

PÆDIATRISK RADIOLOGI: BEVÆGEAPPARATET

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Overlæge

Røntgen og skanning

Aarhus Universitetshospital

1



WWW.RADIOLOGY.DK

2



3



4

- ▶ Knoglebiologi og knoglealder
- ▶ Frakturer
- ▶ Tumorer - Generelt (ellers A-kursus Ortoradiologi)
- ▶ (Infektioner A-kursus Ortoradiologi)
- ▶ (Osteochondroser A-kursus Ortoradiologi)
- ▶ Hoftedysplasi og hofteforandringer ved cerebral parese
- ▶ Systemiske sygdomme og syndromer
- ▶ Tema: Det haltende barn
- ▶ Cases undervejs – og evt. til slut
- ▶ Litteraturforslag (Bøger, artikler. Links)

EMNER

5

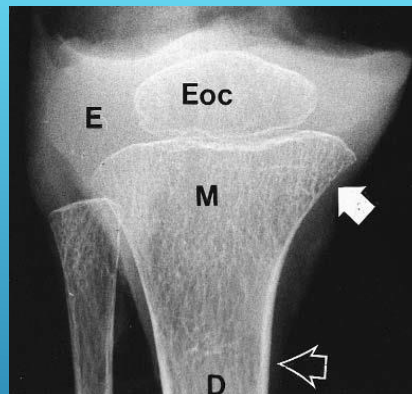
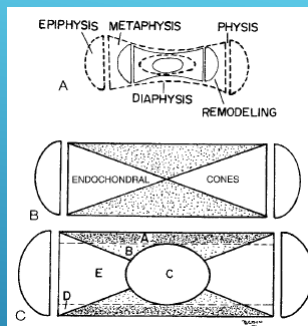
KNOGLEBIOLOGI

6

- ▶ **Vækstlinie:**
Stødabsorberende
Svagere end
ligamentene
- ▶ **Tyk periost**
Ud over at være
tyk, også meget
stærk
Nedsætter risikoen
for
frakturdislokation
Løser bundet til
knoglen – især hos
mindre børn
- ▶ **Anderledes
biomekanik:**
Mindre skrøbelige
Fleksible, elastiske
og plastiske

KNOGLER: BØRN VS. VOKSNE

7



8



7. gestationsmåned: Metacarpale knogler

ENCHONDRAL OG INTRAMEMBRANØS OSSIFIKATION



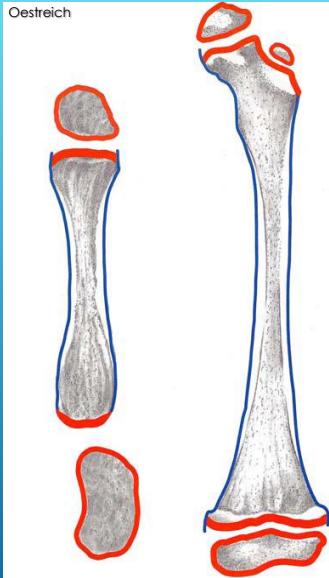
9



5 DAGE GAMMEL DRENG

10


Oestreich



KNOGLEVÆKST

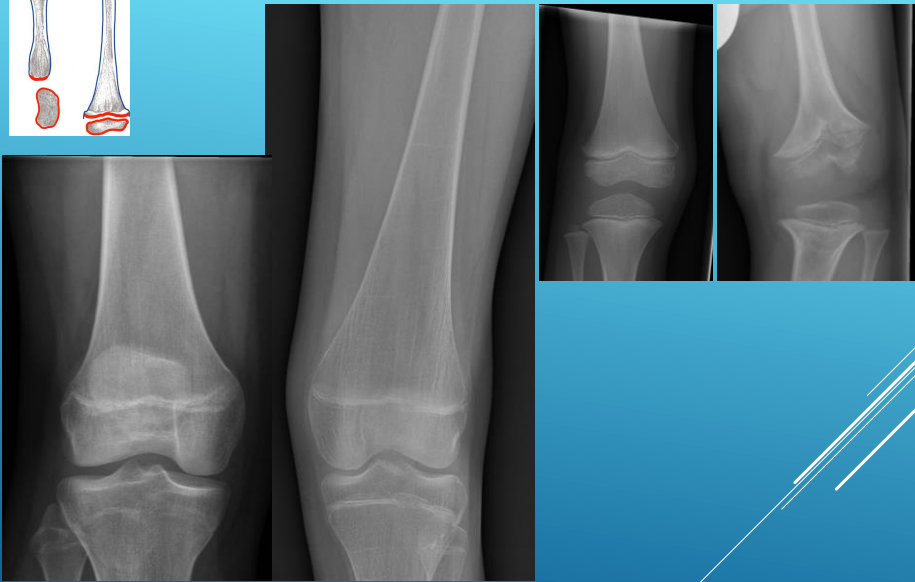
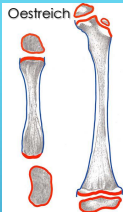
Enchondral ossifikation

Intramembranøs ossifikation

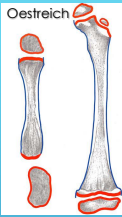


11


Oestreich



12




Oestreich



13 år


Konkav

Konveks




Marfan – 13 år

Konkav



6 år

Konkav

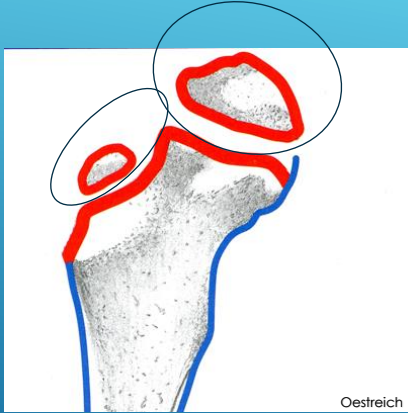


Achondroplasi – 6 år

Meget konkav

Hhv. systemisk øgning (Marfan) og reduktion af enchondral vækst (achondroplasi), begge med normal intramembranøs vækst

13




Oestreich

Diafyse

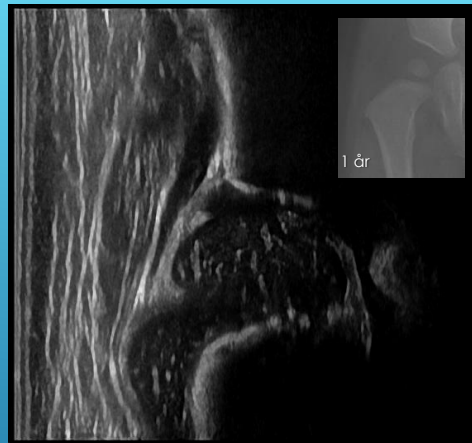
Metafyse

Epifyse/Apofyse

Fyse (epifyselinien (radiologi) eller vækstskenen (anatomi))



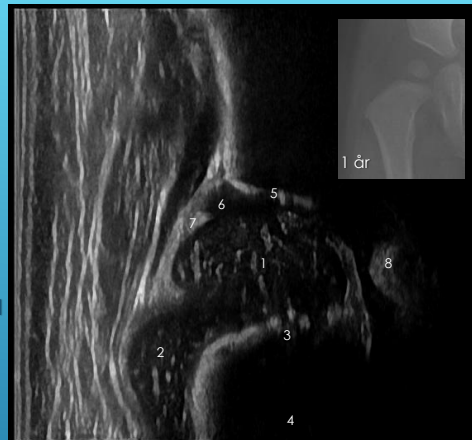
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NEONATAL: UL SKANNING AF HØJRE HOFTE

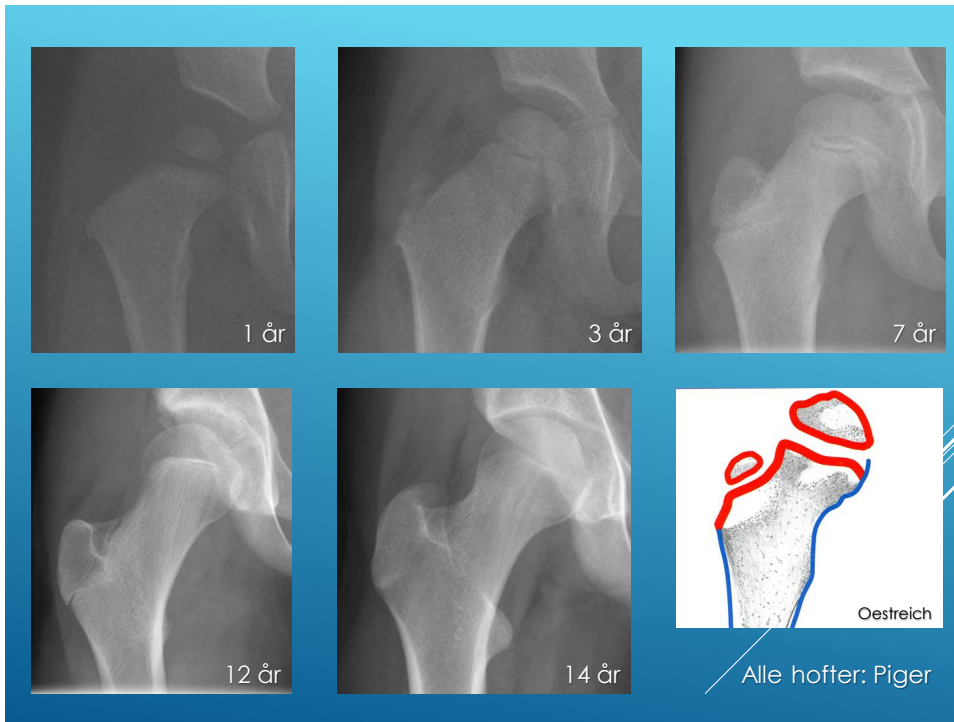
15

1. Caput femoris
2. Trochanter major
3. Metafyse (femur)
4. Diafyse (femur)
5. Acetabular loft
6. Bruskede del af acetabulum
7. Labrum der fortsætter i ledkapsel
8. Os pubis (ossificeret del)

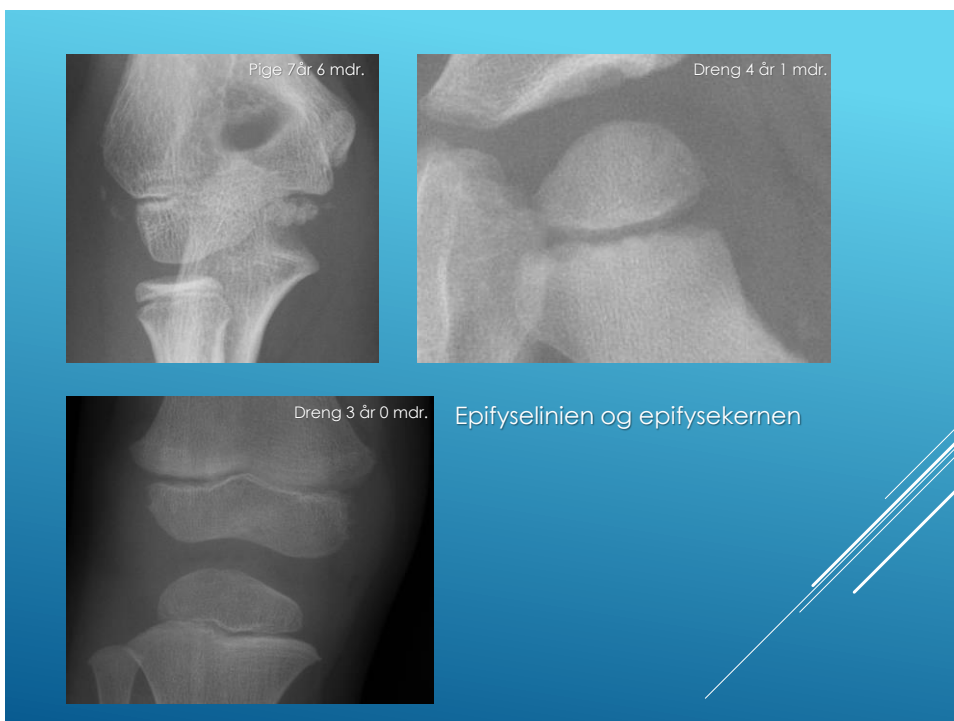


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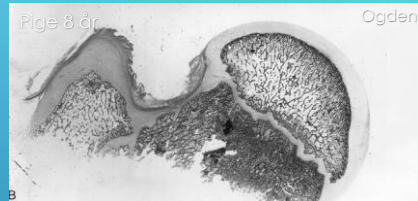
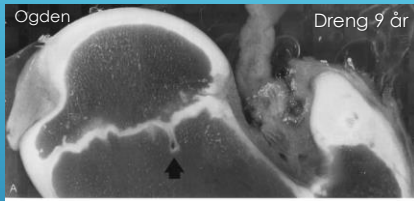
16



17



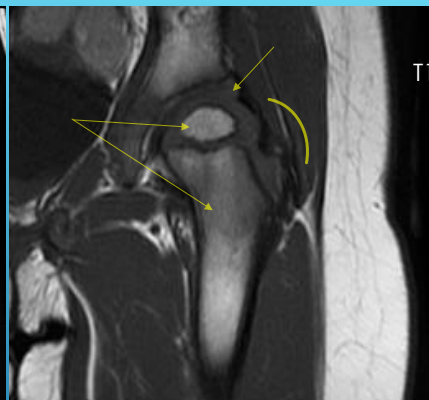
18



FYSENS FACON I PROXIMALE FEMUR
MAKROSKOPISK OG HISTOLOGISK.



19

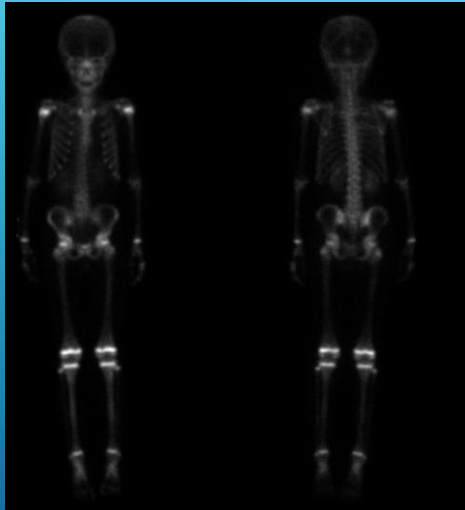


PIGE 3½ ÅR (HER GRÆNSEDYSPLASTISKE HOFTER)



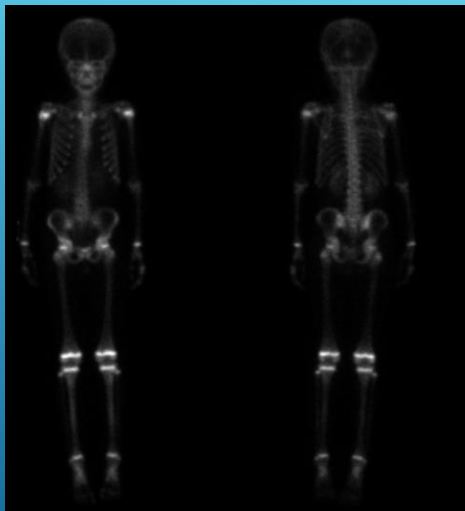
Se i øvrigt: Laor et al. 2009

20

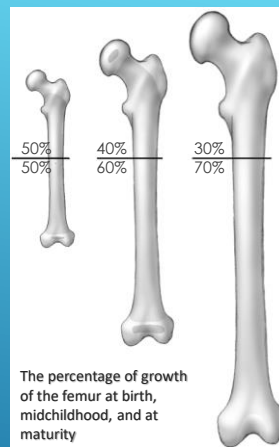


9-ÅRIG BARN: TECHNETIUM SCINTIGRAFI, NORMAL UNDERSØGELSE

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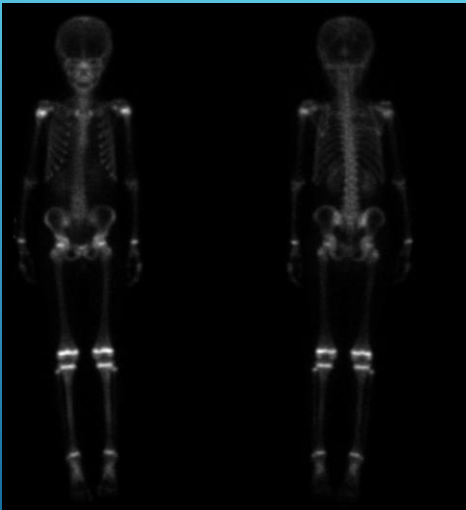
9-ÅRIG BARN: TECHNETIUM SCINTIGRAFI, NORMAL UNDERSØGELSE



The percentage of growth of the femur at birth, midchildhood, and at maturity

Peterson 2007

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9-ÅRIG BARN: TECHNETIUM SCINTIGRAFI, NORMAL UNDERSØGELSE

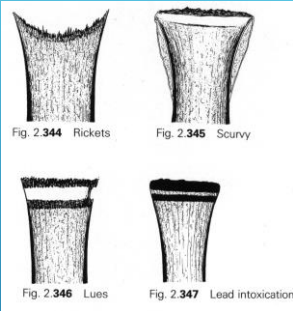
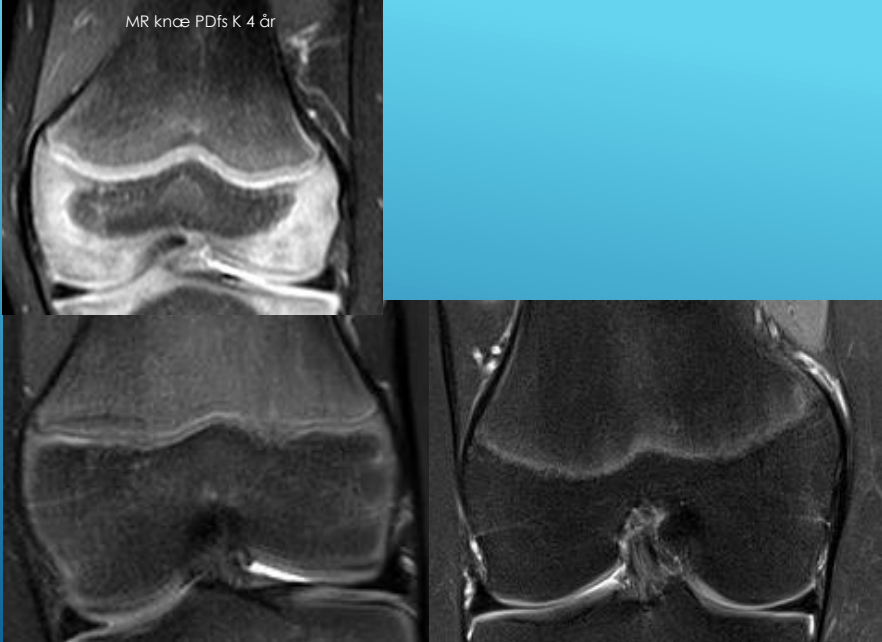


Fig. 2.344 Rickets Fig. 2.345 Scurvy
Fig. 2.346 Lues Fig. 2.347 Lead intoxication

Köhler Zimmer

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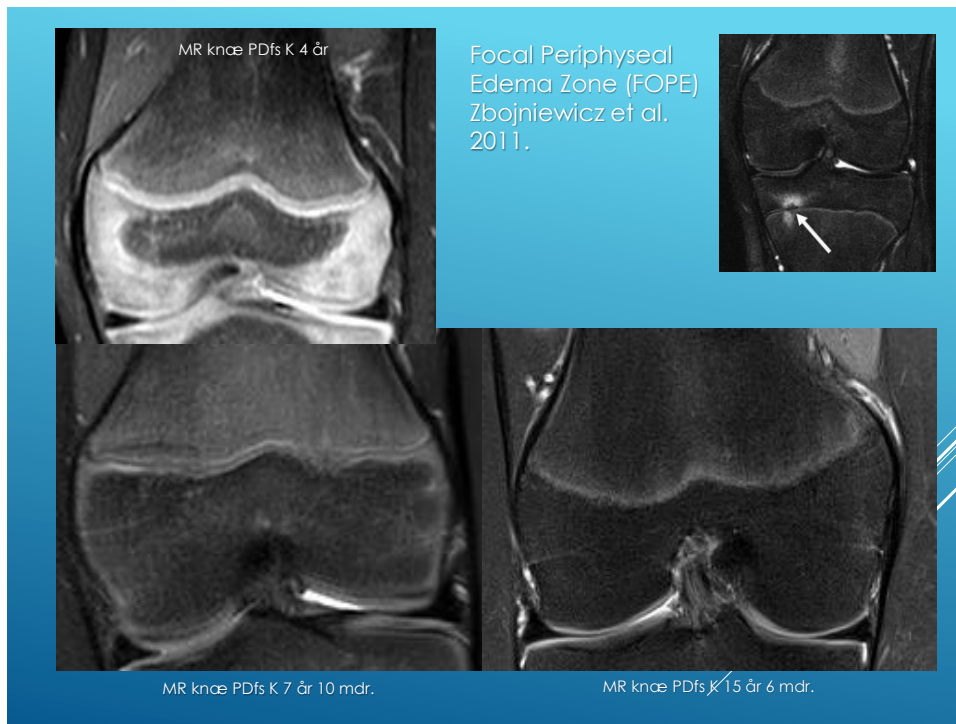


MR knæ PDfs K 4 år

MR knæ PDfs K 7 år 10 mdr.

MR knæ PDfs K 15 år 6 mdr.

