

1000 New Technologies and Outcomes of PTCA

Wednesday, March 22, 1995, Noon-2:00 p.m.
Ernest N. Morial Convention Center, Hall E
Presentation Hour: 1:00 p.m.-2:00 p.m.

1000-31 Late Recanalization of Chronic Total Coronary Occlusion: Maintained Vessel Patency Improves Global and Regional Left Ventricular Function and Avoids Remodeling

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To determine whether late recanalization of total coronary occlusions improved left ventricular (LV) function, we studied LV ejection fraction (EF) and regional wall motion (Stanford method) on RAO 30° LV angiography in 41 consecutive pts (31 M, 10 F; age: 56 ± 9 yrs) who underwent successful percutaneous recanalization of a chronic (>10 days), complete (TIMI grade 0) occlusion of either the left anterior descending (LAD) or right coronary artery (RCA) and who had a complete evaluation before and at 6 months following recanalization. At 6 months, 11 pts had reocclusion (Gr1) and 30 pts (Gr2) had maintained patency (TIMI grade 3). *Evolution of global LV function:* in Gr 1, LVEF increased from 53 ± 13 to 61 ± 19% (p = 0.09), due to an increase in LV enddiastolic volume (EDV) from 85 ± 25 to 112 ± 56 ml (p = 0.09), while LV endsystolic volume (ESV) was unchanged (42 ± 22 to 42 ± 29 ml). In contrast, in Gr 2, increase in LVEF (57 ± 14 to 64 ± 13%, p < 0.005) corresponded to a decrease in LVESV (39 ± 29 to 33 ± 22 ml, p = 0.09) while LVEDV remained unchanged (85 ± 41 to 93 ± 53 ml, p = ns).

Regional wall motion was assessed on 8 anterior radii for pts with LAD occlusions, and 8 inferior radii for pts with RCA occlusions. In Gr 1, none of the occluded artery-related radii improved. In Gr 2, a significant increase in fractional shortening was present in 7 of 8 occluded artery-related radii, both for LAD and RCA occlusions.

Maintained vessel patency after late recanalization of totally occluded coronary arteries improves global and regional LV function without subsequent increase in LV enddiastolic volume; in contrast, when the artery reoccludes, LVEF tends to improve due to an increase in LV enddiastolic volume, corresponding to a remodeling phenomenon. Late (>10 days) recanalization of complete coronary occlusions is beneficial to LV function.

1000-32 Spontaneous Evolution of Nonocclusive Coronary Dissection After PTCA: A 6 Month Angiographic Follow-up Study

Alberto Cappelletti, Alberto Margonato, Giovanni Berna, Sergio L. Chierchia. *Istituto Scientifico H S Raffaele, Milano*

We have previously shown that, when good distal flow is maintained, dissection after PTCA has a favourable short term (24 hrs) evolution and does not require bail-out interventions or CABG.

To evaluate the long term (6 months) clinical and angiographic evolution of non occlusive dissection, we submitted 129 consecutive patients (103 male, mean age 53 ± 11 yrs) undergoing elective PTCA (147 lesions, 66 LAD, 49 CX, 32 DX) to repeat angiography 24 hrs and 6 months after the procedure. Lesions were measured by QCA and coronary dissection was graded using the NHLBI classification (types A-E; Huber Am J Cardiol 1991;68:467). Mean stenosis was 85 ± 11% before and 25 ± 7% immediately after PTCA (p < 0.001). Residual stenosis was not significantly different at the 24 hrs restudy (24 ± 9%). Non occlusive coronary dissection (flow TIMI grade 3 in all pts) was seen in 49/147 lesions (33%) and evolved as follows:

Dissection (tot)		24 hrs 41 (28%)	6 months 18 (12%)
	Immediate 49 (33%)		
A	33	27	10
B	10	8	5
C	4	4	2
D	2	2	1

