

Staying Out of Trouble in Pediatric Orthopaedics

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UT Health
San Antonio

I have no disclosures.



Who Am I?



 UT HEALTH
SCIENCE CENTER®
SAN ANTONIO



Who Am I?

UT Southwestern
Medical Center



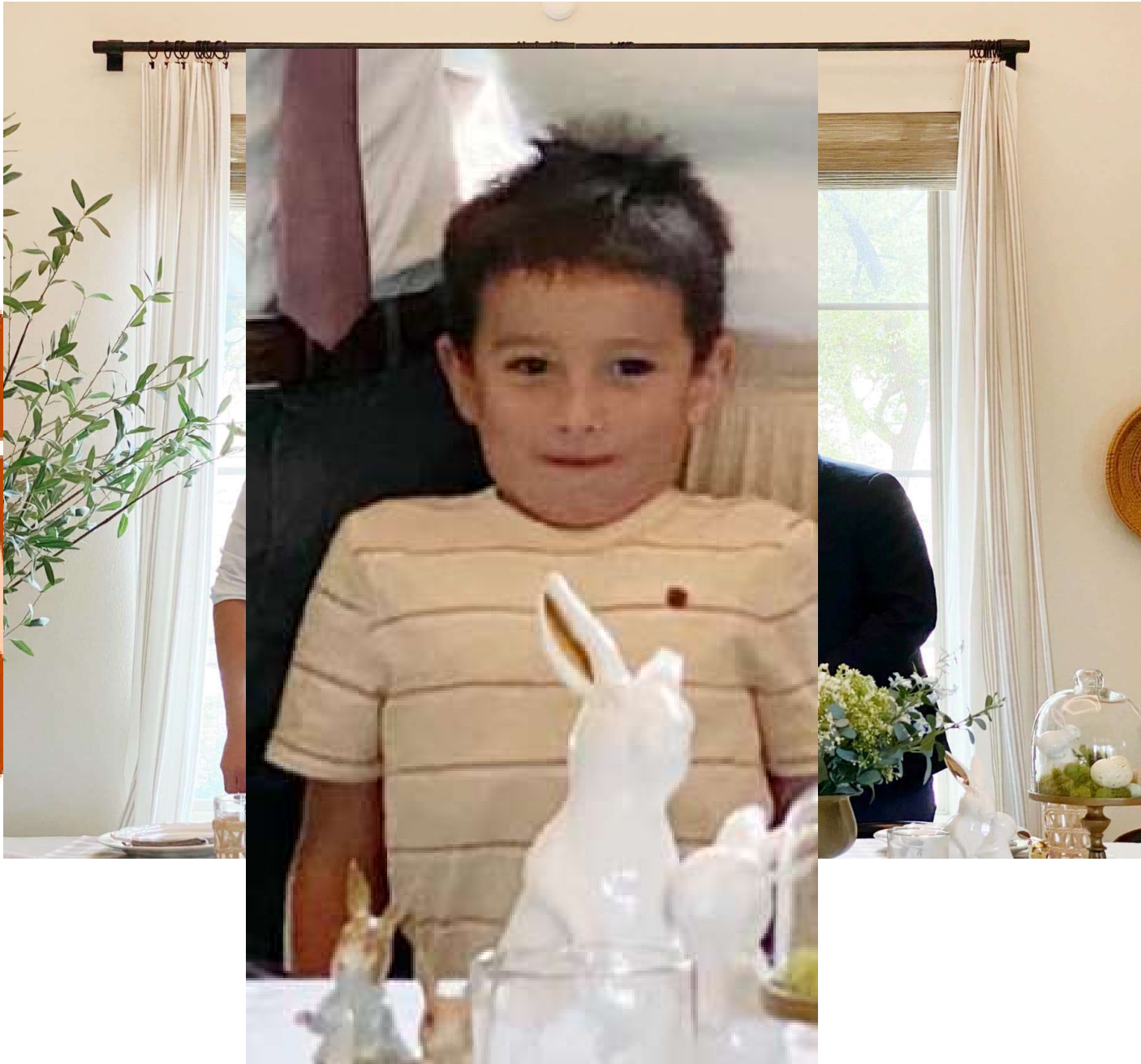


Who Am I?





Who Am I?



Outline

Elbow Fractures

Physeal Fractures

Femur Fractures

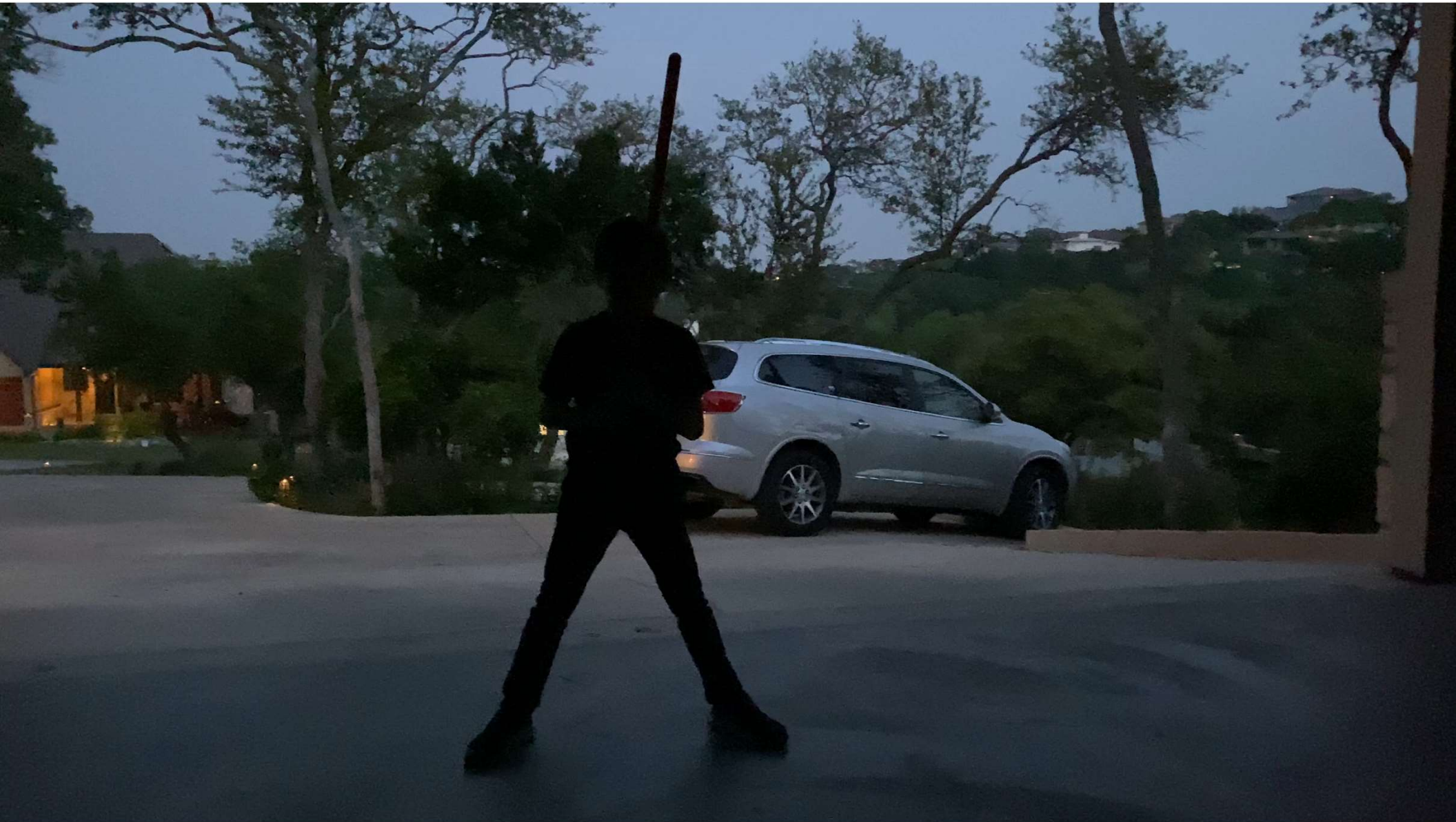
Non-accidental Trauma

SCFE

Tarsal Coalitions

DDH

Are you ready?





The year is 2023. The Death Star and their evil

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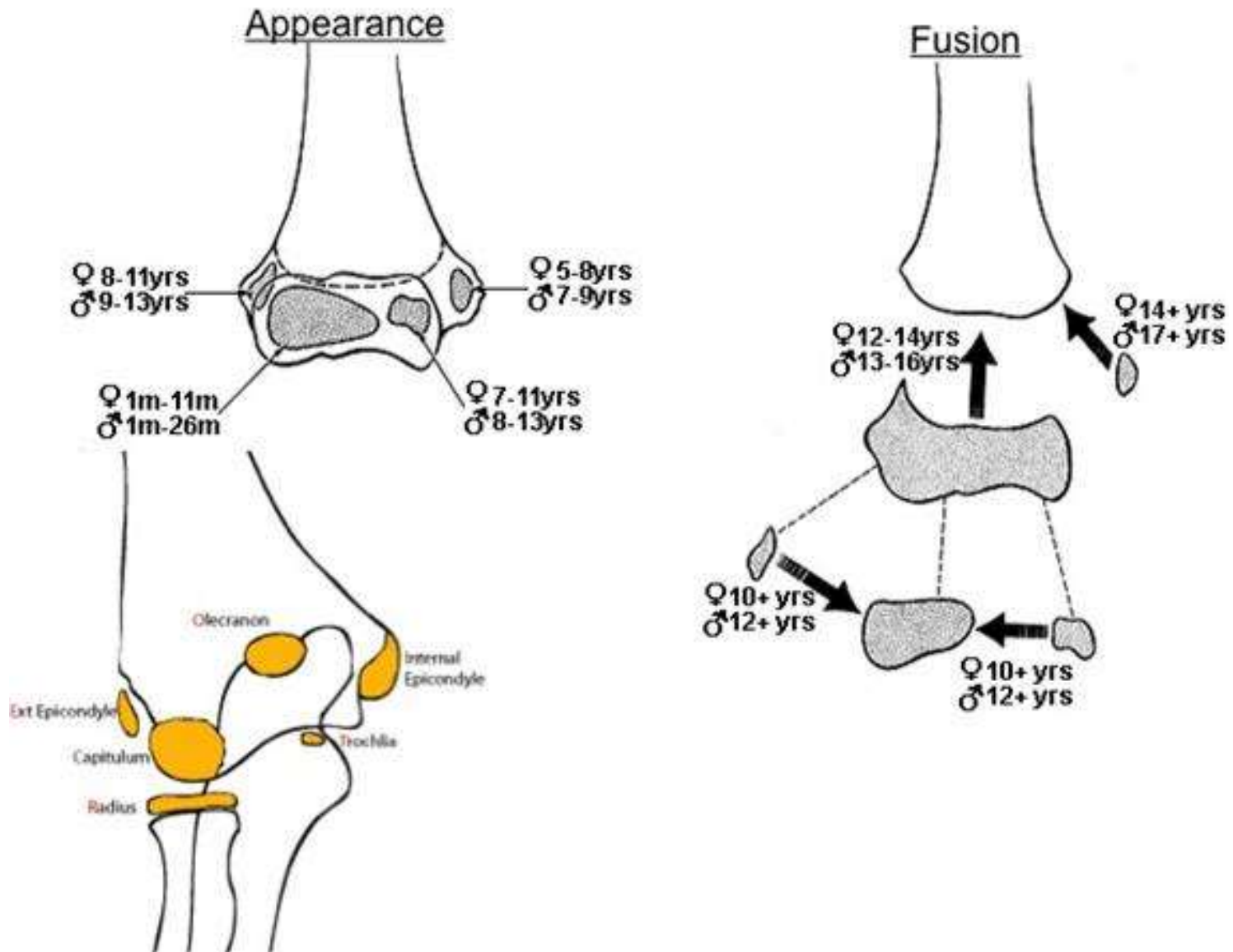
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The Elbow



