1196-17 The Impact of Intracoronary Radiation on In-Stent Restenosis Involving Ostial Lesions

Andrew E. Ajani, Edouard Cheneau, R. Larry White, Hongsheng Wu, Hamid Yazdi, George Aggrey, Dancia Langley, Ellen Pinnow, Augusto D. Pichard, Lowell F. Satler, Kenneth M. Kent, Joseph Lindsay, Ron Waksman, *Washington Hospital Center, Washington, Dist. of Columbia.*

Background: Coronary interventions in ostial lesions have a high rate of recurrence of restenosis. The aim of this study was to compare 6-month clinical and angiographic outcomes of patients (pts) with in-stent restenosis (ISR) involving the ostium treated with intra-coronary radiation therapy (IRT) compared to placebo and also to non-ostial lesions treated with IRT. **Methods:** We assessed 1295 pts enrolled in gamma (192-Iridium) and beta (90-Yttrium) radiation trials for ISR at the Washington Hospital Center. Of pts receiving IRT, 99 (8%) pts had ostial ISR and 1169 (90%) pts had non-ostial ISR, and only 27 pts had ostial ISR and were treated with placebo. **Results:** Baseline demographic, angiographic and procedural details were similar, except ostial IRT pts had a trend towards shorter lesions (14.0±10.8 vs. 32.4±14.3 mm, p=0.06), and had a higher rate of saphenous vein graft disease (47% vs. 19%, p<0.001), compared to non-ostial IRT pts. Ostial lesions treated with IRT for ISR had a reduced rate of recurrent restenosis compared to ostial lesions treated with placebo (Table). Outcomes at 6 months including restenosis rates were similar for the ostial and non-ostial IRT group. **Conclusions:** Intracoronary radiation continues to be effective for ostial in-stent restenotic lesions and should be comfortably used for this challenging anatomic location.

Clinical and Angiographic Outcomes at 6 Months

	IRT		Placebo
	Ostial (N=99)	Non-Ostial (N=1169)	Ostial (N=27)
Angiographic Restenosis, %	11	29*	55†
Late Loss, mm	0.33±0.70	0.47±0.72	0.99±0.64†
TVR, %	23	22	50†
MACE, %	25	22	54†
Late Total Occlusion, %	2	4	4

*P < 0.05 IRT Ostial vs. IRT Non-Ostial,
†P < 0.05 IRT Ostial vs. Placebo Ostial

1196-18 High Dose Intracoronary Gamma Radiation for Patients With Diffuse In-Stent Restenosis: Six Versus One Month of Antiplatelet Therapy

Ron Waksman, Andrew E. Ajani, Edouard Cheneau, Dong-Hun Cha, Hongsheng Wu, Chad Brown, Michael Porrazzo, Lowell F. Satler, Augusto D. Pichard, Kenneth M. Kent, Ellen Pinnow, Joseph Lindsay, *Washington Hospital Center, Washington, Dist. of Columbia.*

Background: The Washington Radiation for In-Stent Restenosis Trial for long lesions, utilizing high dose (18 Gy) of intracoronary radiation therapy (IRT): LONG WRIST HIGH DOSE, aimed to determine the safety and efficacy of higher doses of γ IRT for the treatment of patients (pts) with diffuse in-stent restenosis (ISR). **Methods:** One hundred and twenty pts with diffuse ISR in native coronary arteries (lesion length 36-80 mm) underwent PTCA, atherectomy, and/or additional stents. The prescribed dose was 18 Gy at 2.0 mm, with a mean ribbon length of 69 ± 6 mm. Six month (mo) clinical outcomes of 60 pts treated with 1 mo of Clopidogrel were compared to 60 pts with 6 mos of Clopidogrel. Additional comparison was made to pts from LONG WRIST who were randomized to placebo (n=61) or 192-Ir with a prescribed dose of 15 Gy at 2 mm (n=60) with 1 mo of Ticlopidine. **Results:** All 120 pts treated with 18 Gy underwent successful IRT. The overall events at 6 mos were lower in the high dose group compared to pts treated with 15 Gy or placebo (Table). Six mos of antiplatelet therapy (APT) in the high dose group was associated with less thrombotic events when compared to one mo of APT. **Conclusions:** High dose radiation (18 Gy) using 192-Ir for diffuse ISR is safe and effective (compared to control and a dose of 15 Gy). Prolonged antiplatelet therapy continues to be protective for late thrombosis even in higher doses of radiation.

	18Gy 1M APT (N=60)	18Gy 6M APT (N=60)	15Gy 1M APT (N=60)	Placebo 1M APT (N=61)	P
Death, %	0	0	5	2	0.11
Q-Wave MI, %	0	5	5	0	0.10
TLR, %	18	14	30	57	<0.001
TVR, %	28	17	33	57	<0.001
MACE, %	28	16	37	59	<0.001
Late Thrombosis, %	8	2	10	5	0.20

1196-19 Prolonged Antiplatelet Therapy and Reduced Stenting Eliminates Late Thrombosis After Radiation: The Scripps III Trial

Paul S. Teirstein, Jeffrey W. Moses, Martin B. Leon, Peter J. Casterella, John P. Reilly, Huan Giap, Shirish Jani, Steven Balter, Prabhakar Tripuraneni, Alexandra Lansky, Manuela Negoita, Roxanna Mehran, *Scripps Clinic, La Jolla, California, Lenox Hill Hospital, New York, New York.*

