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SOCIETÀ ITALIANA DI CHIRURGIA

SOCIETÀ NAPOLETANA DI CHIRURGIA

ACGC

Napoli SURGERY

PROGRAMMA SEMINARI

28 SETTEMBRE

Aula Magna Scuola di Medicina di Scampia
Centro Congressi Università degli Studi di Napoli Federico II
Via Valerio Verbano Snc, Scampia - Napoli

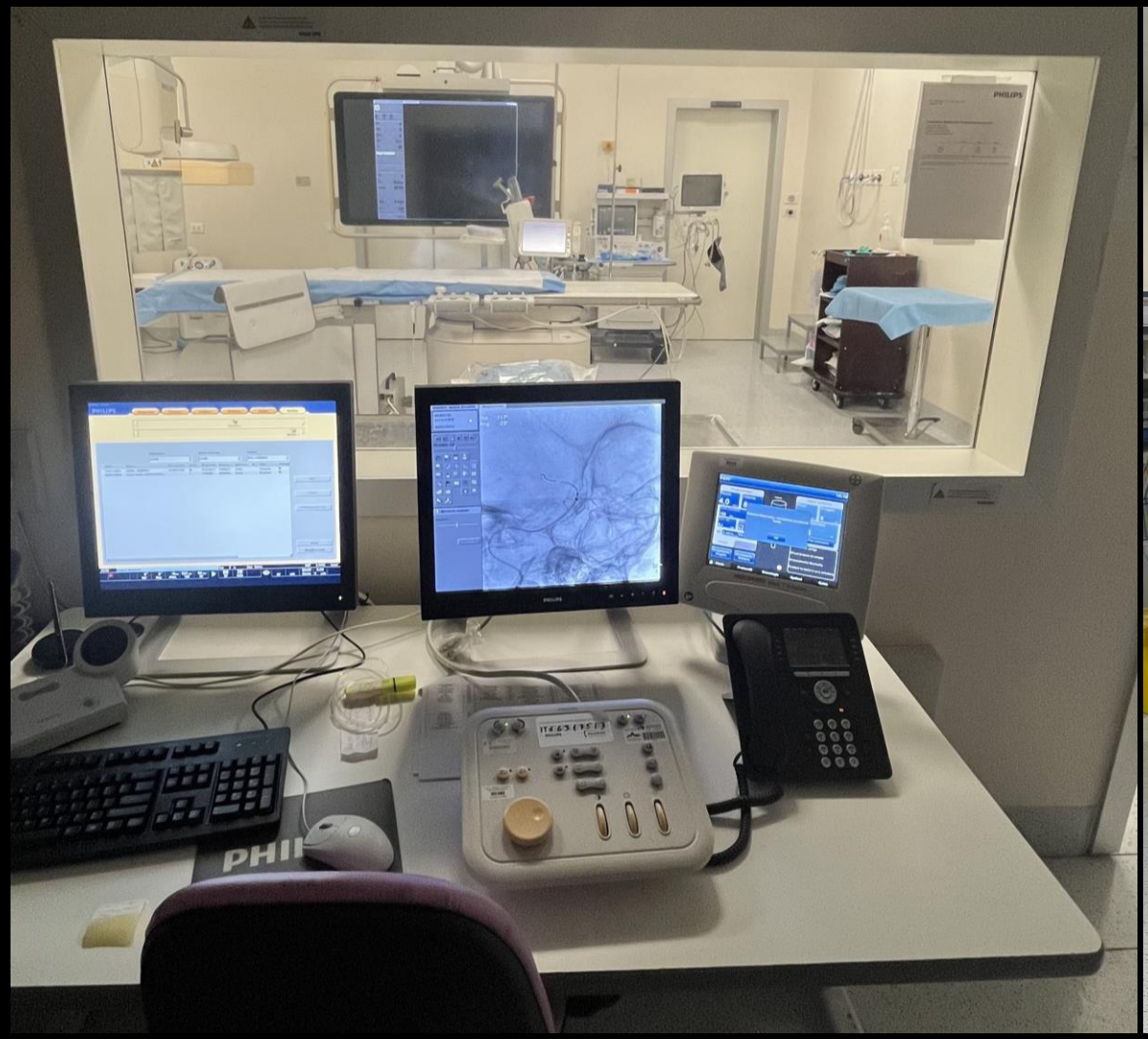
Napoli
SURGERY

UOC NEURORADIOLOGIA ODM

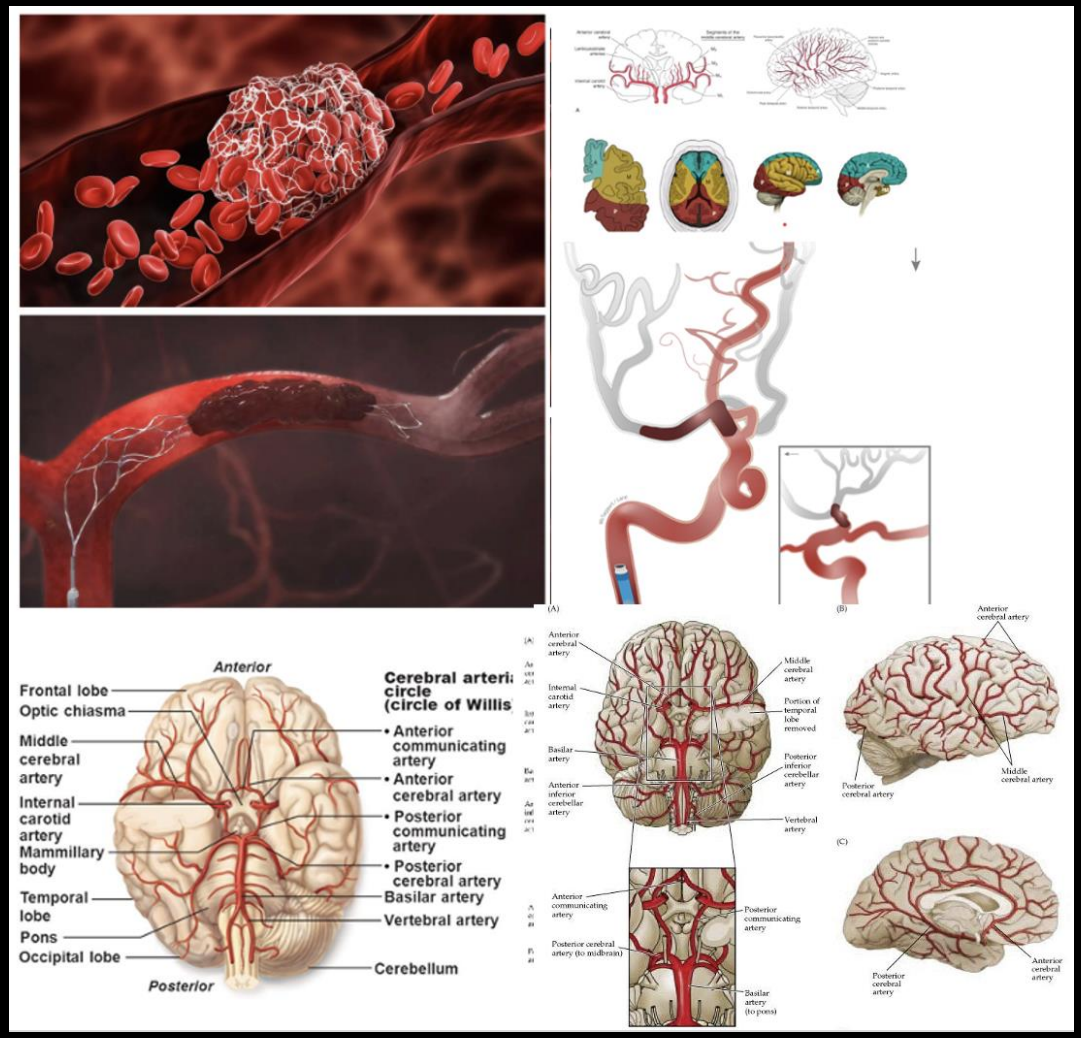
Nuove evidenze sul trattamento endovascolare dell'Ictus Ischemico acuto: Indicazioni e terapia adiuvante

Dott. G. Loiudice

Trattamento Endovascolare



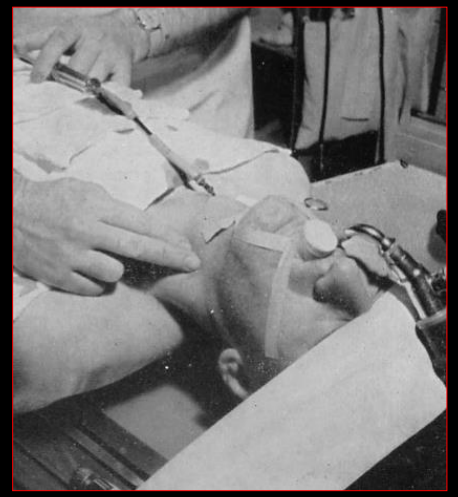
- L’ictus ischemico causato da **occlusione di grandi vasi (LVO)** è oramai riconosciuto come una delle principali cause di disabilità a lungo termine
- La conferma del dato clinico ed il trattamento mediante trombolisi endovenosa e/o trombectomia endovascolare (ET) sono fondamentali per ridurre la **morbilità e la mortalità** (1).
- Necessità di un adeguato **triage pre-ospedaliero** ed **inquadramento diagnostico clinico**
- **Esami diagnostici strumentali** non invasivi ed invasivi (TC smdc, sCTA, mCTA, CTP e DSA)
- Limiti intrinseci dovuti alla difficoltà organizzative con mancanza di un **protocollo univoco definito ed approvato in ambito territoriale**.
- Lievi **ritardi temporali** possono concorrere a determinare un aumento della morbilità e persino l’esclusione del candidato all’intervento di ET (2)



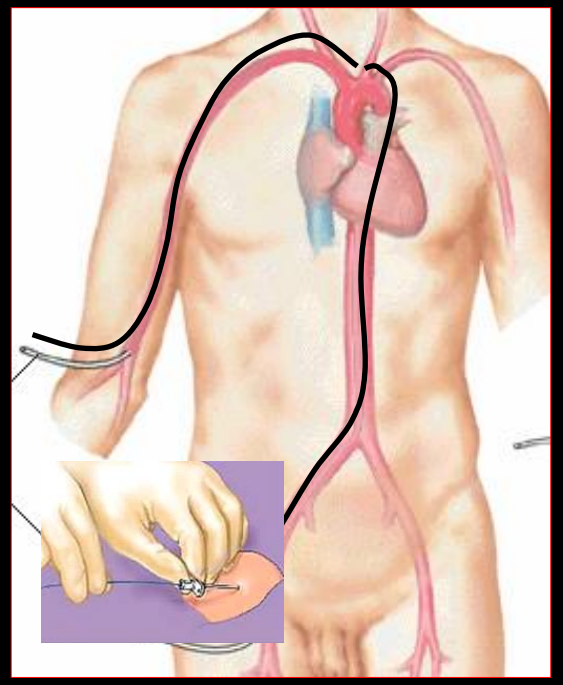
1) Murray NM, Unberath M, Hager GD, Hui FK. Artificial intelligence to diagnose ischemic stroke and identify large vessel occlusions; 2) Goyal M, Jadhav AP, Bonafe A, Diener H, Mendes Pereira V, Levy E, Baxter B, Jovin T, Jahan R, Menon BK, Saver JL; SWIFT PRIME investigators. Analysis of Workflow and Time to Treatment and the Effects on Outcome in Endovascular Treatment of Acute Ischemic Stroke: Results from the SWIFT PRIME Randomized Controlled Trial. Radiology. 2016 Jun;279(3):888-97.

Angiografia cerebrale

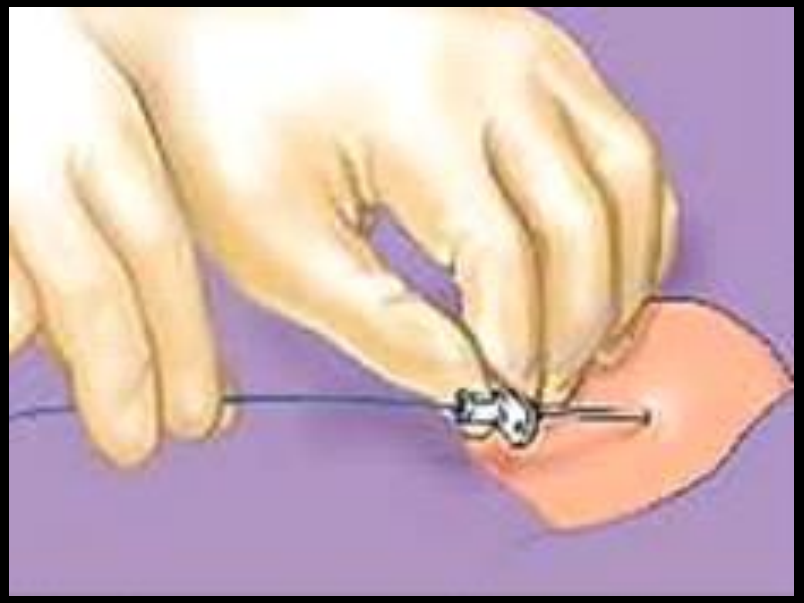
1927 Moniz presenta la prima angiografia cerebrale mediante puntura diretta della carotide

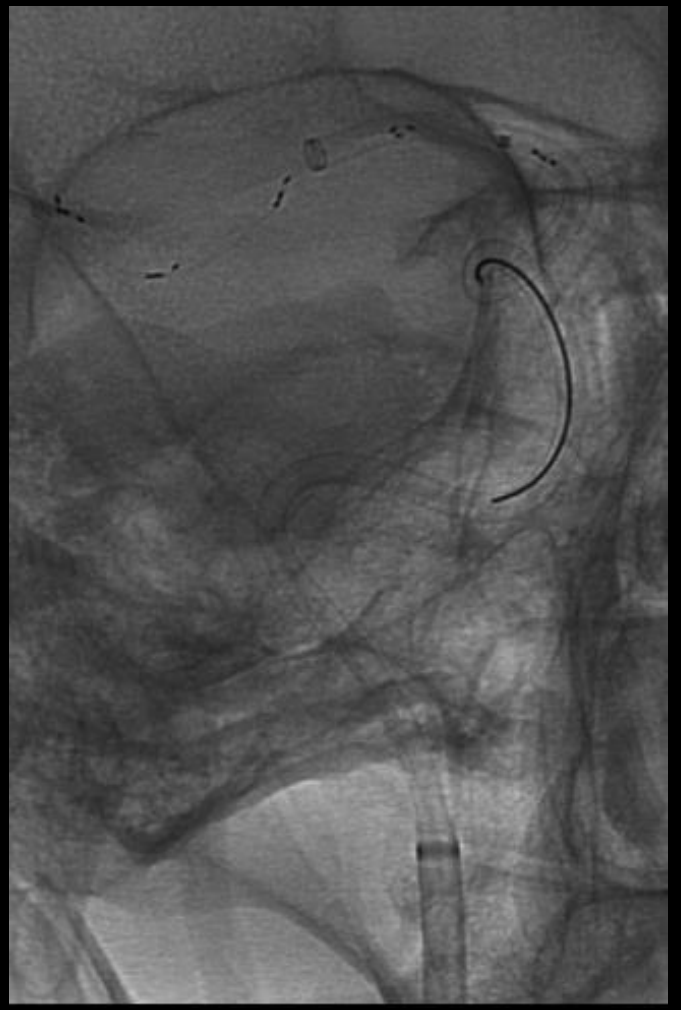


1950 Seldinger presenta la tecnica di angiografia mediante cateterismo arterioso con approccio periferico



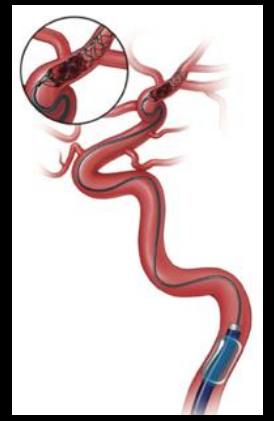
Angiografia cerebrale

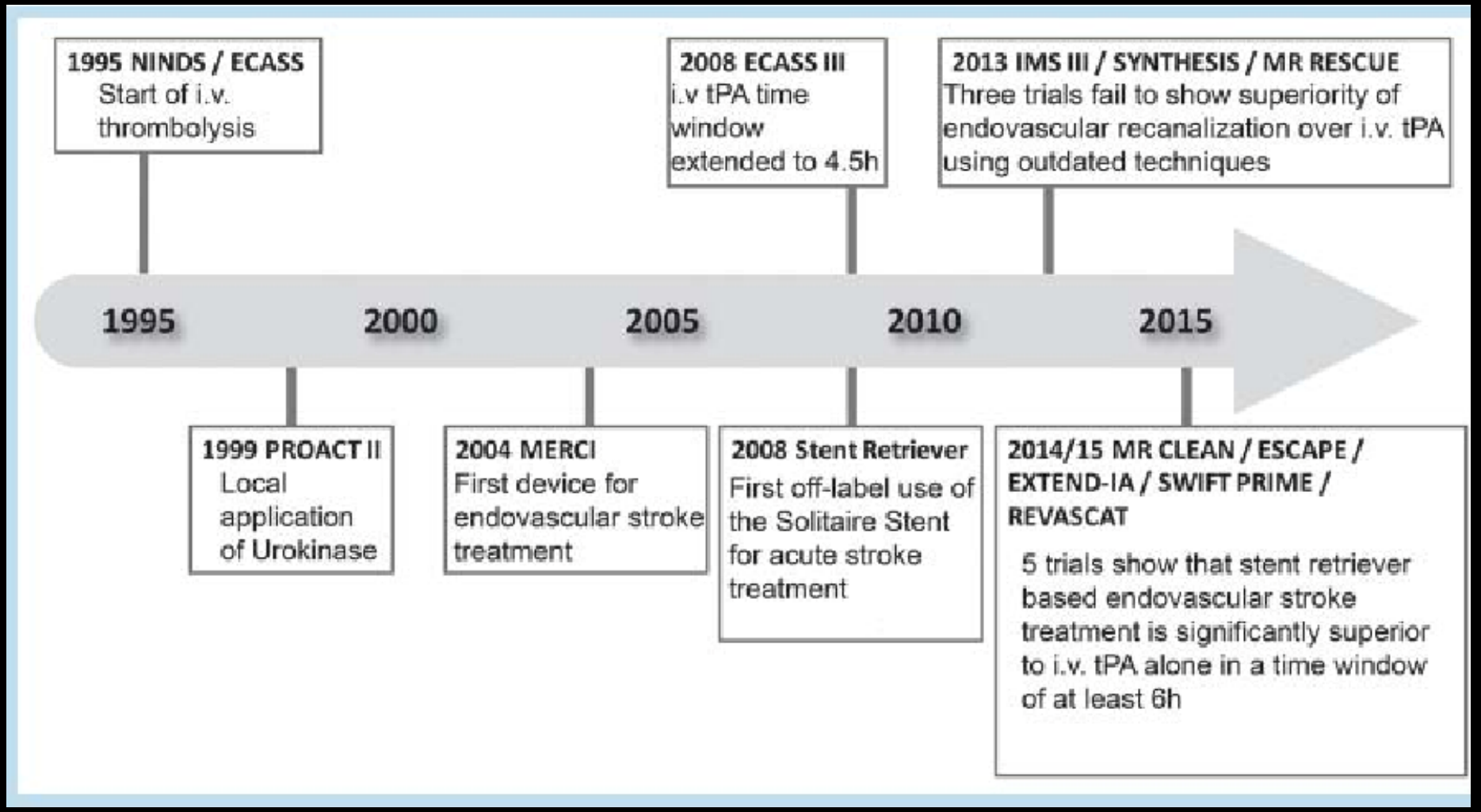




- *Blind-Exchange*
- *Mini-pinning technique MeVO*
- *ANTRACK Technique*
- *Double Guide Technique*

TROMBECTOMIA MECCANICA: EVIDENZE





-MR CLEAN- -REVASCAT- -SWIFT PRIME- -EXTEND 1A- -ESCAPE-

A Randomized Trial of Intraarterial Treatment for Acute Ischemic Stroke

O.A. Berkhemer, P.S.S. Fransen, D. Beumer, L.A. van den Berg, H.F. Lingsma, A.J. Yoo, W.J. Schonewille, J.A. Vos, P.J. Nederkoorn, M.J.H. Wermer, M.A.A. van Walderveen, J. Staals, J. Hofmeijer, J.A. van Oostayen, G.J. Lycklama à Nijeholt, J. Boiten, P.A. Brouwer, B.J. Emmer, S.F. de Bruijn, L.C. van Dijk, L.J. Kappelle, R.H. Lo, E.J. van Dijk, J. de Vries, P.L.M. de Kort, W.J.J. van Rooij, J.S.P. van den Berg, B.A.A.M. van Hasselt, L.A.M. Aerden, R.J. Dallinga, M.C. Visser, J.C.J. Bot, P.C. Vroomen, O. Eshghi, T.H.C.M.L. Schreuder, R.J.J. Heijboer, K. Keizer, A.V. Tielbeek, H.M. den Hertog, D.G. Gerrits, R.M. van den Berg-Vos, G.B. Karas, E.W. Steyerberg, H.Z. Flach, H.A. Marquering, M.E.S. Sprengers, S.F.M. Jenniskens, L.F.M. Beenen, R. van den Berg, P.J. Koudstaal, W.H. van Zwam, Y.B.W.E.M. Roos, A. van der Lugt, R.J. van Oostenbrugge, C.B.L.M. Majoie, and D.W.J. Dippel, for the MR CLEAN Investigators*

N Engl J Med 2015; 372: 11-20

Thrombectomy within 8 Hours after Symptom Onset in Ischemic Stroke

T.G. Jovin, A. Chamorro, E. Cobo, M.A. de Miquel, C.A. Molina, A. Rovira, L. San Román, J. Serena, S. Abilleira, M. Ribó, M. Millán, X. Urra, P. Cardona, E. López-Cancio, A. Tomasello, C. Castaño, J. Blasco, L. Aja, L. Dorado, H. Quesada, M. Rubiera, M. Hernández-Pérez, M. Goyal, A.M. Demchuk, R. von Kummer, M. Gallofré, and A. Dávalos, for the REVASCAT Trial Investigators*

N Engl J Med 2015; 372: 2296-2306

Stent-Retriever Thrombectomy after Intravenous t-PA vs. t-PA Alone in Stroke

Jeffrey L. Saver, M.D., Mayank Goyal, M.D., Alain Bonafe, M.D., Hans-Christoph Diener, M.D., Ph.D., Elad I. Levy, M.D., Vitor M. Pereira, M.D., Gregory W. Albers, M.D., Christophe Cognard, M.D., David J. Cohen, M.D., Werner Hacke, M.D., Ph.D., Olav Jansen, M.D., Ph.D., Tudor G. Jovin, M.D., Heinrich P. Mattle, M.D., Raul G. Nogueira, M.D., Adnan H. Siddiqui, M.D., Ph.D., Dileep R. Yavagal, M.D., Blaise W. Baxter, M.D., Thomas G. Devlin, M.D., Ph.D., 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*

N Engl J Med 2015; 372: 2285-2295

Endovascular Therapy for Ischemic Stroke with Perfusion-Imaging Selection

B.C.V. Campbell, P.J. Mitchell, T.J. Kleinig, H.M. Dewey, L. Churilov, N. Yassi, B. Yan, R.J. Dowling, M.W. Parsons, T.J. Oxley, T.Y. Wu, M. Brooks, M.A. Simpson, F. Miteff, C.R. Levi, M. Krause, T.J. Harrington, K.C. Faulder, B.S. Steinfort, M. Priglinger, T. Ang, R. Scroop, P.A. Barber, B. McGuinness, 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*

N Engl J Med 2015; 372: 1009-1018

Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

M. Goyal, A.M. Demchuk, B.K. Menon, M. Eesa, J.L. Rempel, J. Thornton, D. Roy, T.G. Jovin, R.A. Willinsky, B.L. Sapkota, D. Dowlatshahi, D.F. Frei, N.R. Kamal, W.J. Montanera, A.Y. Poppe, K.J. Ryckborst, F.L. Silver, A. Shuaib, D. Tampieri, D. Williams, O.Y. Bang, B.W. Baxter, P.A. Burns, H. Choe, J.-H. Heo, C.A. Holmstedt, B. Jankowitz, M. Kelly, G. Linares, J.L. Mandzia, J. Shankar, S.-I. Sohn, R.H. Swartz, P.A. Barber, S.B. Coutts, E.E. Smith, W.F. Morrish, A. Weill, S. Subramaniam, A.P. Mitha, J.H. Wong, M.W. Lowerison, T.T. Sajobi, and M.D. Hill for the ESCAPE Trial Investigators*

N Engl J Med 2015; 372:1019-1030

Circulation
Volume 140, Issue 11, 10 September 2019; Pages e596-e646
https://doi.org/10.1161/CIR.0000000000000678

ACC/AHA CLINICAL PRACTICE GUIDELINE

2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

Donna K. Arnett, PhD, MSPH, FAHA, Co-Chair, Roger S. Blumenthal, MD, FACC, FAHA, Co-Chair, Michelle A. Albert, MD, MPH, FAHA, Andrew B. Buroker, Esq, Zachary D. Goldberger, MD, MS, FACC, FAHA, Ellen J. Hahn, PhD, RN, Cheryl Dennison Himmelfarb, PhD, RN, ANP, FAHA, Amit Khera, MD, MSc, FACC, FAHA, Donald Lloyd-Jones, MD, SCM, FACC, FAHA, J. William McEvoy, MBBCh, MEd, MHS, Erin D. Michos, MD, MHS, FACC, FAHA, Michael D. Miedema, MD, MPH, Daniel Muñoz, MD, MPA, FACC, Sidney C. Smith Jr, MD, MACC, FAHA, Salim S. Virani, MD, PhD, FACC, FAHA, Kim A. Williams Sr, MD, MACC, FAHA, Joseph Yeboah, MD, MS, FACC, FAHA, and Boback Ziaeian, MD, PhD, FACC, FAHA

Stroke
Volume 50, Issue 12, December 2019; Pages e344-e418
https://doi.org/10.1161/STR.0000000000000211

AHA/ASA GUIDELINE

Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

See related article, p 3331

William J. Powers, MD, FAHA, Chair, Alejandro A. Rabinstein, MD, FAHA, Vice Chair, Teri Ackerson, BSN, RN, Opeolu M. Adeoye, MD, MS, FAHA, Nicholas C. Bambakidis, MD, FAHA, Kyra Becker, MD, FAHA, José Biller, MD, FAHA, Michael Brown, MD, MSc, Bart M. Demaerschalk, MD, MSc, FAHA, Brian Hoh, MD, FAHA, Edward C. Jauch, MD, MS, FAHA, Chelsea S. Kidwell, MD, FAHA, Thabele M. Leslie-Mazwi, MD, Bruce Ovbiagele, MD, MSc, MAS, MBA, FAHA, Phillip A. Scott, MD, MBA, FAHA, Kevin N. Sheth, MD, FAHA, Andrew M. Southerland, MD, MSc, FAHA, Deborah V. Summers, MSN, RN, FAHA, and David L.

