

# DES de SPECIALITE - NEURORADIOLOGIE

*Année académique 2016-2017*

## Pathologie vasculaire cérébrale aiguë



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<http://www.saintluc.be>

Ulg – 25 novembre 2016

**ISCHEMIE (→infarctus)**

**HEMORRAGIE**

Intra-  
parenchymateuse

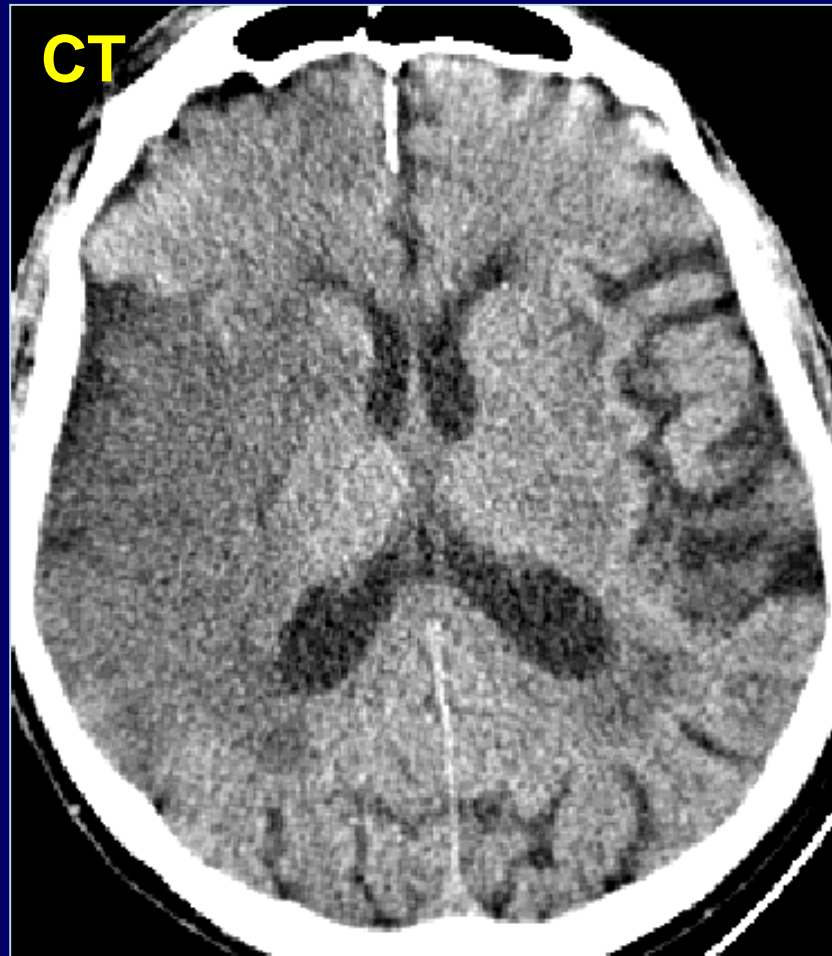
Extra-  
parenchymateuse

**THROMBOSE  
VEINEUSE**

'corticale'  
'superficielle'

'profonde'  
'centrale'

# Ischémie cérébrale aiguë



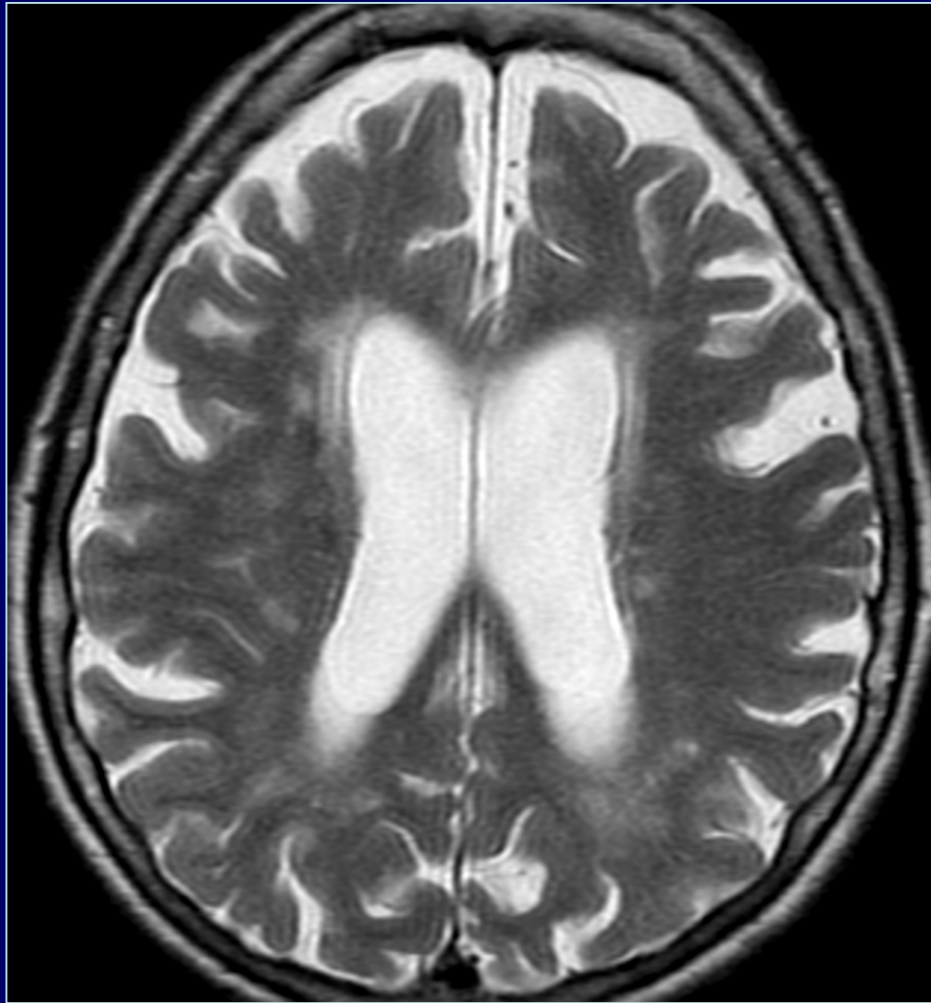
**hypodensité**



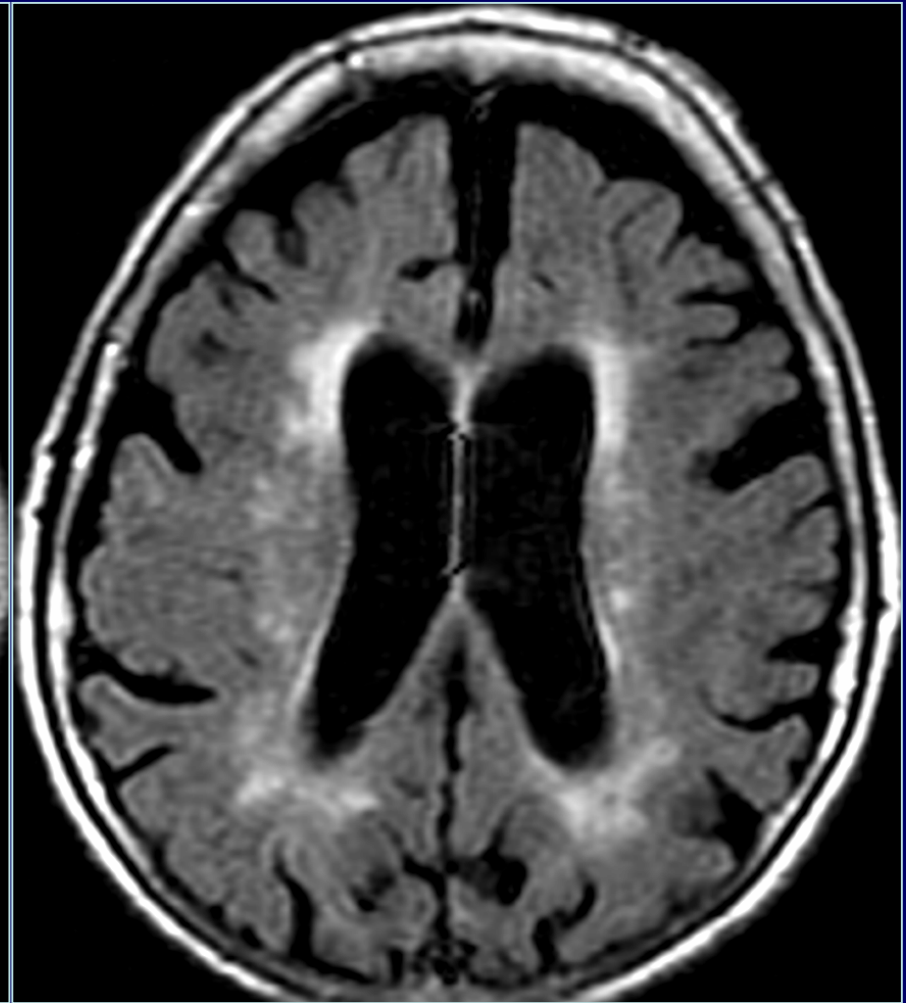
**hypersignal FLAIR/T2**

> 6 heures (« fenêtre thérapeutique » pour traitement thrombolytique)

<6 heures: imagerie de diffusion (Diffusion-Weighted Imaging)



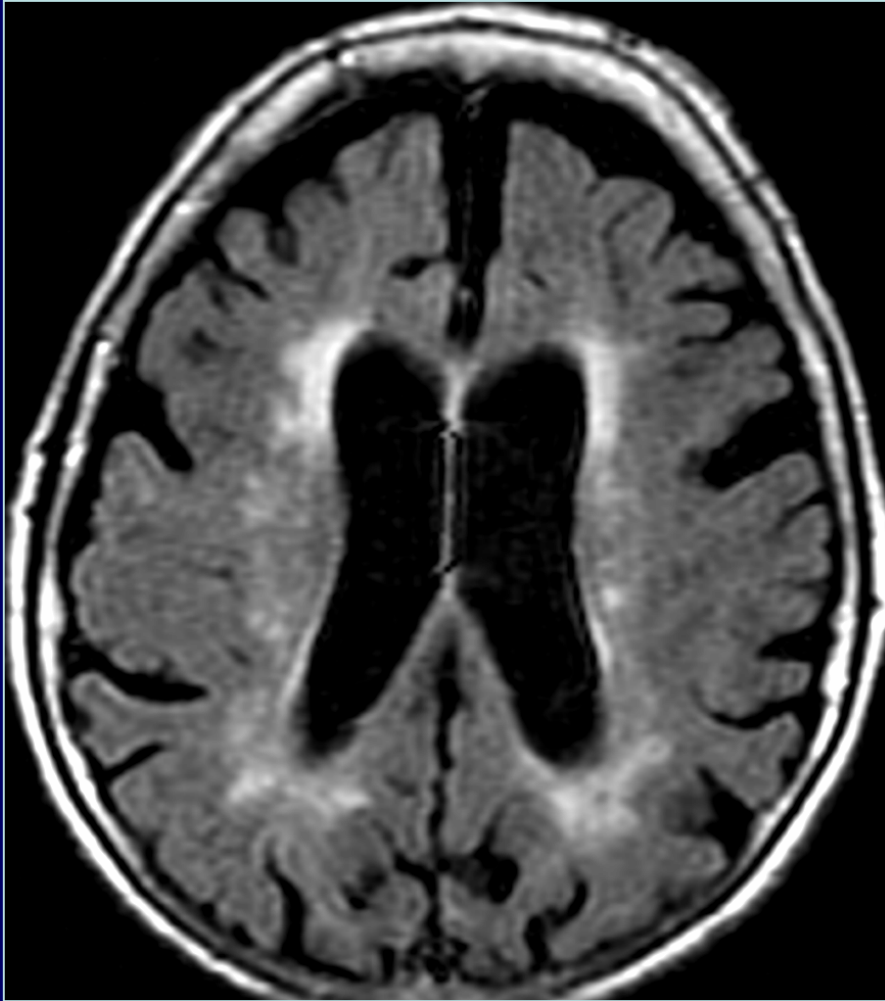
**T2-FSE**



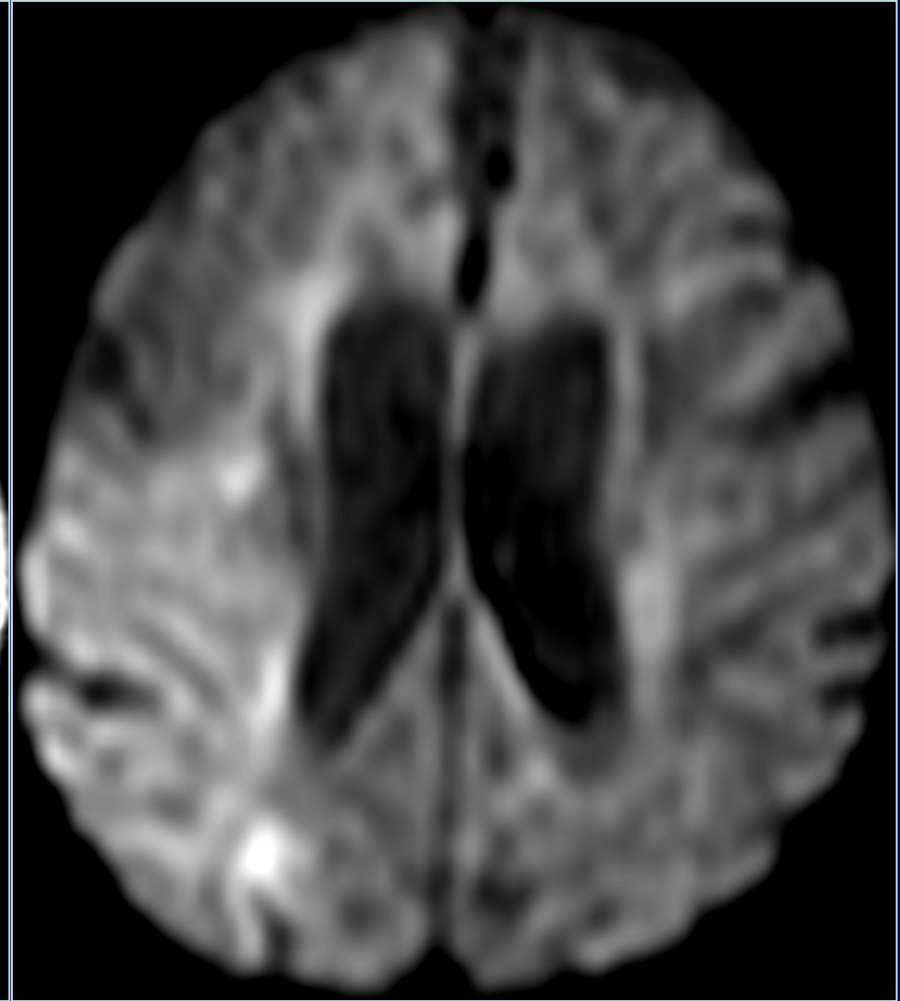
**FLAIR**



<6 heures: imagerie de diffusion

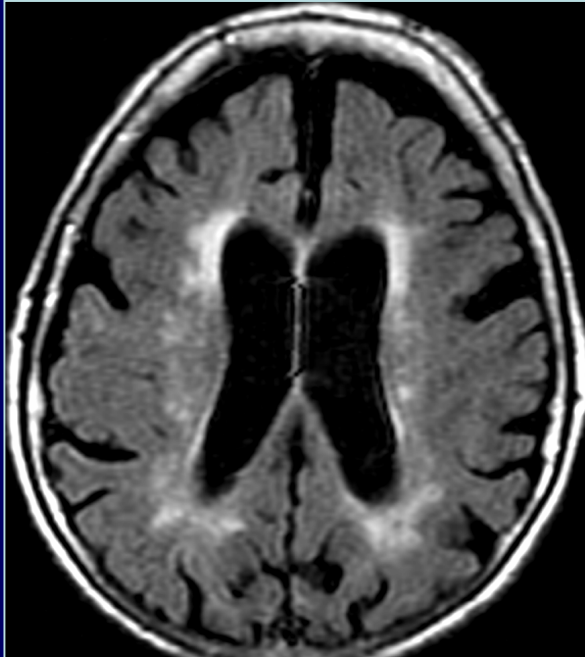


**FLAIR**

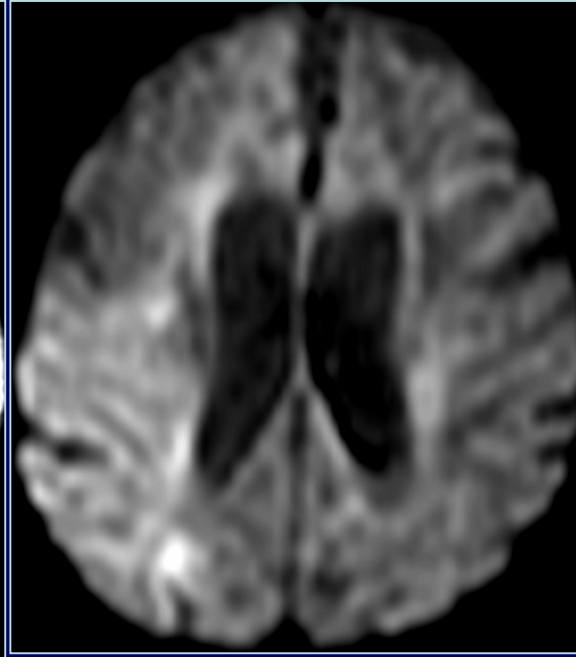


**Imagerie de diffusion**

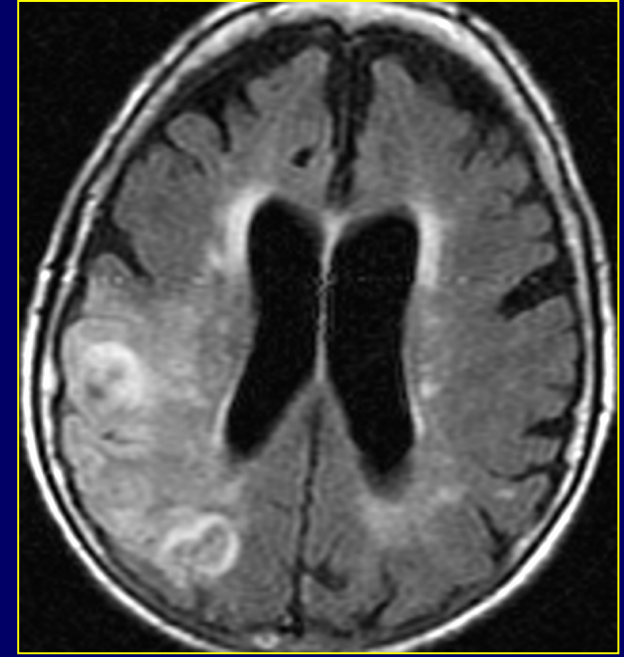
<6 heures: imagerie de diffusion



**FLAIR 3 heures**

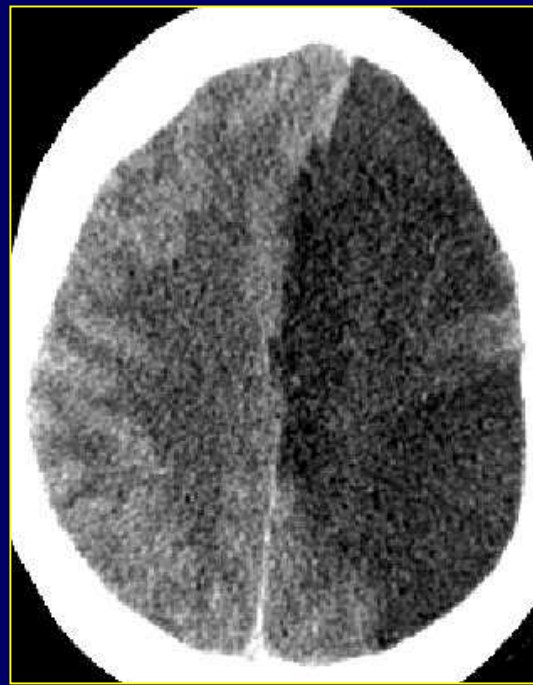
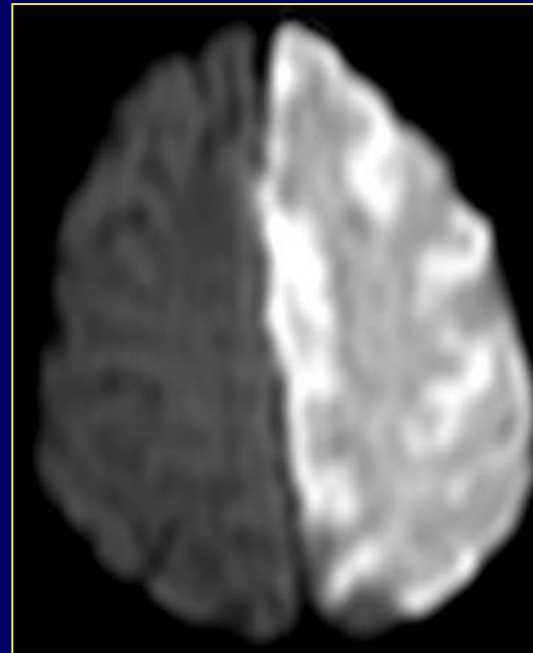
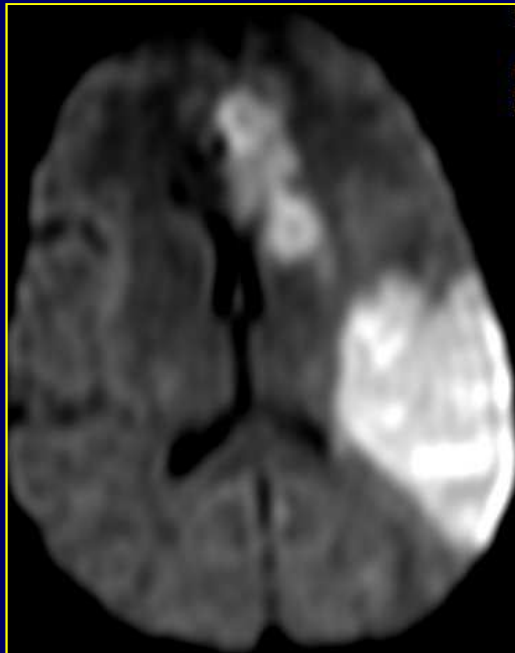


