

Conquering the Wide-Neck Brain Aneurysms with Newer Devices

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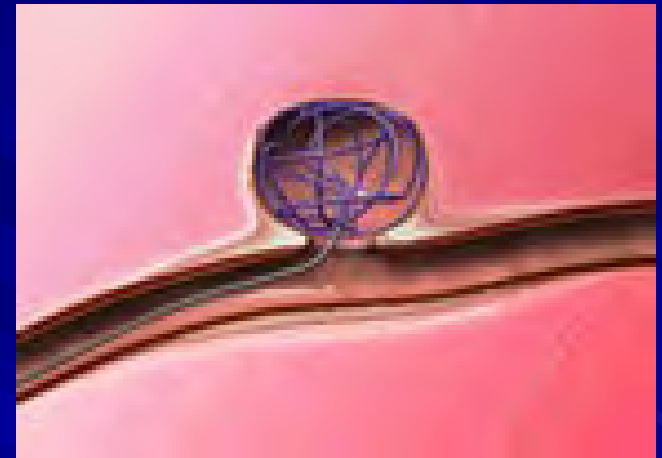
History of Surgical Aneurysm Treatment

- 1937 – Dr. Walter Dandy performed the first aneurysm clipping
- Surgical Clipping – revised over the years became the standard for aneurysm treatment



History of Endovascular Aneurysm Treatment

- 1991 – Guglielmi (Neuroradiologist) described coils to fill brain aneurysms detached with an electric current
- 1995 – FDA approved GDCs (Guglielmi Detachable Coil) to treat brain aneurysms



Newer Endovascular Treatment of Brain Aneurysms

■ Flow Diverters

- Pipeline 2011
- Surpass Streamline
- Surpass Evolve
- Fred (Flow-Redirectional Endoluminal Device)

