**COMPUTED TOMOGRAPHY ANGIOGRAPHY VS. CORONARY ANGIOGRAPHY: A 3D VESSEL FEATURE COMPARISON AND VALIDATION**

**J.A. Garcia**

Orlando Health, Orlando, FL, USA

*Background*: Differences in vessel features between computed tomography angiograms (CTA) and coronary angiograms (CA) have not been rigorously studied, therefore we sought to validate CTA 3-dimensional (3D) vessel data against coronary angiography by forward projecting 3D-CTA based centerlines and diameters to the same view as used for standard angiograms.

*Methods*: We retrospectively analyzed 20 patients with both modalities. First, the features of 3D coronary tree including vessel centerlines and effective diameters were generated and exported from the CTA images. The derived 3D model was then imported into a coronary modeling software environment enabling advanced quantitative analysis, forward projection, and optimal view map generation. The validation on vessel features entailed measuring the root-mean-square (RMS) errors of centerlines and diameters between the 2D arterial tree manually identified from the angiogram and the 3D model created from CTA after this model was projected to the identical angiographic view. Offline working view selection using the CTA reconstructions versus operator selected working views were then compared in terms of vessel foreshortening.

*Results:* The RMS error of vessel centerlines and diameters between the 3D CTA models and 2D arteries from angiographic views were 3.42 ± 0.92 mm and 0.84 ± 0.26 mm for the left coronary arterial tree, and 3.56 ± 1.26 mm and 0.83 ± 0.67 mm for the right coronary arterial tree, respectively. When comparing the vessel foreshortening from operator selected views to optimized views predicted by 3D CTA models, vessel foreshortening could be reduced from 9.8% ± 6.66 to 1.42 ± 0.93% (P=0.005).

*Conclusion*: The vessel features in terms of centerline and diameter created from CTA are not significantly different from those identified on CA. Use of the 3D CTA model to perform pre-procedural PCI optimal view selection may reduce vessel foreshortening for interventional working views.