CARDIAC MAGNETIC RESONANCE IMAGING UNVEILS HIDDEN MYOCARDIAL DAMAGE THAT CANNOT BE EVALUATED BY ECHOCARDIOGRAPHY OR ELECTROCARDIOGRAPHY IN PATIENTS WITH CHRONICALLY OCCLUDED CORONARY ARTERY DISEASE

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Saturday, March 24, 2012, 9:30 a.m.-10:30 a.m.

Session Title: Imaging: MRI in Coronary and Non-coronary Disease States
Abstract Category: 21. Imaging: MRI
Presentation Number: 1086-4

Authors: Jin-Ho Choi, Sung-A Chang, Young Bin Song, Joo-Yong Hahn, Seung Hyuk Choi, Jae Oh, YeonHyeon Choe, Hyeon-Cheol Gwon, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, South Korea

Background: Chronic total occlusion (CTO) is not uncommon among patients with coronary artery disease, but a history of prior myocardial infarction (MI) has been known to be found only in a half of patients with CTO. We investigated extent of myocardial damage using cardiac magnetic resonance imaging (CMR) and compared that with 2D echocardiography as well as electrocardiography (ECG) of patients with coronary artery disease having CTO.

Methods: We analyzed CMR, echocardiography, and ECG of 96 consecutive patients (age=62+-12 year, male gender=88%) with angiographically documented CTO obtained before PCI from Jan 2007 to Aug 2010. In addition to routine evaluations, delayed hyperenhancement (DH), which corresponds to myocardial infarction scar, was quantitatively measured using a dedicated workstation.

Results: Pathological Q wave in ECG was identified in 22.9% of the patients. DH was identified in all patients with Q wave, and could be found in 83.8% of patients without Q wave. By echocardiography, the mean regional wall motion index (WMSI) was 1.249±0.361, and regional wall abnormalities (RWMA) were found in 53.1%. DH was identified in 87.5% of all patients, 98.0% of patients with RWMA, and still could be found in 75.6% of patients without RWMA. There were significant relationships between DH volume% and WMSI (r=0.551, p<0.0001) and left ventricular ejection fraction (r=−0.585, p<0.0001). The cut-off threshold of DH volume that predicted RWMA was DH volume%≥14.3% (AUC=0.835, sensitivity = 71%, specificity 87%, PPV 86%, NPV 72%) by ROC analysis.

Conclusions: In our CTO cohort, CMR identified the evidence of previous myocardial infarction in 87.5% using DH. However, Q wave in ECG and RWMA in Echo were present in 22.9% and 53.1%, respectively. Hence, the prevalence of previous myocardial infarction is shown to be much higher than previously known in patients with CTO.