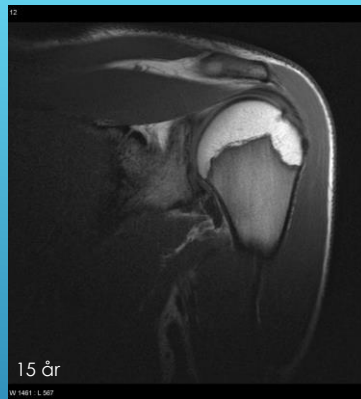
24



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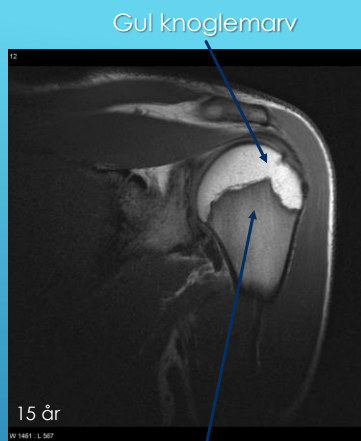


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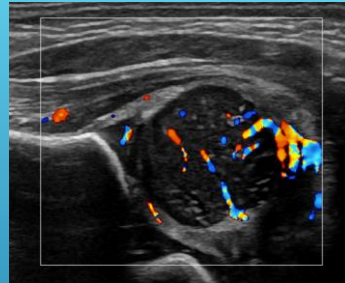
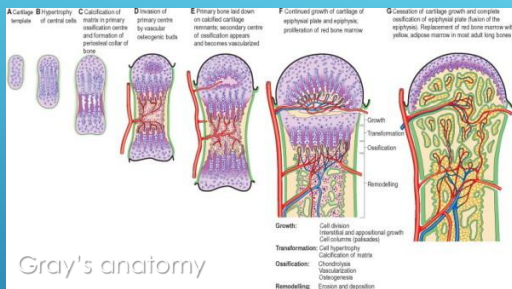
RTG. OG MR AF PROXIMALE HUMERUS.

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BEMÆRK:
DEN MEGET UREGELMÆSSIGE EPIFYSELINIE.
DET FORSKELLIGE SIGNAL FRA AFIYSEKERNEN OG
METAFYSE/DIAFYSE REGIONEN

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Husk: Der er kar i epifyser og apofyser, i modsætning til ledbrusk, og dette før ossifikation starter!

KNOGLERS BLODFORSYNING

(OMTALT PÅ A-KURSUS I MSK RADIOLOGI)

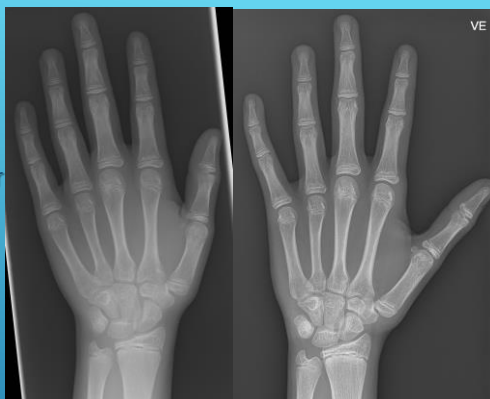
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KNOGLEALDER

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Indikation:

- ▶ Pubertas precox (Endokrin sygdom mistænkt)
- ▶ Forudsige sluthøjde
- ▶ Bestemmelse af tidspunkt for kirurgi:
 - ▶ Skoliosekirurgi
 - ▶ Kirurgi ved anisomeli (LLD)
 - ▶ Valgus/varus korrektion i underekstremiteter
- ▶ M. fl.



Samme barn hhv. 12 år 4 mdr. og 15 år 1 mdr.

KNOGLEALDERBESTEMMELSE

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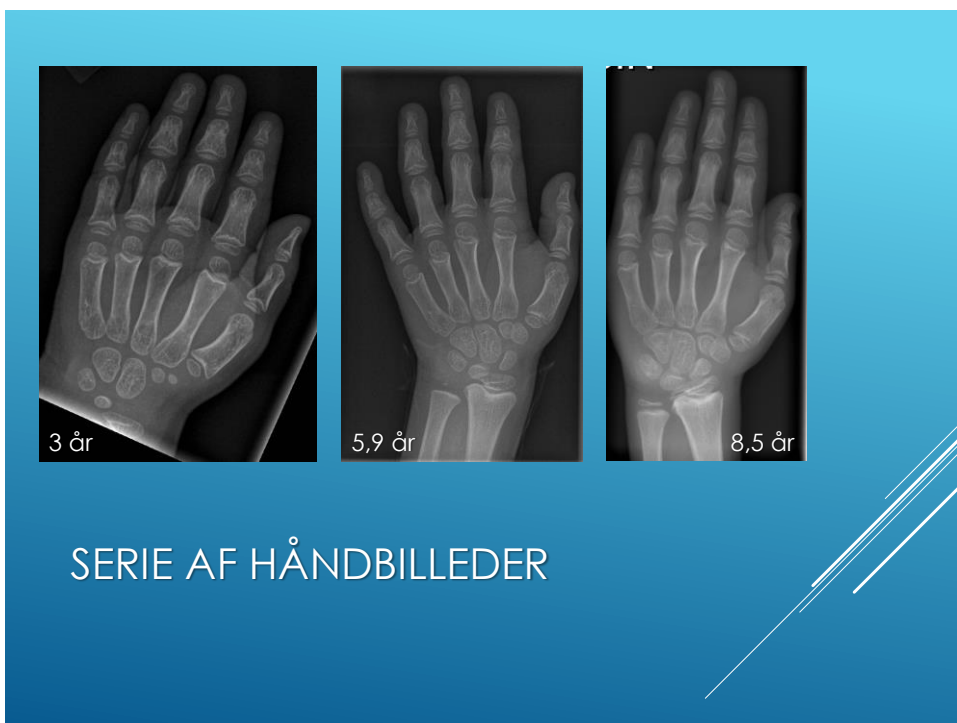
- ▶ Forskellige metoder
- ▶ Hånden:
 - ▶ Tanner-Whitehouse 3
 - ▶ Greulich-Pyle
 - ▶ BoneXpert (automatisk metode)
- ▶ Risser (Crista apofysen)
- ▶ Sauvegrain (Albuen)
- ▶ M. fl.
- ▶ Udover selve aldersbestemmelsen, bør de enkelte knogler også vurderes

KNOGLEALDERBESTEMMELSE

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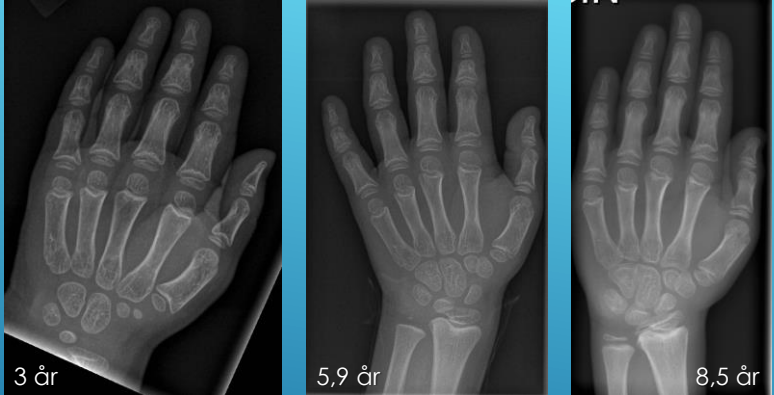


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Ej udført

BE:4,1 år/TW:6,7 år

BE: 5,4 år/TW:9,1 år



3 år

5,9 år

8,5 år

ESPE 2015

**AUTOMATISK
KNOGLEALDERBESTEMMELSE VS.
MANUEL VED METAFYSÆR
CHONDRODYSPLASI (MCKUSICK)**

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► Case

4-ÅRIG PIGE, HØJRE HÅND

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VENSTRE HÅND TIL SAMMENLIGNING


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ACCELERERET KNOGLEALDER

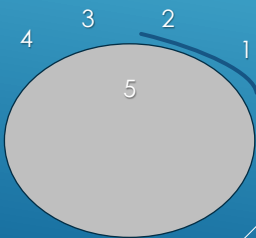
MODER DEBUTEREDE MED JUVENIL IDIOPATISK ARTRIT I
SAMME ALDER. PÅ UL SYNOVIT I HØJRE HÅND.

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- ▶ Ringapofyserne på vertebra lukker på (cirka) samme tid som crista apofysen
- ▶ Stadium 5:
 - ▶ Kvinder 18,1 år
 - ▶ Mænd 18,6 år

RISSER STADIER 0-5



Apofysen ossificerer lateralt fra og fusionerer medialt fra.

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- ▶ Radiographic Atlas of Skeletal Maturation – Kahn et al., Thieme 2012
- ▶ <https://www.orthorad.de/index.php/orthorad/pedbone>
- ▶ App Pedbone
- ▶ BoneXpert software

LITTERATUR OG LINKS

40

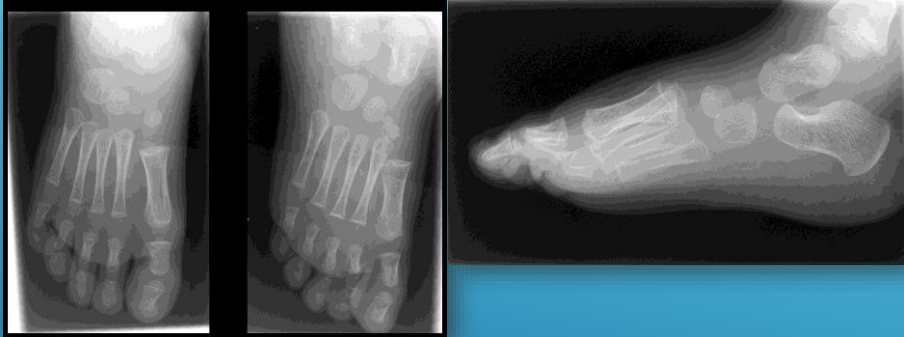
FRAKTURER

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- ▶ Henvisning:
 - ▶ Anamnese
 - ▶ Objektive fund
 - ▶ Klinisk diagnose
- ▶ Beskrivelse:
 - ▶ Er undersøgelse teknisk OK
 - ▶ Selve beskrivelsen
- ▶ Frakturtyper
- ▶ Frakturheling
- ▶ Specifikke pædiatriske frakturer
- ▶ Frakturfølger og komplikationer

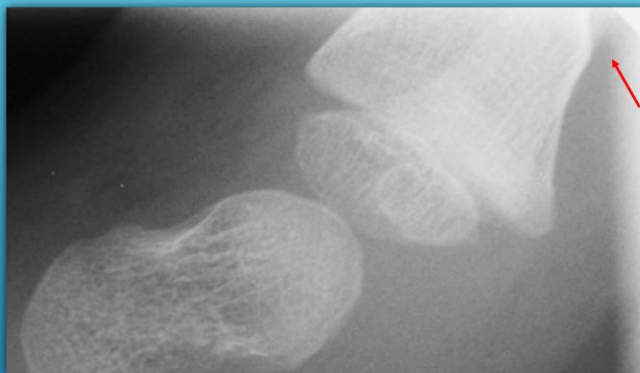
FRAKTURER

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2½-ÅRIG DRENG, VIL IKKE STØTTE PÅ
HØJRE FOD, KLINISK MISTANKE OM
METATARS FRAKTUR

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ANAMNESE OG KLINISKE
OPLYSNINGER ER VIGTIGE - MEN
"KLINIK" KAN VÆRE SVÆRT HOS
BØRN

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PIGE 1 ÅR 11 MDR, OBS.
ANTEBRACHIUM FRAKTUR
KOMMENTARER?

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Albuen kun
undersøgt i et
plan:
Insufficient
undersøgelse.



PIGE 1 ÅR 11 MDR, OBS.
ANTEBRACHIUM FRAKTUR

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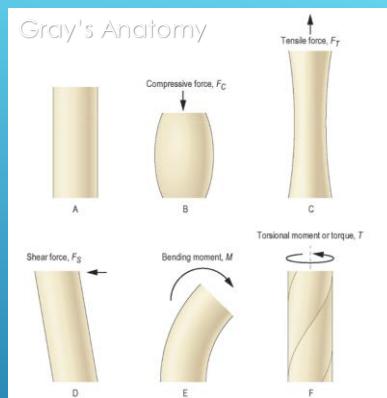
PIGE 4 ÅR 11 MDR. FALDTRAUME

48



PIGE 4 ÅR 11 MDR. FALDTRAUME
SUPRACONDYLÆR HUMERUS FRAKTUR
ANSAMLING I LEDDET

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TRAUME MEKANISMER

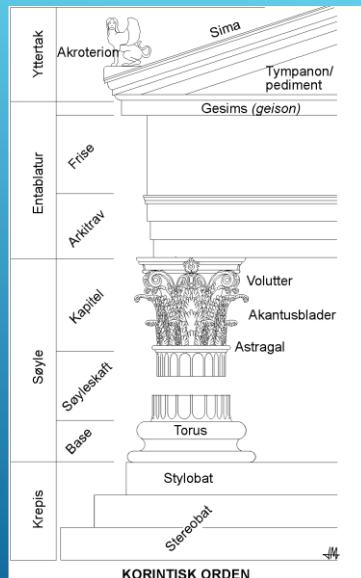
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4-ÅRIG PIGE: TORUS (BUCKLE) FRAKTUR



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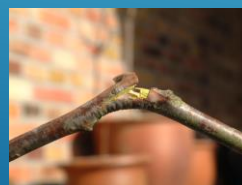


https://upload.wikimedia.org/wikipedia/commons/0/0c/Soyleorden_korintisk.png

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4-ÅRIG DRENG: GREENSTICK FRAKTUR

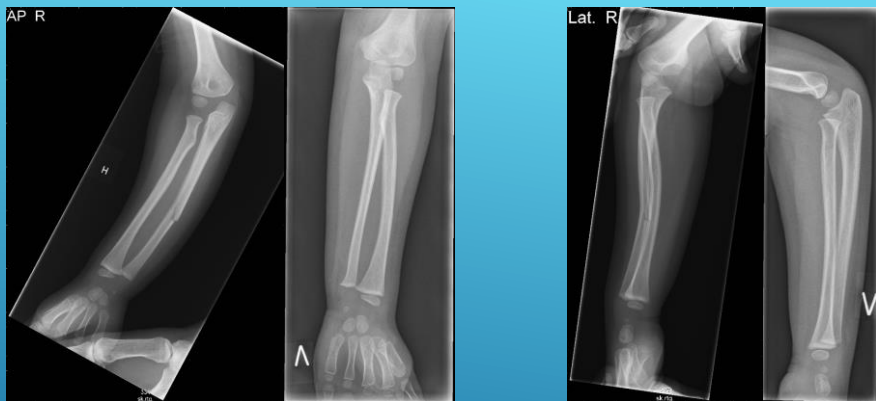


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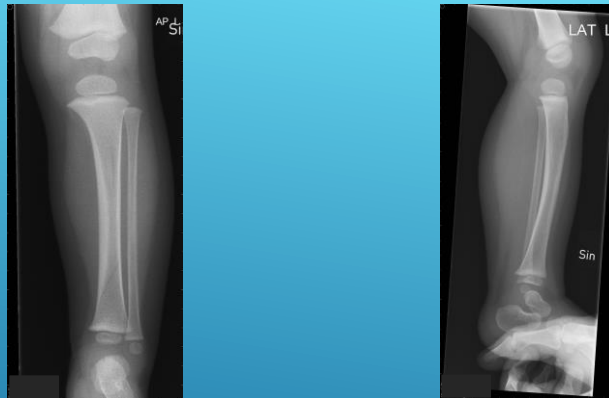
4-ÅRIG PIGE: FRAKTUR TYPE?

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4-ÅRIG PIGE: RADIUS BØJNING
(BOWING)
RASKE VENSTRE SIDE TIL
SAMMENLIGNING

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15 MDR GAMMELT BARN:
TODDLERS FRACTURE

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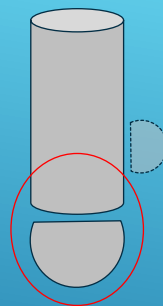
- ▶ 1-3 års alderen
- ▶ Falder på fikseret ben, hvilket giver rotation i tibia, således der kommer en spiral fraktur
- ▶ Kan hvis udisloceret være vanskelig at se på primære undersøgelse
- ▶ Ved vedvarende symptomer nyt røntgen efter 10-14 dage.

15 MDR GAMMELT BARN: TODDLERS FRACTURE



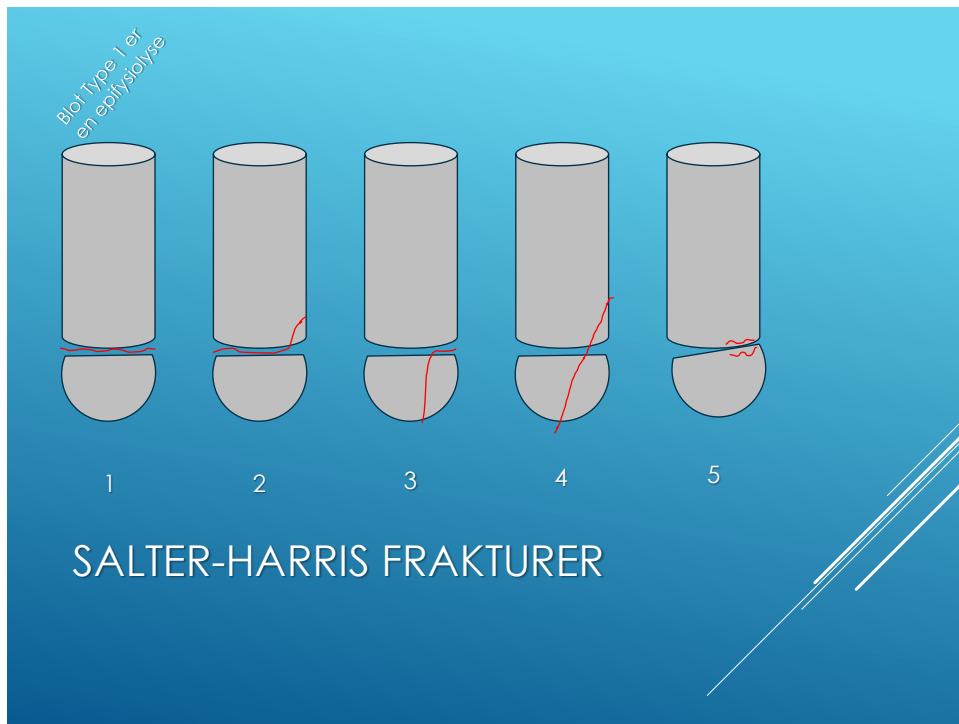
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- ▶ Diafyse
- ▶ Metafyse
- ▶ Fyse (Vækstskive)
- ▶ Epifyse
- ▶ (Apofyser)

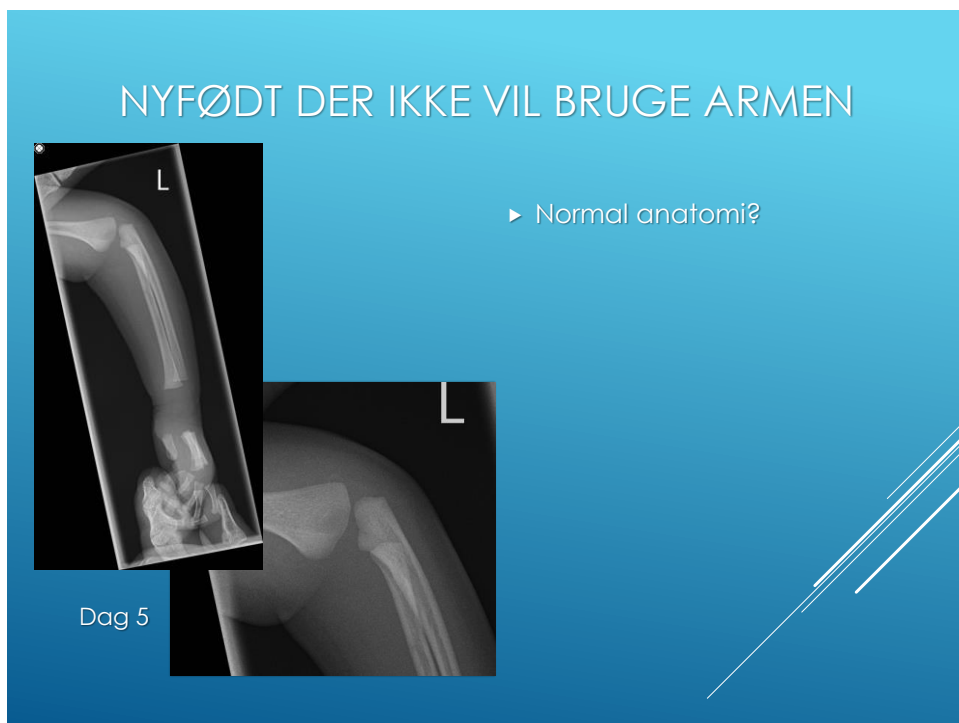


EPIFYSENÆRE FRAKTURER (VÆKSTPLADELÆSIONER)

