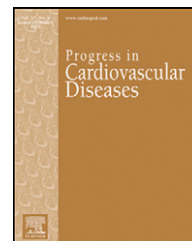


Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

[www.onlinepcd.com](http://www.onlinepcd.com)

# Symptomatic Carotid Artery Disease: Revascularization <sup>☆</sup>



Piero Montorsi<sup>a</sup>, Stefano Galli<sup>a</sup>, Paolo M. Ravagnani<sup>a</sup>, Marco Roffi<sup>b,\*</sup>

<sup>a</sup>Department of Clinical Sciences and Community Health, University of Milan, Centro Cardiologico Monzino, IRCCS, Milan, Italy

<sup>b</sup>Division of Cardiology, University Hospital, Geneva, Switzerland

## ARTICLE INFO

### Keywords:

Carotid artery stenosis  
Carotid stenting  
Carotid endarterectomy  
Randomized trials  
Review  
Emboic protection  
Stents

## ABSTRACT

Patients with symptomatic carotid artery disease should be managed by a multidisciplinary team including neurologists, vascular surgeons and interventionalists. Duplex ultrasound is the most widely used diagnostic modality to assess carotid disease, followed by additional imaging tests (CT- or MR-angiography) to confirm the severity of the stenosis, detect brain lesions, and assess intracranial circulation as well as the supra-aortic anatomy. Although overall randomized trial results favored (CEA) over carotid artery stenting (CAS) in symptomatic patients, this was likely related to the insufficient expertise of the endovascular specialists in several of the trials. CAS should be considered as a valid alternative to CEA in patients with favorable anatomy and in those at high-surgical risk, provided it is performed by experienced operators in high volume centers. Under those circumstances, it is reasonable to offer the patients the two options (CEA or CAS) after description of pros and cons of each therapy. CAS results may be further improved by better patient selection, new techniques, and technology advancements.

© 2017 Published by Elsevier Inc.

## Contents

Introduction . . . . .	602
Symptomatic carotid stenosis . . . . .	602
Timing of carotid revascularization . . . . .	602
Carotid endarterectomy . . . . .	603
Randomized trials of CEA vs. medical treatment . . . . .	603
Carotid artery stenting . . . . .	603
Randomized controlled trials of CEA vs. CAS in symptomatic patients: in-hospital and 30-day events . . . . .	604
Meta-analysis of the RCTs . . . . .	605
Randomized controlled trials of CEA vs. CAS in symptomatic patients: long-term outcomes . . . . .	605
Large-scale CAS vs. CEA registries . . . . .	606
Symptomatic carotid disease: how to improve outcomes . . . . .	607
Patient selection and risk stratification . . . . .	607
Pharmacologic treatment . . . . .	607

<sup>☆</sup> Statement of Conflict of Interest: see page 609.

\* Address reprint requests to Professor Marco Roffi, Division of Cardiology, Geneva University Hospitals, Rue Gabrielle-Perret Gentil 4, 1211 Geneva, 14, Switzerland.

E-mail address: [marco.roffi@hcuge.ch](mailto:marco.roffi@hcuge.ch) (M. Roffi).

<http://dx.doi.org/10.1016/j.pcad.2017.04.002>

0033-0620/© 2017 Published by Elsevier Inc.

Improving CAS . . . . .	608
Proximal embolic protection . . . . .	608
Double layer mesh stents . . . . .	608
Transradial approach . . . . .	609
Conclusions . . . . .	609
Statement of conflict of interest . . . . .	609
Acknowledgments . . . . .	609
References . . . . .	609

## Introduction

Stroke is the third most common cause of death worldwide, behind cardiac disease and cancer, and is the number one condition associated with serious, long-term disability. In the United States, each year approximately 800,000 people experience a new or recurrent stroke, at a cost of \$33 billion in 2011; those costs are expected to triple by 2030. Of all strokes, 85% are ischemic in nature and 15%–25% of ischemic strokes are caused by carotid artery disease.<sup>1</sup> The primary mechanism of stroke due to carotid stenosis is embolism to the intracranial vasculature of thrombotic material or atherosclerotic debris, secondary to rupture of a vulnerable carotid plaque. Similarly to acute myocardial infarction, the first stroke is an unheralded event in approximately 80% of patients. In the Asymptomatic Carotid Surgery trial (ACST), half of ipsilateral ischemic strokes in patients with >60% prior asymptomatic carotid stenosis were disabling or fatal, underscoring the importance of prevention.<sup>2</sup>

