1112 Coronary Stenting: Difficult Lesion Subsets

Tuesday, March 31, 1998, Noon–2:00 p.m.
Georgia World Congress Center, West Exhibit Hall Level
Presentation Hour: Noon–1:00 p.m.

1112-77 Sustained Benefit of Stenting in Chronic Occlusions: Long-term Follow-up of the SICCO Study

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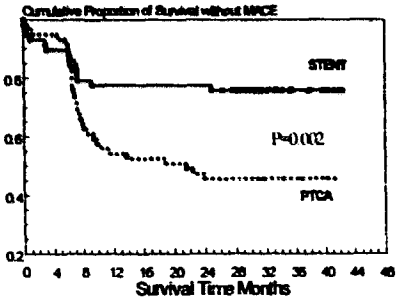
Background: The SICCO study showed that additional stent implantation improves the angiographic outcome after successful angioplasty of chronic coronary occlusions (CCO) with a reduction in the binary restenosis rate from 75% to 32%. To assess the clinical benefits of stenting versus angioplasty in CCO we performed a long-term follow-up of the SICCO population.

Methods: A total of 117 eligible pts with a successfully recanalized CCO were randomized to additional stenting (grA, n = 58, PS-JJ stents with full anticoagulation), or not (grB, n = 59). Main exclusion criteria were CCO <2w., ref. diam <2.5 mm, vessel anatomy unfavorable to stenting or bailout stenting. All pts were followed for the occurrence of Major Adverse Cardiac Endpoints (MACE): Myocardial infarction, target lesion revascularization (TLR) or death.

Results: After 2 2 to 3.5 y. (median 2.6) of follow-up the mortality was 1.7% in grA vs. 5.1% in grB (ns). TLR occurred in 19.0% of grA: (10 PTCA and 1 CABG) and in 49.2% of grB (25 PTCA, 4 CABG)(p = 0.006). MACE-free survival was superior in grA (logrank p = 0.002)



Conclusion: Stent implantation in chronic coronary occlusions resulted in a superior long-term clinical outcome as compared to angioplasty alone.

1112-78 Internal Mammary Artery Graft Angioplasty – A Single Center Experience

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Increasing use of internal mammary artery grafts (IMA) in the surgical revascularization of coronary artery disease has made the need for percutaneous angioplasty of IMA stenoses more common. We analyzed 139 pts who underwent angioplasty of 145 IMA graft stenoses at our institution between 1/94 and 5/97. Of these 120 were left, 22 were right and 3 were free right IMA grafts. Stenoses were located at the anastomotic site in 72.5%, 5% were ostial and 22.5% in the body of the IMA. 40% of angioplasties were performed within an year of surgical procedure, regardless of the site of IMA stenosis. New devices were used in 30 pts: 2 laser, 1 atherectomy and 27 stents. 6 pts had stents for restenotic lesions. Angiographic success (postprocedural stenosis <50%) was obtained in 85% of cases. In-hospital and late (6 months to 3 years) complications are shown below.

In-hospital complications (%)				Late complications (%)			
MI	Repeat PTCA	Emergent CABG	Deaths	MI	Repeat PTCA	CABG	Deaths
2	2	0.6	2	9.6	15.8	0.6	2

Conclusion: Angioplasty of IMA grafts is safe. Its effectiveness is comparable to that in native coronary arteries.

1112-79 Palmaz-Schatz Stenting in Unprotected Left Main Coronary Artery Stenosis: Immediate and Follow-up Results

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Background: To evaluate the efficacy and safety of Palmaz-Schatz (PS) Stent treatment in unprotected Left Main Coronary Artery (ULMCA).

Method: We analyzed consecutive 38 patients (pts) treated in ULMCA lesion from March 91 to December 96: 28 males (74%), mean age of 66 ± 15 years. Treated pts were divided into two groups; poor candidate group (PC) with one or more risk factor for CABG, 18 pts and good candidate group (GC) without risk factor for CABG, 20 pts. The expected high risk factor for CABG of the PC group were related to old age (≥75 yrs) in 9 pts, cerebrovascular disease in 7 pts, poor LV function (ejection fraction <40%) in 4 pts, prior CABG in 4 pts, poor run off in 1 pt, cancer in 1 pt, COPD in 1 pt. Decision of stenting in the GC group was primarily based on anatomical suitability for stenting. Stenting was performed successfully in all pts. There was one in-hospital death in PC due to acute closure of RCA dilated one week later. 1 pt with poor LV function died from cardiac failure. 1 pt with hepatic cancer had sudden death. 1 pt died from cardiac failure due to aortic stenosis worsening. 1 pt in GC died from restenotic MI.

	Immediate results		Follow-up results		
	In-hospital death/ EmCABG/MI	Stent thrombosis	Death	MI	CABG
PC 18 pts	1 pt (5.6%)	0	3 pts (18%)	1 pt (5.9%)	1 pt (5.9%)
GC 20 pts	0	0	1 pt (5.0%)	1 pt (5.0%)	0

Angiographic restenosis	Repeat PTCA	Target lesion revascularization
5 pts (29%)	2 pts (12%)	3 pts (18%)
2 pts (10%)	2 pts (10%)	2 pts (10%)

Conclusion: Stenting in unprotected LMCA could be a challenging alternative to CABG in selected patients, deserving further careful clinical evaluation.

