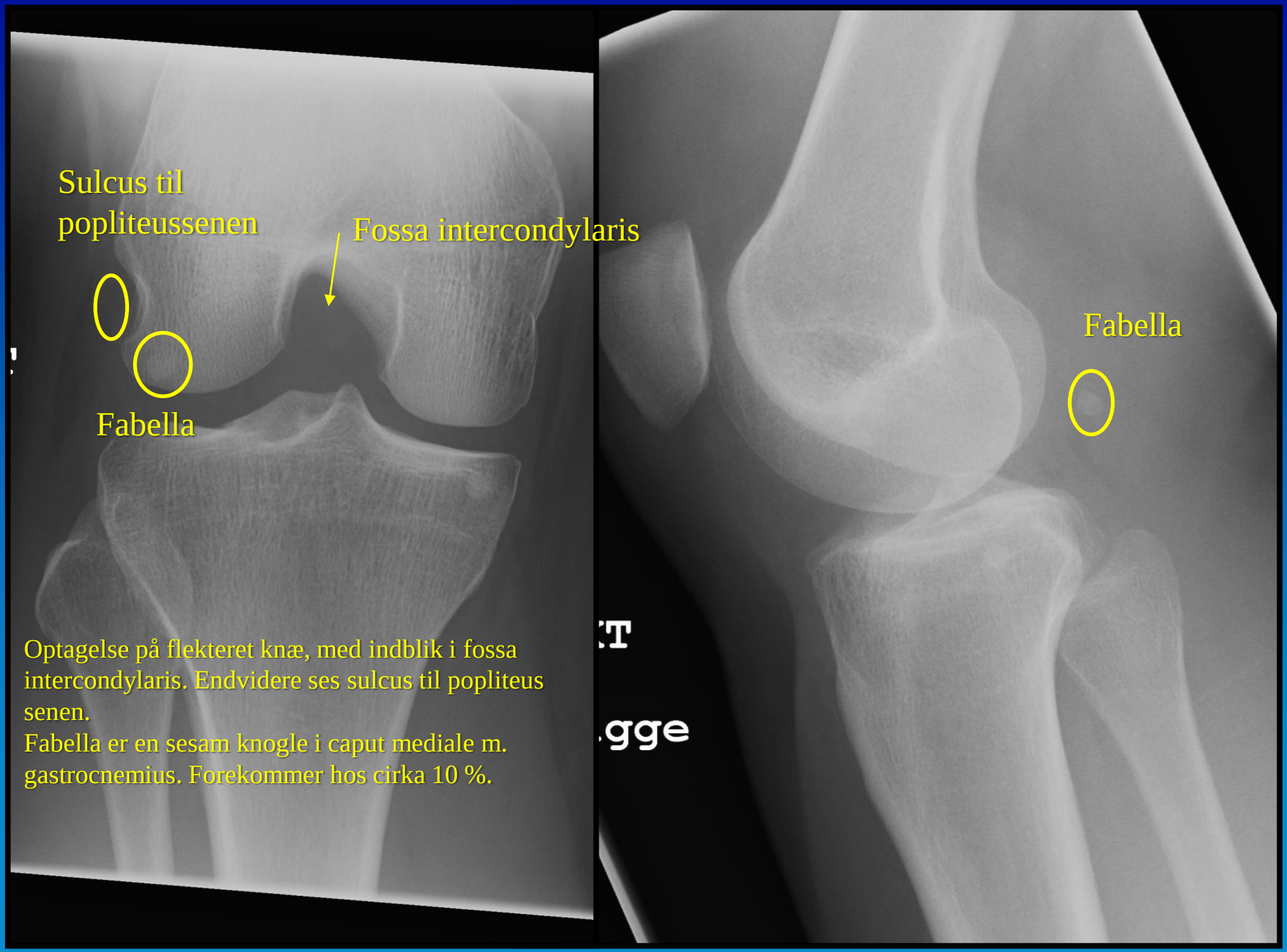


1) Condylus medialis et lateralis
2) Fossa intercondylaris – Ses ej
3) Epicondylus medialis et lateralis –Ses ej
4) Condylus medialis et lateralis tibiae
5) Eminentia intercondylaris
6) Tuberculum intercondylare mediale et laterale
7) Area intercondylaris ant. et post.
8) Tuberositas tibiae
9) Caput fibilae
10) Apex capitis fibulae
11) Collum fibulae
12) Basis patellae
13) Apex patellae

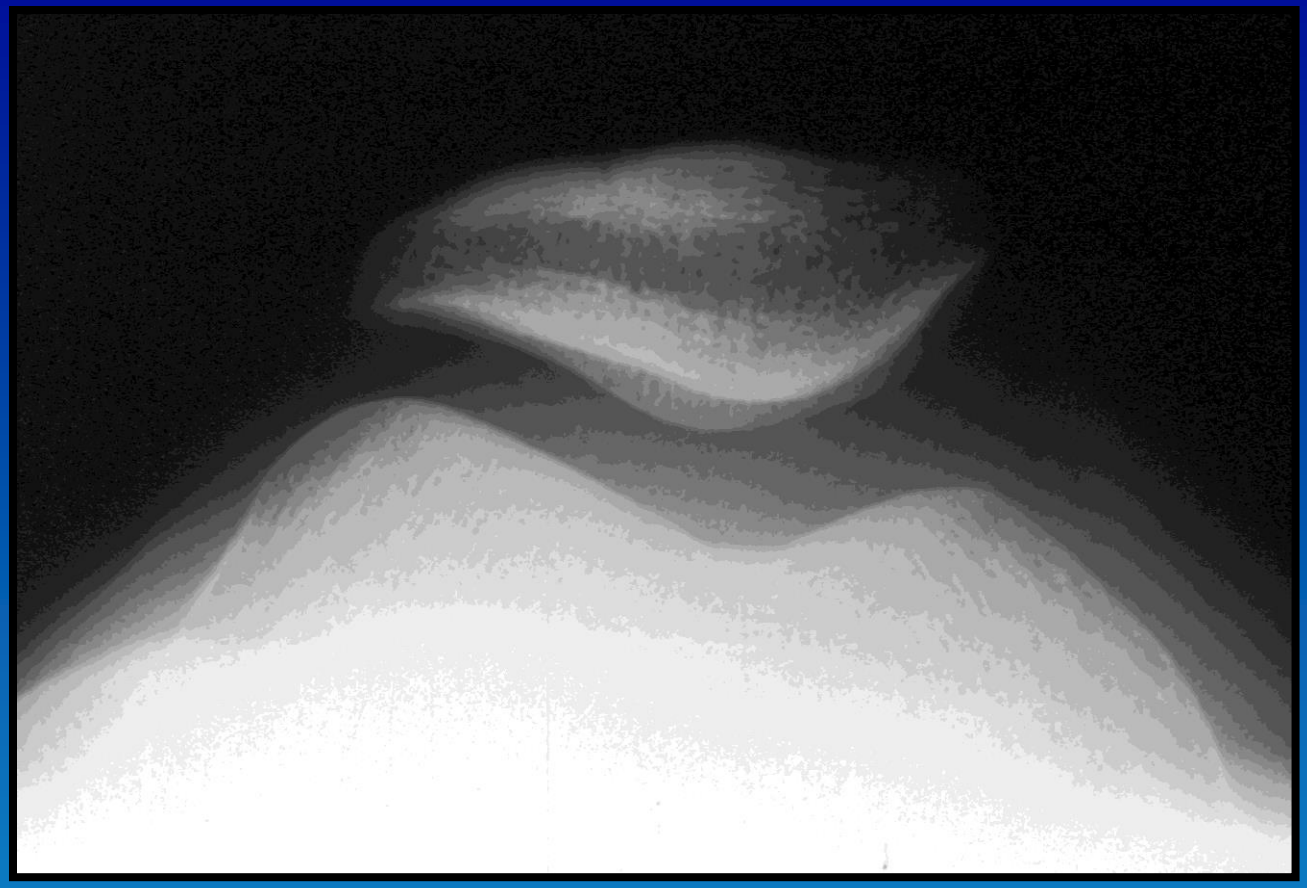


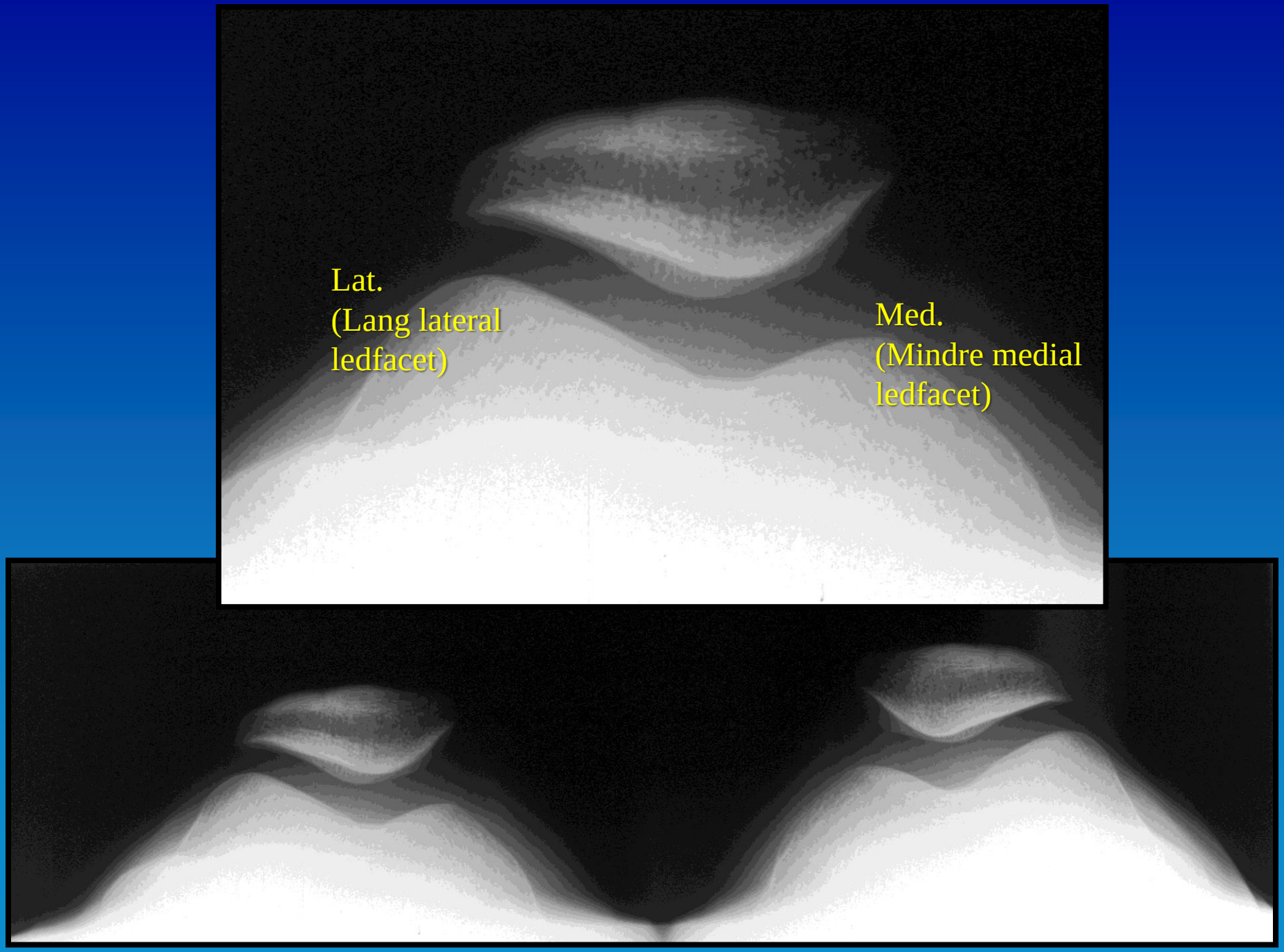
En lidt skrå (udadroteret) optagelse giver flot indblik til articulatio tibiofibularis.





