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TCT-117 Impact of Proximal Cap Ambiguity on the Outcomes of Chronic Total Occlusion Intervention: Insights From the PROGRESS-CTO Registry

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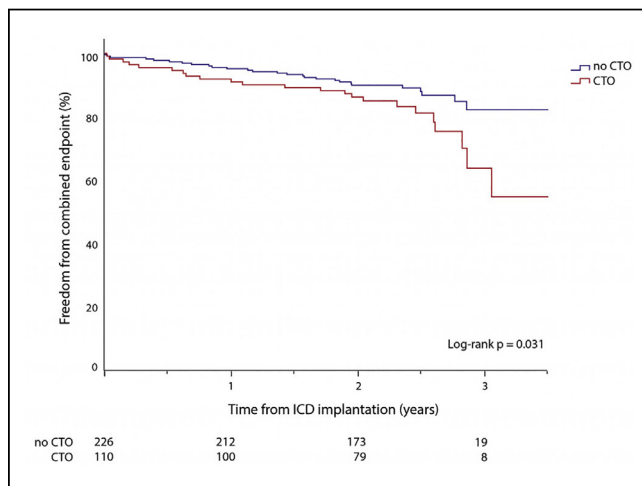
Authors

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BACKGROUND A chronic total occlusion (CTO) increases the risk for sudden cardiac death (SCD). An implantable cardioverter-defibrillator (ICD) is an important treatment option to prevent SCD in patients with ischemic cardiomyopathy. We aimed to investigate the impact of CTO on the risk for appropriate ICD shocks and mortality in a nationwide prospective cohort.

METHODS In the nationwide DO-IT registry, patients receiving an ICD for primary prevention in the Netherlands between September 2014 and June 2016 were included and prospectively followed for at least 2 years (n = 1,442). For this substudy, we identified patients with ischemic cardiomyopathy (n = 663) and reviewed all available coronary angiograms (n = 415) for the presence of a CTO. Revascularized CTOs were excluded (n = 79). Primary end point was the composite of all-cause mortality and appropriate ICD shocks.

RESULTS A total of 336 patients were included (67 ± 9 years old, 20.5% female). An unrevascularized CTO was observed in 110 patients (32.7%). The primary end point occurred in 21.1% of CTO patients (n = 23) and in 11.9% of no-CTO patients (n = 27; P = 0.034) during a median follow-up of 27 months (IQR 24-32). An unrevascularized CTO was an independent predictor for the primary end point (hazard ratio 1.77, 95% CI 1.01-3.08; P = 0.046), together with NYHA class ≥II and age, but not for the primary end point components separately.



CONCLUSION In this nationwide prospective registry of primary prevention ICD recipients, the presence of an unrevascularized CTO was associated with a higher incidence of the composite end point of all-cause mortality and appropriate ICD shocks.

CATEGORIES CORONARY: Complex and Higher Risk Procedures for Indicated Patients (CHIP)

TCT-116

Impact of Sex Differences on Changes in Myocardial Perfusion Following Percutaneous Coronary Intervention of Chronic Total Coronary Occlusions: A Serial [¹⁵O]H₂O Positron Emission Tomographic Perfusion Imaging Study



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BACKGROUND Data on sex differences in chronic total coronary occlusion (CTO) percutaneous coronary intervention (PCI) are scarce. Prior studies have demonstrated CTO PCI to reduce ischemia, however female patients are less likely to undergo revascularization. This study sought to investigate the impact of gender on myocardial perfusion changes following CTO PCI as measured by [¹⁵O]H₂O positron emission tomography (PET) perfusion imaging.

METHODS A total of 212 patients were prospectively enrolled in a single-center CTO registry and underwent single-vessel CTO PCI, combined with [¹⁵O]H₂O PET imaging at baseline and 3 months follow-up. Baseline and follow-up resting myocardial blood flow (MBF), hyperemic MBF and coronary flow reserve (CFR) allocated to the CTO territory were quantitatively assessed. The presence of residual ischemia was defined as hMBF ≤2.3 mL/min per g in the CTO area at follow-up.

RESULTS This study comprised 34 (16%) women and 178 (84%) men. Mean age in women was higher compared to men (68 ± 9 vs 61 ± 10 years, P < 0.01). In women, resting MBF at baseline was more elevated than in men (1.02 ± 0.24 vs 0.84 ± 0.21 mL/min per g, P < 0.01). Similarly, baseline hMBF was found to be higher in women (1.81 ± 0.53 vs 1.64 ± 0.53 mL/min per g, P = 0.03), and showed a higher increase after CTO PCI (Δ1.06 ± 0.71 vs Δ0.71 ± 0.66 mL/min per g, P = 0.01). Improvement in CFR after CTO PCI was more evident in female patients (Δ1.17 ± 1.04 vs Δ0.82 ± 0.89, P = 0.04). At 3-month follow-up, the proportion of patients with residual ischemia was lower in women vs men (9 (27%) vs 91 (51%), P = 0.01).

CONCLUSION We found a higher increase in hyperemic MBF and CFR following CTO PCI in women compared to men, as measured by serial [¹⁵O]H₂O PET imaging. In addition, lower rates of residual ischemia were observed in women. This study suggests the potential benefit of a lower threshold for CTO PCI in female patients.

CATEGORIES CORONARY: Complex and Higher Risk Procedures for Indicated Patients (CHIP)

TCT-117

Impact of Proximal Cap Ambiguity on the Outcomes of Chronic Total Occlusion Intervention: Insights From the PROGRESS-CTO Registry



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BACKGROUND The impact of proximal cap ambiguity on procedural techniques and outcomes of chronic total occlusion (CTO) percutaneous coronary intervention (PCI) has received limited study.

