Physeal Injury Case Presentations

Children’s Mercy Hospital
Kansas City, MO
Case 1
• 14 y 6 mo old high school freshman sustained injury to left knee when tackled playing football
• Otherwise healthy
• Physical Exam:
  • Skin intact
  • Palpable pulses distally
  • Normal neurological exam in left lower extremity
• Closed reduction was done in the ER on the night of injury
• No change in neurological or vascular exam post reduction
• Taken to OR the following day for closed reduction and transphyseal percutaneous pinning
One week post op
Six weeks post injury
• Scheduled to be seen again 3 months post injury…
Case 2
8 yr 0 mo female hit by a car as she was crossing the street

No systemic injuries

Sustained a right distal tibia fracture and an injury to the right knee
Underwent closed reduction and perc pinning of the distal femoral physeal injury the next morning, along with closed reduction and casting of the tibia fracture.
Two weeks post-op
Six weeks post injury at the time of pin removal
2 months post injury
6 months post injury

Has full active ROM of her right knee and roughly symmetric leg lengths

Xrays of the knee are concerning for development of a physeal bar
8 mm X 14 mm central bar identified on the MRI
Case 3
• 8 y 6 mo old male injured ankle while jumping on trampoline
• Otherwise healthy
• Physical exam
  • Skin intact
  • DP & PT pulses palpable
  • Motor and sensation intact
• He underwent closed reduction and splinting in the ED on the night of injury
• Taken to OR the day after injury for closed reduction and percutaneous fixation of medial malleolus fracture
• 1 month post op
• 4 months post op
• 9 months s/p injury and fixation
• Harris growth arrest line noted
• No deformity present on physical exam
• 15 months s/p injury and fixation
• No deficits or deformity noted
• Very involved in sports
• Harris growth arrest line noted to be further from physis
• 4 years s/p injury and fixation
• Doing well with no limitations
• Few degrees of hindfoot varus, however this is asymptomatic
• Currently 13 years and 8 months old.
• Remains active and asymptomatic and will return for follow up as needed
Case 4
- 11 y 5 mo female sustained L ankle injury while jumping on trampoline
- Presented to her local urgent care center and placed in posterior splint
- Presented to CMH 5 days later for further evaluation
- Neurovascular examination unremarkable
Bone age between 12-13 years of age
• Taken to OR next day for ORIF medial malleolus and closed reduction and percutaneous pinning of distal fibula
3 weeks post op
Case 5
12 y 5 mo male
From Amish family
injured in an altercation with a horse
Syndesmotic tightrope buttons
Distal tibial physis
• 12 y 11 mo old injured while being tackled playing football 9/30/2017
• Otherwise healthy
• Injury closed but with skin tenting
• Neurovascular exam intact
• Underwent closed reduction in ER on the night of injury
• Placed in an AO splint
• Subsequently discharged home for follow up later that week
Xrays 5 days post injury
- CT scan done 11 days post injury
- Showed malreduction of physis with a loose fragment of bone in between the Thurston-Holland fragment and the intact portion of the distal tibial metaphysis
At 11 days post-injury, thought too swollen to operate on safely

Examination under anesthesia showed tibia fracture could not be moved

Decided to treat definitely in short leg bivalved cast
Case 7
12 y 5 mo old injured R ankle while playing soccer

Otherwise healthy

Physical Exam:
  - Skin intact
  - Neurovascularly intact
• Closed reduction and casting in the ER the night of the injury
• Seen in clinic one week post-injury

• Radiographs demonstrate 10° of valgus

• After discussion with family, decided to treat non-operatively with close monitoring
• One month post-injury

• Transitioned to a short leg waterproof weight-bearing cast at this time

• Overall, doing well
• 3 months post-injury

• Ambulating in regular shoes with no pain

• Radiographs demonstrate valgus of 5° now
• 6 months post-injury

• Currently back to playing soccer and reports no pain

• Radiographs demonstrate improved valgus alignment, also with apparent asymmetric closure of distal tibial growth plate
• Due to return in 2 months with weightbearing x-rays of ankle and a hand film for bone age
• Likely to have completion epiphyseodesis if deformity is right distal tibia/fibula
Case 8
• 6 y 10 mo male injured left leg while an adult fell on his leg at a trampoline park in Omaha, Nebraska!

• Otherwise healthy

• Physical exam:
  • No wounds
  • Able to straight leg raise
  • Motor, sensation, and vascular exam unremarkable
• Splinted in Nebraska and brought to CMH ER the following day
• Casted in the ED and admitted to observation for compartment checks

• Discharged home 24 hours later with no complications

• Follow-up in one week
One week post injury

Mild discomfort but easily managed

Neurovascular exam intact
• 6 weeks post-injury, doing well

• Taken out of cast and allowed to be weight-bearing as tolerated

• Family headed to Mexico for Spring Break
3 months post injury

Mom is concerned that he is still limping and soccer season is starting

He has started physical therapy-this is continued and he is scheduled for follow up in 3-4 months
• 10 months post-injury

• Mom still notices a slight limp, but reports no pain and able to keep up with sports / activities

• Physical exam shows hyperextension on the left

• Radiographs demonstrate a partial physeal arrest
• 7 y 7 mo old at this time

• 1.5 cm sq anterolateral bridge in the proximal tibial physis

• Remaining physis appears healthy
• 7 y 7 mo old at this time

• 1.5 cm sq anterolateral bridge in the proximal tibial physis

• Remaining physis appears healthy
Needle localization done under anesthesia in CT suite

Then patient brought to OR for drilling and excision of physeal bar
Physeal bar is drilled over threaded guide pin, then excised with a currette.
• Now 8 y 2 mo old
• 5 months post-op
• Physical Exam:
  • Slight leg length discrepancy
  • Hyperextends to 15 degrees, improved from preoperatively
• Sent for CT
CT scan shows elongating bar anteriorly and laterally
Now 8 y 6 mo of age

1 year, 8 mo post injury

10 months post bar excision

No worsening of extension and valgus deformity, but no correction either

Walking and running without pain

No worsening of leg length discrepancy

Plan for follow up in 3-4 months
Returns a year later

9 y 6 mo of age

Seen elsewhere, and another physeal bar excision and a medial epiphyseodesis was performed
Case 9
14 y 5 mo
male
Injured at football practice when tackled and fell on dominant right hand
Underwent closed reduction and casting in the ER on the night of injury
6 weeks post reduction and casting. Out of all immobilization. No pain.

Follow up?
Case 10
• 13y 2 mo old premenarchal female injured her knee at softball after a collision with a teammate
• X-rays were obtained and no fracture was appreciated
• Continued to have pain and underwent MRI which showed MCL tear as well as edema
• She was eventually seen in the CMH sports medicine clinic 12 days after injury
• It was determined she had SH 2 injury
• Taken to OR the next day for closed vs open reduction and possible pinning
• In the OR, the proximal tibial physis gapped medially when valgus stress applied

• It did reduce with varus stressing, but would return to valgus deformity when the force was removed
It was decided that percutaneous pinning was necessary
2 weeks post op
• 2 months post op
3 months post op, returns to softball and other sports activities, at one year had not developed further deformity due to advanced skeletal age.