RETINAL CHOLESTEROL EMBOLIZATION AFTER CORONARY ANGIOGRAPHY

EMBOLISMOS RETINIANOS POR COLESTEROL TRAS ANGIOGRAFÍA CORONARIA

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ABSTRACT

Case report: We report a patient with multiple cholesterol retinal embolism in both eyes following coronary angiography. She also had associated renal, skin and cardiac manifestations of the Cholesterol Embolization Syndrome (CES) and died 10 weeks later. Autopsy revealed cholesterol crystal emboli in several organs.

Discussion: Atheromatous plaques can be ruptured and displaced during a diagnostic catheterisation, and thus can be a potential source of these massive emboli. Retinal cholesterol crystals help to establish the diagnosis of the syndrome, particularly when other systemic manifestations exist. When this complication occurs, the prognosis can be devastating because of associated multiorgan failure (Arch Soc Esp Oftalmol 2006; 81: 413-416).

Key words: Retinal embolism, cholesterol, atheromatous, coronary angiography, diagnosis.

RESUMEN

Caso clínico: Se presenta un paciente con múltiples embolismos retinianos por colesterol en ambos ojos, tras una coronariografía. Asociaba además, manifestaciones renales, cutáneas y cardíacas del Síndrome de Embolismo por Colesterol (CES), falleciendo a las 10 semanas. La autopsia confirmó la presencia de cristales de colesterol en múltiples órganos.

Discusión: Las placas ateromatosas, durante un procedimiento invasivo arterial, pueden ser origen de embolizaciones masivas por colesterol. La presencia de émbolos retinianos ayuda al diagnóstico del síndrome, sobre todo cuando se acompaña de sintomatología sistémica. El pronóstico vital es malo por la insuficiencia multiorgánica.

Palabras clave: Embolismo retiniano, colesterol, ateroma, angiografía coronaria, diagnóstico.
INTRODUCTION

The cholesterol crystals embolism syndrome (CES) is caused by dissemination in arterial blood circulation from an ulcerated atheromatous plaque, a process which is identified with increasing frequency above all after arterial manipulation (heart catheterism, coronary angioplasty, arteriography or heart surgery), although it can also arise spontaneously in old patients with several aortic atheromatosis and after anticoagulant or fibrinolitic treatment (1). The certainty diagnosis must be based on the biopsy of involved organs where the presence of multiple cholesterol emboli can be confirmed as well as in the eye fundus study.

CASE REPORT

A 73-year old patient, former smoker and with hyperlipemia history, operated on for inserting a triple aortic-coronary bypass eleven years ago, who was admitted due to a one-month clinical evolution of disnea and angina upon minor efforts. For this reason a coronariography was performed via heart catheterism which revealed a coronary disease of three vessels with non-revascularizable obstruction of the saphenous-marginal obtuse bridge. Prior to the procedure, the patient was in treatment with anti-platelet aggregation and exhibited moderate kidney insufficiency (3.7 mg/dl creatinine) which was not a contraindication for the study.

Since the catheterism, the patient exhibited a general syndrome with asthenia and anorexia, evidencing in the analyses carried out two weeks later a worsening of the kidney function, with 7.5 mg/dl of creatinine and eosinophiles of 13%. Accordingly, the patient was admitted with suspected acute kidney insufficiency due to CES after cardiac catheterism. Due to the progressive increase of creatinine the patient required hemodyalisis, and new signs appeared on the side of a foot (livido reticularis, purple spots) which, after a biopsy, did not reveal cholesterol emboli.

After 40 days, the patient was referred to ophthalmology for eye fundus study with the following results: visual acuity of 0.8 in both eyes, IOP of 13 mm Hg and the right eye fundus exhibited a microhemorrhage above the papilla and 4 cholesterol emboli (fig. 1) and the left eye fundus a further two emboli located in the temporal and nasal branch (fig. 2).

Subsequently, the patient suffered heart insufficiency accompanied by signs of acute peripheral ischemia with worsening of his general condition and progressive lack of consciousness up to his death 73 days after the coronariography.

The necropsy exhibited numerous cholesterol emboli in the vascular structures of thyroids, pancreas, heart, spleen (fig. 3), liver and kidney (fig. 4).

Fig. 1: Microhemorrhage and cholesterol emboli in the right eye.

Fig. 2: Cholesterol emboli in the left eye.
DISCUSSION

CES is due to the release of cholesterol emboli from ulcerated atheromatous plaques which, in a size range of 100-200 µ, occlude the arterioles of different organs. This syndrome usually appears after invasive arterial procedures (surgery and catheterism) or the use of anticoagulating or fibrinolytic medication in patients with vascular risk factors (high blood pressure, diabetes, family history, dyslipemia, tobacco smoking).

The clinical expressions of the disease vary according to the occluded area. Kidneys, abdominal organs and skin of the lower limbs are the most frequently involved organs with expressions of kidney failure, livido reticularis and acrocyanosis, although symptoms may also appear in the brain, skeletal muscles and retina (1,2).

CES exhibits an immediate acute phase and a sub-acute phase in the following weeks, caused by an inflammatory response to the cholesterol crystals which may appear in analyses as a certain degree of eosinophilia and an increase in the sedimentation rate (2).

In our case, the kidney involvement produced a progressive insufficiency of the organ, with the pathological anatomy finally exhibiting the presence of cholesterol crystals in the kidney’s arterioles.

The alterations in distal areas of the lower limbs usually consist in the presence of painless skin lesions of the livido reticularis type which may reach necrosis. A skin biopsy may be negative if the segment does not include the characteristic cholesterol crystals.

The presence of emboli lesions in different abdominal organs, demonstrated in the necropsy, give an idea of the severity of the process as well as of the difficult management thereof, which should be symptomatic and utilize statins as stabilizers for the atheromatous plaque, avoiding anticoagulation and fibrinolysis. In spite of the treatment, the vital prognosis is somber due to a mortality rate of about 80% (2).

Repercussions of this syndrome in the eyes will depend on the localization of the emboli and may appear anything between minutes to days after the arterial manipulation. On many occasions, patients exhibit no symptoms due to an incomplete occlusion of the vascular clearance. The cholesterol emboli (Hollenhorst plaques) are whitish-yellowish and can be located in the central retina artery, its main branches (3), distal or in the cilioretinal artery (4,5). Sometimes, obstructive processes in CES can appear in the eye fundus only as microhemorrhages (4).

In summary, CES is a pathology which the ophthalmologist must be acquainted with due to the large amount of cardiological invasive procedures being performed, and in which the presence of retinal emboli can assist the diagnostics.

REFERENCES

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