

Hip Dislocations and Associated Fractures

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6/15/2018



Disclosures

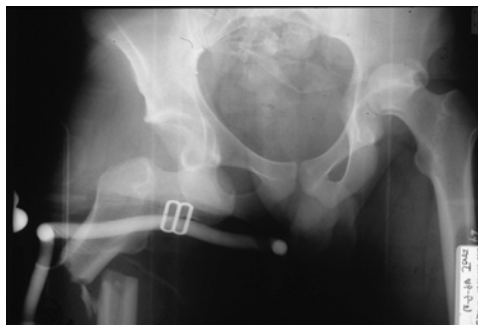
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Objectives

- Understand the mechanism of injury
- Clinically diagnose hip dislocations
- Identify the appropriate imaging for hip dislocations
- Understand when operative and non-operative treatments of hip dislocations are indicated
- Identify associated fractures
- Recognize the complications associated with hip dislocations

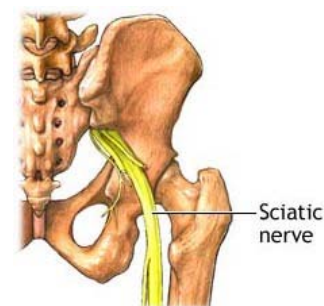
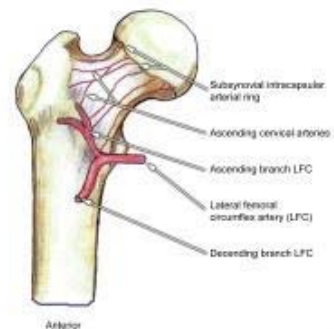
Introduction

- Hip dislocations
 - associated with other fractures
 - acetabular fractures
 - femoral head and neck fractures
 - damage to vascular supply of femoral head
- May lead to long term disability
 - osteonecrosis and OA



Anatomy

- Medial femoral circumflex artery
 - Primary blood supply to femoral head
 - kinked with filling defects in posteriorly dislocated hips
- Sciatic nerve
 - close proximity
 - passes posterior to posterior wall
 - can be injured with dislocations
 - 10% in adults
 - 5% in pediatrics
 - Typically neuropraxia
 - Usually resolve with hip reduction and observation



Mechanism of Injury

- Require substantial force
 - Fall from height
 - athletic injury
 - very rare
 - dashboard injury
- Direction of dislocation
 - Posterior
 - axial load to femur with flexion and adduction
 - Anterior
 - externally rotated and abducted



Hip Position and Fracture Pattern

- Hip position at time of injury
 - determines fracture/dislocation
- Posterior Dislocation
 - Extension=femoral head fracture
 - Abduction=posterior wall fracture



Thompson and Epstein Classification of Hip Dislocations

- Type 1-Dislocation with at most small posterior wall fracture
- Type 2-Dislocation with large posterior wall fracture
- Type 3-Dislocation with comminuted posterior wall fracture
- Type 4-Dislocation with acetabular floor fracture
- Type 5-Dislocation with femoral head fracture

Thompson and Epstein, *J Bone and Joint Surg*, 1951

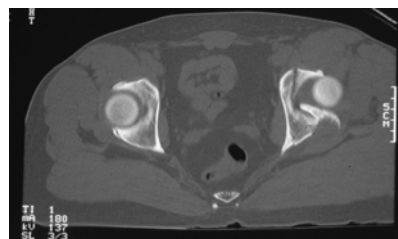
Diagnosis

- Hip position
 - Posterior Dislocation
 - More common than anterior for athletes
 - Results in Flexed, Adducted, IR leg
 - Affected leg shortened
 - Anterior Dislocation
 - ER, Flexion, Abduction
- Neurovascular check
 - Sciatic nerve
- Pain on palpation around hip
- Pain with any hip motion
- Check for associated knee injuries



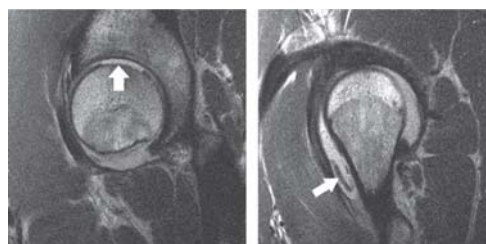
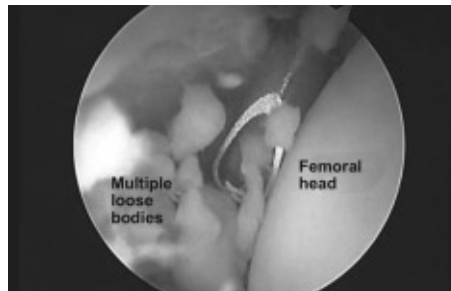
Pre-Reduction Imaging

- AP pelvis
 - Posterior
 - Femoral head smaller
 - lesser trochanter poorly visualized
 - Anterior
 - Femoral head larger
 - lesser trochanter in full profile
- CT scan before reduction
 - Need to visualize the head and neck
 - r/o occult fracture
 - CT if high suspicion for non-displaced FN fracture and won't significantly increase time to reduction



