Thrombectomie de l'AVC:
récommendations actuelles et évolutions futures

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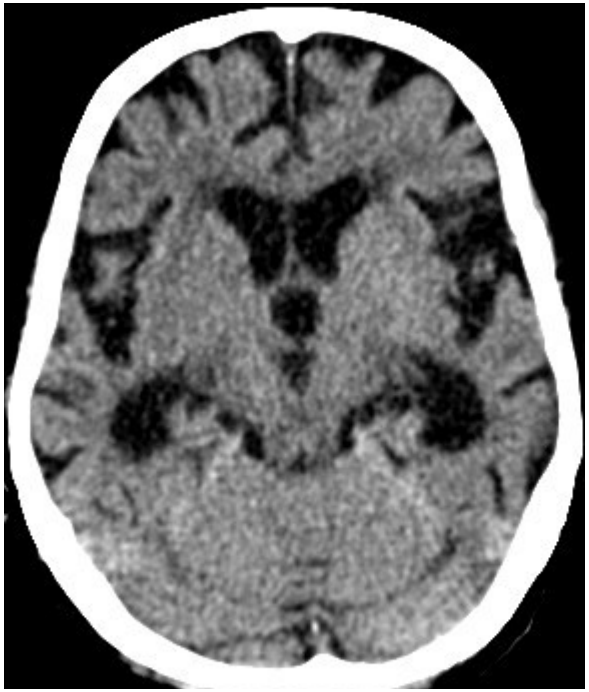
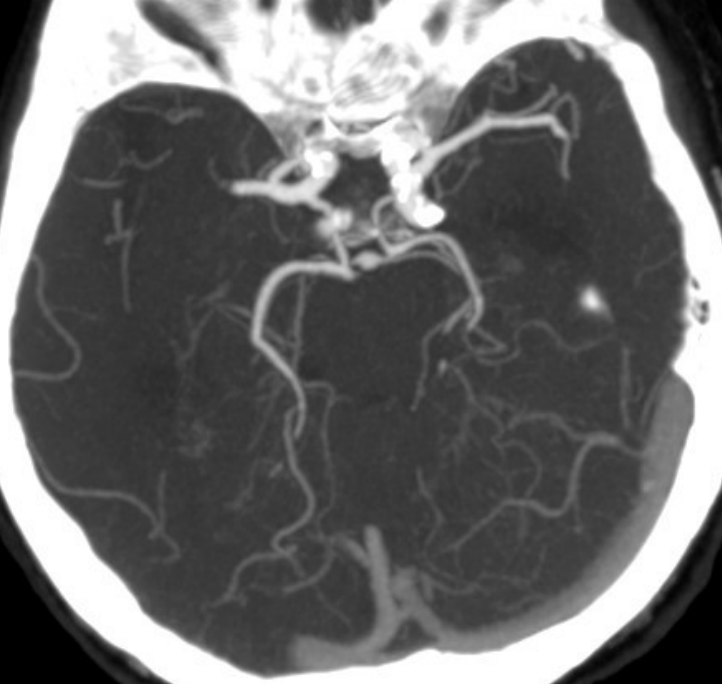
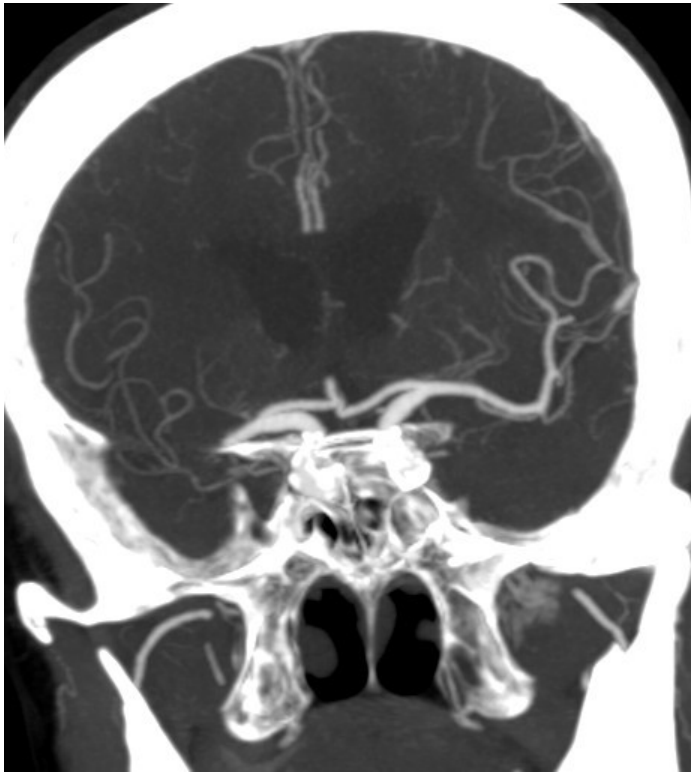
Reperfusion cérébrale

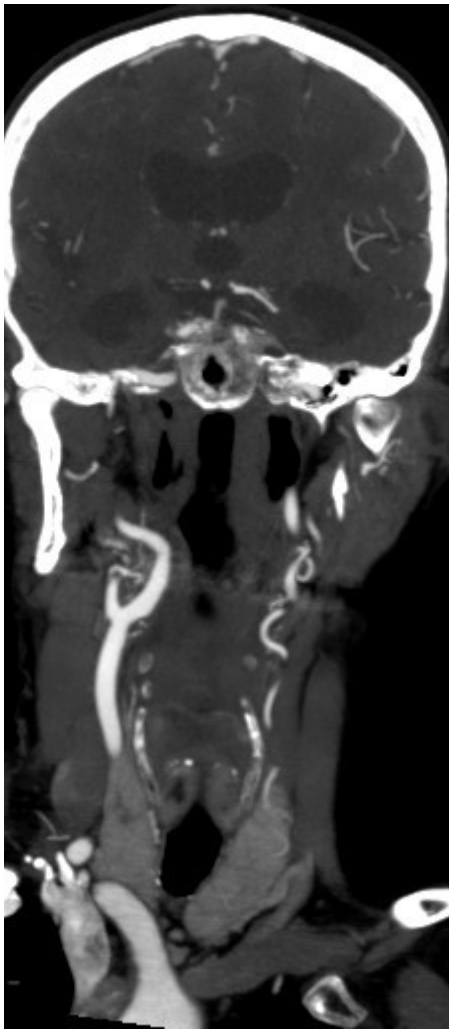
Qu'est ce que la thrombectomie mécanique ?

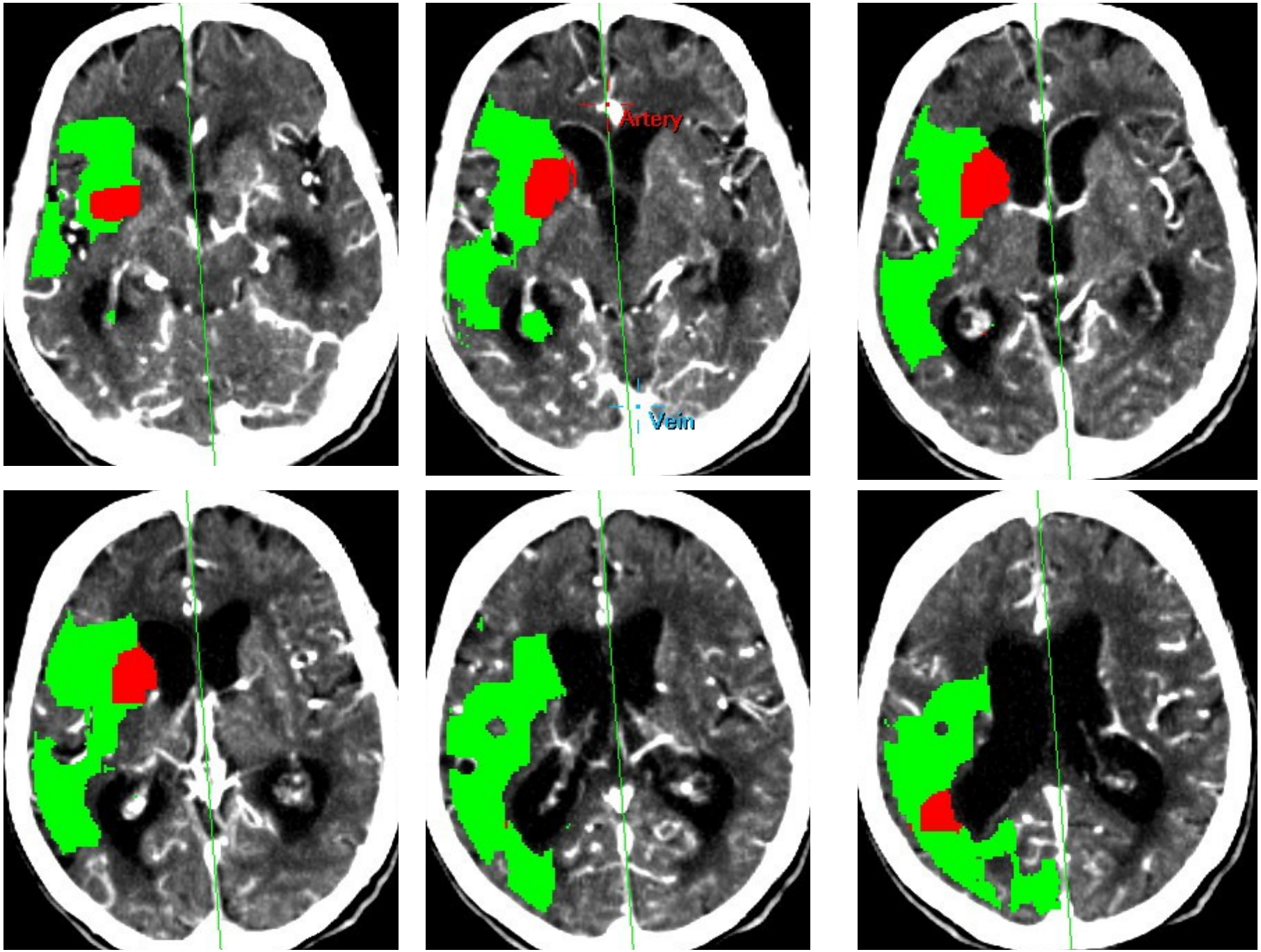
- Patiente de 86 ans, autonome à domicile, hémiplégie gauche brutale à 8h00. NIHSS 13 à l'arrivée.
- Scanner cérébral à 10h47.





