

## FIRST DEMONSTRATION THAT INCREASED PLAQUE VOLUME AND MORE NON-CALCIFIED PLAQUE BY INTRAVASCULAR ULTRASOUND ARE ASSOCIATED WITH LOWER FRACTIONAL FLOW RESERVE, INDEPENDENT OF LUMINAL SIZE MEASUREMENTS

i2 Poster Contributions

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**Background:** Luminal measurements by intravascular ultrasound (IVUS) such as minimal lumen area (MLA) correlate with fractional flow reserve (FFR). Whether lesion length and plaque burden are independently associated with FFR is unknown.

**Methods:** Fifty symptomatic patients underwent invasive angiography with IVUS with radiofrequency backscatter (IVUS-VH; Volcano) and FFR. IVUS-VH was performed with a 20 MHz catheter (Eagle Eye) with 0.5 mm/s pullback speed in the entire artery. Plaque burden, percentage atheroma volume (PAV), MLA, and minimal lumen diameter (MLD) were quantified. Non-calcified plaque (NCP), necrotic core, fibrous, and fibro-fatty volumes and % were obtained. FFR across the lesion was determined by averaging 3 measurements with intra-coronary injections of adenosine (30-90 mcg per artery). Multiple regression was performed to assess relationship between IVUS-VH parameters and FFR with  $p < 0.05$  being significant.

**Results:** By linear regression, MLA, MLD, PAV and NCP% significantly ( $p < 0.05$ ) correlated with FFR (r-value 0.32, 0.33, -0.29 and -0.32, respectively). In multiple regression, only whole-artery-based PAV and NCP% remained independent predictors, correlating inversely with FFR.

**Conclusions:** Higher plaque burden in the entire artery, incorporating lesion length, and higher NCP% were independently associated with lower FFR. This is the first validation that lesion length, plaque burden and plaque composition are associated with FFR, independent of luminal measurements.

