

## The ups and downs in the treatment of carotid disease

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Cerebrovascular disease is one of the main causes of death and disability in our country. It is estimated that there are about 250,000 strokes a year in Brazil, of which about 85% have ischemic etiology.<sup>1</sup> Of all victims, only 1/3 progress satisfactorily; of the remaining, 1/3 die whereas the others survive with severe sequelae. Those statistical data indicate the need of a countrywide policy for prevention and treatment.<sup>1,2</sup> As medicine evolved, the etiopathogenic mechanisms of ischemic stroke have been explained. In most cases, atherothrombosis is the main villain.<sup>2,3</sup> Prophylactic measures, especially smoking cessation and control of hypertension, two of the main etiologic factors involved, have been widely disseminated and applied. Encouraging results have been obtained with control of metabolic diseases, such as dyslipidemias and diabetes. Knowledge of the metabolic syndrome complexity clarified the mechanisms of atherogenesis, but its prevention is seldom used.<sup>2,4</sup> Thus, there is a high number of individuals evolving with progressive atheromatous lesions, and risk of serious clinical manifestations is high. An important percentage of ischemic strokes results from atheromatous plaques located in the carotid bifurcation.<sup>1-4</sup> These data, which are extremely summarized here, suggest that the treatment of such lesions is more than necessary. Nowadays, the major question is the following: despite the medical progress for the management of cerebrovascular disease, is there a consensus in the treatment of carotid bifurcation stenosis? In fact, there is not! Today many options are offered, ranging from the best medical treatment to endovascular procedures, going through direct surgery. Search for the ideal method is the theme of an article extensively and widely based in recent literature by Bonamigo & Lucas, "Critical analysis of indications and outcomes of surgical treatment for carotid disease," published in the current issue of *Jornal Vascular Brasileiro*.<sup>5</sup>

By observing the several publications on this theme, it is possible to have a clear impression that, in studies whose advisors are non-surgeon specialists, there is a selection of surgical groups with inferior results to be compared with those obtained with the endovascular treatment. And vice versa!<sup>6</sup> Certainly none multi-center study comparing carotid endarterectomy (CE) with carotid *stenting* and angioplasty (CA) reached the excellence degree recommended for the treatment of

asymptomatic individuals, regardless of method.<sup>7</sup> Thus, at least in that indication, those investigators could only be authorized to work within the context of specific clinical trials. Far from the reality: in the Sapphire study alone, 71% were asymptomatic, and complication rates ranged between 5.4-7.8%, well above the recommended rate (3%)!<sup>6</sup>

Except for the treatment of acute ischemic stroke, which is still rare, every procedure on carotid arteries is prophylactic. Intervention aims at preventing ischemic stroke ipsilateral to the lesion, with minimal perioperative risk and with lasting results. It is also certain that complications related to carotid revascularization procedures are frequently devastating and potentially catastrophic for the patient and also for the physician! It is much worse if the individual has never presented any neurological symptom.

## Indications

Among the many indications of carotid stenosis listed in the article by Bonamigo & Lucas,<sup>5</sup> we agree that treatment of carotid stenosis can be indicated for asymptomatic individuals with stenosis of 70% or more, with good life expectancy, and in those with stenosis of 60% or more, with contralateral occlusion, provided that complication rates regarding morbidity and mortality in the group are below 3%.<sup>8</sup> Our practice is also to perform simultaneous treatment of asymptomatic stenosis with obstruction degree above 69% in patients with indication of myocardial revascularization.

CE is the only method that consistently reached the indexes recommended for the treatment of asymptomatic carotid lesions, but only in centers of excellence. Success levels obtained in recently published multi-center studies using CA in asymptomatic individuals do not authorize its use in that setting, unless in scientific studies.<sup>6,7,9-11</sup>

For symptomatic patients, treatment is indicated in cases of stenosis of 70% or more, 50% or more with contralateral occlusion, over 50% with persistent symptoms despite proper pharmacological treatment and in the presence of intraluminal thrombus or complex plaques, always symptomatic. The latter group comprehends atheromatous ulcers. In that subgroup, rate of neurological morbidity and mortality should not be exceeded 7%.<sup>11-14</sup> The results of multi-center studies are much above that limit, both in CE and CA groups.<sup>6</sup> Thus, treatment of carotid lesions using CA should be restricted to the treatment of patients with patent neurological symptoms, since their results hardly reached that morbidity and mortality level (5.4-12.1%)!<sup>7</sup>

