Angiographic Characteristics and Procedural Results of Percutaneous Coronary Intervention for In-Stent Compared to Chronic Total Occlusion

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Background – The frequency of total restenosis occlusion pattern (Mehran classification type IV) of coronary stents range between 7%-10%. Pathology analysis of in-stent total occlusions revealed early neointima proliferation with late reduction in cellularity and a parallel increase in extra-cellular matrix deposition but no calcification. Accordingly, we hypothesized that intervention for in-stent chronic total occlusion (IS-CTO) would be at least as successful as and potentially safer than intervention to native CTO (N-CTO).

Methods – Using the RMC interventional cardiology data base we identified 24 patients who underwent PCI to IS-CTO [BMS (21/24, 88%), Cypher (3/24, 12%)] between 1.2004 and 3.2008. Patient characteristics, angiographic and procedural measures were compared to 119 patients who underwent PCI for N-CTO during the same period.

Results Median time from stent implantation to intervention was 18.5 (2-164) months. Patient baseline characteristics did not differ between groups with a trend for higher rates of diabetes among IS-CTO compared to N-CTO (54% vs. 34%, p=0.1). Location of CTO differed between groups with RCA/PDA dominated IS-CTO (67% vs. 32%, p=0.003). Also, proximal location was more frequent in IS-CTO (63% vs. 38%, p=0.045). Tapering of the stump, bridged collaterals and distal vessel visualization rates were similar among groups as well as use of stiff and hydrophilic wires. Procedural success rates were similarly high (83% vs. 84%, p=0.8). There were one dissection in the IS-CTO and no other complications while intervention to N-CTO was associated with 19 events (11 dissections, 3 acute thrombosis, 1 acute closure and 4 perforation). Overall intra-procedural complication rates did not differ statistically (4.2% vs. 16%, p=0.2).

Conclusions Intervention for IS-CTO is associated with similarly high success rates as PCI for N-CTO and carries an excellent safety profile. These data may support interventions for IS-CTO.