The Elbow

C - 2

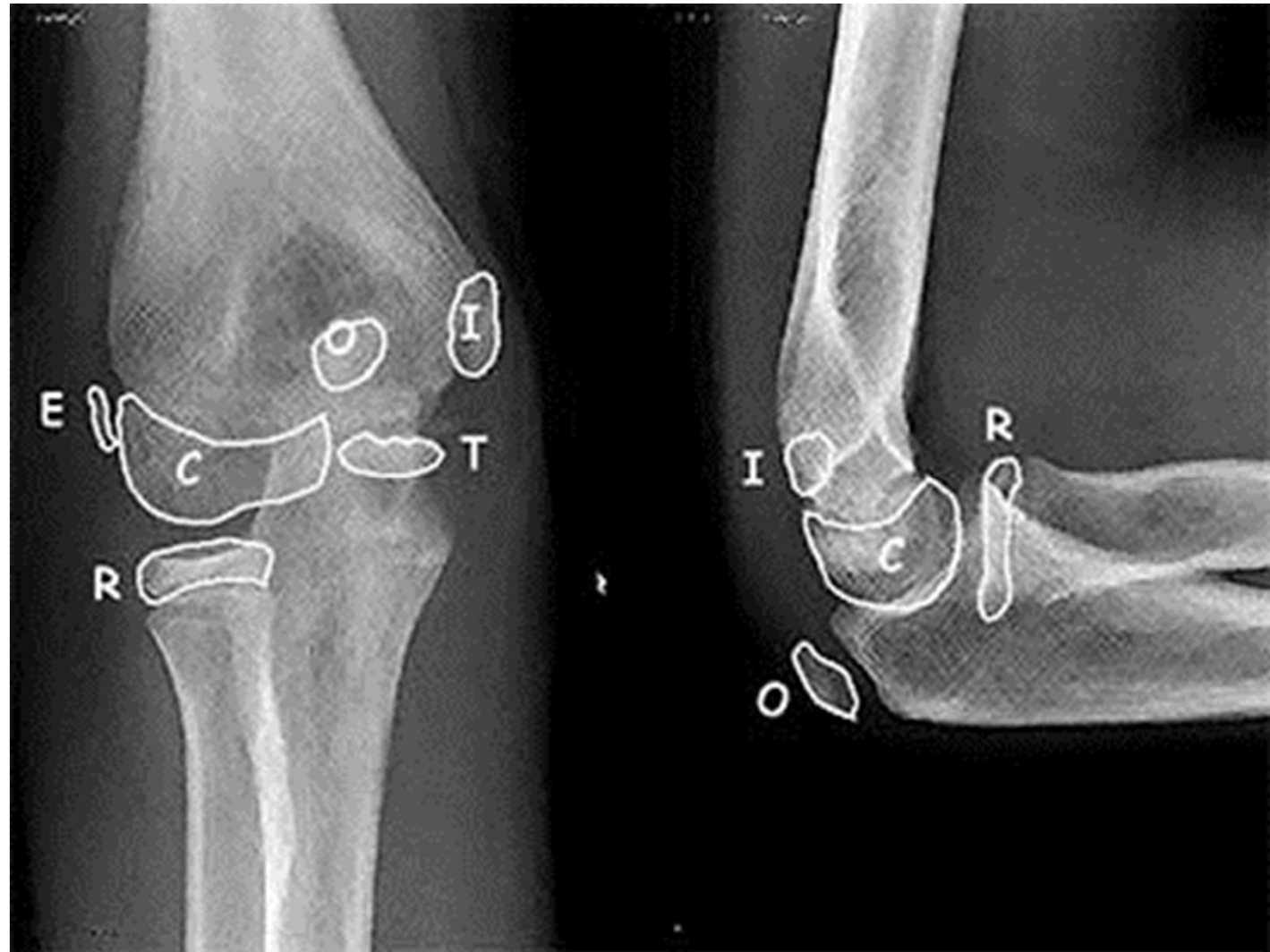
R - 4

M - 6

T - 8

O - 10

L - 12



The Elbow

C – 2

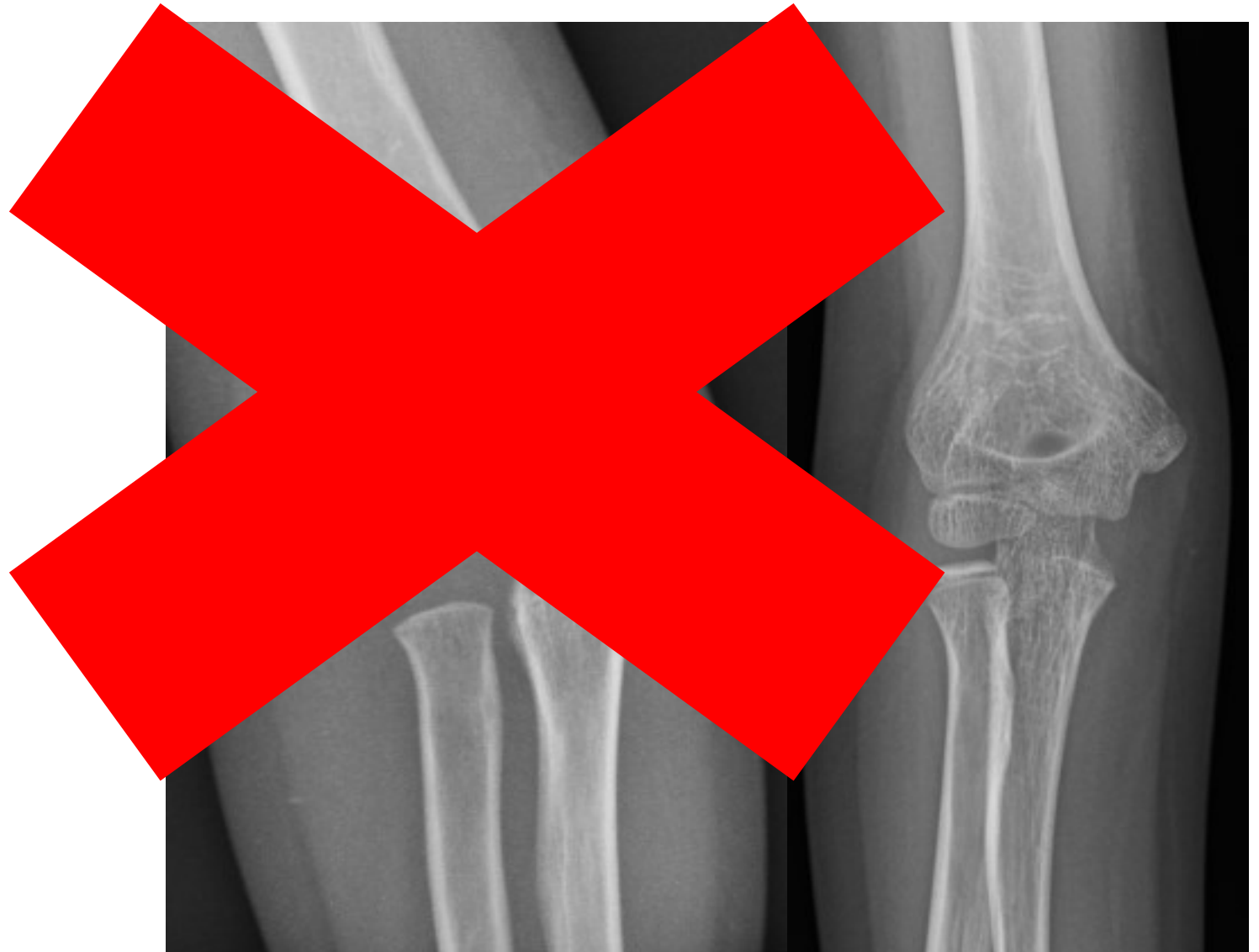
R – 4

M – 6

T – 8

O – 10

L – 12



Supracondylar Humerus Fx

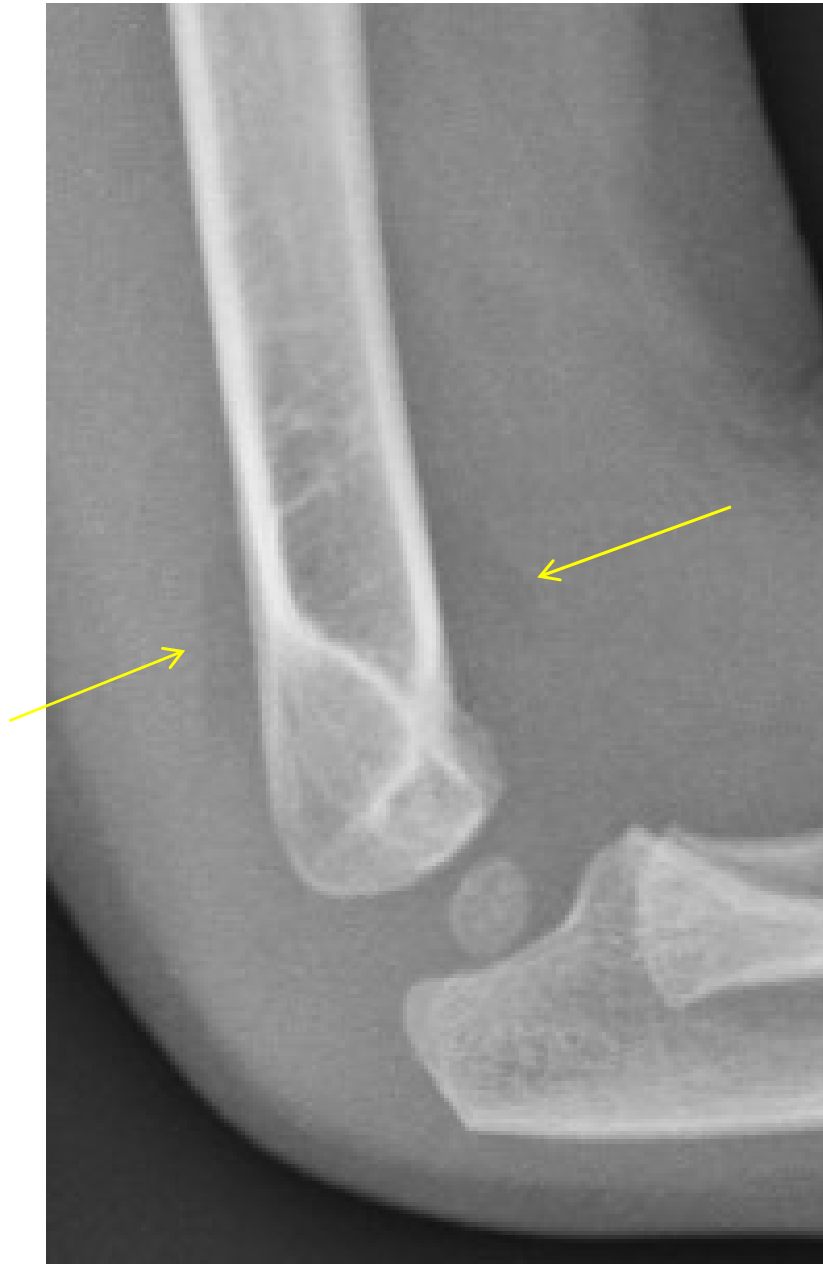
Common injury

Often needs surgery

AIN palsy



Fat Pad Sign



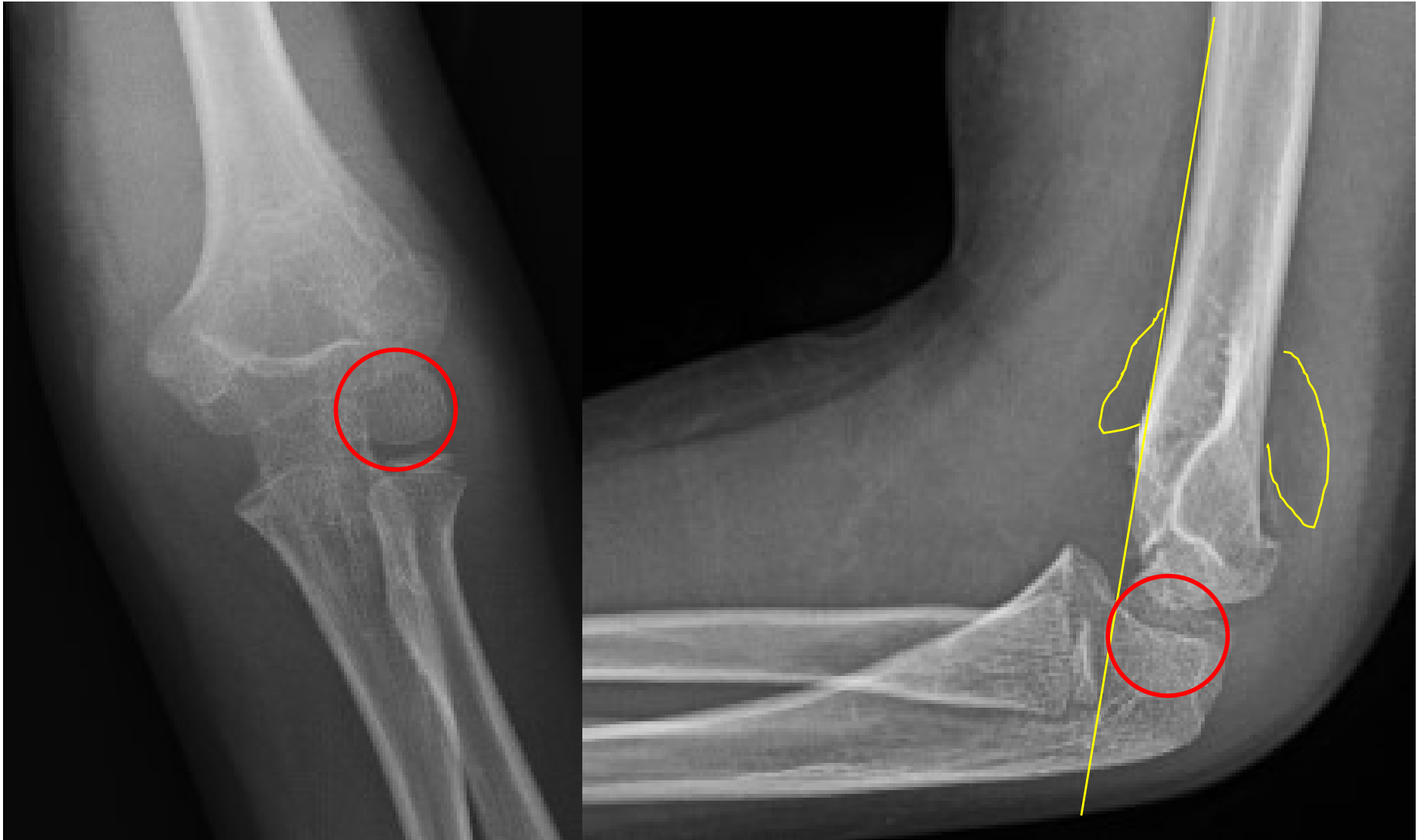
Fat Pad Sign



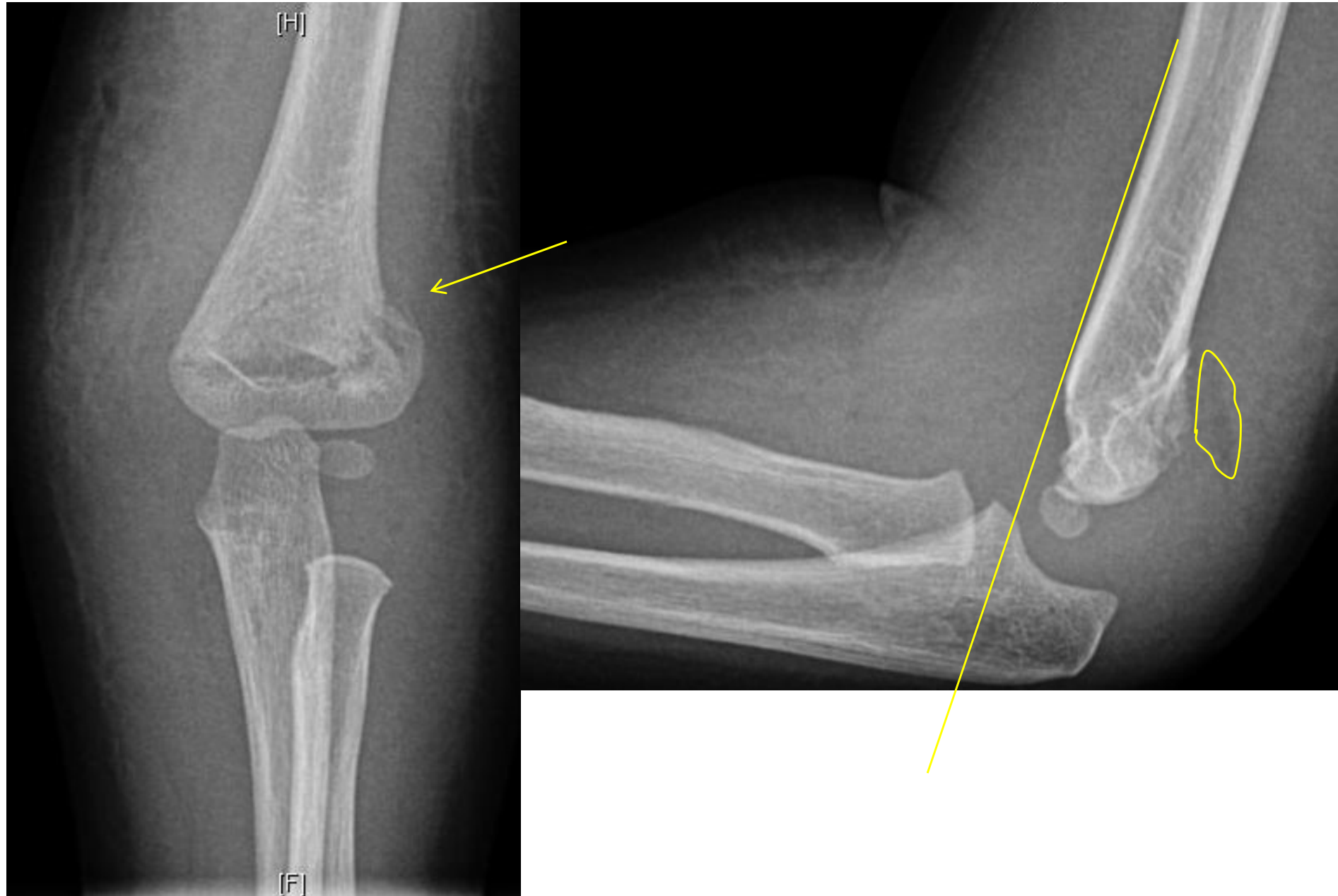
Anterior Humeral Line



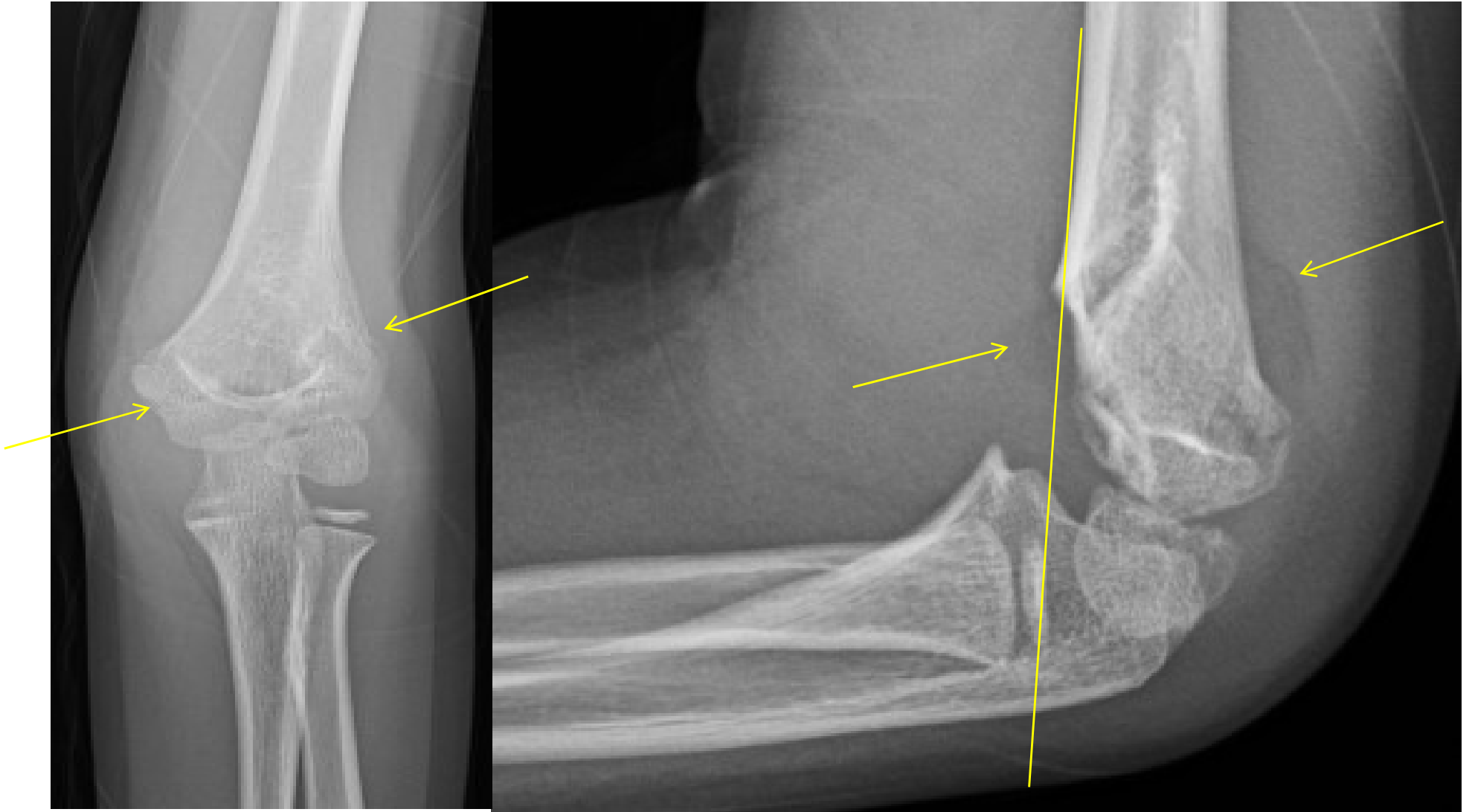
Anterior Humeral Line



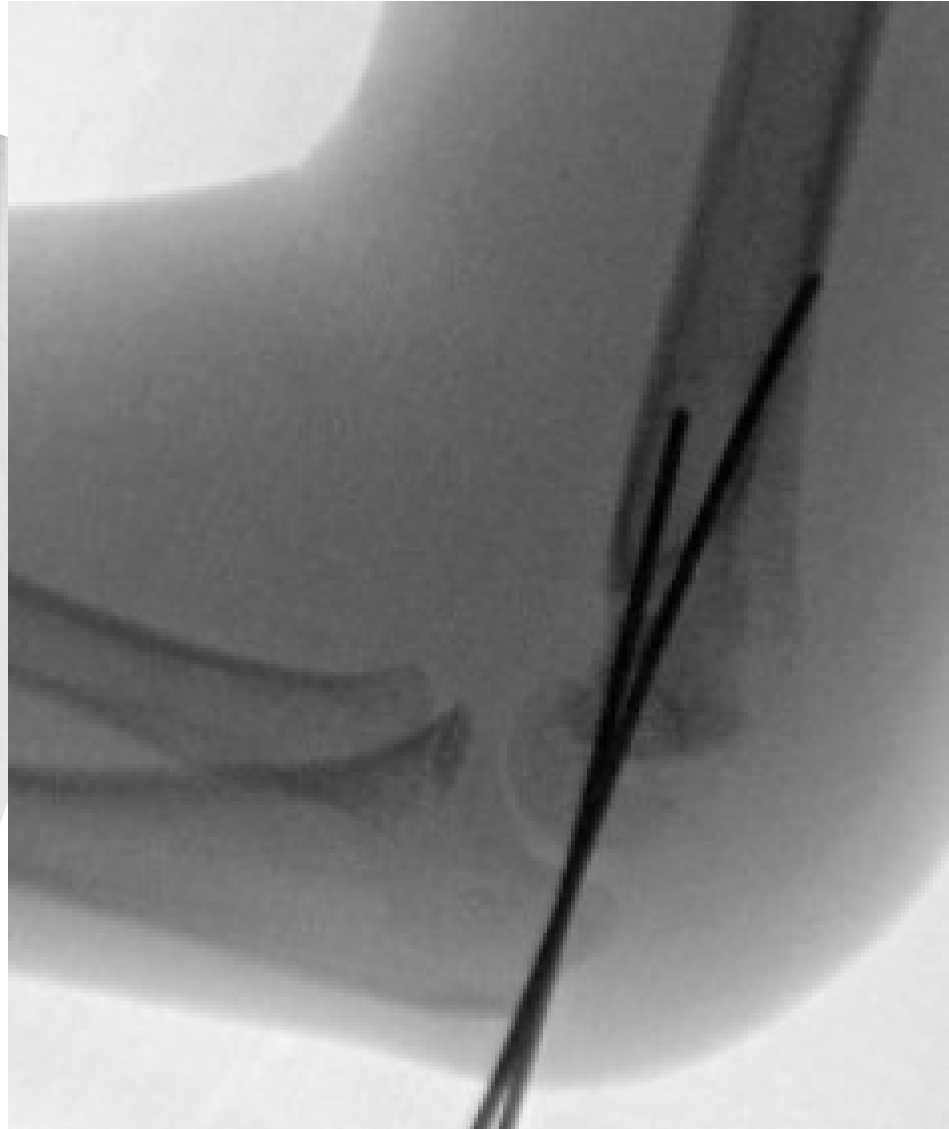
Supracondylar Humerus Fx



Supracondylar Humerus Fx



Supracondylar Humerus Fx



Supracondylar Humerus Fx



Medial Epicondyle Fractures



Medial Epicondyle Fractures

50% associated with elbow dislocation

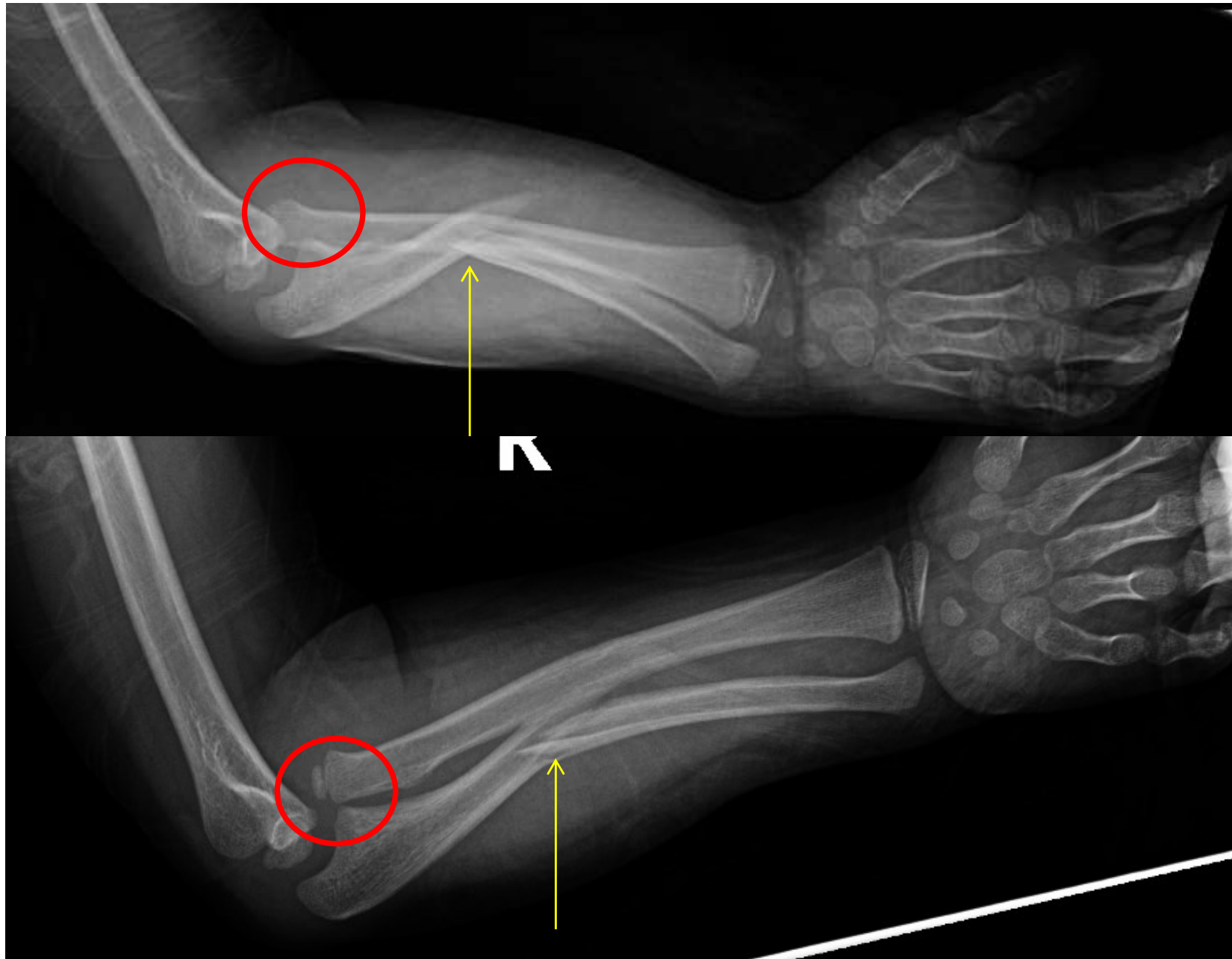
Should try to reduce elbow



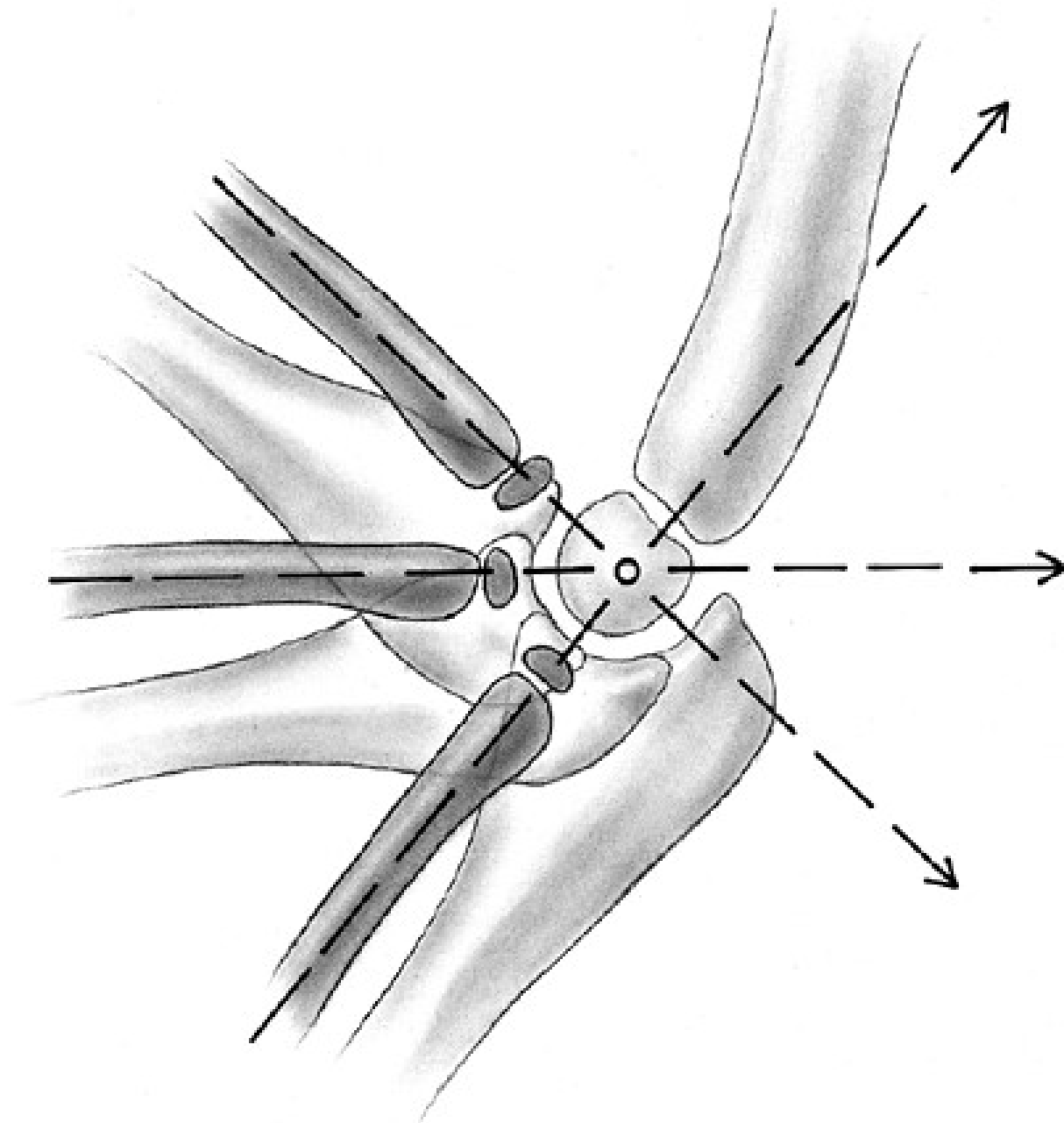
Medial Epicondyle Fractures



Monteggia Fractures



Imaging



Imaging



Treatment

Closed reduction and casting

Closed reduction, IMN

Open reduction and plating



Monteggia Fractures



Monteggia Fractures



Monteggia Fractures



Lateral Condyle Fractures

2nd Most common elbow fracture

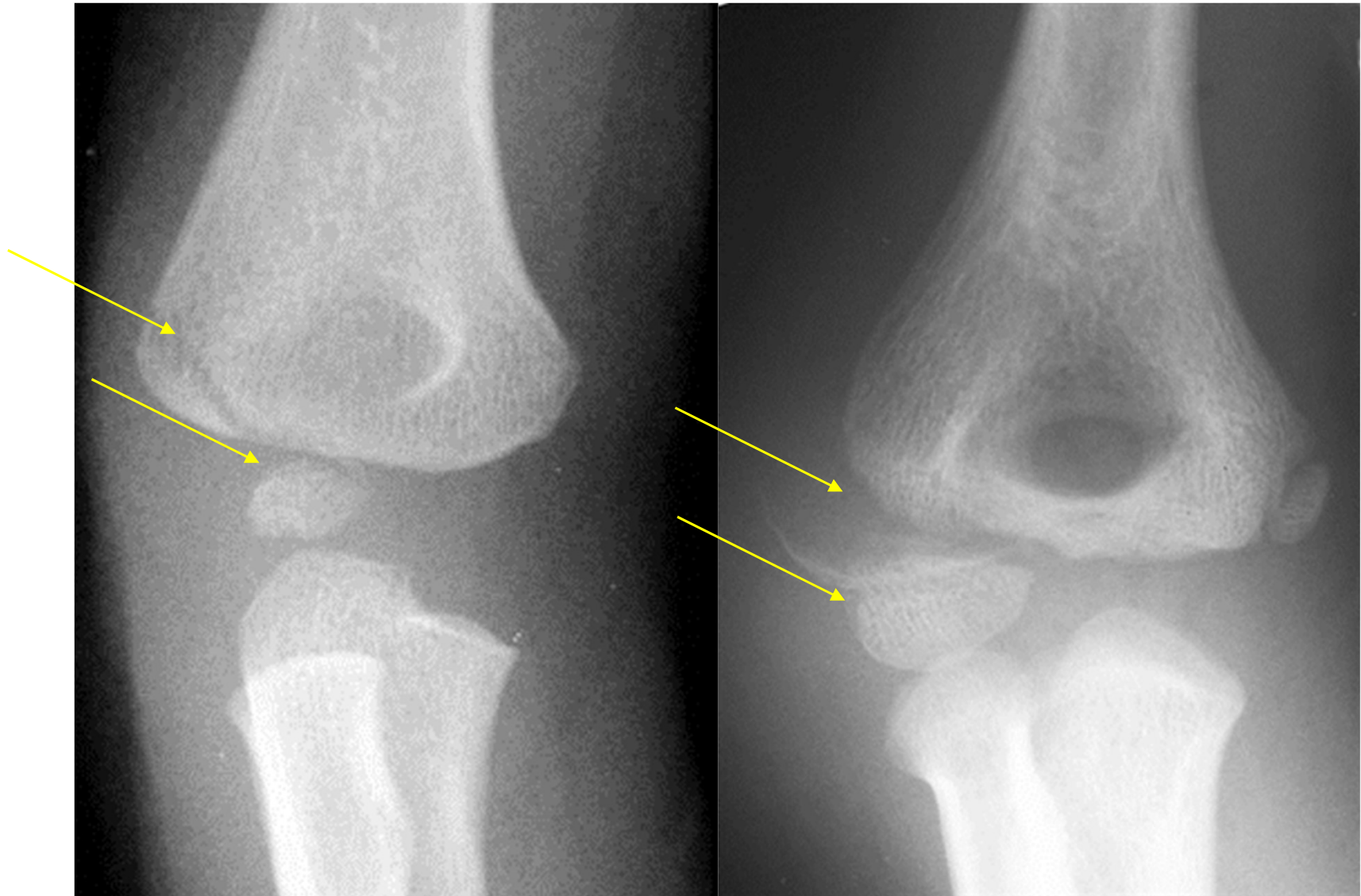
Most need operative fixation



Lateral Condyle Fractures



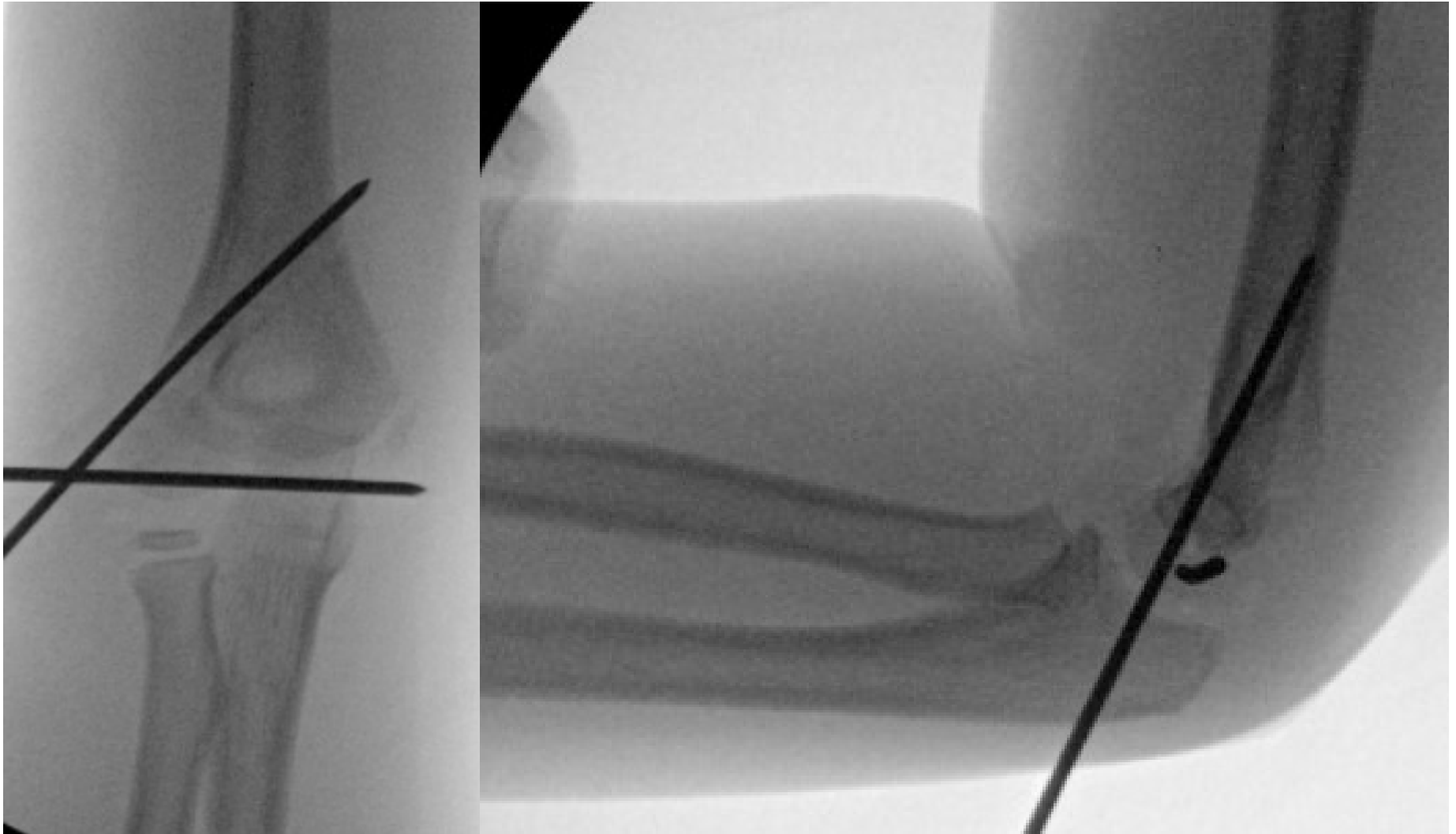
Lateral Condyle Fractures



Lateral Condyle Fractures



Lateral Condyle Fractures



Lateral Condyle Fractures



Lateral Condyle Fractures



Lateral Condyle Fractures



Lateral Condyle Fractures



Lateral Condyle Fractures



Lateral Condyle Fractures



Questions?

