“Step & Shoot” Cardiac Gated CT for Detection of Pulmonary Embolism: Technique and Advantages

Dinesh K Sharma, MD
Department of Radiology, Thomas Jefferson University Hospital, Philadelphia, PA

Introduction

• Pulmonary Embolism (PE) is a common condition with significant morbidity and mortality.
• Prompt recognition, diagnosis and management is important, as untreated PE complications are high; also treatment with long term anticoagulation has serious complications.

Modalities

• Pulmonary Angiogram:
  – Gold Standard, however, provides only
  – Two-dimensional planar images
  – Vessel overlap
  – Invasive with risks
• CT: CTA with introduction of spiral/helical
  – CT

Impression:
Suboptimal contrast opacification limit valuation of segmental and subsegmental PE. No filling defect in the main, left and the right pulmonary trunk to suggest presence of central PE.

“S&S” Prospective Gated CTA

Learning Objectives:
A: Describe the technique of CTA
B: Discuss the advantages:
  i. Contrast dose
  ii. Visualization of vessels
  iii. Decreased radiation dose

Technique

• Patient on table supine, feet first
• IV line ante cubital fossa or forearm
• 18 G preferred. May use 20 G
• EKG leads placed
• Scout is taken

Technical Data

• KV: 80-100 depending on pt body wt.
• MAS: 170-200
• Scan: 256 Slice (ICT Phillips)
• Detector width: 0.625 mm
• Z-direction thickness per rotation: 8 cm
Contrast Dose

- Amount 50-60 cc
- Given as a bolus from tube A at the rate of 5 to 5.5 cc per sec (18-10 g iv access).
- Followed immediately by mixture of 10 cc of contrast and 30 cc of saline from tube B.

Images obtained in axial plane.

Reformation in multiple planes at 3-D work-station.

Normal Anatomy

- Rt Main PA
- Truncus Anterior (superior)
- Br. to middle lobe
- Br to sup. segment
- Basal seg brs.
- Third-order branches

54 yrs. F with h/o right Leg swelling x 3 days. Now with SOB

Other uses Pulm AVM

Conclusion

- “S & S” Cardiac Gated CT study for PE is useful and has advantage over regular PE study due to:
  - Better visualization of small vessels due to lack of motion artifacts
  - Reduced dose of contrast
  - Reduced radiation dose