Ecole de la thrombectomie Clermont-Ferrand, 09/02/24

OCCLUSIONS TERMINO-CAROTIDIENNES

OCCLUSIONS DISTALES PRIMAIRES ET SECONDAIRES

> Quel stent ? Quelle technique ? Quel micro KT ?

> Faut-il aller en ACA ? Comment ?

> Quel stent pour quel caillot ? Autres dispositifs…

Dr Marc-Antoine Labeyrie, marc-antoine.labeyrie@aphp.fr

Neuroradiologie interventionnelle, Hôpital Lariboisière, Paris

Occlusion terminocarotidienne

Objectifs :

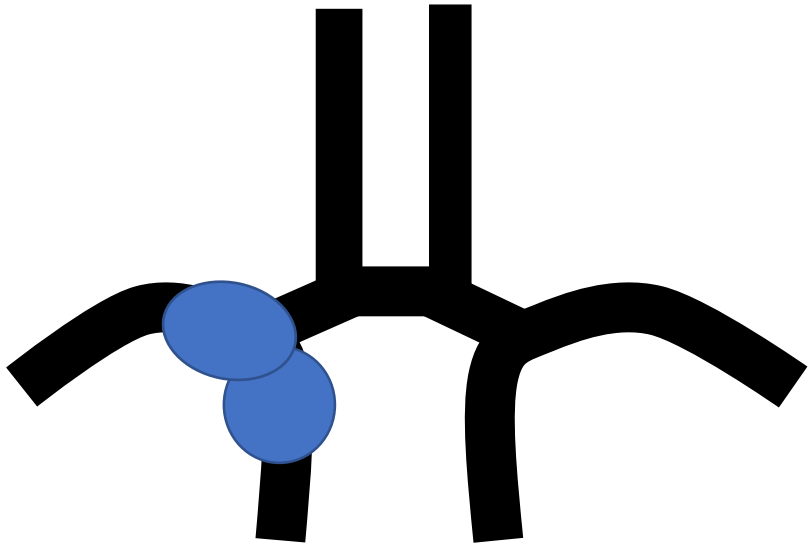
- Savoir localiser le thrombus
- Déterminer sa forme
- Comprendre le polygone de Willis
- Connaitre les spécificités de la prise en charge

1/ Quels risques spécifiques ?

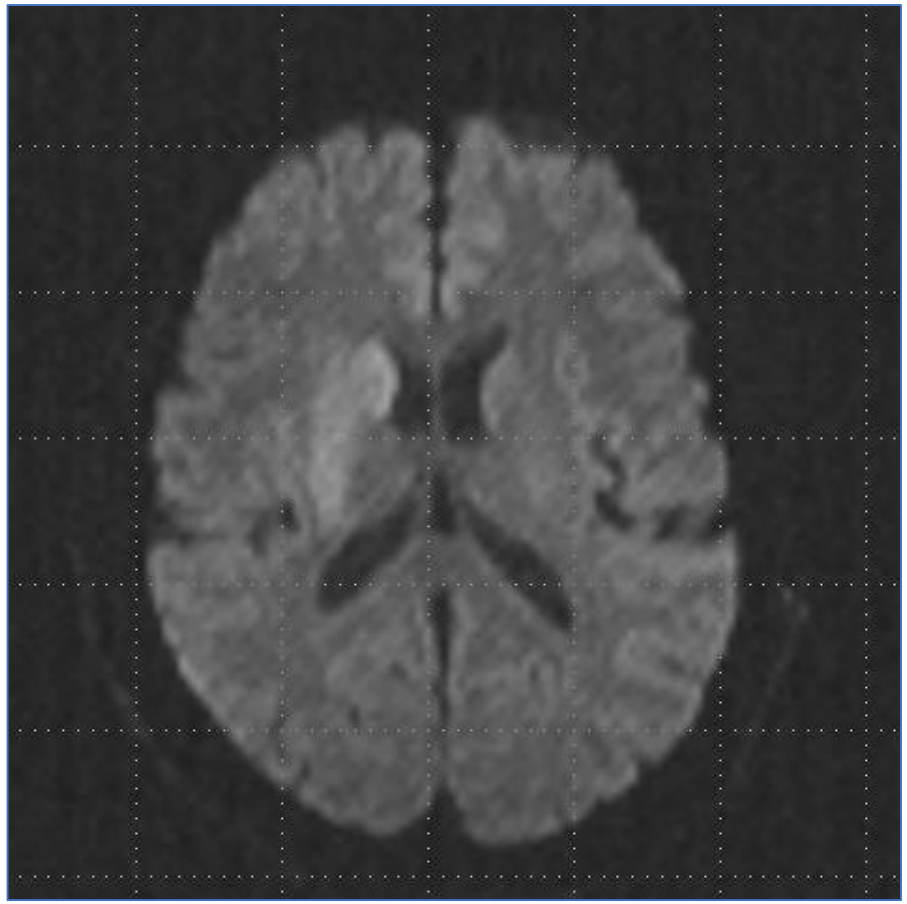
- Thrombus volumineux
- Infarctus choroïdien antérieur
- Importance du polygone de Willis
- L'embole erratique distal dans l'ACA

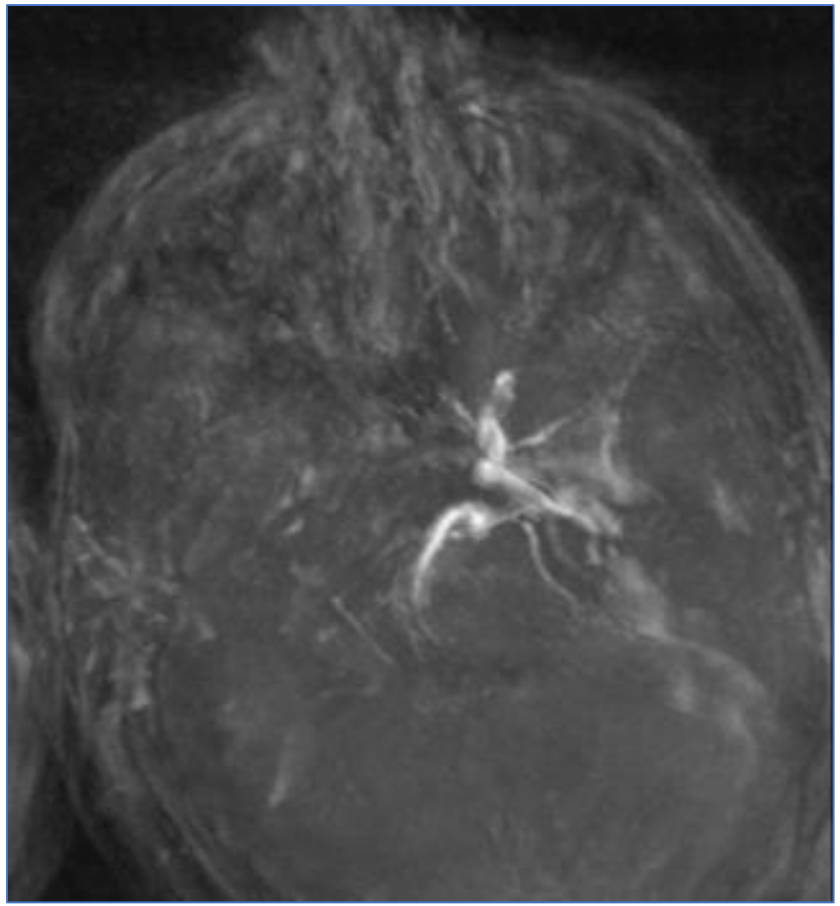
- Pronostic globalement défavorable

(28% de mRS <3)



