

Is surgery always the best treatment for severe carotid stenosis in the frail elderly?



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Is surgery always the best treatment for severe carotid stenosis in the frail elderly?

OBJECTIVES: Presentation of a case of carotid stenosis in an elderly patient with multiple co-morbidities, and its management.

METHODS: Pre-operative management of an elderly patient affected by carotid artery stenosis with cardiac, metabolic and renal comorbidities and a recent history of buccal squamous carcinoma.

RESULTS: Pre-operative anesthesiologic assessment showed an increased risk for the presence of heart failure, cardiogenic pulmonary hypertension, mild/moderate stage renal disease.

CONCLUSION: The frail elderly represents a real challenge for the surgeon, because in choosing treatment other options must be taken into account both in view of local disease and of various systemic comorbidities.

KEY WORDS: Carotid atherosclerotic disease, Carotid stenosis, Frail elderly, Glycosamino-glycanpolysulfate gel, Phlebitis, Stroke

Introduction

Stroke is a disease with a specific relevance in the populations living in the industrialized world. It is the third leading cause of death in the adult population, following myocardial infarction and cancer, causing 10-12% of all deaths¹.

According to the Framingham study, in 85% of cases stroke is ischemic and, within this category, embolic stroke occurs in approximately 25% of cases¹.

The carotid atherosclerotic disease is a modifiable risk factor for ischemic stroke. An hemodynamically significant stenosis may reduce the blood flow and thus the cerebral perfusion, especially in the presence of a bilateral stenosis. Furthermore, according to the plaque features and the percentage of the stenosis, in case of a fibro-lipid plaque there is the risk that the plaque may thrombose and/or embolize occluding an intracranial vessel and causing an ischemic stroke.

The NASCET study has demonstrated the validity and the better usefulness of the surgical approach in the advanced carotid disease, compared with medical therapy alone².

The aim of the presentation of this case is to discuss the topic under two main aspects: although often decisive, surgery should not be pursued at all costs; the initial clinical examination of a patient ought to be as comprehensive as possible and not only targeted to the presented symptoms.

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Case Presentation

History - A 74-years old Caucasian, male patient, was visited at the outpatient clinic of Vascular Pathology of the General and Noninvasive Surgery Operative Unit of the University Policlinic "Federico II" of Naples. The main symptom at the presentation was a superficial phlebitis of the left leg due to a former peripheral venous access for intravenous therapy. The anamnesis of the patient revealed an history of type II diabetes treated with oral hypoglycemic agents and insulin supplementation (introduced 9 months earlier because of the high values of HbA1c during the treatment with only oral hypoglycemic agents), arterial hypertension, hypercholesterolemia, hypertriglyceridemia, smoking habit (approximately 96.5 pack-years, that means almost 32 cigarette daily, considering that the patient was smoking since he was 15), paroxysmal nocturnal dyspnea. The patient reported smoking cessation 4 months earlier, after the diagnosis of a stage III squamous cell carcinoma of buccal vestibule, infiltrating the anterior branch of the right mandible.

Neoplasia was treated with a resection of the anterior branch of the right mandible followed by a cycle of 7 weeks of radiotherapy, with a dose of 70 Gy fractioned in daily doses of 1.8-2 Gy.

As a therapy for his phlebitis, the patient was prescribed a daily dose of 6000 IU sodium enoxaparin, and the local application of a glycosamino-glycanpolysulfate gel. Despite the presence of a chronic arterial disease, an elastic compression was also applied, as the pressure indexes while reduced, were still higher than 0.6³.

Physical Examination - Once confirmed the diagnosis of superficial phlebitis, with no clinical signs of Deep Vein Thrombosis, our further evaluation was focused on the control of peripheral pulses, because of a reported intermittent claudication after a walk of about 70 meters, with a recovery time of about 5 minutes. The examination of peripheral pulses showed a bilateral reduction of the anterior and posterior tibial arteries pulse. The measurement of Winsor index confirmed this finding, with a value of 0.74 (left) and 0.68 (right). The objective examination of the Carotid arteries showed a thrill and a murmur on the right side.

