Lower Extremity Dislocations: Management and Triage on the Field

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Dislosures

- None
Purpose

- To provide you with knowledge which may guide you through the on-field management and triage of dislocations of the lower extremity
Lower Extremity Dislocations
(too many to cover)

- **Hip**
  - (Femoroacetabular)

- **Knee**
  - Patellofemoral
  - Tibiofemoral
  - Proximal tibiofibular

- **Ankle**
  - Tibiotalar
  - Distal tibiofibular

- **Foot**
  - Subtalar
  - Lisfranc (Tarsometatarsal)
  - MTP
  - Interphalangeal
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Management and Triage

- **Management**
  - What do I do to the patient?

- **Triage**
  - What do I do with the patient?
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Hip Dislocations

- Anatomy
- Types
- Issues
- Management and Triage
Hip Anatomy

- Ball and socket joint
- Stability due to conformity of joint, labrum, and capsule
- Blood supply
Blood Supply to the Hip

- Medial femoral circumflex
- Lateral femoral circumflex
- Obturator branch
Types of Hip Dislocations

- **Posterior**
  - Most common type (>90%)
  - Leg will be flexed slightly, adducted, and internally rotated

- **Anterior**
  - Less common
  - Leg will be flexed abducted, and externally rotated
Issues to Consider

- With dislocation, there will be soft tissue trauma (ligaments, capsule, labrum, etc) along with possibility of:
  - Neurological compromise
  - Concurrent bony injury (fractures)

- Vascular flow to femoral head is compromised and must be restored ASAP to minimize risk of AVN
Management of Hip Dislocation on the Field

- Must make accurate diagnosis
  - Lots of pain with fixed posturing of leg

- Must do neurologic examination
  - Sciatic nerve at risk (esp peroneal division)
  - Foot drop most common
Radiographic Imaging
Management of Hip Dislocations on the Field

- If orthopedic background or have a comfort level, can try a closed manual reduction (CMR) on the field....often the easiest time to reduce a joint is right after the injury

- If not, splint leg in the position it is in and call an ambulance ASAP!!
Triage of Hip Dislocation on Field

- They all go to the hospital (reduced or not)

- If it is not reduced on field, it is a TRUE EMERGENCY!!!! If reduced, it is non-emergent

- Need Xray, closed reduction, and post-reduction CT scan (evaluates for loose fragments in joint or fractures)
Pre-reduction CT scan
Post-reduction CT scans
Ravens with Hip Dislocations
NCAA BCS Football Championship
Summary of Hip Dislocations

- Accurate diagnosis on field
- Need neurologic examination
- Attempted closed reduction
  - Not recommended if no orthopedic background
- All go to the hospital by ambulance
- Xrays, CMR, CT scan
- Surgery need depends on concurrent injuries
- Worry about long term AVN
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Knee dislocations

- Anatomy
- Types
- Issues
- Management and Triage
Bony Anatomy of the Knee

- Femur
- Tibia
- Fibula
- Patella
Ligaments and Articulations

- ACL/PCL
- MCL/LCL
- Tibiofemoral
- Tibiofibular
- Patellofemoral
Types of Knee Dislocations

- **Patellofemoral**
  - Very common
  - Medial and lateral
  - Lateral much more common (>90%)

- **Tibiofemoral**
  - Named for direction tibia goes
  - Anterior, posterior, medial, lateral….most are a combination injury
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Patellofemoral dislocation

- Patellofemoral joint is inherently unstable

- Stability conferred by bony conformity, soft tissues, and quadriceps

- Most forces around knee lead to a laterally directed force……lateral dislocations are much more common
Issues with patellar dislocation

- >90% lateral
- Can be associated with osteochondral fractures and loose bodies
- Associated soft tissue injury (MPFL)
- Knee held in a flexed position with patella along lateral femoral condyle
Lateral Patellofemoral Dislocation
Xray of patellofemoral dislocation
Management of patellar dislocation on the field

- Reduce by placing gentle medial pressure on lateral border of patella while simultaneously extending knee
Management of patellar dislocation on field

