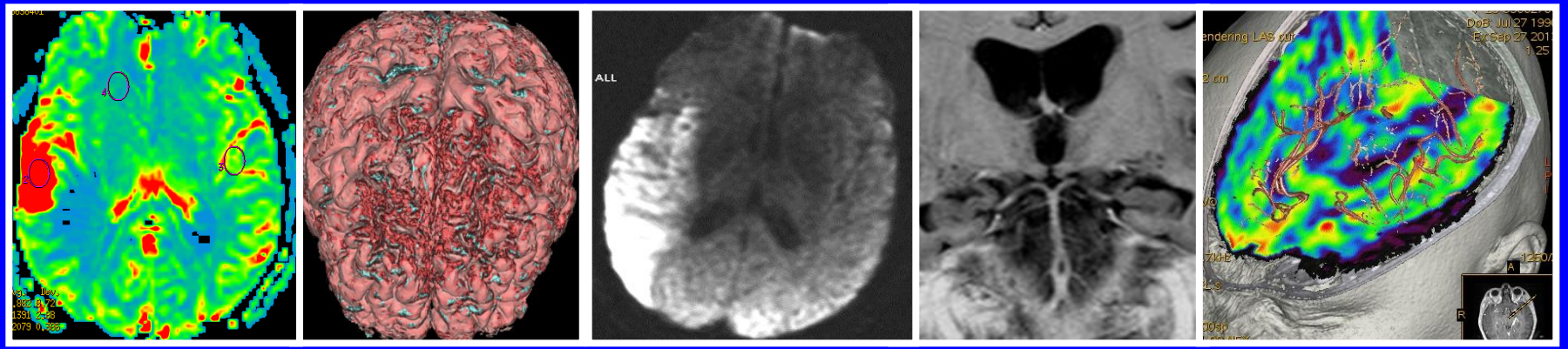
dasa DIAGNOSTICO MAIPU

NEUROIMÁGENES EN ACV



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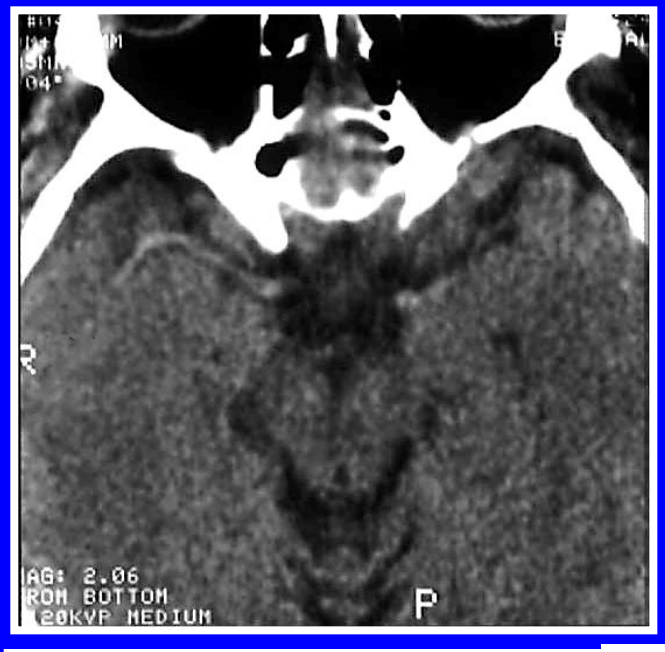
ACV ISQUEMICO

- **1) ACV AGUDO**
- **2) CAUSAS DE ACV**
- **3) IMÁGENES DE PARED VASCULAR**

3 hs. del episodio



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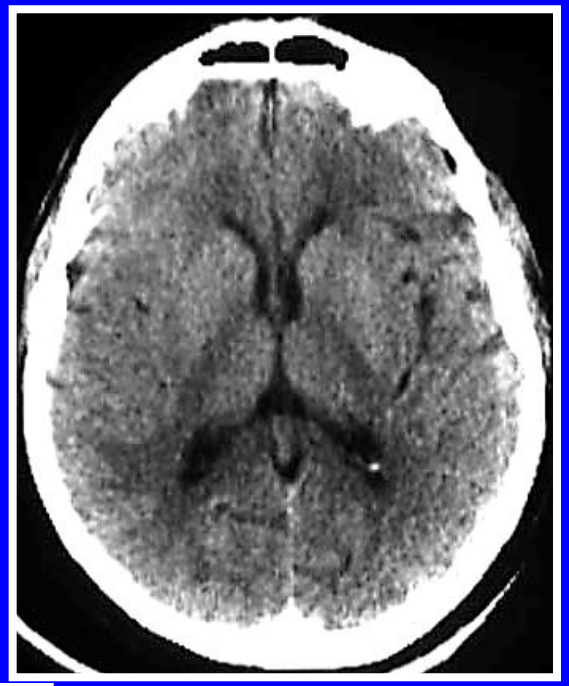
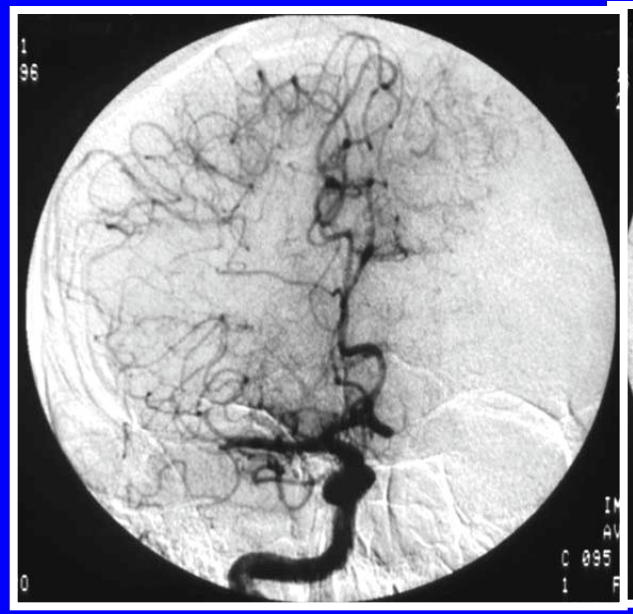
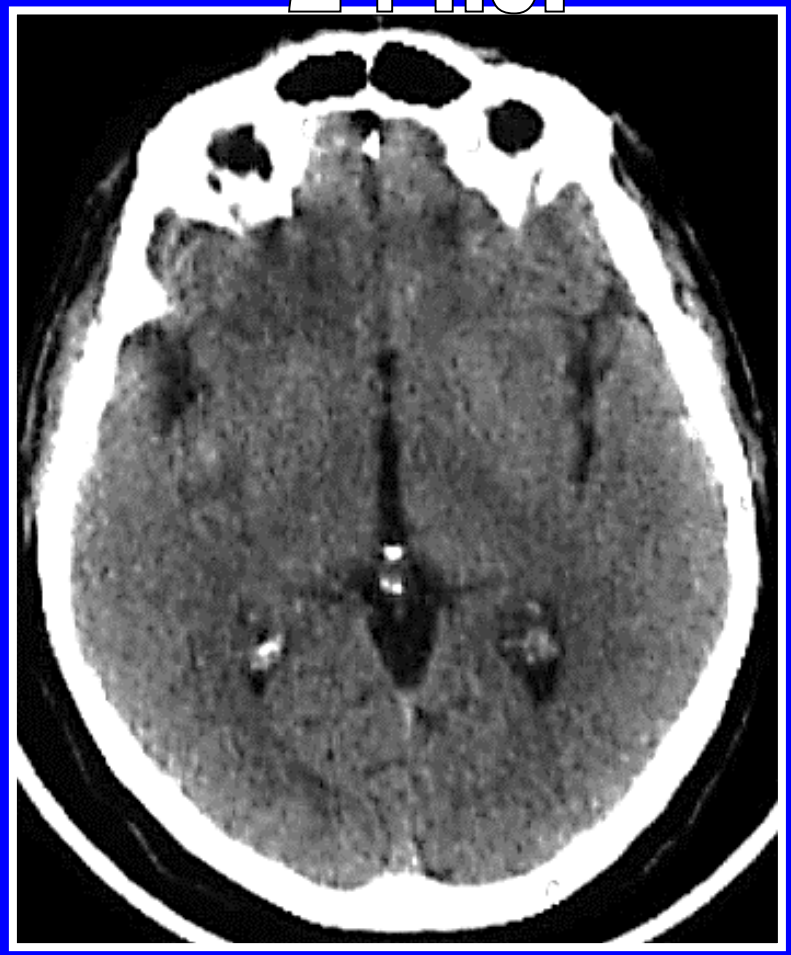
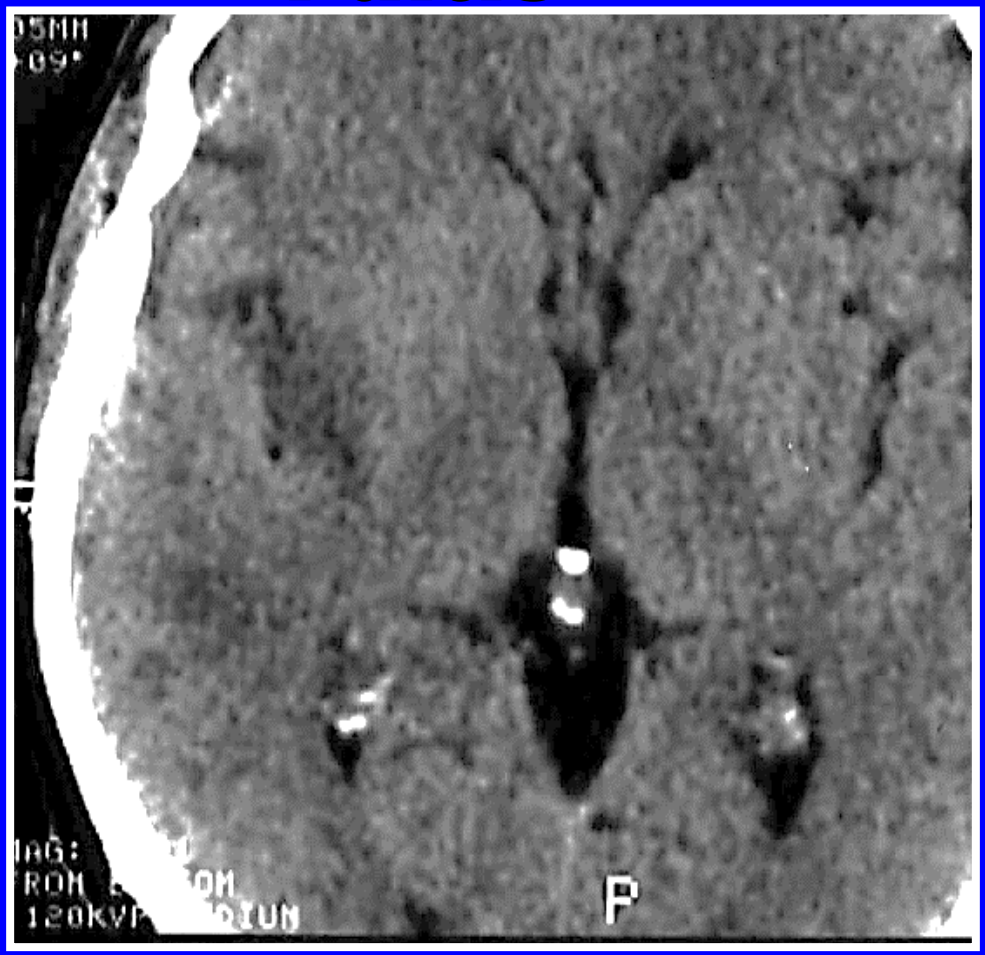




24 hs.



7dias



ACV. GENERALIDADES

- 85% isquémicos
- 15% hemorrágicos
- Neuroimágenes:
- TC simple
- TC multiparamétrica (ATC y PTC)
- RM (Difusión, Perfusión)
- Angio RM (cerebro y cuello)
- Echo-Doppler
- Medicina Nuclear

DIAGNÓSTICO EN ACV AGUDO

OBJETIVOS:

- 1. Localización y extension de la obstrucción
- 2. Volumen" del "CORE" del infarto
- 3. Viabilidad tisular (penumbra)
- 4. Grado de colateralización.

DIAGNÓSTICO EN ACV AGUDO

- **TC:**
- **Signo de la arteria hiperdensa**
- **Perdida de la interfase SG/SB**
- **Borramiento de los bordes de la insula**
- **Hipodensidad de los ganglios de la base**

Signo de la arteria hiperdensa

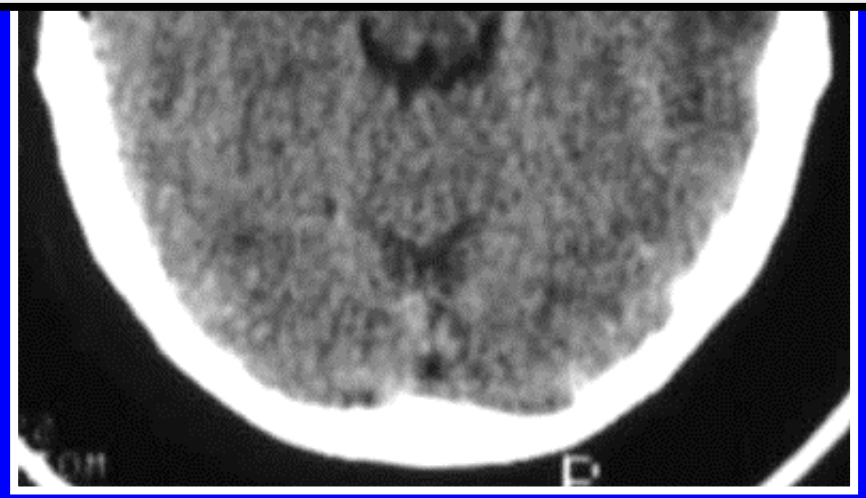
Neuroimaging of Acute Stroke

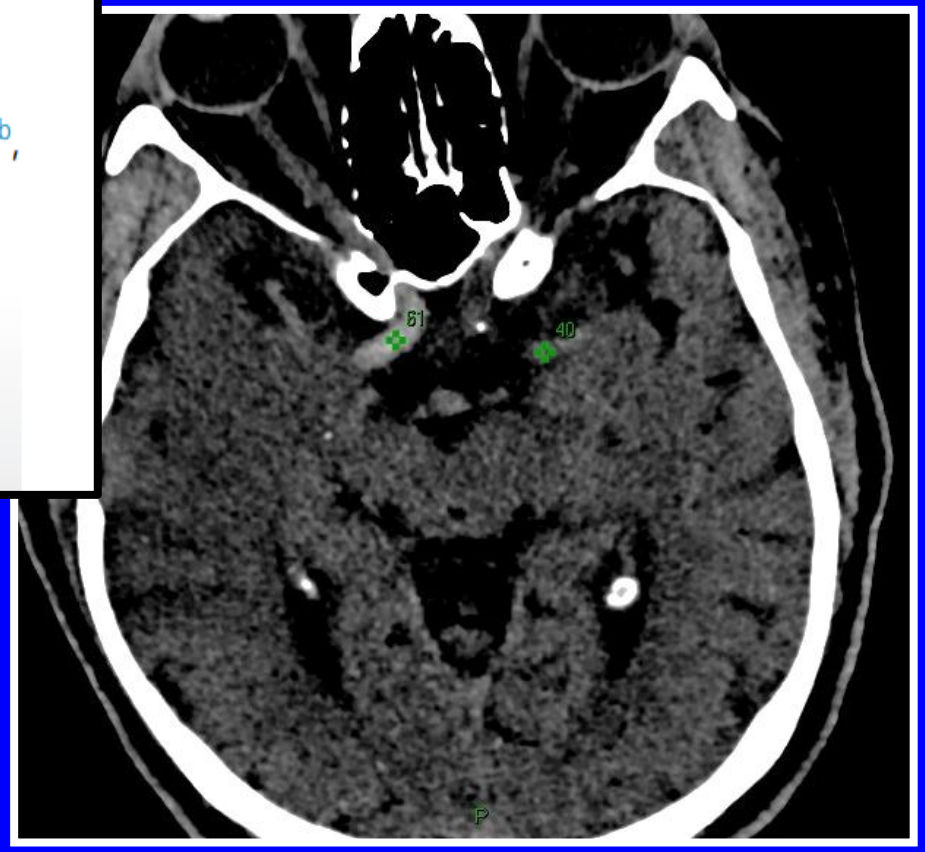
Neurol Clin 38 (2020) 185–199
https://doi.org/10.1016/j.ncl.2019.09.004

Ashutosh P. Jadhav, MD, PhD[a,*], Shashvat M. Desai, MD[a], David S. Liebeskind, MD[b], Lawrence R. Wechsler, MD[a]

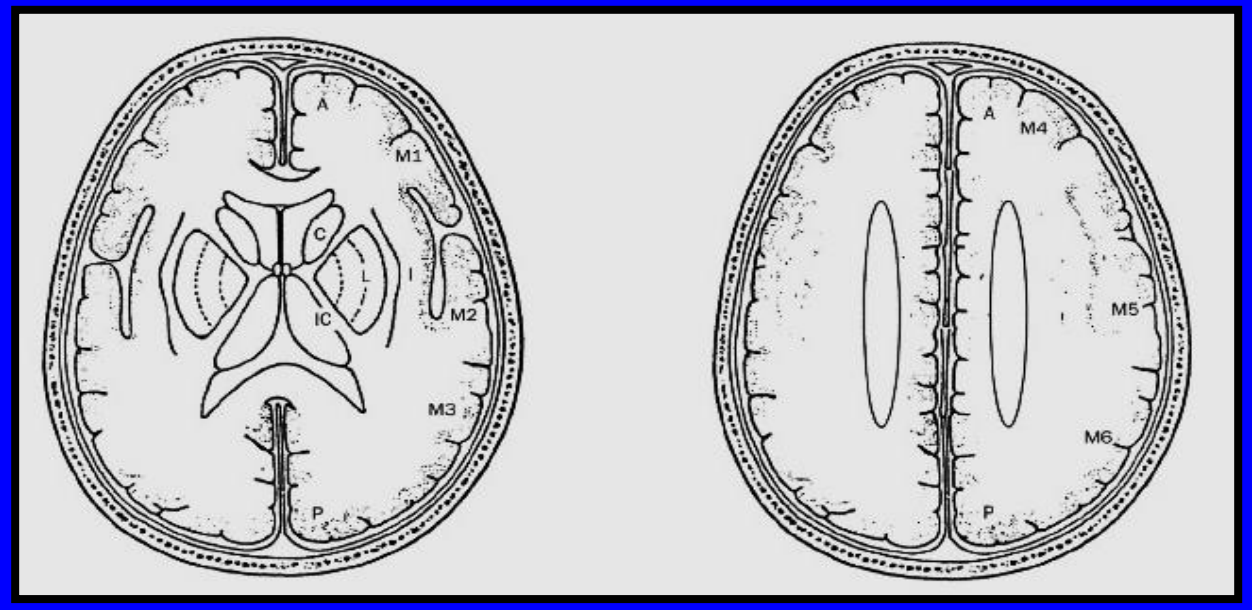
KEYWORDS

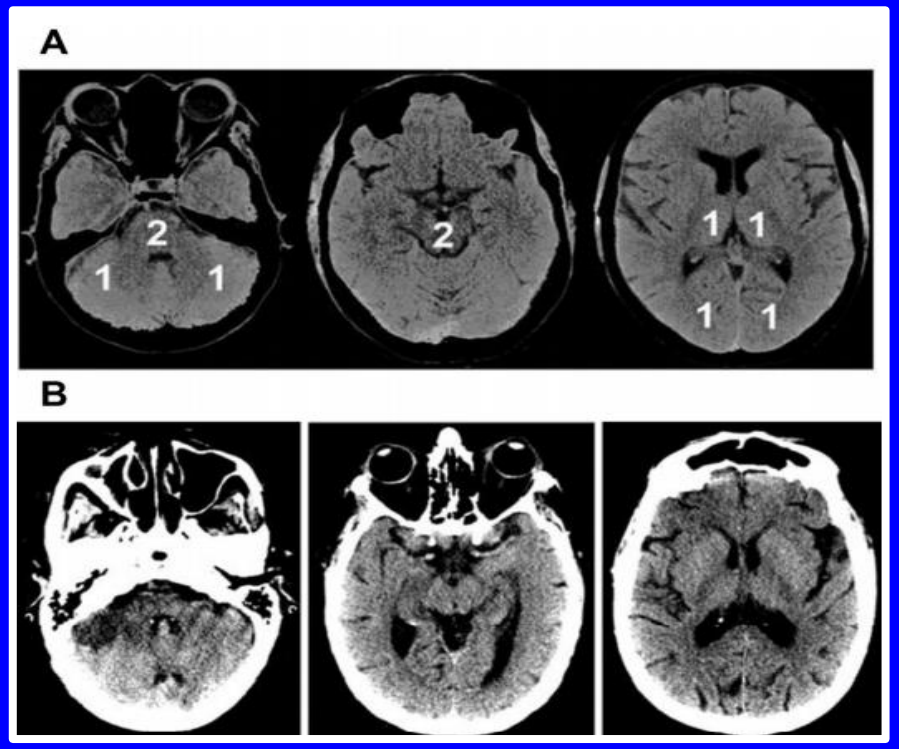
• Stroke • Ischemic stroke • Neuroimaging • Infarction • Hemorrhage
• Thrombectomy

