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Pullback pressure gradient and treatment decisions in chronic coronary syndrome: a single-center experience

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Introduction: Fractional flow reserve (FFR) shows whether coronary stenosis is hemodynamically significant, but not how disease is distributed along the vessel. The pullback pressure gradient (PPG) fills this gap by distinguishing focal from diffuse disease.[1] We assessed how PPG-defined disease patterns influenced treatment decisions and functional results after percutaneous coronary intervention (PCI) in chronic coronary syndrome.

Patients and Methods: We retrospectively analyzed 86 patients (**Table 1**) from a single centre who underwent coronary angiography with FFR and PPG measurement. PPG was calculated from manual FFR pullbacks (CoroFlow v3.6, Abbott).[2] Patients were divided by FFR (≤0.80 or >0.80); in those with FFR ≤0.80, disease was classified as diffuse (PPG <0.46), mixed (PPG ≥0.46 and <0.63) or focal (PPG ≥0.63). We recorded treatment in each category and compared pre-PCI FFR, post-PCI FFR and the change in FFR (ΔFFR) between focal and mixed disease using two-sided Welch t-tests. Values are mean ± standard deviation.

Results: Forty-two patients (48.8%) had FFR ≤0.80: 12 with diffuse, 14 with mixed and 16 with focal disease (**Figure 1A**). All patients with diffuse disease were treated medically, whereas 11 of 14 with mixed

TABLE 1. Baseline characteristics of the study population (86 patients).

Characteristic	Cohort n = 86
Male sex, n (%)	53 (61.6)
Age, years	66.7 ± 10.1
Canadian Cardiovascular Society angina class, n (%)	
Class I	54 (62.8)
Class II	17 (19.8)
Class III	15 (17.4)
Class IV	0 (0.0)
Low-density lipoprotein cholesterol, mmol/L	2.7 ± 0.9
Creatinine, μmol/L	83.9 ± 27.5
Estimated glomerular filtration rate, mL/min/1.73 m²	78.9 ± 17.3
Arterial hypertension, n (%)	72 (83.7)
Hyperlipidaemia, n (%)	72 (83.7)
Diabetes mellitus, n (%)	26 (30.2)
Smoking, n (%)	33 (38.4)

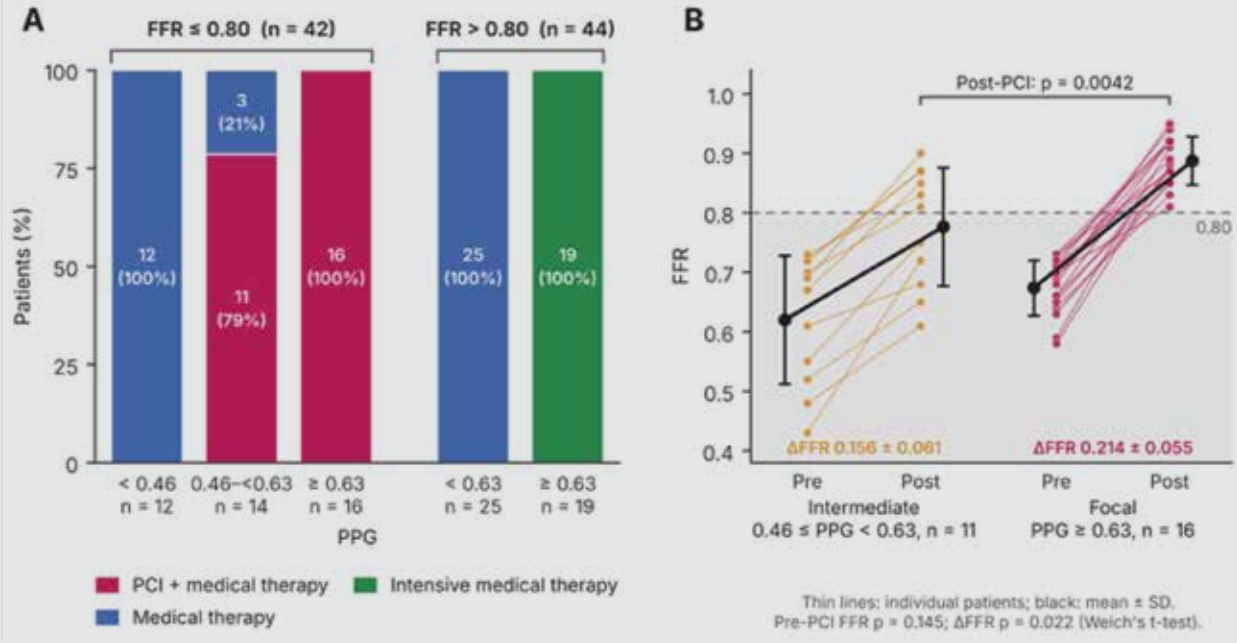


FIGURE 1. Treatment strategy by fractional flow reserve and pullback pressure gradient category (A), and fractional flow reserve before and after percutaneous coronary intervention in mixed and focal disease (B).

Abbreviations: FFR, fractional flow reserve; ΔFFR, change in fractional flow reserve after percutaneous coronary intervention (post-procedural minus pre-procedural value); PCI, percutaneous coronary intervention; PPG, pullback pressure gradient; SD, standard deviation.

and all 16 with focal disease underwent PCI. PCI was thus deferred in 15 of 42 patients (35.7%) despite FFR ≤0.80. The remaining 44 patients had FFR >0.80 and were managed medically, with intensified therapy in the 19 with PPG ≥0.63. Pre-PCI FFR did not differ significantly between focal and mixed disease (0.674 ± 0.047 vs 0.620 ± 0.108; p = 0.145). After PCI, however, FFR was higher in focal disease (0.888 ± 0.040 vs 0.776 ± 0.100; mean difference 0.111, 95% CI 0.042–0.180; p = 0.0042), reflecting a larger FFR gain (ΔFFR 0.214 ± 0.055 vs 0.156 ± 0.061; p = 0.022) (**Figure 1B**). Five of 11 patients (45.5%) with mixed disease still had a final FFR ≤0.80, compared with none with focal disease.

Conclusion: Adding PPG to FFR separated patients into distinct treatment pathways, and roughly one in three patients with FFR ≤0.80 did not undergo PCI. After PCI, focal disease was associated with a larger FFR gain and better final FFR than mixed disease despite similar baseline values, consistent with the PPG Global study.[3] Disease pattern therefore seems worth considering alongside FFR. Given the observational design and procedural endpoints only, these data cannot establish whether PCI deferral is safe or clinically beneficial.

LITERATURE

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