- Reduce patellofemoral joint
- Does not return to game
- Apply knee immobilizer/compression/ICE
- WBAT in extension with crutches
Triage of Patellofemoral Dislocation

- Patient may go home with knee immobilizer/crutches (ER not necessary)
- Advise to ice/elevate
- Xray when convenient
- Needs evaluation by orthopedic surgeon
  - MRI
  - Brace and Physical therapy
  - +/- surgery
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Knee dislocation (tibio-femoral)

- Low velocity (athletic) vs high velocity (MVA)
- Can be anterior (30%), posterior (25%), medial, lateral, or rotational--named for tibial position
- Limb threatening injury
- EMERGENCY!!!!
Issues to consider with knee dislocations

- 20-40% knee dislocations will have a vascular injury (popliteal artery) that can lead to limb loss

- 20-40% knee dislocations will have a neurologic injury (peroneal nerve) and many are permanent injuries

- Compartment syndrome is not uncommon
Management of knee dislocations on the field

- Call 911 and get an ambulance if not at game

- Must check distal pulses and neurologic exam PRIOR to any reduction maneuver

- Attempt reduction on field by reproducing the injury (especially if vascular compromise)
  - Anterior dislocation…..hyperextension
  - Posterior dislocation…..hyperflexion

- Splint leg whether reduced or not
Triage of knee dislocations

- All go to hospital immediately by ambulance
- Call hospital
- Need immediate reduction, Xrays, orthopedic and vascular evaluations
- Admission to hospital (typical)
  - May need early vascular intervention
  - May need early orthopedic intervention
Prefer to not see these X-rays on your players
Clinical appearance of knee dislocation
Marcus Lattimore knee dislocation
# Summary of Knee dislocations

<table>
<thead>
<tr>
<th>Patellofemoral</th>
<th>Tibiofemoral</th>
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</thead>
<tbody>
<tr>
<td>Reduce on field</td>
<td>Neurovascular exam</td>
</tr>
<tr>
<td>RICE</td>
<td>Call 911</td>
</tr>
<tr>
<td>Knee immobilizer</td>
<td>Reduce on field??</td>
</tr>
<tr>
<td>Xray when convenient</td>
<td>Splint</td>
</tr>
<tr>
<td>Orthopaedic evaluation</td>
<td>All go to hospital on emergent basis, especially if vascular compromise!!!</td>
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Ankle dislocations

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Ankle Anatomy

- Tibia, Talus, Fibula
- Tibiotalar and distal tibiofibular (syndesmosis) joints
- Talus is constrained by the bony architecture of the ankle (ligaments)
Types of Ankle Dislocations

- Named for position of the talus. Can be anterior, posterior, medial, lateral, or a combination.
- Most common are lateral, posterior, posterolateral.
- Usually closed, but can be open injuries.
Xrays of ankle dislocations

Normal ankle

Lateral ankle dislocation
Xrays of ankle dislocations

Normal lateral ankle

Posterior ankle dislocation
Issues with ankle dislocations

- Always associated with fractures of ankle
- Medial skin compromise from lateral or posterolateral dislocations
- Rarely associated with neurovascular compromise
Medial skin compromise
Management of ankle dislocations on the field

If you can achieve better position and alignment of ankle (ie—closed reduction), then do it
  • Minimizes pain for patient
  • Minimizes risk of medial skin compromise
  • Helps to keep swelling down

Splint on the field

Ice, elevation
Triage of Ankle Dislocations

- All go to hospital (not local walk-in centers) for X-rays to assure that reduction of ankle is acceptable and for proper splinting

- Need orthopedic follow up for surgery
Clinical appearance
Summary of Ankle Dislocations

- Always associated with fractures of ankle
- Can develop local skin compromise
- Urgent reduction/splint if possible on field
- All go to hospital for X-rays to check reduction
- Will need orthopedic evaluation for surgery
In conclusion.....

- If you can ever reduce a dislocated joint with reasonable safety, do it
  - You will not do any harm to patient, and you may help them substantially
  - Use judgment with knees and hips!!!

- All get splinted on field

- Hips, knees, and ankles go immediately to hospital; Patella can go home

- All require orthopedic doctor follow-up