

### Dual lumen balloon-augmented onyx embolization of carotid-cavernous fistula via transorbital route Travis Ryan Ladner; Brandon J. Davis MD PhD; J Mocco Vanderbilt University Medical Center

VANDERBILT WUNIVERSITY MEDICAL CENTER

### Introduction

Endovascular intervention remains the primary treatment of indirect carotid-cavernous fistulas (CCFs). Surgical cannulation of the superior ophthalmic vein (SOV) provides a safe, reliable, and direct venous route. Onyx liquid embolic agent (eV -3, Irvine, CA) has become a favored modality for embolization of CCFs. We report a case of successful Scepter balloon catheterassisted (Microvention, Tustin, CA) Onyx embolization of a Barrow Type D CCF via direct operative cannulation of the SOV.

#### **Case Presentation**

A 21-year-old man with right-face lymphangiomatosis presented with a 3 -week history of right-sided proptosis, chemosis, visual decline, and cranial bruit. Diagnostic angiography revealed a right Type D CCF supplied by both internal carotid artery (recurrent ophthalmic branch) as well as external carotid artery (meningohypophyseal trunk) feeders.

Initial ICA and ECA angiography



## Operation

A right orbitotomy was performed along the supraorbital rim. The SOV was identified, inspected, and cannulated via a 4-French sheath. A Scepter 4 mm balloon catheter was advanced in the SOV, visualizing brisk arterial flow in the cavernous sinus, and a Transform balloon (Stryker, Fremont, CA) was positioned in the ICA for protection during Onyx embolization. Following 3000 units of heparinization, three sets of coils were deployed in the cavernous sinus to reduce flow volume and provide a scaffold for the Onyx. The Scepter balloon was inflated to occlude the SOV and the Transform balloon was inflated to occlude the ICA. Onyx embolization was then performed.



#### Post-coiling of cavernous sinus



Post-Onyx embolization



# Results

The patient was discharged in excellent condition. At one month followup he was doing well with no recurrence of symptoms.

### Conclusions

Use of the Scepter balloon reduced reflux risk, as the inflated balloon occluded the SOV temporarily while the second lumen allowed for flow of Onyx into the fistula, without the need to create an Onyx plug. This was a feasible and effective alternative approach.