INTERMISSION



Outline

Elbow Fractures

Physeal Fractures

Femur Fractures

Non-accidental Trauma

SCFE

Tarsal Coalitions

DDH

Physeal Fractures

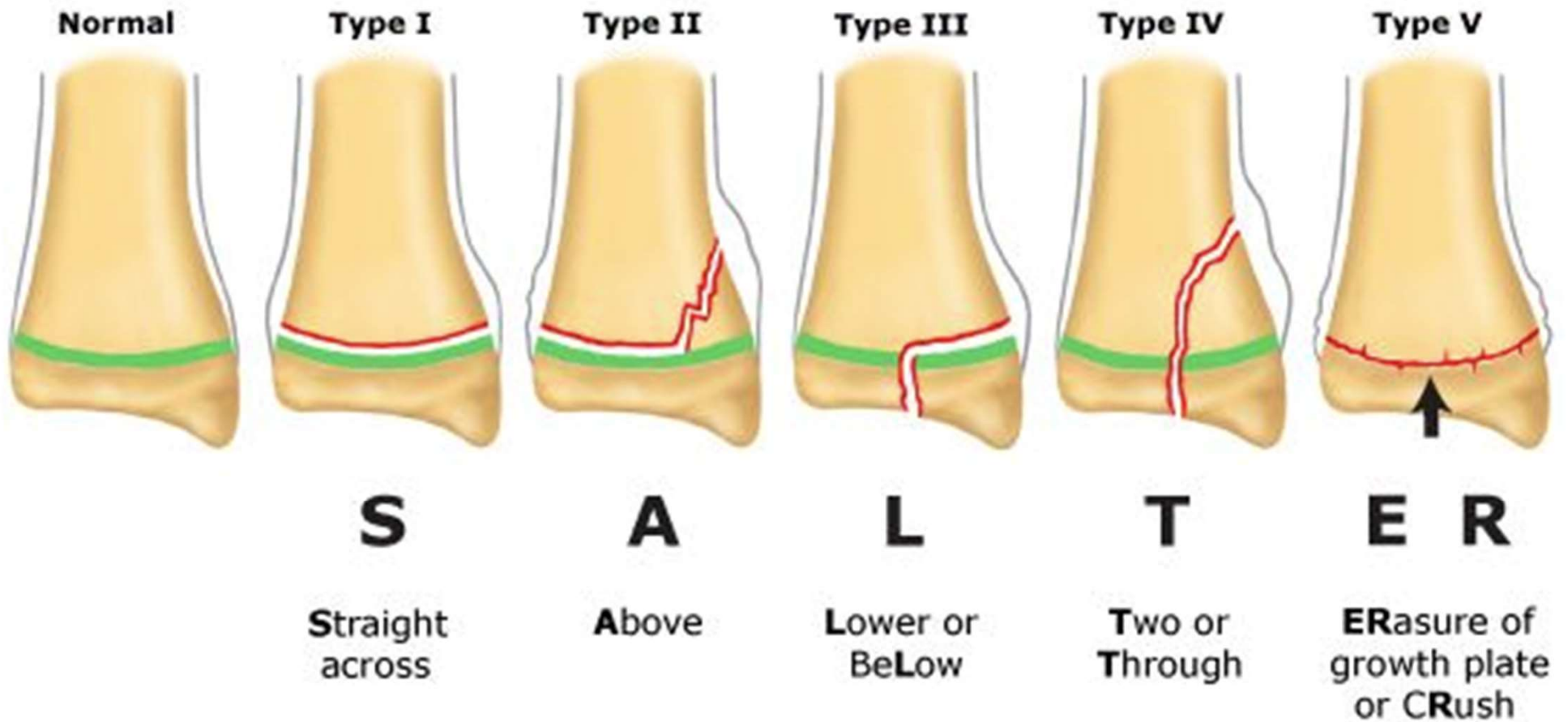
Salter Harris 1-5

↑Growth arrest 1-5

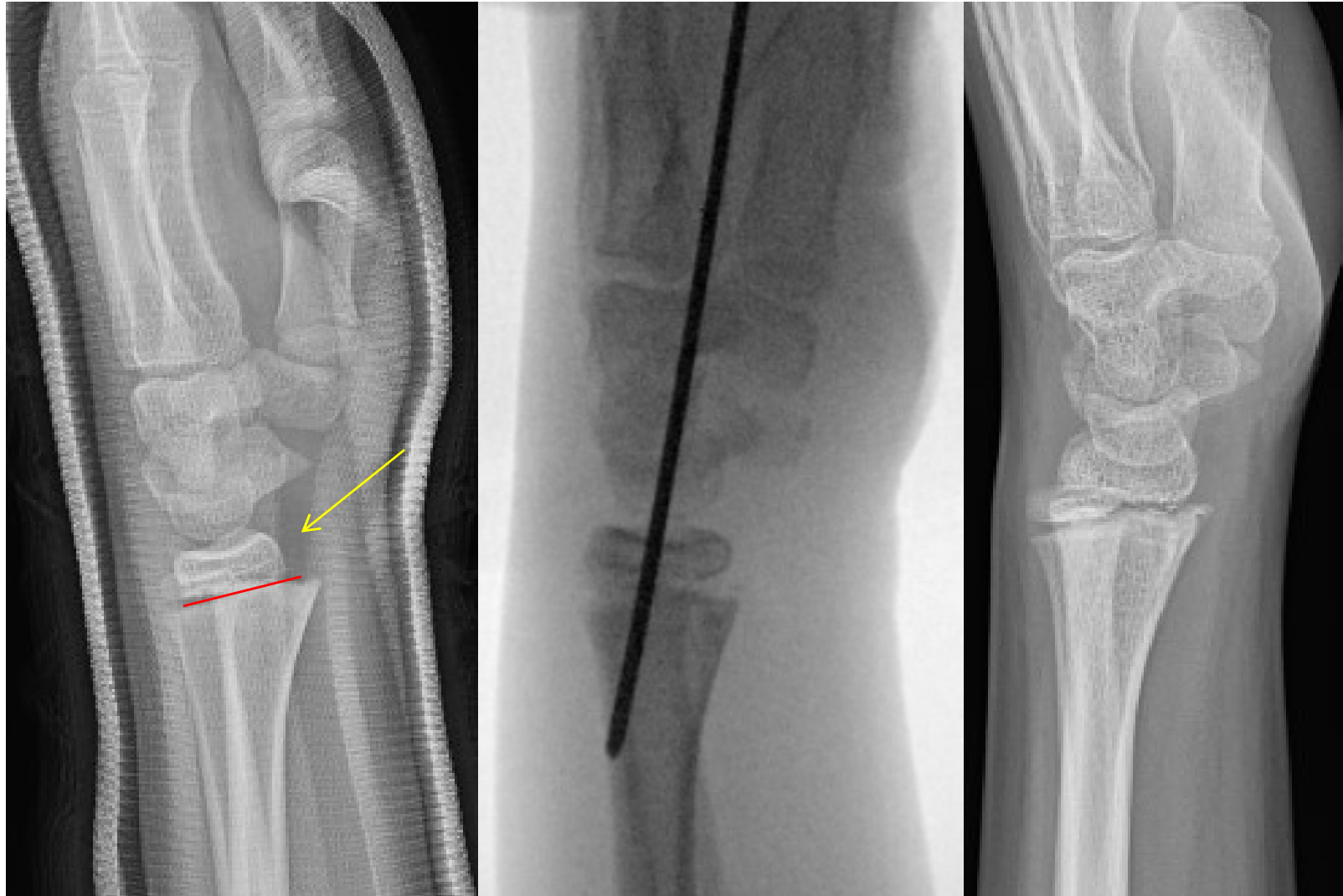
↑Remodeling potential at active physes



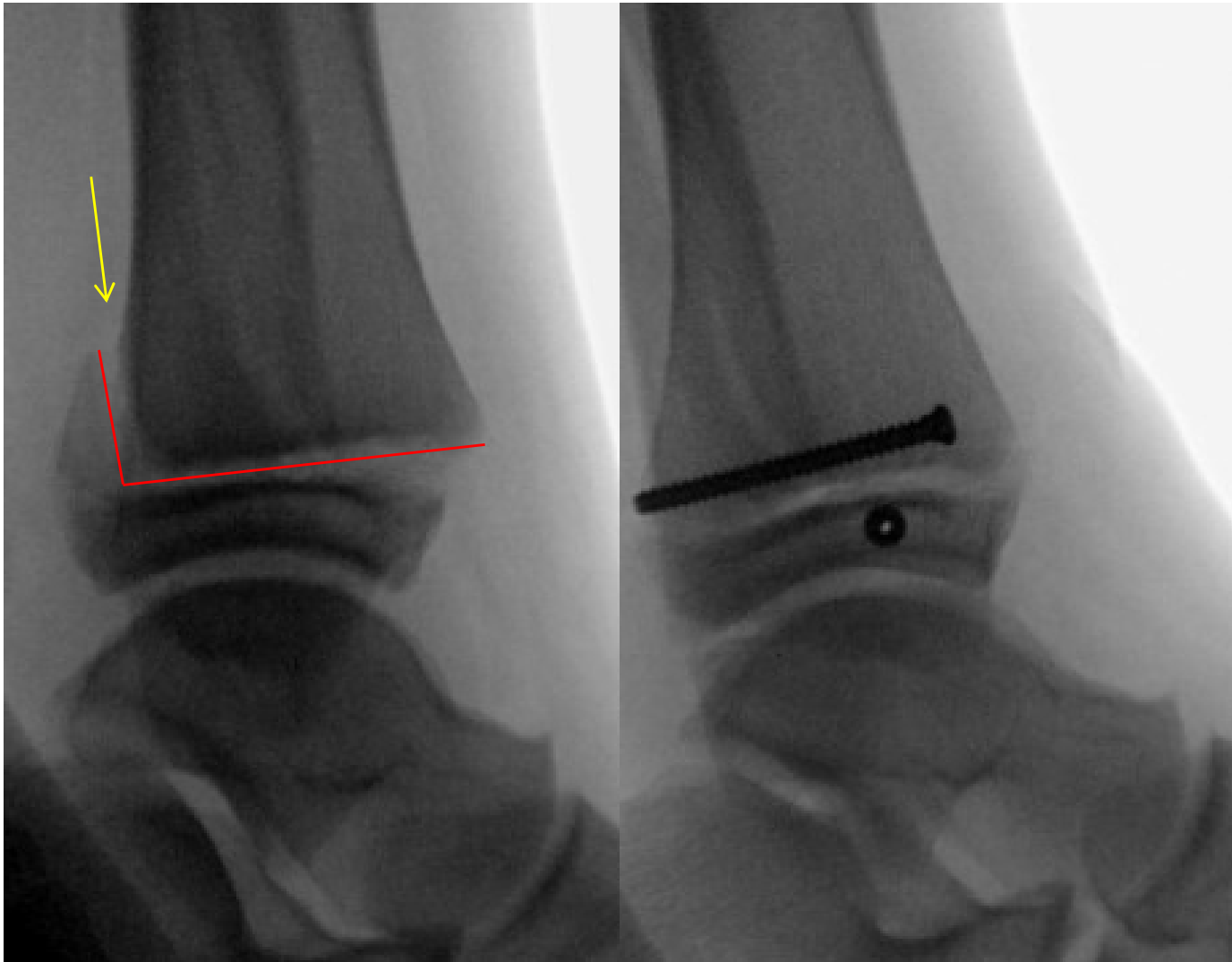
Physeal Fractures



Physeal Fractures



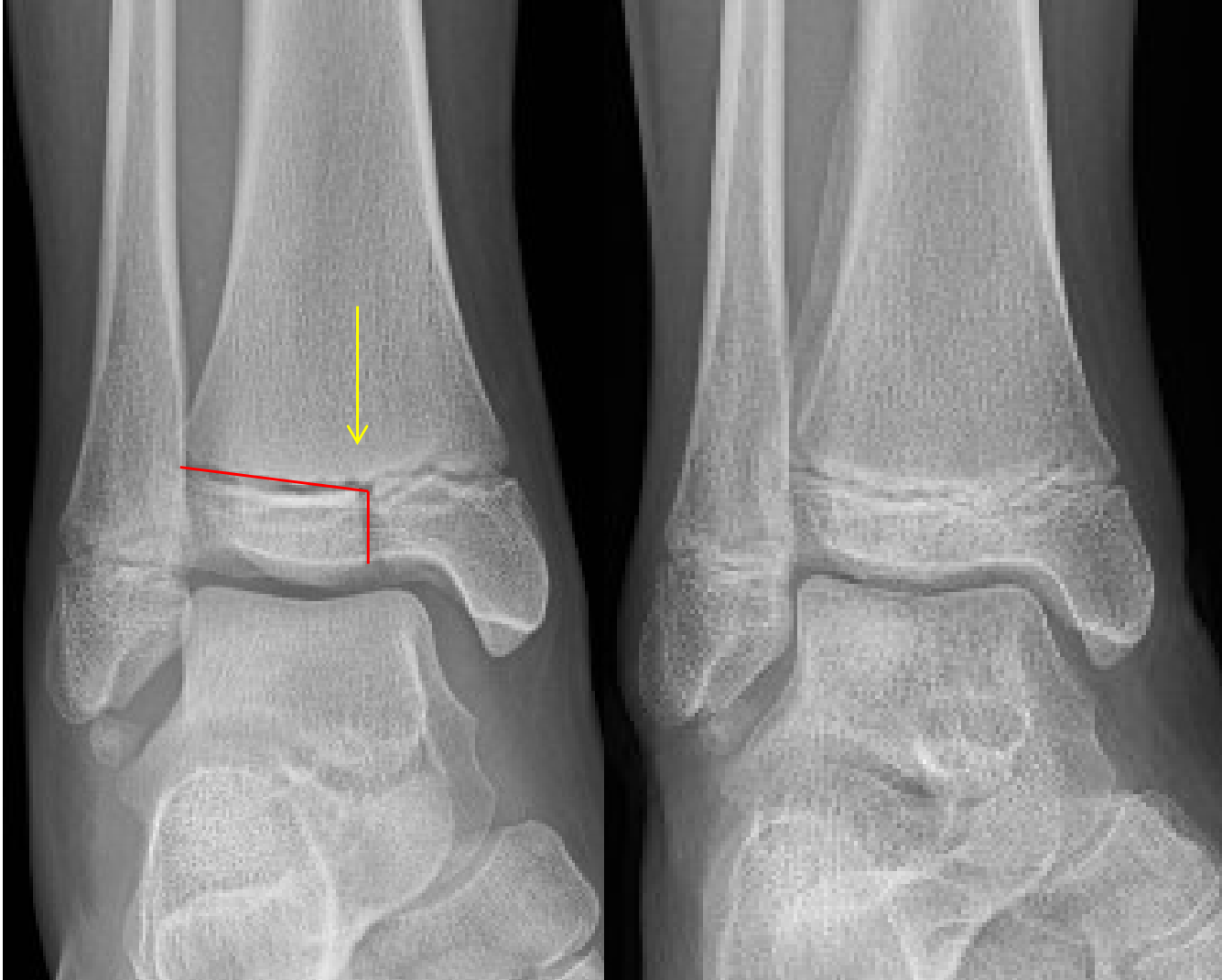
Physeal Fractures



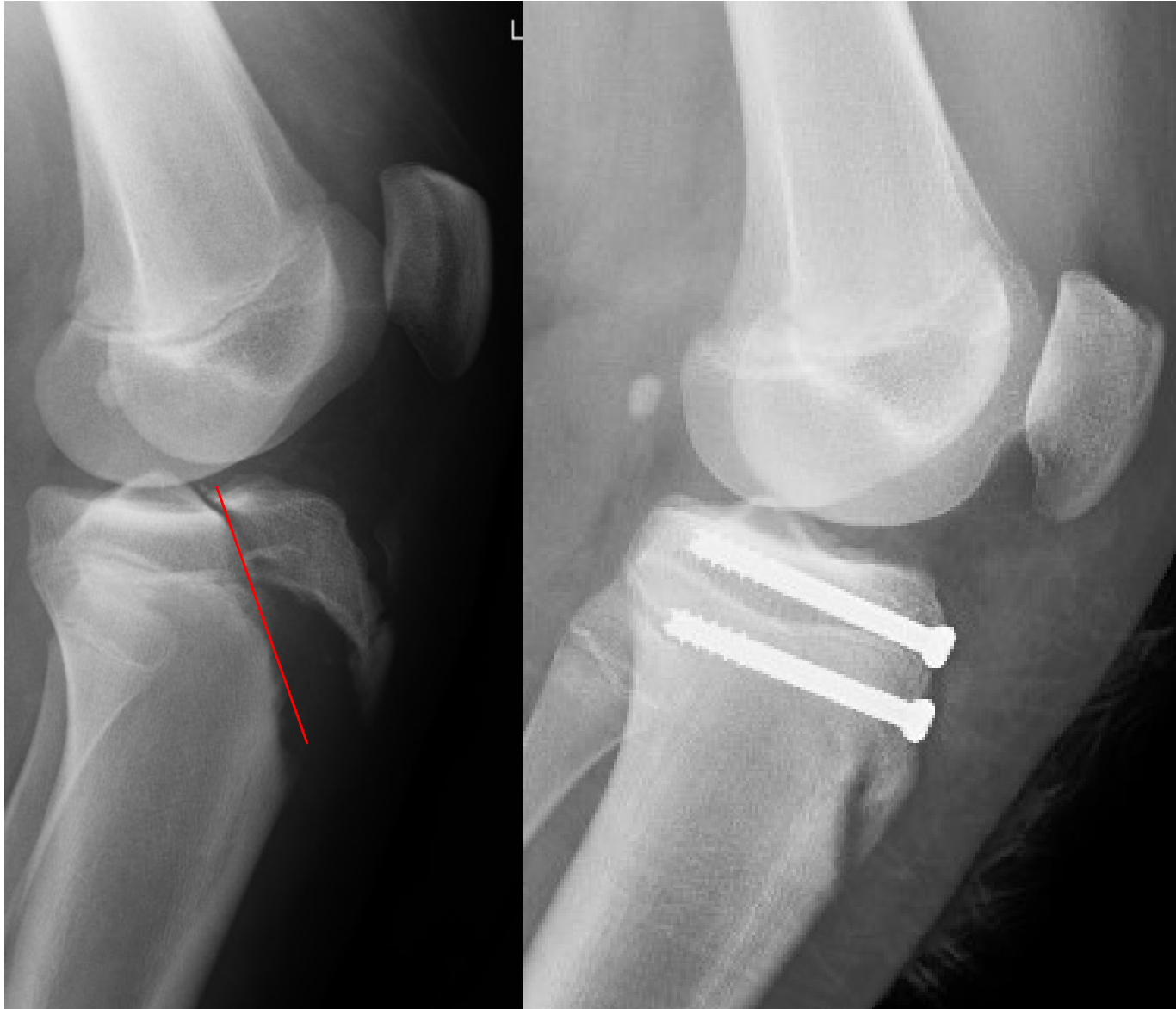
Physeal Fractures



Physeal Fractures



Physeal Fractures



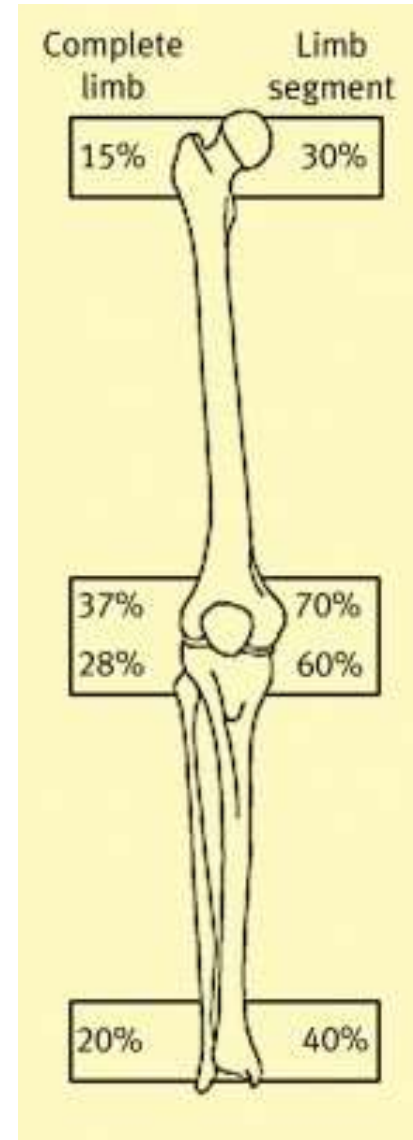
Lower Extremity Physeal Growth

Proximal femur - 3 mm / yr

Distal femur - 10 mm / yr

Proximal tibia - 6 mm / yr

Distal tibia - 3 mm / yr



Upper Extremity Physeal Growth

Humerus

80% Proximal



Forearm

