ESC Heart & Brain Workshop

Workshop 2 catheter-based thrombectomy

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Paris
France

Jan 20th, 2018

ESC Council Stroke
BAYER
Boehringer Ingelheim
Daiichi-Sankyo
Bristol-Myers Squibb
Pfizer
Medtronic
Further, Together

Declaration of Interest

Financial Disclosures (grants[1], presentations[2], consultant[3], meetings[4], other[5])

- French Stroke Foundation[1]
- French Ministery of Health[1,5]
- Boehringer[3,4]
- Servier[3]
- Astra Zeneca[2]
- Bayer[4]
- Medtronic[2,4]
- Acticor[3]
- Amgen[2]
- Club NeuroVasculaire Ile De France[5]

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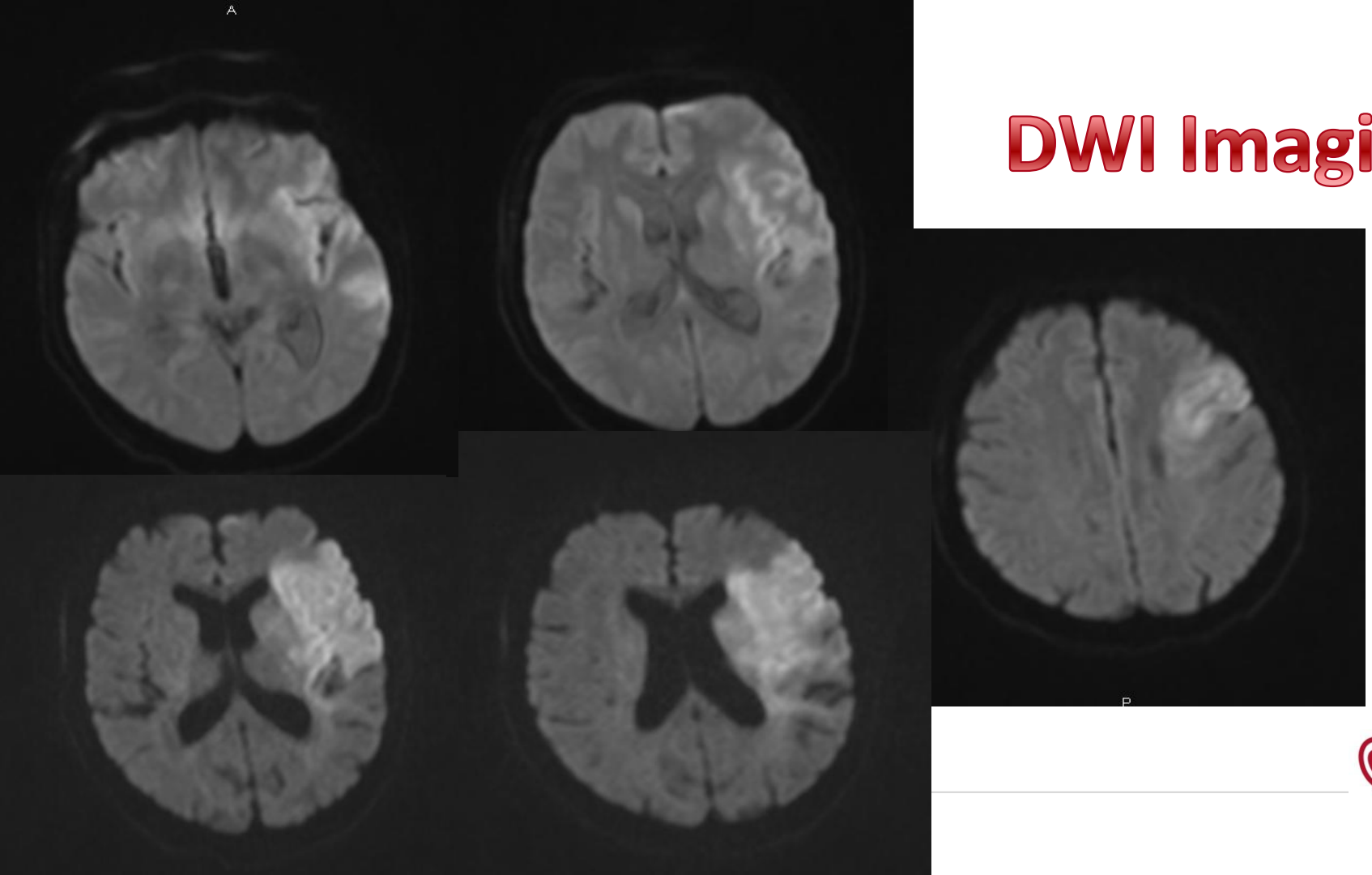
Emergency department of a center without thrombectomy facilities

- 42 old male
- No medical history except for migraine
- No vascular risk factors
- 5:00 pm: Right hemiplegia and aphasia (NIHSS 18)
- MRI 9:05 pm, ASPECTS 5

