CASE REPORT

A Rare Case of Spontaneous Revascularization in a Patient with Significant Carotid Artery Disease

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ABSTRACT

Severe common and external carotid artery disease is a rare entity, which generally occurs in patients with advanced atherosclerosis. This report describes the case of an 83-year-old woman, who was referred to our hospital due to dizziness, headaches and loss of balance, permanent amaurosis of the right eye, decreased visual acuity of the left eye and bilateral hypoacusis at high frequencies.
A color Doppler ultrasound of the neck vessels revealed significant bilateral common and external carotid artery and right carotid bulb disease, with a reverse revascularization circuit through bilateral external carotid arteries, which also showed significant stenosis in their respective origins.

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Key words > Atherosclerosis - Carotid arteries - Ultrasound

INTRODUCTION

Severe common carotid artery disease is a rare entity, which generally occurs in patients with advanced atherosclerosis involving ipsilateral and contralateral external and internal carotid arteries, and vertebral arteries. Moreover, concomitant significant stenosis of external carotid arteries may cause cerebral hypoperfusion. (1, 2)

The purpose of this case report is to describe this rare form of carotid artery disease, and analyze how the external carotid artery becomes a significant collateral pathway for cerebral circulation in these cases.

CLINICAL REPORT

We present the case of an 83-year-old female patient with a history of hypertension, hypothyroidism, atrial fibrillation, and physical inactivity.

The patient reported a history of dizziness, headaches and loss of balance at neck rotation to both sides, permanent amaurosis of the right eye, and decreased acuity of the left eye of several months duration. She also presented with bilateral hypoacusis at high frequencies and unsteady gait.

The physical examination at the time of consultation showed a lucid, alert and oriented patient, with Glasgow 15/15, asymptomatic for angina and dyspnea, without signs of heart pump failure. Her blood pressure was 120/60 mm Hg, S1 and S2 were present in 4 areas, she had 2/6 aortic systolic murmur, regular symmetrical peripheral pulses, and good peripheral perfusion.

A color Doppler ultrasound of the neck vessels revealed the following: occlusion of the right common carotid artery due to a prior thrombus (Figure 1); significant left common carotid artery stenosis above 50%, due to a predominantly echogenic (fibrotic), homogeneous plaque (Figure 2); significant stenosis of the right carotid bulb (70-90%) due to a predominantly echogenic (fibrotic), homogeneous plaque; significant stenoses in the origin of bilateral external carotid arteries, with remodeling of the right external carotid artery (6.8 mm diameter) and total reversed flow in both arteries (Figure 3); bilateral vertebral arteries with antegrade flow and compensatory low-resistance pattern (high diastolic velocity); right ophthalmic artery occlusion; and permeable left ophthalmic artery with high-resistance pattern (absent diastolic flow).

The brain MRI revealed lacunar encephalopathy at the level of the basal ganglia, with left predominance. The magnetic resonance angiography showed severe left internal carotid artery arteriopathy and severe right carotid artery stenosis with normal intracranial circulation.

DISCUSSION

The interest in this rare case is based on the following data:

a) The low prevalence of severe common carotid artery disease, from 2% to 27%, depending on the series. (1, 2) In general, these patients have advanced atherosclerosis with concomitant occlusion of ipsilateral and contralateral external and internal carotid arteries, and vertebral arteries. How-

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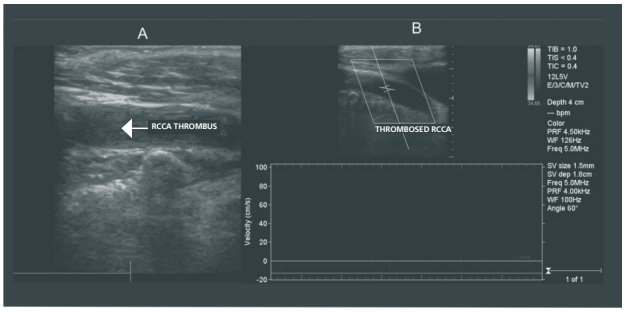

Fig. 1. A. Two-dimensional echocardiography showing right common carotid artery (RCCA) occlusion due to a prior thrombus (arrow). **B.** Absence of Doppler signal in the artery.