Optagelse på flekteret knæ, med indblik i fossa intercondylaris. Endvidere ses sulcus til popliteus senen.
Fabella er en sesam knogle i caput mediale m. gastrocnemius. Forekommer hos cirka 10 %.

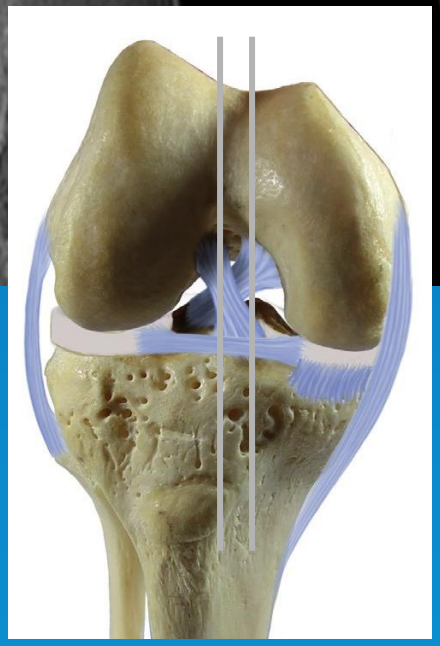


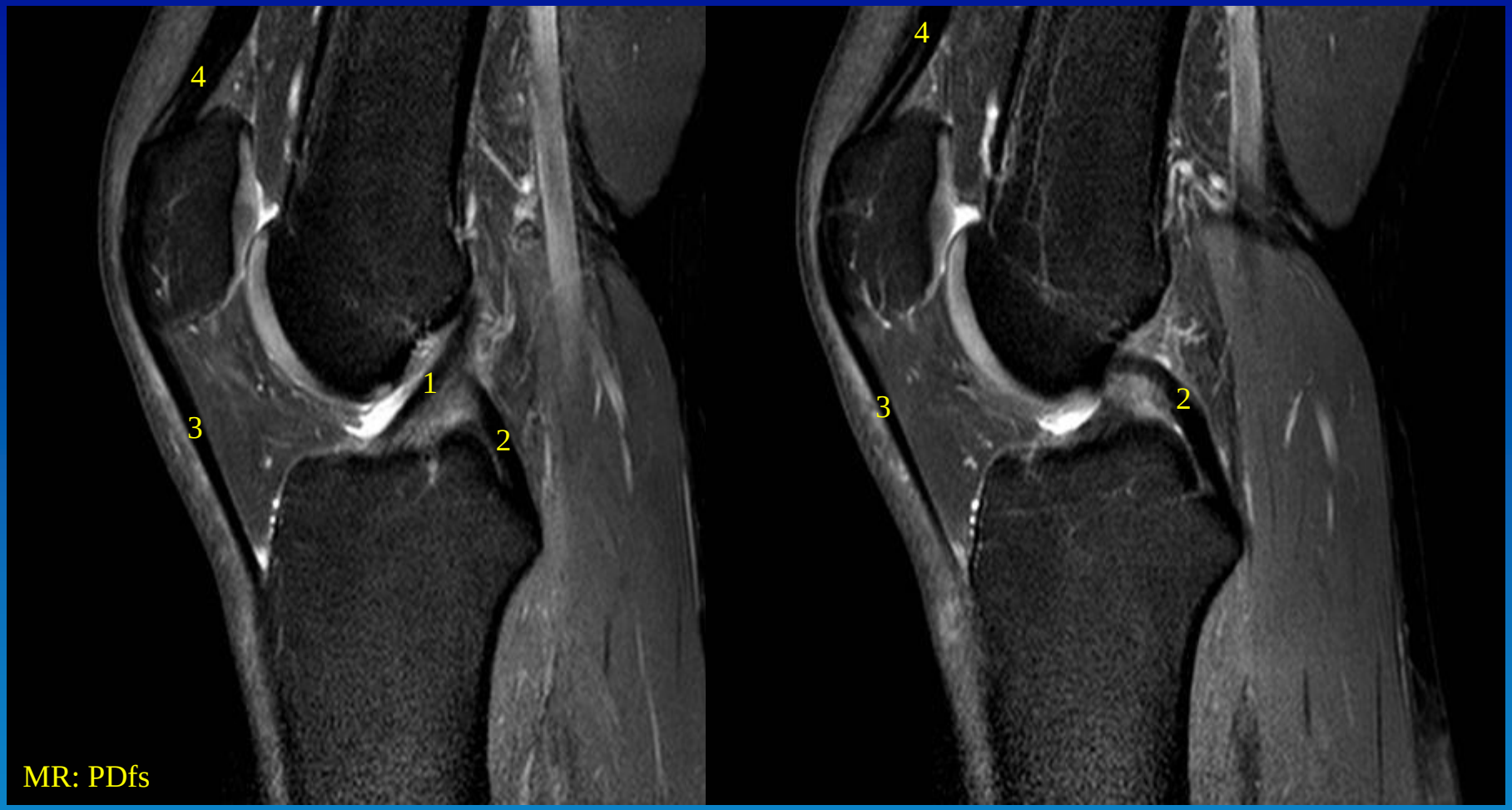

Lat.
(Lang lateral ledfacet)
Med.
(Mindre medial ledfacet)

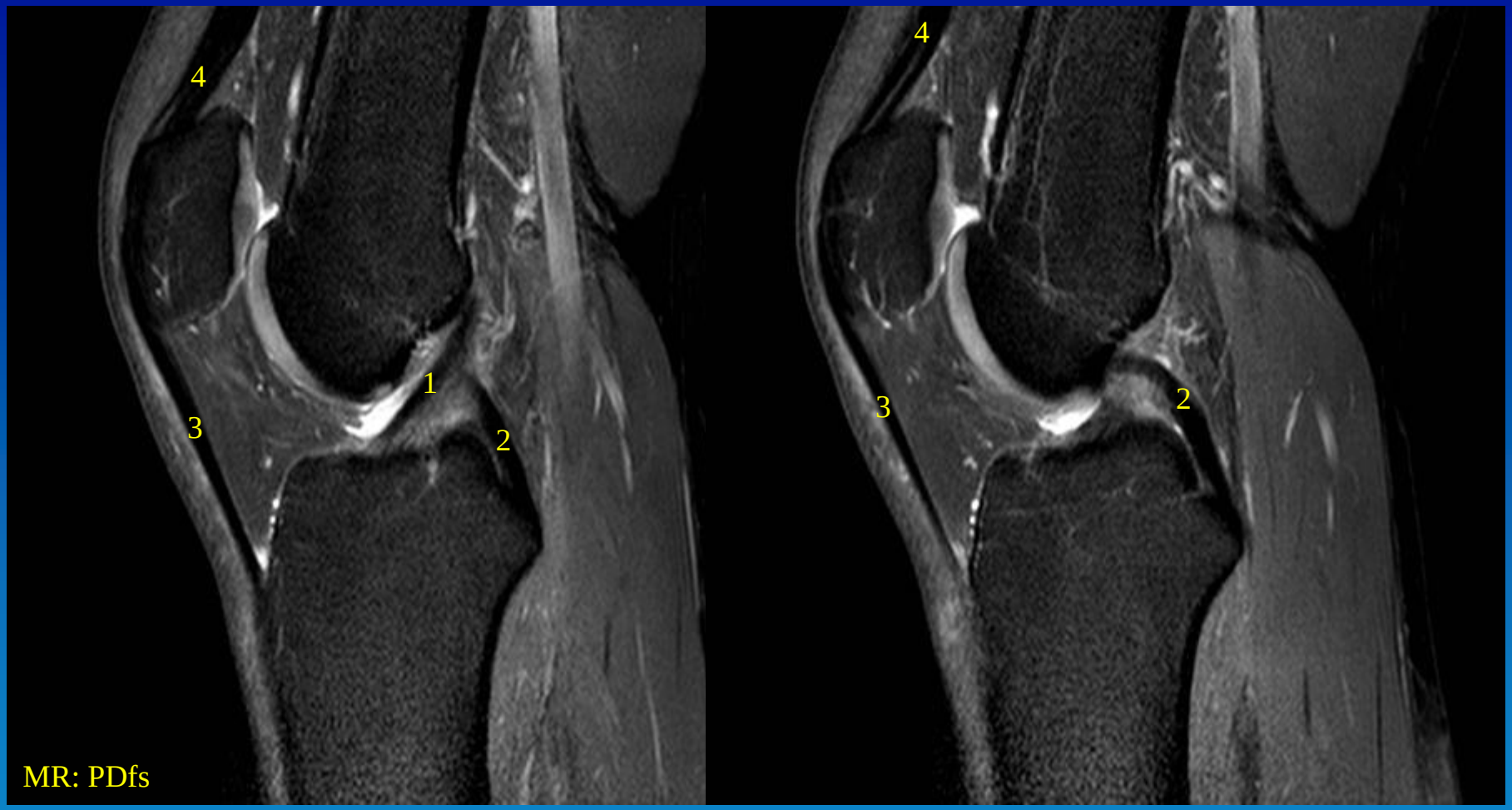
Knæledsarthrose hos 77 årig mand.

