

Publication

Effect of reader experience on variability, evaluation time and accuracy of coronary plaque detection with computed tomography coronary angiography

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To assess the effect of reader experience on variability, evaluation time and accuracy in the detection of coronary artery plaques with computed tomography coronary angiography (CTCA). Three independent, blinded readers with three different experience levels twice labelled 50 retrospectively electrocardiography (ECG)-gated contrast-enhanced dual-source CTCA data sets (15 female, age 67.3 +/- 10.4 years, range 46-86 years) indicating the presence or absence of coronary plaques. The evaluation times for the readings were recorded. Intra- and interobserver variability expressed as kappa statistics and sensitivity, specificity, and negative and positive predictive values were calculated for plaque detection, with a consensus reading of the three readers taken as the standard of reference. A bootstrap method was applied in the statistical analysis to account for clustering. Significant correlations were found between reader experience and, respectively, evaluation times ($r = -0.59$, $p < 0.05$) and intraobserver variability ($r = 0.73$, $p < 0.05$). The evaluation time significantly differed among the readers ($p < 0.05$). The observer variability for plaque detection, compared with the consensus, varied between kappa = 0.582 and kappa = 0.802. Variability of plaque detection was significantly smaller ($p < 0.05$) and more accurate ($p < 0.05$) for the most experienced reader. Reader experience significantly correlated with observer variability, evaluation time and accuracy of coronary plaque detection at CTCA.

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