

Assessment Of Coronary Artery Stenosis Using Coronary Computed Tomography Angiography And 3D Virtual Intravascular Endoscopy For Patients Population Of Calcium Score > 400

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Purpose: This study aimed to assess the diagnostic values of coronary computed tomography angiography (CCTA) and 3D virtual intravascular endoscopy (VIE) in comparison to conventional invasive coronary angiogram (ICA) (gold standard) for patients population of calcium score >400.

Patients and Methods: From January 2013 to June 2016, 64 patients underwent CCTA with coronary calcium score >400 were recruited. 35 patients subsequently underwent ICA for further evaluation and management. Out of these patients, VIE was done for 14 patients. Three main coronary artery branches were assessed and the degrees of stenosis was compared between CCTA and ICA, as well as VIE and ICA to determine if there is any significant difference in the diagnostic performance between CCTA and VIE..

Results: The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) and accuracy of CCTA and VIE compared to ICA are presented in Tables 1 and 2, respectively. Generally, VIE achieved better accuracy than CCTA however it has a limitation where the more specific locations (i.e. proximal, middle and distal portions) of the arteries could not be identified. Nevertheless, additional information of the coronary wall changes could be obtained via VIE based on the composition of coronary plaques. A smooth intraluminal appearance was usually observed for a simple calcified or non-calcified plaque on VIE, while irregular intraluminal appearance was seen in heavily calcified or mixed plaques.

Conclusion: A high calcium score of >400 did not significantly reduce the accuracy, sensitivity and specificity of CCTA; however, it decreased the sensitivity of detecting significant stenosis at the distal left circumflex. VIE images clearly demonstrated the coronary wall changes with significantly improved accuracy and sensitivity in assessing coronary artery stenosis. Therefore, VIE could be used as a complementary tool to CCTA for assessment of coronary artery disease.