1060-84 Long Term Results of Laser Angioplasty for In-stent Restenosis

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Excimer laser angioplasty with adjunctive PTCA (ELA) has recently been shown to be safe and efficient for the treatment of in-stent restenosis. This study investigated the clinical and angiographic results of 73 pts, previously treated with ELA in stents, after a six months period.

There was one sudden death and 1 clinically apparent myocardial infarction. Angina pectoris classified as ≥CCS II reoccurred in 36 pts. Follow-up angiography was obtained in 68 pts (92%) with 107 stents. This group was at high risk for restenosis, since previously 17 pts (25%) had a total occlusion and recanalization, 11 pts (16%) had stents located in coronary artery bypass grafts, 16 pts (24%) had undergone multiple stenting (>2 stents/vessel) and in 47 pts (69%) stents had been implanted into small vessels (<3.00 mm in diameter). Quantitative coronary angiography 6 months after ELA revealed a >50% diameter stenosis in 35 pts (52%); in 20 of these pts diameter stenosis was >70%. Total occlusions were present in 7 pts (10%). The treatment after 6 months was medically in 39 pts (57%). Re-PTCA was necessary in 6 pts (9%), repeat ELCA in 7 pts (10%), rotational angioplasty in 6 pts (9%) and coronary artery bypass surgery in 10 pts (15%). Event-free survival was 56%.

Conclusions: Excimer laser angioplasty was associated with a 62% recurrence rate of restenosis after 6 months. However, the rate of necessary interventions is lower.

1060-85 Patterns of In-stent Restenosis: Classification and Impact on Subsequent Target Lesion Revascularization

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We analyzed the angiographic patterns of in-stent restenosis (ISR) and their impact on subsequent target vessel revascularization (TLR). 152 pts had 166 lesions (121 native vessel, 45 vein graft) previously treated with Palmaz-Schatz stents. Patterns of ISR were defined as focal (length < 10 mm, n = 81), diffuse (length ≥10 mm, not extending beyond the stent margins, n = 38), proliferative (length >10 mm *and* extending beyond the stent margins, n = 29), or total occlusion (TO, n = 18). Quantitative angiographic (QCA) parameters included lesion length, pre-and post-intervention reference (mm), minimum lumen diameter (MLD, mm), and diameter stenosis (DS, %). All pts were followed for at least 1 yr. 53 pts were diabetic. 34 lesions had previous (prev.) ISR. Device use included PTCA (n = 56), excimer laser angioplasty (n = 45), rotational atherectomy (n = 32), additional stents (n = 24), or their combination.

	Focal	Diffuse	Proliferative	TO	p
Prev. ISR	8%	20%	34%	50%	<0.0001
Reference	3.1 ± 0.6	2.7 ± 0.4	2.8 ± 0.8	2.6 ± 0.7	0.0084
Pre-MLD	1.1 ± 0.6	0.8 ± 0.3	0.5 ± 0.3	0	0.0001
Final-MLD	2.5 ± 0.9	2.1 ± 0.6	2.2 ± 0.5	1.6 ± 0.4	<0.0001
Final DS	24 ± 17	21 ± 13	24 ± 15	32 ± 11	0.3533
TLR	19%	35%	50%	83%	0.0001

Using multivariate logistic regression analysis, the only predictors of subsequent TLR (including device use, reference vessel size, final QCA results, and history of diabetes) were (1) prev. ISR (odds ratio = 11.9, p = 0.0006) and (2) pattern of ISR (odds ratio = 7.7, p = 0.0523).

We Conclude: After the treatment of ISR, subsequent TLR is determined by (1) a prev. episode of ISR and (2) the current pattern of ISR, presumably by quantifying the magnitude of the proliferative response. Regardless of device use, ISR presenting as a TO has a TLR of 83%. These findings should be used to select pts for more aggressive new approaches to treat ISR, i.e. brachytherapy.

1060-86 Clinical Pattern and Long-term Behavior of Significant Angiographic Restenosis After Coronary Stenting

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Objective: To determine the clinical significance and the long-term behavior of dichotomic restenosis (R) after coronary stenting (CS).

Methods: We followed 509 consecutive pts who underwent CS in 558 lesions. Angiography done at 6.9 ± 1.4 months in 96% of eligible pts showed R (>50% QCA criterion) in 119 lesions (25.5%; CI95%: 21.7–29.8) from 114 pts (60 ± 10 yrs, 89% male) who underwent long-term follow-up (FU). Percentage of diameter R was 64 ± 15% (minimal lumen diameter 1.3 ± 0.5 mm, reference diameter 3.1 ± 0.7 mm).

