

How to Access and Treat Occluded intracranial Arteries with Tortuous Anatomy and Ridged Skull Base anatomy



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TOSHIBA
STROKE &
VASCULAR
RESEARCH CENTER



Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

Affiliation/Financial Relationship

Company

- Toshiba – Honorarium
- Medtronic - Honorarium

This is not a typical stroke patient

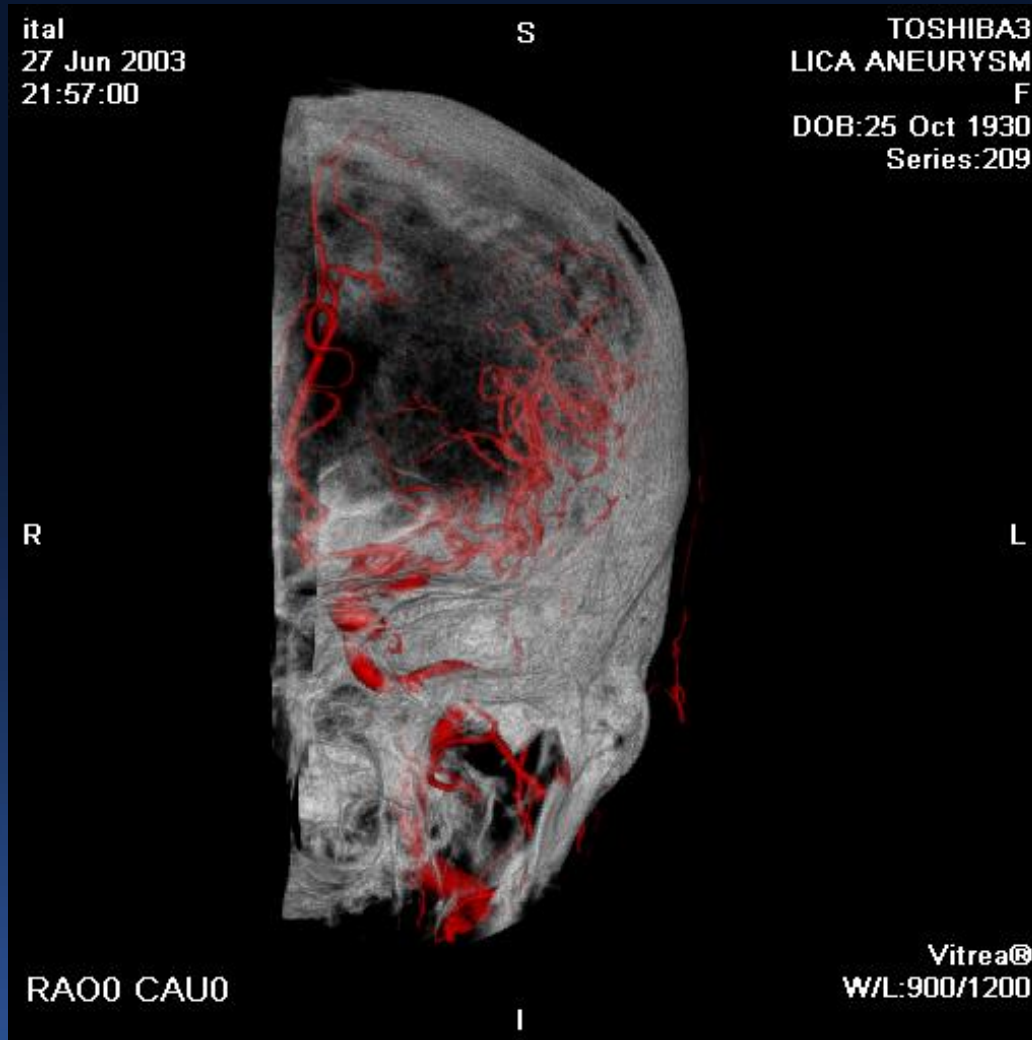


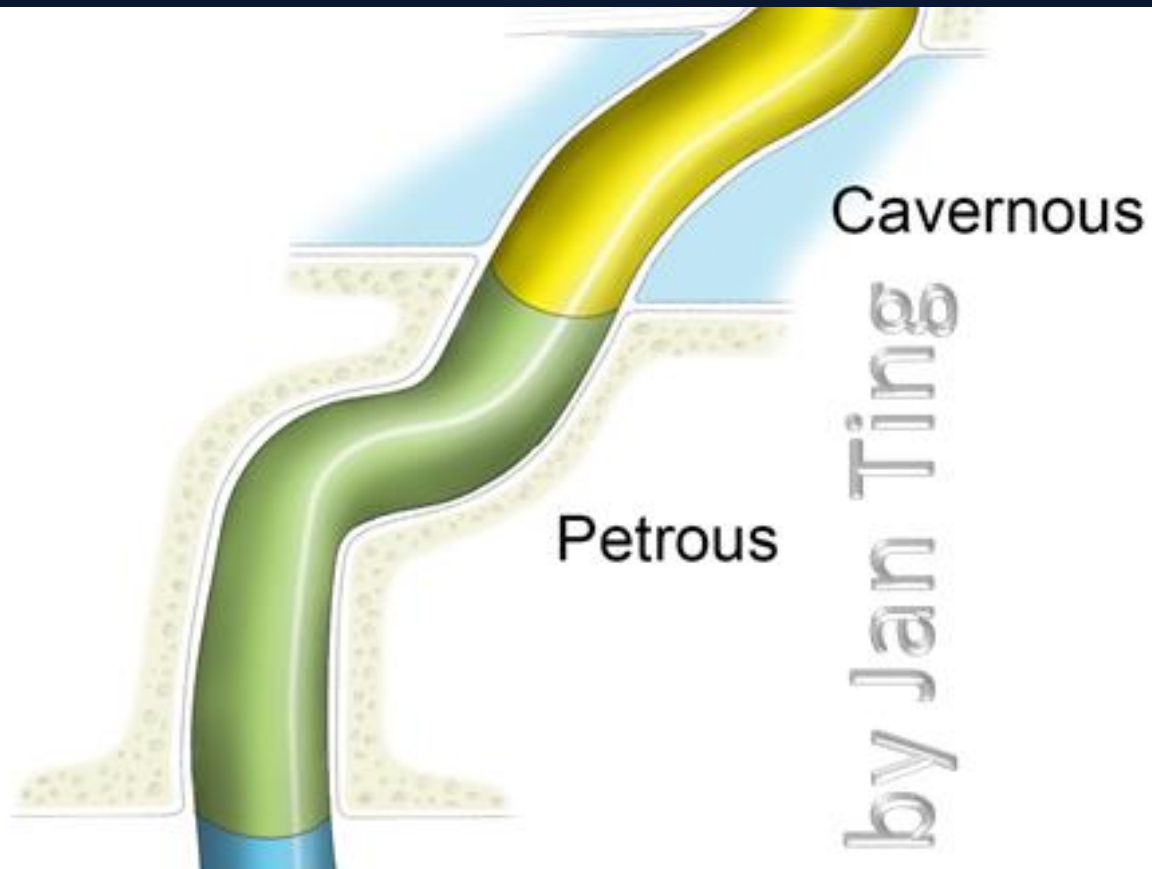


This is!!



Then the skull...



