

Pediatric Orthopedic Clinical Case Discussion (Knee injuries)

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knee injuries in children

Case 1

9-year-old boy, fell off bicycle

Presented with knee pain , inability to bear weight

O/E: swollen knee in a semi-flexed position

knee injuries in children

Case 1

9-year-old boy, fell off bicycle



knee injuries in children

Case 1

9-year-old boy, fell off bicycle

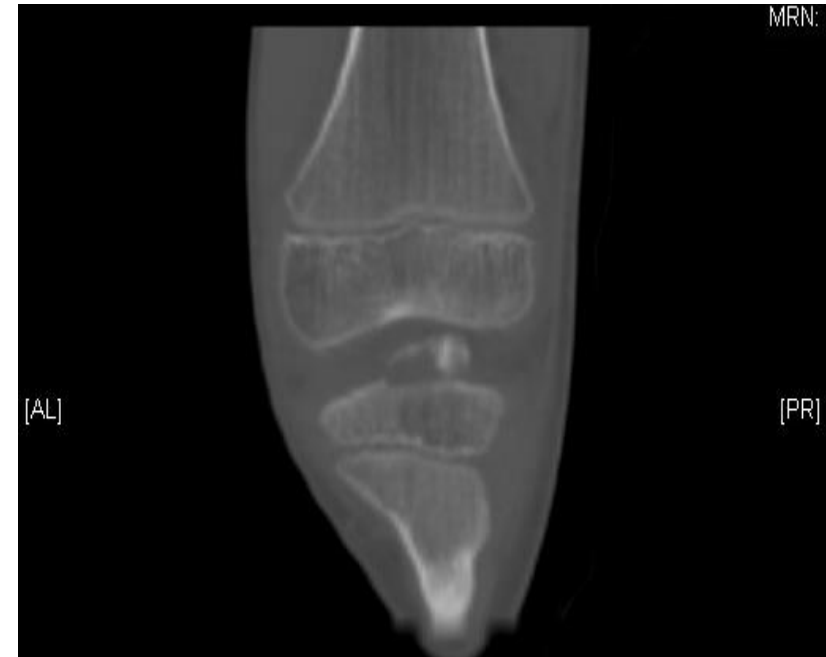
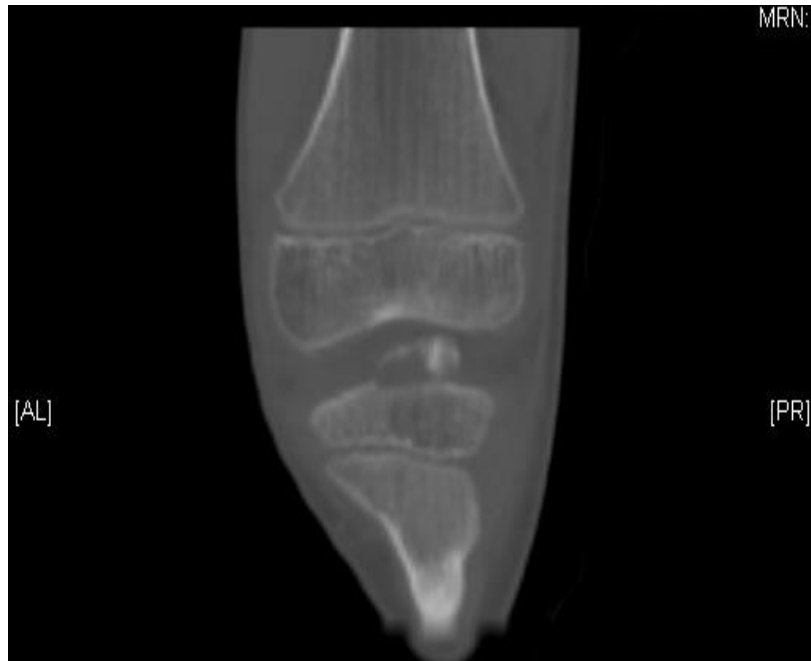


Do You need any further investigation ?