Abdominal examination was negative; there were no appreciable abdominal masses and clinical signs referable to an aneurysmal dilatation of the abdominal aorta.

Chest examination showed decreased breath sounds at the bases, with both inspiratory and expiratory wheezing. The cardiac examination revealed a slight increase at percussion of the hearth area; a diastolic murmur was detected on auscultation on the mitral focus. The value of blood pressure was 155/85 mmHg.

The neurological examination was essentially negative.

Investigations - Blood samples had the following results: Hb1Ac 7.8%, haemoglobin 11.7 g/dl, total cholesterol 374 mg/dl, HDL cholesterol 70 mg/dl, LDL cholesterol

263 mg/dl, triglyceridemia of 209 mg/dl, BUN 45 mg/dl, creatinine 1.4 mg/dl with an estimated GFR of 44 ml/min, according to Cockcroft-Gault formula (the patient weighed 67 kg and was 165 cm tall), sodium 136 mmol/l, potassium 4.2 mmol/l, chlorine 102 mmol/l, international normalized ratio of prothrombine (INR) 1.1, prothrombinic activity 93 %, activated partial thromboplastin time (APTT) 26.6 secs.

The cardiologist confirmed the presence of heart failure, with sonographic signs of left ventricular dysfunction, attributable to Class C in accordance with the ACC-AHA classification.

An echo-color Doppler⁴ evaluation was the integrative part of the examination due the presence of the superficial phlebitis and the advanced atherosclerotic disease with multiple cardiovascular risk factors.

In addition the patient was investigated with angio-CT of cervical arteries and brain CT with contrast medium. Angio-CT confirmed the percentages of stenosis: measured during echo-color-doppler assessment and no alterations of vertebral arteries, while the CT did not detect signs of previous ischemic injuries nor of chronic cerebro vascular insufficiency.

Our habit in the study of this kind of patients is an US evaluation of epiaortic vessels, of abdominal aorta and of lower limb vessels with venous Compression UltraSound test (CUS). The latter confirmed the presence of a superficial phlebitis of the great saphenous vein used for venous access, in the lower third of the leg.

The abdominal aorta was found to have a normal caliber (anteroposterior diameter of 1.85 cm and latero-lateral of 1.91 cm) with the presence of multiple, not hemodinamically significant, circumferential calcifications of the intima.

The duplex examination of the neck vessels, showed a fibro-calcific plaque at the origin of the right internal carotid artery, determining a stenosis of about 65-70%, with a peak velocity of 134 cm/sec downstream of the stenosis. In addition, it was detected a 50% stenosis of the left internal carotid artery, not hemodynamically significant.

Discussion

Carotid stenosis, arterial insufficiency of the lower limbs, kidney failure and left heart failure, are a direct result of atherosclerosis caused by diabetes, hyperlipidemia and smoking habit.

Atherosclerosis had compromised both large vessels and microcirculation. In fact, the patient suffered by a mild/moderate stage renal impairment (GFR, calculated using the Cockcroft-Gault formula, amounted to 44 ml/min) and a left heart failure with consequent cardiogenic pulmonary hypertension.

The peripheral circulation was similarly compromised, and this was evidenced by stage II a lower limbs chronic arterial insufficiency and bilateral carotid stenosis.

Carotid stenosis is a potential risk factor for ischemic stroke. The increase of the flow rate downstream of the stenosis right above the threshold value of 120 cm/sec with a > 65% stenosis is, in theory, an indication to the surgical treatment of Carotid Endo-Arterectomy (CEA)⁵, which, actually, represents the gold standard in the treatment of carotid stenosis⁶. However, some considerations are due.

The patient had recently undergone surgery for removal of the buccal neoplasm, followed by a cycle of seven weeks of adjuvant radiotherapy.

