Caution Using Brachial Systolic Pressure to Calibrate Radial Tonometric Pressure Waveforms: Lessons From Invasive Study

To the Editor:

We were very interested to read the recent article by Segers et al.1 that prompted the correspondence from O’Rourke and Takazawa,2 who were concerned about the reliability of brachial artery tonometry and the lack of relevant invasive data, as well as the subsequent response from Segers et al.3

We have recently conducted an invasive study that may help resolve these issues. In 12 subjects (ages 51 to 80 years; 8 men) undergoing coronary angiography, measurements of arterial pressure were made using sensor-tipped intra-arterial wires in the proximal aorta and subclavian, brachial, and radial arteries. Data were recorded and analyzed as described previously.4 We found that systolic pressure rose progressively in the more peripheral arteries and was 5 mm Hg higher in the radial compared with the brachial artery (P<0.002; Table).

These findings confirm previous studies showing that there is amplification of brachial systolic pressure and pulse pressure compared with aortic pressure but also indicate that the degree of pressure augmentation between the brachial and radial arteries may be at least as large as the augmentation between the brachial and proximal aortas. These data lend support to the concerns expressed by Segers et al.5 regarding the current practice for the calibration of radial pressure waveforms to brachial artery pressure and directly address the reservations expressed by O’Rourke and Takazawa.2 We believe the approach used by Segers et al.1 using mean and diastolic pressures to calibrate radial pressure waveforms, offers a pragmatic solution to this problem.

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