Post Reduction Imaging

- CT scan post reduction
 - r/o loose bodies, acetabular fractures, congruency of reduction
- MRI post reduction
 - 92% loose bodies (Dahners JOT 2006)
 - 93% labral tears (Khanna et al. Arthroscopy 2014)
 - r/o osteonecrosis at 6 weeks



Treatment

- Dislocated hip is EMERGENCY
 - early reduction to decrease risk of AVN and DJD
 - restores blood flow to femoral head
 - requires proper anesthesia
 - conscious sedation vs general anesthesia
 - General anesthesia for 12-16 y/o
 - requires team
- Streamline eval and treatment
 - controversial regarding time to reduction
 - general consensus is the sooner the better
 - <6 hours to reduce risk of AVN
 - Attempt on field reduction if arrival to medical facility will be > 6 hours



Allis Maneuver Reduction Technique

Assistant: Stabilizes pelvis
 Posterior-directed force on both ASIS's

Surgeon: Stands on stretcher
 Gently flexes hip to 90°
 Applies progressively increasing traction to the extremity
 Applies adduction with internal rotation
 Reduction can often be seen and felt
 If unsuccessful, to OR for emergent closed reduction attempt vs open



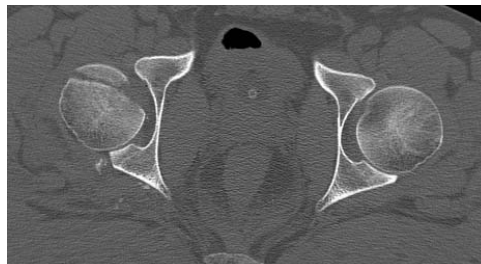
Post Reduction Treatment

- Hip stable with congruent reduction on CT
- No flexion >60, adduction, and IR
- TDWB 4-6 weeks
- follow up X-rays prior to WB
- Return to Sport
- Full ROM and strengthening achieved
- No signs of AVN on MRI @ 6 weeks
- Shelley et al Sports Health 2014



Indications for Surgery

- Irreducible hip dislocation
- interposed soft tissue vs fragment or fracture
- Incarcerated fragment
- Scope vs open excision
- Associated femoral neck fracture
- Fix fracture then reduce
- Displaced required emergent ORIF
- Incongruent reduction
- Unstable hip after reduction
- post acetabular fracture

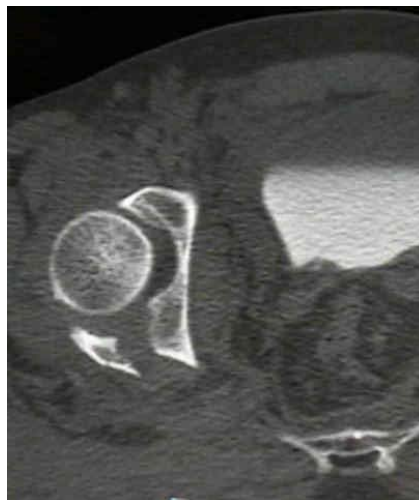


Relative Indications for Hip Arthroscopy

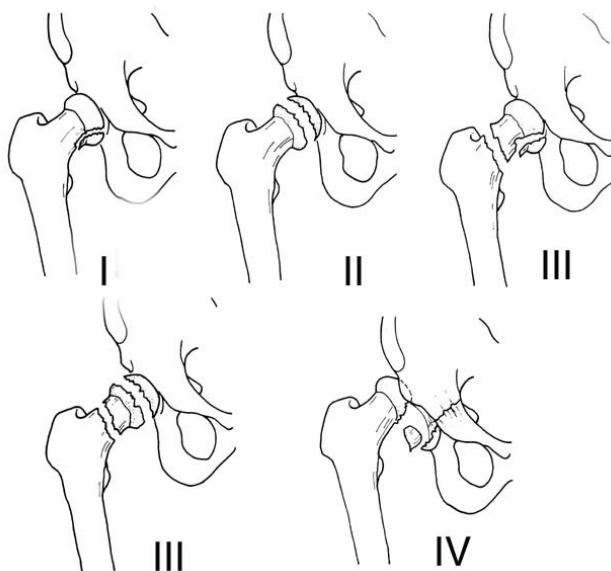
- Alternative to open arthrotomy for simple dislocation with non concentric reduction
- Alternative to open arthrotomy for fracture dislocation with a non concentric reduction associated with stable acetabular fracture not requiring ORIF
- Relative indication with concentric reduction to evaluate for loose body or labral tear.
- Faulk JAAOS 2010;18:199-209.

