

Prise en charge de l'AVC à la phase aiguë : quelle place pour la thrombectomie ?

F. Clarençon

15/06/2016

**Service de Neuroradiologie Interventionnelle.
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Comment ré-ouvrir une artère : les différents mécanismes

Thrombolyse

DISSOLUTION

1958 agents pharmacologiques IV

1980 agents pharmacologiques IA

1994 IA + fragmentation mécanique
(microguide ou ballonnet)

Flux (AngioJet), US (TransCr, EKOS), laser (EPAR)

Thrombectomie/Thomboaspiration

2002 thromboaspiration manuelle

2004 Dispositif MERCI (mechanical thrombectomy) FDA approval

2007 Penumbra (système thromboaspiration) FDA approval

2008 Premiers stentrievers

...Cath. d'aspiration large : 5MAX...

“Flow restoration” sans retrait du caillot

1999 Stents intra-crâniens

... Stentrievers..

RETRAIT

BYPASS ENDOVASCULAIRE

NEJM n° mars 2013

16

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Endovascular Treatment for Acute Ischemic Stroke

Alfonso Ciccone, M.D., Luca Valvassori, M.D., Michele Nichelatti, Ph.D., Annalisa Sgoifo, Psy.D., Michela Ponzi, Ph.D., Roberto Sterzi, M.D., and Edoardo Boccardi, M.D., for the SYNTHESIS Expansion Investigators*

ABSTRACT

BACKGROUND
In patients with ischemic stroke, endovascular treatment results in a higher rate of recanalization of the affected cerebral artery than thrombolytic therapy. However, comparison of the two approaches has not been performed.

METHODS
We randomly assigned 362 patients with acute ischemic stroke within 6 hours after onset, to endovascular therapy (with tissue plasminogen activator [t-PA]), a combination of these approaches (or t-PA alone) as soon as possible after randomization, or to standard care (no disability (defined as a modified Rankin score of 0 indicating no symptoms, 1 no clinical disability, and 6 death) at 3 months).

RESULTS
A total of 181 patients were assigned to receive endovascular therapy, and 181 to intravenous t-PA. The median time from stroke onset to the start of treatment was 3.75 hours for endovascular therapy and 2.75 hours for intravenous t-PA ($P < 0.001$). At 3 months, 55 patients in the endovascular-therapy group (30.4%) and 63 in the intravenous t-PA group (34.8%) were alive without disability (odds ratio adjusted for age, sex, stroke severity, and atrial fibrillation status at baseline, 0.71; 95% confidence interval, 0.44 to 1.14; $P = 0.16$). Fatal or nonfatal symptomatic intracranial hemorrhage within 7 days occurred in 6% of the patients in each group, and there were no significant differences between groups in the rates of other serious adverse events or the case fatality rate.

CONCLUSIONS
The results of this trial in patients with acute ischemic stroke indicate that endovascular therapy is not superior to standard treatment with intravenous t-PA. (Funded by the Italian Medicines Agency, ClinicalTrials.gov number, NCT00640367.)

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

MARCH 7, 2013

VOL. 368 NO. 10

Endovascular Therapy after Intravenous t-PA versus t-PA Alone for Stroke

Joseph P. Broderick, M.D., Yuko Y. Palesch, Ph.D., Andrew M. Demchuk, M.D., Sharon D. Yeatts, Ph.D., Pooya Khatri, M.D., Michael D. Hill, M.D., Edward C. Jauch, M.D., Tudor G. Jovin, M.D., Bernard Yan, M.D., Frank L. Silver, M.D., Rüdiger von Kummer, M.D., Carlos A. Molina, M.D., Bart M. Demaerschalk, M.D., Ronald Budzik, M.D., Wayne M. Clark, M.D., Osama O. Zaidat, M.D., Tim W. Malsich, M.D., Mayank Goyal, M.D., Wouter J. Schonewille, M.D., Mikael Mazighi, M.D., Ph.D., Stefan T. Engelberth, M.D., Craig Anderson, M.D., Ph.D., Judith Spilker, R.N., B.S.N., Janice Carrozella, R.N., B.A., R.T.(R), Karla J. Ryckbors, R.N., B.N., I. Scott Janis, Ph.D., Renée H. Martin, Ph.D., Lydia D. Foster, M.S., and Thomas A. Tomsick, M.D., for the Interventional Management of Stroke (IMS) III Investigators

ABSTRACT

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Trial of Imaging Selection and Endovascular Treatment for Ischemic Stroke

Chelsea S. Kidwell, M.D., Reza Jahan, M.D., Jeffrey Gornbein, Dr.P.H., Jeffry R. Alger, Ph.D., Val Nenov, Ph.D., Zahra Ajani, M.D., Lei Feng, M.D., Ph.D., Brett C. Meyer, M.D., Scott Olson, M.D., Lee H. Schwamm, M.D., Albert J. Yoo, M.D., Randolph S. Marshall, M.D., Philip M. Meyers, M.D., Dilip R. Yavagal, M.D., Max Wintermark, M.D., Judy Guzy, R.N., Sidney Starkman, M.D., and Jeffrey L. Saver, M.D., for the MR RESCUE Investigators*

ABSTRACT

Ify patients who are most likely to benefit from endovascular thrombectomy and whether endovascular thrombectomy improves outcome in patients remains unclear.

In patients within 8 hours after the onset of large-
stroke to undergo mechanical embolectomy (Merci device) or receive standard care. All patients underwent noninvasive imaging of the brain. According to whether the patient had a favorable penumbral pattern (large amount of salvageable tissue and small infarct core) or a nonpenumbral pattern (small or absent penumbra). We assessed outcomes

using the 90-day modified Rankin scale, ranging from 0 (no symptoms) to 6 (dead).

RESULTS

Among 118 eligible patients, the mean age was 65.5 years, the mean time to enrollment was 5.5 hours, and 58% had a favorable penumbral pattern. Revascularization in the embolectomy group was achieved in 67% of the patients. Ninety-day mortality was 21%, and the rate of symptomatic intracranial hemorrhage was 4%; neither rate differed across groups. Among all patients, mean scores on the modified Rankin scale did not differ between embolectomy and standard care (3.9 vs. 3.9, $P = 0.99$). Embolectomy was not superior to standard care in patients with either a favorable penumbral pattern (mean score, 3.9 vs. 3.4; $P = 0.23$) or a nonpenumbral pattern (mean score, 4.0 vs. 4.4; $P = 0.32$). In the primary analysis of scores on the 90-day modified Rankin scale, there was no interaction between the pretreatment imaging pattern and treatment assignment ($P = 0.14$).

CONCLUSIONS

A favorable penumbral pattern on neuroimaging did not identify patients who would differentially benefit from endovascular therapy for acute ischemic stroke, nor was embolectomy shown to be superior to standard care. (Funded by the National Institute of Neurological Disorders and Stroke; MR RESCUE ClinicalTrials.gov number, NCT00389467.)

Comparaison r-TPA IV vs TM Pas de différence

randomization (434 patients to endovascular therapy and 222 to intravenous t-PA alone). The proportion of participants with a modified Rankin score of 2 or less at 90 days did not differ significantly according to treatment (40.8% with endovascular therapy and 38.7% with intravenous t-PA; absolute adjusted difference, 1.5 percentage points; 95% confidence interval [CI], -6.1 to 9.1, with adjustment for the National Institutes of Health Stroke Scale [NIHSS] score [8-19, indicating moderately severe stroke, or ≥20, indicating severe stroke]), nor were there significant differences for the predefined subgroups of patients with a NIHSS score of 20 or higher (6.8 percentage points; 95% CI, -4.4 to 18.1) and those with a score of 19 or lower (-1.0 percentage point; 95% CI, -10.8 to 8.8). Findings in the endovascular-therapy and intravenous t-PA groups were similar for mortality at 90 days (19.1% and 21.6%, respectively; $P = 0.52$) and the proportion of patients with symptomatic intracranial hemorrhage within 30 hours after initiation of t-PA (6.2% and 5.9%, respectively; $P = 0.83$).

CONCLUSIONS

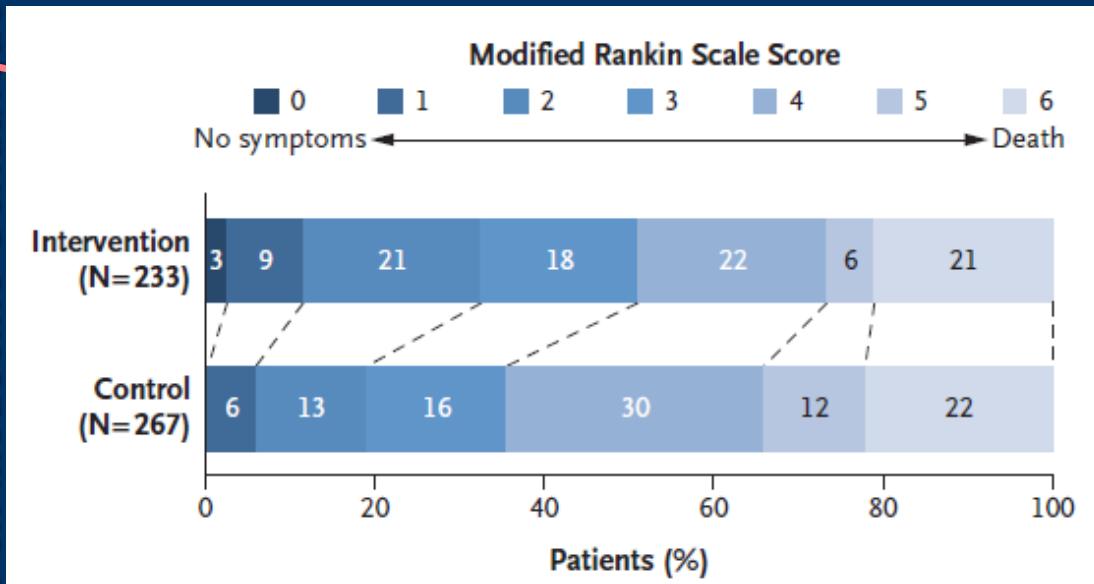
The trial showed similar safety outcomes and no significant difference in functional independence with endovascular therapy after intravenous t-PA, as compared with intravenous t-PA alone. (Funded by the National Institutes of Health and others; ClinicalTrials.gov number, NCT00359424.)

N ENGL J MED 368:10 NEJM.org MARCH 7, 2013

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- **MR CLEAN**
(Berkhemer OA. NEJM. 2015)



- **Mortality:** no significant difference
- **Outcome:** consistent better outcomes in favor of the intervention for all categories of the modified Rankin scale, except for death. **13.5 percentage points** (95% CI, 5.9 to 21.2) in the rate of functional independence (modified Rankin score 0 to 2) in favor of the intervention (32.6% vs. 19.1%).

ORIGINAL ARTICLE

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. Momish, 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*

< 12h

Faible infarctus
Pénombre

ESCAPE Study:

The rate of functional independence (90-day modified Rankin score of 0 to 2) was increased with the intervention (53.0%, vs. 29.3% in the control group; $P<0.001$).

ORIGINAL ARTICLE

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*

< 4h30
*rTPA IV vs
rTPA IV + TM*

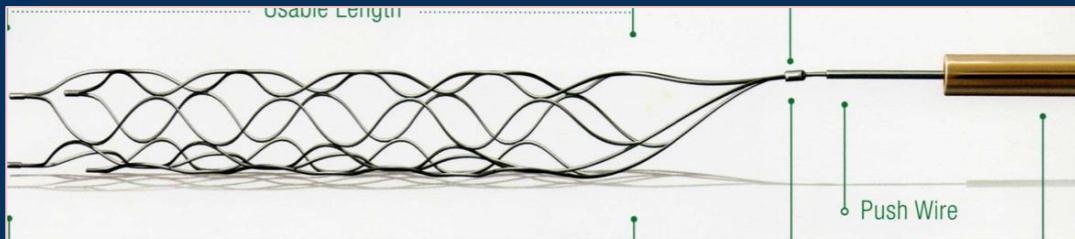
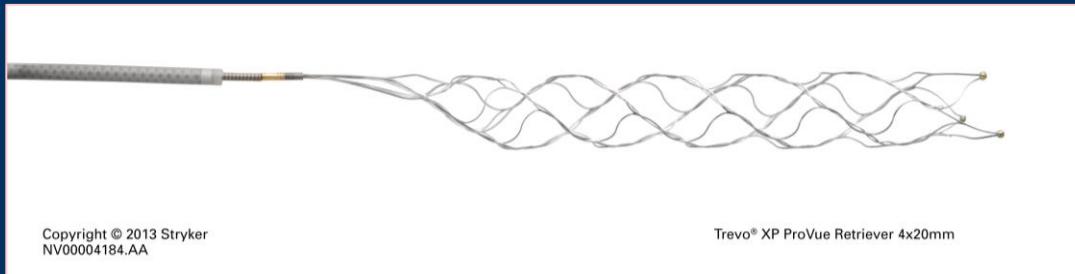
- ***Extend-IA Study:***

Functional outcome at 90 days (mRS 0-2, 71% vs. 40%;
 $P = 0.01$)

