Pitfalls in coronary CT angiography with 64 VCT Light Speed – GE - our initial experience

Rad.teh. Danijela Pejkovik
Special hospital for surgery diseases “Filip II”
Skopje, Macedonia
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64 Cardiac MSCT

Noninvasive exact procedure comfortable for the patient, 3-D or 4-D image for volumetric display of the coronary blood vessels.
64 Cardiac MSCT - Indications

- Detection of CAD for a patient with atypical chest pain/angina
- Screening in asymptomatic patients with high risk for CAD
- Evaluation of suspected coronary anomalies before/after cath lab
- Coronary assessment before cardiac & vascular surgery
- Planning of interventions - stenting
- Stent & CABG follow up
- Triple rule out (aortic dissection, PE, CAD)
- Evaluation of valvular and ventricular function
64 Cardiac MSCT - our initial experience

- February to July 2008,
  - 254 coronary CTA
- performed by two radiological technologists and independently analyzed by two radiologists
- Cardiac SSsegment 30 – 75 BPM ECG gated protocol
64 Cardiac MSCT

- High speed scanning (rot.time 0,35)
- High spatial and temporal resolution
- Thin slices - 0,625 mm,
- Visualization in all planes
  (sagital, transversal, coronal)
- Acquisition in diastolic phase

What more we need?
- 3D postprocesing
- ECG gating
- An injector
  - Blood pressure monitor
  - Anti shock therapy
  (allergic reaction, chest pain)
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• patient preparation:
  - getting an accurate patient history, - ECG / HR / TA / TT
  - explain to the patient the CT examination
    (Instructions for breath hold: test the breath-hold of the patient before the acquisition 8-20 sec, contrast enhancement effects)

• medical premedication
  (if it is necessary)
64 Cardiac MSCT — Breath - hold instructions

« Breath in and hold your breath »

Pitch A

Pitch B

2-3s

5-7s

Stable window

Reaction time

HR

time
64 Cardiac MSCT - Positioning

Patient feet first

• Reference point: SN
   IV in the right arm: canila: 20G / 18G
   (injection rate = up to 5 ml/s)

• ECG far from the injector, screen to face the acquisition console
  - 3 Leads: (on bone contact)

  Very usefull to fix all the wires to avoid a bad ECG trace. (avoid artifacts)
64 Cardiac MSCT
SS Segment 45 – 70 BPM 0.625mm

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64 Cardiac MSCT - Scout
• R-R peak
64 Cardiac MSCT
- Setting the acquisition field of the patient's scout
64 Cardiac MSCT - Positioning the reference image on the Smart Prep

11:00:54 Acquisition Impossible. Refroidissement tube. Baisser mA ou kV pr activ. système.
64 Cardiac MSCT - Ca scoring
In our hospital we use the "smart prep" option (setting the localizer 2cm above the carina - the point for extrapolating similar slices in predetermined intervals and for observing the concentration of the contrast material in the ascending aorta).
64 Cardiac MSCT

Coronary by-pass grafts
64 Cardiac MSCT - Results:

Out of 254 performed examinations:

- 48 (18.8%) - *motion artifacts* and high noise,
- In 10 (3.9%) - *obesity* of the patients,
- 11 (4.3%) CTA - *breathing artifacts*,
- 9 (3.5%) *non-optimal enhancement* (early or late scanning),
- In 7 (2.7%) *communication* with the patients and
- In 11 (4.3%) - *heart rate* (over 80 BPM).

Breathing artifacts
Heart rate. Obesity. Non-optimal enhancement

Right chamber
Ao ASC

Cardiosurgery - Skopje
64 Cardiac MSCT

- **Limitations:**
  - Heart frequency above 65-70 bpm
  - Uncooperative patient
  - Obese patients

- **Unwanted reactions:**
  - Extravasations of the contrast under the skin
  - Iodine allergy

- **Relative contraindications:**
  - Oversensitivity to the contrast material (premedication needed)
  - Arrhythmia
Conclusion

• For a correct accomplishment of coronary CTA, the main goal is a good cooperation and communication with the patients in their preparation and during the examination.

• As well as a good educated technologist for correct following of the parameters (ECG triggering, optimal enhancement, scan delay)