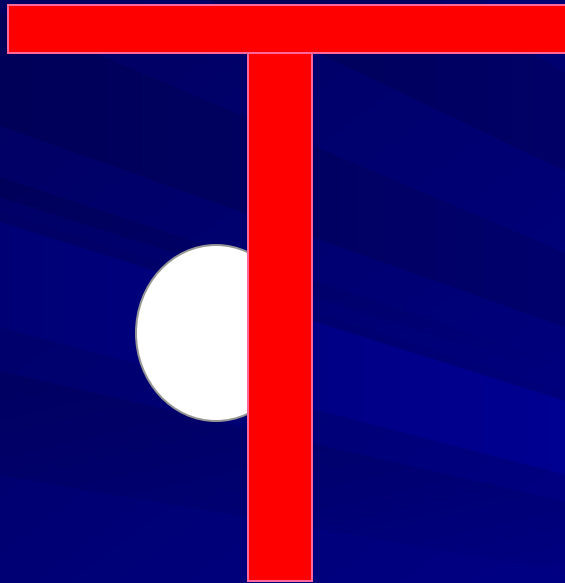


■ Intracascular Devices

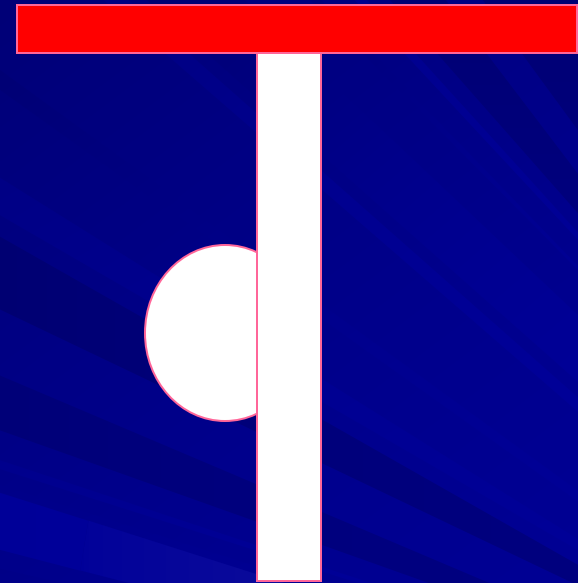
- WEB (Woven EndoBridge)
- Contour



Reconstructive vs Deconstructive Aneurysm Treatment

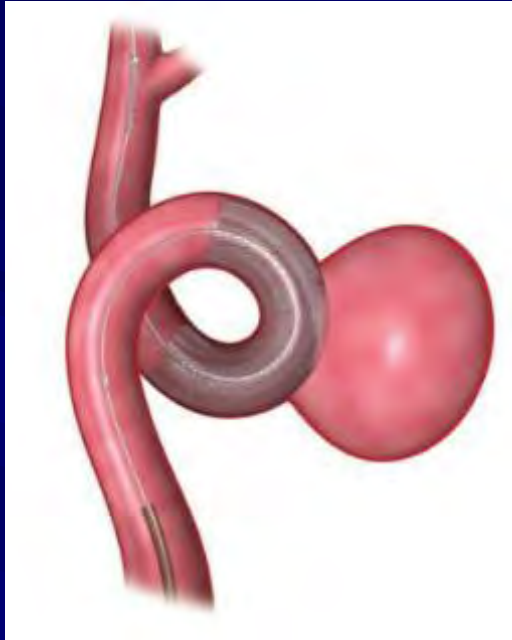


Reconstructive:
Exclude aneurysm
but keep parent
artery open



Deconstructive:
Aneurysm & Parent
artery occlusion

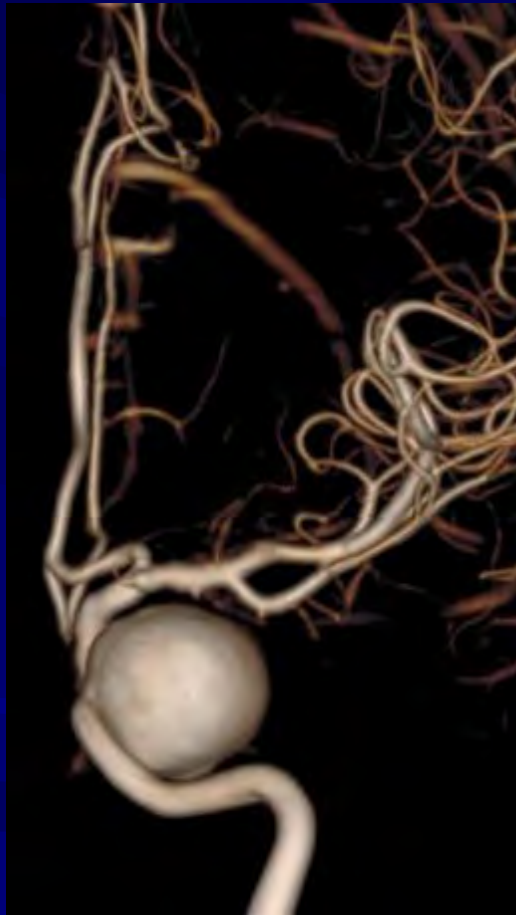
Flow Diversion



Trends in Global Research for Treating Intracranial Aneurysms: A Bibliometric Analysis

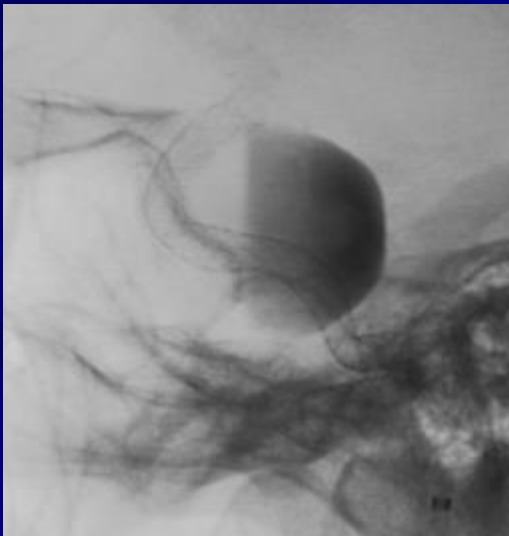
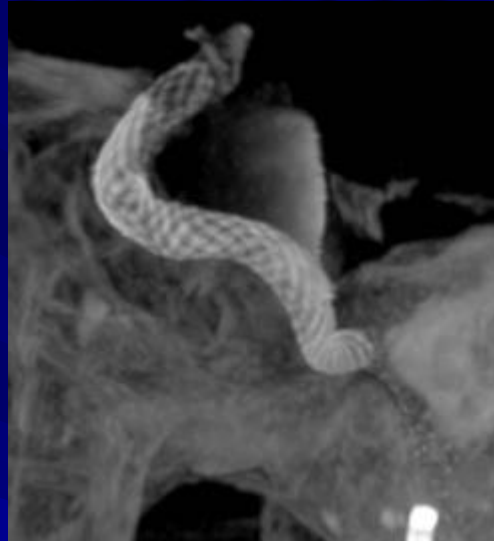
Allen Ye Fu¹, Siddhant Kumarapuram², Sanjeev Sreenivasan², Sudipta Roychowdhury³, Gaurav Gupta²