1112-80 Stent Placement in Long (≥15 mm) Coronary Lesions

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Patients (pts) with long lesions (L) have a worse angiographic and clinical outcome after PTCA compared to pts with short lesions (Sh). We compared 371 L pts (≥15 mm long) with 1420 Sh pts after successful stent placement. Six-month angiographic follow-up was performed in 300 L pts (80.1%) and in 1121 Sh pts (79.4%; p = 0.71). Restenosis was defined by a %-diameter stenosis >50%. L pts did not differ from Sh pts with respect to vessel distribution, balloon size, balloon pressure and reference diameter before and after intervention. After four weeks there were no significant differences between the two groups considering the major adverse cardiac events (MACE) and subacute stent closure. At one year the rate of MACE was higher by L pts (28.3% vs. 21.8%, p = 0.01), but there was no significant difference in the combined occurrence of MI or cardiac death (4.6% vs. 3.7%, p = 0.4). Angiographic results are presented in the table.

	Long lesions	Short lesions	p-value
Balloon/vessel size	1.06 ± 0.11	1.06 ± 0.12	ns
Acute gain (mm)	2.14 ± 0.57	2.10 ± 0.58	ns
late loss (mm)	1.26 ± 0.84	1.04 ± 0.74	<0.001
%-Diameter stenosis	44.4 ± 25.9	37.5 ± 23.2	<0.001
Restenosis rate	33.7%	25.2%	0.004

Conclusions: Stent placement in lesions ≥15 mm long can be achieved with good acute angiographic and clinical results. Long-term angiographic and clinical outcome however, is impaired by a greater late loss and higher restenosis and clinical event rate.

1112-81 Clinical Outcome of Patients Undergoing Coronary Stenting for Extended Lesions ≥30 mm?

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Background: Balloon angioplasty of extended coronary lesions (ECL) ≥30

mm is associated with a high rate of recurrence and reintervention. The influence of coronary stenting on the clinical outcome in patients (pts) with ECL ≥30 mm remains debated.

Methods: Between May 1995 and May 1997, 186 pts, 152 males and 34 females, mean age 65 ± 5 years (range 33–88 years), of whom 42% presented unstable angina and 79% had multivessel disease, underwent coronary stenting of ECL ≥30 mm (mean length lesion 35.5 ± 5 mm, range 30–90 mm). Lesion characteristics included eccentricity (82%), side branch inclusion (38%), bend location (32%), calcification (32%), or total occlusion (10%). All pts received aspirin (250 mg o.d.) and ticlopidine (250 mg b.i.d.) initiated 48 h before the procedure. Intravascular ultrasound was not used during the procedure. Stent deployment was performed with high pressure balloon inflation (mean 14.5 ± 2.5 atmospheres).

Results: Two-hundred-thirty-nine stents (1.3/pt, 1.1/lesion), Wallstent (42%), Gianturco-Roubin II (40%), Nir (8%), Palmaz-Schatz (6%), miscellaneous (4%) were implanted in RCA (38%), LAD (33%), grafts (18%) or LCx (11%). Stent deployment was successfull in 99.5%. On-line post-procedural quantitative coronary analysis showed: final mean stent diameter = 3.5 ± 0.5 mm (range 2.5–5.5 mm) and mean length stent = 41 ± 10 mm (30–70 mm). Final stent diameter ≥3 mm was achieved in 81.7% of cases. In-hospital major cardiac events included two deaths (1.1%) (one subacute thrombosis and one ventricular fibrillation), 3 nonfatal MI (1.65%) and one emergency CABG (0.55%) (extensive dissection). Clinical follow-up (3–27 months), obtained in 160/184 pts (91%), revealed 4 cardiac deaths (2.4%), 2 nonfatal MI (1.2%) and 50 recurrent angina (31%) with target lesion revascularization in 22 cases (13.6%) including PTCA in 20 pts and CABG in 2. Three pts underwent PTCA on other lesions.

Conclusion: Stenting of coronary lesions ≥30 mm resulted in high procedural success and low immediate complications rate. Mid-term results included a relative high rate of recurrent angina and target lesion revascularization.

1112-82 "Slow Flow" Following Aortocoronary Vein Graft. Stenting: Incidence, Predictors and Procedural Implications

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Background: Embolization of atheromatous debris following PTCA and stenting of coronary vein graft lesions can result in "slow flow" attributable microvascular obstruction. Our objectives were to determine the incidence and clinical predictors of "slow flow" following vein graft stenting and to identify technical factors of the stent procedure related to "slow flow."

Methods: Medical records and coronary angiograms of 49 consecutive patients (pts) undergoing stenting for one or more vein graft lesions were reviewed. Treated lesions were characterized quantitatively and qualitatively by an angiographic core laboratory. "Slow flow" was defined as ≤ TIMI 2 with ≤ 50% lesion narrowing.

