

How to Optimize? Aspect of FFR Believer

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Percutaneous coronary intervention (PCI) restores blood flow of the ischemia related myocardium and helps improving clinical outcome of the patient. Luminal gain with balloon and stent angioplasty reduces pressure gradient between upstream and downstream of the target stenosis. Hyperemic coronary pressure gradient corresponds to proportionally same blood flow reduction. Fractional flow reserve (FFR) is a lesion-specific index for the determination of inducible myocardial ischemia. As FFR-guided revascularization provides favorable credits for future prognosis, post-PCI FFR value can provide information of residual ischemia burden including suboptimal lumen gain, mechanical peri-stent problem, and presence of concomitant serial/diffuse stenosis. FFR can be measured easily by using pressure wire as a workhorse wire of routine PCI procedure as well as immediate after PCI procedure. While gold standard assessment method of PCI optimization was an angiographic residual percent diameter stenosis (%DS), recent clinical studies demonstrated that intravascular imaging methods including intravascular ultrasound (IVUS) and optical coherence tomography (OCT) warrant better PCI optimization and target vessel revascularization (TLR) related clinical outcome. Post-PCI FFR value demonstrated correlation with IVUS and OCT derived stent cross-sectional area. Clinical studies consistently showed that higher post-PCI FFR related better clinical outcome. FFR recording with pressure pullback method can determine the specific point of pressure step up may related to mechanical problem of PCI procedure. Intra-stent pressure gradient may suggest focal stent underexpansion. Abrupt pressure gradient step-up around persistent area may suggest flow limiting dissection or intramural hematoma/thrombus formation even without angiographic visible dissection. Post-PCI FFR surrogate residual ischemia burden in case with concomitant serial/ diffuse stenosis. Once PCI performed upon FFR-guided decision, unexplained low post-PCI FFR value provide clinical needs of intravascular imaging evaluation for the PCI optimization. Cut-off value of post-PCI FFR related favorable clinical outcome from the large scaled cohort will add physiologic insight for clinical success of PCI and define factors associated with target vessel failure and residual ischemia burden. In summary, peri-procedural FFR/coronary physiology could offer guidance for better procedure optimization as well complimentary tool as intravascular imaging.