MULTIDETECTOR COMPUTED TOMOGRAPHY MYOCARDIAL PERFUSION IMAGING AND FRACTIONAL FLOW RESERVE IN PATIENTS WITH CALCIFIED CORONARY LESIONS

ACC Moderated Poster Contributions
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Background: Although computed tomography (CT) angiography for the non-invasive detection of coronary artery disease has been established, the presence of severe calcified lesions remains a limitation. The aim of the present study is to evaluate the usefulness of multidetector CT myocardial perfusion imaging to detect functional coronary stenosis as determined by fractional flow reserve (FFR) in patients with calcified coronary lesions.

Methods: Patients with suspected coronary artery disease who had a calcified vessel with Agatston score ≥ 200 underwent 256 slice adenosine stress CT myocardial perfusion imaging and CT angiography. The FFR was measured in the calcified vessels with ≥ 50% diameter stenosis on invasive angiography. FFR ≤ 0.80 was considered hemodynamically significant. We used an analysis of the receiver-operating characteristic (ROC) curves to assess CT angiography and CT perfusion. The two blinded observers visually assessed the CT data.

Results: The FFR was measured in 45 vessels with calcified lesions (Agatston score 678.4 ± 521.6) of 33 patients (Age 72.0 ± 9.1 years, 76% male). In the vessel-based analysis, the area under the ROC curve for CT perfusion (0.82) was greater than that for CT angiography (0.55). CT perfusion had similar sensitivity (82% vs. 100%, p = 0.23), higher specificity (82% vs. 11%, p < 0.001), and higher diagnostic accuracy (82% vs. 44%, p < 0.001) for detection of functional coronary stenosis as compared with CT angiography.

Conclusion: Adenosine stress myocardial perfusion imaging with multidetector CT clinically offers feasible diagnostic performance in detecting functional coronary stenosis noninvasively in patients with calcified lesions. CT perfusion evaluation is a more reliable method to detect coronary artery disease with calcification as compared with CT angiography.