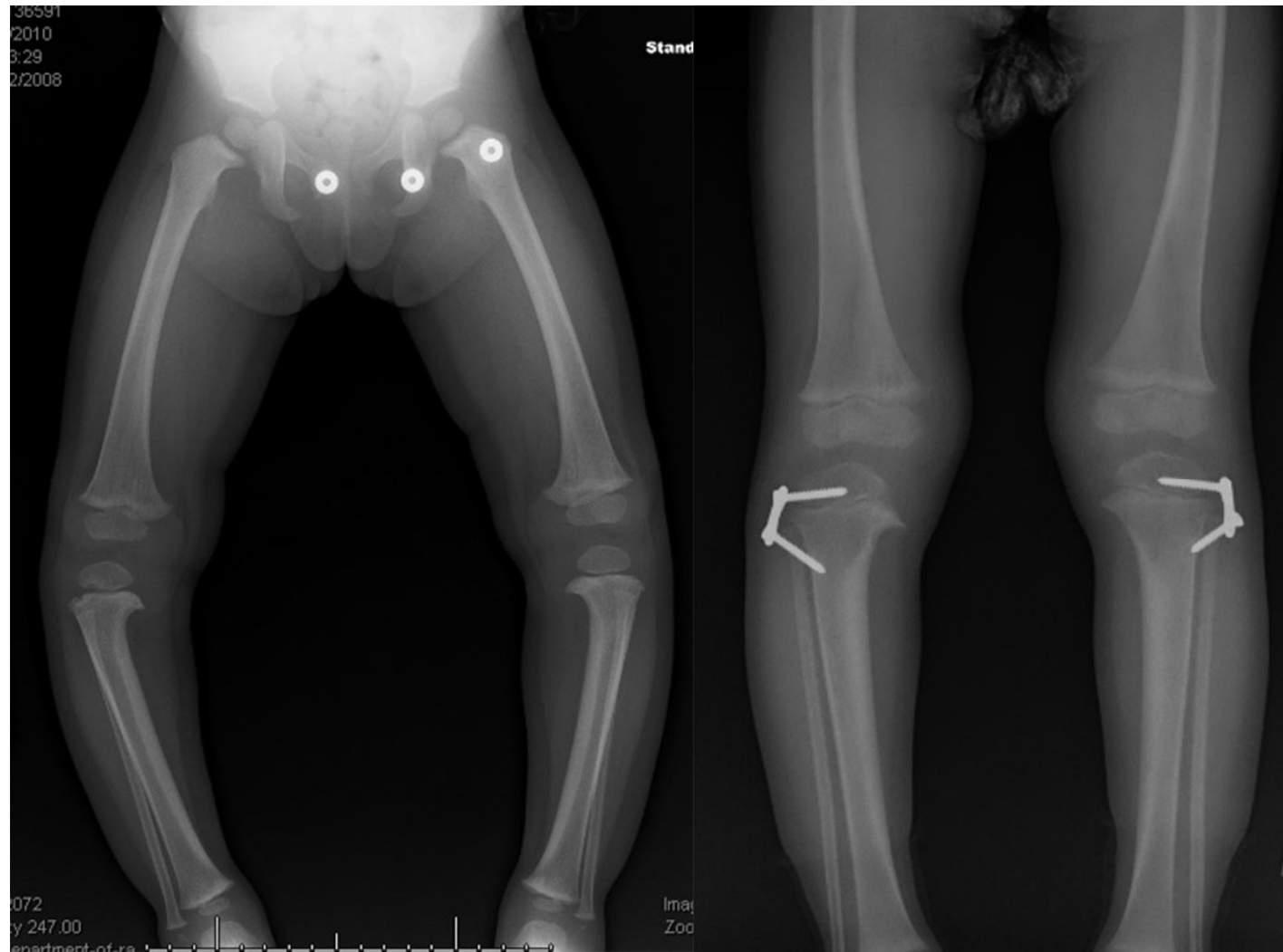
80% Distal



Age at skeletal maturity

Girls – 14

Boys – 16

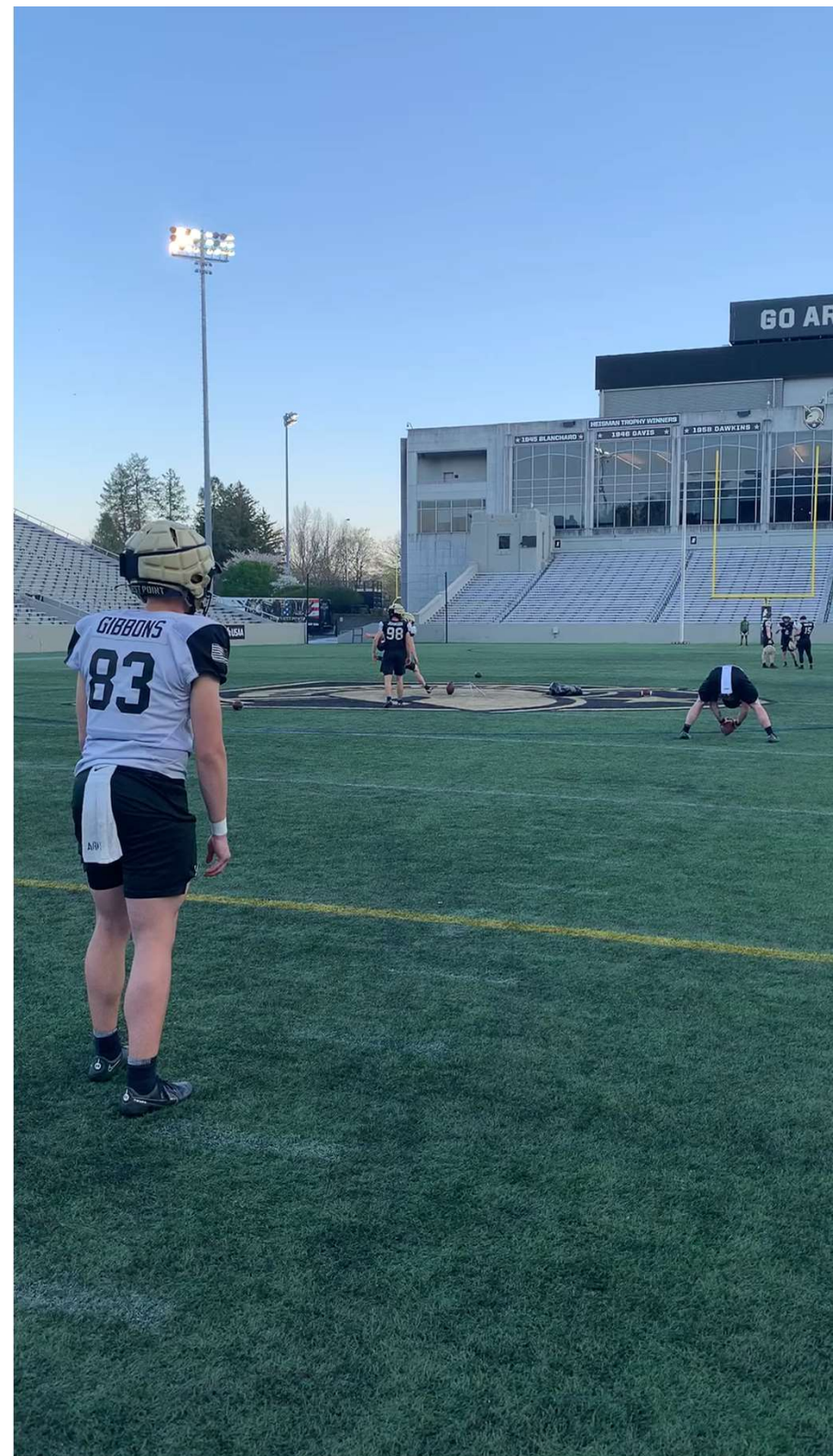


Questions?

INTERMISSION



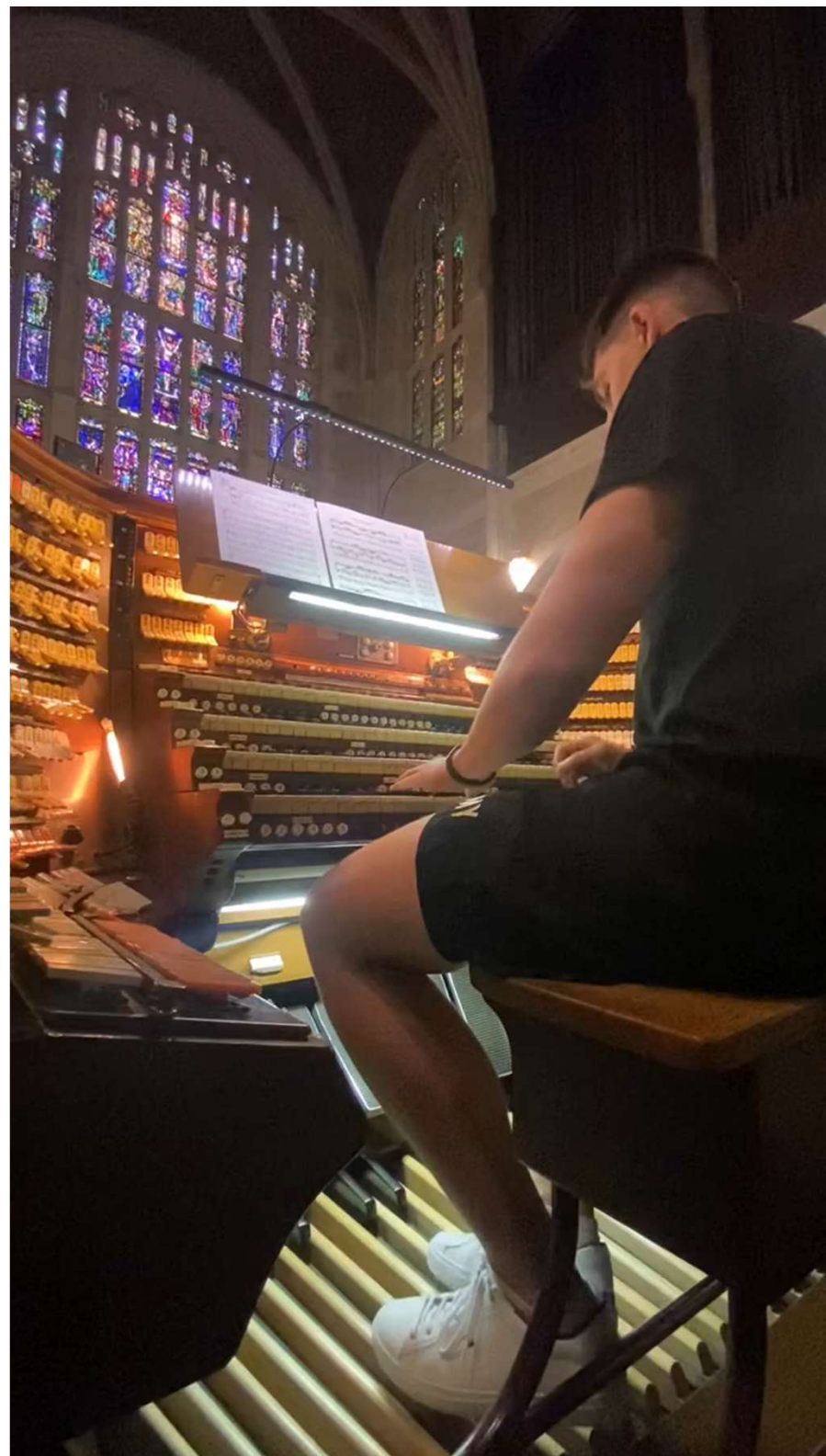
INTERMISSION



INTERMISSION



INTERMISSION



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SCFE

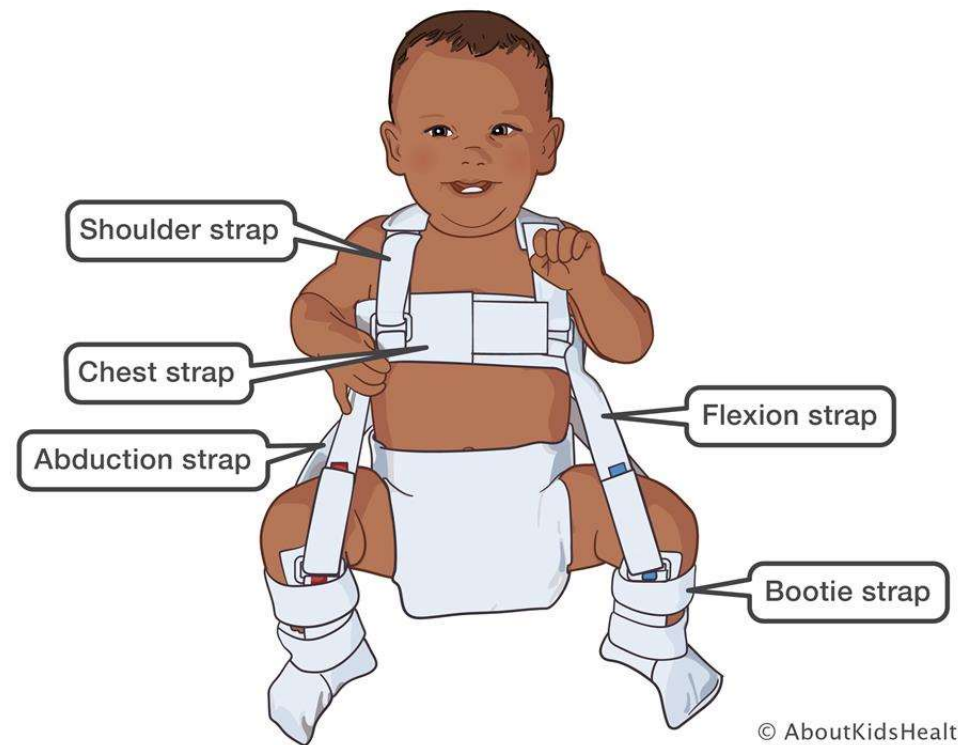
Tarsal Coalitions

DDH

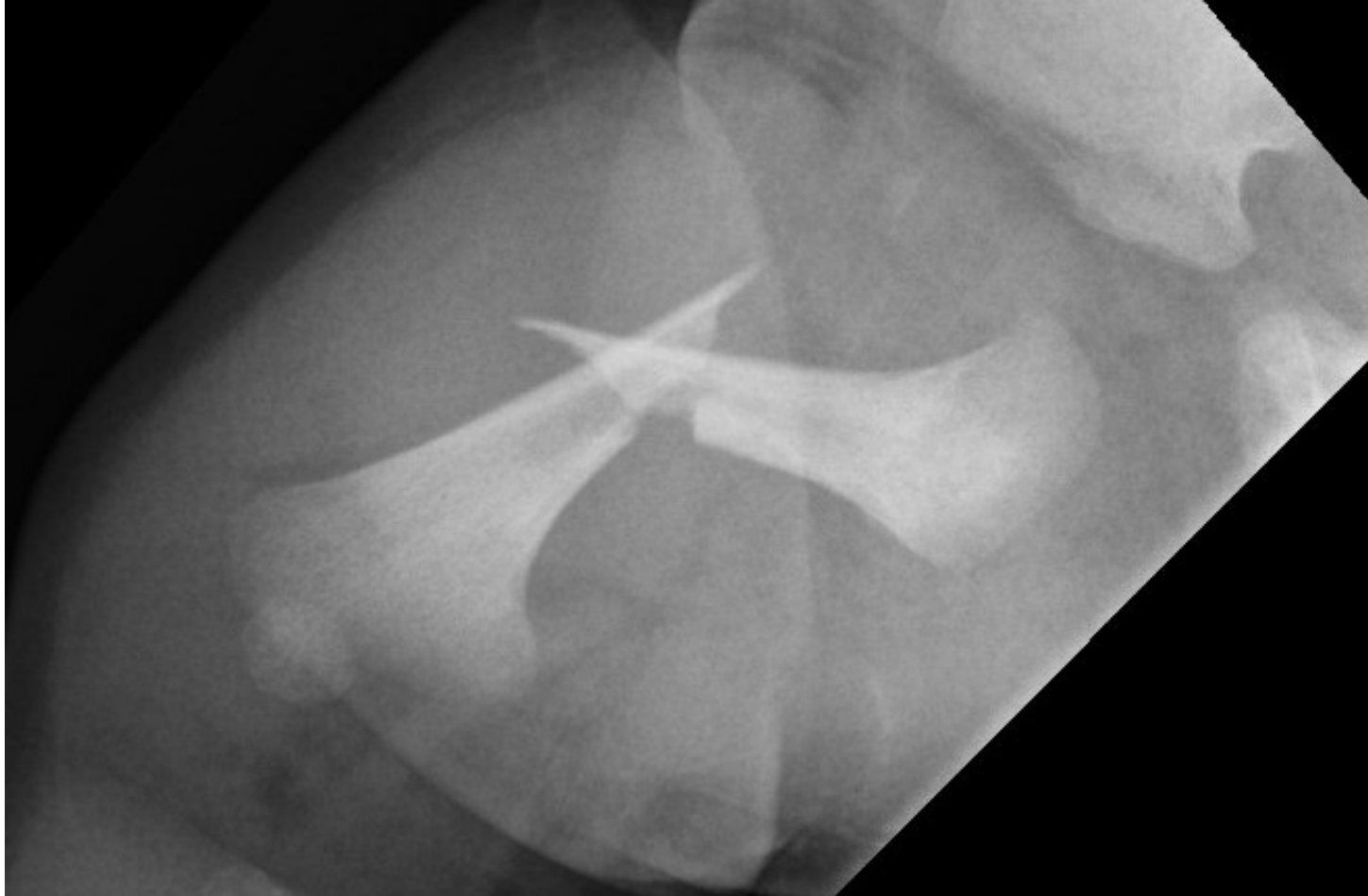
Femur Fractures



<6mo – Pavlik



<6mo – Pavlik



<6mo – Pavlik



6mo-6 yr – Spica Cast





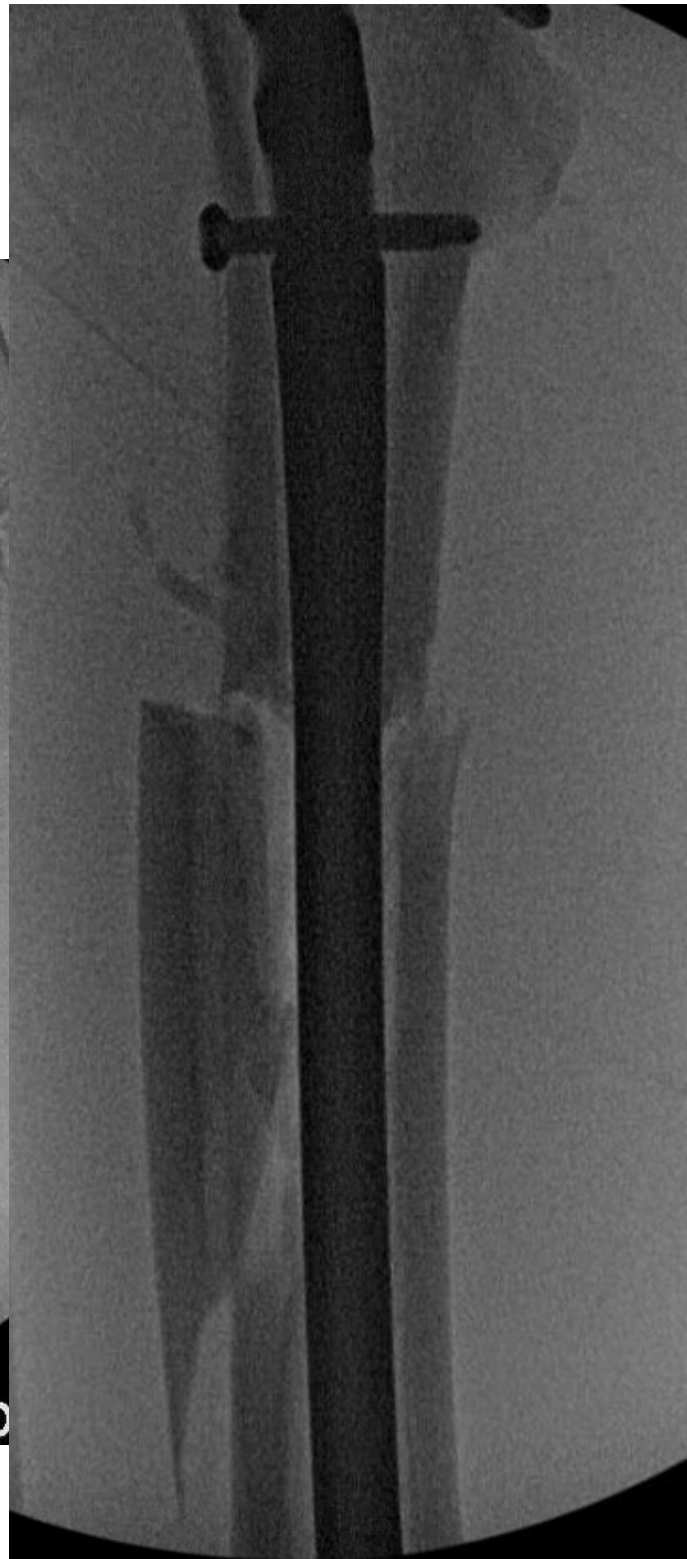
6-11yr – Plate vs Flex Nail



6-11yr – Plate vs Flex Nail



>12yr or 100lbs Rigid IMN



Questions?

INTERMISSION



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DDH

Non-accidental Trauma

50% of fractures in children younger than 1 year of age

What to look for?

