DIAGNOSIS OF PHYSIOLOGICALLY SIGNIFICANT CORONARY ARTERY STENOSES BY TRANSLUMINAL ATTENUATION GRADIENT OF 64-DETECTOR ROW CORONARY COMPUTED TOMOGRAPHY ANGIOGRAPHY: A VALIDATION STUDY WITH FRACTIONAL FLOW RESERVE

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Background: Discrepancy between angiographical stenosis and ischemia-causing stenosis is not uncommon. Previously we have shown that transluminal attenuation gradient (TAG) derived from coronary CT angiography can identify angiographically significant stenoses. In this study, we validated TAG with invasively obtained fractional flow reserve (FFR) and angiographic QCA.

Methods: TAG was determined on 102 major epicardial coronary arteries in 62 patients who underwent CCTA and FFR during invasive coronary angiography. Diagnostic performance of TAG for ischemia-causing stenosis was assessed using FFR ≤ 0.80 as the reference standard.

Results: A total of 45 (44.1%) vessels showed FFR ≤ 0.80. The overall diagnostic performance of TAG determined by ROC analysis was moderate (AUC= 0.660+/-0.057). The sensitivity, specificity, PPV and NPV of TAG cut-off <= -0.654 (HU/mm) for FFR ≤ 0.80 were 44%, 91%, 79%, and 68% on a per-vessel basis. At present, QCA was done in 82 cases. By net reclassification index (NRI) analysis, TAG cutoff= 50% by QCA (NRI=-3.7%, p=0.20). TAG was much worse than QCA especially in LAD group (N=47, NRI=-25.5%, p=0.013), but was comparable in non-LAD group (N=35, NRI=25.7%, p=0.79).

Conclusions: TAG was related to the significant physiological coronary artery stenosis, but diagnostic performance was moderate and not higher than angiographic QCA.