ESC Council Stroke

DWI Imaging



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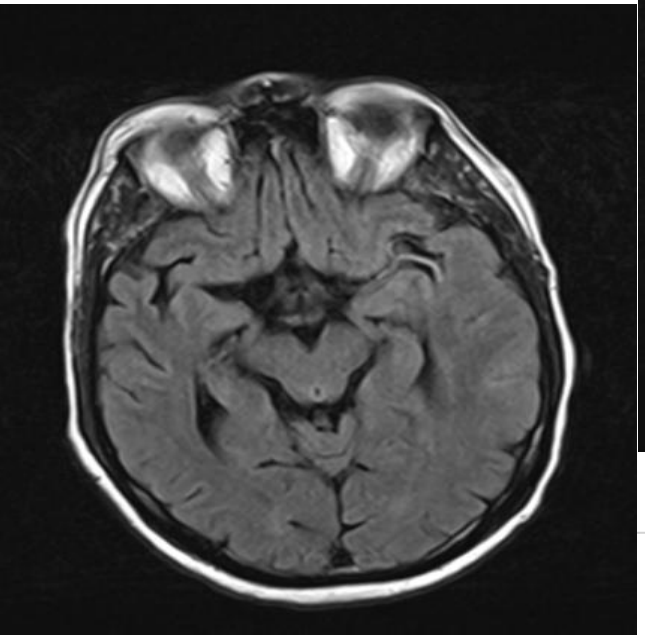
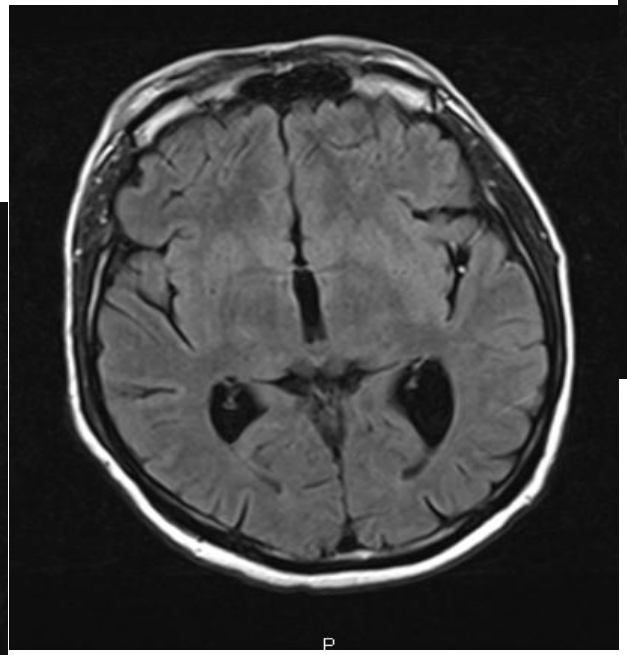
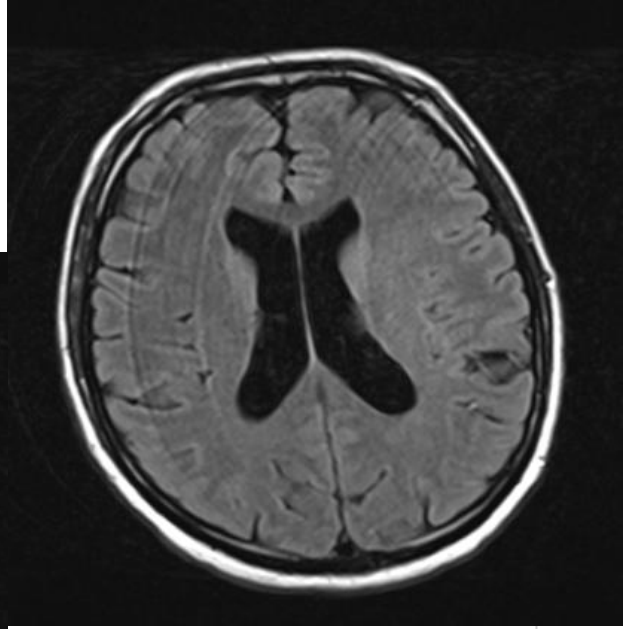
FLAIR Imaging







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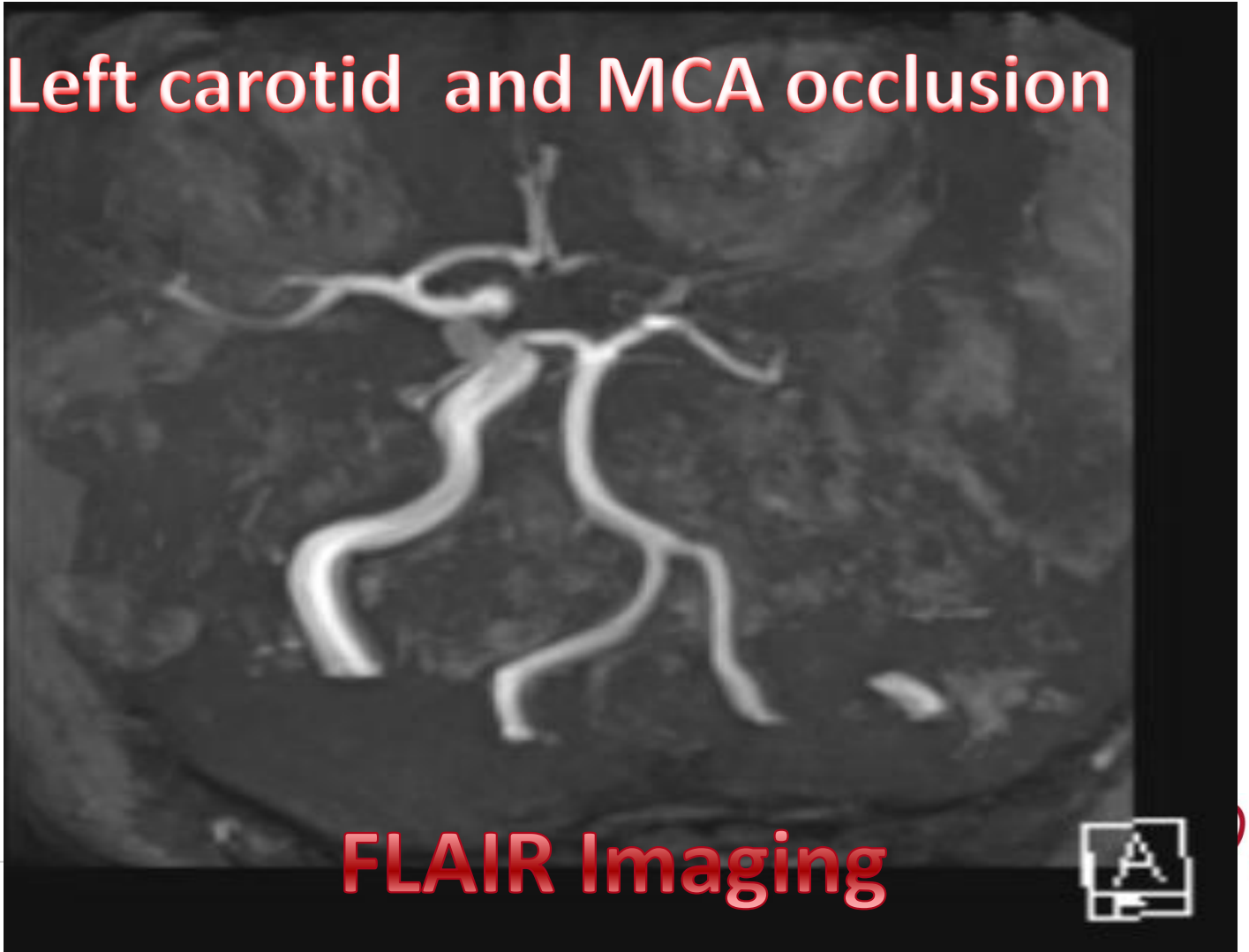
Left carotid and MCA occlusion