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Case 1

9-year-old boy, fell off bicycle



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Case 1

9-year-old boy, fell off bicycle



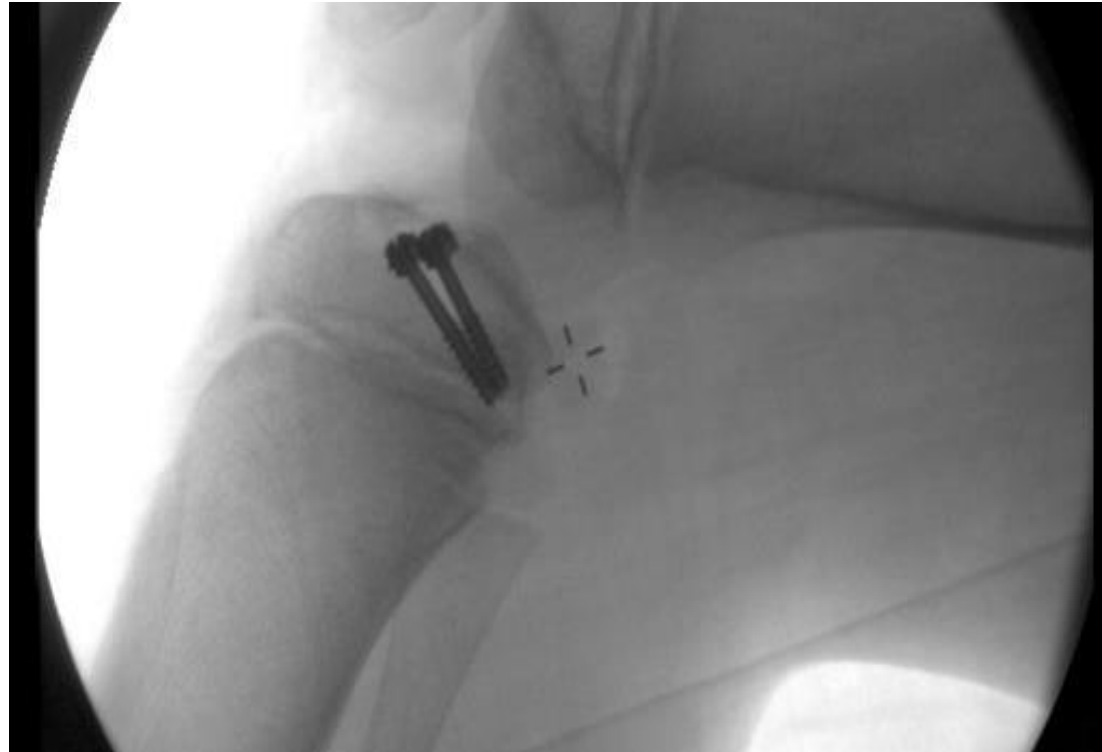
What you do now?



knee injuries in children

Case 1

9-year-old boy, fell off bicycle



knee injuries in children

Tibial Spine Injuries

- Relatively uncommon injuries.
- Between ages 8-14 years.
- Axial loading to hyperextended knee with ext. rotation of the femur

knee injuries in children

Tibial Spine Injuries

- It represents the broad insertion point of the ACL
- Ant. Horn of the MM & intermeniscal lig. lie next to tibial spine & can be entrapped in the fracture site

