Coronary artery calcium scoring: Influence of adaptive statistical iterative reconstruction using 64-MDCT

Summary / Zusammenfassung

OBJECTIVE: Assessment of coronary artery calcification is increasingly used for cardiovascular risk stratification. We evaluated the reliability of calcium-scoring results using a novel iterative reconstruction algorithm (ASIR) on a high-definition 64-slice CT scanner, as such data is lacking.

METHODS AND RESULTS: In 50 consecutive patients Agatston scores, calcium mass and volume score were assessed. Comparisons were performed between groups using filtered back projection (FBP) and 20-100% ASIR algorithms. Calcium score was measured in the coronary arteries, signal and noise were measured in the aortic root and left ventricle. In comparison with FBP, use of 20%, 40%, 60%, 80%, and 100% ASIR resulted in reduced image noise between groups (7.7%, 18.8%, 27.9%, 39.86%, and 48.56%, respectively; p<0.001) without difference in signal (p=0.60). With ASIR algorithms Agatston coronary calcium scoring significantly decreased compared with FBP algorithms (837.3±130.3; 802.2±124.9, 771.5±120.7; 744.7±116.8, 724.5±114.2, and 709.2±112.3 for 0%, 20%, 40%, 60%, 80%, and 100% ASIR, respectively, p<0.001). Volumetric score decreased in a similar manner (p<0.001) while calcium mass remained unchanged. Mean effective radiation dose was 0.81±0.08mSv.

CONCLUSION: ASIR results in image noise reduction. However, ASIR image reconstruction techniques for HDCT scans decrease Agatston coronary calcium scores. Thus, one needs to be aware of significant changes of the scoring results caused by different reconstruction methods.

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Funding Source(s) / Unterstützt durch
SNF (Personen- und Projektförderung)

Duration of Project / Projektdauer
Jan 2012 to Oct 2012