i2 summit 2011
innovation in intervention
ACC in partnership with CRF

E1743
JACC April 5, 2011
Volume 57, Issue 14

i2 SUMMIT

OPTICAL COHERENCE TOMOGRAPHY ACCURATELY DETERMINES NEOINTIMAL COVERAGE AND STENT AREA OF BARE METAL AND DRUG-ELUTING CORONARY STENTS

i2 Poster Contributions
Ernest N. Morial Convention Center, Hall F
Sunday, April 03, 2011, 10:00 a.m.-11:15 a.m.

Session Title: Intravascular Diagnostics I
Abstract Category: 3. Intravascular Diagnostics
Session-Poster Board Number: 2503-536

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Background: Optical coherence tomography (OCT), with10-fold greater resolution than current imaging modalities, has demonstrated great promise for the in vivo assessment of neointimal stent coverage. However, limited data validating OCT with standard pathologic measures exists.

Methods: 22 stents (7 Liberté, 7 Taxus Liberté, and 8 Jactax, Boston Scientific; 3.0 x 12mm) were implanted in porcine coronary arteries. OCT images obtained 20 days post implantation were matched with corresponding histological slices. Lumen area, stent area, neointimal thickness, and neointimal area were measured by two independent operators at two time points.

Results: 66 frames (3 per stent) were analyzed by OCT and matched to pathologic measures. OCT demonstrated excellent correlation with pathologic measures of lumen area (R=0.95), stent area (R=0.89), neointimal thickness (R=0.93), and neointimal area (R=0.83) (Figure). Mean differences for lumen area [0.172 (0.055, 0.289) mm2], stent area [-0.110 (-0.240, 0.020) mm2], neointimal thickness [0.048 (0.037, 0.058) mm], and neointimal area [-0.282 (-0.396, -0.168) mm2] demonstrated the strong similarities between OCT and pathology.

Conclusion: OCT accurately and reproducibly assesses luminal area and neointimal coverage in a variety of bare-metal and drug-eluting stents, validating the use of OCT for the in vivo assessment of neointimal stent coverage in patients.