Independent evaluation of an FDA approved Computational simulation system for deployment of flow diverters in intracranial aneurysm treatment. (ID 111)

Authors:

Introduction
The limited design of flow diverters (FD) can sometimes result in challenges with their deployment for the treatment of intracranial aneurysms (IA), particularly when there is wall discrepancy in parent vessel diameter at the proximal and distal landing zones and when there is significant aneurysm tortuosity.

A computer program was developed for independent evaluation of a computational simulation (CS) system, which models the deployment of FDs in a small series of IAs.

Materials and Methods
CS of FD deployment was performed in series of 4 IAs (3 in an anterior circulation and one in the posterior circulation) using commercially available Surgical Preview® (Medtronic, USA) software.

A library of virtual vessel divertent stent models, which have been validated against physical devices, was then used to simulate deployment of the same devices into the vessels.

CS was performed retrospectively in 2 of the IAs, and prospectively before FD deployment in 2 patients. For CS, preprocedural CTA images were segmented and then reconstructed to form computational models of the aneurysms.

The results from CS were compared with the clinical results from FD deployment for each of the IAs.

Results
All IAs were treated using Pipeline Flow (Medtronic, USA) as the FD. There was good qualitative agreement between CS results and the actual clinical deployment in terms of final length and configuration of the FD as well as IA neck coverage.

Conclusion
Our initial experience suggests that CS of FD deployment has the potential to accurately predict the actual behavior of IA during the treatment of IA and can serve as a useful adjunct tool for appropriate device and landing zone selection in the treatment of complex IA.

References