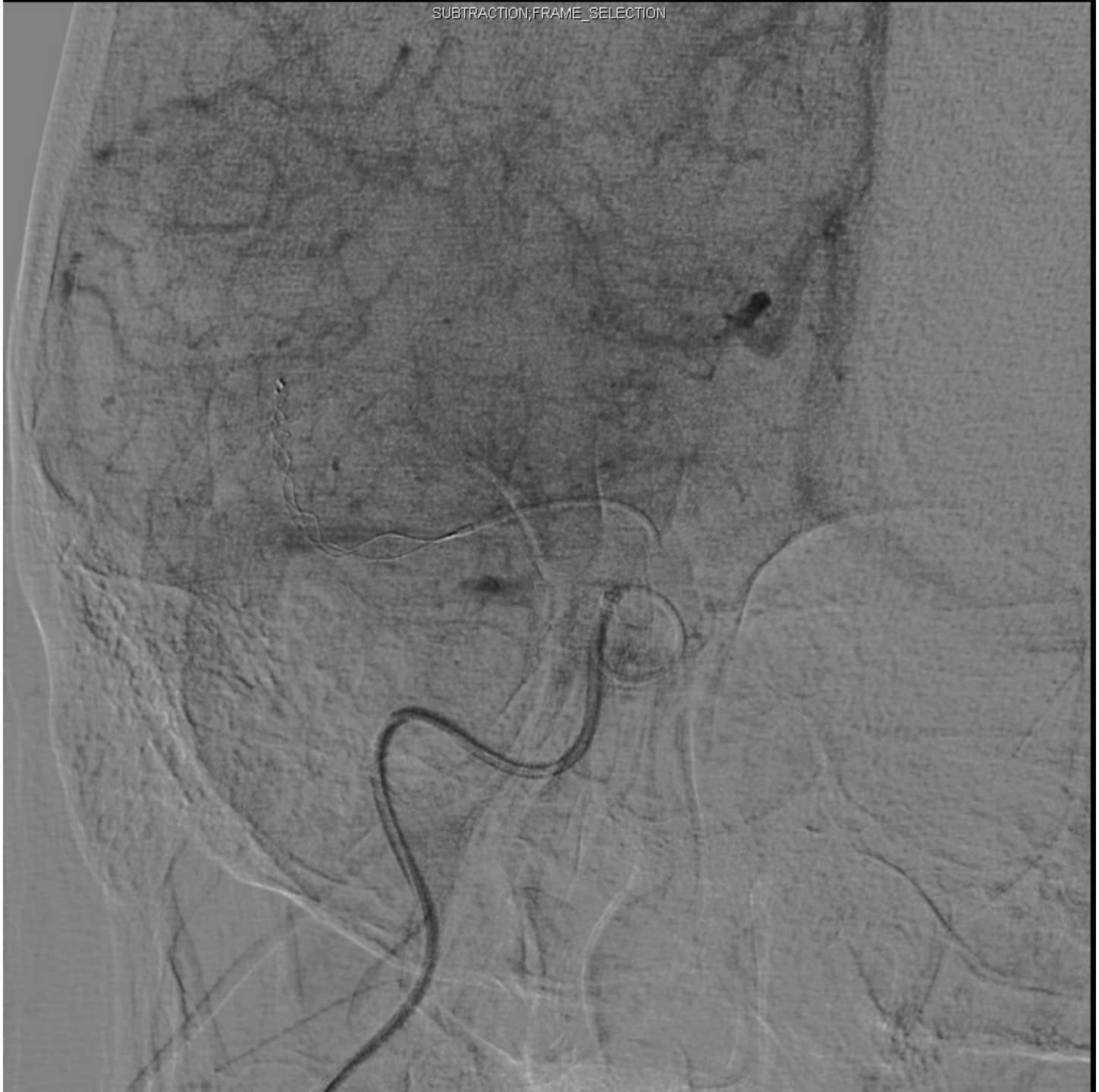





Artery
Vein

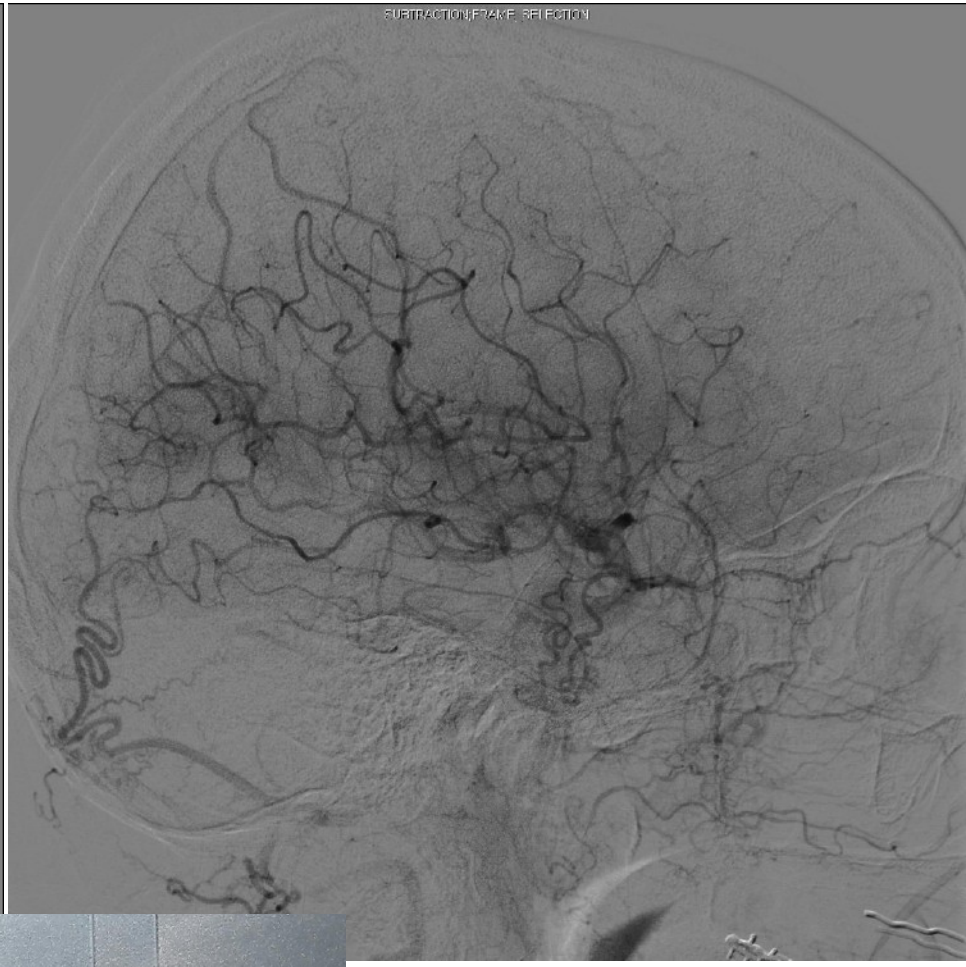
Thrombolyse IV à 11h10
Entrée en salle à 11h25
Ponction fémorale à 11h40

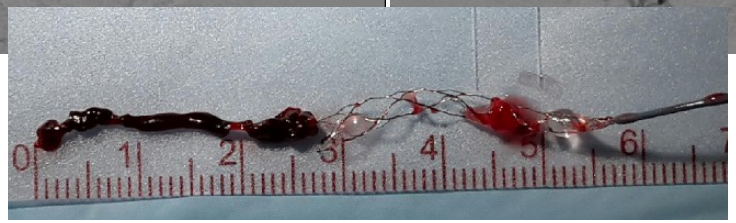

SUBTRACTION;FRAME_SELECTION

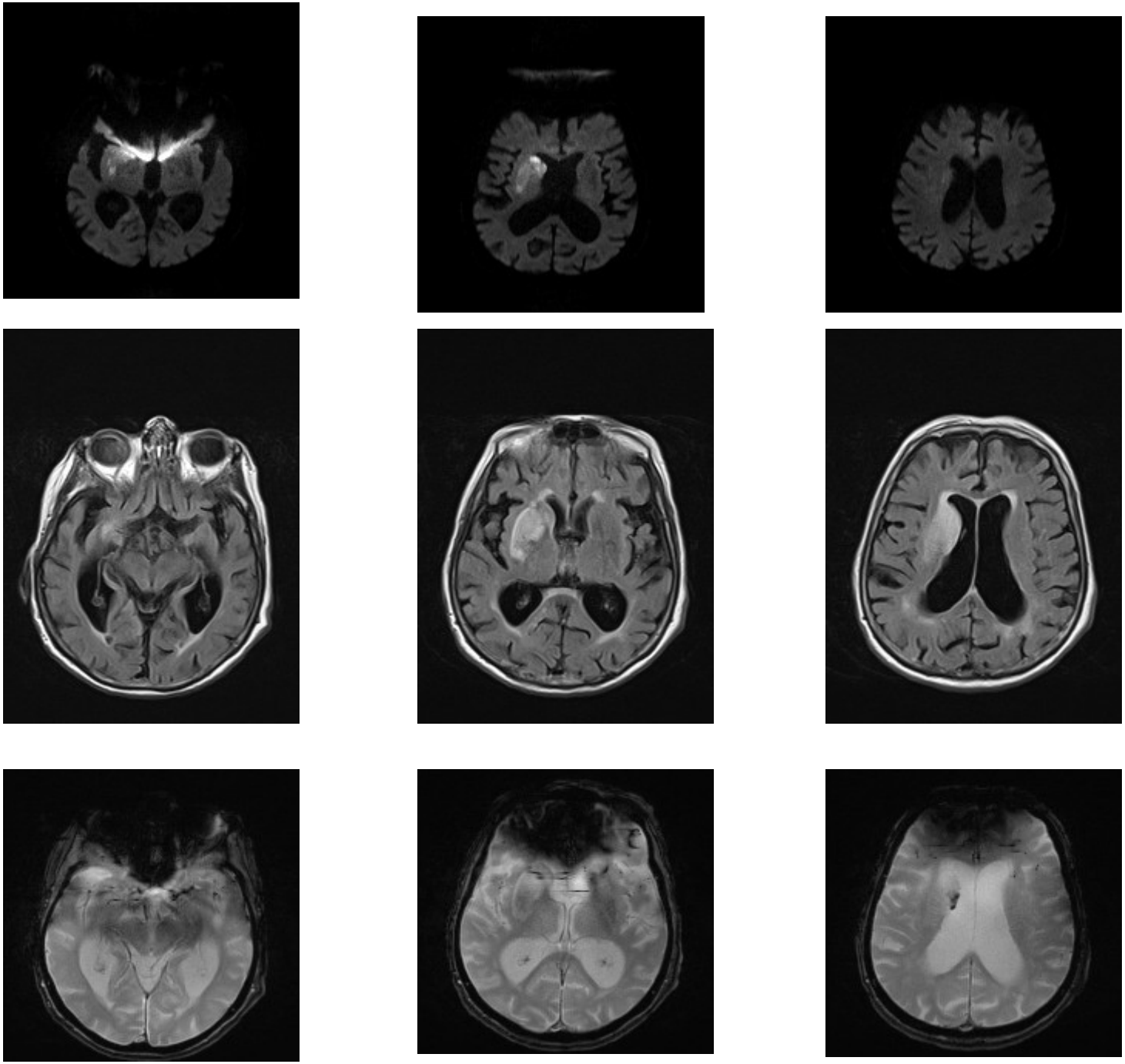


11h50

Recanalisation TICI 3 à 11h53
NIHSS 9 post-thy







IRM à J1
NIHSS 0 à J5
mRS 1 à M3

Traitement de l'infarctus cérébral

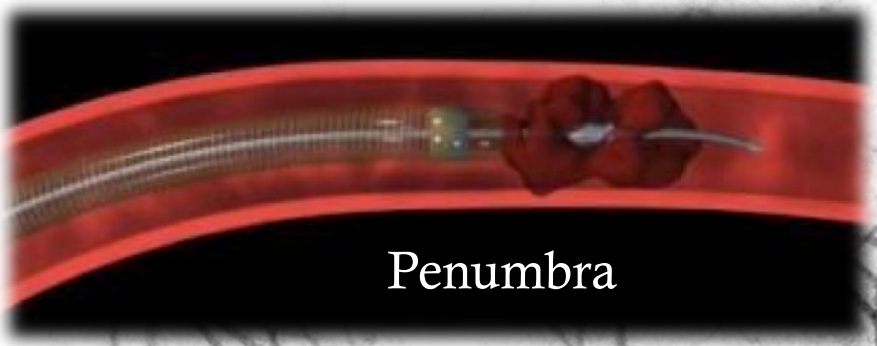
Les 3 recommendations

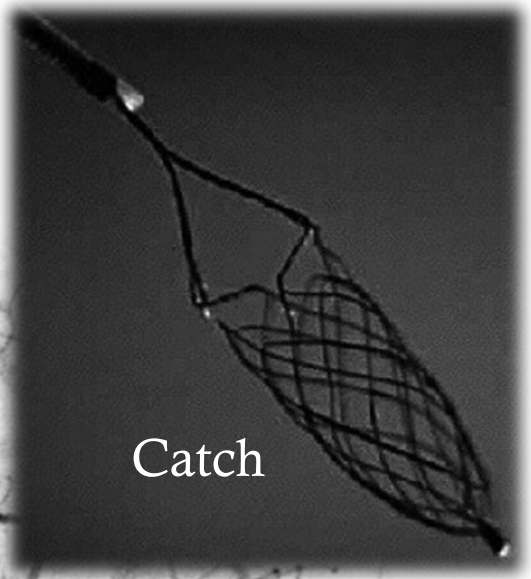
① Unité Neuro-Vasculaire

② Thrombolyse IV (rt-PA)