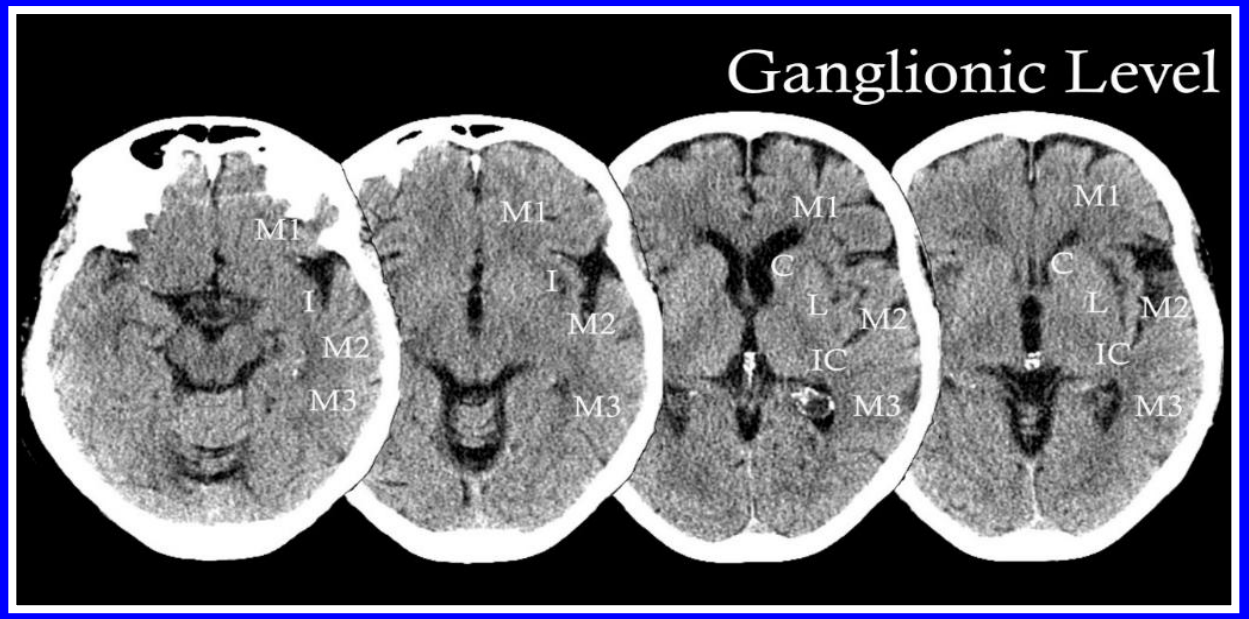


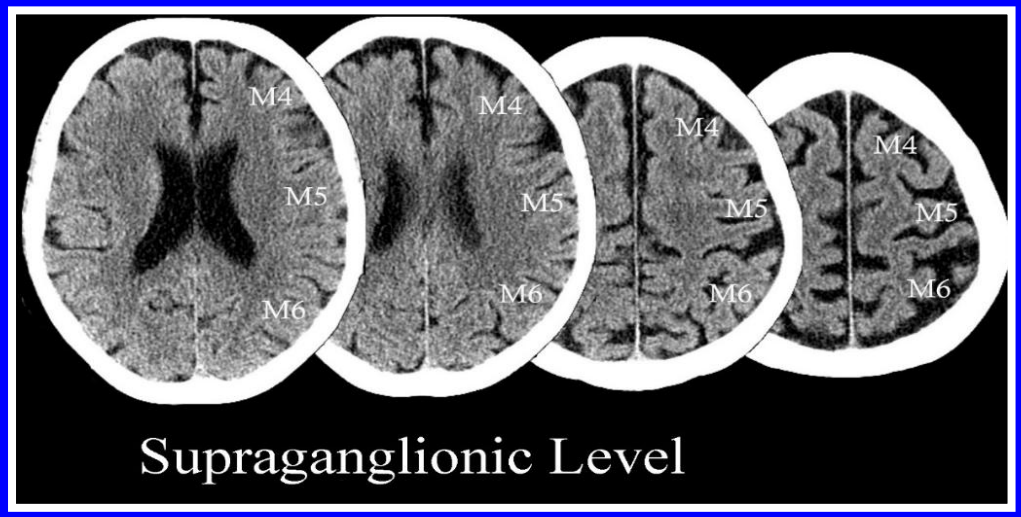


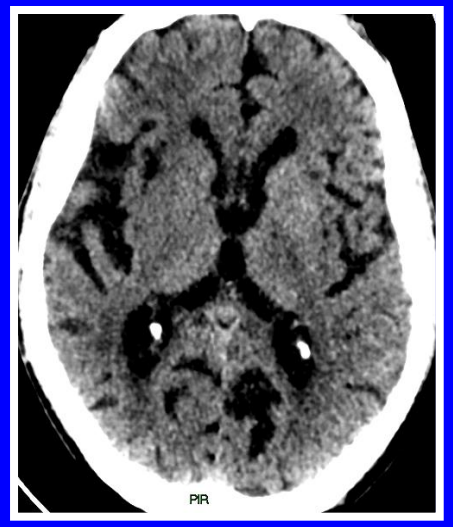
ASPECT y pfASPECT







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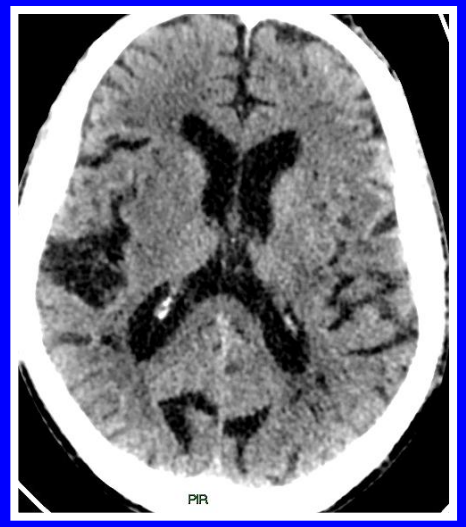
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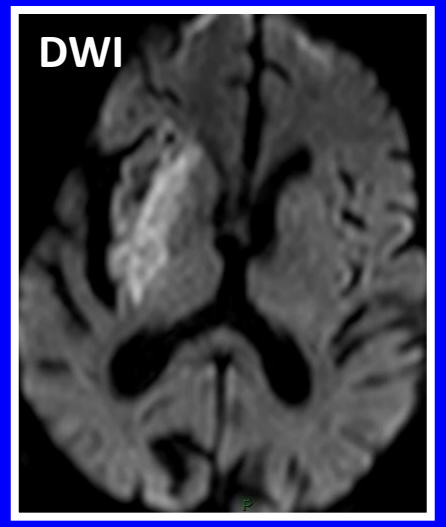
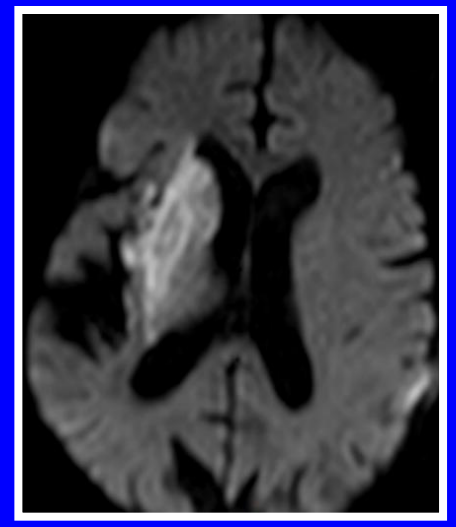
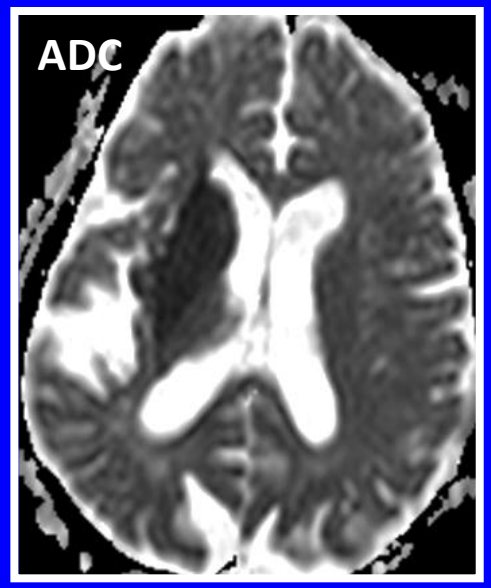

DWI

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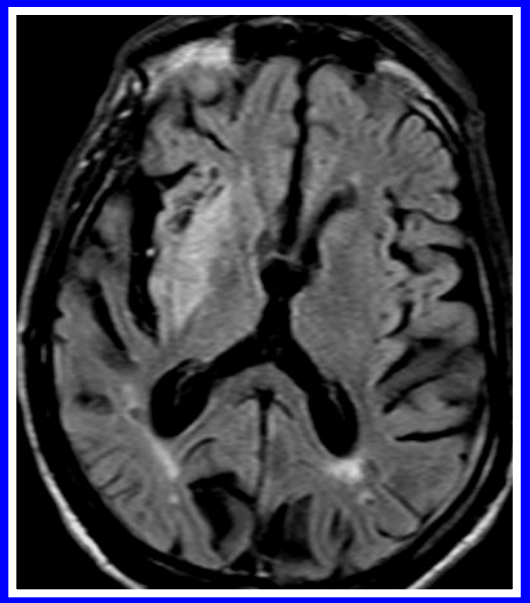
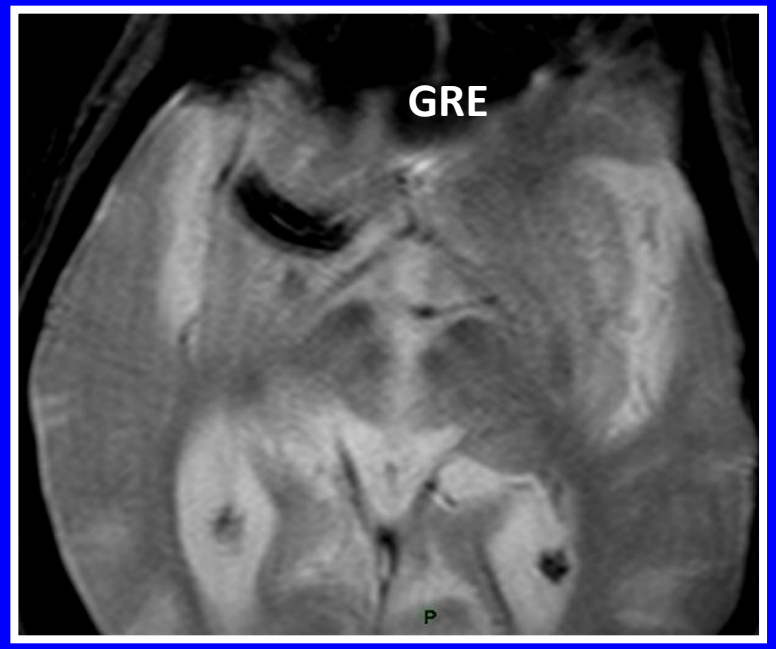
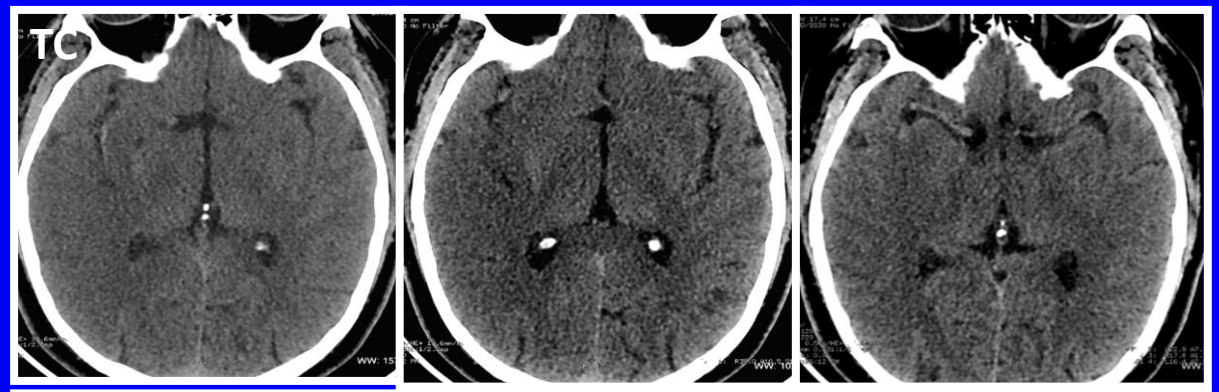
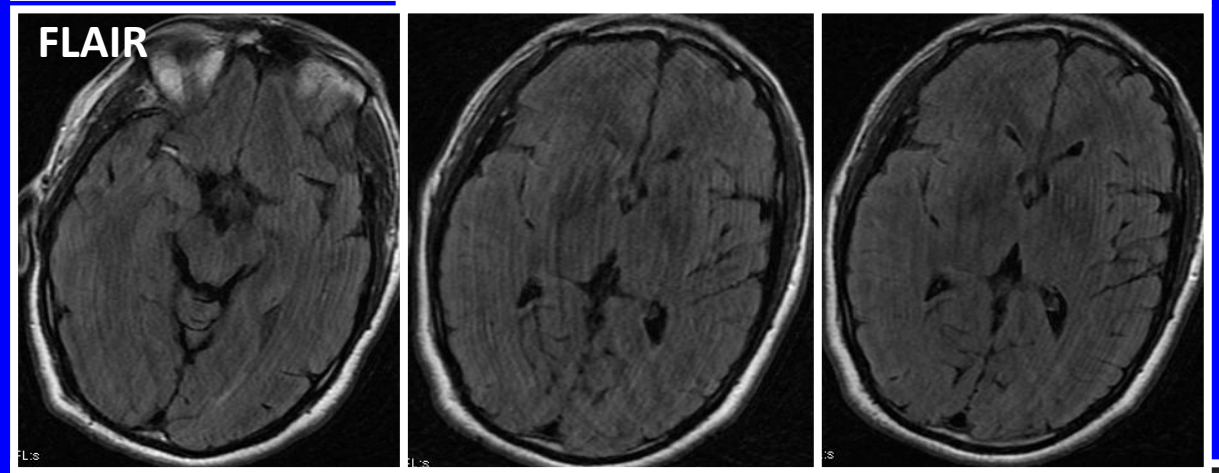



GRE
P


TC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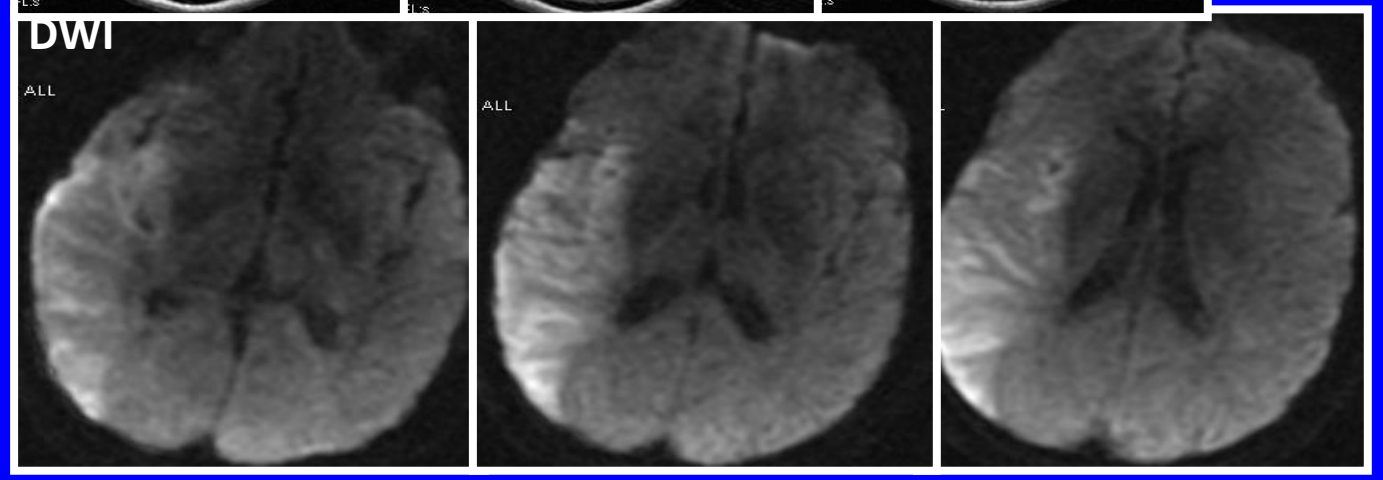
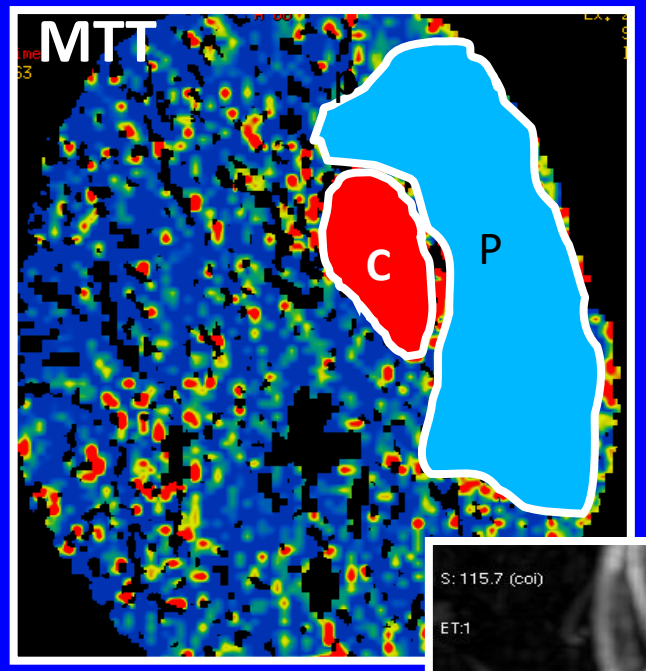
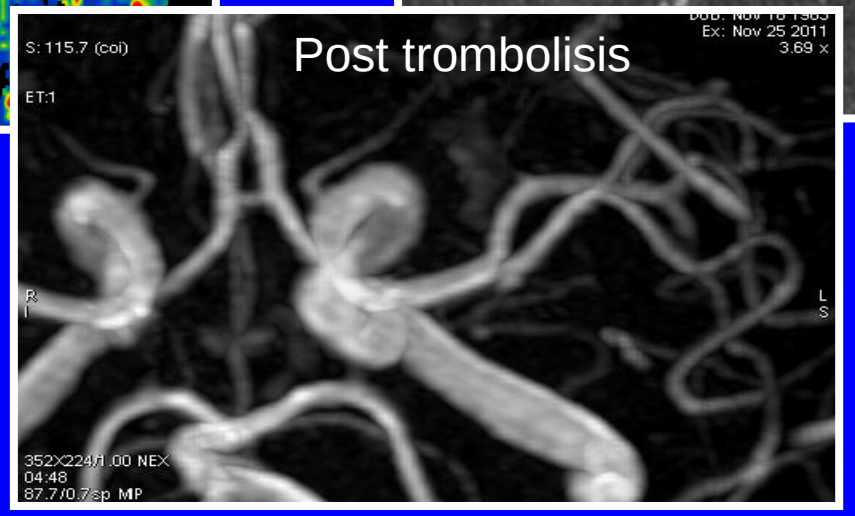

