Contrast Media and Tomographic Procedures

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Section 4

History

- History can be obtained from several sources:
  1. Patient’s referring physician
  2. The patient’s chart
  3. Obtaining information from the patient
  4. Clinician interviewing the patient prior to injection of contrast (you).

Consent

- Informed consent **must** be obtained prior to delivery of IV contrast media.
- The risks, benefits, and alternative choices must be explained to and understood by the patient or guardian.
- Informed consent form must be witnessed and signed.

Contrast Administration

- Must be administered by a qualified physician or trained radiologic nurse, or technologist.
- The physician will prescribe the nature, dose and rate of administration.
- Administering individual must remain with the patient to observe for possible reactions.
- A rad. Tech. usually prepares the contrast for delivery.
**Barium Sulfate**
- Barium Sulfate: It can be mixed with water, or can come already prepared.

**Air in Stomach**
- For a double contrast series of the stomach the patient is given air producing crystals when mixed with a small amount of water fizzes. It produces gas or air in the stomach, the patient is instructed not to burp.

**Thick Barium**
- The patient is then given a much thicker barium to drink, this is what coats the lining of the stomach, the patient is instructed to roll from side to side in order to coat the stomach.

**Water Soluble Contrast**
- Water soluble contrast has the advantage of moving more quickly through the system, it will completely move from the stomach to the colon in 4 hours.
- BE: It doesn’t line the mucosa as well as barium, but it can easily be removed by aspiration before or during surgery.
- Examples are Hypaque/Gastrografin used for people with the possibility of a fistula, or perforation.
Intravenous Contrast Media

- Conventional contrast media
- Low osmolality media - lower concentrate of molecules in the solution

Iodinated IV contrast agents possess a small risk of reactions, which can range in severity from minor to fatal. Risks can be reduced when proper assessment of the patient’s history, and previous reactions to contrast media is done.

IONIC Contrast Media

- The physical properties of the contrast media include the ions or particles associated with the chemical breakdown of the contrast media when it enters the blood, the number and size of the iodine molecules, and the number and size of the molecules of any chemical additive.
- Ionic compounds dissolve into charged particles when it enters the blood.

NON-IONIC Contrast

- Used when less risk of reaction is required:
  1. Active asthma requires inhaler
  2. Insulin dependent diabetes
  3. Severe cardiac disease
  4. Hx of reaction to contrast media
  5. Hx of allergy to iodine containing substances (shellfish, iodine, contrast)
  6. Inability to communicate history
  7. Physician always uses it.

Pathology which Causes Iodine Reactions

- Pheochromocytoma
- Sickle cell disease
- Metastatic renal disease
- Hepatic disease
- Severe hypertension or CHF
- Renal transplant
- Diabetics
- Subarachnoid hemorrhage
Lab Values

- Make sure that patients BUN and Creatinine are in normal limits prior to giving intravenous contrast.
- BUN 7-18mg/dl
- Creatinine serum .6-1.2mg/dl
- Male creatinine urine .8-2.5 g/24 h
- Female creatinine urine .6-1.8 g/24 hr.
- Patient’s weight and age should be verified as well prior to giving contrast.

Mild Reactions

- Discontinue injection if not completed.
- Notify Radiologist or house physician
- Often no treatment is necessary, reassure patient.
- Document reaction

Moderate Reactions

- Tachycardia, hypertension, hypotension, dyspnea, wheezing, laryngospasm, bronchospasm.
**Moderate Reaction**

- Maintain IV and inform Radiologist or house physician.
- Administer epinephrine 1:1000 while waiting for physician.
- Administer O2 6-10L/min via face mask and obtain vital signs.
- Administer epinephrine for urticaria, facial, laryngeal edema, mild to moderate bronchospasm.
- Bronchospasm administer beta agonist inhalers, if it advances page anesthesia STAT.
- Transfer patient to appropriate unit.
- DOCUMENT PATIENT REACTION IN CHART

**Severe Reaction**

- Call a code immediately.
- Notify house staff, and monitor vitals, including EKG.
- Maintain IV and provide fluid replacement of LR or NS.
- Initiate O2 at 6-10L/min via face mask.
- For hypotension with brachycardia (possible vasovagal reaction) elevate legs, or trendelenberg position.
- Prepare .6-1.0mg atropine for IV administration. Repeat atropine up to a dose of 2 mg (for adults).

**Severe Reaction**

- Anaphylaxis
- Convulsions
- Cardiopulmonary arrest

**Contrast Administration Post Reaction**

- Patients physician should always be consulted prior to a contrast media being given to a patient with a prior history of any reaction to a contrast media.
- Normally if the benefit of the examination outweighs the risk, administration of medications to prevent reaction, and a crash cart and crew will be standing by.
Steroids
- Steroids can be given when a history of prior reaction or asthma is given.
- Prednisone 50mg PO x 3 doses
- The first dose should be 24 hours prior to study.
- Second dose 12 hours prior to study.
- Last dose one hour prior to study.
- Diphenhydramine 50mg PO X1 dose. One hour prior to study.
- Outpatients should be informed that they will need someone to drive them home.

Cystokon
- For cystograms Cystokon or a similar contrast. If your department wants you to catheterize then, you should be properly trained in sterile technique. Some facilities prefer that a nurse do the catheterizing.

Hysterosalpingogram
- Reproductive System - Female reproductive system is seen using either water soluble or oily contrast agents.
- The contraindications are not to the contrast agent but to the study itself. It should not be performed if the patient is pregnant, has a pelvic or vaginal infection or during menses!!!

Sialography
- Oily contrast agent used to demonstrate salivary ducts
**Tomography**

- Area of fulcrum is clear whereas all areas above and below fulcrum are blurred.

**Tomograms**

- Tomograms were the CT of the past, and a lower dosage for IVP’s than CT.

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**Tomograms**

On page 344-345 in Merrill’s volume 3 are the various body parts and focal levels as well as slice thickness that may be used in tomography.

You may want to read ppg. 340-345 in Vol. 3.