MRAD 223:
Contrast – Purpose and Types

MRT Program

Contrast

- Purpose
- Types of contrast
- Contraindications

Purpose

What is Contrast?

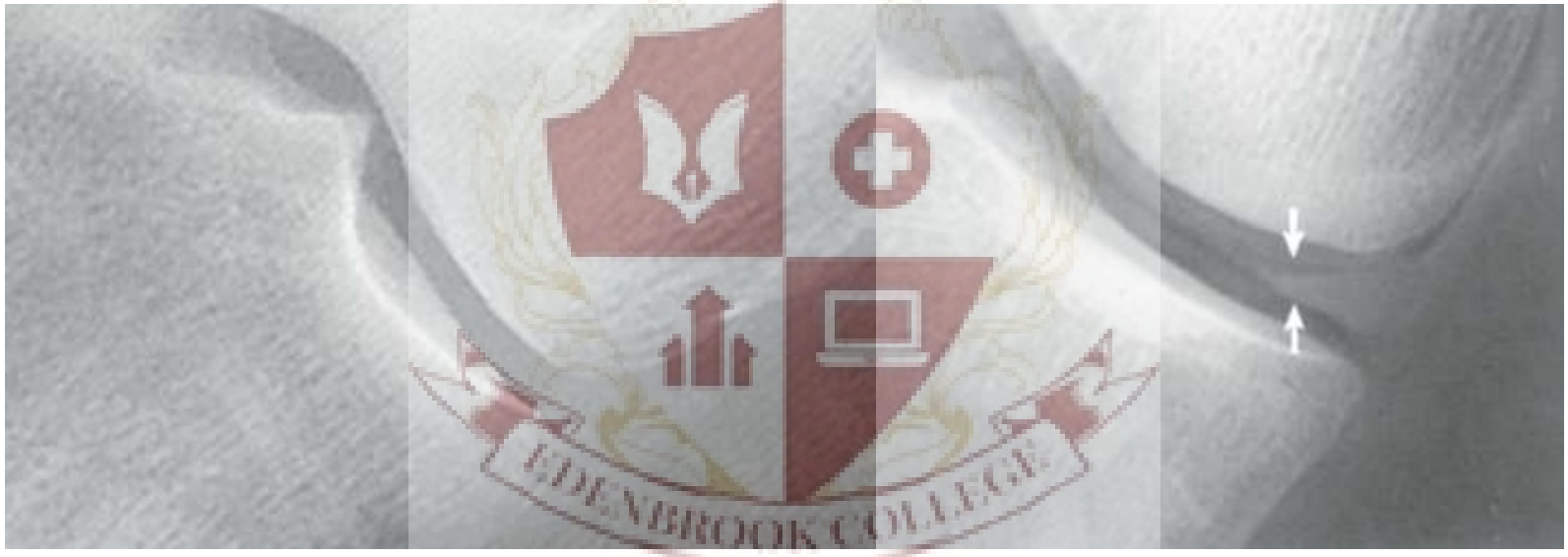
- A substance that is added to the body to facilitate imaging internal structures that are difficult to visualize



Purpose

Why use Contrast?

- Changes absorption characteristics



Why use Contrast?

- Enhances radiographic contrast of tissues that normally appear to have similar shades



Ehrlich pg. 352 Fig. 19-2

Why use Contrast?

- Contours/fills structures for better visualization
  - Diminishes effects of superimposition

https://radiopaedia.org/cases/zenker-diverticulum-7



Properties of Contrast Media and Brand Names

- Classified as "negative" (example air) contrast agent because it barely attenuates x-rays or "positive" contrast agents which attenuate more x-rays because of the iodine composition.
- Examples of positive, "Brand name" water soluble, injectable contrast agents include: Optiray, Ominpaque, and Conray

Types of Contrast

1. Barium Sulfate
2. Air/Gases
3. Iodine compounds



Barium Sulfate

Aka. Barium

- A radiopaque (+) contrast medium used as a diagnostic aid in radiographic imaging
- It is an inert inorganic salt
  - Colouring and flavoring may be added
- Has different concentrations

Packaging:

- Powder
- Liquid
- Paste

- Water must be added to barium prior to administration

Barium Sulfate

On its own Barium has no flavor

- However has a very chalky consistency, and is white in color

As an inert compound:

- Barium does not react chemically with the body in an extreme way
- Allergies to barium itself are extremely rare and few side effects occur
  - Barium will absorb water

Viscosity (thickness) determines administration method

Air & Gases

Air & Gases

- Absorb less radiation than surrounding tissues
  - Negative contrast agent
- Commonly used with Barium
  - Air fills the lumen; barium coats the mucosal lining

Air causes cramping and must be administered slowly to avoid pt. discomfort

- CO2 (carbon dioxide) can be used instead of air for colonography
  - Causes less cramping
  - More easily absorbed by the body

Iodine Compounds

Positive Contrast Agents

- Mix readily with blood and other body fluids
  - Water soluble
- Are excreted by the kidneys
- Come in many different forms
  - Volumes
  - Strengths
  - Types
- Not all are created equal
  - Some can only be used for 1 type of exam
- Contraindications should be referenced using the drug package insert

Iodine Compounds

Are water-soluble carbon-based organic chemicals

- Molecules are composed from iodine and various other atoms
- Molecules that contain more iodine atoms are considered more concentrated

Chemical composition of these molecules (number of iodine atoms vs other atoms within the molecule; and the size of the molecules) affects:

- How we can use the contrast media
- Image quality
- Chance of adverse reaction

Contraindications

Iodinated Contrast Media

- Patient's who have a history of:
  - Compromised renal function
  - Compromised cardiac function
  - Compromised respiratory function
  - Allergies

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