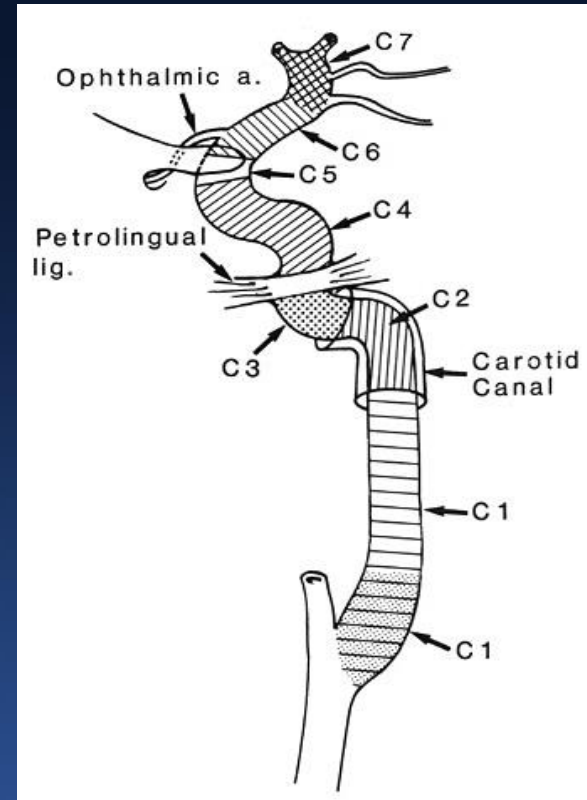
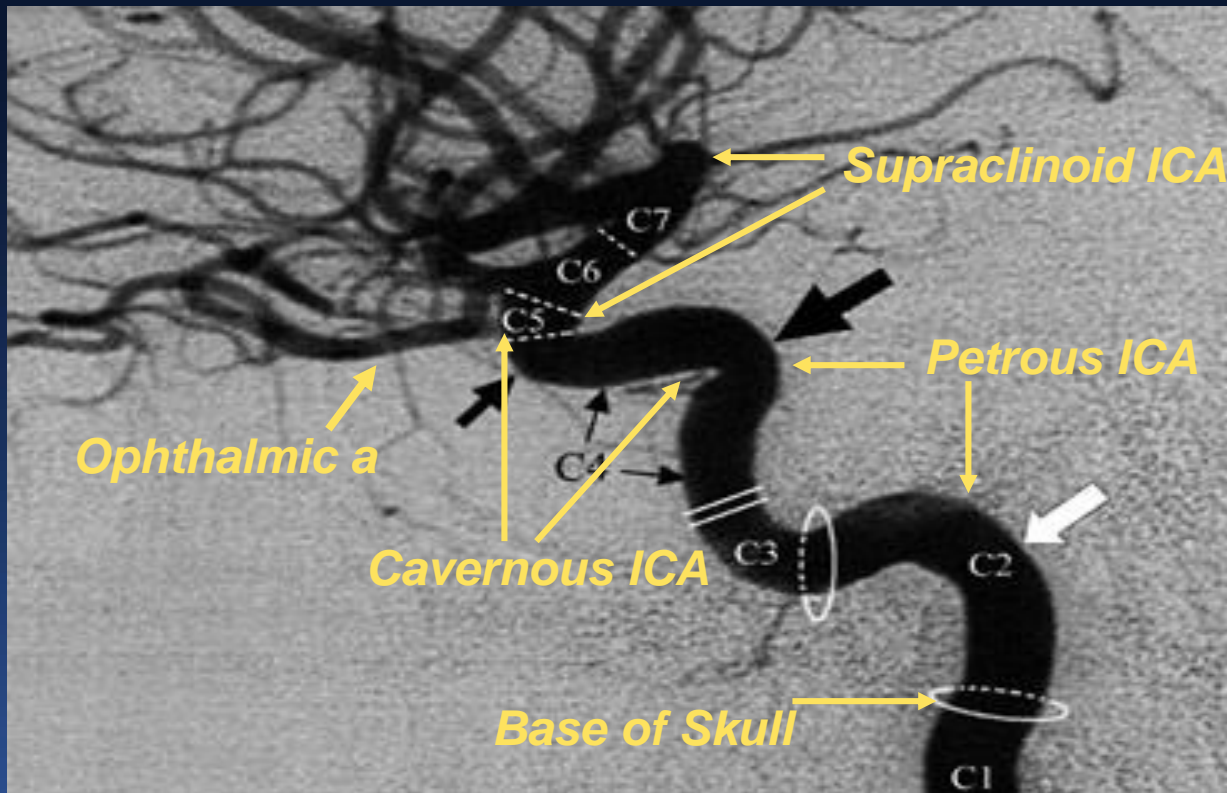


Internal Carotid

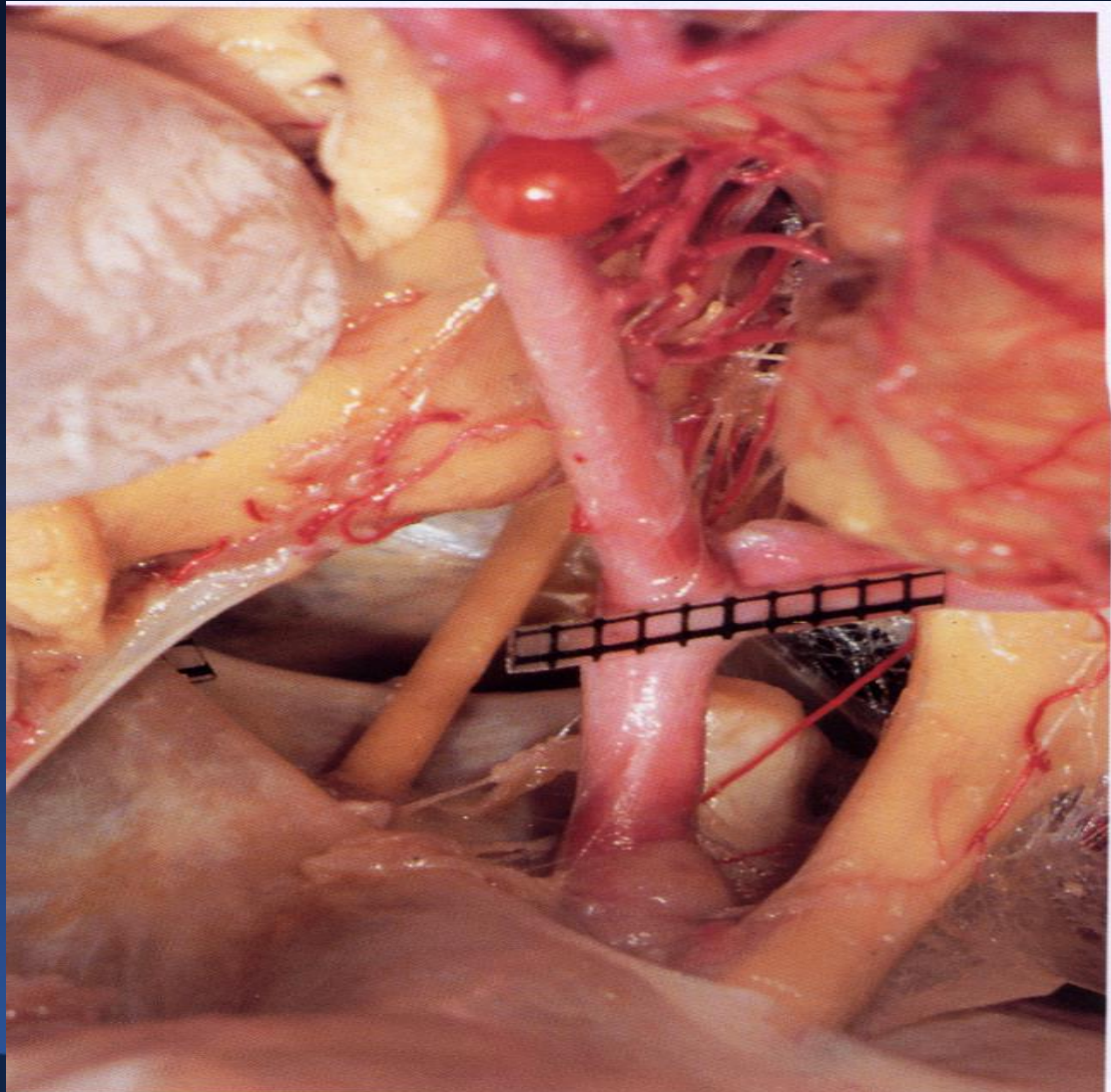
- Becomes fixed 2-3 mm proximal to skull base
- Petrous to supraclinoid segments are encased in bone / ligament / dura
- Intracranial branches are more mobile, but fragile



Then the Dura....