knee injuries in children

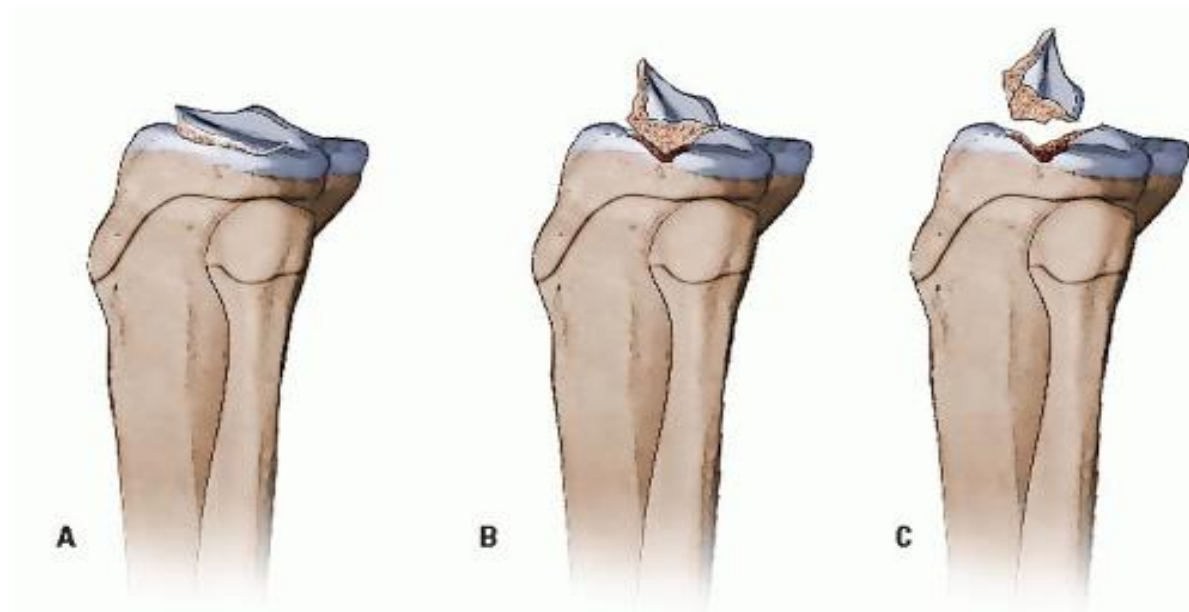
Tibial Spine Injuries

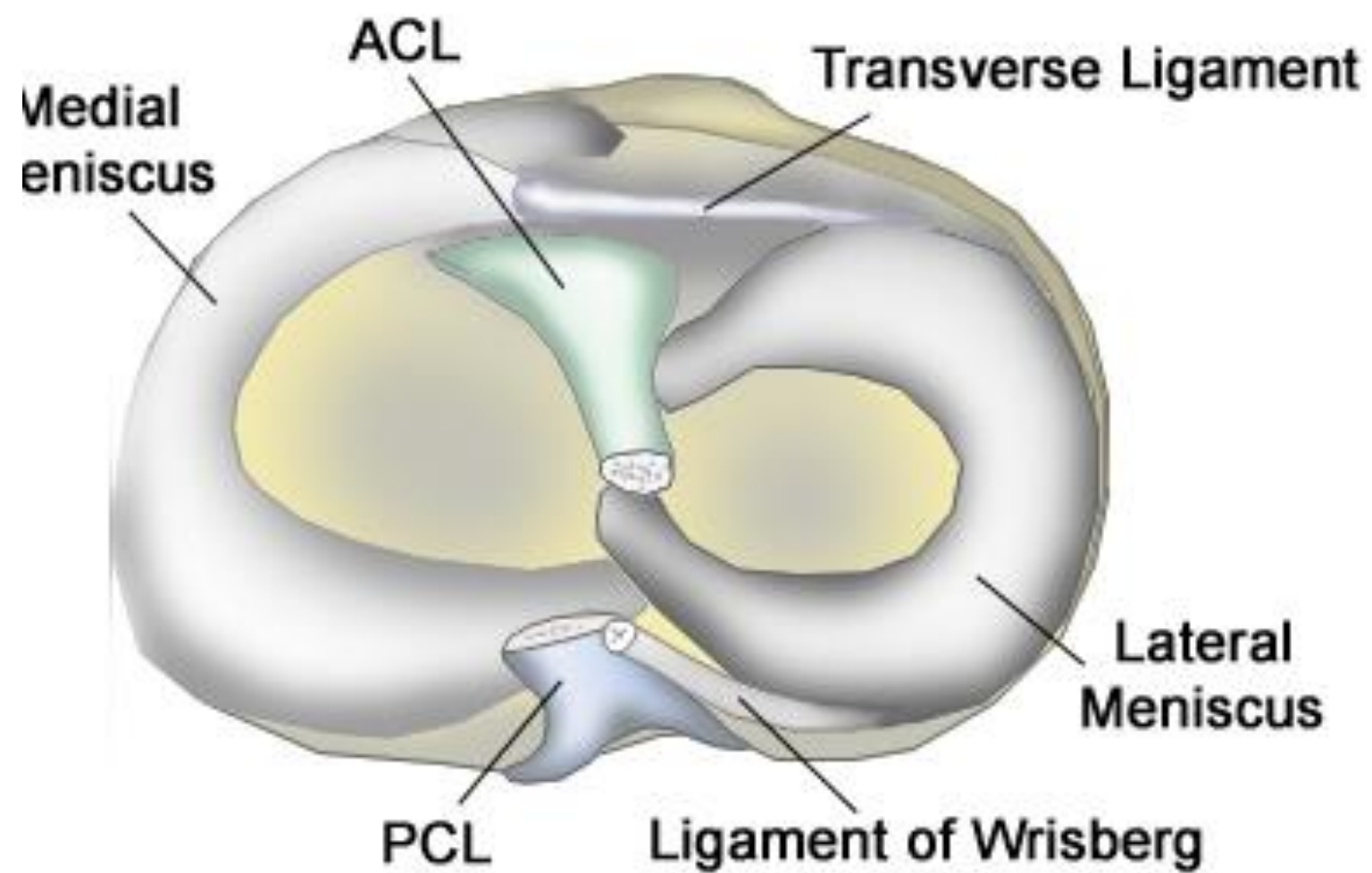
Myers & McKeever Classification

Type I

Type II

Type III





knee injuries in children

Tibial Spine Injuries

Myers & McKeever Classification

Type I

Long leg cast
(LLC) 6 weeks
in slight flexion

Type II

Closed reduction
(hyperextension)
& LLC