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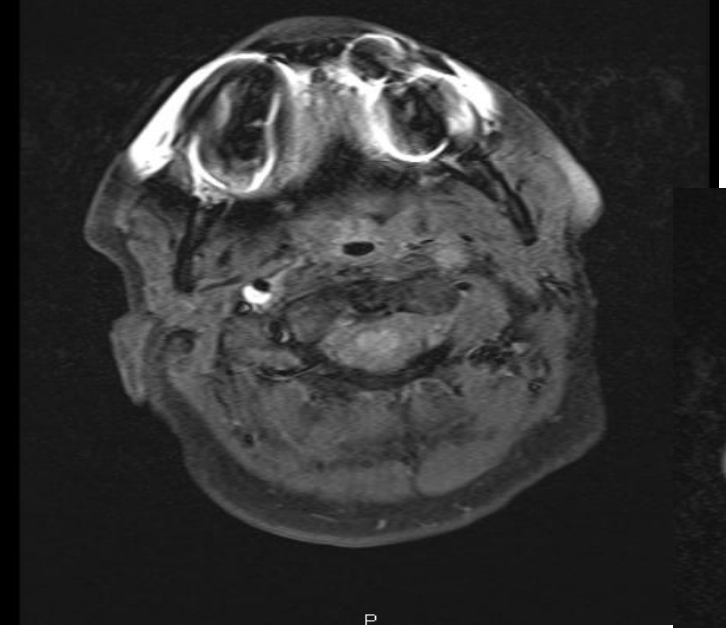
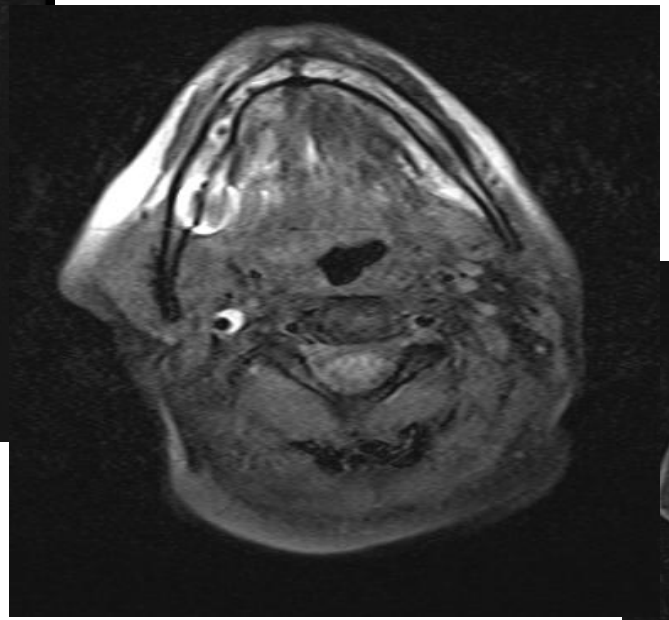
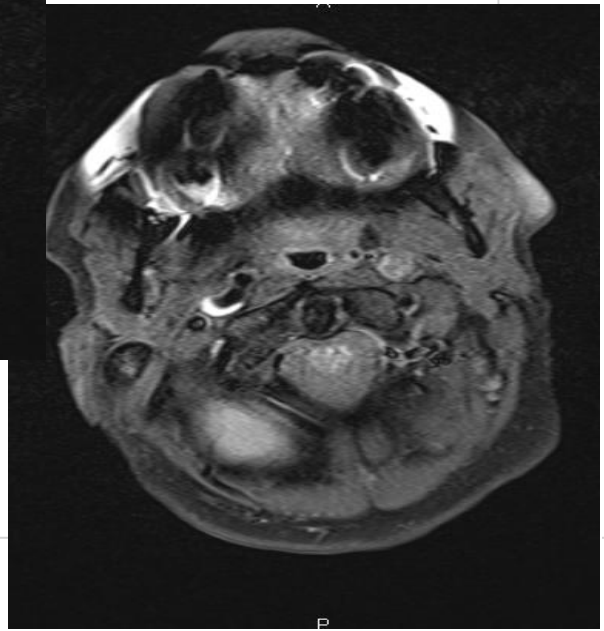
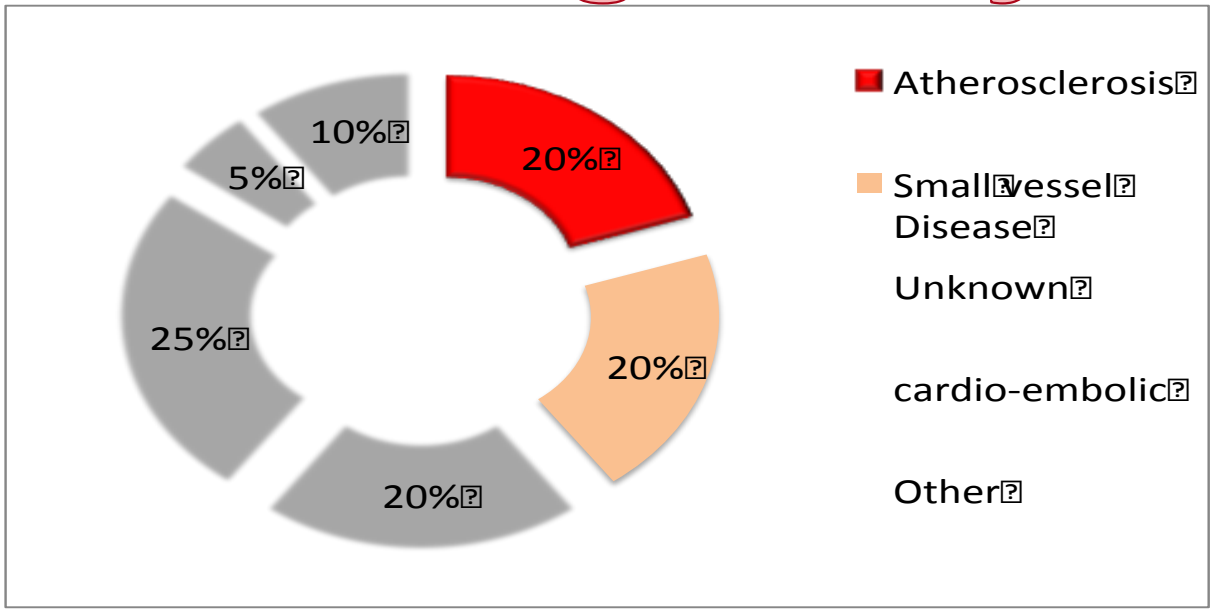
Right carotid dissection

