



Why is fixing the plumbing so difficult?

Fixing a blocked pipe seems easy to figure out: either put a new pipe inside the old one, or just replace the blocked pipe, and with less intervention there should be fewer problems. But when the pipes are arteries, fixing a blockage is not so simple. We have had many years to learn the nuances of coronary stenting and several years to recognize the foibles of aortic endovascular repair, yet controversies remain. Now we are embarking on a similar educational journey with carotid artery stenting.

Carotid and coronary stenting share several features. The vessels accumulate atherosclerotic plaque that may rupture and embolize downstream with devastating consequences; or the plaque, thrombosis, or intimal proliferation may occlude the vessel, causing distal ischemia. Brain or cardiac dysfunction may also result from smaller parenchymal vessel disease, and this must be distinguished from macrovessel occlusive disease in order to spare the patient a potentially useless vascular intervention.

A catheter-based procedure to expand the carotid lumen or seal over plaque would seem to be safer than endarterectomy, which requires general anesthesia. But the reality is not always so simple. In this issue of the *Journal* (page 892), Aksoy et al discuss the Carotid Revascularization Endarterectomy Versus Stenting Trial (CREST), a randomized outcome study of carotid stenting vs endarterectomy. With experienced surgeons known to have low complication rates and trained interventionalists (using an embolic protection device), the differences in the outcomes of the two procedures were minimal. There was a 1.2% absolute increase in the rate of perioperative myocardial infarction with endarterectomy and a 1.8% absolute increase in the rate of stroke (most classified as minor) with stenting. Hazard ratios had statistical significance, but the differences in absolute risk were truly small.

Overall complication rates in CREST were quite low; hence, the conclusions are not applicable to all operators—a usual caveat in applying procedural clinical trial data to our own patients.

In this patient population (described as having conventional risk), with skilled operators, to my eye there is little to *a priori* routinely recommend stenting over carotid surgery—not what I would have expected from this study. Nonetheless, it is imperative for our vascular interventionalist colleagues to continue to track detailed outcome data, as there may be subsets of patients who will receive greater benefit or decreased risk from one or the other procedure. Certainly, we will see specific patients in whom one or the other procedure will be favored, based on specific factors not evaluated in this or any other trial.

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