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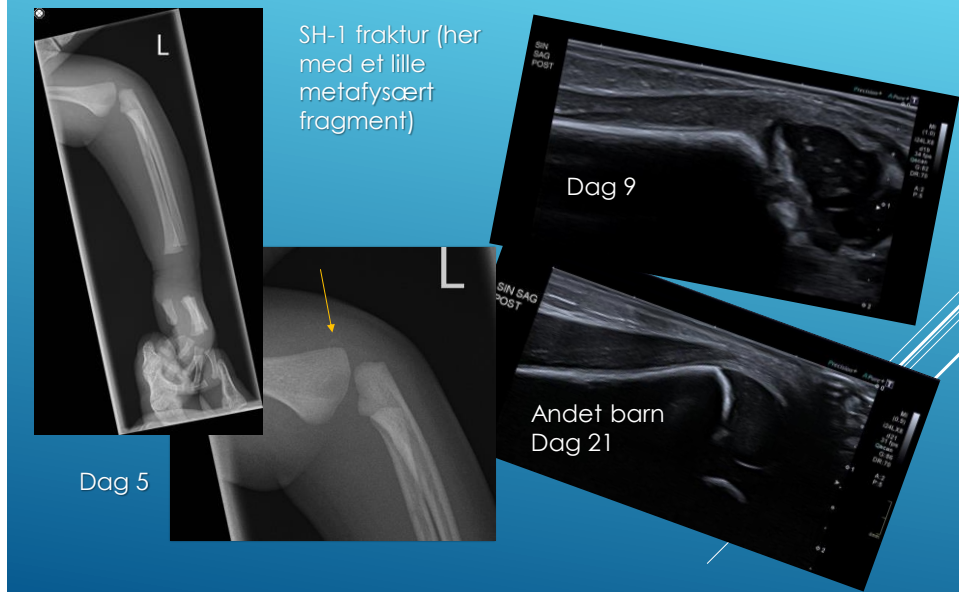


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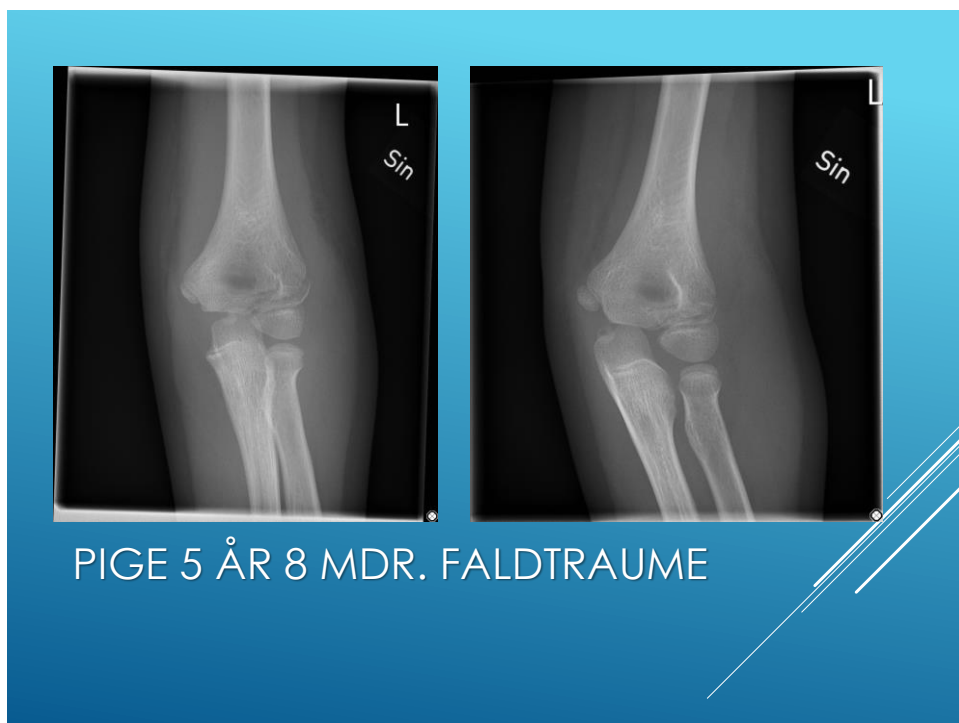


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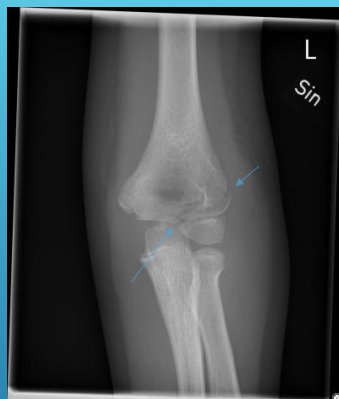
OBSTETRISK FRAKTUR: DISTALE HUMERUS



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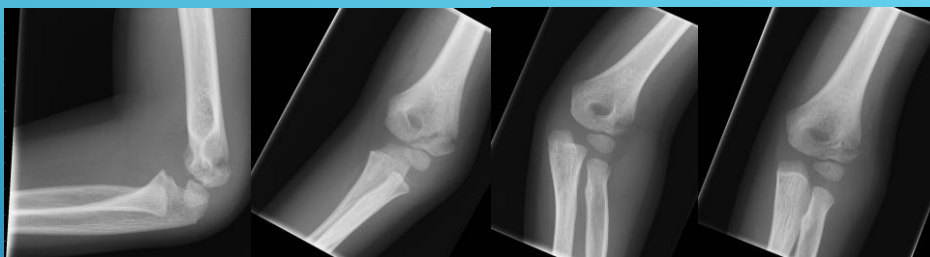


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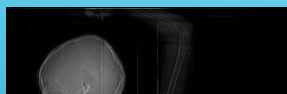
PIGE 5 ÅR 8 MDR. FALDTAUME
LATERAL HUMERUS CONDYL
FRAKTUR (SH-4 FRAKTUR)

63

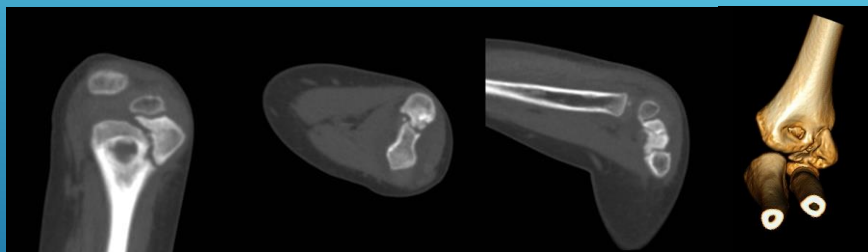


FIRE PROJEKTIONER: LATETAL, AP
OG TO SKRÅ
LATERAL CONDYL FRAKTUR

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Armen over hovedet reducerer
stråledosis til barnet



CT SKANNING
(2½ UGE SENERE)

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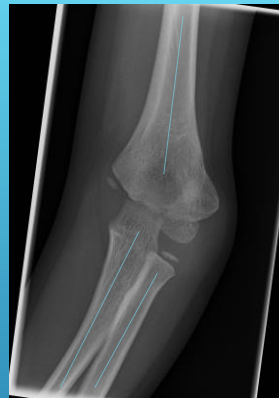
KONTROL 4 MDR EFTER TRAUMET

66



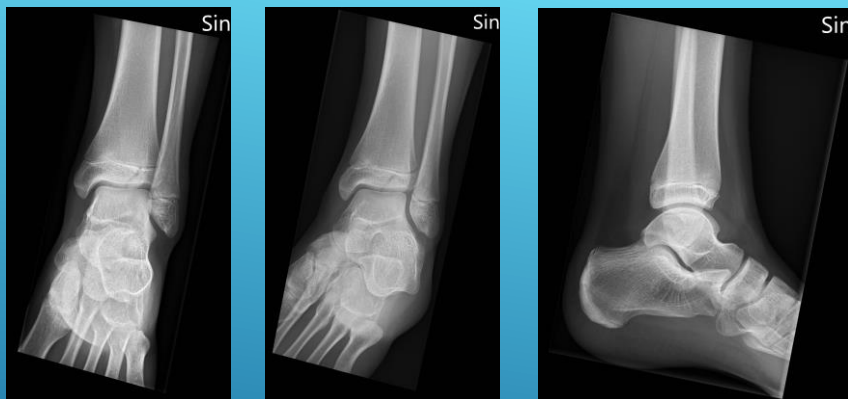
KONTROL ET ÅR EFTER TRAUMET:
TRAUMEFØLGER?

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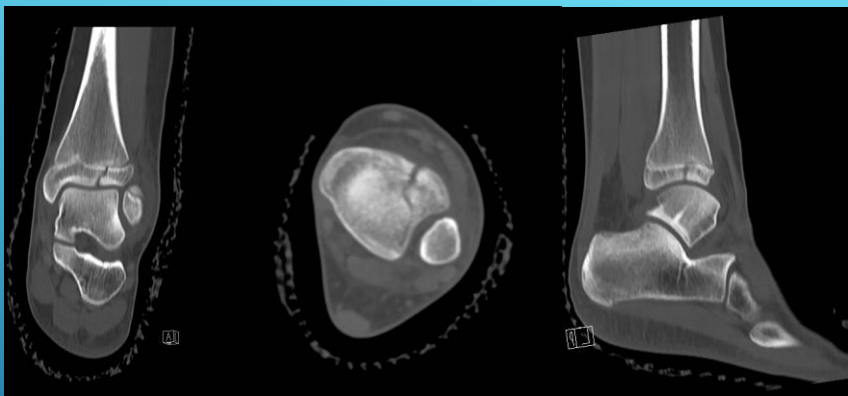
KONTROL ET ÅR EFTER TRAUMET:
VARUS VINKLING PGA.
VÆKSTFORSTYRRLSE

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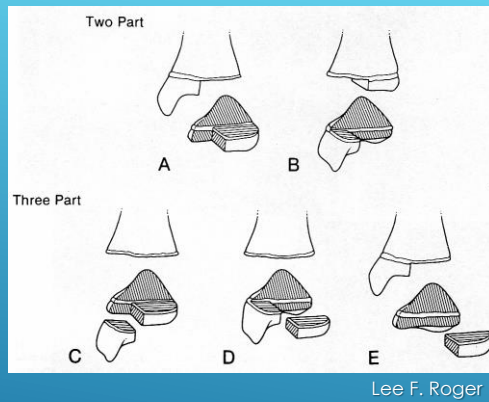
JUVENIL TILLAUX FRAKTUR (S-H
TYPE 3) (13-ÅRIG PIGE)

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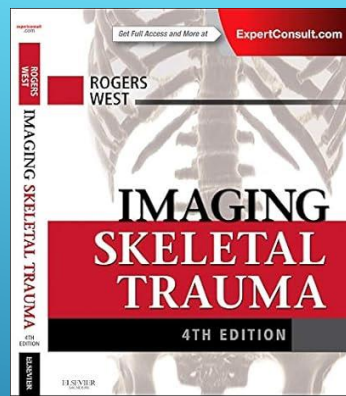
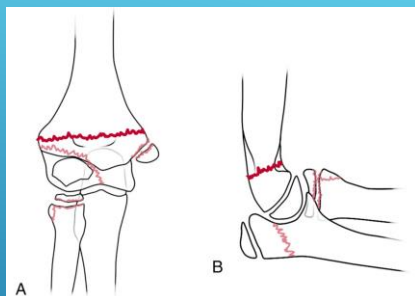
JUVENIL TILLAUX FRAKTUR (S-H
TYPE 3) (13-ÅRIG PIGE)

70



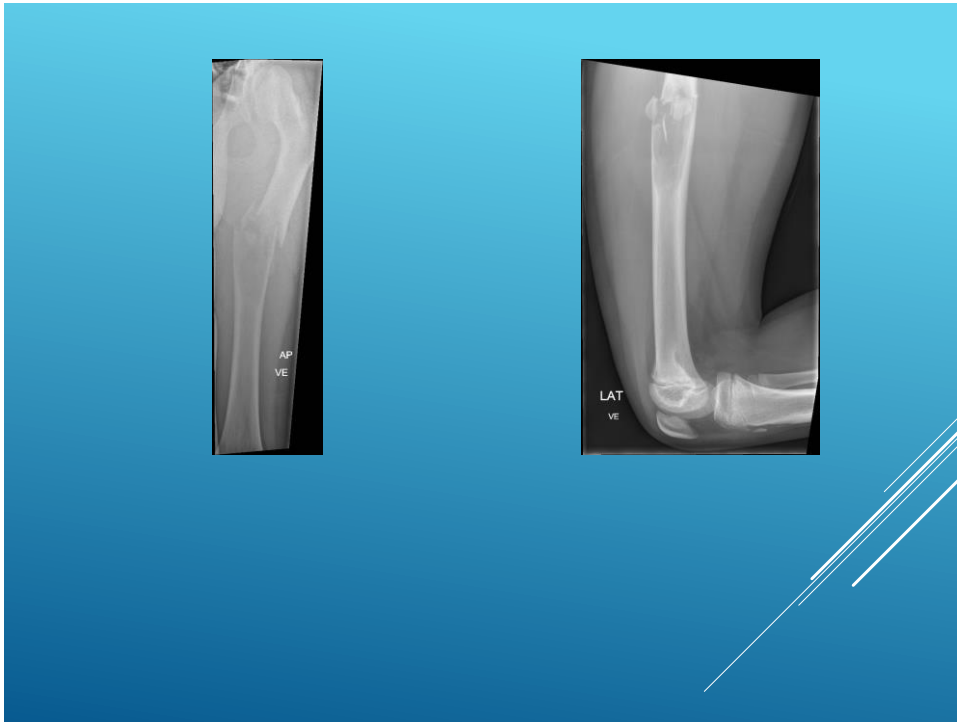
TRIPLANE FRACTURES (KOMPLEKS SKADE)

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KENDSKAB TIL DE ALMINDELIGSTE FRAKTURSTEDER

72



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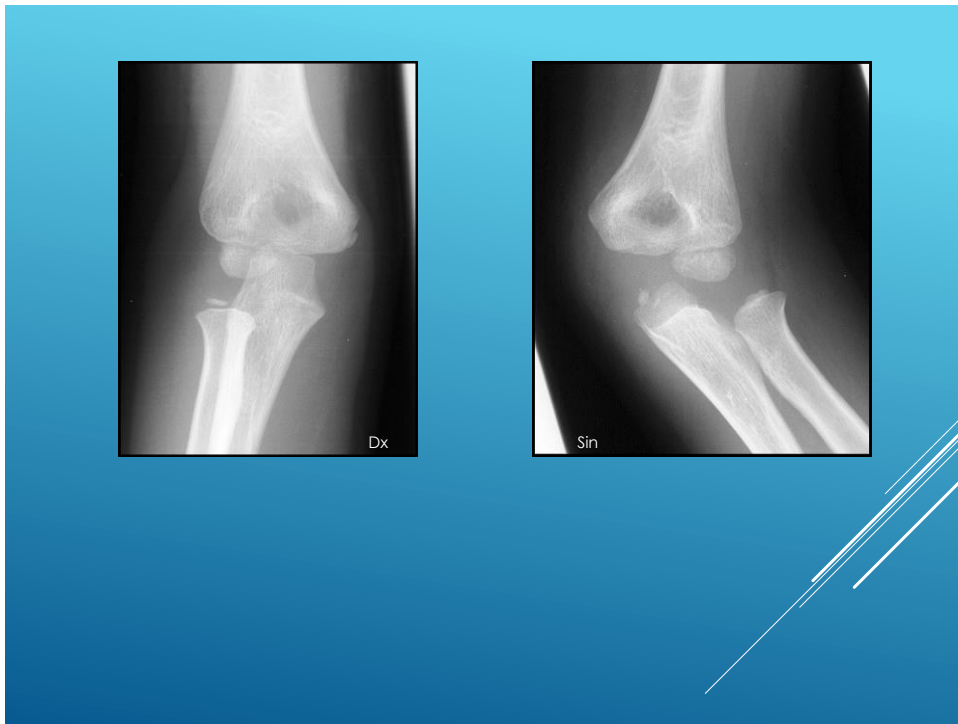
RTG. VE ALBUE EFTER TRAUME

75

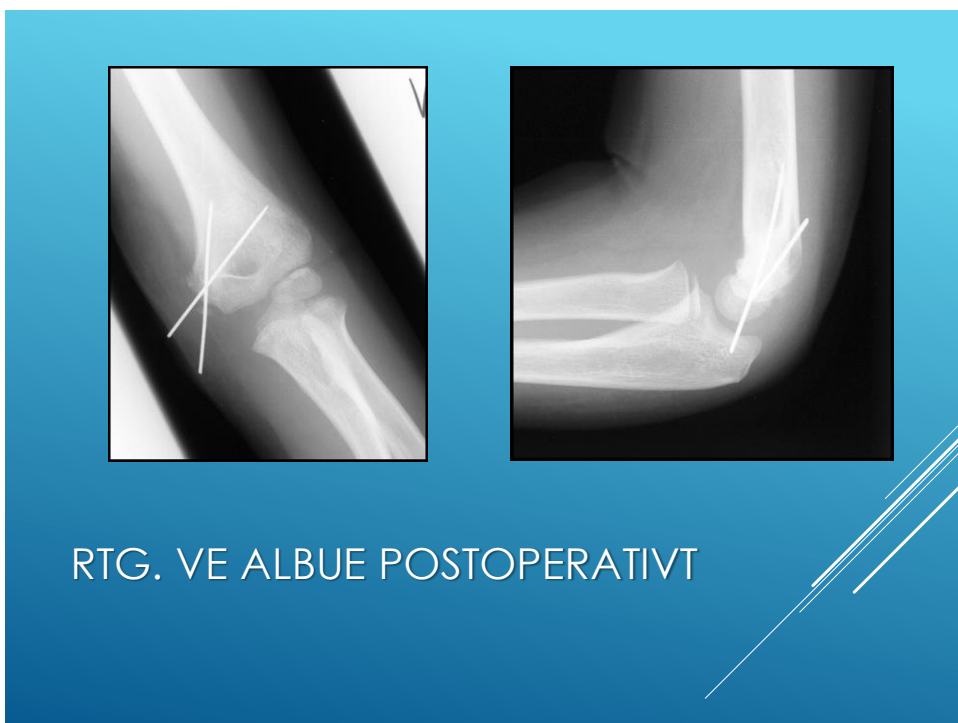


RTG. RASKE HØJRE ALBUE TIL SAMMENLIGNING

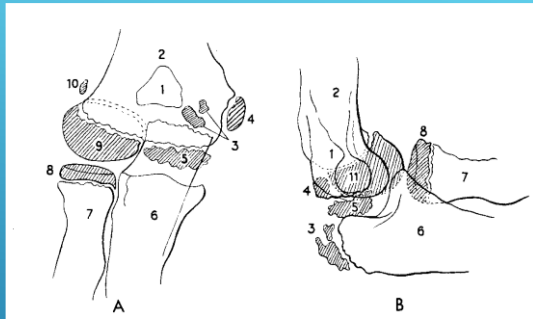
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CRITOL

C: Capitulum humeri
 R: Radial head
 I: Internal epicondyle
 T: Trochlea humeri
 O: Olecranon
 L: Lateral epicondyle

ANLÆGGELSE AF EPI- OG
 APOFYSER I ALBUEN HOS BØRN.

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13-ÅRIG DRENG – SYMPTOMER FRA
 VENSTRE HOFTE GENNEM LÆNGERE
 TID

80



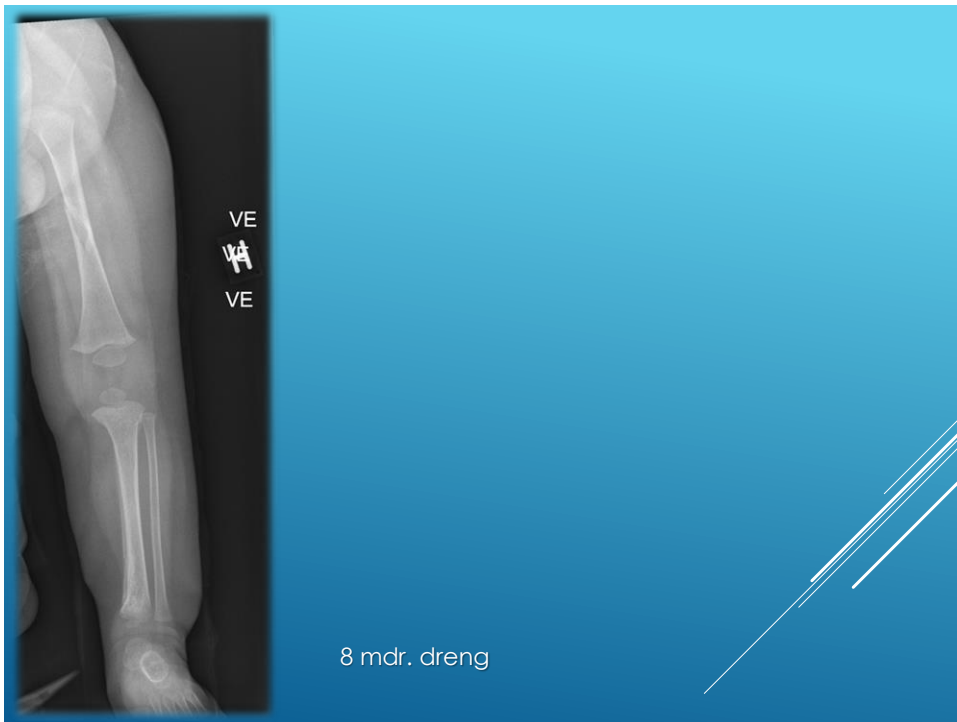
SPINA ILIACA ANTERIOR INFERIOR (SIAI) AVULSION UNDER OPHELING

81

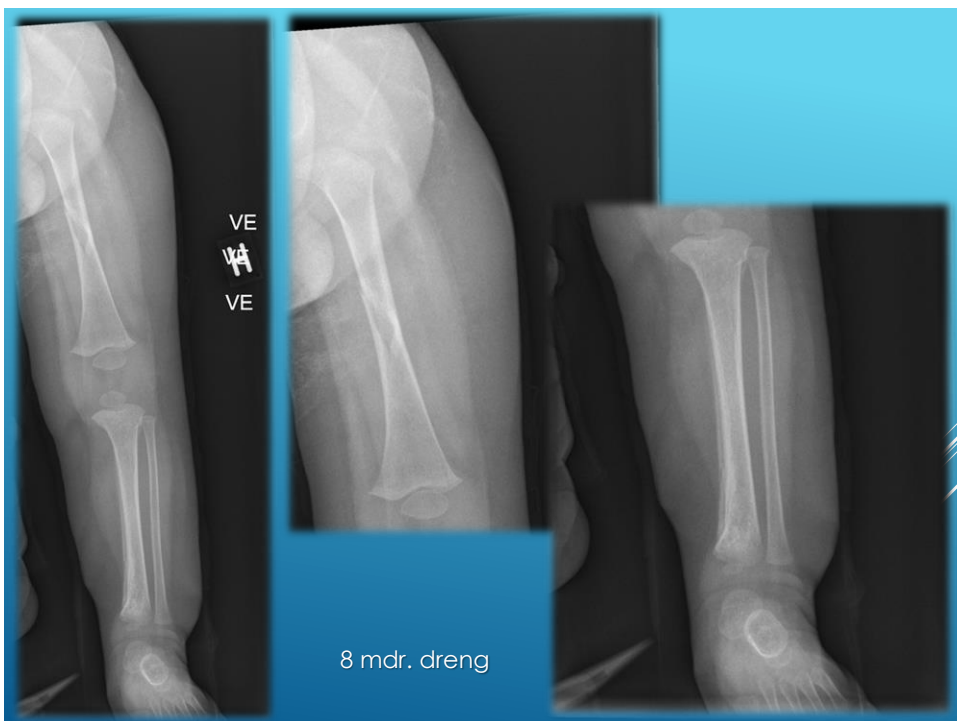
- ▶ Mediale humerus epicondyl
- ▶ Spina iliaca anterior superior
- ▶ Spina iliaca anterior inferior
- ▶ Tuber ischiadicum
- ▶ Sportsaktive (sprint, fodbold, tennis..)
- ▶ Unge

