Teaching Module VI
Extravasation
Extravasation

This slide deck was prepared by

Marie-France Bellin
University Paris Sud 11
France
Extravasation

- A well-recognized complication of contrast-enhanced imaging studies
- Prevalence of 0.04%-1.3% with automated power injectors
- Vast majority of extravasation of CM causes only mild soft-tissue injury
- Severe skin ulceration and necrosis may rarely occur

Wang et al., Radiology 2007
Risk factors
Patient-related factors

• Inability to communicate (infants, small children, unconscious patients, language barrier)
• Fragile or damaged veins (chemotherapy, steroids, IV drug abuse)
• Obesity
• Arterial insufficiency
• Compromised venous or lymphatic drainage
Risk factors

Technique-related factors

- Use of power injector
- Less optimal injection sites; lower limbs and distal veins
- Large volume of CM
- High-osmolar CM
- Use of indwelling IV lines for CM injection
- Use of metal needles vs plastic cannulae
Mechanism

• Osmotoxicity (osmolality above 1025-1420 mOsm/kg water) and associated phlebitis

• Chemotoxicity of contrast media

• Large volume of extravasated contrast medium causing mechanical compression and compartment syndrome

• Acute inflammation followed by chronic inflammatory process, fibrosis, and muscle atrophy
Clinical picture

- Varies from minor erythema to tissue necrosis
- May rarely lead to sequelae and permanent disability
- Skin blistering, altered tissue perfusion, paresthesia, and increasing pain may develop in severe cases

![Intraoperative photo of the two-incision technique for release of the anterior and lateral compartments. The patient is a 25-year-old female recreational runner with bilateral exertional compartment syndrome.]
Clinical picture

Wang et al., Radiology 2007
Clinical picture

Wang et al., Radiology 2007
ESUR guidelines for prevention

- Meticulous IV technique

- Use appropriate size plastic cannula placed in a suitable size vein to handle the flow rate used during the injection

- Test injection with normal saline

- Use non-ionic contrast medium
ESUR guidelines for management

- **Conservative treatment** is adequate in most cases:
  - limb elevation
  - ice packs
  - careful monitoring

- **If serious injury** is suspected, seek the advice of a surgeon
Conclusions

- Extravasation often involves large volumes and nearly always resolves with conservative treatment
- Moderate injuries occur in a small number of patients
- Severe injuries are rare
Thank you for your attention