**Diffusion 3 heures**



**FLAIR 24 heures**

72 heures

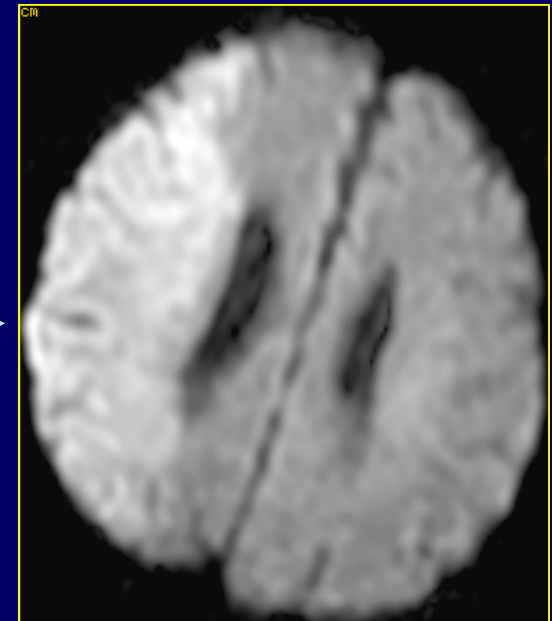
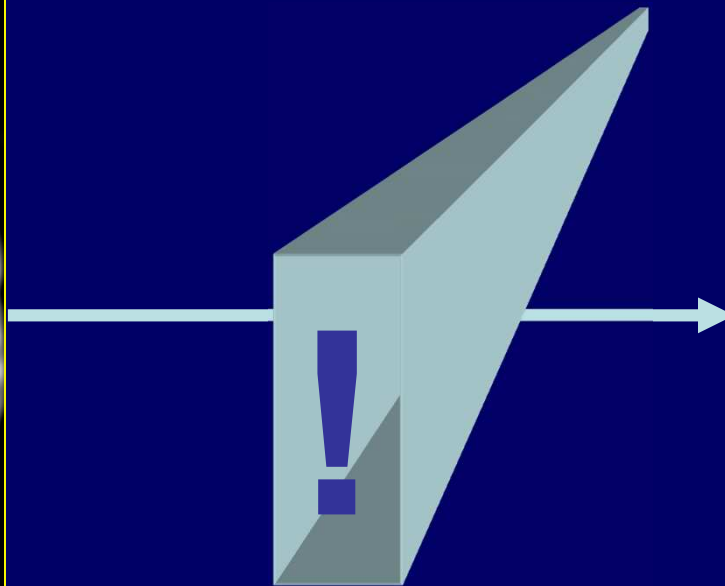
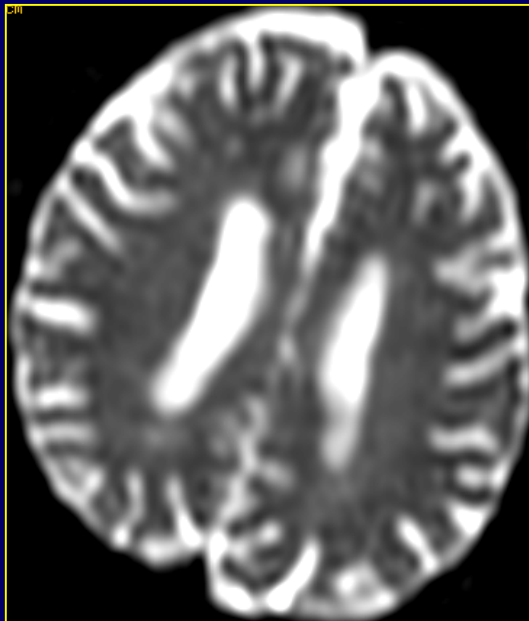


MR  
=  
CT

<6 heures

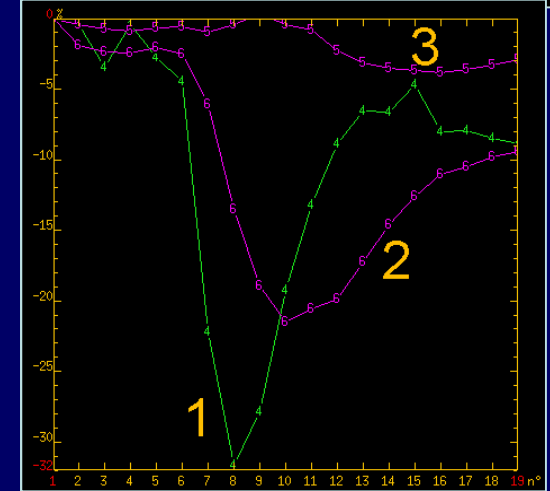
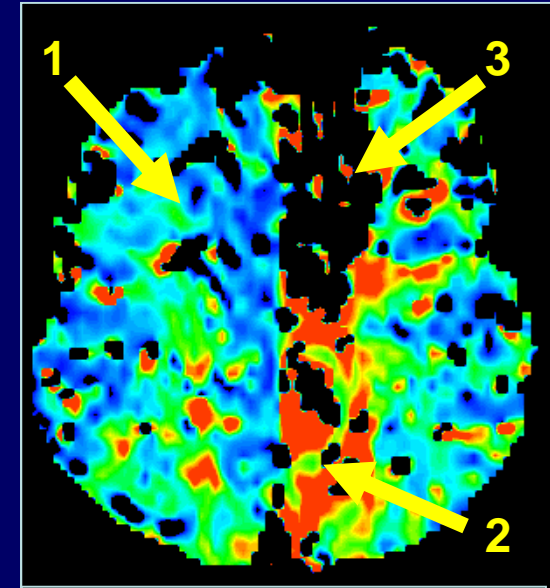
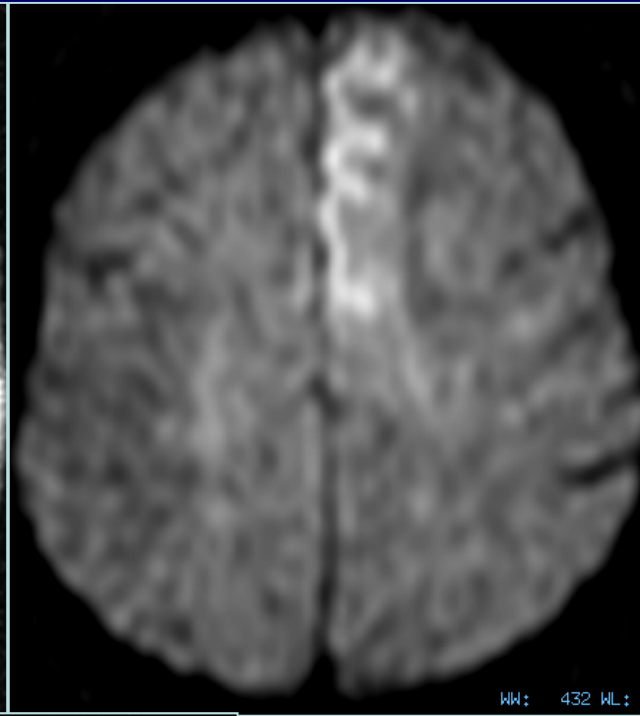
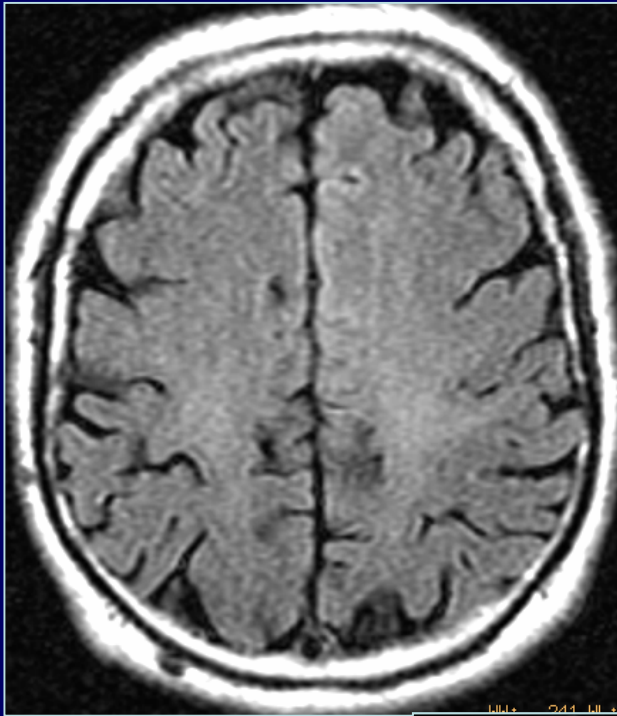


???

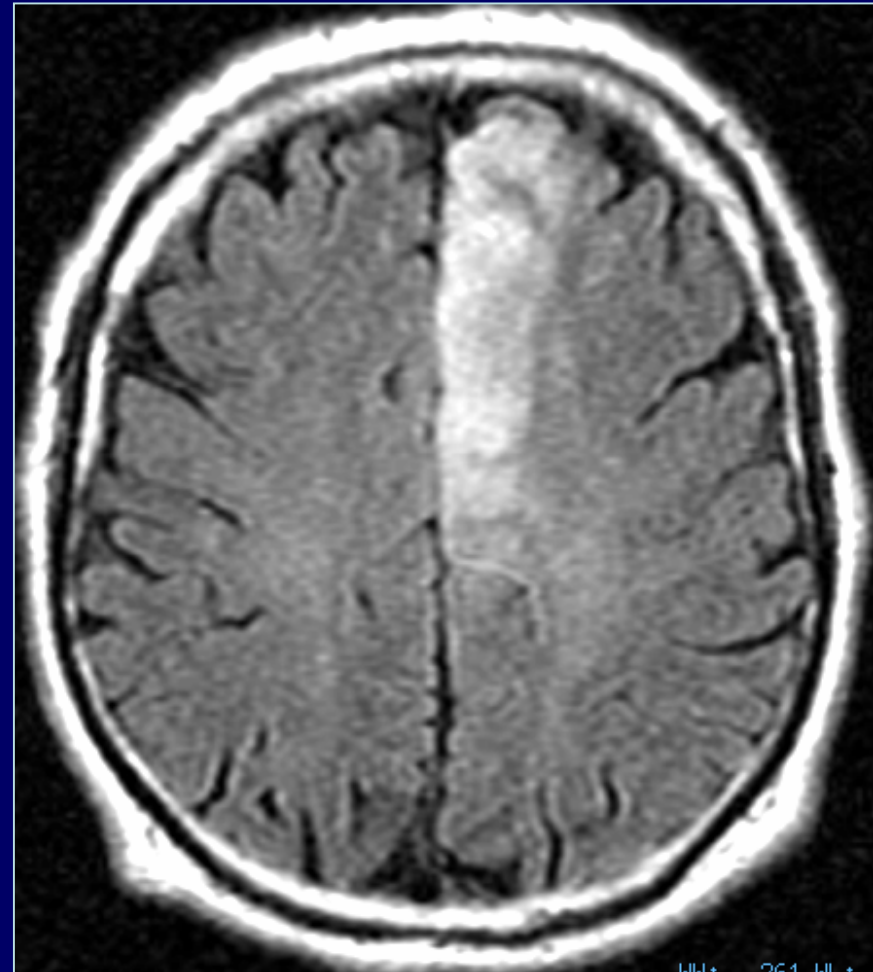
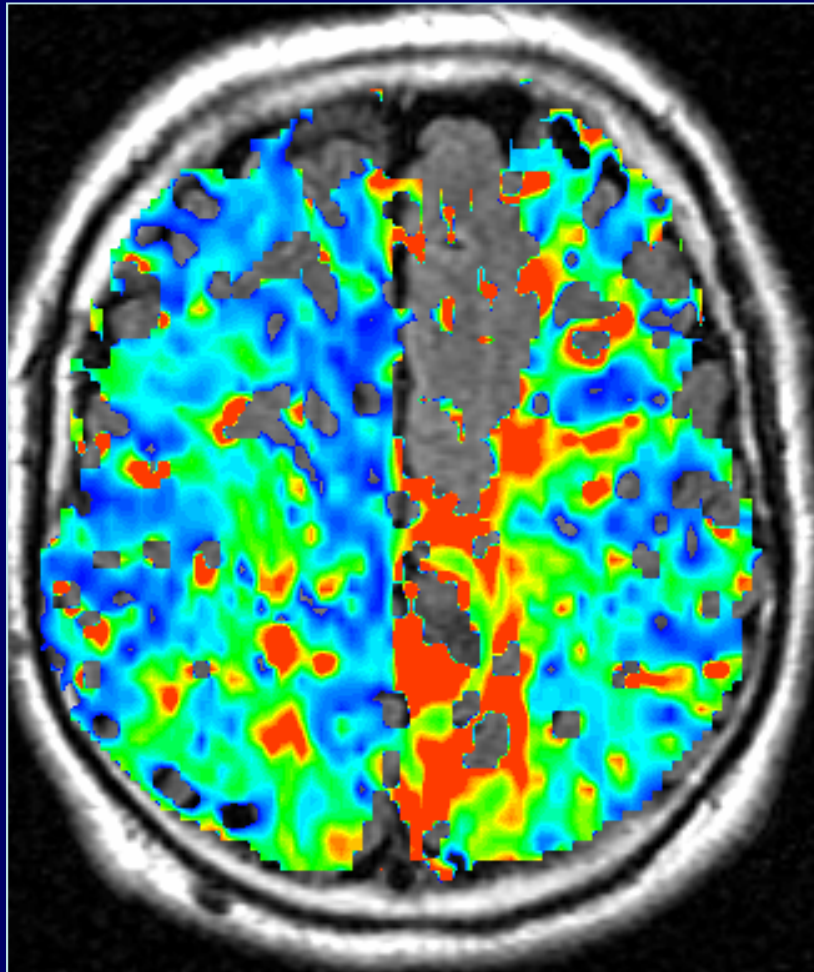




# <6 heures: imagerie de perfusion (Perfusion-Weighted Imaging) (I)

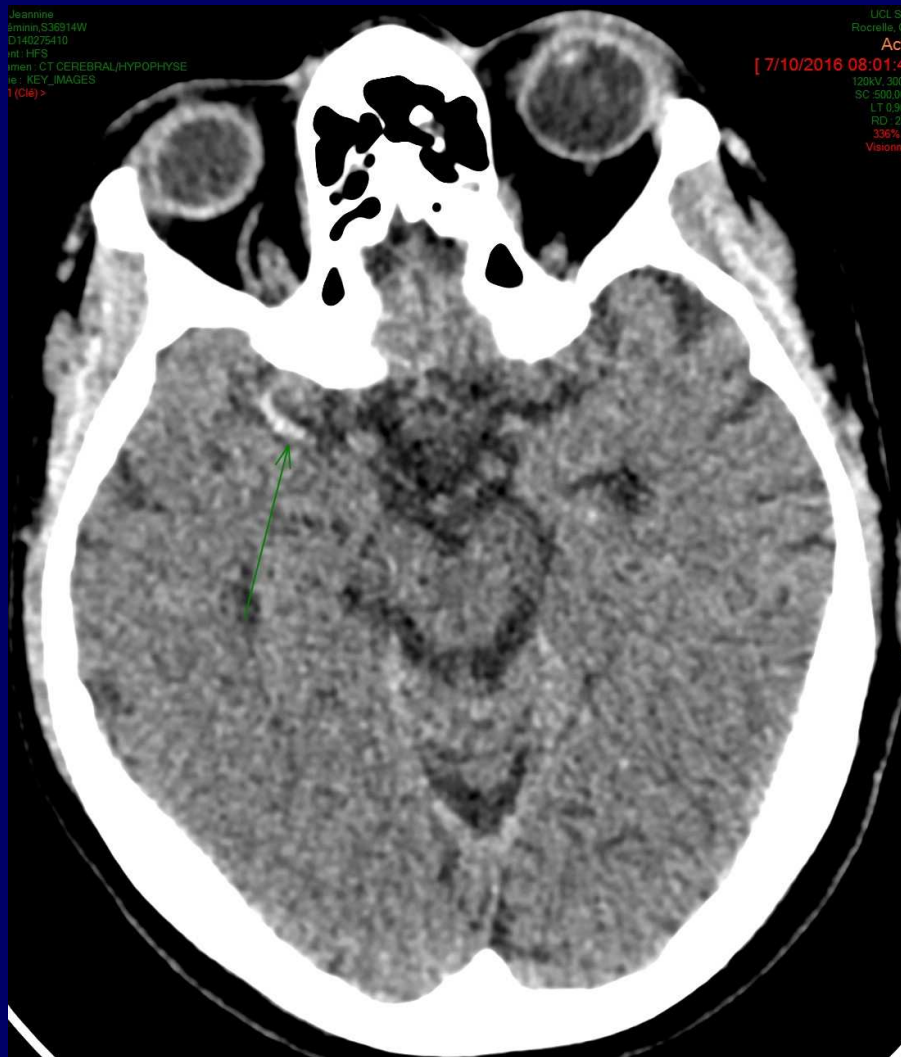


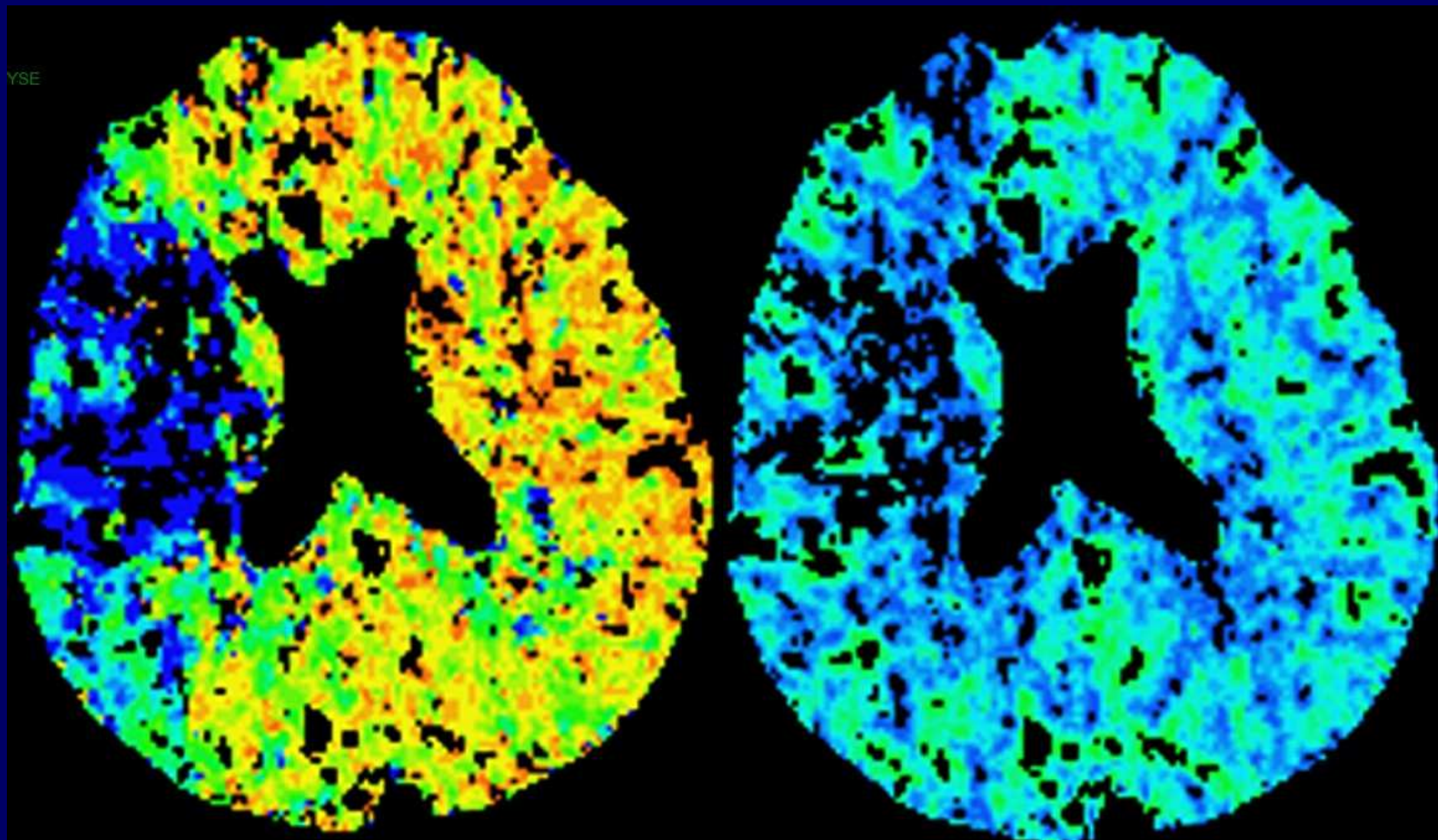
<6 heures: imagerie de perfusion (Ib)