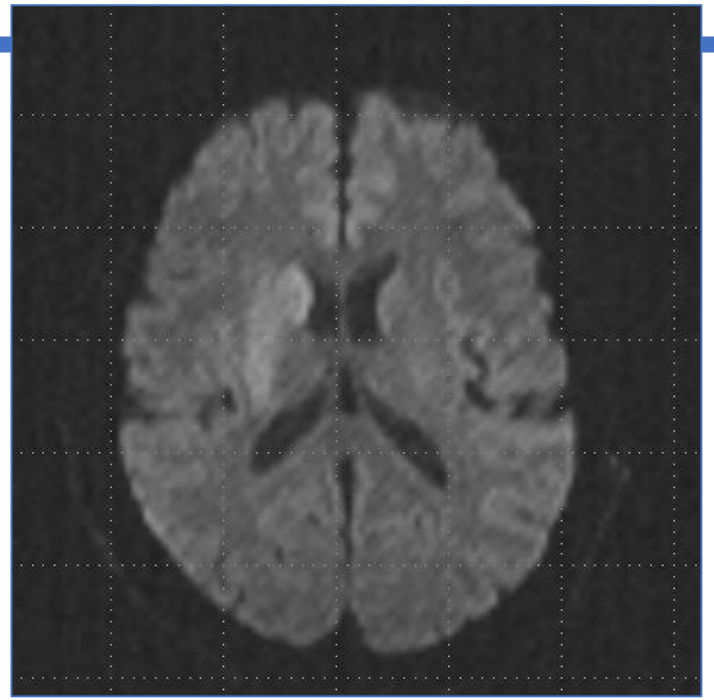
2/ Localiser le thrombus

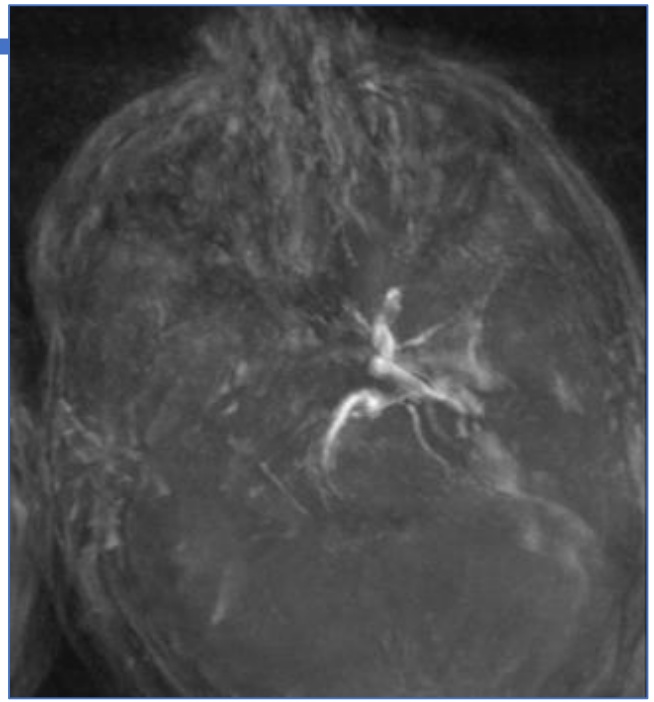


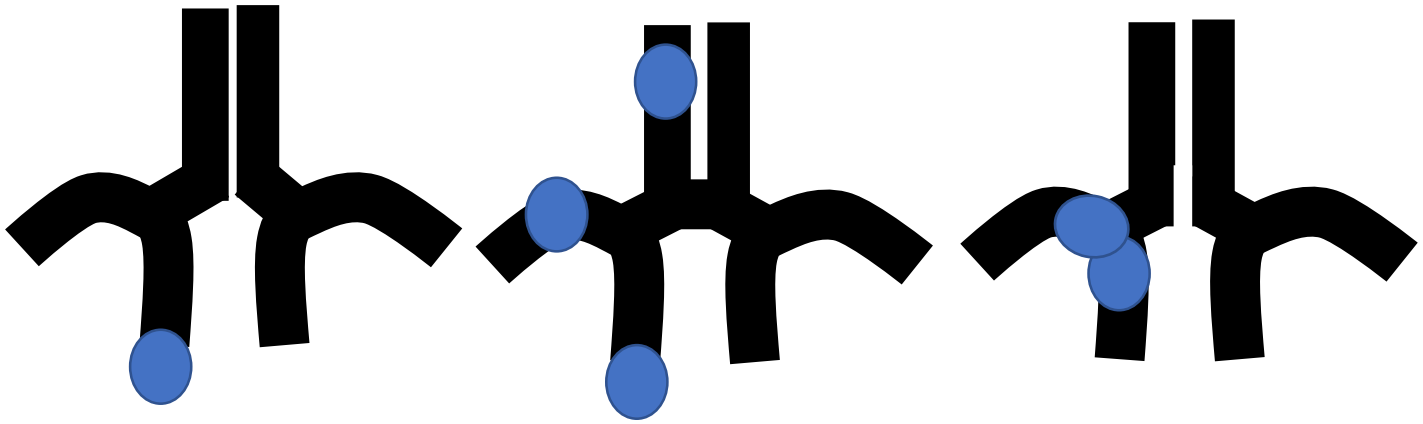


2/ Localiser le thrombus

- ACI cervicale
- ACI cervicale + ACM = « Tandem »
- TACI-ACM

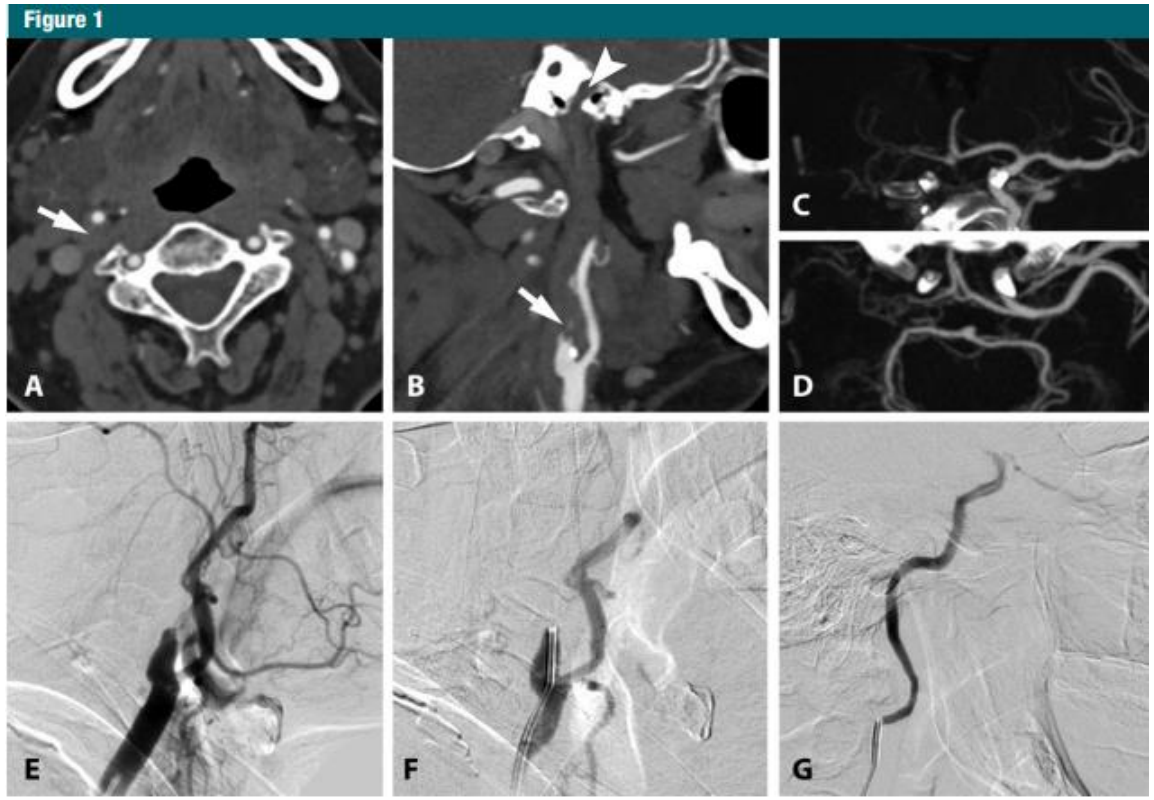


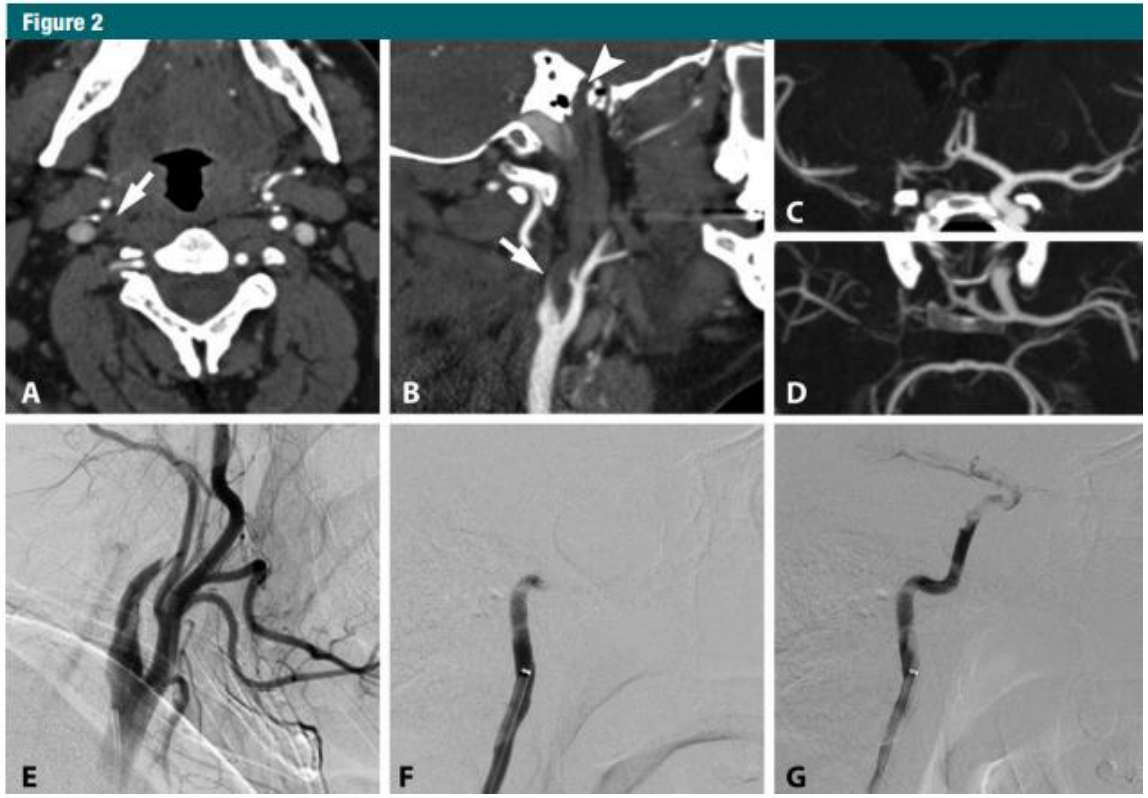




2/ Localiser le thrombus

- Imagerie vasculaire injectée

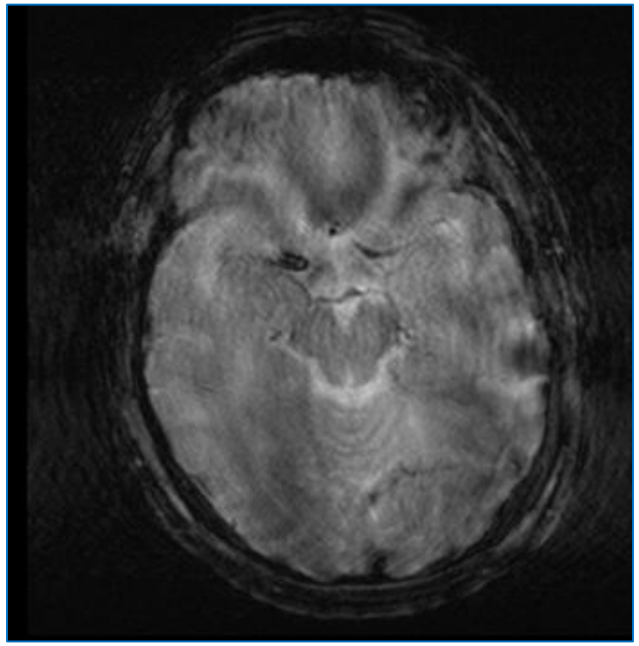




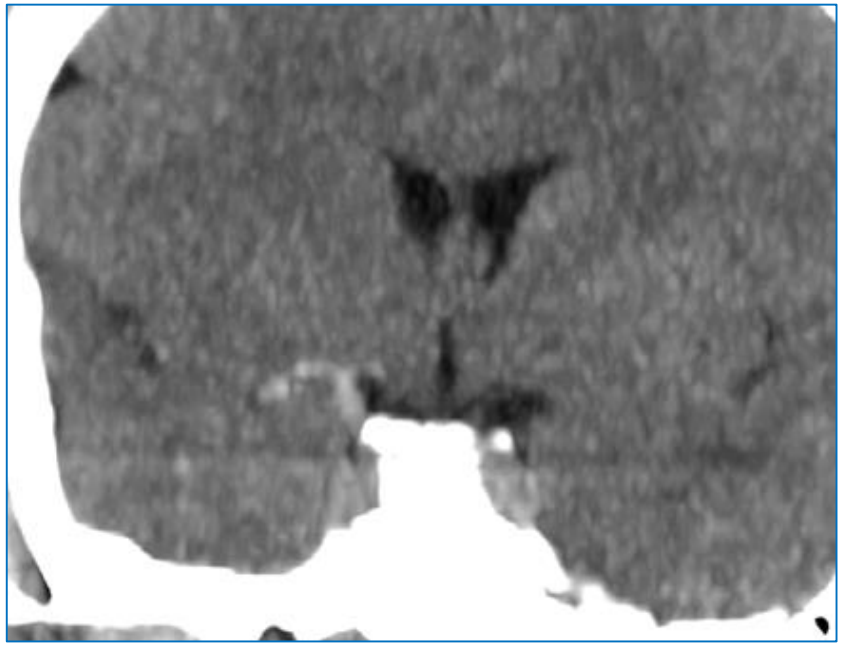
Diouf et al. Radiology 2018

2/ Localiser le thrombus

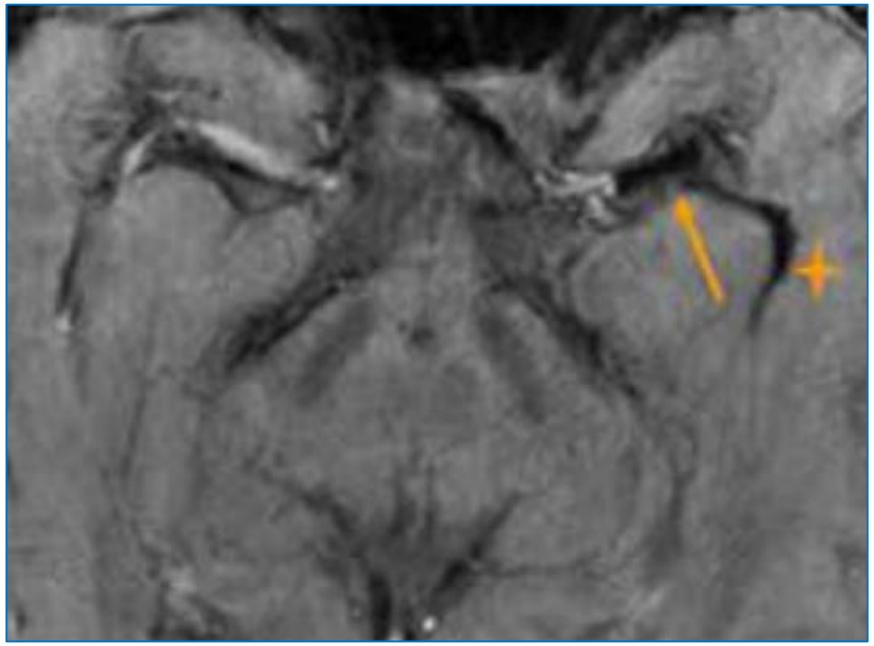
- Imagerie du thrombus



T2*



CT mip

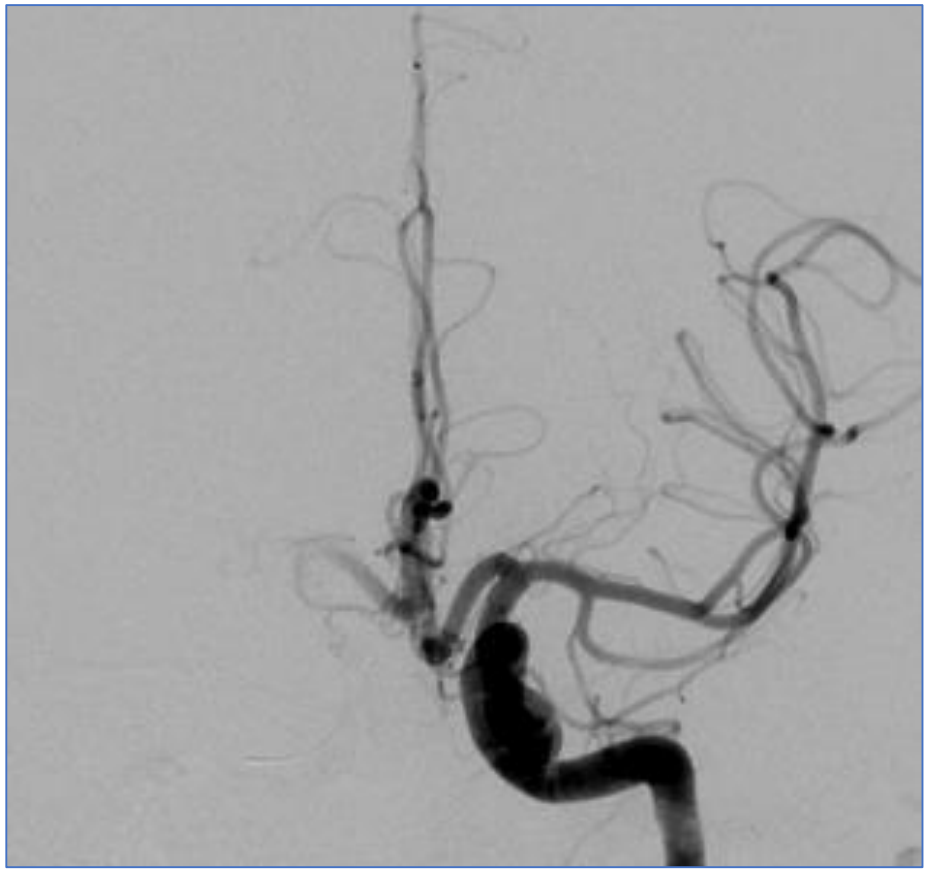


SWI

Allibert et al. Internal journal of Stroke 2014

2/ Localiser le thrombus

- Intérêt de l’évaluation complète du polygone (deuxième voie ?)



3/ Forme du thrombus