- Delay
- Weird story
- Multiple injuries
- Specific injuries



Non-accidental Trauma

Risk Factors

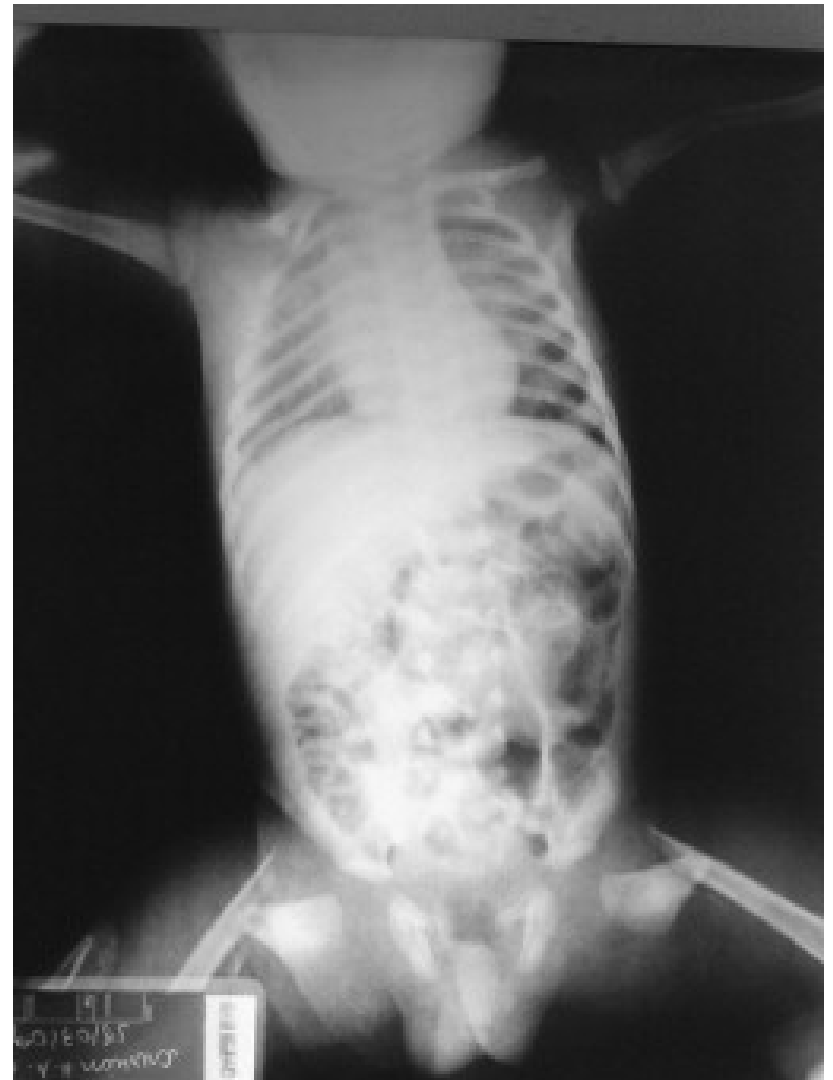
1st born

Unplanned

Premature

Disabilities/CP

Step-child



Non-accidental Trauma

Risk Factors

single-parent home

unemployment

drug-use

lower socioeconomic status

lack of support system



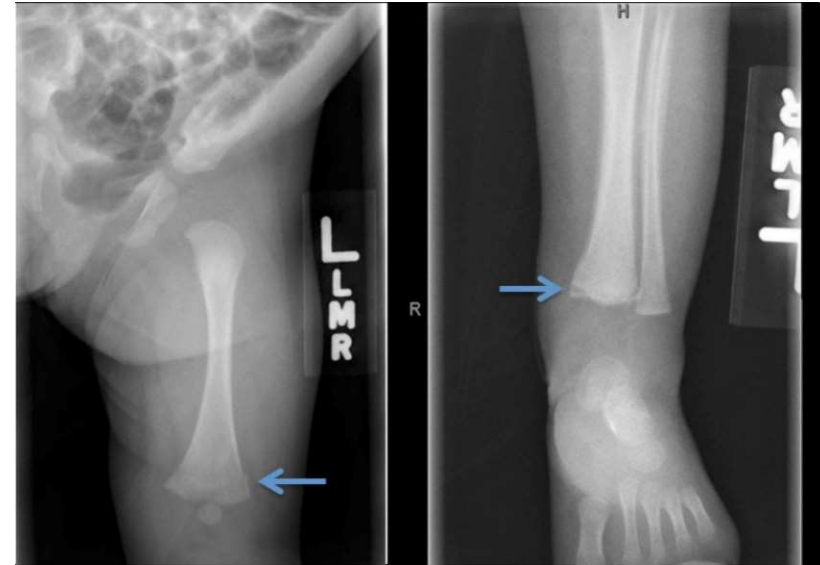
Non-accidental Trauma

Femur fracture <1yr

Corner Fracture

Metaphyseal junction

Distal Humerus physeal fracture



Non-accidental Trauma

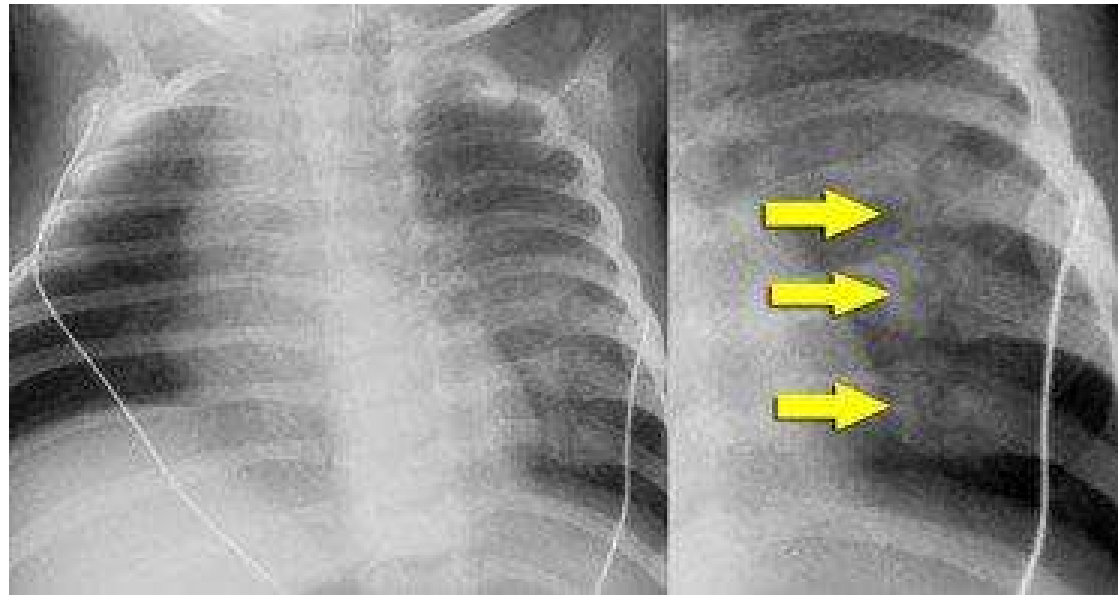
Report

Unreported – 50% repeat abuse, 5-10% death

Admit

Social Worker
Skeletal Survey

Treat



Questions?

INTERMISSION



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SCFE

Male

Obese

12-14 yo

KNEE PAIN



SCFE

KNEI

Growth plate



Femoral head

12-1

Femur

BL?

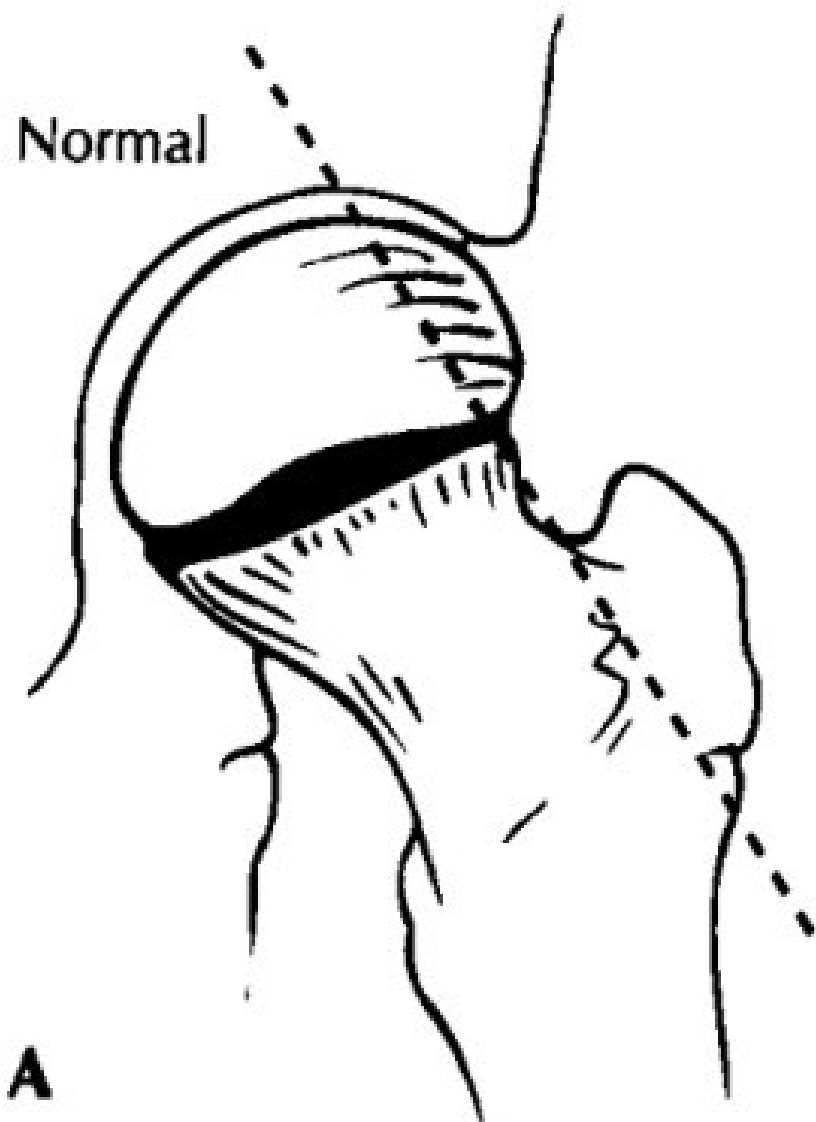
Growth plate



SCFE

Femur

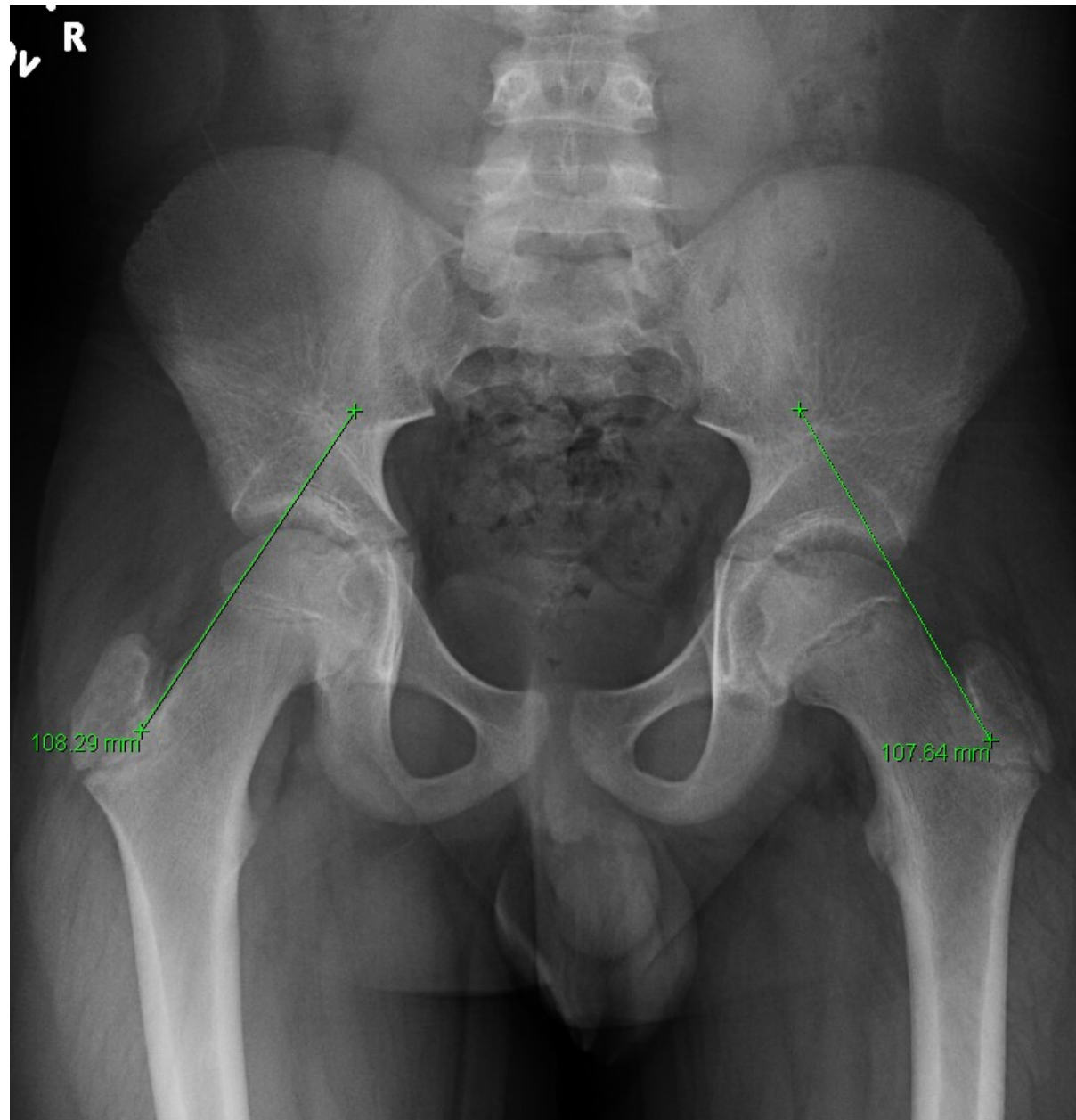
SCFE



SCFE



SCFE



SCFE



SCFE



SCFE



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11yo F w/ Ankle Pain



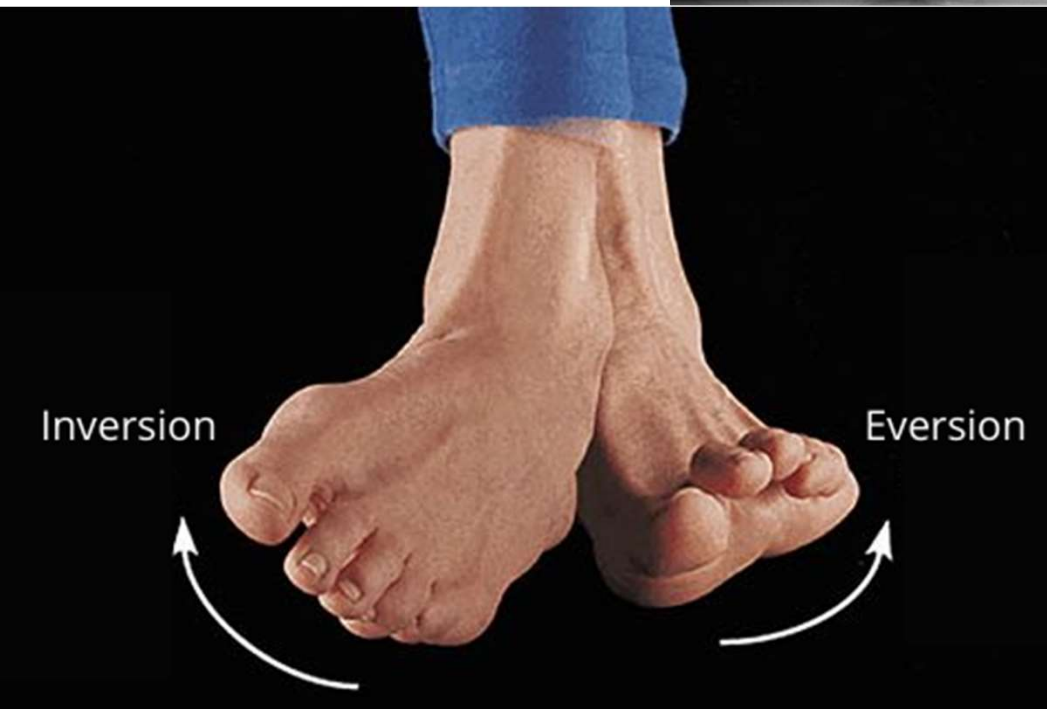
11yo F w/ Ankle Pain



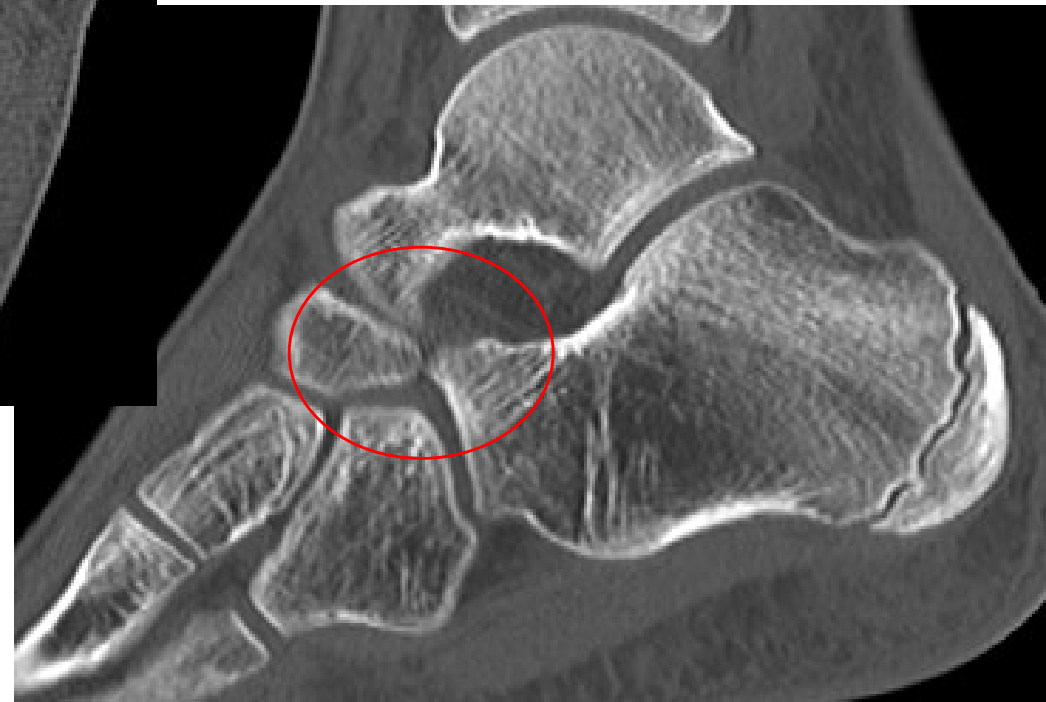
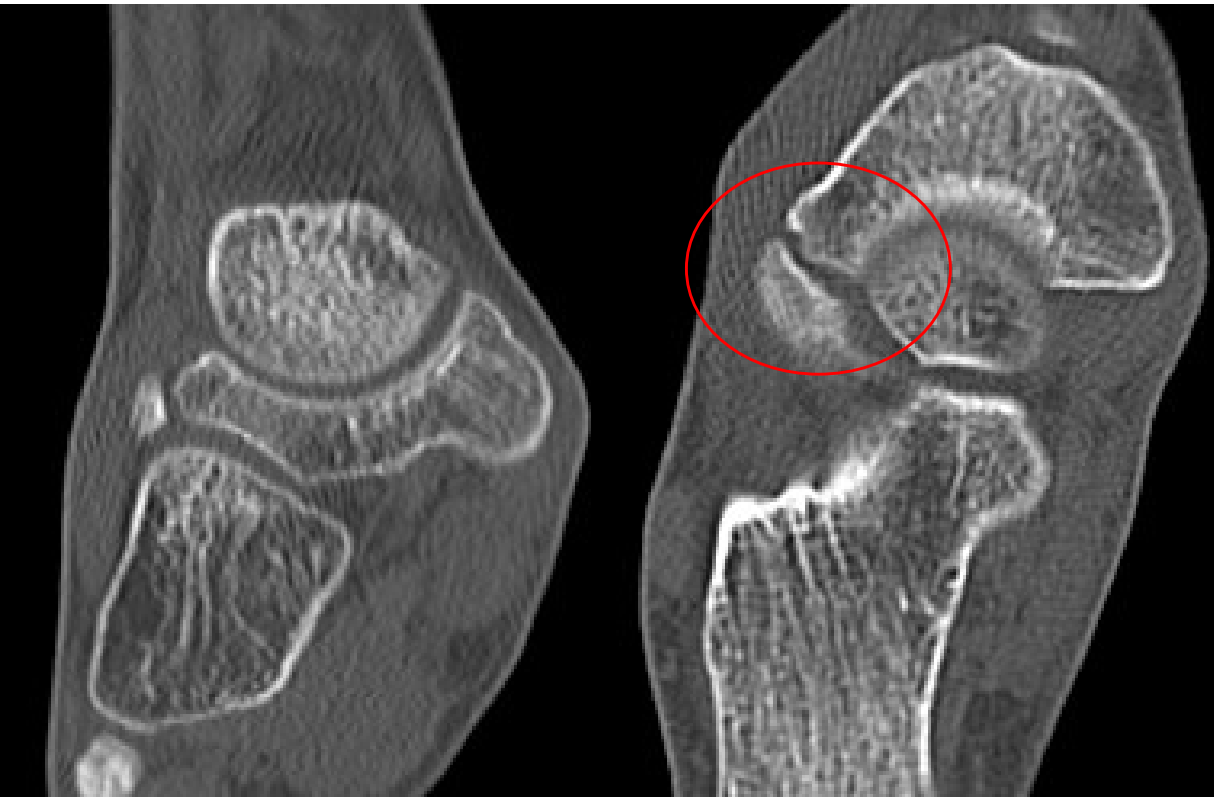
11yo F w/ Ankle Pain

Hx – lateral ankle pain

PE – ↓subtalar motion



11yo F w/ Ankle Pain



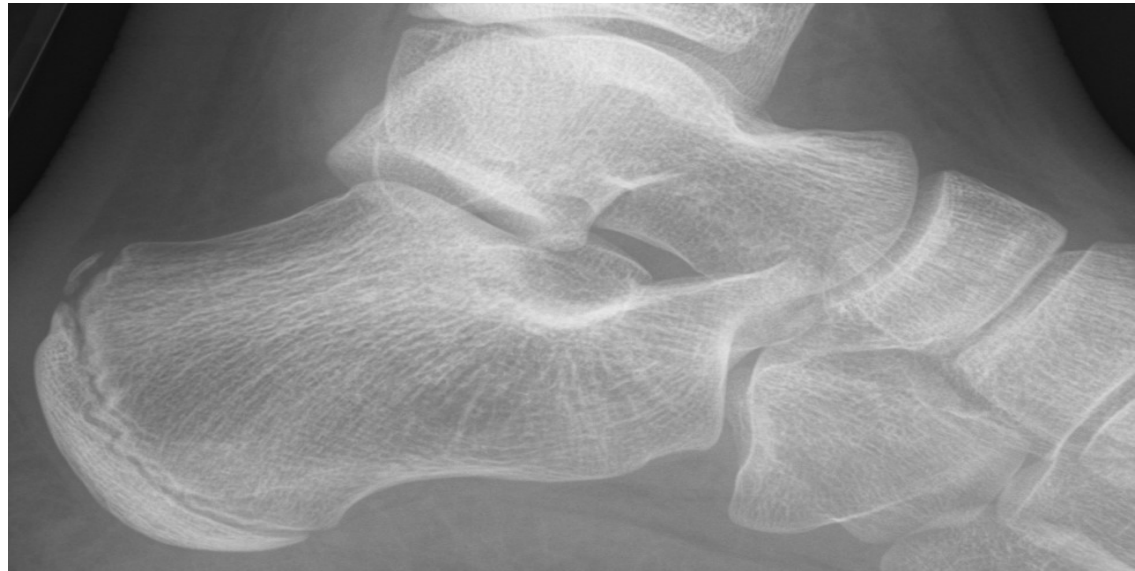
Tarsal Coalition

Most common coalitions:

