

Pipeline device can treat challenging 'distal anterior' brain aneurysms

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A recently introduced technology called the Pipeline Embolization Device (PED) can provide a less-invasive approach for difficult-to-treat aneurysms of the arteries supplying blood to the front of the brain, reports a study in the July issue of *Neurosurgery*, official journal of the Congress of Neurological Surgeons, published by Wolters Kluwer.

Originally developed for use in deeper areas of the [brain](#), the PED is also safe and effective for aneurysms of more "superficial" brain blood vessels that are challenging to treat by conventional methods, according to the study by Dr. Adnan H. Siddiqui, MD, PhD, of University at Buffalo, N.Y., and colleagues.

High Success Rate with Pipeline Device for Difficult Aneurysms

The researchers reviewed the outcomes of PED treatment for brain aneurysms of the "distal anterior" circulation in 28 [patients](#). The patients—18 women and ten men, average age 52 years—were treated at ten US neurosurgery centers between 2011 and 2013.

An aneurysm is a weakened spot in a blood vessel wall. If the aneurysm enlarges or ruptures (breaks), it can cause a stroke or life-threatening bleeding in the brain. The PED was approved in 2011 for treatment of aneurysms in the main artery supplying the front of the brain (internal carotid artery).

The new study focused on patients with aneurysms of higher branches serving the front of the brain (middle cerebral artery and others). Aneurysms in this area are usually relatively easy to reach and treat—either by surgical "clipping" to block off the aneurysm or endovascular "coiling" to fill it up.

But the study patients had aneurysms that were harder to treat because of shape, size, or other characteristics. Seven patients had "giant" aneurysms, while five had internal bleeding (dissecting aneurysms). Eleven of the aneurysms had returned after previous treatment.

Neurosurgeons decided to use the PED approach to treat these difficult aneurysms. The PED is a metal mesh device that is guided through the patient's blood vessels to the affected vessel. Once in place, the device is expanded, routing blood flow past the aneurysm.

One or more PEDs were successfully placed in 27 out of 28 patients. In some patients with dissecting or ruptured aneurysms, "coils" were used along with PEDs. Three patients had complications within 30 days, a rate of 10.7 percent. Two of the complications were strokes.

Follow-up imaging studies showed that the aneurysm was completely blocked off (occluded) in 21 of 27 cases, for a success rate of 77.8 percent. For patients with previously treated aneurysms, the complete occlusion rate was 70 percent.

Flow diversion with the PED has become an increasingly accepted approach to aneurysm treatment. However, there is relatively little experience with this approach in treating aneurysms of the distal anterior [blood vessels](#).

The new study suggests that the PED can be used safely and effectively for "anatomically complex or recurrent" [aneurysms](#) in the distal anterior

circulation. Dr. Siddiqui and coauthors emphasize the need for larger-scale studies with long-term follow-up to assess and improve the outcomes of PED treatment in this group of patients.

More information: Ning Lin et al. Treatment of Distal Anterior Circulation Aneurysms With the Pipeline Embolization Device, *Neurosurgery* (2016). [DOI: 10.1227/NEU.0000000000001117](https://doi.org/10.1227/NEU.0000000000001117)

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