DWI
ALL
ALL

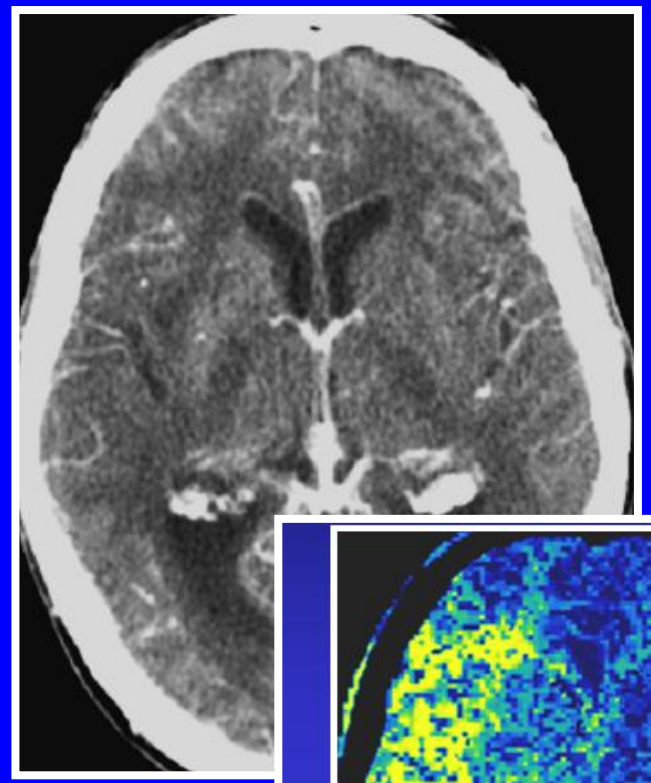
DWI

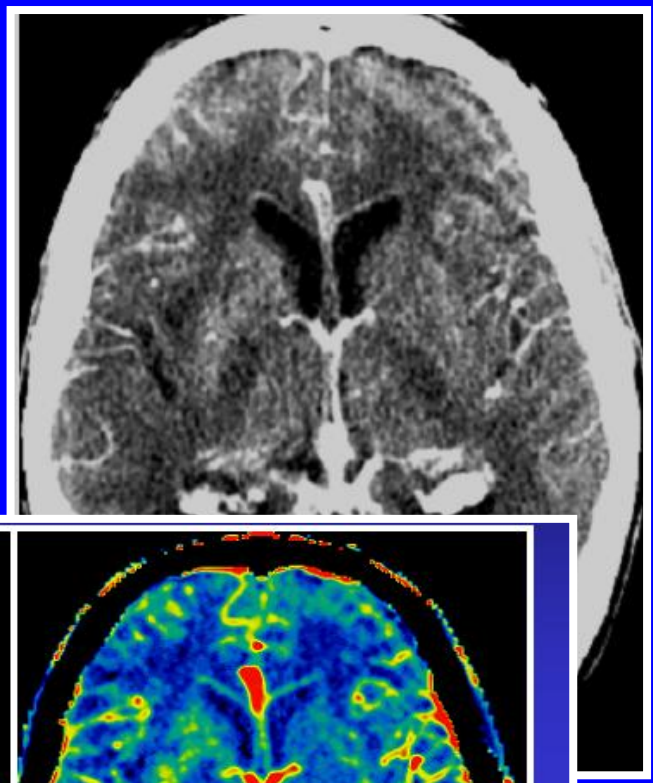
PWI

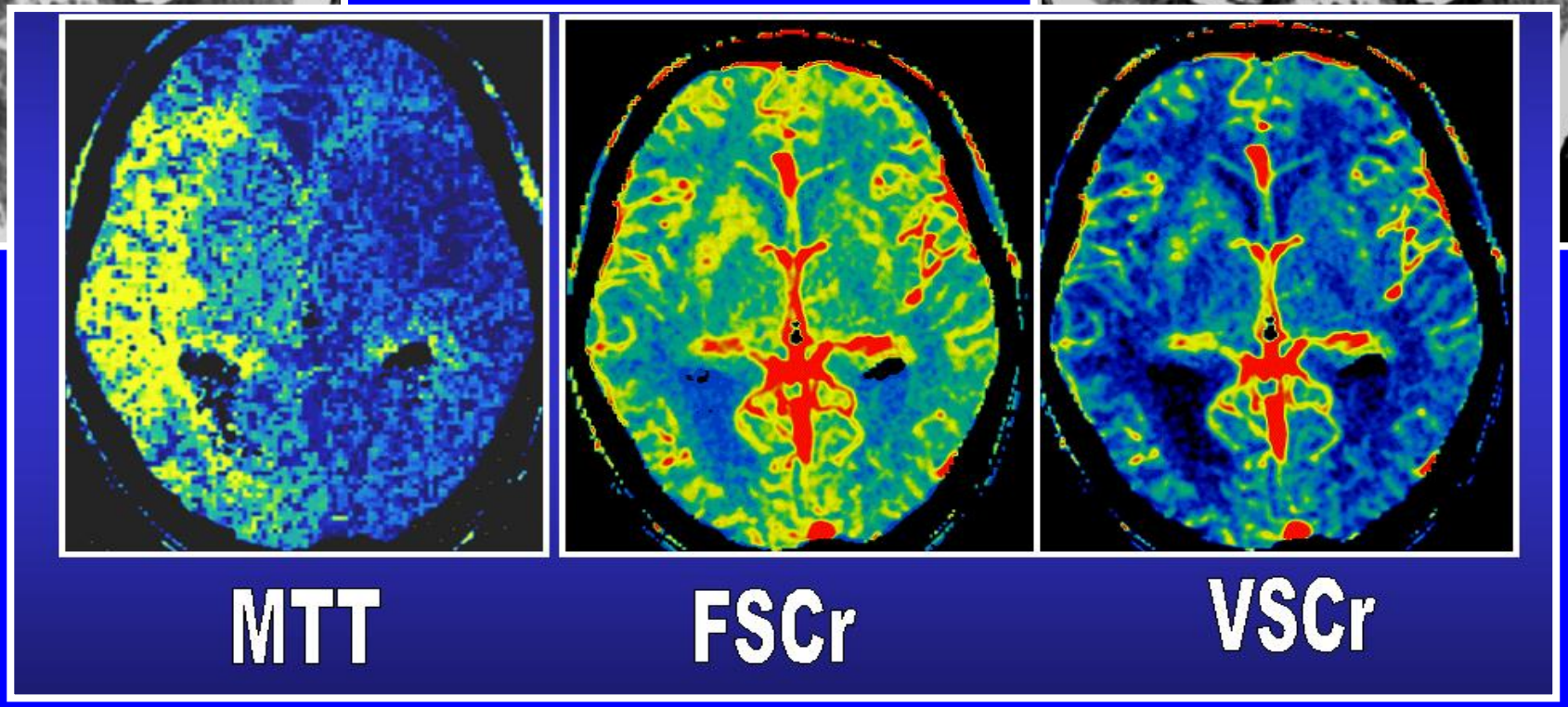


ANGIO TC








MTT
FSCr
VSCr

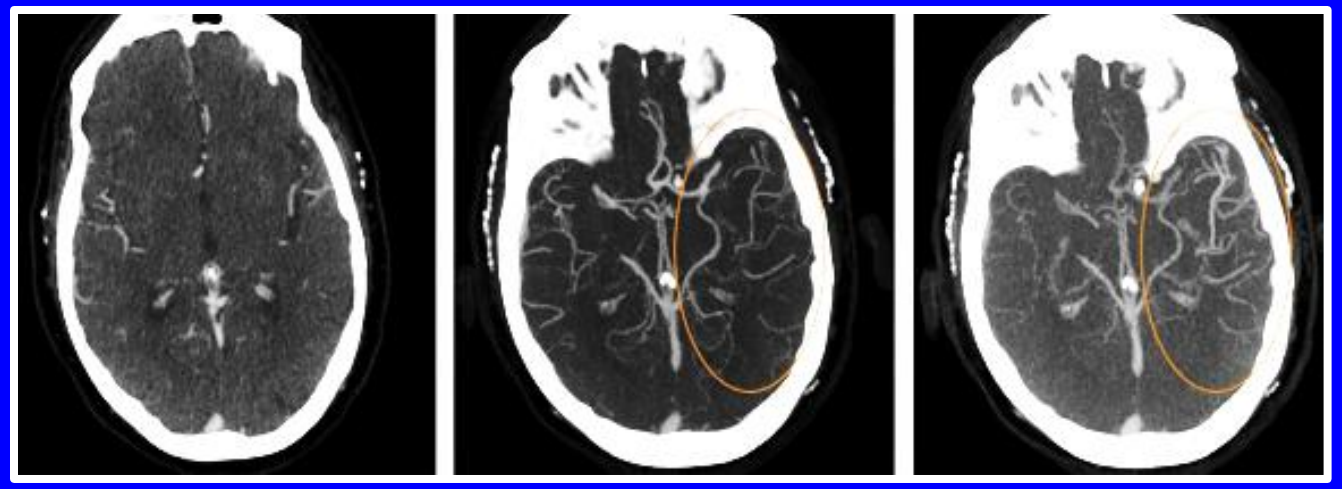
"TIPS" sobre TEMPORALIDAD y DWI/PWI en ACV agudo

- **Volúmen DWI > 70 ml: pobre pronóstico**
- **Cálculo "rápido" de volumen del core isquémico (DWI): "ABC/2"**
- **Hiperintensidad en FLAIR: 6 hs aprox**
- **Hiperintensidad en T2: 8 hs aprox**
- **Hipointensidad en T1: 16 hs aprox**
- **Utilidad en "wake-up" strokes**
- **MR WITNESS (Mismatch DWI-FLAIR).**

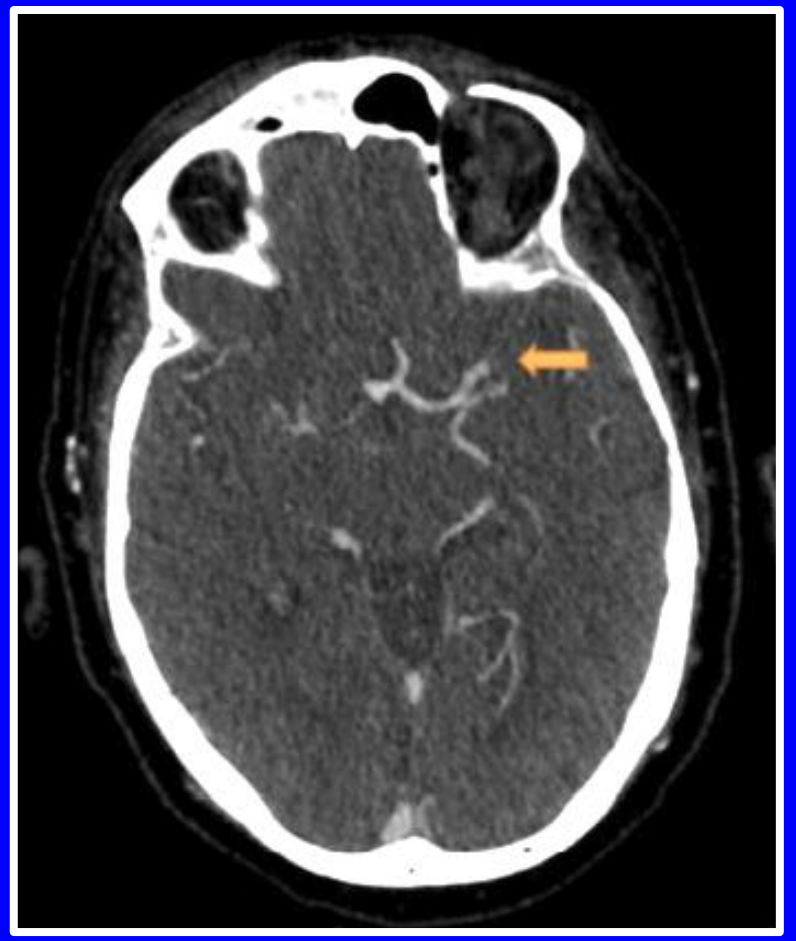
(Lancet Neurology, 2011; 10 (11): 978-986).

ACV AGUDO (Parámetros cuantitativos)

- Volumen **CORE (oclusión M1): < 30%**
- Volumen **PENUMBRA: ttp/mtt/: > 6 seg.**



AP. Jadhav et al, Neurol Clin 38 (2020) 185-199



“TRIALS” DE TROMBECTOMIA MECANICA, incluyendo subgrupos del DAWN y DEFUSE-3, usaron CTP o MRP para medir volumen del core isquemico y de la penumbra y seleccionar pacientes para trombectomía.

AMBOS TRIALS fueron exitosos y establecieron que el TEJIDO POTENCIALMENTE SALVABLE (Penumbra) es la clave para obtener buenos resultados en oclusiones de grandes vasos, MAS ALLA DE LAS 6 hs.

TRIAL RECIENTE PARA ESTABLECER VENTANA TARDIA en la administración de IV-tPA mas allá de las 4.5 hs fue realizado usando CTP

Nogueira RG, Jadhav AP, Haussen DC, et al. Thrombectomy 6 to 24 hours after stroke with a mismatch between deficit and infarct. N Engl J Med 2018;378:11–21.

Albers GW, Marks MP, Kemp S, et al. Thrombectomy for stroke at 6 to 16 hours with selection by perfusion imaging. N Engl J Med 2018;378:708–18.

25. Thomalla G, Simonsen CZ, Boutitie F, et al. MRI-guided thrombolysis for stroke with unknown time of onset. N Engl J Med 2018;379:611–22.

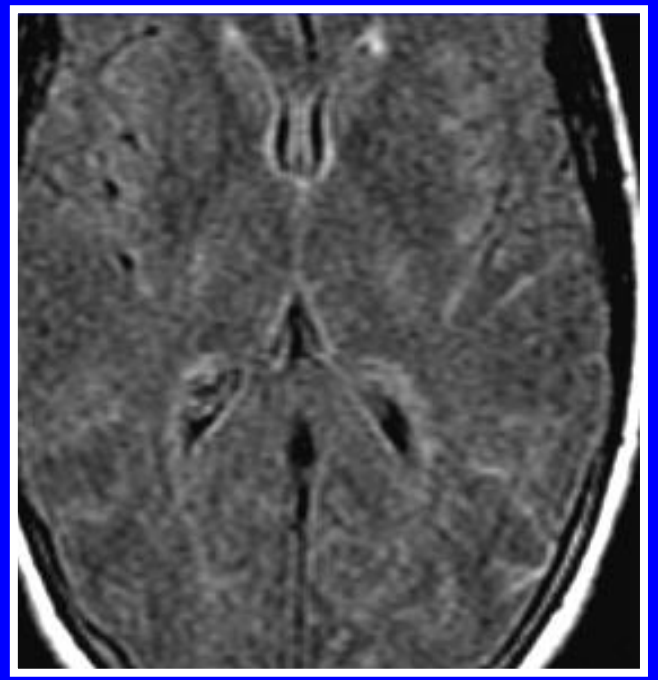
HIPERINTENSIDAD VASCULAR EN FLAIR e HIPOINTENSIDAD EN GRE/SWI

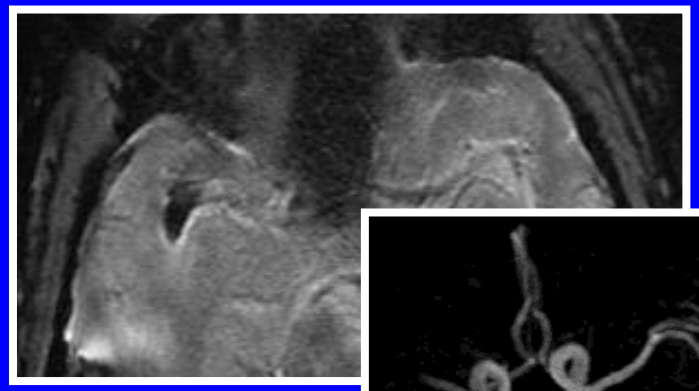
- **Vasos hiperintensos en FLAIR sobre el territorio vascular afectado**
- **Vasos hip** **hb**
  (aument **o)**
  Mismatc

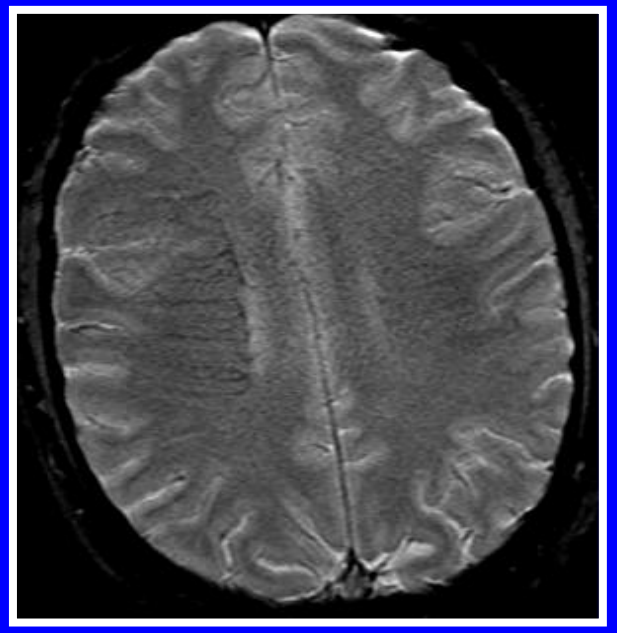
Multiple Hypointense Vessels on Susceptibility-Weighted Imaging in Acute Ischemic Stroke: Surrogate Marker of Oxygen Extraction Fraction in Penumbra?