J Neurointerv Surg. 2018 Nov;10(11):1057-1062. doi: 10.1136/neurintsurg-2018-013793. Epub 2018 May 8.

Anterior cerebral artery embolism during thrombectomy increases disability and mortality

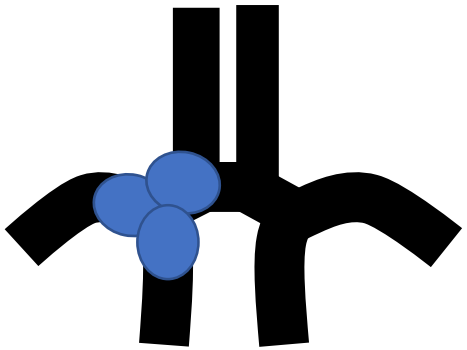
Vanessa Chalumeau [1], Raphaël Blanc [1], Hocine Redjem [1], Gabriele Ciccio [1], Stanislas Smajda [1], Jean-Philippe Desilles [1], Daniele Botta [1], Simon Escalard [1], William Boisseau [1], Benjamin Maïer [1], Julien Labreuche [2], Mickaël Obadia [3], Michel Piotin [1], Mikael Mazighi [1 4 5 6]

Affiliations + expand

PMID: 29739828 DOI: 10.1136/neurintsurg-2018-013793

- Forme du thrombus (I ou Y)
- Embole erratique dans A2/A3
  - Près de 20% des vrais T. vs. 5% ?
  - Grèvent le pronostic
  - Parfois déjà présent avant le geste
  - Problématique des emboles distaux

TICA-M1-A1



4/ Thrombectomie vs. Aspi vs. Combiné ?