Linee guida **dell'American Heart Association/American Stroke Association del 2019**.

Nei pazienti con **AIS** con **LVO** che si presentano **entro 6 ore** dall'esordio dei sintomi si consiglia di orientare la selezione del pazienti verso la trombectomia meccanica, dopo il preliminare studio **TC senza mdc**, **CTA** ed **eventualmente RM**, **senza specifiche necessità aggiuntive come CTP**. Nella finestra estesa a 6-24 ore invece si consiglia di utilizzare la **CTP** o l'imaging **RM ponderato in diffusione (DWI)** con o senza **perfusione RM**

3. In patients with AIS who awake with stroke symptoms or have unclear time of onset > 4.5 hours from last known well or at baseline state, MRI to identify diffusion-positive FLAIR-negative lesions can be useful for selecting those who can benefit from IV alteplase administration within 4.5 hours of stroke symptom recognition.	IIa	B-R	New recommendation.

3. Noncontrast CT (NCCT) is effective to exclude ICH before IV alteplase administration.	I	A	Recommendation revised from 2013 AIS Guidelines.
4. Magnetic resonance (MR) imaging (MRI) is effective to exclude ICH before IV alteplase administration.	I	B-NR	Recommendation revised from 2013 AIS Guidelines.
5. CTA with CTP or MR angiography (MRA) with diffusion-weighted magnetic resonance imaging (DW-MRI) with or without MR perfusion is recommended for certain patients.	I	A	New recommendation.

2.2.4. Mechanical Thrombectomy Eligibility–Multimodal Imaging	COR	LOE	New, Revised, or Unchanged
1. When selecting patients with AIS within 6 to 24 hours of last known normal who have LVO in the anterior circulation, obtaining CTP or DW-MRI, with or without MRI perfusion, is recommended to aid in patient selection for mechanical thrombectomy, but only when patients meet other eligibility criteria from one of the RCTs that showed benefit from mechanical thrombectomy in this extended time window.	I	A	New recommendation.

DEFUSE III

- Lo scopo dello studio è dimostrare che, pazienti con occlusione di grossi vasi del circolo anteriore (ICA o MCA) che hanno un imaging favorevole alla TC di perfusione o alla MRI, beneficiano del trattamento endovascolare anche oltre la finestra di tempo terapeutico (dalle 6 alle 16 ore dall'inizio dei sintomi)
- Risultati attesi mRS a 90 giorni

mRS a 90 gg	0	1	2	3	4	5	6	tot
Endovascolare	18.0 %	11.5%	19.6%	11.5%	16.4%	11.5%	11.5%	100%
Medica	9.7%	7.9%	15.0%	17.7%	14.4%	17.7%	17.7%	100%

IL TEMPO È FONDAMENTALE MA NON È UGUALE PER TUTTI

La diversa tolleranza all'occlusione dipende anche dall'efficacia del circolo collaterale

Le 6 ore sono una convenzione (per ora) necessaria ma:

il trattamento deve essere il più precoce possibile

il tempo che conta è quello biologico

SELEZIONE DA "TIME BASED" A "TISSUE BASED"

Conclusions

Compared with bridging therapy, direct EVT may be equally effective and yield a lower rate of ICH and clot migration in patients with AIS.

Zhang J, Chen S, Shi S*, et al* Direct endovascular treatment versus bridging therapy in patients with acute ischemic stroke eligible for intravenous thrombolysis: systematic review and meta-analysis - *Journal of NeuroInterventional Surgery* 2022;**14:**321-325

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging

G.W. Albers, M.P. Marks, S. Kemp, S. Christensen, J.P. Tsai, S. Ortega-Gutierrez, R.A. McTaggart, M.T. Torbey, M. Kim-Tenser, T. Leslie-Mazwi, A. Sarraj, S.E. Kasner, S.A. Ansari, S.D. Yeatts, S. Hamilton, M. Mlynash, J.J. Heit, G. Zaharchuk, S. Kim, J. Carrozzella, Y.Y. Palesch, A.M. Demchuk, R. Bammer, P.W. Lavori, J.P. Broderick, and M.G. Lansberg, for the DEFUSE 3 Investigators*

ORIGINAL ARTICLE

A Randomized Trial of Intraarterial Treatment for Acute Ischemic Stroke

Olvert A. Berkhemer, M.D., Puck S.S. Fransen, M.D., Debbie Beumer, M.D., Lucie A. van den Berg, M.D., Hester F. Lingsma, Ph.D., Albert J. Yoo, M.D., Wouter J. Schonewille, M.D., Jan Albert Vos, M.D., Ph.D., Paul J. Nederkoorn, M.D., Ph.D., Marieke J.H. Wermer, M.D., Ph.D., Marianne A.A. van Walderveen, M.D., Ph.D., Julie Staals, M.D., Ph.D., et al., for the MR CLEAN Investigators*

- **La valutazione del circolo collaterale con mCTA per la selezione dei pazienti in studi clinici randomizzati randomizzati come ESCAPE e MR CLEAN hanno suggerito l'utilità della valutazione del circolo collaterale come determinante per la selezione del paziente candidato a trombectomia meccanica, con una sensibilità e specificità simili alla DSA per la valutazione dinamica del circolo di compenso, ma con una rapidità di esecuzione e disponibilità maggiore nei Presidi Ospedalieri**

Thrombectomy for anterior circulation stroke beyond 6 h from time last known well (AURORA): a systematic review and individual patient data meta-analysis

Tudor G Jovin*, Raul G Nogueira*, Maarten G Lansberg, Andrew M Demchuk, Sheila O Martins, J Mocco, Marc Ribo, Ashutosh P Jadhav, Santiago Ortega-Gutierrez, Michael D Hill, Fabricio O Lima, Dioga C Haussen, Scott Brown, Mayank Goyal, Adnan H Siddiqui, Jeremy J Heit, Bijoy K Menon, Stephanie Kemp, Ron Budzik, Xabier Urra, Michael P Marks, Vincent Costalat, David S Liebeskind, Gregory W Albers

	Number of participants	Country where trial was conducted	Age, years	NIHSS	Time window included in the analysis, h	Endovascular treatment modality	Primary endpoint analysis
DAWN[9]	206	Canada, France, Spain, USA	≥18	≥10	6–24	Trevo stent-retriever	Utility weighted mRS[13] and dichotomised mRS 0–2
DEFUSE 3[10]	182	USA	≥18–90	≥6	6–16	All US FDA approved devices (stent-retrievers, aspiration catheters)	Ordinal mRS (shift)
ESCAPE[4]	49	Canada, Ireland, South Korea, UK, USA	≥18	≥6	6–12	All approved devices by localregulatory agency (stent- retrievers, aspiration catheters)	Ordinal mRS (shift)
RESILIENT[12]	26	Brazil	≥18	≥8	6–8	Solitaire stent-retriever, Penumbra aspiration catheters	Ordinal mRS (shift)
POSITIVE[11]	21*	USA	≥18	≥8	6–12	All US FDA approved devices (stent-retrievers, aspiration catheters)	Ordinal mRS (shift)
REVASCAT[5]	21	Spain	18–85	≥6	6–8	Solitaire stent-retriever	Ordinal mRS (shift)

In all cases, target vessels were the intracranial internal carotid artery, M1 segment of the middle cerebral artery, or both. The NIHSS ranges from 0 to 42, with higher scores indicating greater stroke severity). The mRS ranges from 0 (no symptoms) to 6 (death). NIHSS=National Institutes of Health Stroke Scale. mRS=modified Rankin Scale. FDA=Food and Drug Administration. *Nine participants categorised as enrolled within 0–6 h of time last seen well[11] were actually randomly assigned beyond 6 h of time last seen well.

Table 1: **Characteristics of participating trials**

- I principali studi presenti in letteratura **(DAWN, DEFUSE III, ESCAPE, RESILIENT, POSITIVE E REVASCAT)** sulla validità ed affidabilità del trattamento endovascolare di trombectomia meccanica in pazienti con AIS da occlusione LVO del circolo anteriore sono stati raggruppati ed analizzati valutando come target la **disabilità su scala mRS a 90 giorni** dei pazienti trattati oltre le 6 ore dall'esordio dei sintomi **(AURORA)**.

The NEW ENGLAND JOURNAL of MEDICINE

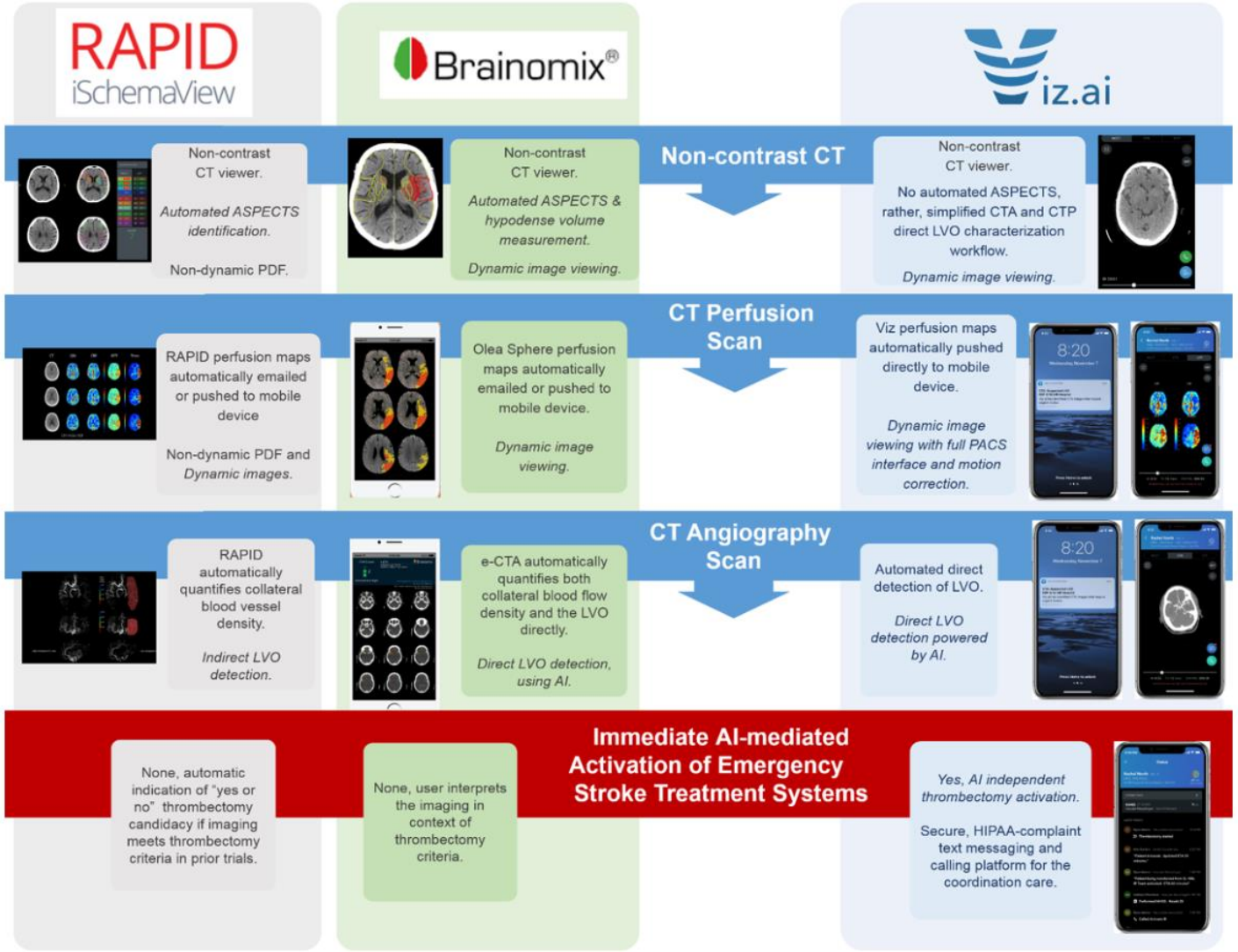
ORIGINAL ARTICLE

Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging

G.W. Albers, M.P. Marks, S. Kemp, S. Christensen, J.P. Tsai, S. Ortega-Gutierrez, R.A. McTaggart, M.T. Torbey, M. Kim-Tenser, T. Leslie-Mazwi, A. Sarraj, S.E. Kasner, S.A. Ansari, S.D. Yeatts, S. Hamilton, M. Mlynash, J.J. Heit, G. Zaharchuk, S. Kim, J. Carrozzella, Y.Y. Palesch, A.M. Demchuk, R. Bammer, P.W. Lavori, J.P. Broderick, and M.G. Lansberg, for the DEFUSE 3 Investigators*

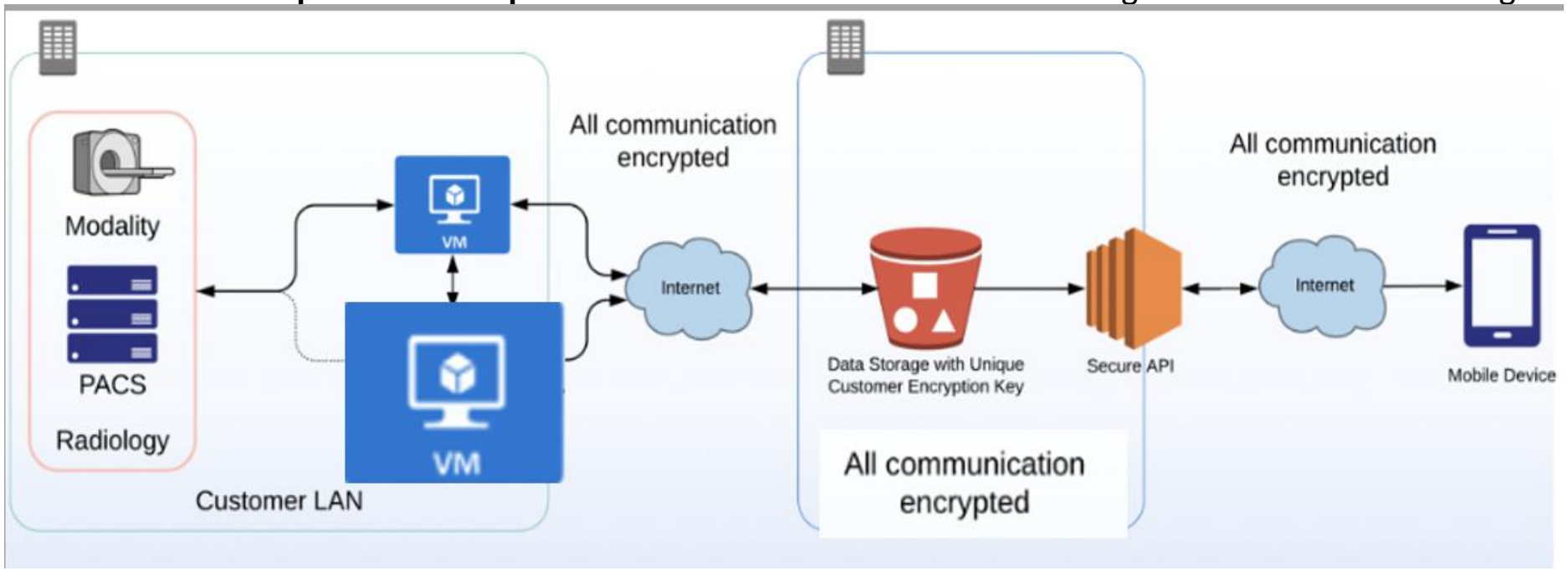
- Nei pazienti con LVO del circolo anteriore valutati nella finestra estesa da 6 a 24 ore dopo l'esordio, si consiglia di utilizzare la **CTP** o l'imaging **RM ponderato in diffusione (DWI)** con o senza **perfusione RM** per determinare l'eleggibilità al trattamento, come proposto dagli studi **DAWN (6-24)** e **DEFUSE III (6-16)**.

La tecnologia di **Intelligenza Artificiale (AI)** varia tra le piattaforme software di imaging dell'ictus attualmente sul mercato a seconda degli **algoritmi** e dei **software** adoperati come **Rapid, Brainomix e Viz** che incorporano sistemi di intelligenza artificiale all'interno del **percorso di elaborazione dei dati**. Questi software presenti in commercio elaborano automaticamente i dati ottenuti dalle indagini strumentali con lo scopo di fornire un contributo per il **triage** e la **diagnosi** del paziente ischemico acuto



Artificial intelligence to diagnose ischemic stroke and identify large vessel occlusions: a systematic review Nick M Murray ,1,2 Mathias Unberath,2,3 Gregory D Hager,2,3 Ferdinand K Hui.

- Si collega allo scanner CT e **distribuisce le immagini alle équipe prima del PACS**.
- I server **Gateway**, situati nella **LAN** del cliente, ricevono le immagini direttamente e **non sono esposti a Internet in alcun modo**.
- I server Gateway avviano solo il traffico in uscita e **non tracciano il traffico di dati proveniente da Internet**.
- Dopo l'acquisizione, le immagini vengono inoltrate attraverso una **connessione HTTPS sicura** crittografata conforme agli standard.
- Se viene rilevato un caso positivo per CTA e/o CTP, viene **inviato un avviso ai dispositivi mobili degli specialisti clinici pre-autorizzati**.
- Il **coordinamento delle cure può iniziare rapidamente** e consente l'accesso alle immagini di tutte le strutture registrate.



ESORDIO DELLA SINTOMATOLOGIA > 4,5 ORE E < 6 ORE
I pazienti dovranno essere inviati alla TM, se allo studio angio-TC cerebrale vi sia evidenza di occlusione prossimale di un grosso vaso (come sopra) fatta eccezione per i pazienti con mRS>2 pre ictus (*ALL. 9*) per la presenza di lesioni del circolo anteriore accertate in TC, MR DW/PW o pTC che si estendono oltre 1/3 del territorio dell'arteria cerebrale media (ASPECT<6) (*ALL. 7*)

ESORDIO DELLA SINTOMATOLOGIA ISCHEMICA DEL CIRCOLO ANTERIORE > 6 ORE
I pazienti dovranno essere inviati alla TM sulla base del mismatch valutato con MR FLAIR/DW o pTC secondo i criteri DAWN /DEFUSE.

CRITERI DI ESCLUSIONE (RELATIVI) PER LA TM

➢ **Età aa: <18 e >80**
➢ **ASPECTS ≤ 5**
➢ **Ridotta "penumbra" ischemica ("mismatch" TAC perfusione / RMN Diff/Perf)**

Original Investigation

April 3, 2023

Outcomes After Endovascular Therapy With Procedural Sedation vs General Anesthesia in Patients With Acute Ischemic Stroke

The AMETIS Randomized Clinical Trial

Russell Chabanne, MD, MSc[1]; Thomas Geeraerts, MD, PhD[2]; Marc Begard, MD[1]; et al

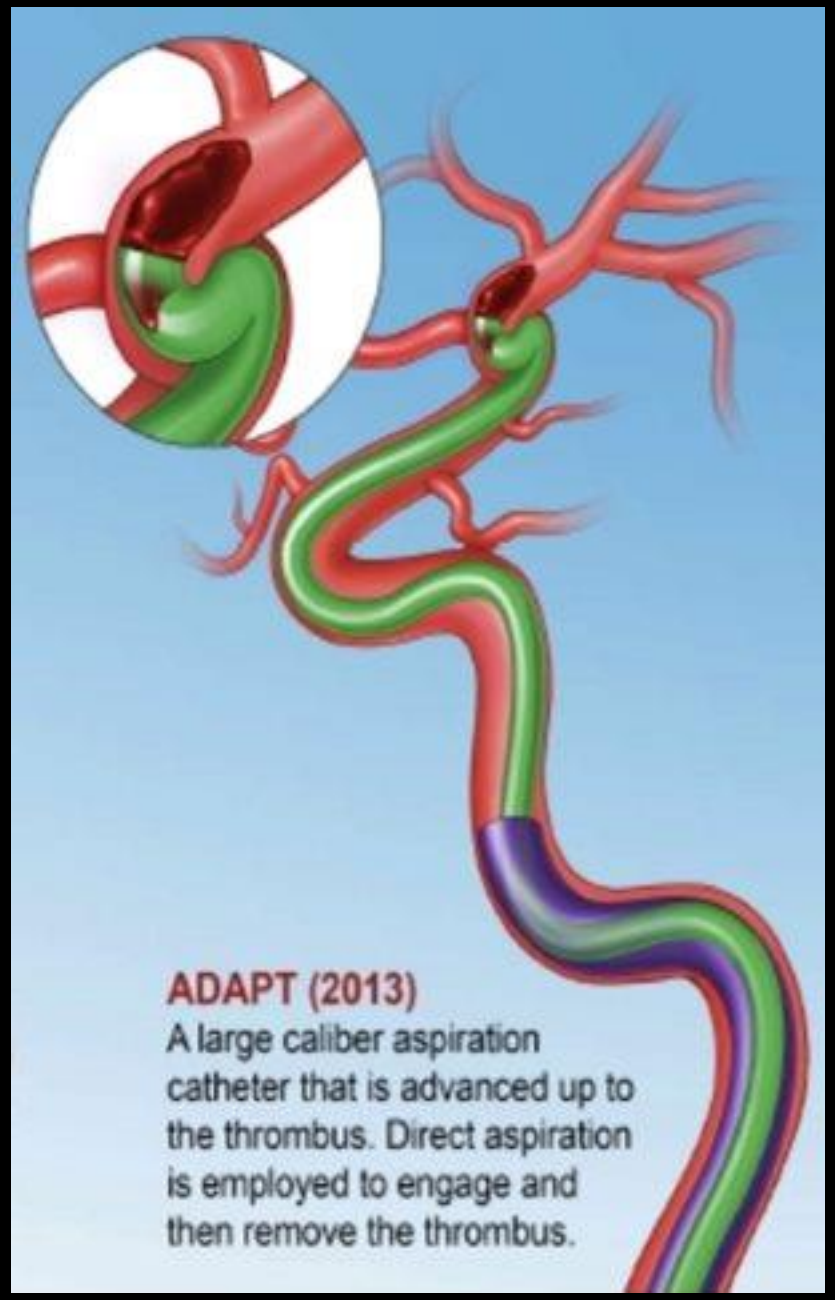
» Author Affiliations

JAMA Neurol. 2023;80(5):474-483. doi:10.1001/jamaneurol.2023.0413

Conclusions and Relevance In patients treated with mechanical thrombectomy for anterior circulation acute ischemic stroke, general anesthesia and procedural sedation were associated with similar rates of functional independence and major periprocedural complications.

