INTRODUCTION

This paper presents a case of an 81-year-old patient with an indirect carotid-cavernous sinus fistula (CCSF). Transfemoral embolization could give rise to an incomplete thrombosis of the fistula. The superior ophthalmic vein (SOV) can be channeled and a retrograde catheterization can be performed to allow the insertion of detachable coils in the fistula by means of a micro-catheter. This technique is safe and effective when carried out by a multidisciplinary team.

ORBITARY APPROACH FOR TREATMENT OF CAROTID-CAVERNOUS SINUS FISTULA

ABORDAJE ORBITARIO PARA EL TRATAMIENTO DE LA FÍSTULA CARÓTIDO-CAVERNOSA

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ABSTRACT

Case report: A male patient with a left carotid-cavernous sinus fistula (CCSF) and two previous attempts of embolization via the femoral vein was treated with embolization through the superior ophthalmic vein (SOV).

Discussion: The main modality of treatment for CCSF is intervention radiology. This aims to occlude the fistula via an arterial route, through the cavernous sinus, or via a venous route, through the inferior petrosus sinus. However, the CCSF is also accessible through the SOV (Arch Soc Esp Oftalmol 2008; 83: 719-722).

Key words: Dural carotid-cavernous sinus fistula, endovascular treatment, embolization, detachable coils.

RESUMEN

Caso clínico: Varón con fístula carótido-cavernosa (FCC) izquierda y antecedentes previos de embolización no exitosos del seno petroso inferior izquierdo con cateterismo venoso femoral. Se realizó embolización de la fístula canalizando directamente la vena oftálmica superior (VOS).

Discusión: La principal modalidad de tratamiento para las FCC es la radiología intervencionista que pretende la oclusión no exitosa del seno petroso inferior izquierdo con cateterismo venoso femoral. Se realizó embolización de la fístula canalizando directamente la vena oftálmica superior (VOS).

Palabras clave: Fístula carótido-cavernosa dural, tratamiento endovascular, embolización, coils desprendibles.
CASE REPORT

An 81-year-old male with a history of CCSF in the left eye (LE) exhibiting an increase of the usual proptosis as well as pain, edema and palpebral ecchymoses. In the three preceding years two attempts at embolization had been carried out by means of a femoral venous catheterism and controlled low pressure with a relapse of the condition, for which reason the embolization of the fistula was prescribed, with direct channeling of the left SOV. The corrected visual acuity (cVA) was on 0.9 in the right eye (RE) and 0.3 in the LE, and the pressure due to flattening of the RE was of 16 mmHg and 23 mmHg in LE. Biomicroscopy revealed slight conjunctival chemosis as well as conjunctival and episcleral vascular tortuosity in the «medusa head» shape with predominance in lower bulbar conjunctiva (fig. 1). Gonioscopy with Goldmann lens revealed a normal angle 4 (Shaffer).

The ocular motility exploration revealed movement restrictions in the extrinsic muscles of the LE without diplopia, whereas Hertel exophthalmometry revealed a 4-mm asymmetry between both ocular globes (RE 14/LE 18).

The indirect ophthalmoscopy exhibited a normal physiological excavation of the papilla, a 2/3 artery-vein ratio as well as venous tortuosity and ingurgitation. The visual field exploration (Goldmann automated perimetry) exhibited an increase of the blind spots in the LE.

Orbital computerized tomography (CT) and nuclear magnetic resonance (NMR) showed the dilatation of the left SOV (fig. 2). Selective arteriography through the femoral pathway confirmed the existence of a left CCSF of Barrows D-type (fig. 3).

The left SOV was channeled by introducing a micro-catheter up to the cavernous sinus (CS). Multiple coils were placed, verifying the flow from the carotid artery towards the fistula and observing the CS excluded from circulation as well as the fistula thrombosis (figs. 4 and 5).

One month after the intervention, the patient was assessed with the following results: cVA: RE: 0.9; LE: 0.5, intra-ocular pressure (IOP) 16 mmHg (both eyes). No alterations in ocular motility were observed and exophthalmometry revealed a 2-mm difference between both ocular globes (14 RE /16 LE). A slit lamp exploration showed a residual dilatation of the inferior conjunctival vessels, while the eye fundus assessment revealed the disappearance of the pre-existing vascular tortuosity (fig. 6).

DISCUSSION

CCSF is an anomalous communication between the cavernous sinus and the arterial branches derived from the intracranial carotid artery. In 75% of cases, there is a traumatic origin due to craniofacial traumatisms or surgery. The remaining 25% originates spontaneously, with arteriosclerosis being an important factor (1,2). Arteriographic classification divides CCSF in direct (carotid-cav-
ernous) or dural (external carotid). Barrow (1985) classified them as (3):

- Type A, communication between the internal carotid artery (ICA) intra-cavernous directly with the CS. This type is mainly traumatic and high flow.
- Type B, communication between the extra-cavernous ICA and the CS.
- Type C, communication between the meningeal branches of the external carotid artery (ECA) and the CS.
- Type D, communication between branches of the ECA and ICA with the CS.

Types B, C and D are usually low flow indirect fistulas located in the dura vessels and which expressed with less symptoms. They frequently evolve towards spontaneous closure (1,2,5).

The low flow CCSF call for a conservative therapeutic approach (carotid compressions, IOP reducing agents) and long-term follow up because between 25 and 50% of cases resolve spontaneously (1,2,4,5). Generally, the high flow CCSF requires endovascular treatment for occluding the fistula (2,4,5).

Of the following conditions require surgical treatment (1):

1. Loss of vision. The increase of pressure in the retinal venous system reduces the arterial perfusion pressure, expressing as a choroidal or retinal ischemia.
2. The IOP can be controlled with maximum medical treatment. IOP increase is due to high venous pressure or the development of iridian neovascularization and pre-trabecular angular closure.
3. Unbearable cephalalgia
4. Malign proptosis with corneal exposure

The CS embolization can be carried out through the femoral vein, the internal jugular, the SOV or the inferior ophthalmic vein (2,4,5).

The percentage of success in the treatment of direct CCSF, i.e., the resolution of clinical symptoms with complete or partial angiographic disappearance of the fistula, ranges between 58 and 100% according to different publications (1,2,4,5).

REFERENCES

