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COMPARISON OF DIAGNOSTIC ACCURACY OF CORONARY CT ANGIOGRAPHY BETWEEN RETROSPECTIVE ECG-GATING WITH DOSE MODULATION AND VIRTUAL PROSPECTIVE ECG GATING WITH AND WITHOUT PADDING

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Background: To reduce radiation exposure, prospecting ECG gating without padding is preferable, but there are no other phase data. To evaluate diagnostic accuracy of coronary CT using various acquisition methods, we compared retrospective ECG gating with dose modulation and "virtual" prospective ECG gating with and without padding.

Methods: 85 consecutive subjects (57 male, 62±12yrs,) who underwent both 320 slice CT (Aquilion one) and conventional coronary angiography (CCAG) within 3 months without incident were included. CT was performed with retrospective ECG-gating with (if heart rate (HR) <80 bpm) and without (if HR>79 bpm) dose modulation. CT images were reconstructed every 5% from 0-95% of RR interval. We assessed for significant coronary stenosis with 3 methods; 1) using only 75% of data as virtual prospective ECG gating without padding, 2) using 70-100% of data if HR < 66 bpm, or using 35-100% of data if HR > 65 bpm as prospective ECG gating with padding, and 3) using all phase data.

Results: Using only evaluable lesions, sensitivity, specificity, positive (PPV) and negative predictive values (NPV) for detecting luminal stenosis compared with CCAG were 85, 95, 72 and 97% for Method 1, 92, 97, 73, and 99% for Method 2, 93, 97, 74, and 99% for Method 3, respectively (P=NS). The number of unevaluable lesions was 8.2, 0.5%, and 0.5% for Methods 1, 2, and 3, respectively (Method 1 > 2, 3, p<0.05).

Conclusion: In virtual prospecting ECG gating at 75% of RR interval, there were significantly more unevaluable lesions.