Type III

Open vs arthroscopic
reduction, internal
fixation (suture
fixation, screws) , &
LLC.

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Case 2

12-year-old boy, Twisted knee while playing basketball



knee injuries in children

Case 2

12-year-old boy, Twisted knee while playing basketball

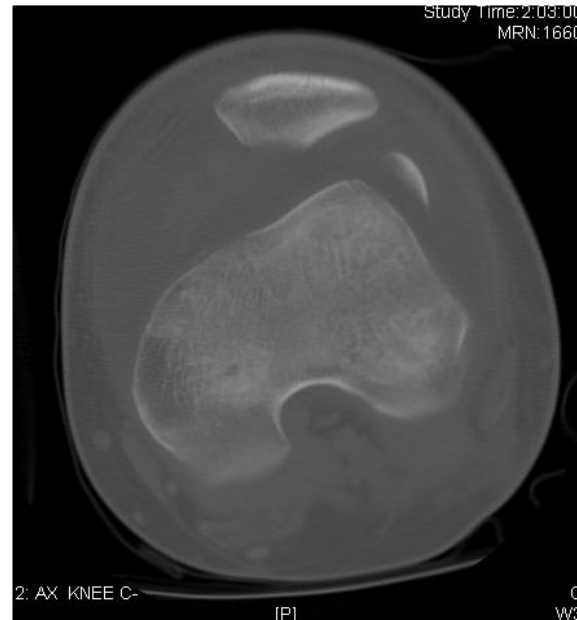


Do you need any further imaging?