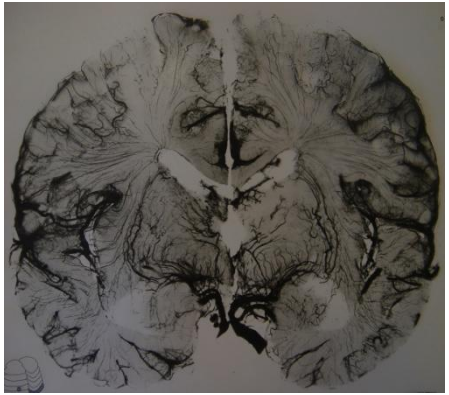






Stroke heterogeneity





Adams et al Stroke 2007

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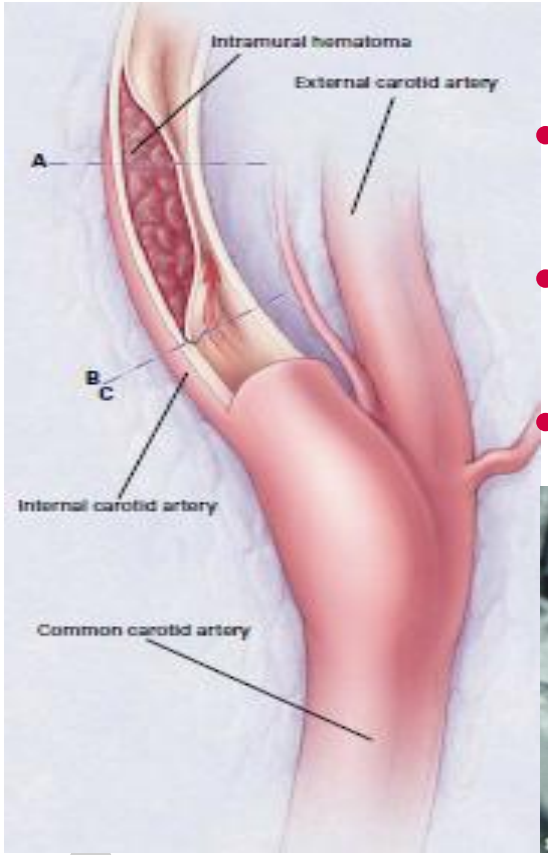
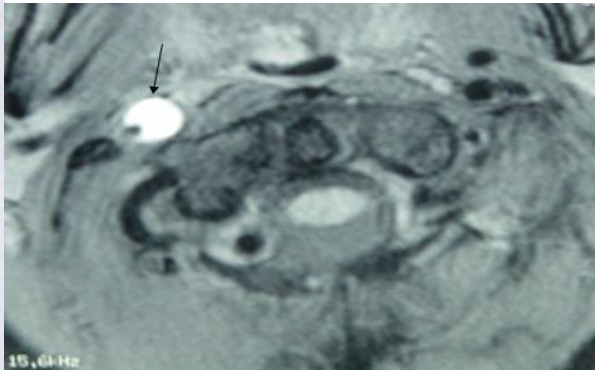
Carotid Artery dissection



- Incidence: 2.5 -3 / 100 000/yr
- 2% of all brain infarction
- 25% of brain infarction <45 years



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Schievink et al NEJM 2001

Question #1- What therapeutic option do you consider?

A. IV aspirin, transfer to stroke unit
B. Clopidogrel and aspirin, immediate transfer to CSC
C. No IV-tPA , immediate transfer to CSC to angio suite
D. IV-tPA , immediate transfer to CSC to angio suite

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Question #1- What therapeutic option do you consider?

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Consensus

International Journal of Stroke WSO

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
wso.sagepub.com
SAGE

- Thrombectomy **in association** with IV tPA within 4.5 h
- LVO of **anterior circulation within 6 h**
- **IV tPA should not delay** thrombectomy
- Thrombectomy to be considered as a first-line choice in the setting of tPA contra-indication

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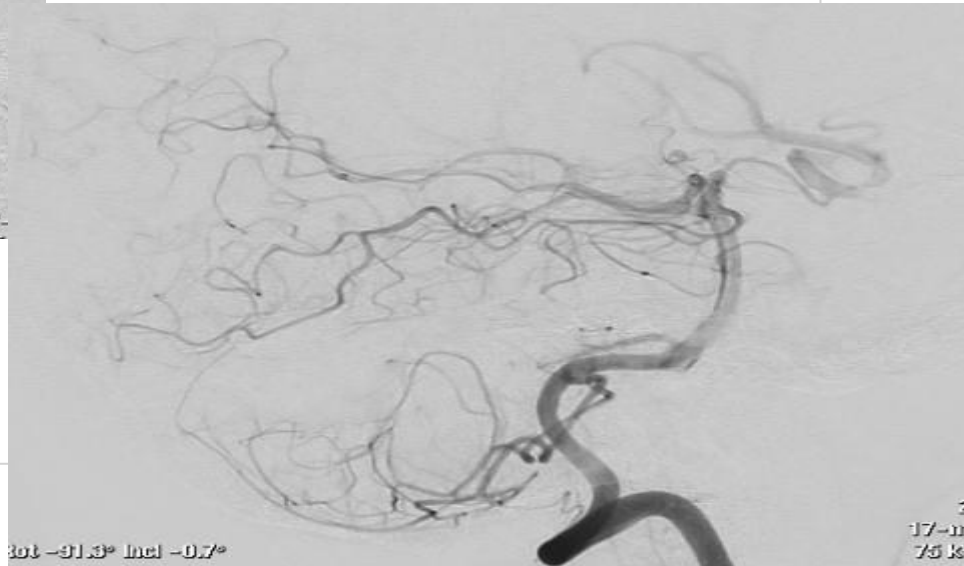
11:30 pm