Results: Significant angiographic R was asymptomatic in 67 of 114 pts (59%). Clinical pattern of symptomatic R included stable angina in 65% of pts, unstable angina in 33% and AMI in 2%. Symptomatic pts had higher frequency of positive stress test (57 vs 32%, p = 0.02). Evidence of R was immediately followed by PTCA or CABG in 25% of asymptomatic pts and in 67% of symptomatic pts. Follow-up was completed at 21 ± 15 months (range: 6–54 months) in 94% of pts. At the end of FU 68% of pts were free of symptoms or events, 11% required further PTCA or CABG, 2% had AMI, and 8% died, without differences between asymptomatic and symptomatic pts. Asymptomatic pts who underwent PTCA or CABG had similar event-free survival rate than asymptomatic pts medically treated (69 vs 78%).

Conclusions: Thus, after CS: 1) most pts with angiographic restenosis R were asymptomatic; 2) pts with symptomatic and asymptomatic R had similar outcome; 3) PTCA or CABG did not modify the outcome of asymptomatic pts with R.

1060-87 Does "the Bigger the Better" Hypothesis After Coronary Stenting Apply in Small Vessels?

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Intravascular ultrasound (IVUS)-guided coronary stenting studies have shown that achieving an intrastent minimum lumen cross sectional area (MLCSA) ≥9 mm² is associated with a low restenosis rate. The purpose of this analysis was to test whether this concept holds true in both small and large vessels.

Methods: A total of 376 pts (439 lesions) had successful IVUS-guided stenting with the Palmaz-Schatz stent and had angiographic follow-up at 5.6 ± 2.9 months. This population was divided into 2 groups according to vessel size: 1) reference diameter ≥3 mm (267 lesions) and 2) reference diameter <3 mm (172 lesions). Acute and long-term angiographic indexes and restenosis rate for both groups are shown in the table below according to whether a MLCSA ≥ 9 mm² was achieved or not:

	MLCSA ≥ 9 mm²	MLCSA < 9 mm²	P
Vessels ≥3 mm	n = 121	n = 144	
Acute gain (mm)	2.62 ± 0.77	2.27 ± 0.66	<0.0001
Late loss (mm)	0.90 ± 0.90	0.95 ± 0.90	0.69
Loss index	0.33 ± 0.36	0.42 ± 0.45	0.10
Restenosis	8/121 (6.6%)	29/144 (20%)	0.002
Vessels <3 mm	n = 28	n = 144	
Acute gain (mm)	2.48 ± 0.58	2.05 ± 0.55	0.0002
Late loss (mm)	1.47 ± 1.0	0.98 ± 0.79	0.007
Loss index	0.63 ± 0.48	0.49 ± 0.41	0.12
Restenosis	7/28 (25%)	35/144 (24%)	0.94

In conclusion achievement of an intrastent MLCSA ≥ 9 mm² lead to a significant reduction in restenosis only in large vessels. The lack of restenosis benefit in small vessels is due to the higher late loss at follow-up.

1060-88 Rotational Ablation With Adjunctive Low-Pressure Balloon Dilatation in Diffuse In-stent Restenosis: Immediate and Follow-up Results

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Background: Balloon angioplasty in diffuse in-stent restenosis (IR) has recurrence rates as high as 88%. Ablation of neointima by high speed rotational atherectomy (RA) with adjunctive low-pressure balloon dilatation (LPBD) might provide better results.

Methods: In a series of 32 pts with diffuse IR (lesion length 18.3 ± 5.8 mm) we performed RA with adjunctive LPBD (4.1 ± 1.0 atm). ICUS was used to ensure sufficient stent expansion (minimal stent diameter 2.7 ± 0.4 mm) and to select the maximal possible burr size (2.3 ± 0.2 mm, burr/artery ratio 0.85).

Results: QCA.

	RD [mm]	MLD [mm]	% DS
Baseline	2.74 ± 0.56	0.46 ± 0.39	83 ± 13
post RA		1.85 ± 0.28*	31 ± 13*
post LPBD	2.81 ± 0.51	2.39 ± 0.38*	14 ± 12*
Follow-up	2.78 ± 0.57	1.29 ± 0.79	54 ± 25

*p < 0.0001 for baseline vs. RA and RA vs. LPBD

The procedure was successful in all patients without adverse events during hospitalization. At 6 months FU (complete for 27 pts) the angio-graphic