- The trial was stopped early because of efficacy after 70 patients had undergone randomization (35 patients in each group)

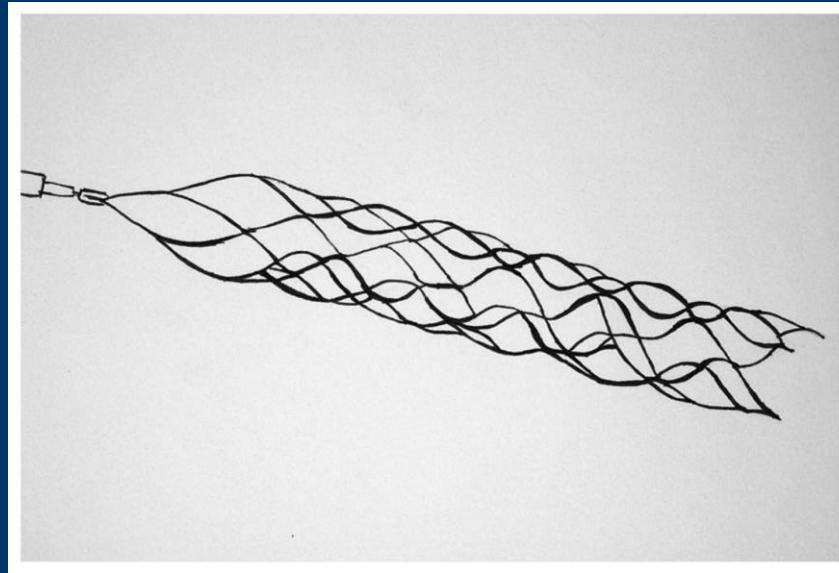
Ce qui a changé :

- Sélection des patients: délai, occl. proximale
- Stent retrievers

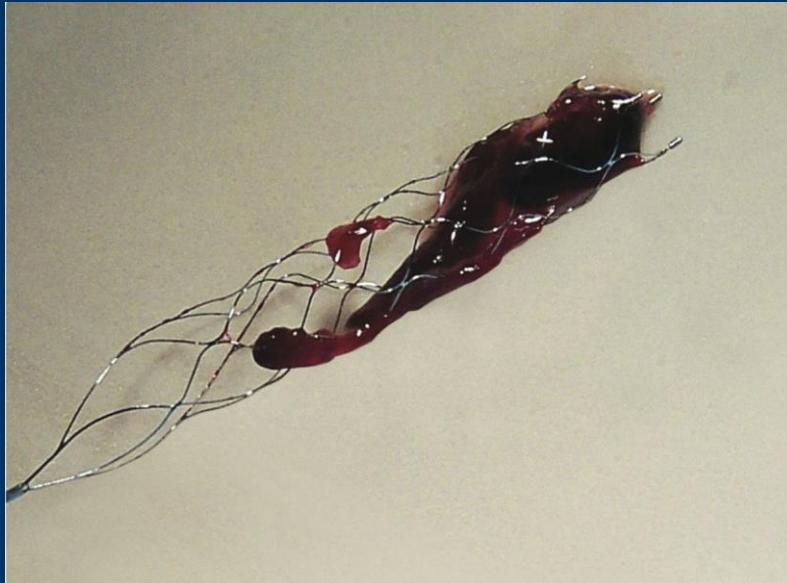


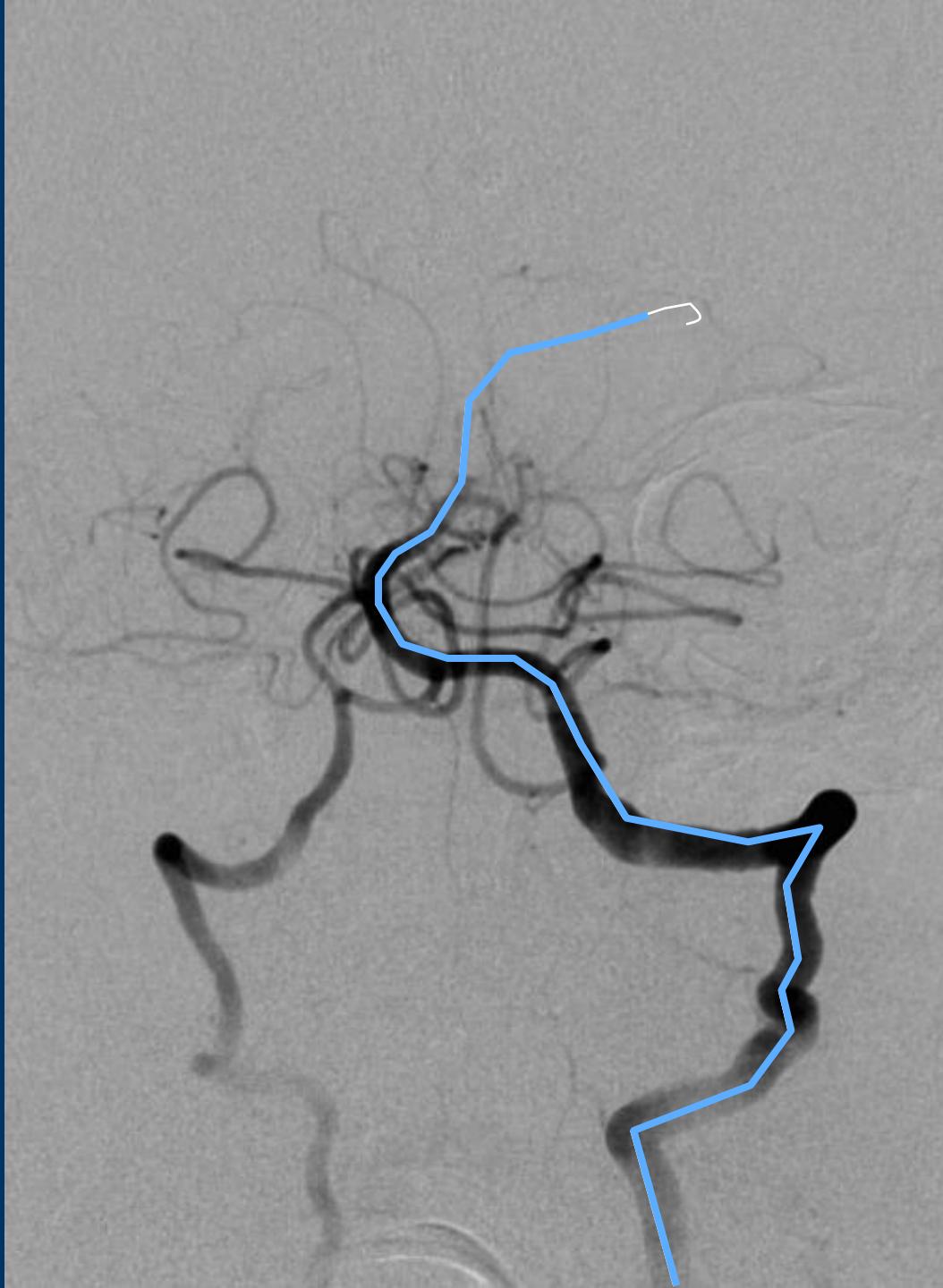
THROMBECTOMIE MÉCANIQUE : ASPECTS TECHNIQUES

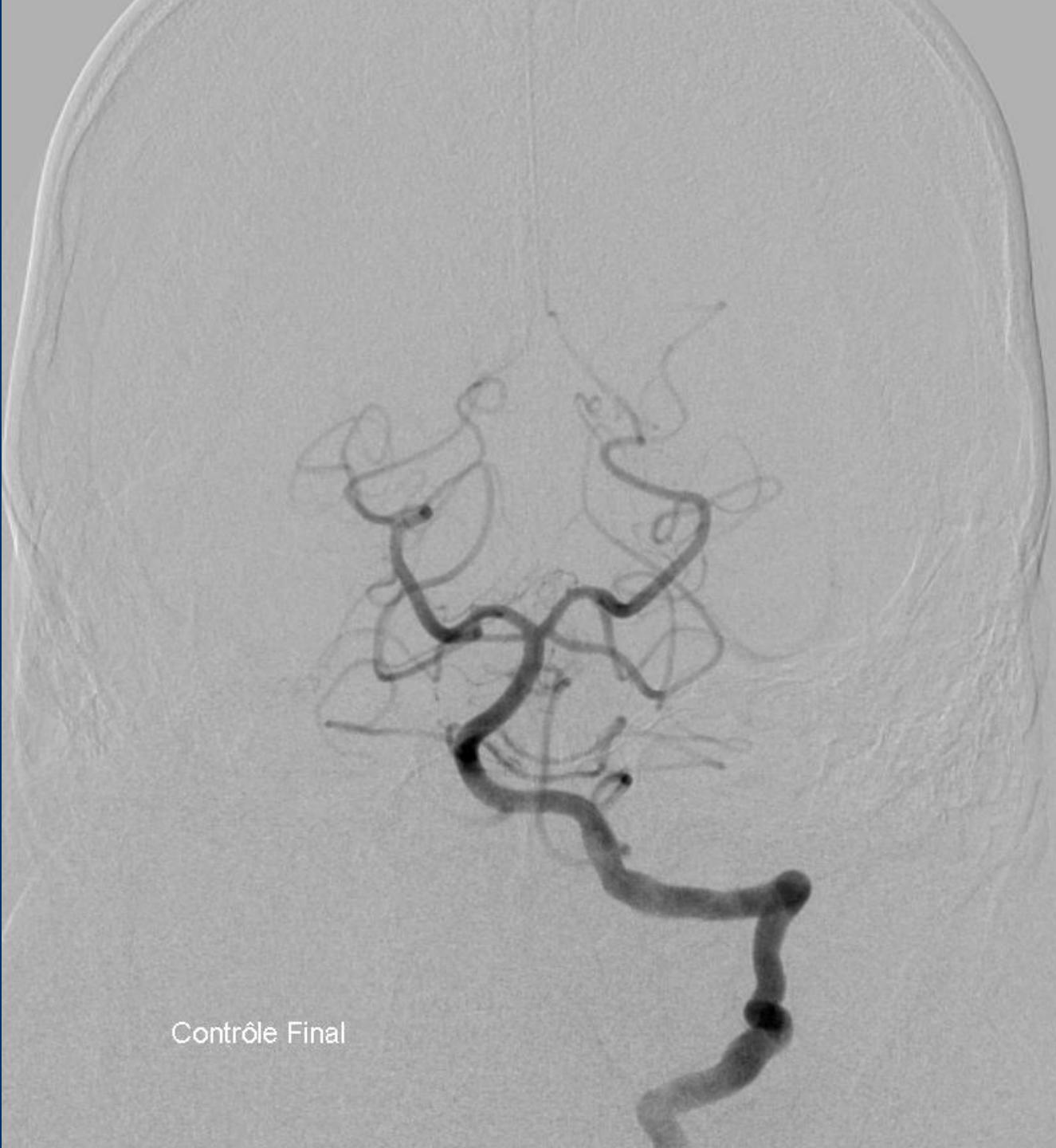
STENTRIEVERS



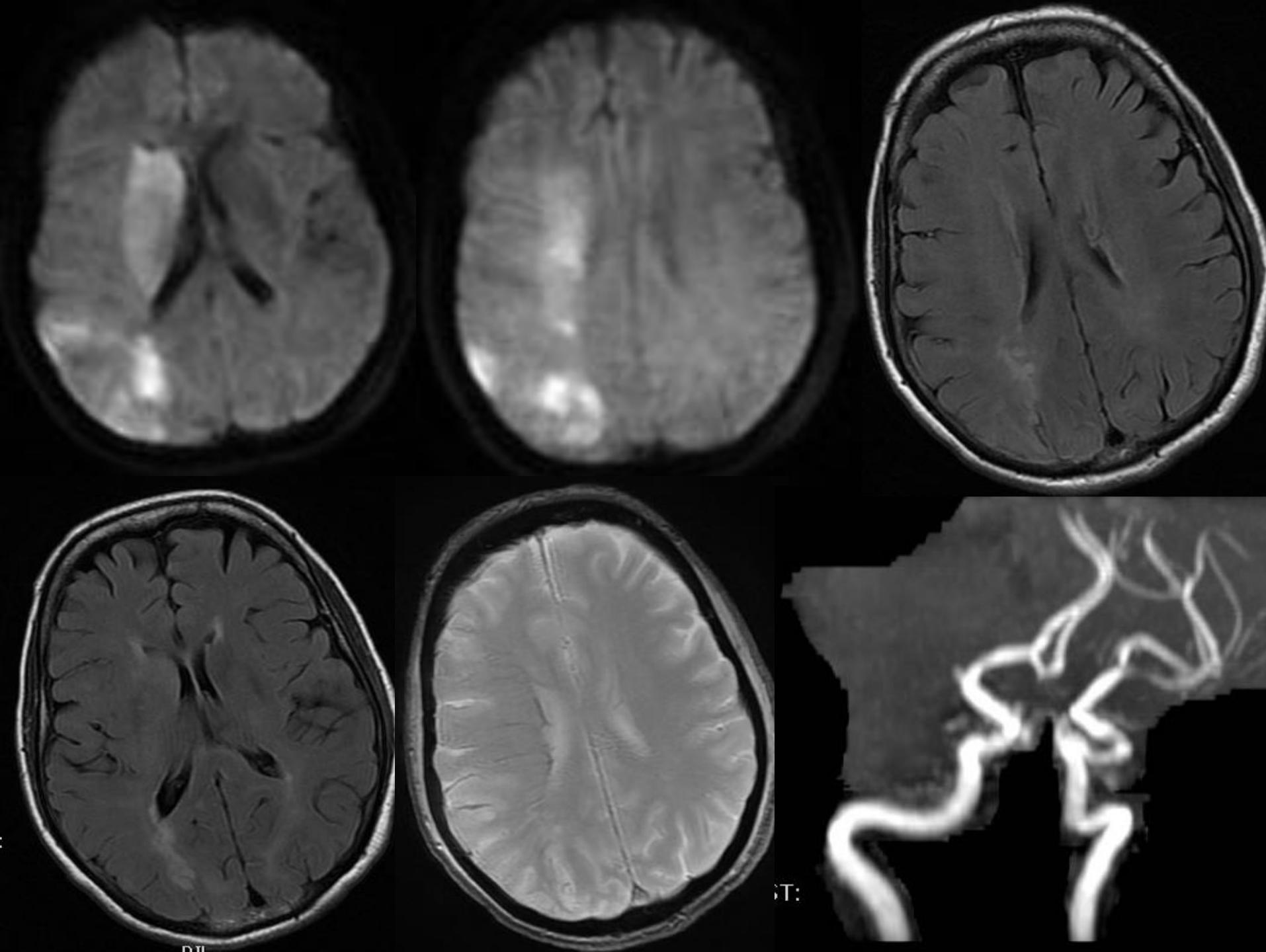
- ***Stent + retriever = Stentriever***
- ***Stent ouvert dans le thrombus***
- ***Effet by-pass + retrait du caillot stent ouvert***