③ Thrombectomie

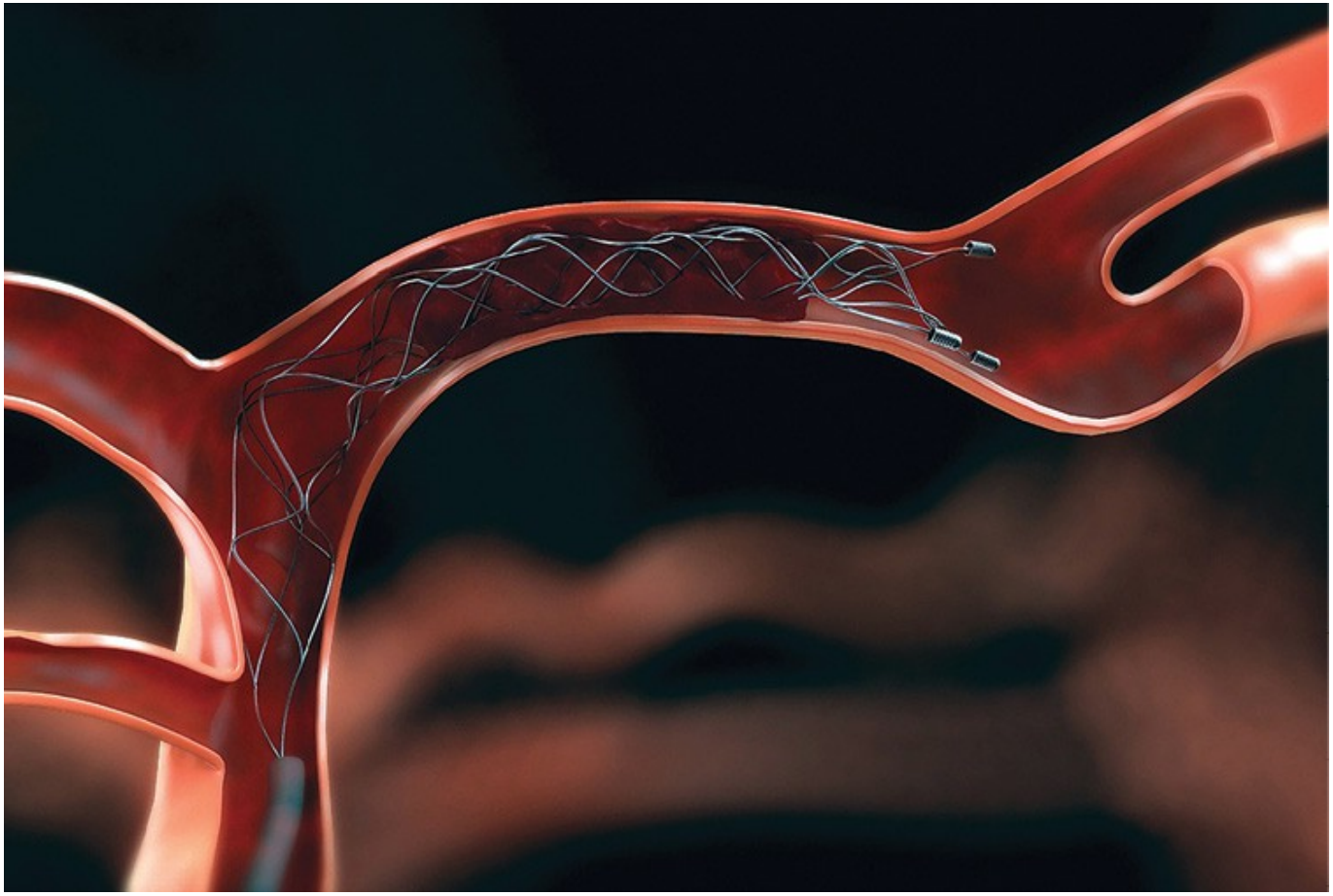
La thrombectomie





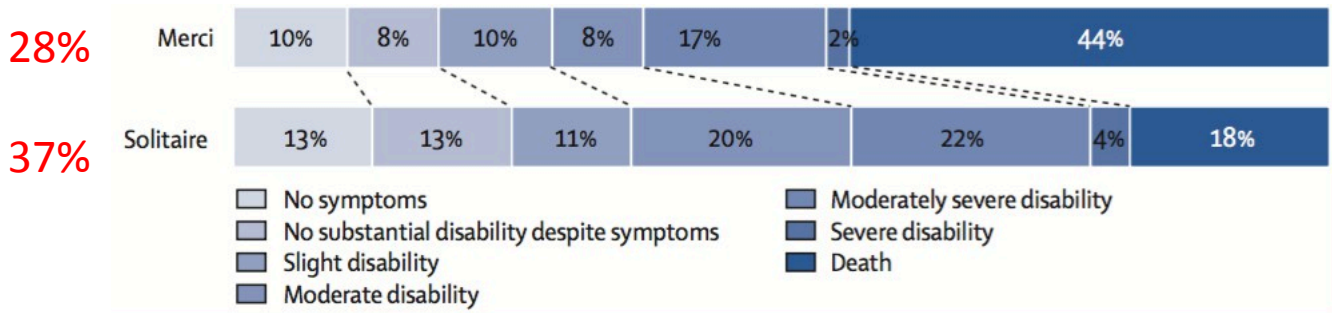
Stent retriever thrombectomy for acute ischemic stroke: Indications, results and management in 2015

B. Gory[a,b,c,*], R. Riva[a], P.E. Labeyrie[a,d], F. Turjman[a,b,c]



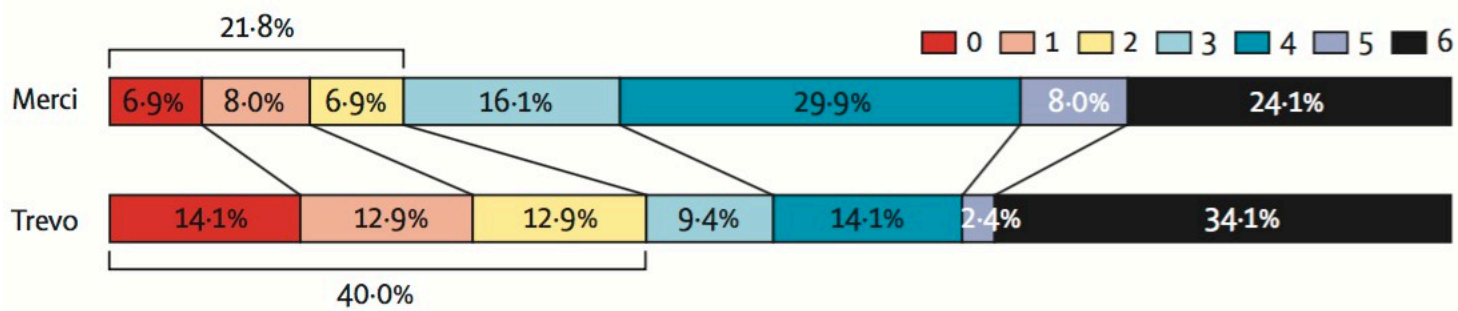
Solitaire flow restoration device versus the Merci Retriever in patients with acute ischaemic stroke (SWIFT): a randomised, parallel-group, non-inferiority trial

Jeffrey L Saver, Reza Jahan, Elad I Levy, Tudor G Jovin, Blaise Baxter, Raul G Nogueira, Wayne Clark, Ronald Budzik, Osama O Zaidat, for the SWIFT Trialists

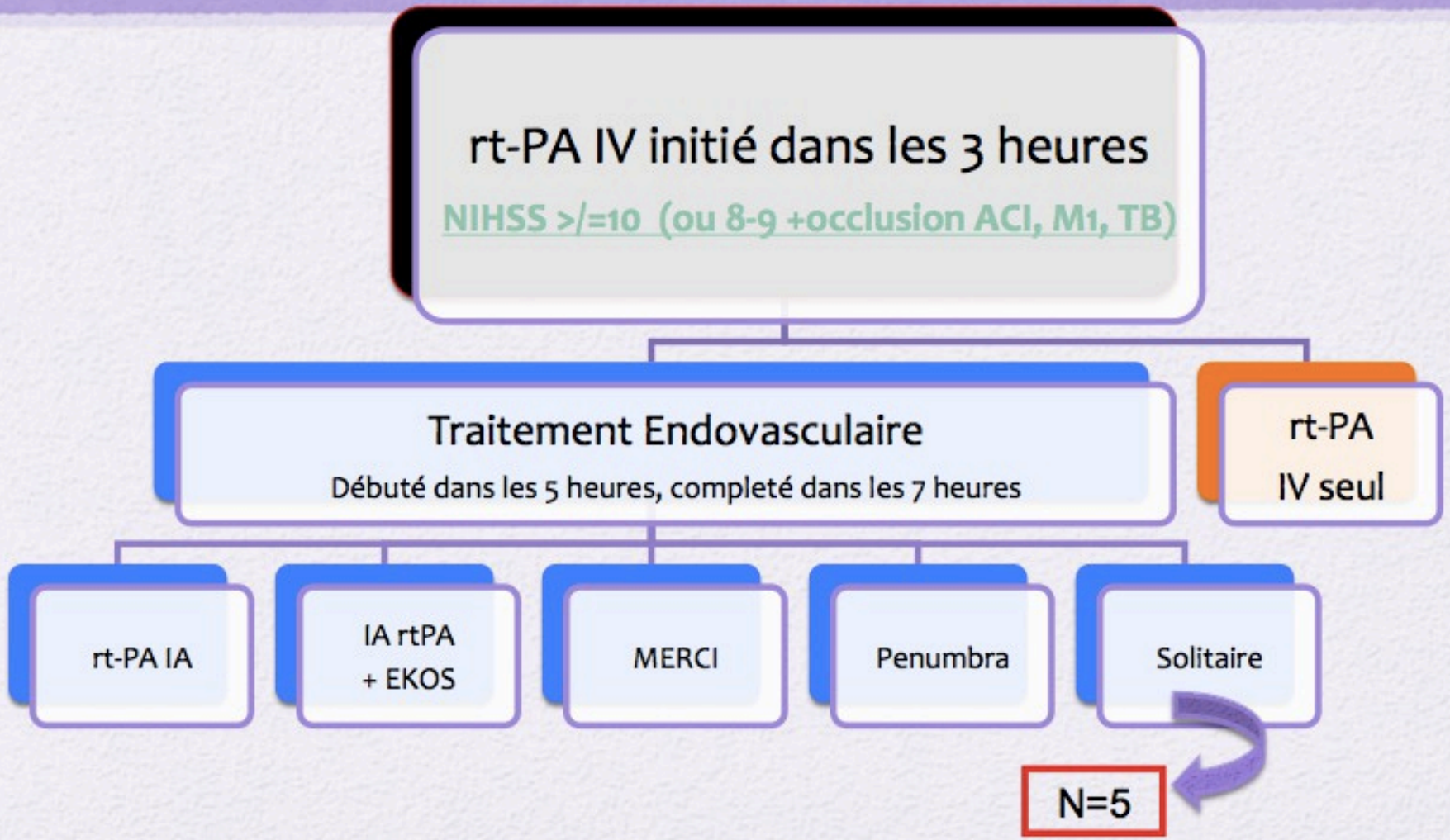


Trevo versus Merci retrievers for thrombectomy revascularisation of large vessel occlusions in acute ischaemic stroke (TREVO 2): a randomised trial

Raul G Nogueira, Helmi L Lutsep, Rishi Gupta, Tudor G Jovin, Gregory W Albers, Gary A Walker, David S Liebeskind, Wade S Smith, for the TREVO 2 Trialists



IMS III



Broderick et al NEJM 2013

Résultat principal de IMS III

	Endovasculaire	rt-PA IV
mRS 0-2 (%)	177 (**40.8%**)	86 (**38.7%**)

NIHSS <\/=19	Endovasc	rt-PA IV
mRS 0-2 (%)	146 (48.3%)	74 (49.3%)