TROMBOASPIRAZIONE

“ADAPT”
A Direct Aspiration First Pass technique



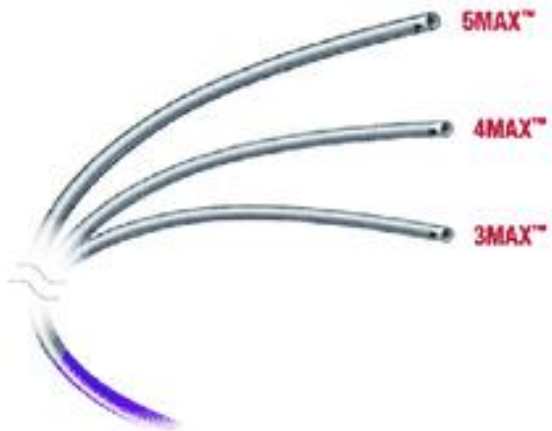
Ace 68

Sofia Plus

Cat 6

Revive IC

Arc

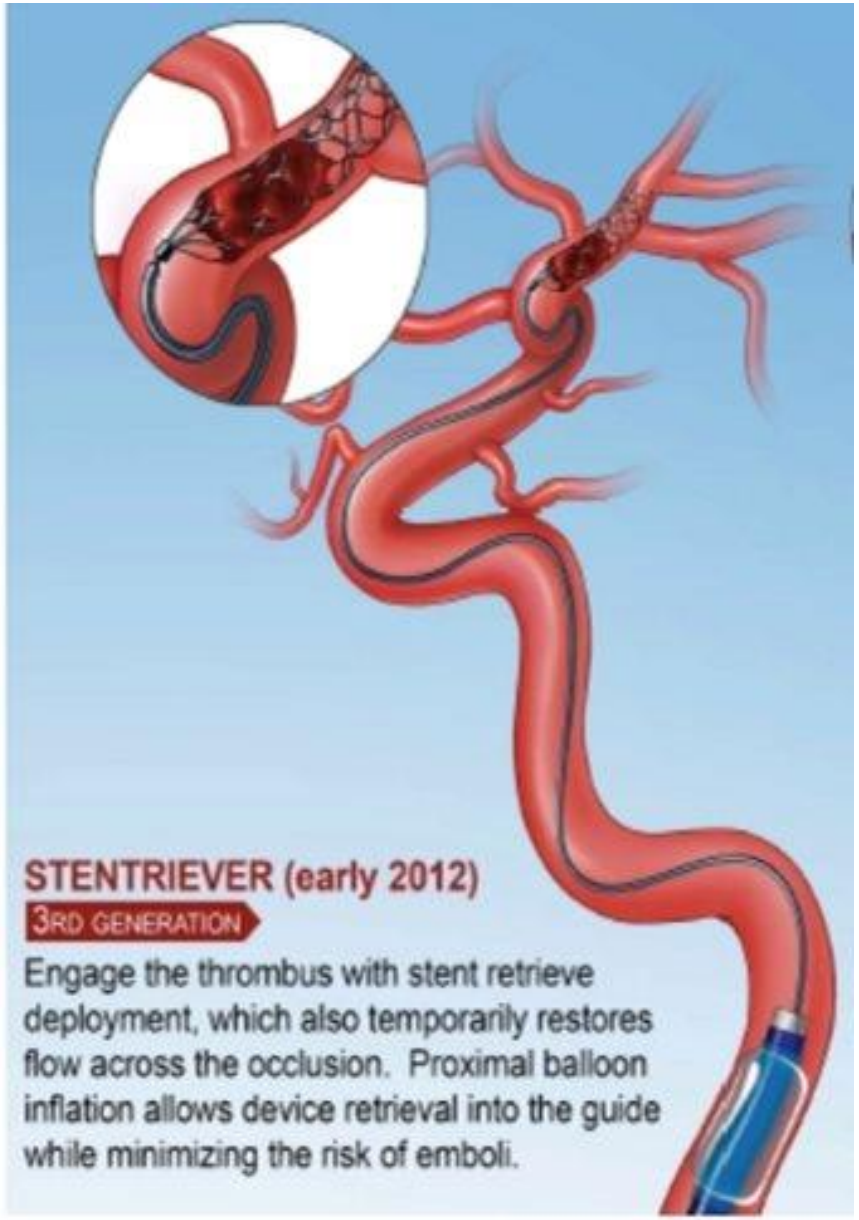


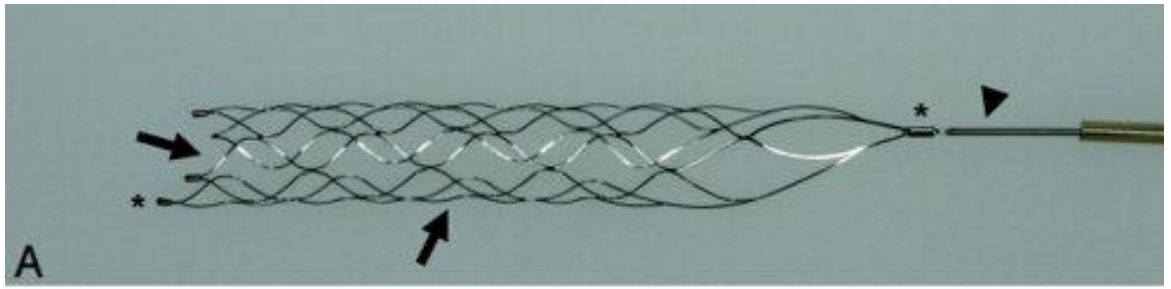
Penumbra Max Series

Penumbra Aspiration system

Medtronic Riptide Aspiration system

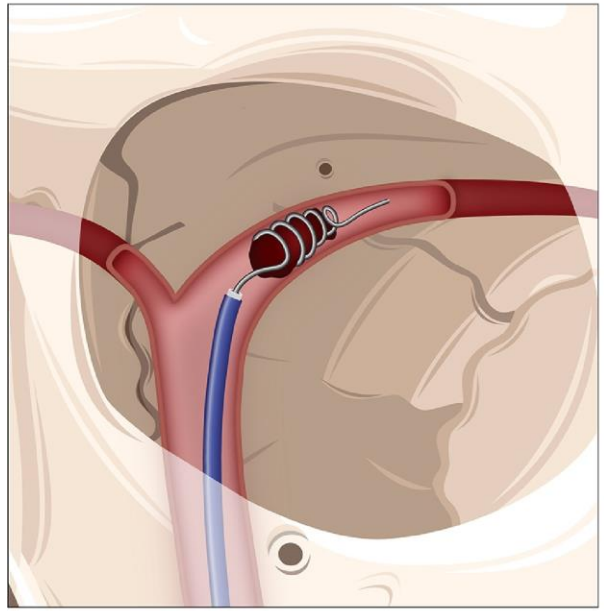
TROMBECTOMIA MECCANICA: STENT



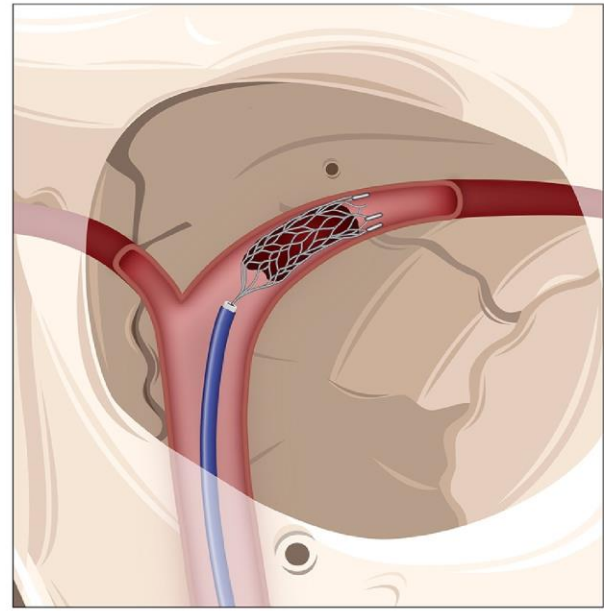


Thrombectomy Devices for Acute Ischemic Stroke:

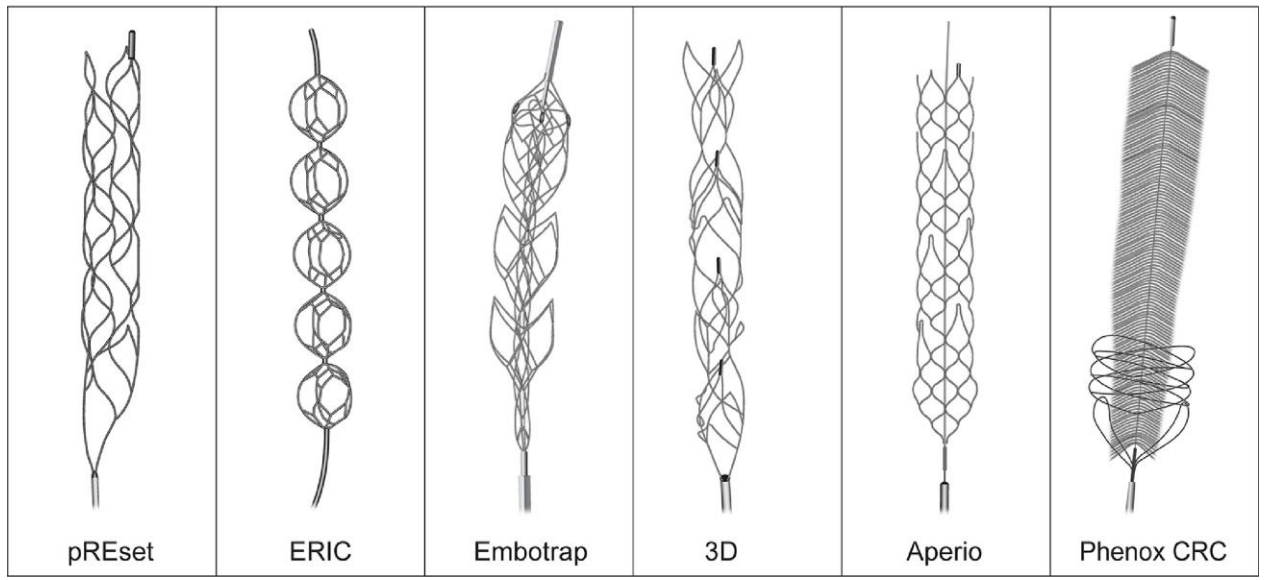
A. First Generation

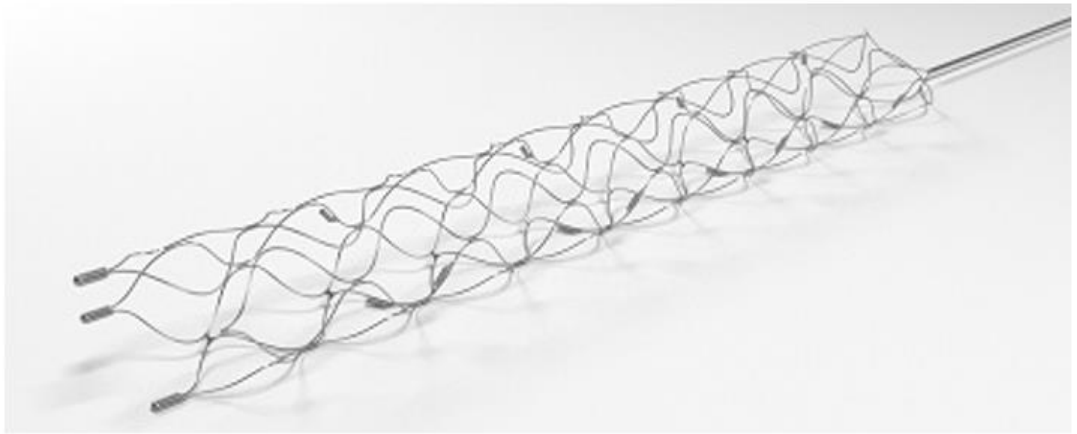


B. Second Generation



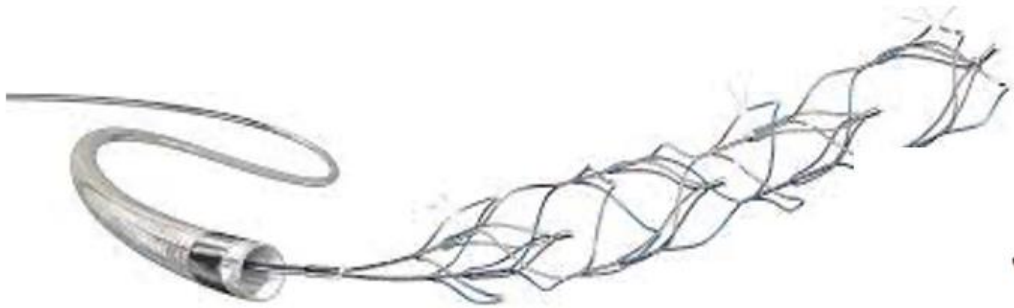
C. Third Generation

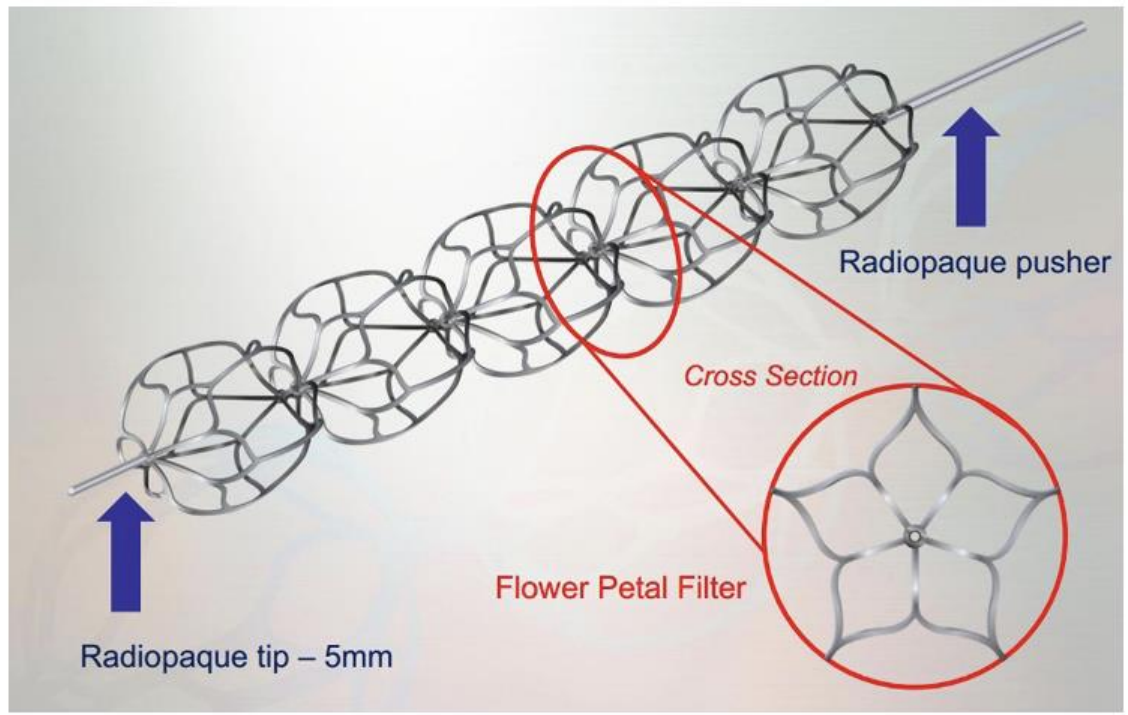


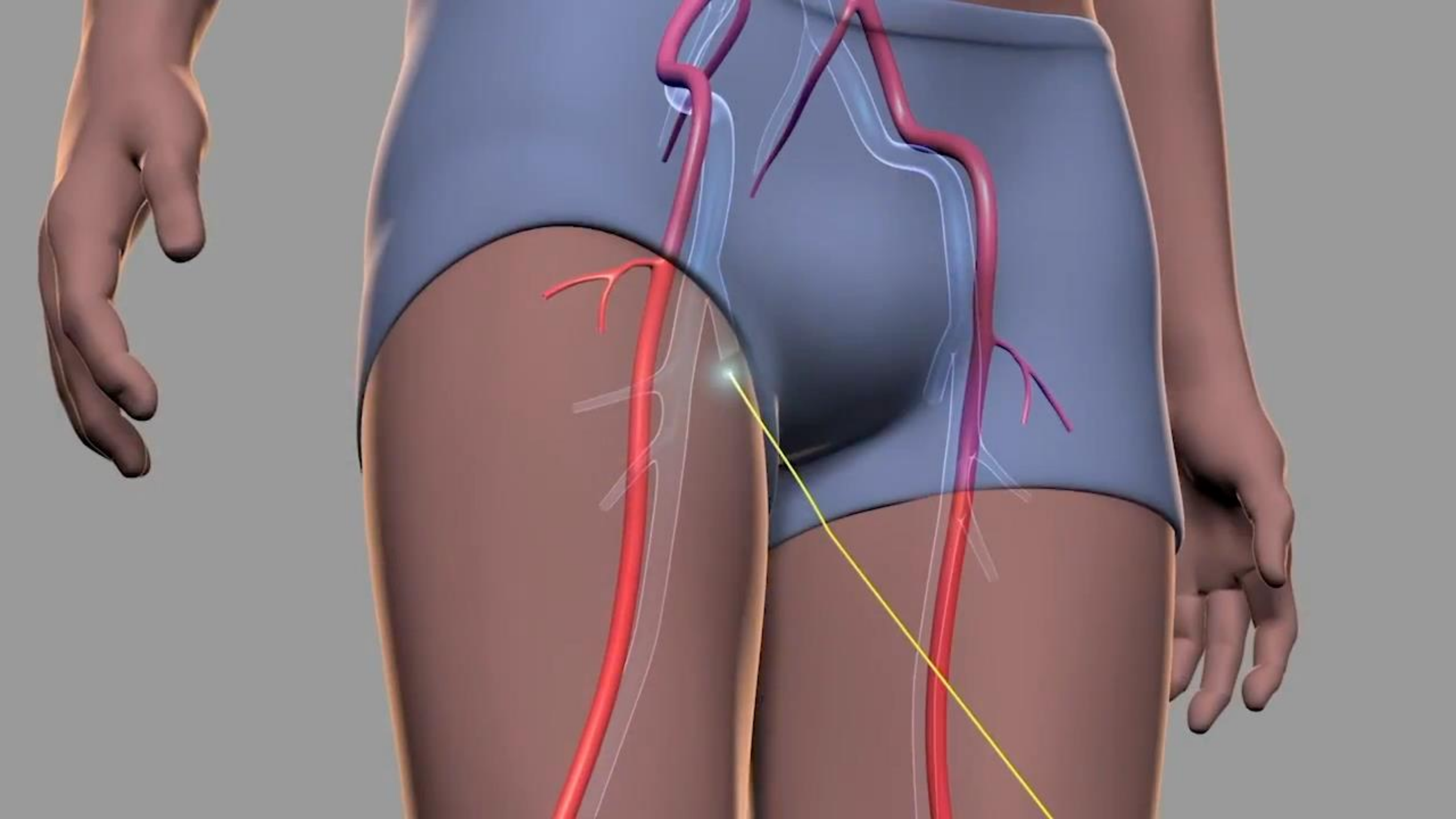



a

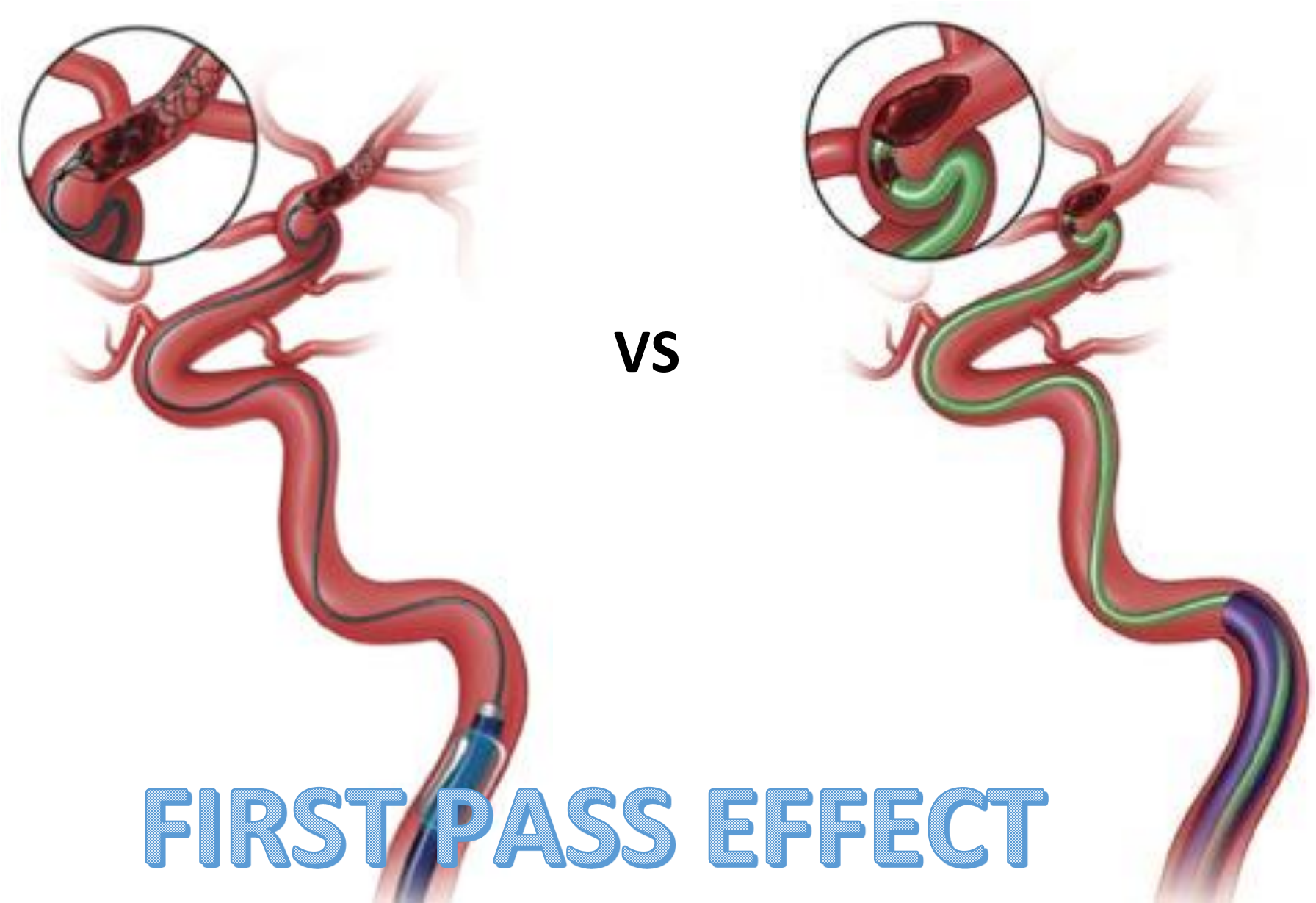

b




Radiopaque pusher
Cross Section
Flower Petal Filter
Radiopaque tip – 5mm



STENT RETRIEVER /TROMBOASPIRAZIONE



VS

FIRST PASS EFFECT

TROMBECTOMIA/TROMBOASPIRAZIONE - EVIDENZE

MR CLEAN
EXTEND I-A
ESCAPE
SWIFT PRIME
REVASCAT

→ Superiorità della trombectomia con Stent Retriever rispetto a IV-tPA (mRS)

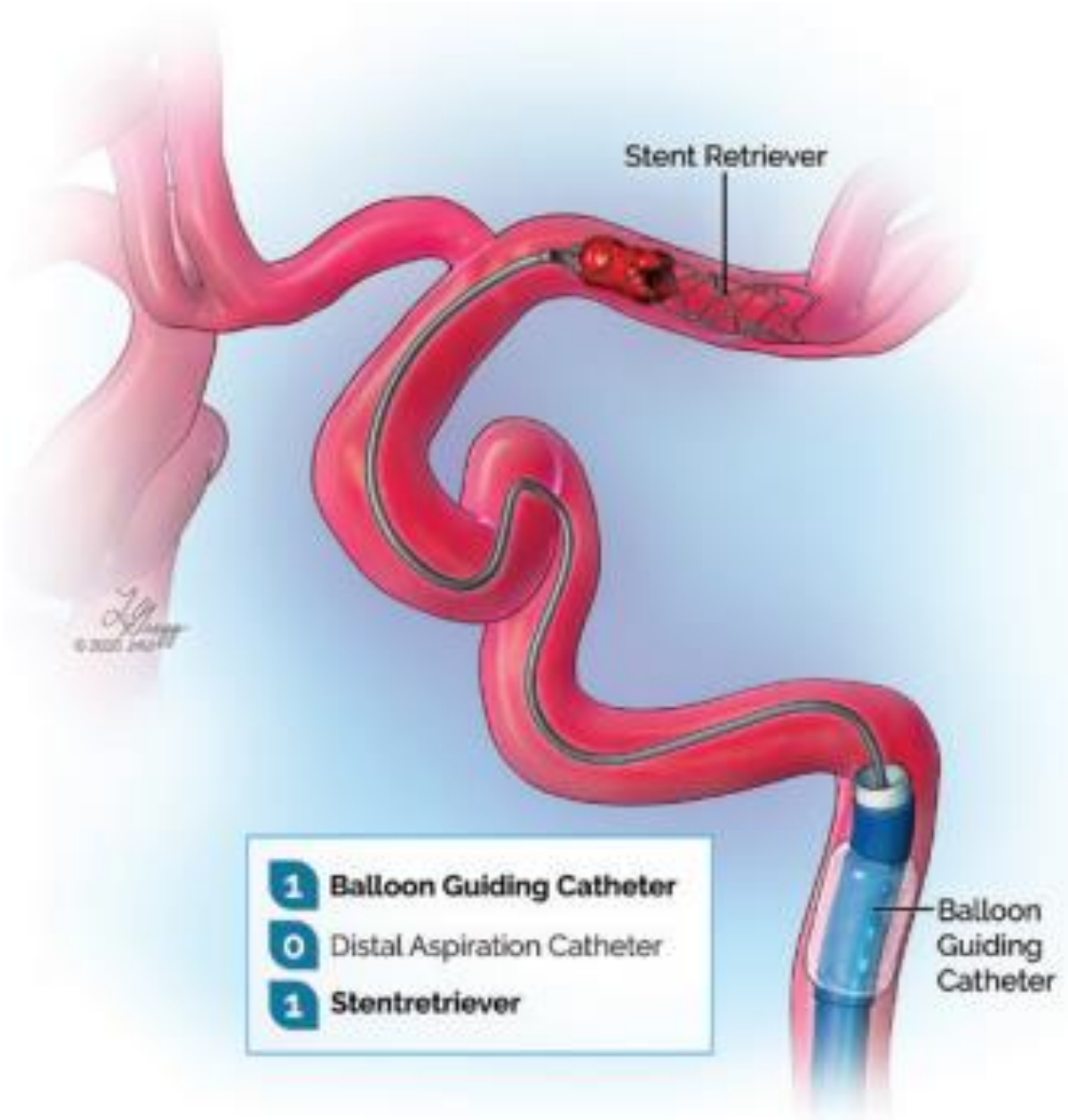
DAWN (6-24)
DEFUSE-3 (6-16)

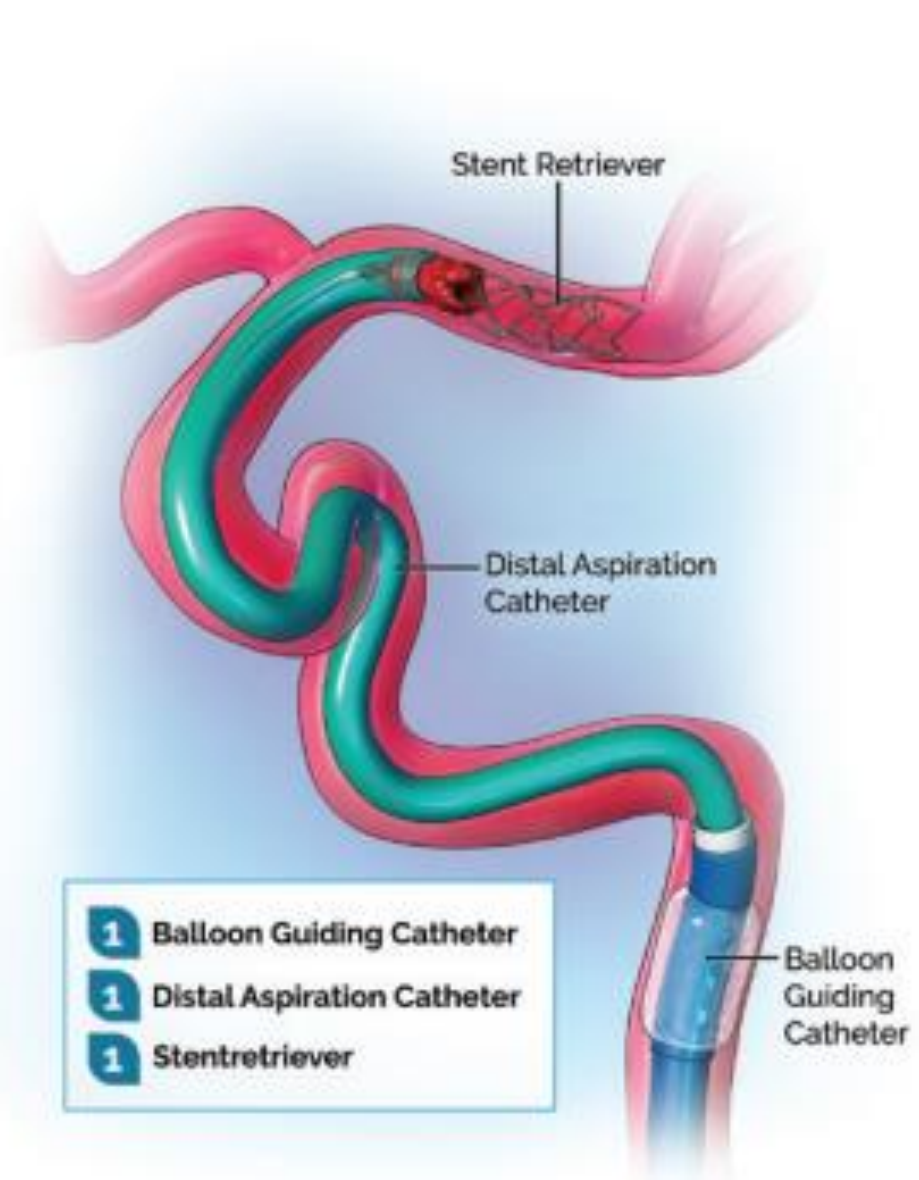
→ Efficacia della trombectomia meccanica con stent retriver ben oltre le 6h