Pipeline Flow Director

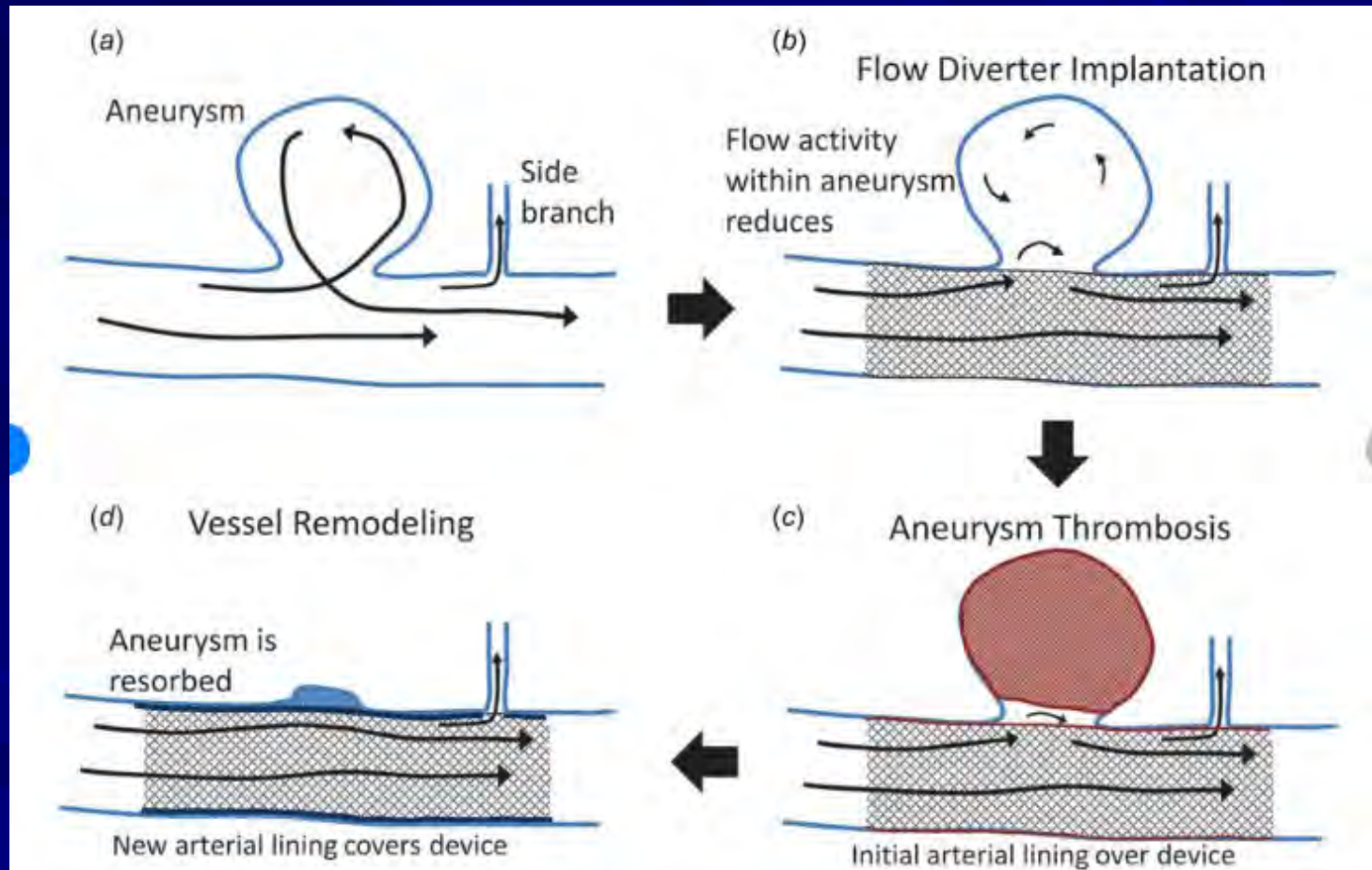


Pipeline Flow Diverter

5 Pipeline Devices Placed

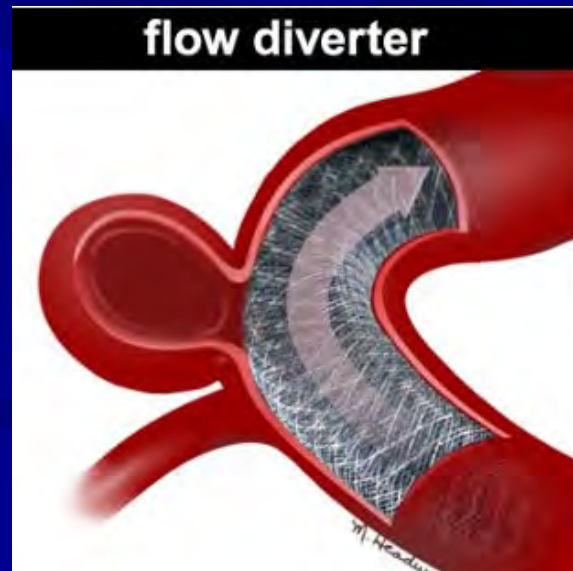


Flow Diversion for Aneurysm



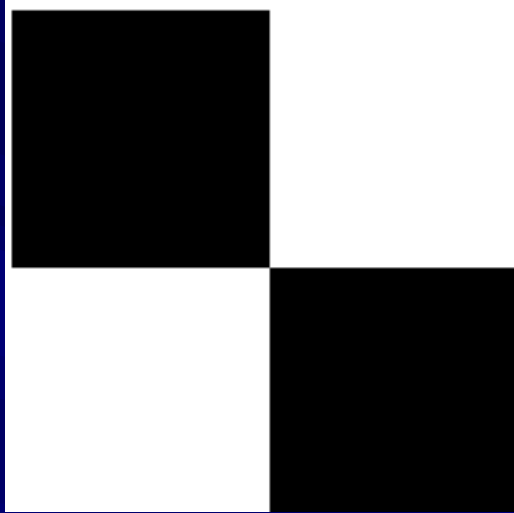
What determines Flow Diversion? Porosity

- Porosity - % open space vs metal
 - Lower porosity is better flow diverter (more metal)
 - Covered stent is 0% porosity but occludes perforators
 - 70% Porosity is safe for keeping perforators open