Randomized Controlled Trial > JAMA. 2017 Aug 1;318(5):443-452. doi: 10.1001/jama.2017.9644.

Effect of Endovascular Contact Aspiration vs Stent Retriever on Revascularization in Patients With Acute Ischemic Stroke and Large Vessel Occlusion: The ASTER Randomized Clinical Trial

Bertrand Lapergue [1], Raphael Blanc [2], Benjamin Gory [3], Julien Labreuche [4], Alain Duhamel [4],

KT D'ASPIRATION > 0.70 ?

- Pas de porteur à ballonnet
- Moins bonne navigabilité ?

JAMA. 2021 Sep 28; 326(12): 1158–1169.
Published online 2021 Sep 28. doi: 10.1001/jama.2021.13827
PMCID: PMC8479584
PMID: 34581737

JAMA Network

Effect of Thrombectomy With Combined Contact Aspiration and Stent Retriever vs Stent Retriever Alone on Revascularization in Patients With Acute Ischemic Stroke and Large Vessel Occlusion

The ASTER2 Randomized Clinical Trial

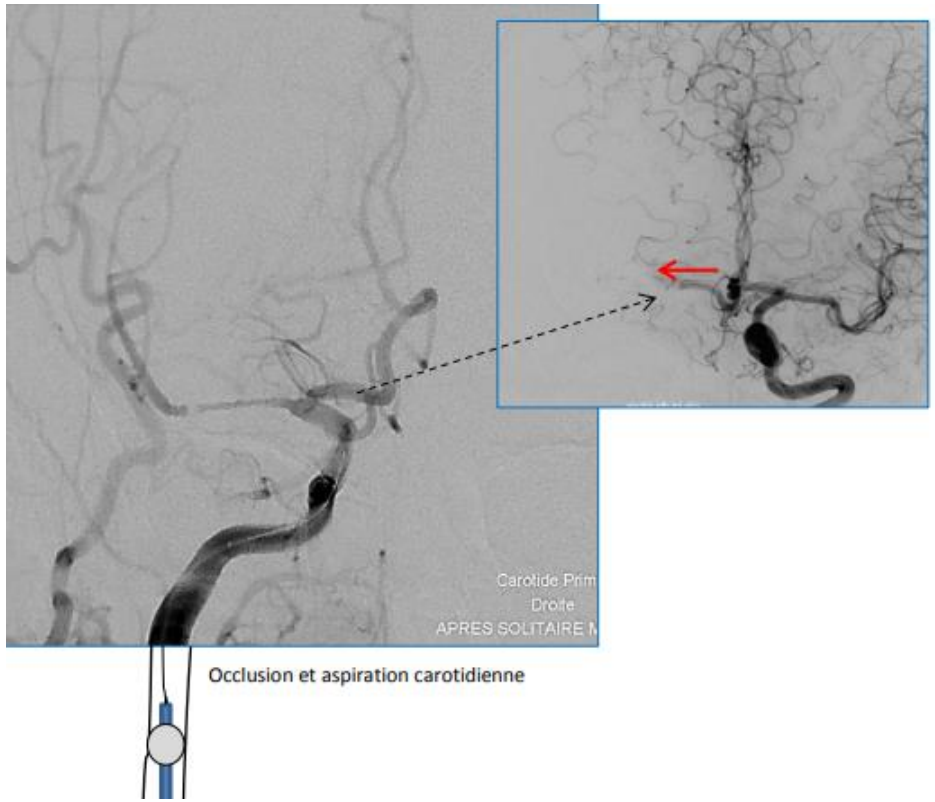
Bertrand Lapergue, MD, PhD,✉ [1] Raphaël Blanc, MD, [2] Vincent Costalat, MD, PhD, [3] Hubert Desal, MD, PhD, [4]
Susanna Saleme, MD, [5] Laurent Spelle, MD, PhD, [6] Gaultier Marnat, MD, [7] Eimad Shotar, MD, [8] François Eugene, MD, [9]

Clinical Trial > Stroke. 2024 Feb;55(2):376-384. doi: 10.1161/STROKEAHA.123.045227. Epub 2023 Dec 21.

Combined Technique for Internal Carotid Artery Terminus or Middle Cerebral Artery Occlusions in the ASTER2 Trial

Alessandro Sgreccia [1], Jean-Philippe Desilles [2], Vincent Costalat [3], Cyril Dargazanli [3], Romain Bourcier [4], Guillaume Tessier [4], Aymeric Rouchaud [5], Suzana Saleme [5], Laurent Spelle [6], Jildaz Caroff [6], Gaultier Marnat [7], Xavier Barreau [7], Frédéric Clarençon [8], Eimad Shotar [8], François Eugene [9], Emmanuel Houdart [10], Benjamin Gory [11], François Zhu [11], Julien Labreuche [12], Michel Piotin [2], Bertrand Lapergue [1], Arturo Consoli [1]; ASTER2 Investigators

5/ Le ballon cervical



Occlusion et aspiration carotidienne

KT ballon 9F et KT ASPI 0.70 ?

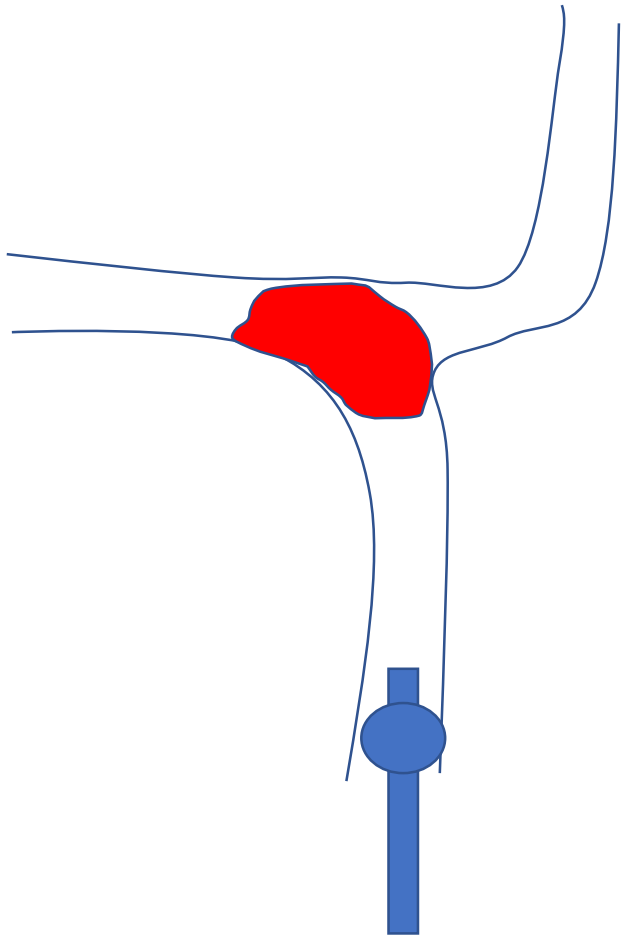
Balloon Guide Catheter is Not Superior to Conventional Guide Catheter when Stent Retriever and Contact Aspiration are Combined for Stroke Treatment

Romain Bourcier [1], Gaultier Marnat [2], Julien Labreuche [3], Hubert Desal [1], Federico Di Maria [4], Arturo Consoli [4], François Eugène [5], Benjamin Gory [6], Cyril Dargazanli [7], Raphaël Blanc [8], Bertrand Lapergue [9]

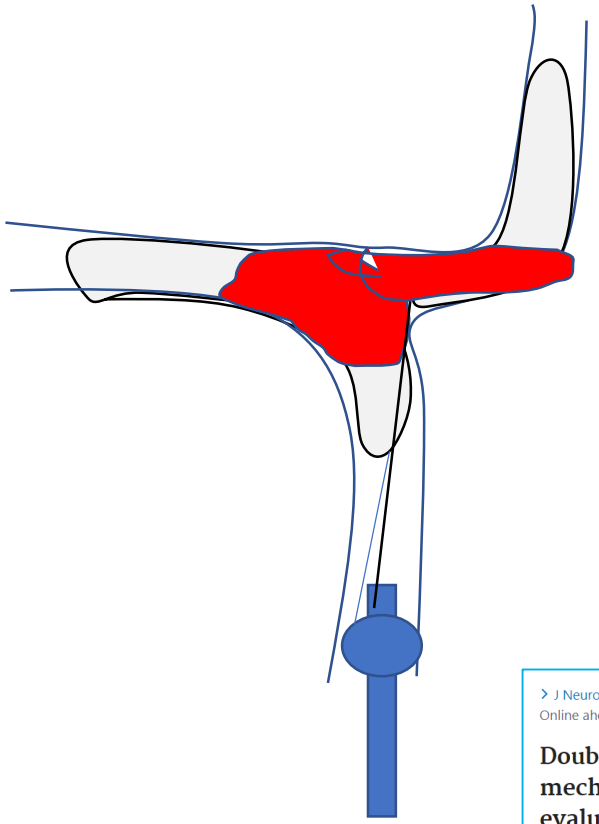
Affiliations + expand

PMID: 32717034 DOI: 10.1093/neuros/nyaa315

6/ La thromboaspiration proximale ?



