



ELEVATED INTRALUMINAL VELOCITIES AFTER SUCCESSFUL RENAL ARTERY STENT INSERTION: IS IT TIME FOR NEW DUPLEX VELOCITY CRITERIA POST-STENTING?

ACC Poster Contributions

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Background: Percutaneous renal artery stenting is a common means of treating atherosclerotic renal artery stenosis. Follow-up post-renal stenting involves assessment of both clinical parameters as well as duplex ultrasound (DUS) to screen for in-stent restenosis (ISR). Whereas DUS is well validated for stenosis measurements in native renal arteries, precise cut-off criteria for stented renal arteries are controversial. Intraluminal stents may alter vessel compliance and increase velocity measurements, which in turn can lead to an overestimation of percent stenosis.

Methods: Routine DUS measurements, including peak systolic velocity (PSV) and renal/aortic velocity ratio (RAR), were obtained in 30 consecutive cases just prior and 1-3 months (1.2 month mean) after renal stent insertion. Pre- and post-procedure velocities were compared via student paired t-test. All renal arteries studied had less than 15% quantitative angiographic stenosis post-stenting. Published duplex cut-off criteria for > 60% stenosis were applied to screen for potential ISR (PSV > 180 cm/s, RAR > 3.5).

Results: Refractory hypertension was the primary indication for renal intervention in all patients (mean age 71.7 +/- 8.5 years, 67% females). 16 patients (70%) had a single renal artery intervention, and 7 had bilateral interventions. DUS parameters were significantly reduced following renal artery stenting (mean difference 121.7 +/- 30.4 cm/s and 1.7 +/- 0.5, $p < 0.001$). However, despite a reduction in pre-procedure velocities, the average velocities by DUS remained elevated (PSV mean 196.2 +/- 65.9 cm/s). Following renal stenting, 20 cases (66%) met criteria for ISR > 60% when applying the native vessel PSV cut-off. RAR appeared normal in most cases (26/30) after stenting (mean 2.4 +/- 1.1).

Conclusion: Peak systolic velocities frequently remain elevated above DUS criteria following renal stent insertion, despite no significant residual stenosis by angiography. RAR may be a more reliable measure to identify significant ISR post-renal stenting. PSV cut-off criteria must be corrected when screening for ISR to avoid overestimation of percent stenosis and unnecessary invasive diagnostics.