**Similar Clinical Outcomes for Sirolimus-Eluting Stent Implantation and Coronary Brachytherapy for the Treatment of In-Stent Restenosis**

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**Background:** Preliminary studies have shown that sirolimus-eluting stent (SES) implantation is safe and effective for the treatment of in-stent restenosis (ISR). However, the clinical efficacy of this new therapeutic approach has not been compared to coronary brachytherapy (CBT), the best treatment currently available for ISR.

**Methods:** We assessed the incidence of major adverse cardiac events (MACE = death, myocardial infarction, target lesion revascularization) in 43 consecutive patients treated with CBT at our institution for ISR (CBT group) and 44 consecutive patients with ISR, without prior irradiation of the target vessel, treated with SES implantation (SES group).

**Results:** Baseline clinical characteristics of the two groups were similar. Relatively more ISR lesions per patient were treated in the SES group (1.2±0.5 versus 1.0±0.2; p=0.02). Angiographically, the prevalence of Mehran class I and II lesions was similar among the two groups (66% CBT versus 63%; p=0.7). In the CBT group periprocedural glycoprotein IIb/IIIa inhibitors utilization was more common (33% versus 9%; p=0.007), and clopidogrel prescription longer (7.5±5.5 months vs 5.9±2.6 months; p=0.005). During 9 months of follow-up, 3 patients (7%) died in the CBT group and 0 in the SES group. The incidence of myocardial infarction was 2.3% in both groups. Target lesion revascularization was performed in 11.6% of the CBT patients and 16.3% of the SES patients (p=ns). The 9-month MACE-free survival was similar in both groups (79.1% CBT versus 81.5%; p=0.8 by log rank).

**Conclusions:** This randomized study suggests that sirolimus-eluting stent implantation is as effective as vascular brachytherapy in the treatment of in-stent restenosis.

**In Vivo Temperature Measurements of Human Atherosclerotic Plaques With a New Balloon-Thermography Catheter: The “Cooling Effect” of Blood Flow**

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**Background:** Ex vivo and in vivo temperature measurements of the human atherosclerotic plaques present a mismatch. This may be due to the ‘cooling effect’ of blood flow. In order to test this hypothesis we designed a new balloon-thermography catheter for temperature measurements during coronary flow interruption. Method: A thermistor probe is positioned at the distal segment of the catheter. Exactly opposite is placed a balloon. During balloon inflation coronary flow is progressively interrupted. We studied 10 patients with effort angina. Coronary flow velocity was continuously recorded. Temperature was recorded at the proximal vessel wall and at the lesion before, during and after complete interruption of blood flow. TDB was assigned as the difference between the background and the maximal temperature during and after balloon inflation. TDI was assigned as the difference between the atherosclerotic lesion and the proximal vessel wall. Results: TDB and during after balloon inflation was 0.01±0.01 and -0.003±0.01°C (p=0.001) respectively. TDI was 0.07±0.04°C at baseline, 0.17±0.06°C (59.3±11.8% increase) during and 0.07±0.06°C after flow interruption (p=0.001)(Figure). TDI was greater than TDB during and after obstruction of flow (p=0.001). Conclusion: In vivo atherosclerotic plaque temperature recording with this new balloon-thermography catheter introduces a new method for the detection of thermal heterogeneity in plaques and possibly resolves the issue of ‘cooling effect’ of blood flow.
ABSTRACTS - Angiography & Interventional Cardiology

T1S6-63 Inaccuracy of Doppler Ultrasound for Assessing Restenosis After Internal Carotid Artery Stenting

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Background: Doppler ultrasonography is widely accepted as a means of non-invasively estimating internal carotid artery (ICA) stenosis. However, the utility of Doppler ultrasonography for assessing in-stent restenosis (ISR) after internal carotid stenting (CS) has not been well studied. We examined the relationship between Doppler ultrasonar cri-

angiography and anatomic restenosis in patients after CS.

Methods: Two hundred and thirty-five patients who underwent CS at our institution and had a follow-up Doppler study done at a minimum of 5 months after the index procedure were studied. Patients with high-grade contralateral stenosis or occlusions were excluded. Twenty-four consecutive patients were identified who had > 50% Doppler-defined ISR on follow-up exam (60-70°: PSV>150 cm/sec, EDV>150 cm/sec, EDV<150 cm/sec, EDV<150 cm/sec). These patients subsequently underwent diagnostic carotid angiography. The PSV, EDV, and ICA/CCA ratio among patients who had true an-
ingraphic ISR were compared with those who did not.