# PERFUSION CT (CTP)





MTT

CBV

Pos. coupe : 187.1 mm

Pos. patient : KFS

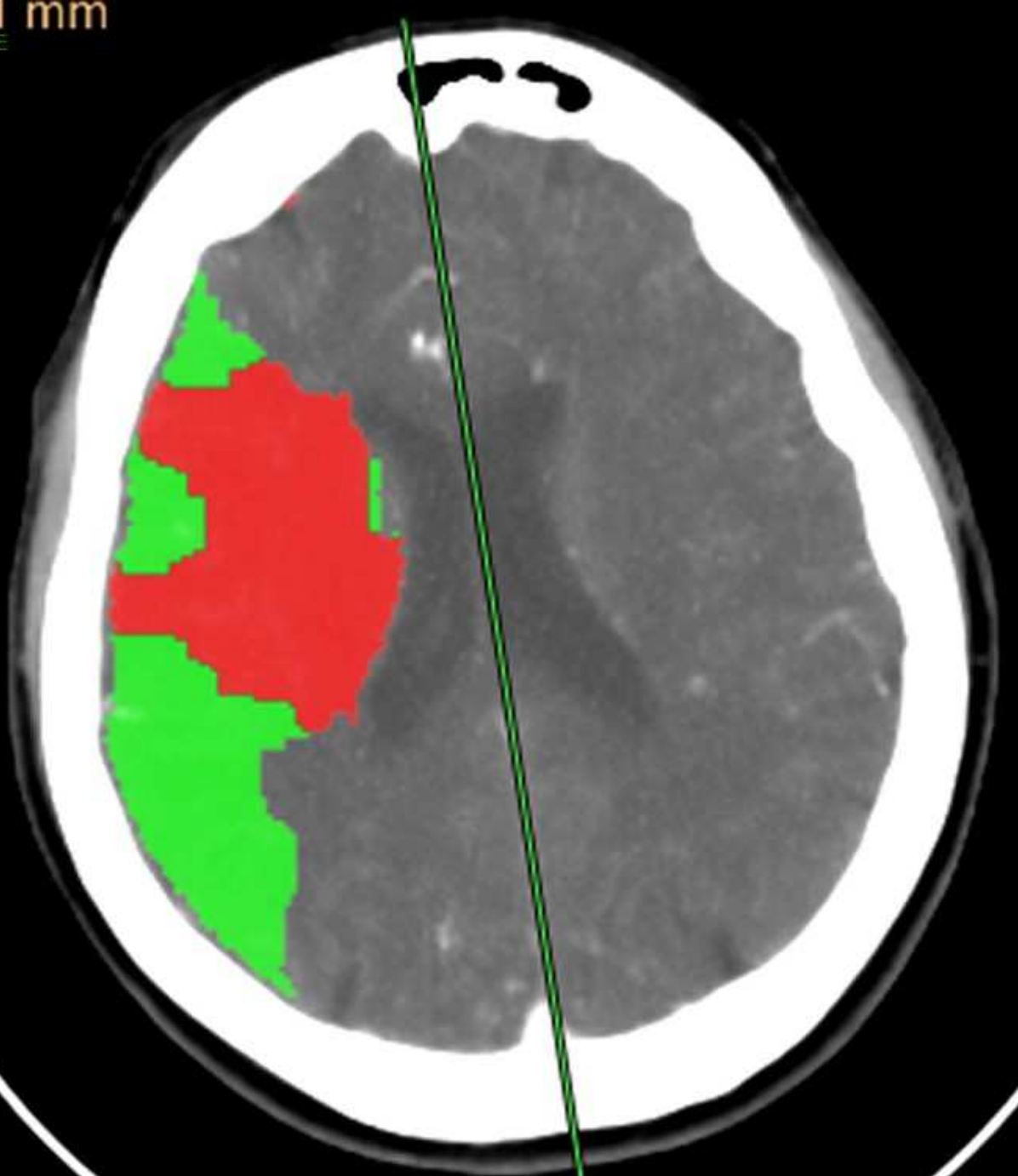
Desc. examen : CT CEREBRAL/HYPOPHYSE

Desc. série : resultats perfusion

< 2184 - 8 >

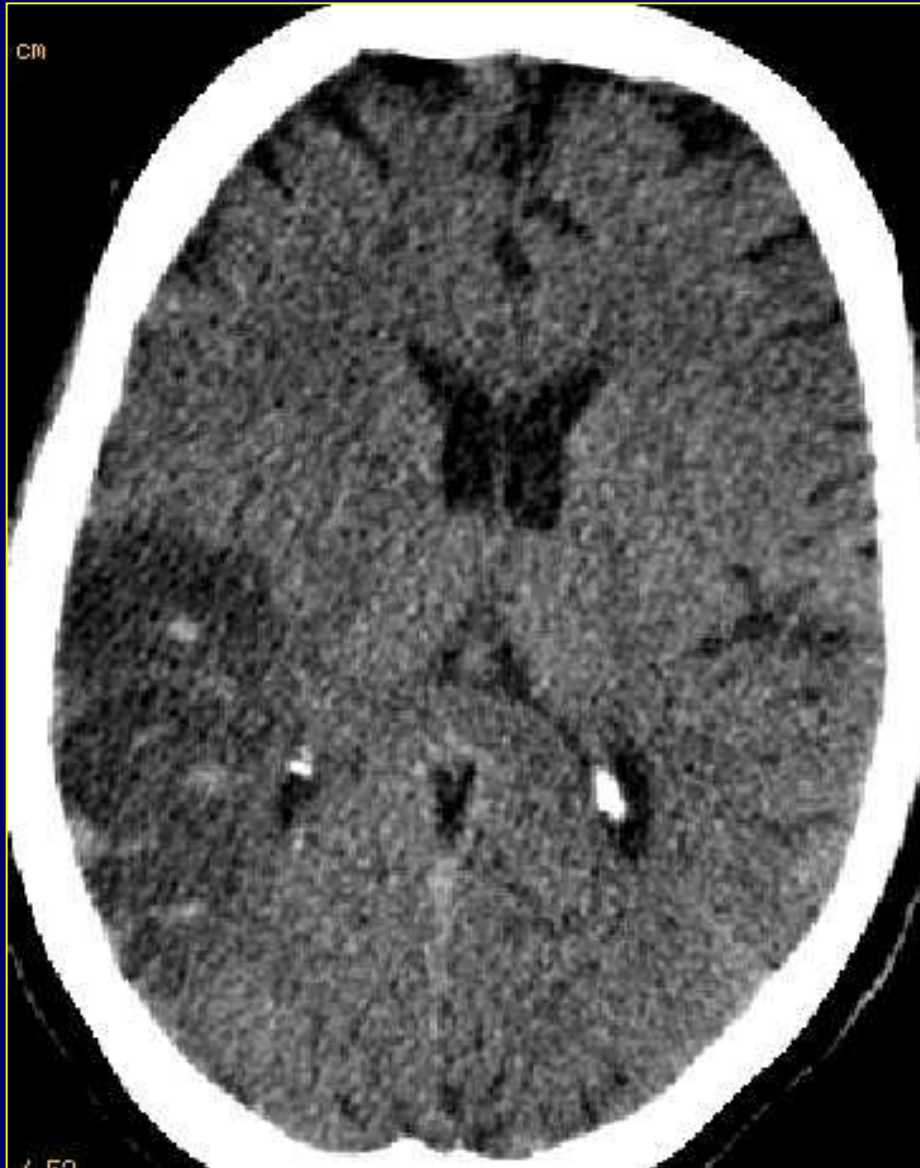
MTT aug. et  
CBV norm.

MTT aug. et  
CBV rouge.



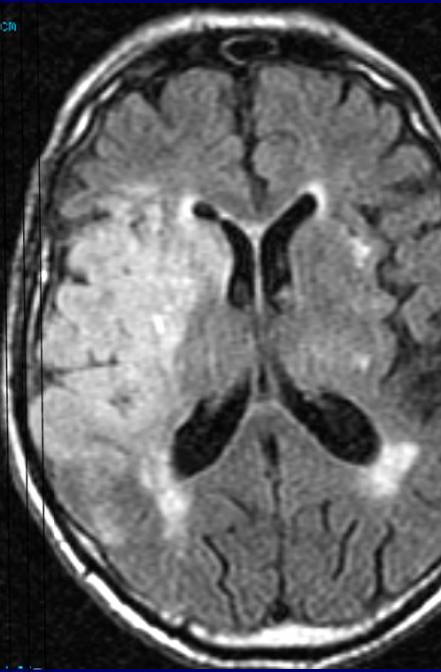


**Transformation hémorragique:** infarctus 'blanc' devenant 'rouge'

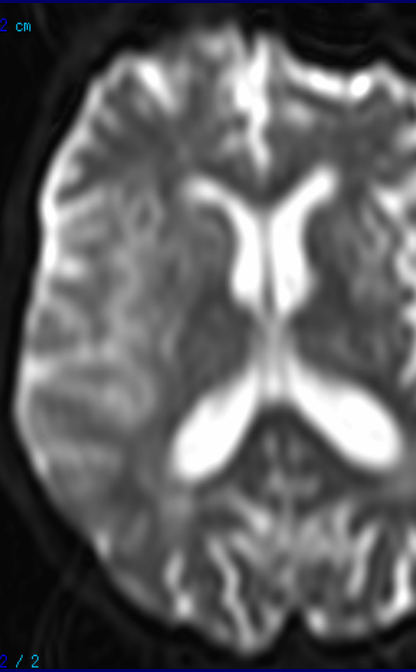




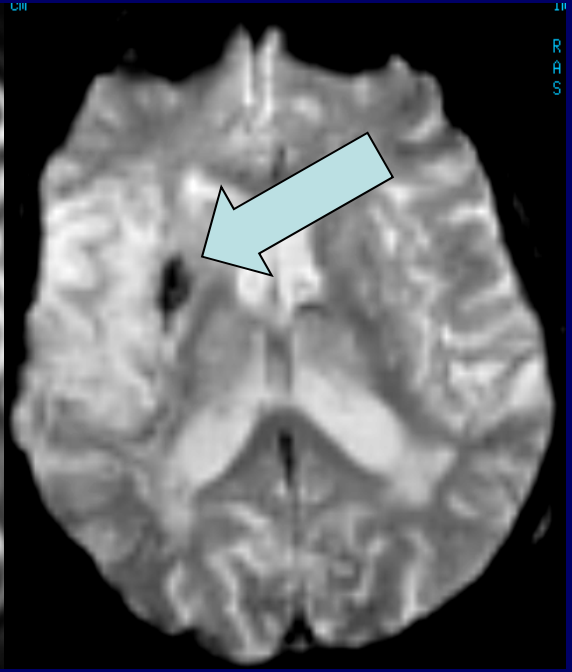
CT



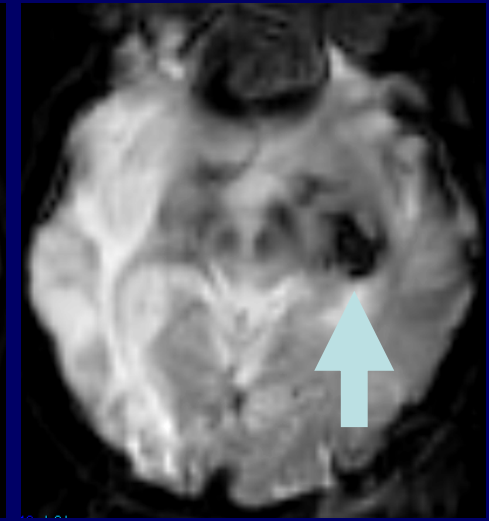
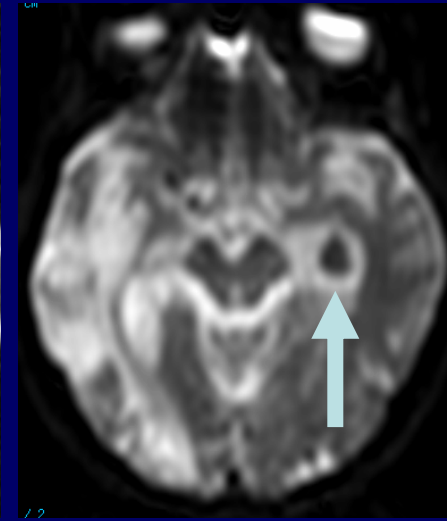
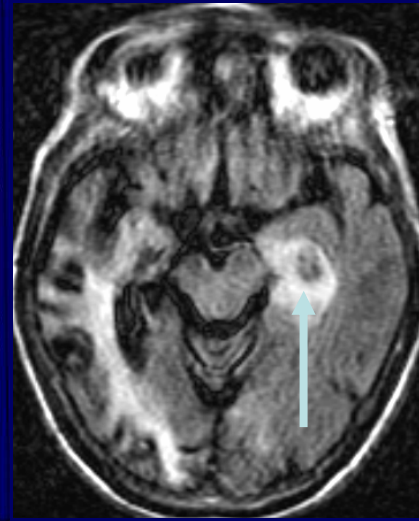
FLAIR



EPI-SE-T2



EPI-GRE-T2\*



# Hémorragie cérébrale

Parenchymateuse  
(cloisonnée)

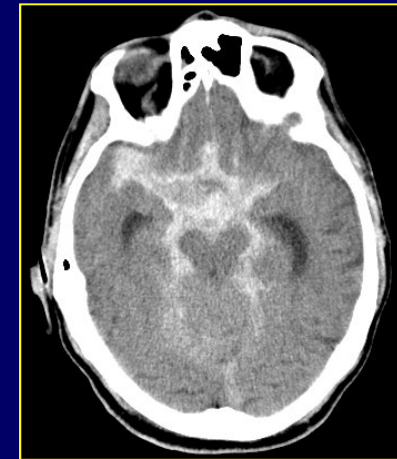
Extra-parenchymateuse  
(non cloisonnée)

Collection  
Péri-cérébrale

Hématome  
parenchymateux

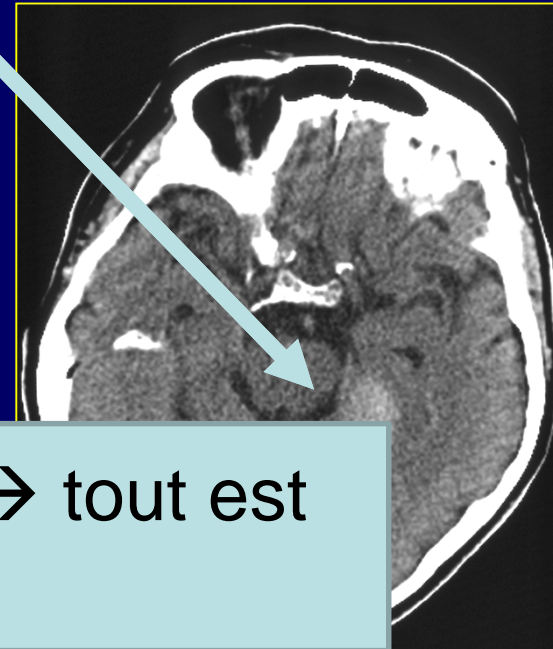
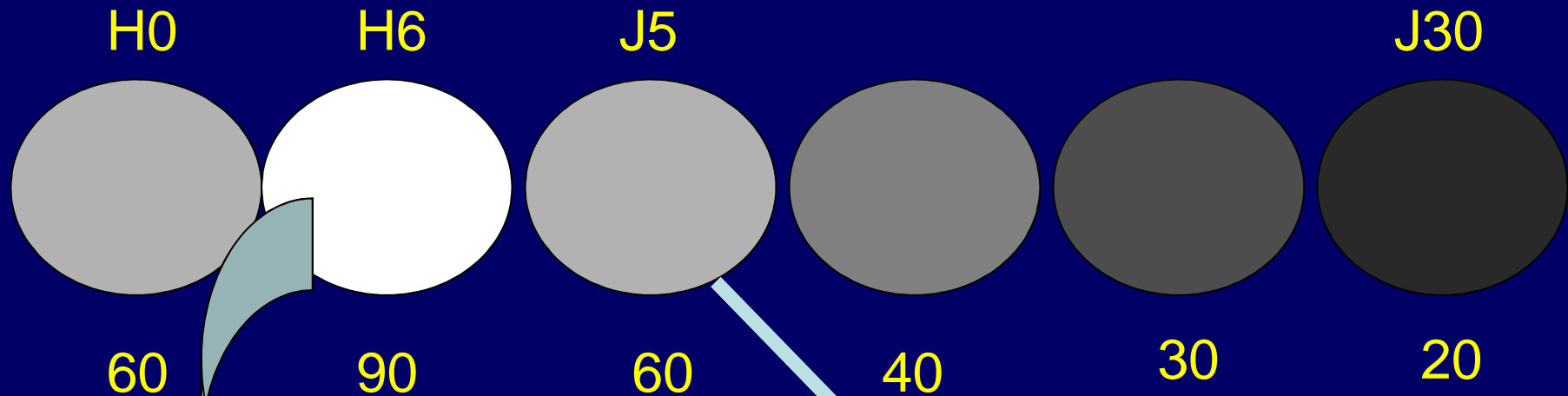
Hémorragie  
ventriculaire

Hémorragie  
méningée





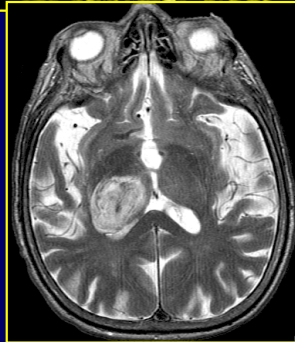
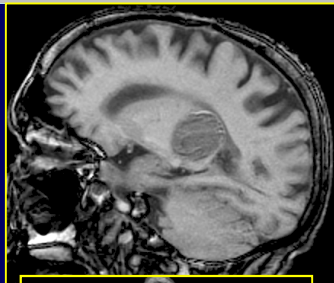
# Hématome parenchymateux en TDM



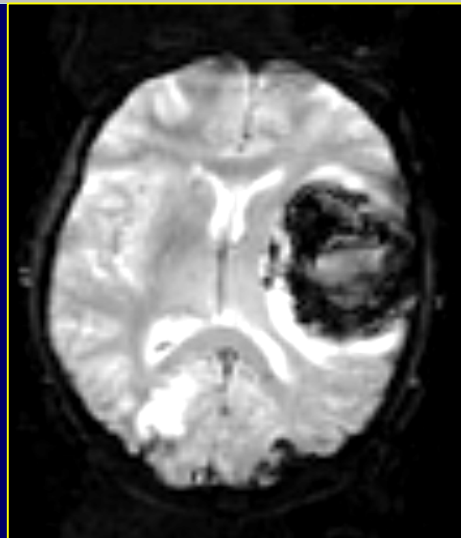
SANG frais en CT → tout est 'simple'

# Hématome parenchymateux IRM

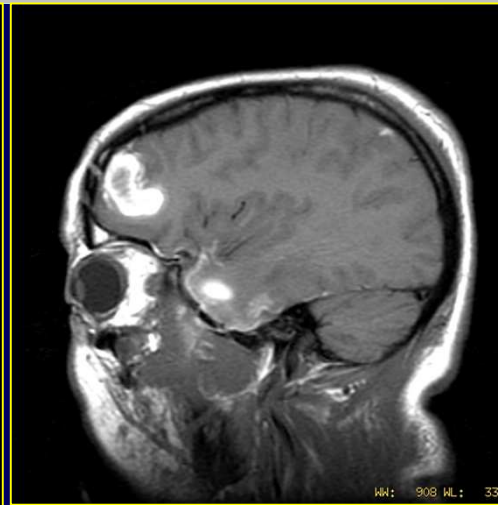
Délai	< 3 heures	4-24 heures	> 48 heures	1 semaine	1 mois
<b>Pondération T1</b> substrat du signal	<b>hypo/iso</b> <i>oxyHb</i>	<b>iso</b> <i>oxyHb</i>	<b>hyper</b> <i>metHb IC</i>	<b>hyper</b> <i>metHb EC</i>	<b>hypo</b> <i>liquide EC</i>
<b>Pondération T2</b> substrat du signal	<b>hyper</b> <i>serum</i>	<b>hypo++*</b> <i>déoxyHb</i>	<b>hypo</b> <i>déoxyHb</i>	<b>hyper</b> <i>metHb EC</i>	<b>hyper</b> <i>liquide EC</i>
					<b>couronne hypo++*</b> <i>hémossidérine</i>
* mieux mis en évidence par susceptibilité magnétique (séquence en écho de gradient)					
EC=extracellulaire / IC=intracellulaire					



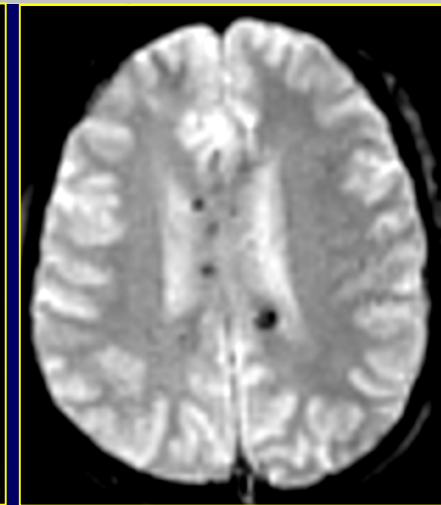
eau



déoxyHb → hypoT2



metHb → hyperT1



hémossidérine → hypoT2

SANG frais en IRM → tout est compliqué

# Sang frais endocrânien

## → Rechercher une cause sous-jacente

→ Malformative vasculaire MAV/fistule >> cavernome

→ Tumeur

## → Séquence de susceptibilité SWI, GRE-T2\*, EPI-GRE-T2\*

→ non pas pour le foyer hémorragique

→ pour trouver ailleurs un effet de susceptibilité  
d'origine sanguine pour cerner un contexte spécifique:

→ Cavernomatose

→ Hémosidérose méningée

→ Angiopathie amyloïde

→ Injecter le PdC en CT scanner (en garde !)

