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A Novel Thin Film Nitinol Covered Neurovascular Stent Significantly Decreases Intra-Aneurysmal Flow In Vitro YOUNGJAE CHUN, University of Pittsburgh, SOOJUNG HUR, Harvard University, MAHDIS SHAYAN, University of Pittsburgh, COLIN KEALEY, Neurosigma, DANIEL LEVI, UCLA School of Medicine, KP MOHANCHANDRA, DINO DI CARLO, GREGORY CARMAN, University of California, Los Angeles — A novel thin film nitinol (TFN) stent has been developed to promote aneurysm quiescence by diminishing flow across the aneurysm's neck. Laboratory aneurysm models were used to assess the flow changes produced by stents covered with different patterns of TFN. Flow diversion stents were constructed by covering Wingspan stents (Boston Scientific, DxL:4x20mm) with TFNs (i.e., 77 and 82 percent porosity). The flow changes that occur after deployment of two different porous TFN covered stent in intracranial aneurysm models were evaluated in vitro. The 82 percent porous TFN covered stent reduced the intra-aneurysmal mean flow velocity by 86.42 percent, while a 77 percent porous TFN covered stent reduced to intra-aneurysmal mean flow velocity to 93.44 percent compared to a nonstented model. Local wall shear rates were also significantly reduced in wide-neck aneurysm model (i.e., 97.52 - 98.92 percent) with TFN stent placement. The results showed that TFN covered stents significantly reduced intra-aneurysmal flow velocity magnitudes and local wall shear rates. This suggests that TFN covered stents with both 77 and 82 percent porosity have great potential to promote thrombosis in both wide-necked and fusiform aneurysm sacs.

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