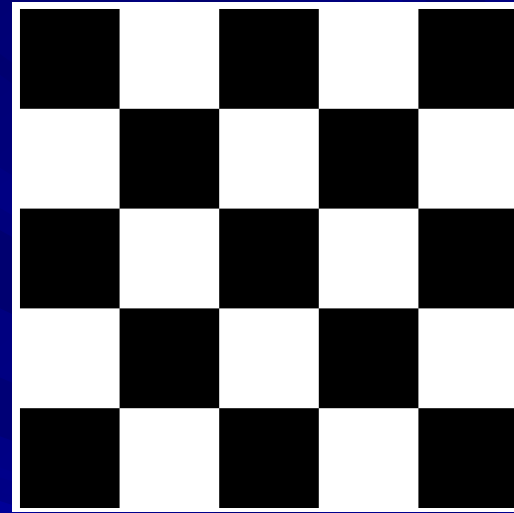


What determines flow diversion?

Pore (Mesh) Density



Porosity 50%
Low Pore Density
(less flow diversion)



Porosity 50%
High Pore Density
(more flow diversion)

What determines Flow Diversion?

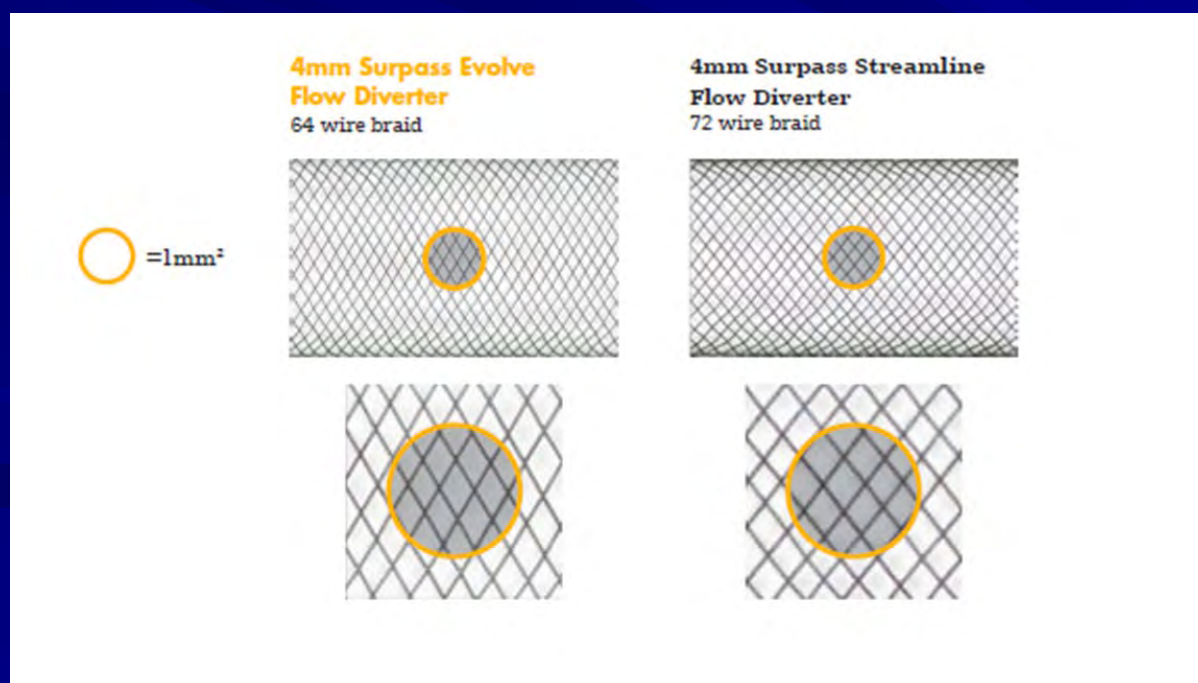
Pore Density (Mesh Density)

- Pore Density (Mesh Density)
 - Higher Pore density is better flow diverter
 - Pipeline first FD with lower pore density (48 wires)
 - Surpass Streamline (72 and 96 wires) and Evolve (64 wires) higher pore density with better flow diversion