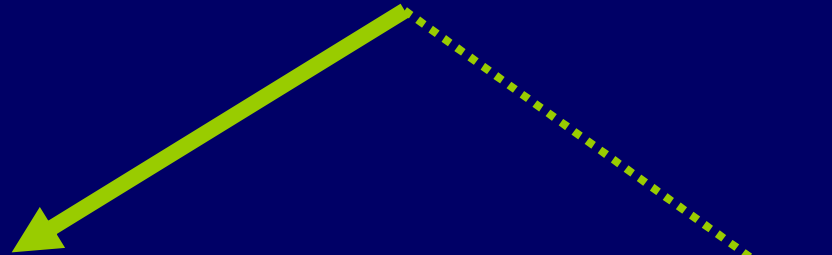
# Hémorragie sous-arachnoïdienne

**Diagnostic  
radiologique  
positif  
d'HSA**

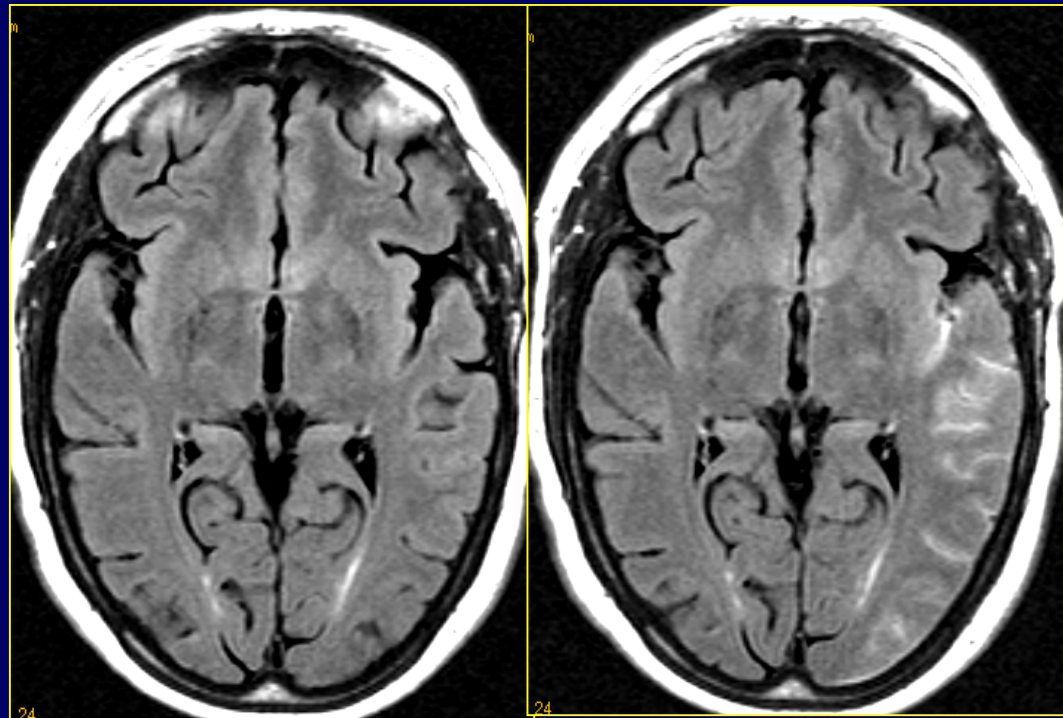


**Rupture  
d'anévrisme  
sacculaire  
intra-cranien  
85%**

1.  Diagnostic (+) d'HSA



CT scan

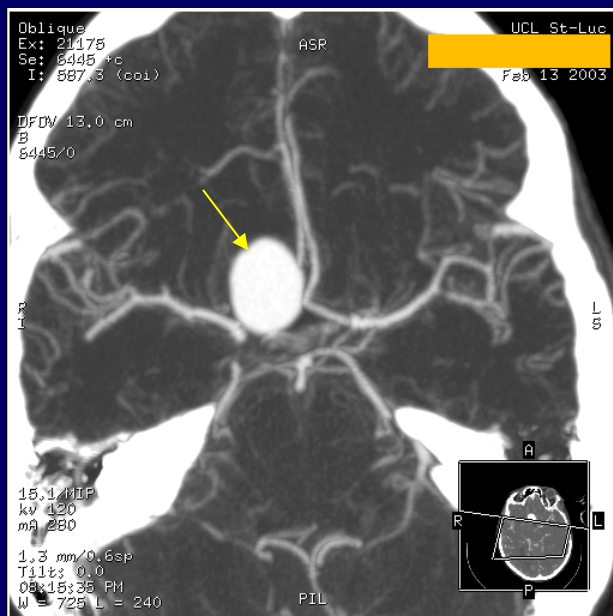
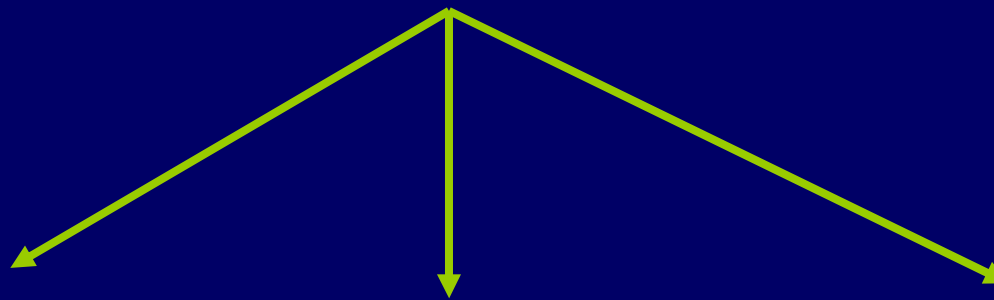


(-)

IRM

(+)

## 2. Localisation de l'anévrisme causal



Angio-CT



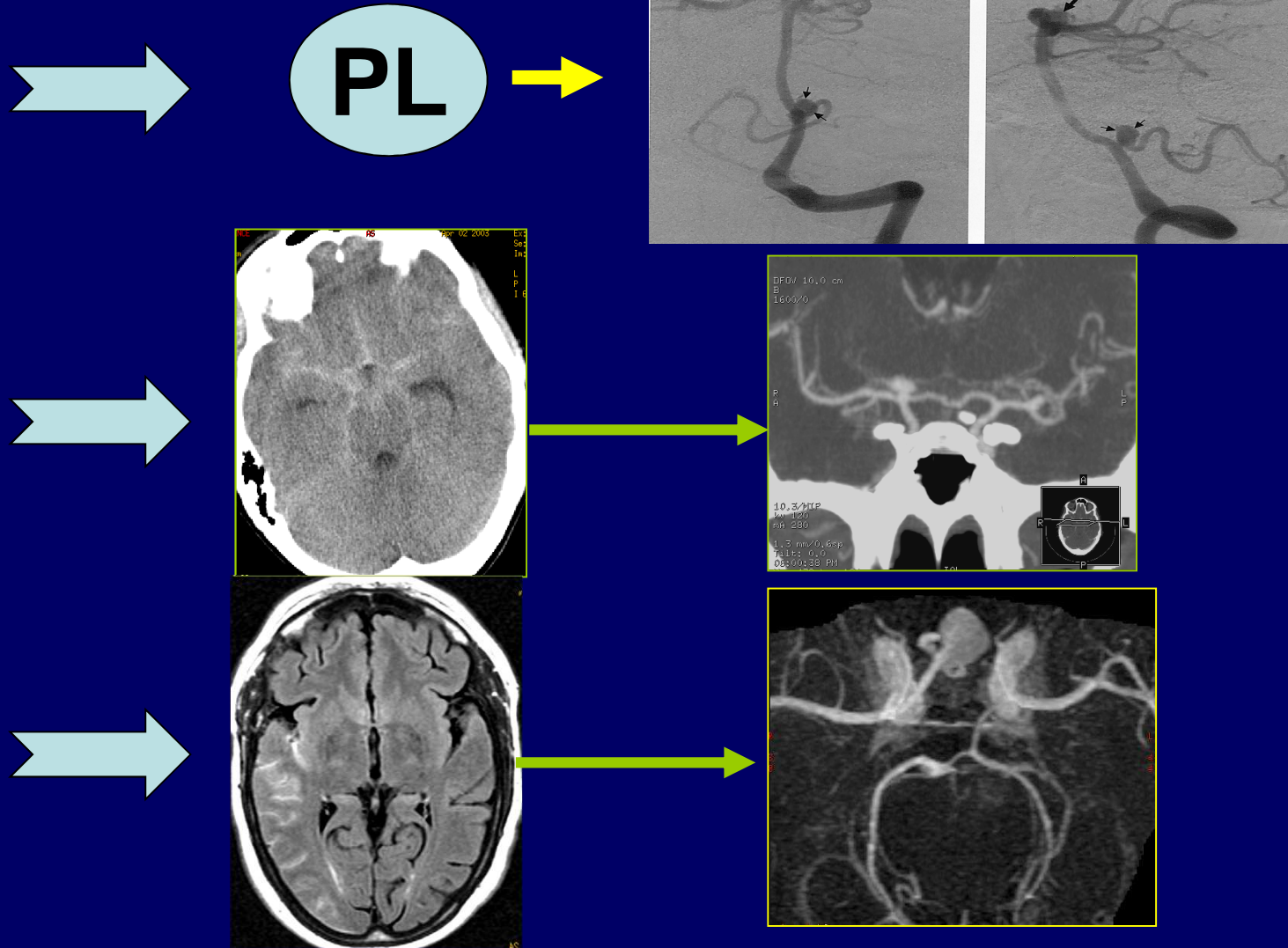
Angio-IRM



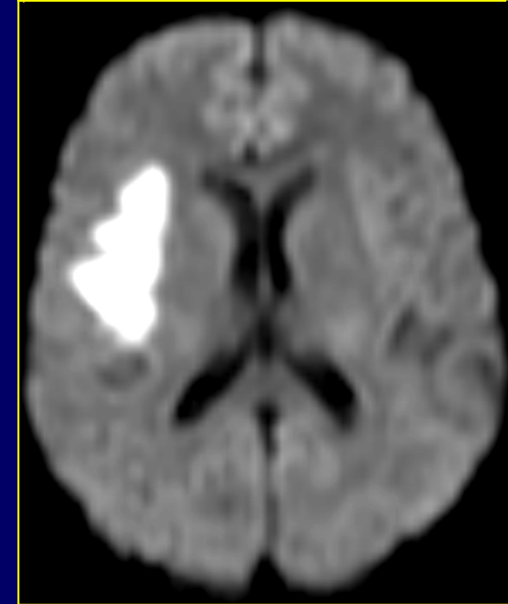
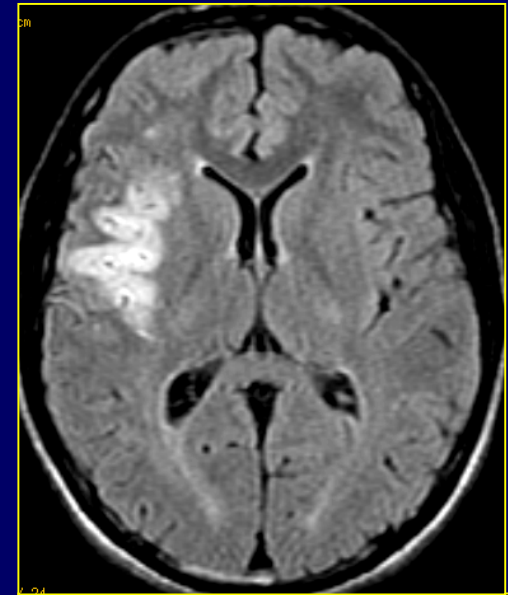
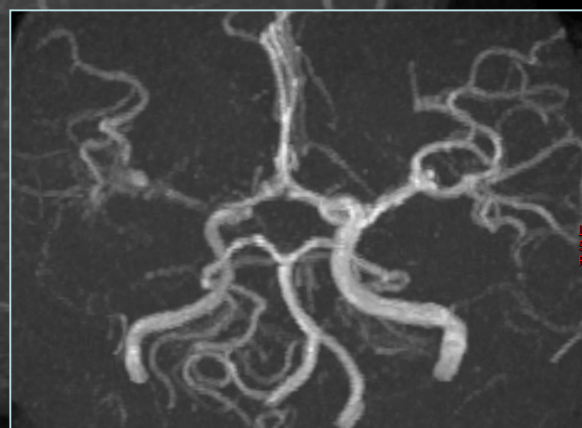
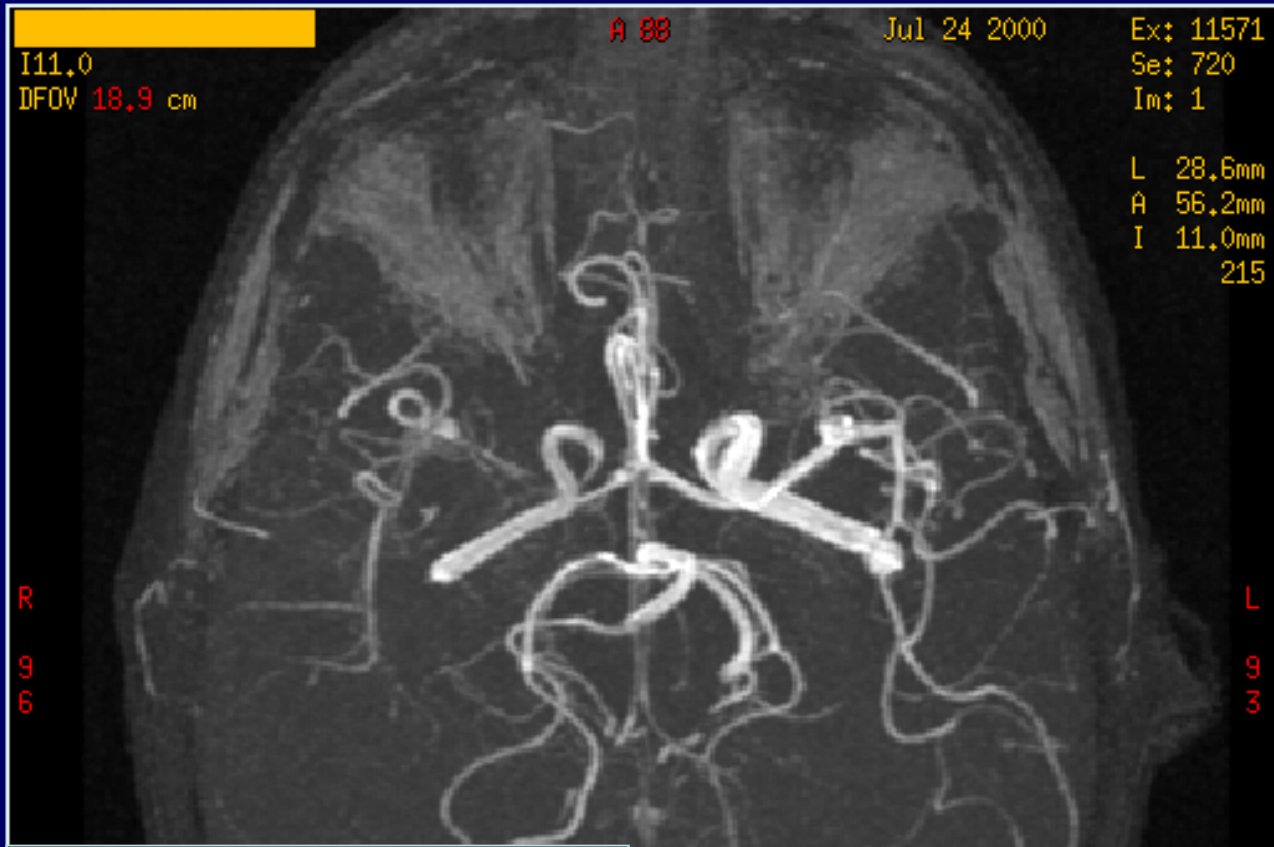
Angiographie



# Diagnostic positif et étiologique d'HSA



# Spasme artériel





Rare: < 1 case / 10.000/an

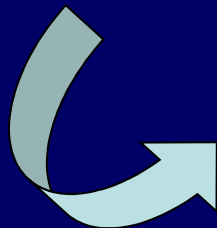


Facteurs de risque

**hypercoagulabilité systémique**

±

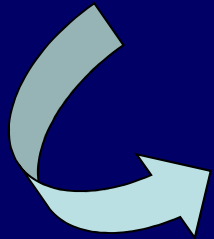
**infections ou dommage tissulaire local**



