

Computed Tomography Myocardial Perfusion on a Patient with Hypertrophic Cardiomyopathy

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Abstract : Introduction: Coronary CT angiography is a non-invasive imaging technique for the assessment of coronary artery disease and has high sensitivity and negative predictive value. However, the correlation between the degree of CT coronary stenosis and the significance of hemodynamic obstruction is poor. The assessment of myocardial perfusion has mostly been undertaken by Nuclear Medicine (SPECT), but it is now possible to perform stress myocardial CT perfusion (CTP) scans quickly and effectively using CT scanners with high temporal resolution. Myocardial CTP is in many ways similar to neuro perfusion imaging technique, where radiopaque iodinated contrast is injected intravenously, transits the pulmonary and cardiac structures, and then perfuses through the coronary arteries into the myocardium. On the Siemens Force CT scanner, a myocardial perfusion scan is performed using a dynamic axial acquisition, where the scanner shuffles in and out every 1-3 seconds (heart rate dependent) to be able to cover the heart in the z plane. This is usually performed over 38 seconds. Report: A CT myocardial perfusion scan can be utilised to complement the findings of a CT Coronary Angiogram. Implementing a CT Myocardial Perfusion study as part of a routine CT Coronary Angiogram procedure provides a 'One Stop Shop' for diagnosis of coronary artery disease. This case study demonstrates that although the CT Coronary Angiogram was within normal limits, the perfusion scan provided additional, clinically significant information in regards to the haemodynamics within the myocardium of a patient with Hypertrophic Obstructive Cardio Myopathy (HOCM). This negated the need for further diagnostics studies such as cardiac ECHO or Nuclear Medicine Stress tests. Conclusion: CT coronary angiography with adenosine stress myocardial CTP was utilised in this case to specifically exclude coronary artery disease in conjunction with accessing perfusion within the hypertrophic myocardium. Adenosine stress myocardial CTP demonstrated the reduced myocardial blood flow within the hypertrophic myocardium, but the coronary arteries did not show any obstructive disease. A CT coronary angiogram scan protocol that incorporates myocardial perfusion can provide diagnostic information on the haemodynamic significance of any coronary artery stenosis and has the potential to be a "One Stop Shop" for cardiac imaging.

Keywords : CT, cardiac, myocardium, perfusion

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