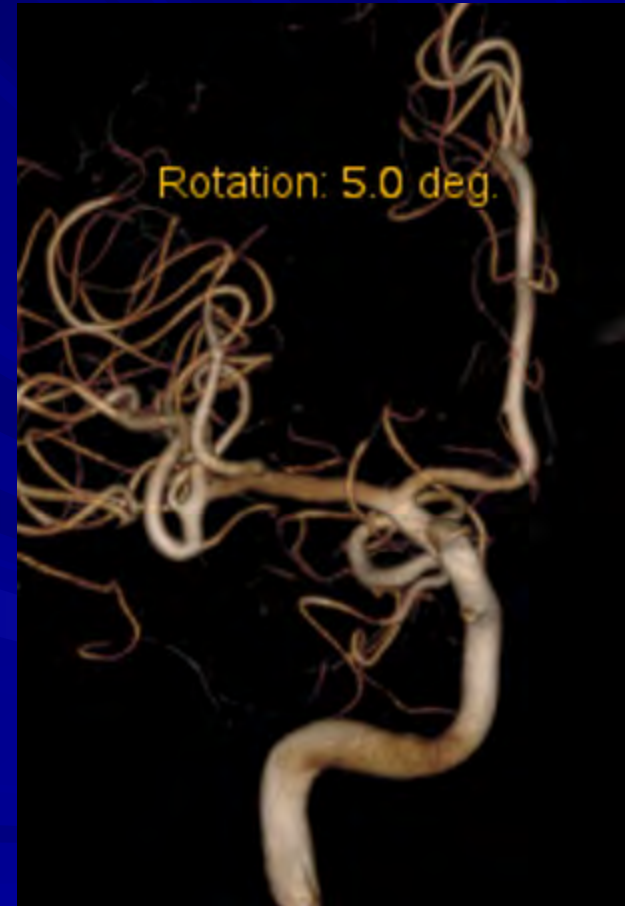
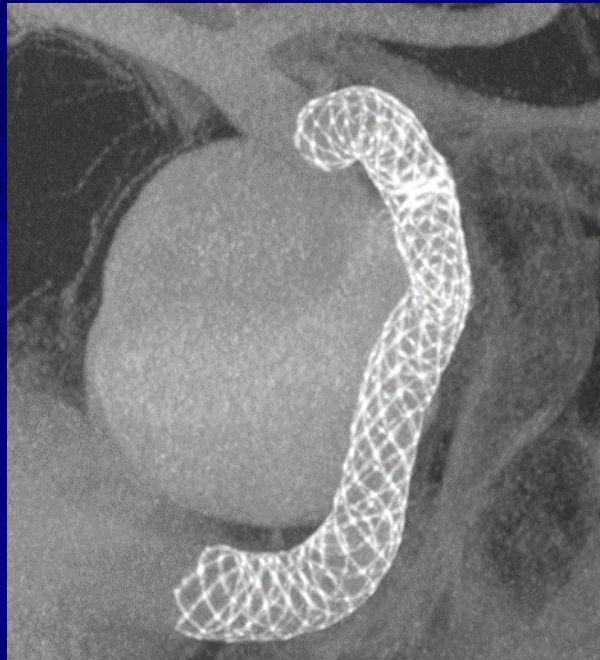
Surpass embolization of intracranial aneurysms: Perspective from a 2-year longitudinal follow-up study across high volume comprehensive stroke centers

Gaurav Gupta ¹, Sanjeev Sreenivasan¹, Ian Kane², Lauren Salguiero¹, Ali Saifuddin², Srihari Sundararajan², Priyank Khandelwal³, Emad Nourallah-Zadeh⁴, Hai Sun¹, Ashish Sonig³, Amit Singla³, Anil Nanda¹, and Sudipta Roychowdhury²