Heart, kidneys and lungs were compromised in varying degrees and this constituted an increased anesthetic risk, as well as factors that could affect the recovery from surgery.

The patient did not report an history of transient ischemic attack (TIA) nor any stroke. Being the patient asymptomatic, should be taken into account the stage of his oncological pathology, susceptible to a probability of 5-year favourable prognosis of less than 50%. For this reason and in consideration of various comorbidities, we can say, with a good level of confidence, that the surgical treatment of Carotid endo-arterectomy (CEA) has not the potential to improve the overall prognosis of the patient⁷.

Two alternatives are given: carotid artery angioplasty and stenting or conservative medical therapy.

Carotid angioplasty and stenting (CAS) is a safe, effective technique in stenosis following radiotherapy⁸ especially in cases like this, where the anesthetic risk is not negligible⁹. However, CAS is burdened, in this category of patients, with a > 50% risk of re-stenosis higher than that related to CEA¹⁰. At 5 years, the rate of relapse in advanced tumors is 56%¹¹, and this should lead to the conclusion that there is the probability of a re-use of radiotherapy. Radiotherapy is an important risk factor for the onset of hemodynamically significant carotid stenosis in long-term survivors treated for facial and neck cancer¹². So, it is reasonable to think that it can be also a risk factor for an in-stent stenosis, in addition to an already significant risk of spontaneous re-stenosis.

For this reason, at least in this phase, we decided for a conservative medical therapy, with antiplatelet drugs and follow-up. After 8 months, the patient, who is in treatment with dual antiplatelet therapy with clopidogrel plus ASA, is asymptomatic for neuro-vascular accidents.

The patient is free of local recurrence for the moment.

Conclusions

Our patient was affected by a meaningful deterioration of his general conditions aggravated for the presence of multiple chronic diseases. In our opinion guidelines are not a must, and have to be applied according to a case-by-case evaluation. This kind of patient requires a comprehensive clinical diagnosis, contextualizing the surgical

pathology within the various suffered comorbidities, weighing the risk-benefit ratio of a surgical treatment.

Riassunto

Lo stroke è la terza causa di morte nel mondo occidentale dopo l'infarto del miocardio ed il cancro, con il 10-12% di tutti i decessi; l'eziologia ischemica riveste un ruolo preponderante (il 25% è su base embolica), per cui la stenosi aterosclerotica carotidea rappresenta un fattore di rischio.

Lo studio NASCET ha provato l'utilità della chirurgia nel trattamento di tale patologia, tuttavia sotto precisi criteri di selezione. Il seguente caso riguarda un paziente affetto da stenosi carotidea che, pur rientrando nei criteri emodinamici di operabilità (percentuale e velocità di flusso), in considerazione delle comorbidità presenti alla diagnosi, non è stato possibile sottoporre a intervento di Trombo-Endo-Arteriectomia (TEA).

Il paziente che si era affidato a noi si presentava completamente asintomatico e ciò è stato confermato anche dalla TC cerebrale cui è stato sottoposto dopo la diagnosi di stenosi. Considerando che la neoplasia del paziente, al momento della diagnosi, era al III stadio e che tale staging consente un tasso di sopravvivenza a 5 anni inferiore al 50% e che la TEA non è esente dal rischio di re-stenosi, si è ritenuto che tale procedura non poteva migliorare la prognosi del paziente.

L'alternativa presa in considerazione, quindi, è stata l'angioplastica con stent. Tuttavia, se si valuta la non trascurabile possibilità di una recidiva locale della neoplasia, non si può escludere l'utilità di un ulteriore ciclo di radioterapia, con il rischio che questa possa determinare una stenosi in-stent, essendo, la neoplasia omolaterale alla stenosi da trattare.

Per questi motivi è stata adottata una terapia conservativa con doppia antiaggregazione (Clopidogrel + Acido Acetil Salicilico). A 8 mesi, il paziente non ha sviluppato incidenti neuro-vascolari.