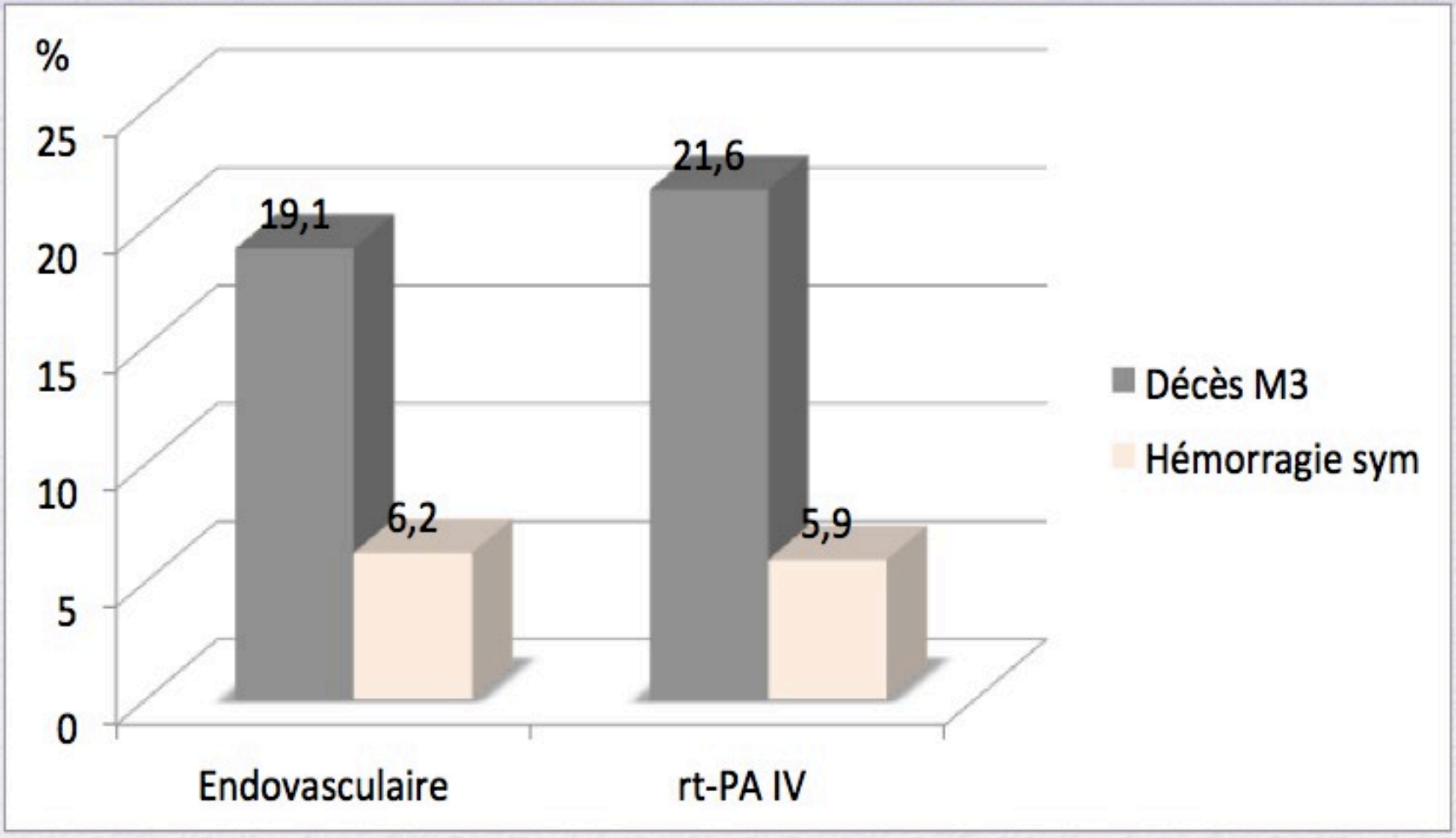
NIHSS >/=20	Endovasc	rt-PA IV
mRS 0-2 (%)	31 (23.5%)	12 (16.7%)

- Temps de recanalisation: 325 minutes (180-418)

Arrêt pour futilité après inclusion 656 patients

Broderick et al NEJM 2013

Tolérance



Broderick et al NEJM 2013

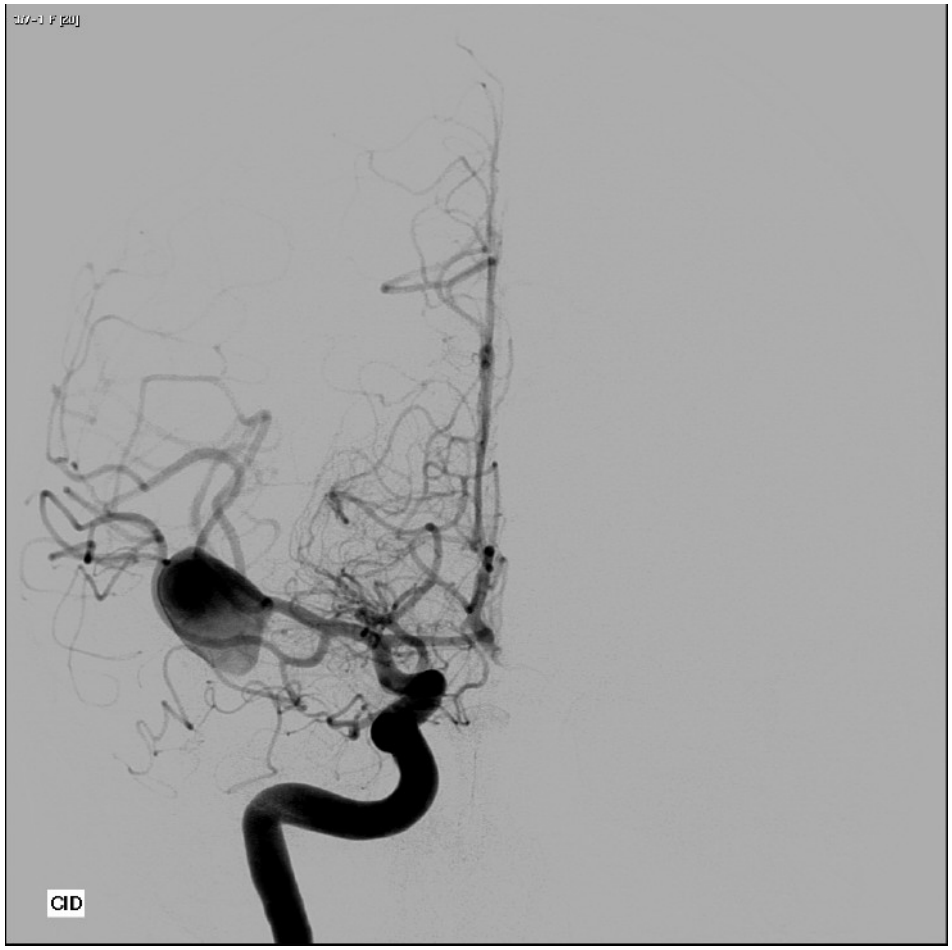
Recanalization and Clinical Outcome of Occlusion Sites at Baseline CT Angiography in the Interventional Management of Stroke III Trial[1]

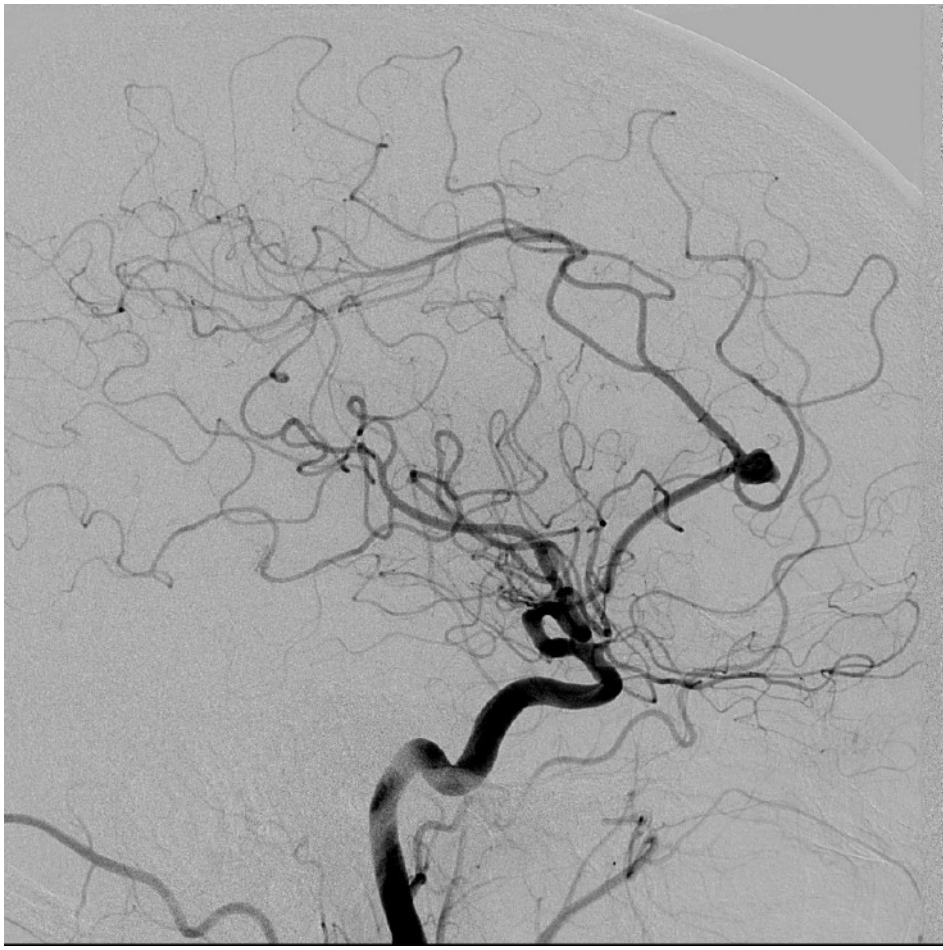
656 patients inclus dans IMS III:
306 angio-scanner vs 350 scanner seul

Significant differences were identified between treatment arms for 24-hour recanalization in proximal occlusions; carotid T- or L-type and tandem ICA and M1 occlusions showed greater recanalization and a trend toward better outcome with endovascular treatment. Vascular imaging should be mandated in future endovascular trials to identify such occlusions.

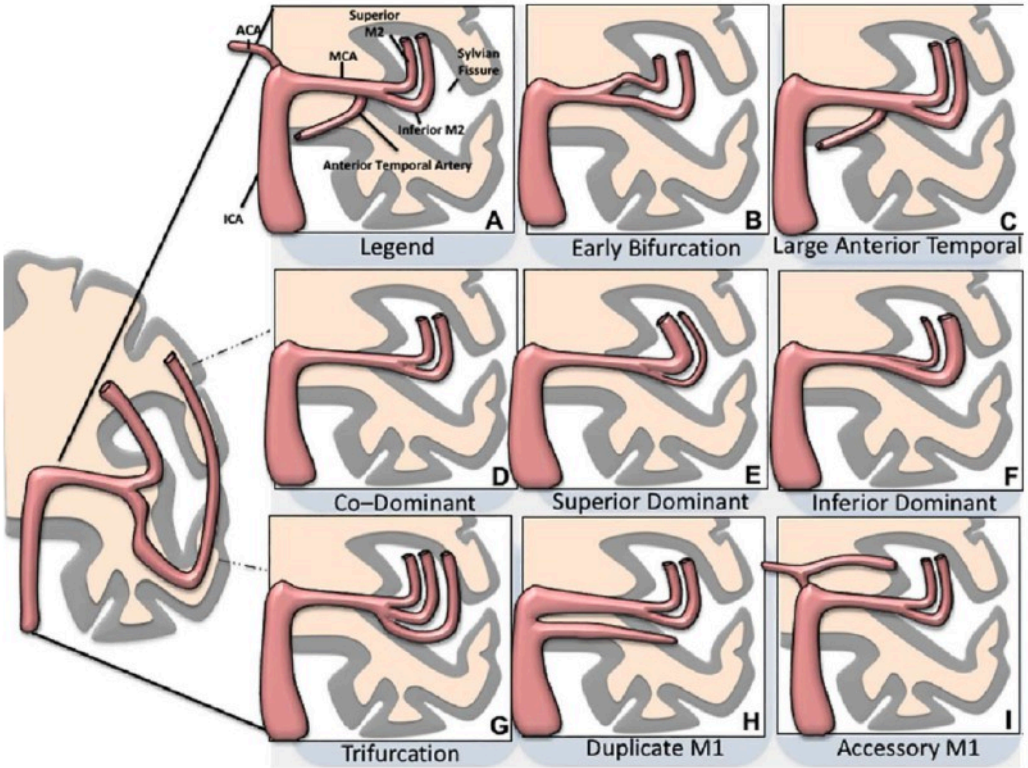
Occlusion artérielle proximale

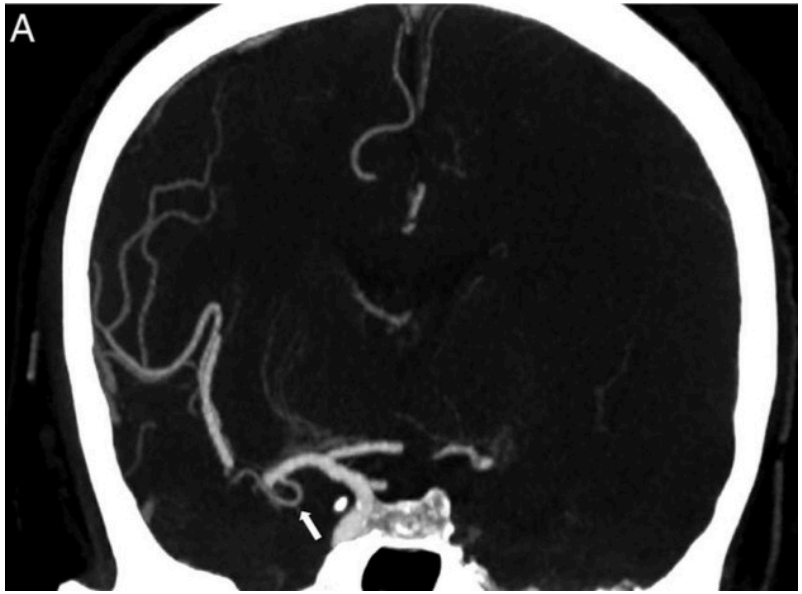
Bases anatomiques





What constitutes the M1 segment of the middle cerebral artery?



