Teaching *NeuroImages*: Carotid-cavernous fistula caused by fibromuscular dysplasia

Yanan Zhang, MD
Hongbo Zheng, MD,
PhD
Muke Zhou, MD, PhD
Li He, MD, PhD

Correspondence to
Dr. He:
heli2003new@126.com

A 26-year-old woman developed headache, diplopia, and pulsatile tinnitus in 10 days. Neurologic examination revealed limitation of left eye movement, left dilated pupil with optic disc swelling and mild decreased vision, and a bruit over the left superior orbit. Her family history, laboratory data, and cerebral MRI showed normal findings. Cerebral CT angiography suggested left carotid-cavernous fistula (CCF). Follow-up angiography confirmed left CCF (figure 1). Nevertheless, multiple stenoses interspersed with aneurysmal dilation segments of carotid, vertebral, and renal arteries were found (figure 2). A diagnosis of fibromuscular dysplasia

(FMD) was finally made. FMD is a rare cause of CCF.^{1,2}

AUTHOR CONTRIBUTIONS

Yanan Zhang: drafting/revising the manuscript, including medical writing for content, study concept and design, analysis and interpretation of data. Hongbo Zheng: drafting the manuscript, analysis and interpretation of radiologic data. Muke Zhou: drafting the manuscript, analysis and interpretation of radiologic data. Li He: study supervision.

REFERENCES

1. Ellis JA, Goldstein H, Connolly ES Jr, Meyers PM. Carotid-cavernous fistulas. *Neurosurg Focus* 2012;32:E9.
2. Poloskey SL, Olin JW, Mace P, Gornik HL. Fibromuscular dysplasia. *Circulation* 2012;125:e636–e639.

Figure 1 Angiography

Left internal carotid artery angiography (arterial phase): (A) anteroposterior, (B) lateral view. (A) High-flow carotid-cavernous fistula (CCF) with venous drains to both cavernous sinuses and then to internal jugular veins (thick arrow) via inferior petrosal sinuses (arrow). (B) CCF drains to an enlarged superior ophthalmic vein (thick arrow), to inferior ophthalmic vein (arrow), to superior (thick dotted arrow) and inferior (dotted arrow) petrosal sinuses, to straight sinus (large arrowhead) via basal vein of Rosenthal (arrowhead), to sphenoparietal sinus (short arrow), and to some cortical veins (short thick arrow). (C) Schematic drawings of venous drainage: 1 indicates superior ophthalmic vein; 2, inferior ophthalmic vein; 3, sphenoparietal sinus; 4, superior petrosal sinus; 5, inferior petrosal sinus; 6, basal vein of Rosenthal; 7, straight sinus; 8, internal jugular veins.

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From the Neurology Department, West China Hospital, Sichuan University, Chengdu, China.

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Multiple stenoses interspersed with aneurysmal dilation segments. (A) Right internal carotid artery, (B) left external carotid artery, (C) right vertebral artery, (D) right renal artery.

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