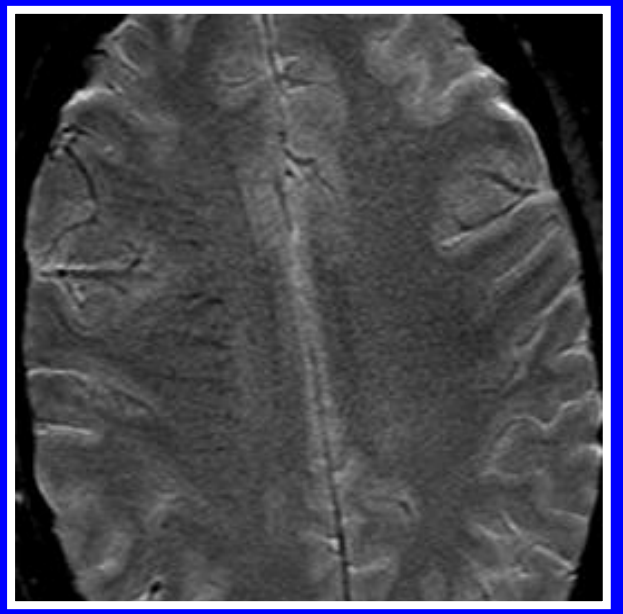
Min-Gyu Park[a] Tae-Il Yang[b] Se-Jin Oh[c] Seung Kug Baik[d] Yang Ho Kang[e] Kyung-Pil Park[a]

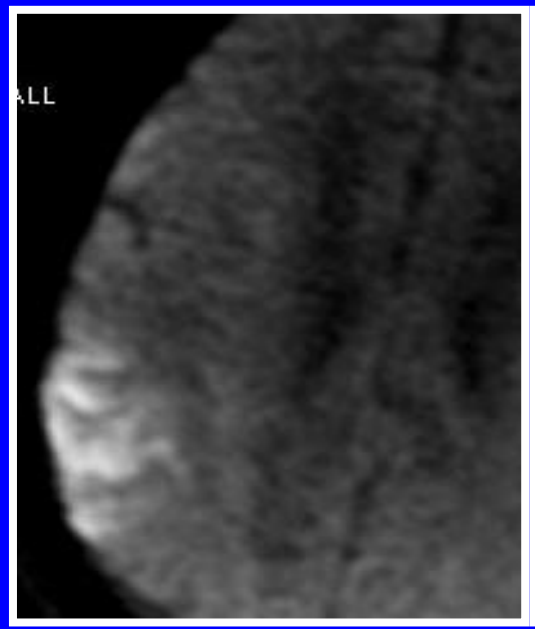
Cerebrovasc Dis 2014;38:254-261

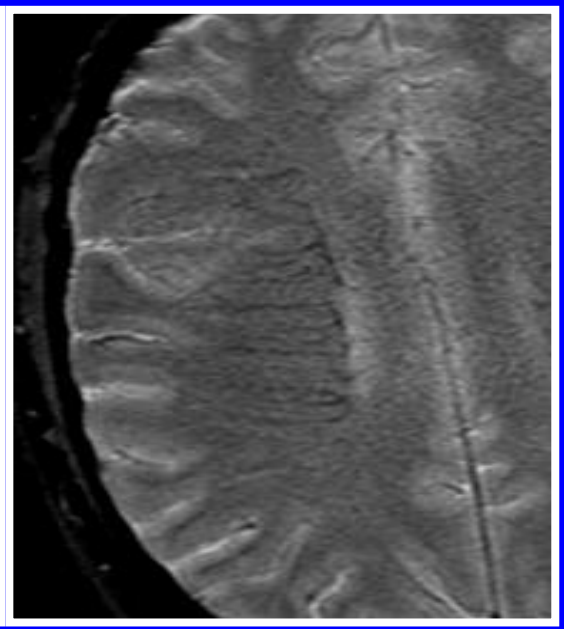


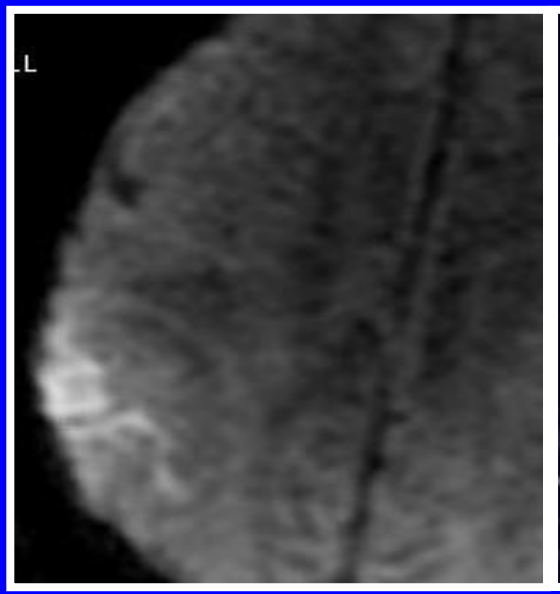


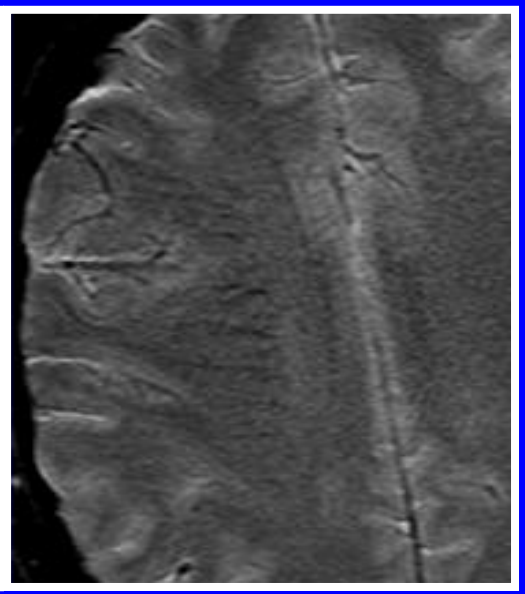




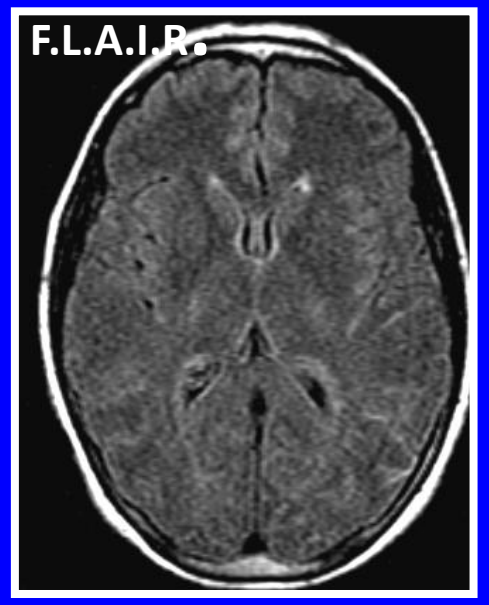


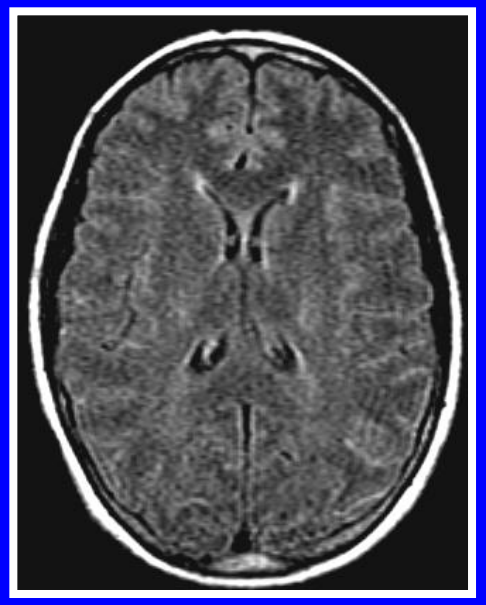


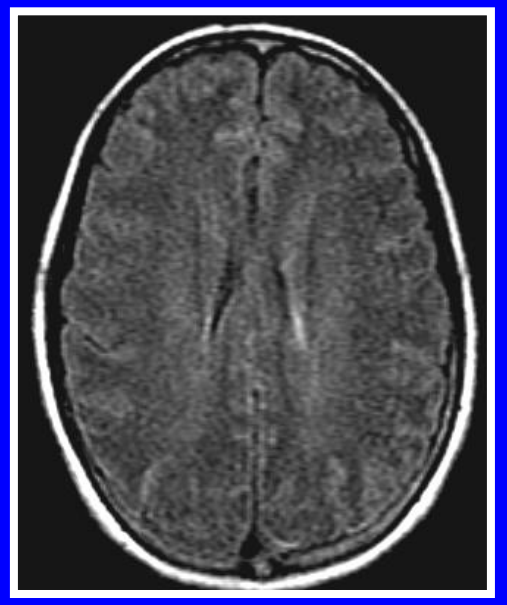


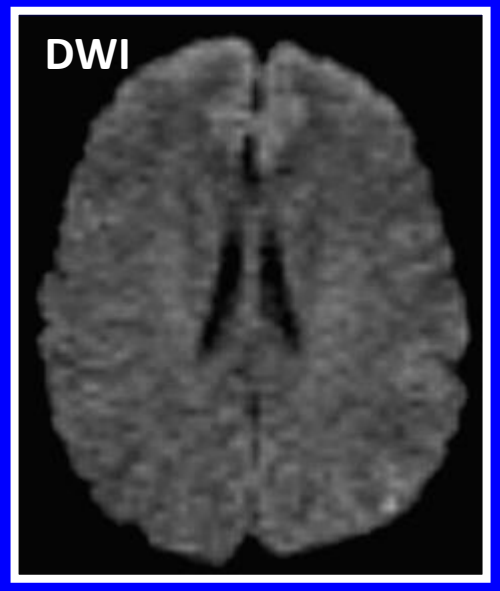


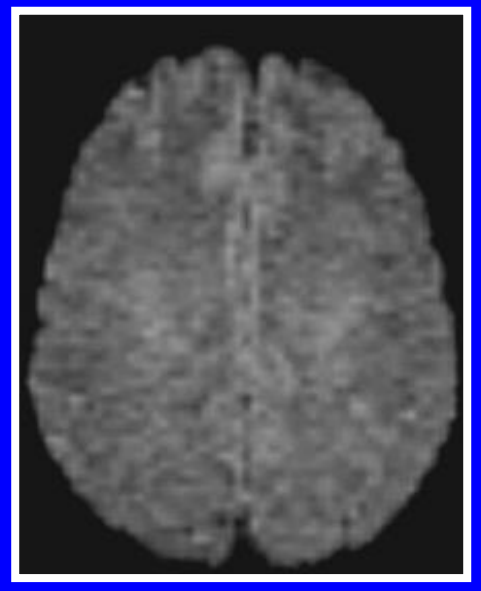
A.I.T

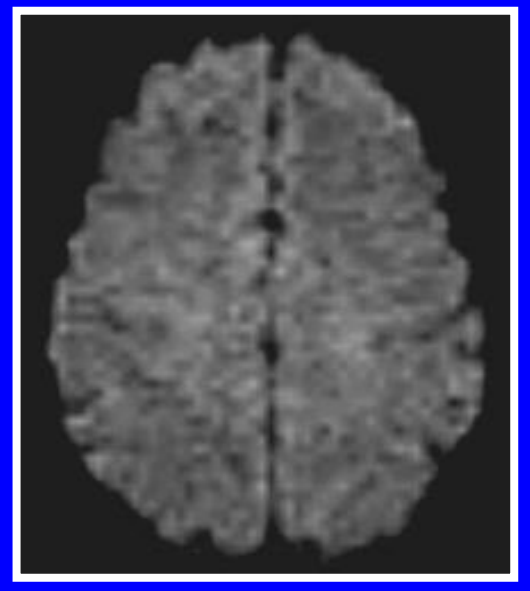


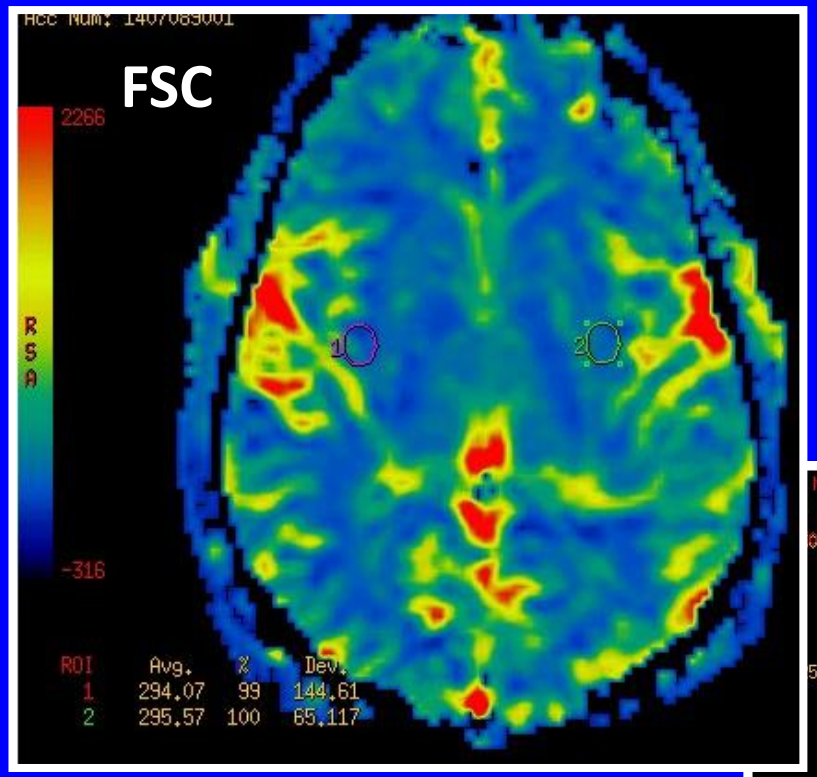


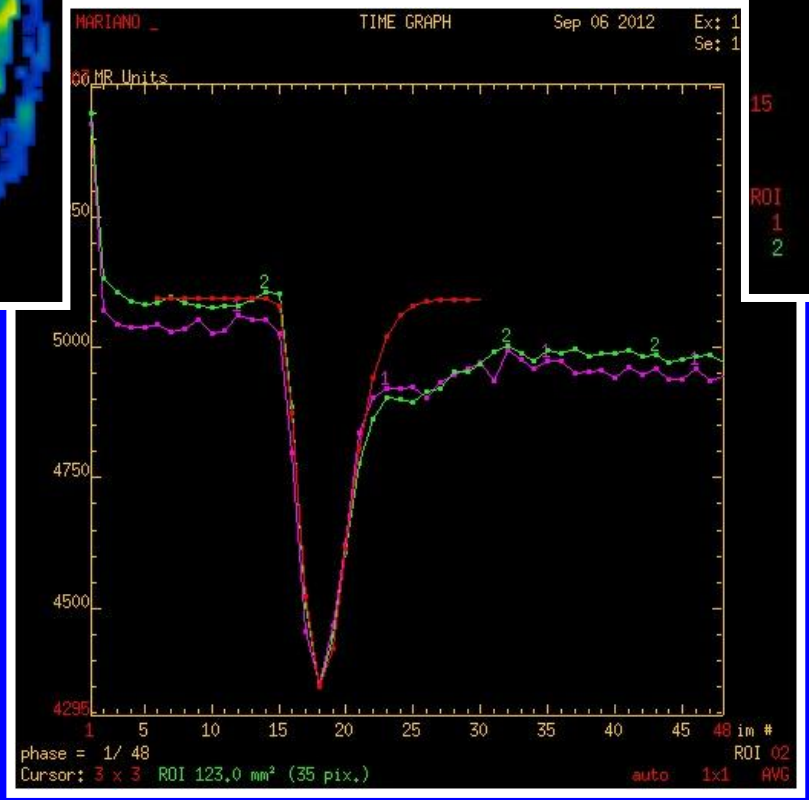


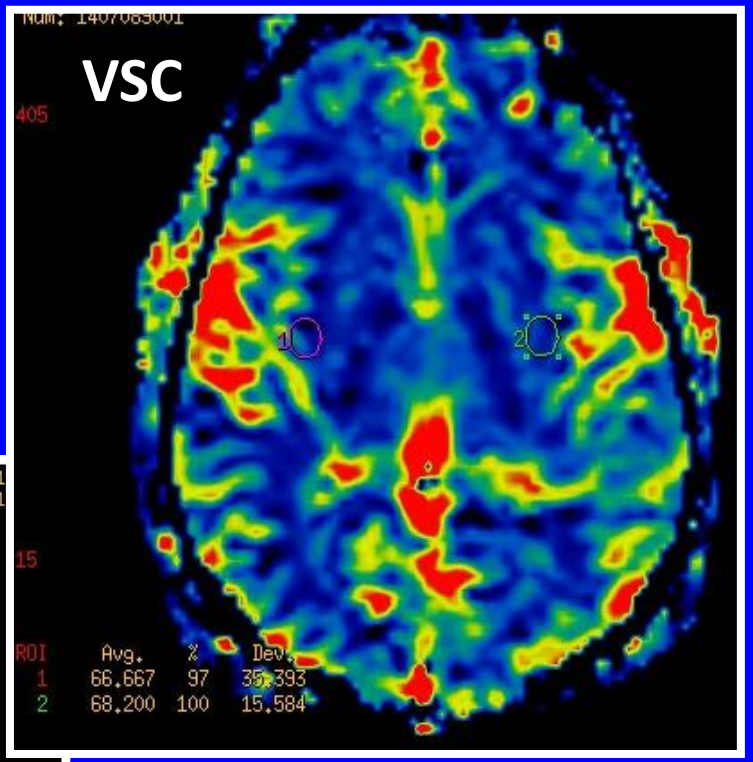




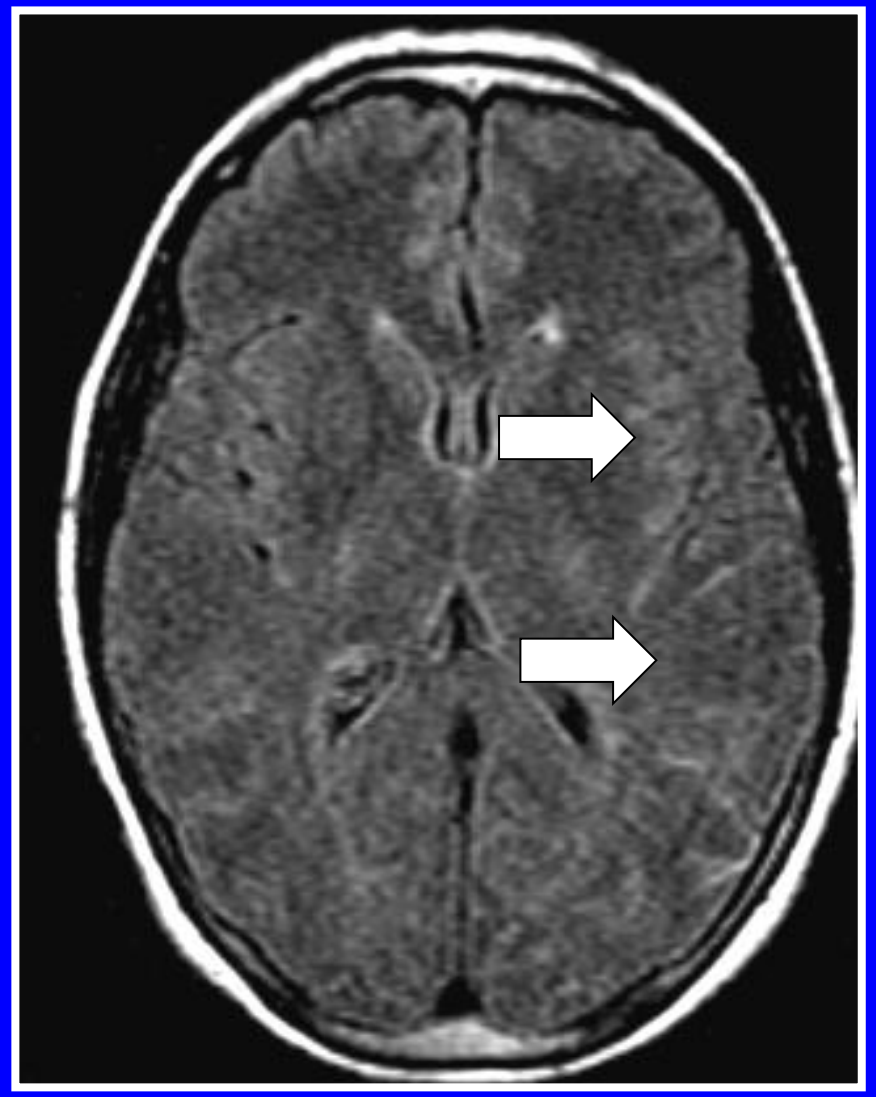


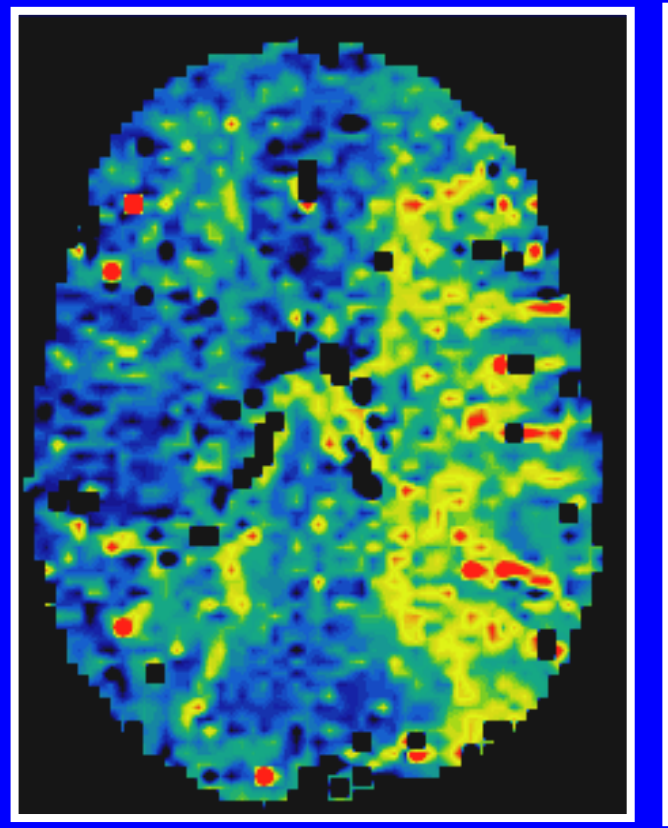

FSC
2266
RSA
-316
ROI Avg. % Dev.
1 294.07 99 144.61
2 295.57 100 65.117

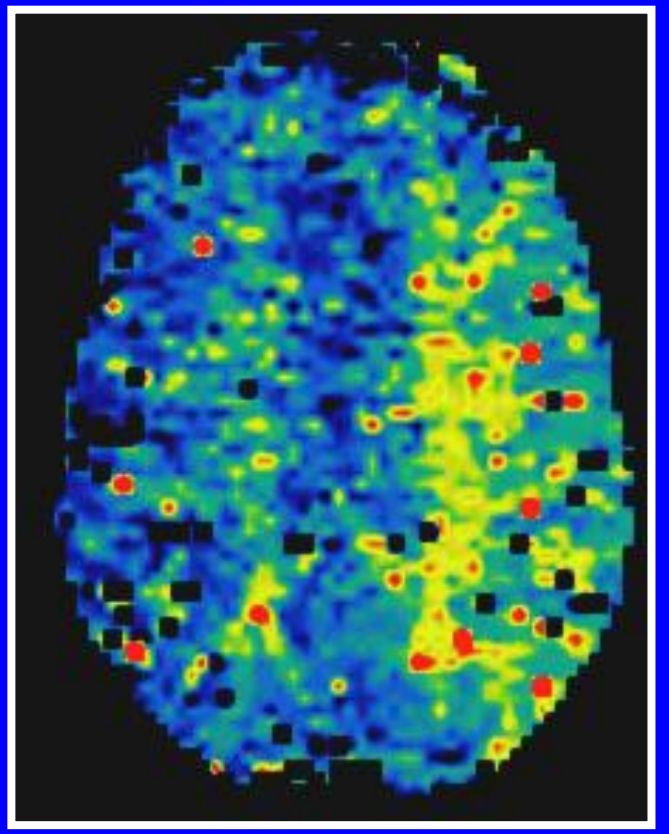

MARIANO
TIME GRAPH
Sep 06 2012
Ex: 1
Se: 1
MR Units
5000
4750
4500
4295
1 5 10 15 20 25 30 35 40 45 48 im #
phase = 1/ 48
ROI 02
Cursor: 3 x 3 ROI 123,0 mm² (35 pix.)
auto 1x1 AVG