Calcaneonavicular

Talocalcaneal

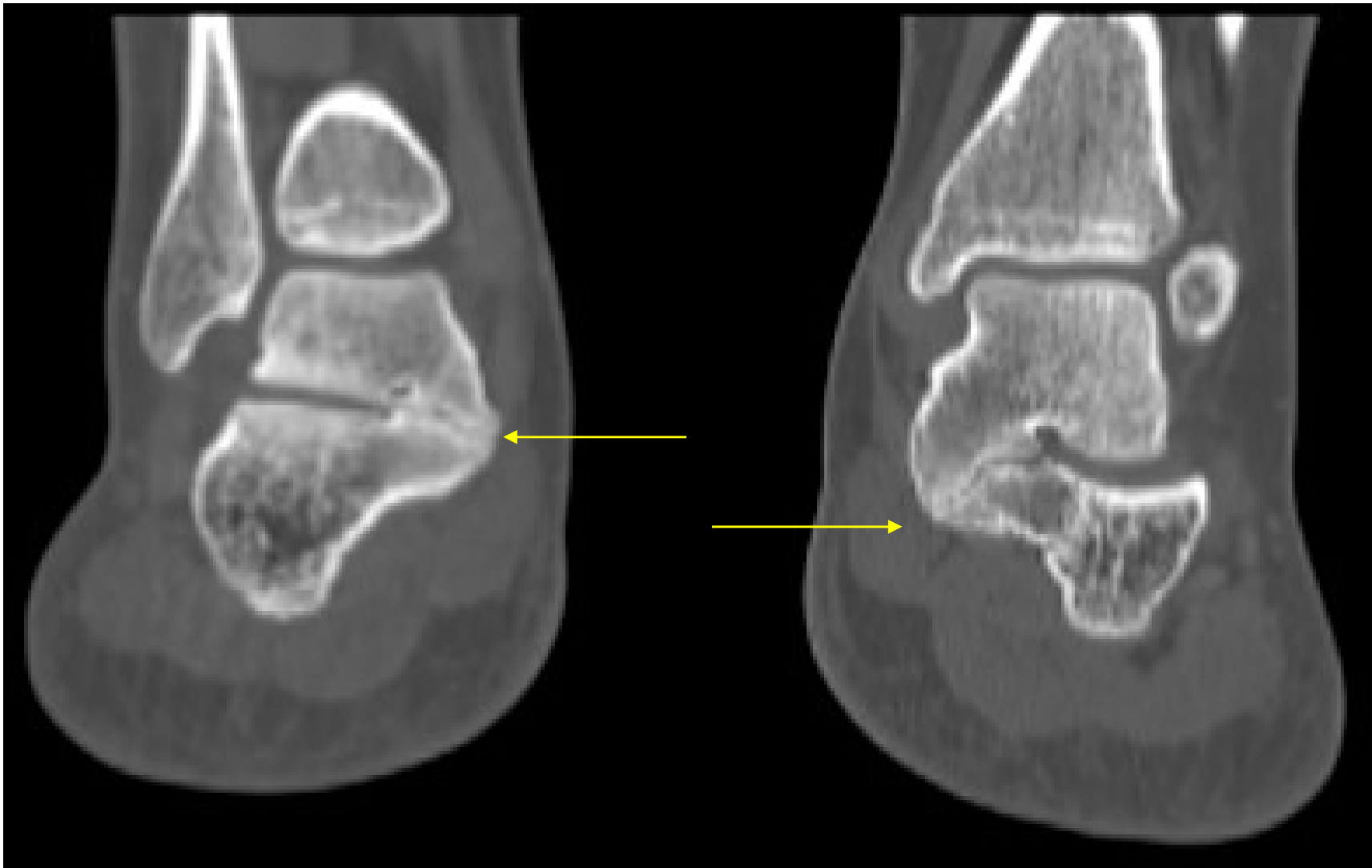
Bilateral up to 60%



Calcaneonavicular



Talocalcaneal



Tarsal Coalition

Symptoms

Anterior/lateral ankle pain

recurrent ankle sprains

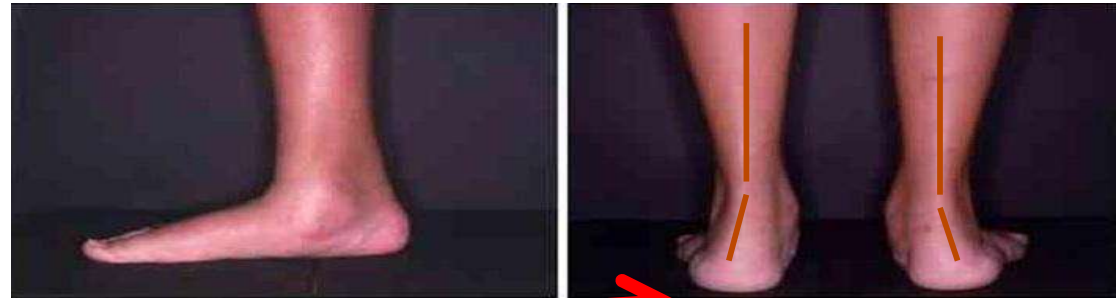


Tarsal Coalition

Physical Exam

Inspection

hindfoot valgus

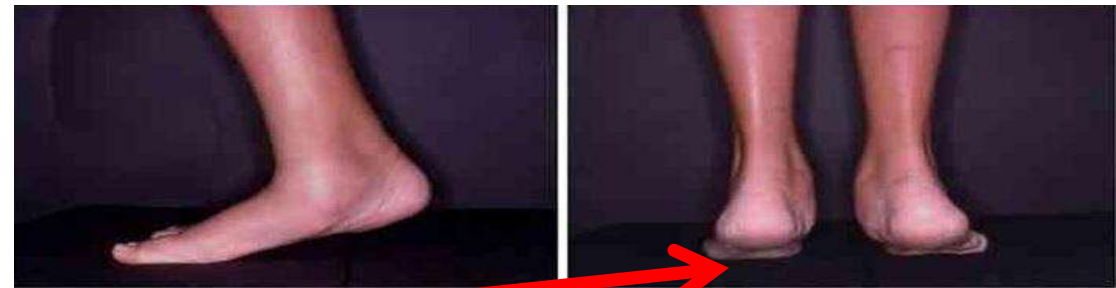


Range of motion

limited subtalar motion

heel cord contractures

arch of foot may not reconstitute upon toe-standing



Tarsal Coalition

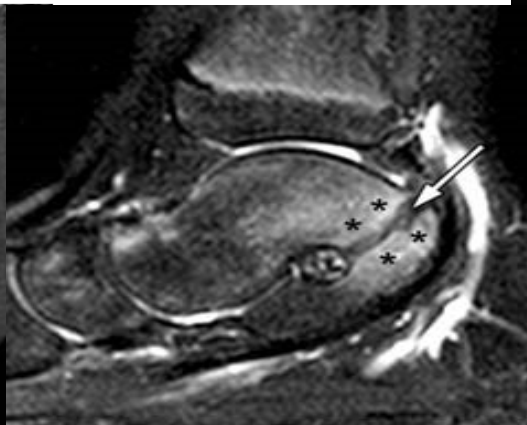
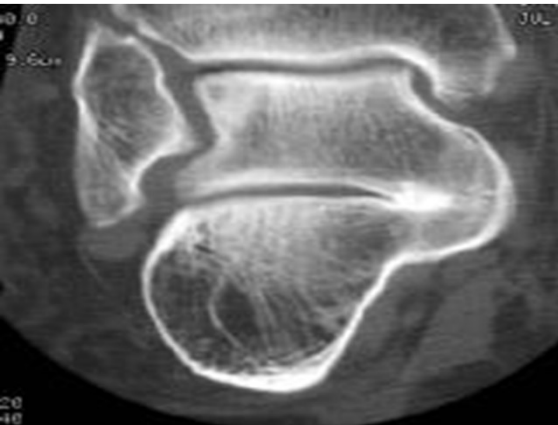


Tarsal Coalition

Imaging

AP, Lat, Oblique, Harris

CT or MRI



Tarsal Coalition

Activity modification, casting,
orthotics

Resection and fat/EDB interposition



Tarsal Coalition



Tarsal Coalition



Questions?

Intermission



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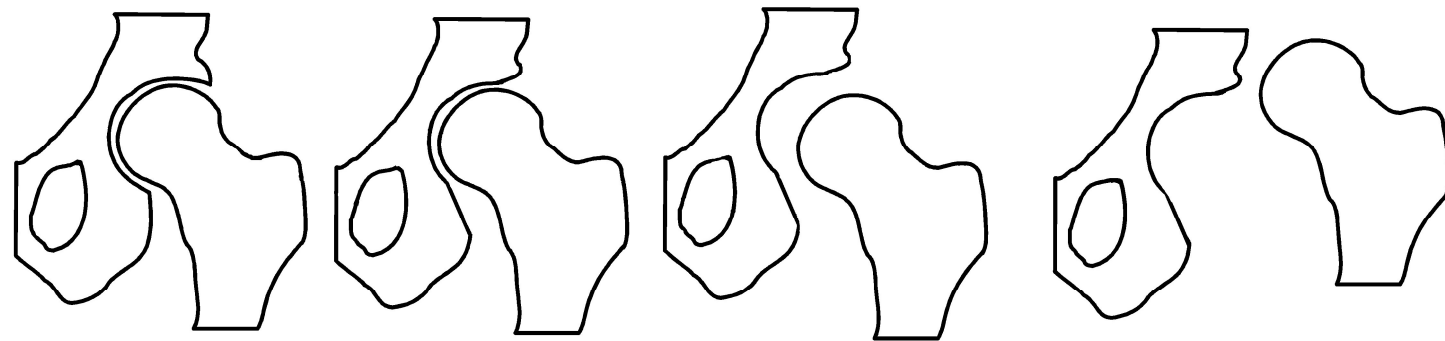
DDH

