

1099-194

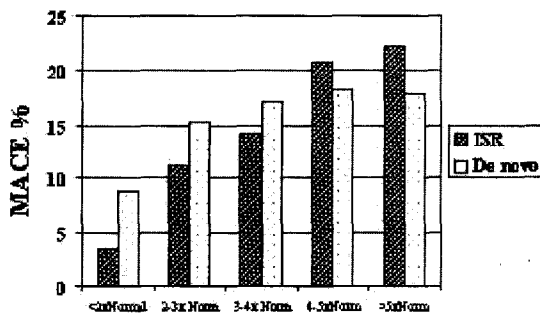
### Percutaneous Coronary Intervention for Saphenous Vein Graft In-Stent Restenotic and De Novo Lesions: Is There a Difference in Enzyme Release and Clinical Outcome?

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**Background:** Procedural complications related to distal embolization remain high after percutaneous coronary intervention (PCI) in saphenous vein grafts (SVG). In-stent restenosis (ISR) lesions differ in terms of morphology and constituents from de-novo lesions. However, the frequency and impact of enzyme release after treatment of ISR has not been established in SVG lesions.

**Methods:** Between January 1990 and June 2001, 2252 consecutive patients underwent percutaneous angioplasty for SVG stenosis at the Washington Hospital Center. Of these, 289 patients were treated for ISR and 1895 patients for de-novo SVG stenosis. Significance of enzyme release (Creatine Kinase) and clinical outcomes were compared between ISR and de-novo lesions. **Results:** Combined major in-hospital complications (death, Q-wave MI and revascularization) were 0.7% in the ISR group and 2.7% in the de-novo group,  $p = 0.04$ . At one year, deaths (6.2% vs 11.9%,  $p=0.014$ ) and non-Q-Wave MI (18.4% vs 26.9%; 0.016) were significantly lower in the ISR group as compared to the de-novo group. Major cardiac events at one year are influenced by the post-procedure Creatine Kinase (CK) release in both ISR and de novo lesions (Figure).

**Conclusion:** Enzyme release after intervention in SVG lesions for de-novo or in-stent restenosis is associated with higher cardiac events. The incidence of enzyme release is lower for ISR when compared with de-novo SVG lesions. Thus, protection devices are not essential in the setting of ISR-SVG.



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### Inflammatory Mechanisms of Dilative Remodeling After Intracoronary Beta Radiotherapy

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We have previously demonstrated that intracoronary radiation with  $^{32}\text{P}$  (ICR) induces dilative remodeling in the presence and in the absence of arterial injury and that the lumen and external elastic lamina areas significantly correlated with dose-rate. The present study investigated the structural characteristics and possible involvement of inflammatory processes in the development of this dilative remodeling. Twenty-four uninjured and 37 balloon injured coronary arteries were subjected to ICR at a dose of 35 Gy to 0.5 mm into the artery wall at dose rates (DR) up to 200 cGy/s with a centered  $^{32}\text{P}$  source. In addition, 14 balloon-injured and 6 non-injured arteries were sham-irradiated with an inactive wire and served as controls. Arteries harvested after 4 weeks were processed for histologic studies and morphometric analysis.

Medial area was not reduced in irradiated vessels ( $0.97 \pm 0.3 \text{ mm}^2$  balloon-injured;  $0.90 \pm 0.4 \text{ mm}^2$  non-injured) when compared with non-irradiated controls ( $0.95 \pm 0.4$  and  $0.59 \pm 0.04 \text{ mm}^2$  balloon-injured and non-injured, respectively,  $P=NS$ ). Percentage of adventitial area stained for collagen in the irradiated arteries ( $46 \pm 11\%$  balloon-injured;  $47 \pm 10\%$  non-injured) did not differ from that in the placebo-treated arteries ( $44 \pm 10\%$  balloon-injured;  $47 \pm 14\%$  non-injured). However, histological analysis demonstrated that the adventitia of irradiated vessels was thicker and contained a high number of activated  $\alpha$ -smooth muscle actin positive myofibroblasts. Expression of the matrix metalloproteinases MMP-2 and MMP-9 was higher in irradiated vessels suggesting an active remodeling process. Using the myeloid cell marker Mac387 we identified a significant number of newly recruited leukocytes in the media and adventitia of the irradiated vessels.