7/ Le Y-stent retriever ?



› Clin Neuroradiol. 2022 Dec;32(4):971-977. doi: 10.1007/s00062-022-01161-2. Epub 2022 Apr 13

First-line Double Stentriever Thrombectomy for M1/TICA Occlusions : Initial Experiences

Pedro Vega [1], Eduardo Murias [2], Jose Maria Jimenez [2], Juan Chaviano [2], Jose Rodriguez [2], Sergio Calleja [3], Montserrat Delgado [3], Lorena Benavente [3], Maria Castañon [3], Josep Puig [4], Helena Cigarran [2], Faustino Arias [2], Rene Chapot [5]

Affiliations + expand

PMID: 35416489 P

Procedural and clinical characteristics

Characteristic	Overall (*N* = 39)
Treatment time[a] *(min)*	238.0 ± 94.6
Intervention time[b] *(min)*	36.0 ± 24.2
Device passes	1.5 ± 1.07
1	27 (69.2%)
2	7 (17.94%)
3	2 (5.12%)
Final TICI 2b/3	39 (100%)
Final TICI 2c/3	34 (87%)
Final TICI 3	32 (82%)
First-pass TICI 2b/3	27 (69%)
First-pass TICI 2c/3	27 (69%)
First-pass TICI 3	25 (64%)
Symptomatic intracerebral hemorrhage	3 (7.6%)
Procedural complications	
Contrast extravasation	2 (5.8%)
Embolism in new vascular territory	0 (0.0%)
NIHSS at discharge (N = 35)	5.9 ± 6.17
0	7 (20%)
1–4	12 (34.2%)

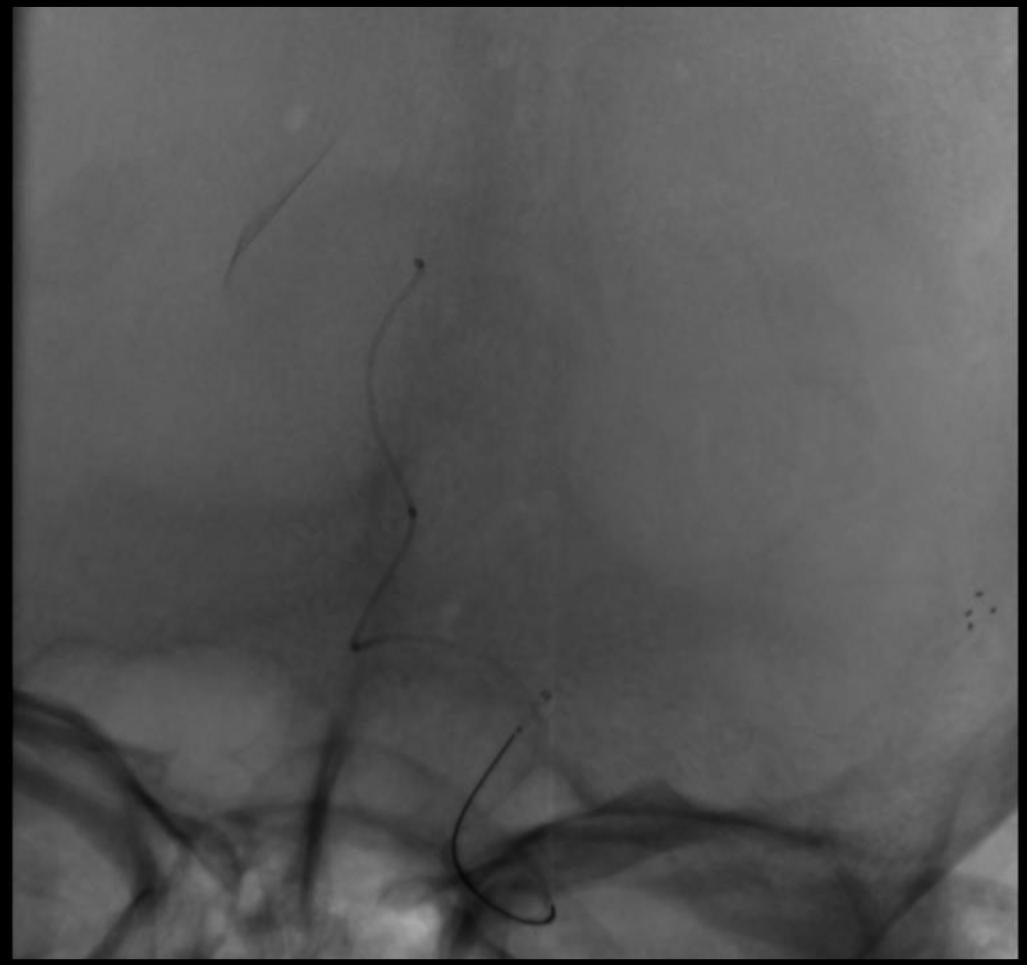
› J Neurointerv Surg. 2023 Jan 10;jnis-2022-019887. doi: 10.1136/jnis-2022-019887. Online ahead of print.

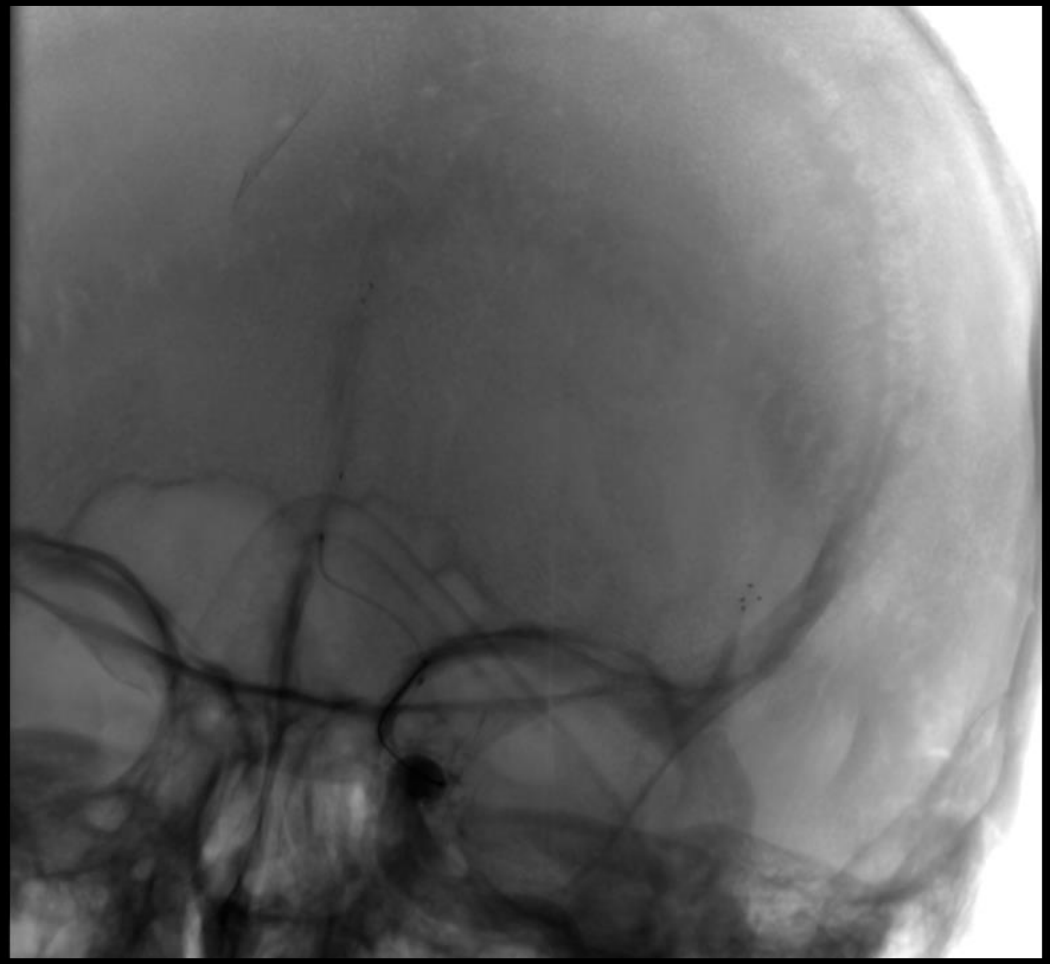
Double stent-retriever as the first-line approach in mechanical thrombectomy: a randomized in vitro evaluation