Facteurs de risque cumulatifs

**10 - 20% SANS** facteur de risque

➔ Diagnostic clinique non *univoque*



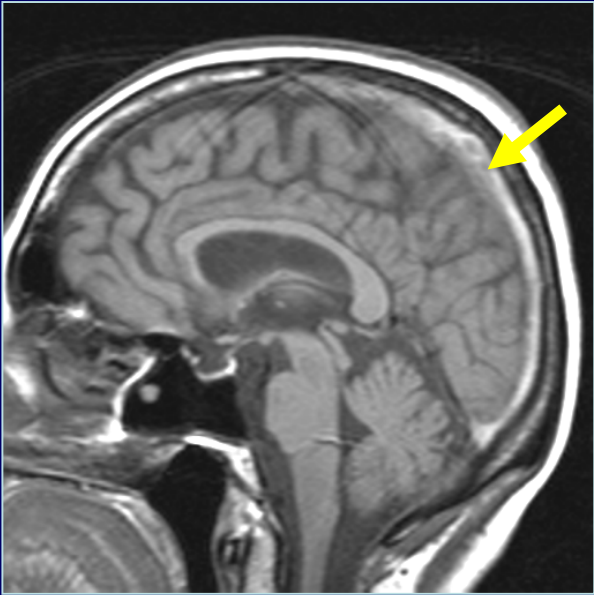
Place majeure de l'imagerie

➔ Forme maligne: évolution fatale en dépit d'un R/ adhoc

intrathrombus rtPA

rheolytic  
thrombectomy

## Localisations de la thrombose veineuse



**Dural sinus thrombosis  
(‘deep’ CVT)**

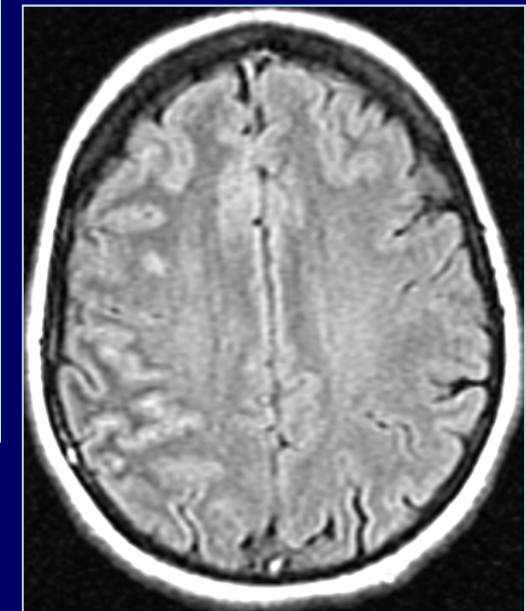
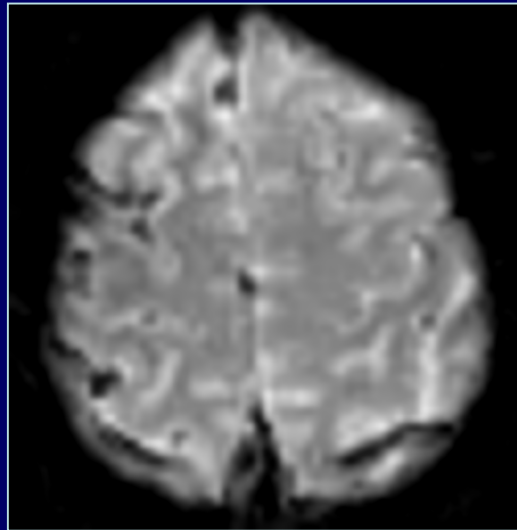
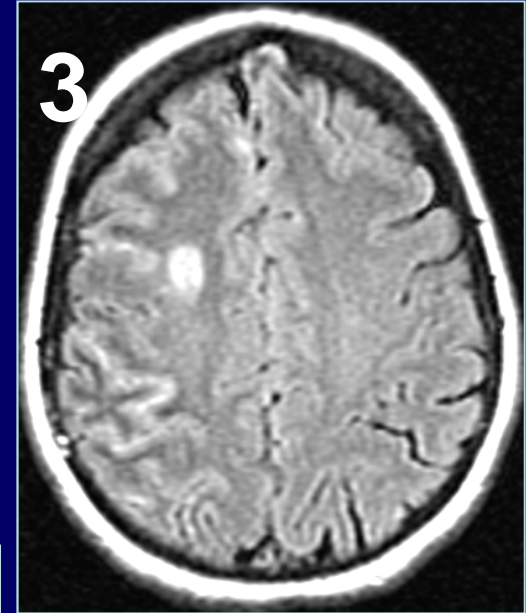
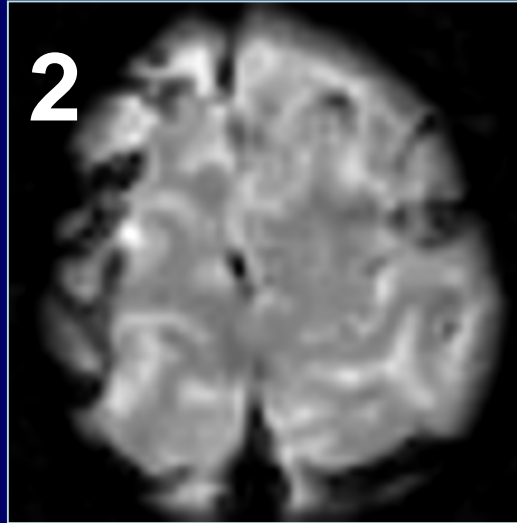
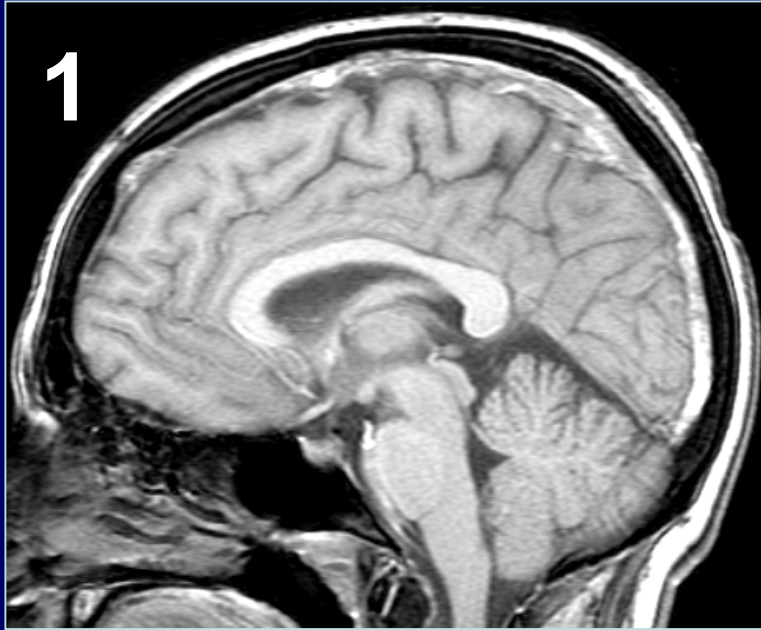


**Cortical vein thrombosis  
(‘superficial’ CVT)**

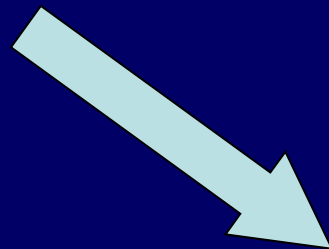


**Deep & superficial  
Dural & cortical**





**venous  
occlusion**



**draining veins  
stasis**



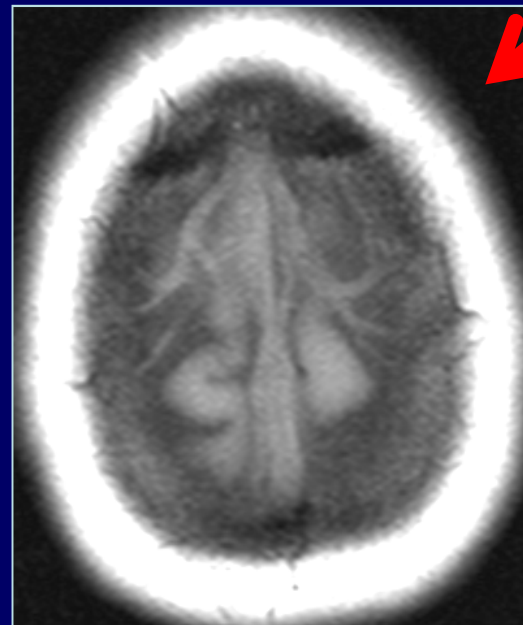
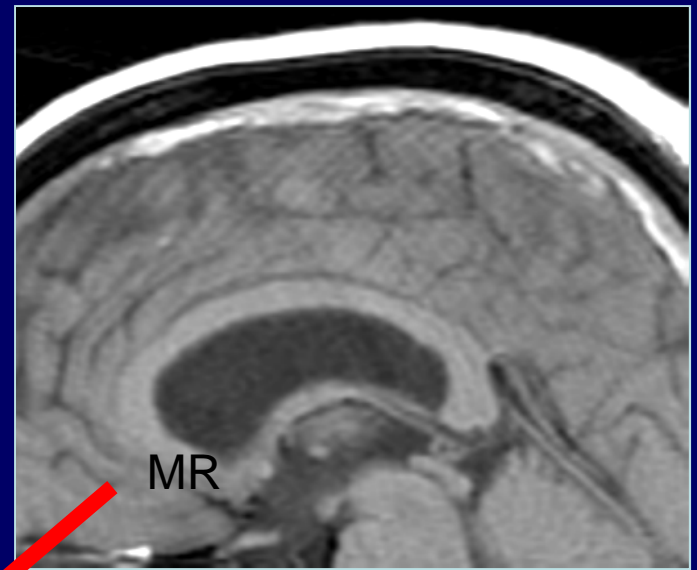
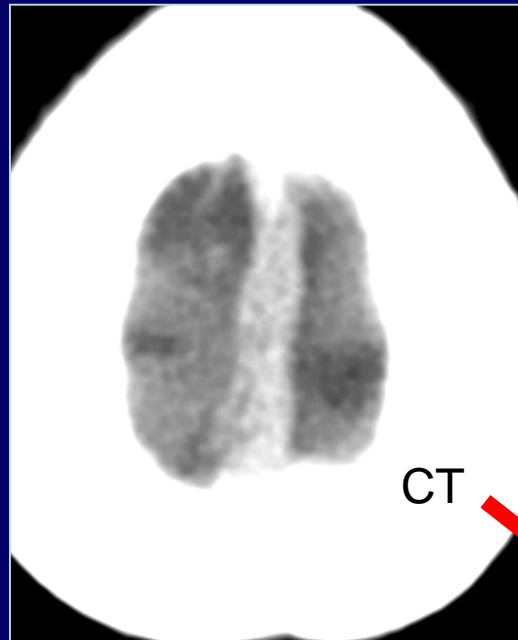
**parenchymal damage**



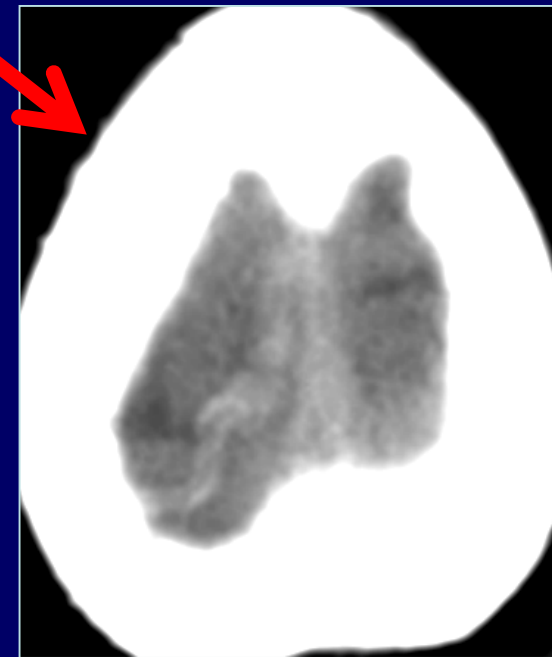
# 'Signe du cordon'



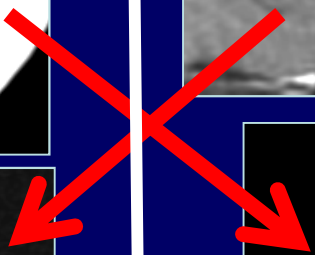
Dépendant du temps

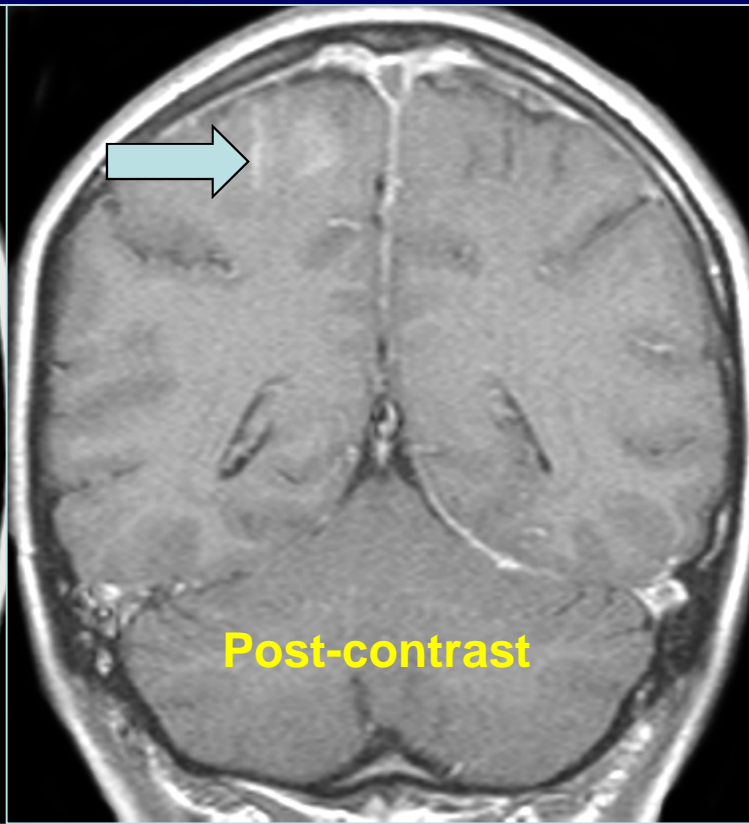
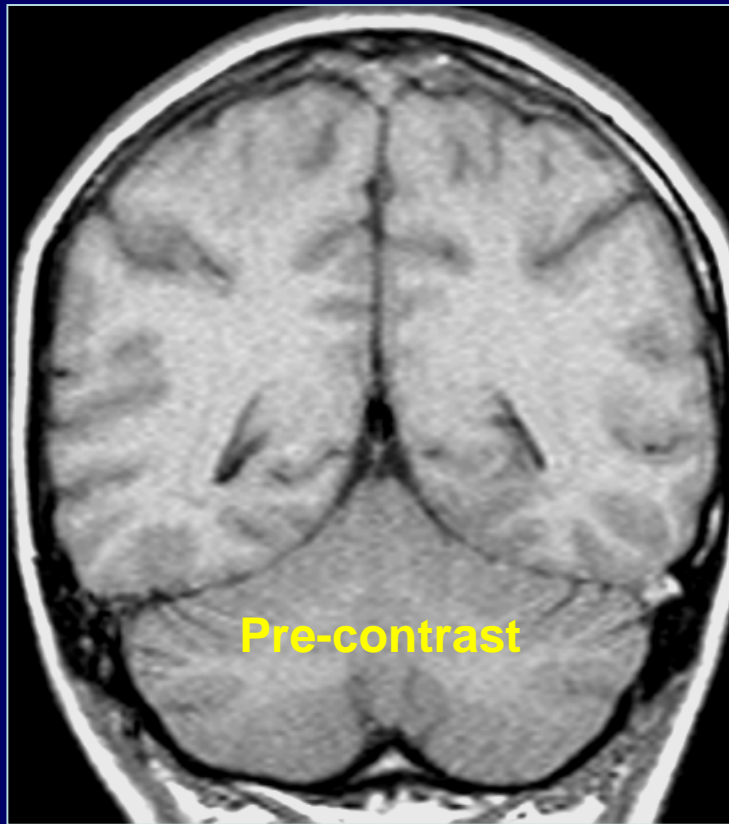


*few hours*



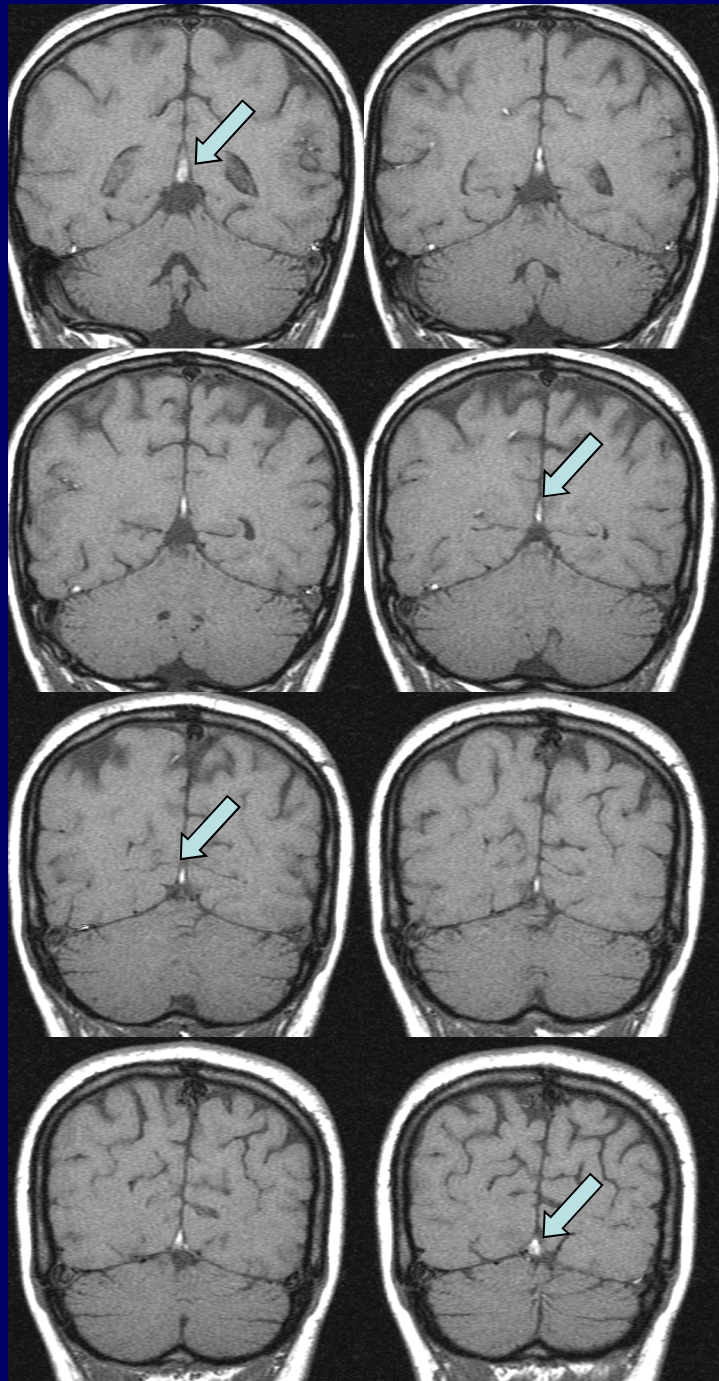
*few days*



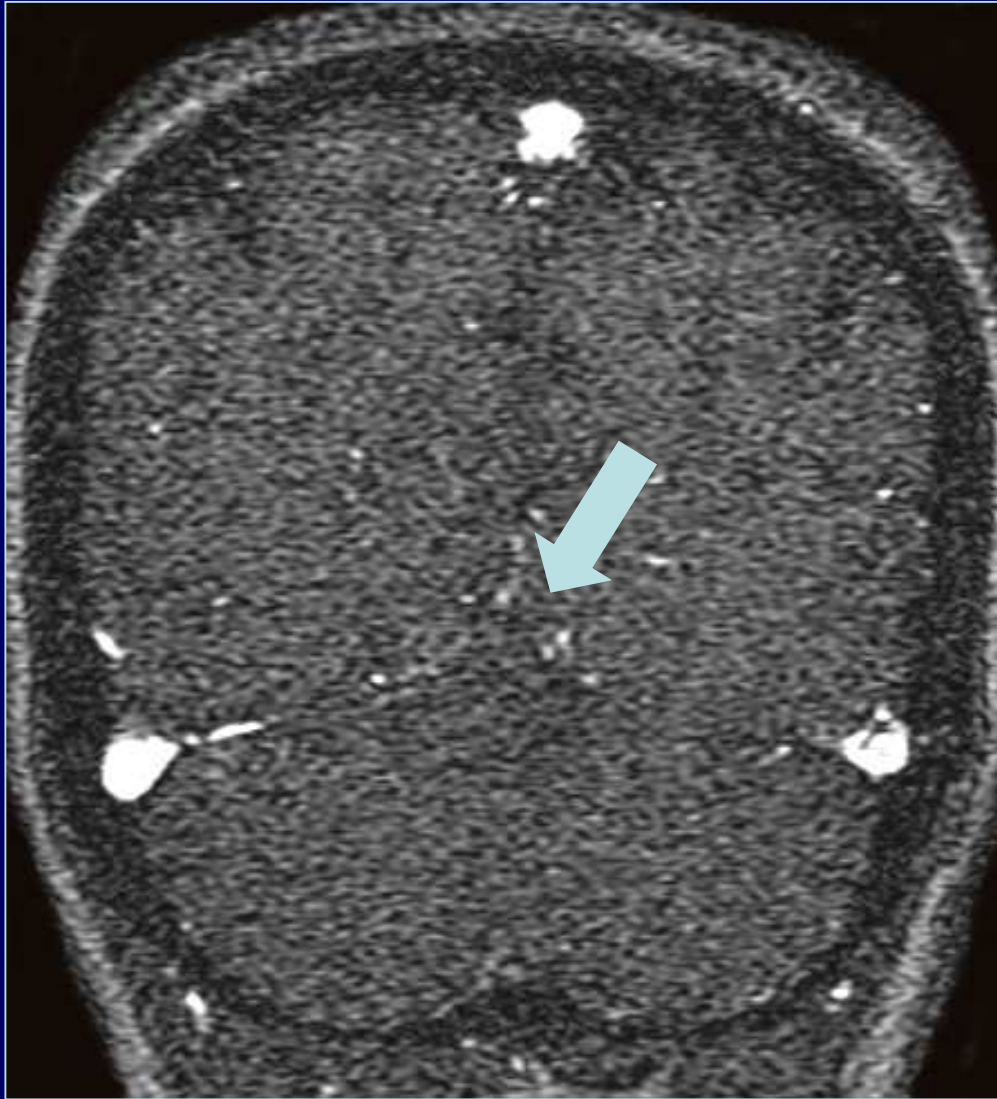


'Signe du delta'