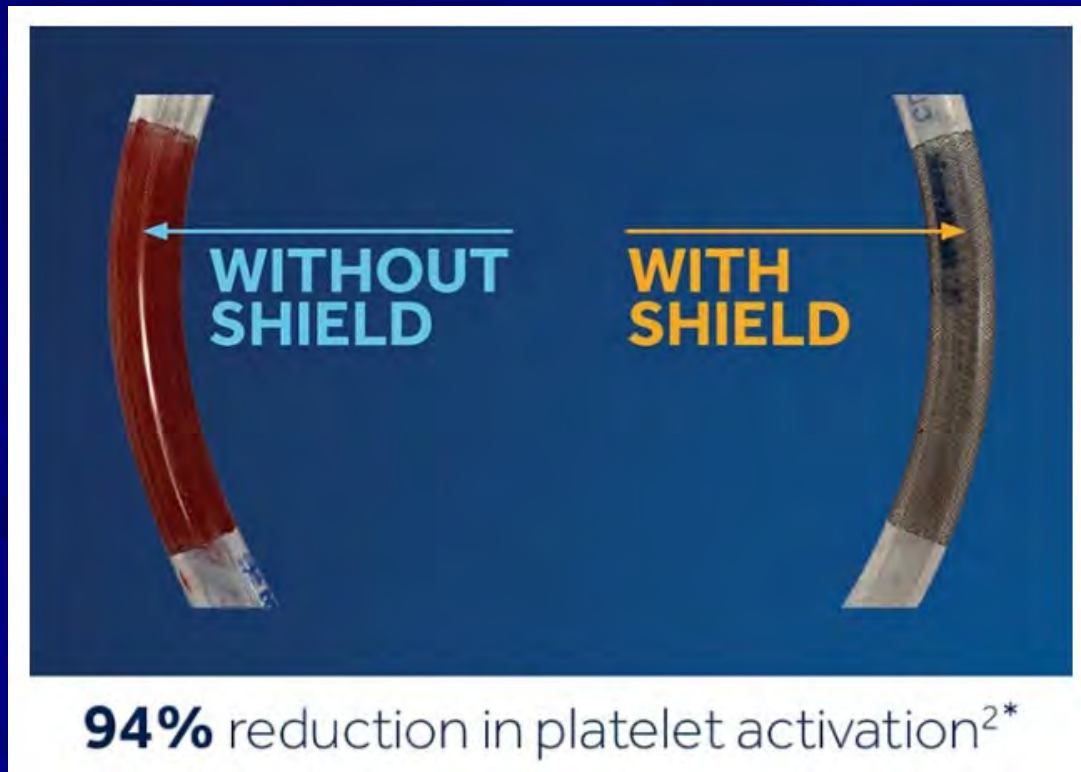
Giant Cavernous ICA Aneurysm

One Surpass Evolve Device

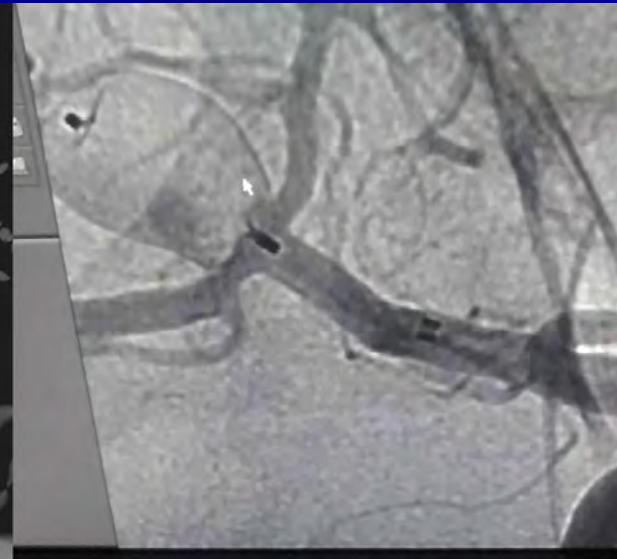
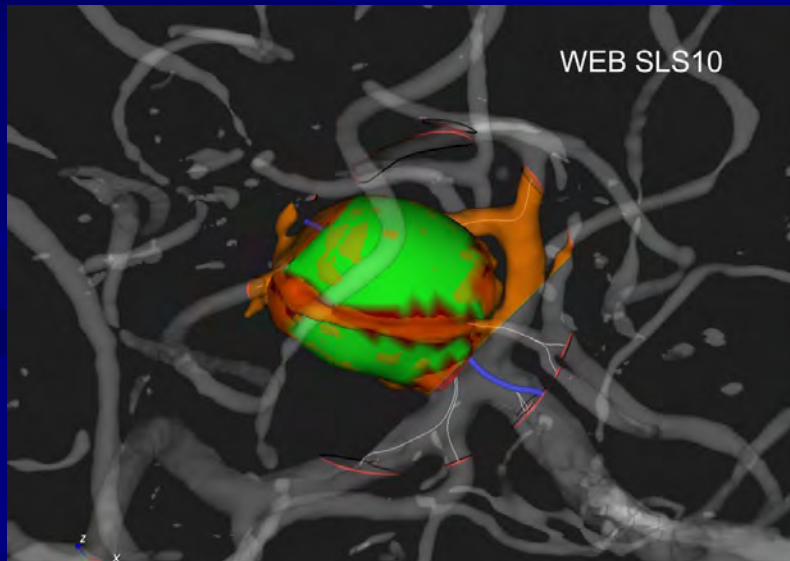
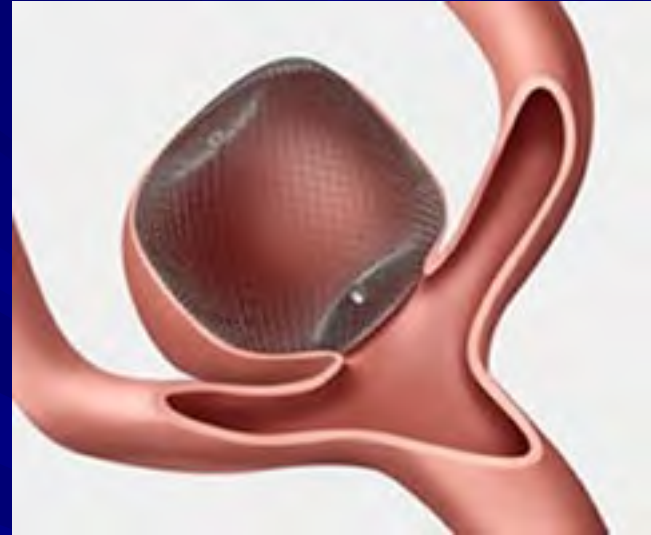


Surface Modification of FD

- Pipeline Shield, Fredx, Evolve Elite
- May decrease thrombogenicity and need for long term antiplatelet therapy



WEB (Woven EndoBridge)



WEB (Woven EndoBridge)

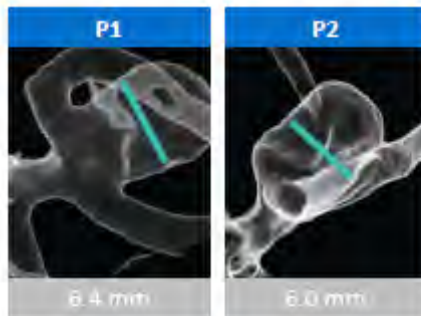
- First US approved Intra-sacular device
- Single device to treat aneurysm
- Can treat wide necked aneurysms
- Can treat ruptured aneurysms
- Allows endovascular treatment of aneurysms which could only be clipped
- Reduces procedure times
- Allows repositioning



