2.64, CI 1.81–3.85, p<.001), diabetes mellitus (OR 2.42, CI 1.38–4.22, p=0.002), alcohol abuse (OR 1.81, CI 1.31–2.49, p=0.001), hydrocephalus (OR 3.35 CI 2.81–4.00, p<0.001), cerebral edema (OR 1.5, CI 1.25–1.85, p<0.001), cardiac arrest (OR 15, CI 7.9–30, p<0.001), and pneumonia (OR 1.93, CI 1.51–2.47, p<0.001). A 0–5 ruptured AVM mortality score was developed: Cardiac arrest (=3), age >60 (=1), Black race (=1), chronic liver failure (=1) diabetes mellitus (=1), pneumonia (=1), alcohol abuse (=1) and cerebral edema (=1). Mortality increased with score. No patient with 5 or more points survived.

Conclusion The Ruptured AVM Mortality Score allows for risk stratification on patients with ICH due to ruptured AVM. This scale could prove useful in prognostication and patient education.


Objective To develop a novel method of non-invasive, patient-specific computational fluid dynamic (CFD) simulation of venous sinus hemodynamics for evaluating stenting eligibility.

Method A patient with IIH and elevated sinus pressure gradient underwent MR venography, phase-contrast MR venography, and venous manometry. Patient-specific dural venous anatomy was segmented from the MR venography to construct 3D models of the venous sinuses. 3D transient patient-specific computational fluid dynamic simulations were conducted using flow rates measured with phase-contrast MR venography as boundary conditions.

Results Successful computational simulations were conducted, allowing for spatio-temporal resolution of velocity and pressure fields within the dural venous sinuses, allowing for the calculation of flow rates, wall shear stress, and pressure gradients. Calculated pressure gradients from CFD were validated against venous manometry with excellent agreement, as shown in figure 1. Time averaged pressure gradients from CFD were within 3% of the measured pressure gradients from manometry, projecting confidence in the ability of the methodology to accurately determine stenting eligibility.

Conclusions We have successfully developed time-resolved, patient-specific 3D computational simulations of the dural venous sinuses for the first time. The methodology can accurately and non-invasively measure venous pressure gradients. This preliminary study serves as a proof of concept for our method to be used as a diagnostic tool for determining venous stenting eligibility, as well as a tool for advancing the general understanding of IIH pathophysiology.

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