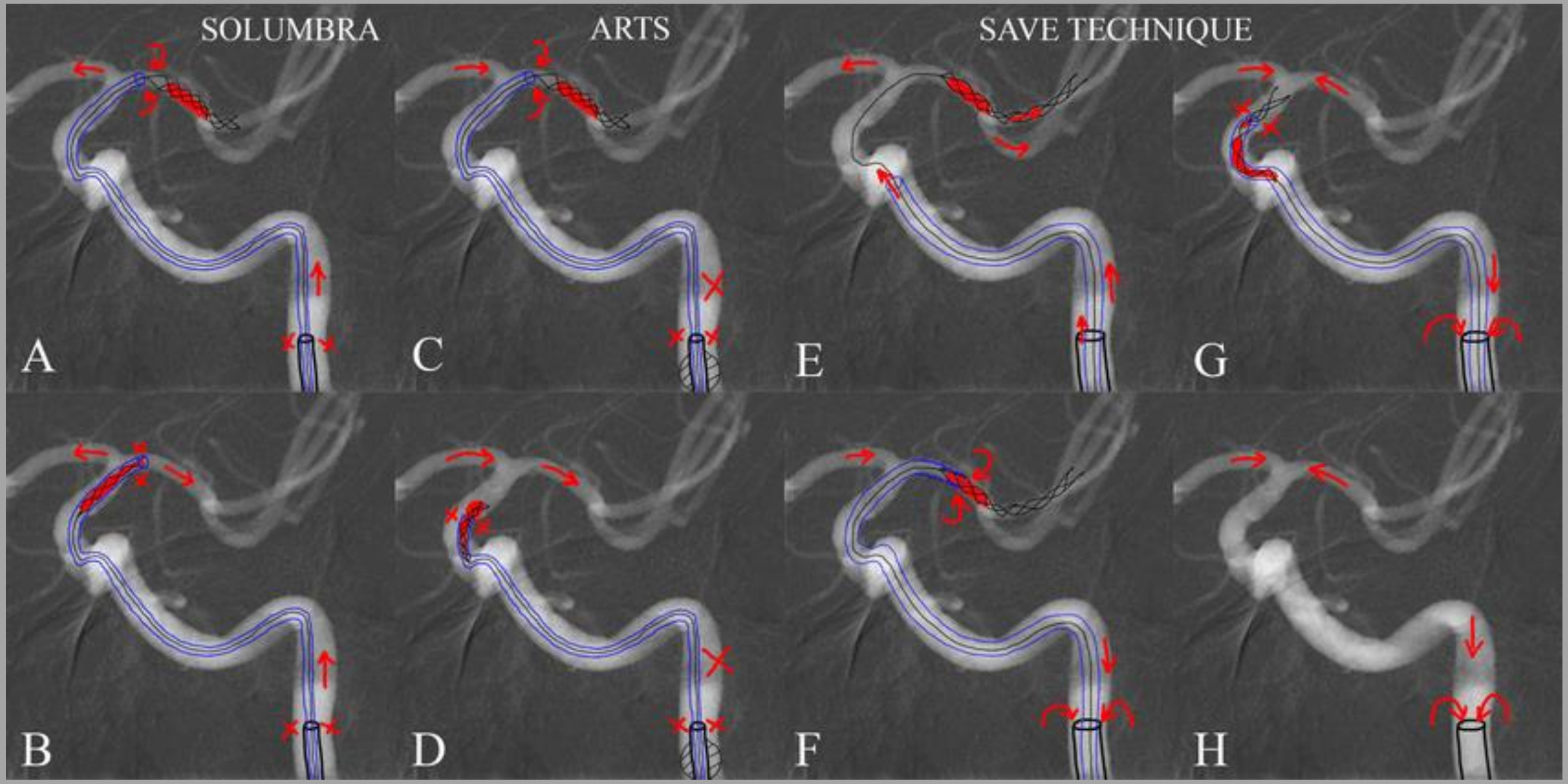
ASTER
COMPASS
PENUMBRA SEPARATOR 3D

→ Non differenze significative nella riperfusione (outcome primario) e nel mRS a 3 mesi (outcome secondario) tra Stent Retriever e ADAPT

COMBINED TECHNIQUE






SOLUMBRA
ARTS
SAVE TECHNIQUE
A
B
C
D
E
F
G
H

PubMed®
Advanced User Guide

Meta-Analysis

A Meta-analysis of Combined Aspiration Catheter and Stent Retriever versus Stent Retriever Alone for Large-Vessel Occlusion Ischemic Stroke

Conclusions: On meta-analysis, aspiration catheter and stent retriever are associated with a superior first pass effect compared with stent retriever alone, but they are not associated with statistically different final reperfusion or functional independence.

PubMed®
Advanced User Guide

Combined stent-retriever and aspiration intra-arterial thrombectomy performance for fragmentable blood clots: A proof-of-concept computational study

Giulia Luraghi et al. J Mech Behav Biomed Mater. 2022 Nov.

Results Overall, 240 SCBT and 301 SR/CA (SR 128, CA 173) patients were analyzed. SRFP (modified Thrombolysis In Cerebral Infarction (mTICI) ≥2c, 43.3% vs 27.9%, p<0.001; mTICI 3, 35.8% vs 25.5%, p=0.009) and final mTICI ≥2b recanalization (89.1% vs 82.0%, p=0.020) rates were significantly higher, puncture-to-reperfusion time was shorter (median (IQR) 43 (31.5–69) vs 55 (38–82.2) min, p<0.001), and the number of passes were fewer (mean±SD 1.72±0.92 vs 1.99±1.01, p<0.001) in the SCBT group. Procedural complications were similar between the groups. In subgroup analysis,

Ischemic stroke
Original research

PDF

PDF + Supplementary Material

Efficacy of combined use of a stent retriever and aspiration catheter in mechanical thrombectomy for acute ischemic stroke

Tomohiro Okuda [1], Koichi Arimura [1], Ryu Matsuo [2], So Tokunaga [3], Kenta Hara [3], Shinya Yamaguchi [4], Hidenori Yoshida [5], Ryota Kurogi [5], Katsuharu Kameda [6], Osamu Ito [6, 7], Tomoyuki Tsumoto [3, 8], Koji Iihara [1, 9], Taichiro Mizokami [10], Takeshi Uwatoko [11], Ataru Nishimura [1], Katsuma Iwaki [1], Masahiro Mizoguchi [1] QNET investigators

Correspondence to Dr Koichi Arimura, Neurosurgery, Kyushu University, Fukuoka 812-8582, Japan;

MASTRO I: Meta-Analysis and Systematic Review of thrombectomy stent retriever outcomes: comparing functional, safety and recanalization outcomes between EmboTrap, Solitaire and Trevo in acute ischemic stroke

Osama O Zaidat*[,1], Shelly Ikeme[2], Sunil A Sheth[3], Shinichi Yoshimura[4], Xin-guang Yang[5], Waleed Brinjikji[6], David F Kallmes[6], Patrick Brouwer[2], John Pederson[7], Ranita Tarchand[8], Annie Steffenson[7], Kevin M Kallmes[7,8], Jillienne Touchette[7] & Tommy Andersson[9,10]

Table 1: Baseline characteristics and demographics

Characteristics	*n* = 70
Mean age (range) (yr)	69.9 [SD, 16.5] (25–96)
Women (%)	48.6
Race (%)	
White	61.7
Hispanic	28.3
Black	6.7
Other	3.3
Atrial fibrillation (%)	56.9
Hypertension (%)	80.3
Hyperlipidemia (%)	52.4
Diabetes (%)	32.8
Previous ischemic stroke/TIA (%)	20
Mean NIHSS on admission (range)	16.3 [SD, 6.6] (3–27)
Mean premorbid mRS (range)	0.4 [SD, 0.9] (0–4)
Premorbid mRS ≤2 (%)	94.0
Location	
ICA (%)	25.7
M1 (%)	54.3
M2 (%)	15.7
M3 (%)	2.9
Basilar (%)	1.4
IV tPA (%)	34.3

Table 2: Procedural variables

Variables	*n* = 70
Anesthesia type (%)	
Conscious sedation	63.2
General anesthesia	36.8
Balloon-guide catheter used (%)	38.6
Intracranial stent (%)	5.7
Intra-arterial tPA (%)	7.1
Mean No. of passes per treatment (range)	2.5 [SD, 1.8] (1–7)
Mean LKN to puncture time (min)	444.7 [SD, 310.4]
Mean puncture to reperfusion (min)	54.2 [SD, 36.0]
Mean LKN to reperfusion time (min)	480.1 [SD, 320.1]
Mean No. of passes per treatment (range)	2.5 [SD, 1.8] (1–7)
Mean No. of passes per treatment with EmboTrap II as definitive device (%)	2.2 [SD, 1.6] (1–7)
Thrombectomy technique	
SRBG	37 (52.9%)
Solumbra	18 (25.7%)
EPIC	15 (21.4%)
Definitive treatment with alternative device (%)	12.9

Note:—SRBG indicates stent retriever with balloon guide; EPIC, Embotrap pinning catheter.

THE RATIONALE FOR MASTRO I STARTED WITH A SIMPLE QUESTION...

Are all SRs the same?

3 STENT RETRIEVERS

51 STUDIES

9,804 PATIENTS

SIGNIFICANTLY **HIGHER mRS 0-2** AT 90 DAYS ($p < 0.001$)

SIGNIFICANTLY **LOWER sICH** ($p = 0.028$)

SIGNIFICANTLY **LOWER MORTALITY** ($p < 0.001$)

NUMERICALLY **HIGHER RECANALIZATION** (NOT SIGNIFICANT) ($p > 0.05$)

vs. Trevo®

SIGNIFICANTLY **HIGHER mRS 0-2** AT 90 DAYS ($p = 0.013$)

NUMERICALLY **HIGHER RECANALIZATION** (NOT SIGNIFICANT) ($p > 0.05$)

MASTRO I results showed that EMBOTRAP® may be associated with statistically significant improved rates of **mRS 0-2 at 90 days** compared to Solitaire™ ($p < 0.001$) and Trevo® ($p = 0.013$).

Primary Results of the Multicenter ARISE II Study (Analysis of Revascularizatio Ischemic Stroke With EmboTrap)

Osama O. Zaidat, Hormozd Bozorgchami, Marc Ribó, Jeffrey L. Saver, Heinrich P. Mattle, René Chapot, Ana Paula Nara Olivier Francois, Ashutosh P. Jadhav, Jonathan A. Grossberg, Christian H. Riedel, Alejandro Tomasello, Wayne M. Clark, Hannes Nordmeyer, Eugene Lin, Raul G. Nogueira, Albert J. Yoo, Tudor G. Jovin, Adnan H. Siddiqui, ... See all authors

Originally published 11 Apr 2018 | https://doi.org/10.1161/STROKEAHA.117.020125 | Stroke. 2018;49:1107–1115

- **Open-label, single-arm, multicenter, prospective clinical study.**
- Safety and efficacy of the EmboTrap device in patients with AIS compared with a performance goal (PG) - efficacy rates for the FDA-approved predicate stent-retriever devices, Solitaire (Medtronic) and Trevo (Stryker) -

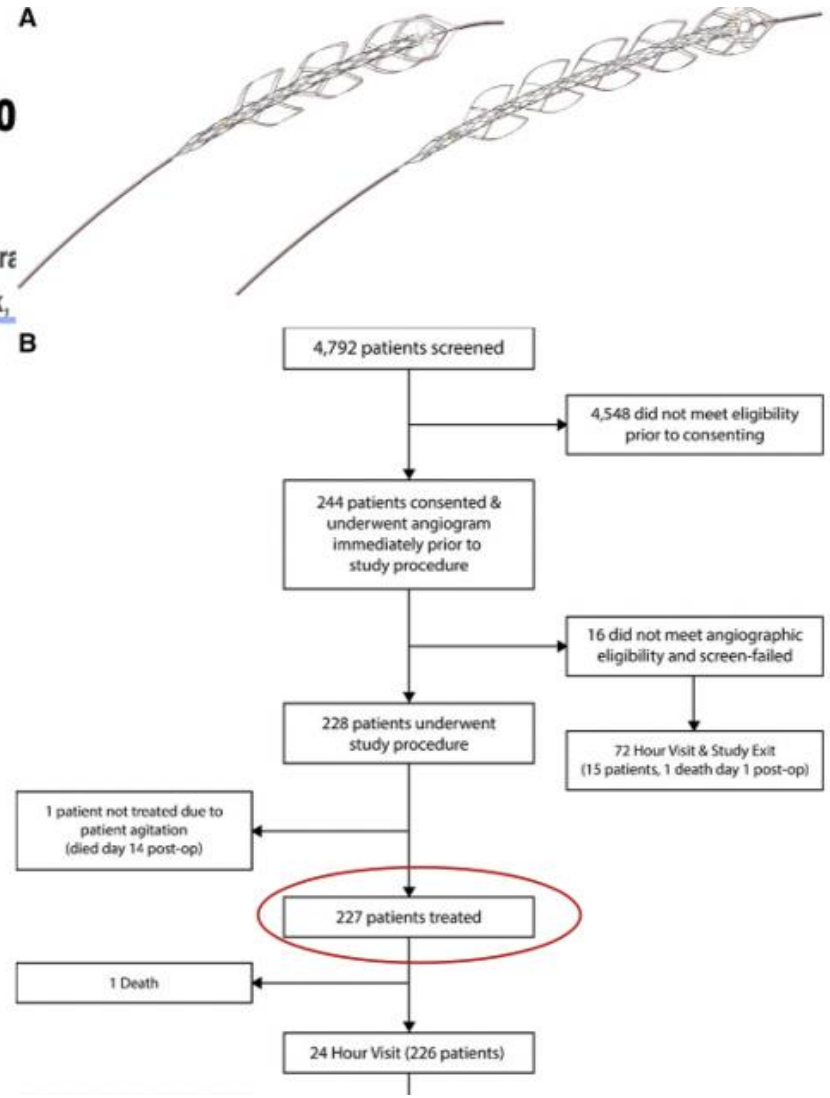


Table 3: Clinical and radiographic outcomes

Outcomes	*n* = 70
Rate of final successful reperfusion (defined as TICI ≥ 2b reperfusion) (%)	95.7
TICI ≥ 2b rate with EmboTrap II as definitive device (%)	82.3
FPE (%)	35.7
Mean 24-hour NIHSS (range)	12.1 [SD, 7.6] (0–32)
Mean NIHSS at day 5/7 or at discharge	10.5 [SD, 11.2] (0–42)
Mean mRS at discharge	3.2 [SD, 1.7] (0–6)
mRS 0–2 at discharge (%)	43.1
Mean mRS at 90 days	2.7 [SD, 2.2] (0–6)
mRS 0–2 at 90 days (%)	52.9

Table 4: Adverse events

Adverse Events	
Embolization to distal or a new territory (%)	15.7
Hemorrhagic conversion (%)	22.9
Symptomatic hemorrhagic conversion (%)	4.3
Mortality in follow-up period (%)	11.4

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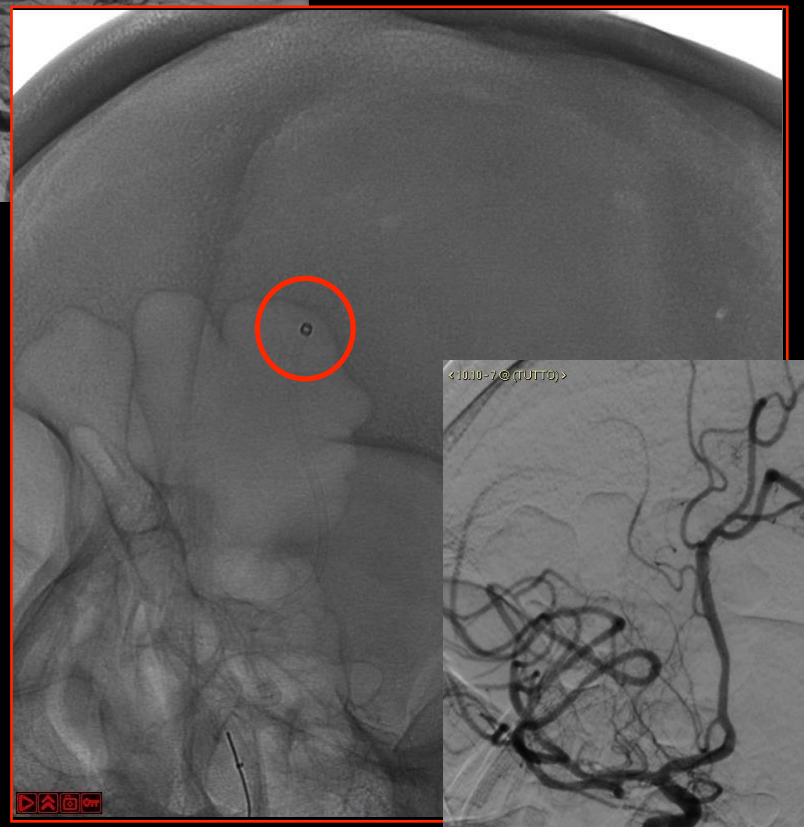
Definitive treatment with alternative device (%)	12.9

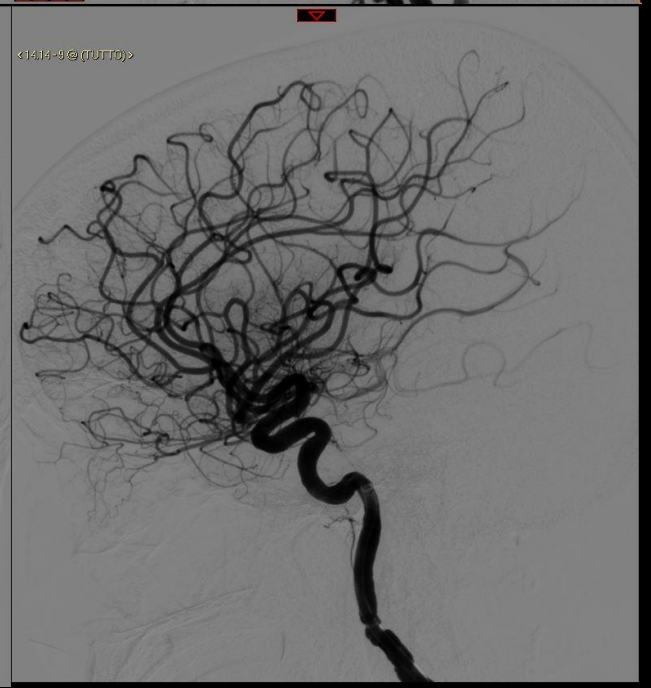
Note:—SRBG indicates stent retriever with balloon guide; EPIC, Embotrap pinning catheter.

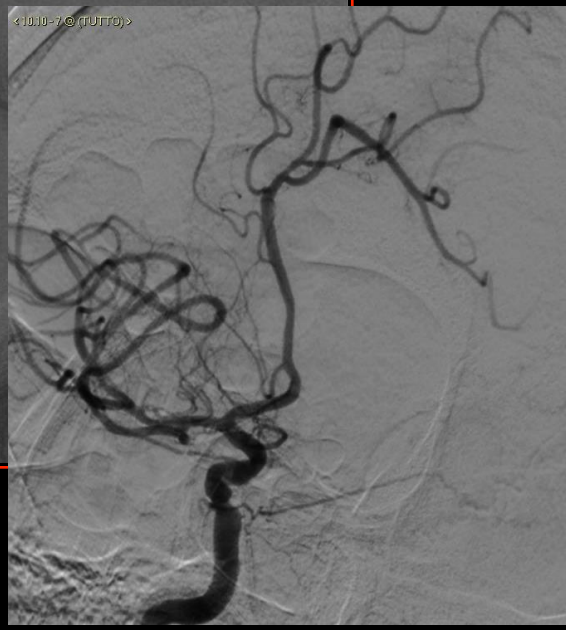
Conclusions

- The EmboTrap device alone achieved **successful reperfusion in 8 of 10 patients,** superior to the preset performance criteria derived from predicate thrombectomy device trials.
- Substantial reperfusion was achieved on a **single pass in one half of patients**
- After **rescue therapies**, **substantial reperfusion was achieved in >9 in 10** of all patients.
- Functional independence at **90 days** was achieved in **two thirds** of ARISE II study patients.

..qualche esempio..







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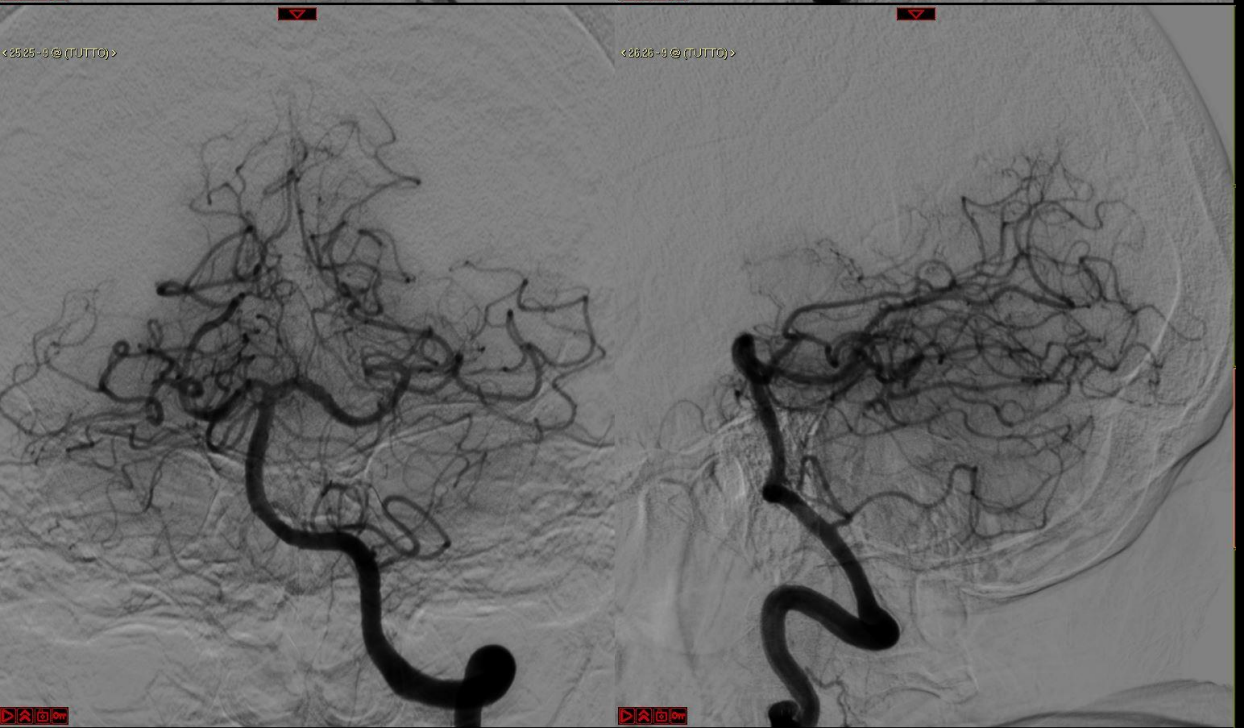

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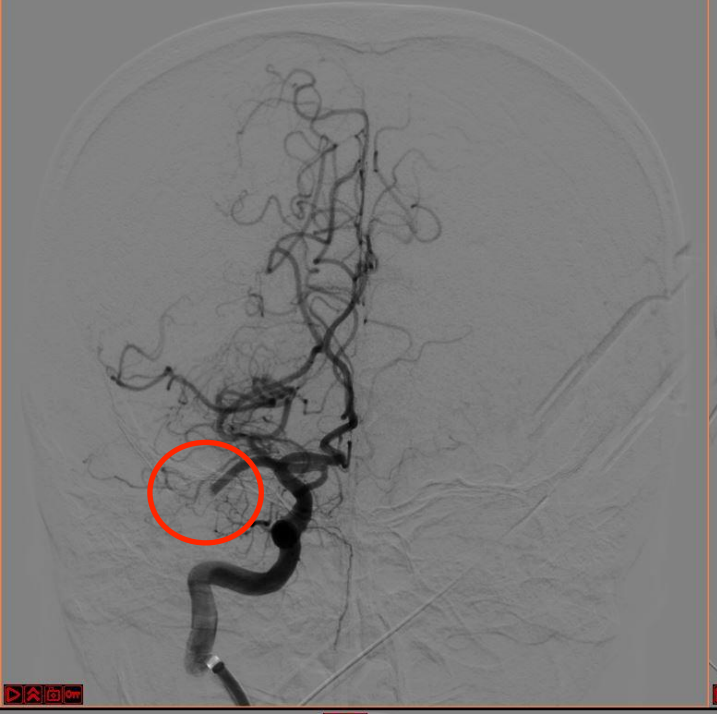

