3D ANALYSIS OF MYOCARDIAL PERFUSION FROM REGADENOSON STRESS COMPUTED TOMOGRAPHY: CAN ACCURACY BE IMPROVED BY ITERATIVE RECONSTRUCTION?

Poster Contributions
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Background: Computed tomography (CT) is an emerging tool to detect stress-induced myocardial perfusion abnormalities. We hypothesized that iterative reconstruction (IR) could improve the accuracy of the detection of significant coronary artery disease using quantitative 3D analysis of myocardial perfusion during vasodilator stress.

Methods: We studied 34 consecutive patients referred for CT coronary angiography (CTCA) who agreed to undergo additional imaging with regadenoson (Astellas). Images were acquired using prospective gating (256-channel, Philips) and reconstructed using 2 different algorithms: filtered back-projection (FBP) and IR applied at the highest level (iDose7, Philips). Custom software was used to analyze both FBP and IR images. An index of severity and extent of perfusion abnormality was calculated for each 3D myocardial segment and compared to perfusion defects predicted by coronary stenosis >50% on CTCA.

Results: Five patients with image artifacts were excluded. Ten patients with normal coronaries were used to obtain reference values, which were used to correct for x-ray attenuation differences among normal myocardial segments. The accuracy of the detection of perfusion abnormalities was tested in the remaining 19 patients. Iterative reconstruction improved the 3D detection of perfusion abnormalities (table).

Conclusions: Iterative reconstruction can improve the accuracy of the detection of myocardial perfusion abnormalities during regadenoson stress.