DISCUSSION

Dr Dennis Bandyk (San Diego, Calif). The Wake Forest University vascular group suggests that renal duplex ultrasound testing immediately following renal artery stent angioplasty can predict the development of restenosis. But, is that the intent of early duplex testing? The technical result of renal artery angioplasty should be assessed by angiography, pressure-gradient measurements, but also, by duplex ultrasound.

The authors chose to use peak systolic velocity >180 cm/s in the stented segment as the criteria for restenosis. The study group consisted of 92 treated arteries in 84 patients – 10 sites with a PSV > 180 cm/s were excluded. Only one-half of patients treated were included in the duplex outcome analysis; an important limitation of this study.

When an early (<1 week) duplex testing was performed on “technically successful” renal angioplasty sites, 10% demonstrated elevated velocity of a residual stenosis; and in the remainder, PSV velocity was increased in 38% of patients to indicate a restenosis had developed. Development of restenosis correlated with elevated preprocedure creatinine and the absence of bilateral disease, and the authors concluded a PSV of 107 cm/s or greater predicted the development of restenosis. I was not convinced by these findings despite my bias that duplex surveillance after angioplasty is of value: to exclude residual stenosis and identify hemodynamic failure of the angioplasty procedure.

My questions to the authors are:

1. Did early duplex testing predict reintervention, and if so, what were the duplex findings associated with reintervention? I think a PSV value of 300 cm/s would be a reasonable criterion for significant restenosis – how often did a renal stent stenosis of this severity occur?

2. Why exclude angioplasty sites with modest PSV elevation (ie, <250 cm/s)? In the 10 stents with a PSV > 180 cm/s, how many progressed and required reintervention?

3. Lastly, how do the authors suggest we use this information? The authors have demonstrated a trend, but the predictive value of their recommended duplex criteria is weak.

Dr Jason W. Christie. I will start with your last question first regarding how to use the value of 107 cm/s, which is the optimal cutoff value on the ROC curve for predicting restenosis. Using that value to guide surveillance is not necessarily what we are proposing. We were not proposing that velocity be used to help determine what you should do differently down the road in terms of surveillance but rather to use that velocity to determine what you should do differently at the time of the procedure. That could be repeating an angioplasty or inserting IVUS to see if there is some other technical failure that is not evident on the traditional measures of success such as digital subtraction angiography or intra-arterial pressure measurements. Therefore, that is what that number would guide. In terms of the criteria for reintervention, we do not use a specific duplex value to determine whether or not someone undergoes a reintervention. That is part of it, but then we only reintervene if they have a physiologically significant restenosis with ischemic nephropathy or severe hypertension and if they derived a benefit from the original intervention.