Independently of the revascularization strategy adopted [conservative, carotid endarterectomy (CEA), or carotid artery stenting (CAS)], therapeutic interventions for carotid artery disease include an aggressive control of modifiable cardiovascular risk factors, especially those linked to cerebrovascular events, such as hypertension, diabetes and smoking, as well as pharmacologic treatment with statins and antiplatelet drugs. While the standard of care of carotid revascularization is CEA (Table 1), in the last 15 years CAS has emerged as an alternative to surgery.<sup>3</sup> Symptomatic patients (i.e. patients with a cerebrovascular ischemic event – either stroke or transient ischemic attack [TIA] – in the preceding six months related to a carotid stenosis) are at the greatest risk of a recurrent neurologic event. However, at the same time they derive the greatest benefit from carotid revascularization. As the rate of recurrence is the highest in the first couple of weeks after a first neurologic event, timely work-up and treatment are essential.

## Symptomatic carotid stenosis

Symptomatic carotid stenosis may cause retinal (ipsilateral amaurosis fugax) or hemispherical ischemia (sudden onset of numbness, paresthesias, slurred speech, weakness) that is either transient or persistent. A careful neurological work-up is indicated in symptomatic patients to rule out symptoms

not related to carotid stenosis such as diplopia, dizziness, vertigo, syncope, blurred vision, memory loss or dementia, being lightheaded, cortical blindness, fall without focal weakness as well as other causes of cerebral ischemia such as cardiac or aortic embolism and intracranial atherosclerosis.<sup>4</sup> Debate exists about the 6-month window from symptom onset to define symptomatic carotid stenosis, as was arbitrarily chosen in the majority of clinical trials. As the risk of a recurrent ischemic event after few weeks decreases to a rate similar to that found in asymptomatic carotid stenosis, a time interval of three months has been recently proposed to define symptomatic carotid stenosis.<sup>5</sup>

In order to qualify for carotid revascularization, cerebral ischemia should be associated with at least a > 50% carotid diameter stenosis; findings that increase the risk of recurrent events include lesion length > 20 mm, irregular surface, ulceration/thrombotic component/hemorrhage, and high lipid content.<sup>6</sup> The same characteristics also increase the risk of embolization during revascularization with both CEA and CAS. Duplex ultrasound (DUS) is the first-line diagnostic tool in patients with suspected symptomatic carotid stenosis, with a sensitivity and specificity of 99% and 84% compared with angiography, respectively. In patients deemed candidates for carotid revascularization based on DUS, an additional carotid as well as brain imaging modality – with computed tomographic or magnetic resonance angiography (CTA and MRA) – is indicated to confirm the degree of stenosis and define the intracranial collateral circulation as well as the anatomy of the aortic arch and supra-aortic vessels. In particular, this information is critical to assess the suitability for CAS. While no consensus exists on the optimal preoperative imaging, a systematic association of DUS and CTA compared with DUS plus MRA has been found to be more cost-effective.<sup>7</sup>

## Timing of carotid revascularization

A systematic review and meta-analysis assessed the stroke risk after an initial TIA of any etiology in 18 cohorts, including a total of 10,126 patients. Overall, the five-day rate of stroke was 5.2% while it ranged between 0% and 13.8%.<sup>8</sup> The lowest risk was seen in studies performed by stroke specialists, suggesting that early dedicated work-up and treatment may be beneficial in recurrence prevention. Similar rates of recurrence have been reported after a minor stroke.<sup>9</sup> Risk scores have been published to predict early risk of stroke after a TIA with overall good predictive values.<sup>10</sup> The pooled

Download English Version:

<https://daneshyari.com/en/article/5619562>

Download Persian Version:

<https://daneshyari.com/article/5619562>

[Daneshyari.com](https://daneshyari.com)