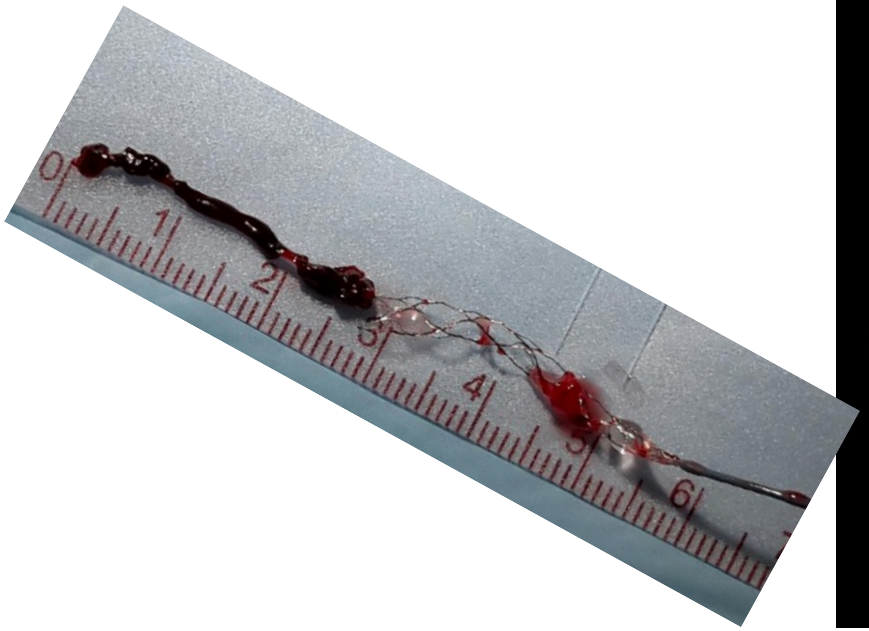


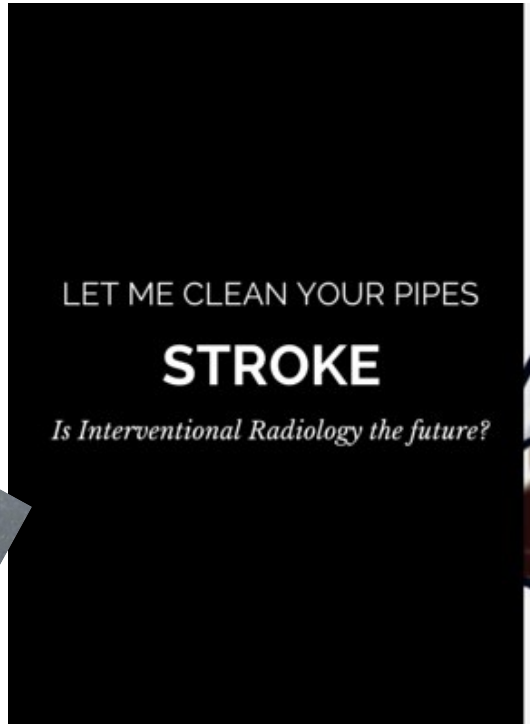
Goyal M, et al. J NeuroIntervent Surg 2016;0:1–5