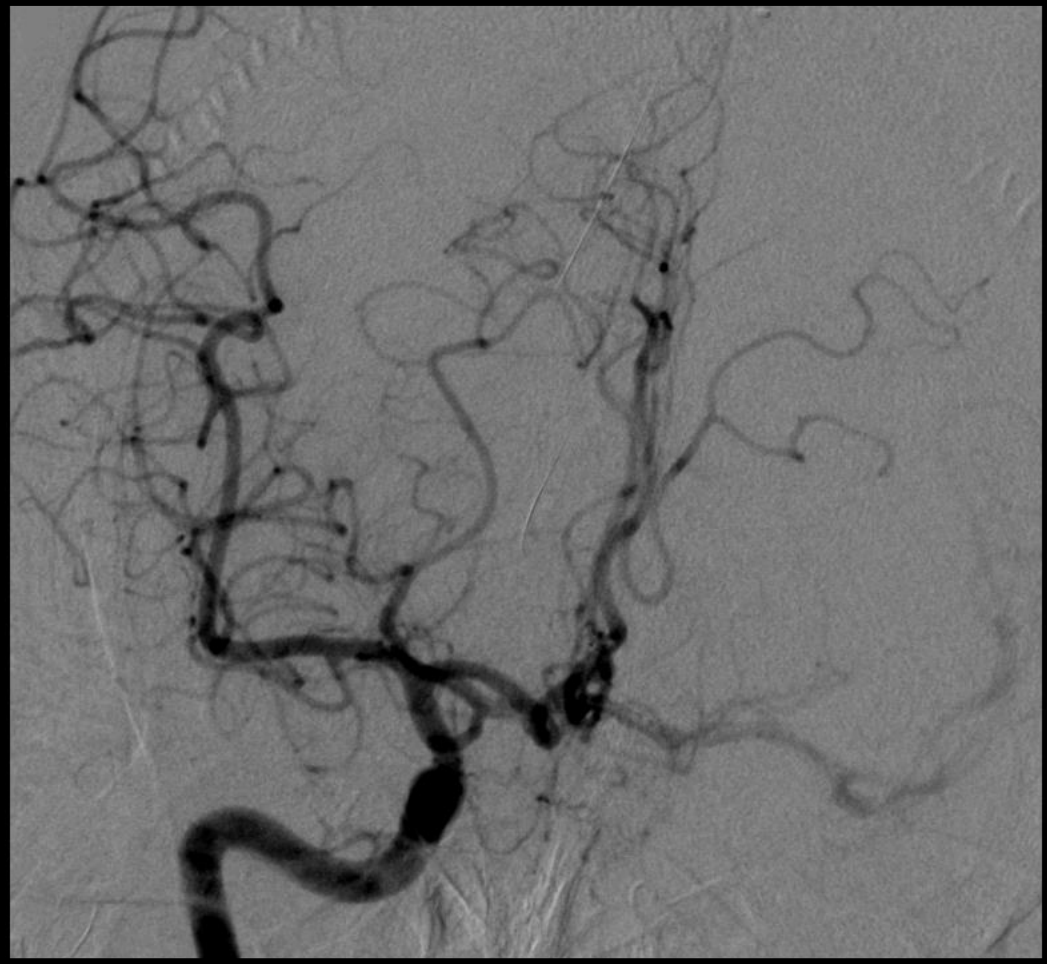
Jiahui Li [1], Riccardo Tiberi [1], Pere Canals [1], Daniel Vargas [2], Oscar Castaño [3 4], Marc Molina [1], Alejandro Tomasello [2], Marc Ribo [5]

Affiliations + expand

PMID: 36627194 DOI: 10.1136/jnis-2022-019887







Take-home message – occlusions TACI

- Exclure les patients avec un infarctus massif ?
- Bien analyser le polygone et la forme du thrombus
- Eliminer un thrombus A2-A3 initial
- La méthode combinée ?
- Le ballon cervical ?
- Le Y stenting ? Si A1

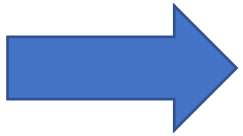
Occlusions distales

Objectifs :

- évaluer le bénéfice/risque
- Connaitre les spécificités de la prise en charge

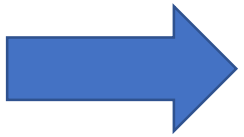
1/ Problématique des occlusions distales

Moins de bénéfice :
- territoire plus petit
- moins de pénombre à sauver



Pénombre +++

Plus de risque :
- Navigation plus dangereuse
- Lésions de traction plus fréquentes



Microcathéter soft
Guide soft
Stents retrievers soft
Thromboaspiration
Thrombolyse IV ou IA

1/ Problématique des occlusions distales

J Neuroradiol. 2022 Nov 24;S0150-9861(22)00172-9. doi: 10.1016/j.neurad.2022.11.007. Online ahead of print.

Complete recanalization predicts favorable outcome in patients with distal M2-M3 middle cerebral artery occlusions following endovascular thrombectomy

Mohamed Abdelrady [1], Imad Derraz [2], Cyril Dargazanli [2], Mourad Cheddad El Aouni [3], Pierre-Henri Lefevre [2], Federico Cagnazzo [2], Carlos Riquelme [2], Gregory Gascou [2], Caroline Arquizan [4], Isabelle Mourand [4], Douraied Ben Salem [3], Vincent Costalat [2], Jean-Christophe Gentric [3], Julien Ognard [3]

Affiliations + expand

PMID: 36436611 DOI: 10.1016/j.neurad.2022.11.007

J Neuroradiol. 2022 Jun;49(4):311-316. doi: 10.1016/j.neurad.2022.03.008. Epub 2022 Apr 6.

Safety and effectiveness of mechanical thrombectomy for primary isolated distal vessel occlusions: A monocentric retrospective comparative study

Mahmoud Elhorany [1], Charlotte Rosso [2], Eimad Shotar [3], Flore Baronnet-Chauvet [4], Kévin Premat [3], Stéphanie Lenck [3], Sophie Crozier [4], Céline Corcy [3], Laure Bottin [4], Ossama Yassin Mansour [5], Atika Talbi [3], El-Sayed Ali Tag El-Din [6], Wael Ahmed Fadel [6], Nader-Antoine Sourour [3], Sonia Alamowitch [4], Yves Samson [2], Frédéric Clarençon [7]

Affiliations + expand

PMID: 35397949 DOI: 10.1016/j.neurad.2022.03.008

ESSAI RANDOMISE DISCOUNT (F. CLARENCON)

2/ Thrombectomie distale

RED 43 (0.43-160) sur microKT ?
3 MAX (0.35-160) sur guide /HD ?
- ≤ 2/3 èmes segments ?
- Moins de risque ?
- Moins efficace ?

TIGER 13 sur HEADWAY DUO 167
- ≤ 4èmes segments ?
- Segment courbe ?

Stent retriever 4-20 sur KT 021
Mini stent retriever sur KT 017
Catch mini sur Headway duo 167
- ≤ 2/3/4 èmes segments ?
- Segments droits ?

Comparative Study › J Neurointerv Surg. 2020 Mar;12(3):279-282.
doi: 10.1136/neurintsurg-2019-014990. Epub 2019 Jun 26.

A comparative analysis of 3MAX aspiration versus 3 mm Trevo Retriever for distal occlusion thrombectomy in acute stroke

Diogo C Haussen [1], Brendan Eby, Alhamza R Al-Bayati [2], Jonathan A Grossberg [3], Gabriel Martins Rodrigues, Michael R Frankel [4 5], Raul G Nogueira

Affiliations + expand
PMID: 31243066 DOI: 10.1136/neurintsurg-2019-014990

Review › Interv Neuroradiol. 2023 Jan 18;15910199231152510.
doi: 10.1177/15910199231152510. Online ahead of print.

Comparing Tigertriever 13 to other thrombectomy devices for distal medium vessel occlusion: A systematic review and meta-analysis

Gautam Adusumilli [1], Hassan Kobeissi [2], Sherief Ghozy [2], Kevin M Kallmes [3], Waleed Brinjikji [2], David F Kallmes [2], Jeremy J Heit [4]

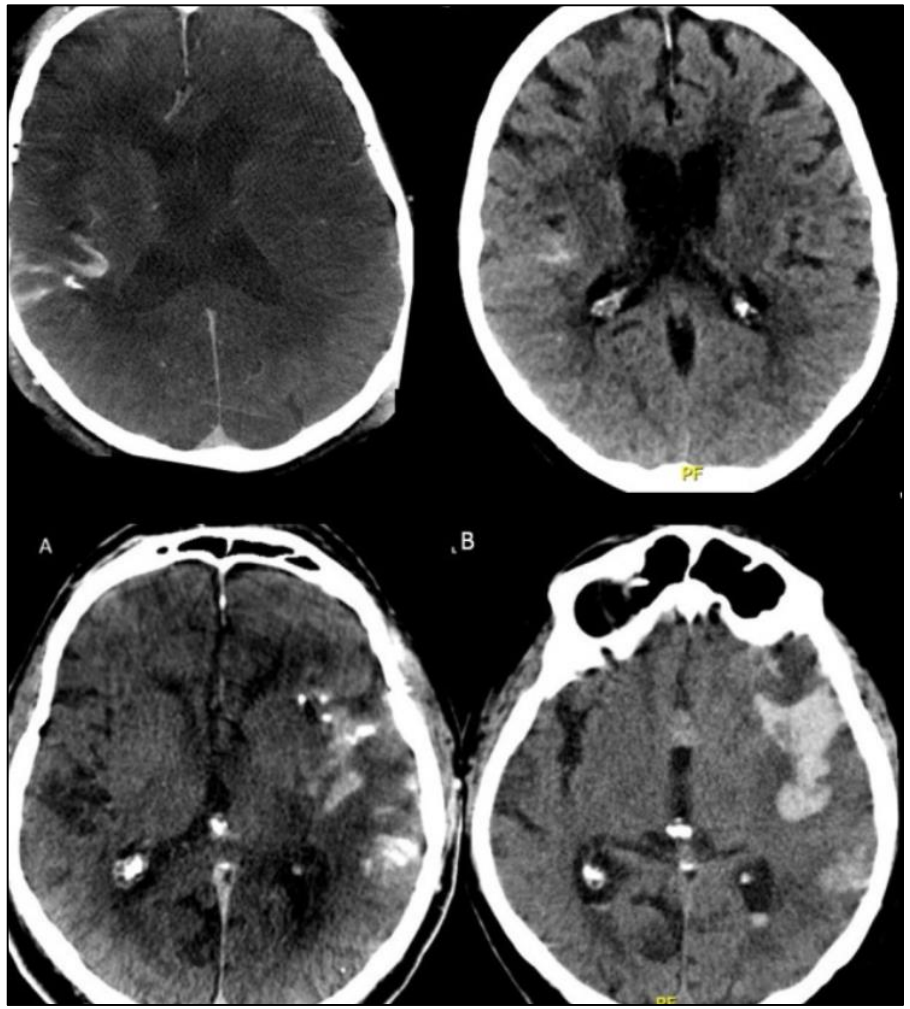
Affiliations + expand
PMID: 36655307 DOI: 10.1177/15910199231152510

› J Neurointerv Surg. 2021 Dec;13(12):1067-1072. doi: 10.1136/neurintsurg-2020-017035. Epub 2021 Jan 19.

