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LETTER

Carotid-Cavernous Fistulas: The Utility of Ocular Echography in Their Differentiation [Letter]

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Dear editor

We read the article by Supasai et al on the clinical differences between Direct and Dural Carotid Cavernous Sinus Fistulas (CCFs) with great interest and would like to provide additional insights.[1]

CCFs are vascular abnormalities that can be classified based on pathogenesis, hemodynamics, and angiography. Pathogenic classification divides CCFs into two subgroups: traumatic and spontaneous. Hemodynamic classification divides CCFs based on flow into low or high subgroups. Lastly, angiographic classification subdivides CCFs into direct and dural fistulas. Direct fistulas show a direct communication between the internal carotid artery and cavernous sinus, while dural fistulas are further divided into three sub-groups based on the location of shunting. Direct fistulas are usually caused by trauma and exhibit a high flow rate, instead dural fistulas are usually spontaneous and exhibit a low flow rate.

The authors endeavored to differentiate between the clinical features and symptoms of direct and dural CCFs. While individuals who exhibit ocular symptoms, such as proptosis, red eye, and glaucoma, might initially consult an expert ophthalmologist, we believe that relying solely on clinical features might be inadequate for distinguishing between them.

We were surprised to see that no mention was present in the paper concerning the use of the echographic findings.

Echography is widely used as a non invasive method to differentiate several disease, among others papilledema due to intracranial hypertension[2] from optic nerve drusen.[3]

However it has also been suggested to rapidly detect and differentiate between dural and direct CCFs since late 1970s with the so called standardized echography by KC Ossoinig[4] utilizing B scan together with an A scan with an 8 MHz non-focused probe with S-shaped amplification that provides more accurate information and measurements of structures than the B-scan technique alone.[5]

In case of direct CCFs, ultrasound detects dilation of the superior ophthalmic vein with pulsation of the walls, vertical veins, and sometimes the inferior ophthalmic vein due to arterialization and increased flow within these vessels. A low and regular reflectivity, weak sound attenuation with an angle k lower than 30°, and the presence of rapid spontaneous movements in the lumen of these vessels indicating flow arterialization.

In cases of dural CCFs, A-scan ultrasound shows thickening of all orbital structures, particularly the extraocular muscles and optic nerve sheaths due to venous congestion in the orbit. The extraocular muscles will appear thickened only on the affected side, with normal reflectivity in the initial phase and subsequently high and irregular reflectivity.

Therefore, we recommend using standardized echography for a rapid and accurate differentiation between dural and direct CCFs after the clinical exam.

Disclosure

All the authors declare that they have no conflicts of interest in this communication.

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