

My patient has carotid stenosis. Should he get stenting or endarterectomy?

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Why is the study important?

Extracranial atherosclerotic disease is an important cause of stroke. Guidelines for practice are still sparse as to whether these patients will benefit more from angioplasty or endarterectomy and trials have shown conflicting results. The primary aim of the Carotid Revascularization Endarterectomy vs. Stenting Trial (CREST) was to compare the outcomes of carotid-artery stenting with those of carotid endarterectomy among patients with symptomatic or asymptomatic extracranial carotid stenosis.

Who were the participants? What was the intervention?

Patients were recruited from 108 centres in the United States and 9 in Canada. Centres assigned patients with symptomatic or asymptomatic carotid stenosis to undergo carotid-artery stenting or carotid endarterectomy. The primary composite end point was stroke, myocardial infarction, or death from any cause during the periprocedural period or any ipsilateral stroke within 4 years after randomization. 2502 patients were enrolled and followed up for a median of 2.5 years. 1271 patients were in the carotid artery stenting arm and 1251 in the carotid endarterectomy arm.

What were the findings?

There was no significant difference in the estimated 4-year rates of the primary end point between carotid-artery stenting and carotid endarterectomy (7.2% and 6.8%, respectively; hazard ratio for stenting, 1.11; 95% confidence interval [CI], 0.81 to 1.51; $p < 0.51$). Of the end-point events, 13 strokes were fatal (7 in the stenting group and 6 in the endarterectomy group), and 1 myocardial infarction was fatal (in the endarterectomy group). An interaction between age and treatment efficacy was detected ($p < 0.02$) with a crossover at an age of approximately 70 years. Carotid-artery stenting tended to show greater efficacy at younger ages, and carotid endarterectomy at older ages. The incidence of ipsilateral stroke was similarly low with carotid-artery stenting and with

carotid endarterectomy (2.0% and 2.4%, respectively; $p < 0.85$).

What were the conclusions?

CREST results indicate that carotid-artery stenting and carotid endarterectomy were associated with similar rates of the primary composite outcome which is periprocedural stroke, myocardial infarction, or death and subsequent ipsilateral stroke among men and women with either symptomatic or asymptomatic carotid stenosis. However, the incidence of periprocedural stroke was lower in the endarterectomy group than in the stenting group, whereas the incidence of periprocedural myocardial infarction was lower in the stenting group. The selection of patients for either carotid-artery stenting or carotid endarterectomy may require attention to age, with younger patients having a slightly better outcome with carotid artery stenting and older patients having a better outcome with carotid endarterectomy.

How can this study affect our clinical practice?

Although carotid disease is not a frequent cause of stroke in Pakistanis, it is important to appreciate that the intervention of angioplasty that appears relatively benign may be associated with more periprocedural stroke than CEA in the best of international centres. As we develop more sophisticated interventional centres in Pakistan, strict internal audit of both our CEA and CAS will guide the right intervention for our patients. At this point at least in Pakistan, CEA may be a better option due to local technical expertise.

Acknowledgement and Disclosure Statement

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Recommended Reading

1. Brott TG, Hobson RW 2nd, Howard G, Roubin GS, Clark WM, Brooks W, et al. Stenting versus endarterectomy for treatment of carotid-artery stenosis. *N Engl J Med* 2010; 363: 11-23.
2. Chimowitz MI, Lynn MJ, Derdeyn CP, Turan TN, Fiorella D, Lane BF, et al. Stenting versus aggressive medical therapy for intracranial arterial stenosis. *N Engl J Med* 2011; 365: 993-1003.

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