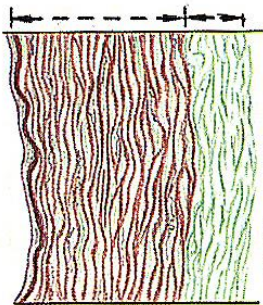
Then suddenly just spinal fluid and nothing else



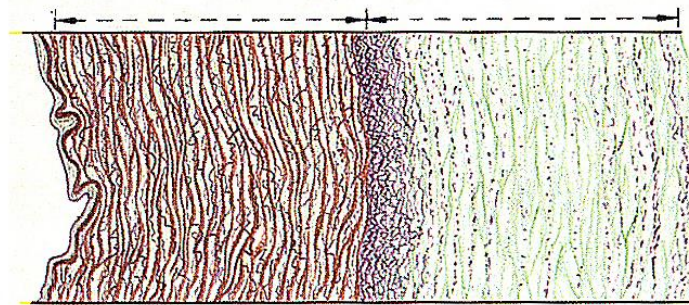
And almost no tissue besides intima and thin media

- **Vessel Composition:**
 - **Cerebral vessels differ from peripheral vessels**
 - **Cerebral vessels exhibit a smaller intima, media, and adventitia vs. peripheral vessels yet contain a greater % of smooth muscle cells**

Aa. basilaris et mesenterica sup. (having largely the same lumen)



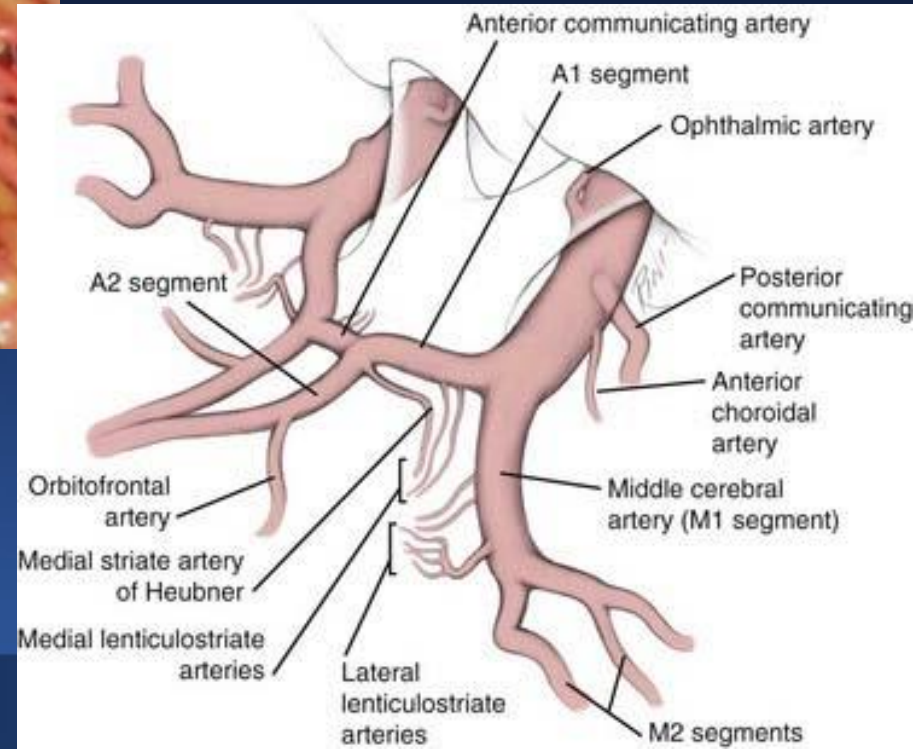
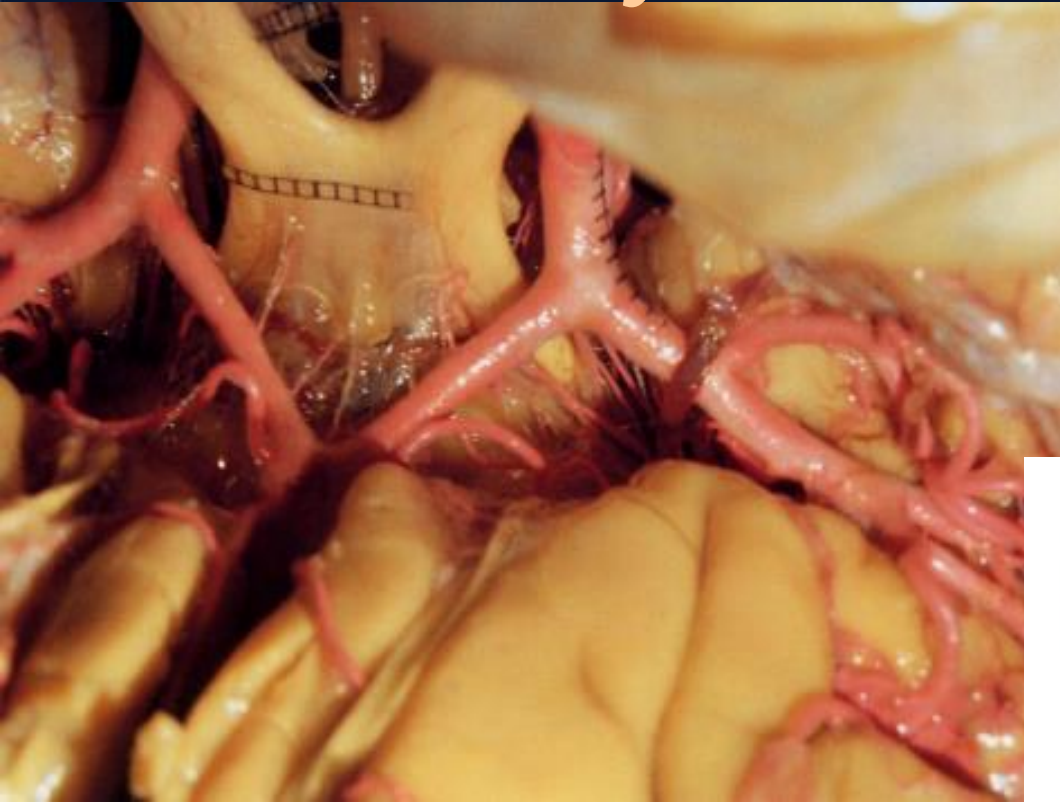
A. basilaris
(approx. 20 muscle cells)



A. mesenterica sup.
(approx. 35 muscle cells)

Wall thickness and number of stratified muscle cells comprising the media of an abdominal artery and a cerebral artery, cross section.

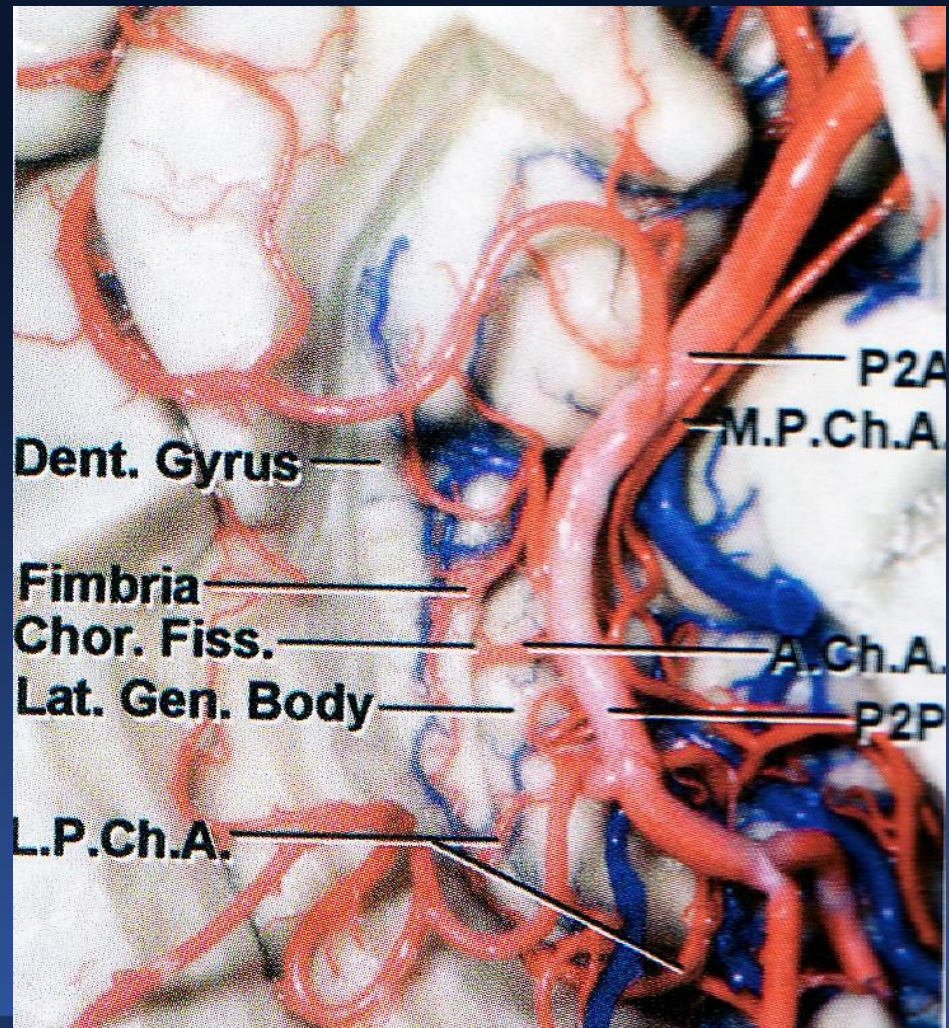
*And tiny little perforators everywhere,
your wire goes*



