

## CLINICAL PRACTICE

## Clinical Images

## Carotid Cavernous Fistula

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A 56-year-old man presented with subacute injection of his right eye and diplopia. He had no head trauma. His exam demonstrated right eye proptosis, chemosis (Fig. 1a), afferent pupillary defect, abducens nerve palsy (Video, available online), decreased visual acuity, and increased intraocular pressure. Non-contrast CT revealed right superior ophthalmic vein distention (Fig. 1b) suggesting vascular pathology. Non-enhanced MRI demonstrated increased signal intensity in the right cavernous sinus (Fig. 1c) consistent with a carotid cavernous fistula (CCF). Indirect CCF was confirmed by cerebral angiography.

CCFs are classified using the Barrow classification.<sup>1</sup> Type A CCFs are direct high-flow connections between the internal carotid artery and cavernous sinus. Young men are at highest risk, as the major cause is head trauma.<sup>2</sup> The presentation is abrupt, and headache and bruits (subjective or auscultated over the globe) are common. Type B–D CCFs are low-flow, indirect connections; risk factors include atherosclerosis, hypertension, diabetes, and collagen disease. Indirect CCFs are more common in postmenopausal women.<sup>3</sup> Unlike direct CCFs, they typically lack a bruit and are more insidious in onset. Direct CCFs are at risk of progression and morbidity without closure.<sup>4</sup> Indirect CCFs rarely result in morbidity and may spontaneously close. Our patient's ocular findings spontaneously improved.

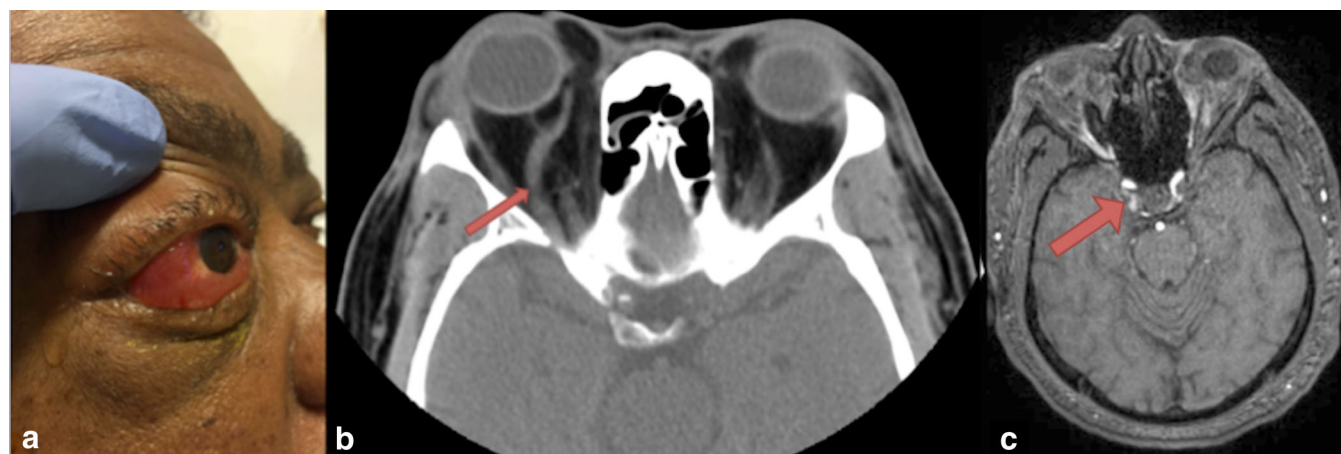


Figure 1 a Demonstrated is right eye proptosis, chemosis, and conjunctival injection. b Non-contrast CT revealed right superior ophthalmic vein distention (arrow) which suggested carotid cavernous fistula. c Non-enhanced MRI revealed asymmetrically increased signal intensity in the right cavernous sinus (arrow) consistent with right carotid cavernous fistula.

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**Compliance with ethical standards:**

**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

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