Usefulness of Cutting Balloon for Treating Very Calcified or Undilutable Coronary Lesions

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Background: Percutaneous coronary revascularization (%C) or nongravity calcified or undilutable coronary lesions remains a difficult problem. Rotational atherectomy has been shown to be a useful tool in this setting but remains technically demanding and associated with a non negligible rate of complications. The purpose of this study was to evaluate the role of Cutting (C) balloon catheter in such lesions.

Methods: Systematic use of C balloon in the treatment of undilutable lesions (resistant to balloon inflation > 16 atm or balloon nouter) or primary intention in highly calcified lesions was retrospectively evaluated from a database of 1,888 consecutive PCI (1999-2002).

Results: During this period C balloon was used in 105 patients (77 with in-stent restenosis and 28, with undilatable or highly calcified lesions). These 28 patients (15% of C) had a mean age of 73.9±8.5 years, 71.4% were male. Indication of C was unstable angina in 57.1% of cases, stable angina in 39.3% and silent ischemia in 3.5%. Indications of C balloon were unstable lesions in 16 lesions and highly calcified lesions in 20. C balloon primary crossing failure occurred in 6/54 lesions (11%): 4 lesions were successfully predilated using an undersized balloon catheter and C balloon crossing was obtained. One lesion was successfully predilated using very high pressure (22 atm.) and then stented. In the remaining lesions predilation failed. Successful opening of the lesion after C balloon crossing was obtained in 31/32 lesions using a mean C balloon size of 2.9±0.40 mm and inflation pressure of 9.7±3.2 atm. Rotablator was used successfully in 2 lesions: 1 after balloon predilation failure and 1 after failure to open the lesion with C balloon. A stent was used in 33/32 lesions and successfully positioned and deployed in all cases. Angiographic success (residual lesion < 30% and final TIMI 3 flow) was obtained in 100% of cases. MACE during hospitalization occurred in 7.1% of cases: non-Q-wave MI 7.1%, Q-wave MI 0.5%, emergency CABG 0% and death 3.5%. Conclusion: Cutting (C) balloon can be a useful tool for treating highly calcified or undilatable lesions. The limitation of the device is a relatively low rate of lesion crossing success.

Which is Better for Lesions With Arterial Positive Remodeling: Stenting or Atherectomy? Results of Stent Versus Atherectomy Randomized Trial

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Intravascular ultrasound (IVUS) studies have shown pre-interventional arterial positive remodeling (PAPR) causes worse clinical outcomes after coronary stenting. START (Stent versus Atherectomy Randomized Trial) was a randomized trial comparing angiographic and IVUS outcomes between primary stenting and aggressive DCA. This study aimed to examine the impact of PAPR on restenosis between the two devices. One hundred twenty-two lesions were randomly assigned to stent (62 lesions) or DCA group (60 lesions). post-procedural pressure post-intervention, lesion stenosis group. Aggressive debulking using IVUS was performed in the DCA group. There were no differences in baseline characteristics, and all procedures were successful without complications. Six month follow up (FU) angiography was performed in 118 lesions. Eligible serial IVUS images were available in 110 lesions (stent:56, DCA:54). PAPR was defined as pre-lesion / reference vessel area > 1.0. Twenty-seven lesions of the stent group and 16 lesions of the DCA group had PAPR. Quantitative coronary angiography and ultrasound results are shown in the table. Restenosis was defined as diameter stenosis at FU > 50%. In conclusion, stenting more accelerates neointimal proliferation compared with aggressive DCA, and it particularly shows a higher restenosis rate in lesions with PAPR. These results suggest that plaque debulking should be preferred to primary stenting for lesions with PAPR.