Contrôle Final

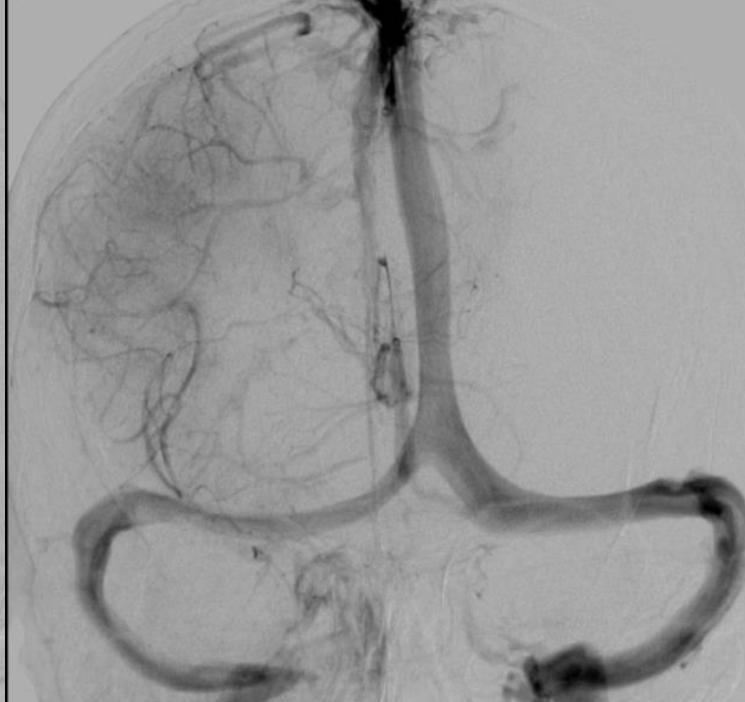


DTI

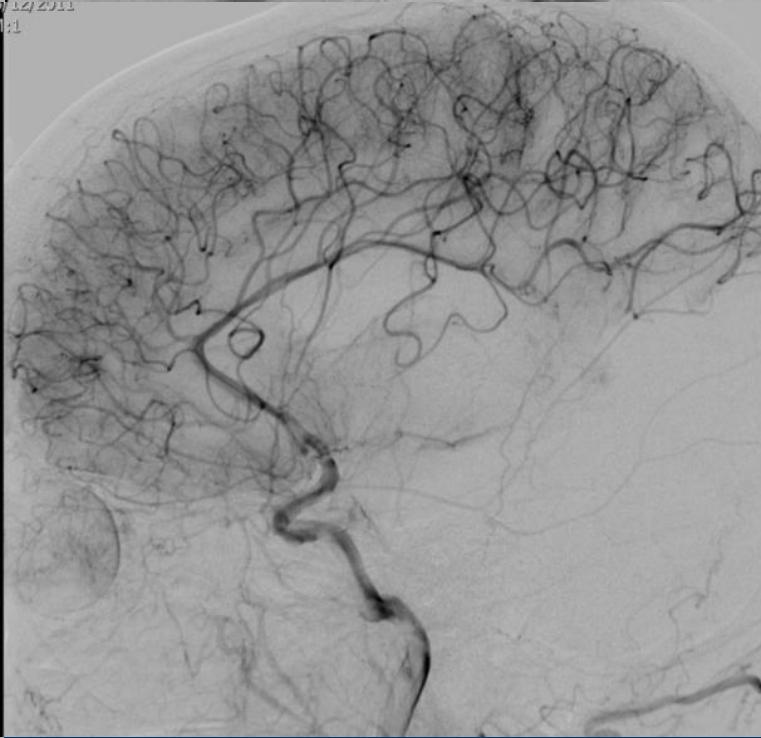
DWI



2/2011



14/2/2011
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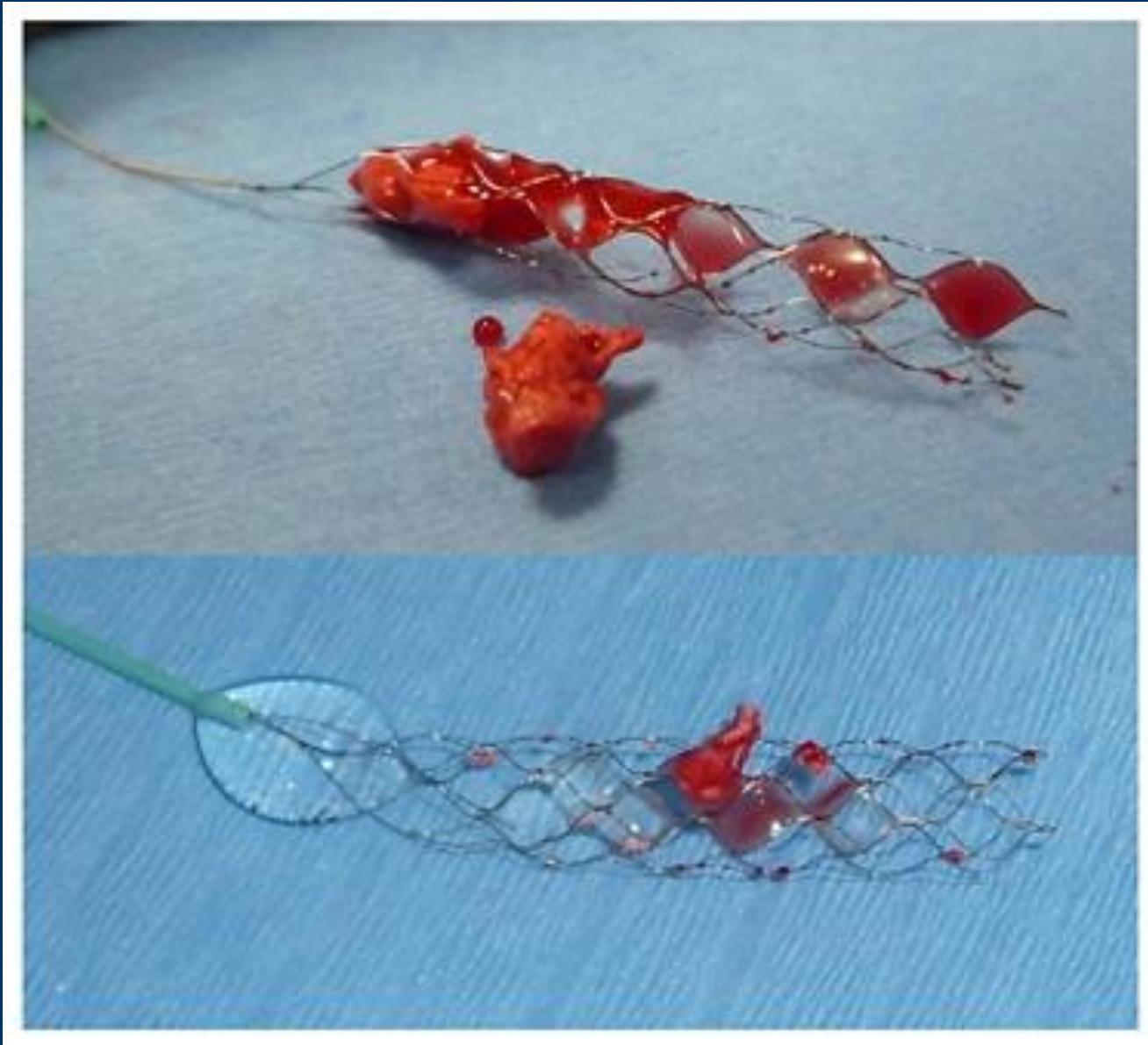




12/2011

300

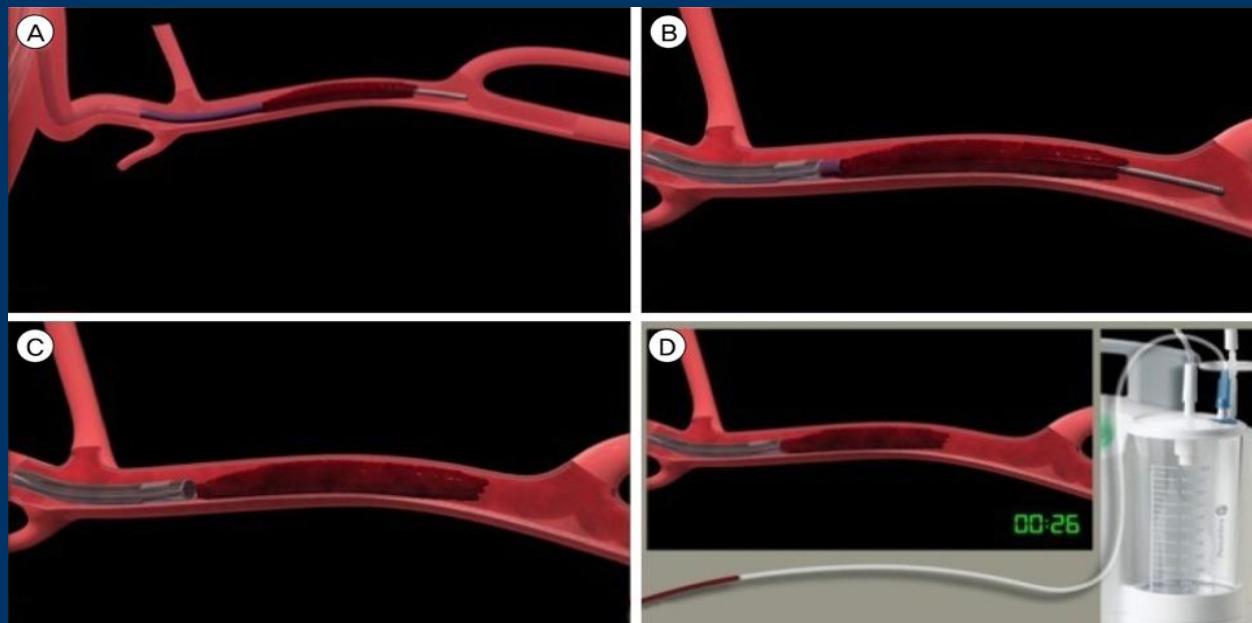




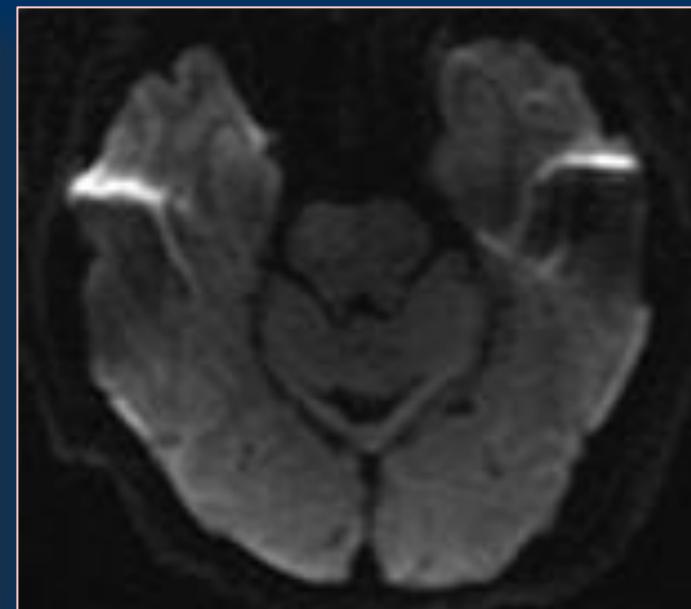
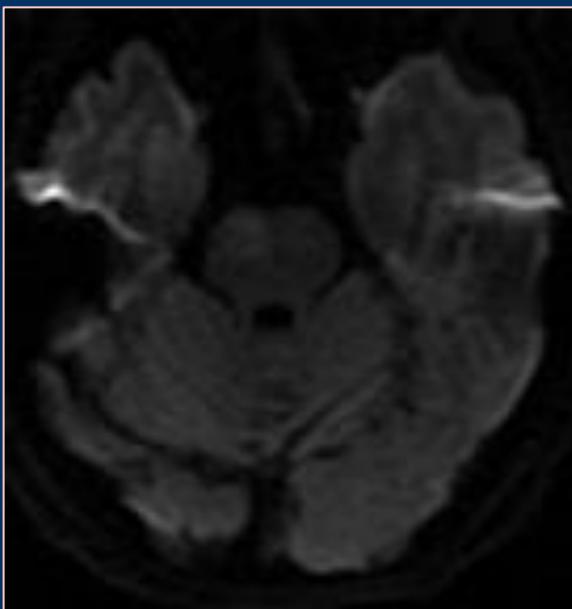


