Asymptomatic carotid artery stenosis

Key concepts

● natural history: reveals low stroke rate (2%/yr), half of which are not disabling

● large randomized trials have revealed moderate surgical benefit versus medical management for: asymptomatic stenosis > 60%

● treatment selection criteria depend on the patient's age, gender, and comorbidities (and therefore life expectancy), and on perioperative complication rate

Practice guideline

● Level I: CEA is reasonable in asymptomatic patients with > 70% ICA stenosis if the risk of perioperative stroke, MI, and death is low

● Level II: It is reasonable to choose CEA over CAS when revascularization is indicated in older patients especially when the anatomy is unfavorable for endovascular intervention

● Level II: It is reasonable to choose CAS over CEA when revascularization is indicated in patients with anatomy unfavorable for surgery

● Level II: prophylactic CAS may be considered in highly selected patients with asymptomatic ICA stenosis (≥ 60% by angiography, > 70% by validated Doppler ultrasound), but the effectiveness compared to medical therapy alone is not well-established

● Level II: In patients with a high risk of complications by either CEA or CAS (includes: age > 80 years, NYHA heart failure class II or IV, LVEF < 30%, class III or OV angina pectoris, left main or multivessel CAD, need for cardiac surgery within 30 days, MI within 4 weeks, and severe chronic lung disease), the effectiveness of revascularization over medical therapy alone is not well-established [1].

Natural history

Prevalence of Carotid artery stenosis > 50% in men and women > 65 years of age is 5–10%, with 1% having stenosis > 80%.

Natural history studies reflect an annual stroke risk of 1–3.4% with asymptomatic carotid artery stenosis of 50–99% at 2–3 years.

A cohort study found similar cumulative rates of ipsilateral stroke over 10 years (9.3%, or 0.9%/year) and 15 years (16.6%, or 1.1 %/year).

Attempts to identify subgroups of patients with asymptomatic Carotid artery stenosis at elevated stroke risk suggest that the rate of unheralded stroke ipsilateral to a hemodynamically significant extracranial carotid artery stenosis is 1–2% annually, with some data suggesting that the stroke rate

may be higher with progressing stenosis or with more severe stenosis. Asymptomatic Carotid artery stenosis is an important marker of concomitant ischemic cardiac disease.

In the REACH Study, patients with asymptomatic Carotid artery stenosis (n=3164) had statistically significantly higher age- and sex-adjusted 1-year rates of transient ischemic attack, non-fatal stroke, fatal stroke, and cardiovascular death compared to patients without asymptomatic Carotid artery stenosis (n = 30 329).

Studies

Asymptomatic carotid artery stenosis studies.

Treatment

For asymptomatic carotid artery stenosis, CEA may be indicated for those with more than 60% stenosis, though each guideline has different suggestions in detail [2].

Outcome

Patients with asymptomatic Carotid artery stenosis (ACS) have severe atherosclerosis and, besides a moderate risk of stroke, are at high risk of myocardial infarction. Although screening for asymptomatic stenosis is not justified for the purpose of identifying patients for inappropriate intervention, ultrasound assessments of atherosclerosis severity may be useful in identifying patients at high risk, in whom intensive medical therapy would markedly reduce risk.

Indeed, the risk of myocardial infarction in ACS is higher than the risk of stroke. It is thus immaterial that randomized controlled trials have not been carried out to test the efficacy of interventions such as antiplatelet therapy. In the Veteran's Administration trial of ACS, patients with no prior history of coronary disease had a 33% 4-year risk of myocardial infarction. Among patients with diabetes, intracranial stenosis and peripheral vascular disease, the 4-year risk of a coronary event was 69%. It is axiomatic, therefore, that all patients with ACS should receive intensive medical therapy. However, despite a widespread belief that carotid endarterectomy (CEA) and stenting (CAS) are justified in ACS, most patients (~90%) with ACS would be better treated with intensive medical therapy than with either stenting or endarterectomy.

Cognitive function is only preserved in a few patients with asymptomatic carotid artery stenosis. Mild cognitive impairment can be precisely detected by performing the discrepancy analysis between crystallized and fluid intelligence tests [3].

Case series

There is a lack of information on the natural history of asymptomatic carotid artery stenosis (AsymCS) associated with cardiovascular diseases that require surgery. The aim of a study was to investigate risk factors for postoperative ipsilateral ischemic stroke and all-cause mortality after cardiovascular surgery in patients with AsymCS.

Among 2158 patients who underwent cardiovascular surgery, 150 patients with AsymCS who didn't undergo carotid revascularization were included. The relationships between preoperative factors, including carotid intraplaque hemorrhage (IPH), and postoperative ipsilateral ischemic stroke and all-cause mortality were analyzed retrospectively.

During the median follow-up of 1087 days of 150 patients with 19 IPH, 12 (8.0%) and 21 (14.0%) encountered ipsilateral infarction and all-cause mortality, respectively. Multivariable Cox regression analyses indicated that IPH was significantly predictive of both ipsilateral infarction (hazard ratio [HR] 21.31, 95% confidence interval [CI], 4.98-91.17; P ≤.001) and all-cause mortality (HR 4.64, 95% CI, 1.61-13.34; P = .004). Another significant factor was peak systolic velocity for ipsilateral infarction with the cutoff velocity of 227 cm/s by the receiver-operating characteristic curve.

In this cohort of patients with AsymCS undergoing cardiovascular surgery, IPH had a close connection with a high risk of both postoperative ischemic stroke and mortality after cardiovascular surgery [4)]

References

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