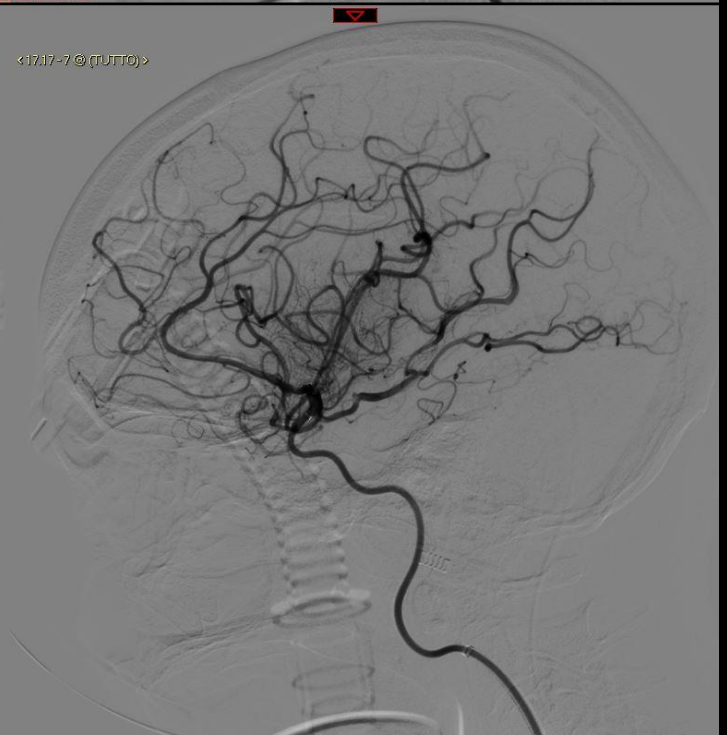

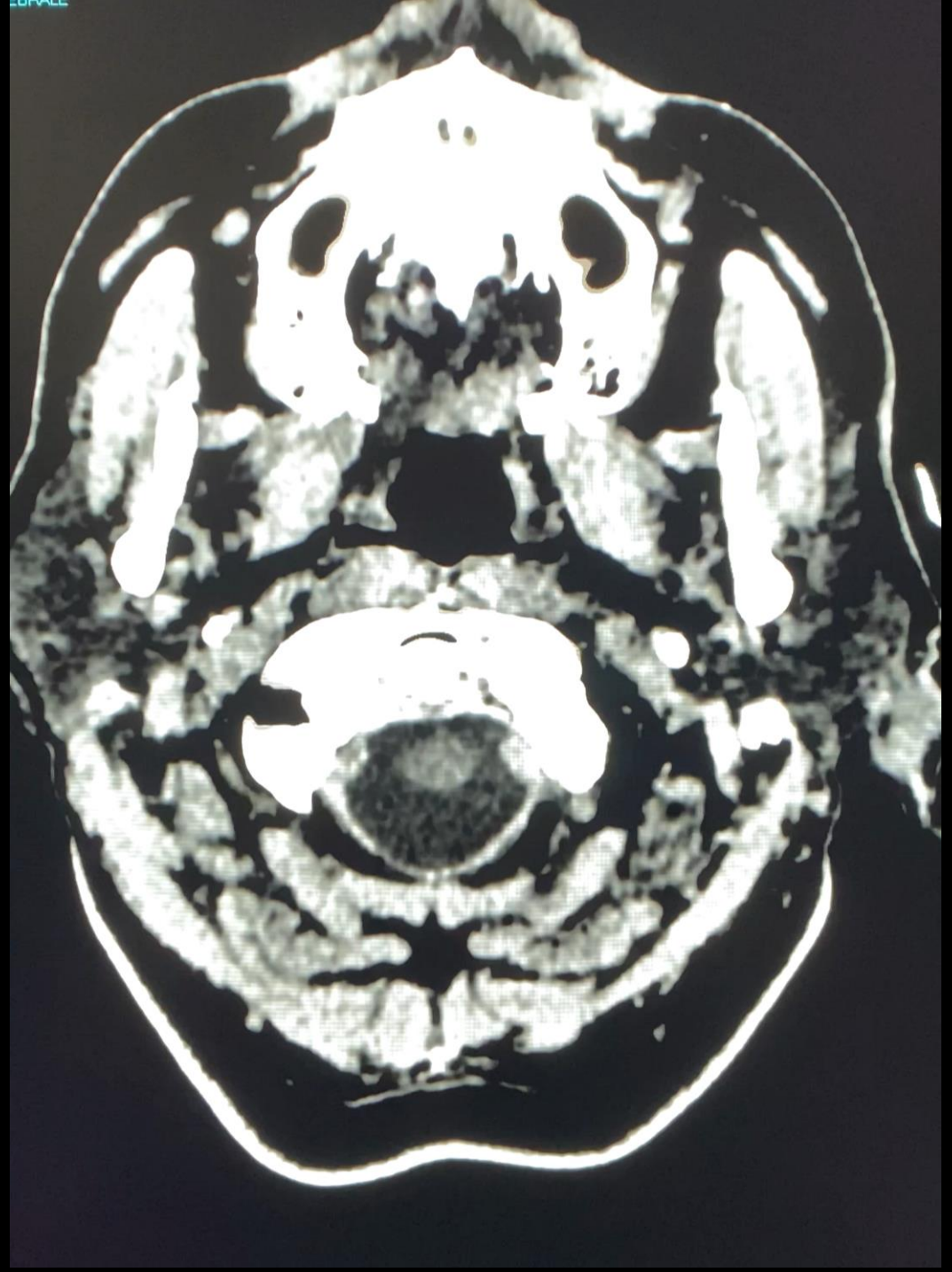

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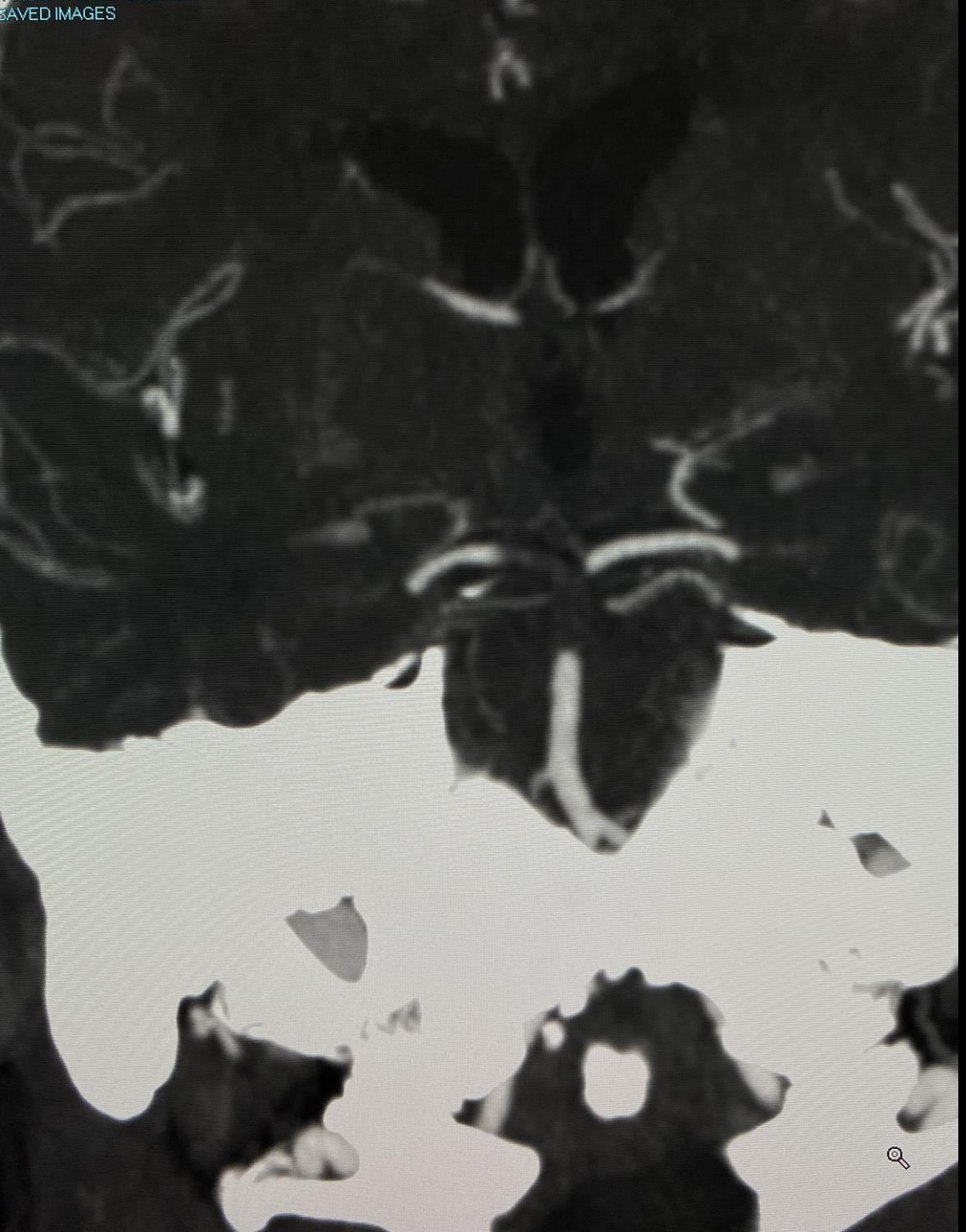
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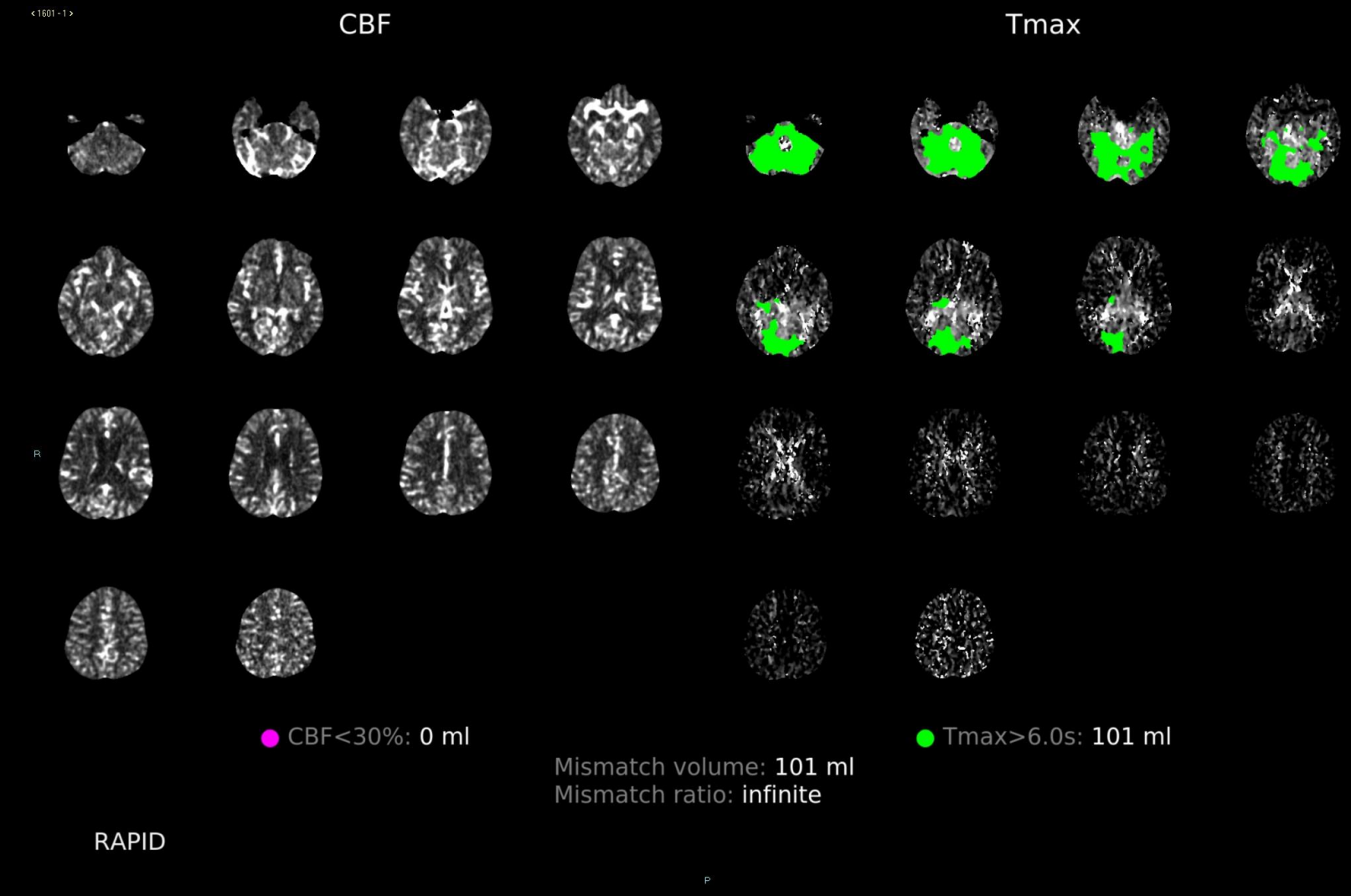
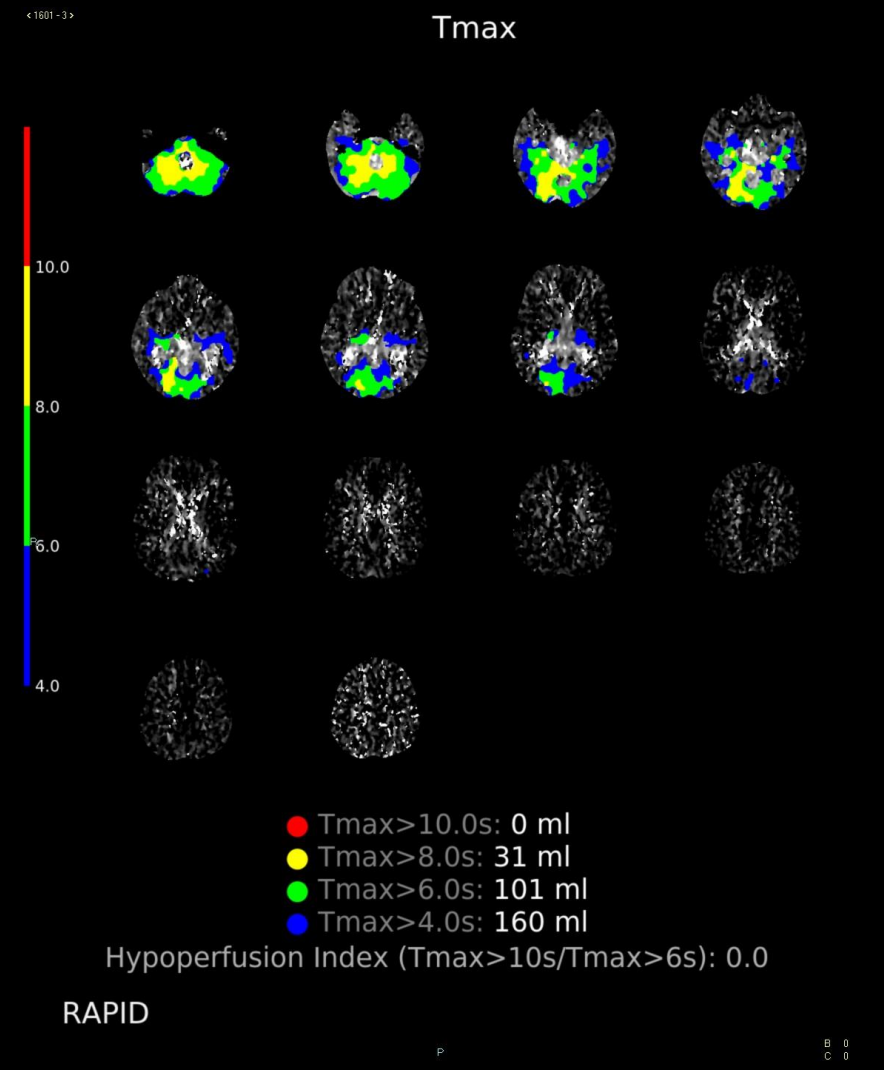
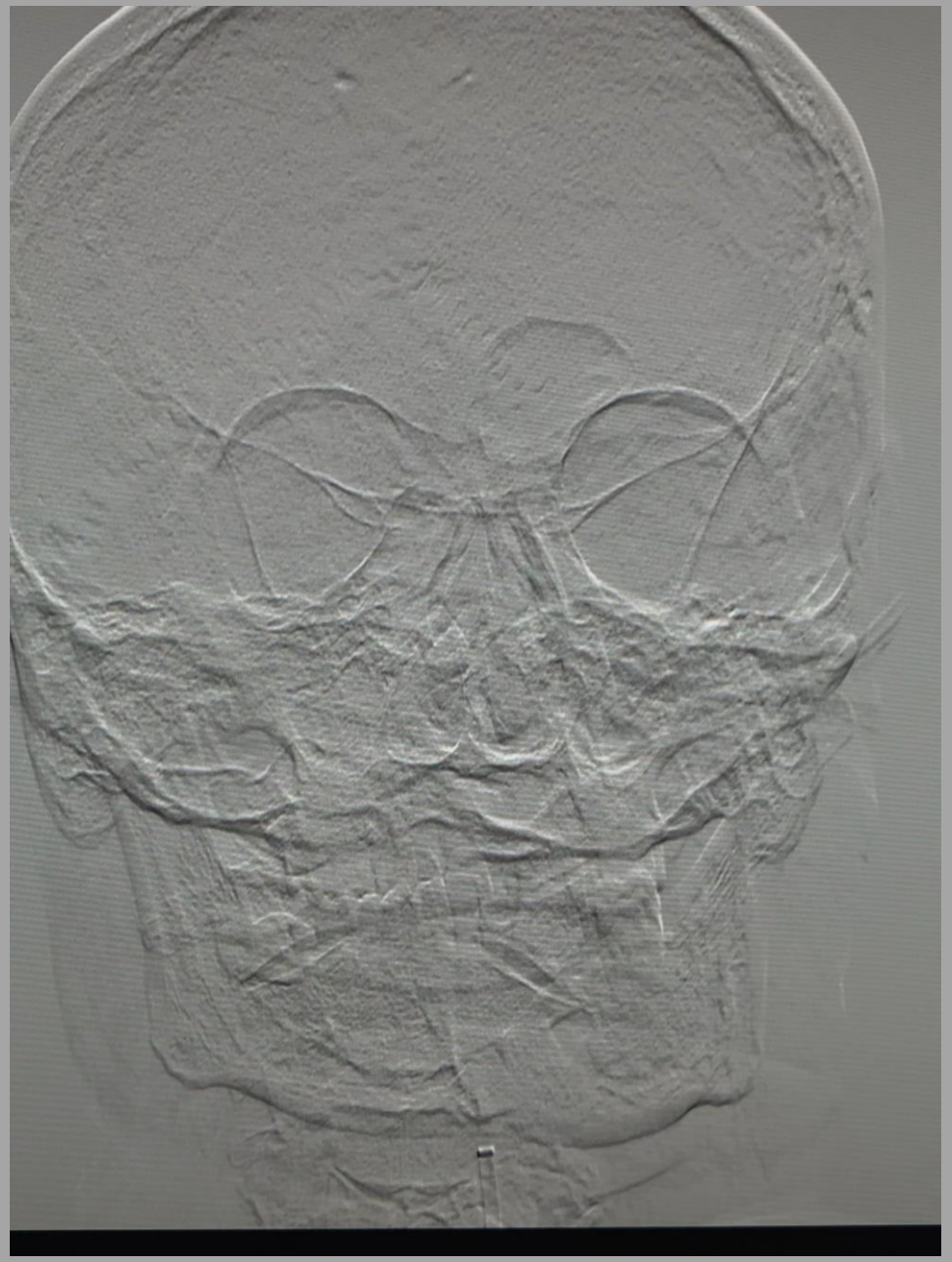
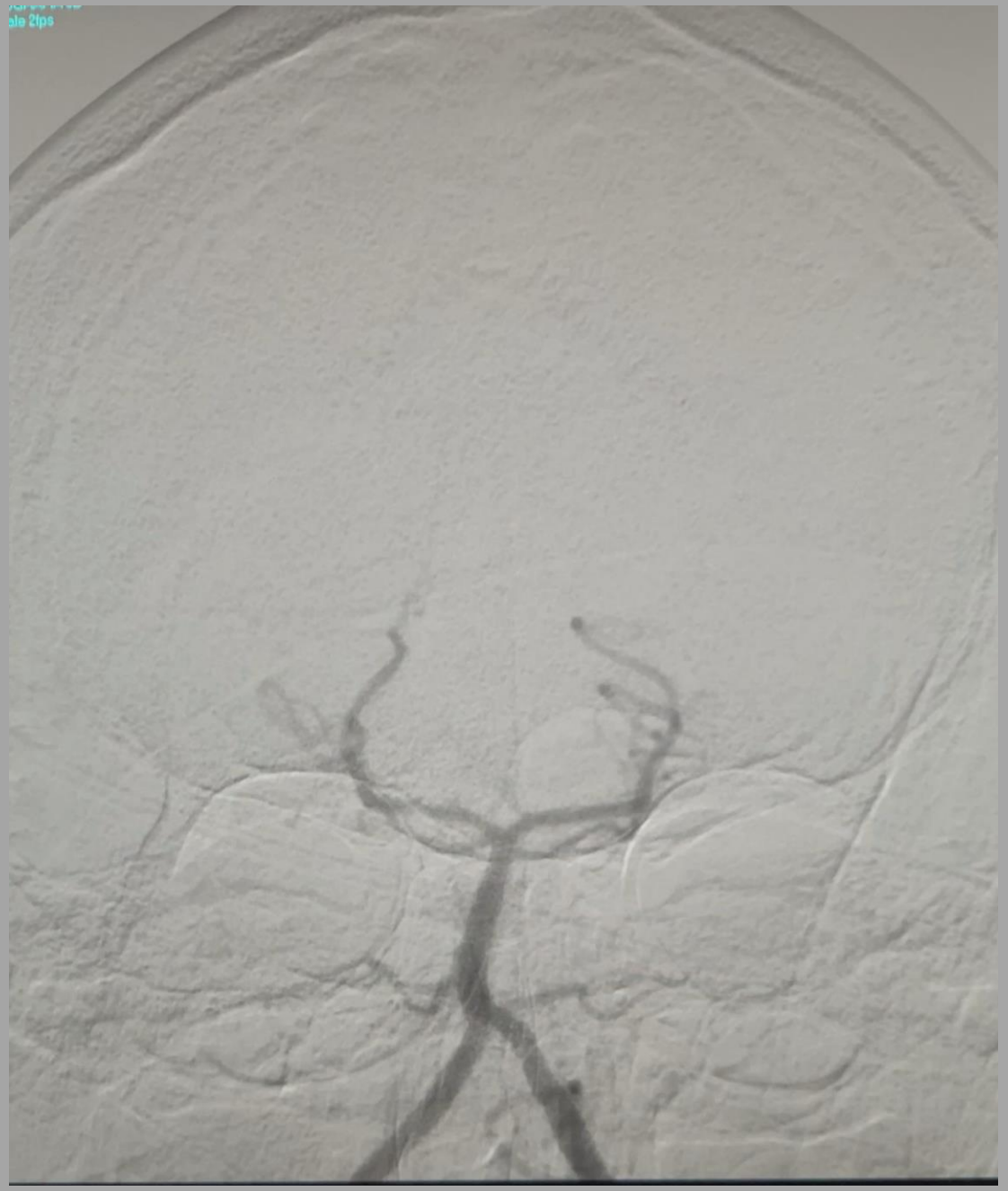
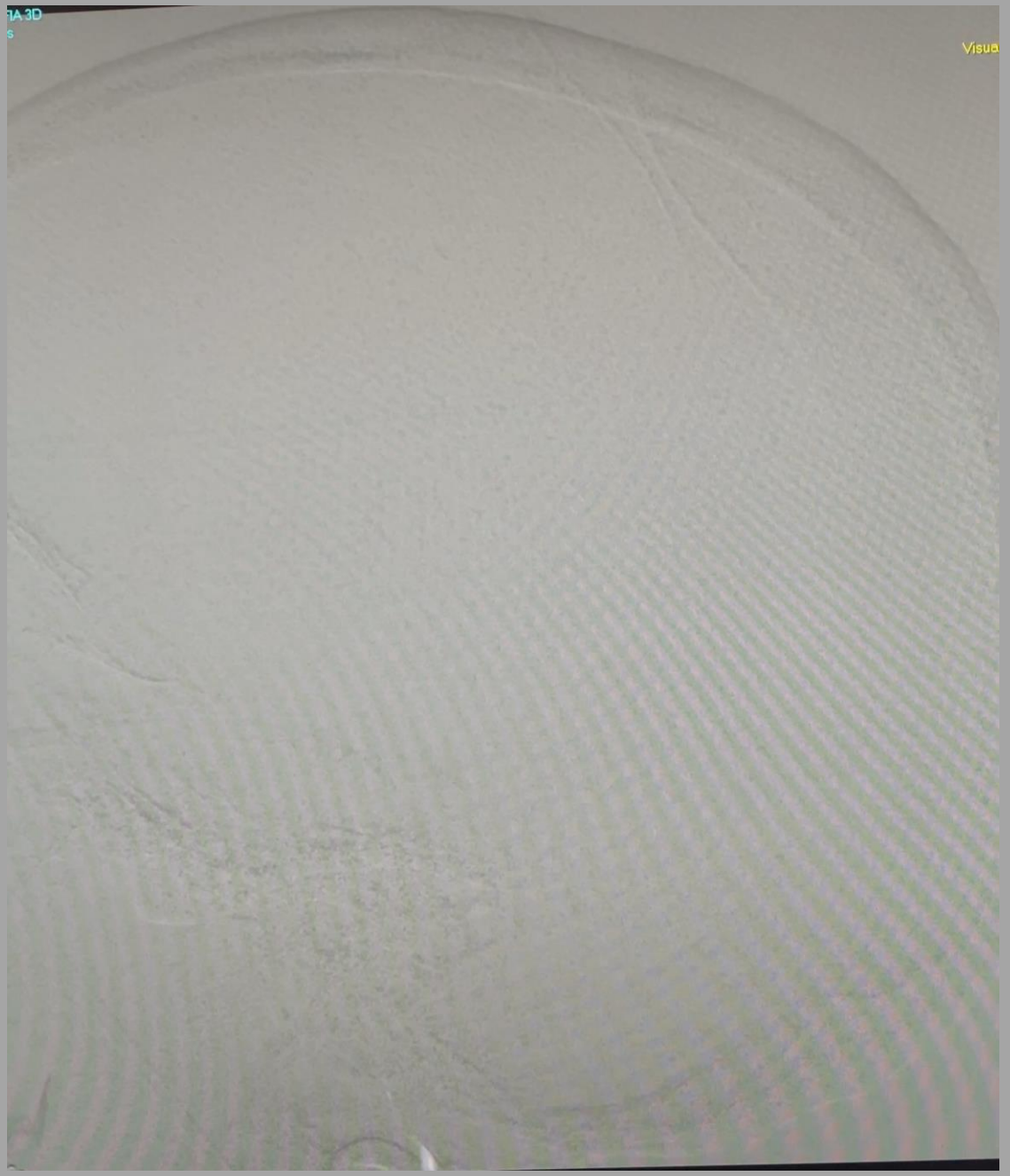
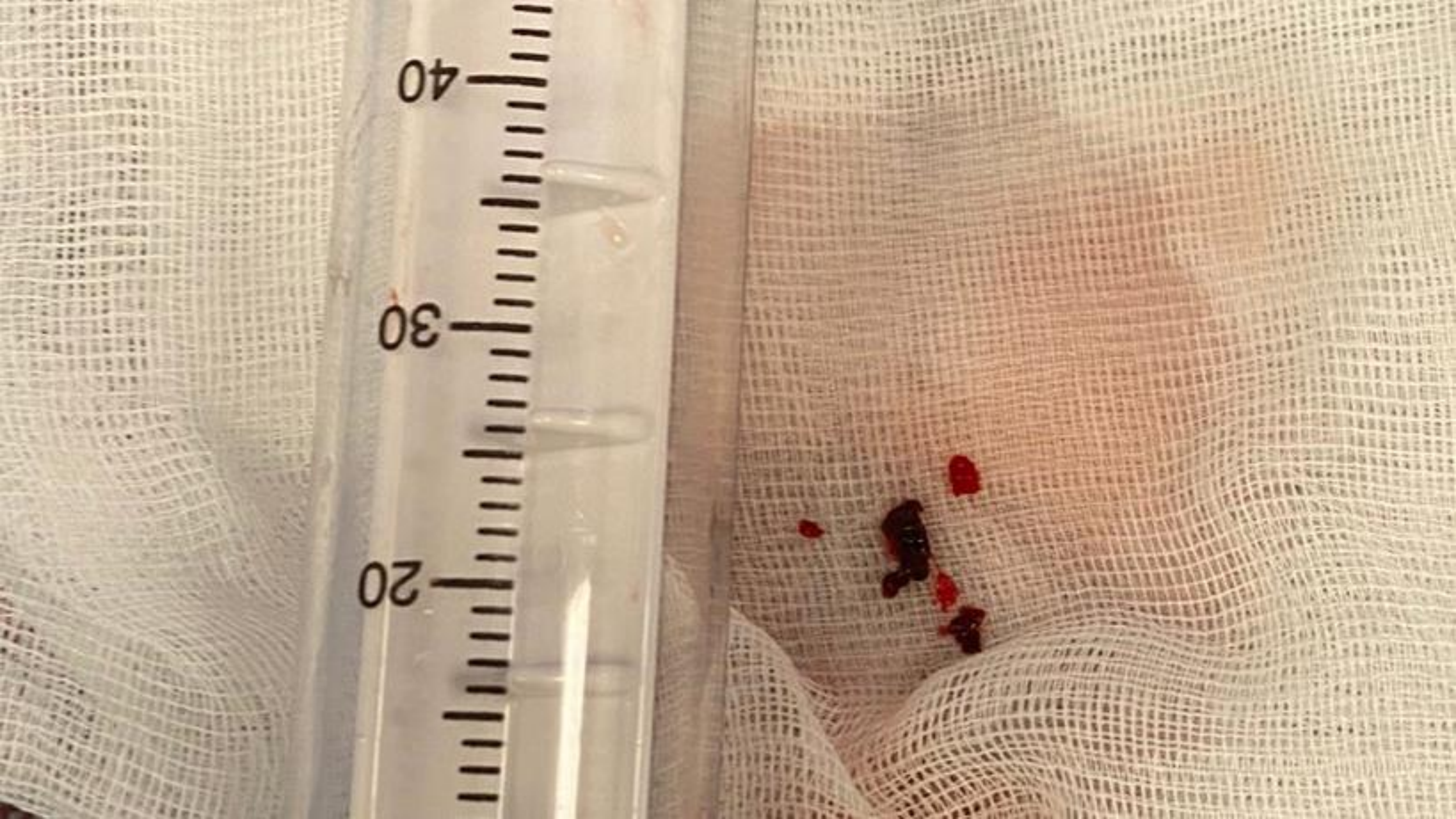

