

Stent Thrombosis: A Poor Man's Disease?

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Objectives: Stent thrombosis (ST) is a rare but devastating complication of coronary stent implantation. ST incidence and potential predictors were assessed in a "real world" single center.

Methods: We searched our database for cases of "definite" stent thrombosis (according to the ARC Dublin definitions). Each case was matched by procedure date, age and gender, with 3 cases of stenting that did not result in ST. Demographic and clinical parameters were compared and socio-economic status was determined according to "Geocartography" polling and market survey database.

Results: 3401 patients underwent stent implantation at our hospital during 2004-2006. 29 cases (0.85%) of "definite" subacute / late stent thrombosis were recorded. No mortality was recorded during 30 days, which may imply a low rate of ST detection that is based on the strict angiographic criteria. Thrombosis occurred 2 days-3 years after stent implantation. Eighty percent of the patients were males and the mean age was 63 ± 11 . All presented with acute myocardial infarction (AMI). Premature clopidogrel administration was reported in 60%. Patients with ST had significantly higher rates of AMI at the time of initial procedure (76 vs. 32%, $p<0.001$), cigarette smoking (60 vs. 28%, $p<0.001$) and use of long stents ($>15\text{mm}$, 72 vs. 60%, $p=0.01$). Bare metal and drug eluting stents use were similar between the groups. Socioeconomic status was significantly lower at the ST group, 4 ± 0.6 vs. 5.4 ± 0.3 (mean \pm SE, scale 1-10, $p<0.05$).

Conclusions: Stent thrombosis incidence in our population is at least 0.85%. ST appears in patients of significantly lower socio-economic status in addition to certain clinical predictors. These results warrant stricter follow-up and support policy by healthcare providers on patients at risk for stent thrombosis.

Chronic Pre-treatment with Statins and the Outcomes of Patients with ST-Segment Elevation Myocardial Infarction Treated with Primary PCI

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Background: Beyond lipid-lowering effects, statins have favorable effects on platelet adhesion, thrombosis, endothelial function, plaque stability, and inflammation. These pleiotropic effects could contribute to the preservation of microvascular function during ischemia and reperfusion. There is limited data about the impact of chronic pre-treatment with statins on the outcome of patients with ST-elevation myocardial infarction (STEMI) treated by primary percutaneous coronary intervention (PCI). Accordingly, our aim was to evaluate the effect of previous treatment with statins on clinical outcomes of such patients.

Methods: We studied 950 consecutive patients with STEMI treated with primary PCI, who were included in our primary PCI registry between 01/2001 – 07/2007. Excluded were patients with cardiogenic shock. Patients were allocated into two groups: those who received chronic pretreatment with statins (n=327) and those who did not (n=623).

Results: As shown in the Table below, despite significantly worse baseline clinical characteristics and similar procedural characteristics, patients who received previous treatment with statins had a lower 30 day mortality rate. At 6 months mortality differences were no longer significant. Multivariate analysis adjusted for factors such as diabetes and the CADILLAC score, showed that previous statin therapy was associated with an odds ratio of 0.4 (0.13-0.96, P=0.04) for 30 day mortality.

Conclusions: The present study suggests that chronic pretreatment with statins before primary PCI for STEMI may be associated with lower short-term mortality, possibly through preservation of the microvascular integrity. Large prospective trials should be performed to verify these findings.

Variable	Previous Treatment with Statins (n=327)	No Previous Treatment with Statins (n=623)	P value
Mean Age (yrs)	62±12	60±13	0.006
Women	22%	16%	0.03
Diabetes	34%	20%	0.0001
Hypertension	58%	38%	0.0001
Hyperlipidemia	79%	27%	0.0001
Smoker	40%	48%	0.01
Previous MI	18%	8%	0.0001
Previous CABG	5.8%	1.1%	0.0001
LVEF<40%	41%	43%	0.5
CADILLAC score	4.5±3.5	4.1±3.6	0.1
Post TIMI 3 flow	96%	95%	0.8
No Reflow	5.3%	6.2%	0.6
GP IIb/IIIa use	75%	78%	0.2
Procedural Success	96%	95%	0.8
Clinical Outcomes			
30 day death	1.5%	3.7%	0.05
30 day re-MI	3.4%	2.6%	0.5
6 months death	4.1%	5.8%	0.3
6 months re-MI	5.8%	4.4%	0.3

Comparative Analysis between Real World Percutaneous Coronary Intervention and Coronary Artery Bypass Grafting for Unprotected Left Main

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Background – Revascularization procedure for unprotected left main (LM) disease, in a real world scenario in our institute, is mostly dictated by assessment of the predicted operative mortality risk. In order to investigate the impact of patients' assessed operative risk and procedural type on early mortality we evaluated, in prospective manner, the outcome of consecutive patients who underwent percutaneous coronary intervention (PCI) or coronary artery bypass graft surgery (CABG).