+6:30 LSN

NIHSS 18

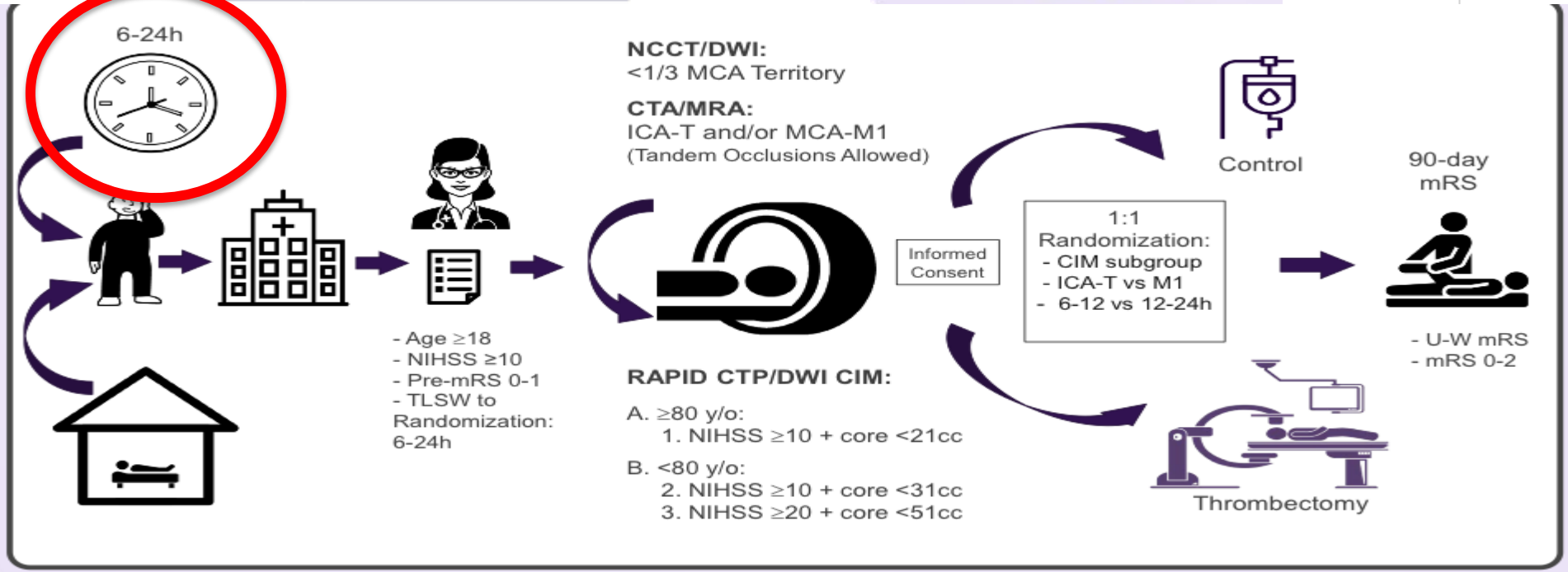


Collateral supply from a Com, p Com and pial arteries (ACA)

ESOC 2017

3rd European Stroke Organisation Conference

DAWN TRIAL



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Thrombectomy reduces disability up to 24 h

	Trevo	MM	Treatment benefit (95% CI)	Bayesian probability of superiority
Day 90 weighted mRS	5.5 ± 3.8	3.4 ± 3.1	2.1 (1.20, 3.12)	>0.9999*
Day 90 mRS (0-2)	48.6%	13.1%	35.5% (23.9%, 47.0%)	>0.9999*

Favorable outcome

ESOC 2017

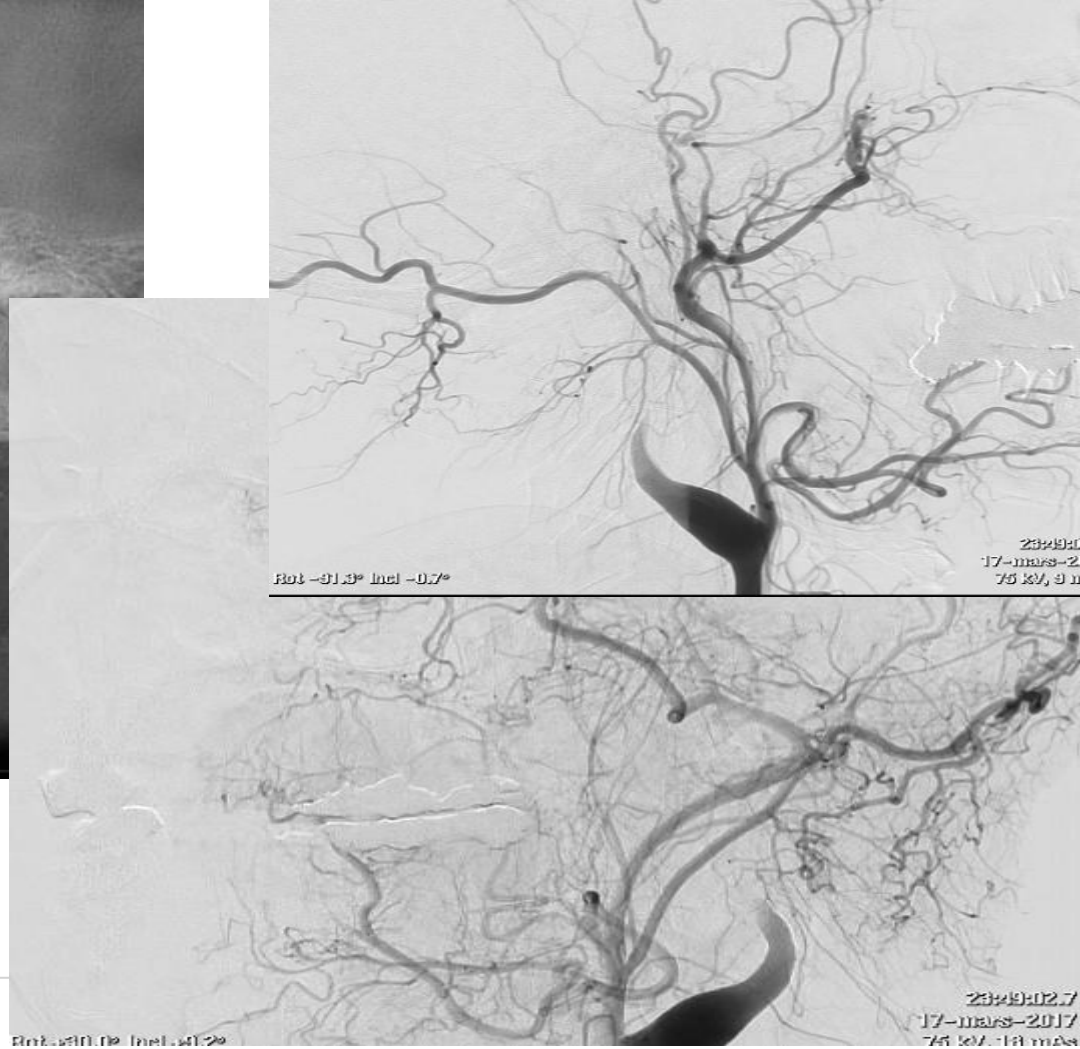
3rd European Stroke Organisation Conference

