

performed *ex vivo* IVPA-US imaging of a fresh human coronary artery, and compared to NIRS and histology.

RESULTS Along the artery lengths, dyslipidemic swine showed significantly greater average cross-sectional lipid area than lean swine (0.089 mm² vs 0.059 mm²; *p*<0.0001). Similar results were shown in *ex vivo* NIRS measurements, in which dyslipidemic swine had a greater average total lipid core burden index (LCBI) than lean swine (50.3 vs 12.0; *p*=0.48). The small average lipid areas and LCBI agreed with histopathology, which showed mild neointimal thickening in both groups.

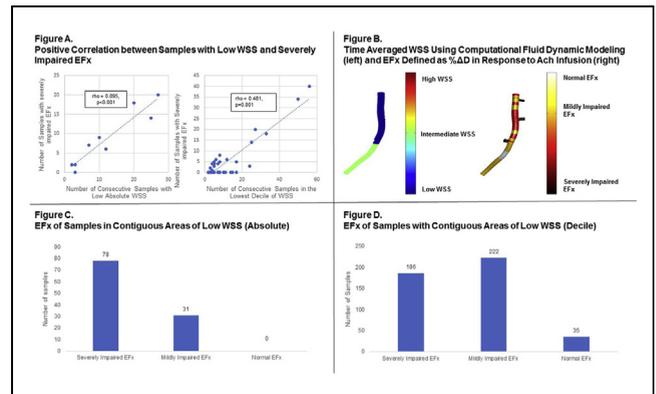
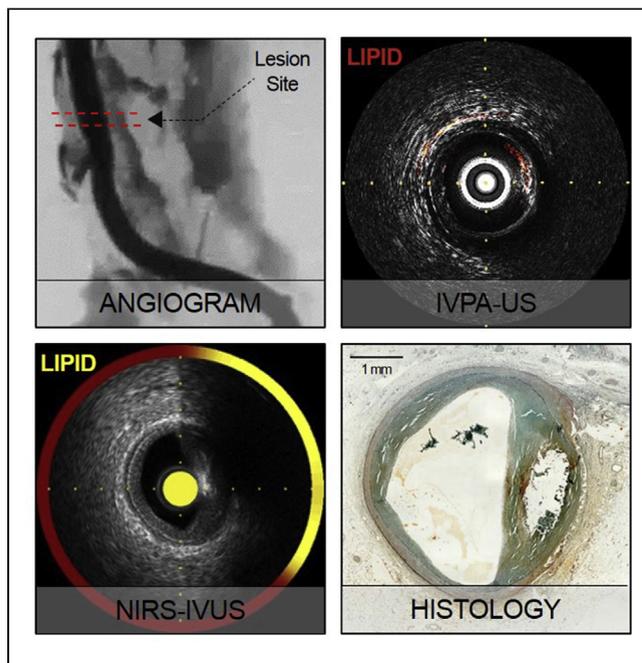
On *ex vivo* imaging of the human coronary artery and histology, we identified advanced fibroatheromas with calcification (**Figure**). The lesion had a total lipid area, as measured in a 4 mm segment, of 25.95 mm² and lipid core volume of 0.247 mm³. The NIRS chemogram-derived lipid area was comparable at 26.38 mm² with a maximum LCBI of 326 in the 4 mm segment.

CONCLUSION As confirmed by NIRS and histology, IVPA-US has sensitivity and depth resolution to detect lipid content in early disease, which enables quantification and localization of lipid cores within plaques.

defined as % $\Delta D \geq +10\%$, $+10\% < \% \Delta D < -10\%$ and $-10\% \leq \% \Delta D$, respectively. Computational fluid dynamics was used to calculate time-averaged WSS (Fig B). Low WSS was defined using an absolute cut-off (<10 dynes/cm²) and by lowest decile (<16 dynes/cm²).

RESULTS In 4,510 coronary samples analyzed, median WSS was 36.7 dynes/cm². There was a strong positive correlation between samples with severely impaired Efx and low WSS using both absolute low WSS ($\rho = 0.90$, *p*=0.001) and lowest decile of WSS ($\rho = 0.63$, *p* < 0.001) (Fig A). Of the 109 contiguous samples with low absolute WSS, none had normal Efx (Fig C). Similarly, there were 443 contiguous samples with lowest decile of WSS, of which only 35 (8%) samples had normal Efx (Fig D). In a multiple linear regression model, a higher number of consecutive samples with low absolute WSS ($\beta=1.185$ *p*=0.016,) or lowest decile of WSS ($\beta=0.933$ *p*<0.0001,) was associated with a higher number of samples with severely impaired Efx independent of age, sex, diabetes, hypertension and % stenosis.

CONCLUSION In patients with non-obstructive CAD, a longer length of low WSS is associated with more endothelial dysfunction.



NURSE & TECH

NURSE AND TECH ABSTRACTS

CRT-400.01

Training, Simulation and Validation of Therapeutic Hypothermia as an Adjuvant Treatment in ST Segment Elevation Myocardial Infarction

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BACKGROUND Therapeutic hypothermia (TH) reduces the damage by ischemic / reperfusion syndrome in cases of cardiac arrest, in which its application is already widely established and carried out in centers of excellence. However its use in patients with ST segment elevation myocardial infarction (STEMI) is still scarce. The simulation decreases the gap between what is taught in theory and its application in professional practice. The aim of the trial was the development of a simulation protocol and training of the multidisciplinary team to perform therapeutic hypothermia as an adjunctive treatment in patients with STEMI, and validation of the method by applying in real cases.

METHODS Use of modern mannequins with realistic simulation situations and different scenarios for the treatment of patients with STEMI undergoing therapeutic hypothermia as an adjunctive treatment, from the emergency room, through the cath lab, and to the intensive care unit (ICU). There were 36 multidisciplinary professionals doing the training among realistic simulation with modern mannequins and real scenarios in sectors of the hospital where the real patients would be treated.



PHYSIOLOGIC LESION ASSESSMENT

CRT-300.08

Coronary Vessels with Larger Contiguous Regions of Low Wall Shear Stress Have More Endothelial Dysfunction

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BACKGROUND Impaired endothelial function (EFx) is associated with atherosclerosis. We hypothesized that a higher number of contiguous coronary samples with low wall shear stress (WSS) is associated with more endothelial dysfunction.

METHODS A total of 44 patients with non-obstructive coronary artery disease (CAD) (mean age 51.2±12.5 years, 27% male, mean stenosis 20%±12%) underwent coronary angiography with and without acetylcholine (ACh) infusion and three-dimensional geometric reconstruction. Efx was defined as % change in lumen diameter (% ΔD) in response to ACh infusion in every 0.5mm coronary vessel sample. Normal, mildly impaired, and severely impaired Efx was