It is interesting to note that 16 years after the NASCET, ACST and ACAS studies, indication parameters for the treatment of carotid arteries remain the same in most services. It is certain that morphology and constitution of the carotid plaque have the potential of influencing choice of treatment method – surgery or angioplasty. Complex lesions, with loss of the fibrous capsule integrity, plaques with high lipid content, ulcerated and with mural thrombi have high emboligenic potential and are more safely treated by CE.<sup>15</sup> Doppler examination, which is performed in practically all patients to be submitted to CE or CA, should analyze these changes, to be considered when choosing a therapeutic method.

Specific indications of CE and CA are presented in detail by Pereira in a recent editorial.<sup>11</sup>

A judicious selection of patients, based on accurate diagnosis and advanced anesthesiological and surgical techniques, along with proper postoperative cares allow excellent results in both options. Deliberately, the patient's preference is listed in both groups. In modern times, many patients come to us with an amazing amount of information about their disorder and willing to be treated by

a given method. In case there is no real contraindication, we believe such desire can be respected.

Curiously enough, introduction of the endovascular method improved endarterectomy outcomes; patients at high risk for surgery can be treated by this method with advantages.

Current cost-benefit ratio is widely favorable to surgery. CE is a procedure with minimal expenses with material. In our institution, it costs five times less than CA.

The issue being discussed here is polemical, which is confirmed by the recent publication of editorials in many journals, including in ours.<sup>6,15,16</sup>

In conclusion, endarterectomy doubtlessly achieved its level of excellence. Results with minimal morbidity and mortality are required and can be obtained. In specialized centers, endarterectomy has been routinely performed, with morbidity and mortality rates lower than 2%.<sup>9,10</sup>

According to epidemiological data in our country, around 100,000 people per year should receive prophylactic benefits from the treatment of their carotid lesions, thus avoiding a catastrophic stroke. However, only a small percentage is privileged. There are no vascular surgeons trained to perform CE, to guide the diagnosis and perform the whole treatment. Even if we – vascular surgeons – try hard, carotid surgery has always been performed with excellence only in a few centers. Dedication and time are essential to obtain consistent results in any training; we agree with Karakanian when he states that "the learning curve for this technique (endovascular) is much faster than that of endarterectomy."<sup>16</sup> Introduction of the endovascular treatment has brought certain democratization to the treatment of carotid diseases. So, more patients can reach the means of treatment, especially in locations without services of surgical excellence.

Over the first decades of the surgical treatment of carotid diseases, surgeons fought with clinicians and neurologists, supporting endarterectomy. We, vascular surgeons, enjoyed a privileged position: except for a few cardiac surgeons and some neurosurgeons, practically only we treated carotid arteries. The endovascular treatment arrived, has developed and progressed. The picture started to include other players! Nowadays, we live a rupture between vascular surgeons – those for and those against the endovascular treatment – and conflicts with angiologists and radiologists/neuroradiologists and between all of them and hemodynamicists and vice versa are observed. They are all fighting over who should perform the treatment of carotid arteries! Today it seems that each group wants to reach the "opponent's vulnerable point." In fact, we, vascular surgeons, are the single specialists that can provide the best of both worlds to the patient: direct surgery or the endovascular method. We should continue following our path seriously and with respect for the patient, avoiding sensationalist or mercantilist temptations. In my opinion, every vascular surgery group should have at least one professional skilled in endoluminal procedures in their team, able to individualize each case, with the aim of providing the best treatment for the patient.

The study by Bonamigo & Lucas, in its abstract, states that in the present time there is no evidence for a wide use of CA, even in high-risk patients.<sup>5</sup> We agree with their statement because of the reasons mentioned above. Comparing all data, endarterectomy is certainly still the best treatment for most patients, but we maintain our belief that the endovascular treatment of the carotid arteries is an evolving method that already has many indications, many of them with better outcomes than CE. The fact that the endovascular treatment does not have expected results in all indications/situations does not imply that they will not be reached in the future. And that future can be close! Let us be ready for it.

We recommend reading the references listed in the article by Bonamigo & Lucas,<sup>5</sup> which are complementary to this editorial.

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