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Case 2

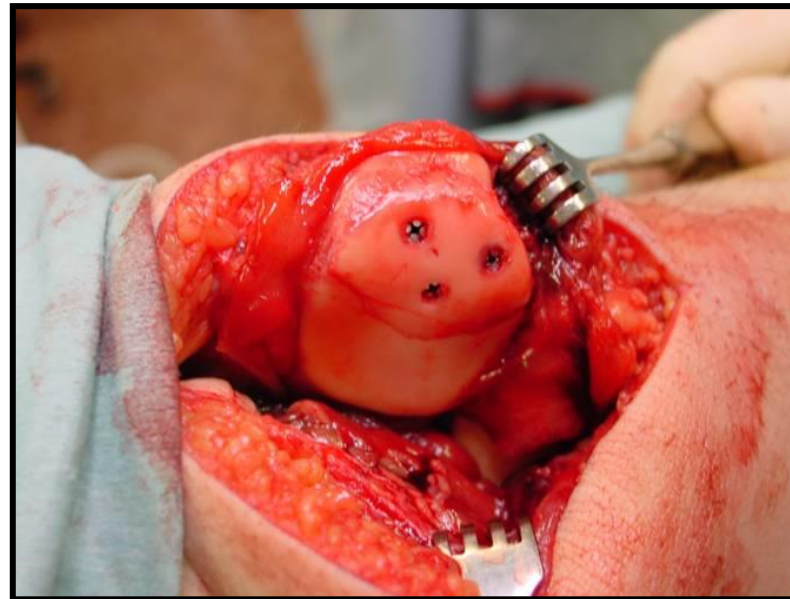
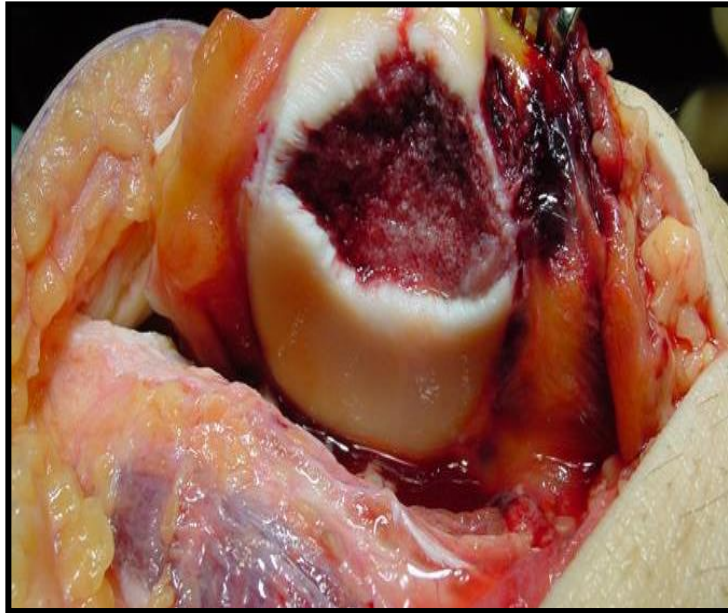
12-year-old boy, Twisted knee while playing basketball



knee injuries in children

Case 2

12-year-old boy, Twisted knee while playing basketball



knee injuries in children

Case 2

12-year-old boy, Twisted knee while playing basketball



knee injuries in children

Osteochondral Fractures

- Mostly associated with patellar dislocation/sublux.
- Sites: medial patellar aspect/ lateral femoral condyle
- Tangential views of the knees for comparison and if suspect. Of patellar disloc. / sublux

knee injuries in children

Osteochondral Fractures

Treatment

Large fragment: fixation (Arthroscopic vs open)

Small fragment: excision +/- microfracture

knee injuries in children

Case 3

10 year-old-boy, Knee injury while tackle in soccer



knee injuries in children

Case 3

10 year-old-boy, Knee injury while tackle in soccer



Describe the injury ?





knee injuries in children

Case 3

10 year-old-boy, Knee injury while tackle in soccer



Describe the injury ?
What you will do next?