HYPPIGE STEDER MED APOFYSIOLYSE

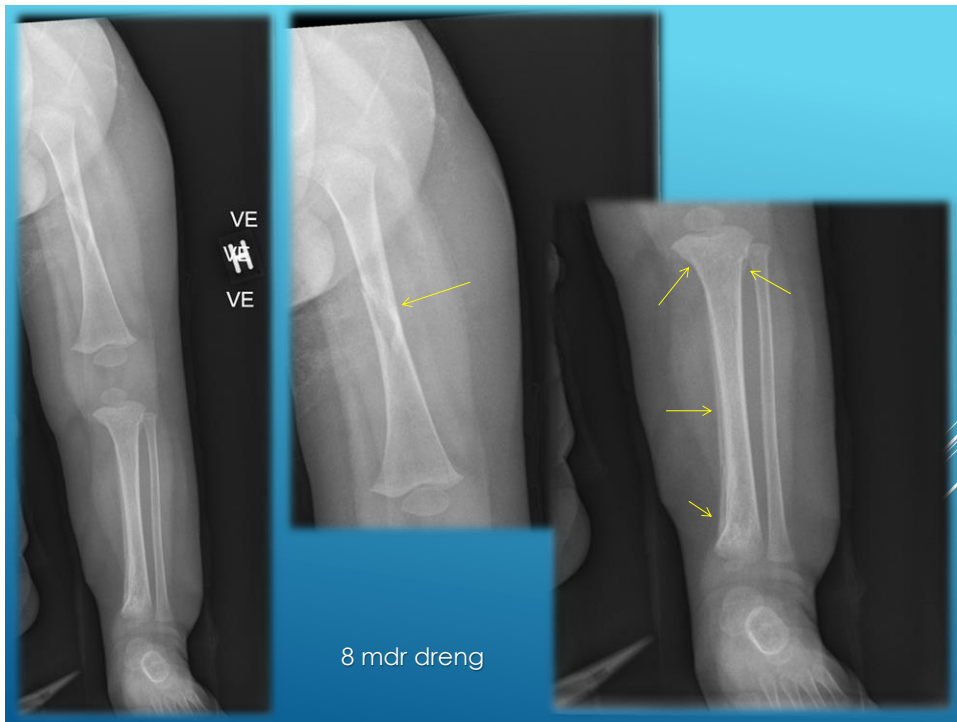
82



83



84



85

- ▶ Torus fraktur
- ▶ Greenstick fraktur
- ▶ Bowing fracture
- ▶ Salter-Harris fraktur type 1-5
- ▶ Patologisk fraktur
- ▶ Apofyse avulsjoner
- ▶ Toddler's fracture
- ▶ Juvenil Tillaux fraktur
- ▶
- ▶ "Battered child"

FRAKTURER: OVERSIGT

86



- ▶ Beskrivelse af fraktur

FEMURFRAKTUR 2-ÅRIG: +0 DAGE

87



- ▶ Lukket/åben
- ▶ Beliggenhed (herunder led involvering / fyse involvering)
- ▶ Komplet, fissur, infraktion
- ▶ Type: Tvær/skrå/indkilet/komminut/kompression/avulsion
- ▶ Forskydning/dislokation (knoglebredde/cm, retning)
- ▶ Vinkling (grader, retning)
- ▶ Rotation (svært/umulig!!)

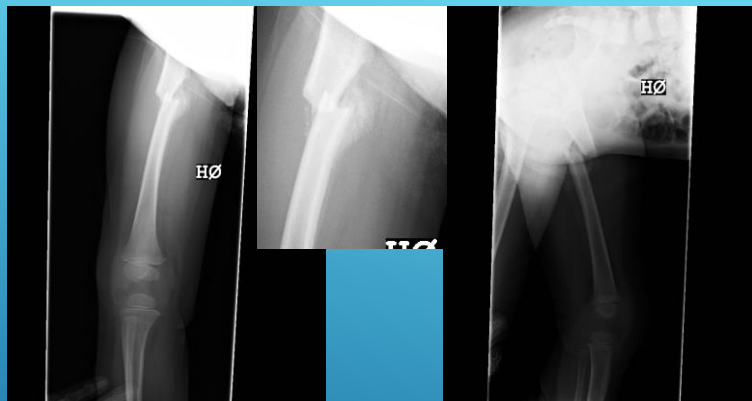
TERMER

88



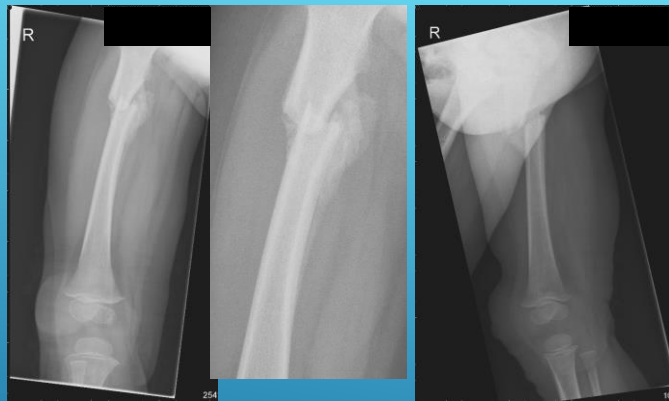
FRAKTURHELING
FEMUR FRAKTUR 2-ÅRIG: +0 DAGE

89



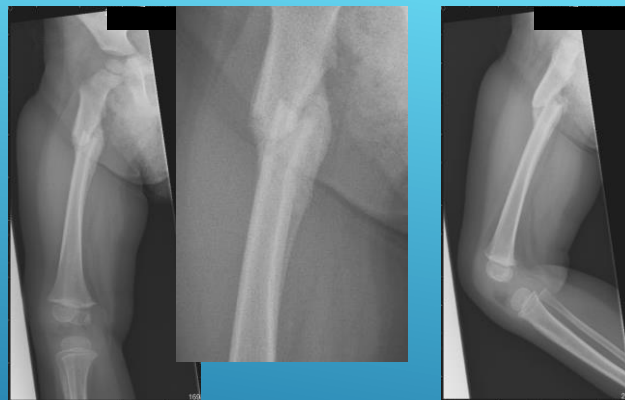
FEMUR FRAKTUR: +14 DAGE

90



FEMUR FRAKTUR: +18 DAGE

91



FEMUR FRAKTUR: +29 DAGE

92



FEMURFRAKTUR: + 2 ÅR

93



FRAKTURLUXATION:
8½ ÅR GAMMEL

94



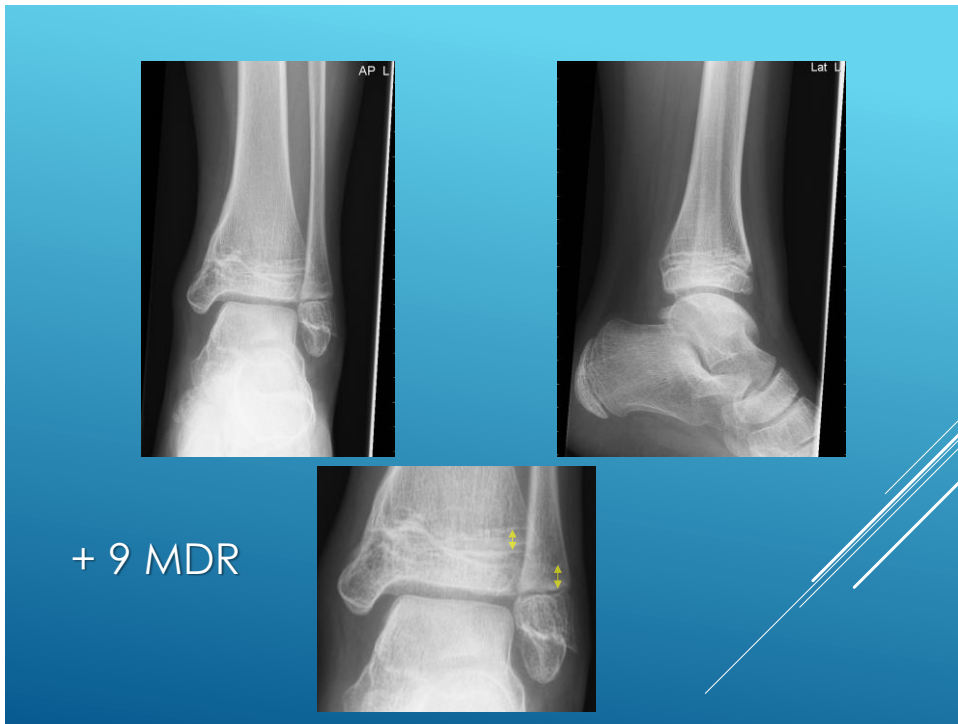
+ 4 MDR

95

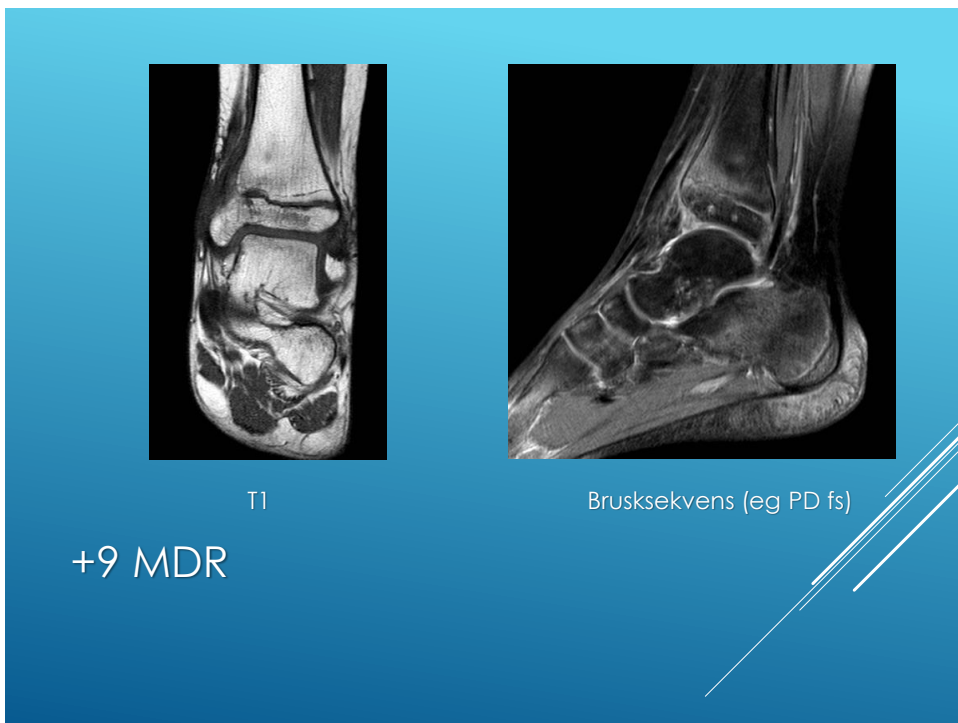


+ 9 MDR

96



97



98

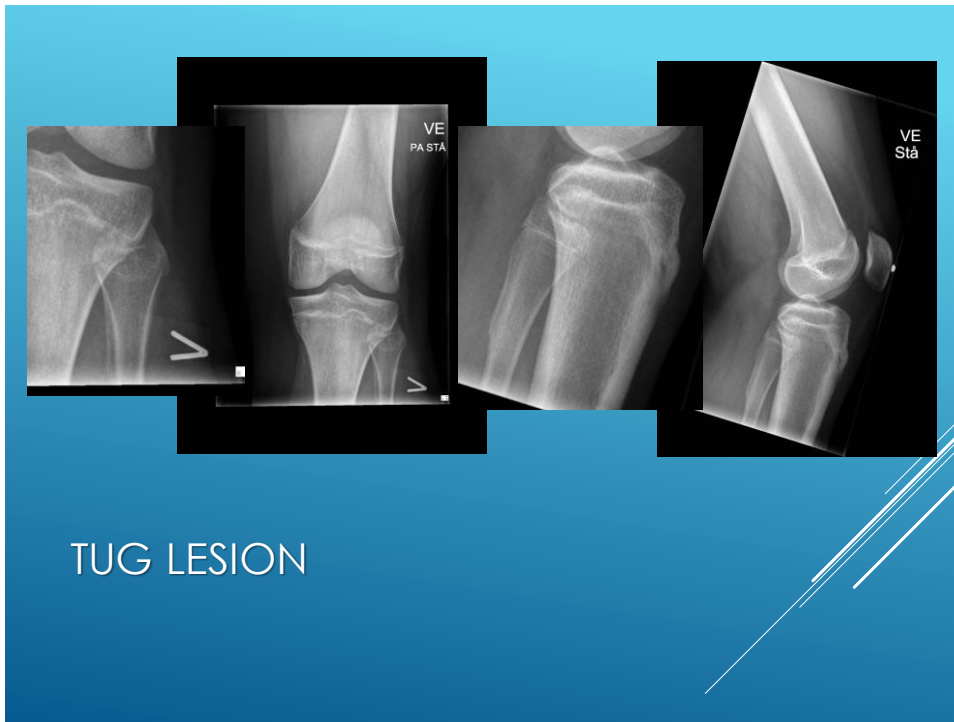
KNOGLETUMORER

99

KNOGLE OG BLØDDELSTUMORER: OVERORDNEDE BETRAGTNINGER

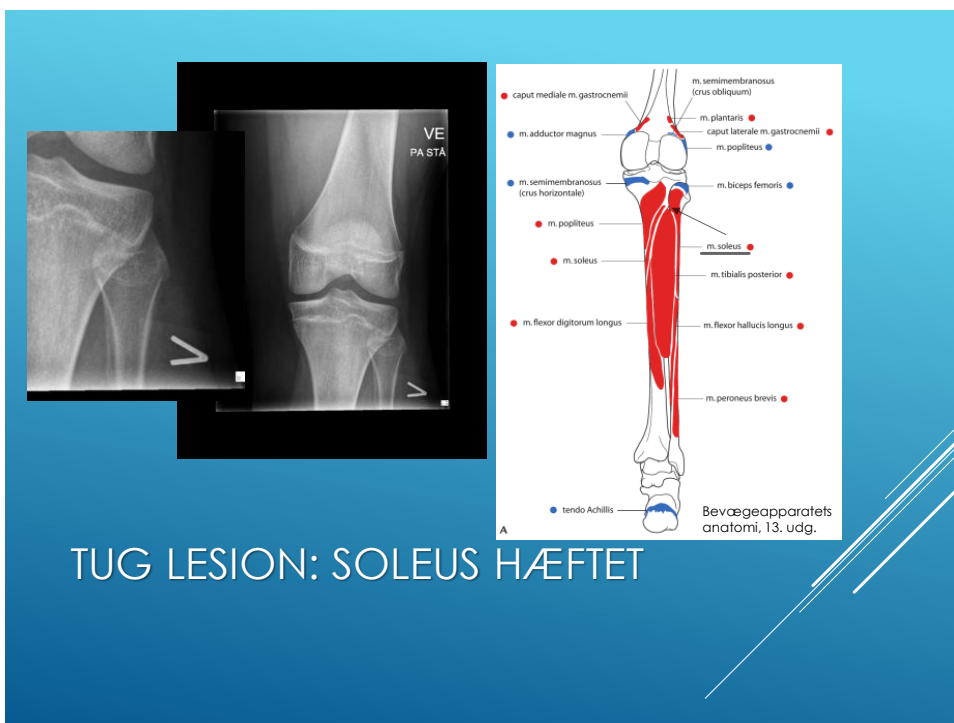
Der henvises i øvrigt til A-kursus i Muskuloskeletal radiologi

100



TUG LESION

101



TUG LESION: SOLEUS HÆFTET

102



FORANDRINGER?

103



NON-OSSIFICERENDE FIBROM

104

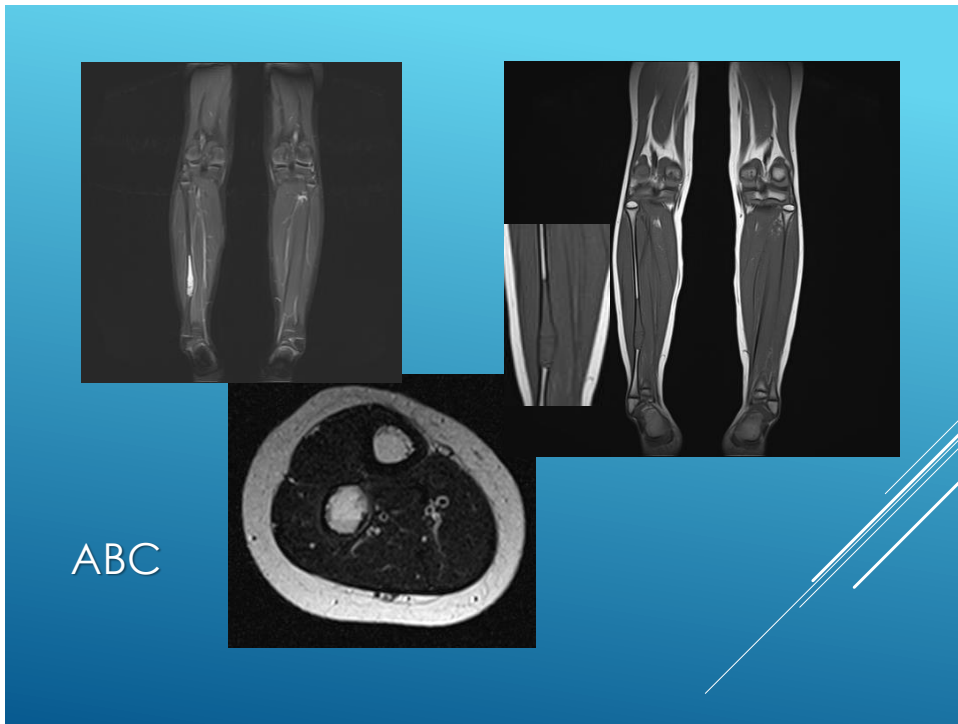


NON-OSSIFICERENDE FIBROM – KONTROL TO ÅR SENERE

105



106



107



108



7-ÅRIG PIGE

109



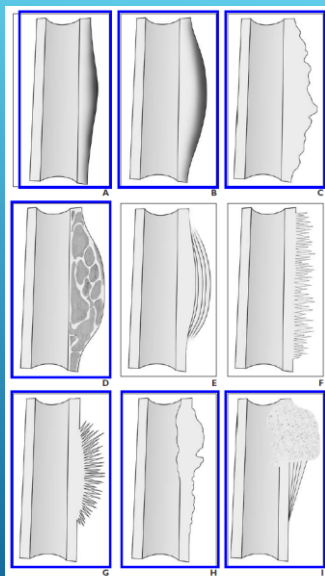
VEDVARENDE SYMPTOMER. NY
RTG. EFTER 4 MDR.

