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Profile and Outcome of Very Late Bare Metal Stent Thrombosis Treated With Percutaneous Coronary Intervention

Ivan Gomez Blazquez[1], Emiliano Fdez-Obanza[1], Victor A. Jimenez Diaz[1], Jorge Sepúlveda[1], Antonio De Miguel Castro[1], Guillermo Bastos Fernández[1], Josué Ponce Bustillo[1], Alberto Ortiz Saez[1], Jose A. Baz Alonso[1], Andres Iñiguez[1]
[1]Hospital Meixoeiro, Complejo Hospitalario Universitario de Vigo, Vigo, Spain

Background: Very late stent thrombosis (VLST) after bare-metal stent (BMS) implantation is a rare complication. There is emerging evidence suggesting that in-stent neoatherosclerosis may play a role, but data on clinical characteristics and prognosis of patients (p) are limited. The aim of this study was to evaluate the profile and outcome of VLST after BMS implantation treated with percutaneous coronary intervention (PCI).
Methods: From January 2006 to May 2012 a total of 9,582 PCI were performed at our center. During this period we identified and retrospectively analyzed 30 consecutive p with angiographically confirmed VLST related to BMS. Minimum follow-up period of 1 year and 2 years was available in 25/30 and 23/30 p, respectively.
Results: Mean age of p was 60±13 years, 93% were male, 53% active smokers, 20% diabetics, 77% had hyperlipidemia and 67% hypertension. Clinical presentation of VLST after BMS was ST-segment elevation myocardial infarction (STEMI) in 27 cases, and 3 p (10%) had non-STEMI. Right coronary artery was the most common location of VLST (57%). Median period from BMS implantation to VLST was 7.9 years (interquartile range, 6.0-9.9 years) and most of the p (70%) were receiving oral antiplatelet therapy at the time of VLST (67% aspirin alone, 3% dual antiplatelet). All p with VLST after BMS underwent successful PCI. Effective thrombus aspiration was achieved in 67% of p and a new stent was deployed in 83% of p (14 DES, 11 BMS). A significant deterioration of LVEF occurred in p with VLST related to BMS (64±6% to 50±9%; p<0.001). Major adverse cardiac events (cardiovascular death or myocardial infarction) rates were 7%, 20%, and 39% at 30 days, 1-year and 2-year follow-up, respectively. During the 2-year follow-up period 3 p died and 6 p had a non-fatal myocardial infarction (recurrent stent thrombosis in 3 p and myocardial infarction not related to prior VLST in 3 p).
Conclusions: VLST after BMS implantation is an uncommon phenomenon, mainly presented as STEMI, and its treatment with a new PCI is feasible and effective. Nevertheless new major adverse cardiac events may occur in this group of p at short- and mid-term follow-up, related to both prior VLST and coronary disease progression.

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Long Term Prognosis of In-Stent Restenosis after Drug-Eluting Stent Implantation and Predictors of Recurrent Restenosis: Data from the ASAN DES-ISR Registry

Won-Jang Kim[1], Shin-Eui Yoon[1], Seung Mo Kang[1], Uk Jo[1], Hyun Woo Park[1], Young-Rak Cho[1], Gyung-Min Park[1], Jong-Young Lee[1], Duk-Woo Park[1], Soo-Jin Kang[1], Seung-Whan Lee[1], Young-Hak Kim[1], Cheol Whan Lee[1], Seong-Wook Park[1], Seung-Jung Park[1]
[1]Heart Institute, University of Ulsan College of Medicine, Asan Medical Center, Seoul, Korea, Republic of

Background: The optimal treatment of in-stent restenosis (ISR) after percutaneous coronary intervention (PCI) with drug-eluting stents (DES) remains an important clinical challenge to routine PCI practice. We evaluated the long-term outcomes of DES-ISR according to treatment modality and determined the predictors of recurrent DES-ISR.
Methods: We assessed outcomes in 488 patients with DES-ISR who underwent repeated revascularization (339 patients; 302 repeated PCI, 37 coronary artery bypass grafting) or medical treatment (149 patients) between February 2003 and December 2007. Their long-term adverse outcomes (death; the composite of death or myocardial infarction [MI]; and target-lesion revascularization [TLR]) were compared, and the predictors of recurrent restenosis after treatment of DES-ISR were evaluated.
Results: During a median follow-up of 37.2 months (interquartile range, 29.8 to 58.4 months), the unadjusted risks of death (2.0% vs 0.7%, p=0.82), MI (0.6% vs 0%, p=0.35), and the composite of death or MI (0.9% vs 0.7%, p=0.82) did not significantly differ between the revascularization and medical treatment groups. In contrast, TLR rate was significantly higher in patients treated with revascularization (7.7% vs 0.7%, p=0.002). After multivariate adjustment using inverse probability of treatment weighting, overall findings were consistent. Multivariate analysis showed that pattern of restenosis, diabetes, and treatment modality were significant independent predictors of repeat restenosis after DES-ISR treatment.
Conclusions: The long-term outcomes of DES-ISR were benign, regardless of treatment modality selected clinically by the physician. Pattern of restenosis, diabetes, and treatment modality were significant predictors of repeated DES failure.