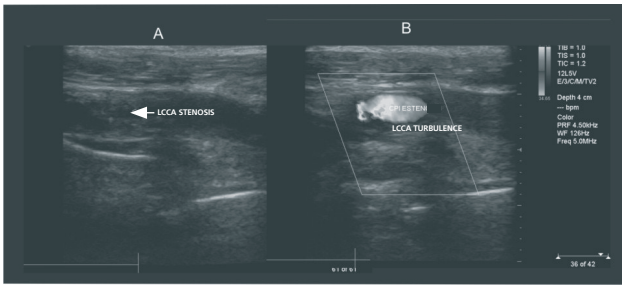

Fig. 2. Significant left common carotid artery (LCCA) stenosis. **A.** Two-dimensional echocardiography showing a predominantly echogenic (fibrotic) homogeneous plaque causing marked lumen reduction. **B.** Turbulence at that level, evidenced by color Doppler.

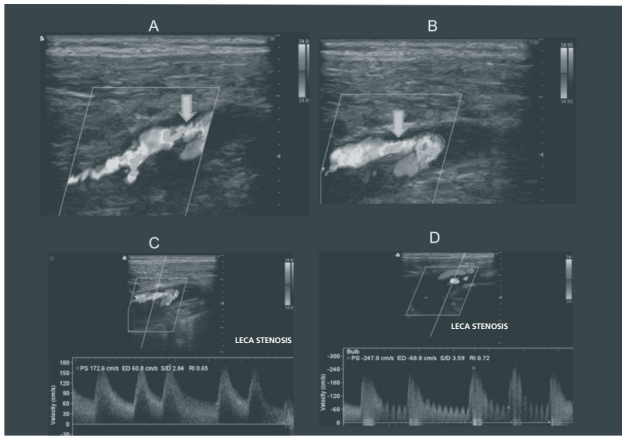

Fig. 3. Significant stenoses are observed in the origin of bilateral external carotid arteries. **A.** Right external carotid artery: color Doppler shows reversed flow (red signal) and the *arrow* indicates the stenotic area. **B.** Same in the left external carotid artery. **C** and **D.** High-velocity turbulent systolic and diastolic flows are observed in the right and left external carotid arteries, respectively.

ever, cases of arteritis or arterial embolism are rare. (2)

b) Something similar occurs in the external carotid artery, and its stenosis could predispose to subsequent cerebral hypoperfusion when the internal carotid artery is occluded (which would also be valid for the occlusion of the common carotid artery). (3-6)

c) Extracranial obliterative disease can turn the external carotid artery into a significant collateral vessel for brain circulation, particularly if the circle of Willis is not affected (3) as is the case of the patient described here.

d) This patient presented not only with reversed flow in the bilateral external carotid arteries (contributing to blood flow in ipsilateral internal carotid arteries), but also with significant stenosis in their origins, hemodynamically behaving as reversed obstructions.

It has been shown that external carotid artery endarterectomy in cases of internal carotid occlusion normalizes cerebral circulation in some patients, particularly in those who have unilateral amaurosis or unilateral occlusive disease, whereas it is less effective in patients with bilateral occlusive disease. (6, 7)

The vidian artery (a remnant of the first aortic arch that passes through the pterygoid canal and anastomoses with the mandibular artery of the internal carotid artery) is described as an important collateral vessel between the external carotid artery and the internal occluded carotid artery. (5) Although not seen in this study, it may have played a significant role in the circuits described here.

RESUMEN

Inusual caso de revascularización espontánea en una paciente con arteriopatía carotídea significativa

La enfermedad grave de las carótidas primitivas y externas es una entidad poco frecuente, que en general ocurre en pacientes con aterosclerosis avanzada. En esta presentación se describe el caso de una mujer de 83 años, derivada por presentar episodios de mareos, cefaleas y pérdida del equilibrio, amaurosis definitiva del ojo derecho, disminución de la agudeza visual del ojo izquierdo e hipoacusia bilateral a altas frecuencias.

El eco-Doppler color de los vasos del cuello mostró enfermedad significativa de las carótidas primitivas y externas bilaterales y del bulbo carotídeo derecho, con un circuito de revascularización inverso a través de las arterias carótidas externas bilaterales, las cuales, a su vez, presentaban estenosis significativas en sus respectivos orígenes.

Palabras clave > Aterosclerosis - Arterias carótidas - Ultrasonido

Conflicts of interest:
None declared.

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