INCREASED FLOW OF SUPERIOR OPHTHALMIC VEIN IN OCULAR DUPLEX AS SIGN OF ARTERIO-VENOUS FISTULA

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INTRODUCTION AND PURPOSE

Arteriovenous fistulas (AVFs) may increase the pressure of the cavernous sinus affecting the flow of orbital vessels. Our aim was to evaluate the utility of ocular Duplex (OD) in the diagnosis and monitoring of AVFs.

PATIENT AND METHODS

Prospective observational study of patients diagnosed of AVF confirmed by digital subtraction angiography (DSA). Consecutive OD were performed to evaluate orbital vessels and structures. Peak systolic velocity (PSV) and resistance index (RI) of the ophthalmic artery (OA) and the superior ophthalmic vein (SOV) were recorded. Anatomy of orbital structures was evaluated.

RESULTS

Three cases were identified. Ocular Duplex showed an increase in PSV, diameter and RI at SOV in all cases as expression of high cavernous sinus pressure.

Case 1: 76 year-old woman presenting with aphasia and facial asymmetry secondary to left parietal cerebral haemorrhage due to dural AVF.

Figure 1. A: Angiography of left external carotid artery showing dural AVF from meningeal media and occipital branches (white arrows) to left lateral sinus (red arrow); **B:** Ocular duplex shows an increase in PSV and RI at SOV (white arrows); **C:** OD after endovascular AVF closure with normal flow of SOV.

Case 2: 65 year-old woman presenting with binocular diplopia diagnosed of dural AVF in the anterior cranial fossa dependent on the ethmoidal branches of the right ophthalmic artery.

Figure 2. A: Angiography of right internal carotid artery shows dural AVF (red arrows) with aferent branches from ethmoidal arteries (white arrows) and abnormal vascular nidus (white arrow head); **B:** OD shows an increase in PSV ophtalmic artery (arrow). **C:** OD of tortuous and dilated ophtalmic artery.

Case 3: 58 year old-man presenting with proptosis and conjunctival hyperemia diagnosed of right carotid-cavernous fistula.

Figure 3. A: DSA of right internal carotid artery shows early contrast filling of cavernous sinus (red arrows) and ophtalmic vein (white arrow) suggesting carotid-cavernous fistula; **B:** OD display a dilated superior ophtalmic with reverse flow (arrow); **C:** OD showing normalization of SOV after treatment.

After closure of AVFs, we found that all of OD parameters returned to normal values.

CONCLUSIONS

PSV and RI of SOV measured with OD may be useful in the diagnosis and monitoring of hemodynamic repercussion of AVFs to cavernous sinus.