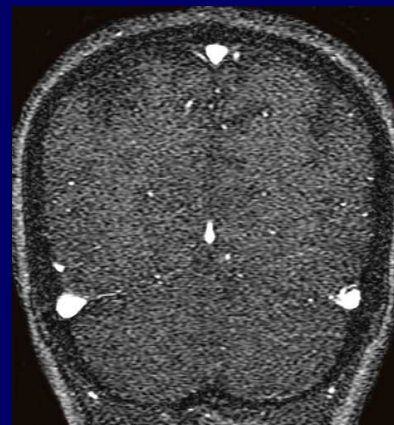
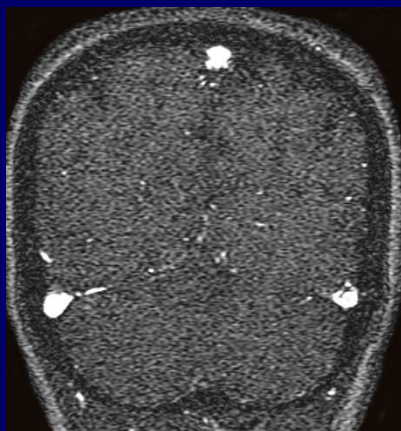
source image



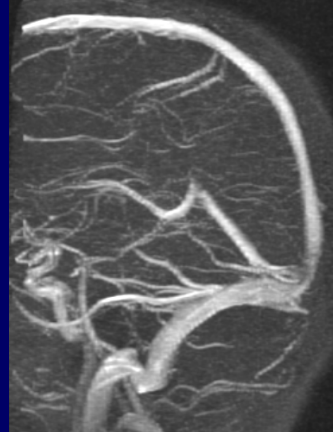
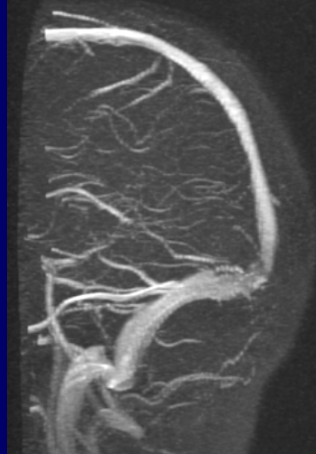
reconstruction



**May 8<sup>th</sup>**



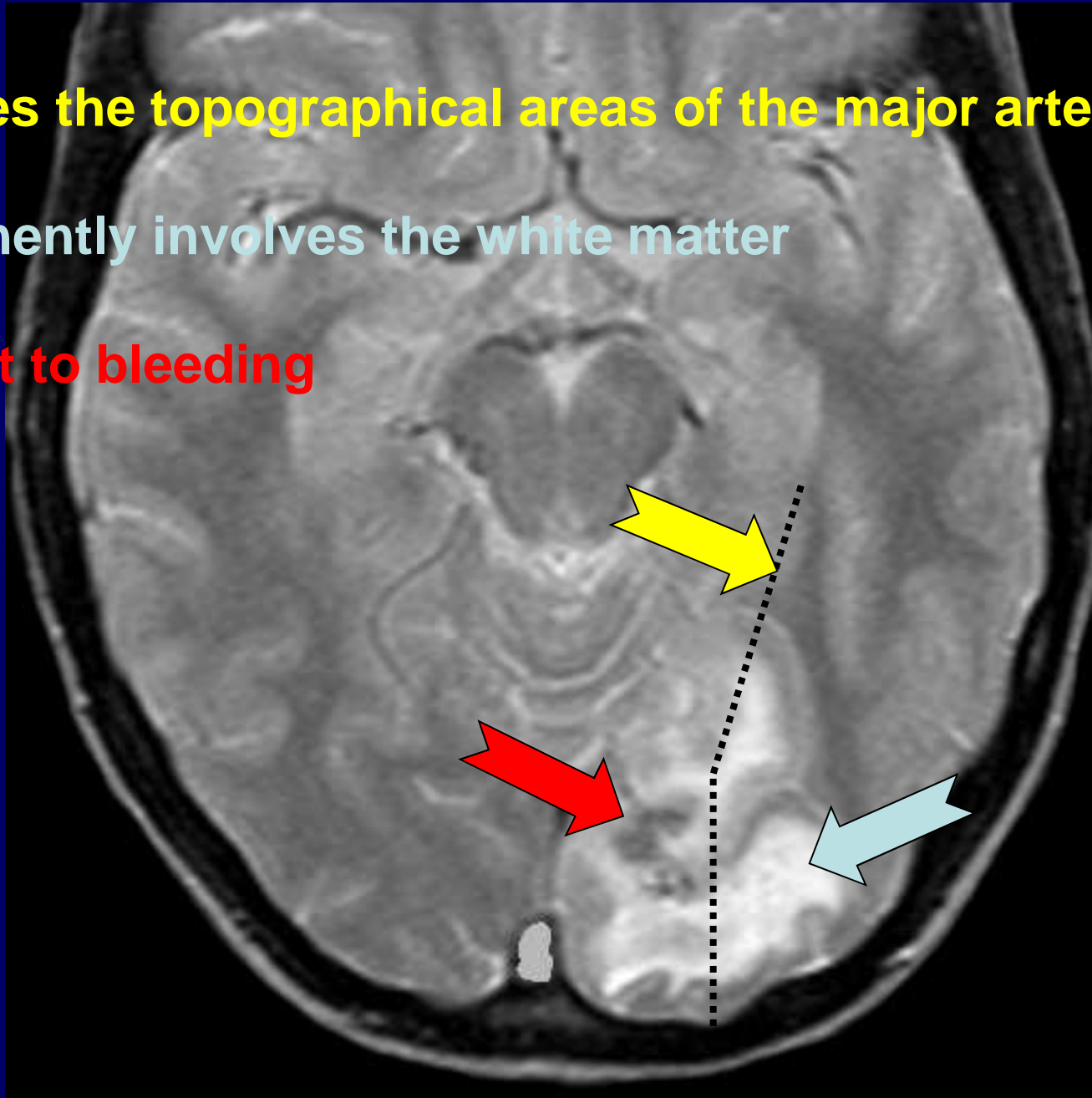
**June 21<sup>th</sup>**



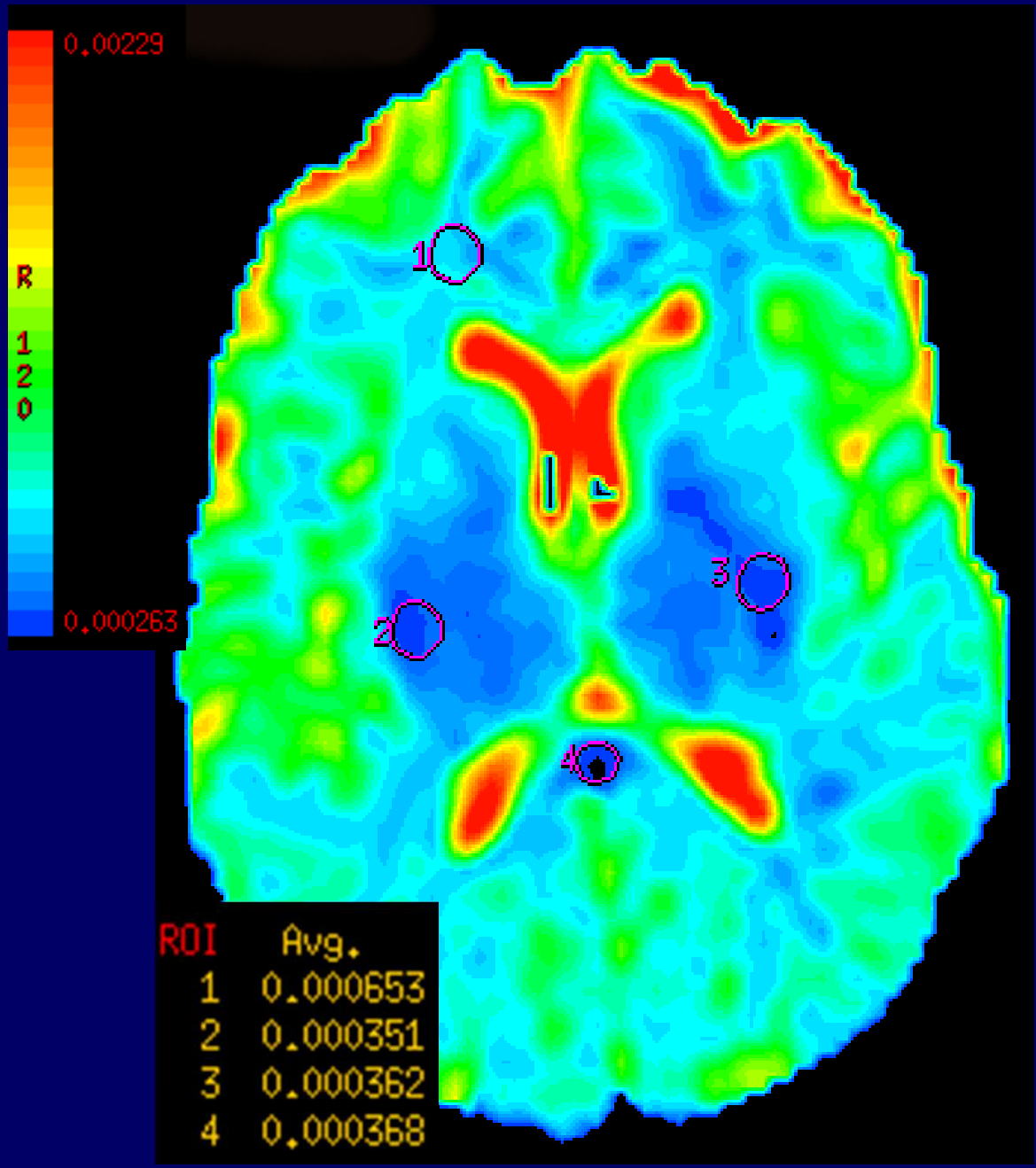
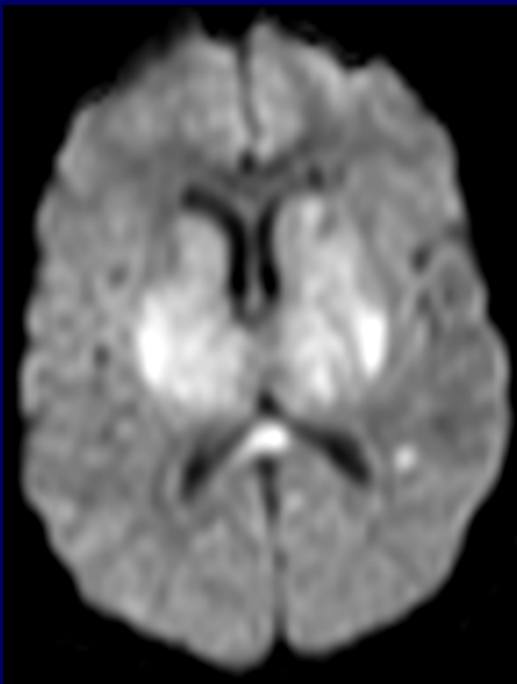
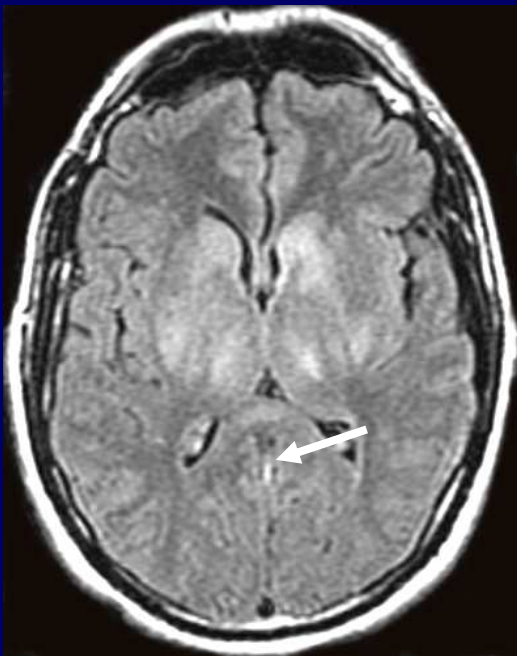
**1. Crosses the topographical areas of the major arteries**

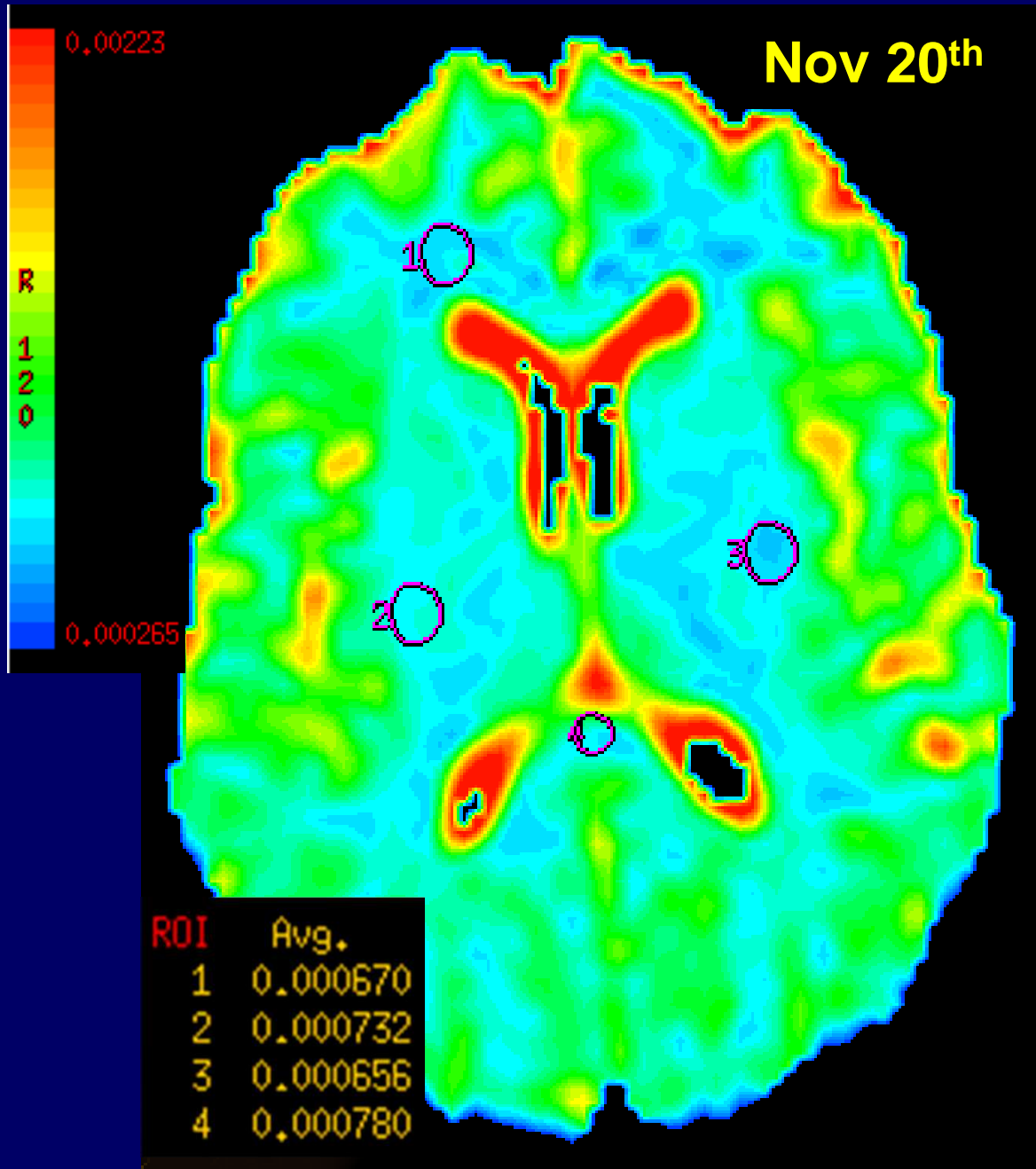
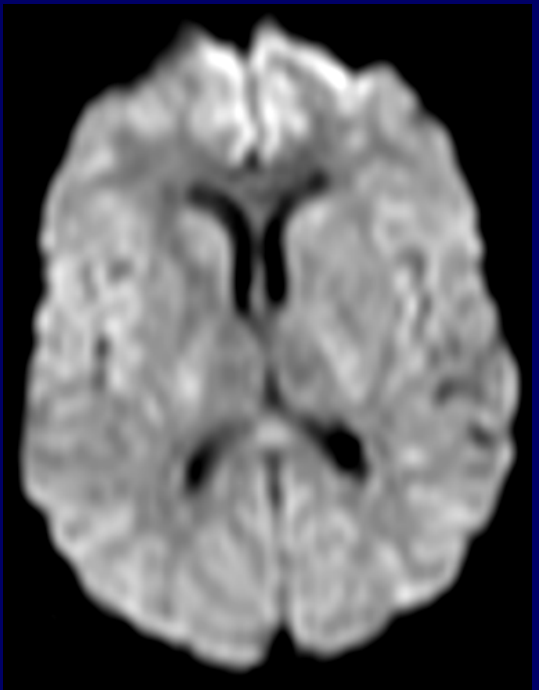
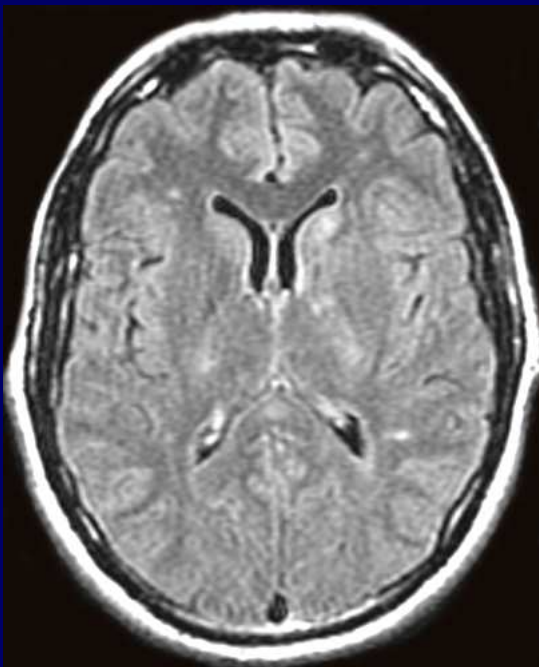
**2. Prominently involves the white matter**