‹ 1601 - 1 ›
CBF
Tmax
R
CBF<30%: 0 ml
Tmax>6.0s: 101 ml
Mismatch volume: 101 ml
Mismatch ratio: infinite
RAPID
P


‹ 1601 - 3 ›
Tmax
10.0
8.0
6.0
4.0
Tmax>10.0s: 0 ml
Tmax>8.0s: 31 ml
Tmax>6.0s: 101 ml
Tmax>4.0s: 160 ml
Hypoperfusion Index (Tmax>10s/Tmax>6s): 0.0
RAPID
P





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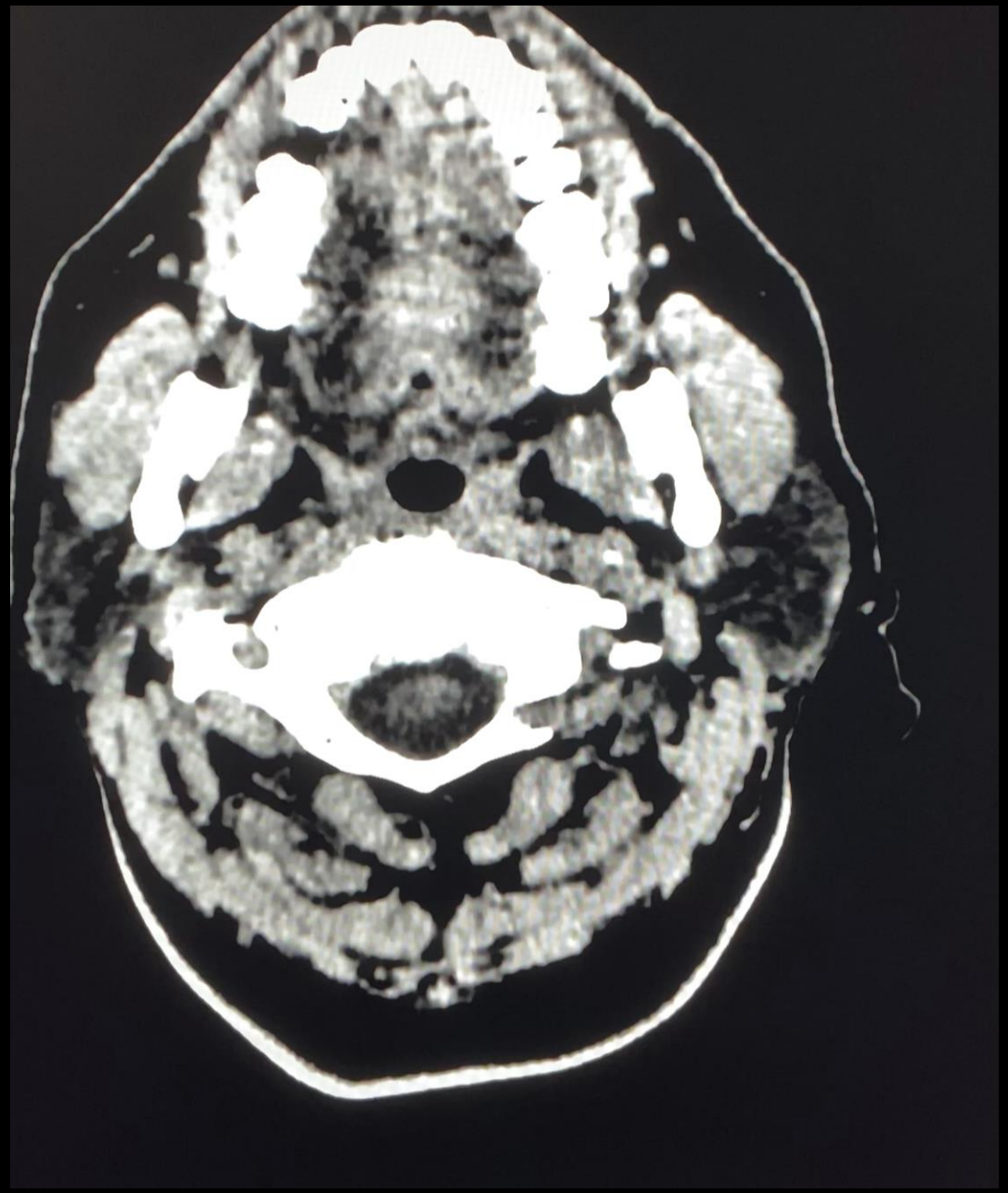

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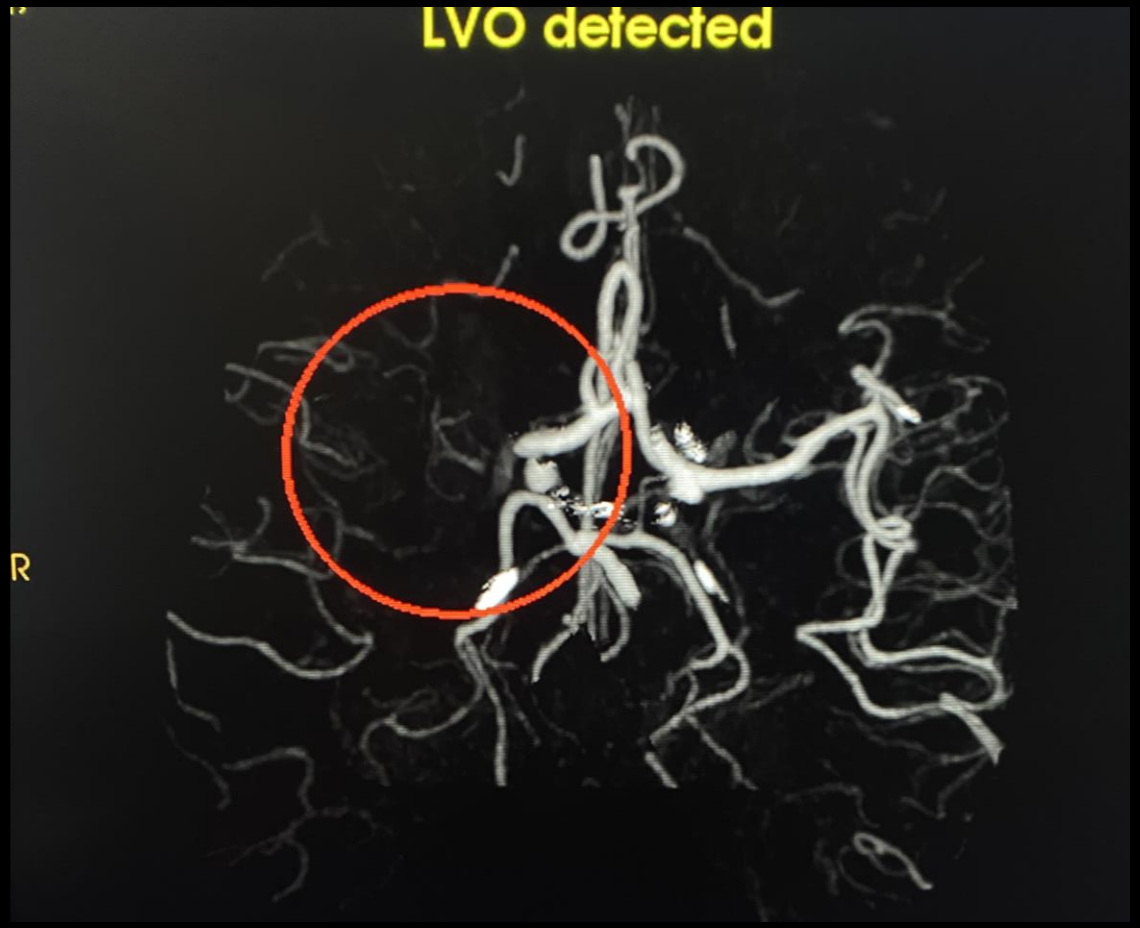

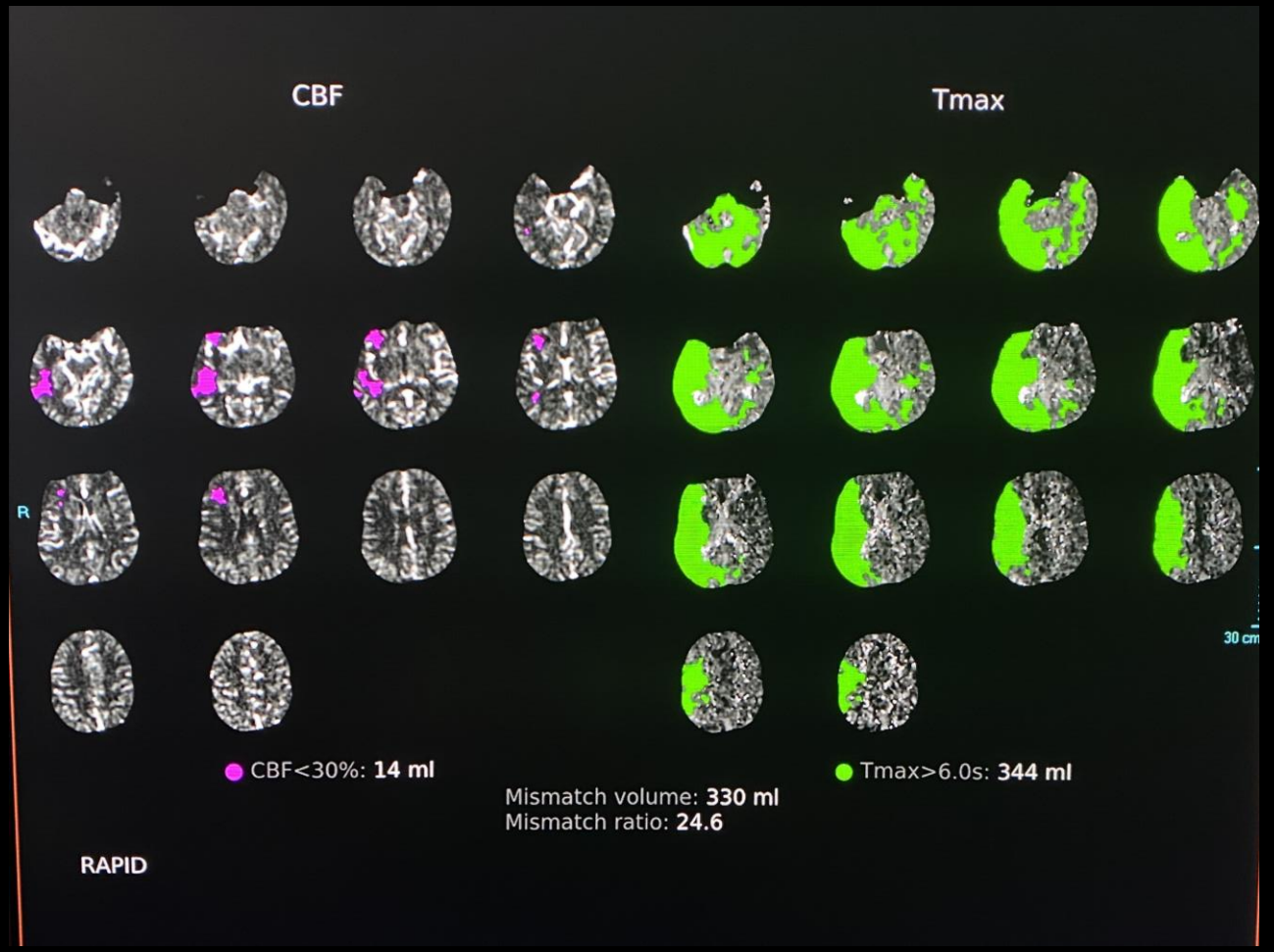

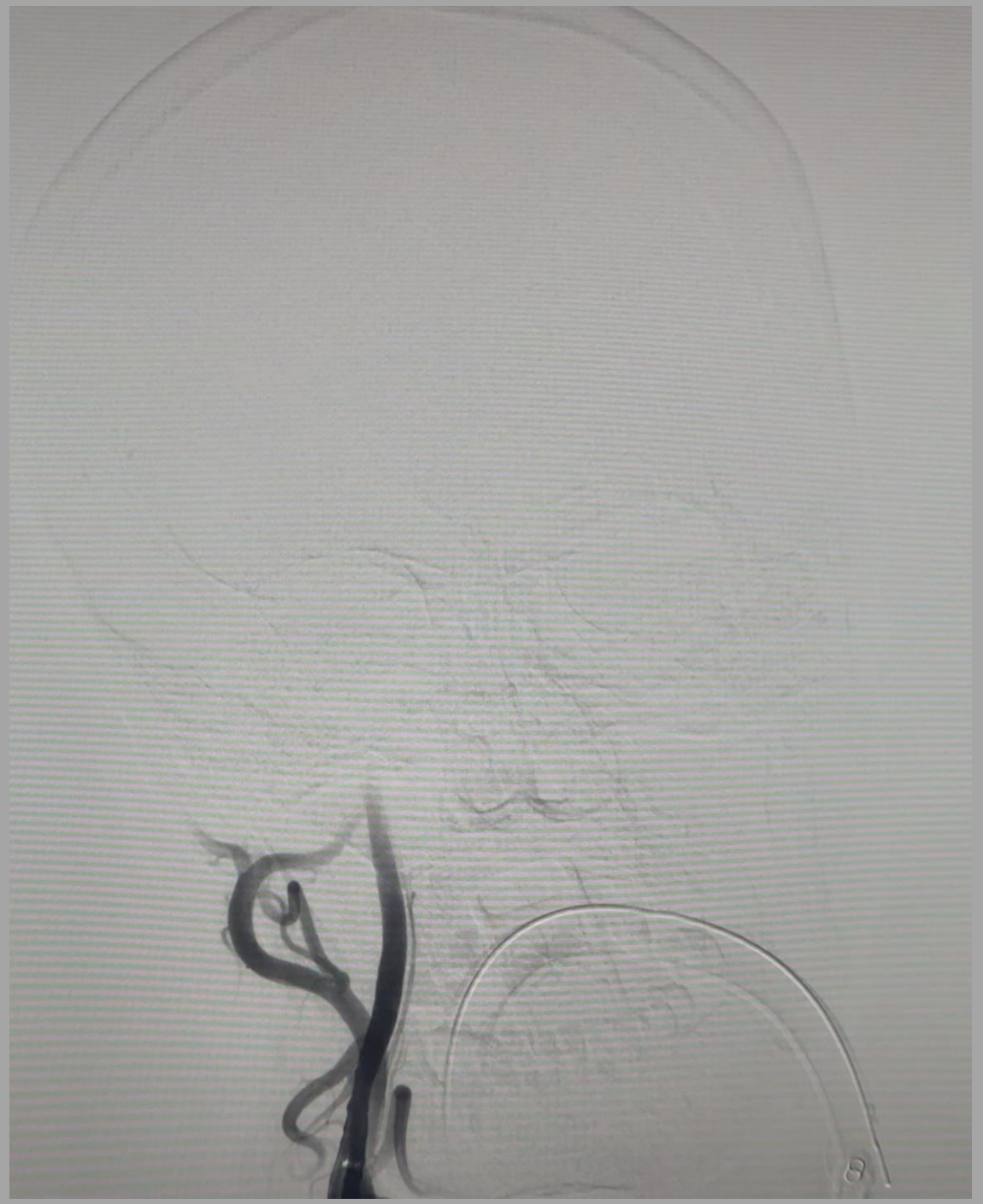

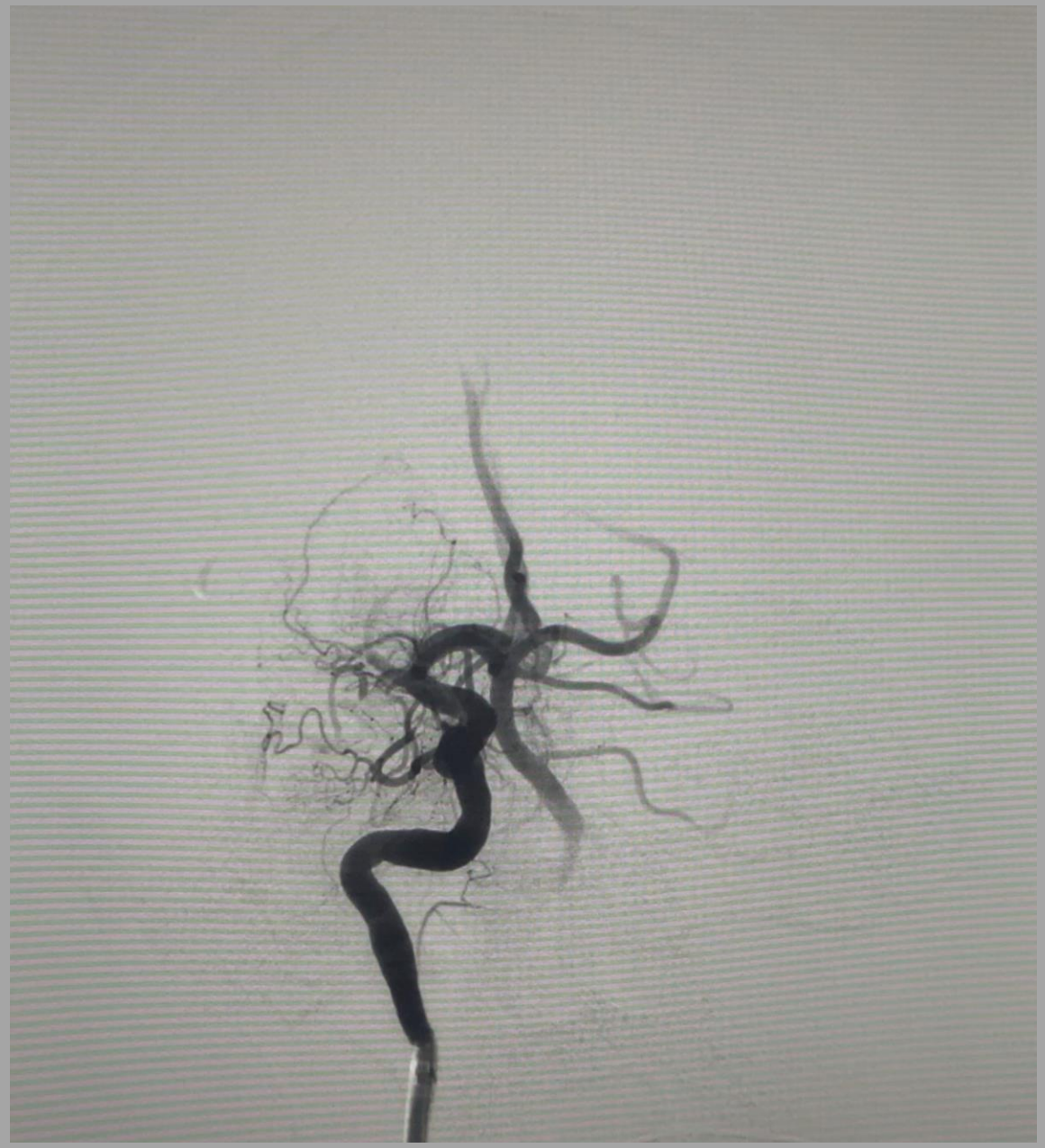

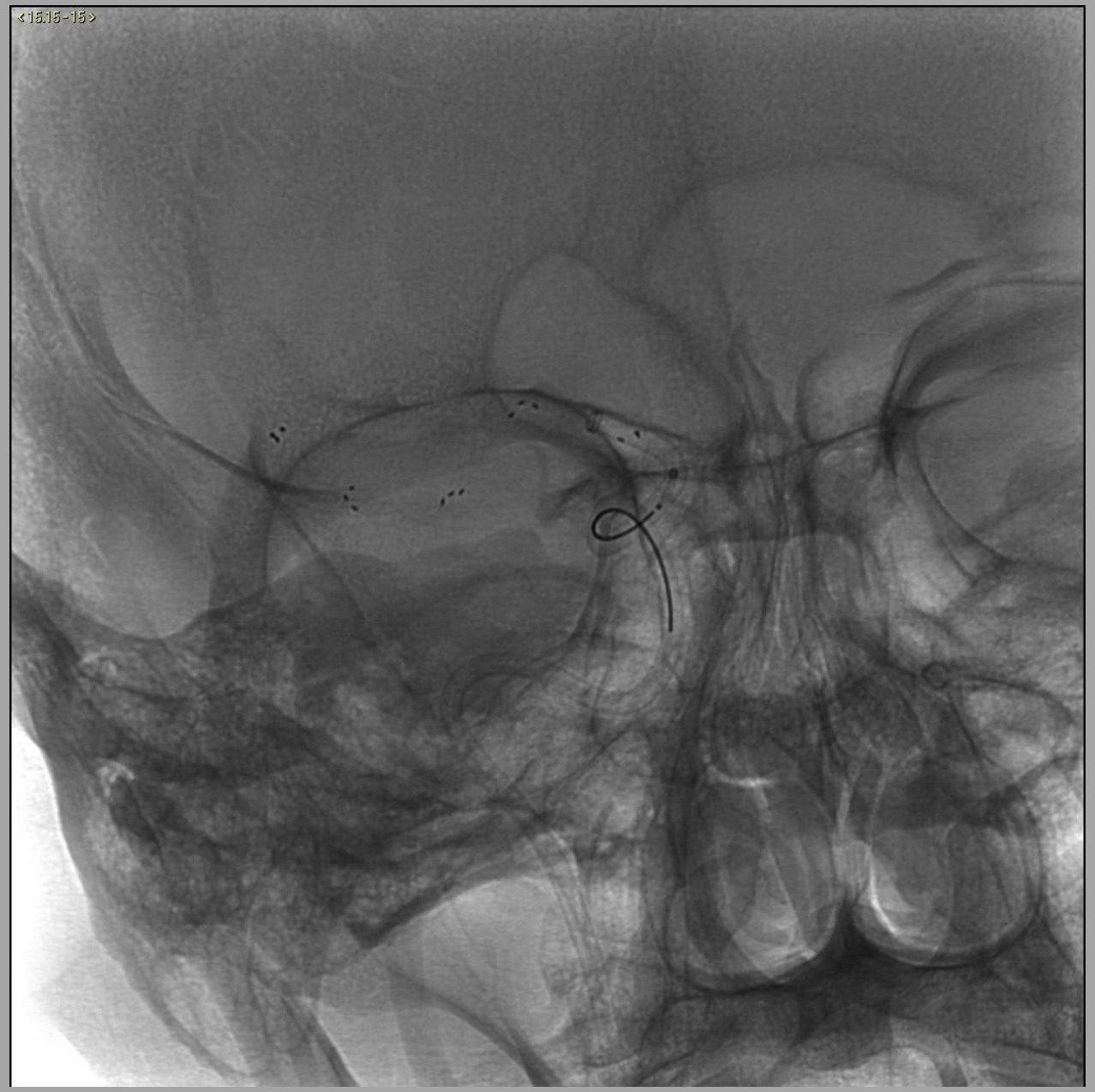
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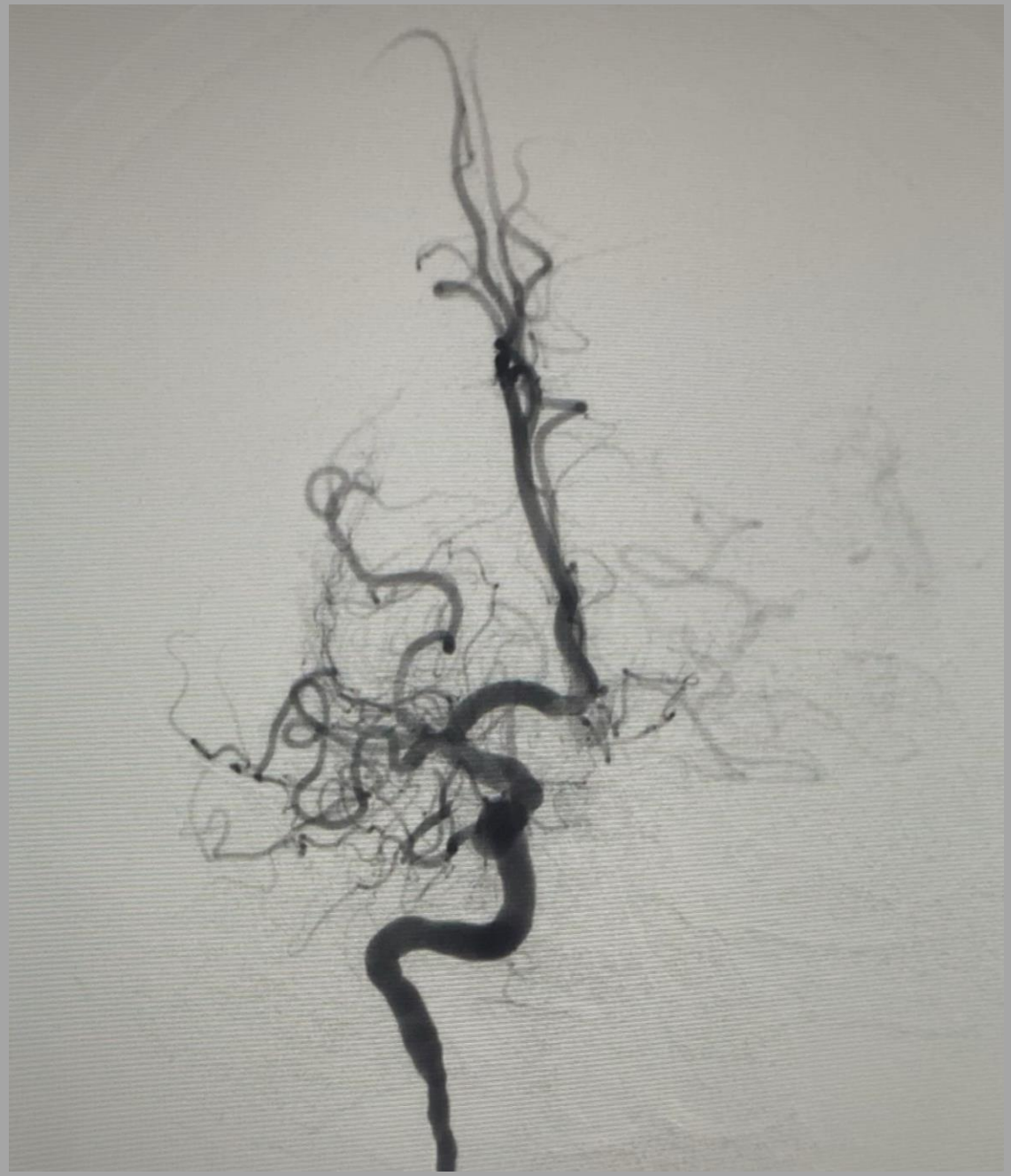