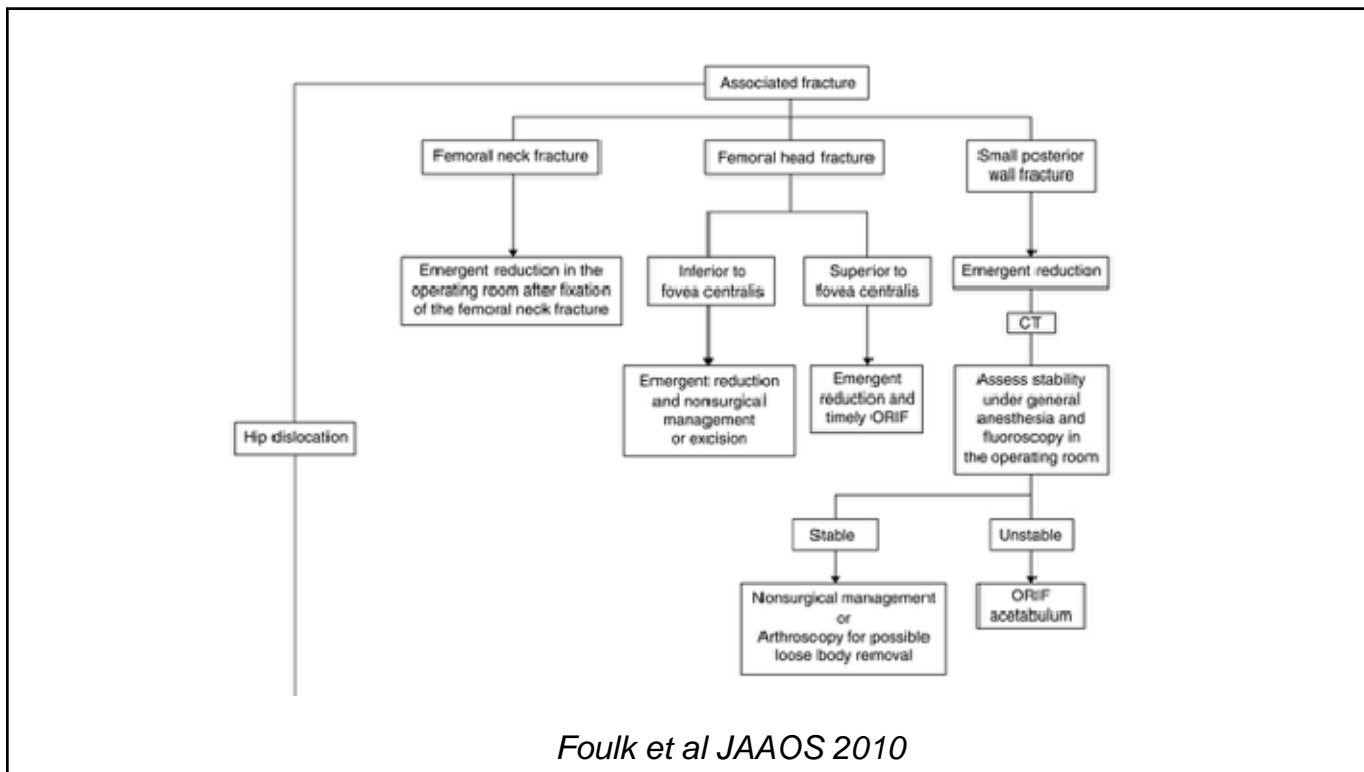
Posterior Wall Acetabular Fracture

- Non-operative
 - <20% posterior wall acetabular fracture
 - size controversial
 - Recommend EUA with fluoroscopy
- Minimally displaced
 - <2mm
- Operative
 - > 2mm of displacement
 - Marginal impaction
 - Unstable fracture pattern
 - > 40-50% posterior wall
 - + EUA if smaller



Pipkin Classification





Complications of Hip Dislocations

- Avascular Necrosis
 - 20X greater risk if hip not reduced within 6 hours of dislocation *Mehlman et al CORR 2000*
- Post Traumatic Arthritis
 - Can occur with or without AVN
 - Unavoidable with severe cartilaginous injury at time of injury
- Incidence increases with associated femoral head and acetabular fracture
 - 16% in pure dislocations
 - 88% in dislocations with severe acetabular fractures
Upudhyay et al, J Bone Joint Surg. (Br.), 1983

Complications of Hip Dislocation

- Sciatic Nerve Injury
 - Incidence 20% in adults and 5% in pediatrics
 - Peroneal nerve affected more commonly than tibial
 - Foot drop-AFO
 - Nerve stretched, compressed, or transected
 - Resolution with reduction
 - 40% complete
 - 25-35% partial resolution
 - No improvement in 3-4 weeks
 - EMG for baseline and localize injury



Summary

- Hip dislocations need to be managed effectively and efficiently
 - <6 hours to reduction
 - poor long term outcomes if reduction and treatment delayed
- Neurovascular check at time of injury and reduction
- CT post reduction to evaluate congruency
- MRI at 6 weeks to r/o AVN
- Worse outcomes with associated fractures, chondral injuries, and AVN

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