

Topical Papaverine as Rescue Therapy for Vasospasm Complicated by Unsecured Aneurysm

Dear Editor,

A 55-year-old female presented in 2010 with a World Federation of Neurosurgeons (WFNS) grade 3 subarachnoid haemorrhage (SAH). She had aneurysms of the right middle cerebral artery (MCA) (Fig. 1A) and anterior choroidal arteries, plus a left pericallosal and anterior cerebral aneurysm (ACA). Clipping was delayed by emergent Takotsubo cardiomyopathy. Coiling of the ACA aneurysm was uneventful, however the MCA aneurysm was uncoilable. Subsequent right MCA spasm was refractory to intrarterial nimodipine, and angioplasty was contraindicated given its proximity to the aneurysm (Fig. 1B). Triple-H therapy was complicated by cardiac dysfunction. Severe hemiparesis prompted urgent surgical intervention, and undiluted papaverine (120 mg/10mL) was applied directly to the spastic MCA and all other aneurysm parent vessels after clipping. We irrigated all vessels except for the right MCA with saline prior to closure. The patient responded dramatically; her hemiparesis improved significantly and transcranial Doppler showed immediate and persistent reduction in right MCA velocity from 268 cm/s to 76 cm/s.

Papaverine is usually given therapeutically at angiography, however there are reports describing instillation into the surgical bed for prophylaxis of vasospasm.¹ Intraoperative topical papaverine for the treatment of active severe vasospasm is rarely reported.² To our knowledge, this is the first such description of sustained reversal of severe symptomatic vasospasm by this method in combination with aneurysm repair in a SAH patient. The procedure is generally safe;³ reports of complications after intracisternal papaverine instillation describe severe hypotension, renal failure, bradycardia and cardiac arrest.³⁻⁵ In all 3 cases, fenestration of the lamina terminals was performed prior to the application of papaverine, which may expose the hypothalamus and/or the vagal nucleus directly to the drug.³⁻⁵ Our patient suffered no complications except for transient mydriasis. Other rare side effects reported include facial nerve palsy and monocular blindness resulting from choroidal infarction.¹ In summary, we believe this should be considered as a treatment option for similar patients, who present with unsecured aneurysms not amenable to endovascular therapy in the setting of severe vasospasm.

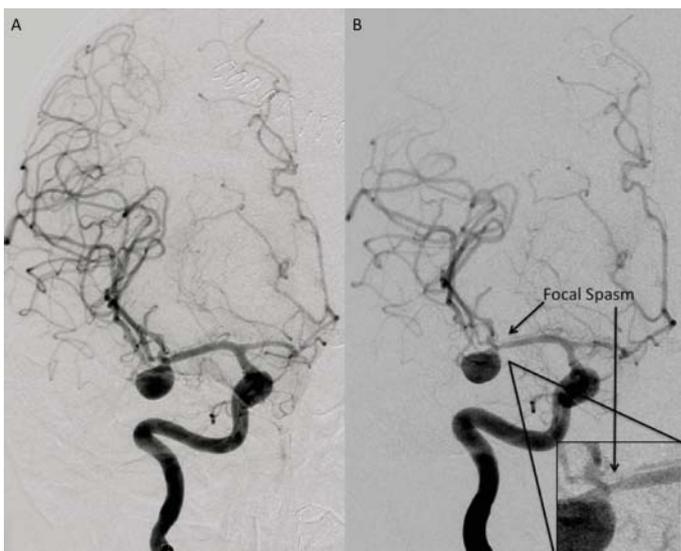


Fig. 1. Right carotid angiogram performed on days 5 (A, left) and 9 (B, right) post subarachnoid haemorrhage, showing diffuse mild middle cerebral artery spasm with a focus of more severe narrowing (arrow) immediately proximal to the large middle cerebral artery bifurcation aneurysm.

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