Ultrasound surveillance after CAS and CEA: what's the evidence?

The rationale of clinical and Duplex ultrasound (DUS) surveillance after carotid endarterectomy (CEA) and carotid artery stenting (CAS) is the detection of recurrent stenoses and the prevention of future carotid-related cerebral ischemic events. This paper addresses the evidence for this approach. The multicenter randomized controlled trials (RCTs) published between 1990 and 2013 were reviewed with respect to DUS surveillance intervals, recurrent stenoses rates and recurrent ipsilateral stroke rates. In addition a Medline literature search from January 1990 until February 2014 was performed by use of the following keywords: "surveillance"; "carotid endarterectomy"; "carotid stenting"; "carotid artery surveillance"; "carotid artery stenosis". Finally we analyzed all carotid-related guidelines published between 2006 and 2013 for recommendations on DUS surveillance after CEA or CAS. Nine RCT protocols (NASCET, ECST, ACST, ACAS, CAVATAS, SAPPHIRE, EVA-3S, CREST, and SPACE) showed similar follow-up intervals (at 1 month, 3 or 4 and at 6, and 12 months after CAS and CEA, then at least once a year). The incidence of a recurrent carotid stenosis (>=50%) or occlusion ranged around 6% four years after CEA or CAS. The annual incidence of any ipsilateral cerebral ischemic event was about 1% and 0.5% after CEA for a symptomatic or an asymptomatic stenosis respectively. Since the overall
incidence of carotid recurrent stenosis and postprocedural strokes is low, DUS is questioned as necessary for all patients after CEA and CAS in prospective single center series. However, certain subgroups of patients (women, diabetics, patients with dyslipidemia, smokers) might have increased rates of restenosis after CEA or CAS. Data on DUS surveillance intervals following CAS is rare. Three out of 21 identified guidelines recommend long-term DUS surveillance, as the benefits are considered to exceed the risks. However, the level of evidence for any recommendation on DUS surveillance is consistently low. Our literature review reveals only little evidence to support routine DUS after CEA within short intervals. Currently a practice with one periprocedural DUS and one DUS after 12 months after CEA seems to be reasonable. In patients with an ipsilateral restenosis>=50%, contralateral disease progression>=50% and in patients who are considered to be at higher risk of restenosis further DUS surveillance seems appropriate. Due to inconsistent long-term data on surveillance after CAS imaging at 6 months and then annually seems reasonable. Further studies on DUS surveillance are necessary.

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