110

- ▶ Onion skin (O)
- ▶ Hair on end periosteal reaction (H)
- ▶ Codmans triangle (C)



111

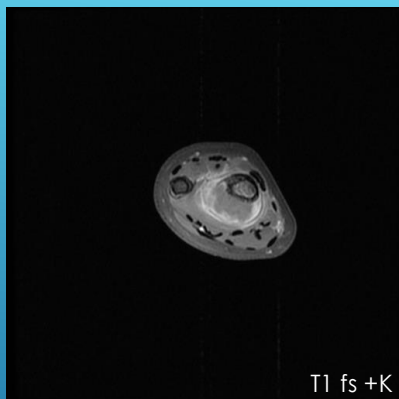


PERIOSTEAL REAKTION

Fig. 1—Various subtypes of nonaggressive and aggressive periosteal reaction. A–I, Diagrams show thin (A), solid (B), thick irregular (C), septated (D), laminated (onionskin) (E) perpendicular/hair-on-end (F) sunburst (G) disorganized (H) Codman triangle (I) periosteal reactions (Courtesy of Larson ME, Boston, MA)

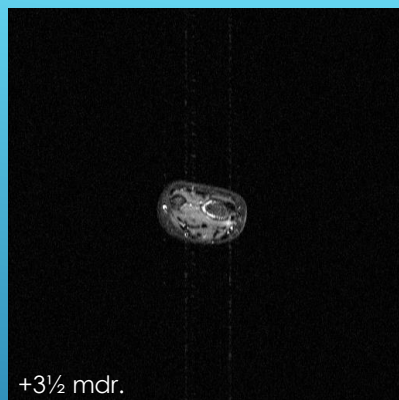
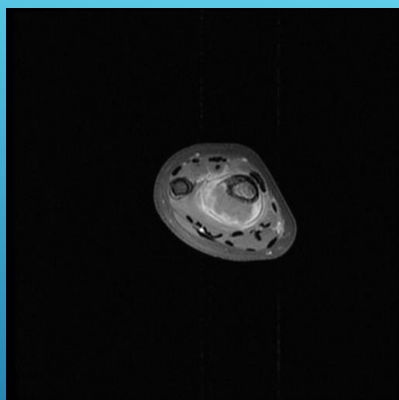
Rana et al. 2009

112



EWINGS SARKOM

113



KONTROL 3½ MÅNED SENERE EFTER KEMOTERAPI

114

- ▶ Primær undersøgelse: Rtg (bidrager til differentialdiagnoser mv.)
- ▶ MR af tumor og hele knoglen mhp. skip lesions ved malign tumor og +K
- ▶ PET-CT afhængig af tumor

KNOGLETUMORER

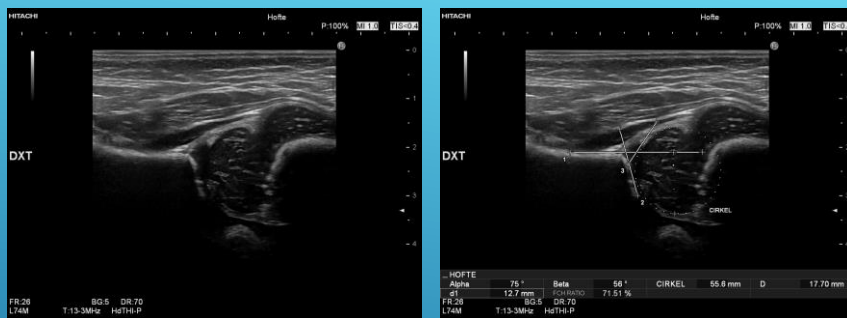
115

KONGENITTE OG ERHVERVEDE FORANDRINGER

116

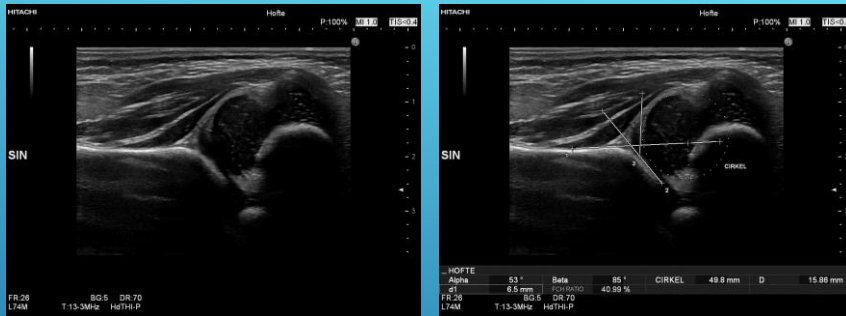
HOFTELESDYSPLASI

117



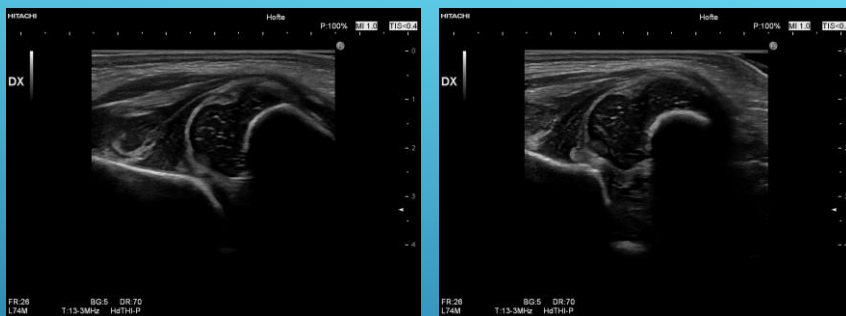
DDH: ULTRALYDSKANNING

118



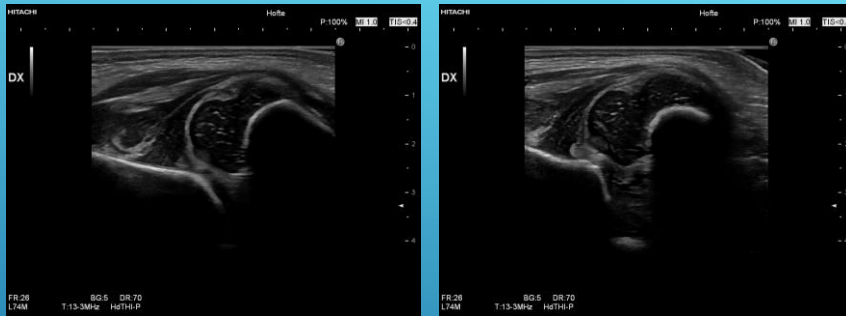
DDH: DYSPLASI OG LATERALISERING, PIGE 9 DAGE

119



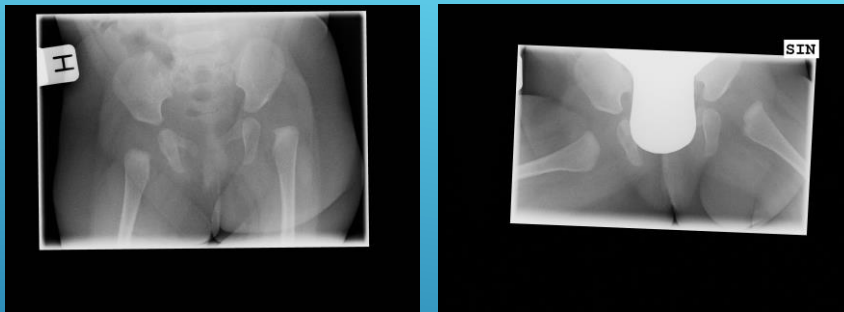
DDH: LUKSATION, DRENG 1 UGE

120



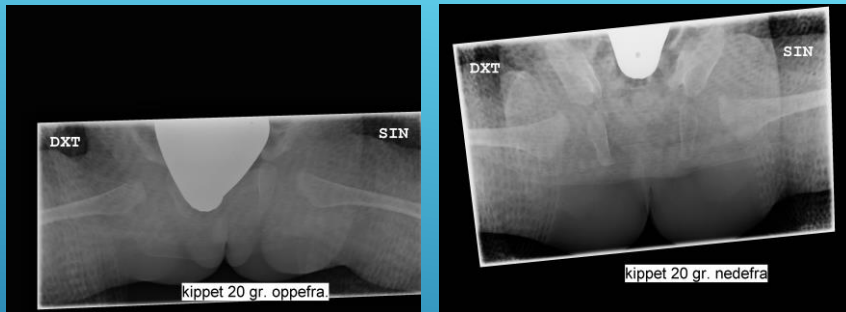
DDH: LUKSATION, DRENG 1 UGE
 BEHANDLING: TIDL. DB-SKINNE I 6
 UGER, SÅ UL KONTROL, NU PAVLIK
 SELE I 4 UGER SÅ KONTROL

121



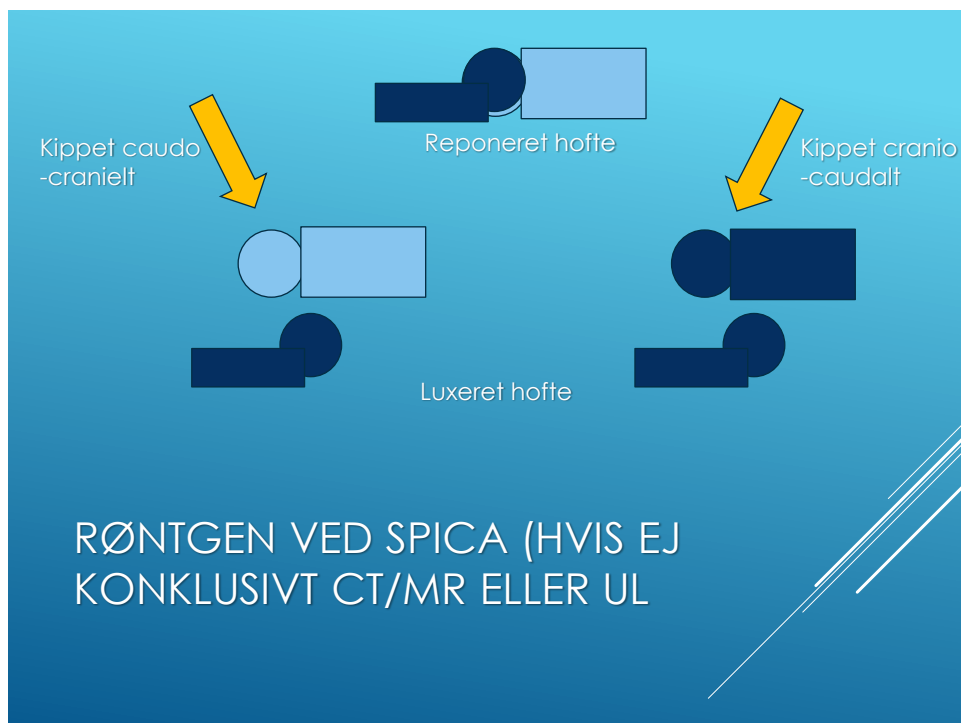
4 MÅNEDER GAMMEL BARN

122



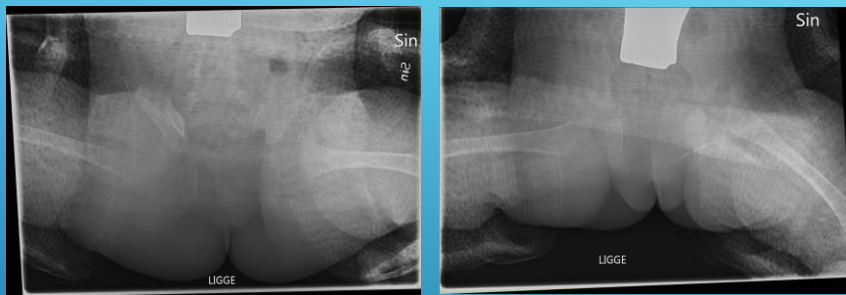
4 MÅNEDER GAMMEL BARN SPICA
BEHANDLING, VELREPONERET

123



RØNTGEN VED SPICA (HVIS EJ
KONKLUSIVT CT/MR ELLER UL

124

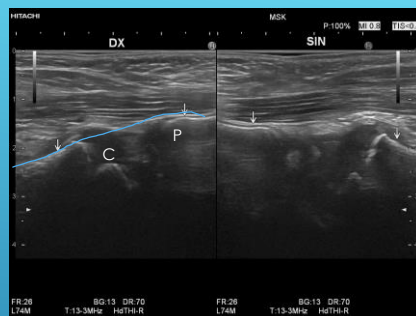


8 MÅNEDER GAMMEL PIGE: SPICA BEHANDLING, IKKE REPONERET

125

5½ måned gammel barn.

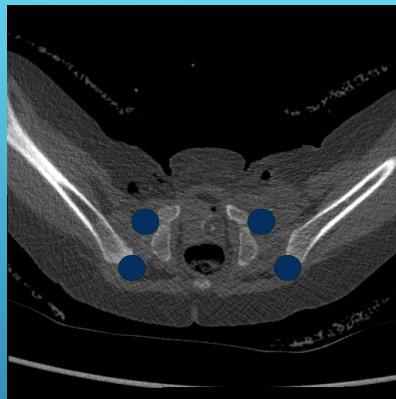
Forkanten af os pubis og femur meta-diafysen ligger på linje



C: Caput femoris. P: Corpus ossis pubis

PER-OP REPONERING AF VENSTRE HOFTE, DYNAMISK UL

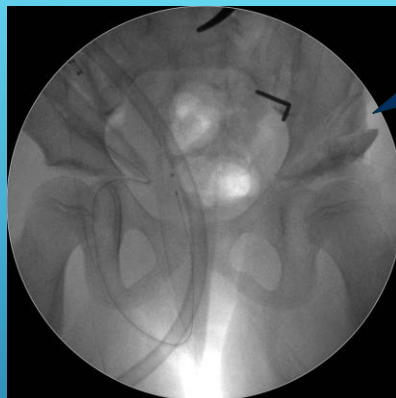
126



CT (ELLER OPTIMALT MR)
I UDVALGTE TILFÆLDE



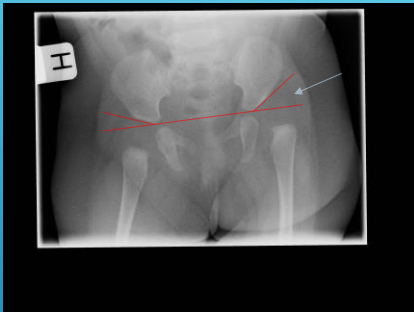
127



6-ÅRIG PIGE BEHANDLET MED
PERIACETABULAR PEMBERTON
OSTEOTOMI

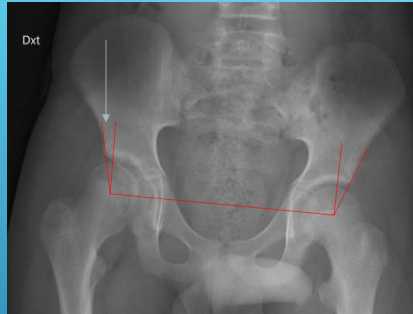
128

Acetabular vinkel



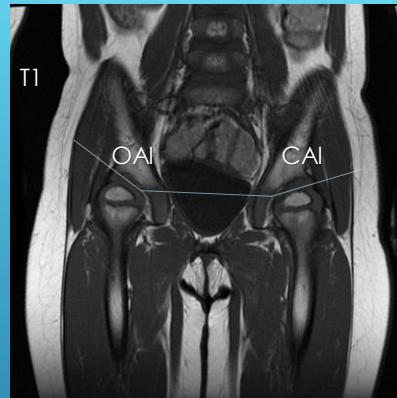
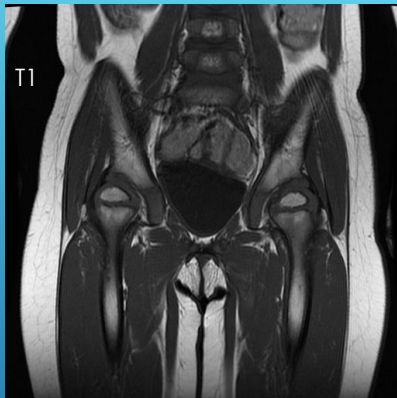
Kaldes ind imellem acetabular indeks: AI

CE vinkel

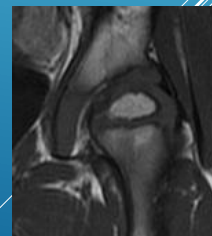


UDMÅLING: INDIMELLEM KAN DET
VÆRE SVÆRT – SKRIV DET SÅ I
BESKRIVELSE

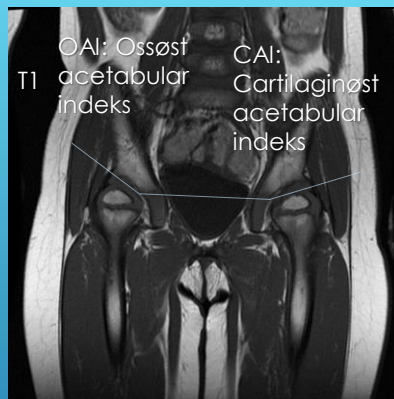
129



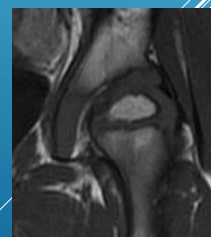
DYSPLASI VURDERING VED MR
SKANNING AD MODUM LI: OAI OG
CAI BESTEMMELSE



130



DYSPLASI VURDERING VED MR SKANNING AD MODUM LI: OAI OG CAI BESTEMMELSE



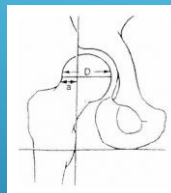
131

- ▶ CPOP: Cerebral parese (og lignende tilstande) opfølgingsprogram, med kontrol af bl.a. (bevægeapparatet):

- ▶ Hoffer (Rtg)
- ▶ Columna (Rtg hvis tegn til skoliose)

- ▶ Reimars index:

- ▶ <33%: Kontrol
- ▶ 33%-40%: Klinisk afgørelse
- ▶ >40%: Normalt operation

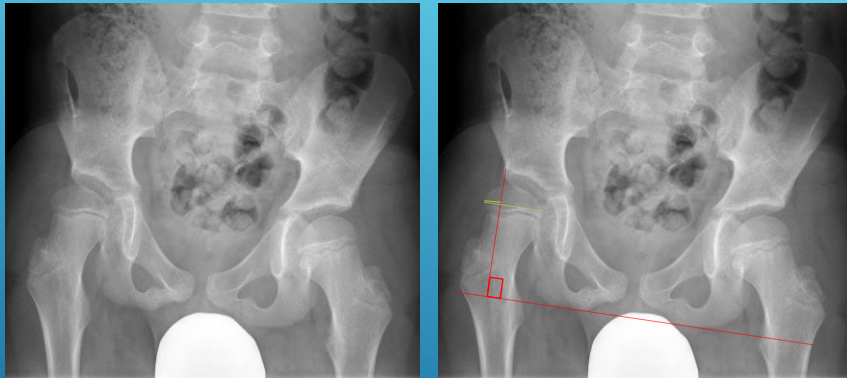


www.cpop.dk

CEREBRAL PARESE

132

Barn med cerebral parese



LATERALISERING, DYSPLASI OG
COXA VALGA
REIMERS INDEX

133

SYSTEMISKE SYGDOMME

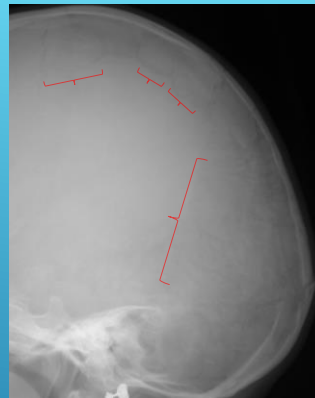
Enkelte eksempler

134

- ▶ 90% pga. mutation i et af de to gener der koder for alfa-kæder i collagen type 1 (COL1A1 og COL1A2)
- ▶ Knogleskørhed med nedsat knoglemasse og abnormt bindevæv
- ▶ Ekstraskeletalt: blå sclerae, dentinogenesis imperfecta, løshed i ligamenter og hud, nedsat hørelse
- ▶ Type 1-5: Stigende sværhedsgrad: 1,4,5, 3 og 2 (perinatal letal)
- ▶ Bemærk: Stor variation i præsentation fra in utero frakturer til milde former med få (eller ingen) frakturer i voksenalder

OSTEOGENESIS IMPERFECTA

135



MULTIPLE OSSA WORMIANA (SES OGSÅ VED EKSEMPELVIS CLEIDOCRANIEL DYSOSTOSE)