knee injuries in children

Case 3

10 year-old-boy, Knee injury while tackle in soccer



knee injuries in children

Patellar sleeve fracture

- Avulsion of the distal cartilaginous portion of patella
- Age 8 – 12 years
- Swollen knee, tense hemarthrosis & inability to bear weight
- Patella Alta on Exam & X Ray

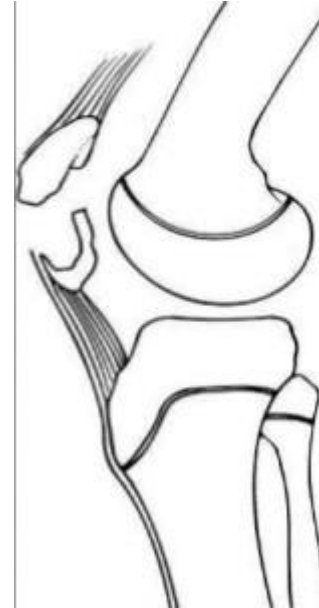
knee injuries in children

Patellar sleeve fracture

- Small Fragment separated from distal pole of patella on X ray



- MRI if Dx ????



knee injuries in children



Patellar sleeve fracture

Treatment

- Patients < 10 years nonabsorbable suture repair & LLC 6-8 weeks
- Patients > 10 years fixation with tension band & K wire
- Patients are allowed for weight bearing in the cast
- SLR exercises in 2 weeks

knee injuries in children

Patellar Fractures

- Rare in children
- Mechanism: Direct ant. Knee trauma Or eccentric load during extension of the knee while jumping or landing
- Tow basic patterns :  Osseous fractures
 Sleeve fractures

knee injuries in children

Patellar Fractures

Treatment

- Similar to adult fractures
- Non-displaced : Non-operatively LLC 6-8 weeks
- Displaced articular surface $> 2-3$ mm: Operative fixation

knee injuries in children

Case 4

15 year-old-boy, Playing basketball and sudden onset left knee pain



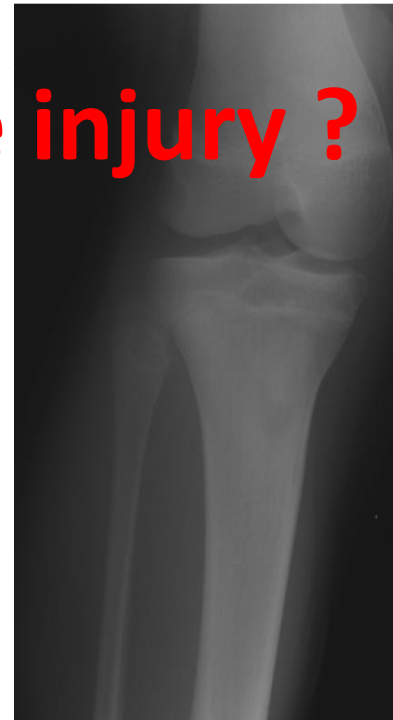
knee injuries in children

Case 4

15 year-old-boy, Playing basketball and sudden onset left knee pain



Describe the injury ?



knee injuries in children

Case 4

15 year-old-boy, Playing basketball and sudden onset left knee pain



Describe the injury ?

What you will do next?

