National trial shows carotid artery surgery and stenting equally effective in preventing stroke

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Physicians now have two safe and effective options to treat their patients at risk for stroke, says a researcher at Mayo Clinic who led a large, NIH-funded, national clinical trial testing surgery or use of a stent to open a blocked carotid artery.

The results, published in the May 26 online issue of the New England Journal of Medicine, also show "excellent safety and long term results for patients with warning signs for stroke as well as for patients without such warning signs," says the national principal investigator, Thomas G. Brott, M.D., professor of neurology and director for research at the Mayo Clinic campus in Florida.

Compared to other large international stroke prevention trials, Carotid Revascularization Endarterectomy vs. Stenting Trial (CREST) is unique in that approximately half of enrolled patients did not have symptoms of carotid disease, while the other half had experienced recent symptoms such as a minor non-disabling stroke or transient ischemic attack (TIA).

The CREST results can inform treatment decisions for both groups of patients, in contrast to results from recent trials completed in Europe. This is important because more than half of the approximately 140,000 carotid surgeries and stent procedures performed in the U.S. each year are performed for patients without symptoms.

Researchers say that while the findings show surgery and stenting had very good long-term outcomes, they differed in the weeks following the procedure — patients who received a stent had fewer heart attacks, and those treated surgically had fewer strokes. Age also made a difference, they say — people younger than 70 did slightly better with stents while those over 70 had better results with surgery.

"We now have two safe and effective methods to treat carotid artery disease that can be targeted to individual patients," says Mayo Clinic neurologist James Meschia, M.D., one of the study's principal co-authors. Such personalized decision-making should translate into improved patient outcomes.

Stroke, an interruption in blood flow to the brain, is the third leading cause of death in the United States. One major cause is the build-up of cholesterol in the carotid artery and the traditional effective treatment has been carotid endarterectomy (CEA), surgery to clear the blockage. More recently, vascular specialists have used carotid artery stenting (CAS), a less invasive procedure that involves threading a stent and expanding a small protective device in the artery to widen the blocked area and capture any dislodged plaque.

But it has been unclear what the comparative risks and benefits of these two procedures are. To find out, the National Institutes of Health funded the Carotid Revascularization Endarterectomy vs. Stenting Trial (CREST). One of the largest randomized stroke prevention trials ever undertaken, CREST enrolled 2,502 patients at 117 centers in the United States and Canada from 2000-2008.

Another strength of CREST is that it was conducted in large and small, public and private hospitals, Dr. Brott says. "The idea was to design a study that reflects the U.S. experience," he says.

Researchers specifically found that:

- After a median follow-up of 2.5 years, there was no difference in the estimated four-year rates of the study's endpoints — early stroke, heart attack, or death and later stroke - between CAS versus CEA — 7.2 percent in the CAS group and 6.8 percent in the CEA group.

- Differences were seen, however, depending on symptom status. In symptomatic patients, the rate of stroke and death in the estimated four-year rates was 8 percent in the CAS group and 6.4 percent in the CEA group, and in asymptomatic patients, the rates were 4.5 percent versus 2.7 percent respectively.

- In the weeks following a procedure, there were differences in outcome between CAS and CEA (death .7 vs. .3 percent, stroke 4.1 vs. 2.3 percent, heart attack 1.1 vs. 2.3 percent).

- There was a low risk of recurrent stroke in both CAS and CEA groups (2.0 vs. 2.4 percent).

Not only were outcomes good in symptomatic patients, they were even better in asymptomatic patients, which suggests the aggressive approach to stroke prevention in the U.S. is warranted, Dr. Brott says.

Limitations to the study include the fact that only one stent device was used and that CREST did not include an arm that randomized patients to use of drug therapy designed to prevent strokes.

"A vital next step is to understand the procedural risks of carotid stenting and endarterectomy in real world settings," says Walter J. Koroshetz, M.D., deputy director of the National Institute of Neurological Disorders

and Stroke, which funded the trial.

Provided by Mayo Clinic