

# Case Lessons

## Transverse venous stenting for the treatment of idiopathic intracranial hypertension

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**Introduction:** Increased intracranial pressure (ICP) usually manifests as visual disturbances, macular edema and loss of vision, headache and/or pulsatile tinnitus. About 10-25% of patients suffer visual impairment from chronic papilledema<sup>1</sup>. Signs and symptoms, history of IIH, medical history, physical examination, and previous radiological examination are crucial in the screening of the patients<sup>2,4</sup>. Patients whose condition are refractory to medical treatment or clinical deuteration should be evaluated with angiography/venography to for intracranial venous sinus stenosis.

**Case presentation:** 23 years old female, overweight (BMI 32) woman presented with a 3-year history of the development of left pulsatile tinnitus as heart murmurs, mainly when lying down to sleep or during exertion. In April 2023, after a viral condition, there were bifrontal headaches accompanied by nausea and double of vision.

Left 6<sup>th</sup> nerve palsy, left ringing pulsatile tinnitus which disappeared on jugular compression were noted on neurological examination on presentation. Ophthalmologist consultation: bilateral stage III papilledema on MRA: Slight asymmetry of the transverse and sigmoid sinuses was noted. She was put on Acetazolamide 1000 mg/day.

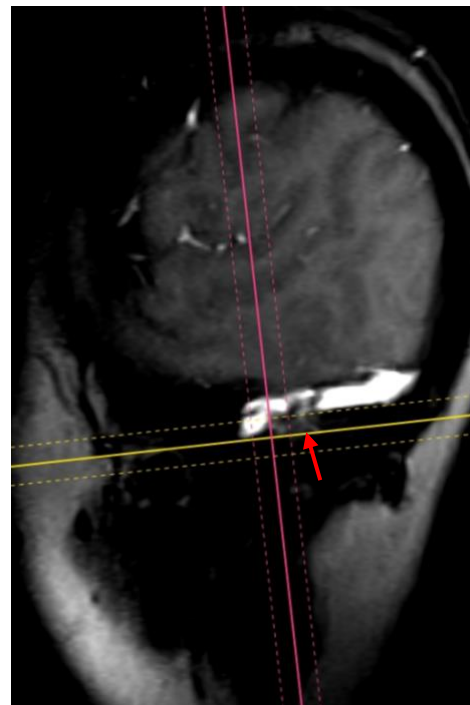


After six months under treatment, clinical improvement is observed, with regress of papilledema but bilateral pulsatile tinnitus more prominent on the left persisted.

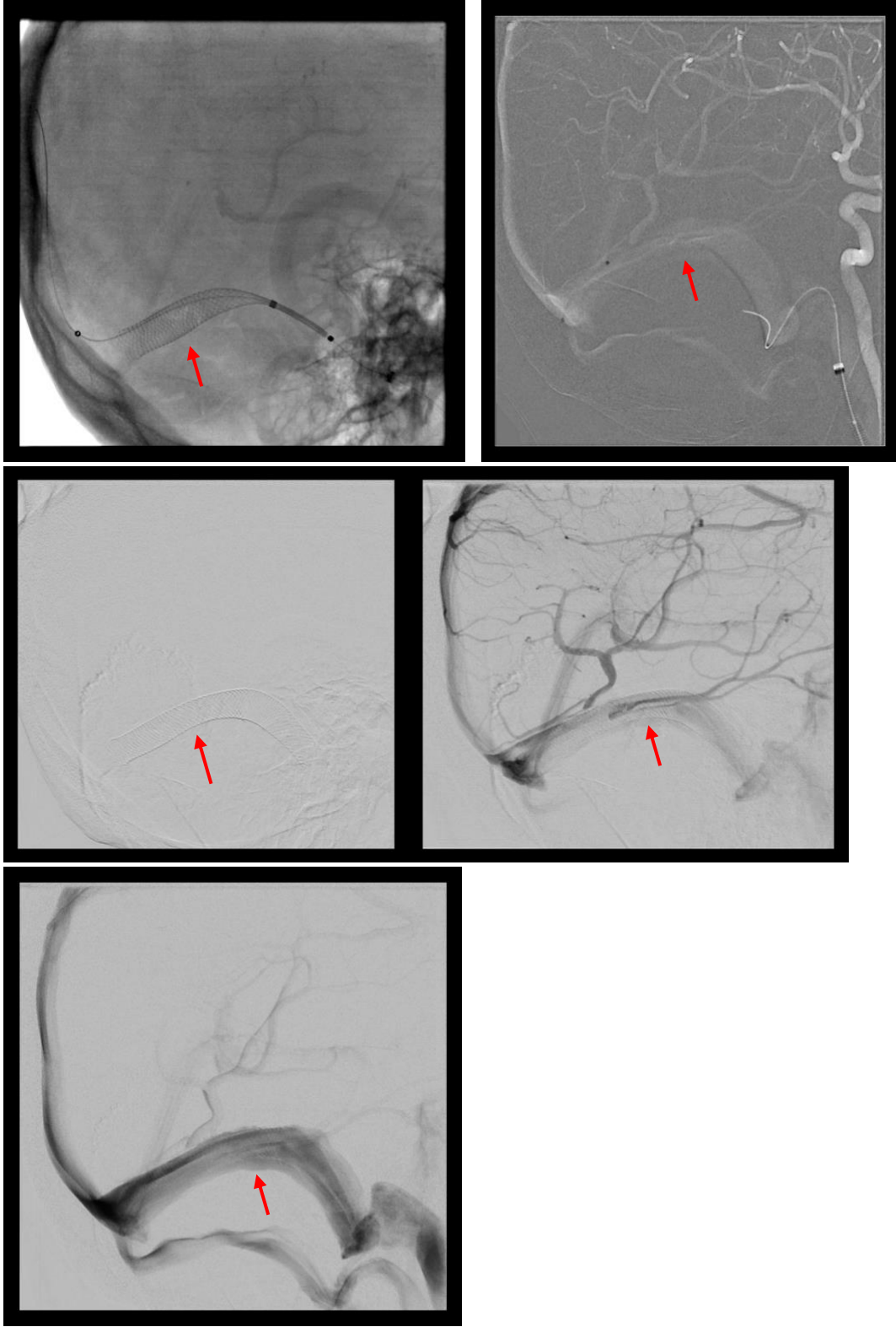
She had been followed up clinically and fundoscopic examination every six months. In the last year she revealed side effects under treatment with Acetazolamide. On CBCT of the temporal bone: Dehiscence of the temporal bone in the mastoid cells before the stenosis