VSC
405
15
ROI Avg. % Dev.
1 66.667 97 35.393
2 68.200 100 15.584

MTT (Tiempo de tránsito vascular)



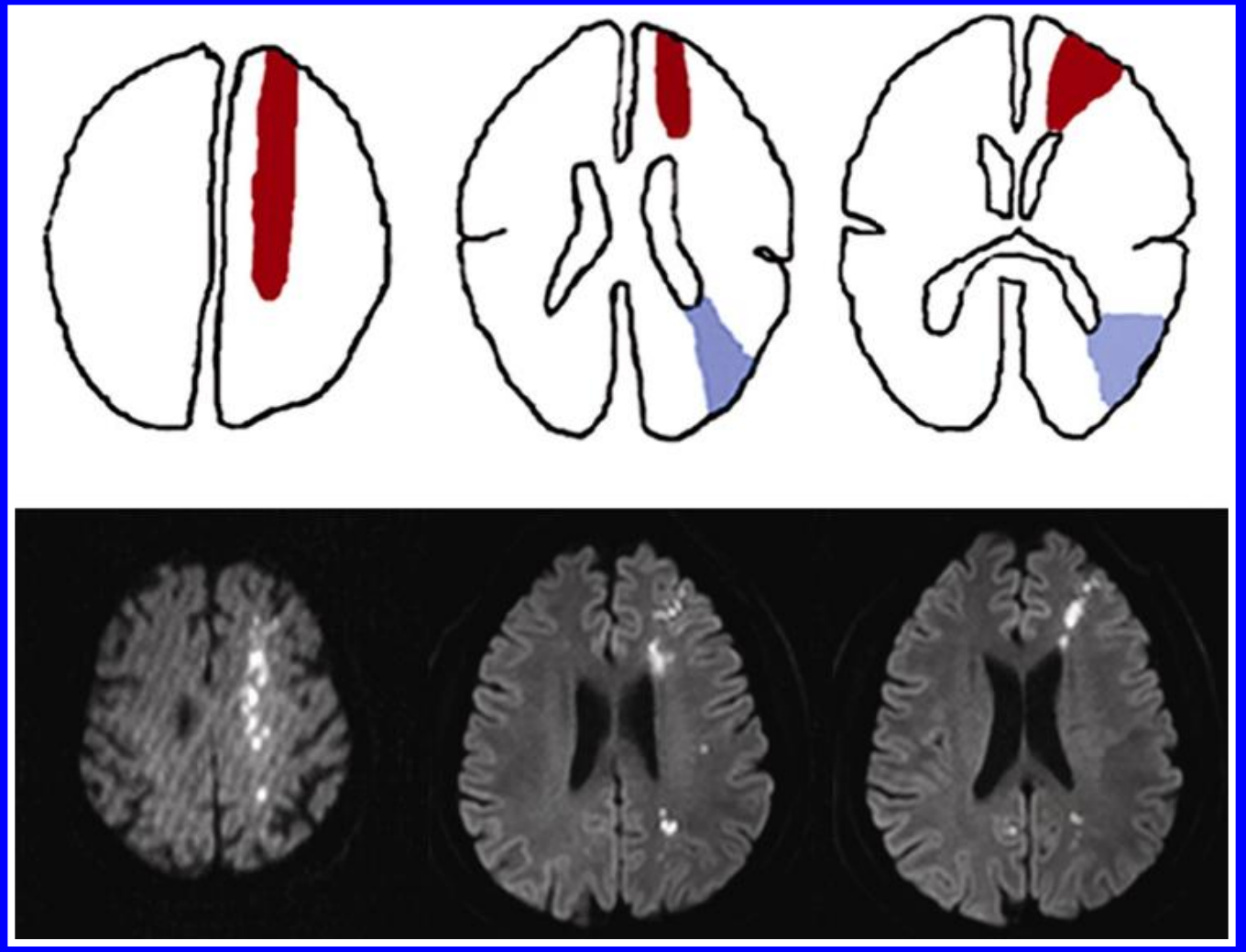


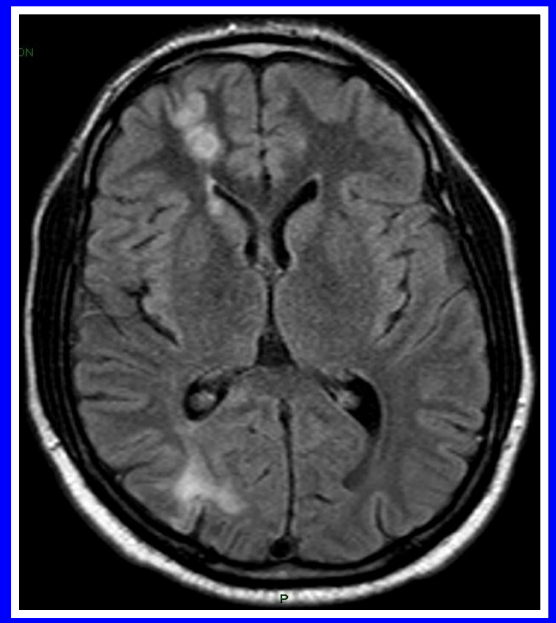


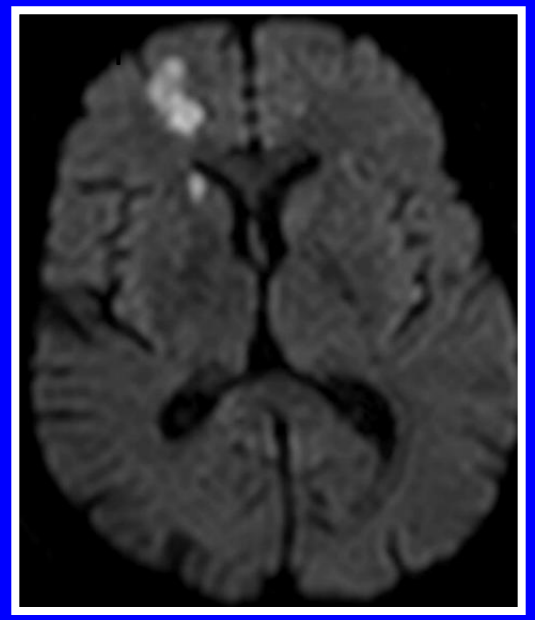
ACV ISQUEMICO

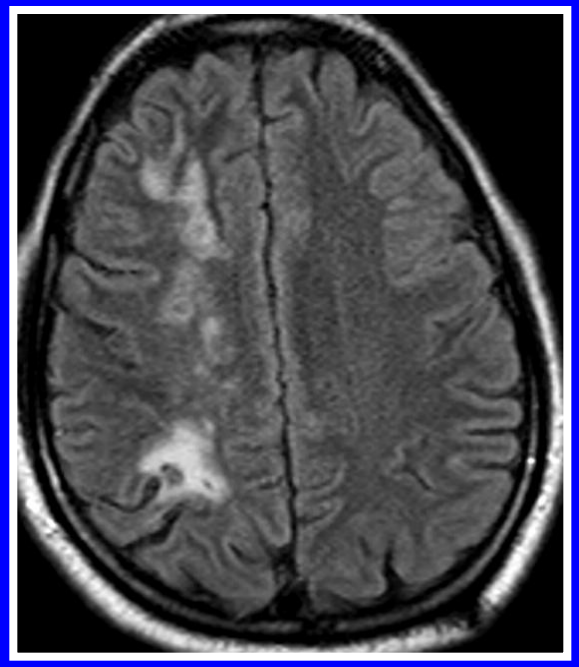
- **1) ACV AGUDO**
- **2) CAUSAS DE ACV**
- **3) IMÁGENES DE PARED VASCULAR**

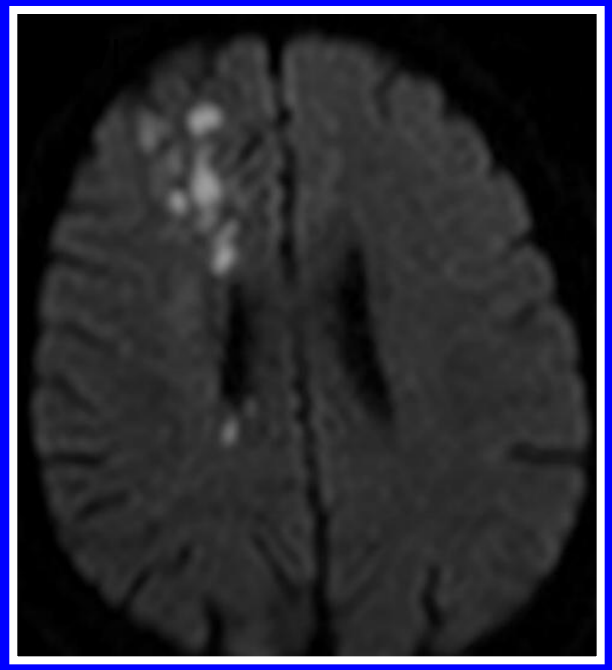
Infartos en territorios vasculares limitrofes

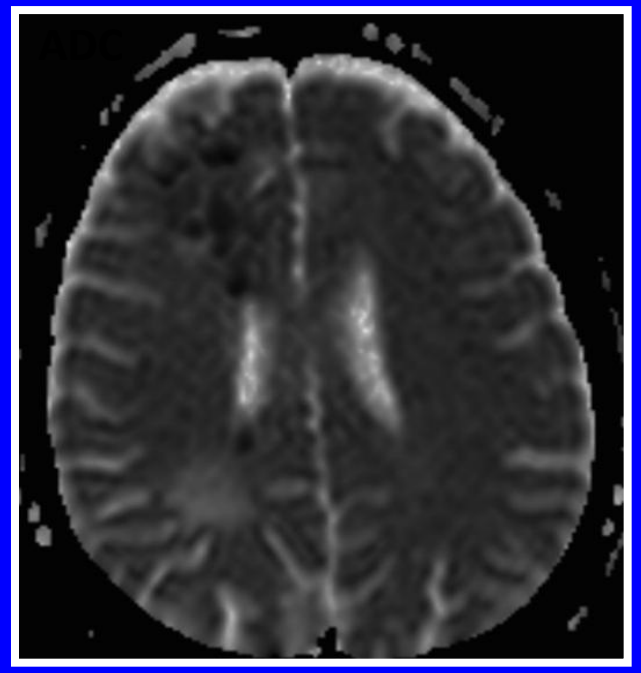












Microangiopatias:

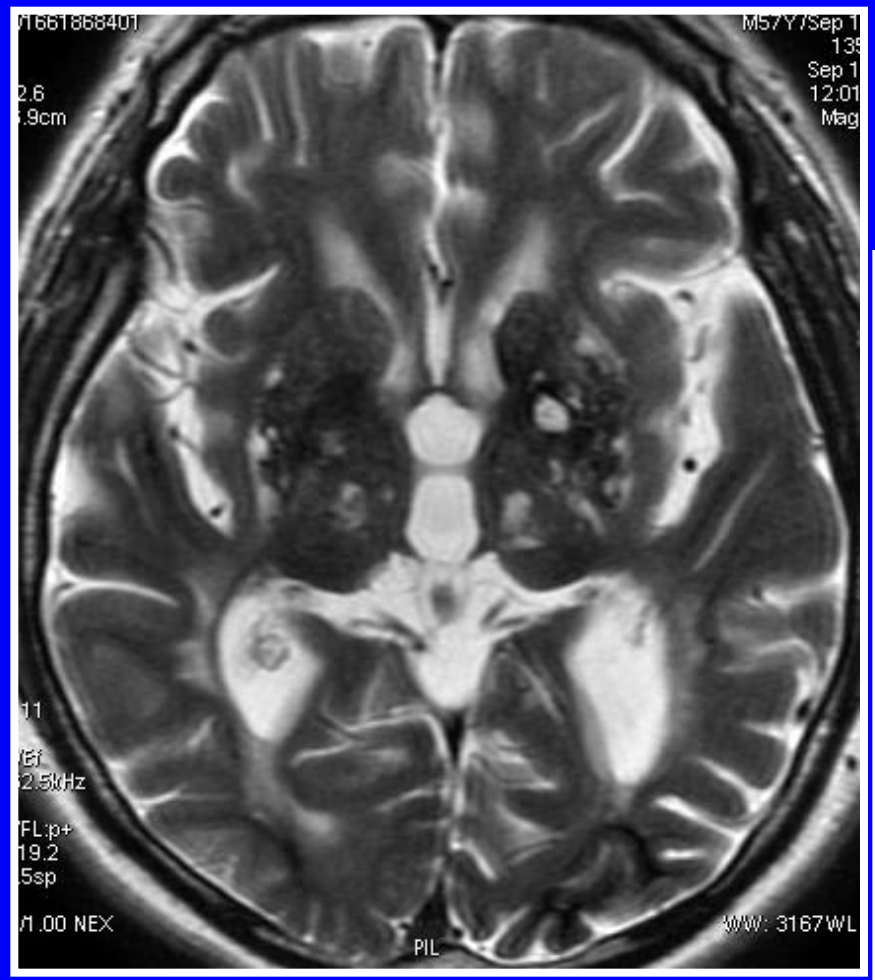
a) Lesiones múltiples profundas

b) Estado ¨lacunar¨

c) Leucoaraiosis

d) Binswanger

e) CADASIL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Sep 1
12:01
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.9cm
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/Ef
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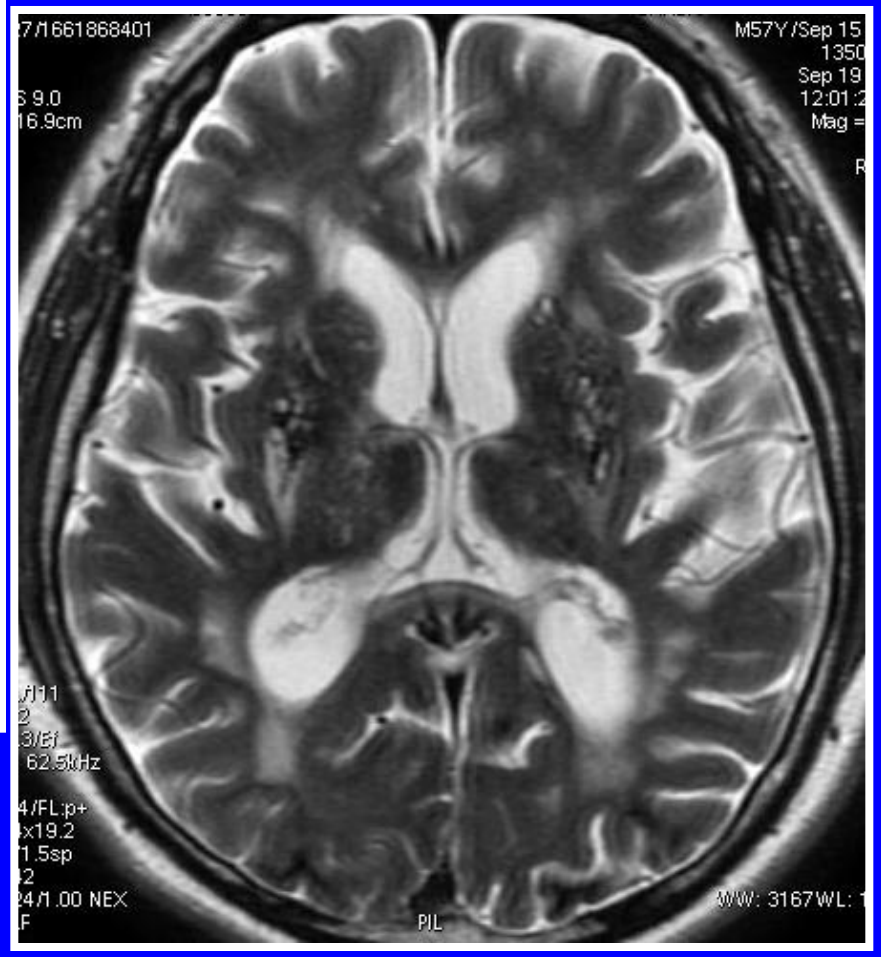
FL:p+
19.2
.5sp
/1.00 NEX
WW: 3167WL
PIL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Sep 19
12:01:2
Mag =
R
S 9.0
16.9cm
/11
2
3/Ef
62.5kHz
4/FL:p+
x19.2
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24/1.00 NEX
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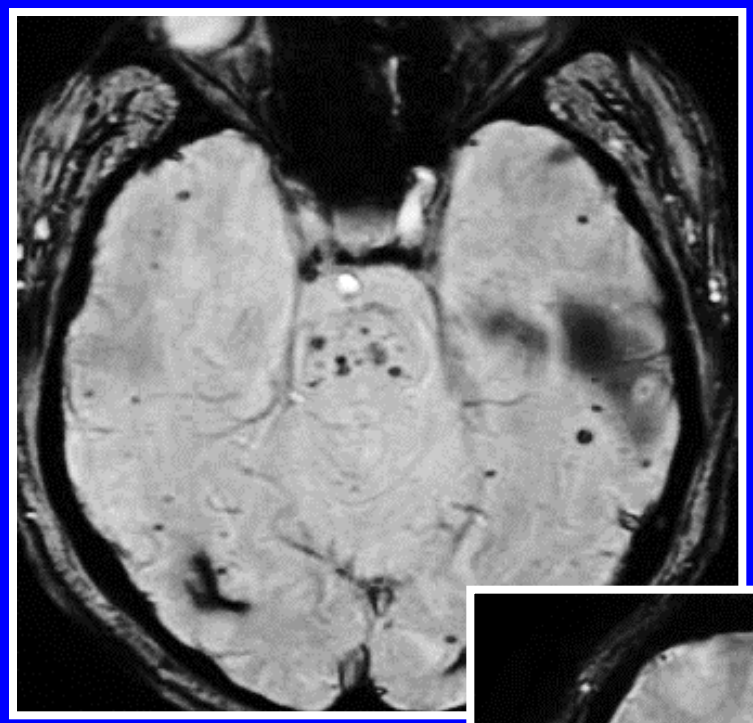
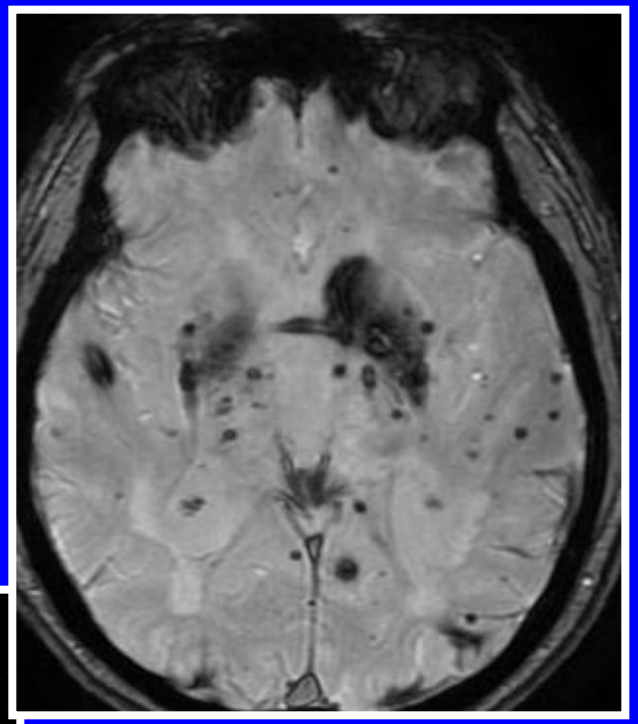
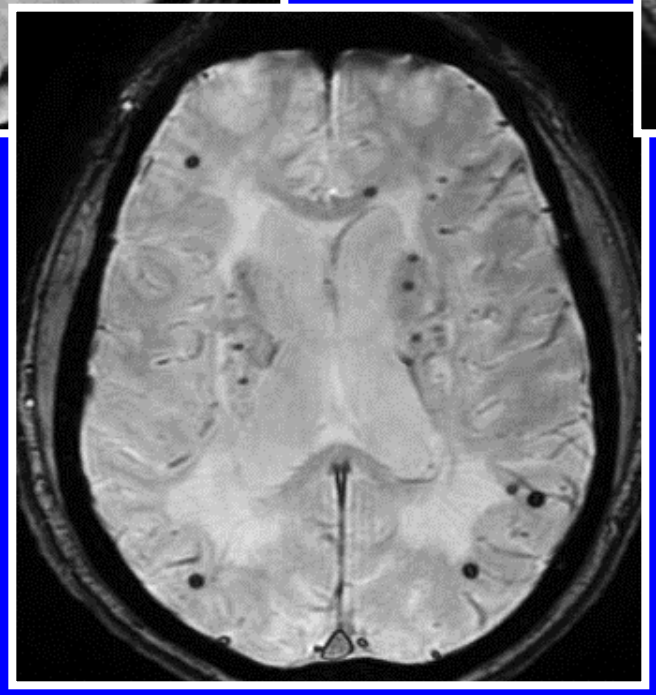
PIL