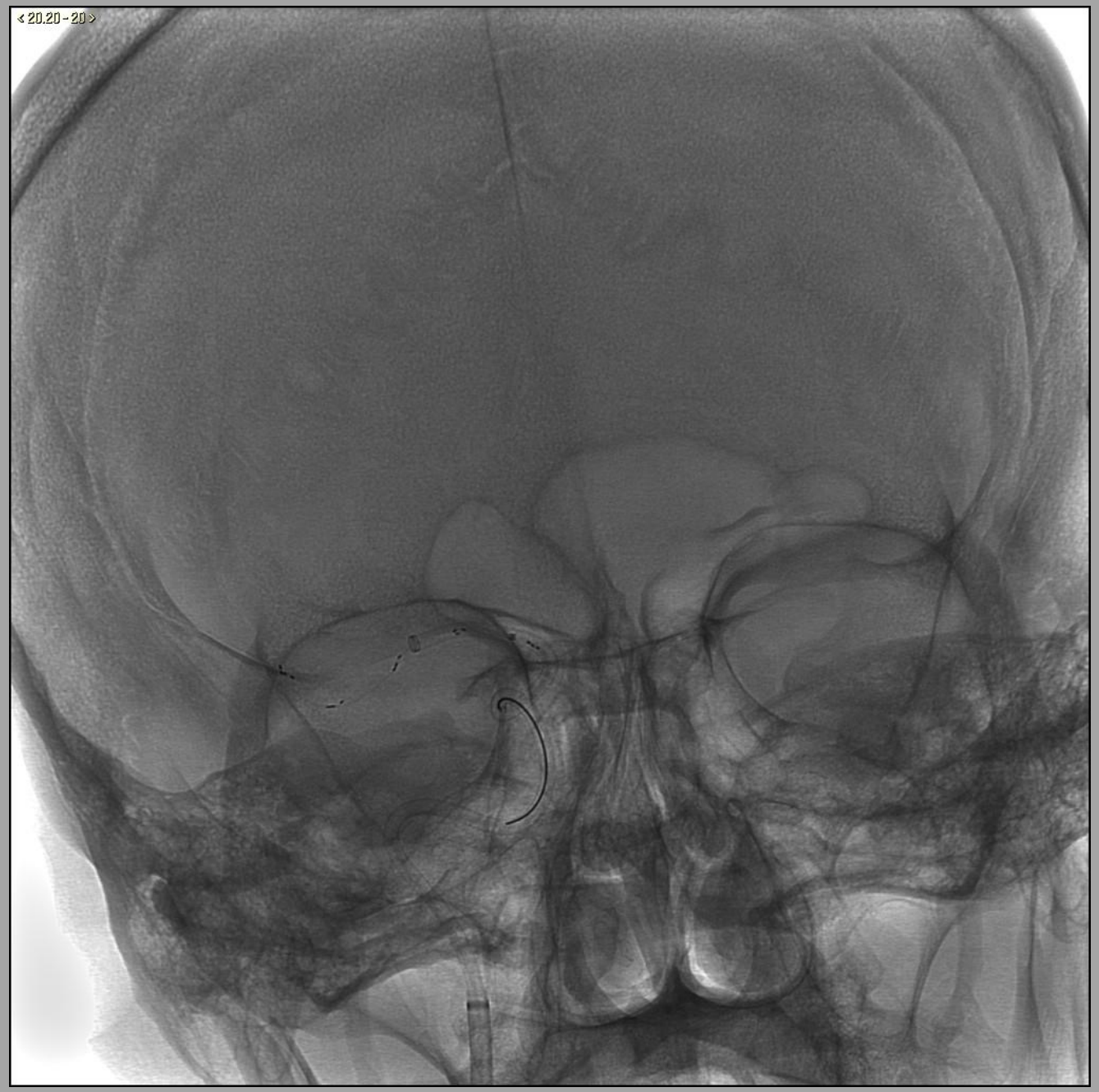
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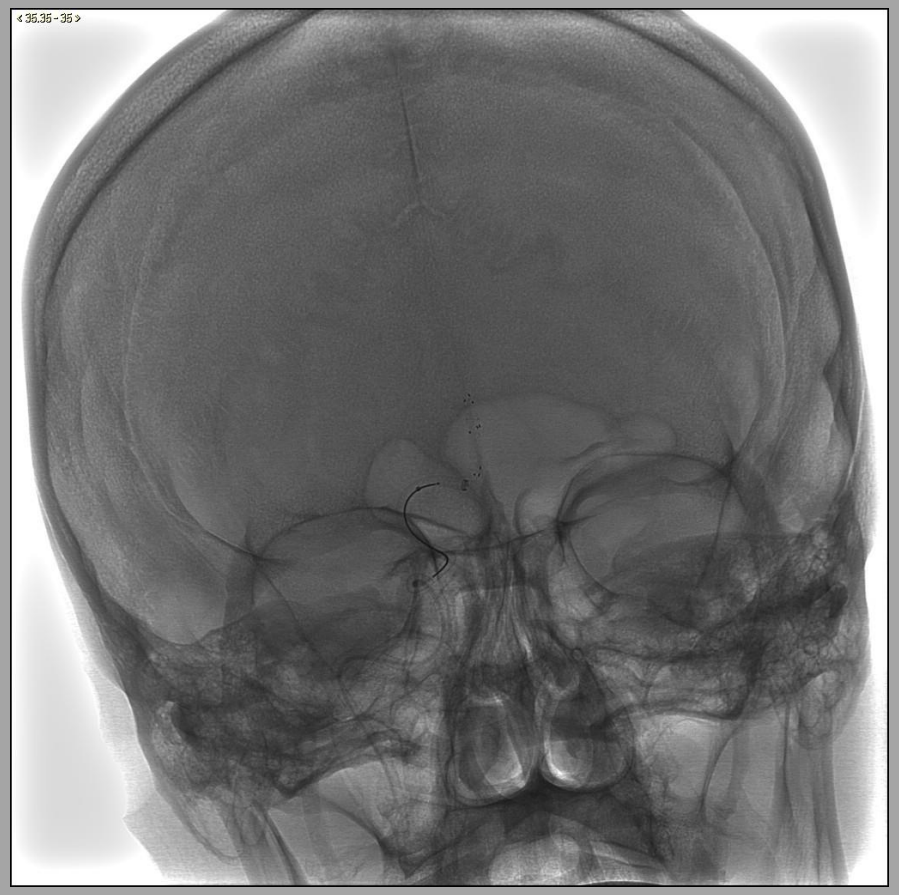
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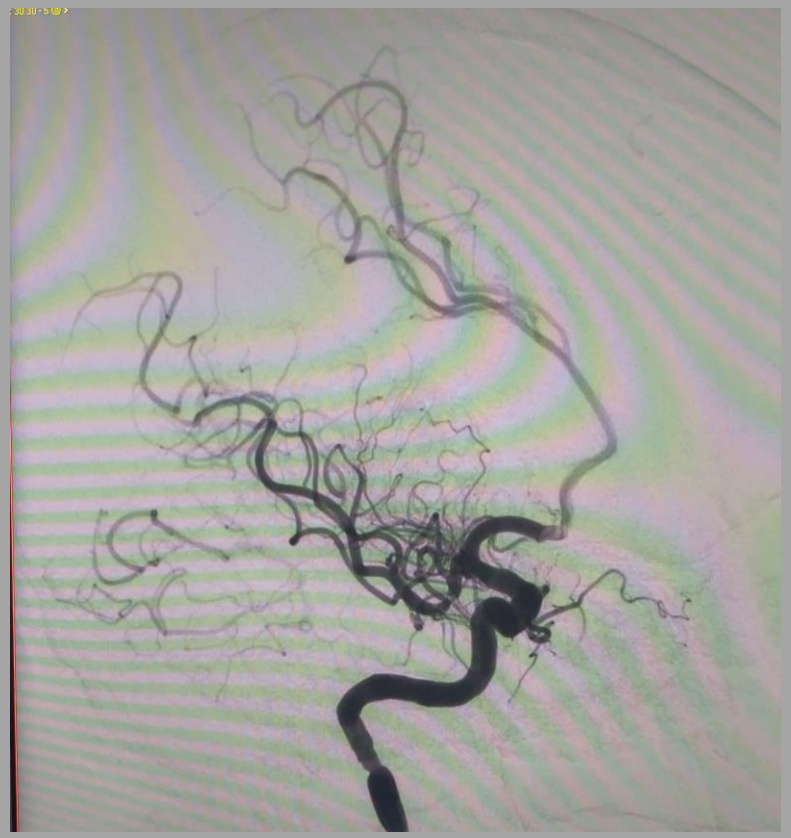
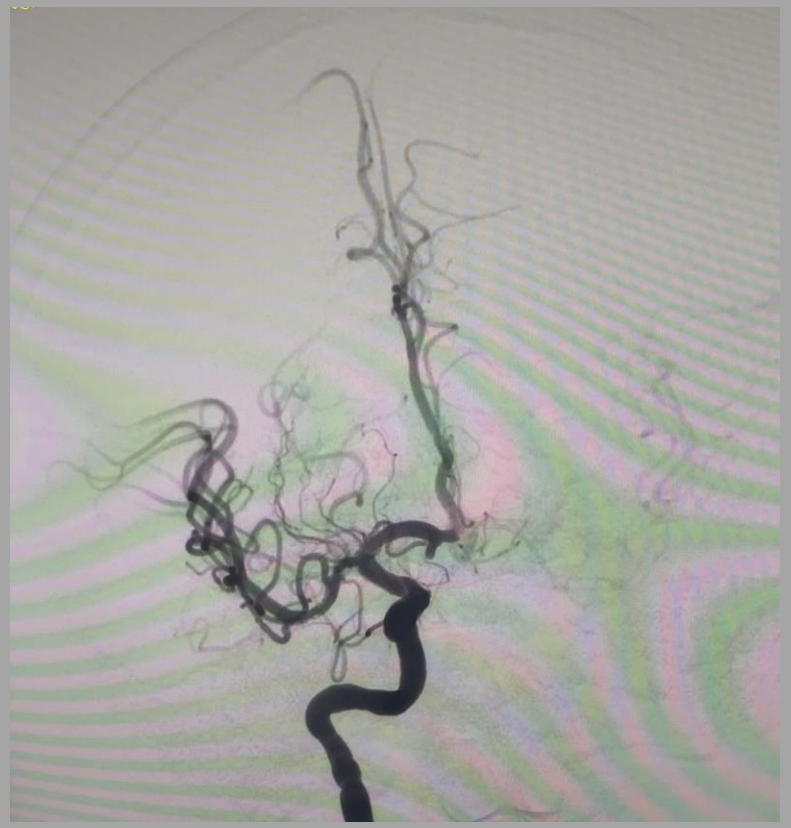
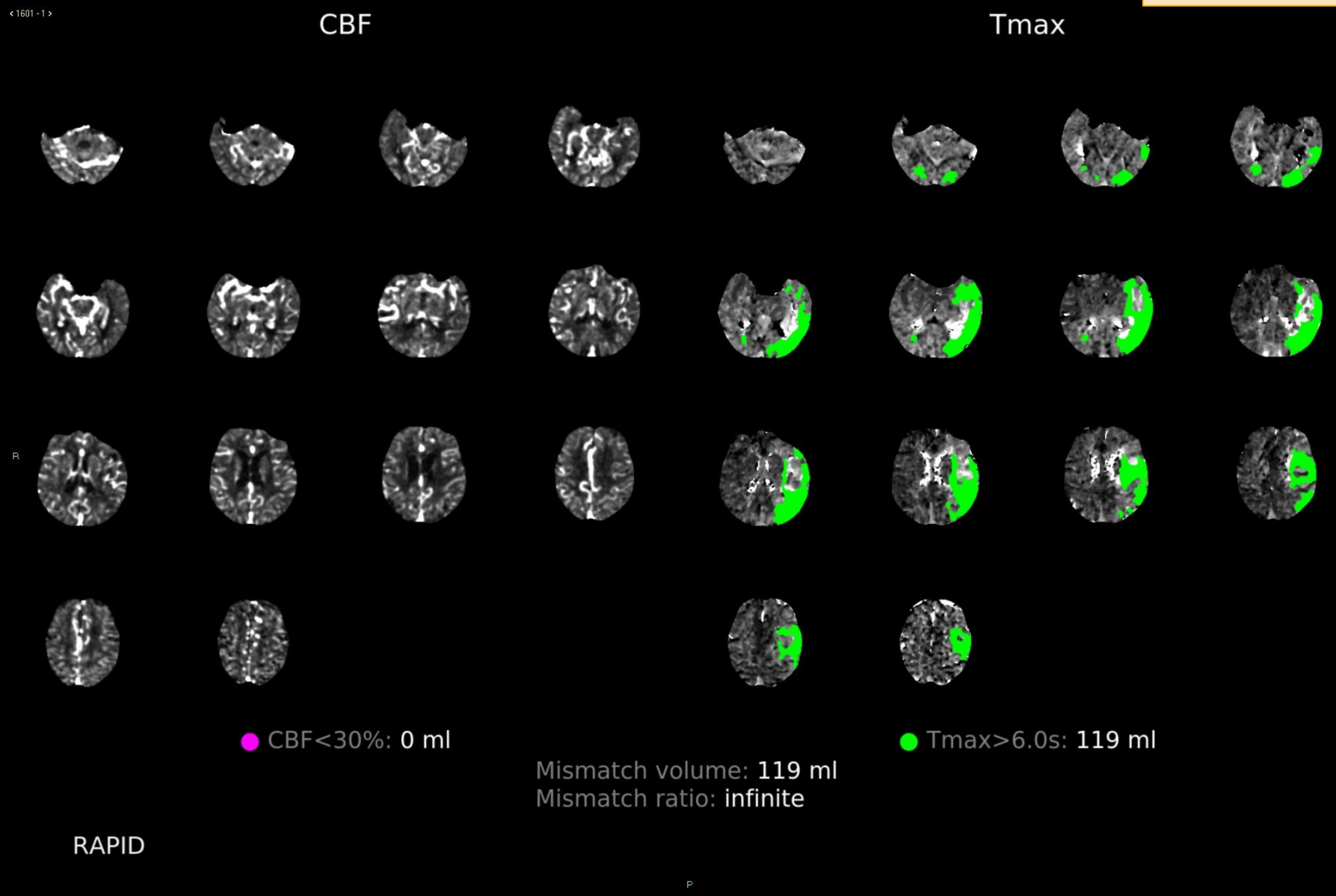




..qualche esempio..



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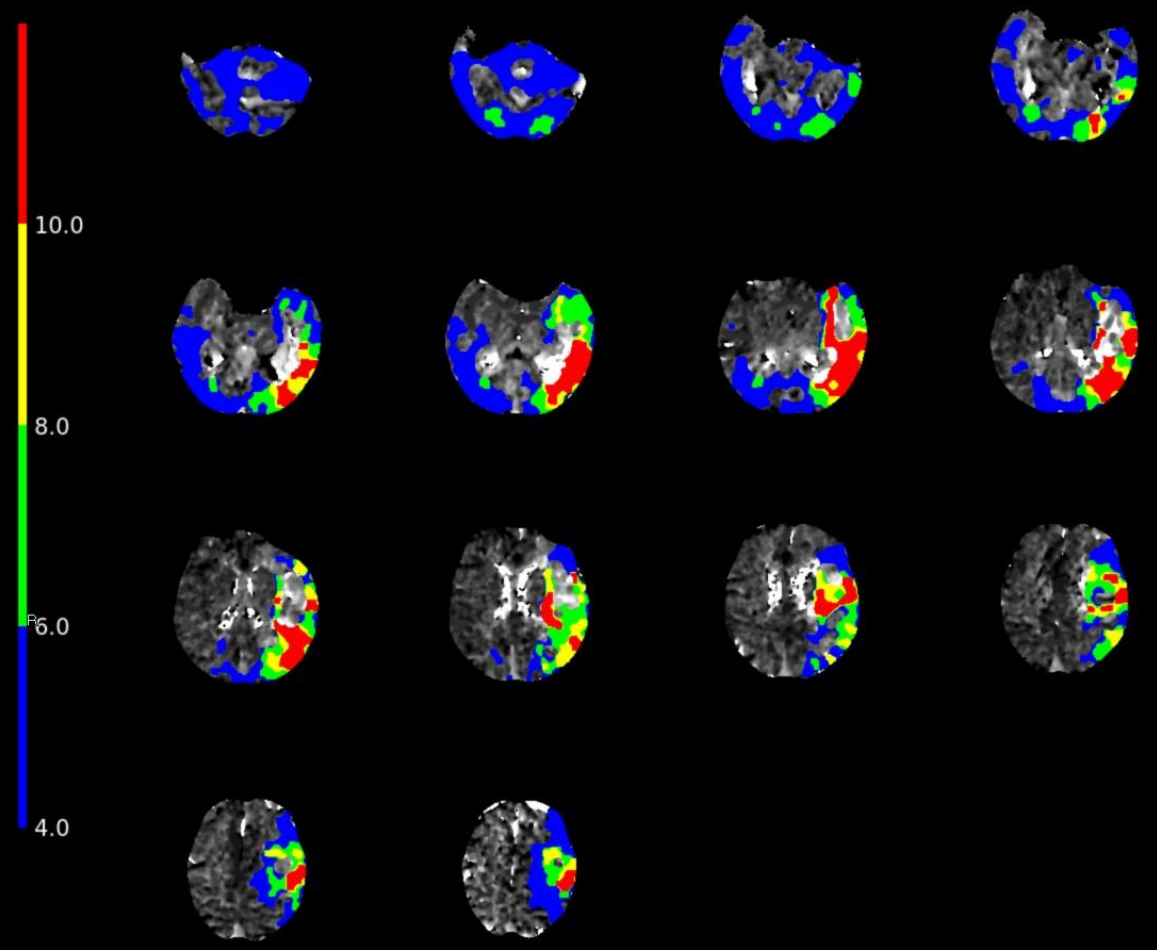
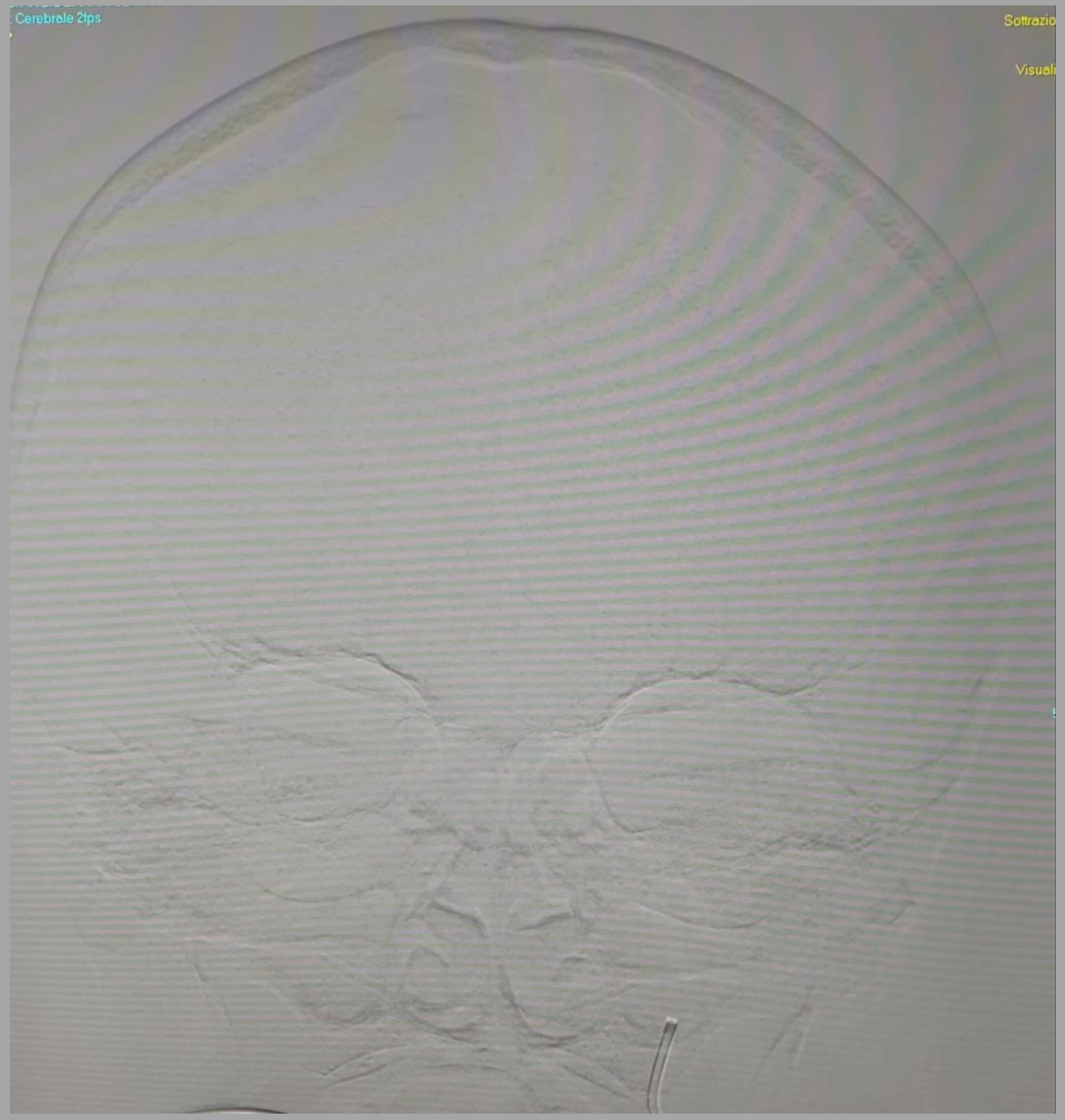
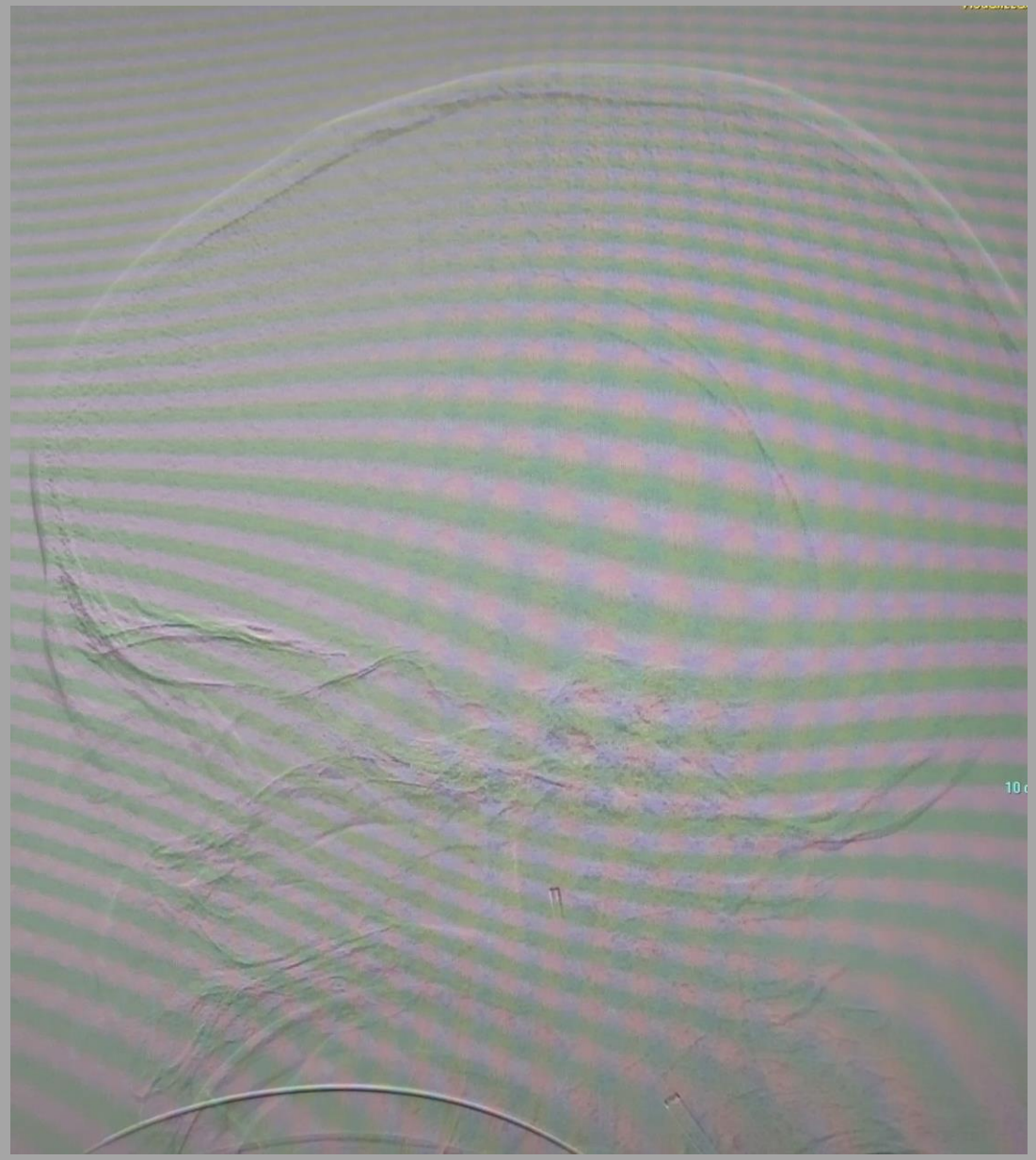
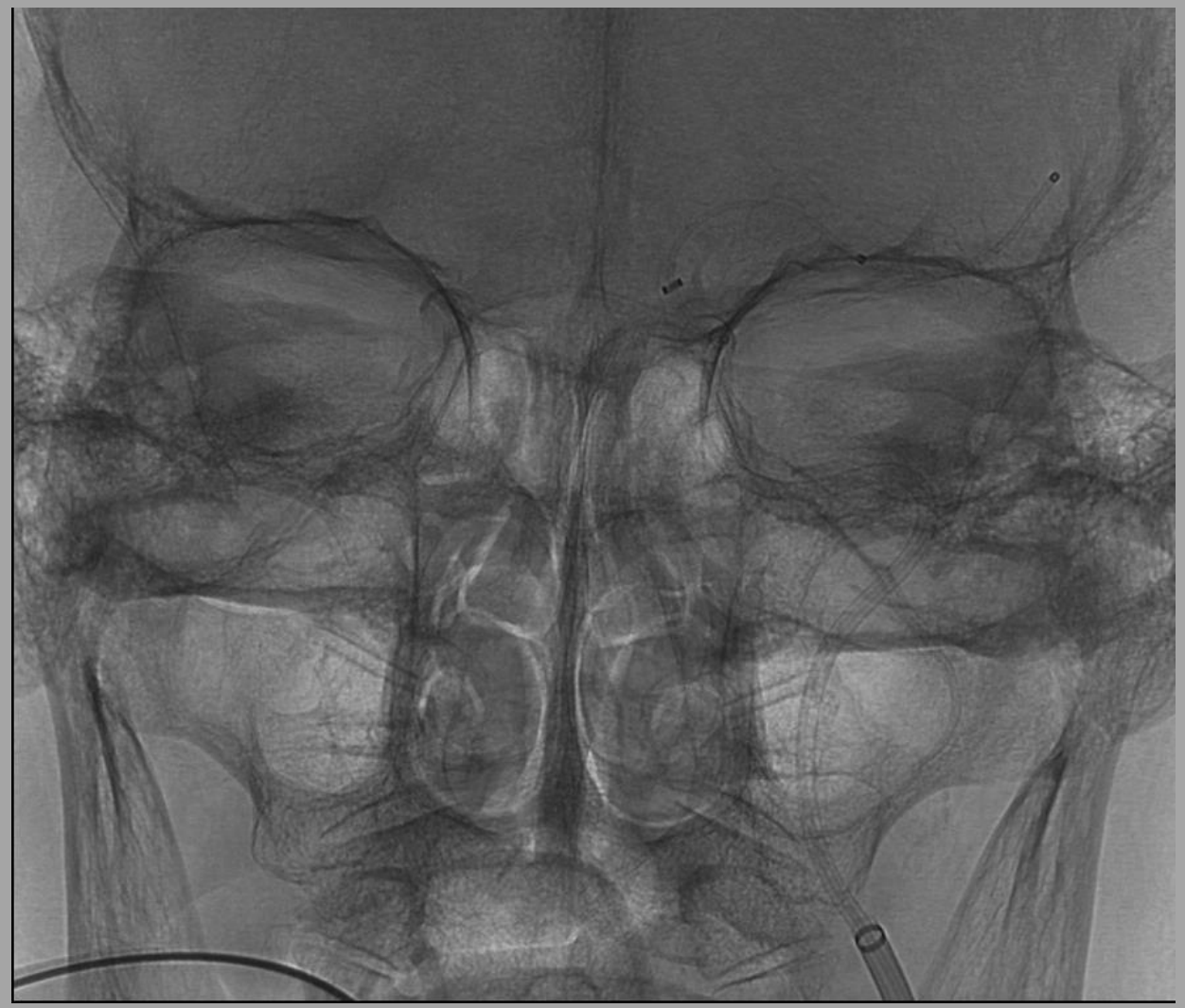
Tmax

