

[2650] Diagnostic Accuracy of Image Postprocessing Methods for the Detection of Coronary Artery Stenoses by Multi-detector Computed Tomography

Stephan Achenbach, MD, Maros Ferencik, MD, PhD, Dieter Ropers, MD, Suhny Abbara, MD, Ricardo Cury, MD, Udo Hoffmann, MD, Koen Nieman, MD, Thomas J Brady, MD, Fabian Moselewski, MD, Werner G Daniel, MD. University of Erlangen, Erlangen, Germany; Massachusetts General Hospital, Boston, MA

We compared the accuracy of 2- and 3-dimensional postprocessing methods for the detection of coronary artery stenoses. MDCT data sets (16x0.75 mm collimation, 375 ms rotation, 80-90 ml contrast agent i.v. at 5 ml/s) of 40 patients (mean age: 56 years, mean heart rate: 61/min) with artifact-free visualization of all coronary arteries were selected. 5 independent investigators evaluated the MDCT data sets concerning the presence of stenoses > 50% diameter reduction, using either exclusively axial images (1mm thickness, "axial"), free oblique multiplanar reconstructions (1mm thickness, "oblique MPR"), free oblique sliding thin slab maximum intensity projections (5 mm thickness, STS-MIP), pre-rendered curved multiplanar reconstructions (curved MPR), pre-rendered curved maximum intensity projections (3mm thickness, curved MIP), or pre-rendered 3-dimensional volume rendering technique reconstructions (VRT). On a per-artery basis, results were compared to invasive coronary angiography. Axial images and oblique MPR had the highest rates of evaluable arteries and accuracies for stenosis detection (see table). The rate of accurately classified arteries (counting unevaluable arteries as not accurately classified) was significantly higher for oblique MPR than for curved MPR (p=0.01), curved MIP (p = 0.03), and VRT (p < 0.001). In conclusion, interactive oblique multiplanar reconstructions are the most accurate method to evaluate MDCT data sets concerning the detection of coronary artery stenoses. Pre-rendered reconstructions have significantly lower accuracy.

Table 1

	Axial images	Oblique MPR	STS-MIP	Curved MPR	Curved MIP	3D VRT
Evaluable	99%	99%	94%	92%	94%	90%
Sensitivity	91%	91%	91%	85%	91%	61%
Specificity	88%	92%	93%	89%	87%	85%
Neg. pred. value	97%	97%	97%	95%	96%	89%
Pos. pred. value	67%	76%	77%	70%	67%	53%
Accurately classified arteries	88%	91%	86%	81%	83%	72%

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