

ASYMPTOMATIC CAROTID RECONSTRUCTION BEFORE CABG – NO

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The optimal management of patients with multisite artery disease is difficult because these patients are not involved in randomized trials. The frequency of patients with $\geq 70\%$ carotid stenosis and concomitant coronary diseases requiring coronary artery bypass ranges from 0.2% (younger than 50 years) to 3.1% in men (≥ 80 years) and 0.1% and 0.9% in women (≥ 80 years). Other investigators found a 4-10% frequency of carotid stenosis ($\geq 80\%$) among patients screened for CABG.

Complications, risk factors for stroke, the impact of symptomatic and asymptomatic stenosis

The overall incidence of perioperative stroke was 2.8%, in more than 13 000 CABG patients, majority of them within the first postoperative day. The incidence of perioperative stroke depends not only on the severity of stenosis (ca.50% of stroke sufferers did not have significant carotid disease!) but also on the number of risk factors and concomitant diseases. The factors for increased risk of stroke are as follows: age ≥ 75 years, carotid stenosis, diabetes, hypertension, chronic renal insufficiency, previous MI or cardiac surgery, peripheral vascular disease, urgent operation, cardiopulmonary bypass time, moderate/severe left ventricular dysfunction, low cardiac output syndrome, atrial fibrillation, need for intraoperative hemofiltration, combination of CABG with valve surgery (7.4%) and previous stroke. A meta-analysis of patients with carotid stenosis undergoing CABG reported a risk of perioperative stroke of 8.5% in patients with previous TIA/stroke versus 2.2% in asymptomatic patients. The status of ascending aorta (as a possible source of emboli) should be also investigated. The manipulations of ascending aorta including cross-clamping, cannulation, and proximal graft anastomosis might increase the stroke risk even without carotid stenosis.

While a recent analysis demonstrated, that in symptomatic patients with a 50–99% stenosis or occlusion have a 7.4% stroke risk, increasing to 9.1% in patients with 80–99% stenosis or occlusion, the prevalence of ipsilateral stroke was only 2.0% in patients with unilateral and *asymptomatic* 50–99% stenosis. In this group, the risk did not appear to increase with stenosis severity. But the *asymptomatic* patients with *bilateral* 50–99% stenosis or a 50–99% stenosis associated with a contralateral *occlusion*, have higher risk for stroke (6.5%) following cardiac surgery, whereas the risk of death/stroke was 9.1%.

The carotid plaque analysis is mandatory before any intervention. Recent observations demonstrated that the plaques on carotid ultrasound increase the risk of stroke and/or death. The 3-year risk of stroke or death was only 1,9% in *asymptomatic* carotid patients but 4.4% with one ulcer and 18.2% with three or more ulcers. The annual stroke risk was 1% in *asymptomatic* patients without echolucency and microemboli on transcranial Doppler, but 8% in the group of microemboli+echolucency patients.

The timing of carotid revascularization and cardiac surgery

The combined CEA–CABG represented 1,1% of all CABG performed in the USA (10 years period) with a stroke rate of 3.9%, a stroke or death rate of 8.6%.

It is important to mention, that the overall complications rate (mortality, stroke, cardiac, wound, respiratory complications etc.) was significantly less in *synchronous* CEA and CABG than in the staged one 42,6 % vs. 48,4%.

If the CEA *preceded* the CABG, the data reported about death, stroke or MI rate was 13% (death 4%, stroke 2%, MI 6%).

So, if a severe carotid stenosis is detected prior CABG, the indication and urgency of CABG should be reassessed:

- severity of stenosis (unilateral? bilateral stenosis or contralateral occlusion)?
- stable or unstable carotid plaque (ulceration on carotid ultrasound or MRI? microemboli on transcranial Doppler)?
- asymptomatic silent ipsilateral brain infarct on MRI?
- estimated complication rate for the carotid intervention?
- stable or unstable coronary disease?

If *asymptomatic* but hemodynamically relevant stenosis found:

- with *stable unilateral* carotid plaque and no silent ipsilateral infarct in the brain CABG

- without carotid reconstruction. (If the estimated death/stroke risk associated to the carotid procedure exceeds 3%, then the carotid stenosis should not be treated).
- if the *unilateral* carotid plaque *stable*, but silent ipsilateral brain infarct was detected on the MRI carotid stenting (CAS) followed by CABG (synchronous if instable CABG).
 - if the *unilateral* carotid plaque *instable* (ulcerations, microemboli and silent ipsilateral brain infarct) (CEA) followed by CABG (synchronous if instable CABG)
 - if *bilateral* carotid stenosis ($\geq 80\%$) or contralateral occlusion and *stable* carotid plaque CAS followed by CABG (synchronous if instable CABG).
 - if *bilateral* carotid stenosis ($\geq 80\%$) or contralateral occlusion is associated with *instable* carotid plaque (silent ipsilateral infarct or plaque ulceration with or without microemboli) CEA followed by CABG (synchronous if instable CABG).

Summary: CEA in *asymptomatic* carotid stenosis should not precede CABG *routinely* except a small group of patients (*instable* carotid plaque and *silent* infarcts in unilateral patients and the group of bilateral stenosis (or contralateral occlusion) patients with *instable* plaque. Irrespective of the revascularization strategy, lifestyle modification and pharmacologic intervention should be also the part of long-term strategy.

References

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