ICR-induced remodeling does not appear to be related to medial necrosis or marked changes in the percentage of adventitial area stained for collagen. Instead, irradiated arteries continue to display an active inflammatory process associated with ongoing leukocyte infiltration, adventitial fibroblast activation and expression of MMPs, all of which may contribute to dilative remodeling.

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### Intracoronary Beta-Irradiation 24 Hours After Percutaneous Coronary Interventions: A Serial Volumetric Intravascular Ultrasound Study

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**Background:** Local irradiation by intravascular brachytherapy (IVBT) immediately after percutaneous coronary intervention (PCI) has been used for the prevention of restenosis. Whether a longer time interval between PCI and IVBT is equally effective is not yet known. In this single center study we compared prompt vs delayed brachytherapy after PCI.

**Methods:** A total of 30 de novo lesions at high risk for restenosis were treated successfully with stenting followed by prompt (immediately after PCI,  $n=15$ ) or delayed (24 hours later,  $n=15$ ) intracoronary beta-irradiation (Sr90/Y90, Novoste Beta-Cath™). The prescribed dose was similar in the two groups. IVUS was performed at the index procedure and 6 months later. IVUS measurements included stent, lumen and intima hyperplasia cross-sectional areas (CSA) every 1mm of stent length and mean values were calculated. Minimum lumen CSA was determined.

**Results:** At baseline, clinical and IVUS characteristics were similar in the two groups. At 6-months, there was no difference in the mean intimal hyperplasia CSA change from baseline between the groups; prompt  $0.3 \pm 0.7$  vs delayed  $0.8 \pm 0.8 \text{ mm}^2$ ,  $p=0.186$ . Similarly, no difference was observed in the changes of the other measured parameters.

**Conclusion:** These results indicate that intracoronary beta-irradiation is equally effective whether performed immediately after PCI or 24 hours later.

## POSTER SESSION

### 1100 Newer Imaging Techniques and Devices for Peripheral Interventions

Monday, March 31, 2003, Noon-2:00 p.m.  
McCormick Place, Hall A  
Presentation Hour: Noon-1:00 p.m.

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### Renal Artery Stenting Using Gadolinium-Based Arteriography in Patients With Baseline Renal Insufficiency

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**Background:** Contrast-induced nephropathy (CIN) may complicate renal artery stenting (RAS) procedures in patients with baseline elevated creatinine (Creat) levels. Non-iodinated Gadolinium (GAD) based contrast has been proposed as an alternative agent that may reduce the incidence of CIN, however, the clinical efficacy of GAD has not been adequately investigated. **Methods:** Between 1999 and present, we employed GAD based arteriography in 20 patients (25 renal arteries) with significant baseline renal insufficiency (Creat > 2.0 mg/dl) undergoing RAS. Baseline Creat levels were compared to post-procedure and long-term follow-up levels. **Results:** Procedural success was 100%. An average of 70 cc of GAD contrast was used per case. Four patients received an additional 28 cc of iodinated contrast due to poor image quality with GAD alone. Over a mean 7-month follow-up period there were two deaths (10%) including one patient who required dialysis prior to expiring. There was no significant change in Creat levels post-procedure compared to baseline. At long-term follow-up, Creat levels were significantly lower compared to baseline (Table). **Conclusion:** Gadolinium based arteriography can be safely and effectively used during RAS in patients with baseline renal insufficiency. This technique may enhance the renal protective effect of RAS in this high risk population with renal artery stenosis.

	Baseline	Post-Procedure	P-Value
Mean Creat (mg/dl)	2.7	2.6	0.42
	Baseline	Long-term Follow-up	P-Value
Mean Creat (mg/dl)	2.7	2.1	0.009

1100-198

### Real-Time Magnetic Resonance Imaging Guidance for Endograft Delivery in a Porcine Model of Abdominal Aortic Aneurysm

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**Background:** Endoluminal stent-grafts are commonly deployed using x-ray fluoroscopy (XRF) in the treatment of abdominal aortic aneurysm (AAA). XRF is limited in representing complex 3-dimensional structures, soft tissue, visceral branches, endoleaks, or endostent without exogenous radiocontrast. Real-time magnetic resonance imaging (rtMRI), in which images are rapidly acquired and reconstructed to the interventionist with minimal latency, can overcome these limitations. We test the feasibility of abdominal aor-