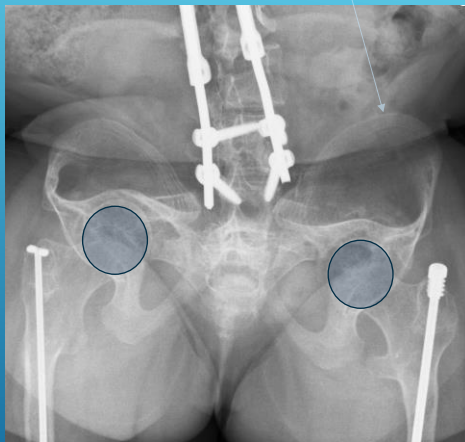
136



OSTEOGENESIS
IMPERFECTA:
CENTRAL MIGRATION AF
CAPUT FEMORIS BILATERALT

16-årig kvinde

137

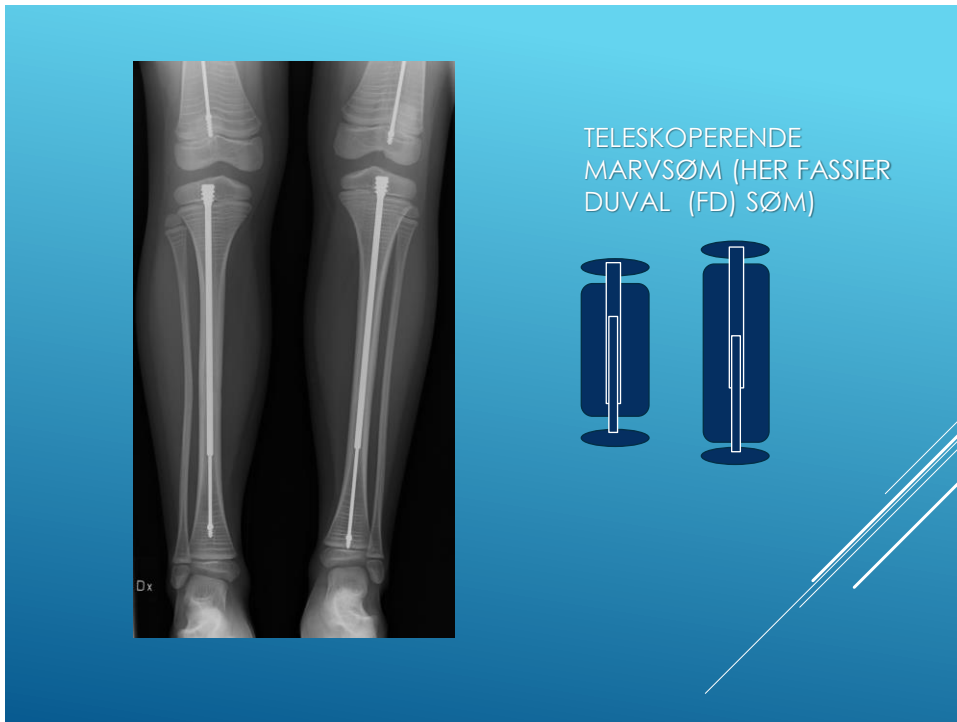


Multiple growth
arrest/recovery/Harris lines

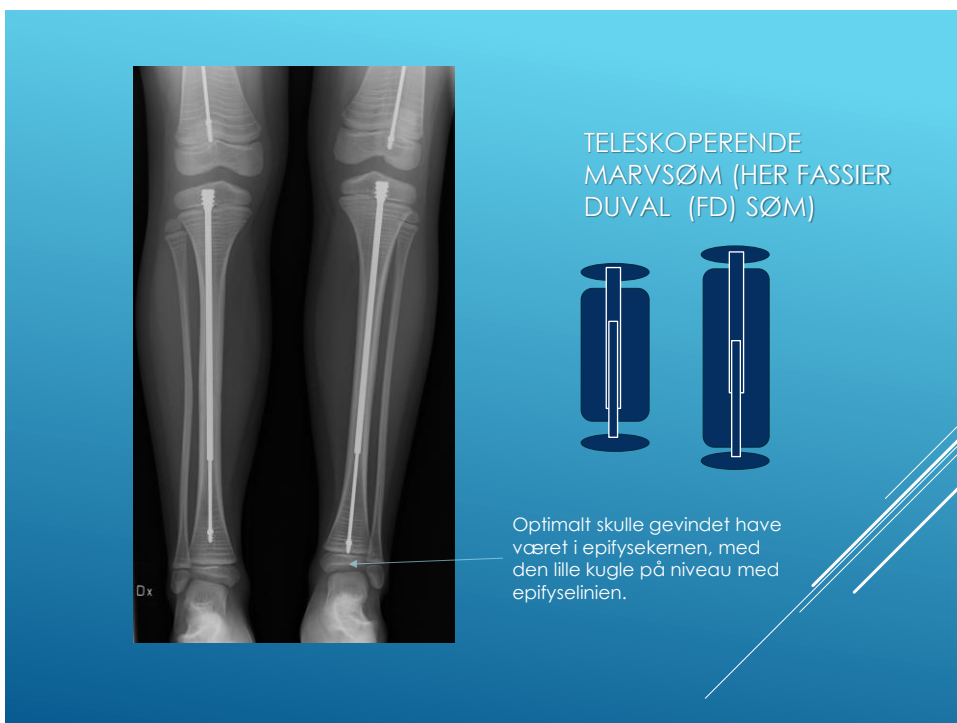
OSTEOGENESIS
IMPERFECTA:
CENTRAL MIGRATION AF
CAPUT FEMORIS BILATERALT

16-årig kvinde

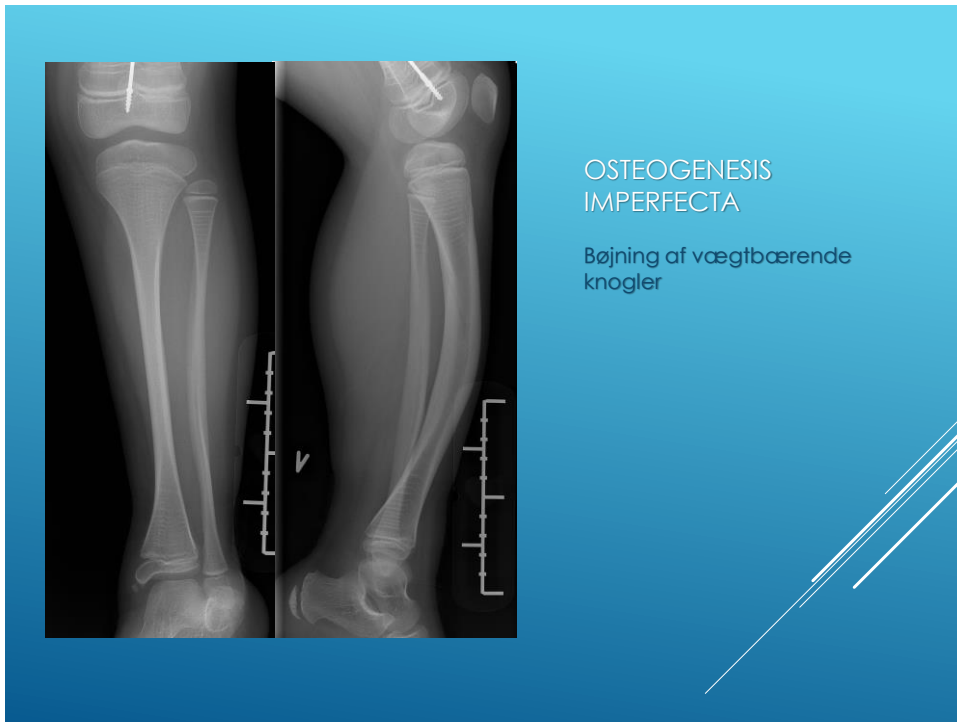
138



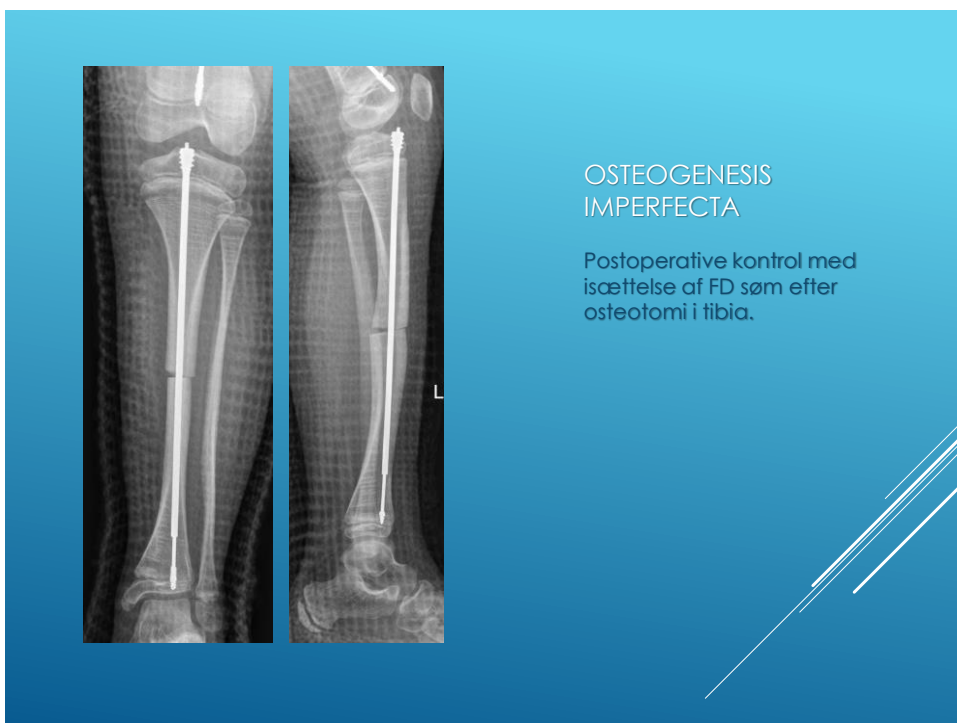
139



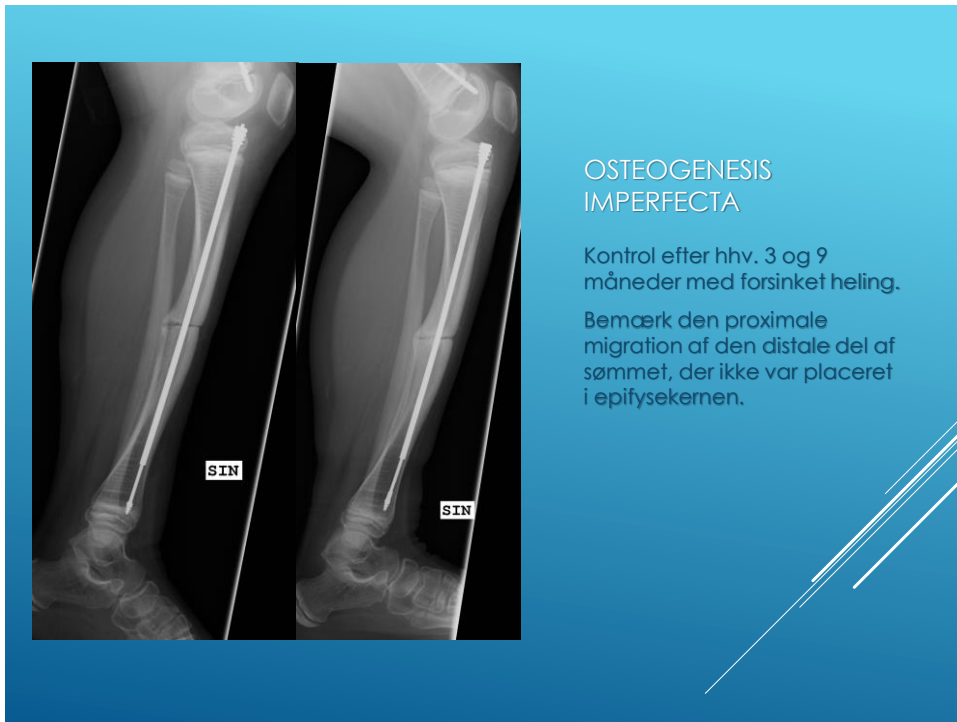
140



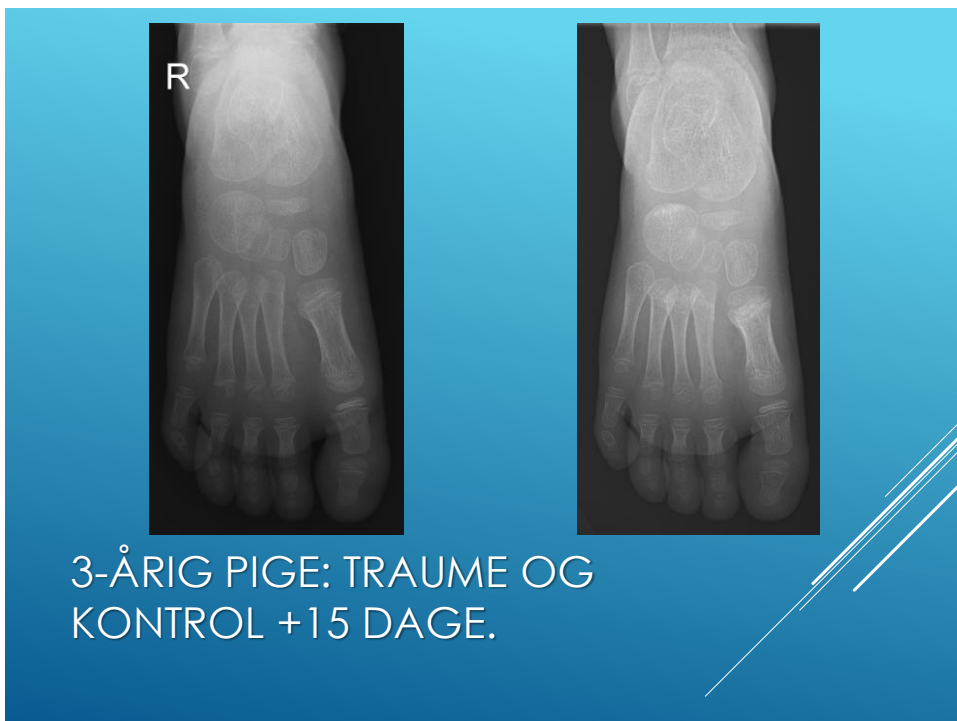
141



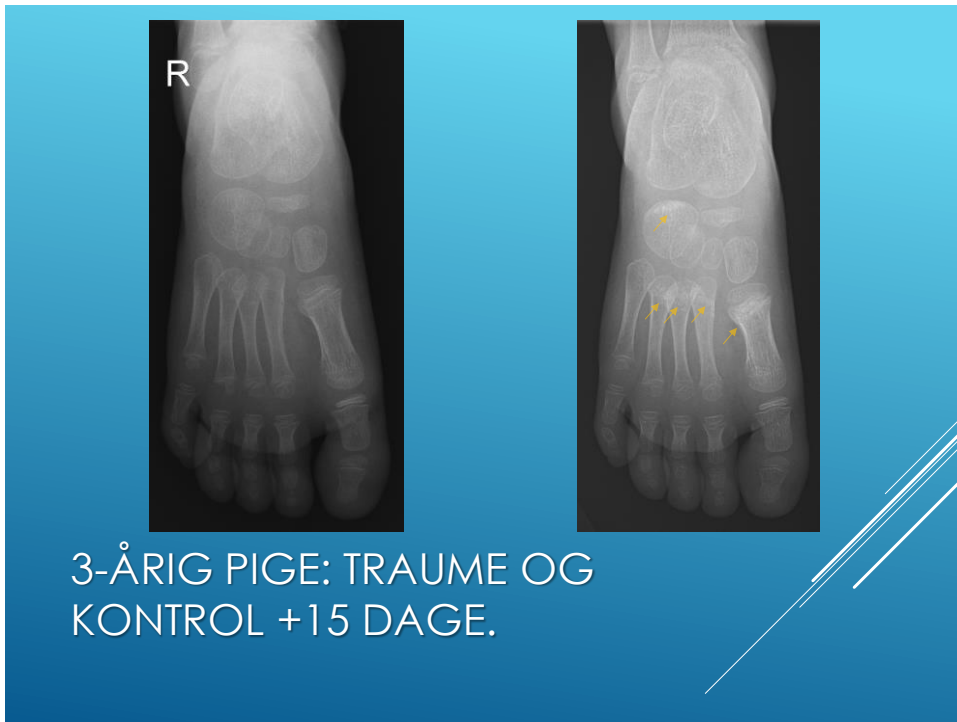
142



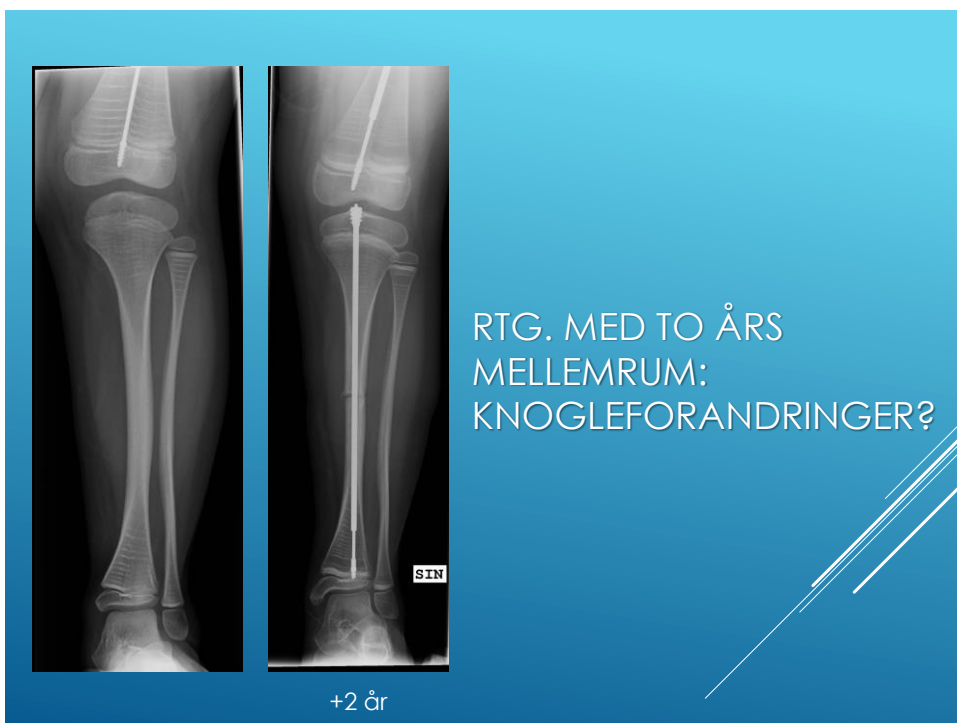
143



144



145



146



RTG. MED TO ÅRS MELLEMRUM

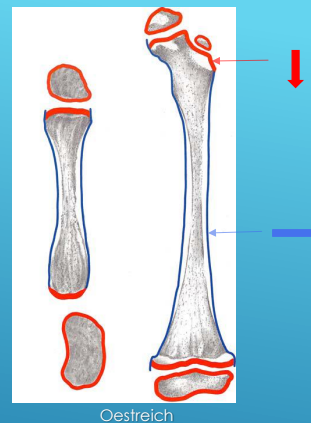
147



RTG. MED TO ÅRS MELLEMRUM:
BIFOSFONATBEHANDLING

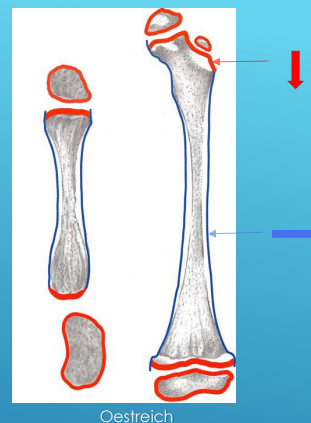
148

- ▶ Dværgvækst
- ▶ Fødselshyppighed: 1:10.000-30.000
- ▶ Autosomal dominant (FGFR3 mutation)
- ▶ Høj mutationsrate (80% har forældre med normal højde)



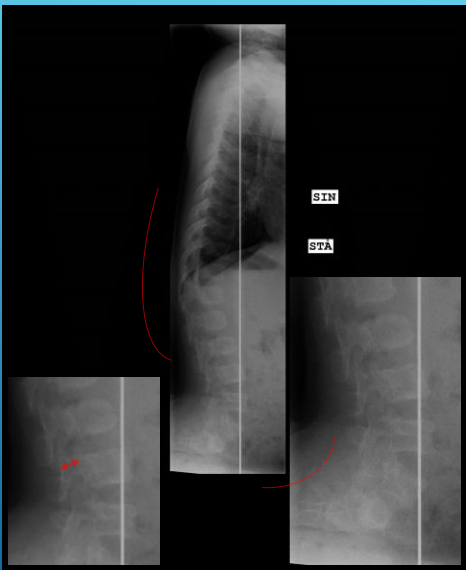
ACHONDROPLASI

149



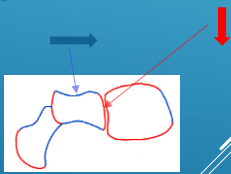
ACHONDROPLASI

150




SKOLIOSEOPTAGELSE

Odontoid hypoplasi (få)
 Udvikling af kyfose (nogle), samt smertegivende lændelordose
 Kort pedikel og interpedikulær afstand. Neurologisk påvirkning af UE ved 20 års alderen hos 20 %



Oestreich

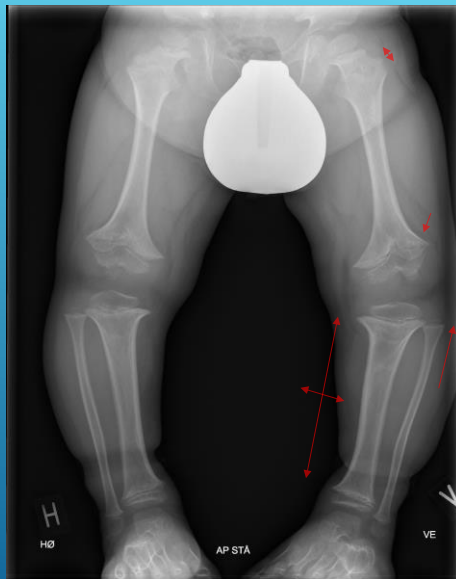
151



HKA OPTAGELSE

HKA: Hip-Knee-Ankle
 Stående optagelse med stor FFA (gerne 3 m eller derover)

152



HKA OPTAGELSE

Øget diameter i forhold til længde (dysproportional)

Kort collum femoris

Metafysære uregelmæssigheder

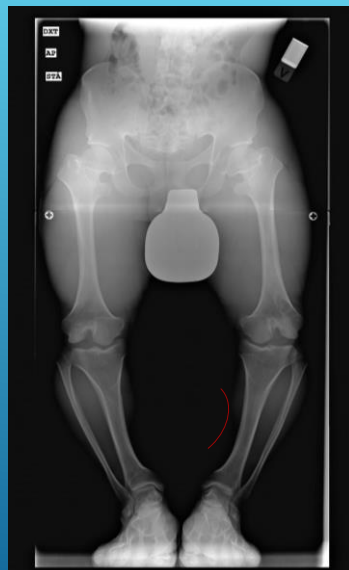
Fibulær overvækst

Genu varum



Oestreich

153



HKA OPTAGELSE

16-årig mand

154

MUCOPOLY- SACCHARIDOSER (MPS)

- ▶ Lysosomal sygdom
 - ▶ 4-6/100.000 nyfødte
 - ▶ Mange subtyper: MPS-I-IX (ikke V eller VIII).
 - ▶ Fraset MPS-II, autosomal recessiv.
 - ▶ Normal ved fødsel (progressiv sygdom)
- ▶ Skeletalt: Dysostosis multiplex
 - ▶ Forsinket vækst/ophør
 - ▶ Håndforandringer
 - ▶ Columna forandringer
 - ▶ Hofteforandringer
 - ▶ Tykke korte diafysler og hypoplastiske epifyser

MORQUIO SYNDROM (MUCOPOLYSACCHARIDOSIS IV)

155

MORQUIO SYNDROM (MUCOPOLYSACCHARIDOSIS IV)

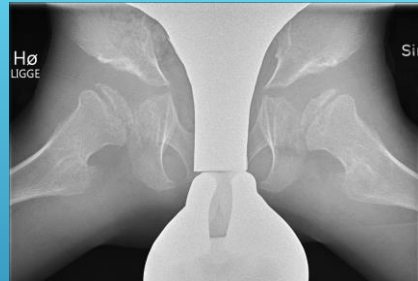


J-FORMET SELLA



156

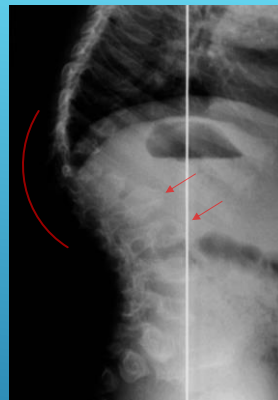
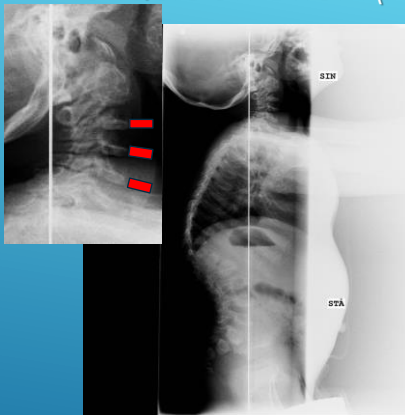
MORQUIO SYNDROM (MUCOPOLYSACCHARIDOSIS IV)



HOFTEDYSPLASI CAPUT FORANDRINGER

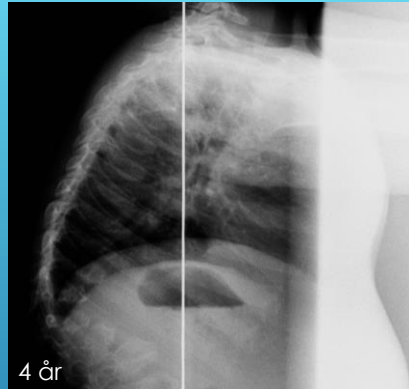
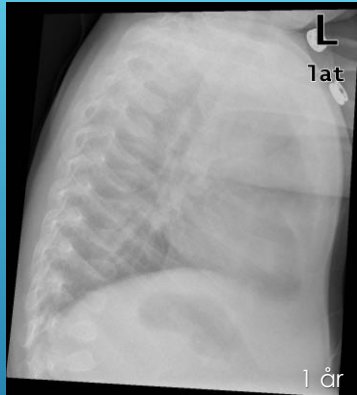
157

MORQUIO SYNDROM (MUCOPOLYSACCHARIDOSIS IV)



PLATYSPONDYLI KYFOSE PÅ THORACOLUMBALE OVERGANG

158



PROGRESSION AF FORANDRINGER (PROGRESSIV SYGDOM)

159

- ▶ Systemiske sygdomme og syndromer kan præsentere sig:
 - ▶ Med tydelige og entydige fund
 - ▶ Med diskrete forandringer
- ▶ Det er vigtigt altid at analysere hele undersøgelsen og evt. tidligere undersøgelser
- ▶ Det er vigtigt at have et godt kendskab til den radiologiske normal anatomi
- ▶ MDT-konferencer er ofte nødvendige.