MR knæled

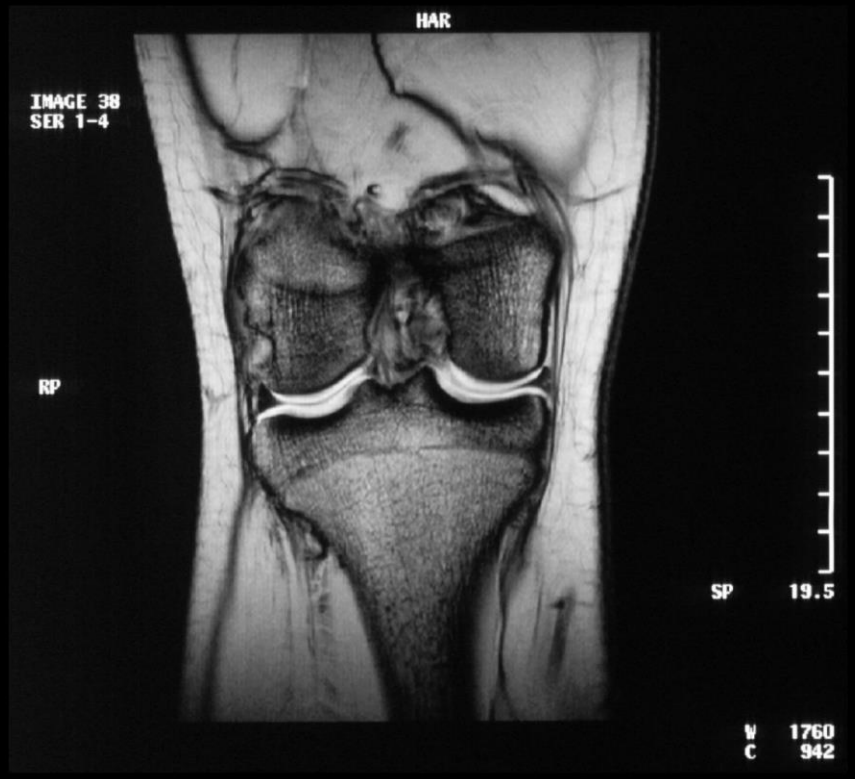
MR: PDfs

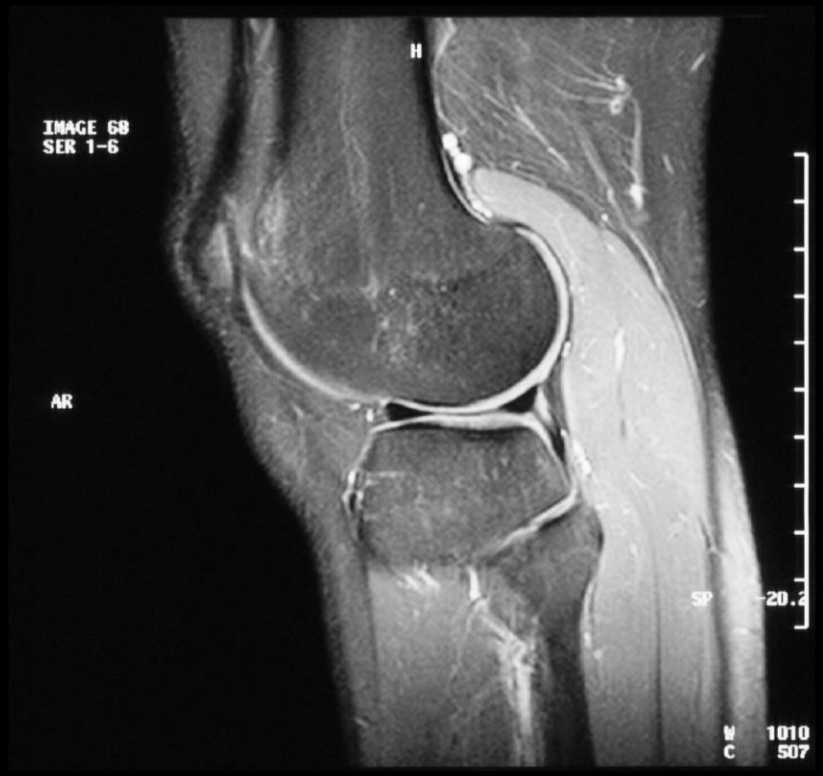



4
1
3
2
4
3
2
MR: PDfs

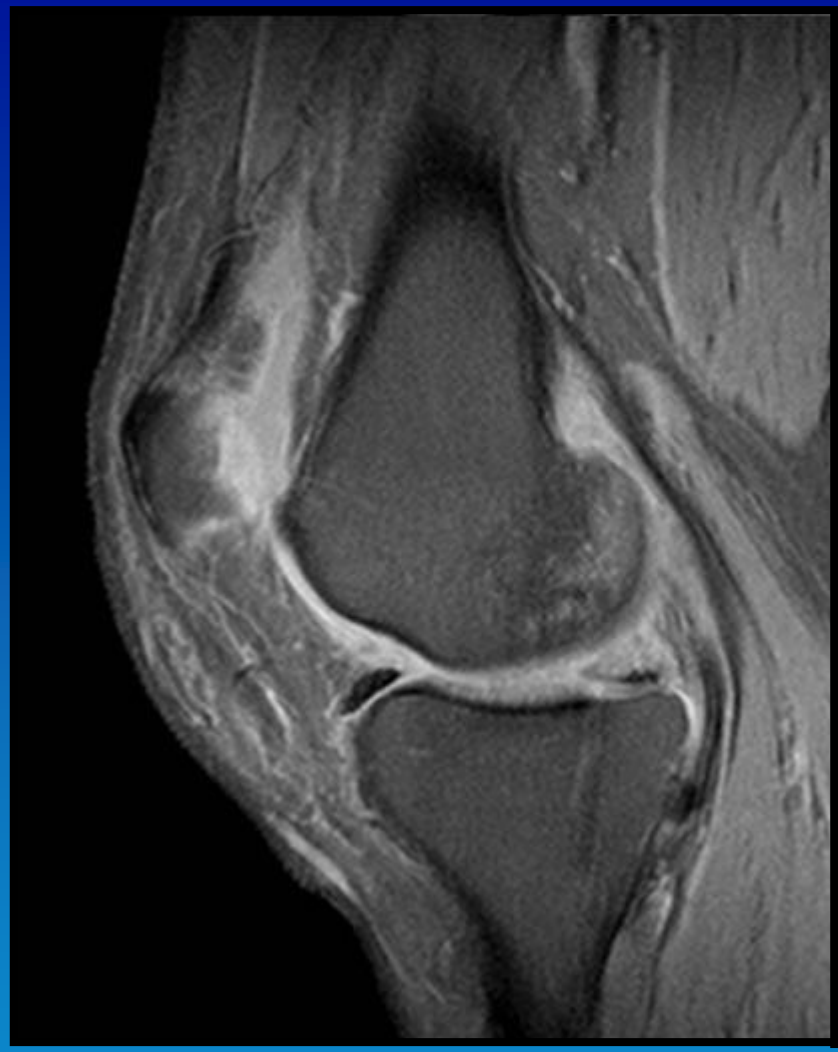


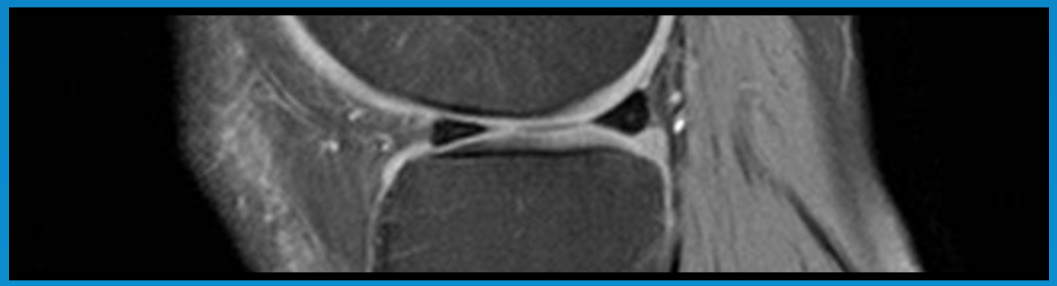
1. Lig. cruciatim anterius (ACL)
2. Lig. cruciatum posterius (PCL)
3. Lig. Patellae
4. Quadricepssene