And more tortuosity

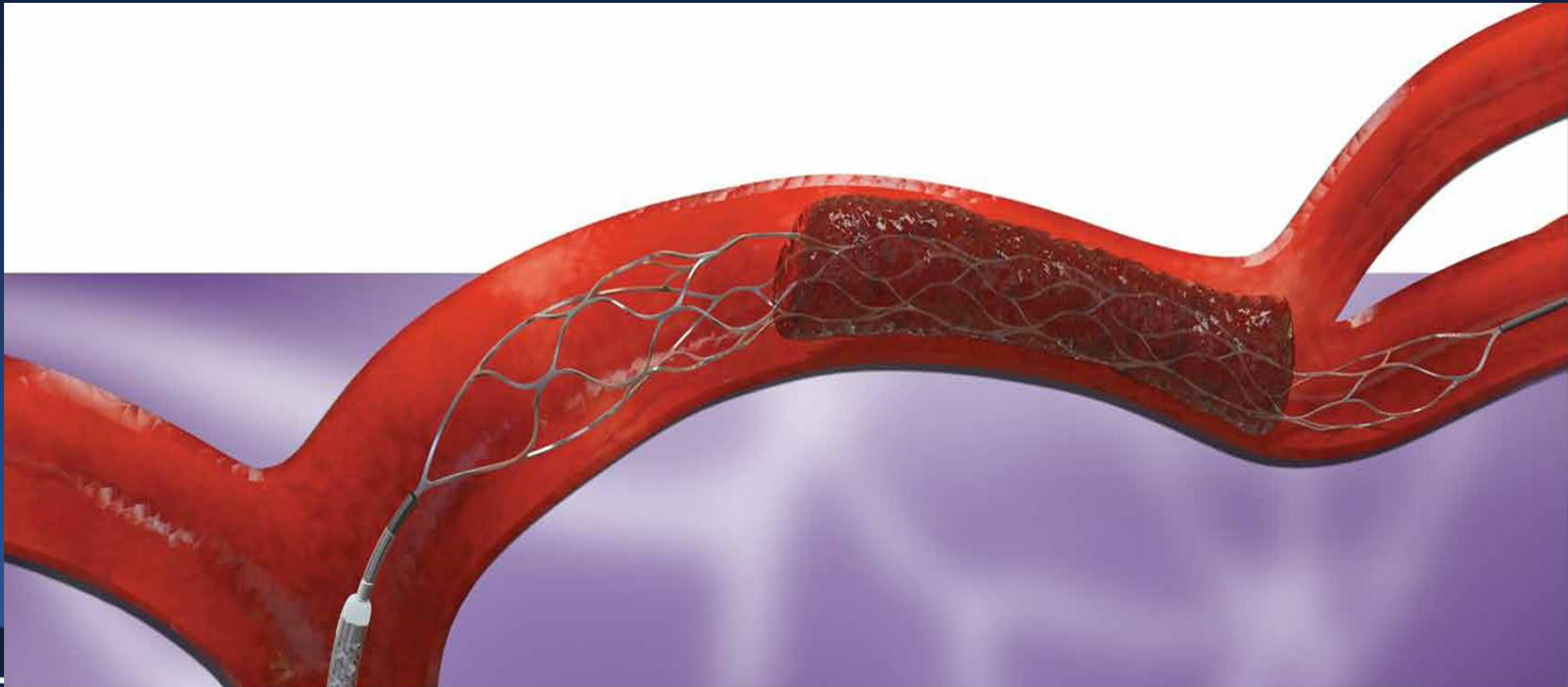
- Lateral posterior choroidal artery
Passes over
Pulvinar through
choroidal fissure
to enter lateral
ventricle

Anastomoses with
AChA near
choroidal fissure



Stroke Has Become a Surgical Entity

- Mechanical Thrombectomy
- Aspiration thrombectomy
- Intra-Arterial TPA
- Stent Retrieval thrombectomy



ORIGINAL ARTICLE

ORIGINAL ARTICLE

A Randomized Trial of Intravenous Alteplase for Acute Ischemic Stroke

The NEW ENGLAND JOURNAL of MEDICINE

Rapid Intravenous Alteplase for Acute Ischemic Stroke

O.A. Berkhemer, P.S.S. Frerking, W.J. Schonewille, J. Staals, J.P.A. Brouwer, E.J. van Dijk, B.A.A.M. van't Hof-Grootenboer, P.C. Vroomen, O. Eklund, A.V. Tielbeek, H.M. den Hertog, E.W. Steyerberg, H.Z. Flintergraaf, L.F.M. Beenen, R. van de Loo, and J. van't Hof-Grootenboer, for the MR CLEAN Investigators*

MR CLEAN

ORIGINAL ARTICLE

ESCAPE

Intravenous Alteplase within 8 Hours after Acute Ischemic Stroke

REVASCAT

T.G. Jovin, M. Broderick, J. C. Morris, M. M. Broderick, L. San Roman, J. Serena, S. Adhikari, M. Kido, M. Millan, X. Urrea, P. Cardona, F. L6pez-Cancio, A. Tomasello, C. Casta1o, J. Blasco, I. Aiz, I. Dorado, M. Rubiera, M. Hern1ndez-P6rez, M. G6mez-Orga, M. Gallofr6, and A. D1valos, for the REVASCAT Investigators*

Thornton, D. Roy, Frei, N.R. Kamal, G. G. S. Leung, D. Tampieri, M. J. S. Hill, J.-H. Heo, S. S. G. Chaturvedi, J. Shankar, S. S. G. Chaturvedi, W.F. Morrish, S. S. G. Chaturvedi, Lowerison, and S. S. G. Chaturvedi, for the REVASCAT Investigators*

The NEW ENGLAND JOURNAL of MEDICINE

NE

THRACE

THERAPY

t-PA

ABSTRACT

nic Stroke
ction

Jeffrey L. Saver, M.D., and the THRACE Investigators*

SWIFT PRIME

EXTEND-IA

Demetrius K. Lopes, M.D., Vivek K. Reddy, M.D., Richard du Mesnil de Rochemont, M.D., Oliver C. Singer, M.D., and Reza Jahan, M.D., for the SWIFT PRIME Investigators*

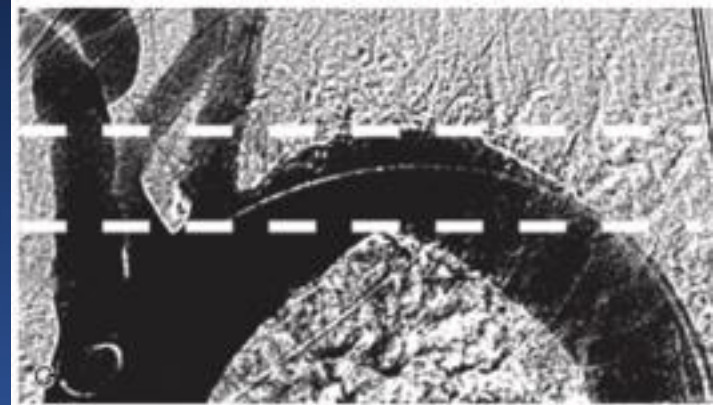
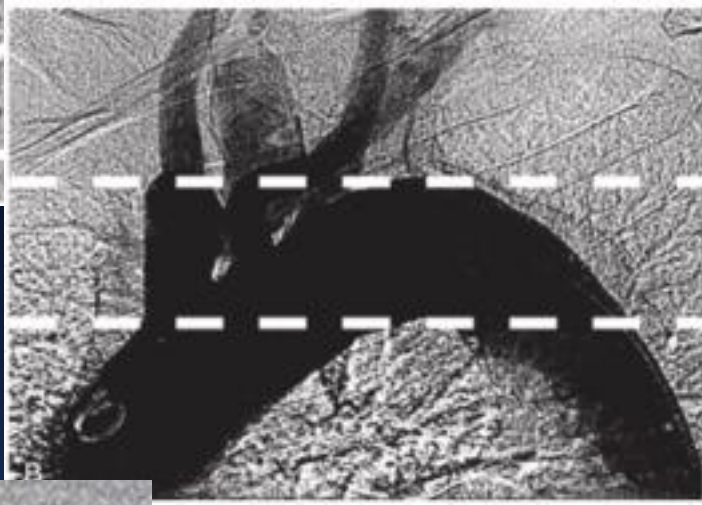
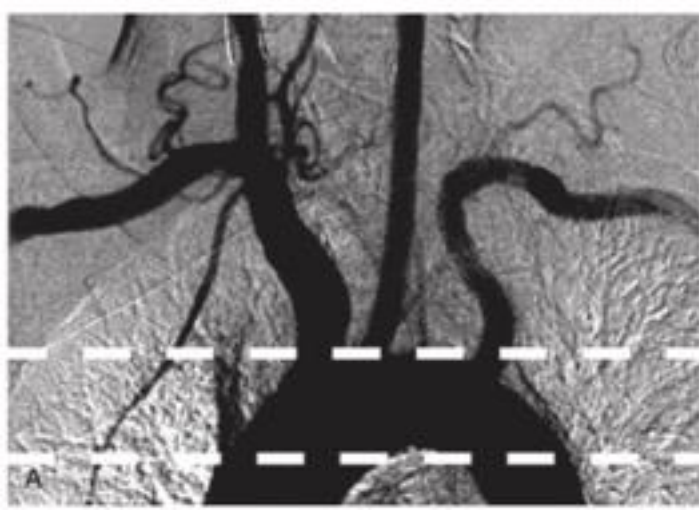
T. Wijeratne, T.G. Phan, W. Chong, R.V. Chandra, C.F. Bladin, M. Badve, H. Rice, L. de Villiers, H. Ma, P.M. Desmond, G.A. Donnan, and S.M. Davis, for the EXTEND-IA Investigators*