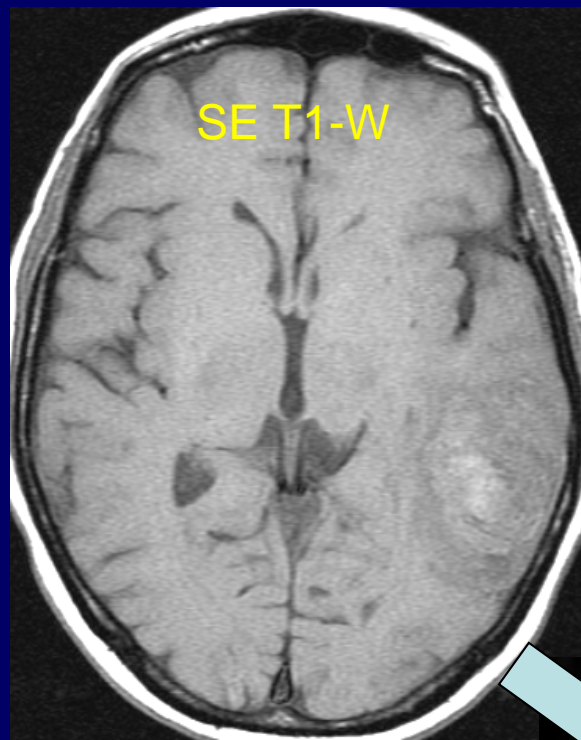
**3. Prompt to bleeding**



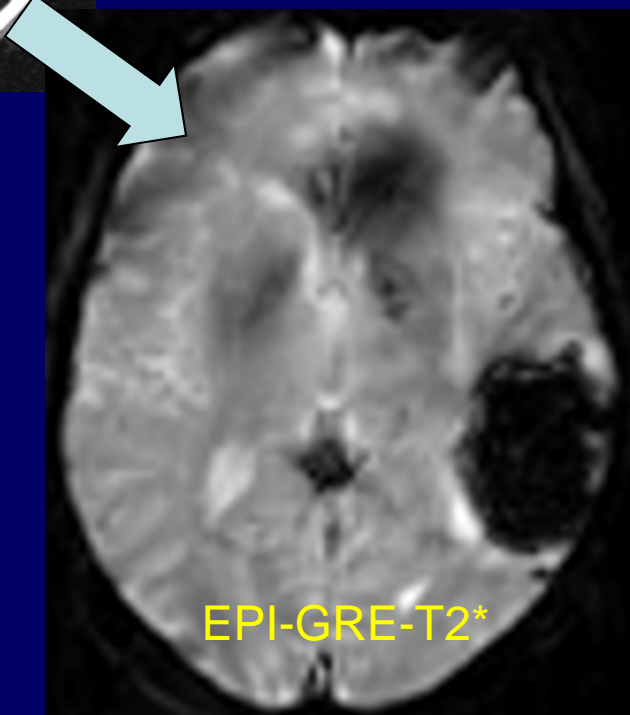






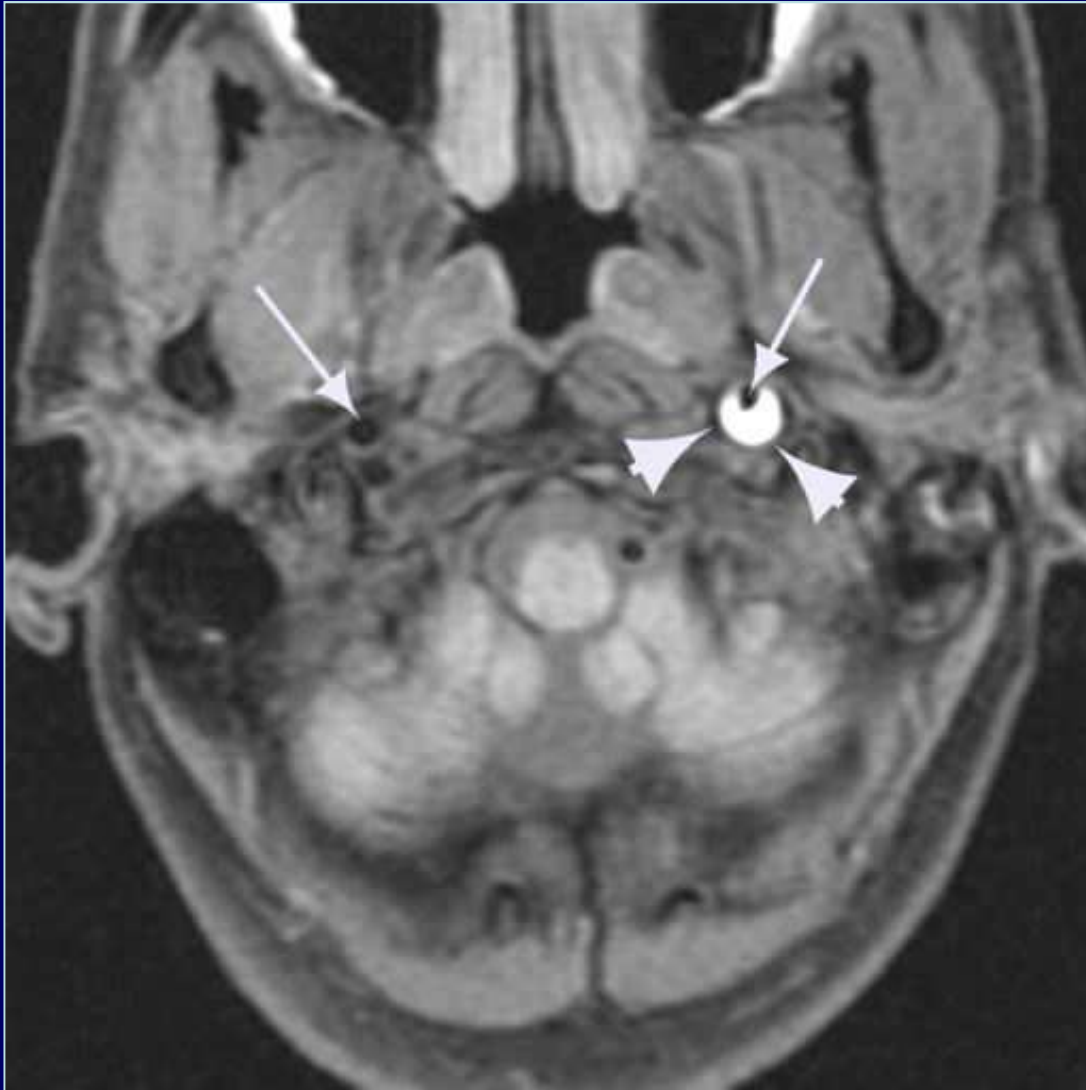


bleeding

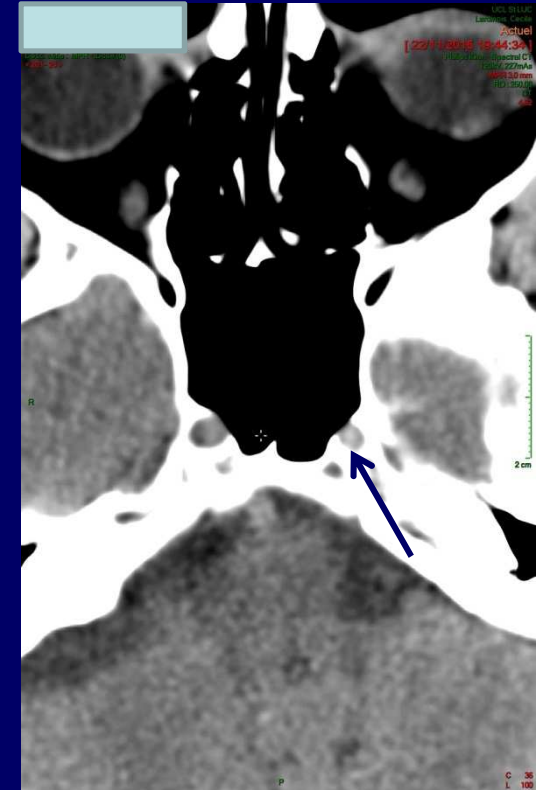
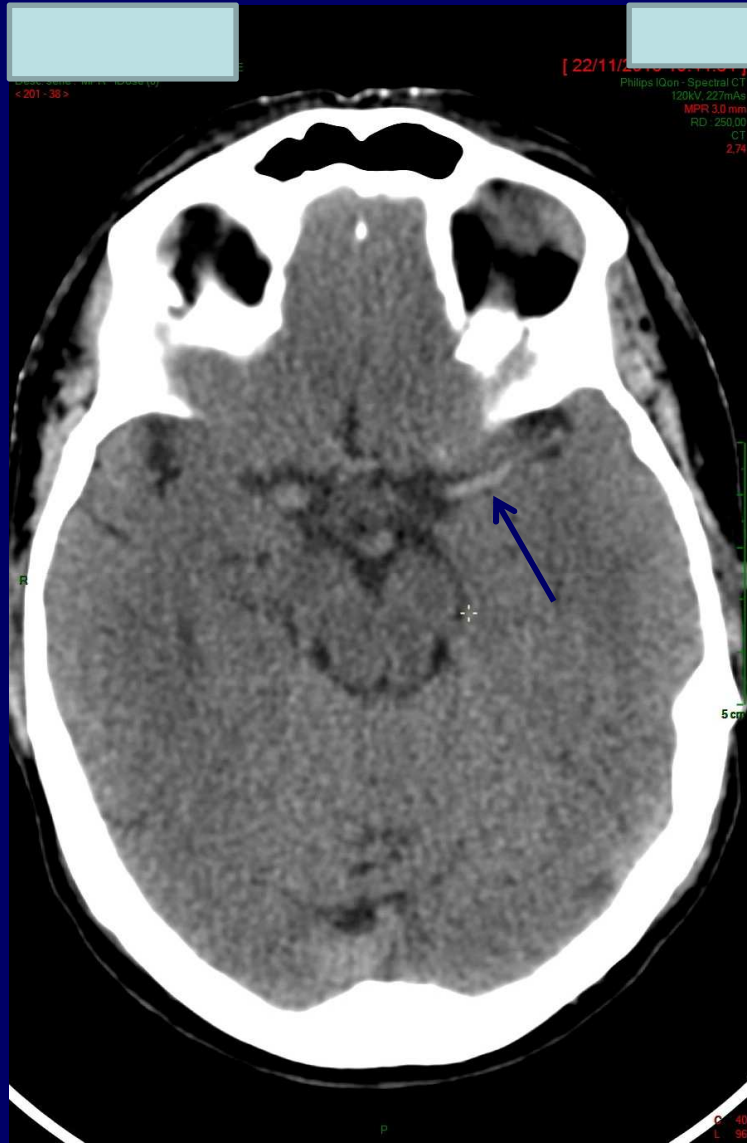


EPI-GRE-T2\*

# Dissection artérielle



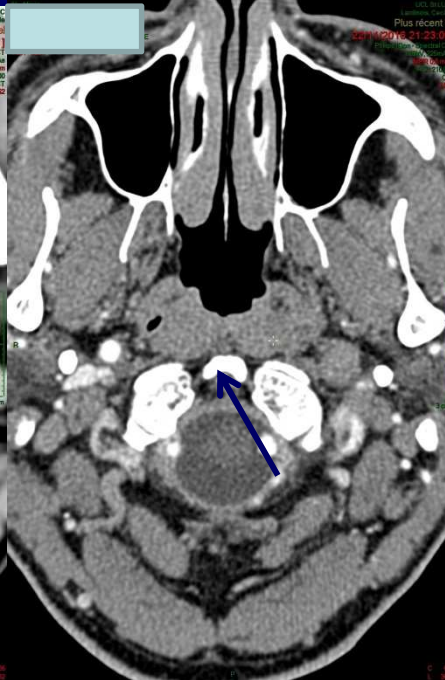
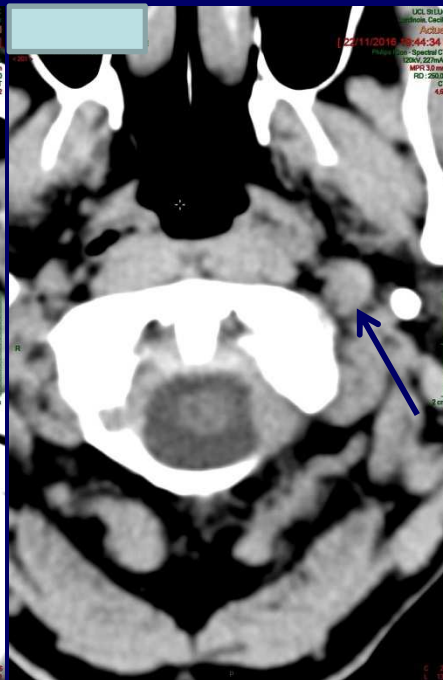
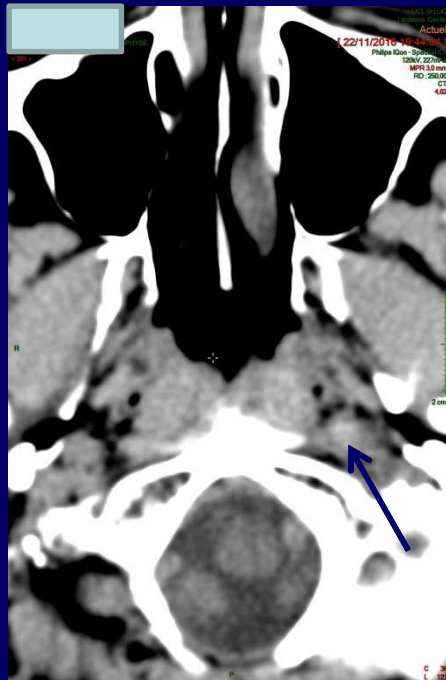
# Case approach 1