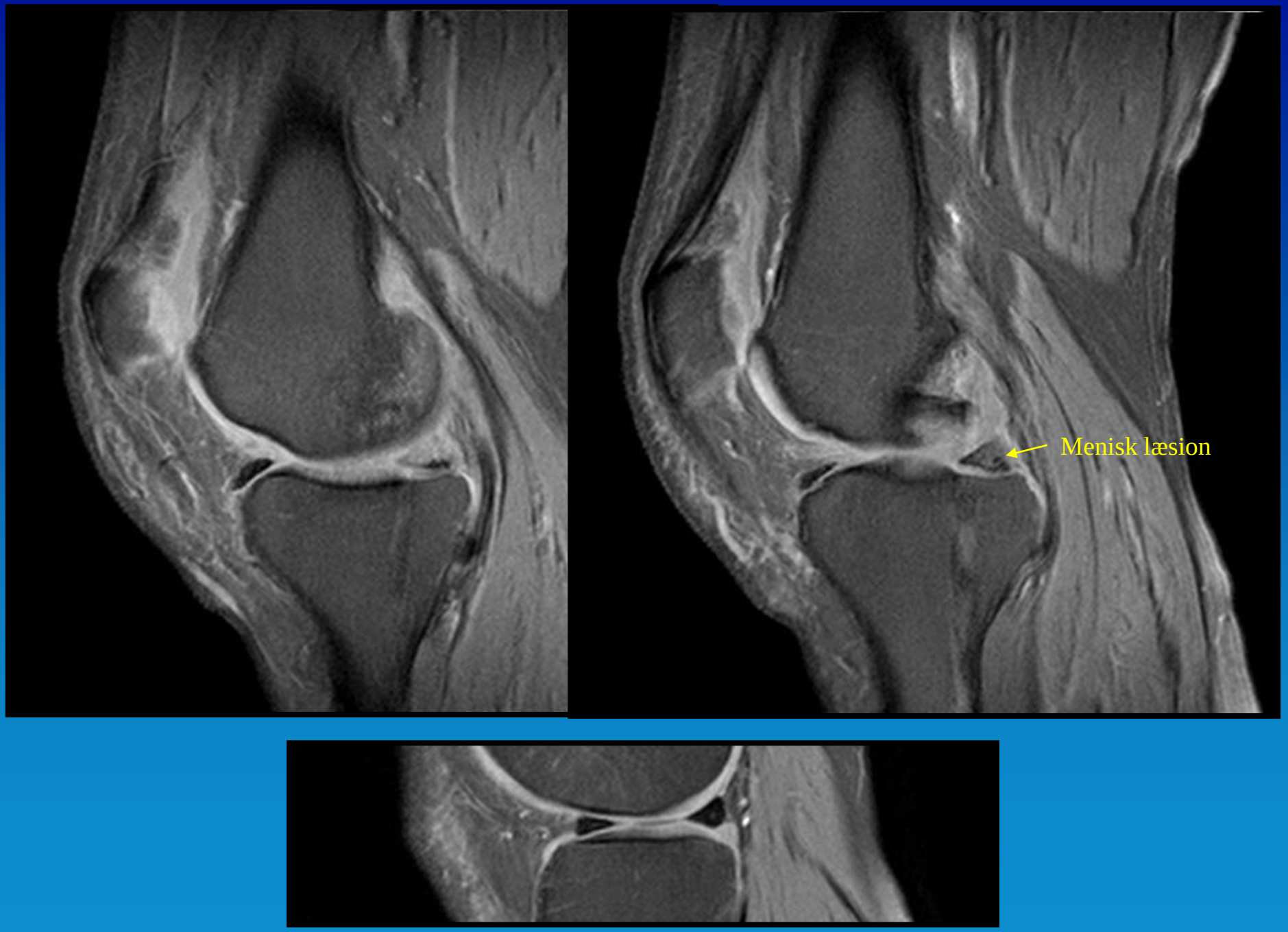

HAR
IMAGE 38
SER 1-4
RP
SP 19.5
W 1760
C 942

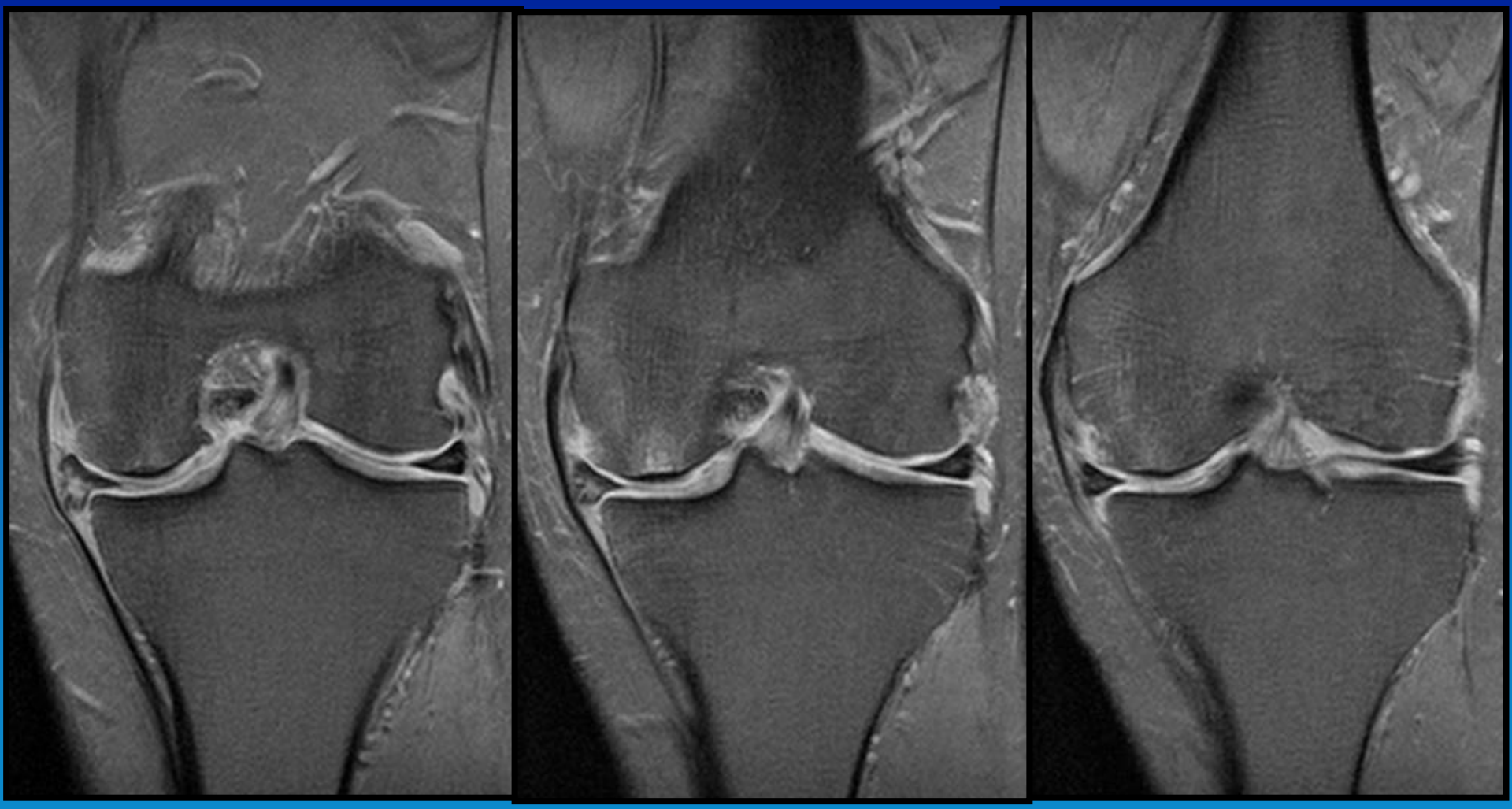

H
IMAGE 68
SER 1-6
AR
SP
W 1010
C 507

MR knæled:
Læsioner





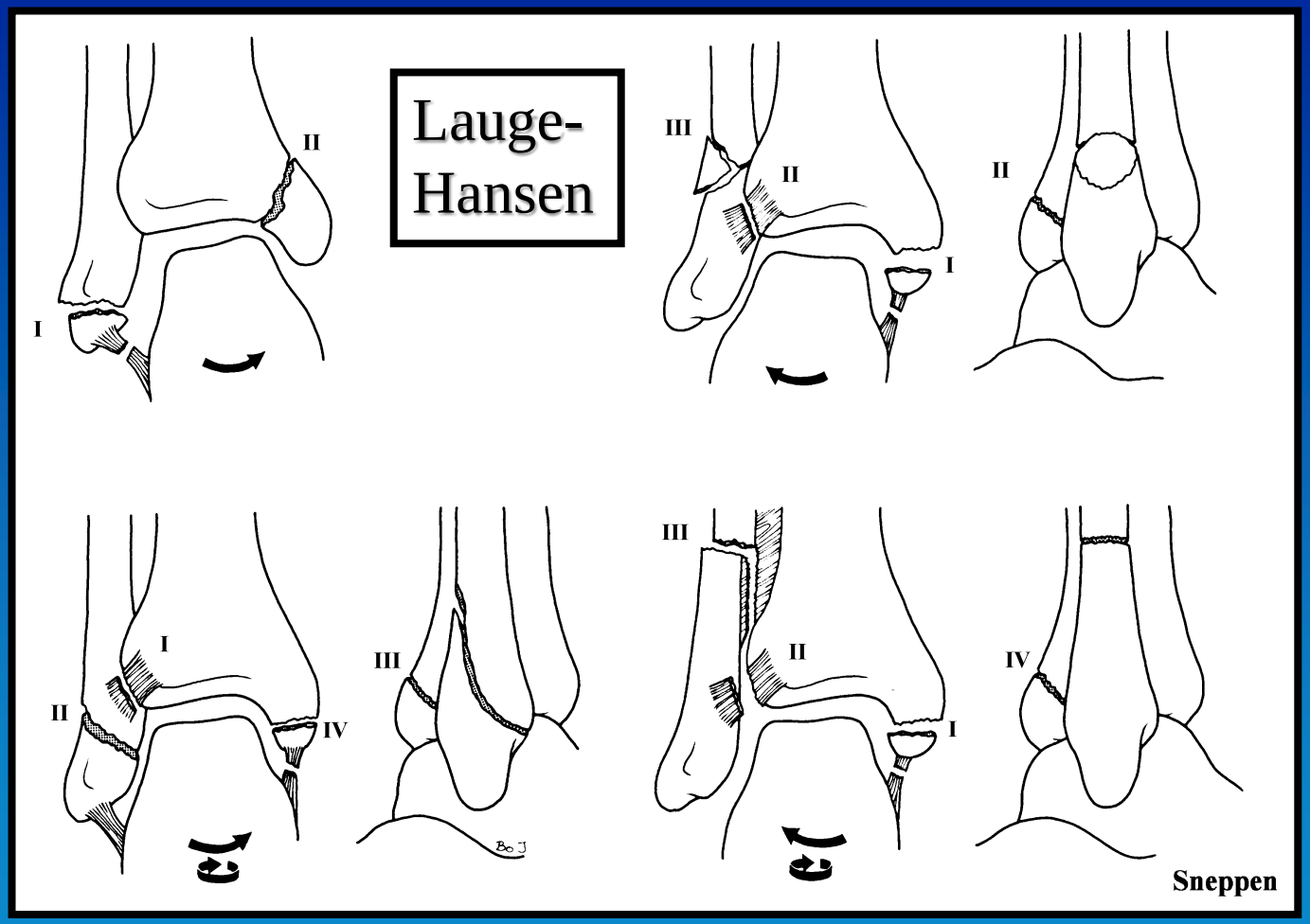

Menisk læsion



