

# Dural Venous Sinus Angioplasty and Stenting for Treatment of Idiopathic Intracranial Hypertension

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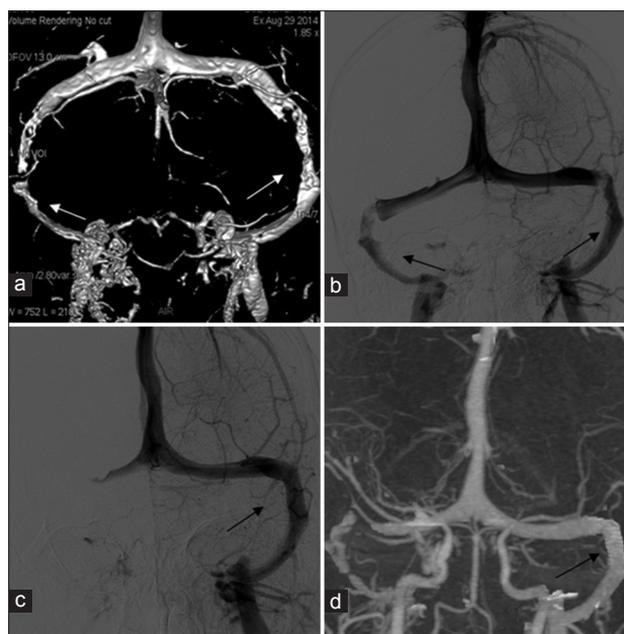
To the Editor: Idiopathic intracranial hypertension (IIH) is a rare neurological disease that is characterized by increased intracranial pressure in the absence of intracranial mass lesions or venous thrombosis.<sup>[1,2]</sup> We described an IIH patient with unusual symptom mimicked by transient ischemic stroke, which dramatically alleviated completely after treatment with dural venous sinus angioplasty and stenting.

A 56-year-old male with a history of hypertension presented with a visual disturbance was admitted to the 2<sup>nd</sup> Affiliated Hospital of Zhejiang University. He complained about progressive doubled vision and bilateral obscuration since four years ago. He went to the local hospital for medical consultation but did not improve after treatment. The patient also had sudden onset of recurrent stereotyped episodes of monocular blindness on his right eye two months ago. He had no headache or tinnitus. Neurological examination revealed bilateral optic disc edema and poor light response of left eye. A lumbar puncture was carried out to exclude intracranial hypertension. The initial pressure of cerebrospinal fluid (CSF) was >400 mmH<sub>2</sub>O (1 mmH<sub>2</sub>O=0.0098 kPa), and the CSF test revealed normal, except for a slightly elevated proteins (490 mg/L, normal range: 80–430 mg/L). Magnetic resonance venography revealed bilateral transverse sinus stenosis [Figure 1a]. Interventional diagnosis and therapy was suggested.

Under general anesthesia, a cerebral arteriogram was performed, showing a severe stenosis of the both transverse sinus with remarkably delayed venous outflow [Figure 1b]. The left internal jugular vein was dominant. Then, his right femoral vein was accessed and a 6-F shuttle sheath was positioned into the left jugular bulb. Intravenous heparin was given to raise the activated clotting time to >250 s. A microcatheter was placed coaxially within the 6-F shuttle and navigated over a 0.014 inch guidewire into the torcula. Simultaneous pressure measurements were obtained from microcatheter tip (a prepoststenosis pressure gradient of approximately 26 mmHg; 1 mmHg=0.133 kPa). Next, a sterling 5 mm × 20 mm balloon angioplasty catheter was positioned across the stenosis and then inflated fully at 10 atmospheres for 5 s. Following balloon angioplasty, a Stiff 0.018 guidewire was exchanged into the superior sagittal sinus. An 8 mm × 40 mm self-expanding stent was deployed across the stenotic segment. Following stent placement, the microcatheter was advanced through the stent to the level of the torcula, and the trans-stenosis

pressure gradient was obtained (a prepoststenosis pressure gradient of approximately 1 mmHg). Cerebral arteriogram was once again performed [Figure 1c].

When the patient was recovered from anesthesia, the symptom of recurrent stereotyped episodes of monocular blindness



**Figure 1:** Contrast-enhanced magnetic resonance venography (a) and digital subtraction angiography (b) showed bilateral transverse sinus stenosis (arrows). Patency of left transverse sinus was remarkable (c, arrow) after stenting treatment. Cranial computed tomography venography (d) showed that the stenosis of left transverse sinus was disappeared (arrow).

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dramatically disappeared completely. Cranial computed tomography venography [Figure 1d] and lumbar puncture were applied on the 3<sup>rd</sup> day after the stenting. The CSF pressure was 270 mmH<sub>2</sub>O. Dual antiplatelet therapy was continued for 6 months followed by aspirin only. So far, no recurrence or deterioration was reported during 50-month follow-up period.

IIH is characterized by headache, tinnitus, and visual disturbance including papilledema, visual field changes.<sup>[1]</sup> The recurrent stereotyped episodes of monocular blindness had never been reported in IIH before. It is hard to exclude transient ischemic attack in the beginning. However, the dramatic recovery after stenting in our case suggested that monocular blindness could be caused by IIH. The pathophysiology of IIH remains unclear. The most widely accepted pathophysiological mechanism for IIH is the obstruction of the intracranial venous drainage.<sup>[1]</sup> Higgins *et al.*<sup>[3]</sup> were the first to report transverse sinus stent placement for medically refractory IIH in 2002; Transverse sinus stent placement canceled the pressure gradient across the stenosis and improved symptoms. Teleb *et al.*<sup>[4]</sup> reported symptom improvement or resolution was seen in 94% (17/18) of patients. The large meta-analysis by Satti *et al.*<sup>[5]</sup> demonstrated that among the three techniques for medically refractory IIH, optic nerve sheath fenestration, CSF shunting, and dural venous sinus stenting, dural venous stenting overweighs the others with the highest technical and clinical success and the lowest complication rates. The conditions of our patients after stenting were stable for 50 months, which also proved the excellent medium and long-term curative effect of this treatment.

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## Conflicts of interest

There are no conflicts of interest.

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