Effectiveness of very low profile thrombectomy device in primary distal medium vessel occlusion, as rescue therapy after incomplete proximal recanalization or following iatrogenic thromboembolic events

Reza Rikhtegar [# 1], Pascal John Mosimann [# 1], Ralph Weber [2], Marta Wallocha [1], Elif Yamac [1], Mohammad Mirza-Aghazadeh-Attari [1], René Chapot [3]

Affiliations + expand
PMID: 33468609 PMCID: PMC8606433 DOI: 10.1136/neurintsurg-2020-017035
Free PMC article

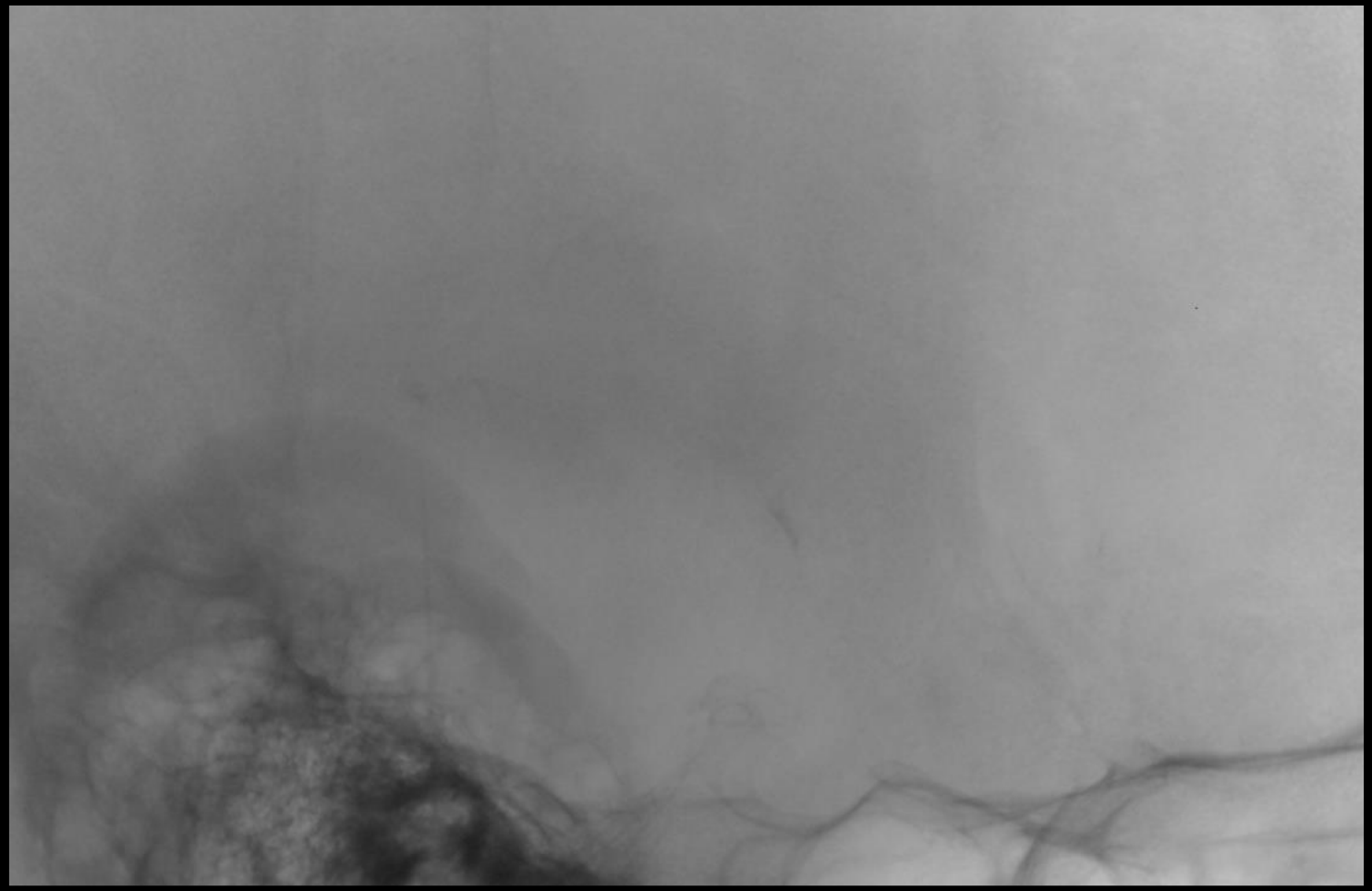


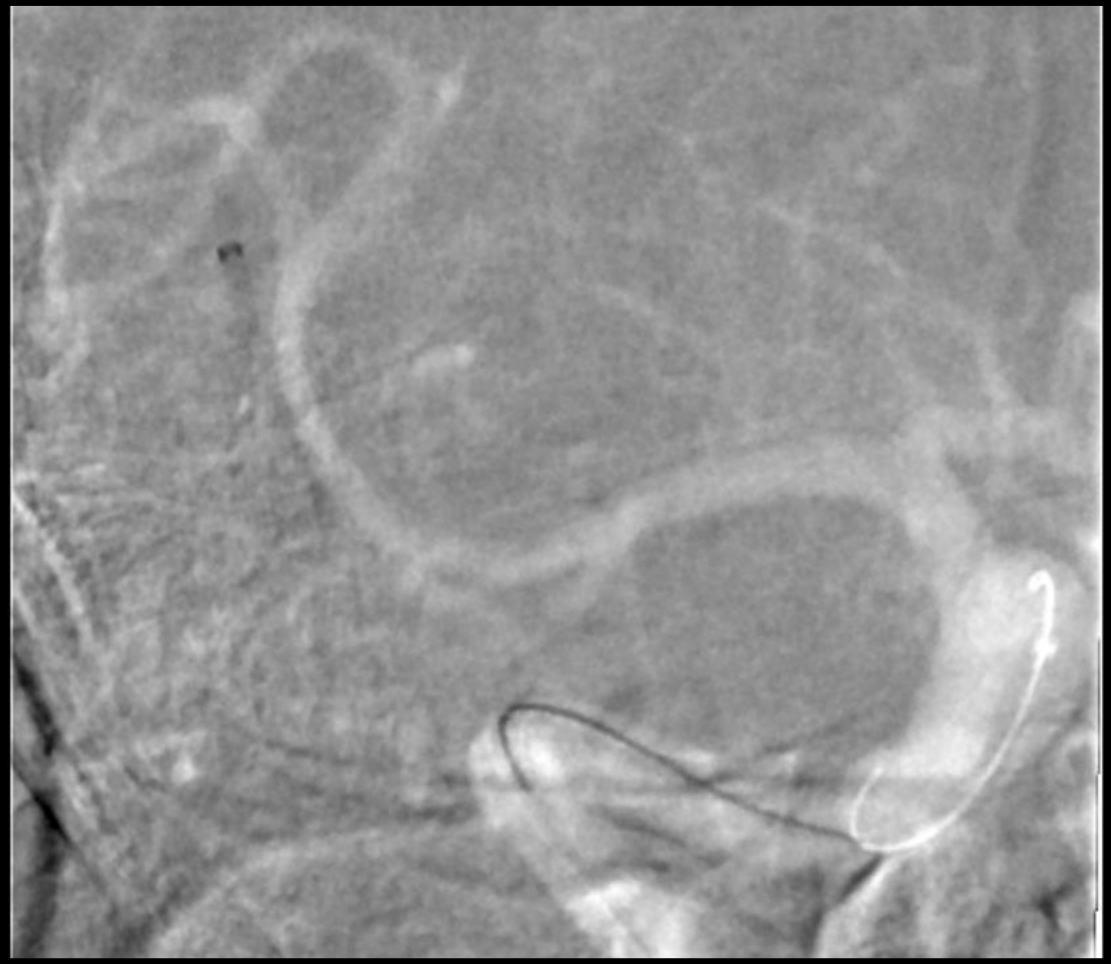
	0	1	2A	2B	2C	3	Total
Primary isolated DMVO, n (%)	7 (20.6)	0 (0.0)	3 (8.8)	4 (11.8)	7 (20.6)	13 (38.2)	34
Secondary DMVO after MT in proximal PLVO, n (%)	10 (14.1)	1 (1.4)	8 (11.3)	10 (14.1)	16 (22.5)	26 (36.6)	71
DMVO related to secondary causes, n (%)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (10.0)	9 (90.0)	10

