Coronary Stenting Approaches in the Treatment of Chronic Total Occlusion: A Contemporary Registry-Based Experience

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Background:
Chronic total occlusion (CTO) is a known prognostic indicator of post-procedural outcomes in the setting of coronary stenting. However, limited "real world" data exist regarding the long-term prognoses of patients who have undergone successful revascularization.

Methods:
All consecutive unselected patients undergoing stenting for CTO (n=272) were identified through an institutional registry. Procedural failure was defined as final diameter stenosis 30% or post-dilatation TIMI flow 3. Outcomes were assessed based on stenting type in the successful procedural cohort. Multivariate logistic regression analyses were used to account for known baseline cardiovascular risk imbalances. The primary endpoint was target vessel revascularization (TVR) at 2-year follow-up.

Results:
Overall procedural failure occurred in 55 (20.2%). Failed revascularization was independently associated with multivessel disease, lesion lengths 15mm, tortuous segments and presence of calcifications. Major complications included coronary dissection (10%) and perforation (2%). Of the successful procedures, 141 (64%) underwent pure drug-eluting stenting (DES), 46 (21%) pure bare-metal stenting (BMS) and 34 (15%) mixed (at least 1 BMS) stenting. At 2-year follow-up, fewer patients in the DES group required repeat revascularization compared to the mixed stenting group (6% vs. 26%, p=0.002). Mixed stenting was an independent predictor of long-term TVR (adjusted OR 2.1, 95% CI 1.1-4.1, p=0.02) compared to DES.

	Drug-Eluting Stenting	Mixed (≥1 Bare Metal Stent)	p
One year	**n=141**	**n=34**	
Death	2 (1.4%)	0 (0%)	0.5
Myocardial infarction	1 (0.7%)	0 (0%)	0.6
Definite stent thrombosis	0 (0%)	0 (0%)	1.0
Target vessel revascularization	6 (4.3%)	4 (11.8%)	0.1
Coronary artery bypass grafting	1 (0.7%)	1 (2.9%)	0.3
Major adverse cardiac events	10 (7.1%)	4 (11.8%)	0.4
Two years	**n=133**	**n=31**	
Death	2 (1.5%)	1 (3.2%)	0.5
Myocardial infarction	1 (0.8%)	4 (13%)	0.003
Definite stent thrombosis	0 (0%)	0 (0%)	1.0
Target vessel revascularization	8 (6%)	8 (26%)	0.002
Coronary artery bypass grafting	2 (1.5%)	3 (9.7%)	0.005
Major adverse cardiac events	13 (9.8%)	10 (32%)	0.003

Conclusions:

Failed revascularization of CTO lesions occur in a fifth of patients undergoing coronary stenting and appear to be associated with complex vessel anatomy. Our data suggest that DES use in this setting are associated with improved 2-year clinical endpoints compared with pure BMS or mixed stenting approaches.