DDH Terminology

Dysplasia – shallow or underdeveloped acetabulum

Subluxation

Dislocation



Teratologic hip

Dislocated in utero and irreducible

Catastrophic If Missed



Catastrophic If Missed



Etiology

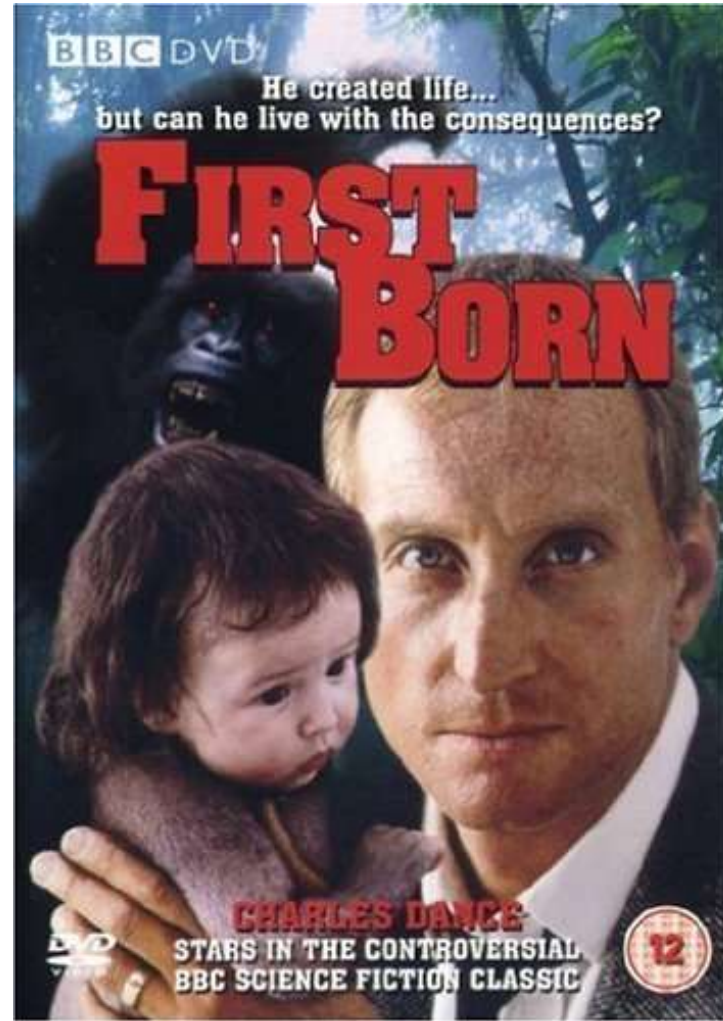
First born

Tighter space

Female – 80%

Family History

+12-33%



Etiology

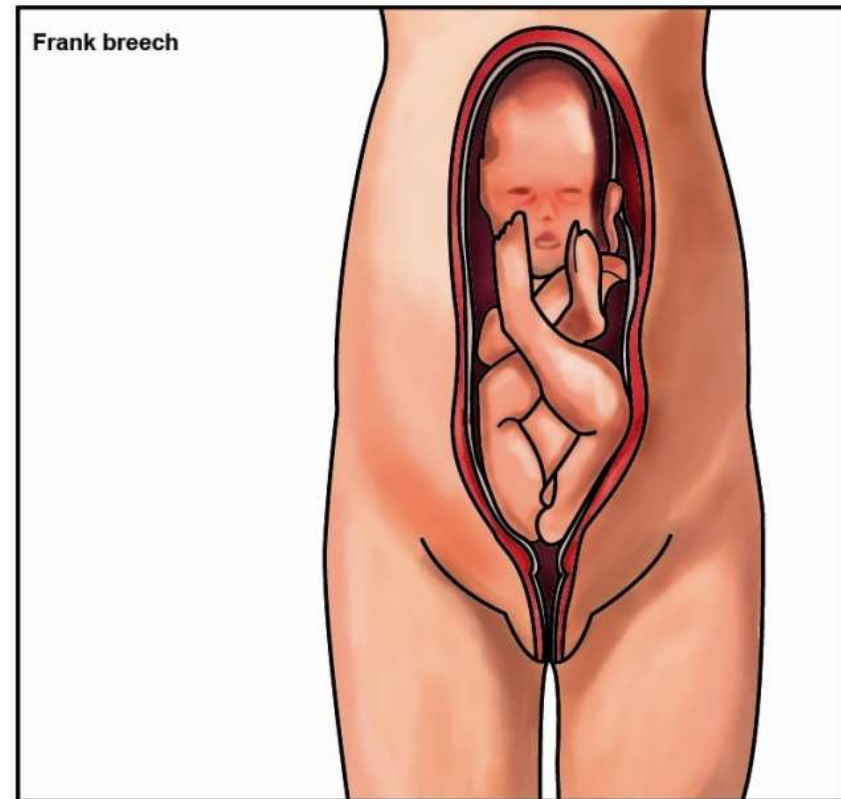
Breech – 20%

60% are 1st born

66% are Female

LEFT

BL 20%



Incidence

0.1/1000 Chinese
Similar in Africans

25-50/1000 NA

Abn newborn exam 1/100

Actual dislocation 1/1000



Presentation

History

FH

Birth order

Position

Oligohydramnios

Reason for referral



Exam

Hip abduction

Barlow/Ortolani

Galeazzi

Klispic

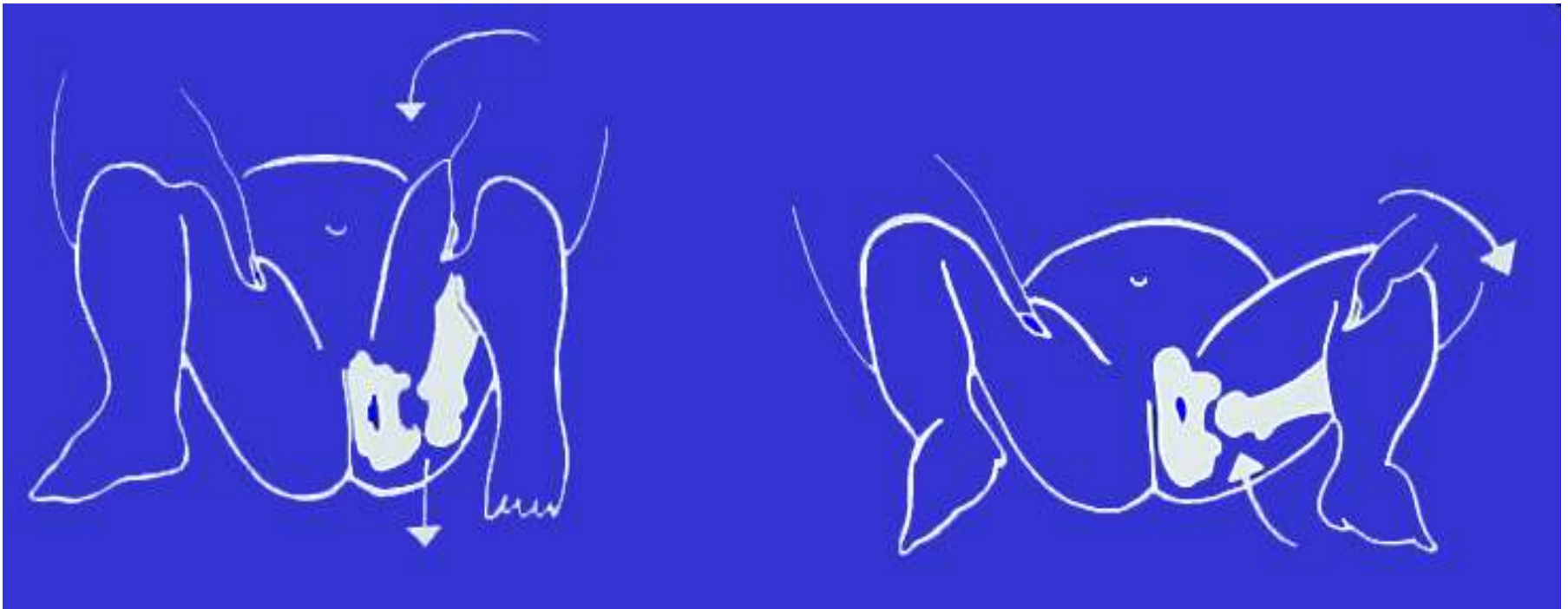
Foot and spine exam

Waddling Gait

Hyperlordosis



Exam Maneuvers

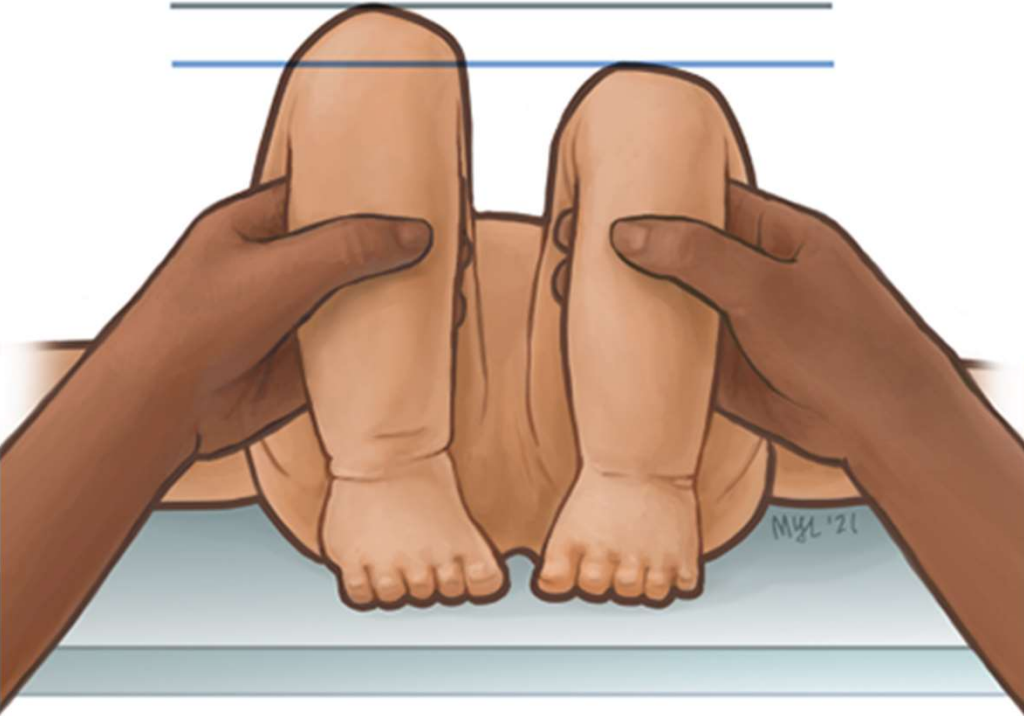


Barlow = Dislocatable

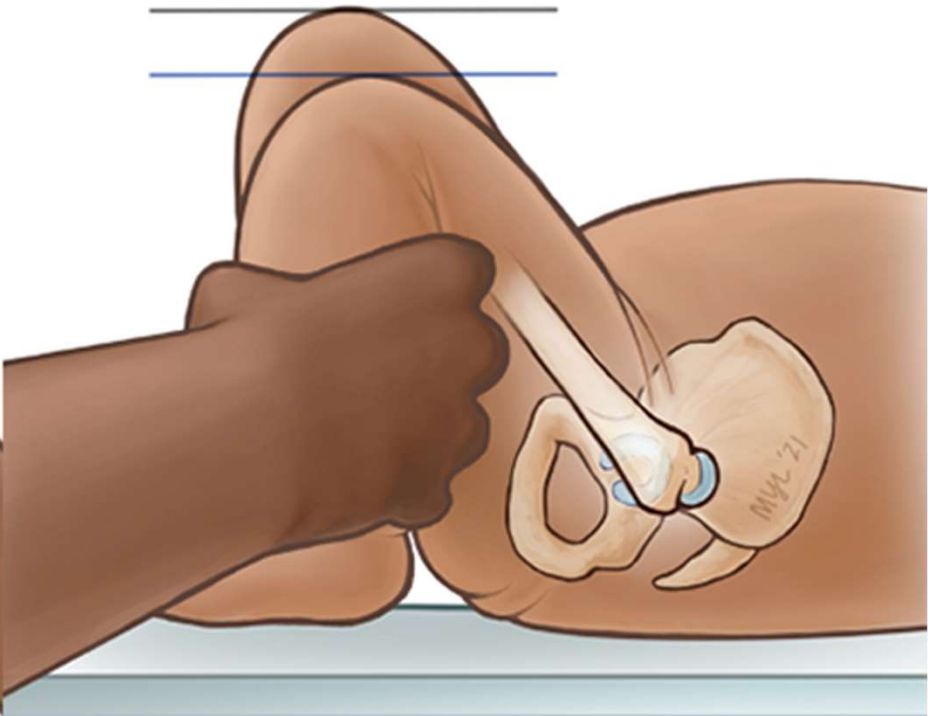
Ortolani = Reducible

Galeazzi

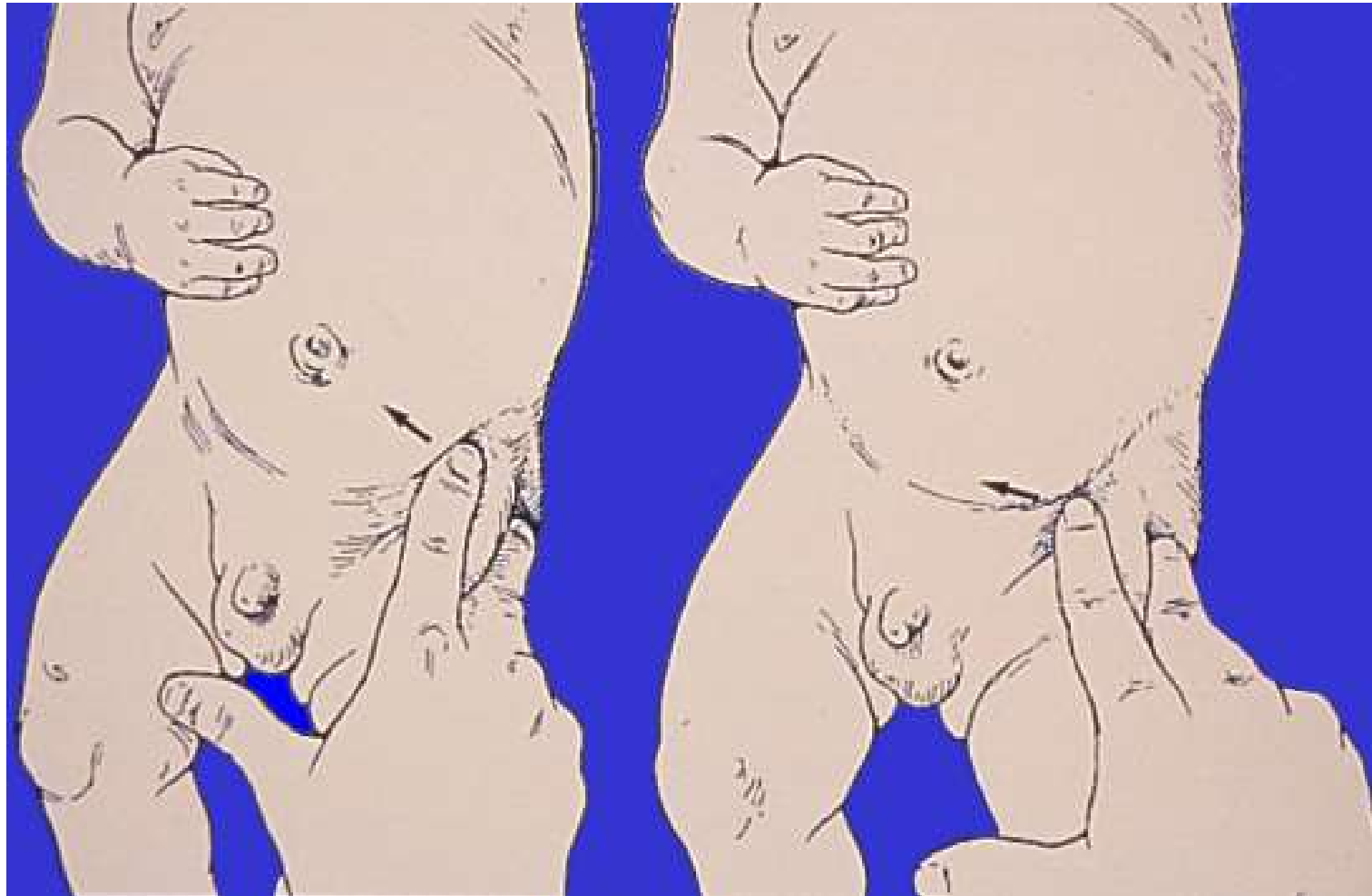
Inferior



Lateral



Klasic



Late Diagnosis



DDH



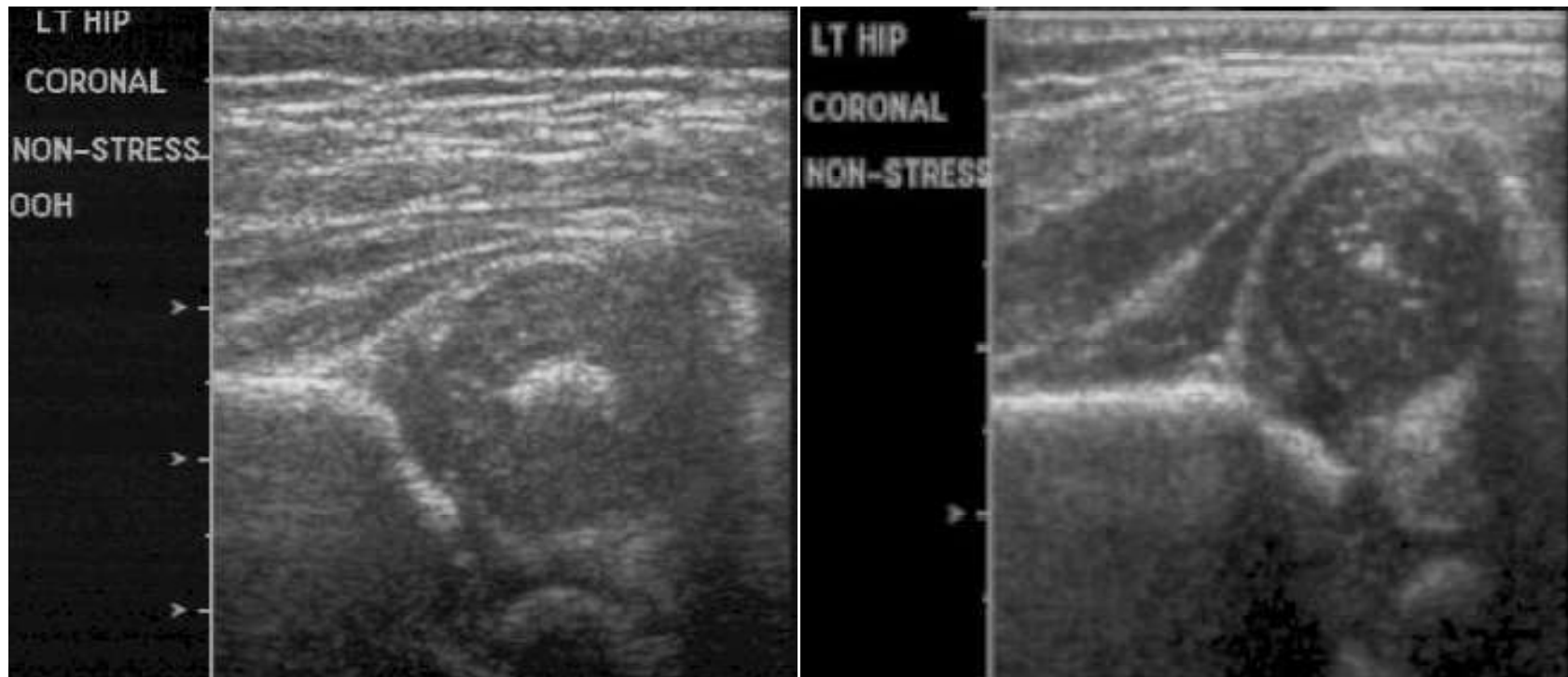
Late Diagnosis

Imaging

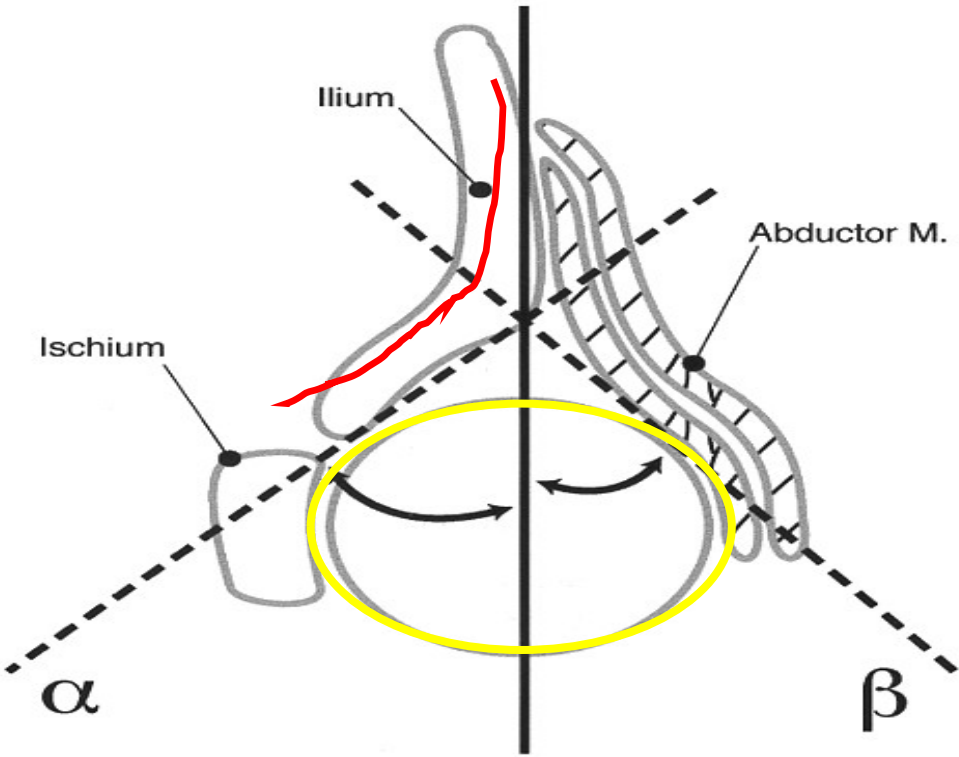
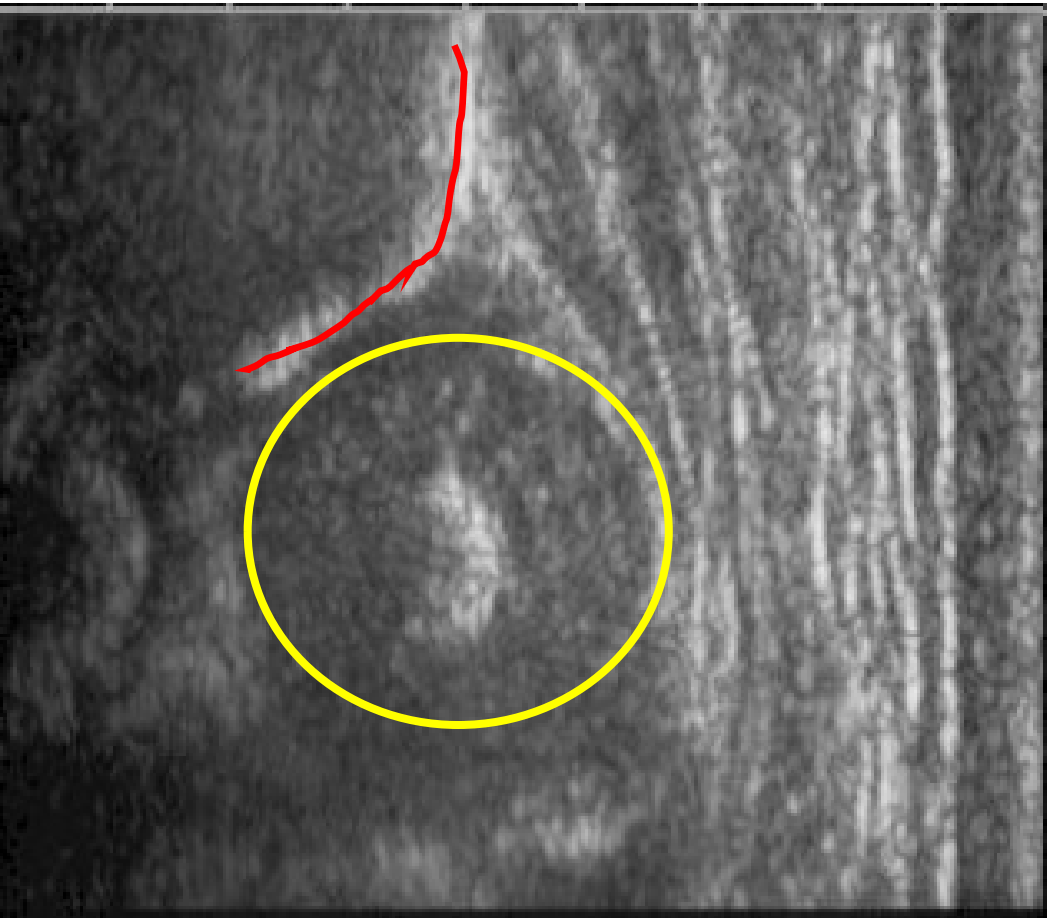
US

Alpha angle

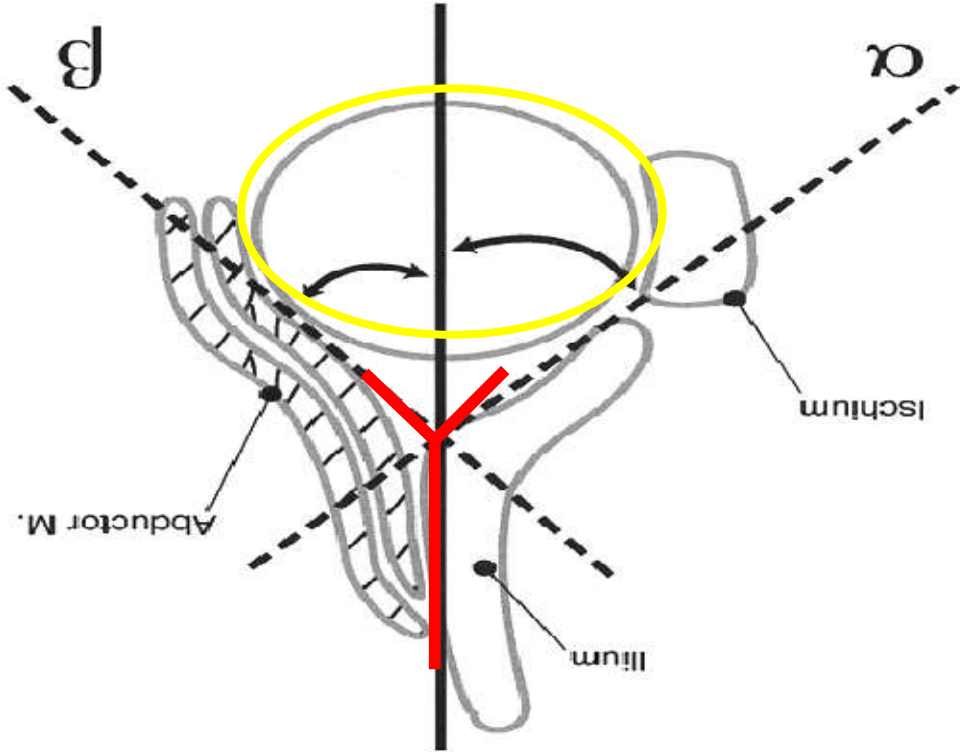
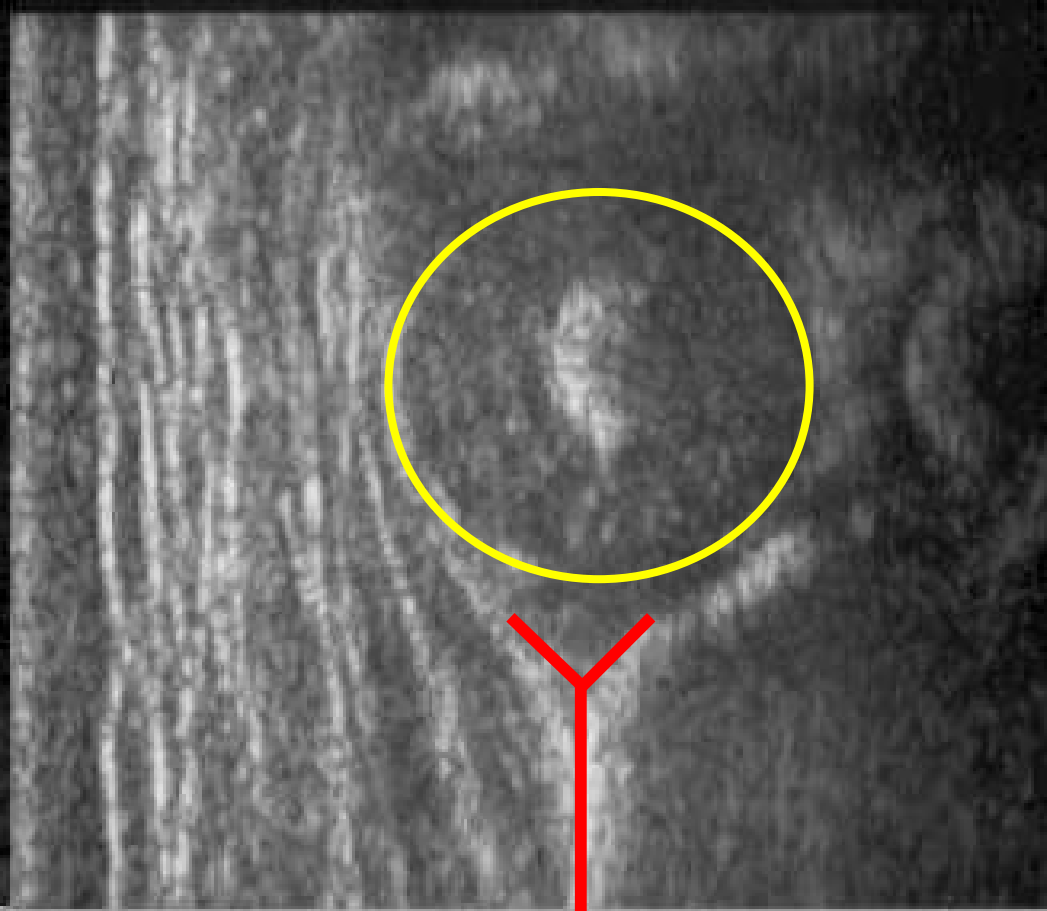
% coverage



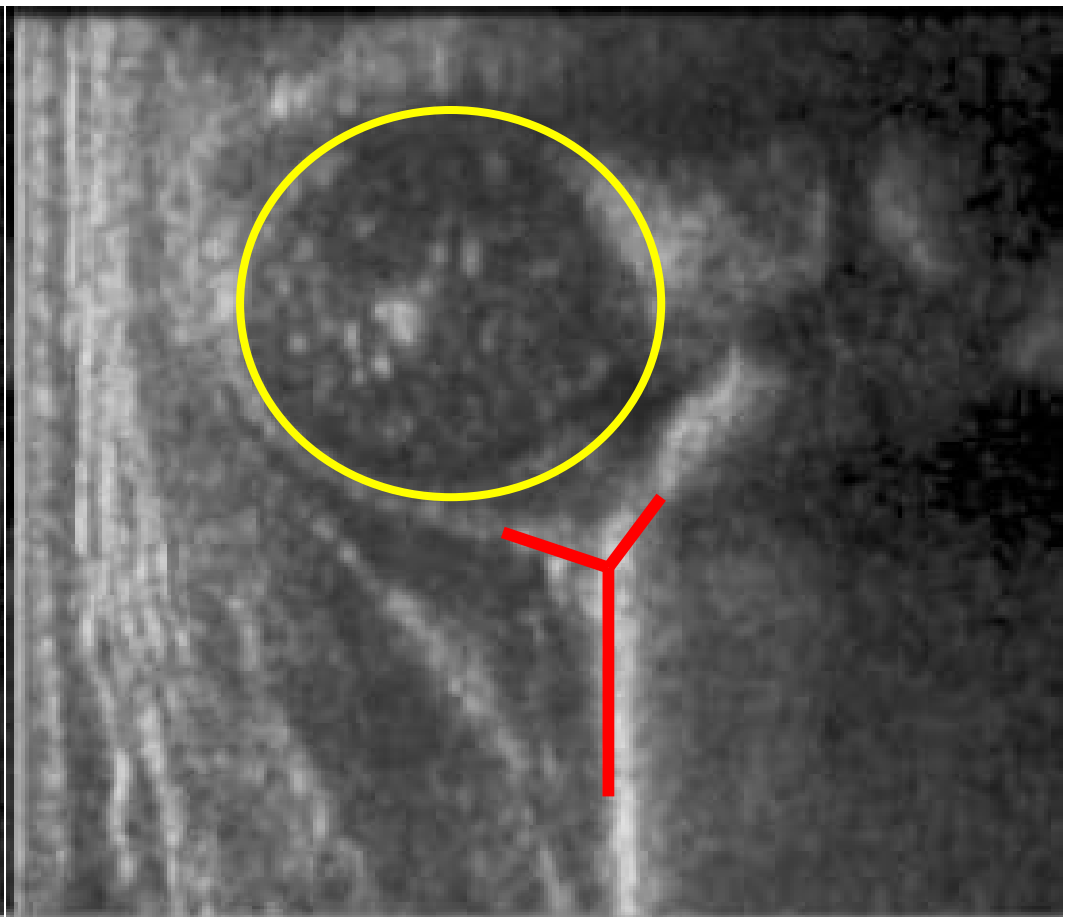
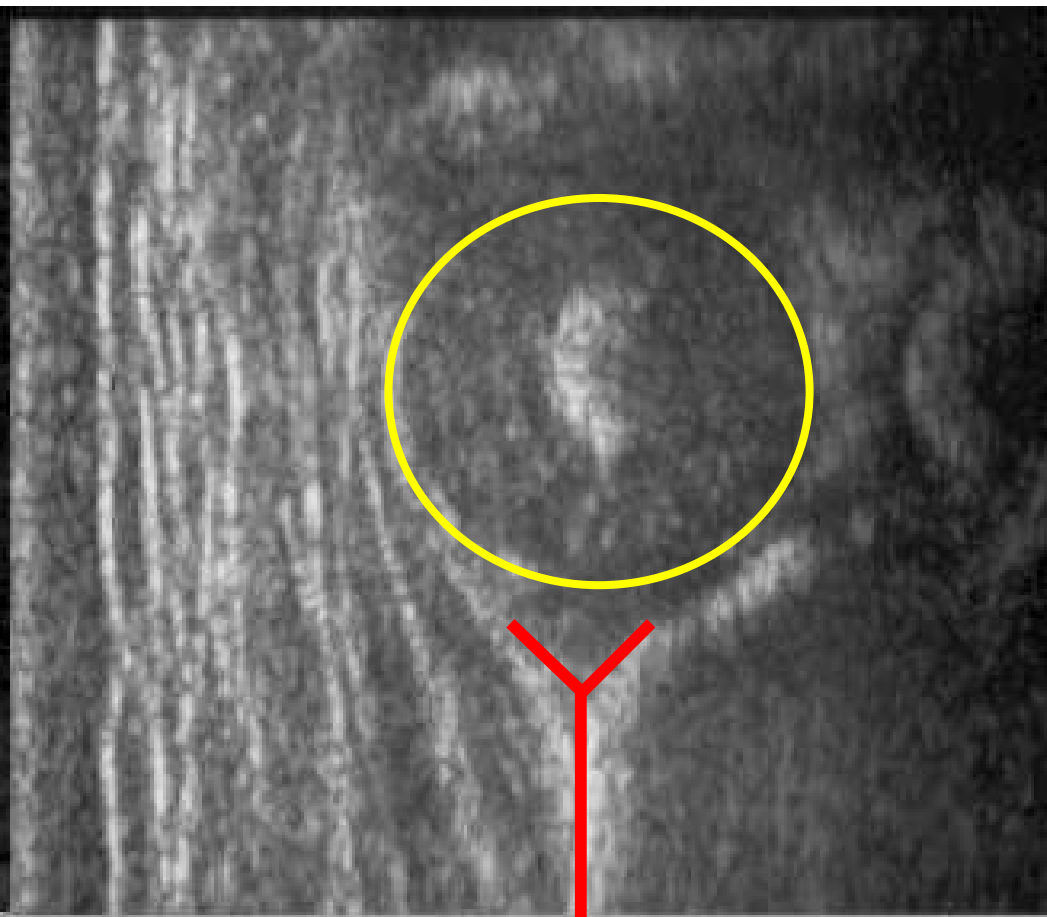
Imaging