Methods – All patients who were referred for revascularization procedure were assessed for predicted operative mortality using the EuroScore system, which integrated patient-related, cardiac-related and operative-related parameters.

Results – 270 patients underwent revascularization procedure for unprotected LM disease (PCI, n=71; CABG, n=199). Of note, 14 (5.2%) patients were presented with cardiogenic shock (PCI, n=12 (17%) vs. CABG, n=2 (1%), p=0.0001). Patients who underwent PCI were more often women (37% vs 26%, p=0.06), older (75±12 years vs. 67±10, p=0.0001), had a lower ejection fraction (48±13% vs. 54±10%, p=0.007), had higher rates of chronic renal failure (27% vs. 11%, p=0.01), history of previous CABG (10% vs. 1.5%, p=0.001) and previous stroke (20% vs. 10%, p=0.03). Presence of additional two or three-vessel disease was similar (86% vs. 88%, p=0.8). EuroScore was significantly higher among those who were referred to PCI (8±3.7 vs. 5.6±3, p=0.0001) with predictive mortality of 10.2% and 6.5%, respectively. Unadjusted mortality rate was higher, although not statistically significant, among those who underwent PCI (11% vs. 6.6%, p=0.2). Adjusted mortality increased in concordance with EuroScore (OR =1.4, 95% CI 1.2-1.7, p=0.01) per 1 score with no impact for the revascularization performed. Importantly, mortality rate among non-cardiogenic shock patients was identical (5.1% vs. 5.2%, p=1.0).

Conclusions – In a current real world scenario, patients who are referred for unprotected LM PCI compared to those who undergo CABG, have substantially higher risk profile and hemodynamic instability. Adjusted mortality rates are comparable between the two strategies. This observation suggests the need for studies aim to evaluate paradigm for unprotected LM revascularization.

Natural History of Saphenous Venous Grafts after Drug Eluting Stenting: Continuous Progression of Disease

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BACKGROUND: Percutaneous coronary intervention (PCI) of saphenous vein graft (SVG) lesions is associated with worse outcomes and high incidence of in-stent restenosis compared with PCI of native coronary arteries. Long-term prognosis is limited by the continuous progression of the disease even after successful drug-eluting stent [DES] implantation

OBJECTIVES: The purpose of the present report was to evaluate the long-term clinical and angiographic outcomes of DES implantation in SVG lesions.

METHODS: Data from consecutive patients who underwent PCI of SVG were imputed into a clinical Database. We evaluated the clinical outcomes up to three years after DES stenting. Included 88 patients [95-grafts] [87% male]. Major adverse cardiac events (MACE) including death, myocardial infarction, target lesion revascularization (TLR), and target vessel revascularization (TVR) were recorded.

RESULTS: The patients mean age was 69±9yrs and the mean age of SVG was 10.5±5.2yrs. The presenting diagnosis was ACS in 72% of patients. And 59% had DM and 15.7% of lesions were 'in-stent' restenotic. Distal protection device was used in 37% of cases and procedural success was achieved in all patients.

	Six months [n=88]	One year [n=84]	Two years [n=56]	Three years [n=38]
Death	1.1%	1.2%	7.7%	7.9%
MI	2.3%	3.6%	7.7%	13%
Stent thrombosis	0%	2.4%	5.9%	7.9%
TVR/graft	7.4%	12.1%	33%	56%
TLR/graft	6.3%	9.9%	28%	49%
CABG	1.1%	3.6%	9.8%	13%
MACE	11.4%	17.9%	41%	66%

CONCLUSIONS: DES implantation in SVG lesions appears safe with favorable and improved short-term outcomes. Nonetheless, long-term results are limited by disease progression in degenerated SVGs and prolonged need for repeat target lesions/vessel revascularization procedures.

A Comparative Analysis of Mortality/Myocardial Infarction Outcomes Using Drug-Eluting Stents vs. Bare Metal Stents in a Large Single Center Israeli Clinical Setting

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Background: The placement of drug-eluting stents (DES) decreases the frequency of repeat revascularization procedures in patients undergoing percutaneous coronary intervention (PCI) in randomized clinical trials. However, concerns have been raised about their long-term safety in 'all commerce' routine clinical practice among large population cohorts.

Methods: From our hospital and HMO Network Database we conducted a clinical registry of all patients undergoing PCI at our institution. We identified a cohort of 4750 patients who received at least one DES (n=2273) during PCI and compared the mortality and myocardial infarction (MI) risk-adjusted outcomes to patients treated using bare metal stents alone (BMS; n=2477) during an index PCI procedure between April 1, 2004, and July 1, 2007.

