Reasonable Incomplete Revascularization Versus Complete Revascularization in Multi-Vessel PCI

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Incomplete coronary artery revascularization (IR) is known to be associated with increased incidence of death, myocardial infarction (MI), repeat revascularization, and angina compared with complete revascularization (CR) in patients with multi-vessel disease (MVD) who underwent percutaneous coronary intervention (PCI). MVD is defined as any non-revascularized vessel with > 1.5 mm diameter and 50 to 100 % diameter stenosis. The frequency of IR is ranged from 45 to 90 % of MVD PCI in current drug-eluting stent (DES) era. There are some factors which are reluctant to perform CR in MVD PCI. Patients with IR have higher prevalence of diabetes, renal insufficiency, complex anatomy, and are more older.

There are several considerations to avoid unnecessary multi-vessel PCI or CR: residual coronary anatomy, functional status, and coronary hemodynamics. The SYNTAX (Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery) score is a measure of degree and complexity of coronary anatomy. Recent studies reported that residual SYNTAX score after PCI is an indicator of long-term mortality and a new prognostic instrument – SRI (SYNTAX Revascularization Index) which is calculated by using baseline and residual SYNTAX score may be useful in assessing the degree of revascularization after PCI. Functional tests such as nuclear measurement of ischemic burden or cardiac magnetic resonance imaging are also useful to estimate IR risk profile. FFR (fractional flow reserve) is a coronary physiology-based modality to assist multi-vessel PCI, and the FAME (Fractional Flow Reserve Versus Angiography for Multivessel Evaluation) trial showed the usefulness of FFR-based multi-vessel PCI compared to conventional angiography-guided PCI. Furthermore, CR guided by FFR measurement reduces adverse cardiac outcomes compared with culprit-only PCI in the recent randomized trial (DANAMI-3-PRIMULTI) which compared CR and culprit-only PCI in ST-segment elevation MI and MVD. Extensive CR is hazardous and associated with increased peri-procedural and long-term adverse outcomes. Interventional cardiologists should consider each patient's status using anatomy, functional or physiology-guided modalities before determination of revascularization strategy.