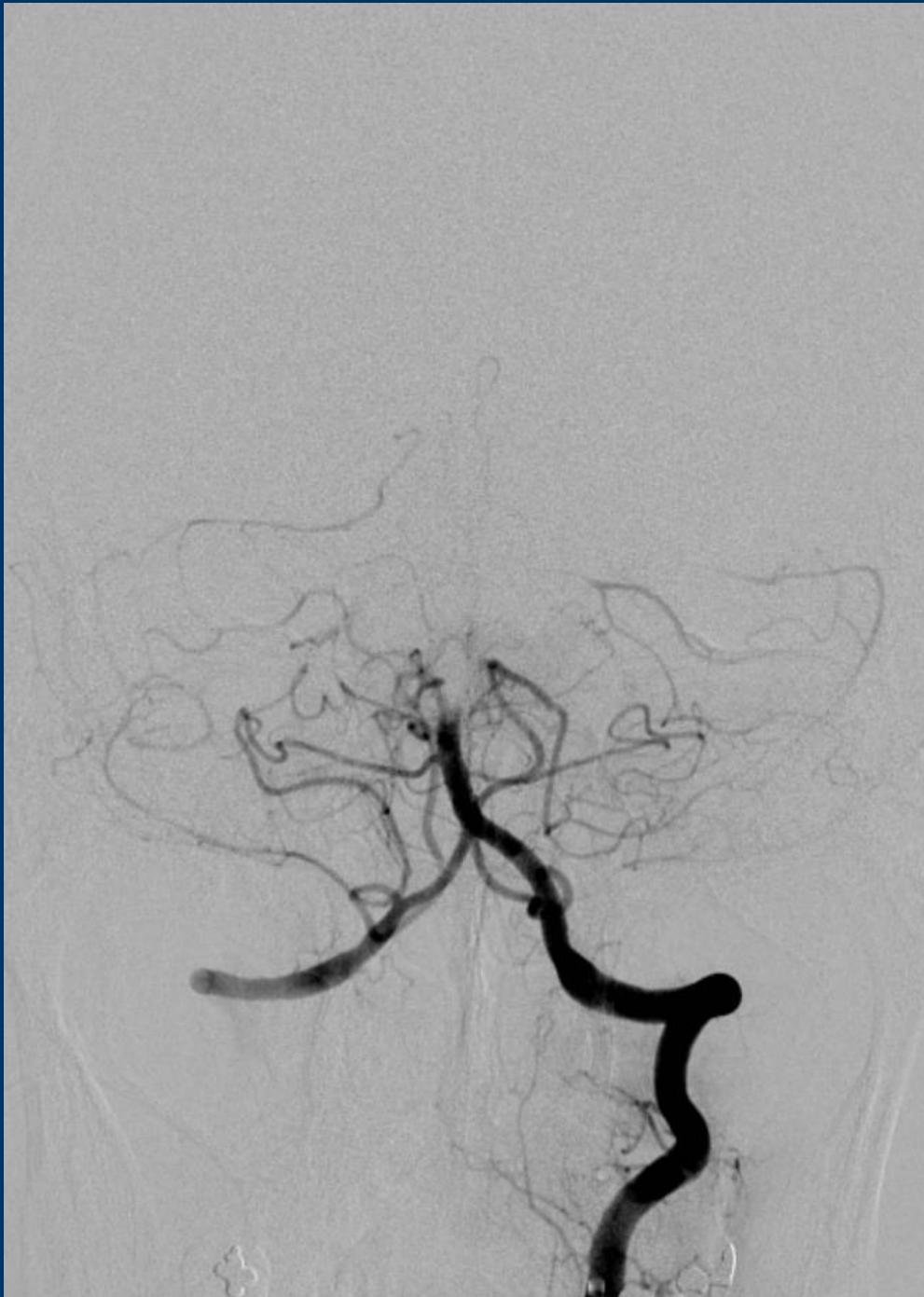
THROMBO-ASPIRATION

- Montée d'un cathéter à large lumière au contact du caillot et aspiration
- Aspiration manuelle (*Vallee JN. Neurology. 2003*)
- Aspiration par pompe

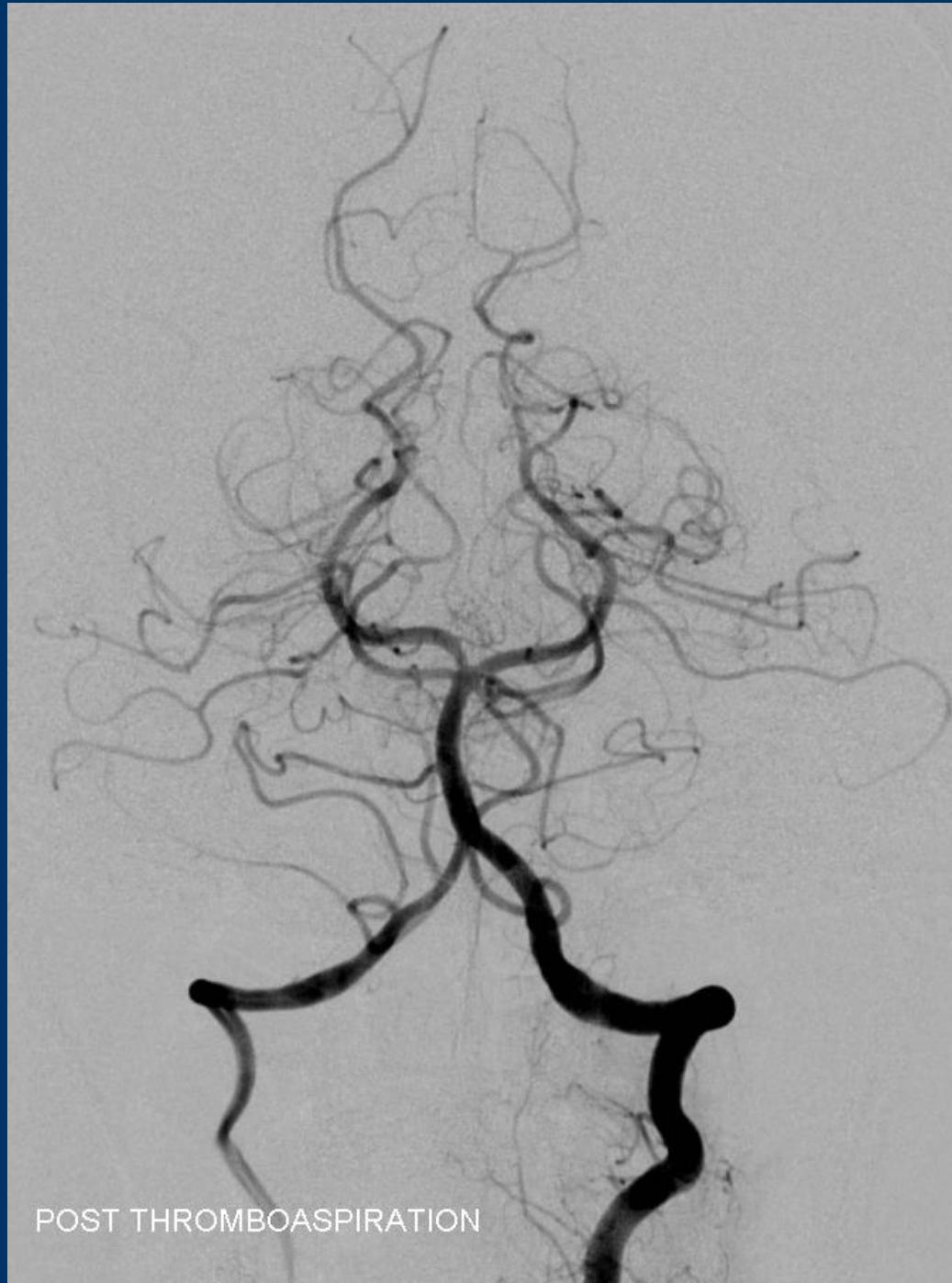


- ***Patiente de 63 ans***
- ***Hémiplégie G***
- ***NIHSS = 12***
- ***Patiente en salle d'angio à H7***









INDICATIONS TM

« Règle des 6 »

- NIHSS ≥ 6
- Délai $\leq 6h$
- ASPECT ≥ 6

RÉSULTATS

- **Recanalisation (TICI 2B ou 3) :**
 - stentriever : 75 à 90%
 - aspiration seule : 50 à 60%
- **Complications :**
 - oedème/hémorragie de reperfusion
 - perforation
 - migration d'embole dans un territoire sain (5 à 10%)

rTPA IV vs rTPA IV + TM

- *ESCAPE* : + 23,7% en faveur TM
- *REVASCAT* : + 15,5% en faveur TM
- *MR CLEAN* : + 13,5% en faveur TM
- *EXTEND-IA* : + 31% en faveur TM
- *SWIFT Prime* : + 24,7% en faveur TM

POPULATION AGÉE (≥ 80 ANS)

- **MR CLEAN : 16% patients ≥ 80 ans**
- **Effet positif de la TM sur cette population : OR = 3,24, 95% CI : 1,21-8,62)**

Consensus



Mechanical thrombectomy in acute ischemic stroke: Consensus statement by ESO-Karolinska Stroke Update 2014/2015, supported by ESO, ESMINT, ESNR and EAN

International Journal of Stroke
2016, Vol. 11(1) 134–147
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DOI: 10.1177/1747493015609778
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SAGE

- High age alone is not a reason to withhold mechanical thrombectomy as an adjunctive treatment (Grade A, Level 1a, KSU Grade A) – new.

INDICATIONS TM PATIENTS ≥ 80 ANS

- Patients ≥ 80 ans \rightarrow TM sauf si :
 - mRS > 3 avant AVC
 - comorbidités majeures
 - Score ASPECT < 4

CASE REPORT

Successful endovascular stroke therapy
in a 103-year-old woman

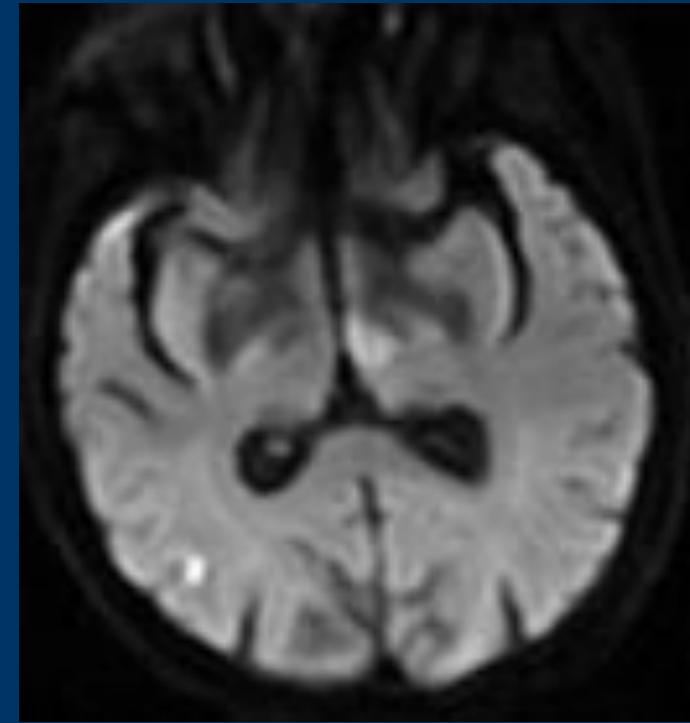
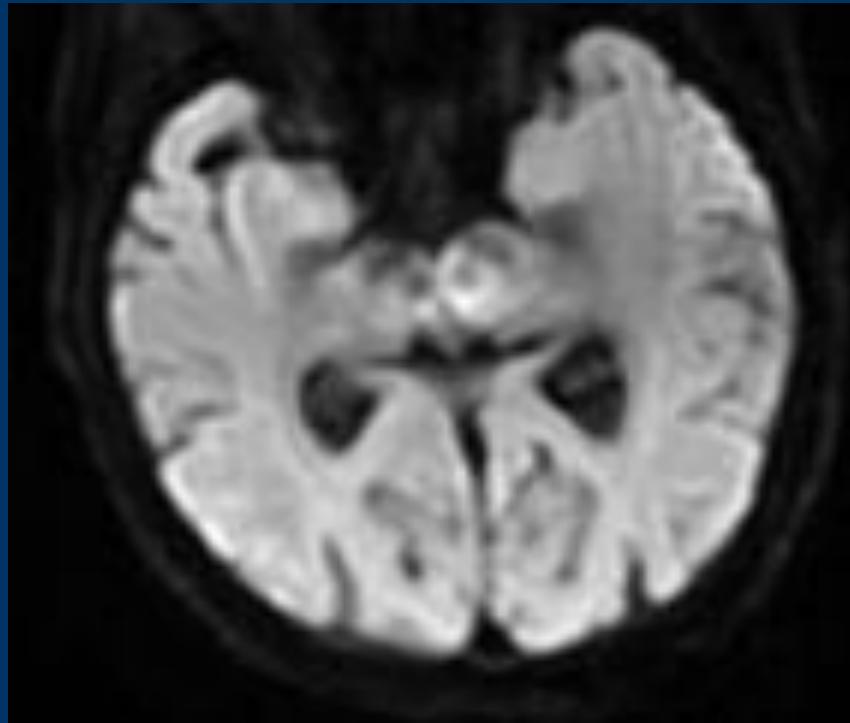
SoHyun Boo,¹ Uzoma B Duru,² Matthew S Smith,² Ansaar T Rai¹

