

Carotid Plaque and Stenosis: What Is the Best Management?

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Carotid atheroma is currently much more easily detected compared previous decades because of recent improvements in prevention program and examination modality, however, definite guideline for treatment is still on debates by its definition, experiences and strategy among the institutes. Asymptomatic carotid atherosclerosis defined as the presence of atherosclerotic narrowing of the internal carotid artery without symptom and a history of recent ipsilateral carotid territory ischemic stroke or transient ischemic attack (TIA). The cutoff which defined clinically significant carotid artery stenosis varies among studies, however, usually ranging from over 50 to 70 % stenosis. The prevalence of asymptomatic carotid stenosis is low in the general population, but increases with age, which is the most important risk factor. The most important consequence of carotid atherosclerosis is ischemic stroke, estimated per year risk of stroke with asymptomatic carotid atherosclerosis (stenosis $\geq 50\%$) is less than 1%. Noninvasive assessments of ICA include duplex ultrasonography (DUS), contrast-enhanced MRA, and computed tomographic angiography. In the absence of a practical strategy for targeting screening to individuals with high risk, we suggest not screening asymptomatic individuals for carotid artery stenosis. Asymptomatic carotid atherosclerosis itself is also an indefinite marker of increased risk for coronary event and vascular death. Patients with asymptomatic carotid stenosis should receive intensive medical therapy for risk reduction strategies including dyslipidemia, antithrombotic management, hypertension, lifestyle modification consisting of smoking cessation, limited alcohol intake, weight reduction, regular aerobic exercise. For medically stable patients who have a life expectancy of at least five years and a high grade ($\geq 80\%$) asymptomatic carotid stenosis at baseline or have progression to $\geq 80\%$ stenosis despite intensive medical therapy is usually recommended for carotid endarterectomy (CEA) which risk for perioperative event is less than 3 %. Recently, both carotid artery angioplasty and stenting (CAS) and CEA provide similar long-term outcomes for patients with asymptomatic and symptomatic carotid occlusive disease, however, the periprocedural risk of stroke and death is higher with CAS. CAS for asymptomatic carotid artery stenosis usually not recommended unless periprocedural risk as listed low ($<3\%$). Symptomatic carotid disease has clinical manifestation defined as any neurologic symptoms within the previous 4 to 6 months. Strategy modality for patients with symptomatic carotid stenosis includes carotid CEA, CAS, and medical management. We should investigate risk-benefits regarding revascularization with CEA or CAS according to the perioperative risk of stroke and death for the surgeon, operator, or center less than 6%. For patients with recently symptomatic carotid stenosis of 70-99 % who have a life

expectancy of at least five years, we recommend CEA rather than medical management alone. For patients with recently symptomatic carotid stenosis of 70 to 99 % who have a life expectancy of at least five years, we suggest CEA rather than CAS when the following conditions apply. For patients with symptomatic carotid disease, the perioperative risk of stroke or death for patients age 70 years and older is approximately two-fold higher with CAS compared with CEA. For select patients with recently symptomatic carotid stenosis of 70 to 99 %, we suggest CAS rather than CEA if any, a carotid lesion that is not suitable for surgical access, radiation-induced vasculopathy, multiple co-morbidities for anesthesia and surgery; however, it is still unclear for better outcome if revascularization is better than medical management for this group. For patients age 70 years and older, the benefit-to-risk ratio of CAS is unknown. For men with recently symptomatic carotid stenosis of 50 to 69 percent who have a life expectancy of at least five years, we suggest CEA rather than medical management. We recommend medical management rather than CEA or CAS for patients with symptomatic carotid stenosis that is less than 50 %. For patients with carotid stenosis and a non-disabling stroke or transient ischemic attack (TIA), we suggest that CEA be performed within two weeks (but not within the first two days) of the last symptomatic event rather than a later time. CEA is not beneficial for patients with elderly patients, hemispheric TIA, coexisting severe contralateral carotid stenosis or occlusion. The benefit of CEA or CAS for patients with moderate to severe ischemic stroke has not been still evaluated in randomized controlled trials, and patients with an ipsilateral stroke who have persistent disabling neurologic deficits are unlikely to benefit from any revascularization modalities which need maximal medical therapy for secondary prevention.