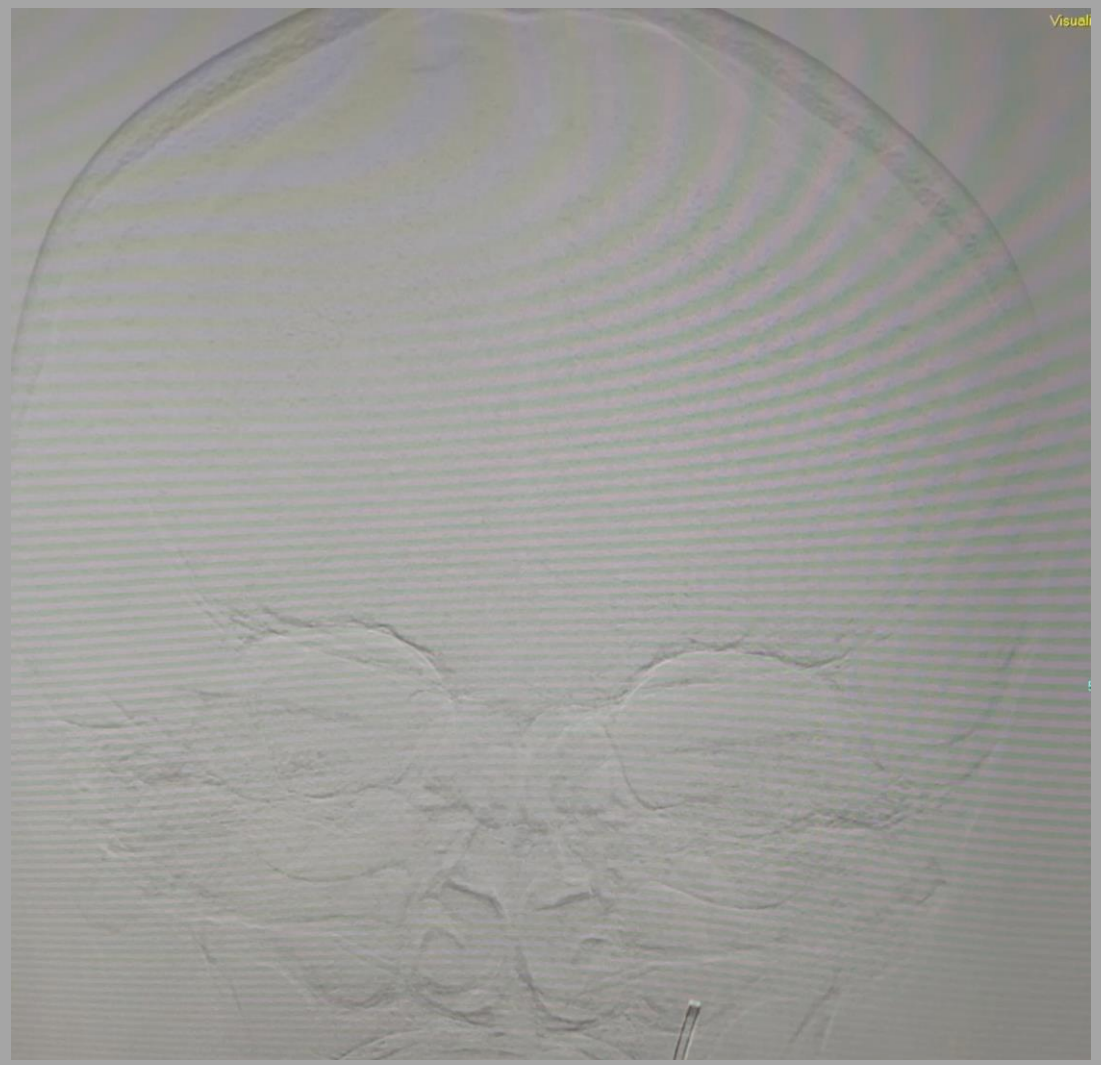


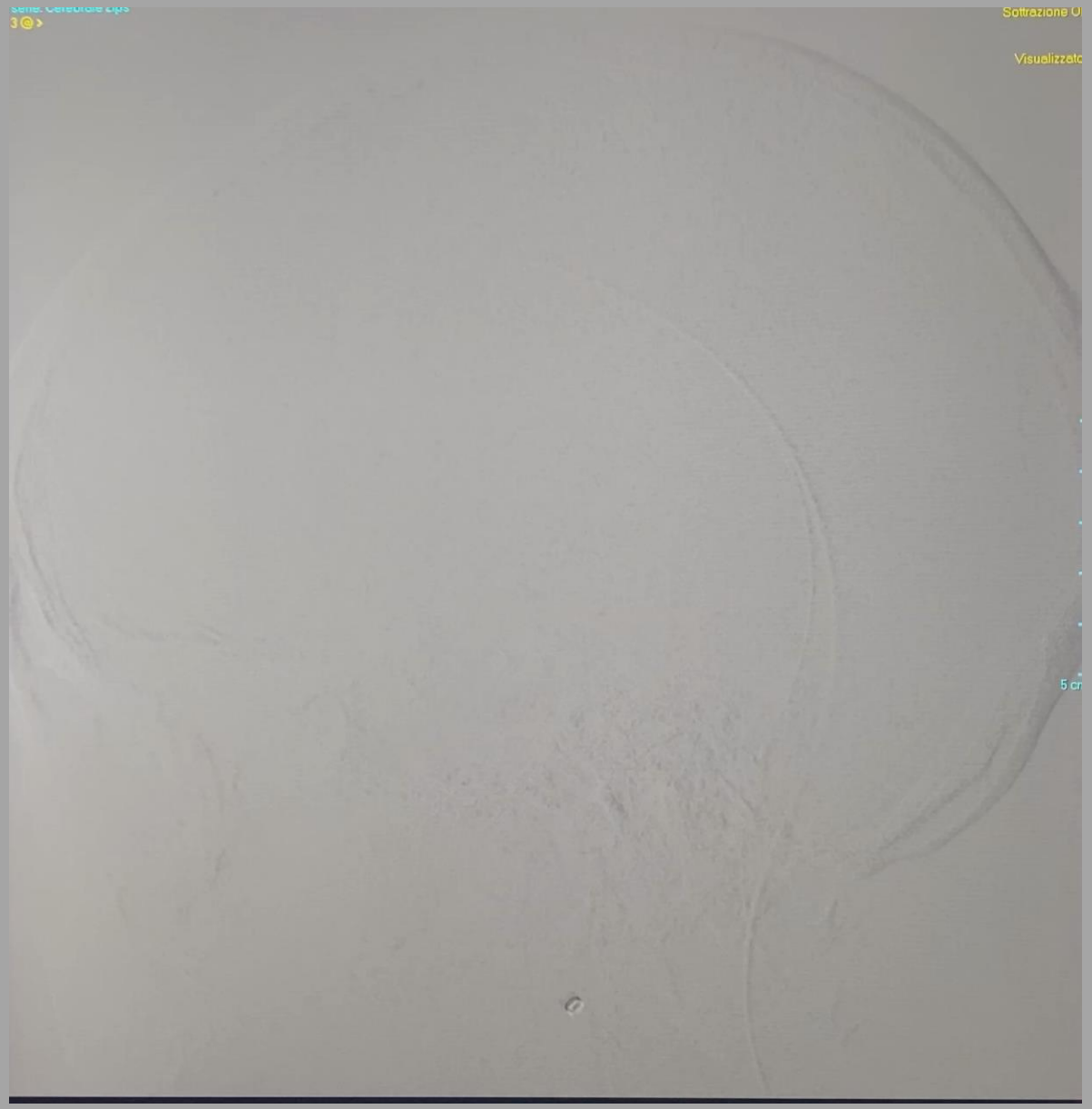
- Tmax>10.0s: 40 ml
- Tmax>8.0s: 67 ml
- Tmax>6.0s: 119 ml
- Tmax>4.0s: 299 ml

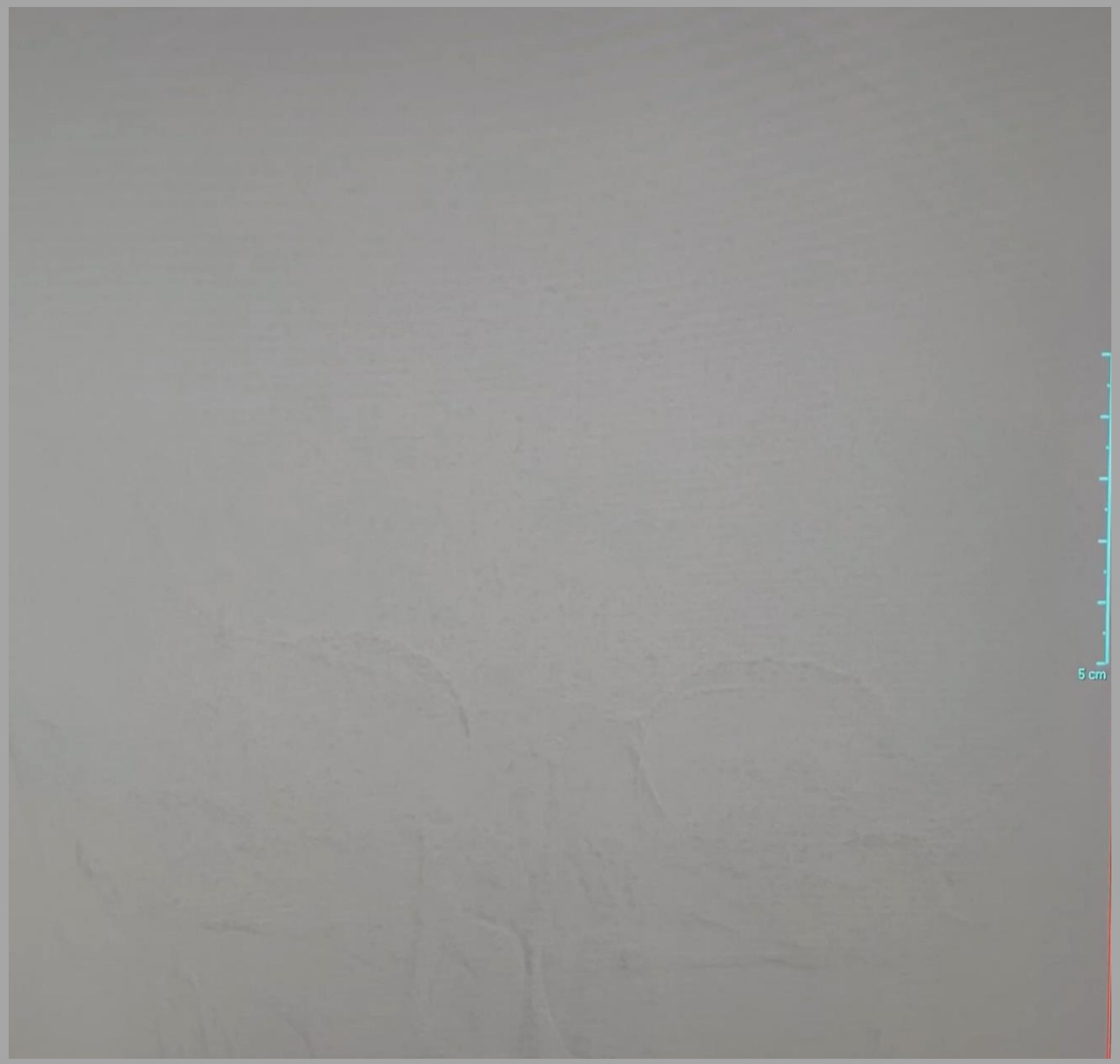

Cerebrale 2fps
Sottrazio
Visuali

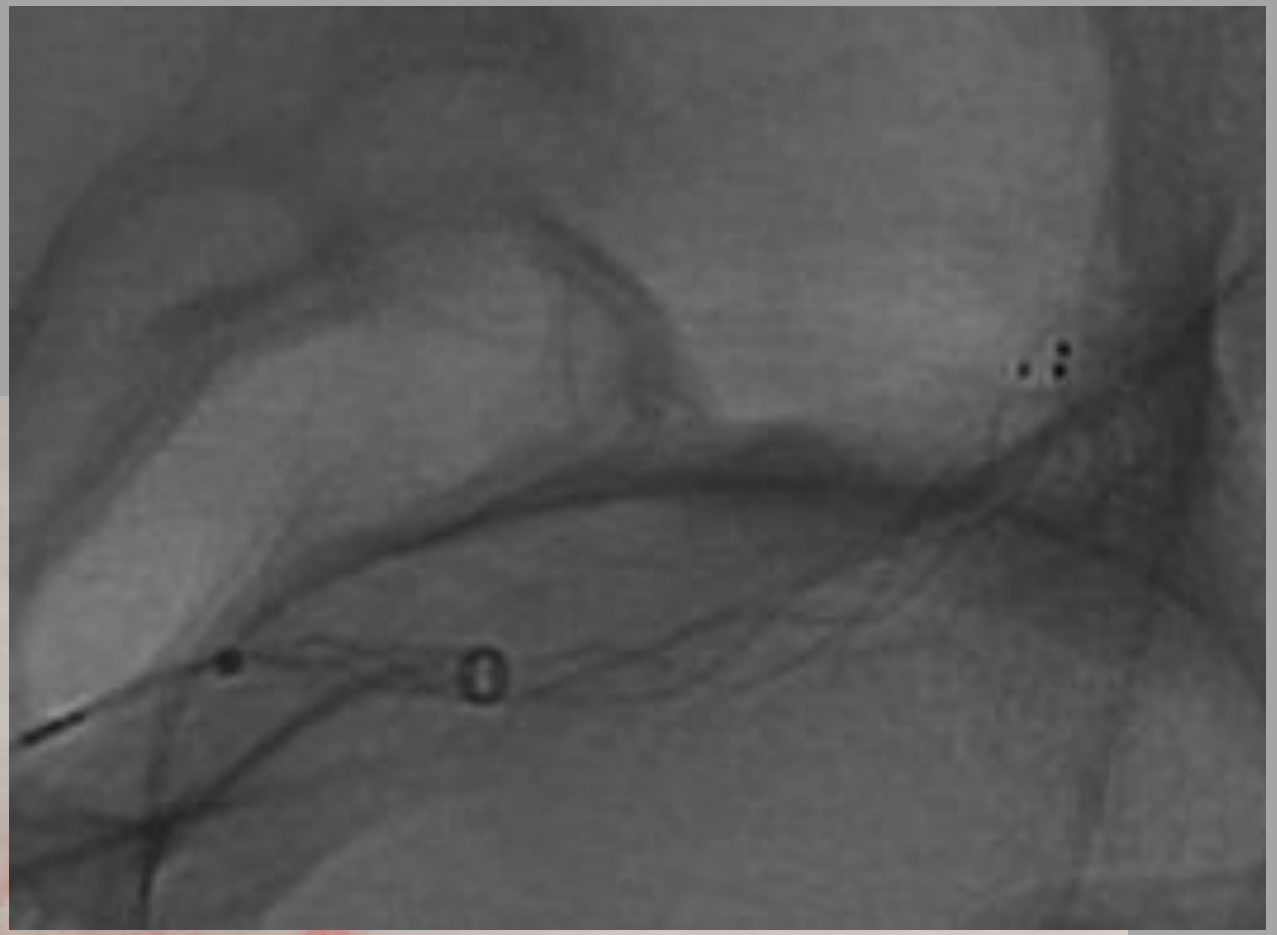




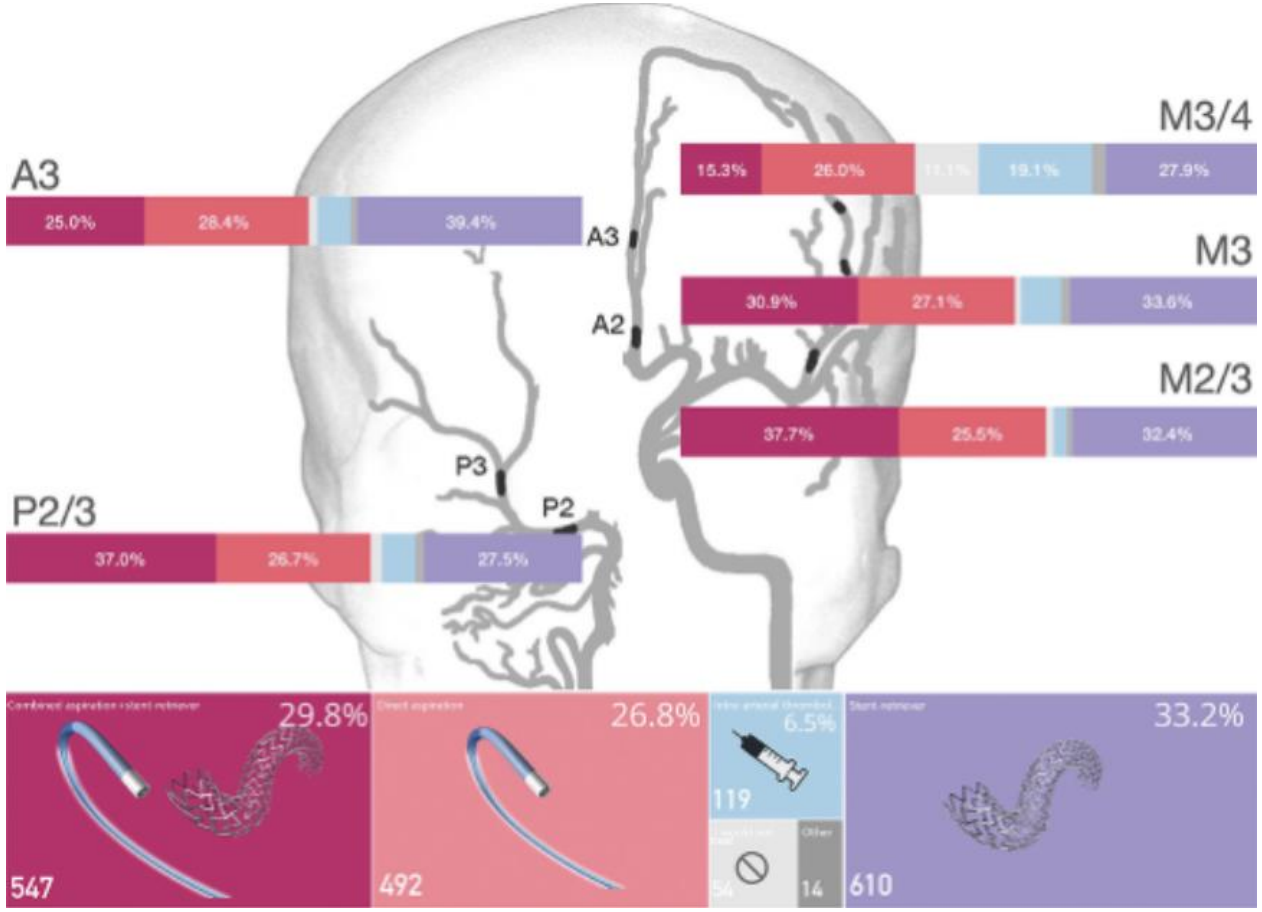



Sottrazione O
Visualizzato
5 cm


5 cm




0
1
2
3
4
5



Endovascular treatment for acute ischaemic stroke due to medium vessel occlusion: data from ANGEL-ACT registry

Dapeng Sun,[#1,2] Raynald ,[#1,3] Xiaochuan Huo,[1] Baixue Jia,[1] Xu Tong,[1] Anxin Wang,[4] Gaoting Ma,[1] Ning Ma,[1] Feng Gao,[1] Dapeng Mo,[1] and Zhongrong Miao[✉1], on behalf of the ANGEL-ACT Study Group

Conclusions

Patients with MeVO achieved similar 90-day mRS, SICH rate and successful recanalisation rate after EVT compared with patients with LVO. Several independent predictors of 90-day good outcome in MeVO patients undergoing EVT were determined, which should be highly considered in MeVO stroke management.

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Review

A review of endovascular treatment for medium vessel occlusion stroke

Johanna Maria Ospel et al. J Neurointerv Surg. 2021 Jul.

Commentary

MeVO: the next frontier?

PDF

Mayank Goyal [1, 2], Johanna Maria Ospel [1, 3], Bijoy K Menon [1, 2], Michael D Hill [1, 2]

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