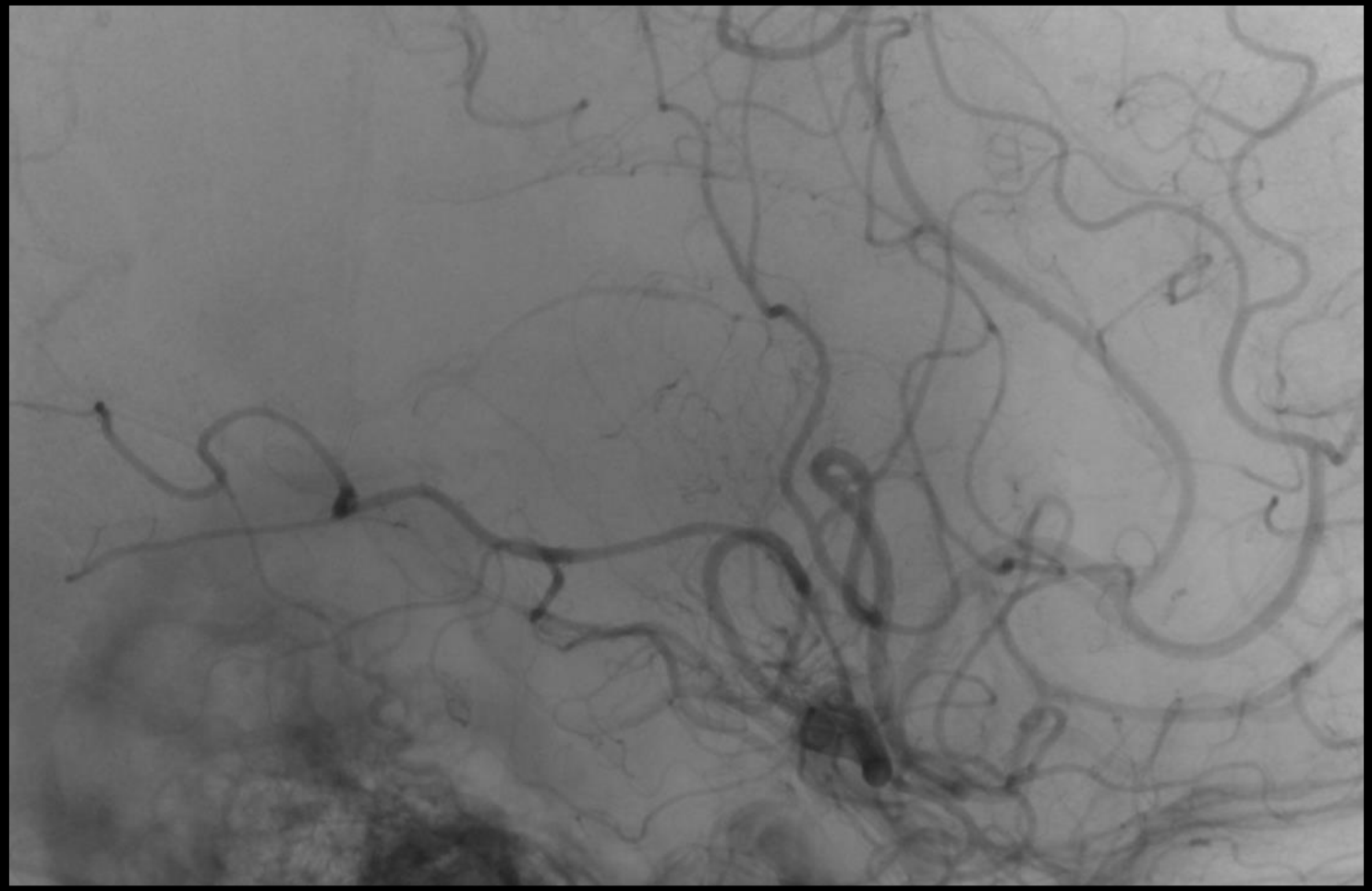
Active SAH caused by guidewire perforation or after a thrombectomy attempt was angiographically identified during the MT procedure in seven (6.7%) of the 105 patients with AIS. Three ceased spontaneously within 10 min after systolic blood pressure reduction below 80 mm Hg. Two needed temporary coiling, while the remaining two required definitive coil occlusion.

Subarachnoid contrast medium extravasation after DMVO MT was observed on immediate postoperative cone-beam CT (CBCT) in 47 (44.7%) of the 105 patients with AIS (groups 1 and 2). No bleeding occurred in elective patients with thromboembolic events treated by distal thrombectomy (group 3).

Symptomatic and asymptomatic intracranial hemorrhage on control brain imaging was observed in 8 (7.6%) and 19 (18.1%) of the 105 patients with AIS, respectively, independently of prior use of IVT (p=0.9).







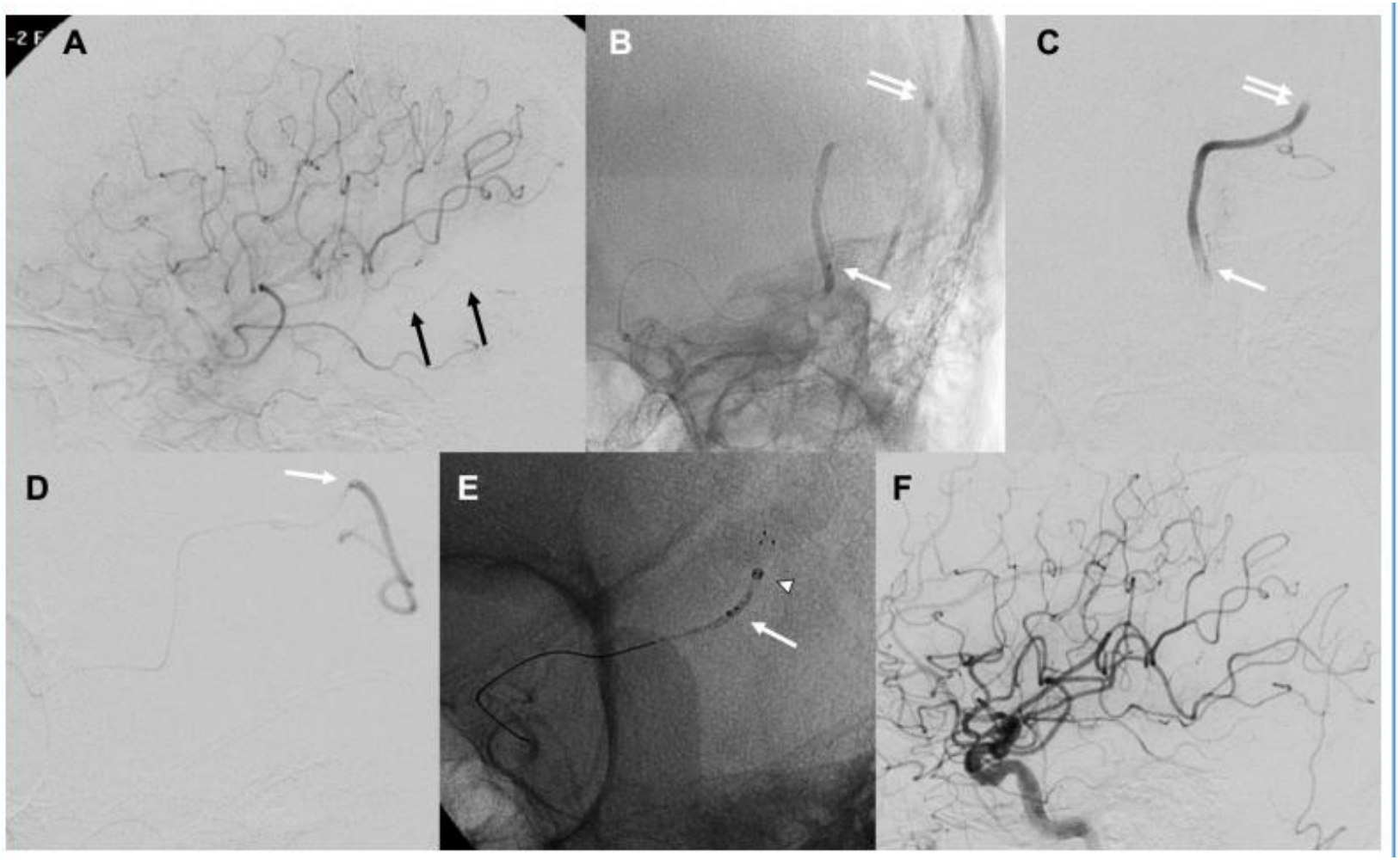
3/ Méthode combinée ?

TECHNICAL NOTE

Check for updates

Distal Thrombectomy with Headway Duo 167 cm and Catchview Mini Stent Retriever: A Technical Note

Lorenzo Piergallini[1,2], Amedeo Cervo[2], Antonio Macera[2], Mariangela Piano[2], Guglielmo Pero[2]



Take-home message – occlusion distale

- Occlusion primaire :

- Faire une perfusion
- Exclure les patients avec un NIHSS faible, surtout si TA normale
- Anesthésie générale ++

- Occlusion secondaire :

- Embole erratique ACA +++
- Pas sous double anti agrégation

3Max moins dangereux ? Mais moins efficace ?

Stent retriever distal / Tiger 13 selon courbe

Combiné sur HEADWAY DUO 167 ++

Bien repérer la localisation du thrombus +++

Adapter la traction