ABSTRACT

Buffalo Stroke Protocol

- **Tower of power**
 - 9F Groin sheath
 - 9F Balloon guide catheter (Ant Circ)
 - **6F Aspiration catheter**
 - Microwire (014)
 - **Microcatheter (025)**
 - Stent Retriever vs Aspiration vs both



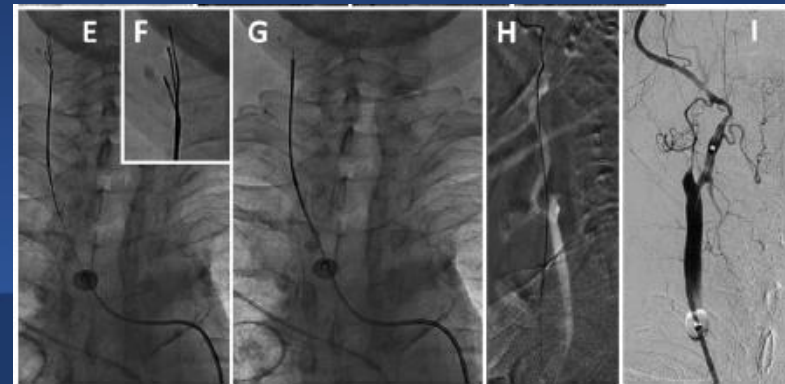
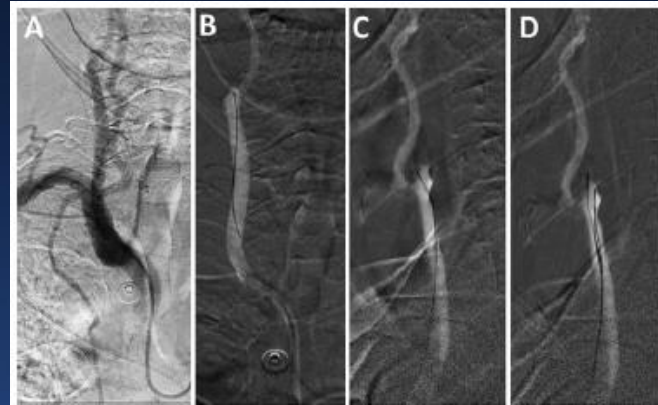
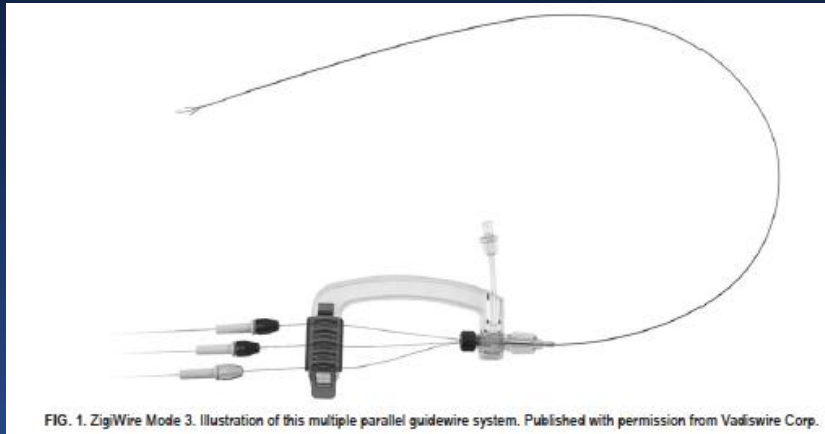


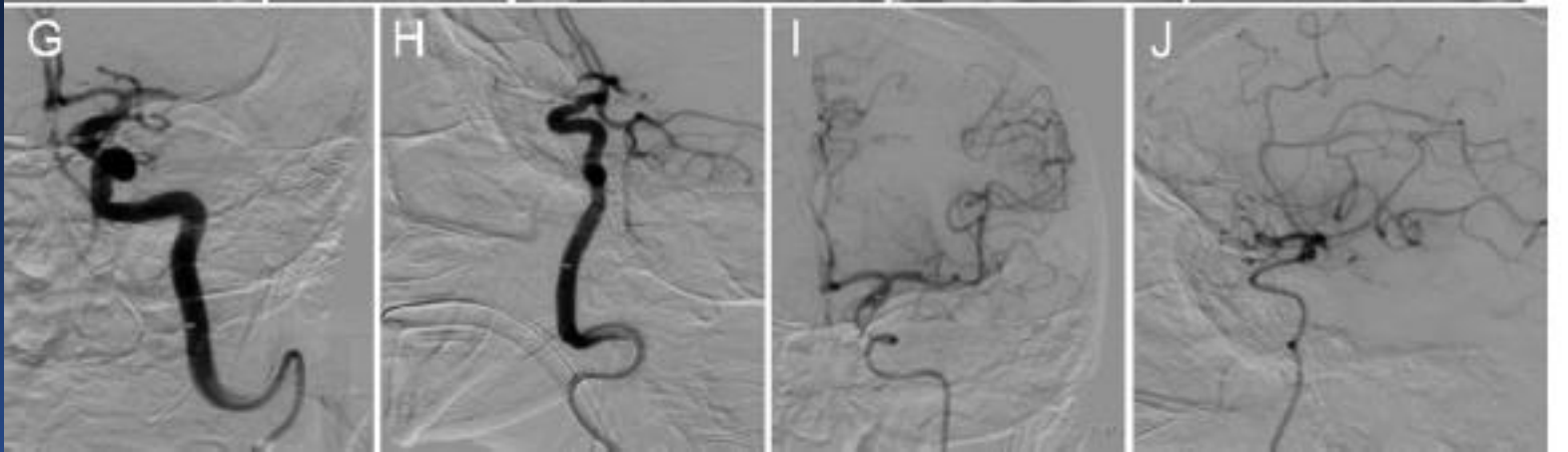
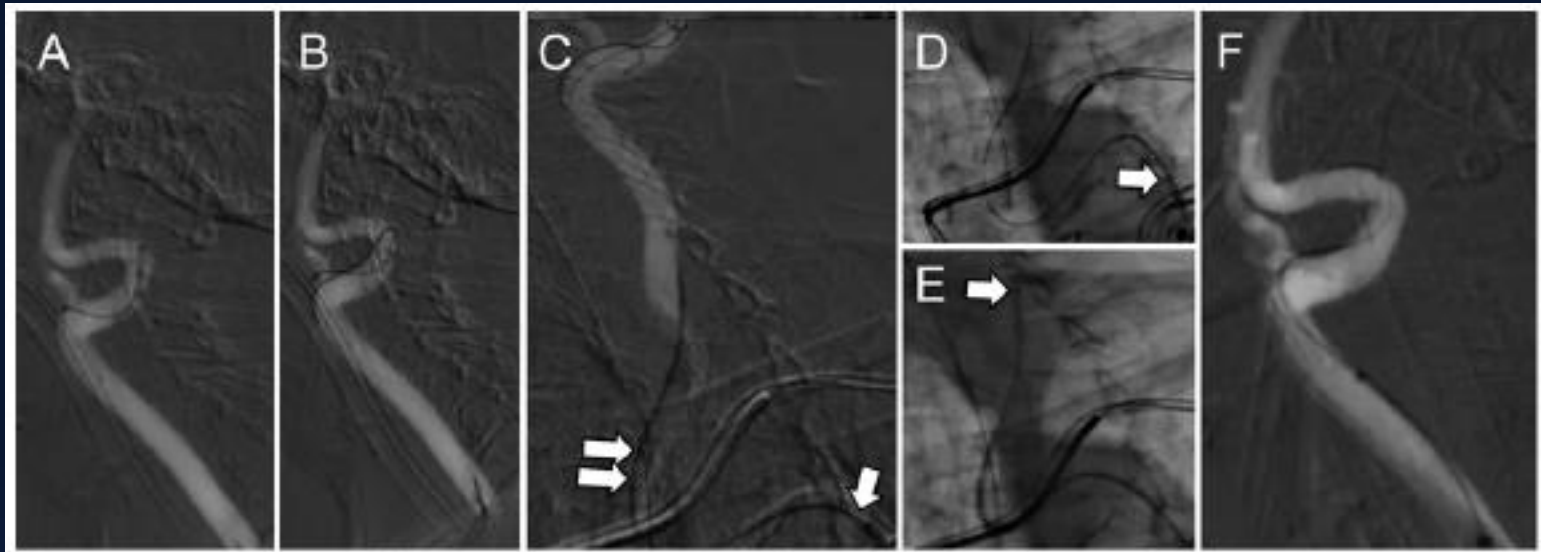
Initial experience with a multiple parallel guidewire support system for complex tortuous aortic arch navigation and great vessel catheterization: technical note