knee injuries in children

Case 4

15 year-old-boy, Playing basketball and sudden onset left knee pain

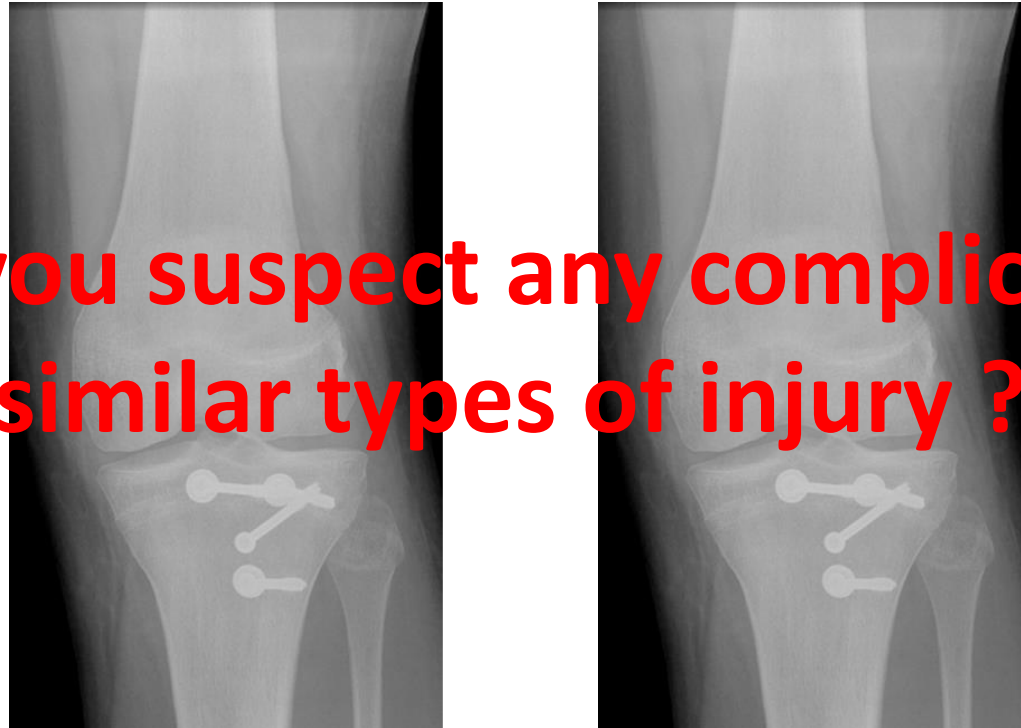


knee injuries in children

Case 4

15 year-old-boy, Playing basketball and sudden onset left knee pain

Do you suspect any complication
in a similar types of injury ?



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Case 4

Compartment Syndrome and Vascular Injury

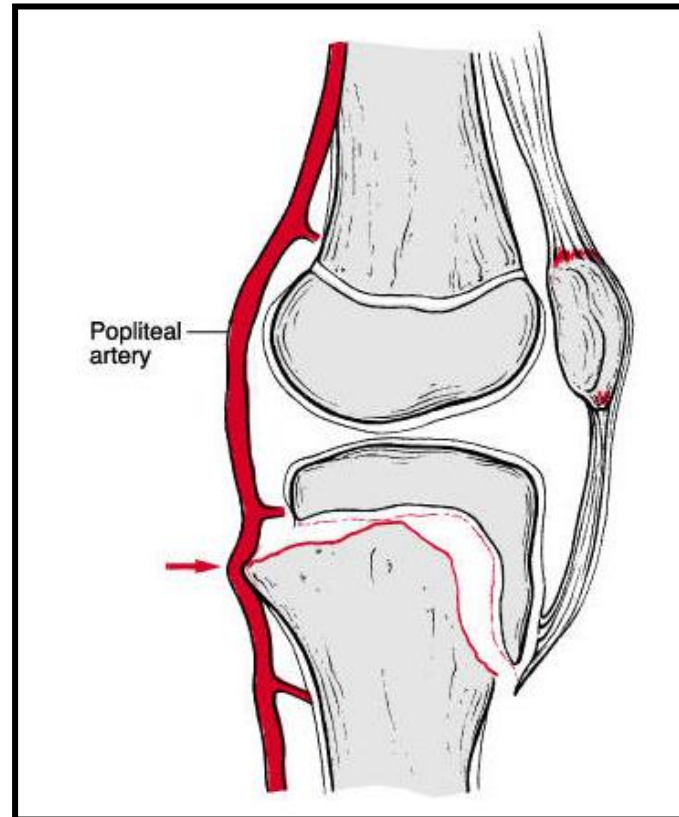


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Case 4

Compartment Syndrome and Vascular Injury

Anterior tibial recurrent artery
and possibly it's branches may
be torn and retract into anterior
compartment musculature