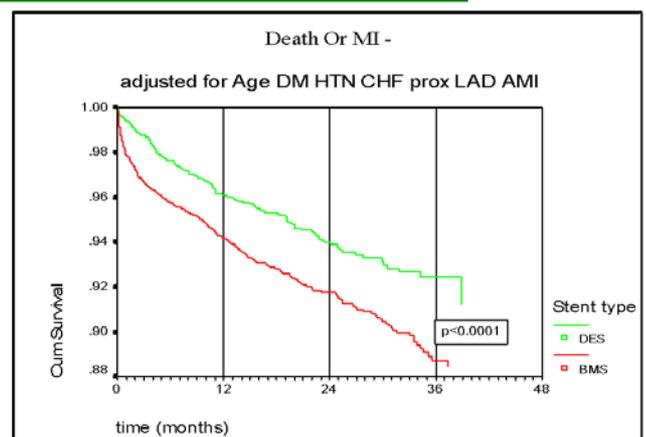
Results: Patients receiving DES were somewhat younger, had more diabetes, hypertension, sustained less heart failure, had less acute or recent MI, and had more proximal LAD culprit lesions (Table).

	All Pts	BMS	DES	P value
n	4750	2477	2273	
Male	75.3%	75.6%	75.1%	NS
Age	65.8	66.4	65.2	<0.0001
DM	38.7%	35.7%	42.0%	<0.0001
HTN	70.7%	69.0%	72.5%	0.01
Prior CABG	15.8%	15.4%	16.2%	NS
CHF	16.8%	18.7%	14.8%	<0.0001
Smoking Hx	35.5%	36.0%	34.5%	NS
Prior MI	24.0%	29.9%	18.3%	<0.0001
Prox LAD (culprit)	16.6%	8.8%	25.1%	<0.0001

The 3-year mortality rate was significantly higher in the BMS group than in the DES group (9.7% vs. 4.7%, $P<0.0001$), whereas the 3-year rate of any MI was similar in the two groups (3.3% and 2.9%, respectively; $P=NS$). The risk-adjusted (for age, DM, HTN, CHF, MI, PCI in Prox. LAD) composite endpoint of Death/MI was significantly higher among BMS treated patients (12.1% vs. 7.5%, $P<0.0001$). Patients who were treated using DES alone had the lowest composite endpoint (7%).

Conclusions: According to our long-term

experiences, DESs do not jeopardize the 3 year clinical outcomes (i.e. death/MI) among 'all commerce' group of patients in a wide variety of clinical scenarios. On the contrary, our risk-adjusted data would indicate a *prognostic benefit* for DES utilization which commences early and sustains for at least 3 years following index PCI.



Predictors and Prevalence of Early Stent Thrombosis in Patients with Acute Coronary Syndrome

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Background: While early stent thrombosis (EST) is an uncommon phenomenon, it has devastating consequences. Activation of platelets and coagulation system play a major role in the pathogenesis of acute coronary syndrome (ACS) and might impact on EST. The prevalence and predictors of EST in ACS patients have not been specifically examined.

Objective: To determine the incidence and predictors of EST in ACS patients from the ACSIS 2006.

Methods: Patients were followed for 30 days. Definite EST was diagnosed in patients with angiographic or autopsy evidence of thrombus. Probable EST was diagnosed if unexplained deaths occurred within 30 days after the procedure or in patients with acute myocardial infarction (MI) involving the target-vessel territory.

Results: Of 1202 ACS patients who underwent percutaneous coronary intervention (PCI) with stenting, 30 (2.5%) sustained EST (19 definite, 11 probable). ST-elevation MI (STEMI) versus NSTEMI/unstable angina patients were more than 4 times likely to sustain ST (3.9% vs. 0.9% p=0.001). The incidence of EST was even higher in STEMI patients who underwent primary PCI (5.6%). Other predictors of EST included: Killip class ≥ 2 (6.4% vs. 1.9%, p<0.01), multi-vessel coronary artery disease (3.6% vs. 0.7%, p=0.02). Drug eluting stent use was not associated with higher risk for EST (3.1% vs. 2.2%, p=0.4). On multivariate analysis only STEMI [OR=6.7, 95% CI (2.5-23)], prior MI [OR=2.8, 95%CI (1.2-6.3)], and Killip class ≥ 2 [OR=3, 95% CI (1.3-6.6)], remained independent predictors of EST.

Conclusion: Among ACS patients, those with STEMI, prior MI and those hemodynamically unstable on admission, are at higher risk for EST.