



Clinical Practice Guideline

Contrast Extravasation

Overview: Extravasation of contrast medium can occur during hand or power injection. Iodinated contrast media are toxic to surrounding tissues, particularly skin. Some patients will experience stinging or burning, but other patients will have little to no immediate discomfort.

The reported incidence of extravasation related to power injection is 0.1% to 0.9% (from 1/1000 patients to 1/106 patients). During dynamic bolus computed tomography (CT), a large volume of contrast can extravasate. These events may require surgical consultation and intervention.

Target Audience: Imaging nurses, radiological technologists, radiologists, radiology residents, radiology managers, healthcare providers, interns, and medical students

Content/Strategies:

- Identify the populations of patients at risk for contrast extravasation:
 - Patients who cannot communicate effectively (e.g., infants, children, elders), or alterations in consciousness
 - Patients who are severely ill or debilitated
 - Patients with abnormal circulation:
 - Peripheral vascular disease
 - Raynaud's disease
 - Venous thrombosis or insufficiency in the limb to be injected
 - Prior radiation or extensive surgery (lymph node dissection or vein harvest) in the limb to be injected
- Identify IV access sites to avoid (more likely to result in extravasation) the following:
 - IVs placed in hand, wrist, foot, or ankle veins
 - Indwelling peripheral IV catheters that have been in place more than 24 hours
 - IVs placed into a limb that has already undergone multiple punctures in the same vein
- Consider use of low osmolality contrast medium (LOCM) in high-risk patients:
 - Extravasation of LOCM is better tolerated and often less damaging than high osmolality contrast medium (HOCM).
- Recognize extravasation injury:
 - On initial physical exam, the site may be edematous, erythematous, and tender.
 - Close clinical follow up for several hours following extravasation is essential.
 - Severity and prognosis of the injury is difficult to determine initially.
 - Extravasation site should be checked for the following:
 - Skin changes (ulceration, blistering)
 - Change in sensation of the affected limb

- Decreased capillary refill
- Acute local inflammatory response may follow extravasation, peaking in 24-48 hours.
- Immediate surgical consultation for
 - Increased swelling or pain that develops after 2-4 hours.
 - Evidence of altered tissue perfusion – decreased capillary refill, change in sensation of affected limb, or skin ulceration or blistering.
- Outpatients should be released only after the radiologist is satisfied that any signs and symptoms that were present initially have improved and/or new symptoms have not developed during the observation period.
- The radiologist should contact the referring physician regarding extravasation injuries.
- Treat extravasation injury: There is no clear consensus on best treatment, but the following are generally recommended:
 - Elevate the affected extremity above the level of the heart. This decreases capillary hydrostatic pressure and promotes resorption of extravasated fluid.
 - Use warm compresses to improve blood flow and absorption of fluid, particularly distal to the site.
 - **OR** use cold compresses to reduce pain at the injection site.
- Document:
 - Location, type, and time of IV placement; type and amount of contrast delivered
 - Initial clinical examination
 - Length of observation and condition of extravasation site to include skin appearance, distal circulation, and changes in sensation
 - Communication with the referring physician
 - Instructions to the patient for self-care and changes that will need immediate attention (and where to get that care)

Suggested Readings

American College of Radiology. (2008). *Manual on contrast media* (Version 6.0). Reston, VA: Author.

American College of Radiology Committee on Drugs and Contrast Media of the Guidelines and Standards Committee of the Committee on General, Small and Rural Practice. (2007). *ACR practice guideline for the use of intravascular contrast media*. Reston, VA: American College of Radiology.

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