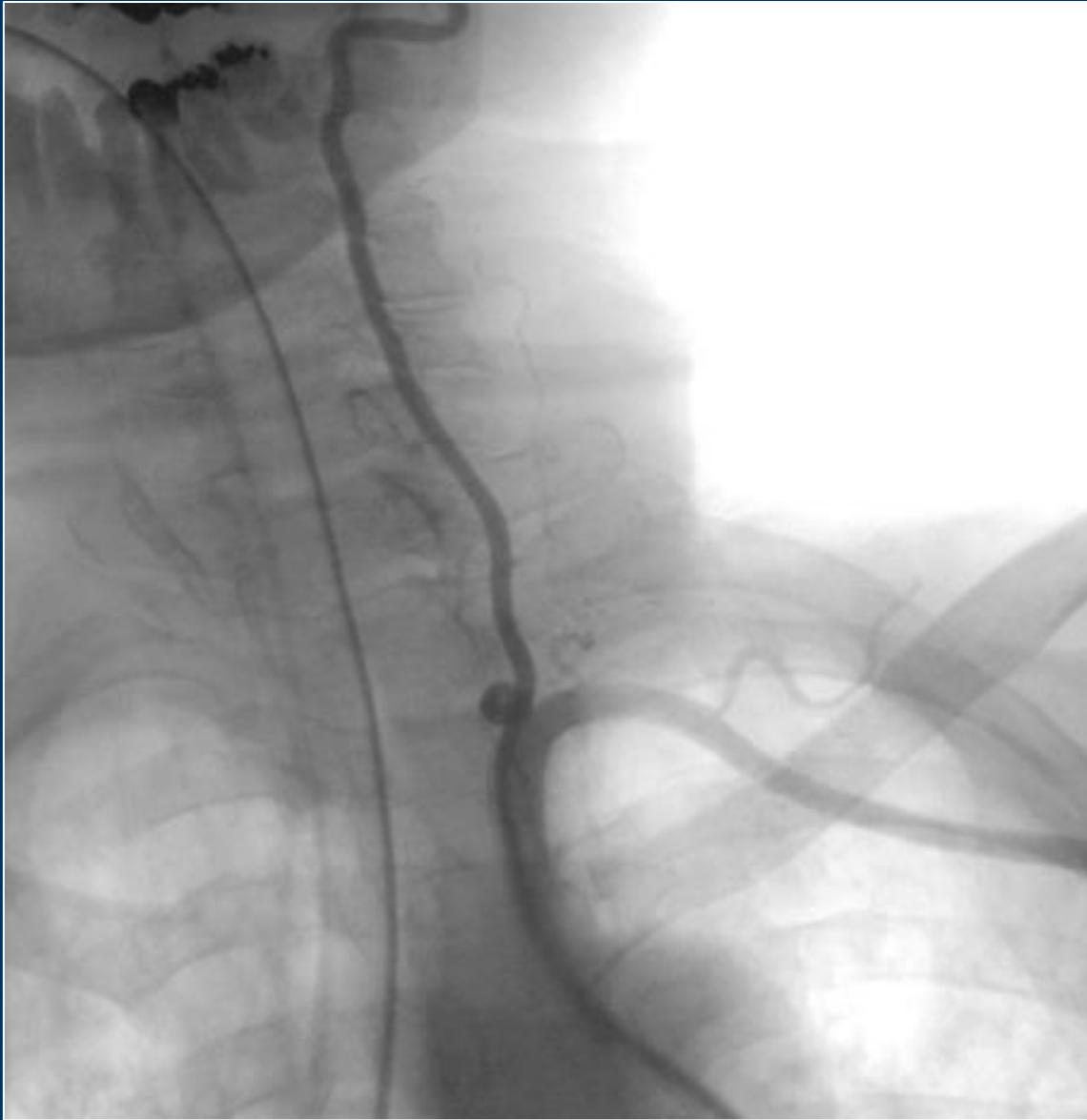
EXEMPLES DE THROMBECTOMIE MÉCANIQUE CHEZ SUJETS ÂGÉS

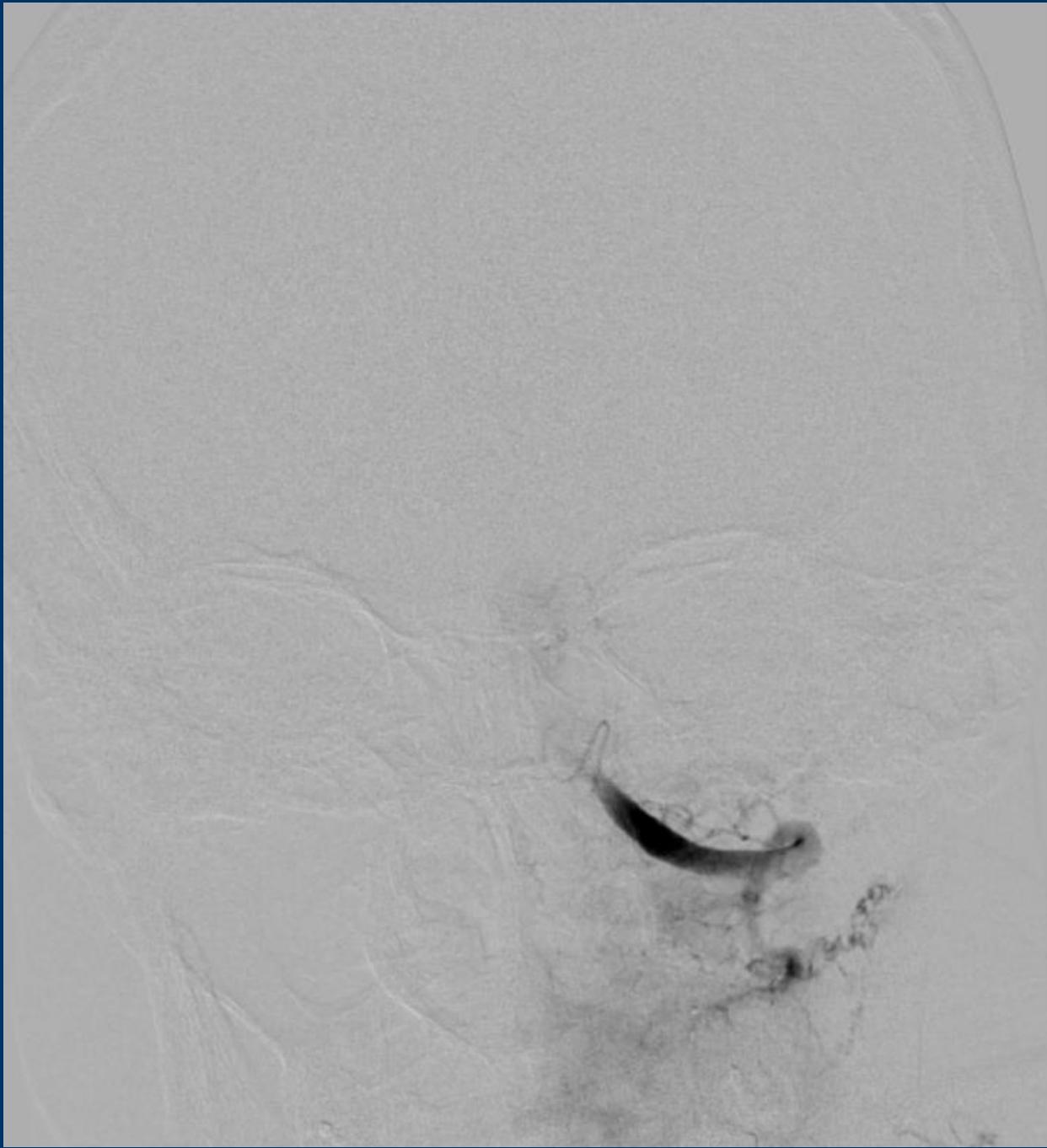


Patiente de 82 ans. Coma brutal