Ankel og fodregion


L

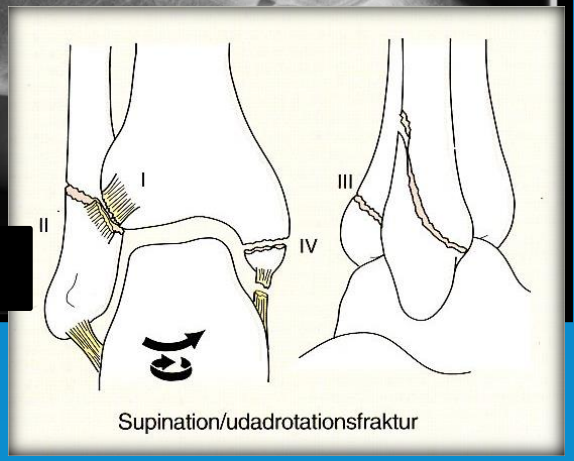

L


Lauge-
Hansen
II
I
III
II
I
II
I
II
IV
III
III
II
I
IV
Sneppen

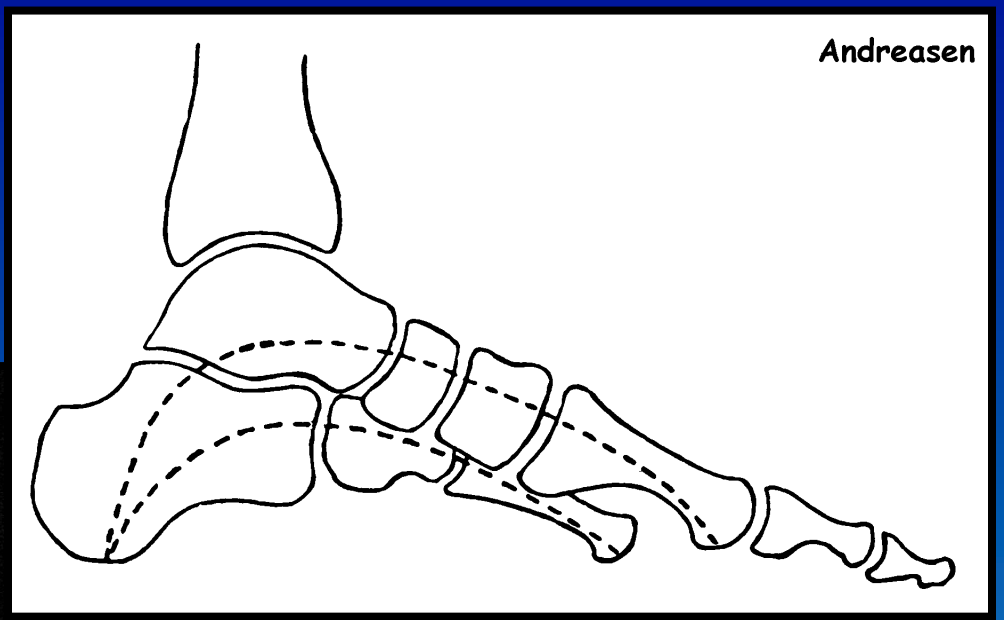
AP

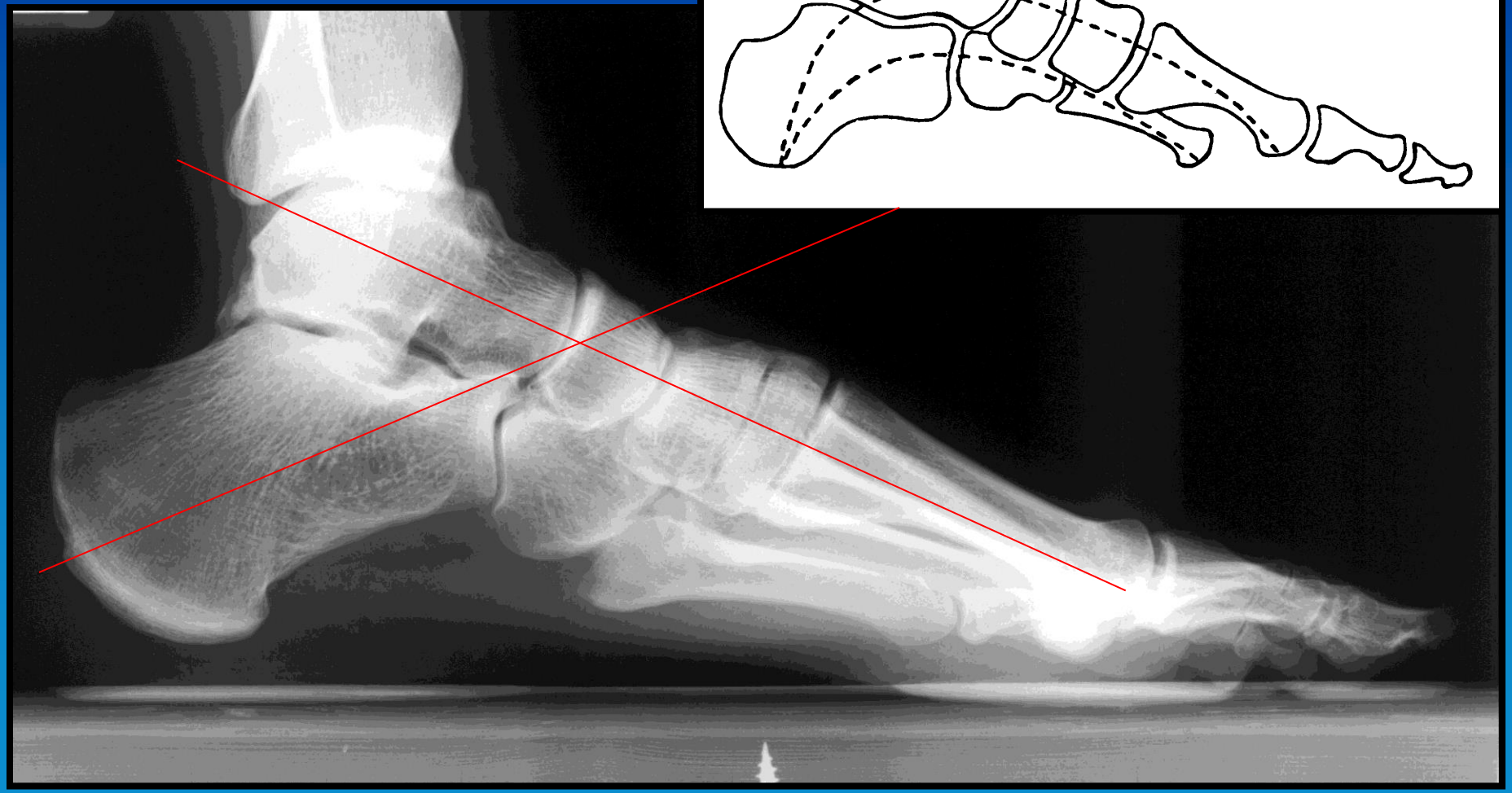
skrå L

Lat. L