Traumatisme  
Douleur cervicale gauche  
Troubles phasiques, 1/2 parésie droite

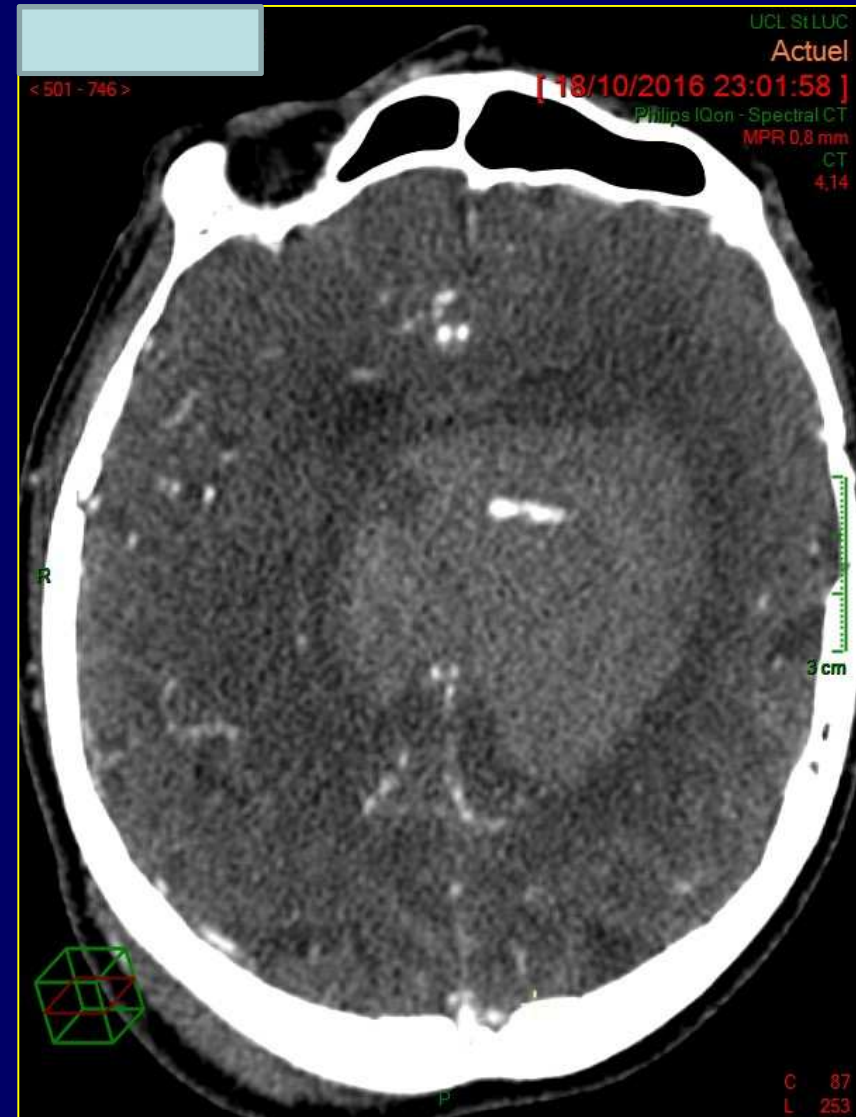


# Case approach 1

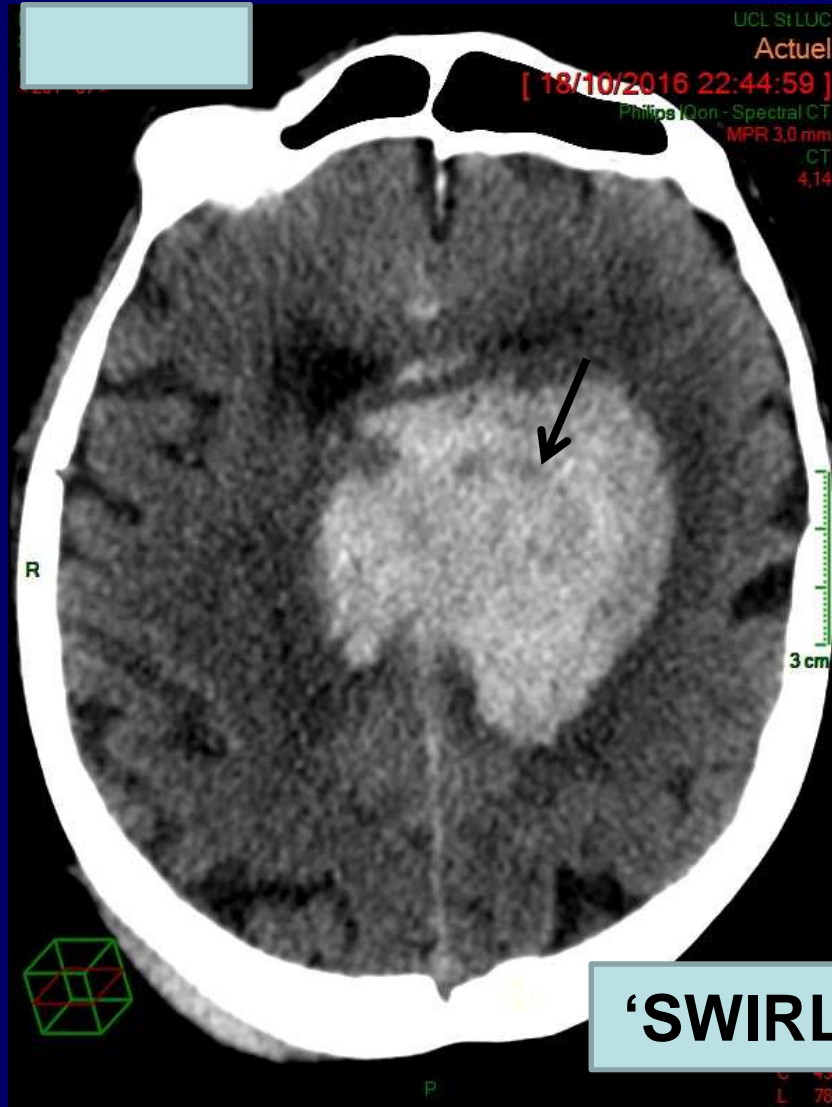




# Case approach 2

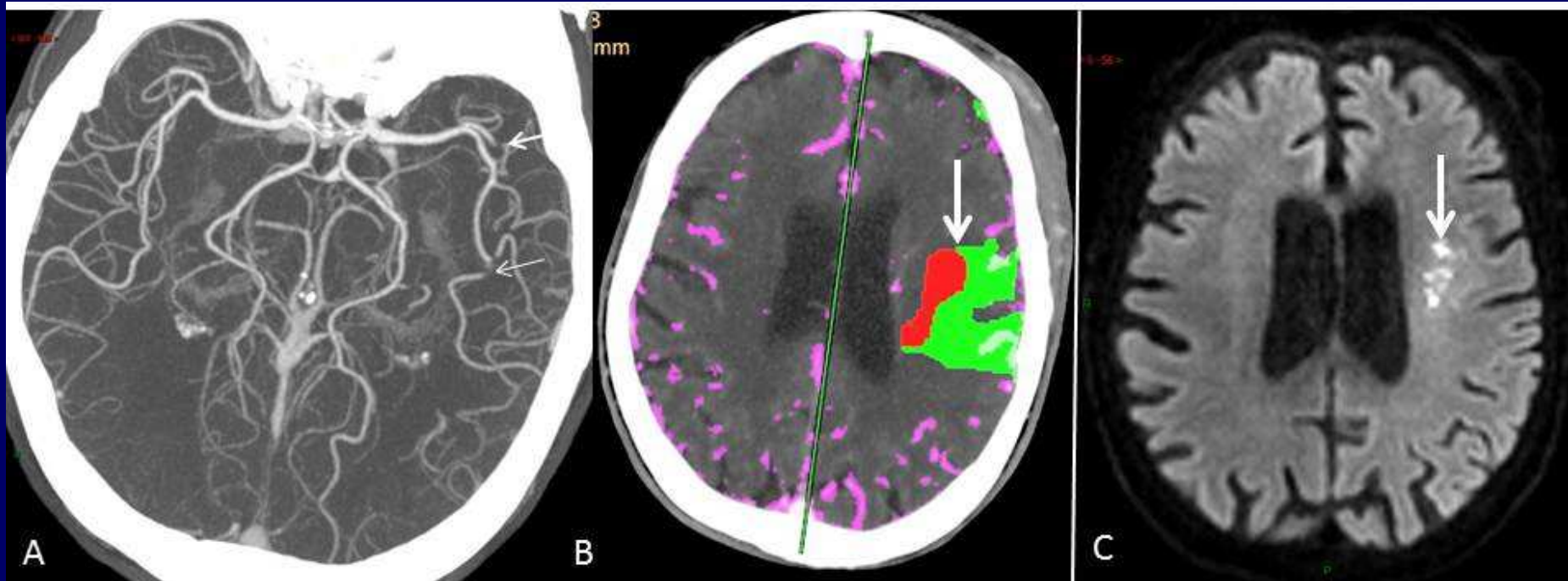


# Case approach 2



**'SWIRL-SIGN'**

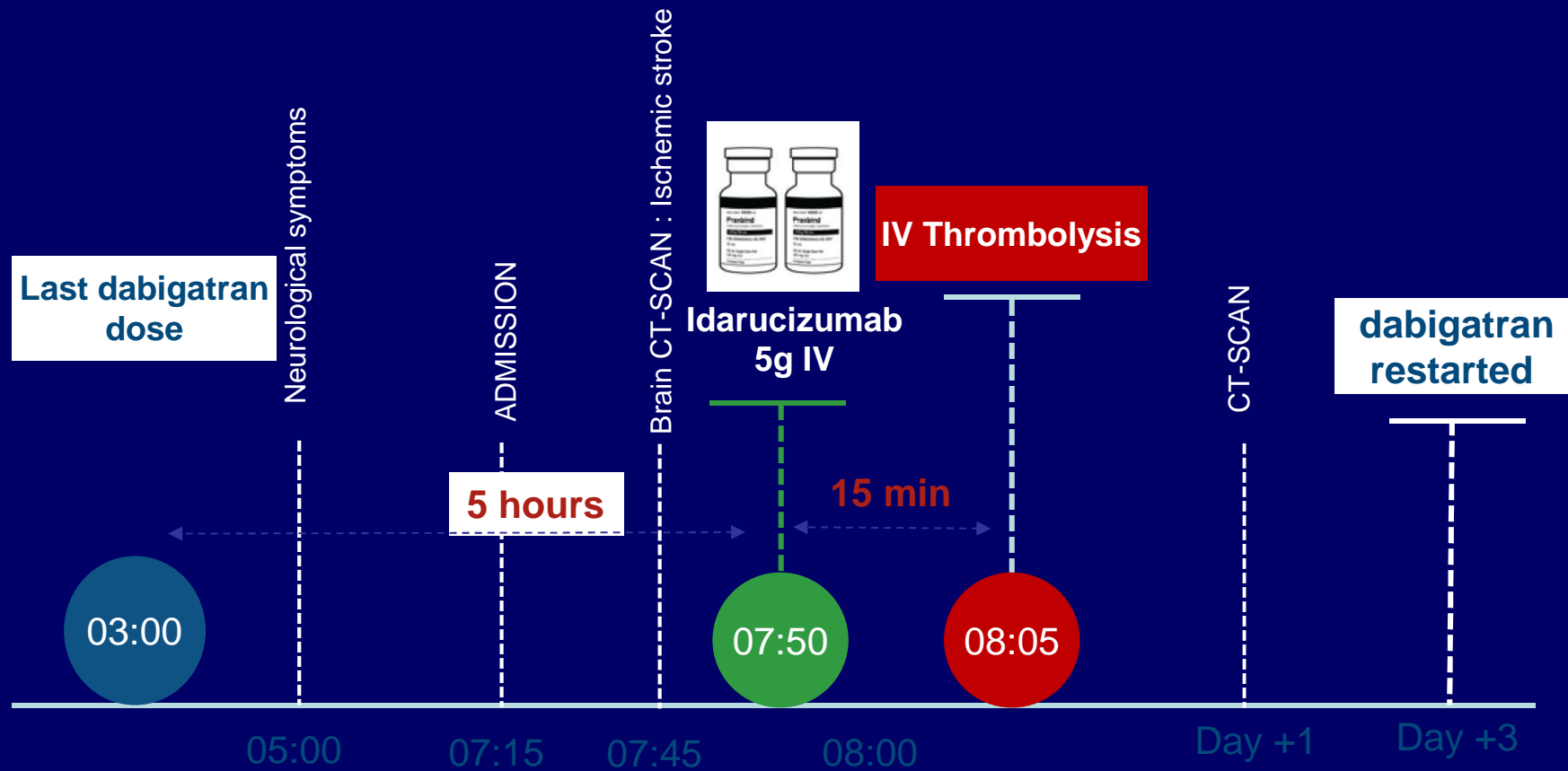
# Case approach 3



85 ans – FA – HTA dyslipidémie

Aphasie et 1/2plégie droit → NHISS 17

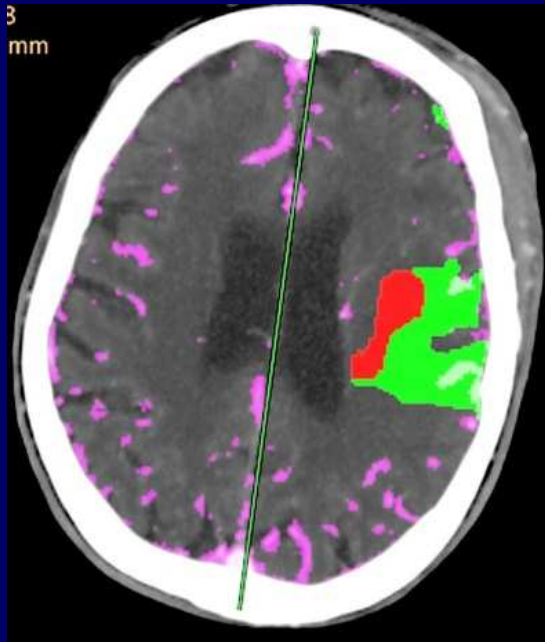
Sous PRADAXA® → CI à la thrombolyse



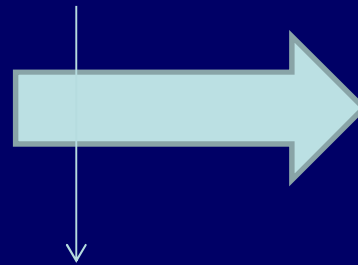
# Case approach 3



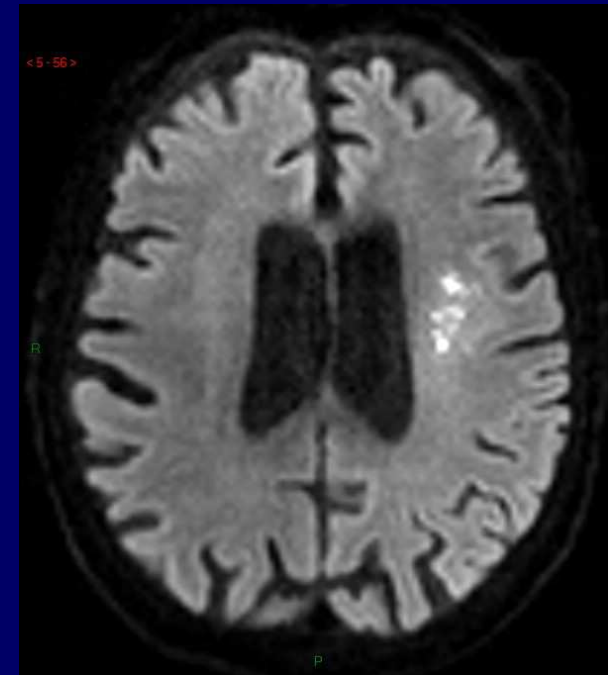
# Case approach 3



Neutralisation du PRADAXA®  
par PRAXBIND®



Thrombolyse !



R/ AC → CI à la thrombolyse IV (risque hémorragique)

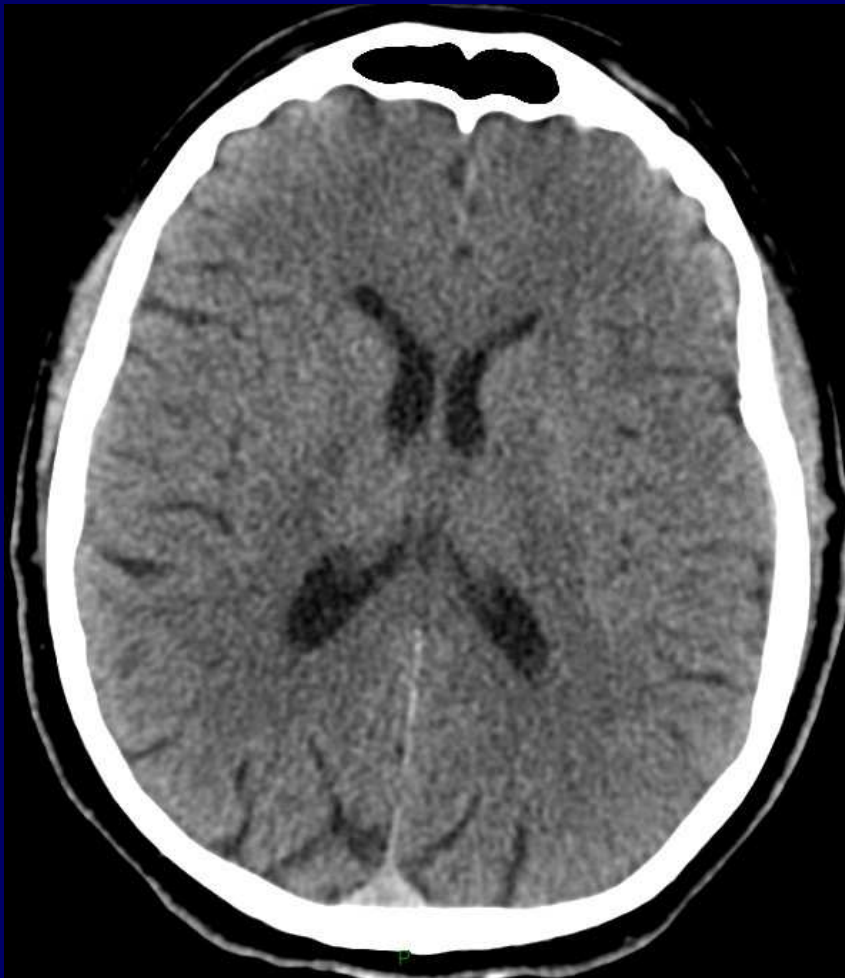
Antivit K → INR >1.7 → exclu

Anti thrombine (Pradaxa®) → agent neutralisant disponible (Praxbind®)

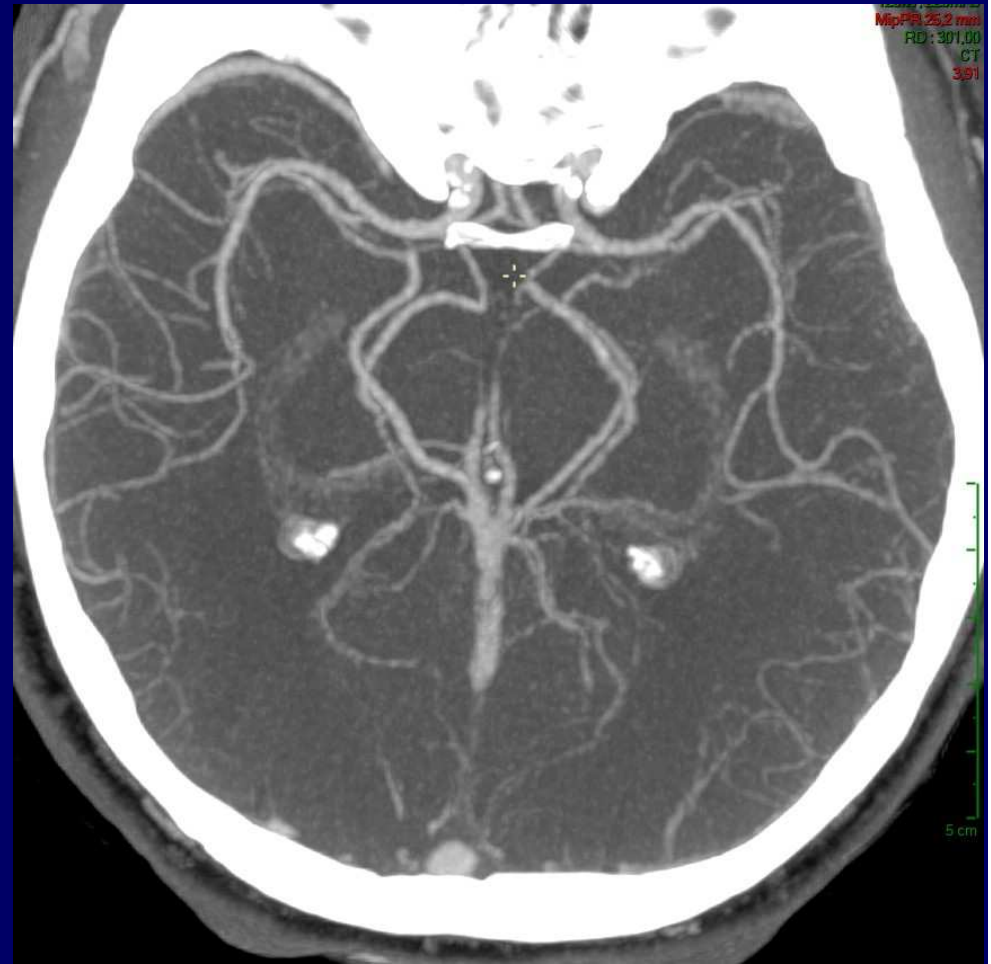
Anti facteur X (Xarelto®) → agent neutralisant dans le pipe-line

# Case approach 4

Hémiplégie droite + aphasie



NCCT: normal



CTA: normal

Que faire ?

# Case approach 4

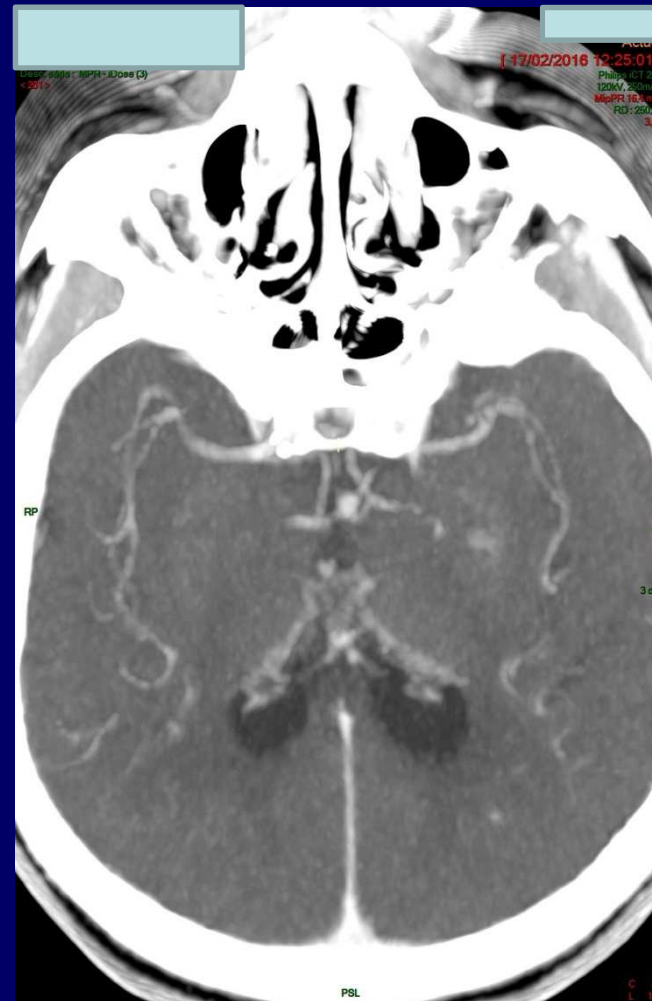


Regarder plus bas !

... trouver un chirurgien vasculaire et une SO libres

# Case approach 5

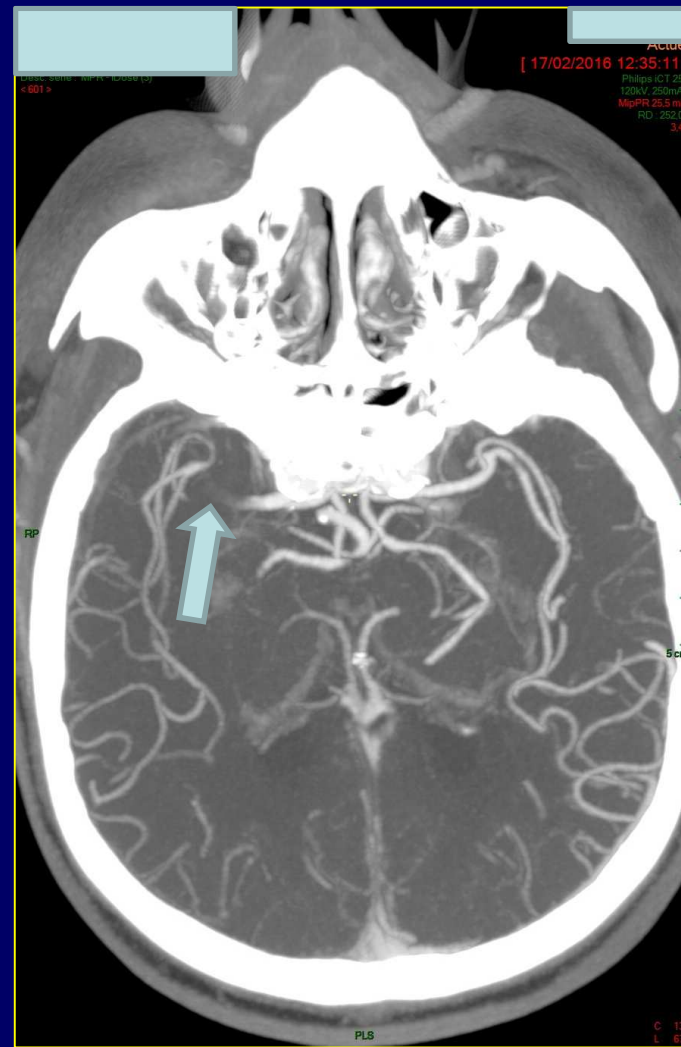
Procédure interventionnelle: TAVI - ½ parésie gauche



Examen 'à blanc'

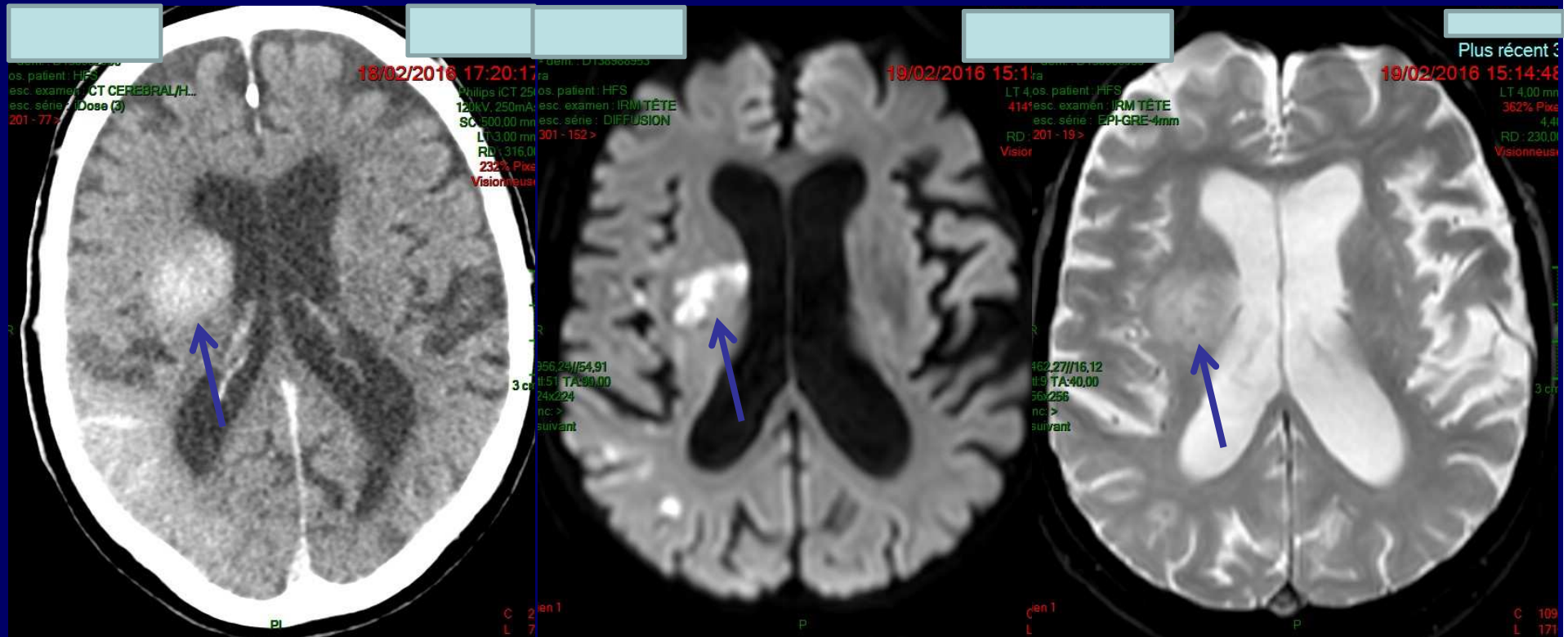


# Case approach 5



Angiogramme → thrombectomie

# Case approach 5



Leakage de molécules de PdC par ischémie endothéliale

TAVI + CTA + THROMBECTOMIE !