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Case Report

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Targeting the Bottleneck: Transverse Sinus Stenting in Idiopathic Intracranial Hypertension – A Case Report

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ABSTRACT

Background: Idiopathic intracranial hypertension (IIH) is characterized by raised intracranial pressure without an identifiable intracranial mass, hydrocephalus, or infection. Increasing evidence supports the role of transverse sinus stenosis in the pathophysiology of IIH. Venous sinus stenting has emerged as an effective treatment in selected patient's refractory to medical therapy.

Methods: This manuscript includes a case of transverse sinus stenting performed for refractory IIH along with a descriptive analysis of ten patients diagnosed with IIH based on clinical and imaging criteria.

Results: stented patients demonstrated significant trans-stenotic pressure gradients and showed immediate clinical and radiological improvement following stenting. Among the ten IIH patients, MR imaging commonly demonstrated empty sella, optic nerve sheath distension, and transverse sinus stenosis.

Conclusion: Transverse sinus stenting is a safe and effective minimally invasive treatment in carefully selected IIH patients. MRI with MR venography plays a pivotal role in diagnosis, patient selection, and follow-up.

Keywords: Idiopathic Intracranial Hypertension, Transverse Sinus Stenosis, Venous Sinus Stenting, Mr Venography, Endovascular Intervention

Introduction

Idiopathic intracranial hypertension (IIH), also known as pseudotumor cerebri, is a disorder characterized by elevated intracranial pressure in the absence of a space-occupying lesion, hydrocephalus, or infection. The condition predominantly affects young women and commonly presents with headache, visual disturbances, papilledema, and cranial nerve palsies.

Magnetic resonance imaging (MRI) is essential in excluding secondary causes of raised intracranial pressure and in identifying imaging features supportive of IIH. Transverse sinus stenosis has been increasingly recognized as a frequent finding in IIH and is believed to play a crucial role in impaired cerebral venous outflow. Venous sinus stenting has emerged as a promising therapeutic option in patient's refractory to medical management.

Diagnostic Criteria

Patients were classified according to the revised Friedman criteria. These include definite IIH, probable IIH, and IIH without papilledema based on cerebrospinal fluid opening pressure, presence of papilledema, cranial nerve palsy, and characteristic neuroimaging findings.

Institutional Experience: Ten Cases of IIH

Ten patients diagnosed with idiopathic intracranial hypertension were evaluated at our institution. All patients were females aged between 22 and 38 years. The most common presenting symptoms were headache and visual disturbances. MRI findings included partial or complete empty sella, optic nerve sheath distension, posterior globe flattening, and transverse sinus stenosis on MR venography. All patients were initially managed with medical therapy.

Case Report: Transverse Sinus Stenting

A 34-year-old female presented with headache, nausea, vomiting, and blurring of vision for two weeks. Clinical examination revealed left lateral rectus palsy. MRI demonstrated partial

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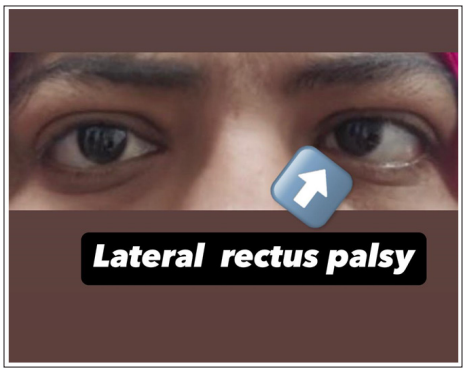
empty sella, optic nerve sheath distension, and posterior globe flattening. MR venography showed severe focal stenosis of the left transverse sinus with hypoplastic right transverse sinus.