WEB Sizing

A. Width Determination

Determine the average Aneurysm Width from 2 orthogonal projections

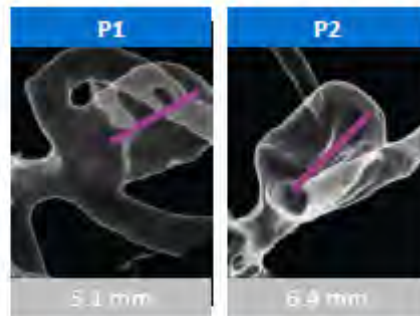


6.2 mm
Average Width

$$(6.4 \text{ mm} + 6.0 \text{ mm}) / 2 = 6.2 \text{ mm}$$

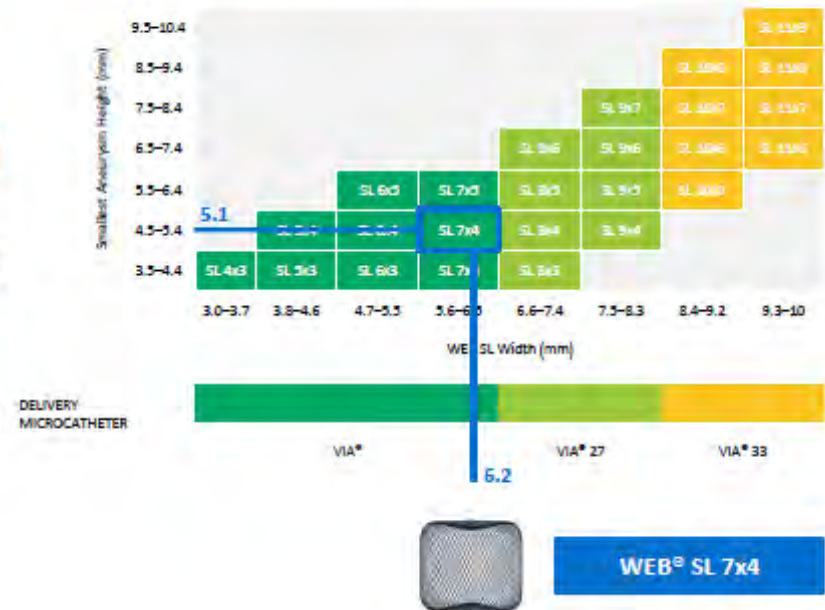
B. Height Determination

Take the smallest Aneurysm Height from 2 orthogonal projections

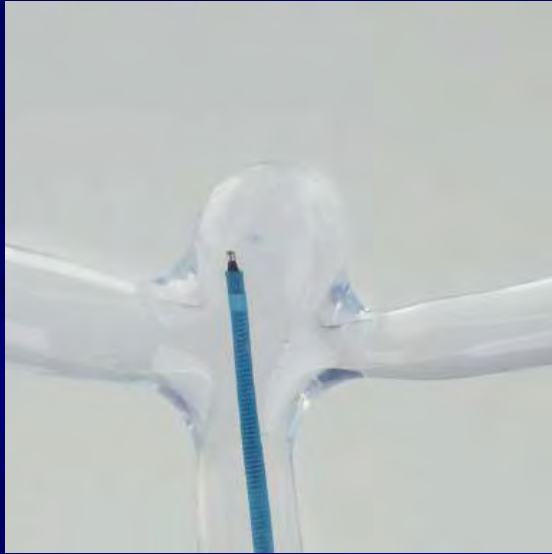


5.1 mm
Smallest Height

C. Device Selection



WEB Deployment

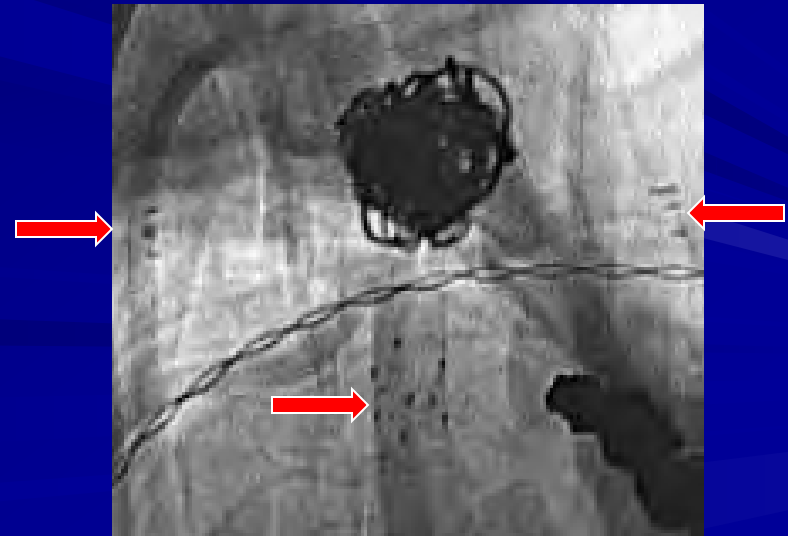
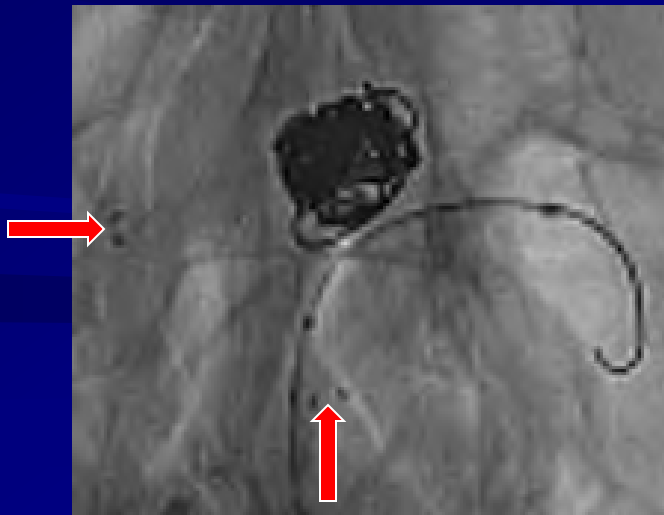
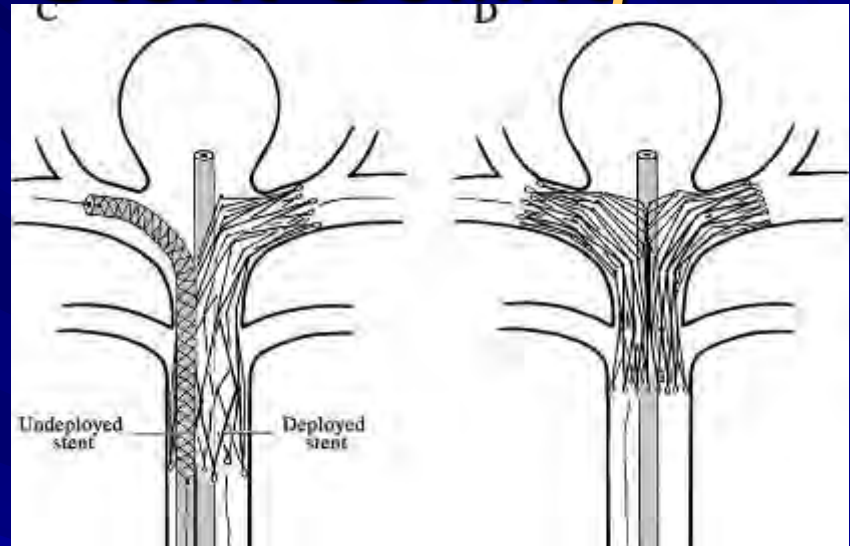


Wide Necked Aneurysm: Coiling versus WEB

