



2019- A-17- SCCT

Abstract 3: Impact Of A Novel Post Processing Technique For Calcium Deblooming On The Diagnostic Accuracy Of Coronary Computed Tomography Angiography

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Introduction: Coronary artery calcification is detrimental to the accuracy of coronary computed tomographic angiography (CTA) in the assessment of stenosis severity. The aim of the current study is to examine the diagnostic accuracy of a prototype calcium deblooming algorithm on detection of significant stenosis on CTA.

Methods: 40 patients with evidence of calcification on their CTA and whom underwent subsequent invasive coronary angiography were identified. CTA studies were read with (CTA_{DEBLOOM}) and without (CTA_{STAND}) the deblooming algorithm blinded to the invasive coronary angiogram findings. Sensitivity, specificity, accuracy, and inter-reader agreement for the detection of stenosis $\geq 50\%$ were evaluated using quantitative coronary angiography as the gold standard.

Results: All studies were diagnostic with 581 segments available for

evaluation. Image score was 3.64 ± 0.72 with CTA_{DEBLOOM}, versus 3.56 ± 0.72 with CTA_{STAND} ($p=0.38$). CTA_{DEBLOOM} had significantly less calcium blooming artifact than CTA_{STAND} (12.5% vs. 47.5%, $p=0.001$). The Sensitivity/Specificity/Accuracy were 64.4/85.2/83.5 for CTA_{DEBLOOM} and 75.0/81.6/81.1 for CTA_{STAND}. CTA_{DEBLOOM} specificity was significantly higher than CTA_{STAND} (85.2% vs. 81.6%, $p=0.017$), with no difference between the algorithms in sensitivity ($p=0.22$), or accuracy ($p=0.09$). Interobserver agreement was fair with both techniques (CTA_{DEBLOOM} $k=0.38$, CTA_{STAND} $k=0.37$).

Conclusions: Coronary calcification deblooming using a prototype post-processing algorithm is feasible and improves the specificity of the CTA exam through the reduction of blooming artefact.

<https://doi.org/10.1016/j.jcct.2018.12.007>

Available online 05 January 2019

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