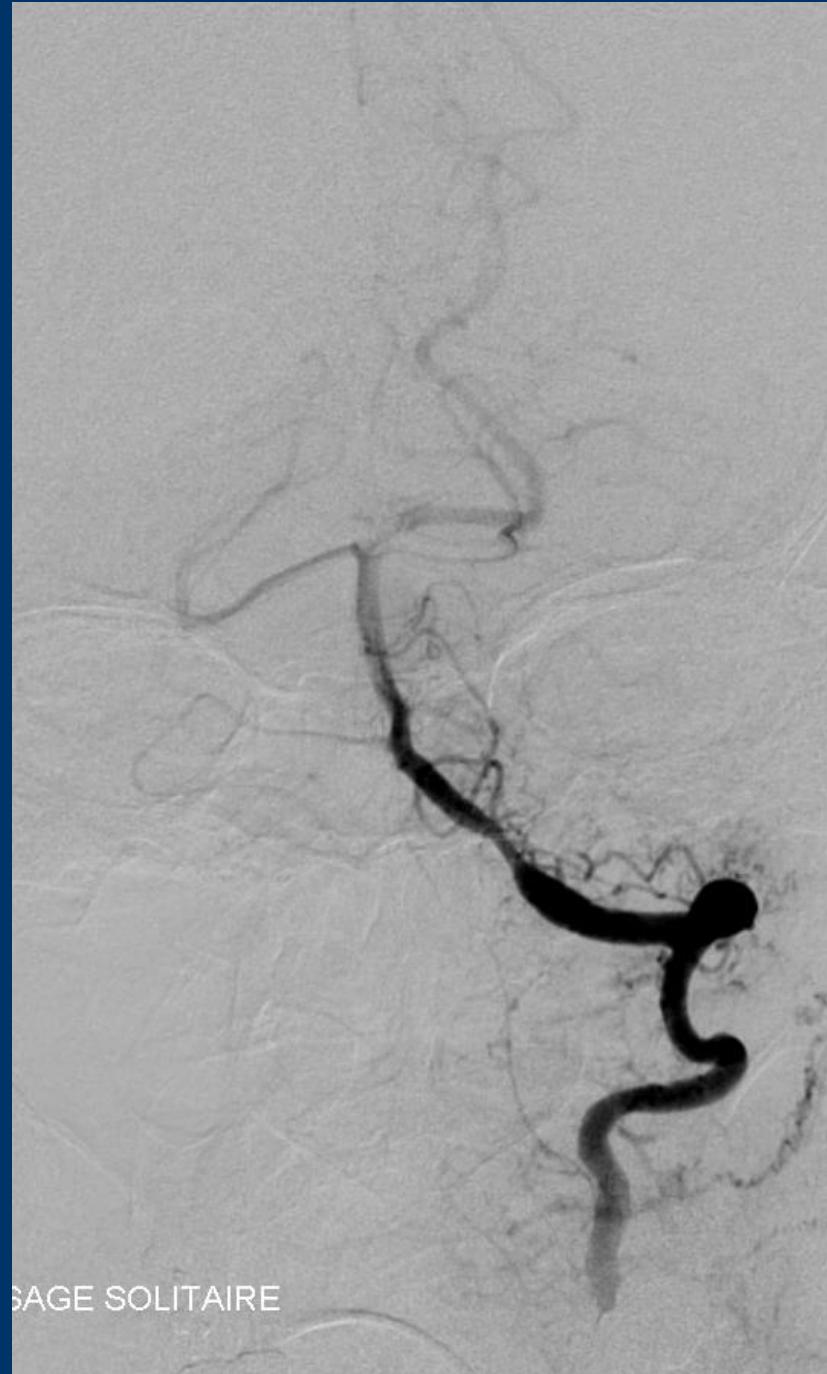




Actualités en Médecine Gériatrique 2016

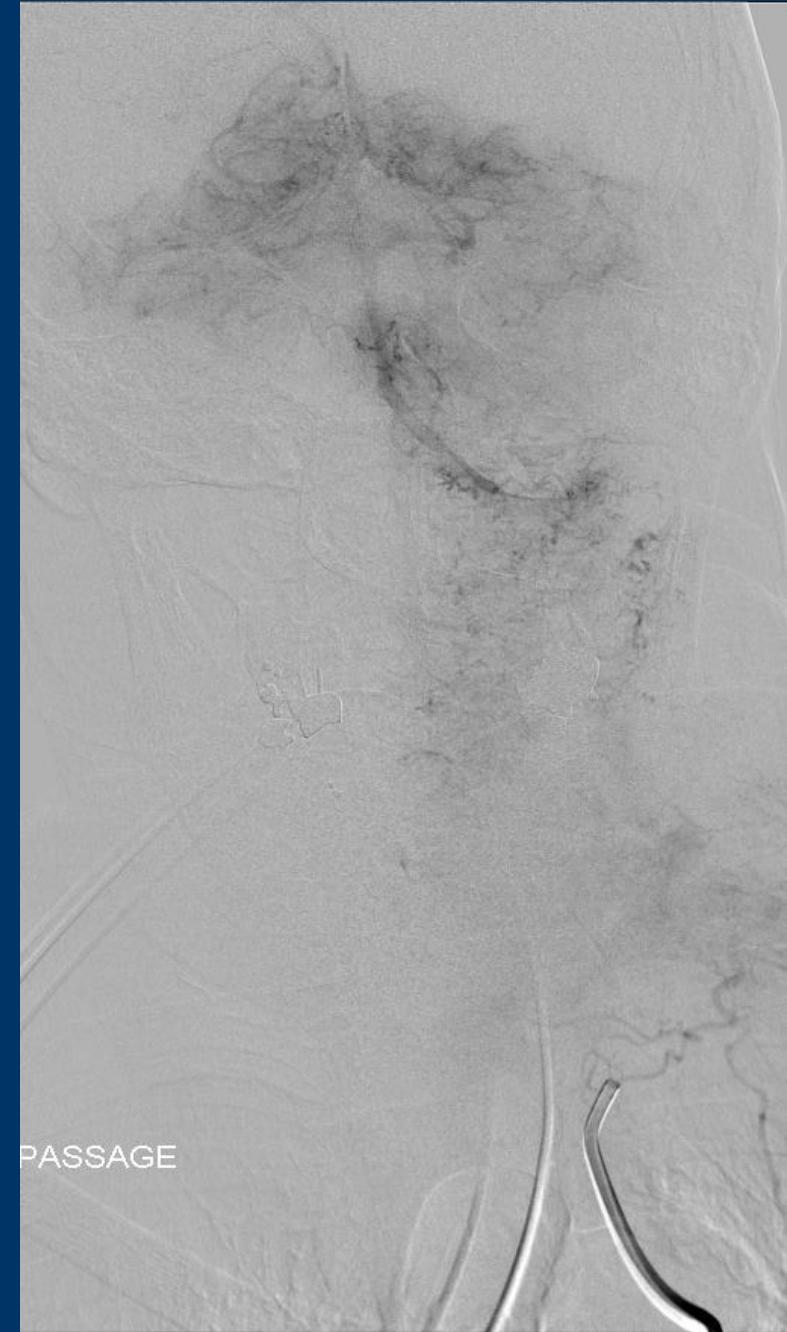
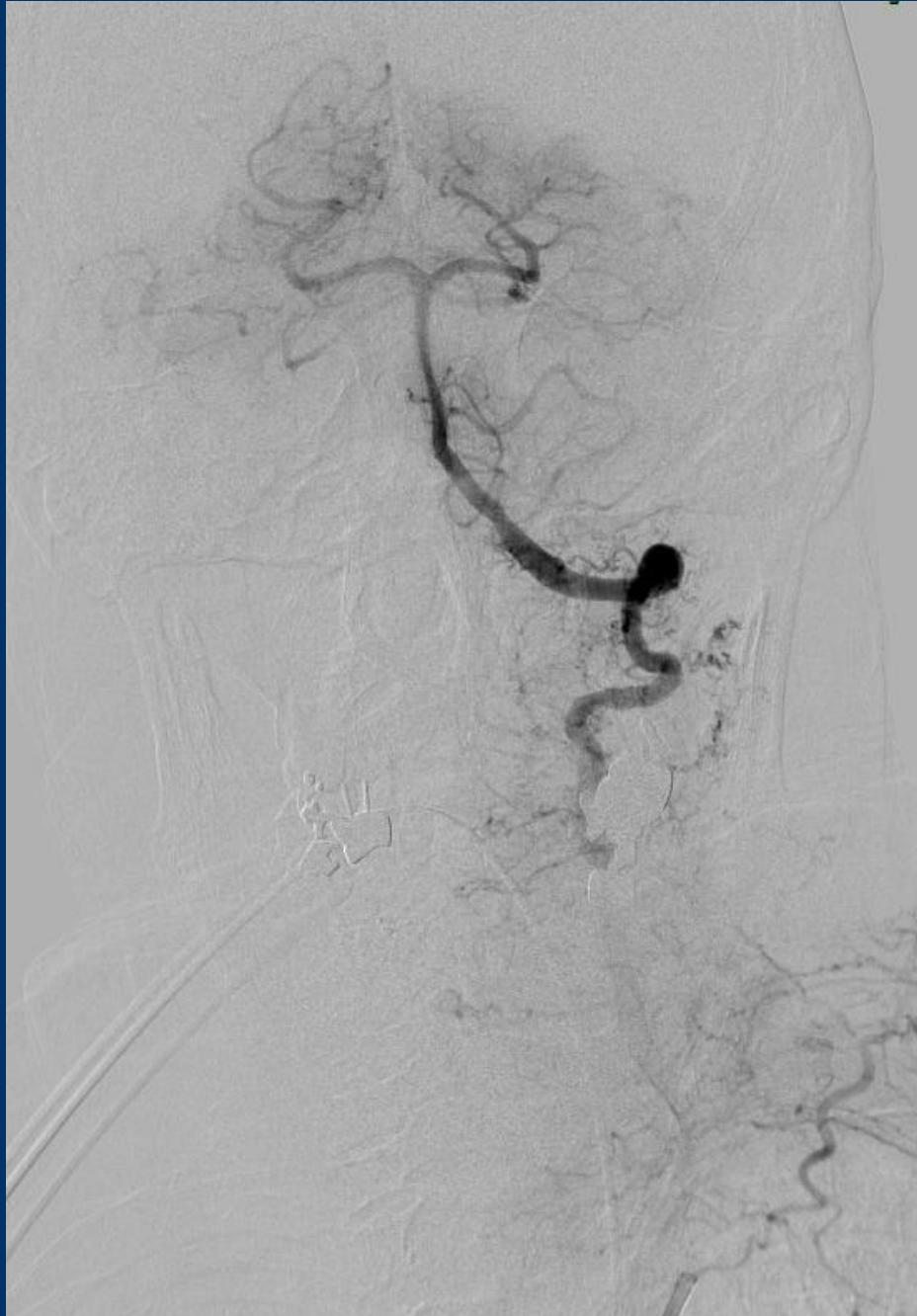