- WEB allows easier treatment of wide necked aneurysm
- Coiling of wide-necked aneurysm may require additional balloon or stent assistance
- Some wide-necked aneurysms are not coilable but could be treated with WEB

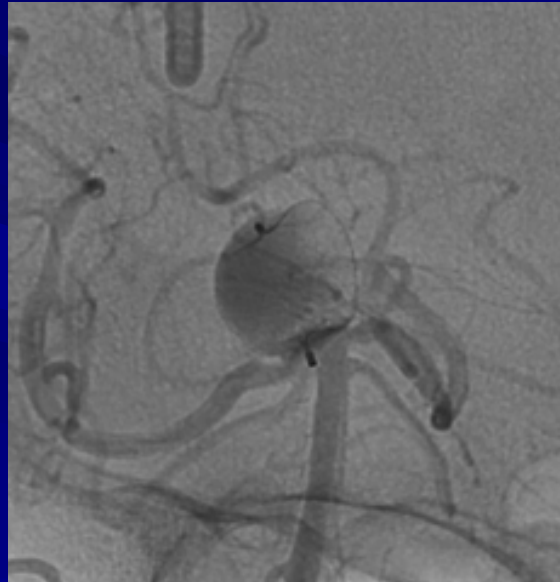
Wide Necked Basilar Tip Aneurysm

Double Y-Stent Coiling



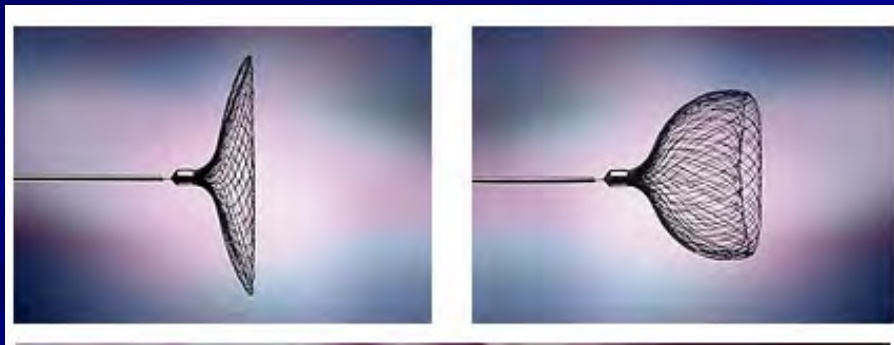
Wide Necked Basilar Tip Aneurysm

Single WEB Embolization



New Frontiers: Contour Device

- New Intrasacular device - Contour
- Intrasacular Flow Disruptor
- May combine aspects of flow diversion with intrasacular occlusion



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