16-18 May, 2017 | Prague, Czech Republic

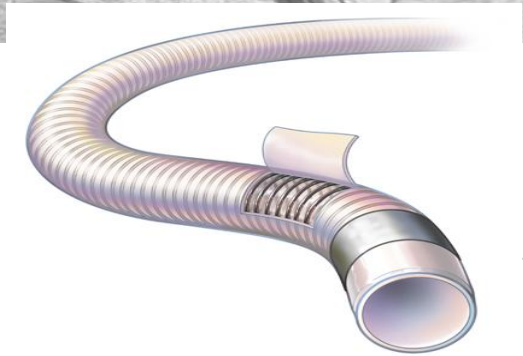
73% relative risk reduction of dependency in ADL's

NNT for any lower disability 2.0

DAWN



Left carotid artery occlusion



Aspiration approach

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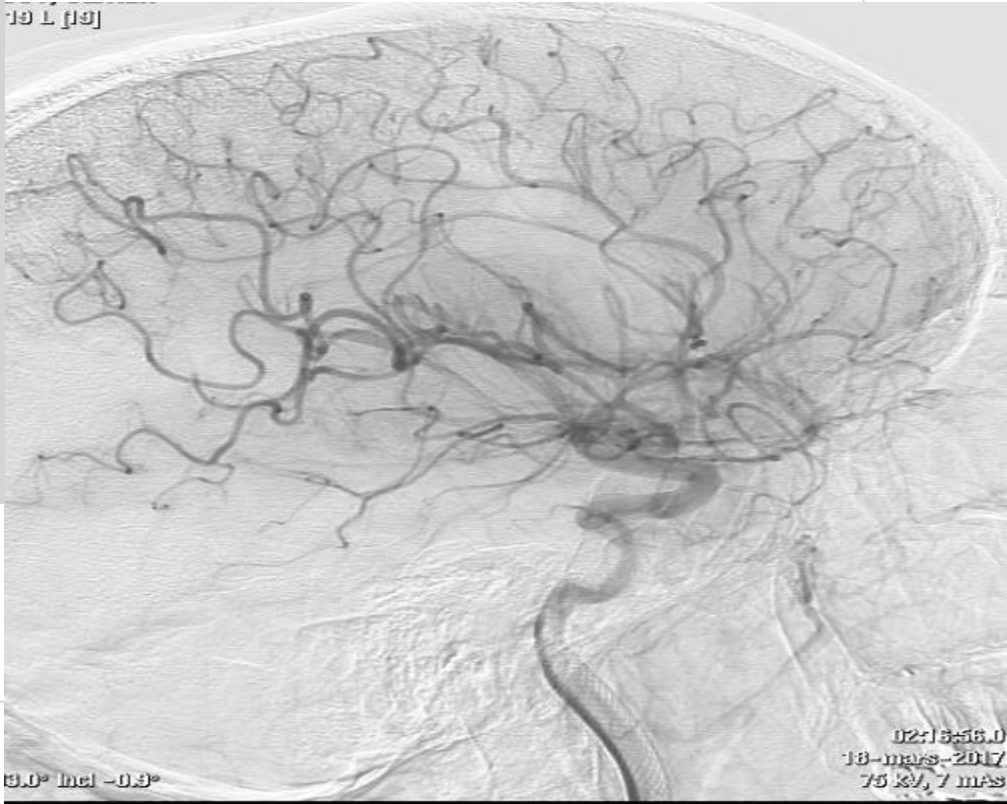
Final angiogram after 3 passes: TICI 2b



1:34 am
(8h 34min from LSN)