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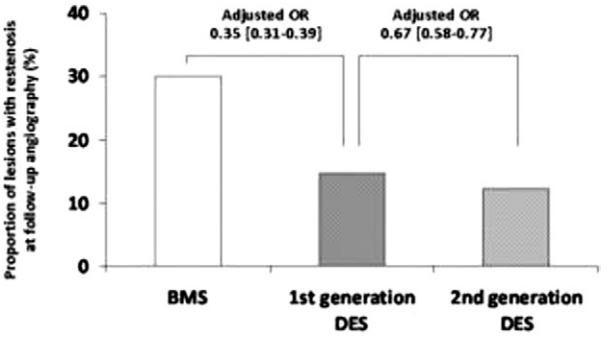
Restenosis after coronary stenting in 10,004 patients with follow-up angiography

Salvatore Cassese[1], Robert Byrne[1], Julinda Mehilli[1], Stephanie Schulz[1], Tomohisa Tada[1], Lamin King[1], Susanne Pinieck[1], Albert Schömig[1], Adnan Kastrati[1]
[1]Deutsches Herzzentrum Munich, Munich, Germany

Background: To date, studies of restenosis after percutaneous coronary interventions (PCI) with bare-metal-stents (BMS) or drug-eluting stents (DES) have not been performed in a very large population undergoing follow-up angiography.
Methods: All patients undergoing successful implantation of coronary stents for de novo lesions from 1998 to 2009 and control angiography at 6 out to 8 month-follow-up were included. Restenotic lesions, cardiogenic shock, dialysis or previous cardiac transplantation represented exclusion criteria. Data were prospectively collected. Restenosis was defined as diameter stenosis ≥50% in the in-segment area at follow-up angiography.
Results: We included 10,004 patients with 15,004 target lesions. At multivariate analysis PCI with DES was the strongest predictor of restenosis (odds ratio - OR 0.28 [95% Confidence intervals, 0.25-0.31]). Other correlates were vessel size (1.59 [1.51-1.68] for each 0.5-mm decrease), stenosis severity (1.03 [1.02-1.05] for each 5% increase), history of by-pass surgery (1.38 [1.20-1.58]), diabetes mellitus (1.32 [1.19-1.46]), left-main (1.35 [1.02-1.81]), B2/C lesions (1.35 [1.20-1.51]) and long-segment stenting (1.27 [1.21-1.33]). First-generation DES was less prone to restenosis as compared to BMS. Second-generation versus first-generation DES further reduced restenosis.



Conclusions: Drug-eluting stents and small vessel size represent the strongest predictors of restenosis. Second-generation DES has superior anti-restenotic efficacy as compared with first-generation DES.

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Everolimus Eluting Stents Versus First Generation Drug Eluting Stents (Sirolimus or Paclitaxel) for Treatment of Drug-Eluting Stent In-Stent Restenosis

Sachin Goel[1], Wael El-Mallah[1], Mobolaji Ige[1], Supriya Gupta[1], E Murat Tuzcu[1], Stephen Ellis[1], Samir Kapadia[1]
[1]Cleveland Clinic, Cleveland, OH

Background: Instent restenosis (ISR) of DES is a growing problem. Data on the outcomes of EES compared to the first generation DES for the treatment of DES ISR are lacking. We compared the outcomes of EES to the first generation DES [Paclitaxel eluting stents (PES) or Sirolimus eluting stents (SES)] for the treatment of DES ISR.
Methods: Patients who underwent percutaneous coronary intervention (PCI) with EES, SES or PES for the treatment of DES ISR at our institution between 1/2008 and 12/2011 were included. We compared EES versus SES/PES for treating DES ISR. In a Cox regression analysis; after adjusting for clinical, angiographic and procedural characteristics, a combined primary endpoint of death, myocardial infarction (MI) and target lesion revascularization (TLR) was was used. Individual components of the primary endpoint, stent thrombosis & target vessel revascularization (TVR) were secondary endpoints.
Results: Over 4 years, 277 patients had PCI for DES ISR, of which 146 were treated with EES and 131 with SES/PES. The 2 groups were well matched with respect to age, gender, smoking history, prevalence of diabetes, COPD, dyslipidemia, renal failure, lesion length and reference vessel and stent diameter. There were 51 cumulative events over a mean follow up of 28 ± 14 months. EES was associated with lower frequency of the primary endpoint compared to SES/PES for treatment of DES ISR (16% vs. 22%), however this was not statistically significant (p=0.4). The individual secondary endpoints of death (4% vs 10%, p=0.06), TLR (13% vs.12%, P = 0.85), MI (8% vs 5%, P = 0.33), TVR (3.4% vs 3.1%, p=1.0) were not different between EES and SES/PES groups.
Conclusions: EES is associated with similar death, MI, or TLR when compared to SES/PES for the treatment of DES ISR. TLR rates remain high for DES ISR even in the second generation DES era, highlighting the need for aggressive risk factor modification and other potential therapies.

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