Background: While the efficacy of coronary brachytherapy for the treatment of in-stent restenosis has been well established, recent reports of excess late thrombosis, leading to myocardial infarction, have raised safety concerns. Previous studies have linked thrombotic episodes to new stent implantation and early discontinuation of antiplatelet therapy. The objective of the SCRIPPS III study was to evaluate the impact of both reduced additional stent implantation and enhanced adjunctive antiplatelet therapy on late target thombosis following brachytherapy.
Methods: At two centers (Scripps Clinic and Lenox Hill) vigorous attempts were made to avoid implanting new stents prior to treatment of in-stent restenosis with gamma radiation. Patients who did not receive new stents were discharged on clopidogrel (75mg per day after a 300mg loading dose) for 6 months and patients who received new stents were treated with clopidogrel for 12 months. All patients received aspirin, 325mg, indefinitely.
Results: Enrollment in this 500 patient registry was completed on 9/12/00; 33.8% had diabetes, 15.2% had treatment of a saphenous vein graft and 39% were treated with a radiation source wire ≥ 55mm in length. New stents were implanted in only 22.7% of study patients. The mean current follow-up time is 11.1 months. Clopidogrel has been discontinued for more than 1 month in 243 (48.6%)patients. To date, one patient who received a new stent sustained an acute stent thrombosis six hours after the index radiation procedure due to distal dissection and two patients who received a new stent sustained a stent thrombosis within two weeks following radiation. There have been no late (≥ 30 day) thromboses.
Conclusion: Minimizing new stent implantation and treatment with prolonged adjunctive antiplatelet therapy appears to eliminate late target thrombosis after coronary brachytherapy. Final follow-up results will be presented.

1196-20 Interprocedural Interval as a Risk Factor for Recurrent Restenosis After Treatment of In-Stent Restenosis: Differential Response With and Without Brachytherapy

Michael P. Savage, David L. Fischman, Richard K. Valicenti, Warren K. Laskey, Theodore A. Bass, Paul S. Teirstein, Jeffrey J. Popma, Richard Kuntz, START Investigators, *Jefferson Medical College, Philadelphia, Pennsylvania.*

In patients undergoing reintervention for in-stent restenosis, a short interval (<90 days) between index and repeat procedures has been identified as an important risk factor associated with recurrent restenosis. We hypothesized that brachytherapy (due to its effects on actively dividing cells) would have greater benefit in patients with short interprocedural intervals and would minimize the importance of the temporal interval as a predictive factor for restenosis. In this START substudy, the effect of beta-radiation vs placebo for the treatment of in-stent restenosis was assessed as a function of the interval between procedures. Compared to patients with intervals >90 d, patients with early restenosis (≤90 d) had smaller vessels (2.66 vs 2.83 mm, p<.05) and were more likely to have class III/IV angina (71 vs 50%, p=.01). Multivariable modeling for recurrent in-stent restenosis demonstrated a significant interaction between the interprocedural interval and restenosis; patients with a prior procedure ≤90 d had higher restenosis risk (odds ratio 5.58, p=.001). Multivariable modeling also demonstrated a significant benefit associated with Sr90 therapy (odds ratio 0.42, p<.05). An interaction between assigned therapy and interprocedural interval was observed. The relation between the interval and restenosis was different for Sr90 vs placebo in that radiation markedly reduced the time effect. For Sr90 patients, recurrent restenosis was comparably low in both early and late groups (11.8 vs 13.6%). In contrast, placebo patients with early repeat procedures were at higher risk of restenosis (66.7 vs 26.4%). Thus, the relative treatment effect of radiation was greater in the early procedure group than in the late group (82 vs 48% reduction).
Conclusions: (1) Risk of in-stent restenosis is inversely related to the interprocedural interval - patients with restenosis within 90 days have higher risk of recurrent restenosis; (2) The relative effect of b-radiation is greater in patients undergoing early repeat procedures but the absolute restenosis rates are low irrespective of the interprocedural interval; (3) Brachytherapy eliminates the effect of the temporal interval on recurrent restenosis.

1196-21 Retreatment Immediately After Gamma Radiation for In-Stent Restenosis Results in Need for Target Vessel Revascularization Beyond Target Lesion

Makoto Hirose, Yoshio Kobayashi, Roxana Mehran, Issam Moussa, George Dangas, Ramona Pop, Milena Adamian, Michael Collins, Mark A. Grise, Alexandra J. Lansky, Gary S. Mintz, Gregg W. Stone, Jeffrey W. Moses, Martin B. Leon, Paul S. Teirstein, *Cardiovascular Research Foundation, New York, New York, Scripps Clinic, San Diego, California.*

Background: Repeat balloon angioplasty or stenting (re-treatment) immediately after gamma radiation for in-stent restenosis (ISR) is sometimes required, usually due to acute recoil. However, little is known about short and long-term outcomes after re-treatment following brachytherapy.
Methods: Balloon angioplasty plus gamma radiation was performed in 154 ISR lesions. Re-treatment after brachytherapy was required in 48 lesions (31%).
Results: Baseline clinical characteristics were similar between the 2 groups. There were no late thromboses. In the subset of lesions with no new stents, TVR (target vessel