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Case 4

Growth disturbance

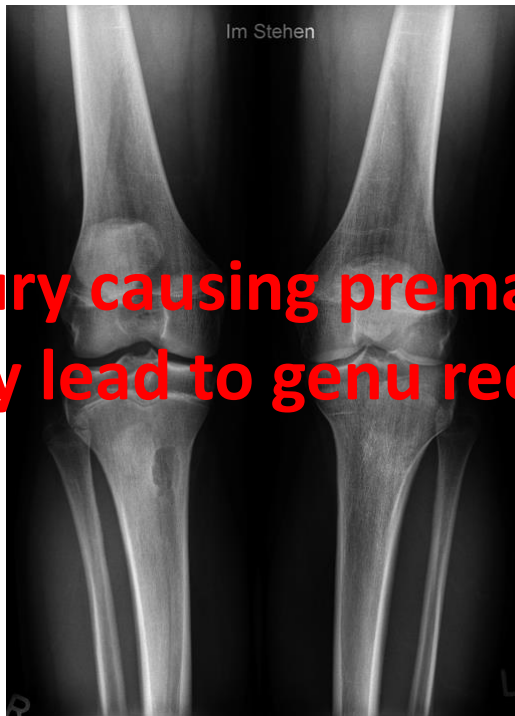


knee injuries in children

Case 4

Growth disturbance

Injury causing premature closure of tibial tubercle may lead to genu recurvatum



knee injuries in children

Case 4

Growth disturbance



knee injuries in children

Case 4

Growth disturbance



knee injuries in children

Case 4 Tibial Tubercle Avulsion

I

Through
apophysis

II

B/T
ossification
centres

III

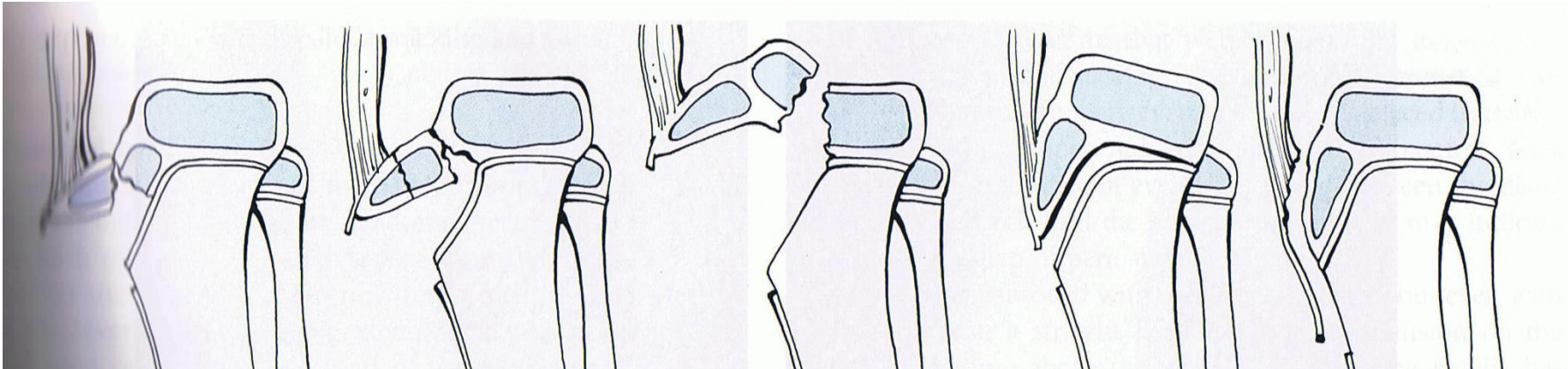
Into joint

IV

Along
physis

V

Periosteal
elevation



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Case 4

Tibial Tubercle Avulsion Management

- Non-displaced type I : CR & Casting LLC 6-8 weeks
- All other types : Operative fixation with screws



Thanks...

for attending
today!

Dr. Omar Samarah