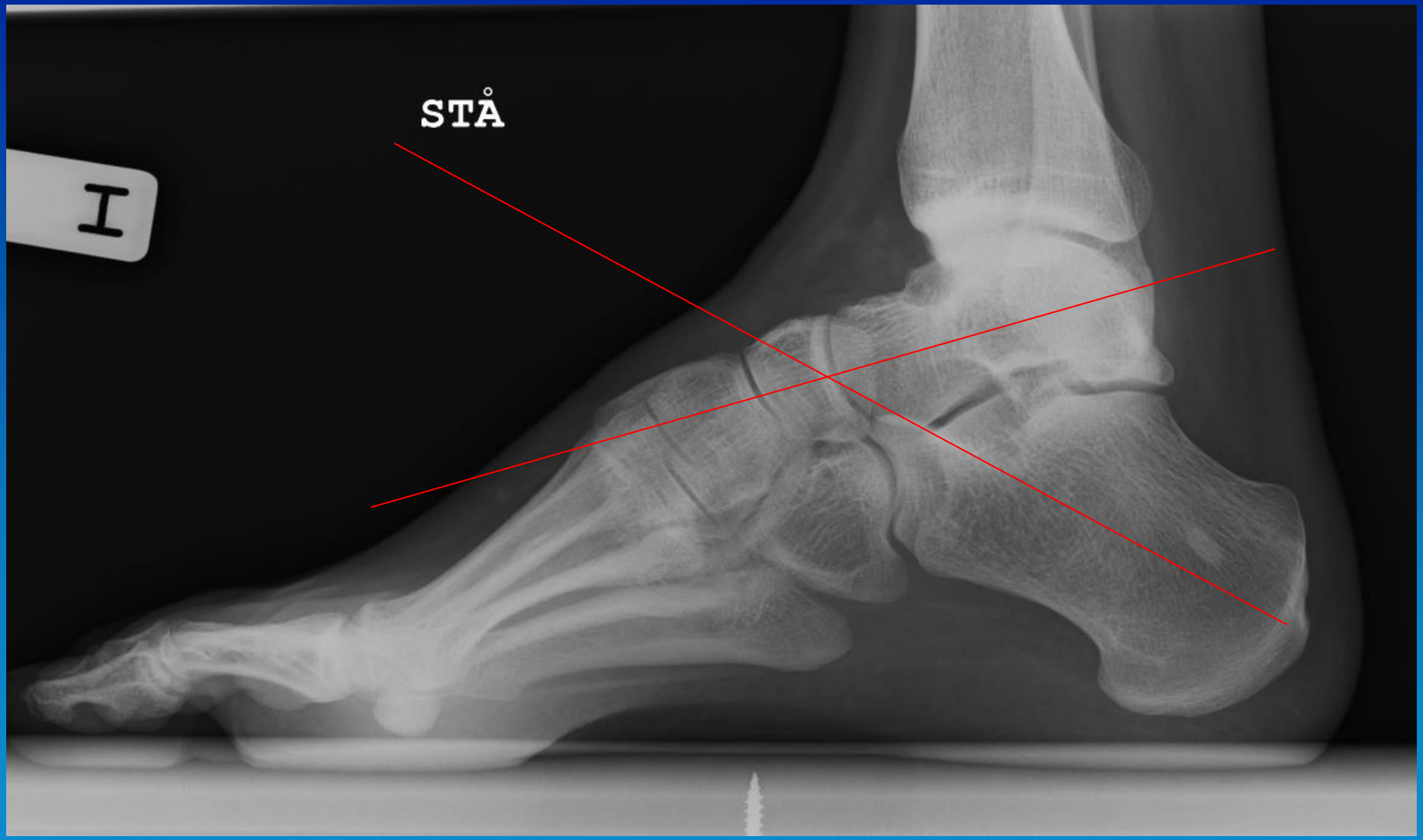
Supination/udadrotationsfraktur


Andreasen


Andreasen

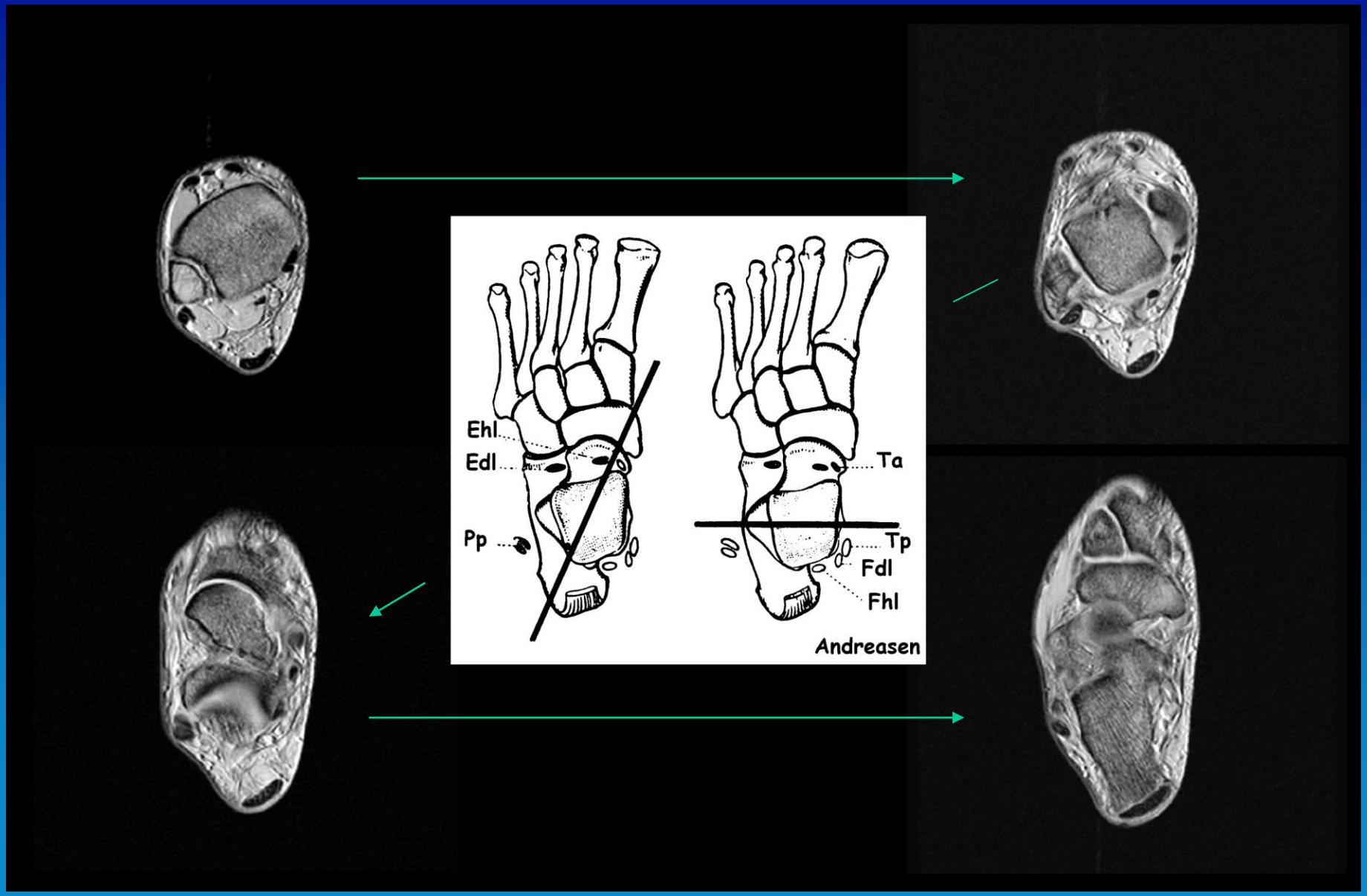
Hulfod (Pes cavus), mand 21 år.

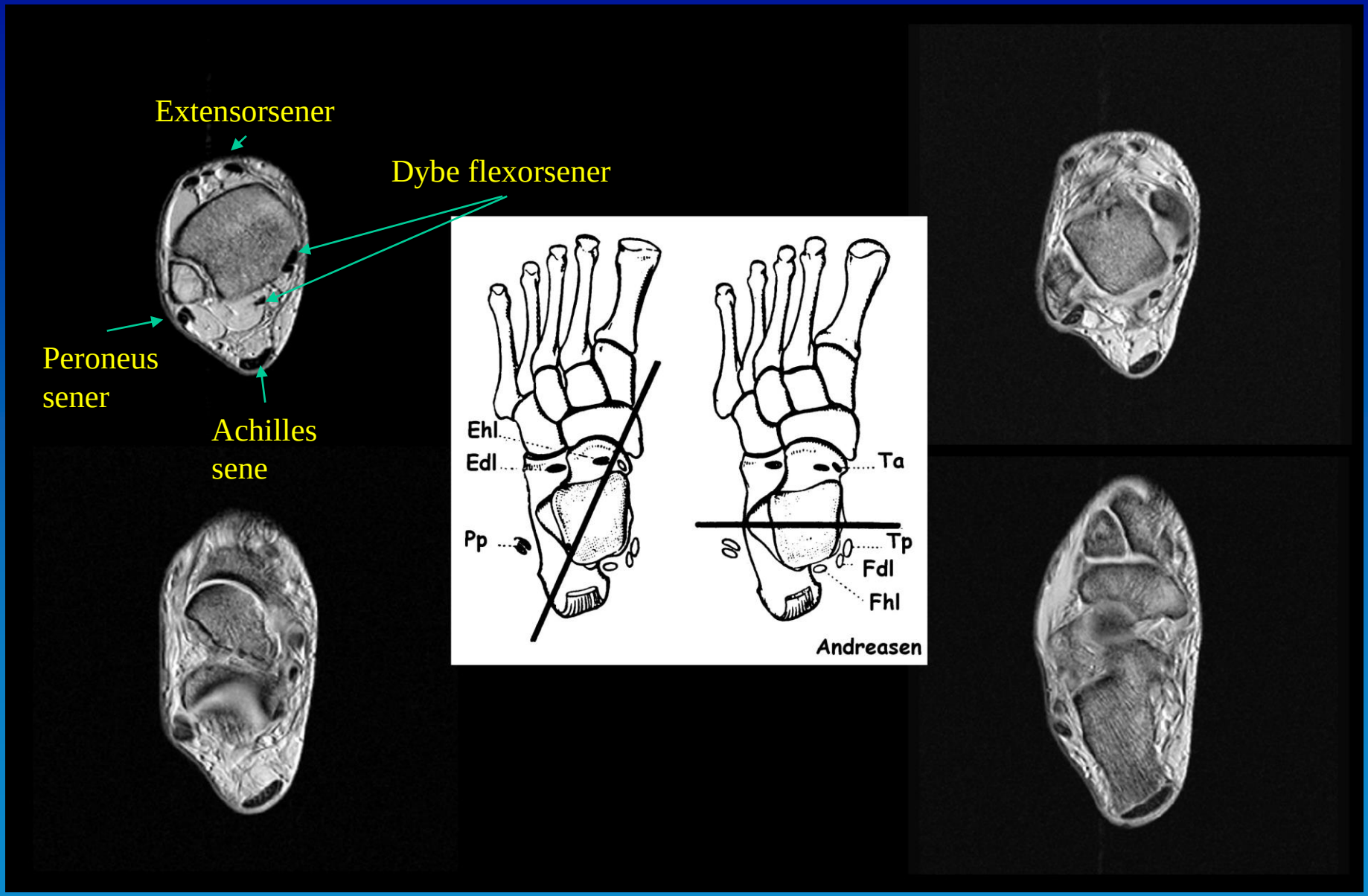
Hulfod (Pes cavus), mand 21 år.