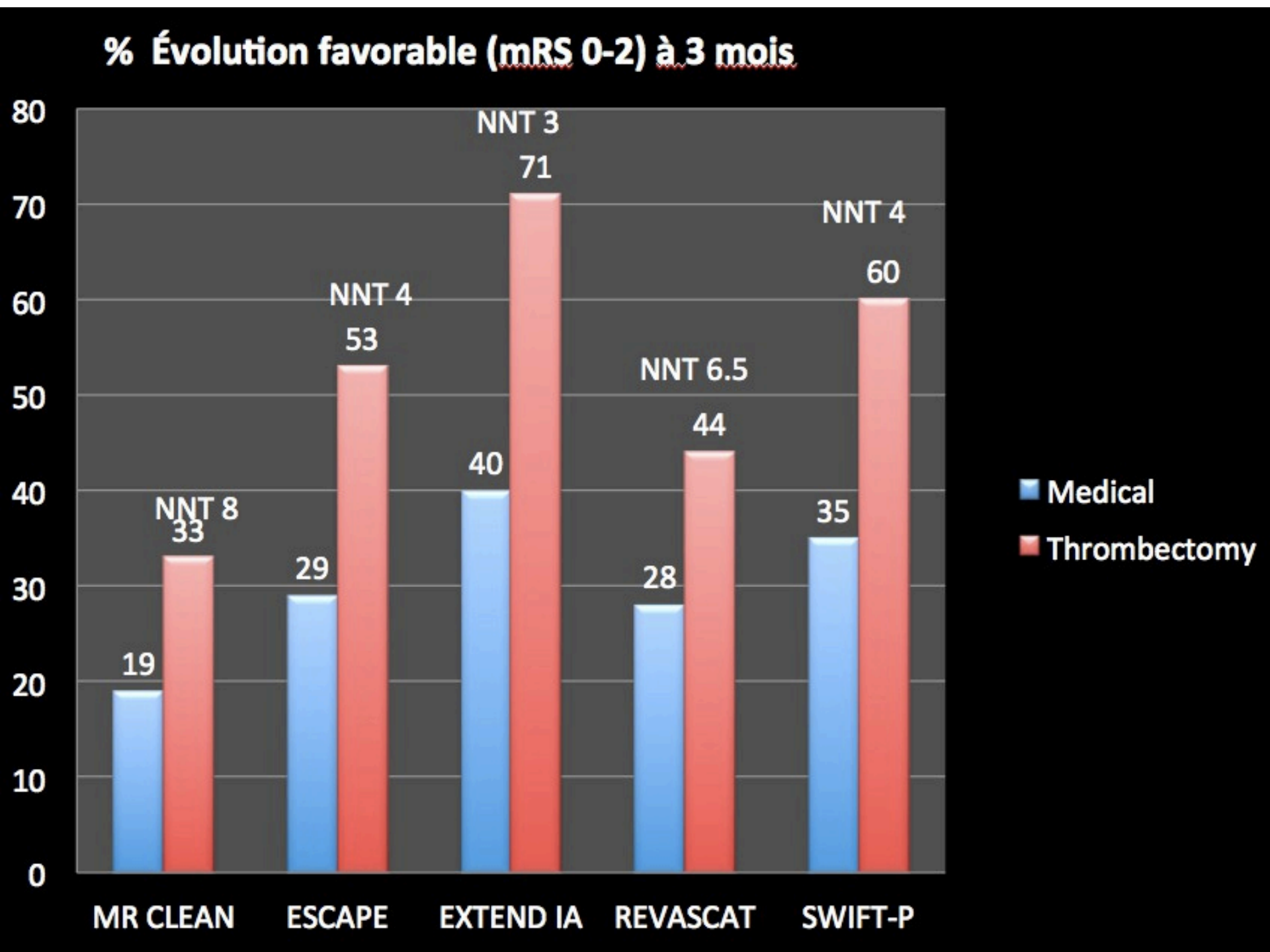
Thrombectomie de l'infarctus cérébral

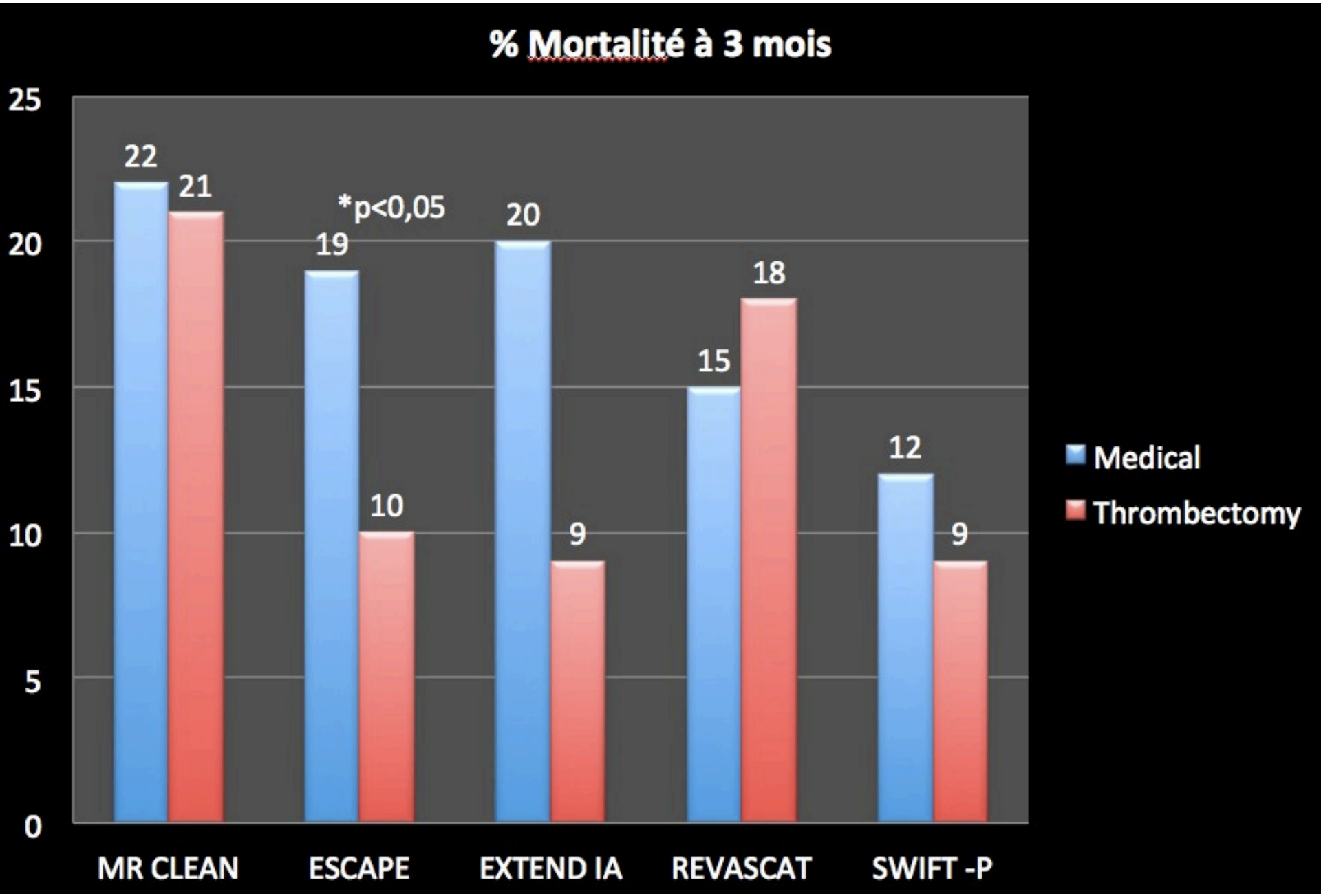
Changement de paradigme

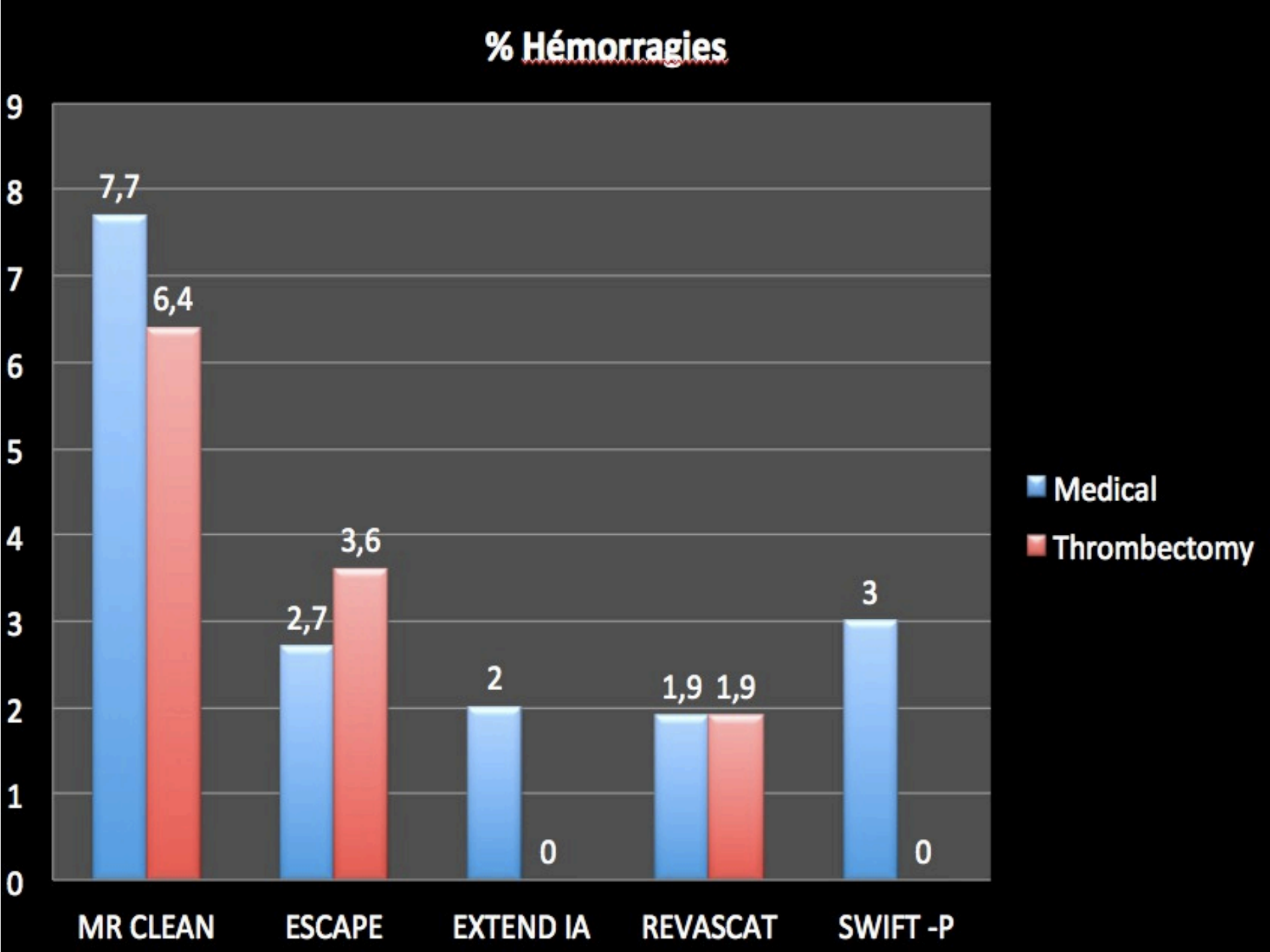
	MR CLEAN	ESCAPE	EXTEND IA	SWIFT PRIME	REVASCAT	THRACE
N patients	502	316	70	196	206	402






% Évolution favorable (mRS 0-2) à 3 mois
80
70
60
50
40
30
20
10
0
NNT 8
33
19
NNT 4
53
29
NNT 3
71
40
NNT 6.5
44
28
NNT 4
60
35
MR CLEAN
ESCAPE
EXTEND IA
REVASCAT
SWIFT-P
Medical
Thrombectomy


% Mortalité à 3 mois
25
20
15
10
5
0
22
21
*p<0,05
19
10
20
9
15
18
12
9
MR CLEAN
ESCAPE
EXTEND IA
REVASCAT
SWIFT -P
Medical
Thrombectomy


% Hémorragies
9
8
7
6
5
4
3
2
1
0
7,7
6,4
2,7
3,6
2
0
1,9
1,9
3
0
MR CLEAN
ESCAPE
EXTEND IA
REVASCAT
SWIFT -P
Medical
Thrombectomy

	MR CLEAN	ESCAPE	EXTEND IA	REVASCAT	SWIFT-PRIME
N (thrombect/ controle)	233/267	165/150	35/35	103/103	98/98
NIHSS incl	>2	>5	-	>6	8-29
NIHSS (thrombect/ controle)	17/18	16/17	17/13	17/17	17/17
Imagerie	CT/CTA/MR/MRA	CT/CTA	CT/MR/CTP/ CTA	CT/MR/MRA/ CTA	CT/MR DWI/ PWI/MRA/CTA
Iv tPA%, Délai min	87% 87/85	73% 125/110	100% 127/145	79% 117/105	100% 110/117
Fenêtre Therap.	6h	12h	8h	8h	6h
Temps de Reperfusion (min)	332	241	248	355	252*
stent trievers (%)	81%	86%	100%	100%	100%
TICI 2b-3 (%)	59%	72%	86%	66%	88%

Société Française Neuro-Vasculaire

LES PRÉCONISATIONS DE LA SFNV

PLACE DE LA THROMBECTOMIE MÉCANIQUE DANS LA PRISE EN CHARGE A LA PHASE AIGUË DE L'INFARCTUS CÉRÉBRAL PAR OCCLUSION DES ARTÈRES DE LA CIRCULATION ANTERIEURE

Travail effectué sous la direction de M. Mazighi, C. Cognard

Document élaboré par le groupe de travail de la SFNV sur la thrombectomie mécanique (TM) dans la prise en charge de l'infarctus cérébral (IC) en phase aigüe à la suite de la publication des études randomisées suivantes :

MR CLEAN[1], EXTEND-IA[2], ESCAPE[3], SWIFT-PRIME[4], REVASCAT[5].

- ***Thrombectomie recommandée***
  - à phase aigue de l'AIC
    - jusqu'à 6 heures du début des symptômes
    - chez patients avec occlusion proximale artères cérébrales.
  - en complément de thrombolyse IV (dans 4,5h) ou d'emblée si contre-indication thrombolyse iv.
  - Par stents retrievers

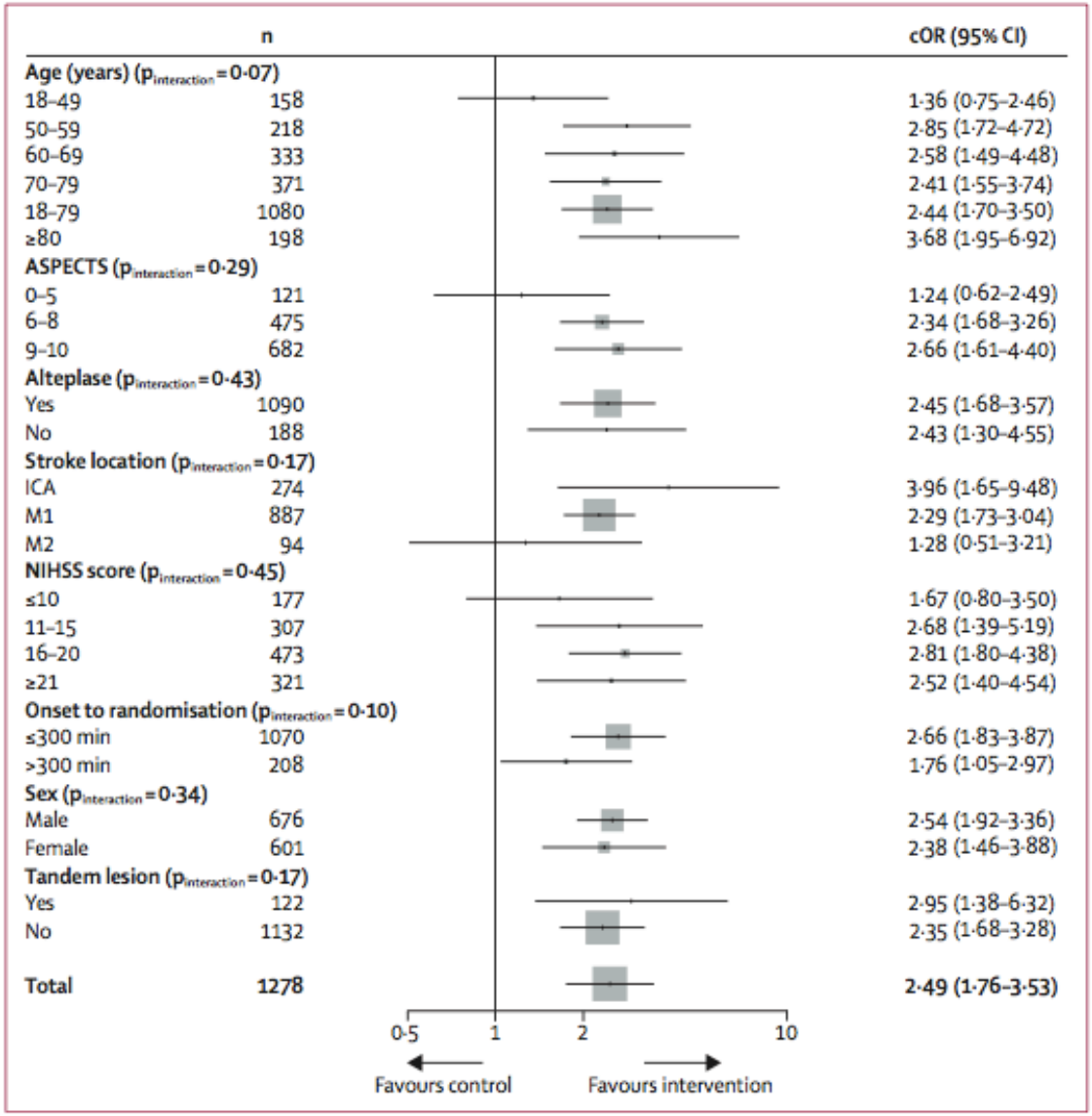
- ***Ne doit pas retarder*** fibrinolyse IV. Fibrinolyse IV ne doit pas retarder thrombectomie.

- ***Le plus rapidement possible***. ***Grade A, Niveau 1a***

1 décès ou handicap gagné pour 4 traités

Endovascular thrombectomy after large-vessel ischaemic stroke: a meta-analysis of individual patient data from five randomised trials

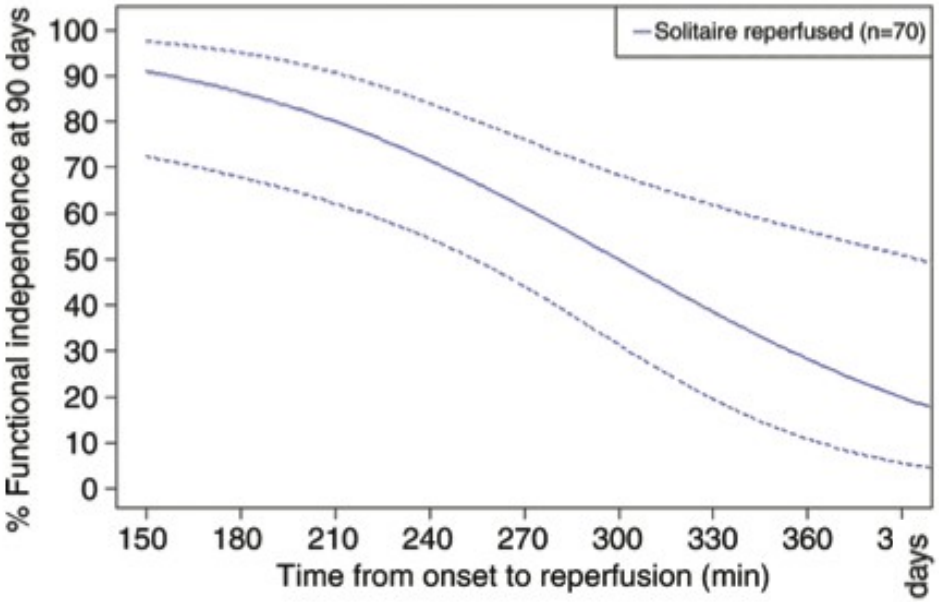
Goyal et al, Lancet 2016

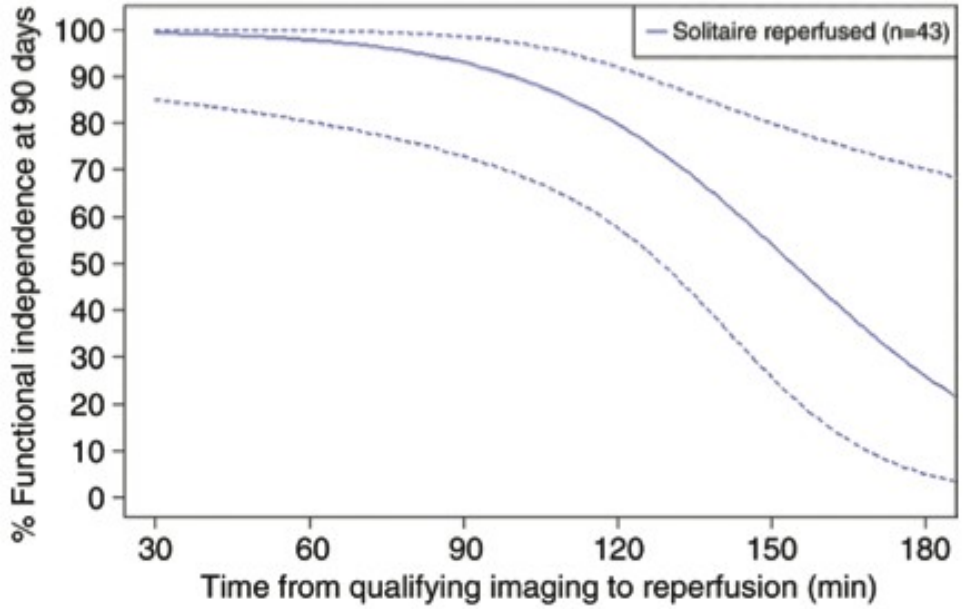


Thrombectomie mécanique

"Time is brain"

Goyal et al, Radiology 2016





Every 6-minute delay from symptom onset to reperfusion in the stent retriever arm was associated with 1–1.5 fewer functionally independent outcomes at 90 days among every 100 patients treated.

