**Vascular Trauma: Mechanism of Injury**

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**Disclosure**

- I have no relationships to disclose.
- I have no unlabeled or unapproved uses of drugs or devices in my presentation.

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**Mechanism of Vascular Injury**

- Civilian/ Military
- Blunt/ Penetrating
- Iatrogenic

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**Mechanism of Vascular Injury**

- Civilian vascular trauma (85% blunt)
- Blunt torso injury
  - Aortic
  - Mesenteric
  - Pelvic
  - Solid organ
- Most common cause
  - Motor vehicle crash
  - Falls

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**Mechanism of Vascular Injury**

- Civilian vascular trauma (85% blunt)
- Blunt extremity injury
  - Axillo/ brachial
  - Femoral
  - Popliteal
  - Tibial/ peroneal
- Commonly associated with
  - Fracture/ dislocations
  - Soft signs of vascular injury

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**Mechanism of Vascular Injury**

- Civilian vascular trauma (85% blunt)
- Injury patterns which require high index of suspicion
  - Seat belt sign across anterior neck
  - Clavicular fracture
  - Displaced humerus fracture
  - Posterior knee dislocation
  - Tibial plateau fractures
- Management requires in-line traction, reduction and reassessment of perfusion
Mechanism of Vascular Injury

- 22 y/o male arrives after MVC hemodynamically normal. Feet well perfused and femoral pulses normal. Right popliteal pulse hard to examine because of knee pain swelling. ABI on right 0.7 (0.97 on left). Films and CT show pelvic fracture.
  - Knee immobilizer and pain control
  - Urgent arteriography
  - Immediate anticoagulation
  - Consent for ORIF of knee
  - Routine trauma work up

Mechanism of Vascular Injury

- Posterior knee dislocation results in popliteal artery injury 4-20% of cases
  - Concomitant peroneal nerve palsy 10-25%
- ABI <0.9 has been shown to have a sensitivity, specificity and positive predictive value of nearly 100% in several studies
  - Selective use of arteriography
  - Duplex as an adjunct
- Arterial injury can exist with a palpable pulse; need sensitive test (ABI, duplex or arteriography)

Mechanism of Vascular Injury

- Civilian vascular trauma (15% penetrating)
  - Low velocity gunshot wounds
  - Knife wounds or stabbings
  - Glass injuries or lacerations
  - Penetrating vascular injury requires management of entry/ soft tissue wound

Mechanism of Vascular Injury

- 20 y/o male arrives hemodynamically normal after GSW to left leg with 22 caliber pistol. Entrance and exit wounds on medial and lateral aspect of left knee. Blood on clothing but no hemorrhage or hematoma. ABI and pulse exam normal.
  - Observation and repeat ABI in 24 hours
  - CTA of left lower extremity
  - Duplex of left lower extremity
  - On-table arteriogram of left leg
  - Selective arteriogram of left leg

Mechanism of Vascular Injury

- Selective arteriography is acceptable in patients with soft signs of vascular injury
  - Selective arteriography based on ankle brachial index of >0.9

Mechanism of Vascular Injury

- Iatrogenic vascular trauma
  - Catheter-based injury
    - Access related
    - Procedure related
    - Closure related
  - Vascular injury from access and illicit drug use
### Mechanism of Vascular Injury

- Military (85% penetrating)
  - Penetrating explosive (multiple soft tissue wounds)
  - Gunshot wounds (higher velocity and therefore greater cavitating effect and more associated injury)
- Military (15% blunt)
  - Motor vehicle accidents
  - Sports injuries (fracture dislocations)

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### Mechanism of Vascular Injury

Questions?