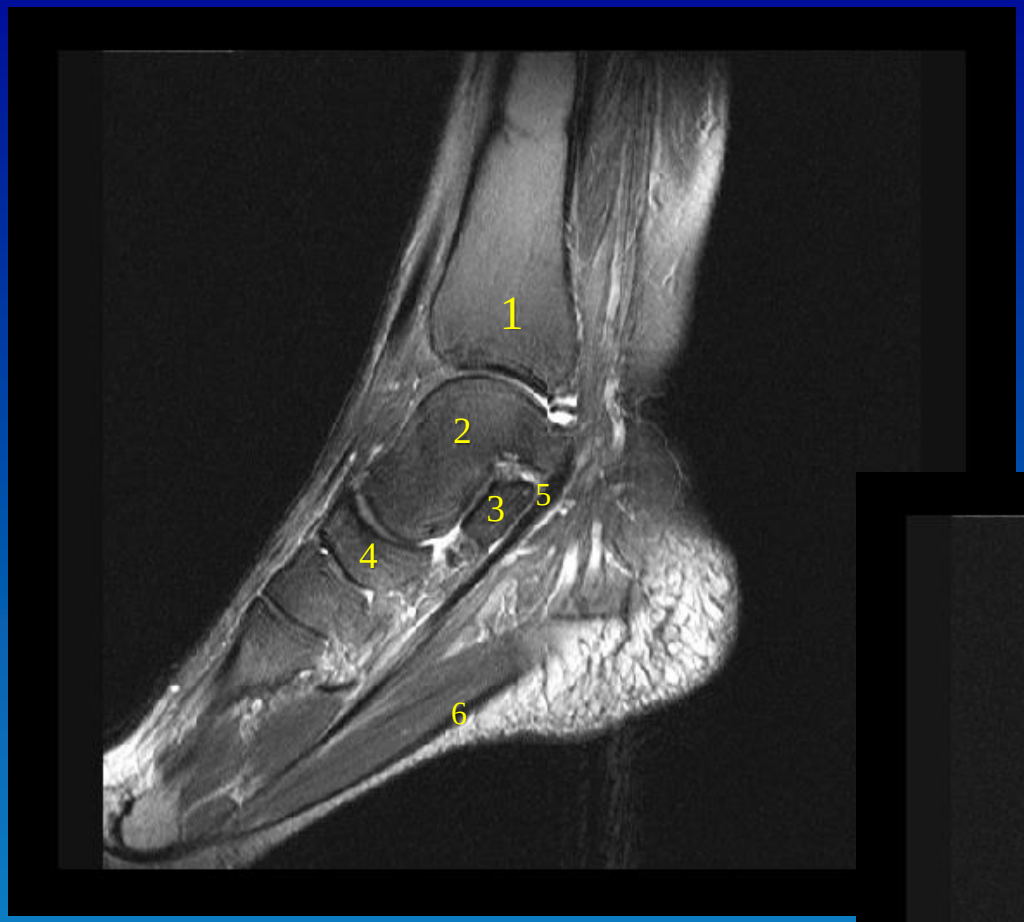


Platfod (Pes planus), dreng 12 år.

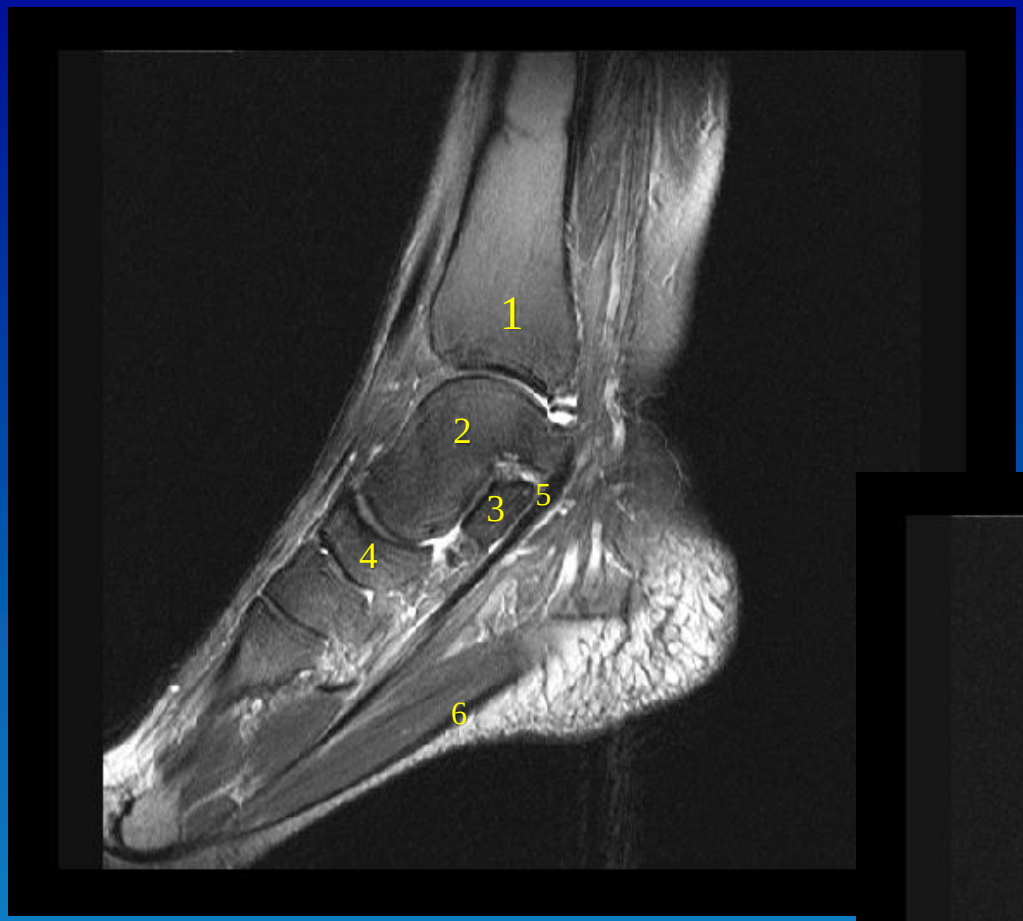
Platfod (Pes planus), dreng 12 år.


Ehl
Edl
Pp
Ta
Tp
Fdl
Fhl
Andreasen


Extensorsener
Dybe flexorsener
Peroneus sener
Achilles sene
Ehl
Edl
Pp
Ta
Tp
Fdl
Fhl
Andreasen