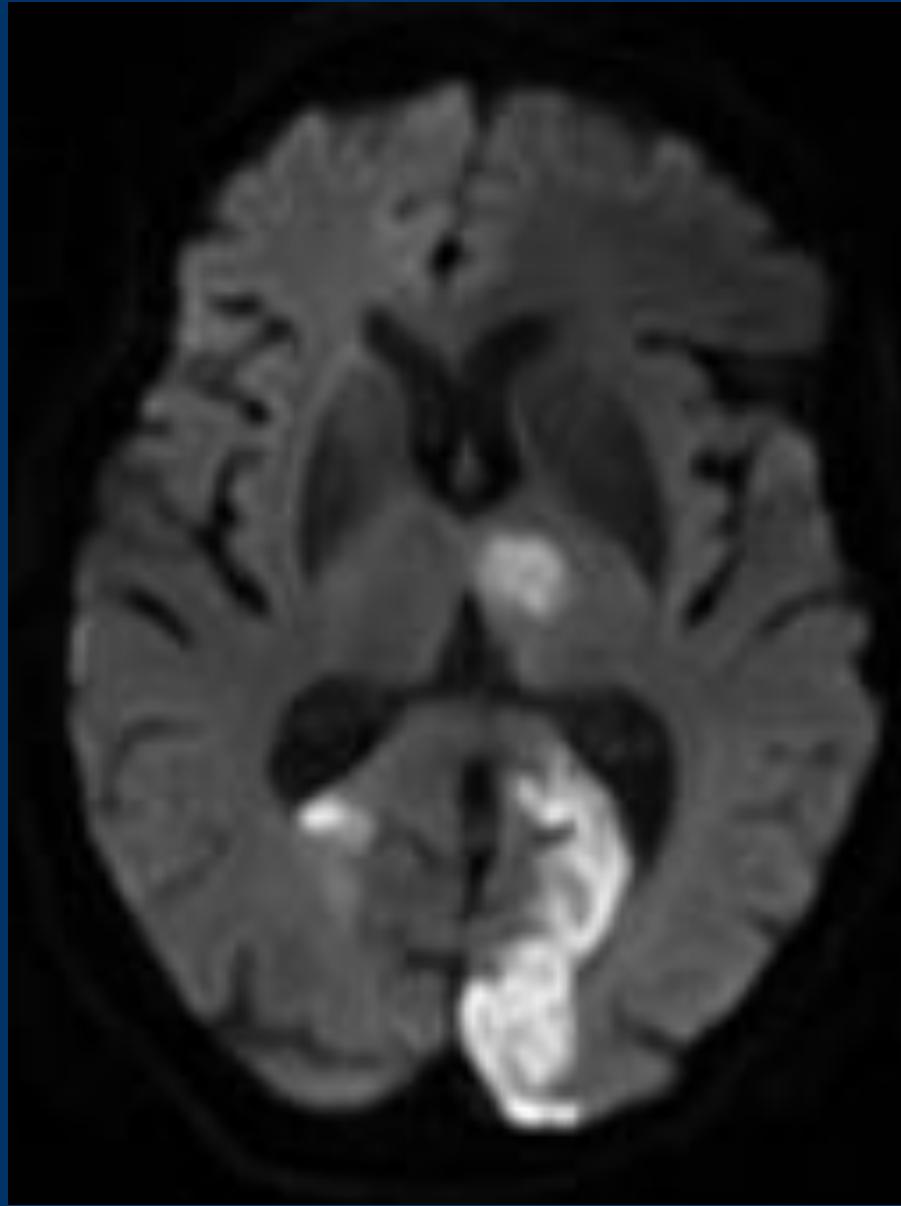


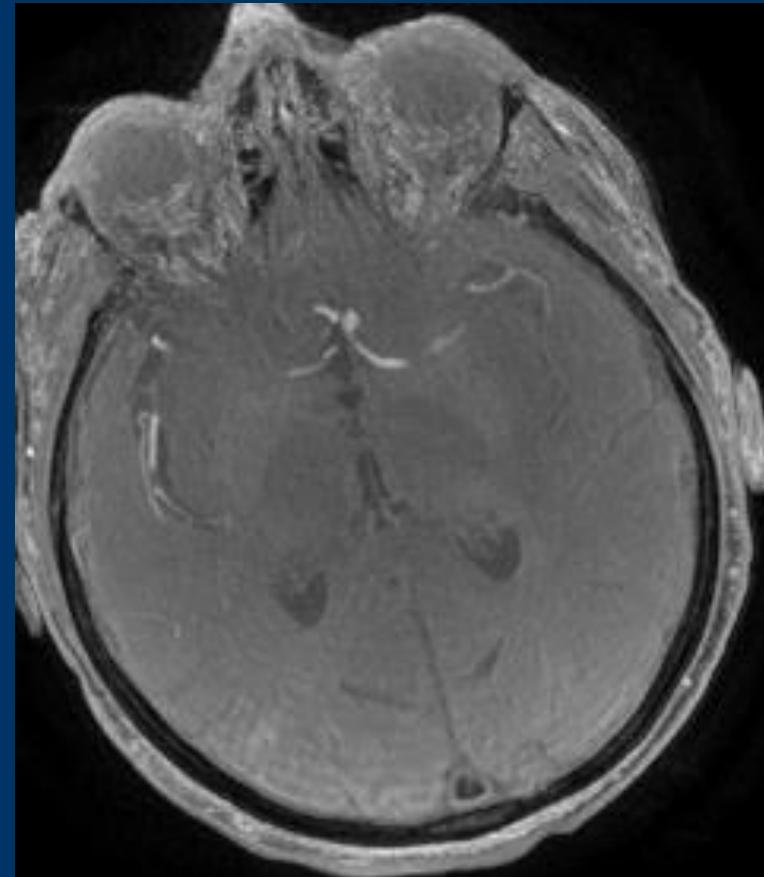
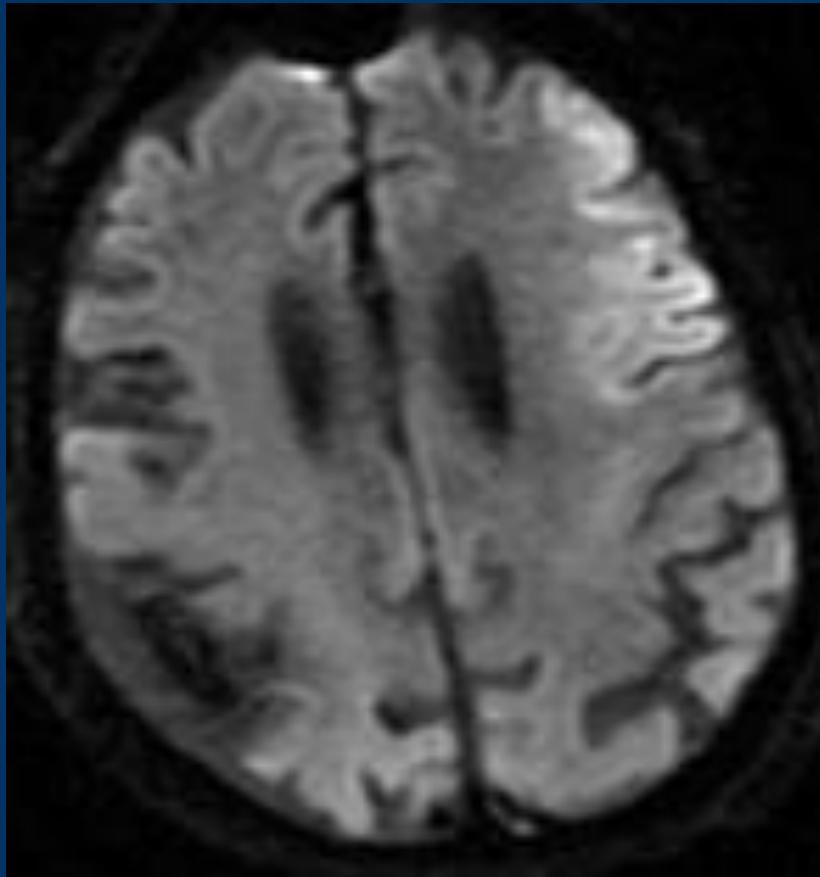


SAGE SOLITAIRE





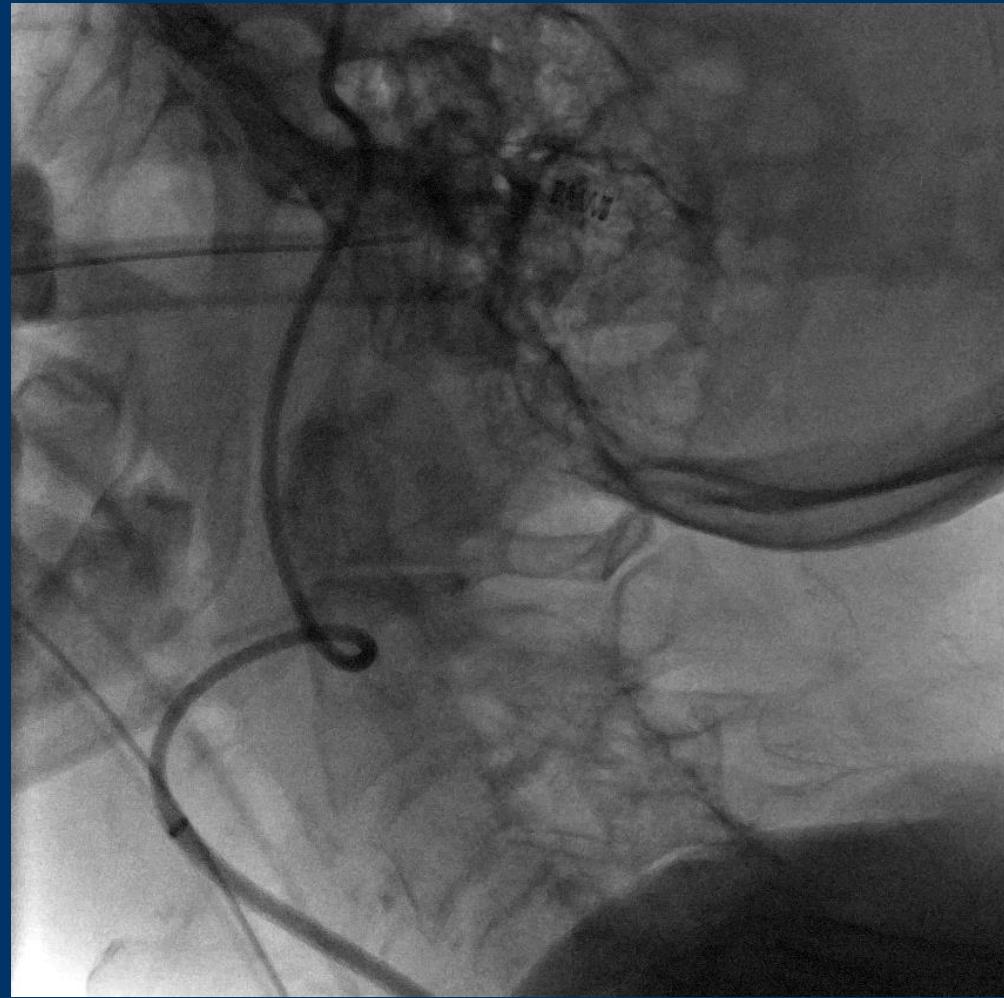
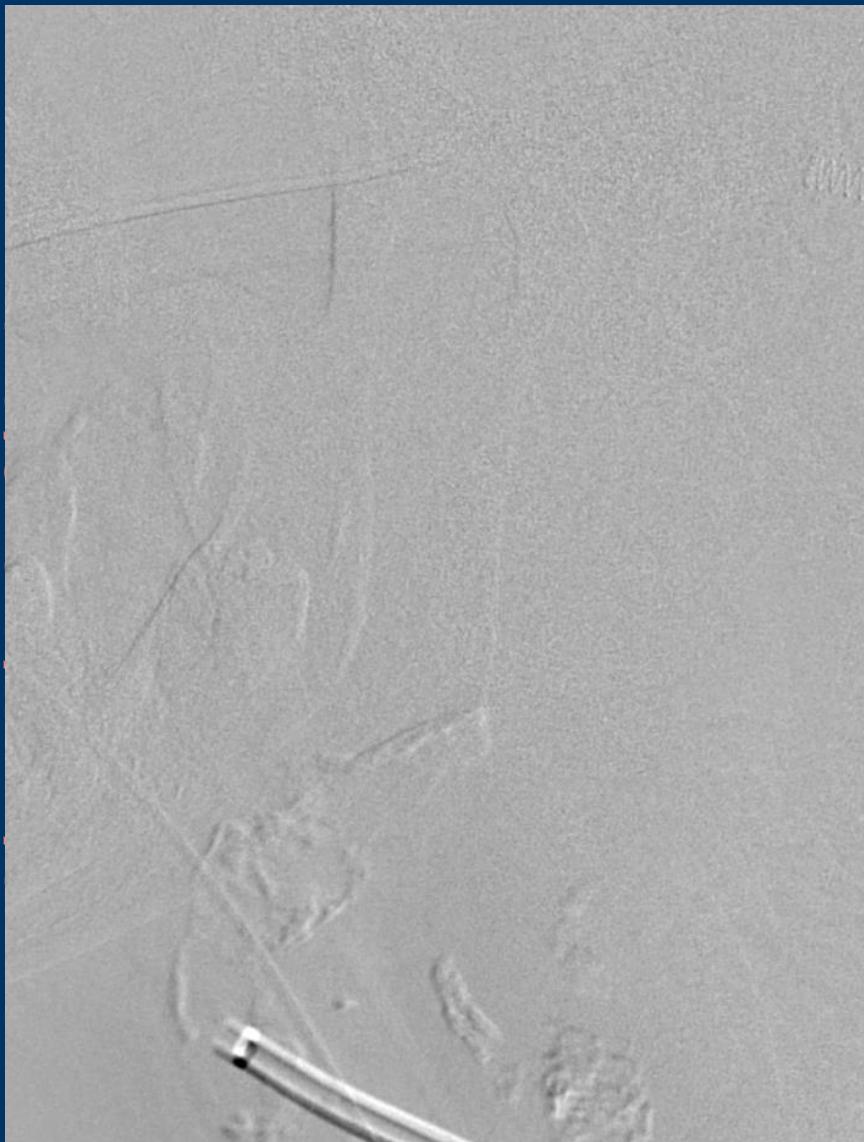




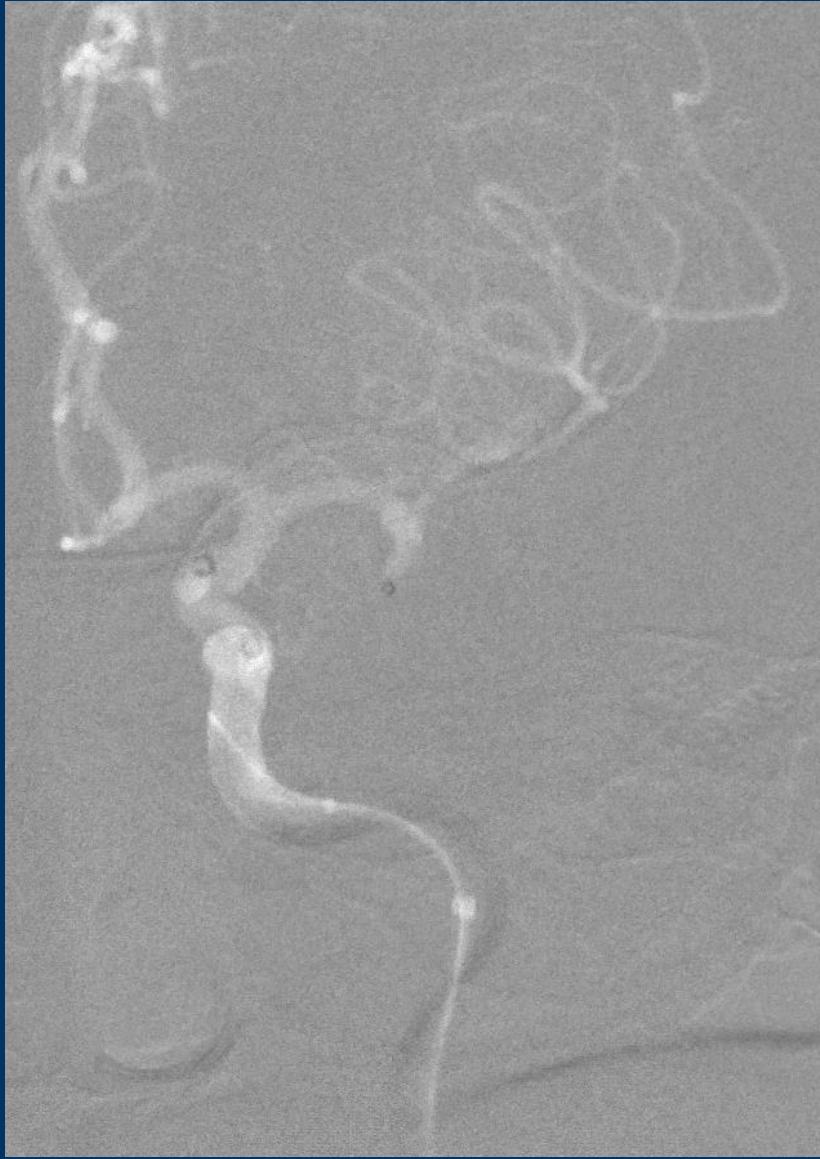
Patient de 89 ans. Déficit ½corps dt. NIHSS = 17

