

Urgent carotid endarterectomy

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Surgery has for many years been considered, by physicians all over the world, the best option for the treatment of carotid artery stenosis. It requires an endarterectomy (a surgical “clearing technique”) of the carotid bifurcation and of the first part of the internal carotid artery. The procedure can be used in different ways depending on the surgeon and his experience and on the anatomy of the carotid. It can be performed using an eversion technique or with a longitudinal arteriotomy and reconstruction with patch angioplasty.

This surgical technique started to become more widespread in the 1990s with the publication of some large randomised controlled clinical trials on symptomatic patients.

The two most important clinical trials were: NASCET (the North American Symptomatic Carotid Endarterectomy Trial) (1) and ECST (the European Carotid Surgery Trial) (2). They studied medical vs surgical treatment for carotid stenosis in patients with recent cerebral ischaemia and proved very significant for the medical and surgical sciences, also because they represented the starting point of methods for assessing the degree of internal carotid stenosis.

The NASCET method calculates the degree of stenosis from the diameter of the internal carotid, while the ECST system estimates the degree of the stenosis from the carotid bifurcation.

Both these trials randomised about 4000 patients who were studied for a period of three years. The results on cerebral ischaemia were the same in the two studies. Patients with more than 70% internal carotid stenosis were treated successfully with surgery, and patients with less than 50% internal carotid stenosis were treated successfully with medical therapy. In patients with 50-70% internal carotid stenosis, outcome was not influenced differently by surgical or medical treatment.

Starting from these results, Italian medical doctors and surgeons created the SPREAD guidelines (www.SPREAD.it) (3) with the support of the major scientific societies.

These guidelines were the starting point for treatment of carotid stenosis with angioplasty and stenting, now used for many years as an alternative to carotid endarterectomy (CE) (4). However, in the literature, most studies demonstrate the supremacy of surgery to stenting as regards mortality and cerebral ischaemia episodes (5).

Today, CE is the method of choice for the treatment of carotid stenosis in both symptomatic as well as asymptomatic patients (6).

Two clinical situations are most frequently encountered in symptomatic patients:

- single or repeated TIAs (crescendo TIA);
- recent stroke.

An urgent CE is often required to:

- reduce the evolution of TIA into stroke (in the case of repeated TIA or crescendo TIA);
- shrink the ischaemic cerebral area and minimise functional damage (stroke in evolution);
- reduce the risk of a second stroke.

The first condition (single or repeated TIA) was studied by many clinical trials in the 1990s (as mentioned before) and led to the creation of the guidelines referred to previously (7).

In carotid surgery, a recent metanalysis (8) on NASCET and ECST data revealed that the time between the onset of TIA and surgery is the most important factor for reducing risk.

The benefit of surgery is very high if the surgical procedure is performed within the first two weeks of the ischaemic event. The benefit decreases proportionally with the delay in surgery (Fig. 1).

From the same data derives the suggestion advanced by SPREAD: “in the case of carotid stenosis of more than 50% (NASCET method) and TIA or minor stroke, an urgent endarterectomy is suggested within two weeks of the clinical event”.

For this reason, the interval of time used (NASCET and ECST) to consider carotid stenosis symptomatic has been reduced from 6 months to 3 months.

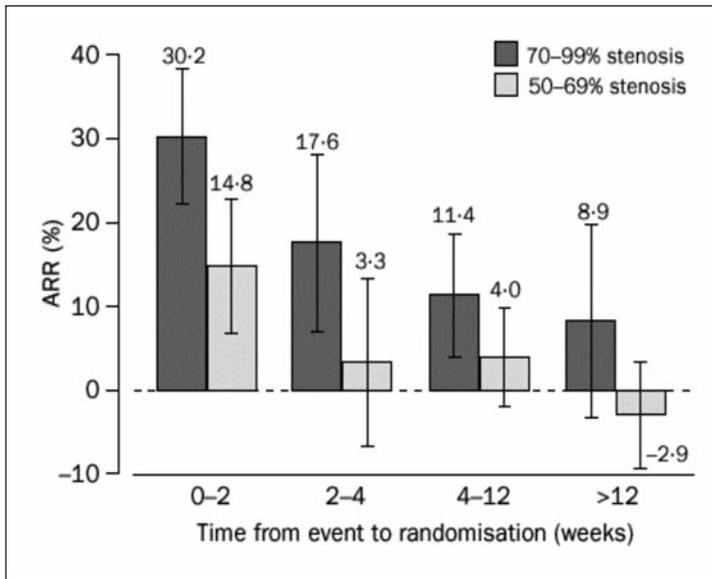


Fig. 1 - Benefit from carotid endarterectomy disappears if surgery > 4 weeks after TIA / minor stroke (by Rothwell, ECST & NASCET investigators, Lancet 2004;363:915-924).

These data strongly support the indication for a surgical procedure in multiple TIA or crescendo TIA, due to the high stroke risk in the event of non-intervention (9).

For these patients, the literature demonstrates that the combined risk of stroke and mortality after surgery does not increase significantly, compared with that of patients operated upon after a single TIA (6). However, this risk is acceptable due to the severe prognosis of these patients with high carotid stenosis and neurological instability (10).

There are no clear and shared guidelines for these patients with acute stroke due to a lack of multicentre and randomised trials on this subject. There is widespread confusion due to mixed reports in the literature (of surgery in patients with TIA along with patients with stroke). These data are of no statistical use.

In this context, the role of urgent CE has been debated for many years and has still not been defined completely.

This is also due to the fact that the reported clinical trials often present non homogeneous indications for emergency carotid surgery and compare the results of surgical procedures in neurological stable versus asymptomatic patients.

An important Italian study (Surgical Treatment of Acute Cerebral Ischemia) (11) was conducted by Sbarigia who considered 96 patients with ischaemic stroke on whom urgent carotid TEA was performed. In this study, neurological mortality was 7.3% and the rate of deterioration of the neurological condition, according to NIHSS criteria, was 3.5%. On the contrary, 45% of the patients showed an improvement in their neurological condition.

It is quite clear that only a good selection of patients for surgery can lead to positive results.

Another previous trial by Eeckstein (12) demonstrated improvement in the patients' neurological conditions, but also reported quite a number of cerebral haemorrhages after endarterectomy. This was due to the fact that the patients were selected on the basis of less strict criteria (all subjects with non-disabling carotid-related stroke were included). On the contrary, the Sbarigia protocol used more selective criteria and, for this reason, made it possible to avoid the feared haemorrhage of the cerebral ischaemic spot.

A more recent study by Sbarigia's group (13) has again confirmed the benefits of immediate surgery after an ischaemic event, highlighting the low percentage of haemorrhagic complications or worsening of the neurological conditions. Quicker neurological discharge was also demonstrated.

The data from our Department of Vascular Surgery in Ancona are similar to those present in the literature. From 1999 to 2009 we conducted CEs on 1,200 patients: 20% were symptomatic patients with a single TIA and 30 cases were patients with multiple TIAs or crescendo TIA who were submitted to an urgent CE. We did not perform CE on patients with diagnosed ischaemic stroke. Our results were good. We obtained the same results in patients with single versus multiple TIAs: the rate of neurological ischaemic events or deaths was 3%. No cerebral haemorrhage was found; no other significant cerebrovascular events occurred. The evident conclusion that can be drawn from these data is that CE is a valid and safe method for the treatment of symptomatic carotid stenosis. Its role is quite clear in symptomatic patients with a case history of single or repeated TIAs or crescendo TIA. However, to clarify its real significance in subjects with recent ischaemic stroke, more clinical randomised trials are needed.

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