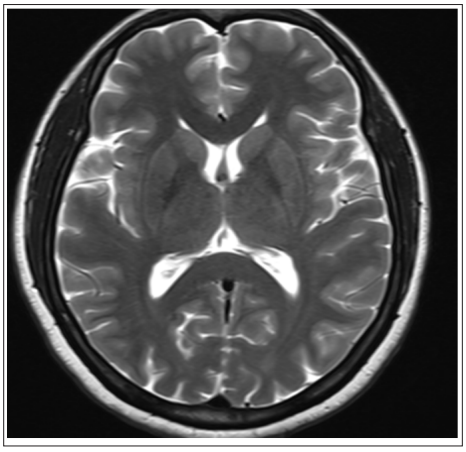
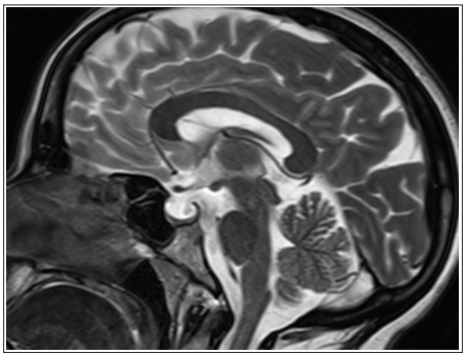
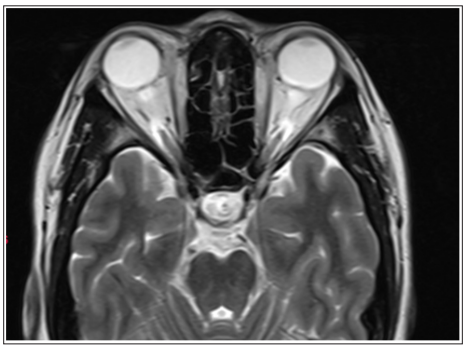
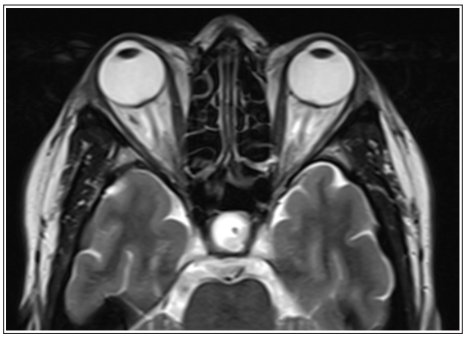


Figure 1: Slit like frontal horn of bilateral lateral ventricles

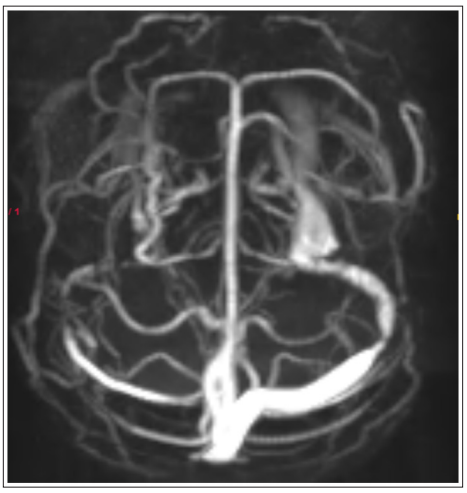


Partial empty Sella with prominent bilateral meckle's cave





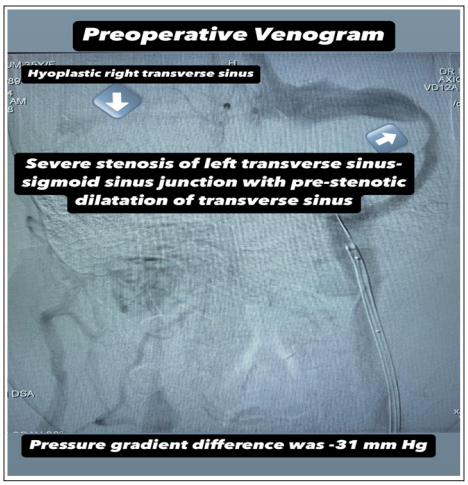
Bilateral optic nerve appears prominent with prominent peri optic nerve sheaths with flattening of bilateral optic disc region with eversion of optic disc