Thrombectomie de l'infarctus cérébral

Traitement de référence

Thrombectomy after intravenous thrombolysis is the new standard of care in acute stroke with large vessel occlusion

Benjamin Gory[1,2,3] and Francis Turjman[1,2,3]

- Questions posées:
  - Délai de reperfusion? 6 heures?
  - Matiels de thrombectomie
  - Sélection des patients en imagerie
  - Type d'anesthésie

Société Française Neuro-Vasculaire

Délégation Rhône-Alpes

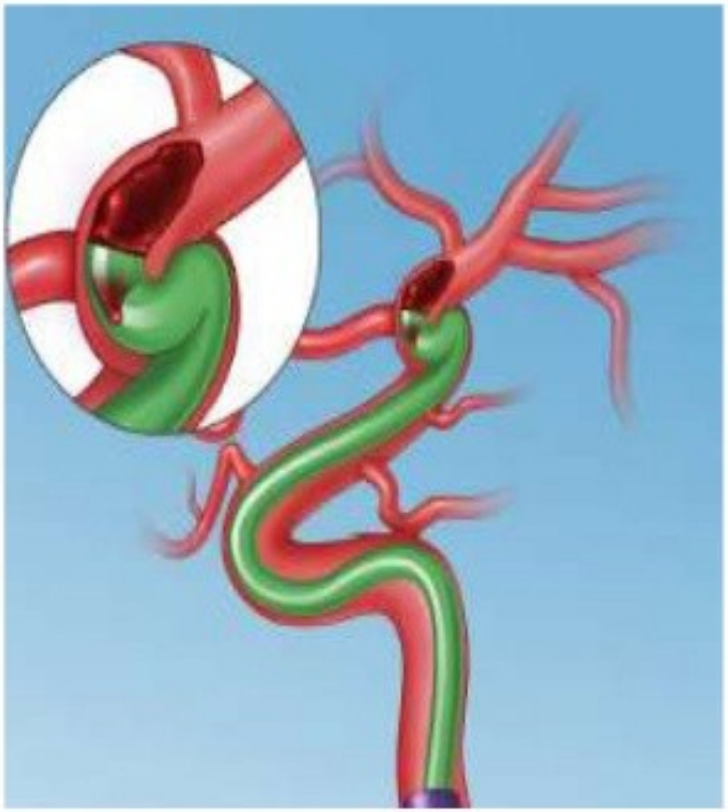
Société Française de Radiologie

SOCIETE FRANCAISE DE NEURORADIOLOGIE

Thrombectomie de l'infarctus cérébral

Thrombo-aspiration

Penumbra Device (ADAPT Technique)

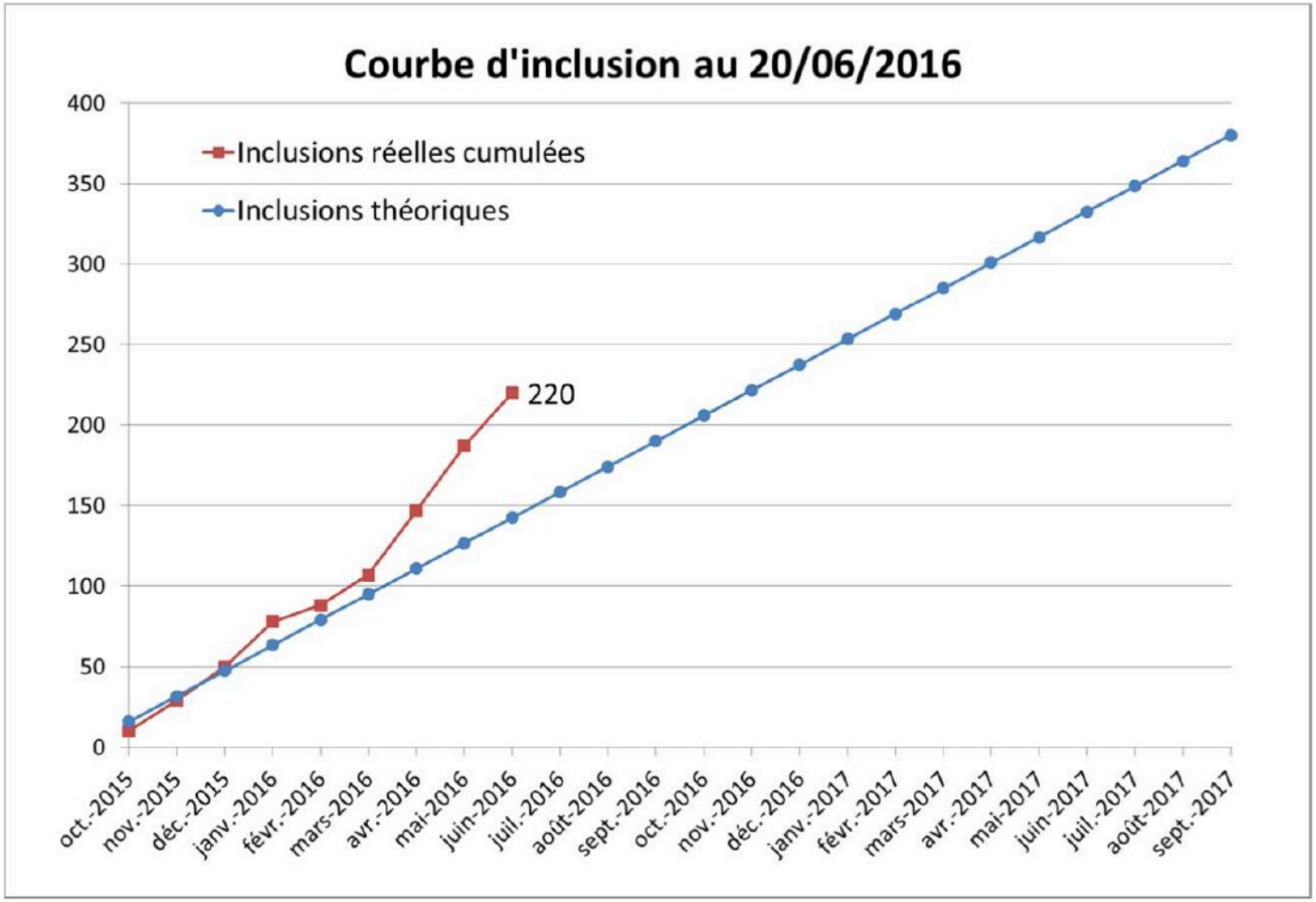


- Direct Aspiration by large catheter at the site of thrombus
- Rapid and Painless Clot Extraction
- Intact Clot Extraction may reduce distal emboli

Spiotta, et al. JNIS, 1/14

Allina Health

Etude ASTER



Responsable scientifique
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Équipe ASTER URC-FOR:
Coordination : Lucia LOPES/Clémence MARCIANO
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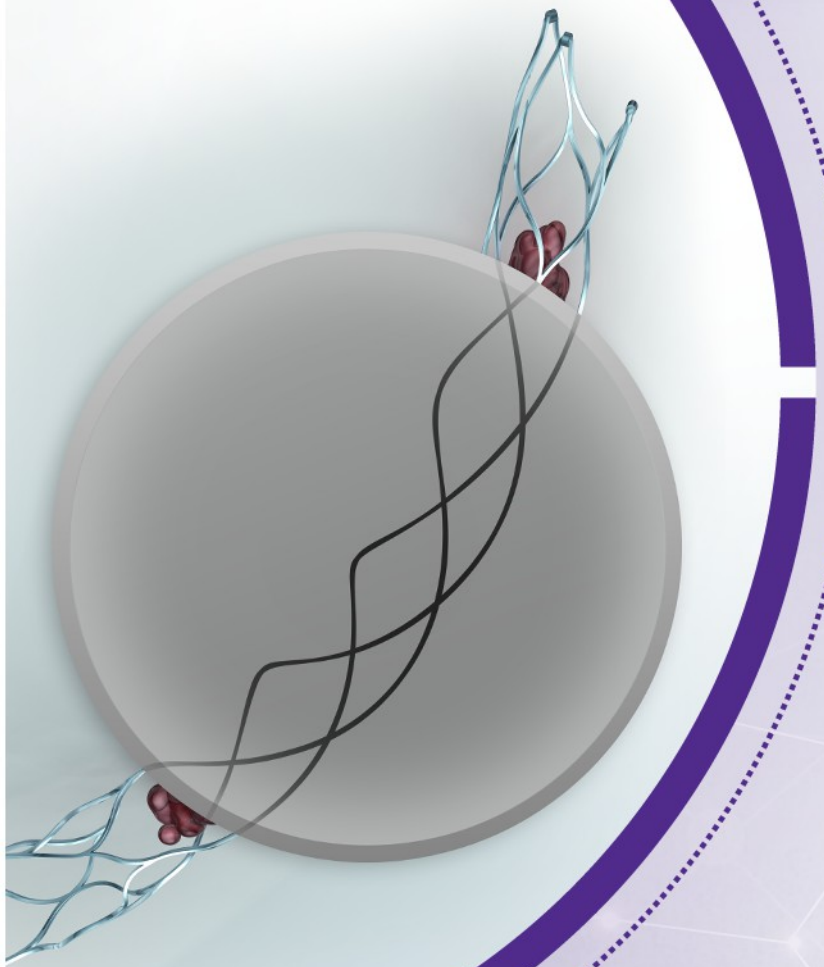


stryker® Neurovascular

DAWN™ TRIAL

DAWN™ Trial

This presentation serves as an overview; always refer to the current version of the clinical trial protocol for full study details. This presentation may contain case studies. Results from case studies are not predictive of results in other cases. Results in other cases may vary.