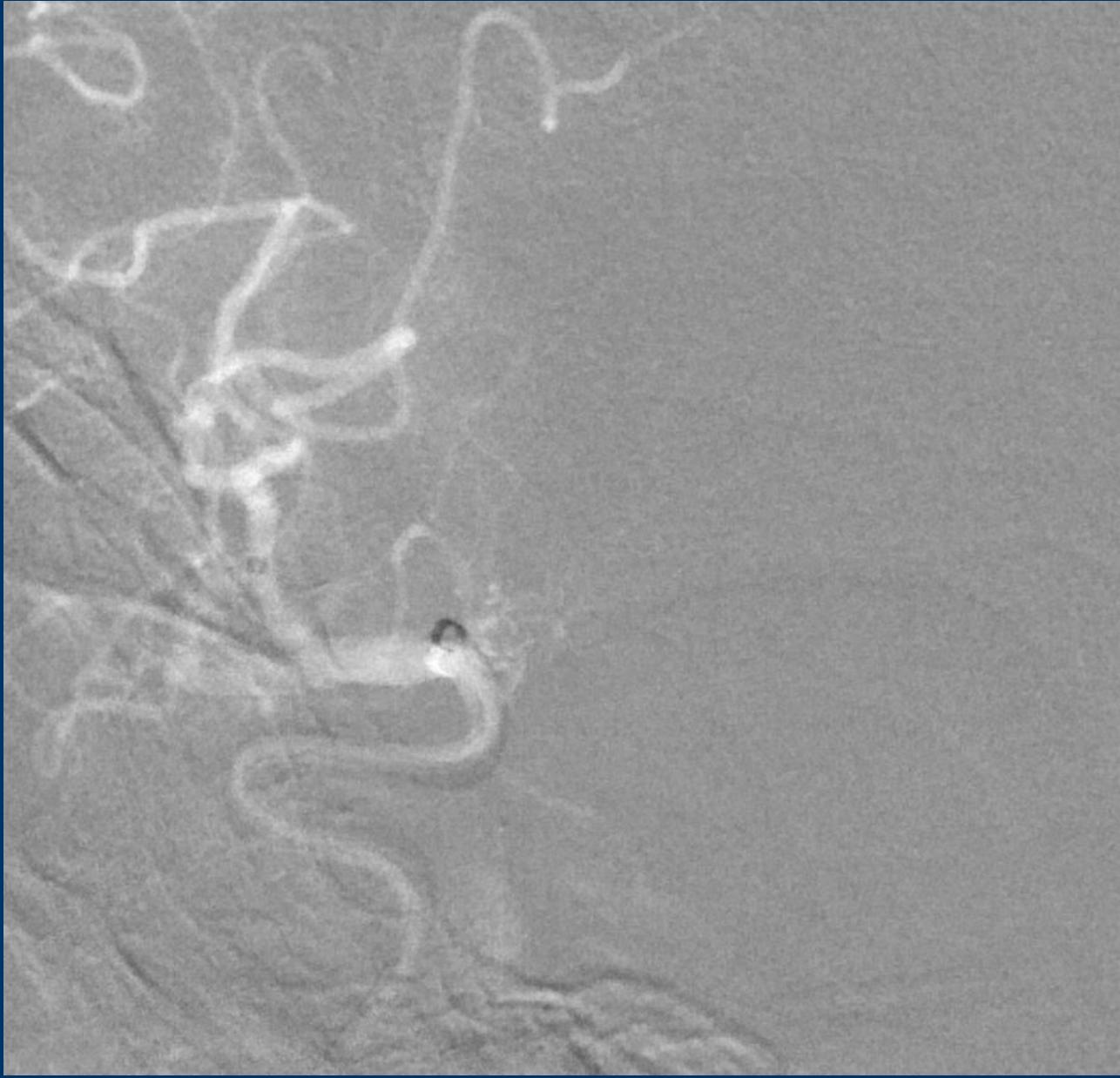










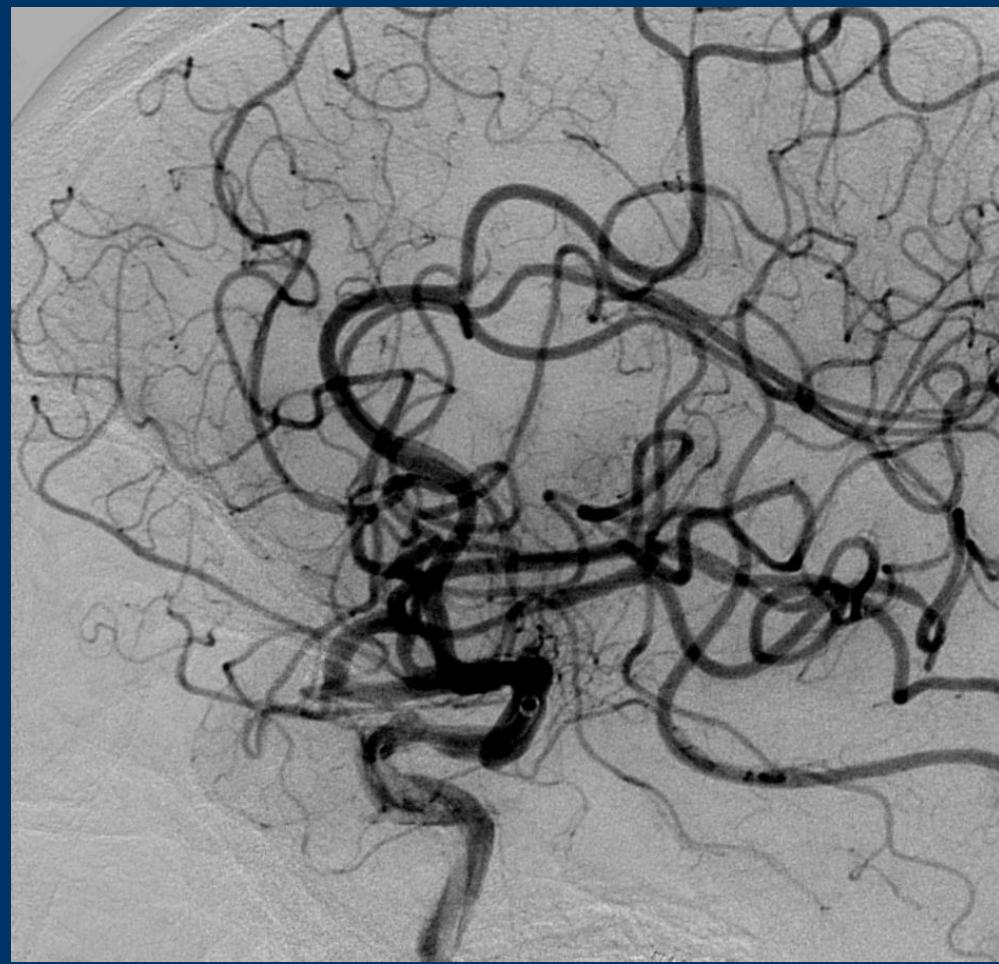
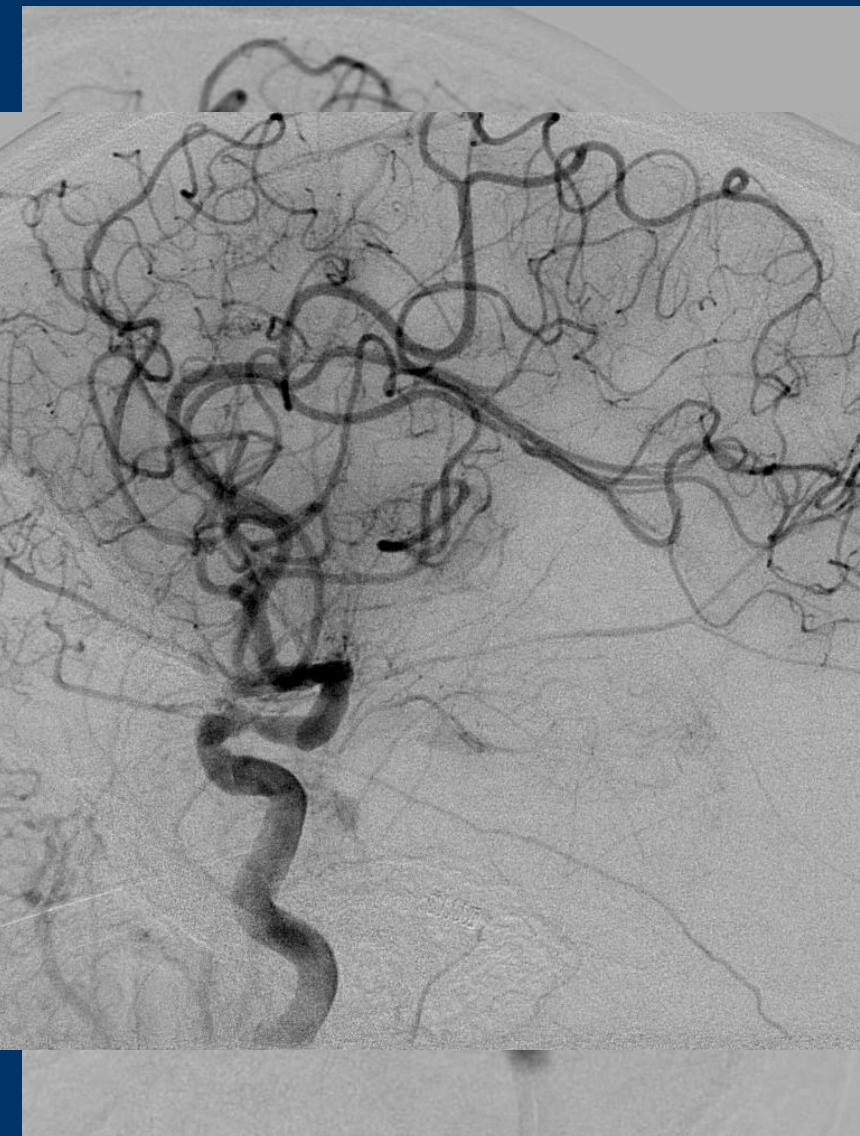


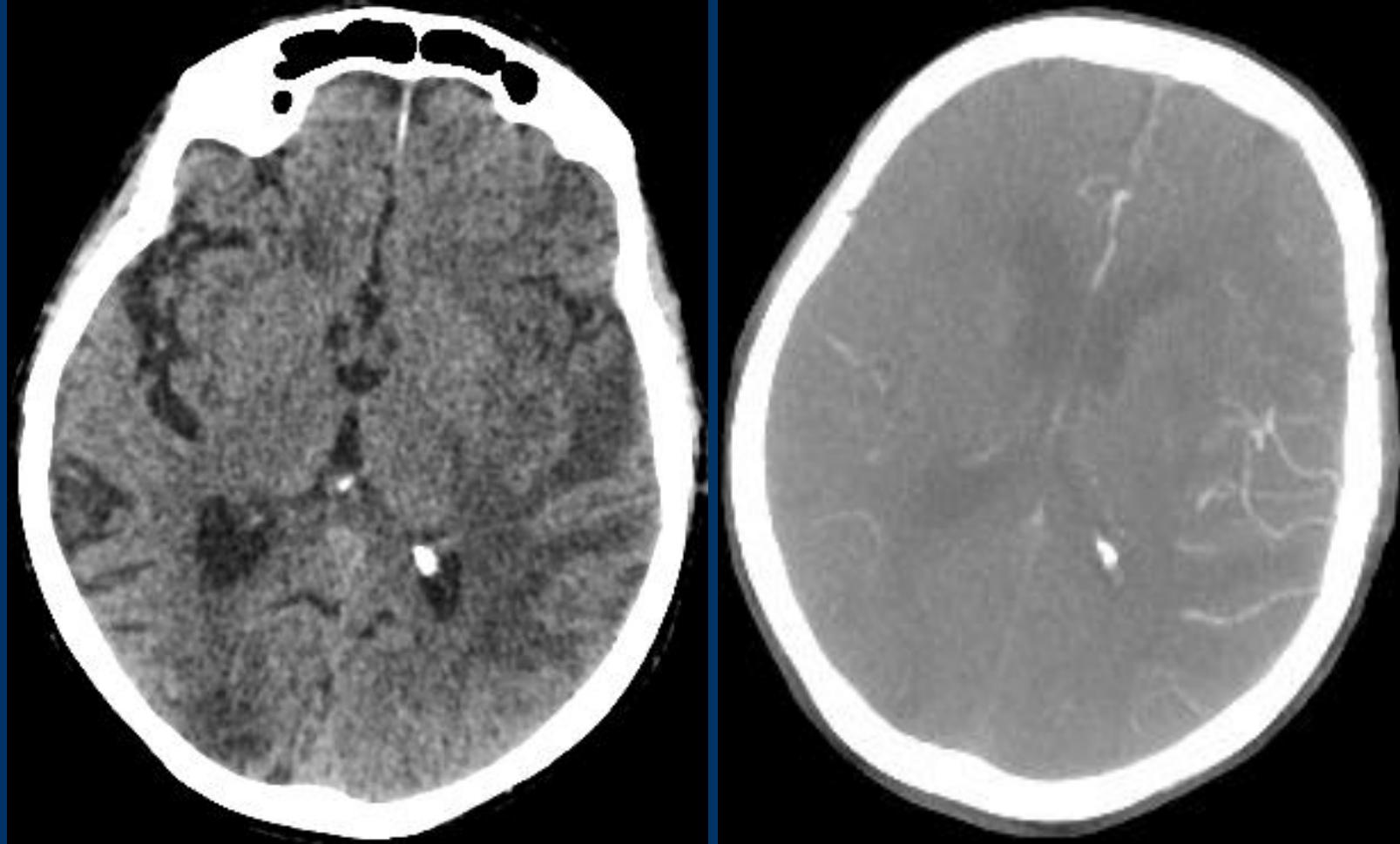
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« Take home » messages



- *L'âge n'est pas une contre-indication à la TM*
- *TM + Ttt médical optimal > Ttt médical seul pour AIC des patients ≥ 80 ans*
- *Règle des « 6 »*

Merci pour votre attention



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frederic.clarencon@aphp.fr*