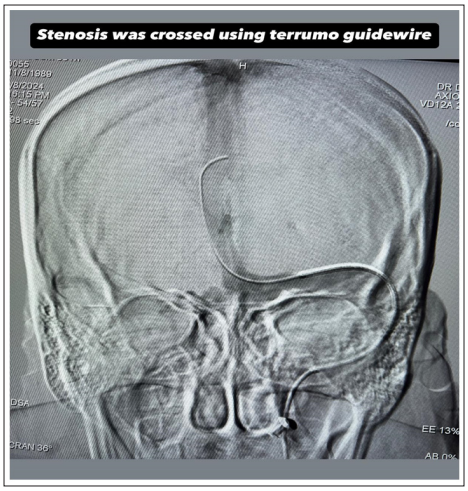


Severe focal stenosis of left transverse noted in its lateral one third with narrowed calibre of sigmoid sinus and dilated proximal 2/3rd of transverse sinus

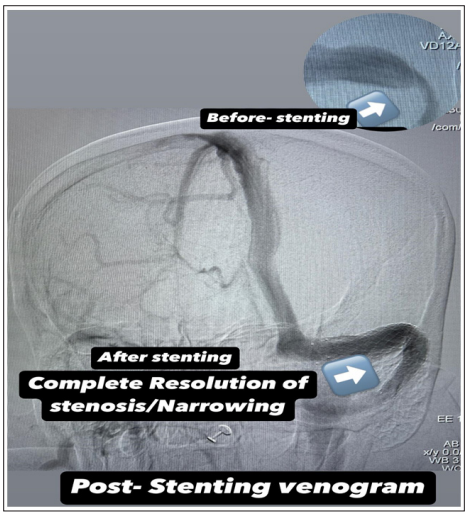
On MRI venography, Severe focal stenosis of left transverse noted in its lateral one third with narrowed calibre of sigmoid sinus and dilated proximal 2/3rd of transverse sinus.

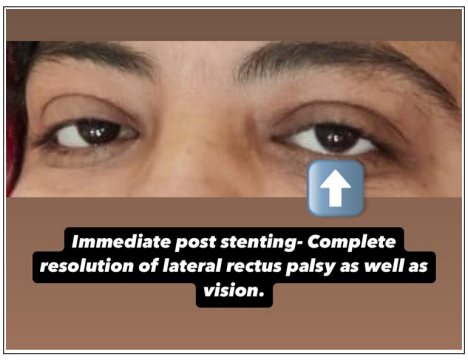
Diagnostic cerebral venography confirmed significant left transverse sinus stenosis with a trans-stenotic pressure gradient of 31 mmHg. A 10 × 80 mm self-expanding venous stent was deployed, resulting in complete resolution of stenosis and immediate clinical improvement.





SR NO	LOCATION	LEFT (PRE STENTING) mmHg	LEFT (POST STENTING) mmHg
1	PROXIMAL TO STENOSIS	46	4
2	DISTAL TO STENOSIS	15	5





Technique

Venous access was obtained via the femoral and internal jugular routes. Cerebral venography and manometry were performed to assess the pressure gradient across the stenotic segment. A self-expanding venous stent was deployed across the transverse sinus stenosis under fluoroscopic guidance. Anticoagulation was administered intra-procedurally.

Discussion

Venous sinus stenosis contributes to elevated intracranial venous pressure and impaired cerebrospinal fluid absorption. Transverse sinus stenting relieves venous outflow obstruction, breaking the cycle of raised intracranial pressure. Several studies have demonstrated favorable outcomes with venous sinus stenting in selected patients with IIH [1-4].

Conclusion

MRI with MR venography is crucial in diagnosing idiopathic intracranial hypertension and identifying patients suitable for venous sinus stenting. Transverse sinus stenting is a safe and effective treatment option in refractory cases, providing significant clinical and radiological improvement.

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