Stroke: *Our Only Focus. Our Ongoing Promise.*

DAWN™ Trial

DWI or CTP

Assessment with Clinical Mismatch in the Triage of

Wake-Up and Late Presenting Strokes Undergoing

Neurointervention

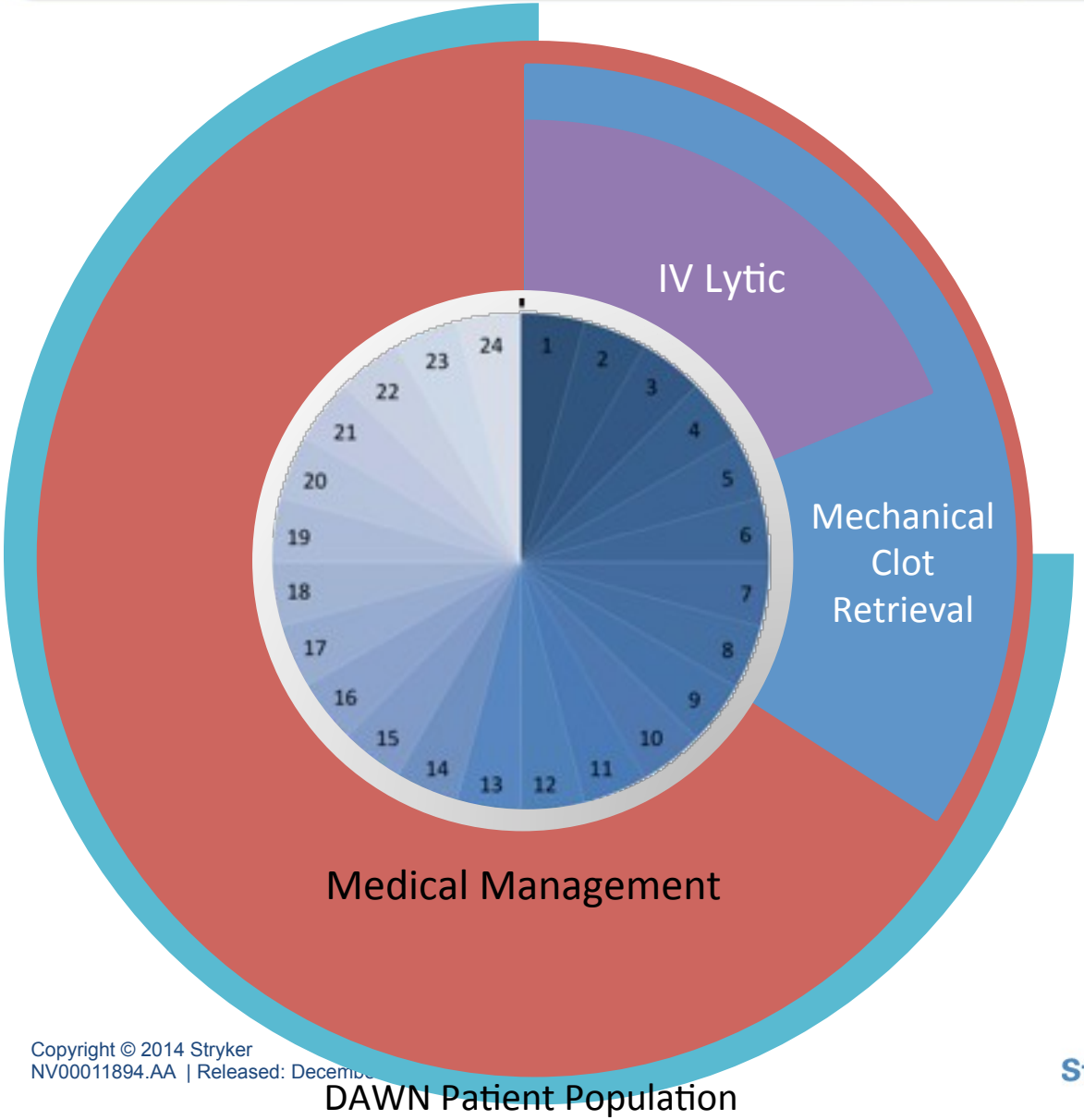
Primary Objective

To evaluate the hypothesis that Trevo thrombectomy plus medical management leads to superior *clinical outcomes* at 90 days as compared with medical management alone in *appropriately selected* subjects experiencing an acute ischemic stroke when treatment is initiated within *6-24 hrs* after last seen well.

DAWN™ Trial Design

- Prospective, randomized (1:1), multi-center, Phase II/III (feasibility/pivotal), adaptive, population enrichment, blinded endpoint, controlled trial
- Up to 50 sites (worldwide)
- 150 subjects (feasibility) up to 500 (pivotal) max
- Primary endpoint:
  - Difference between the *average weighted* mRS at 90 days between treatment and control groups

The Importance of DAWN™ Trial



- Level 1 evidence study establishing a **new option** at approved study facilities for an underserved patient population who are currently *only eligible for medical management*
- 20-30% of AIS patients arrive to the ED more than 8 hours from symptom onset

DAWN™ Trial
Unique Design Elements

Primary Endpoint: Weighted mRS

- Designed to capture health state transitions across the entire spectrum
- Endpoint that is a combination of both efficacy and safety
- Differentiates outcomes
- Patient-centered outcomes analysis

Designed to measure effectiveness & safety in single endpoint

mRS	0	1	2	3	4	5	6
Weight	**10**	**9.1**	**7.6**	**6.5**	**3.3**	**0**	**0**

Enrichment

- Designed to fine tune the patient population based on core infarct size
- Identify subgroups experiencing clinical benefit

0-50 cc → 0-45 cc → 0-40 cc → 0-35 cc → 0-30 cc

DAWN™ Trial
Unique Design Elements

Clinical Imaging Mismatch

- Standardizes clinical imaging to select subjects
- Literature supports core infarct size being predictive of outcomes
- NIHSS assessment (clinical deficit) represents tissue at risk in real time, can be easily administered (and repeated) multiple times, and is validated in clinical practice

General Inclusion Criteria

1. Clinical signs and symptoms consistent with the diagnosis of an acute ischemic stroke, <u>and</u> subject belongs to one of the following subgroups:
   a. Subject has failed IV t-PA therapy (defined as a confirmed persistent occlusion 60 min after administration)
   b. Subject is contraindicated for IV t-PA administration
2. Age ≥ 18
3. Baseline NIHSS ≥ 10 (assessed within one hour prior to measuring core infarct volume)
4. Subject can be randomized between 6 to 24 hrs after time last known well

Imaging Inclusion Criteria

1. < 1/3 MCA territory involved, as evidenced by CT or MRI
2. Occlusion of the intracranial ICA and/or MCA-M1 as evidenced by MRA or CTA
3. Clinical Imaging Mismatch (CIM) defined as one of the following on RAPID MR-DWI or CTP-rCBF maps:
   a. 0-20 cc core infarct and NIHSS ≥ 10 (and age ≥ 80 years old)
   b. 0-30 cc core infarct and NIHSS ≥ 10 (and age < 80 years old)
   c. 31 cc to ≤ 50 cc core infarct and NIHSS ≥ 20 (and age < 80 years old)

Flow Chart – Screening and Enrollment

Age ≥ 18
NIHSS ≥ 10
Pre-stroke mRS 0-1
< 1/3 MCA territory involved, as evidenced by CT or MRI
Occlusion of the intracranial ICA and/or MCA-M1, by MRA or CTA
Subject can be randomized within 6-24h from TLSW

Screen Failures (SF): subject does not meet general or CTA/MRA inclusion/ exclusion criteria – record as SF on log

↓

Written Consent from subject or LAR
(if not obtained prior to RAPID)

↓

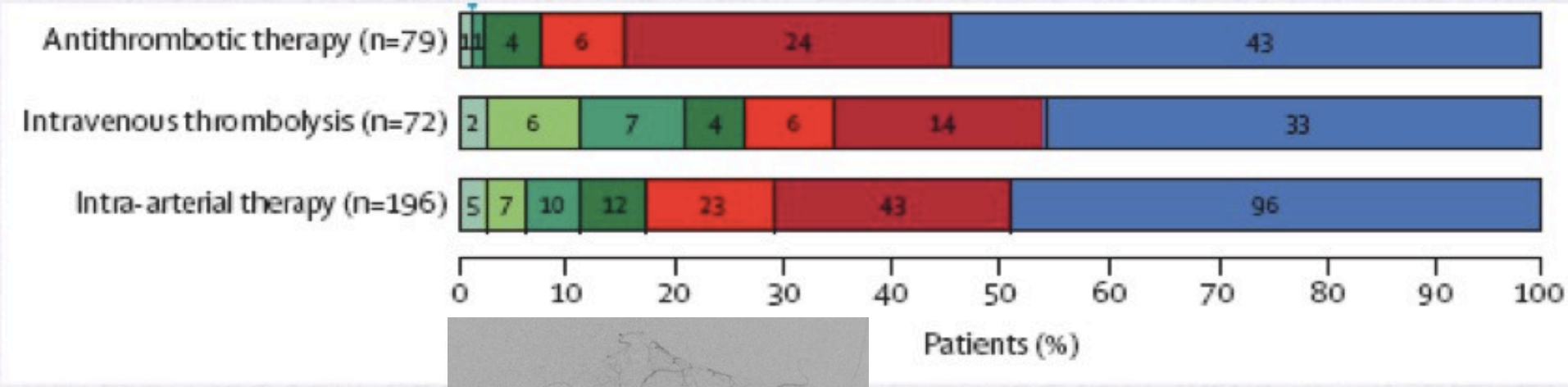
Clinical Imaging Mismatch (CIM) defined as one of the following on RAPID MR-DWI or CTP-rCBF maps:

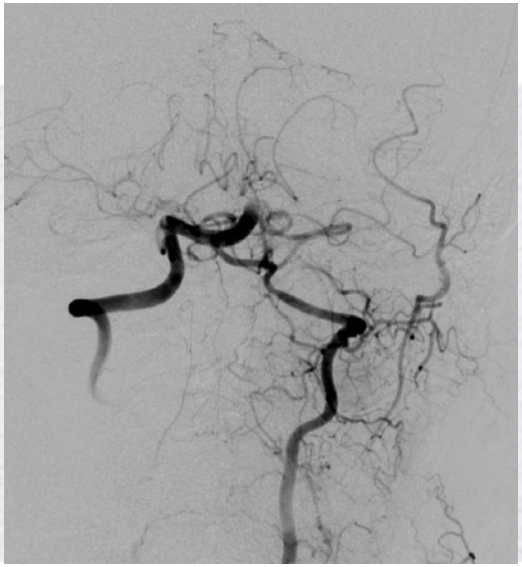
a. 0-20 cc core infarct & NIHSS ≥ 10 (& ≥ 80 yrs old)
b. 0-30 cc core infarct & NIHSS ≥ 10 (& < 80 yrs old)
c. 31 to ≤ 50 cc core infarct & NIHSS ≥ 20 (& < 80 yrs old)

Screen Failures (SF): subject does not meet DAWN CTP/ MRI infarct volume criteria, not enrolled – record as SF on log

Occlusion Artère Basilaire

BASICS, registre, international, 592 patients





Lancet Neurol. 2009 Aug;8(8):695-7.

Thrombectomie de l'infarctus cérébral
Occlusions basilaires

Gory et al, JNNP 2015

- Série consécutive Lyonnaise:
  - 22 patients thrombectomisés de Mars 2010 à Mars 2013 (10 comas)
  - Recanalisation (TICI≥2b): 73%
  - Evolution favorable (mRS≤2 à 3 mois): 27%
  - Mortalité à 3 mois: 45%
  - Hémorragie cérébrale symptomatique à 24 heures: 4%
- Revue systématique de la littérature et méta-analyse incluant notre série

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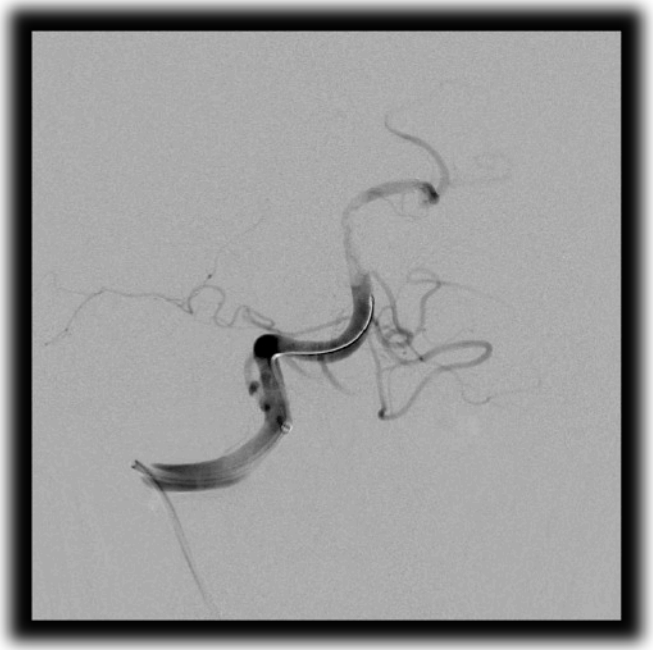
Table 2 Pooled rates of recanalisation and clinical outcomes

Outcomes	Number of Studies	Number of Patients	Pooled Rates (95% CI)
Successful recanalisation (TICI ≥2b)	15	312	81% (73%–87%)
90-day favourable outcome (mRS ≤2)	14	288	42% (36%–48%)
Mortality	15	312	30% (25%–36%)
Symptomatic intracranial haemorrhage*	14	288	4% (2%–8%)

*Symptomatic intracranial haemorrhage was defined as any parenchymal haematoma, subarachnoid haemorrhage or intraventricular haemorrhage associated with worsening of the National Institutes of Health Stroke Scale score by ≥4 within 24 h.
mRS, modified Rankin Scale; TICI score, Thrombolysis In Cerebral Infarction.

Basilar artery International Cooperation Study
BASICS trial



BASICS

STENT RETRIEVER

AMERICAN HEART ASSOCIATION STRONGLY SUPPORTS A NEW STROKE TREATMENT

CPR Certification HQ
ONLINE CPR CERTIFICATION AND TRAINING CENTER