METHODS We examined the clinical and angiographic characteristics and procedural outcomes of 11,169 CTO PCIs performed in 10,932 patients at 42 US and non-US centers between 2012 and 2022.

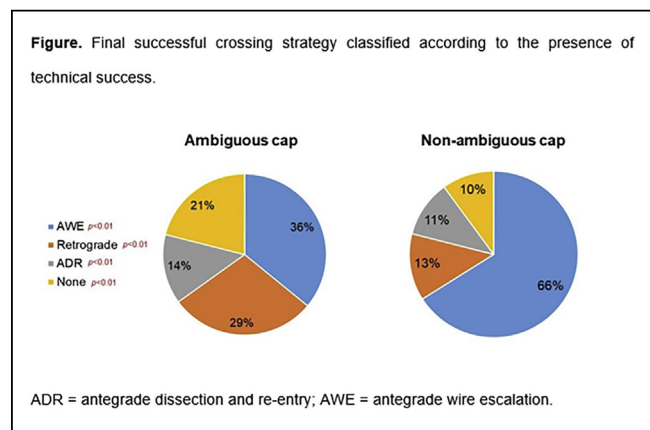
RESULTS Proximal cap ambiguity was present in 35% of CTO lesions. Patients whose lesions had proximal cap ambiguity were more likely to have had prior PCI (65% vs 59%; $P < 0.01$) and prior coronary artery bypass graft surgery (37% vs 24%; $P < 0.01$). Lesions with proximal cap ambiguity were more complex with higher J-CTO score (3.1 ± 1.0 vs 2.0 ± 1.2 ; $P < 0.01$) and lower technical (79% vs 90%; $P < 0.01$) and procedural success (77% vs 89%; $P < 0.01$) rates compared with non-ambiguous CTO lesions. The incidence of major adverse cardiovascular events (MACE) was higher in cases with proximal cap ambiguity (2.5% vs 1.7%; $P < 0.01$). The retrograde approach was more commonly used among cases with ambiguous proximal cap (51% vs 21%; $P < 0.01$) and was more likely to be the final successful crossing strategy (29% vs 13%; $P < 0.01$). PCIs of CTOs with ambiguous proximal cap required longer procedure time (140 [95-195] vs 105 [70-150] min; $P < 0.01$) and more contrast volume (225 [160-305] vs 200 [150-280] mL; $P < 0.01$).

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BACKGROUND The few randomized controlled trials (RCTs) on chronic total occlusion (CTO) percutaneous coronary interventions (PCI) are subject to selection bias.

METHODS We performed a meta-analysis of national and dedicated CTO PCI registries and compared patient characteristics and outcomes with those of RCTs that randomized patients to CTO PCI vs medical therapy. Given the large sample size differences between RCTs and registries, we focused on the absolute numbers and their clinical significance. We considered a 5% relative difference between groups to be potentially clinically relevant.

RESULTS From 2012 to 2022, 6 RCTs compared CTO PCI vs medical therapy ($n = 1,047$) and were compared with 15 registries (5 national and 10 dedicated CTO PCI registries). Compared with registry patients, RCT patients had fewer comorbidities, including diabetes, hypertension, previous myocardial infarction, and prior coronary artery bypass graft surgery. RCT patients had shorter CTO length (29.6 ± 19.7 vs 32.6 ± 23.0 mm, a relative difference of 9.2%) and lower J-CTO scores (2.0 ± 1.1 vs 2.3 ± 1.2 , a relative difference of 13%) compared with those enrolled in dedicated CTO registries. Procedural success was similar between RCTs (84.5%) and dedicated CTO registries (81.4%) but was lower in national registries (63.9%).



CONCLUSION Proximal cap ambiguity in CTO lesions is associated with higher utilization of the retrograde approach, lower technical and procedural success rates, and higher incidence of in-hospital MACE.

CATEGORIES CORONARY: Complex and Higher Risk Procedures for Indicated Patients (CHIP)

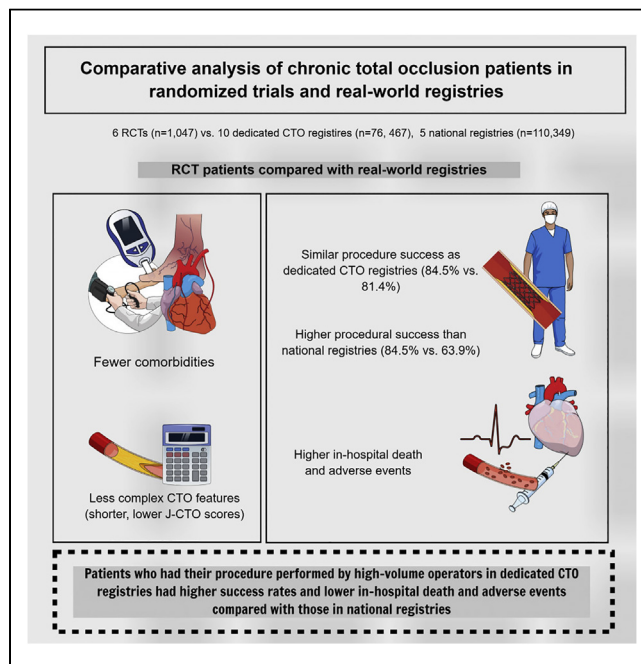
TCT-118

Comparative Analysis of Patients' Characteristics in Chronic Total Occlusion Revascularization Studies: Trials Versus Real-World Registries



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CONCLUSION There is a paucity of randomized data on CTO PCI outcomes (6 RCTs, 1,047 patients). These patients have lower-risk profiles and less complex CTOs than those in real-world registries. Current evidence from RCTs may not be representative of real-world patients and should be interpreted within its limitation.

CATEGORIES CORONARY: Complex and Higher Risk Procedures for Indicated Patients (CHIP)