Leonardo Rangel-Castilla, MD,^{1,2} Hakeem J. Shakir, MD,^{1,2} and Adnan H. Siddiqui, MD, PhD¹⁻⁵

Departments of ¹Neurosurgery and ³Radiology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, State University of New York; ²Department of Neurosurgery, Gates Vascular Institute, Kaleida Health; ⁴Toshiba Stroke and Vascular Research Center, University at Buffalo, State University of New York; and ⁵Jacobs Institute, Buffalo, New York

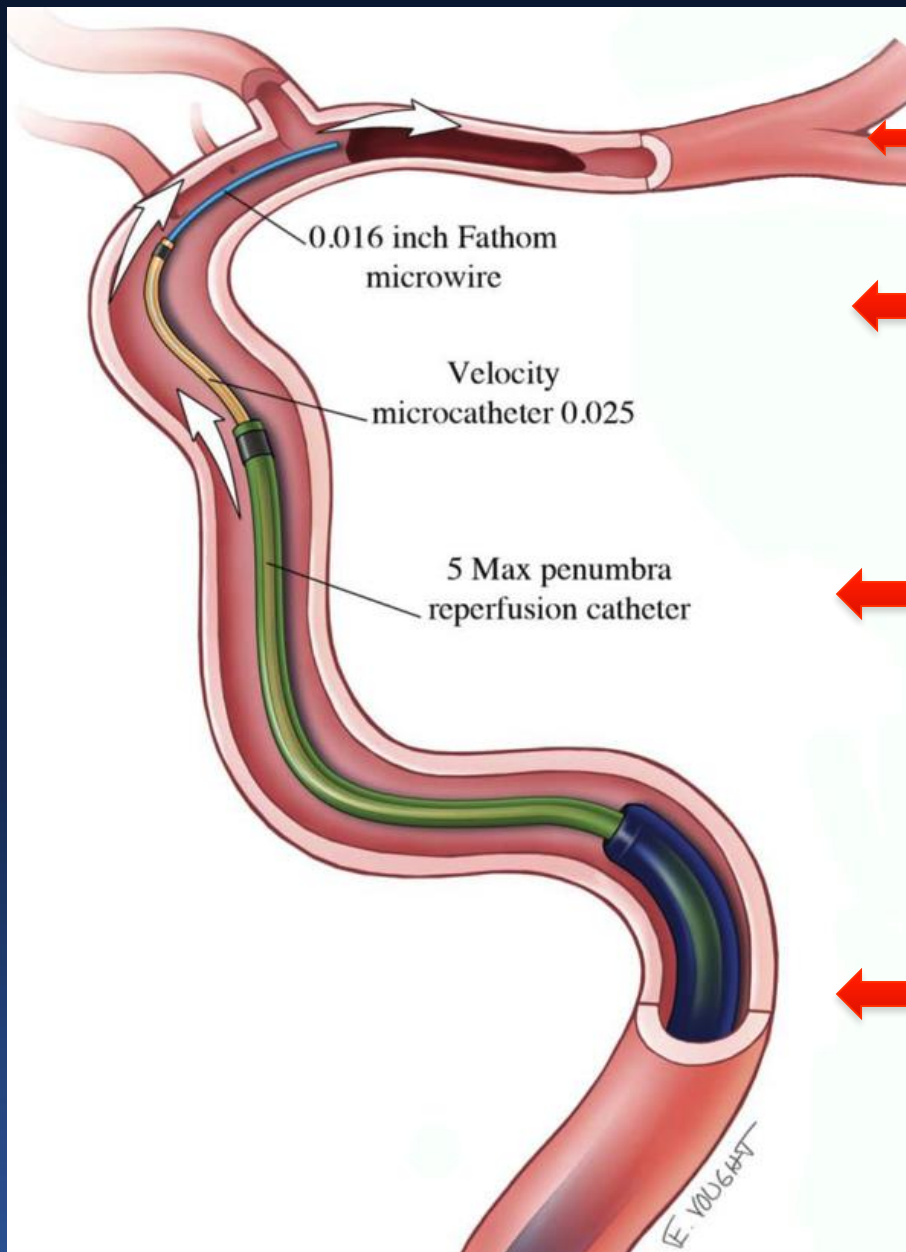
Neurosurg Focus 42 (4):E14, 2017





Multiple Coaxial Catheter System for Reliable Access in Interventional Stroke Therapy

- 28 cases
- Acute Ischemic stroke
- Progressive support / tri-axial support
- 8F guide cath
- 6F intermediate
- Microcatheter and 014 microwire