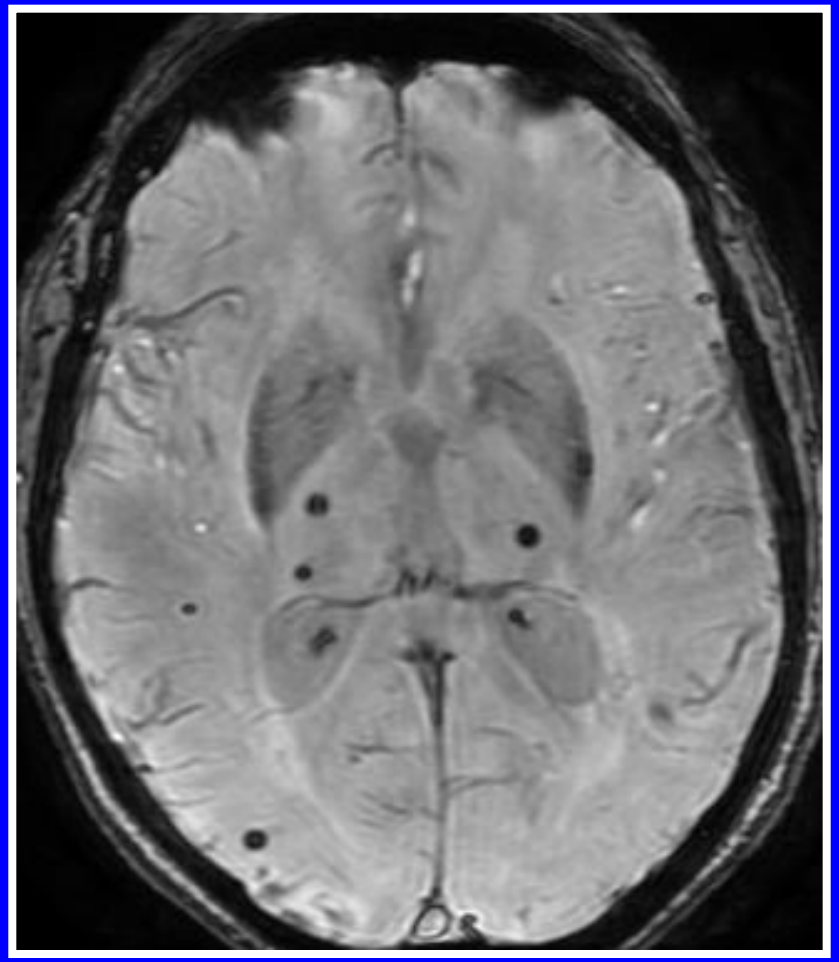




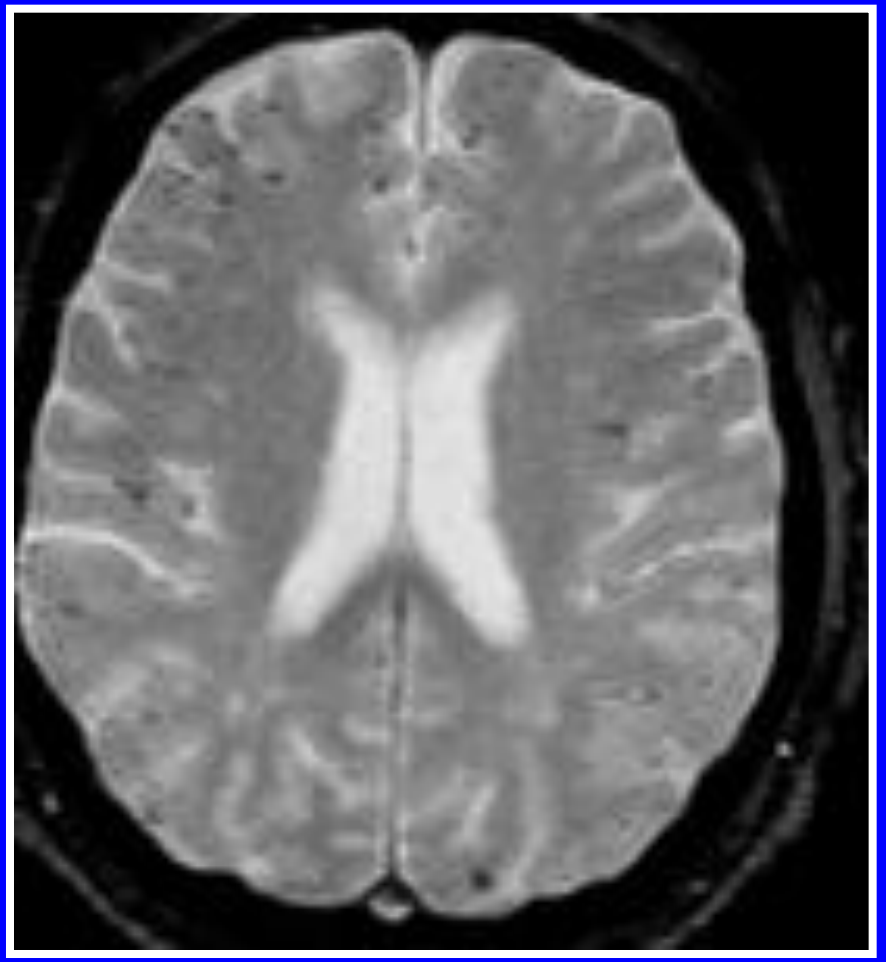


“MICROBLEEDS”

