Clinical outcome in high-risk STEMI patients with multivessel disease: towards recanalization of CTOs following primary PCI
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Chapter 9

Relation of multivessel primary percutaneous coronary intervention for ST-elevation myocardial infarction to outcome and/or non-infarct artery intervention of a chronic total occlusion

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We read with interest the recent report by Cavender et al., questioning the guidelines and use of multivessel percutaneous coronary intervention (PCI) in the setting of ST elevation myocardial infarction (STEMI). The investigators concluded that multivessel primary PCI for STEMI does not improve in-hospital outcomes, even for patients with cardiogenic shock.

We recently investigated the impact of multivessel disease (MVD) with or without a chronic total occlusion (CTO) in a non-infarct related artery (IRA). From 1997 to 2005, we treated 3277 STEMI patients with primary PCI in our center. Patients were categorized as having single vessel disease (SVD), MVD without a CTO and MVD with a CTO in a non-IRA. We performed a “landmark survival analysis” to 5-year follow-up, with a landmark set at 30 days. A CTO in a non-IRA was a strong and independent predictor of 30-day mortality (adjusted Hazard Ratio [HR] 3.6, p<0.01), whereas MVD without a CTO was only a weak predictor of (adjusted HR 1.6, p<0.01). In 30-day survivors, a CTO in a non-IRA remained a strong predictor (adjusted HR 1.9 p<0.01), whereas MVD without a CTO lost its independent prognostic value. This was also true for a cohort of cardiogenic shock patients only. Furthermore, a CTO in a non-IRA was associated with a worse left ventricular function during hospitalization for the index event and a decrease in left ventricular function during follow-up. Patients with MVD without CTOs had a left ventricular function comparable to SVD patients.

In addition to the possible mechanisms by which revascularization of the non-IRA is associated with increased mortality mentioned by Cavender et al., our data suggest another possible mechanism. Because the presence of a total occlusion, rather than a stenosis in a non-IRA seems to drive the worse prognosis in STEMI patients with MVD, it is questionable if treatment of additional non-culprit lesions (with the exception of CTOs) will result in any clinical benefit.

Therefore, we recently initiated the Evaluating Xience V and left ventricular function in PCI on occlusions after STEMI (EXPLORE) trial, the first randomized clinical trial powered to investigate clinical outcome after the percutaneous treatment of CTOs. EXPLORE is a multicenter randomized clinical trial in which 300 STEMI patients treated with primary PCI with a CTO in a non-infarct related artery will be randomized to either PCI of the CTO in a staged procedure within 7 days after the index event or to standard medical post-STEMI treatment. The Explore trial will determine whether additional percutaneous treatment of a CTO after STEMI improves left ventricular ejection fraction and reduces left ventricular end diastolic volume measured by cardiac magnetic resonance imaging at four months follow-up.
References


