**ESTABLISHMENT OF CORONARY MICROEMBOLI VOLUME CAUSING VISIBLE MYOCARDIAL MICROINFARCTS ON MDCT AND MRI**

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Objective: To determine the threshold volume of coronary microemboli causing reproducible visibility of myocardial microinfarcts on MDCT and MRI. The sizes of microemboli used were similar to those that pass through the pores of distal filtration devices.

Background: Rupture and erosion of atherosclerotic plaque, may occur spontaneously or as a result of percutaneous coronary interventions (PCI).

Methods: Under X-ray guidance, a 3F catheter was placed selectively in LAD coronary artery of 18 pigs and 16 or 32 cubic-mm volumes of <120micron microemboli were delivered. Delayed contrast enhanced (DE) MDCT, MRI and histopathological stain were used to visualize microinfarct. A semi-automatic threshold method and histology were used to measure and characterize microinfarct, respectively.

Results: Microinfarcts were visible by the naked eye on DE-MDCT and DE-MRI in all animals that received 32cubic-mm of microemboli, but only in 2/3 of the animals that received 16cubic-mm. The semi-automatic threshold method provided measurements of microinfarct sizes in all 18 animals. The contrast between microinfarcts and viable myocardium after administration of contrast media was less on MDCT than on MRI. Histopathology showed evidence of necrosis, apoptosis, inflammation, edema and microvascular obstruction in all animals.

Conclusions: Microemboli volumes greater than 32cubic-mm, but not less than 16cubic-mm, provide reproducible visualization of microinfarct on MDCT and MRI. The clinical implications of these modalities: 1) can be used interchangeably for visualizing and measuring microinfarct size after PCI, and 2) may help in testing the effectiveness of current and new distal filtration devices used to protect myocardium from microembolization.