The case is discussed with Prof. Emmanuel Houdart, diagnosis based on modified Dandy criteria was made. Taking into consideration all the data's endovascular treatment was proposed as the optimal choice.

**Endovascular procedure:** G.A.: Femoral arterial puncture, 5F introducer placement. The measurement of the pressures showed the absence of the gradient difference before and after sinus stenosis, because the patient under treatment with Acetazolamide which compromise the result. Two carotid wall stents 7x50 were placed in a telescopic form, the stenosis was corrected and the dehiscence was covered. Satisfactory angiographic result at the end of the intervention. Cervical suture + manual compression in the femoral artery.



**Fig 2:** A: DSA showing left transvers sinus stenosis. B: MRI showing severe stenosis of left transvers sinus



**Fig 3:** Endovascular procedure showing the successful placement of the two carotid wall stents 7x50 placed in a telescopic form. The stenosis was corrected and the dehiscence was covered.

**Discussion:** A pilot study in JNS found that conservative medical treatments for IIH often do not effectively control the condition, leading to progressive vision loss<sup>2,3</sup>. Treatments like optic nerve sheath fenestration and CSF shunting provide some relief but are not long-lasting. Venous sinus stenting with ICP monitoring showed immediate improvement in venous pressure and significant decrease in ICP, benefiting patients with refractory IIH and venous sinus stenosis. However, long-term monitoring is needed for potential stent-adjacent stenosis<sup>2</sup>.

## References:

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5. Stenting for Venous Sinus Stenosis in Patients With Idiopathic Intracranial Hypertension: An Updated Systematic Review and Meta-Analysis of the Literature

## REVIEW

# Stenting for Venous Sinus Stenosis in Patients With Idiopathic Intracranial Hypertension: An Updated Systematic Review and Meta-Analysis of the Literature

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**BACKGROUND AND OBJECTIVES:** Although venous sinus stenting (VSS) improves cerebrospinal fluid reabsorption and decreases intracranial pressure in patients with idiopathic intracranial hypertension (IIH), the underlying pathophysiology of IIH is not well understood. We present a review and meta-analysis of the literature on VSS for IIH treatment, focusing on the rates of restenosis and symptom recurrence.

**METHODS:** We performed a systematic review of PubMed and Embase databases between January 1, 2011, and December 31, 2021. Articles including  $\geq 5$  patients with IIH and venous sinus stenosis treated with VSS and post-treatment rates of restenosis (de novo stenosis at a different anatomic location along the dural sinuses or restenosis within or adjacent to the stent) were selected. Demographic, procedural, and outcomes data were collected and analyzed. Mean values for variables collected were pooled, and a mean value was calculated with a 95% CI.

**RESULTS:** Twenty-four articles were included, comprising 694 patients and 781 VSS cases. The mean age was 33.9 (CI, 31.5–36.2) years. The mean body mass index was 35.3 (CI, 32.9–37.7) kg/m<sup>2</sup>. Before VSS, 98.8% (CI, 96.8%–100.0%) of patients experienced headaches, 87.7% (CI, 80.6%–95.5%) had visual acuity issues, 78.7% (CI, 69.9%–88.5%) had papilledema, 58.3% (CI, 46.0%–73.9%) had tinnitus, and 98.8% (96.4%–100.0%) had symptoms refractory to previous therapies. After VSS, 77.7% (CI, 71.1%–84.95%) experienced symptom improvement and 22.3% (CI, 15.1%–29.0%) had persistent or worsened symptoms. Pooled restenosis rate was 17.7% (CI, 14.9%–20.9%).

**CONCLUSION:** VSS is effective in alleviating IIH signs and symptoms, but the associated high rates of restenosis and persistent symptoms highlight the need for further investigation of this procedure and other adjunctive treatments for IIH.

**KEY WORDS:** Idiopathic intracranial hypertension, Pseudotumor cerebri, Venous sinus stenosis, Venous sinus stenting