0 to 44%). **Conclusion:** Early lumen area loss occurred frequently at 91 minutes after treatment of diffuse ISR. These data may suggest that early lumen loss may be one of the important mechanisms of recurrence of ISR in diffuse ISR.

	Before	After	P*	91 min later	P†
Ref diameter, mm	2.60±0.47	2.77±0.40	0.01	2.71±0.32	NS
MLD, mm	0.78±0.33	2.23±0.39	<0.0001	2.06±0.67	NS
Lumen CSA, mm2	2.0±0.9	6.4±1.3	<0.0001	4.5±0.8	<0.0001
EEM CSA£ , mm2	17.9±3.8	18.2±3.9	NS	18.4±4.0	NS
Stent CSA, mm2	8.9±2.4	9.3±2.4	NS	9.2±2.3	NS
Plaque CSA, mm2	15.9±3.3	11.8±3.2	0.02	13.9±3.9	0.0001

1103-12 **Direct Stenting Improves Target Lesion Revascularization in Saphenous Vein Graft Lesions: An Intravascular Ultrasound-Guided Study**

Andrea S. Abizaid, Roxana Mehran, Gary S. Mintz, Alexandra J. Lansky, Gregg W. Stone, Alexandre Abizaid, George Dangas, Thos Limpijankit, Yanis Iakovou, Jeffrey Moses, Martin B. Leon, *Lenox Hill Heart & Vascular Institute, New York, Cardiovascular Research Foundation, New York.*

Background: Direct stenting (DS) may be associated with lower acute and long-term complications especially in saphenous vein graft lesions (SVG) that are prone to both acute complications (distal embolization, slow/no-reflow) and late recurrence.
Methods: We analyzed 786 patients who underwent intravascular ultrasound (IVUS)-guided stent implantation in SVG lesions: 75 pts with DS and 711 with pre-dilation plus stenting (B+S). Pts were followed for one year. Acute procedural results and long-term follow-up are reported (Table). Results: Pts treated with DS were older (71±8 vs 68±9 years, p=0.01); had lower ejection fractions (35±11% vs 42±15%, p=0.002); and more degenerated SVG lesions (45% vs 28%, p=0.0001) compared to pts treated with B+S.Conclusions: Despite having more degenerated disease, pts treated with IVUS-guided DS of SVG lesions had (1) larger lumen dimensions, (2) fewer angiographic complications, (3) a reduction in non-Q myocardial infarctions (reduced frequency of CK-MB elevation), and lower rates of TLR compared to pts treated with a strategy of B+S. Thus, IVUS-guided DS may be the preferred method of treating these high-risk lesions.

	DS	B+S	p
Angiographic complications, % (dissections, distal embolization, or slow/no reflow	2.3	8.9	0.001
# of stents	2.0±1.2	1.9±1.2	NS
CK-MB elevation(≥5x normal),%	15	26	0.07
Final IVUS lumen area, mm^2	8.71±2.75	8.11±2.47	0.004
Final IVUS minimum stent area, mm^2	9.02±2.42	8.31±2.44	0.01
Final IVUS minimum lumer diameter(mm)	3.2±0.4	2.9±0.5	0.001
1-year target lseion revascularization, %	6.4	16.1	0.03

POSTER SESSION

1104 Intravascular Ultrasound and Mechanisms of Disease

Monday, March 18, 2002, Noon-2:00 p.m.
Georgia World Congress Center, Hall G
Presentation Hour: Noon-1:00 pm

1104-13 **Serial (Postintervention and Follow-Up) Volumetric Intravascular Ultrasound Findings in Recurrent In-Stent Restenosis Lesions: A Comparison of Native Coronary Artery and Saphenous Vein Grafts After Conventional Catheter-Based Treatment**

Javed M. Ahmed, Gary S. Mintz, Marco T. Castagna, Marco Zimarino, Ron Waksman, Augusto D. Pichard, Lowell F. Satler, Kenneth M. Kent, Neil J. Weissman.

We compared serial (post-intervention and follow-up) volumetric intravascular ultrasound (IVUS) findings after conventional catheter-based treatment of recurrent in-stent restenosis (ISR) lesions in native coronary arteries and saphenous vein grafts (SVG). Patients were selected from the placebo arms of two randomized intracoronary γ-radiation trials WRIST (Washington Radiation For In-Stent Restenosis Trial)and SVG WRIST. IVUS measurements included mean stent, lumen, intimal hyperplasia (IH=stent-lumen) cross-sectional areas (CSA); minimum lumen CSA (MLA); and maximum (Max) IH CSA
Results. Native ISR lesions were slightly longer. Mean post-intervention stent and IH CSA were similar in native and SVG ISR lesions. However, post-intervention mean and minimum lumen CSA's were significantly larger in SVG WRIST lesions (Table). At follow-up there was a more heterogeneous response in IH distribution over the length of SVG ISR lesions resulting in a greater increase in maximum IH CSA and a greater decrease in follow-up minimum lumen CSA in SVG lesions.
Conclusion. Serial IVUS analysis shows that there is a more heterogeneous neointimal response after conventional catheter-based treatment of SVG ISR lesions. This biological difference may explain higher recurrence rates after treatment of SVG ISR lesions without adjunct vascular brachytherapy.