Question # 2- in the cathlab, you decide

A. Stenting of the left extracranial carotid

B. Angioplasty alone of the left extracranial carotid

C. Left carotid occlusion

D. No endovascular therapy

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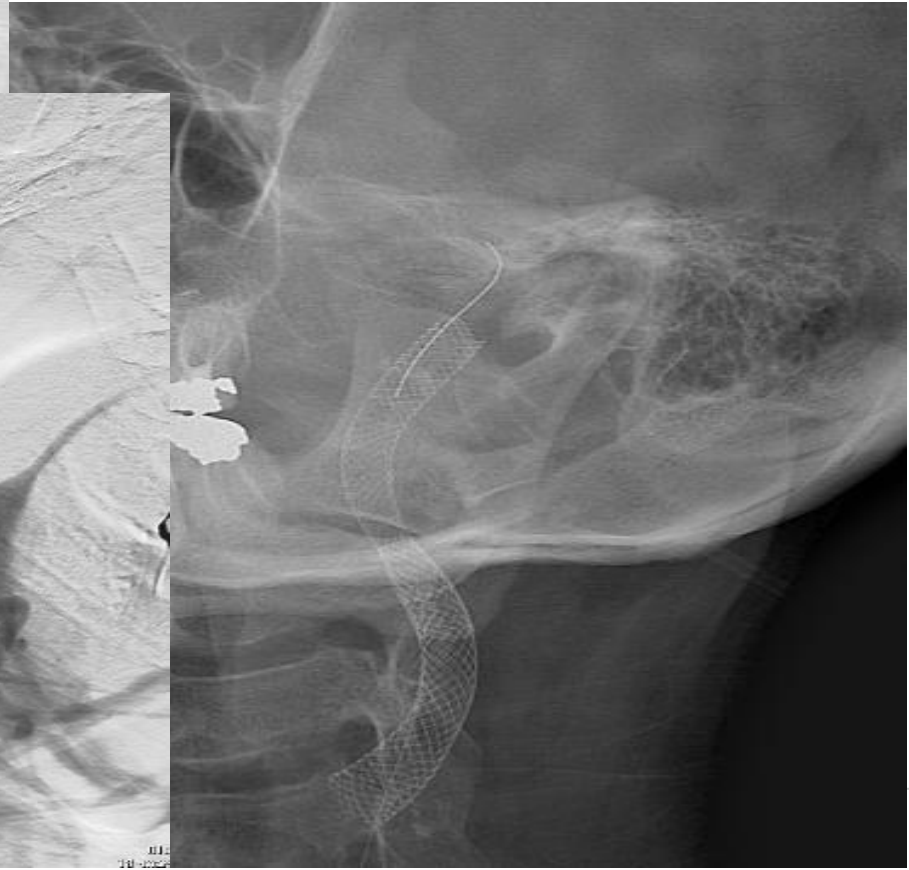
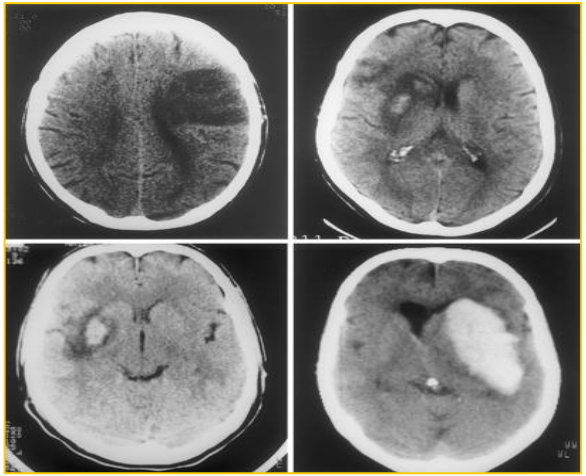
L ICA stenting

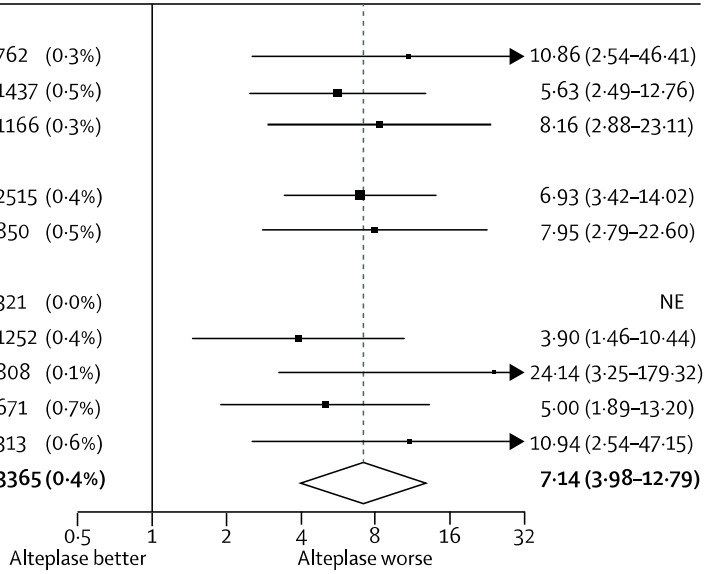


tPA increases intracranial bleeding risk



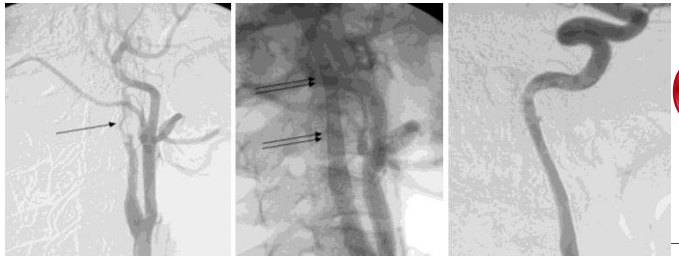
Frequent+++

	Alteplase (n=3391)	Control (n=3365)	Odds ratio (95% CI)*
Treatment delay			
≤3·0 h	22/787 (2·8%)	2/762 (0·3%)	10·86 (2·54–46·41)
>3·0≤4·5 h	35/1375 (2·5%)	7/1437 (0·5%)	5·63 (2·49–12·76)
>4·5 h	34/1229 (2·8%)	4/1166 (0·3%)	8·16 (2·88–23·11)
Age (years)			
≤80	59/2512 (2·3%)	9/2515 (0·4%)	6·93 (3·42–14·02)
>80	32/879 (3·6%)	4/850 (0·5%)	7·95 (2·79–22·60)
Baseline NIHSS score			
0–4	3/345 (0·9%)	0/321 (0·0%)	NE
5–10	20/1281 (1·6%)	5/1252 (0·4%)	3·90 (1·46–10·44)
11–15	23/794 (2·9%)	1/808 (0·1%)	24·14 (3·25–179·32)
16–21	24/662 (3·6%)	5/671 (0·7%)	5·00 (1·89–13·20)
≥22	21/309 (6·8%)	2/313 (0·6%)	10·94 (2·54–47·15)
All patients	**91/3391 (2·7%)**	**13/3365 (0·4%)**	**7·14 (3·98–12·79)**



Motto C, et al. Stroke. 1999
Emberson et al Lancet Neurol 2014

tPA increases intracranial eeding risk



Early administration of aspirin in patients treated with alteplase for acute ischaemic stroke: a randomised controlled trial

