



Double edged Knife Contrast Medium in ER

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Agenda

- CM – What it is ?
- Use in ER
- Risks
- Complications
- Precautions & Management

What is a CM?

- Used to supplement the capabilities of various imaging modalities
- IV : Iodine based
- Ionic or non Ionic
- High/Low/Iso Osmolar
- Non Ionic Iso or low osmolar (recent)
- MRI – Gadolinium based

Indication – Controversy?

- IV/Oral in Abdominal CT
- Uncomplicated Appendicitis, Diverticulosis, Nephrolithiasis - Plain vs Contrast
- Mesenteric Ischemia, Portal vein thrombosis, CA, Bowel obstruction(Oral)

CT head with Contrast

- Tumours
- CVT
- Carotid / Vertebral artery dissection
- Aneurysmal Bleed

Contrast Enhanced USG

- Solid Organ injury, Bleeding Hematomas, AAA

The Problem

- Hypersensitivity
- Renal injury (Acute or delayed)
- Non Renal complications

Who is at risk?

- Prior history of allergy
- Atopic tendencies
- Dehydration
- Age
- Serious illness and chronic debilitating
- Anemia
- Co-medications
- Malignancies

Creatinine: Pre screen – Indications

1. Anatomic variations
2. Renal surgeries
3. Renal endangering Medications
4. Nephropathy (prior)
5. Prior renal dialysis /Renal malignancies
3. Nephropathy-associated chronic diseases
4. Drugs interfering with renal excretions

Management – Contrast Media

- Urgent CT – known H/O Allergic Reactions (Adult)
 1. Alternative
 2. Hydrocortisone 50 mg IV every 4 hours until procedure is completed + Diphenhydramine 50 mg PO **or** 25 mg IV, 1 hour prior to procedure.
 3. If allergy or contraindications to steroids - premedicate with diphenhydramine 50 mg PO **or** 25 mg IV, 30-60 minutes prior to procedure

Precautions

Problem : The osmolality of iodinated CM was postulated to cause extracellular fluid shifts, leading to cell dehydration and increased intracellular fluid viscosity, which precipitates cellular dysfunction

- Hydration
- IVF vs Sodabocard infusion Vs NAC Vs Theophylline Vs Statins Vs Diuretics = No studies on benefit over each other

Non Renal

Mild	Moderate	Severe
<ol style="list-style-type: none"> 1. Altered taste 2. Anxiety 3. Chills 4. Cough 5. Dizziness 6. Flushing 7. Headache 8. Itching 9. Nasal stuffiness 10. Nausea, vomiting 11. Pallor, Rash, hives 12. Sweats 13. Swelling of eyes or face <p>Warmth</p>	<ol style="list-style-type: none"> 1. Bronchospasm 2. Wheezing 3. Hypertension 4. Mild hypotension 5. Dyspnea 6. Laryngeal edema 7. Tachycardia/bradycardia 8. Generalized or diffuse erythema 	<ul style="list-style-type: none"> • Cardiopulmonary arrest • Convulsions • Profound hypotension • Arrhythmias • Laryngeal edema (severe or rapidly progressing) • Unresponsiveness

Management - Mild

1. Diphenhydramine 25 mg PO/IM/IV, (may repeat up to 50 mg total dose) or Hydroxyzine 25 mg PO/IM if allergic to diphenhydramine
 - Hydrocortisone 100 mg IV Push over 1 minute, if no improvement in 5 minutes,
 - Epinephrine (1:1,000) 0.5 mL subcutaneously if no cardiac contraindications

Moderate / Severe

Bradycardia /Vagal Reaction (responsive patient) - ABC

- Atropine 0.5 mg IV push repeat atropine 3-5 mins (0.04 mg/kg) or 3 mg total

Hypotension with Tachycardia

- Epinephrine (1:1,000) 0.5 mL subcutaneously

Resp Distress – Beta Agonist Neb

Seizure : Lorazepam

Rebound prevention

Drug	Dose	Daily Max dose
Hydrocortisone	50mg IV 1-2 min every 6 hours	200 mg / day
Methylprednisolone	40 mg-125mg IV 1-2 min every 6 hours	N/A

Renal –Immediate

Contrast induced-acute kidney injury (CI-AKI)

“Abrupt deterioration in kidney function, manifested by an increase in serum creatinine level with or without reduced urine output”

Intra arterial = > risk

Diagnostic criteria – CM AKI

1. Absolute serum creatinine increase of greater than or equal to 3.0 mg/dL ($> 26.4 \mu\text{mol/L}$)
2. An increase in the percentage of serum creatinine of greater than or equal to 50%
3. Urine output reduced to less than or equal to 0.5 mL/kg per hour for at least 6 h

Delayed renal

- Nephrogenic systemic fibrosis (Gadolinium based agents chelation)
- Fatal , cant be detected by imaging

Delayed Non renal

- 1 hr to 1 week
- Iodine provoked thyroid dysfunction (disrupted auto regulation)
- High risk for hyperthyroid status patients

Safe renal practices

1. Patients with $\text{SCr} \geq 2 \text{ g/dL}$ and/or $\text{eGFR} \leq 60 \text{ mL/min per } 1.73 \text{ m}^2$
 - Withhold contrast / alternative modalities
 - Adequate hydration
2. Patients with end-stage renal disease who still produce urine
 - Consider alternative diagnostic study if feasible
 - Use lowest possible dose of contrast
 - Use intermediate to low osmolar and/or low risk GBCA
 - Followed by prompt dialysis
3. End-stage renal disease Anuric-Routine volumes

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Thank you