Collateral Flow Index to Assess Myocardial Viability: Chugh’s Hypothesis Revisited

To the Editor:

The article by Werner et al1 in the December 12, 2000, issue of Circulation provides further evidence that the collateral flow index can be used to quantify collaterals and correlates with the presence of preserved myocardial contractile function. This supports Chugh’s hypothesis, which was first put forward in 1997 and was published in the British Journal of Cardiology in 2000.2 Chugh’s hypothesis refers to the use of intracoronary Doppler and pressure studies to assess collateral flow index for quantifying collaterals as a means of assessing viability or the potential for recovery of infarcted myocardium.

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Response

We fully agree with Dr Chugh’s statement that both Doppler and pressure recordings are effective means of assessing collateral function in humans. In our study,1 we used Doppler velocimetry, but additional pressure recordings with the potential for obtaining measurements of collateral and microvascular function through collateral and peripheral resistance indices could have enhanced the assessment further.2 We recently reported our preliminary data on such a combined approach in chronic occlusions.3 On the basis of our experience with these techniques in chronic occlusions, however, we have some reservations about the suggested use of these invasive parameters as a surrogate for assessing viability distal to an occlusion.

A close association between viability and collateral function would assume that collaterals will not or will only inadequately develop in patients with large myocardial infarctions after the occlusion has occurred. We observed a difference in collateral flow index between patients with and without regional dysfunction, but the individual variability of collateral flow index among patients was considerable. Collateral function in a number of patients with impaired regional function reached similar levels to those of patients with normal regional function. Because of this considerable overlap of functional parameters between patient groups, we would not advocate the application of these invasive techniques as a substitute for other noninvasive methods of assessing myocardial viability. Therefore, on the basis of our data, we would not support Dr Chugh’s hypothesis.

Another issue raised in Dr Chugh’s letter—whether there is a “potential for recovery of infarcted myocardium” dependent on the collateral function present at the time of the recanalization—is certainly of interest. This question will be the focus of future studies but cannot be answered at the present time.

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