Results: True ISR (>50% by quantitative coronary angiography) was present in 8/24 patients (33.3%), while 16/24 patients (66.6%) did not have ISR by angiography. The median PSV (range: 152-427 cm/sec) and EDV (range: 34-200 cm/sec) for the entire cohort were 231 cm/sec and 68 cm/sec, respectively. In 6 patients (25%) there was no ISR by Doppler criteria but there was significantly higher among patients with true angiographic ISR as compared to those without angiographic ISR (PSV: 350 cm/sec vs. 201 cm/sec, p=0.004; EDV: 139 cm/sec vs. 54 cm/sec, p=0.006). Furthermore, the median ICA/common carotid artery (CCA) ratio was significantly higher among patients with true angiographic restenosis as com-
pared to those without (3.92 vs 1.62, p=0.009).

Conclusions: Among patients with carotid stents, current Doppler criteria for defining restenosis are not accurate. Modified Doppler criteria with higher thresholds for PSV and EDV, as well as the use of ICA/CCA ratios are more appropriate for assessing ISR after CS.

T1S6-64 Carotid Angioplasty and Stenting: Early and Late Follow-Up Results

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Purpose: Our objective was to evaluate immediate and long-term results of carotid angioplasty and stenting and the clinical impact of cerebral protection systems. Material-

Methods. From June 1997 to June 2003 a total of 674 patients (mean age 71 ±7.8) underwent carotid stenting for carotid stenosis.

Primary technical success achieved in 672/674 (99.70%). Procedure failures were treated for entrapment of Angioguard wire in the proximal end of the stent by a Palmspoor treat-

surgery by cut-down without complications and the second one due to a spiral dissec-
tion of internal carotid caused by Percusurge occlusive balloon. Twenty-eight (4.17%) patients had sympathetic complications: 1 (0.15%) death, 2 (0.30%) major stroke (1.23%), 11 (1.65%) minor stroke, and 6 (0.89%) intracranial hemorrhage. 7 (0.40%) TIA and 1 (0.15%) arterial wall perforation. In hospital and 30-days complications in protected group (547 patients): 1 (0.18%) death, 2 (0.37%) major stroke, 6 (1.10%) minor stroke, 7 (1.28%) intracranial hemorrhage, 6 (1.10%) TIA and 1 (0.18%) arterial wall per-

nismicular complications rate in protected group was 15 (2.72%). We used: Angioguard 236 (43,14%), Mednova Neuroshield 95 (17,37%), Trap-filter 67 (12,25%), Percusurge 26 (4,75%), MOMA 20 (3,66%), Acculink 15 (2,74%), Parodi System 7 (1,28%). Complications related to the use of embolic protection devices were: two (0.37%) dissection treated with angioplasty, one (0.18%) vessel occlusion by spi-

al dissection, one (0.18%) "trapped" guidewire.

Long-term outcome (range 3 months-72 months) was concluded in 510 patients. Patients free for major and minor neurologic events was 471 (92,35%). Complications: neurologi-

cal death 4 (0.78%), major ipsi-lateral non-fatal stroke 2 (0.39%), minor ipso-lateral non-
fatal stroke 0 (0%), stunt crush 1 (0.20%), stunt migration 2 (0.39), death (other causes) 17 (3.3%). Color-Doppler follow up examination showed 13 (2,55%) asymptom-

atic restenosis (≥ 50%).

Conclusion: Our results suggested that carotid angioplasty and stenting is a safe in term of early and long term results. Cerebral protection devices appears effective.

T1S6-65 Post-Carotid Artery Stent Hypotension and Optimal Pressor Use

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Background: Hypotension is common following carotid artery stenting (CAS), and may be mediated by vagal stimulation and/or suppression of sympathetic outflow. Both mixed α/β agonists dopamine (DA) and more selective α-agonists (norepinephrine (NE) and phenylephrine (PE)) have been used, but the most effective treatment of post-CAS hypotension is unknown. Methods: We analyzed data for consecutive patients requiring treatment of post-CAS hypotensive episodes. Choice of vasoactive agent was made by the treating physician. Endpoints included infusion duration, coronary care unit (CCU) length of stay (LOS), TIA, new arrhythmia, cardioversion, angina, and any major adverse event. Results: Over 5 years, CAS stenting was performed in 438 patients. CCU admis-

sion included non-responder s, whose vasoactive treatment was required in 42 patients (9.6%): DA in 20 patients (46%), NE in 13 patients (31%), and PE in 9 patients (21%). Vasopressor infusion time was 31.8 ± 10.6 h for DA, compared with 23.8 ± 8.1 h for NE (p<0.052) and 22.2 ± 6.1 h for PE (p<0.028). CCU LOS was 46.5 ± 14.1 h for DA compared with 36.9 ± 9.1 h for the NE and PE groups combined (p=0.066). Adverse events are listed in the Table. Major adverse events were more common among patients receiving...