ASPIRIN 300 mg within 90 min following IV ALTEPLASE

	Aspirin (n=148)	Standard treatment (n=137)	Relative risk (95% CI)	p value*	Absolute difference (95% CI)
Initial ischaemic stroke (including progressive stroke)	99 (66·9%)	102 (74·5%)	0·90 (0·77 to 1·04)	0·16	–7·6% (–18·1 to 3·0)
Recurrent ischaemic stroke	10 (6·8%)	3 (2·2%)	3·09 (0·87 to 10·89)	0·09	4·6% (–0·2 to 9·3)
Symptomatic intracranial haemorrhage	11 (7·4%)	1 (0·7%)	10·18 (1·33 to 77·83)	0·006	6·7% (2·2 to 11·2)
Other cerebral pathology	2 (1·4%)	4 (2·9%)	0·46 (0·09 to 2·49)	0·43	–1·6% (–5·0 to 1·8)
Systemic ischaemic disease (including myocardial infarction)	0	0	..	..	..
Systemic haemorrhage	1 (0·7%)	1 (0·7%)	0·93 (0·06 to 14·66)	1·00	–0·1% (–2·0 to 1·89)
Other systemic pathology	8 (5·4%)	5 (3·6%)	1·48 (0·50 to 4·42)	0·48	1·8% (–3·1 to 6·6)
Pre-existing poor functional status	17 (11·5%)	21 (15·3%)	0·75 (0·41 to 1·36)	0·34	–3·9% (–11·8 to 4·1)

Published Online
June 28, 2012
http://dx.doi.org/10.1016/S0140-6736(12)60949-0

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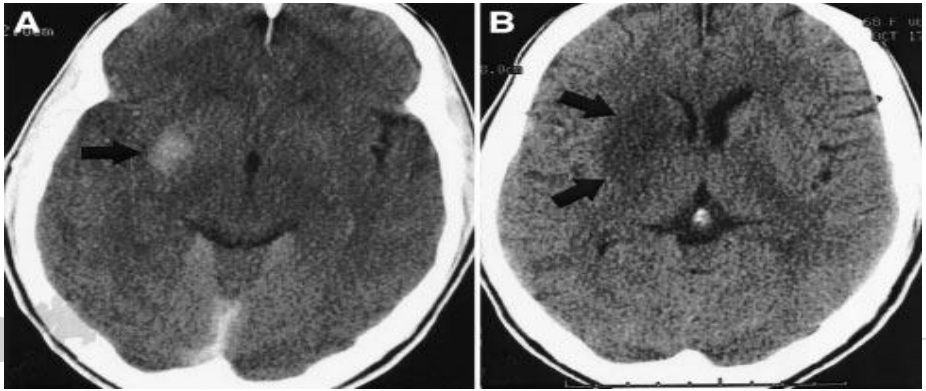
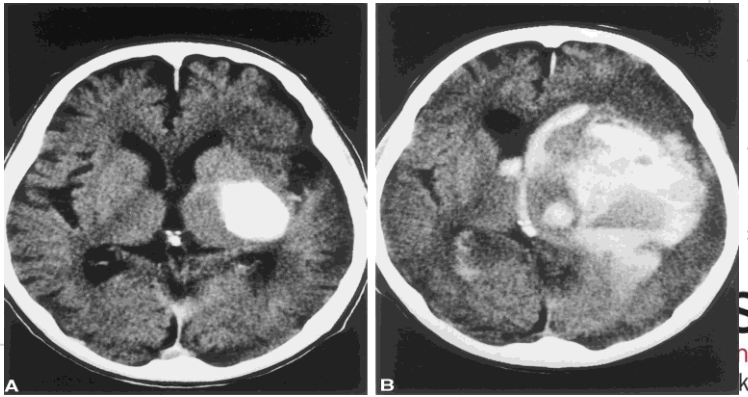
Blood Brain Barrier Rupture

- CT post-intervention
- BBB rupture: up to 60%
- Associated with:
  - Mortality (OR: 2.37; 1.06-5.32)
  - Hemorrage (OR: 6.38; 2.66-15.22)

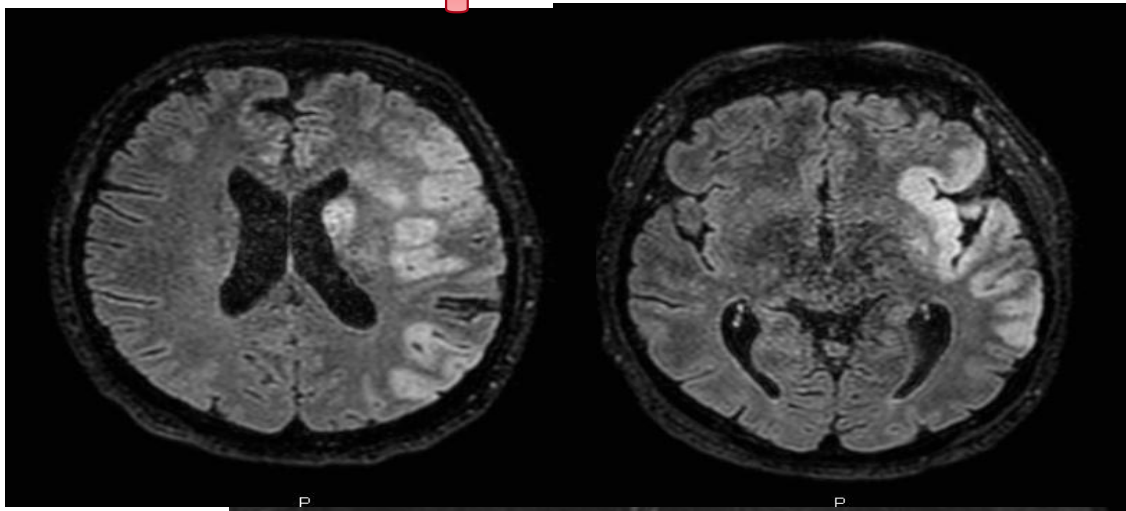




Desilles et al Neurology 2013
Wildenhain SL, Jungreis CA, Barr J, et al. AJNR 1994.
Mericle RA, Lopes DK, Fronckowiak MD, et al. Neurosurgery 2000.

Follow-up

- **24h later**
  - NIHSS 18 -> 5 for
    - Upper limb drift:1
    - Facial droop:1
    - Minor aphasia:1
    - R hemianopia: 2



- **3 month follow up**
  - Persistant minor aphasia
  - mRS = 2

Take home messages

- tPA in association with Thrombectomy is the gold standard
- Acute ischemic stroke: high risk condition for bleeding
- Look for salvageable brain
- Spectrum of different etiologies

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