Coronary Endothelial Dysfunction Predicts Long-term Prognosis In Patients Undergoing First Generation Drug-eluting Stent Implantation

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Background: Fractional flow reserve (FFR) guided percutaneous coronary intervention (PCI) has been validated in the FAME trial, which demonstrated a statistically significant reduction in the composite of death or myocardial infarction compared to an angiographic-guided approach. At two years of follow-up, 3.2% of patients who had deferral of a FFR negative stenosis (> 0.80) returned for revascularization of the deferred lesion. Only 0.2% of the deferred lesions resulted in a late myocardial infarction (MI). We sought to evaluate the outcomes of FFR-deferred lesions in a community-based cardiac referral center.

Methods: A retrospective analysis was conducted of the FFR cases performed at Kaiser Permanente Medical Center in Santa Clara, CA over a two-year period. Outcomes of the patients who had deferral of FFR negative lesions were assessed out to two years.

Results: 5,558 patients underwent diagnostic coronary catheterization from 2010-2011. FFR was performed on 219 patients with a total of 224 intermediate coronary lesions undergoing hemodynamic FFR assessment. 144 stenoses (64.3% of total FFRs) were found to be <0.80 and PCI was deferred in these 140 patients. From this cohort, 38 lesions from a total of 32 patients returned for subsequent coronary angiography. Reasons for repeat angiography included post-cardiac transplant surveillance, stable angina, unstable angina, or MI. Of the 32 patients, 10 patients (7.1% of total deferred FFR patients) underwent revascularization of the originally deferred lesion, with 8 undergoing PCI and 2 undergoing CABG surgery. Average length from deferral to subsequent revascularization was 257 days. None of the originally deferred lesions resulted in a late MI or in-hospital death out to two years of follow-up.

Conclusions: Fractional flow reserve assessment has been increasingly adopted at our cardiac referral center and accounted for 3.9% of patients that underwent coronary angiography over the initial two years of adoption. FFR-guided therapy yielded outcomes that were comparable to that seen in the FAME study, with 7.1% of deferred lesions requiring revascularization and no deferred stenosis resulting in a subsequent MI or in-hospital death.