Results

<table>
<thead>
<tr>
<th>Reference vessel (mm)</th>
<th>MLD (mm)</th>
<th>Stenosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>Post-Pre</td>
<td>Post-Pre</td>
</tr>
<tr>
<td>Target lesion(GroupA)</td>
<td>1.92±0.35</td>
<td>0.78±0.37</td>
</tr>
<tr>
<td>Main vessel</td>
<td>2.04±0.51</td>
<td>1.69±0.65</td>
</tr>
<tr>
<td>Target lesion(GroupB)</td>
<td>2.75±0.55</td>
<td>2.32±0.95</td>
</tr>
<tr>
<td>Main vessel</td>
<td>2.40±0.60</td>
<td>1.71±0.74</td>
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</tbody>
</table>

P<0.05 vs DCA

Intervention in Saphenous Vein Grafts: A Predictive Model of Mortality Based on Clinical Presentation of 5,899 Consecutive Cases in the ACC-NCDR Registry


Background and Methods: Percutaneous coronary intervention (PCI) in saphenous vein grafts (SVG) may have unpredictable and potentially catastrophic outcomes due to the inherent instability of degenerative graft atheroma and thrombus. A predictive model based on clinical presentation would aid in evaluating beneficial versus risk in these patients. We utilized the ACC-NCDR registry, consisting of 145,482 SVG between 1998-2000, to analyze outcomes in 5,899 SVG procedures and to develop a nomogram to predict mortality based on clinical presentation.

Results: In this patient cohort, 47% had previous PCI, 25% were having an acute intervention, and 72% had Class III or IV angina. At least one stent was placed in 75% of cases, and 20% had multi-site PCI. Angiographic success was attained in 93%. There was a 1.46% in-hospital mortality rate. The acuity of the procedure was the single most predictive factor: elective procedures carried 0.6% mortality, urgent cases 1.2%, emergent procedures at 8.3%. SVG intervention is a marker for multi-vessel disease (p=0.0001, odds ratio 1.62 (1.41, 1.84)), and the presence of shock (p=0.0001, OR 8.87 (2.56, 29.24)). Multivariate analysis revealed six variables to be predictive: age (p=0.0001, odds ratio 1.82 (1.41, 2.34)) - 10 points for age 50 and 10 points for each 10-year increment; presence of shock (p=0.0001, OR 6.54 (3.31, 12.9)) - 54 points; emergent or salvage intervention (p=0.0001, OR 7.19 (2.49, 14.6)) - 71 points; 18 or more BMS, 20 or more lesions 1.5 points; renal failure (p=0.0001, OR 7.00 (0.69, 8.00)) - 6 points; EF <40% and 8 points every 10% decrement. A nomogram consisting of a score comprised of 52 points was highly predictive of mortality, with a mean absolute error of 0.002 of predicted vs. observed risk, up to 15% mortality. A score of less than 65 points predicted 1% or less risk, 152 points 5% risk, 177 points 10% risk, and more than 193 points 15% risk.

Conclusions: The number and diversity of the ACC-NCDR registry provides a format for post-procedural angiograms obtained from 691 patients with 506 lesions undergoing SVG intervention in a true evaluating the efficacy profile of the Percutech GuardWireTM distal protective device. Lesion morphology analysis included all 145,482 SVGs. The study was associated with higher AC, which may in part be explained by the small sample size of patients with such morphologic characteristics (SVGD > 75%: AC 13.6%; noAC 11.4% P=NS and SVGD > 75%: AC 7.6%; noAC 5.0% P=NS). Conclusions: The presence of angiographic evidence of thrombus and more extensive SVG degeneration increase the risk of angiographic complications during SVG intervention, emphasizing the importance of distal protection devices, especially in these complex lesion subsets.

Angiographic Indicators for the Use of Distal Protection Devices in Saphenous Vein Graft Interventions

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Background: Many new intracoronary devices have been developed to reduce the risk of percutaneous intervention in saphenous vein grafts (SVG). The safety and efficacy of some of these devices has previously been proven. It is however unclear if there are particular subgroups of patients that are at higher risk of complications and would thus derive greater benefit from the use of such devices. Methods: We analyzed baseline and post-procedural angiograms obtained from 691 patients with 506 lesions undergoing SVG intervention in a true evaluating the efficacy profile of the Percutech GuardWireTM distal protective device. Lesion morphology analysis included all 145,482 SVGs. The study was associated with higher AC, which may in part be explained by the small sample size of patients with such morphologic characteristics (SVGD > 75%: AC 13.6%; noAC 11.4% P=NS and SVGD > 75%: AC 7.6%; noAC 5.0% P=NS). Conclusions: The presence of angiographic evidence of thrombus and more extensive SVG degeneration increase the risk of angiographic complications during SVG intervention, emphasizing the importance of distal protection devices, especially in these complex lesion subsets.