Dislocated knee

Mechanism
- High velocity trauma
  - MVA
  - Vehicle-pedestrian accidents
- Low velocity trauma
  - Sports injuries

Physical Exam
2/3 present already reduced on presentation to the ED
- Almost normal
- Mild effusion
- Abrasion
- Severe ligament laxity
- The destroyed knee will often have less effusion and pain than moderately injured ones

The Damage
- Complete disruption of all major ligaments
- Popliteal artery 10%
- Peroneal nerve 25%
  - Paresthesias dorsal foot
  - Foot drop
  - First web space anesthesia
- Tibial nerve injury
  - Plantar dysesthesias
  - Weakness with plantar flexion

Spontaneously reduced dislocations have just as much chance of popliteal artery damage as those still out

Treatment
- Relocate immediately in neutral position
- Check pulses before and after relocation
- Check peroneal and tibial nerves after reduction
- Signs of arterial damage
  - Decreased pulse
  - Expanding hematoma
  - Ischemic extremity
• *Immediate vascular and ortho consultation and arteriogram or just operate*
• No overt signs of arterial damage
  • No hard signs of artery damage
  • Ankle-brachial index >0.9—observe
  • Ankle-brachial index <0.9—imaging study of the artery

Ankle-brachial index
• Measure highest systolic reading in both arms
  – Record first doppler sound as cuff is deflated
• Use highest of the two arm systolic pressures
• Measure systolic pressure in leg
  – Cuff applied to calf
  – Record first doppler sound as cuff is deflated
  – Use doppler
    • Record dorsalis pedis pressure
    • Record posterior tibial pressure
  – Use highest systolic ankle pressure (DP or PT)
• Calculate ratio of each ankle to brachial pressure
  – Divide highest systolic ankle by highest systolic brachial pressure

Post splint in 15 degrees of angulation
Emergency
• Orthopedic emergency
• 6-8 hours

Complications
**Popliteal artery damage may be present even though the pulse is intact**
• Peroneal nerve injury—25%
• Tibial nerve injury
• Popliteal artery damage 10%
• Repair of damaged artery within 8 hours—20% amputation
• Repair of damaged artery after 8 hours—80% amputation

**Ultra-low velocity injuries**
  Mechanism is daily activities, i.e.
  Trippling
  Falling off a curb
  Patients with high BMI

Azar, et al. 2011
• 17 cases
• Ultra-low-velocity knee dislocations
  – Stepping off a curb
  – Stepping off a step
  – Falling while walking
• 13 patients
• BMI > 40
• 40% popliteal artery injury
• 55% nerve injury
• 16 yo, 17 yo, and two 19 yo
• One 8 year old with BMI 32

The higher the BMI the more likely artery and peroneal nerve injury

Fortunately, only 1 knee was not dislocated at the time of diagnosis.

Awareness of the potential for secondary injuries is paramount!

**Dislocated Knee**

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*Ultra-Low-Velocity Knee Dislocations*
Azar FM, et al.

*Management of acute knee dislocation: The Pittsburg experience*
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Jones RE et. al.
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*Vascular injuries associated with dislocation of the knee*
Green NE, Allen BL
Non-invasive Vascular Tests Reliably Exclude Occult Arterial Trauma in Injured Extremities
Johansen et al
J Trauma 1991;31(4):515-522

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Twaddle B, et al:
J Orhto Trauma 2003;17:198

Role of Arteriography in Assessing Popliteal Artery Injury in Knee Dislocations
Klineberg EO, et al.
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10-Year Review of Knee Dislocations: Is Arteriography Always Necessary?
Hollis JD, et al.
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Multi-slice CT Angiography for Arterial Evaluation in the Injured Lower Extremity
Inaba K, et al
J Trauma 2006;60:502-507

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Busquets AR, et al.
J Trauma 56:625628

Ultra-low velocity knee dislocations

DISLOCATION OF THE KNEE: AN EPIDEMIC IN WAITING?
Gray A. D. Edwards, MBCHB, MRCS, Steven M. Sarasin, MBCHB, FRCS, and Andrew P. Davies, MBCHB, FRCS, MD

Ultra-Low-Velocity Knee Dislocations
Frederick M. Azar, Jason C. Brandt, Robert H. Miller III and Barry B. Phillips

Low-velocity knee dislocation in the morbidly obese
Folt J, Vohra T,
Changing presentation of knee dislocation and vascular injury from high-energy trauma to low-energy falls in the morbidly obese
Georgiadis AG, et al.
JOURNAL OF VASCULAR SURGERY Volume 57, Number 5 1196-1203

Current Concepts in Acute Knee Dislocation: The Missed Diagnosis?
McKee L, et al.
The Open Orthopaedics Journal, 2014, 8, (Suppl 1: M5) 162-167

Knee dislocation of a morbidly obese patient:
A case report
RR Shetty, SB Mostofi, PL Housden

Pathological Knee Dislocation in the Morbidly Obese
Sneenath MM, et al.

Knee Dislocation in Overweight Patients
Peltola EK, et al.
AJR:192, January 2009 101-106

Chronic Anterior Shoulder Dislocation
Calvert 1941
91 chronic anterior shoulder dislocations reduced
68 had axillary artery rupture
50% of those died

Rockwood and Wirth 1996
Gentle manipulation under general anesthesia
Be prepared to do an open reduction if gentle manipulation fails

Verhaegen 2012
2 cases reported of axillary artery rupture after reduction of chronic anterior shoulder dislocation. One case was only 4 weeks out of joint.

The humeral head often lies close to the axillary artery when anteriorly dislocated. Adhesions form between the two structures. Movement of the humeral head causes the adhesions to pull on the artery with the possibility of rupture.

3 weeks is often used as the time needed to define a chronic dislocation. This takes into account the time required for adhesion formation.
Patients who are at risk of a chronic dislocation have:

- Dementia
- Alcoholism
- Mentally challenged patient
- Seizure disorders and the above
- Multiple trauma
- People that live a long way from medical care (other countries)

**Treatment**

Do not reduce a shoulder dislocation out for 3 weeks or more.
If an anterior shoulder dislocation is possibly chronic and you can’t be sure—call for help from your friendly orthopedic surgeon.

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**Chronic Anterior Shoulder Dislocation**

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Filip VERHAEGEN, Ide SMETS, Marc BOSQUET, Peter BRYST, Philippe DEBEER
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**Chronic glenohumeral dislocation.**
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**Chronic shoulder dislocations**
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*J Shoulder Elbow Surg* 2003;12:446-450

**Disorders of the Shoulder**
Lippincott 2014