Dokumenttyp: journal article

Autor(en) des Beitrags:
Muenzel, Daniela, D; Kabus, Sven, S; Gramer, Bettina, B; Leber, Vivian, V; Vembar, Mani, M; Schmitt, Holger, H; Wildgruber, Moritz, M; Fingerle, Alexander A, AA; Rummeny, Ernst J, EJ; Huber, Armin, A; Noël, Peter B, PB

Titel des Beitrags:
Dynamic CT perfusion imaging of the myocardium: a technical note on improvement of image quality.

Abstract:
To improve image and diagnostic quality in dynamic CT myocardial perfusion imaging (MPI) by using motion compensation and a spatio-temporal filter. Dynamic CT MPI was performed using a 256-slice multidetector computed tomography scanner (MDCT). Data from two different patients - with and without myocardial perfusion defects - were evaluated to illustrate potential improvements for MPI (institutional review board approved). Three datasets for each patient were generated: (i) original data (ii) motion compensated data and (iii) motion compensated data with spatio-temporal filtering performed. In addition to the visual assessment of the tomographic slices, noise and contrast-to-noise-ratio (CNR) were measured for all data. Perfusion analysis was performed using time-density curves with regions-of-interest (ROI) placed in normal and hypoperfused myocardium. Precision in definition of normal and hypoperfused areas was determined in corresponding coloured perfusion maps. The use of motion compensation followed by spatio-temporal filtering resulted in better alignment of the cardiac volumes over time leading to a more consistent perfusion quantification and improved detection of the extend of...
perfusion defects. Additionally image noise was reduced by 78.5%, with CNR improvements by a factor of 4.7. The average effective radiation dose estimate was 7.1±1.1 mSv. The use of motion compensation and spatio-temporal smoothing will result in improved quantification of dynamic CT MPI using a latest generation CT scanner.