SYNDROMER OG DYSPLASIER (OFTEST) SPECIALISTOPGAVE

160

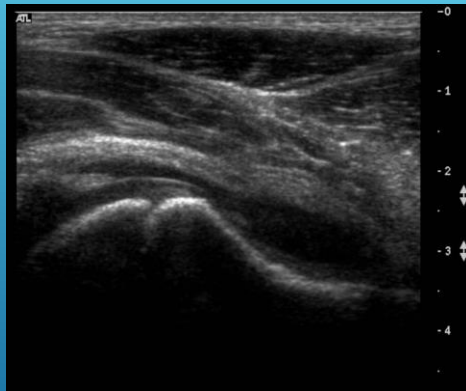
DET HALTENDE BARN

161

- ▶ 7-årig dreng.
- ▶ Spontan opstået smerter i venstre hofteregion, for få dage siden.
- ▶ Ligger med hoften flekteret.
- ▶ Afebril

BILLEDDIAGNOSTIK?

162

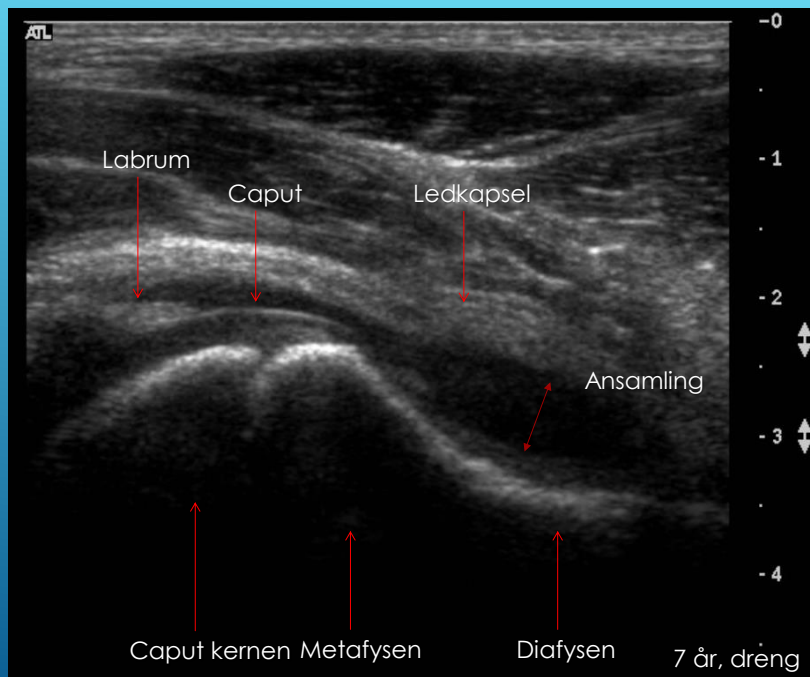


ULTRALYD

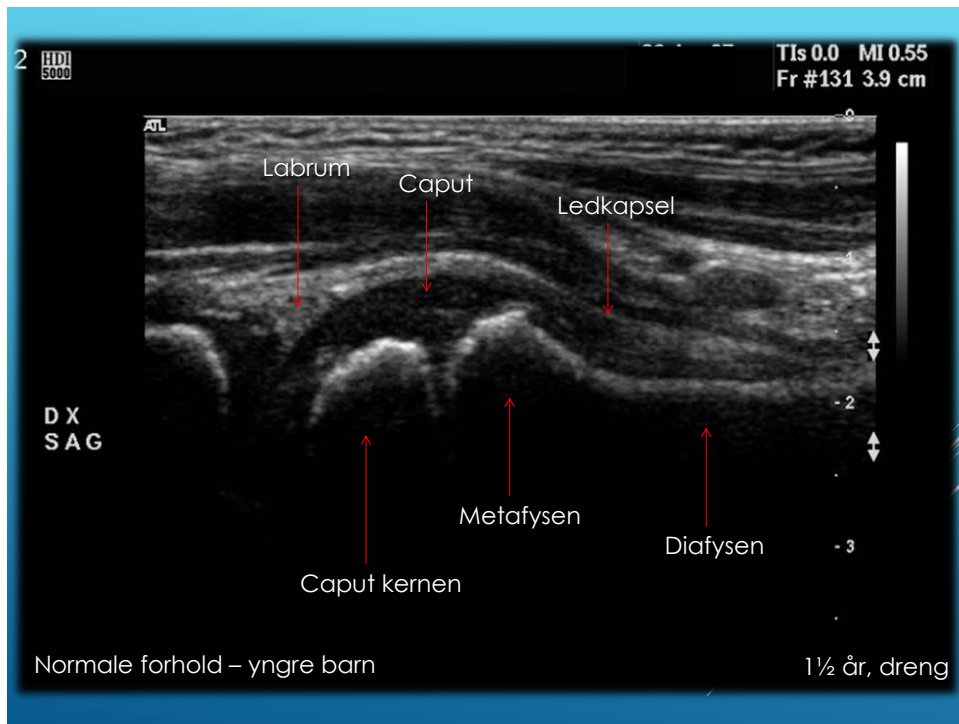
Kort anamnese – serøs coxit?

Længere anamnese (> 1 uge?), eller reciderende symptomer: Rtg. bækken AP+Lauensteins projektion.

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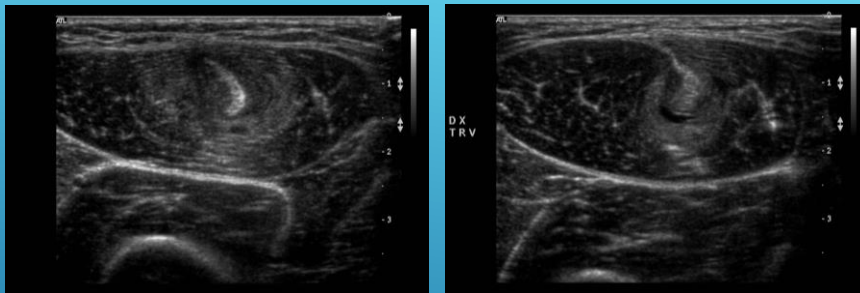


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BILLEDDIAGNOSTIK?

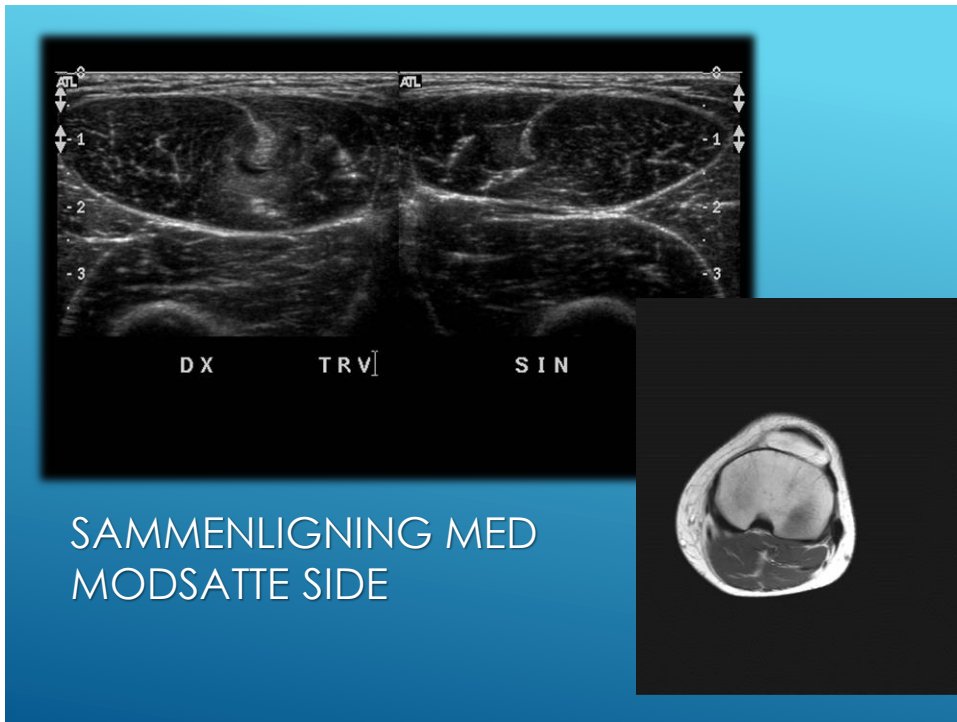
- ▶ 9-årig dreng med ømhed og hævelse gennem 1½ måned i højre lår anteriort.
- ▶ Klinisk mistanke om tumor.

167

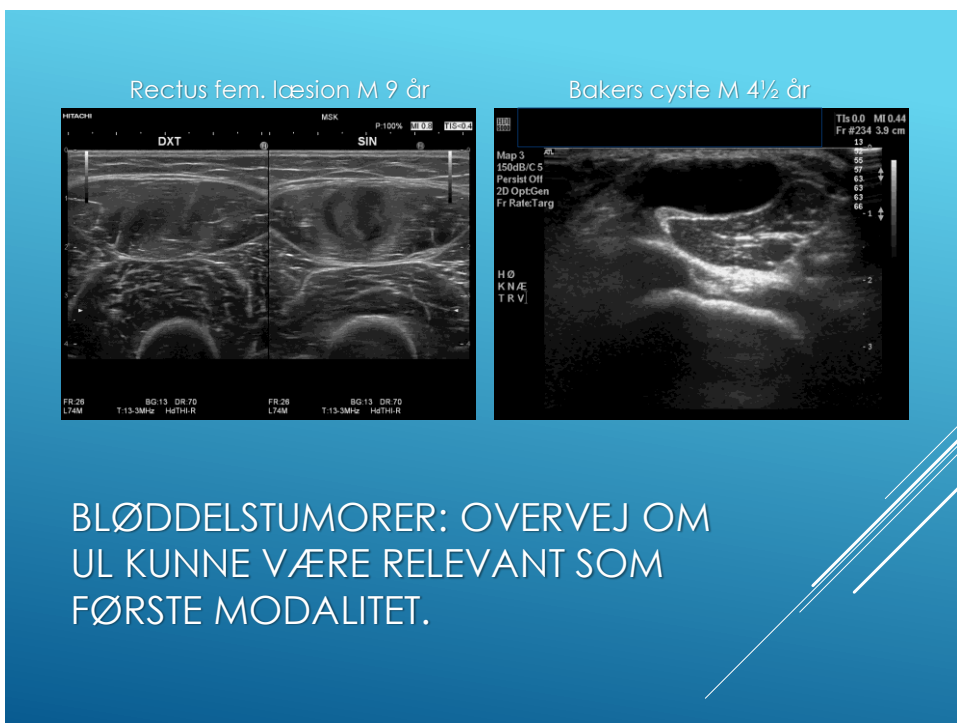


SKANNING HHV. PROXIMALT OG
DISTALT VED HÆVELSEN

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169



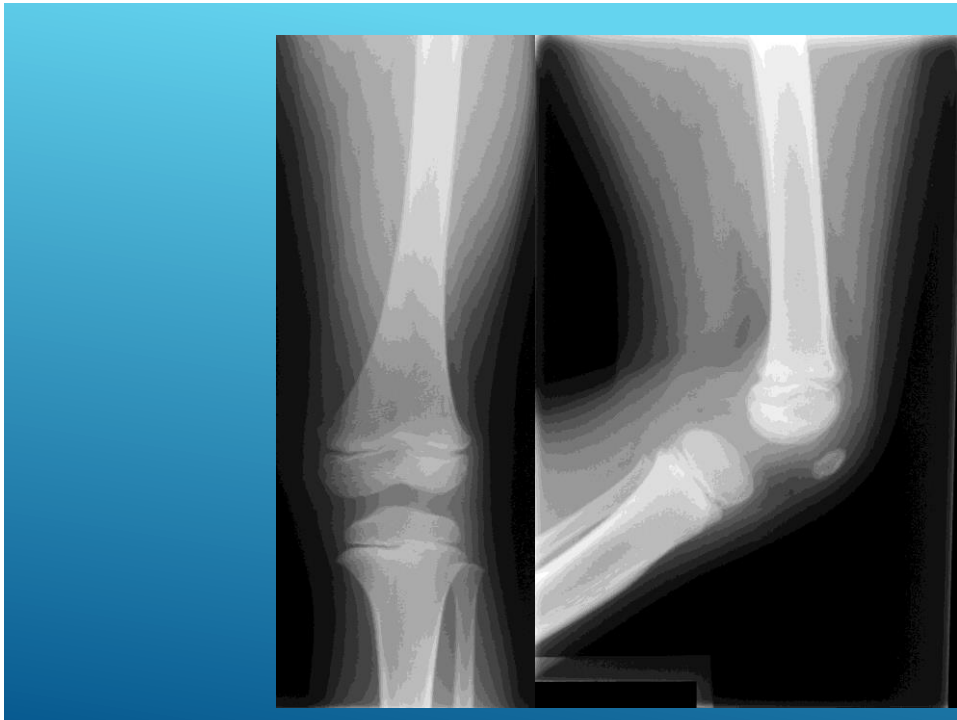
170



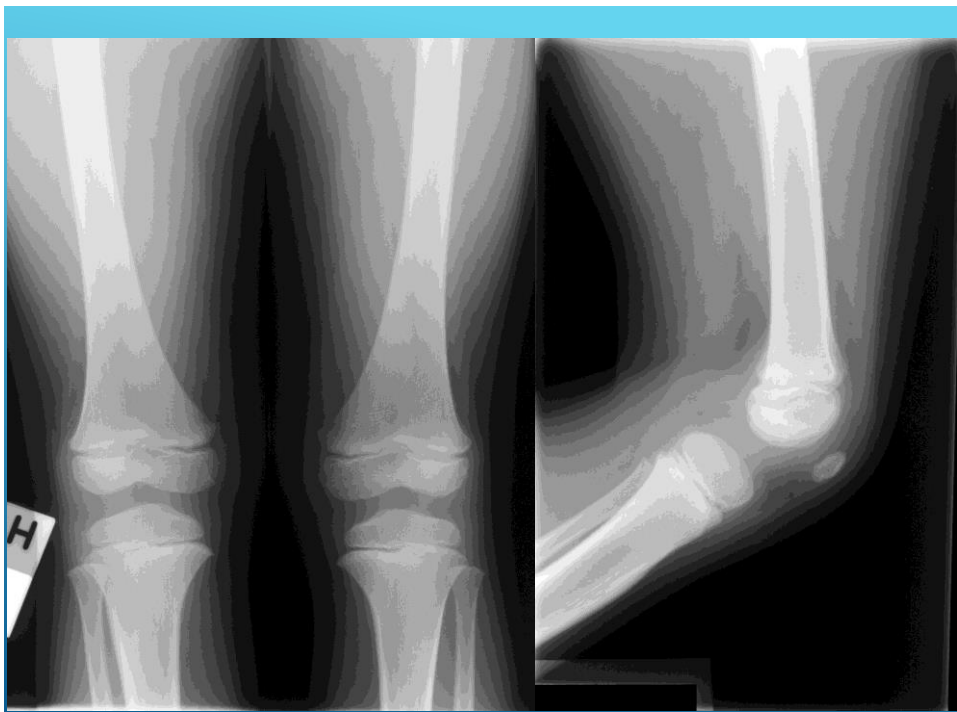
171



172



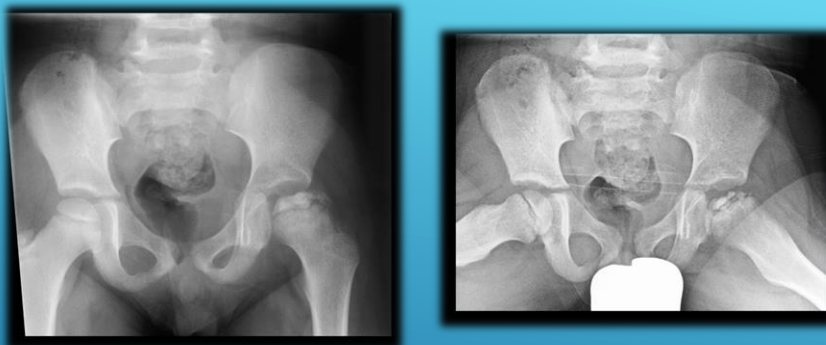
173



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DRENGEN NU 6 ÅR GAMMEL
(11 MÅNEDER SENERE),
SMERTER FRA VENSTRE HOFTE.