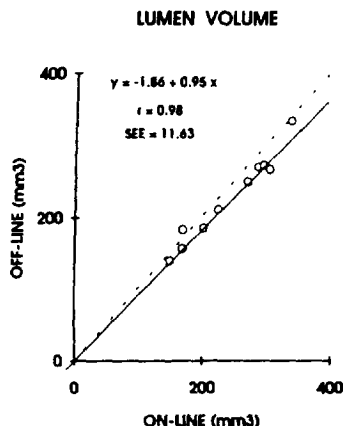
At the 6 month follow-up study, restenosis was seen in 51/147 lesions (34%), of which 5/49 (10%) had dissection and 46/106 (43%) did not. No cardiovascular events or recurrence of symptoms were recorded in the absence of restenosis.

Therefore 1) nonocclusive dissection after PTCA usually improves after 6 month; 2) in the absence of flow impairment and ischemia this complication does not require any further intervention; 3) non occlusive dissection is not associated with increased incidence of restenosis.

1000-33 On-line Automated Lumen Volume Measurement With 3-D Intracoronary Ultrasound During Coronary Interventions

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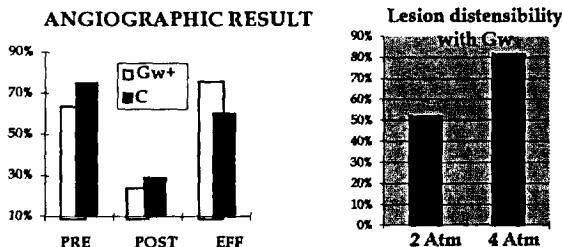
The aim of the study was the clinical validation of an on-line fully automated lumen detection technique with intravascular ultrasound (IVUS). *Methods:* Assessment of lumen dimensions with IVUS was performed in 10 pts undergoing transcatheter therapy (5 PTCA, 2 DCA, 3 Stents). The images of 10 coronary segments 20 mm long in the treated area were acquired during motorized pull-back (1 mm/s) and processed using an automated contour detection algorithm based on acoustic quantification of blood backscatter and coronary wall. For each segment, 171 ultrasound images (8.5/mm) were processed in the laboratory, immediately after acquisition (processing time: 1.35 min.) and subsequently corrected off-line by an experienced analyst. Segment lumen volume was calculated by multiplying mean lumen area by segment length. *Results:* Of the 1,710 on-line IVUS cross-sections obtained, 232 (13.6%) could not be analyzed due to failure of the algorithm used for lumen detection induced by presence of side branches, lack of sharpness of the lumen-wall interface or shadowing from calcium interpreted as lumen. On the remaining frames (1,478; 86.4%), on-line vs off-line comparison for mean lumen area and segment volume was performed. On-line measurement of lumen area and volume were highly correlated with the off-line measurements (r = 0.85 for area; see fig. for lumen), with a mean difference of 7.4 ± 14.1% and 5.9 ± 5.4% for lumen area and volume, respectively. *Conclusion:* In selected optimal sequences of images acquired during coronary interventions, on-line automated quantitative 3-D provides reliable measurements of lumen dimension, requiring limited manual interaction.



1000-34 Facilitated Lumen Enlargement by Longitudinal Force Focused Angioplasty

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By longitudinally concentrating dilating force, a guidewire (Gw) external to the balloon may facilitate PTCA mediated lumen enlargement. In vitro measurements showed a three-fold increment in the linearly directed dilating force at the interface of the external guidewire and the balloon. ACC/AHA type A or B lesions (n = 10) underwent Gw facilitated PTCA using an 0.012" guidewire as the "cutting wire," and angiographic results were compare to a control group (n = 37) of lesions undergoing conventional PTCA.



The lesions yielded (no "waist") at 4.3 Atm in the guidewire facilitated group and at 6.7 Atm in the control group (p = 0.005). During the first inflations, the balloon achieved 52% of the maximal balloon size at 2 Atm and

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