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Commento e Commentary

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L'indicazione fondamentale all'esecuzione di una TEA carotidea è rappresentata dalla scoperta di una placca arteriosclerotica ulcerata, specie se rivelata da un episodio di TIA. Altra possibile indicazione è l'evidenza di una stenosi emodinamicamente significativa con riduzione del flusso intorno all'80% se monolaterale, in presenza o meno di manifestazioni di insufficienza vascolare cerebrale. In realtà non è mai stato statisticamente dimostrato in modo definitivo il valore profilattico della TEA, in assenza di pregressi episodi di TIA, ed anzi vi è l'opinione che i possibili rischi nell'esecuzione di una TEA carotidea non sono inferiori a quelli di un trattamento non operativo ma limitato alla prevenzione farmacologica.

Lo stenting della carotide interna, come correttamente riportato nello studio, presenta il rischio di una restenosi, che si aggiunge al rischio delle non semplici manovre operative, possibili causa di temibili episodi embolici in ambito cerebrale.

La situazione illustrata nel caso presentato era quella di una stenosi carotidea valutata intorno al 60%, per cui in assenza di ulcerazioni della placca non c'è a rigore indicazione non discutibile all'esecuzione di una TEA, anche se sommata alla stenosi della carotide interna controlaterale intorno al 50% senza conseguenze emodinamiche, in un quadro di arteriopatia multidistrettuale (arterie coronariche, renali, iliaco-femorali).

Anche prescindendo dalla presenza di una patologia neoplastica che aveva richiesto, ed avrebbe potuto ancora richiedere un trattamento adiuvante radioterapico in ambito cervico-craniale, è del tutto da condividere la decisione degli Autori di soprassedere all'intervento di TEA della carotide interna per ripiegare sulla profilassi farmacologica.

La rischiosità dell'intervento di tipo anestesilogico appare in realtà sopravvalutata, dato l'esito positivo dell'anestesia praticata per l'esecuzione dell'intervento affrontato dal paziente per la rimozione del carcinoma esteso della mandibola, e che dunque avrebbe verosimilmente potuto essere affrontato nuovamente in caso di necessità. L'unica remora è rappresentata dagli inevitabili esiti della pregressa radioterapia cervicale che avrebbe potuto creare qualche difficoltà alla dissezione.

* * *

The main indication to a carotid endarterectomy is represented by the discovery of an ulcerated atherosclerotic plaque, especially when revealed by an episode of TIA. Another possible indication is the evidence of a hemodynamically significant stenosis with reduction of the flow around 80%, in the presence or not of manifestations of cerebral vascular insufficiency. In fact it has never been statistically proven in a definitive way the prophylactic value of TEA in the absence of previous episodes of TIA, and indeed there is the opinion that the possible risks in the execution of a carotid endarterectomy are not inferior to those of a non-operative treatment but limited to the pharmacological prevention.

Stenting of the internal carotid artery, as correctly reported in the study, presents the risk of non-simple operative maneuvers, possibly cause of dangerous embolic events within the brain, which adds to the risk of restenosis.

The situation illustrated in the case presented was that of a carotid stenosis evaluated at around 60%, whereby in the absence of ulceration of the plaque there is strictly speaking no indication questionable execution of a TEA, even if added to the stenosis of the contralateral internal carotid l around 50% without hemodynamic consequences, within a framework of the multiple arterial disease (coronary arteries, renal, iliac-femoral).

Even apart from the presence of a neoplastic disease that had required and would still require adjuvant radiotherapy in cervical-cranial area, is entirely up to share the authors' decision to postpone the intervention of the internal carotid TEA to an adequate pharmacologic prophylaxis.

The risk of a new anesthesia appears overestimated, since the positive outcome of former anesthesia practiced for the execution of the surgical removal of the extended carcinoma of the mandible, and that therefore would probably once again been necessary in the future. The only obstacle could be represented by the inevitable results of previous cervical radiotherapy that could create some difficulties in the dissection.

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