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10-ÅRIG PIGE: KNÆSMERTER

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10-ÅRIG PIGE: DISCOID LATERAL
MENISK

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DET HALTENDE BARN

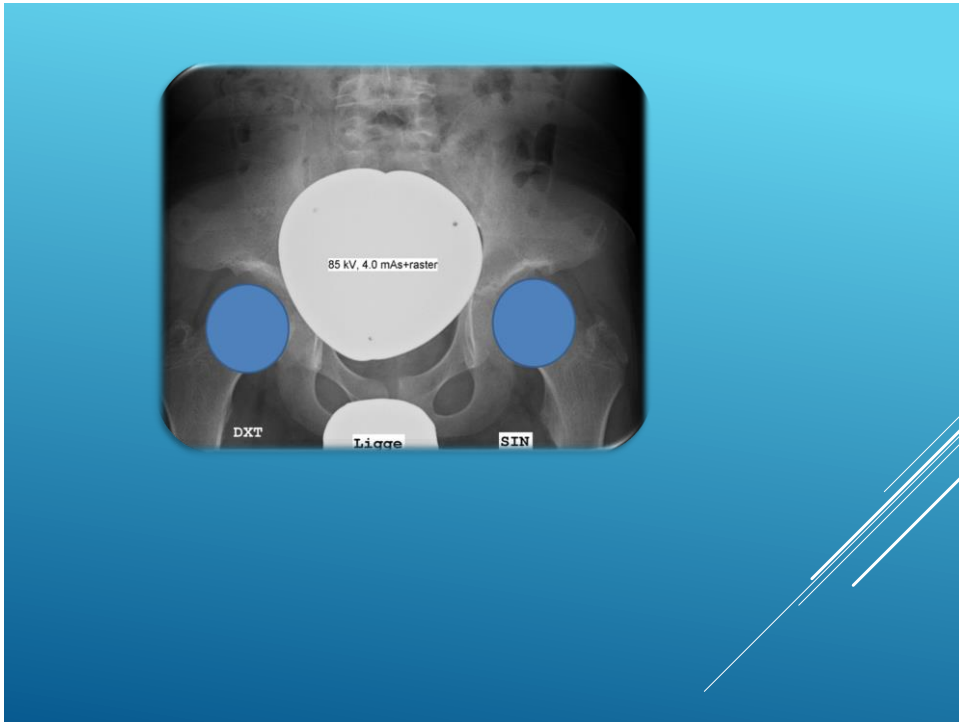
CLP vs. spondyloepifysær dysplasi

179

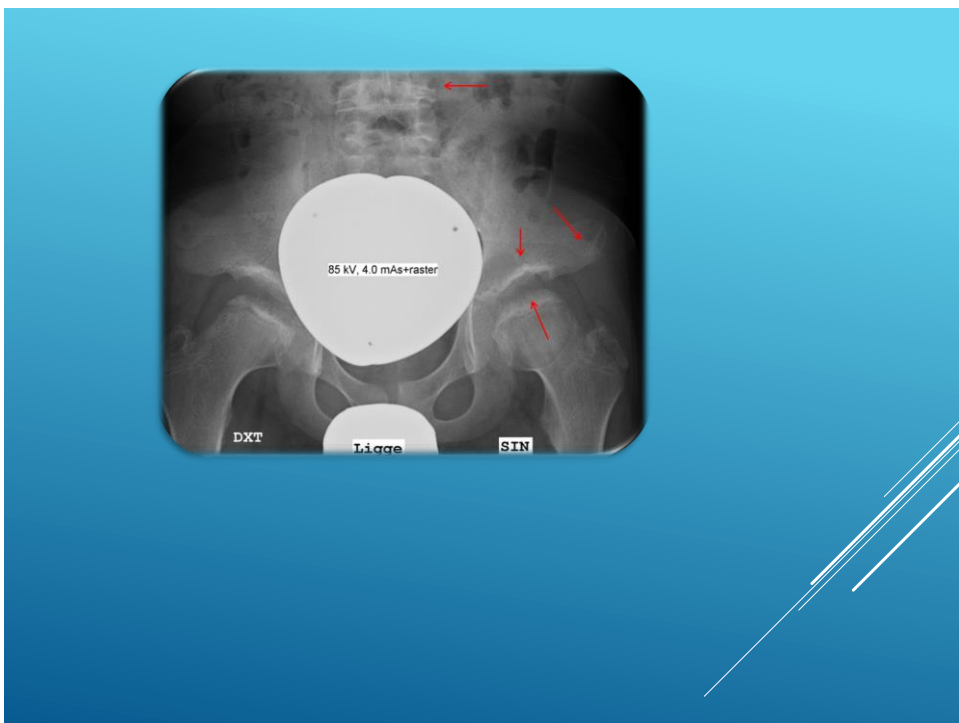


BILATERAL MB. CALVÉ-LEGG-
PERTHES – FULGT FOR DETTE
GENNEM FLERE ÅR – NU 12 ÅR

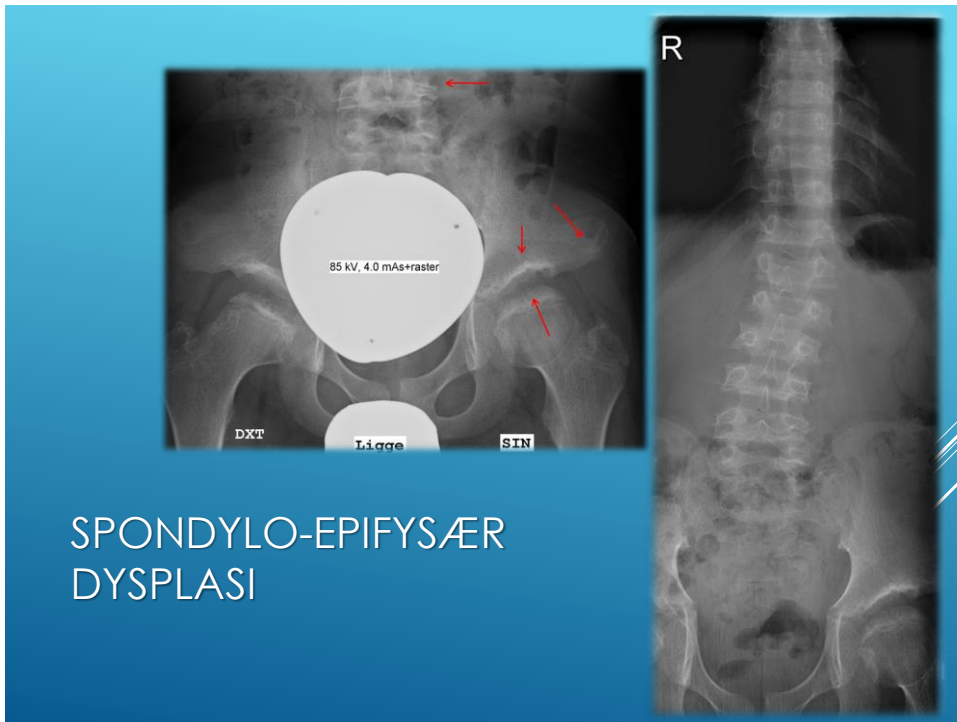
180



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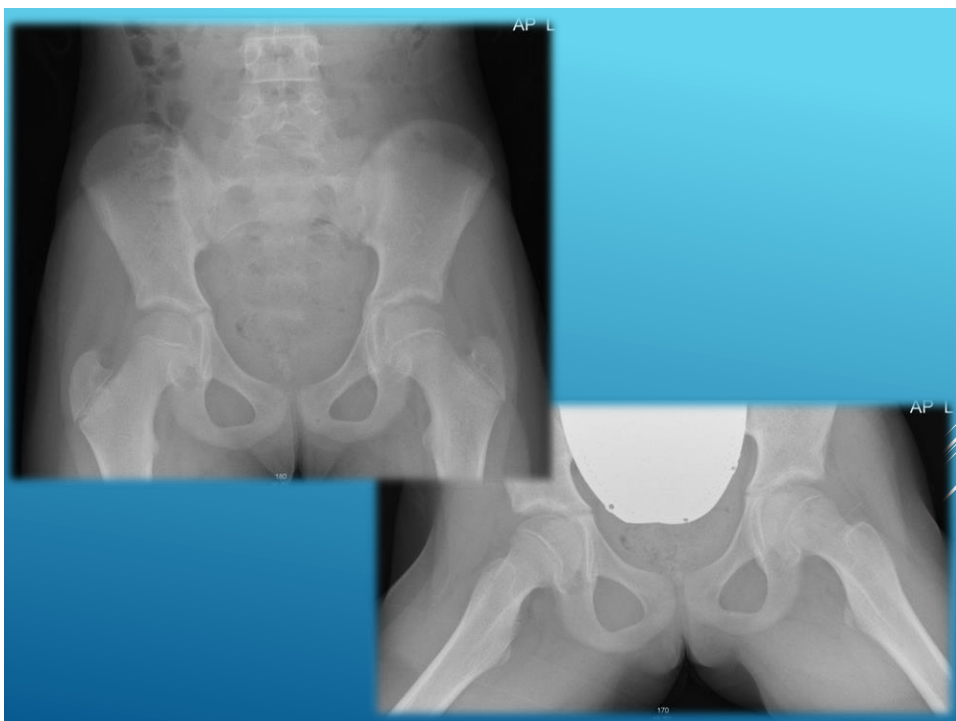
183



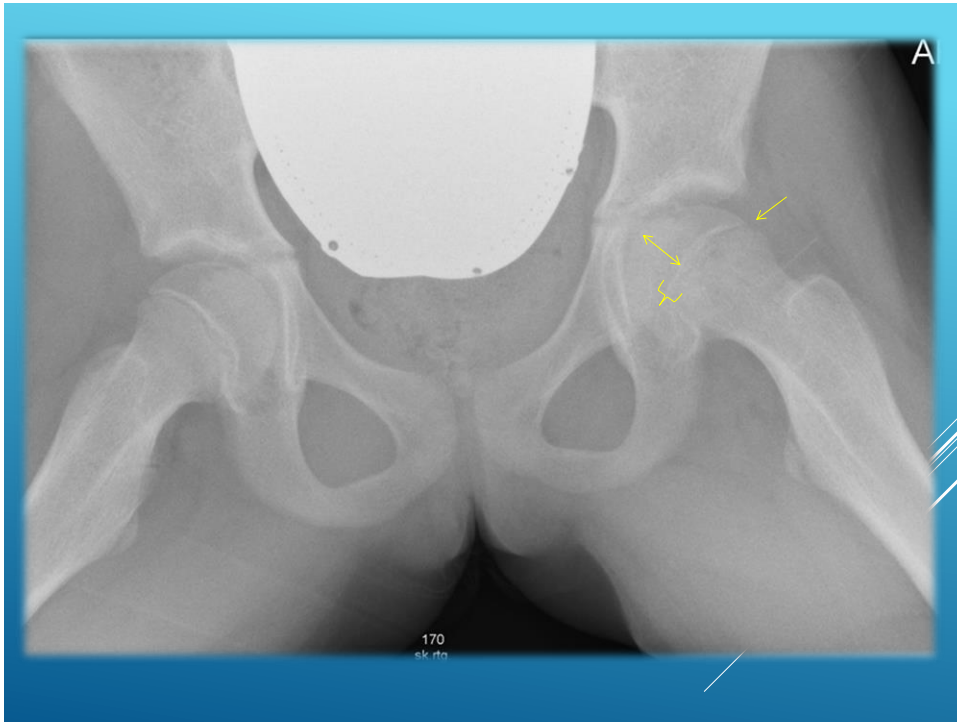
184

11-ÅRIG PIGE, VÆLTET PÅ
CYKEL.
SMERTER FRA VENSTRE HOFTE.

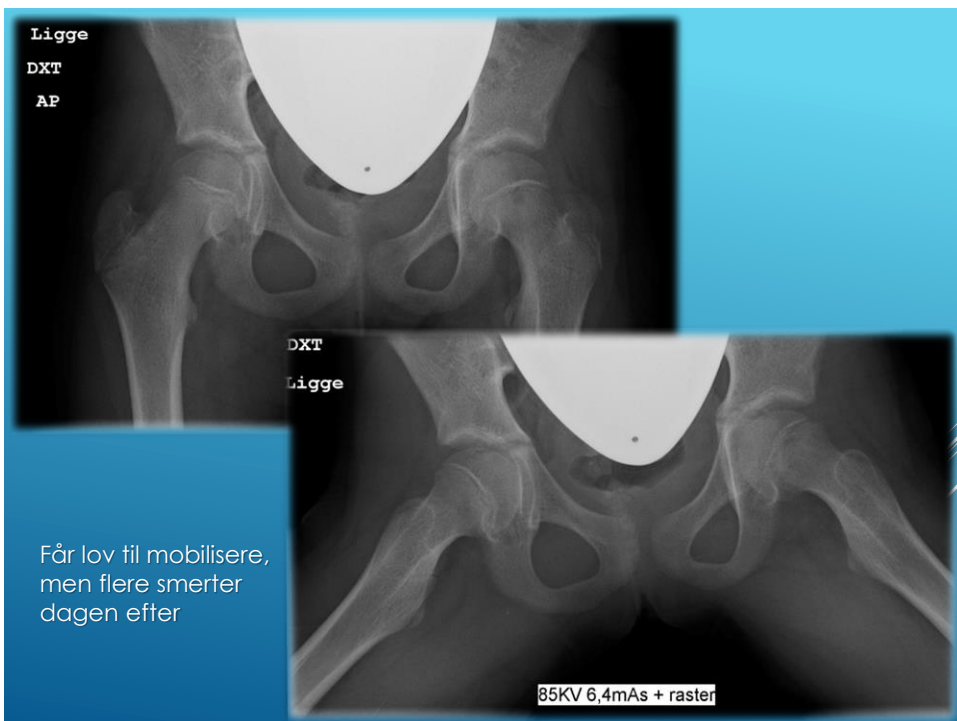
185



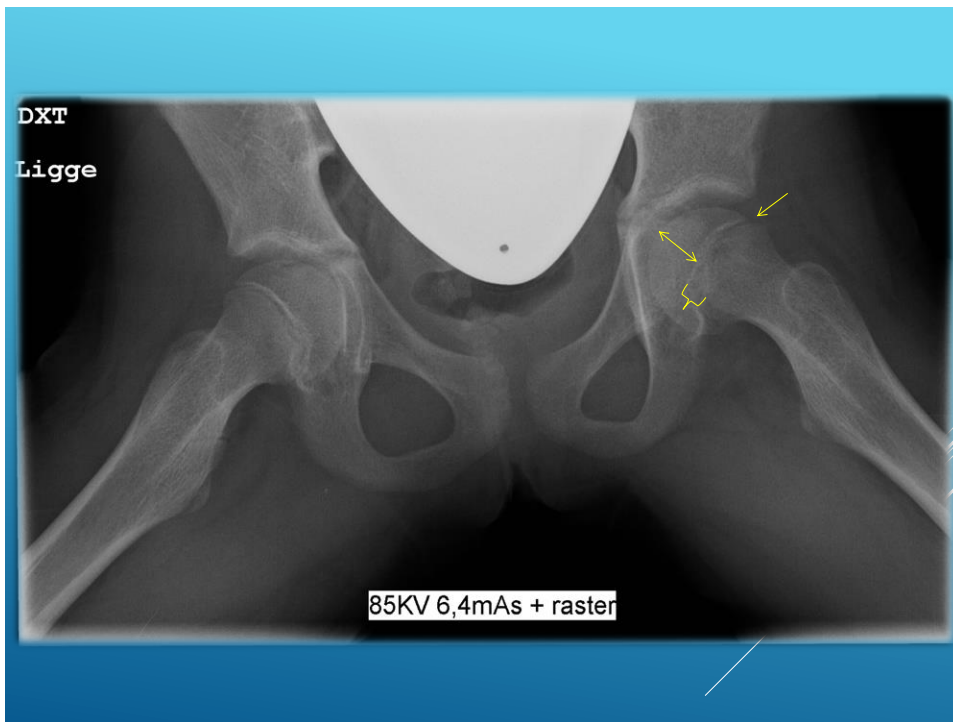
186



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CAVE!

Epifysiolyse svarende til caput femoris, er en akut tilstand, hvor der foretages akut operation.

190

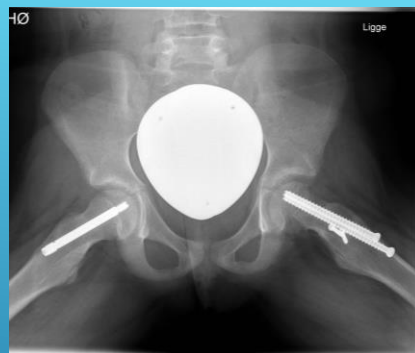
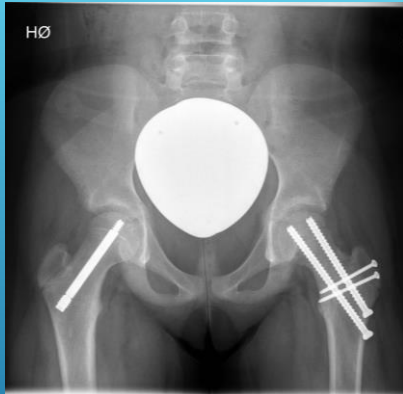
Pt. Nr 1



10 ÅR OG 11 MDR.

191

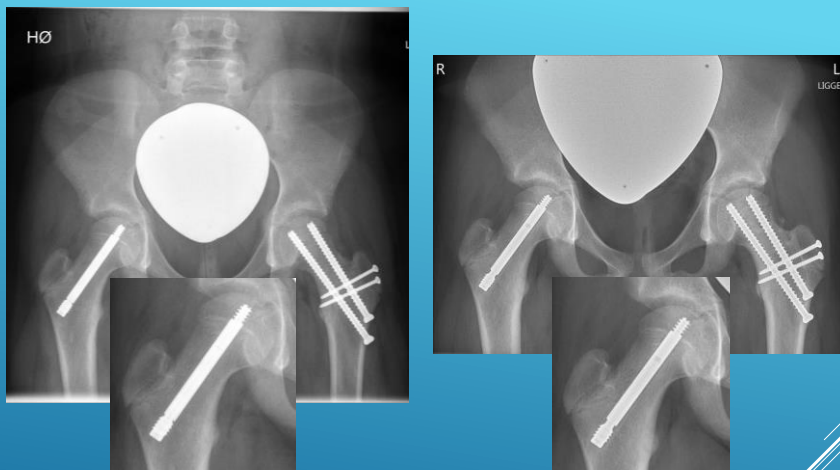
Pt. Nr 1



11 ÅR 4 MDR.

192

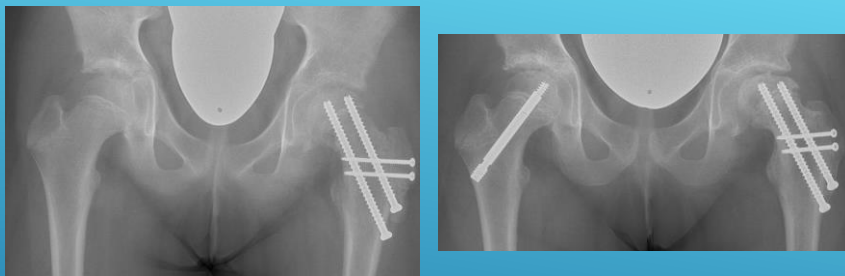
Pt. Nr 1



11 ÅR 4 MDR. + 12 ÅR 0 MDR.

193

Pt. Nr 2

KONTROL 11 DAGE EFTER OP (12 ÅR
OG 2 MDR.) SAMT KONTROL EFTER
5½ MDR.

194

Pt. Nr 2



KONTROL 11 DAGE EFTER OP (12 ÅR
OG 2 MDR.) SAMT KONTROL EFTER
5½ MDR.

195

Pt. Nr 3



12 ÅR 11 MDR. OG 13 ÅR 6 MDR.

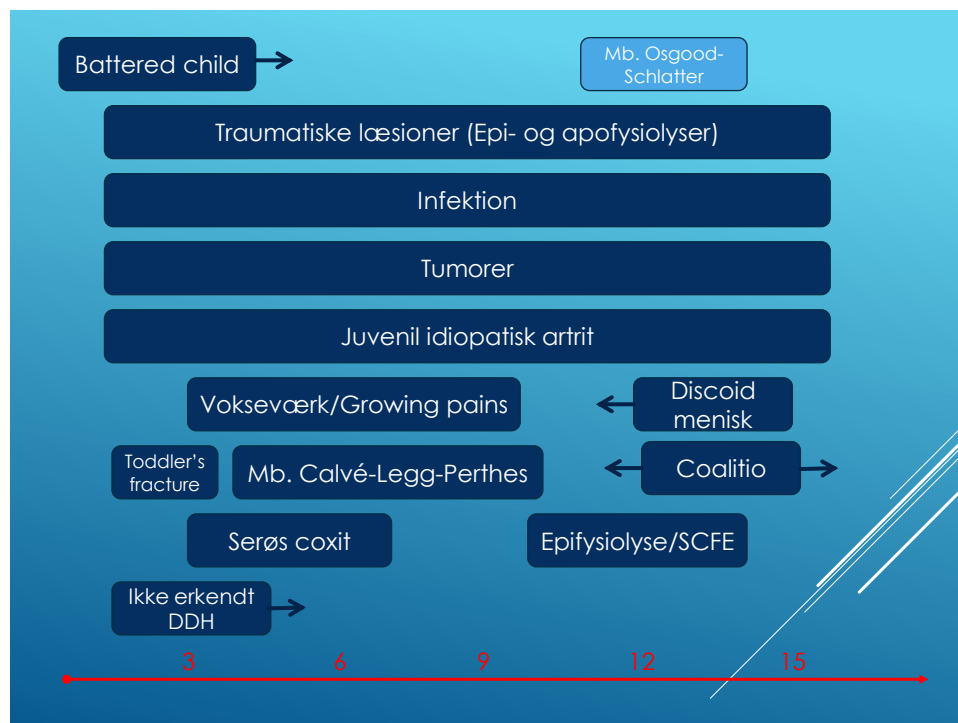
196

Pt. Nr 3



12 ÅR 11 MDR. OG 13 ÅR 6 MDR.
CHONDROLYSE

197



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- ▶ Accident & Emergency Radiology – Raby et al., Saunders Elsevier 2015
- ▶ Atlas of Normal Roentgen Variants that may simulate Disease – Keats et al, Elsevier 2012
- ▶ Bone Dysplasias. An atlas of Genetic Disorders of Skeletal Development – Spranger et al., Oxford University Press 2018
- ▶ Borderlands of Normal and Early Pathologic Findings in Skeletal Radiography (Köhler/Zimmer) – Schmidt et al., Thieme 1993 (Findes i 2003 udgave)
- ▶ Growth of the Pediatric Skeleton – Oestreich, Springer 2008
- ▶ Epiphyseal Growth Plate Fractures – Peterson, Springer 2007

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- ▶ Hip Sonography – Graf, Springer 2006
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- ▶ Chan et al.: MR Imaging of Pediatric Bone Marrow, RadioGraphics 2016; 36:1911-1930
- ▶ Dighe et al.: Fetal Skeletal Dysplasia: An Approach to Diagnosis with Illustrative Cases, RadioGraphics 2008; 28: 1061-1077
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- ▶ Rana et al.: Periosteal Reactions, AJR 2009; 193: 259-272
- ▶ Tsai et al.: High-resolution CT with histopathological correlates of the classic metaphyseal lesion of infant abuse. Pediatr Radiol (2014) 44: 124-140
- ▶ Zbojniec et al.: Focal Periphyseal Edema (FOPE) Zone on MRI of the adolescent Knee: A potentially painful manifestation of physiologic physeal fusion?. ARJ 2011; 197: 998-1004

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- ▶ <http://omim.org> (Syndromer)
- ▶ https://www.orthorad.de/index.php/orthorad/pe_dbone (Normal anatomi - Røntgenbilleder)
- ▶ <http://cpop.dk> (Cerebral parese opfølgingsprogram)

LINKS

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