1
2
3
4
5
6


7
8

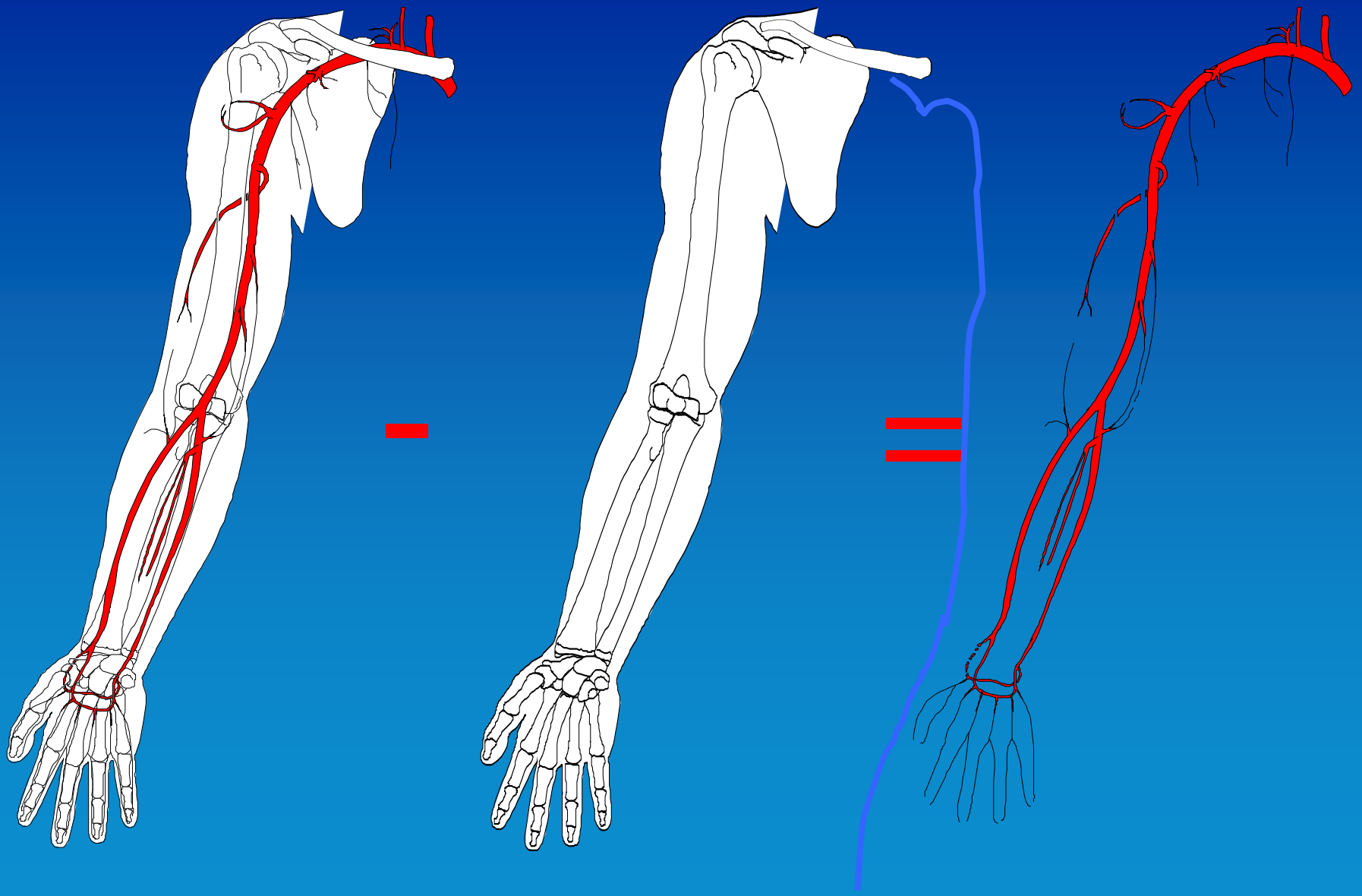


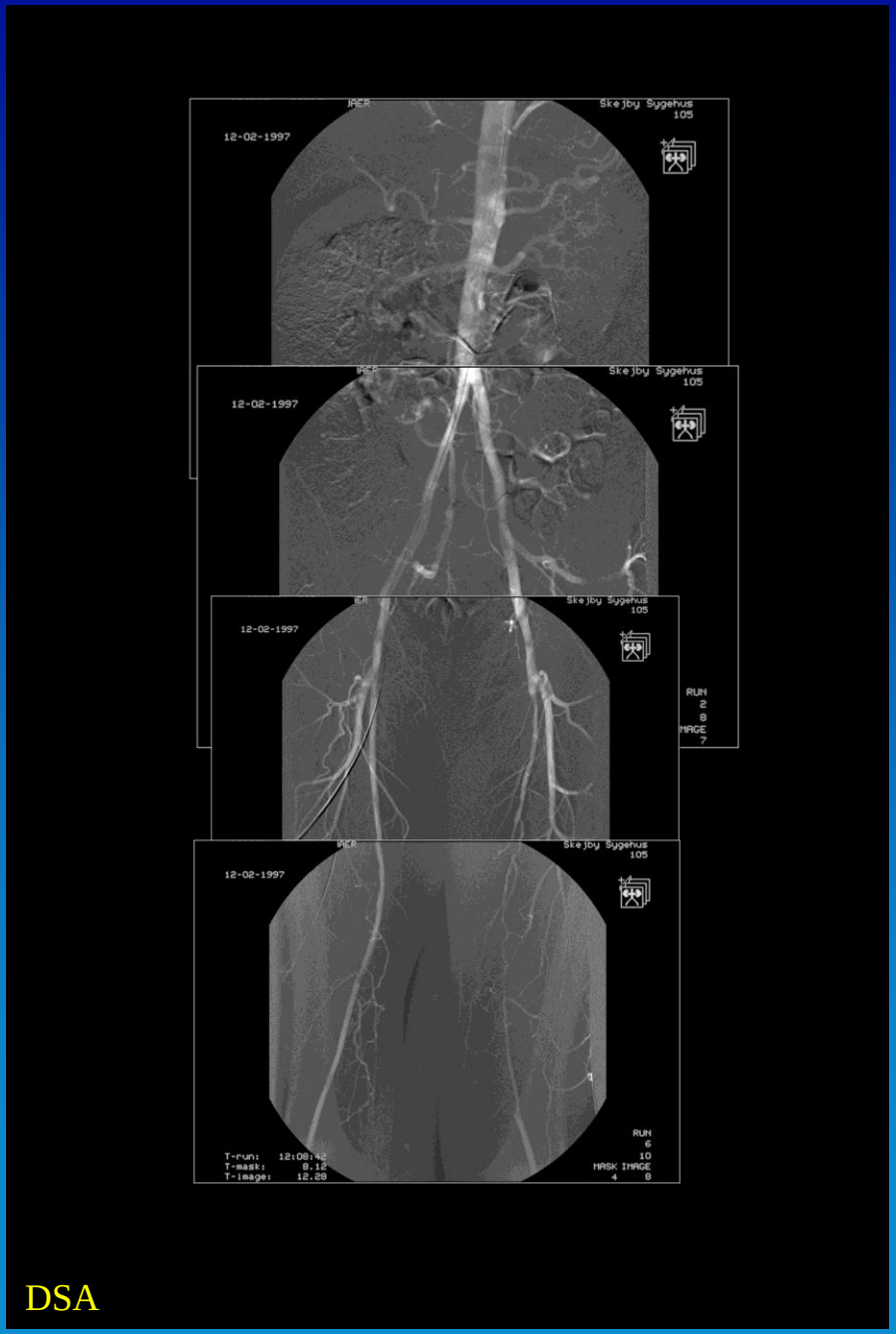
1) Tibia
2) Talus
3) Sustentaculum tali
4) Os naviculare
5) Flexor hallucis longus senen
6) Aponeurosis plantaris
7) Calcaneus
8) Achillessenen

Underekstremitetens kar

Arteriosklerose hos 55 årig kvinde.

DSA: Digital subtraktions angiografi




IAER
Skejby Sygehus
105
12-02-1997
IAER
Skejby Sygehus
105
12-02-1997
Skejby Sygehus
105
12-02-1997
RUN
2
8
MAGE
7
IAER
Skejby Sygehus
105
12-02-1997
RUN
6
10
MASK IMAGE
4 8
T-run: 12:08:42
T-mask: 8.12
T-image: 12.20

DSA

A. femoralis

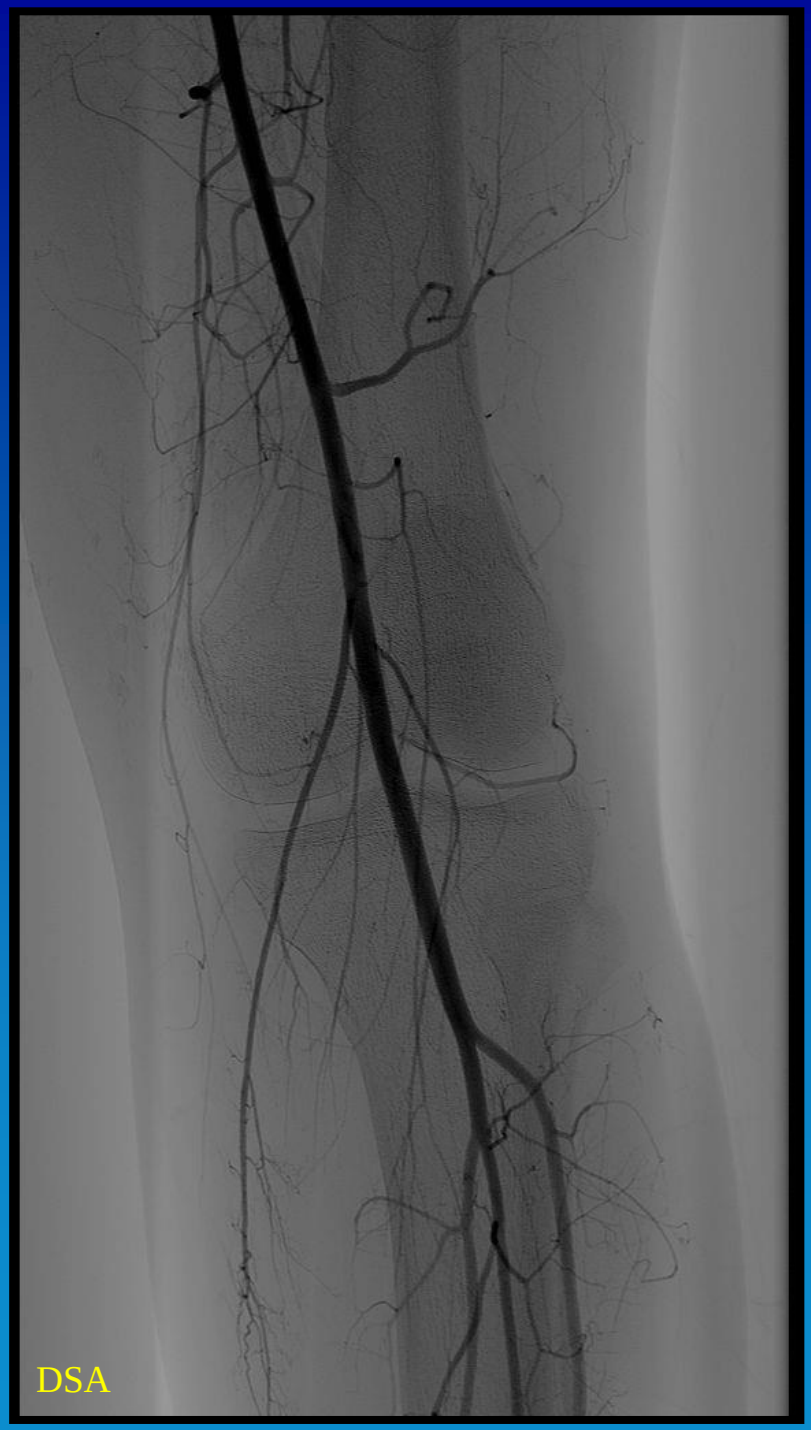
A. circumflexa femoris lateralis

A. circumflexa femoris medialis

A. profunda femoris

Aa. perforantes

Venstre ben



A. femoralis

A. poplitea

- Rete articularis genus

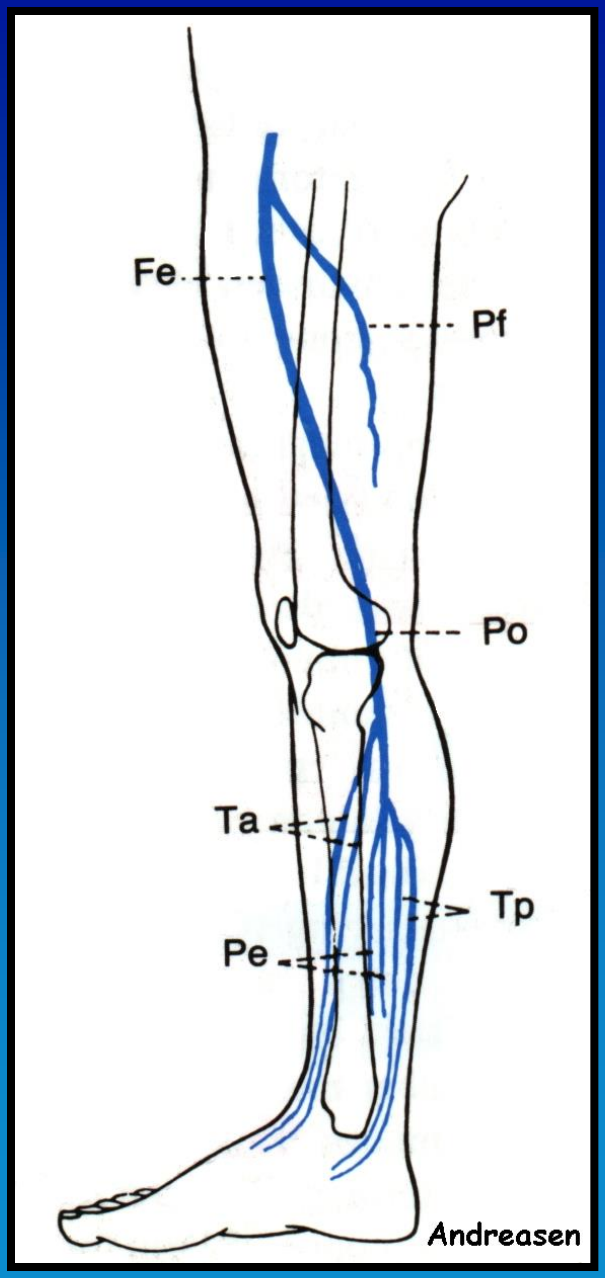
A. tibialis anterior

A. tibialis posterior

A. fibularis

Venstre ben

Underekstremitets venesystem


Fe
Pf
Po
Ta
Tp
Pe
Andreasen