Endovascular middle cerebral artery embolic stroke model: a novel approach

L Fernando Gonzalez,1 David S Warner,2 Huaxing Sheng,1 Eduardo Chaparro1

A video (video 1) describing a novel murine endovascular stroke model is presented. Traditional middle cerebral artery (MCA) occlusion models include a blind insertion of a monofilament string12 into the common or external carotid artery with the expectation to selectively occlude the MCA. However, significant mortality occurs due to subarachnoid hemorrhage and variability in stroke size, possibly related to the filament’s malposition—for example, external carotid or proximal internal carotid artery (ICA). Additionally, while the string is in place, it occludes the entire extracranial ICA affecting also the collateral pial circulation.

Our model includes tail artery access, which tolerates several procedures facilitating survival studies. This model uses autologous blood clot deployed directly into the MCA, resembling what occurs in clinical practice. Autologous thrombi could be lysed with IA/IV tissue plasminogen activator.

In summary, we describe a novel model that resembles real practice, permits multiple catheterizations, results in reliable embolization under fluoroscopic guidance and allows therapeutic interventions not available with traditional models.