Imaging

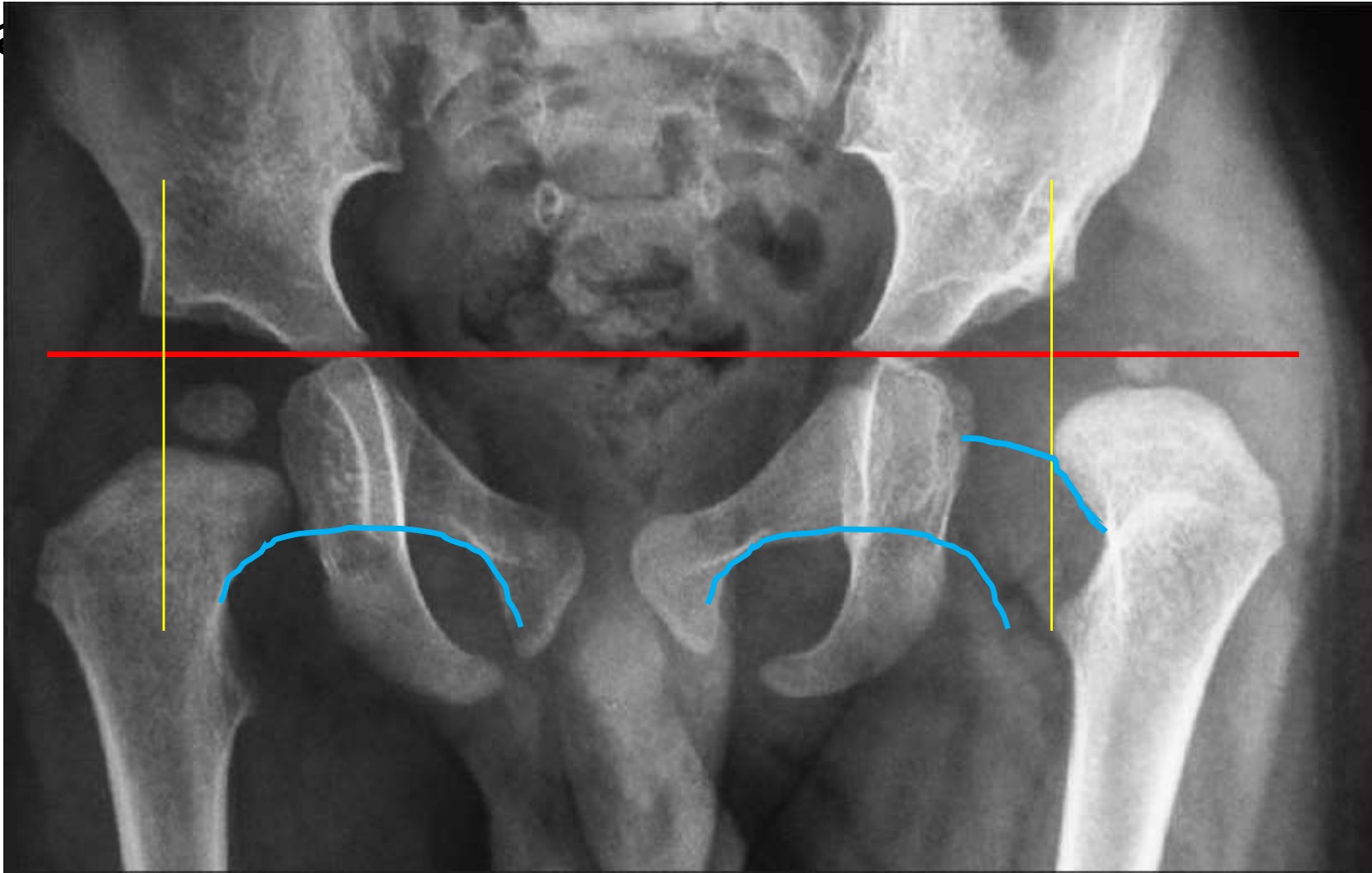


Imaging



Imaging

AP &



Treatment <6mo



Arnold Pavlik

Pavlik Harness

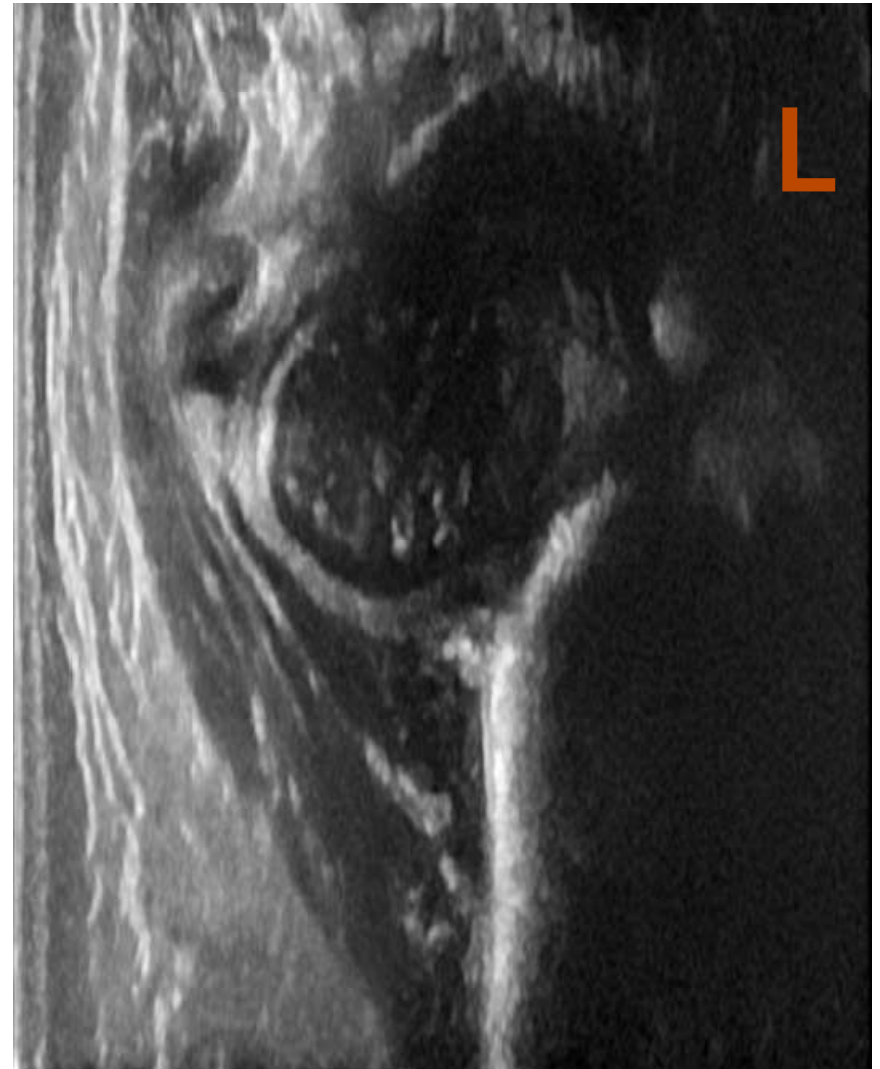
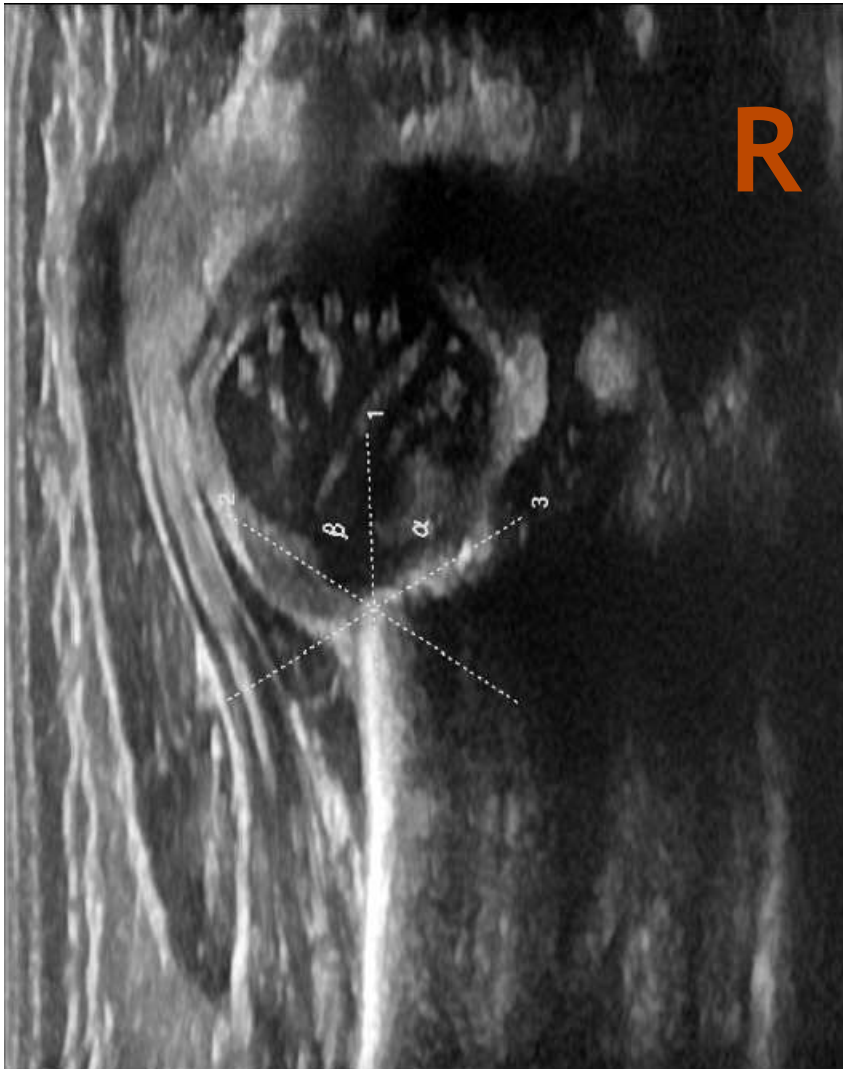
Confirm w/ US

D/c after 3wks if not reduced

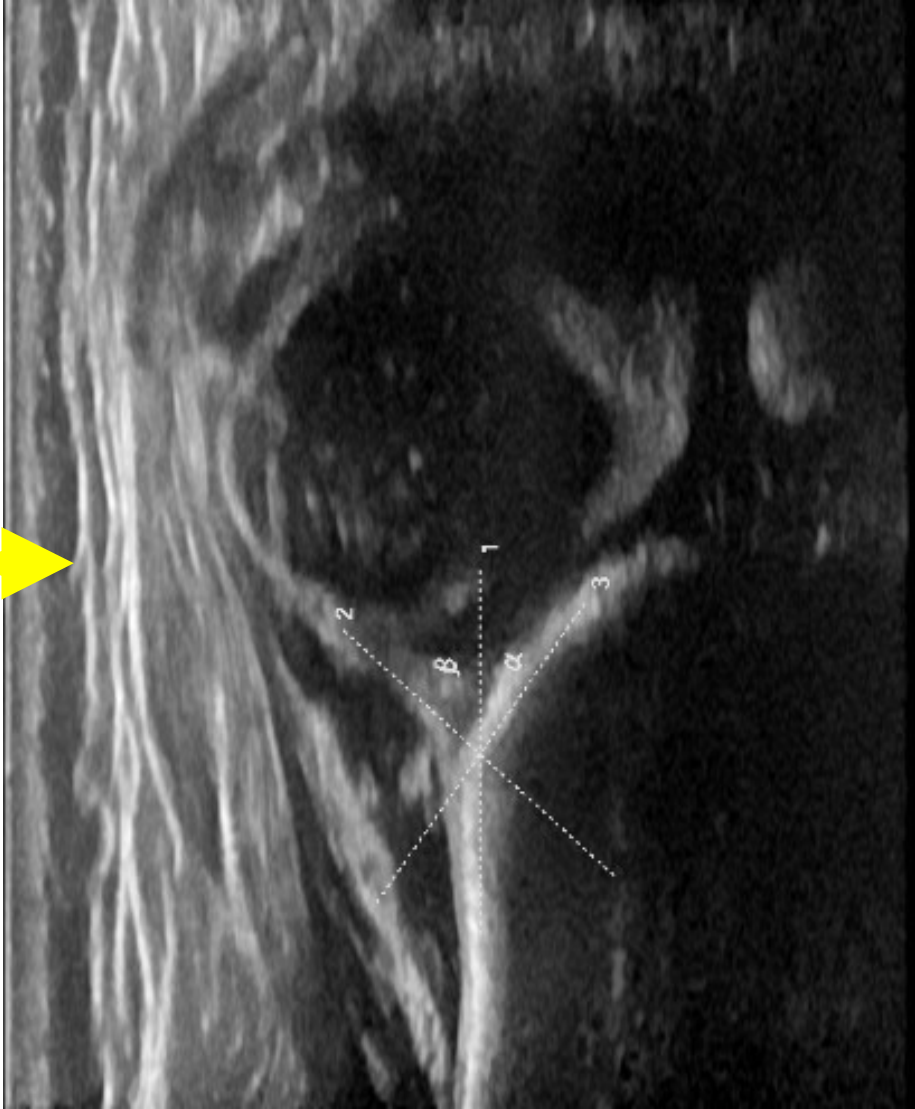
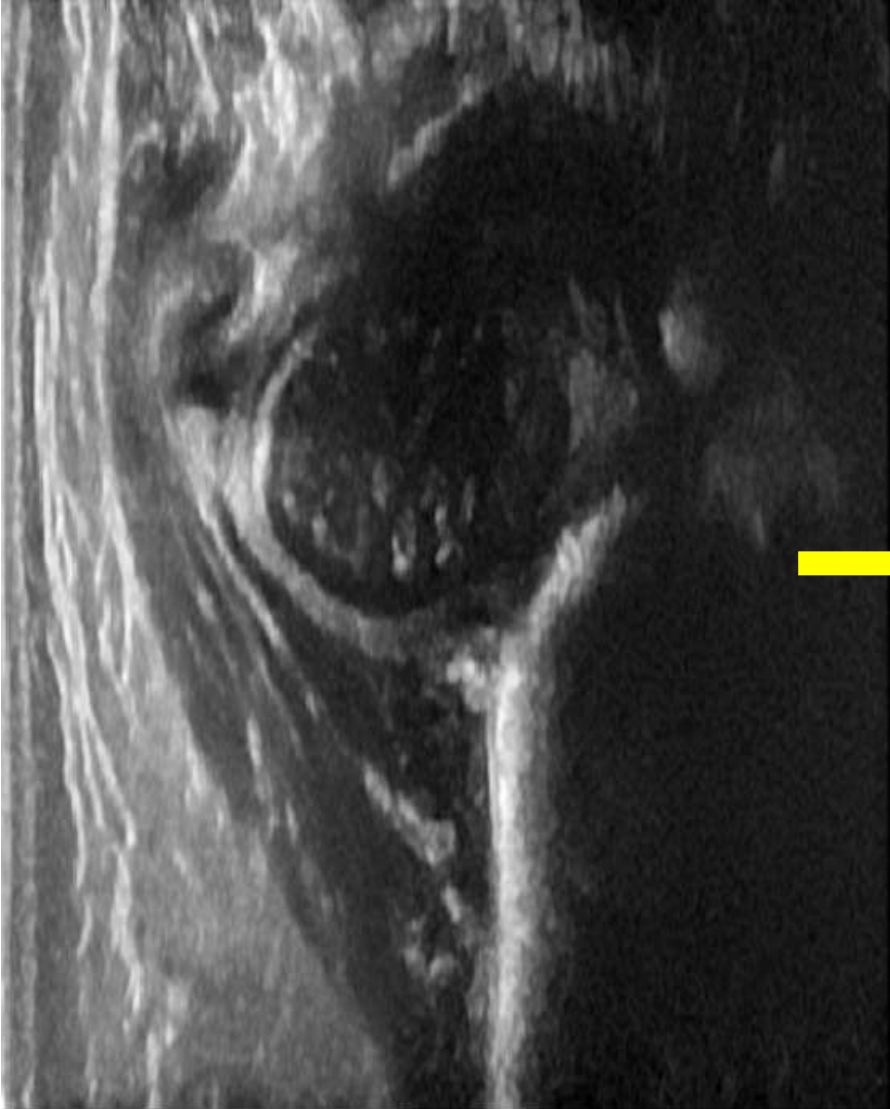
Tx – at least 6 weeks



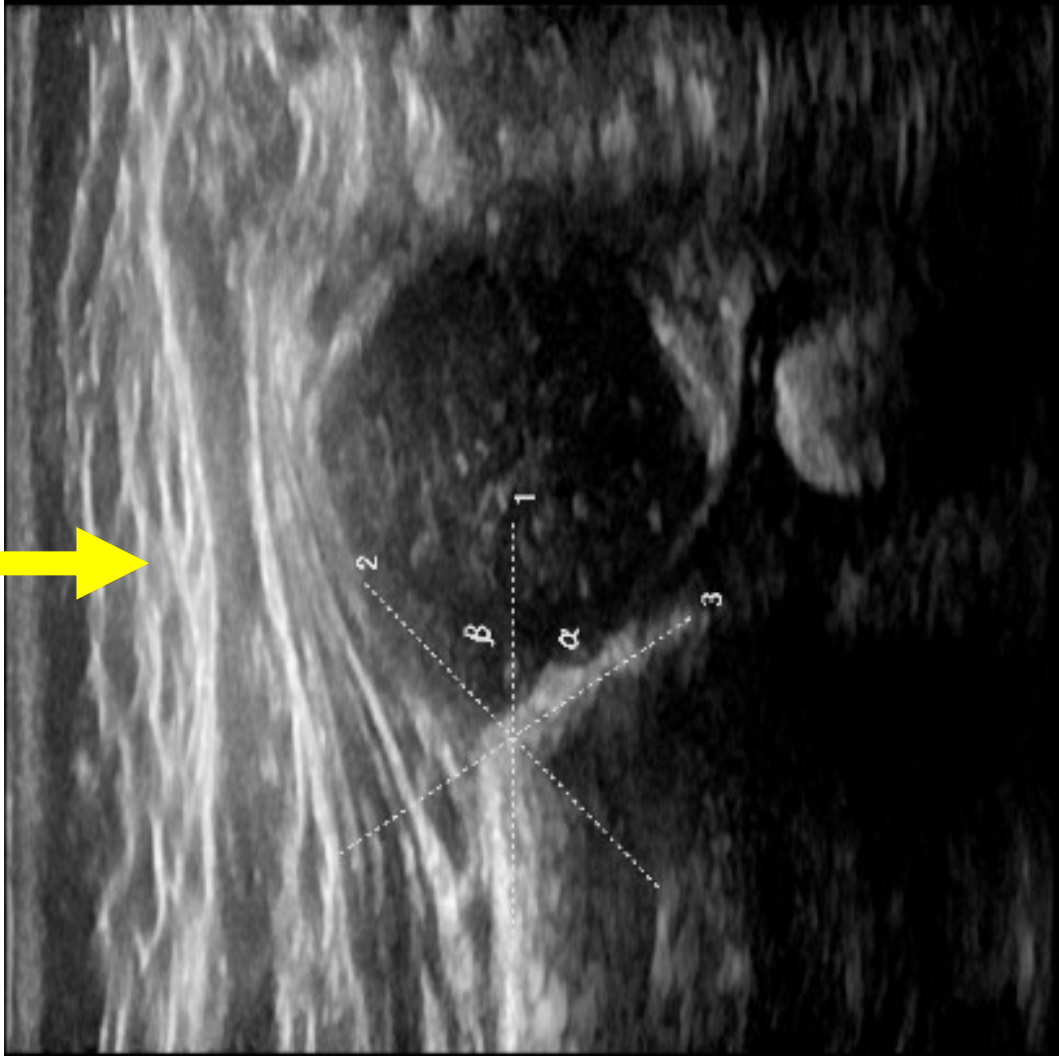
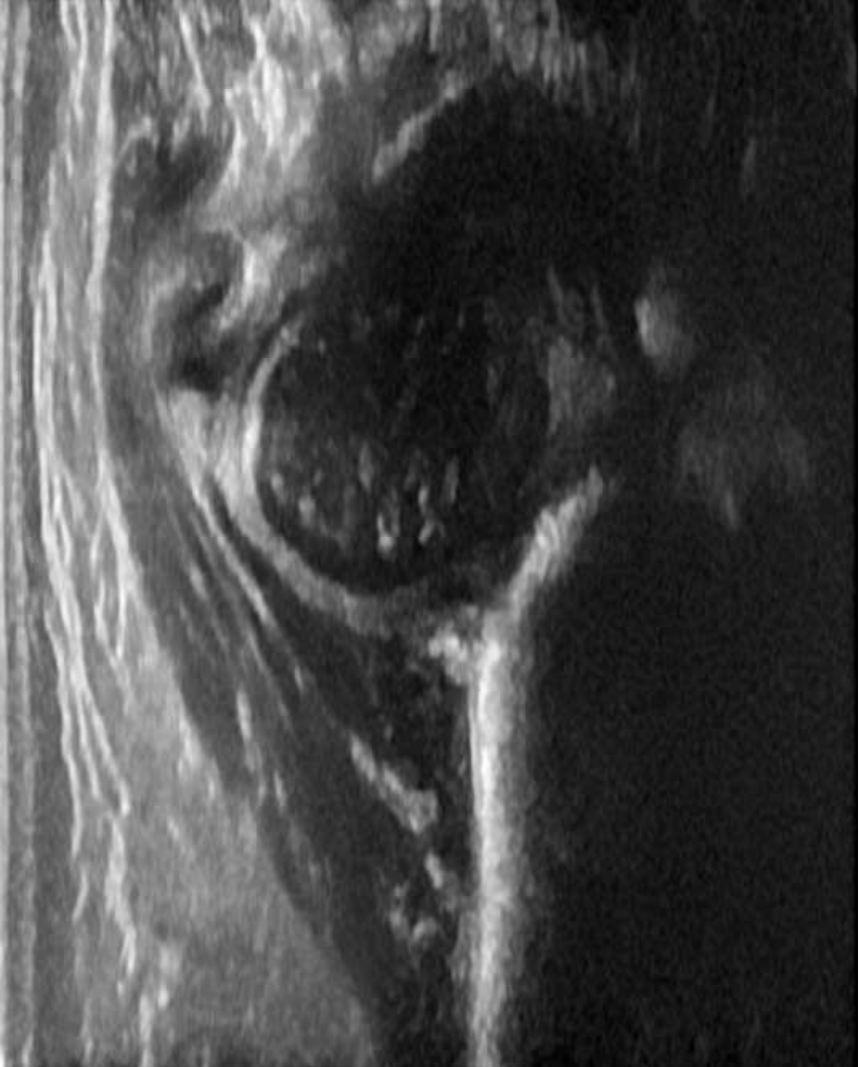
DDH



DDH 2 weeks



DDH 6 weeks

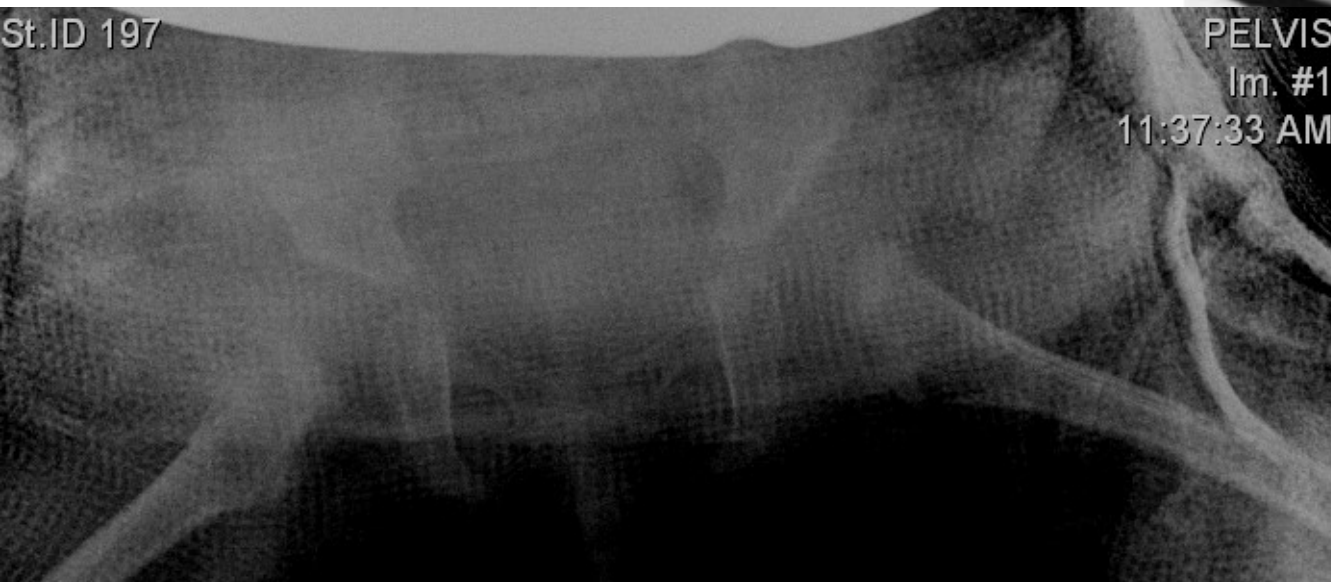


Treatment 6-18mo

Closed vs Open Reduction

EUA with arthrogram

Change cast at 6wks



Questions?

Gibbons2@uthscsa.edu

Thank You!



Thank You