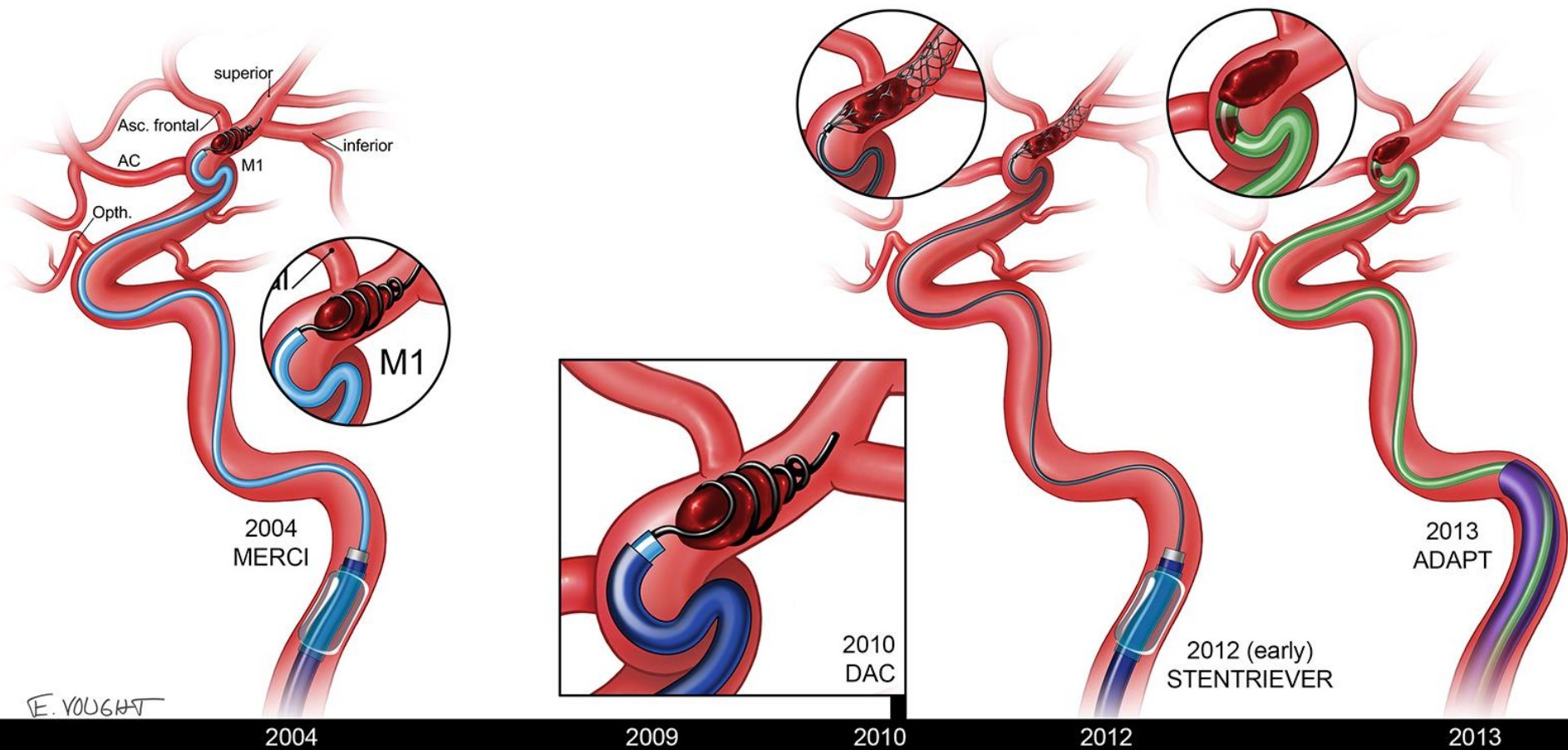
0.014 microwire to cross clot

0.025+ microcatheter To deliver stent retriever

6F intermediate catheter ID 0.060+ to assist aspiration & retrieval

Balloon Guide

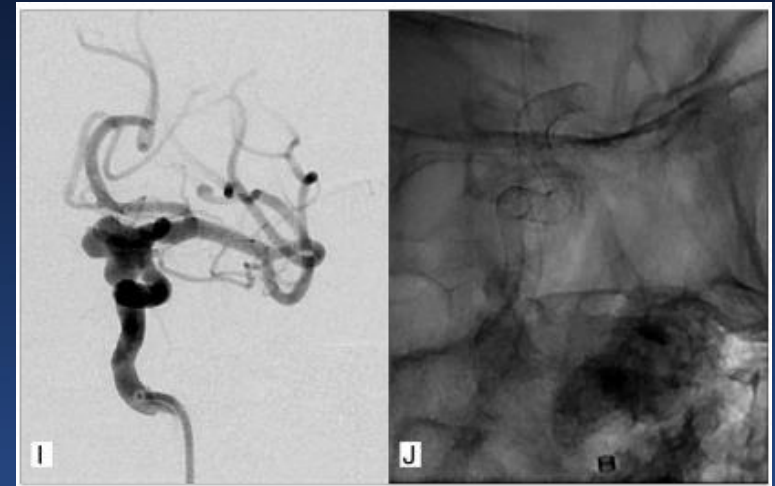
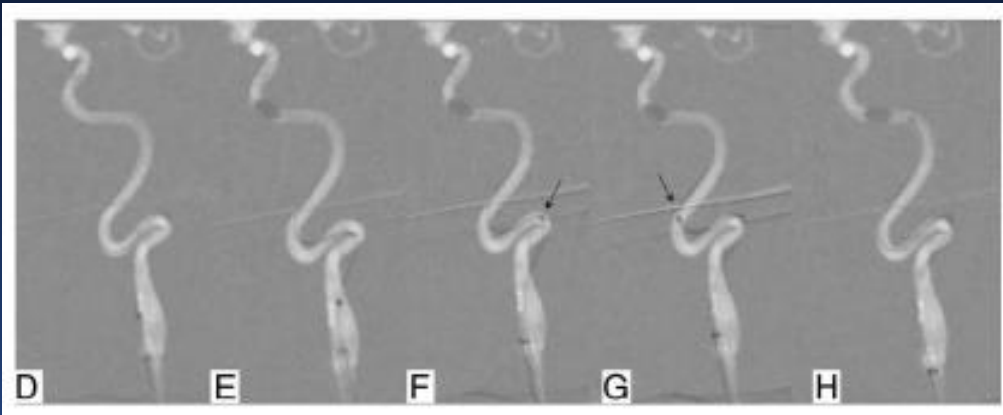
A field in motion.....



ORIGINAL RESEARCH

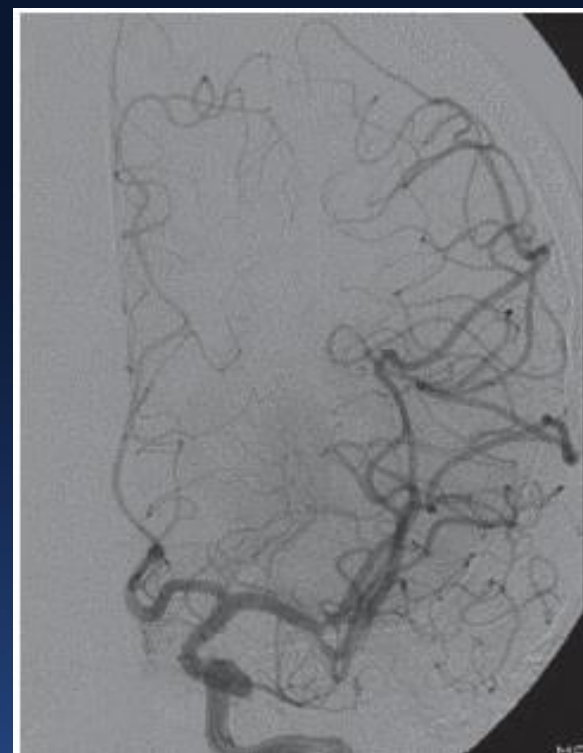
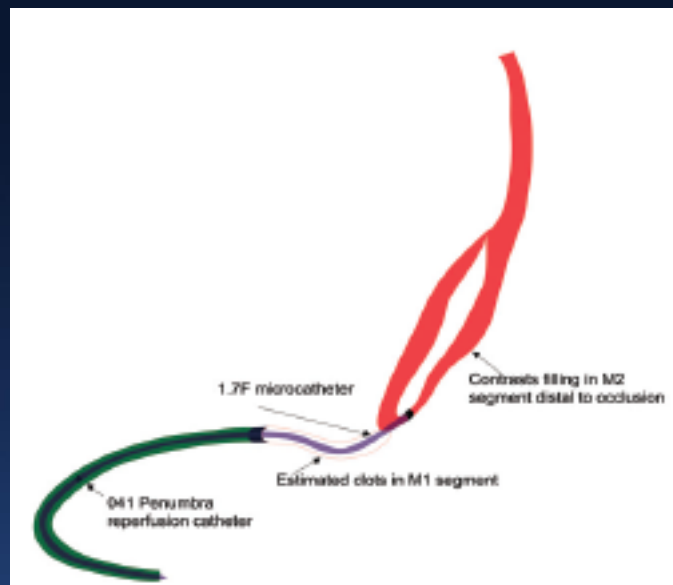
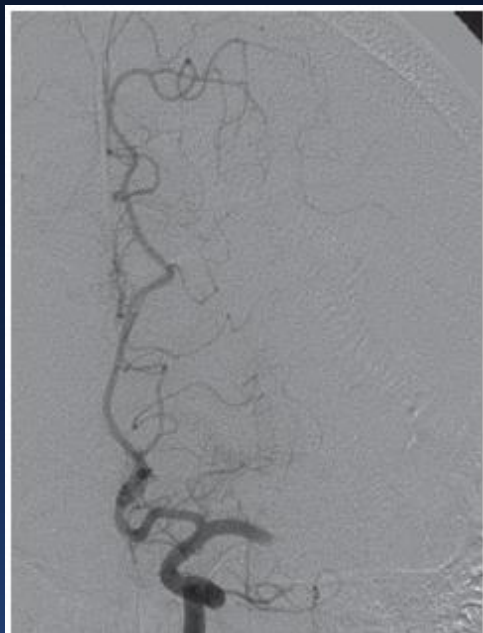
Balloon-assisted guide catheter positioning to overcome extreme cervical carotid tortuosity: technique and case experience