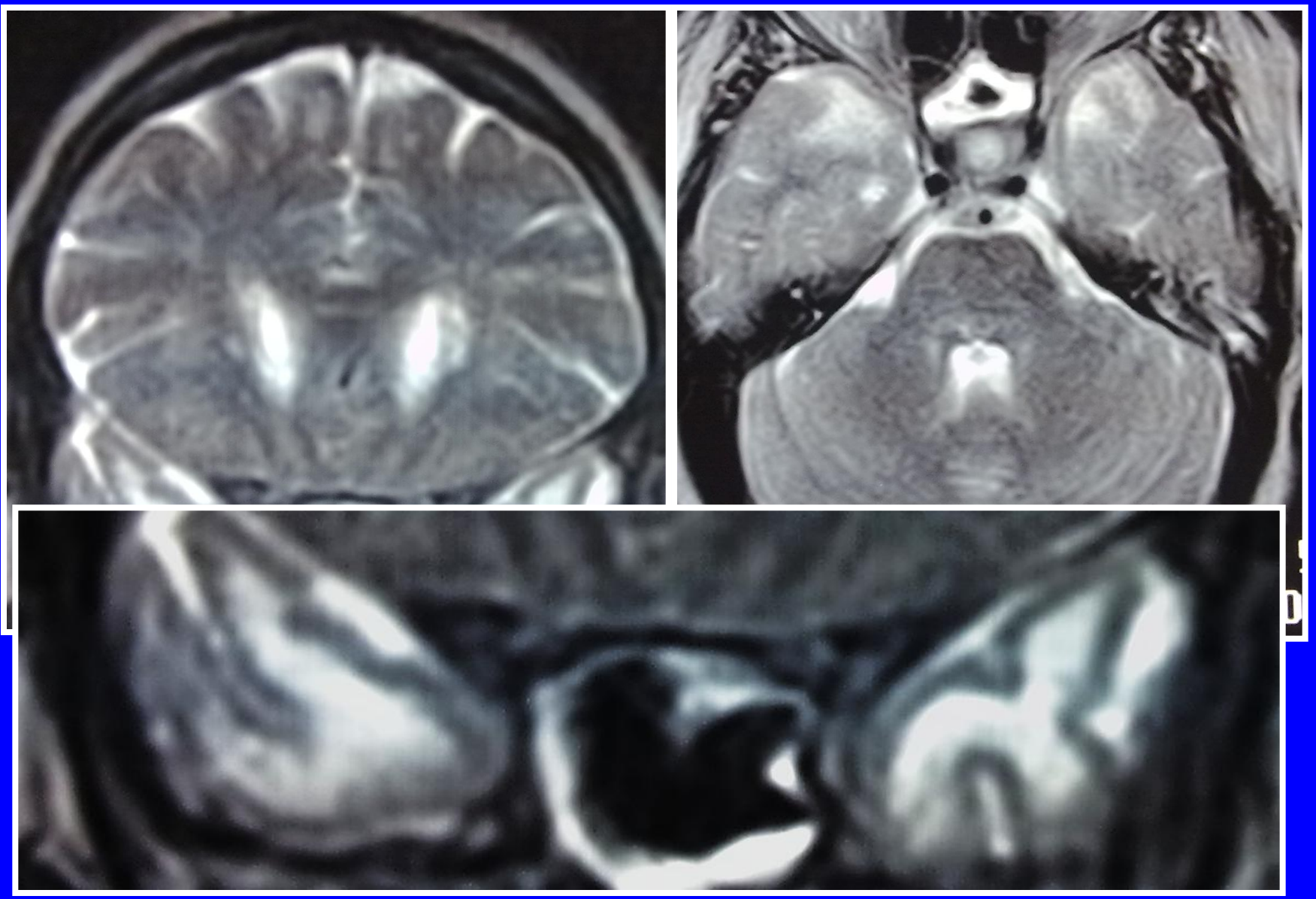
MICROANGIOPATIA



AMILOIDOSIS

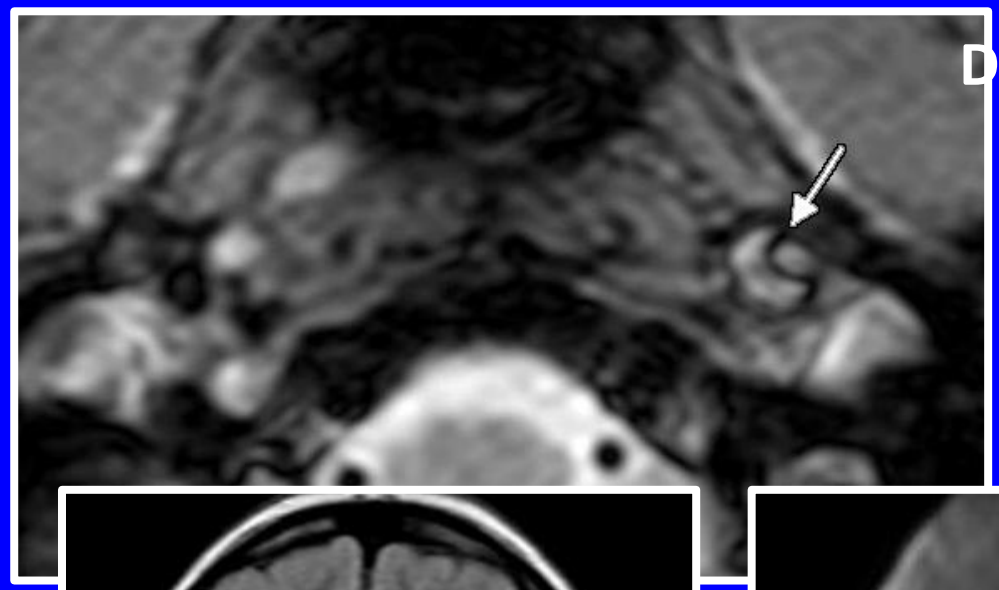


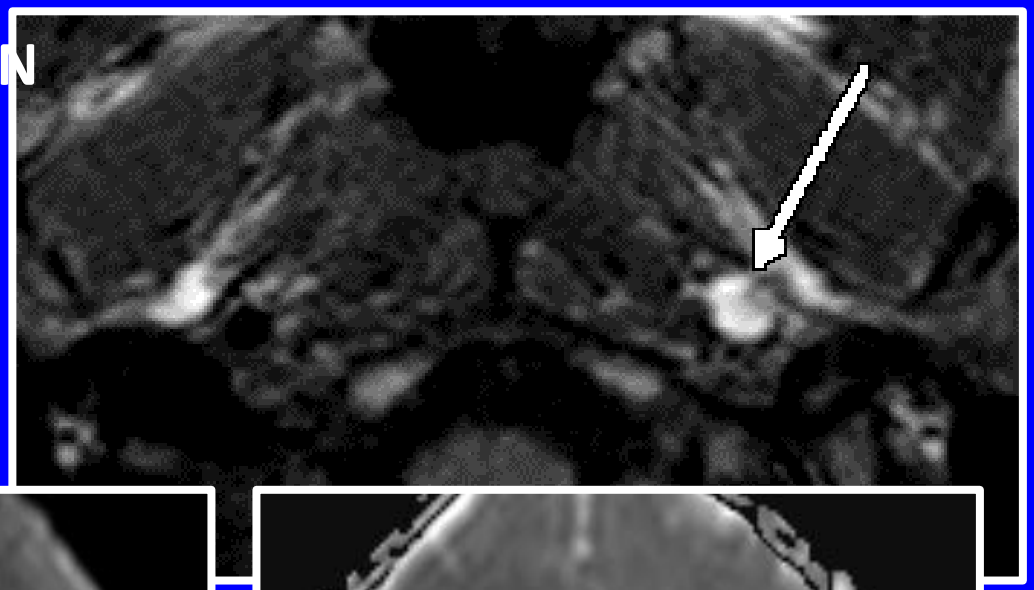
GRE

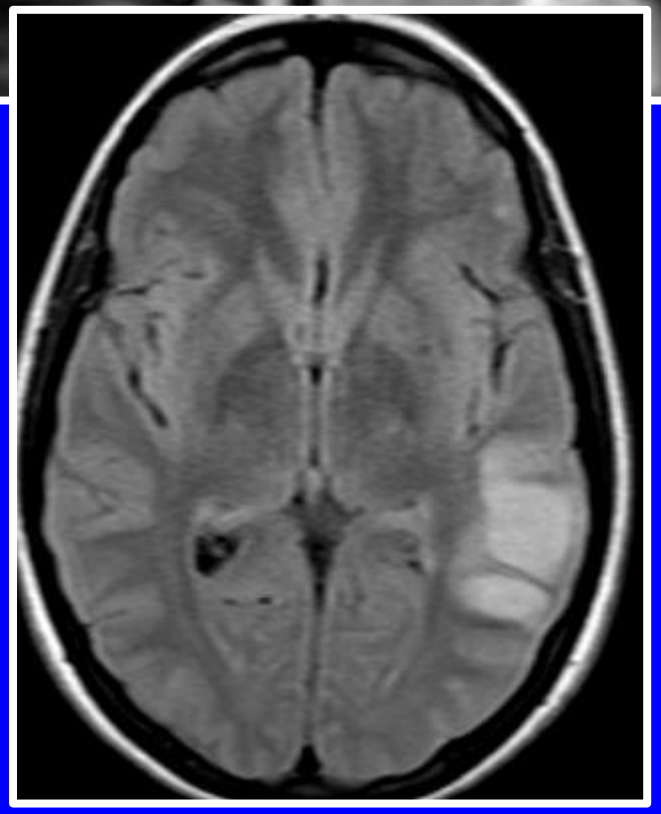


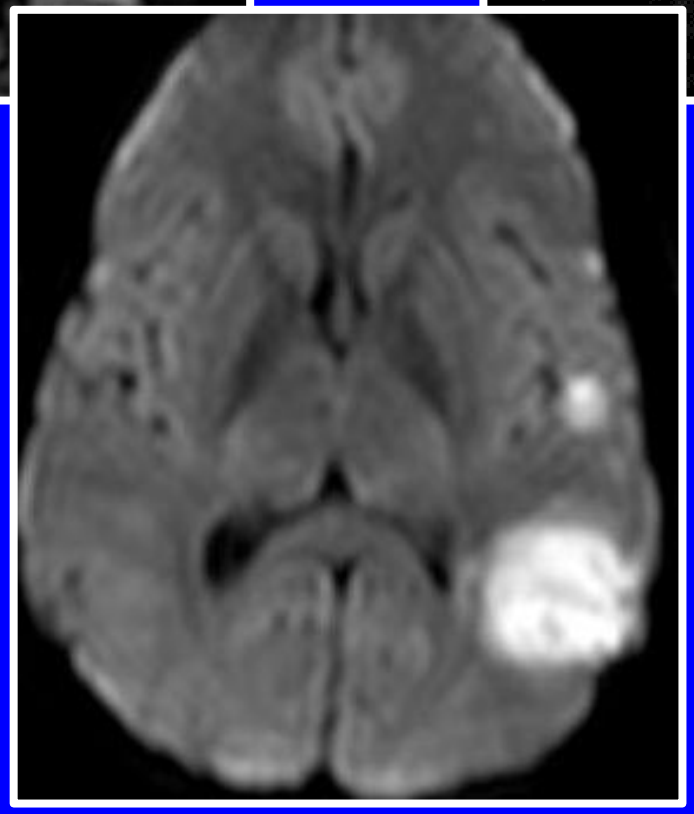
CADASIL

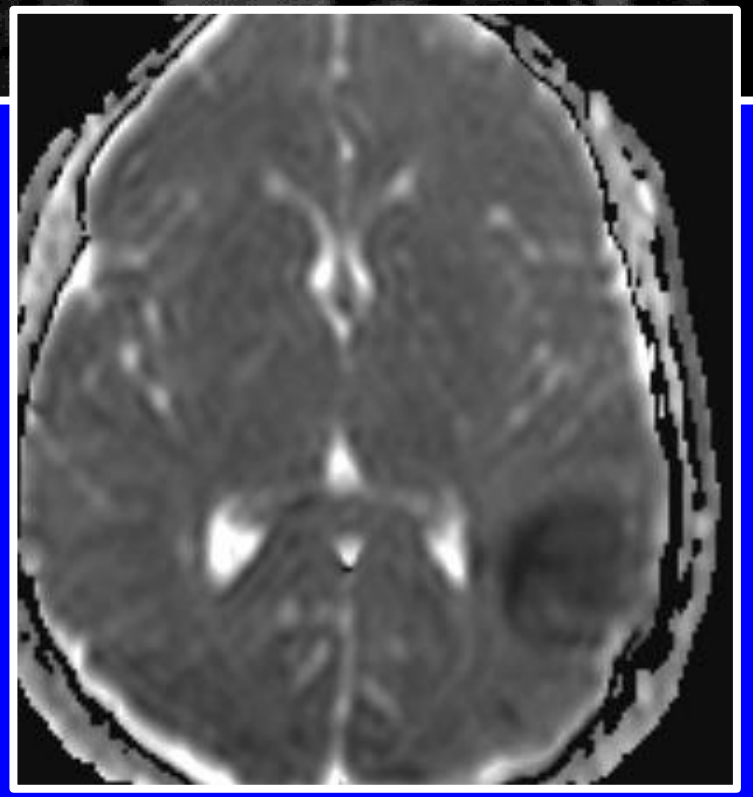
DISECCION





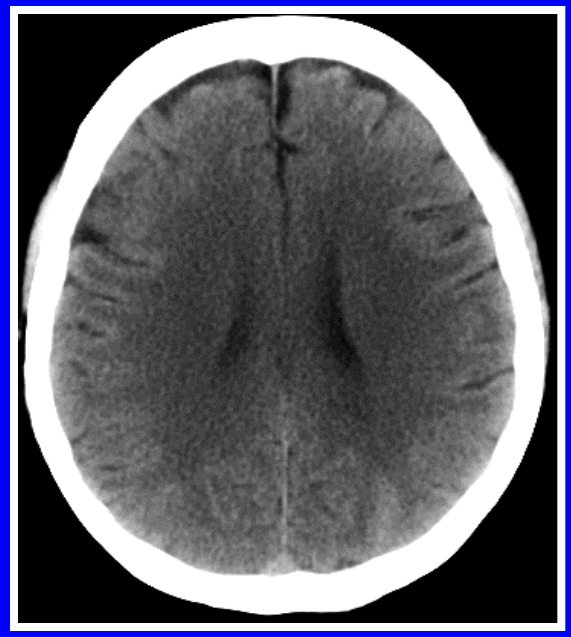


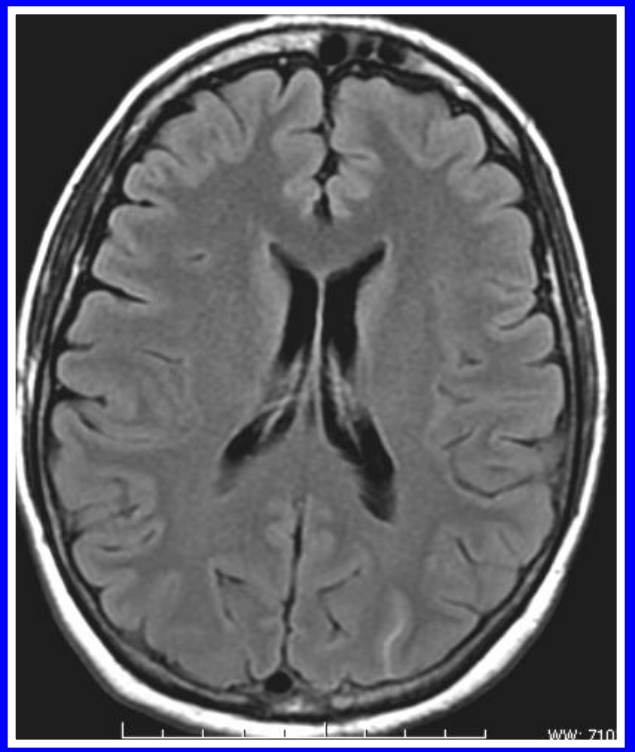




Mujer, 50 años que presenta cefalea “en estallido”

14/03/09

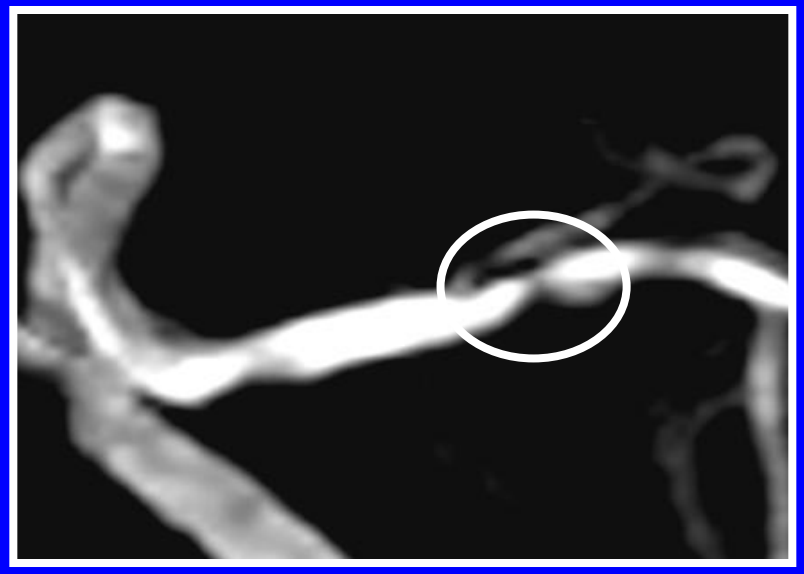




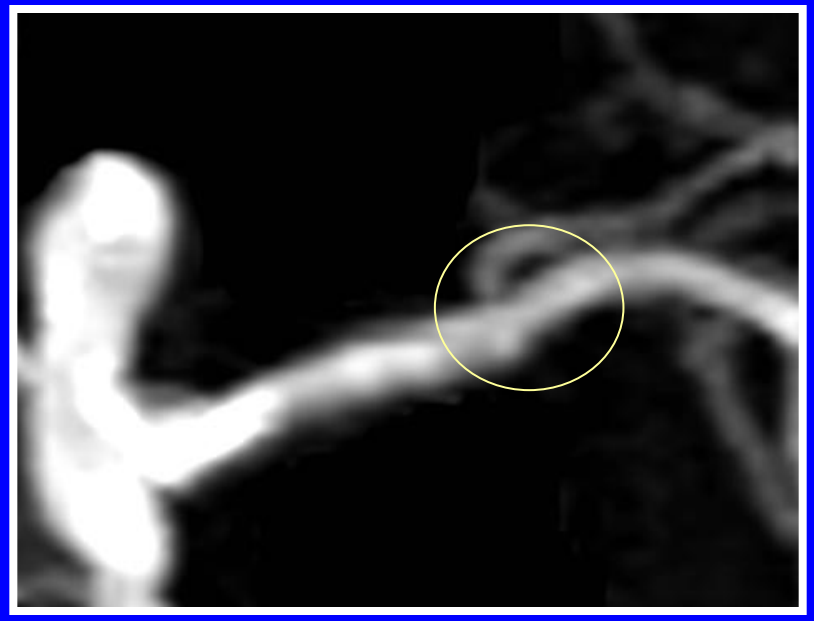
En retrospectiva…

Estenosis ACM izquierda proximal

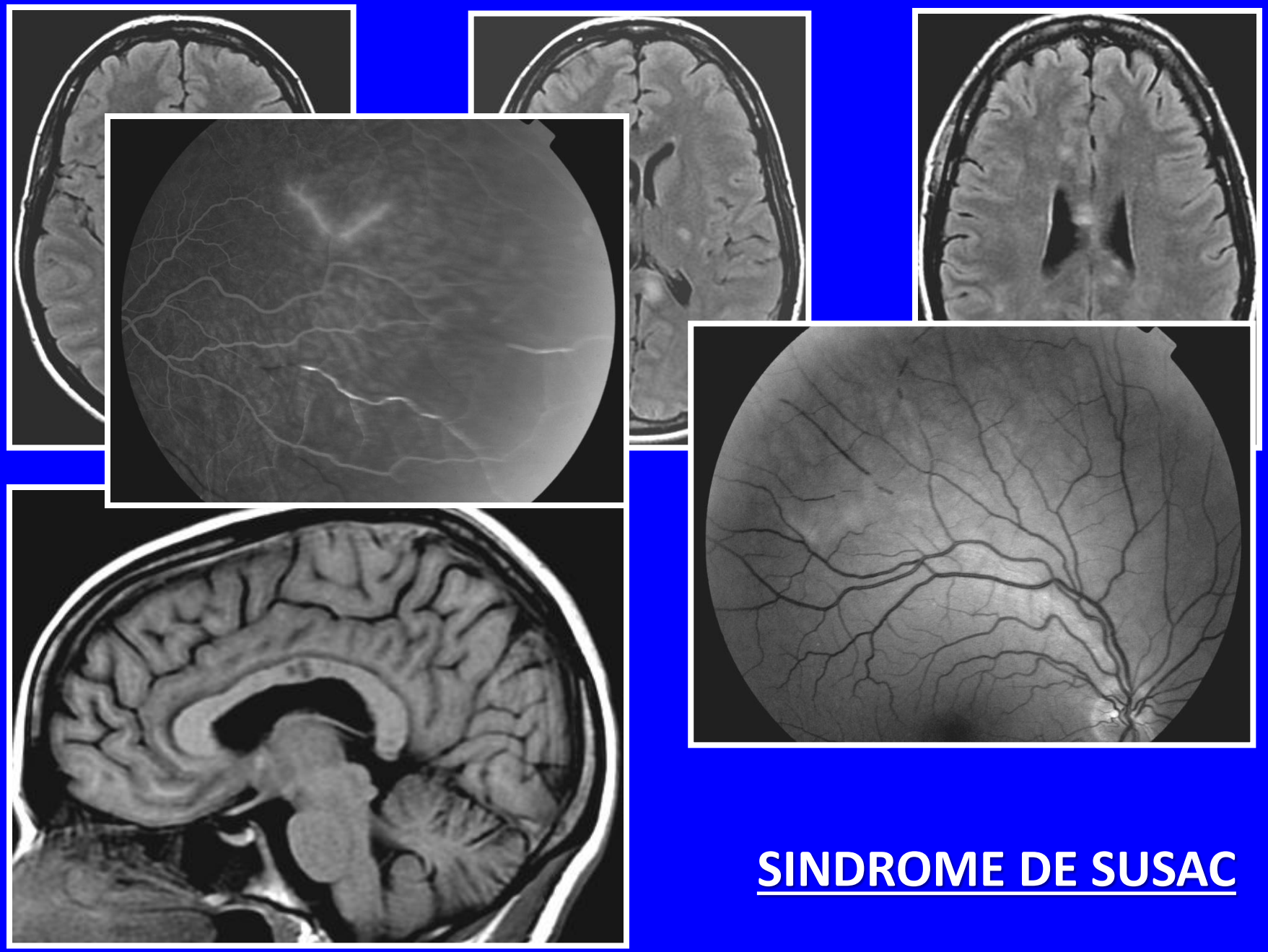
14/03/09



26/03/09

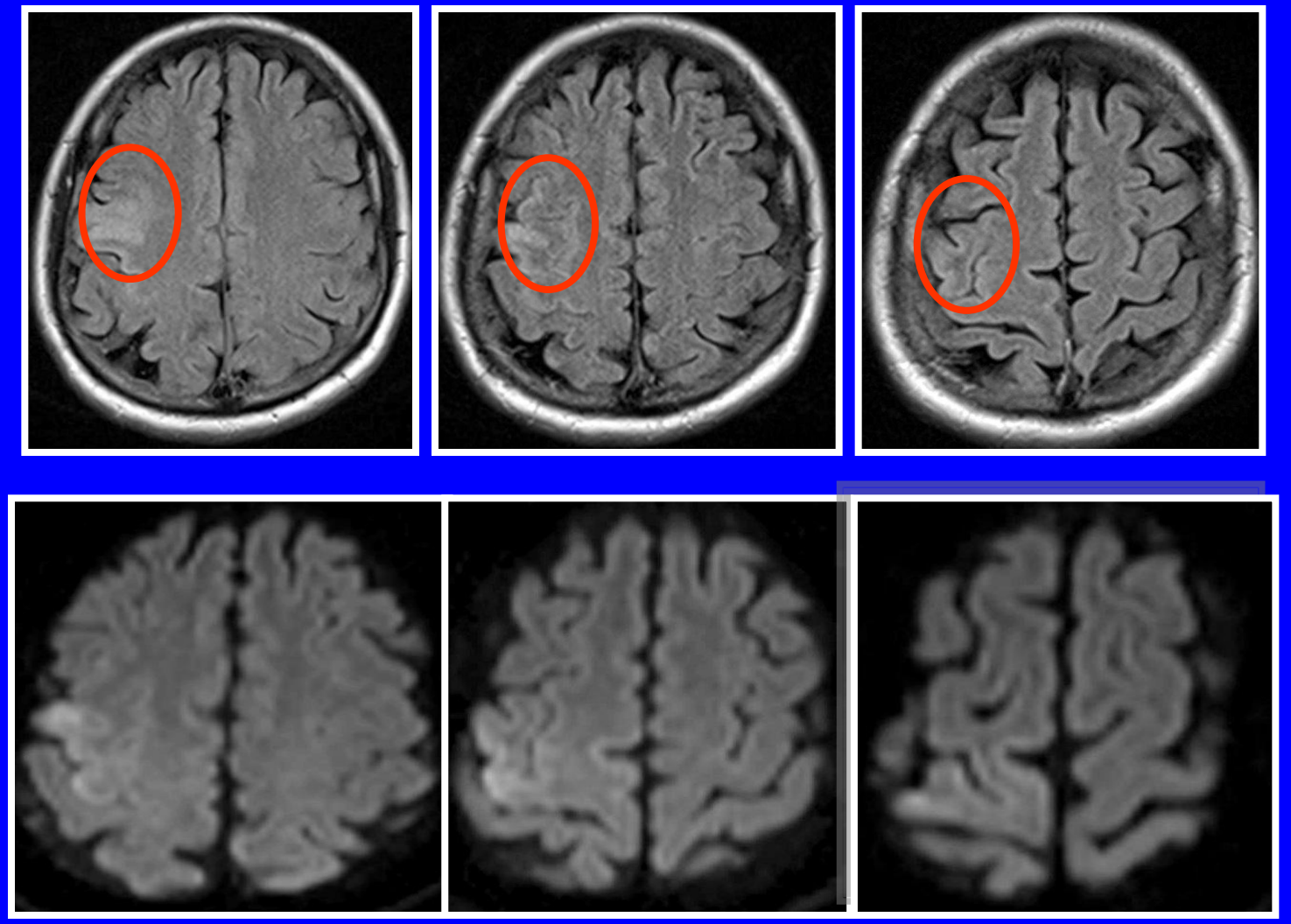


SVCR (Sindrome de vasoconstricción reversible).

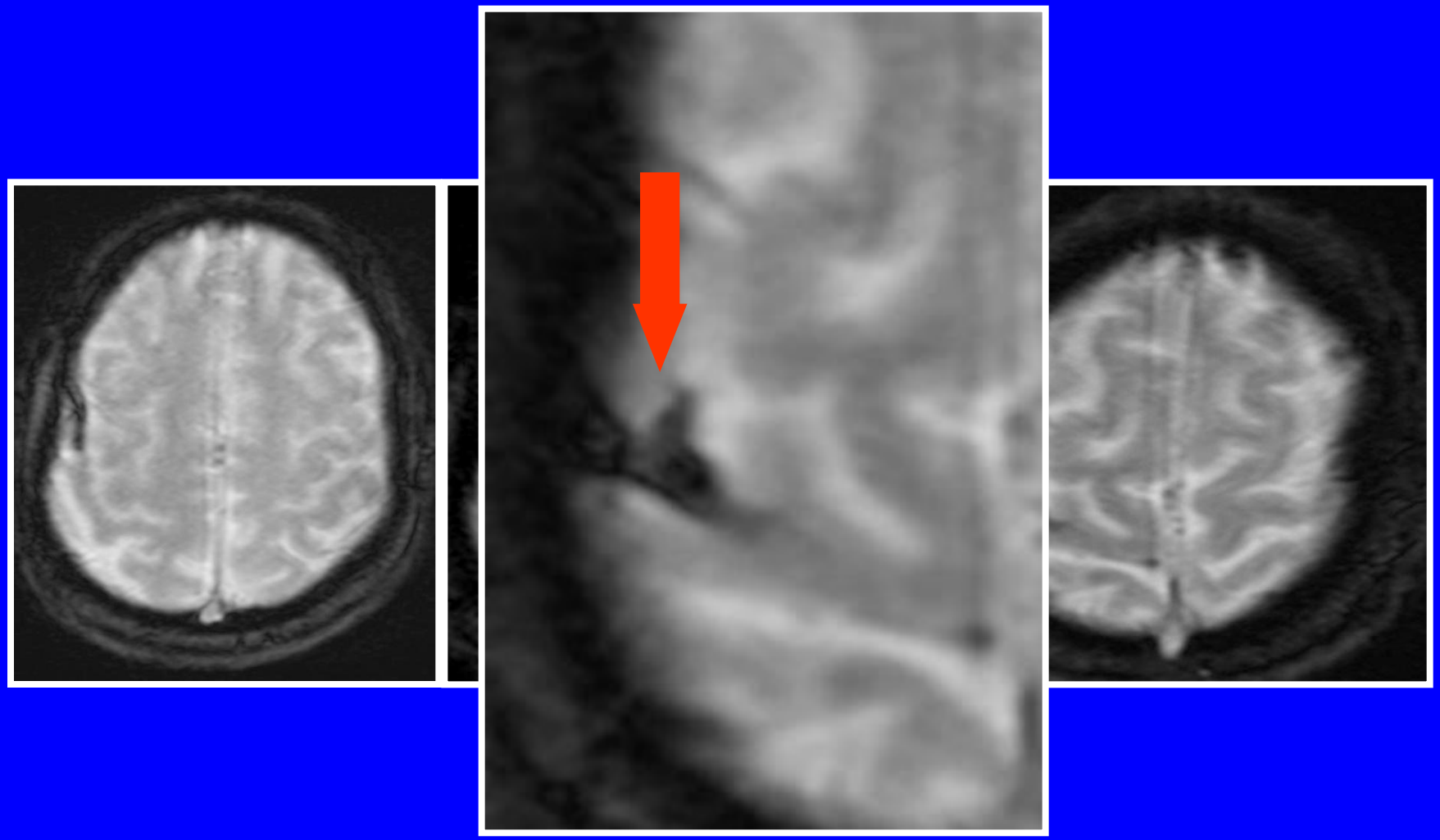


SINDROME DE SUSAC

Infarto cortical, pre-rolándico derecho, con edema gyral, secundarios a trombosis venosa cortical aislada

