

CORONARY ARTERY DISEASE

Measuring FFR improves success of PCI

A study has shown that measurement of fractional flow reserve (FFR) to aid stent positioning during percutaneous coronary intervention (PCI) in patients with multivessel coronary artery disease decreases the risk of major adverse cardiac events within the subsequent year.

Coronary angiography is commonly used to identify ischemia-causing lesions that require stenting. FFR is the ratio of a stenotic artery's maximum blood flow to that of a normal artery, both of which can be easily measured during coronary angiography. Ischemia-causing coronary stenosis is defined as $FFR \leq 0.80$. Retrospective studies have indicated that FFR-guided PCI can improve event-free survival in patients with multivessel coronary artery disease. Tonino and colleagues designed a multicenter, randomized, controlled trial to compare the success of PCI guided by coronary angiography alone with PCI guided by FFR in addition to coronary angiography in patients with multivessel coronary artery disease.

The investigators used angiographic appearance and clinical data to identify all lesions with stenosis of $\geq 50\%$ of

the vessel's diameter in the 1,005 patients enrolled in the trial. Patients randomly assigned to the angiography-only group ($n = 496$) underwent stenting of all identified lesions. FFR was measured in the stenotic coronary arteries of the other 509 patients, and stenting was performed only on those lesions found to have $FFR \leq 0.80$. Significantly fewer stents were placed in patients assigned to FFR-guided PCI than in patients in the angiography-only group (1.9 versus 2.7). Fewer patients who received FFR-guided therapy experienced death, non-fatal myocardial infarction or repeat revascularization within the subsequent year, compared with patients who underwent PCI guided only by coronary angiography (13.2% versus 18.3%).

According to Nico Pijls, one of the study investigators, this trial demonstrates that by "using FFR systematically, we can make PCI a better, more effective and safer treatment."

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Original article Tonino, P.A. L. *et al.* Fractional flow reserve versus angiography for guiding percutaneous coronary intervention. *N. Engl. J. Med.* **360**, 213-224 (2009).