Lissa Peeling, David Fiorella

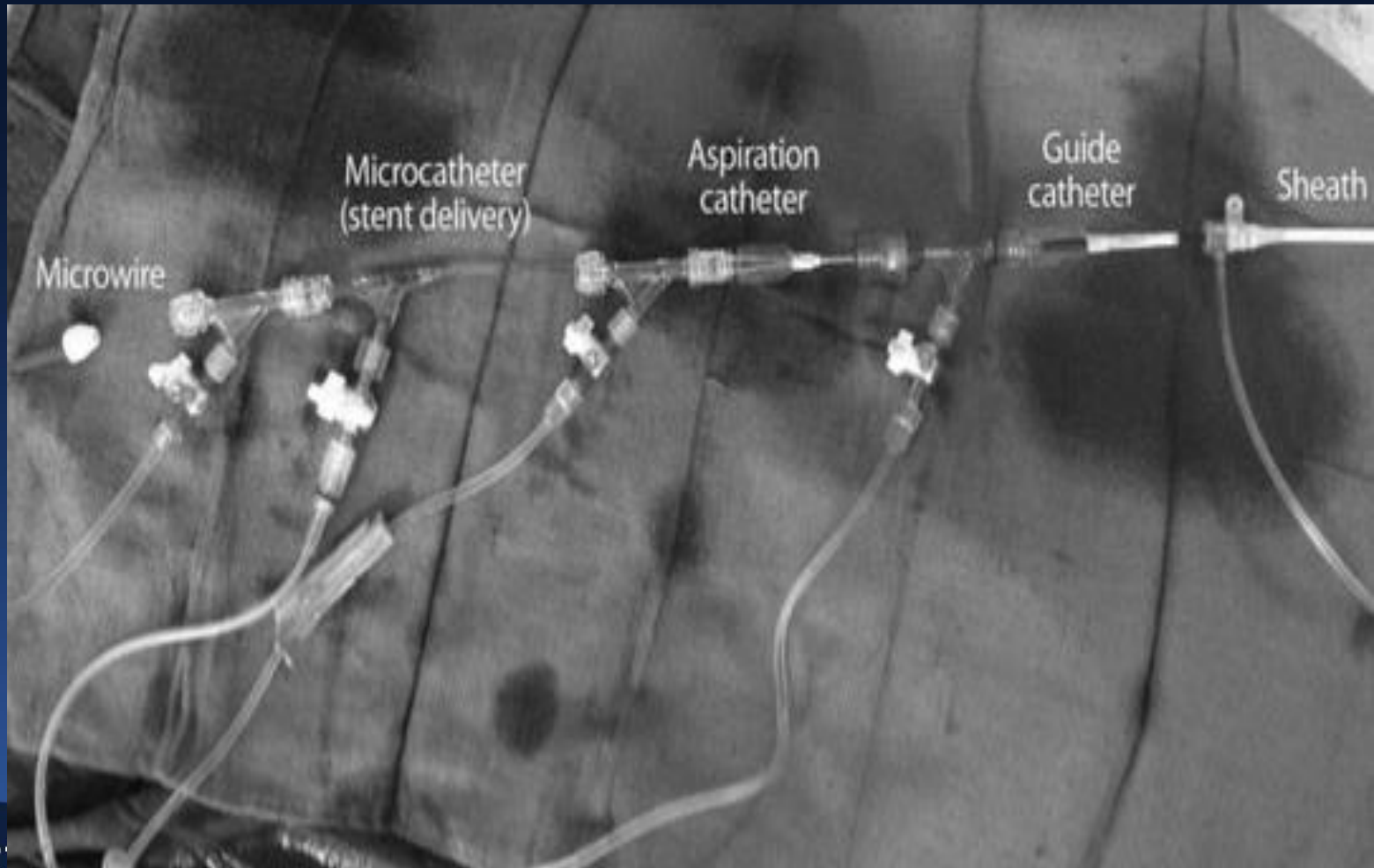
J NeuroIntervent Surg 2013;0:1–5. doi:10.1136/neurintsurg-2013-010655

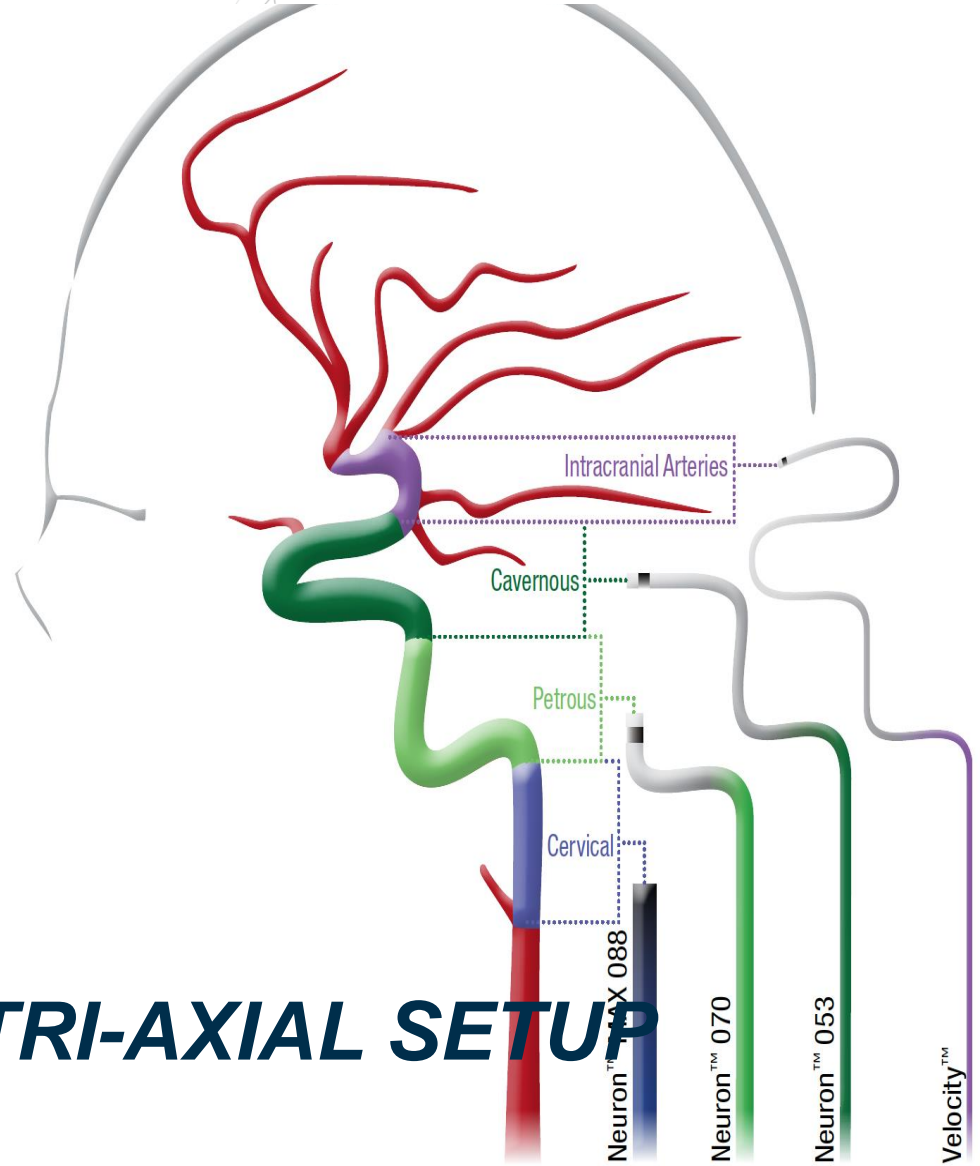
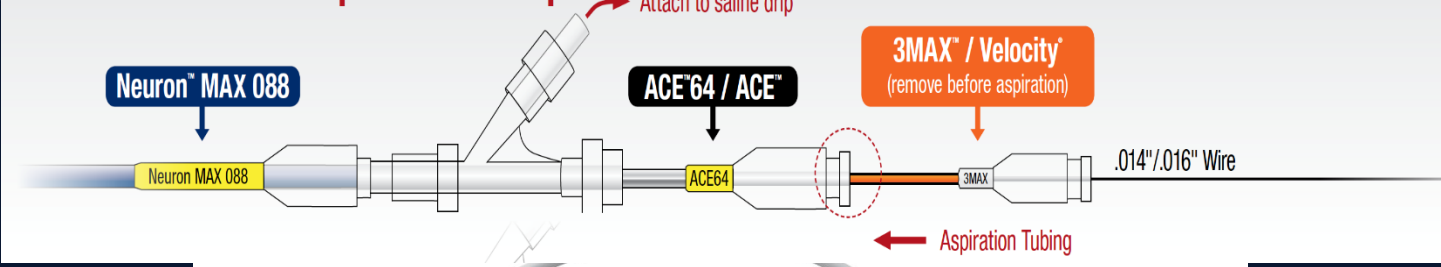
Direct Thrombus Retrieval Using the Reperfusion Catheter of the Penumbra System: Forced-Suction Thrombectomy in Acute Ischemic Stroke

AJNR Am J Neuroradiol 32:283-87 | Feb 2011



Stent retriever assisted Aspiration





TRI-AXIAL SETUP

A case of severe tortuosity

***Thank you!
Questions?***

