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Does recanalization of chronic total occlusion reflect on myocardial function?

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Background: Percutaneous coronary intervention for chronic total occlusion (PCI CTO) is still high risk procedure and it is doubtful will it become standard of care. There is evidence that it can reduce angina but even silent ischemia represent ischemic burden that ultimately lead to left ventricle remodeling and electrical instability.

Purpose: Our aim was to access effectiveness of percutaneous coronary intervention (PCI) when added to optimal medical therapy (OMT) on myocardial function.

Methods: We compared two groups of pts. First patients with percutaneous coronary intervention of chronic total occlusion with optimal medical therapy and second group - patients with only optimal medical therapy (control group). Echocardiographic exam was performed before randomization and after 6 months of follow-up. Doppler intervals- isovolumetric relaxation time (IVRT), isovolumetric contraction time (IVCT) and ejection time (ET) were measured. MPI (Myocardial performance index) is equal to the sum of the IVRT and IVCT divided by the ET. Velocity of early mitral wave (E) was divided by average peak early diastolic annular velocity (e"). Peak longitudinal strain was assessed in 17 left ventricular segments. Time intervals from start 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 intervals from 17 segments, reflecting myocardial contraction heterogeneity.

Results: A total of 94 age matched CTO patients (48 in PCI + OMT group and 46 in OMT) were analyzed. Changes in ejection fraction (EF), diastolic function represented by E/e", global cardiac function represented by MPI, global longitudinal strain (GLS) and myocardial dispersion changes were compared between groups. At follow up between groups in there was no significant change in ejection fraction (EF), diastolic function, GLS and mechanical dispersion, but there was improvement in MPI.

Conclusion: Myocardial performance index is sensitive marker which can detect subtle improvement in global myocardial function after recanalization of chronic total occlusion..

Variable	PCI + OMT (n = 46)			OMT (n = 48)			ΔOMT vs. ΔPCI + OMT p value
baseline	At 6month follow up	P value	baseline	At 6month follow up	P value		
EF (%)	55.69 ± 8.56	54.83 ± 8.44	0.10	50.22 ± 11.71	51.42 ± 10.45	0.06	0.71
MPI	0.676 ± 0.99	0.632 ± 0.96	<0.01*	0.593 ± 0.14	0.604 ± 0.12	0.22	<0.01*
E/e"	13.10 ± 6.90	12.05 ± 5,08	<0.05*	14,12 ± 5.70	13.02 ± 5.62	<0.05*	0.23
GLS (%)	-14,38 ± 3,38	-15,22 ± 3,68	<0.05*	-13.33 ± 3.43	-13.29 ± 3.42	0.87	0.07
Mechanical dispersion (ms)	63.89 ± 26.22	57.35 ± 27.33	<0.01*	53.30 ± 21.68	50.00 ± 22.40	0.05	0.06

Δ- percentage changes between baseline and at 6 month follow up