	Native ISR (n=39)	SVG ISR (n=36)	P
Length (mm)	29±11.0	25±10.8	0.08
Post-intervention			
Mean stent CSA (mm2)	9.1±2.5	10.1±3.2	0.13
Mean lumen CSA (mm2)	5.8±2.4	7.3±2.3	0.007
Mean IH CSA (mm2)	2.7±1.8	3.2±1.7	0.19
Max IH CSA (mm2)	3.8±1.7	4.6±2.4	0.12
MLA (mm2)	4.8±1.4	5.6±1.6	0.02
Follow-up			
Max IH CSA (mm2)	5.3±1.5	8.2±3.2	<0.0001
MLA (mm2)	3.0±1.3	2.8±1.3	0.53
δ			
Max IH CSA (mm2)	1.4±1.3	4.4±2.1	<0.0001
MLA (mm2)	-1.7±1.3	-2.8±1.7	0.004

1104-14 **Angiographic and Intravascular Ultrasound Analysis of Overlapped Beta-Radiation Fields on Vessel Geometry After Manual Stepping Brachytherapy**

Thomas M. Schiele, Andreas König, Andrea Zimmermann, Johannes Rieber, Florian Krötz, Hae-Young Sohn, Monika Baylacher, Barbara Pöllinger, Ralf Kantlehner, Eckart Dühmke, Karl Theisen, Volker Klauss, *University Hospital, Ludwig-Maximilians-University, Munich, Germany.*

Background: Intracoronary radiation has been shown to be effective for the treatment of in-stent restenosis. Longer lesions exceed available radiation length requiring manual stepping for complete coverage of the injured vessel segment. We investigated the effects of overlapped radiation fields on the vessel geometry.
Methods: Serial angiographic and intravascular ultrasound analysis was performed in 17 patients. Following interventional procedures, a non-centered 90Sr/90Y seed train of 40mm length was used for brachytherapy. The radiation catheter was positioned in 2 steps. Exact positioning avoiding gaps or overlaps was attempted. Serial (post radiation and follow-up) quantitative coronary angiography measurements of minimal lumen diameter (MLD) and late lumen loss (LLL) and volumetric intravascular ultrasound measurements (automated motorized pullback, speed 0.5mm/sec) of the lumen cross sectional area (CSA) (LA), stent CSA (SA), total vessel CSA (VA), neointima CSA (NIA) and peristent CSA (PSA) were performed at overlapped and adjacent sites.
Results: Mean lesion length was 52.5±17.2mm. Reference diameter measured 3.0±0.5mm. Radiotherapy was successful in all patients. Complete match of overlapped radiation fields was achieved in 1 patient, geographic miss occured in 1 patient (-0.8mm) and overlap in 15 patients (range 0.5 to 4.6mm). At 9 months, there was no evidence of perforation or aneurysm at the overlapped segments. Angiographic and IVUS results are shown in the table.

Parameter	Overlapped segment	Adjacent segment	p value
MLD post intervention [mm]	2.87±0.69	2.78±0.69	0.456
MLD follow-up [mm]	2.65±0.65	2.44±0.74	0.387
LLL [mm]	0.22±0.31	0.34±0.27	0.552
Change mean SA [mm^2]	-0.28±0.45	-0.22±0.43	0.981
Change mean LA [mm^2]	-0.57±1.2	-0.93±1.1	0.355
Change mean NIA [mm^2]	+0.29±1.1	+0.71±1.3	0.245
Change mean VA [mm^2]	-0.42±0.88	+0.49±0.71	0.001
Change mean PSA [mm^2]	-1.37±1.22	+0.71±0.82	0.011

1104-15 **Variability of Area Measurements Obtained With Different Intravascular Ultrasound Catheter Systems: Impact on Clinical Trials and a Method for Accurate Calibration**

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Background: Intravascular ultrasound allows precise and highly reproducible measurements of coronary artery dimensions. Atherosclerotic plaque burden is the major endpoint in ongoing progression trials. The variability of cross-sectional area (CSA) measurements between different catheter systems is incompletely characterized.
Methods: Intravascular ultrasound imaging was performed using a cylindrical phantom with 5 sections of different known CSA ranging from 3.24 to 27.99 mm2. A total of 3642 in-vitro measurements with 4 different catheter systems (Atlantis™, Ultra-Cross™, In-Vision™, Avenar™) were performed. These measurements were divided into a model building and a validation dataset. Models containing up to a 8th order term were evaluated. The adjusted R2, the prediction sum of squares (PRESS) and the mean square prediction error (MSPR) were used in the model selection process.
Results: Over- and under- estimation of the true CSA of up to 18% was observed with different catheter systems. Calibration equations for the different systems could be devel-