

GIUSEPPE

I'm Giuseppe Lanzino, professor of neurosurgery and radiology at the Mayo Clinic. And we have been involved with some of the early clinical studies which have eventually led to the FDA approval of one of these devices to provide for flow diversion for intracranial aneurysms.

LANZINO:

Flow diversion is a new philosophical approach to the treatment of intracranial aneurysms. From an endovascular point of view, traditionally we have treated aneurysms filling the aneurysm itself with coils. With this new approach, a device is placed across the aneurysm neck, and the device diverts flow away from the aneurysm back into the normal vessel. And eventually, this leads to occlusion of the aneurysm.

A new approach with flow diversion is indicated in some selected patients with complex aneurysms located along the proximal segment of the intracranial carotid artery. Aneurysms in this are aneurysms that traditionally are very challenging to treat effectively either with current surgical techniques or with current endovascular techniques.

This new approach opens a new therapeutic option for those patients who have very large or giant aneurysms of this segment of the internal carotid artery, which quite often in the past would have required complex bypass techniques and complete occlusion of the aneurysm as well as the normal vessel.

We have been part of multicenter studies that have looked at the safety and effectiveness of these devices, and we have treated over 30 patients with aneurysms in this particular location with flow diversion.

I will explain now with a series of drawings and then an angiogram of a large aneurysm how the concept of flow diversion works. This series of drawings summarizes how flow diversion works for intracranial aneurysms. In this drawing, we see a schematic aneurysm. And as blood flows through the vessel, enters the aneurysm, and then leaves the aneurysm, creating a flow inside the aneurysm itself.

With flow diverters, a device is placed across the neck of the aneurysm. And what that device does, it changes the flow pattern so that blood flow, it's redirected away from the aneurysm back into the normal vessel. Over time, this flow diversion induces a certain amount of clot formation inside the aneurysm.

And eventually, this blood clot leads to complete aneurysm occlusion. And as we have seen with MRIs, as the blood clot inside the aneurysm forms a sort of scar, it eventually will retract leading to a shrinkage and even disappearance of the aneurysm while the anatomy of the normal vessel is preserved.

In this angiogram, though, we see a very large aneurysm arising from the cavernous portion of the internal carotid artery. This planar radiograph illustrates the placement of three devices, one within the other, to reconstruct the curvature of the normal vessel in that specific segment.

And this is the follow-up angiogram six months later, showing that the aneurysm is no longer visualized and the normal anatomy has been restored.