Results: "Slow flow" was observed in 11/49 pts (22%). Univariate analysis comparing "slow flow" to "non-slow flow" pts revealed no differences in regard to pt age, gender, coronary risk factors, graft age, recipient artery, presence of thrombus, ulceration, angulation, multiple lesions, calcification, lesion location in graft, class, asymmetry or dissection, severity before or after stenting, reference diameter or initial TIMI flow grade. "Slow flow" was most commonly observed after the pre-stent balloon deflation (6/11 pts) but was also seen immediately after stent deployment (3/11) and after high-pressure balloon deflation (2/11).

Conclusions: "Slow flow" occurred in 22% of stented vein grafts and could not be predicted by any baseline feature. Although "slow flow" was observed during each phase of stenting, it was most common after the pre-stent balloon deflation. Treatments to avoid "slow flow" during in vein graft stenting should be administered at procedure outset.

1112-83 Delayed Time Course of Target Lesion Revascularization Following Saphenous Vein Graft Angioplasty

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Background: Target lesion revascularization (TLR) after successful native coronary angioplasty usually occurs within first 6–9 mos. Time course of TLR following successful saphenous vein graft (SVG) angioplasty may be different.

Methods: We followed 1267 pts with 1590 SVG lesions successfully treated with angioplasty for at least 1 year. Among them, 150 pts (66 ± 10 yrs, 83% with unstable angina, 40% with diabetes) with 241 lesions (55% treated with stents; SVG age = 97 ± 58 months, 35% ostial, 21% degenerated) had TLR.

Results: The cumulative occurrence of TLR over time is as follows:

	6 months	9 months	12 months	24 months
TLR	54%	69%	78%	88%

The steepest rise in TLR occurred up to 8 months (TLR rate = −1.2 ± 0.307 × Time; $r^2 = 0.99$), after which there was still continued attrition, albeit at a slower rate (TLR rate = 70.7 ± 0.019 × Time; $r^2 = 0.80$). Patients with TLR <8 months had lower EF (40 ± 13% vs 46 ± 12%, p < 0.05), more ostial location (41% vs 28%, p = 0.08), and smaller reference vessel size (3.1 ± 0.5 mm vs 3.3 ± 0.6 mm, p < 0.01).

Conclusion: The time course of TLR following successful SVG angioplasty appears prolonged, with only 54% occurring within the first 6 months and continued TLR even after 1 year.

1112-84 Immediate and Long Term Outcome After Transcatheter Interventions in Patients After Coronary Bypass Surgery

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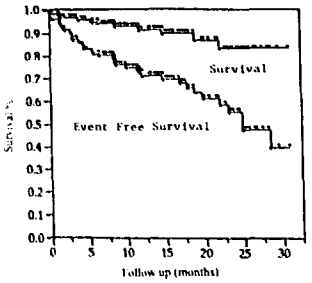
Since redo CABG is associated with a higher morbidity and mortality, percutaneous revascularization is an attractive alternative. We report the short and long term clinical outcomes of 135 pts (174 lesions) undergoing percutaneous graft revascularization. There were 106 males, the mean age was 68 ± 9, 39% were diabetics, 61% had prior MI and 32% had a prior intervention. One hundred and twenty eight (95%) patients presented with an acute coronary syndrome. The mean age of grafts was 9 ± 4 years. While conventional PTCA was used in 17.8% of the cases, stenting was used in 83%. Immediate success rate was 95.4% (TIMI 3 flow: 93%). During hospitalization, abrupt closure occurred in 1 patient (0.7%), death in 4 pts (2.9%), post-procedure NQMI in 22 pts (16.3%), emergency redo CABG in 1 patient (0.7%) At mean follow up of 20 ± 1 months there were 12 (8.8%) deaths, 2 MI (1.5%), 18 (13.3%), target vessel revascularization and 9 (6.7%) redo CABG. By Kaplan-Meier estimates survival and event-free survival was 86 and 62% respectively.



Conclusion: Despite the fact that graft interventions are associated with initial high success rate the long term outcome is limited by the increased number of revascularization procedures.

1112-85 Elective GR II™ Stenting in Small Vessels: Multicenter Results

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A multicenter U.S. registry study was designed to evaluate elective stenting using the GR II™ stent in small vessels (diameter ≥2.1 mm and ≤3.0 mm) with lesions ≤30 mm long. Demographics: 262 patients, 64% male, 30% diabetic, 45% high cholesterol, 65% multivessel disease, 38% prior MI, 22% prior CABG. Lesions: reference vessel diameter 2.6 ± 0.3 mm (45% ≤ 2.5 mm), lesion length 14 ± 8 mm (39% ≥15 mm), diameter stenosis 75 ± 21%, 62% class B2 and C, 44% diffuse disease, 29% moderate/severe proximal tortuosity.

Results: Stents (20 or 40 mm long) were successfully implanted in 258 patients (98.5%, 1.4 stents/lesion); average residual stenosis was 2 ± 2%. Post-procedure, patients received ticlopidine and aspirin. Acute thrombosis (<24 hours) occurred in 1.6%, subacute thrombosis in 2.4%. Cardiac events are shown in the table. Multivariate predictors of TLR at 31–180 days included female gender (p = 0.05) and number of stents (p = 0.07).