

Echocardiographic assessment of the impact of percutaneous revascularisation of chronic total occlusion on myocardial function and electrical stability, two-year follow up period

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Background: Chronic total coronary occlusion (CTO) is frequent finding in patients with ischaemic heart disease, but it is not clear yet how it affects myocardial function, especially electrical stability. Myocardial strain by echocardiography can objectively quantify extent and timing of myocardial deformation. Echocardiographically derived dyssynchrony, mechanical dispersion, is good predictive tool for patients at risk of ventricular arrhythmias.

Purpose: The purpose of this study was to evaluate the influence of chronic total occlusion percutaneous coronary intervention (CTO PCI) on myocardial contractility and arrhythmogenicity.

Methods: We analysed total of 35 CTO patients (age 56 ± 9 , 86% male). Conventional echocardiographic exam with two dimensional speckle tracking echocardiography (2D STE) was performed before CTO PCI and after 24 months of follow-up. Peak longitudinal strain was assessed in 17 left

ventricular segments. 2D STE computed global longitudinal strain (GLS). Time intervals from start of Q/R on electrocardiogram to peak negative strain during the cardiac cycle were assessed. Mechanical dispersion was defined as the standard deviation of this time interval from 17 left ventricular segments, reflecting myocardial contraction heterogeneity.

Results: 24 months after CTO PCI patients showed no change in ejection fraction (EF) ($55.75 \pm 7.56\%$ vs. $56.03 \pm 6.29\%$, $p=0.622$). There was slight improvement in GLS ($-14.89 \pm 2.81\%$ vs. $-15.93 \pm 2.64\%$, $p<0.05$). Mechanical dispersion was significantly reduced ($62.78 \pm 23.44\text{ms}$ vs $47.96 \pm 12.10\text{ms}$, $p<0.001$)

Conclusion: CTO recanalization improved GLS without changes in left ventricular EF after 24 months. Mechanical dispersion as a surrogate for arrhythmogenic substrate was reduced by CTO PCI.