Internal Carotid Artery and Sphenoidal Emissary (Vesalian) Vein Fistula Mimicking a Carotid–Cavernous Sinus Fistula

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Keywords

carotid–cavernous sinus fistula, sphenoidal emissary (Vesalian) vein, intracranial arteriovenous malformation

Figure 1. Fistula between the Petrous Segment of the Left Internal Carotid Artery and Sphenoidal Emissary (Vesalian) Vein. A, Magnetic resonance angiography with engorged left cavernous sinus. B, Conventional angiography injection of the left ICA demonstrating orbital veins (arrow 1) and pterygoid plexus (arrow 2) filling during the arterial phase. C, Balloon occluding the cavernous segment of the ICA showing arterial phase filling of the sphenoidal emissary (Vesalian) vein (arrow). D to E, Time delay sequence of ICA microcatheter injection showing Vesalian vein filling only after contrast reaches the petrous segment of the ICA (E, arrow). F, X-ray showing coils within Vesalian vein and cavernous sinus. G, Postprocedure angiogram. ICA indicates internal carotid artery.

Case Report

A 53-year-old woman presented to an outpatient appointment with one month of pulsatile tinnitus and progressive orbital swelling. Clinical examination revealed left pulsatile exophthalmos, chemosis, and an orbital bruit. Magnetic resonance angiography (MRA) demonstrated enlargement and high flow through the cavernous sinus on the left (Figure 1A). Clinical presentation was thought to be

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consistent with a carotid–cavernous sinus fistula defined as an abnormal communication between the internal carotid artery (ICA), external carotid artery, or any of their branches and the cavernous sinus.¹ However, conventional angiography revealed fistulization between the petrous portion of the ICA and the sphenoidal emissary (Vesalian) vein rather than a direct arterial communication into the cavernous sinus (Figure 1B-E). The sphenoidal emissary (Vesalian) veins normally connect the cavernous sinus with the pterygoid or pharyngeal plexuses.² In our patient, arterial blood flowed retrograde through the Vesalian vein into the cavernous sinus, leading to the abnormal flow pattern initially noted on MRA. To our knowledge, a petrous ICA to sphenoidal emissary (Vesalian) vein fistula has not been previously reported but is clinically important as coiling of this small vein is therapeutic (Figure 1F-G).

Declaration of Conflicting Interests

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