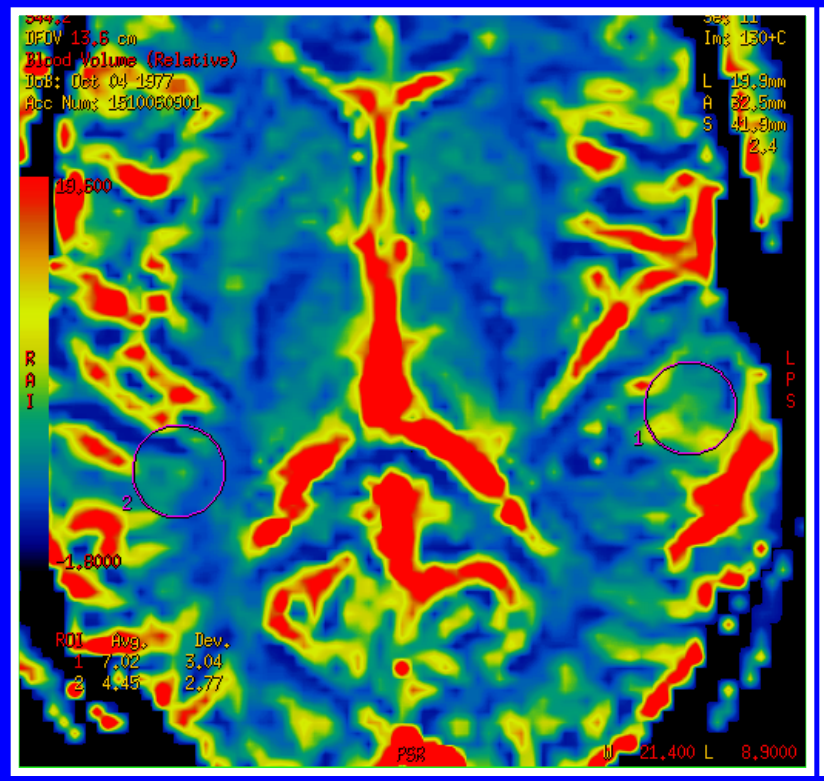


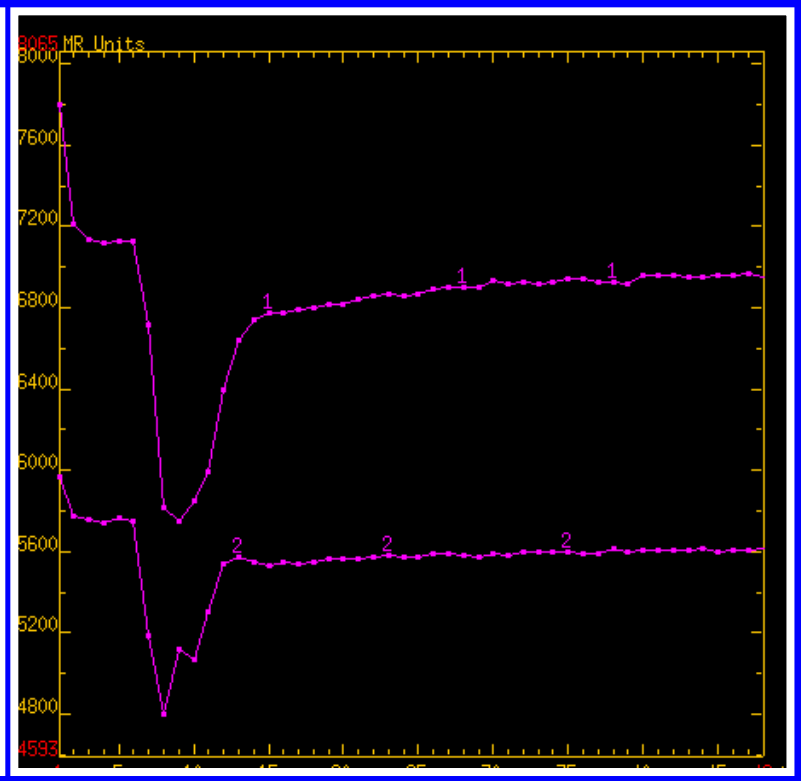
Infarto cortical, pre-rolándico derecho, con edema gyral, secundarios a trombosis venosa cortical aislada



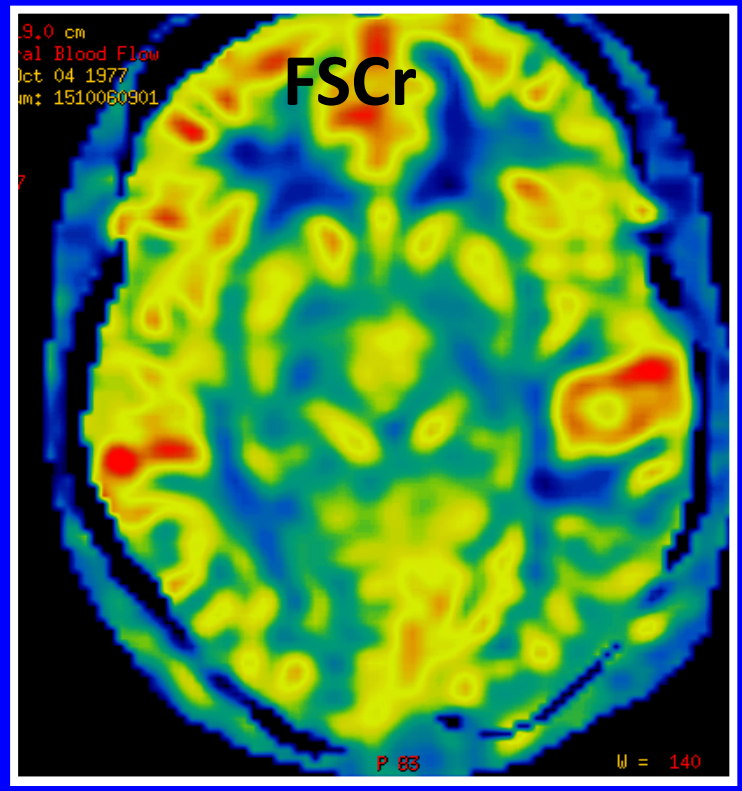
ASL (Arterial Spin Labeling)

VSCr (DSC)





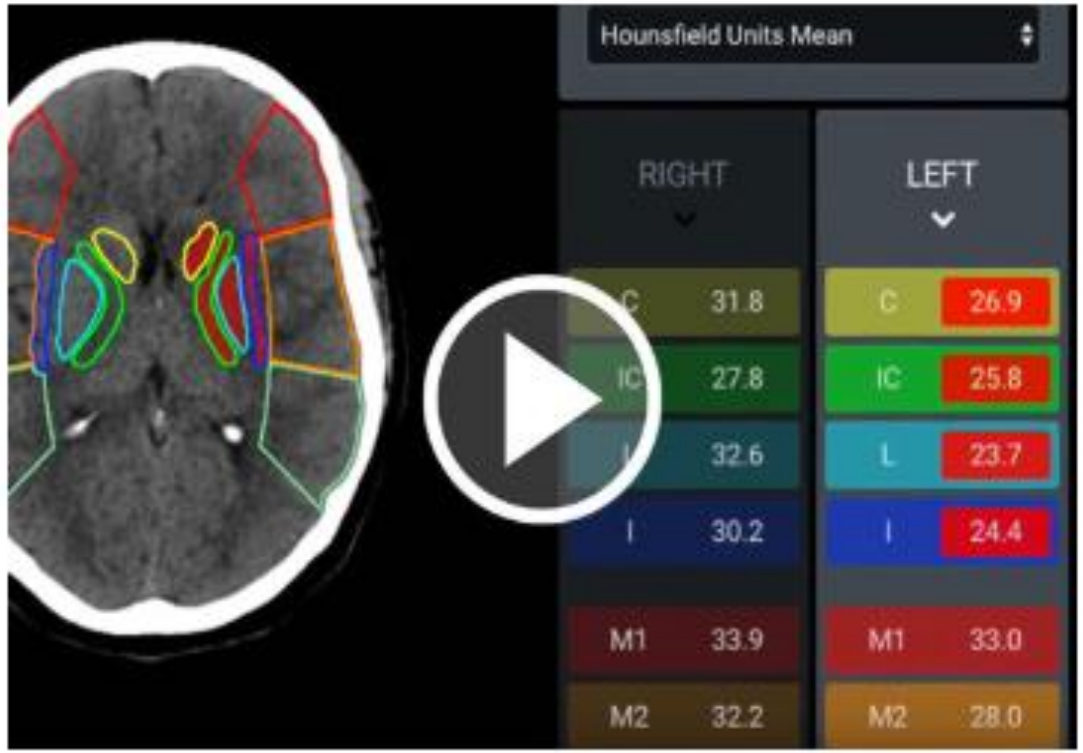
ASL

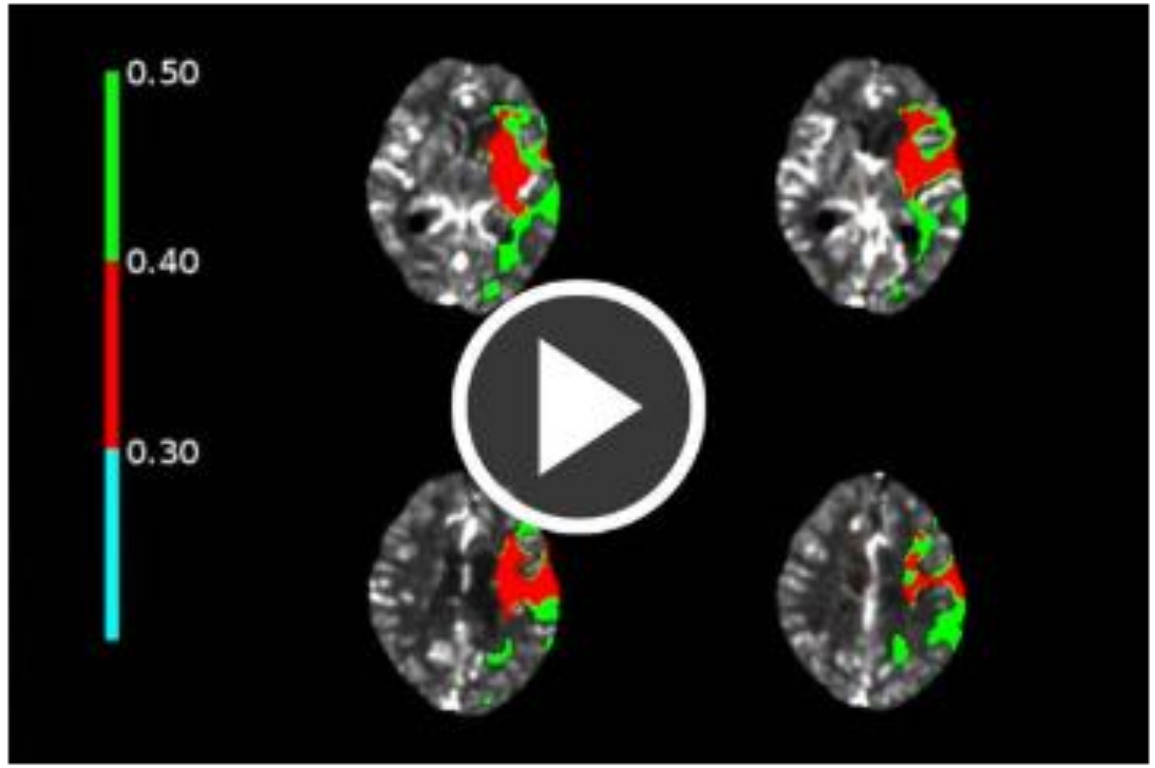


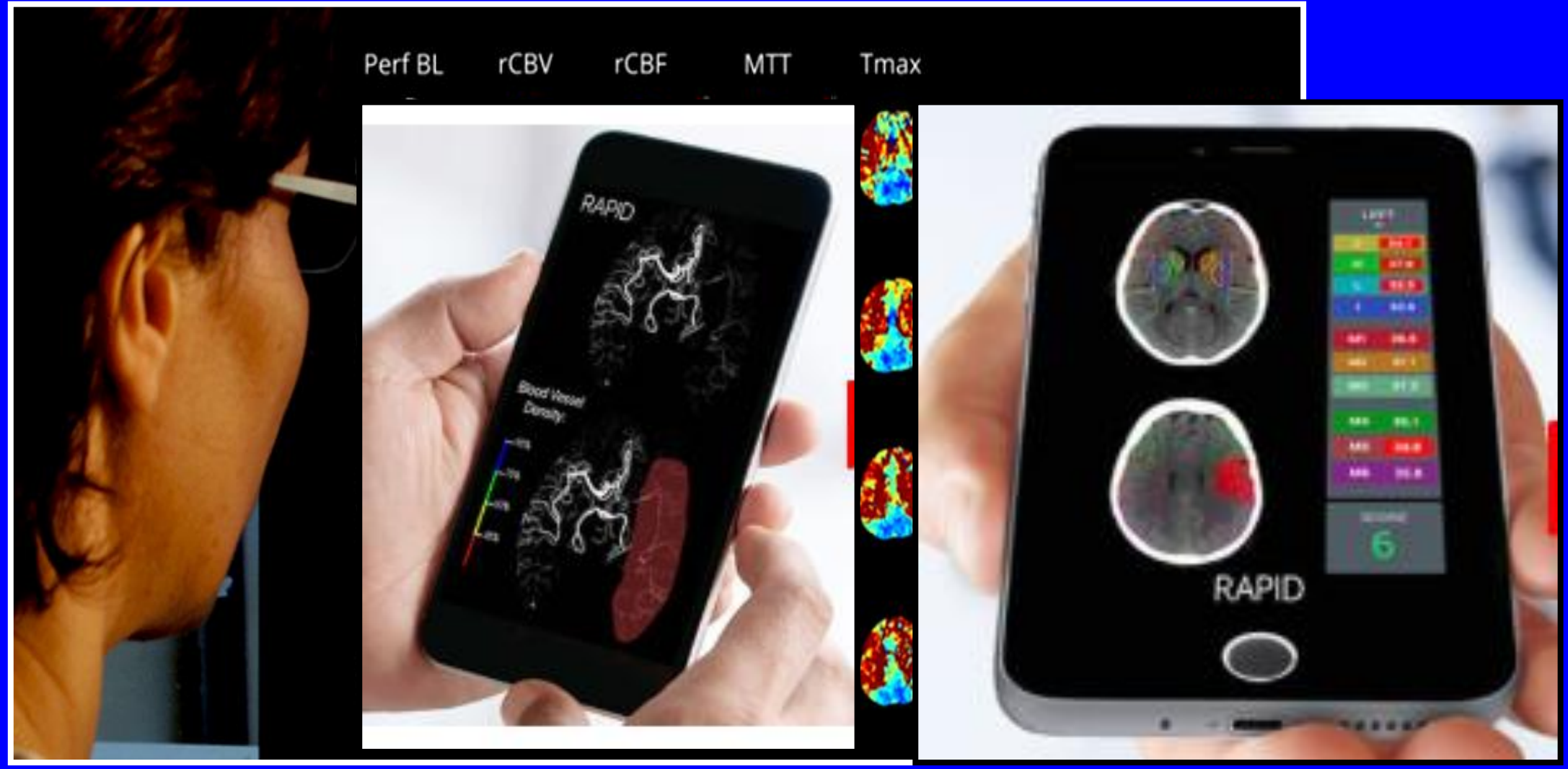
ANALISIS AUTOMATIZADO (TC)

maView RAPID

http://www.i-rapid.com/using-rapid



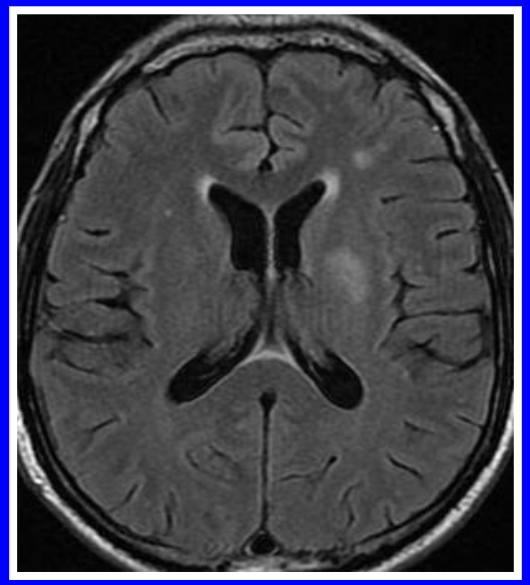


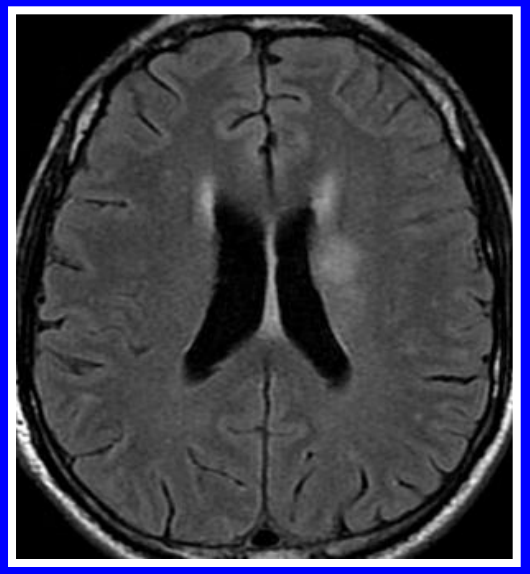

Perf BL
rCBV
rCBF
MTT
Tmax
RAPID
Blood Vessel Density
RAPID
6

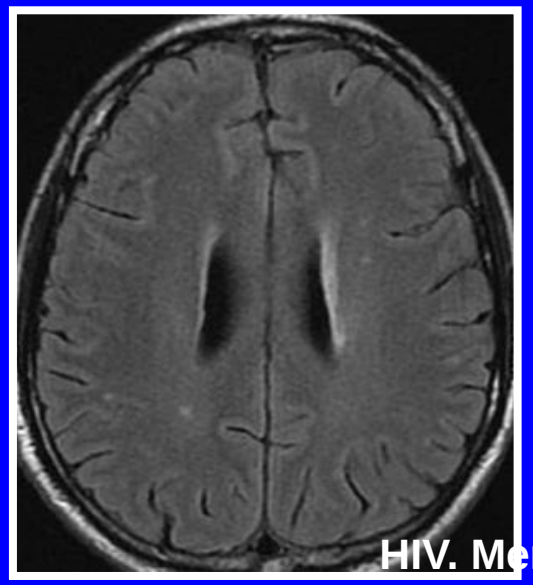
ACV ISQUEMICO

- **1) ACV AGUDO**
- **2) CAUSAS DE ACV**
- **3) IMÁGENES DE PARED VASCULAR**

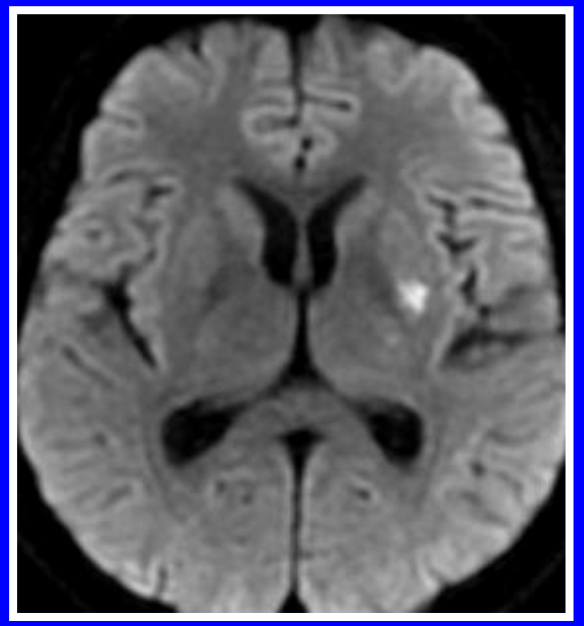
IMÁGENES DE PARED VASCULAR

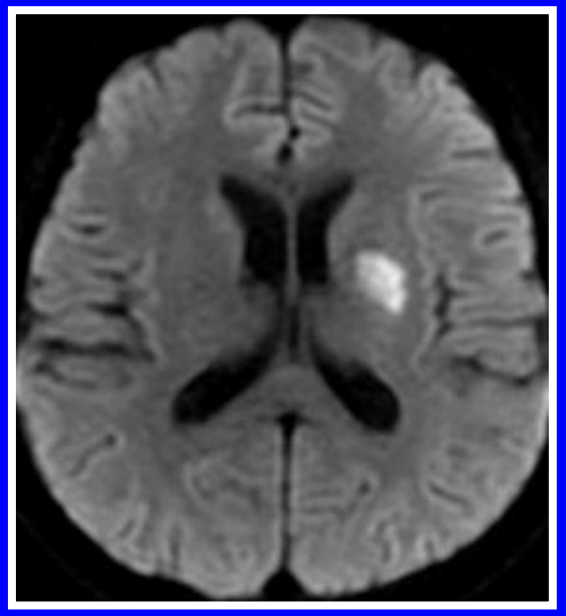


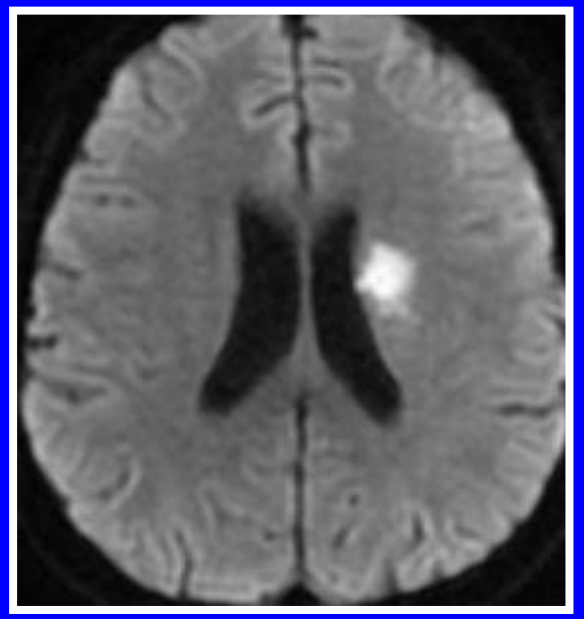


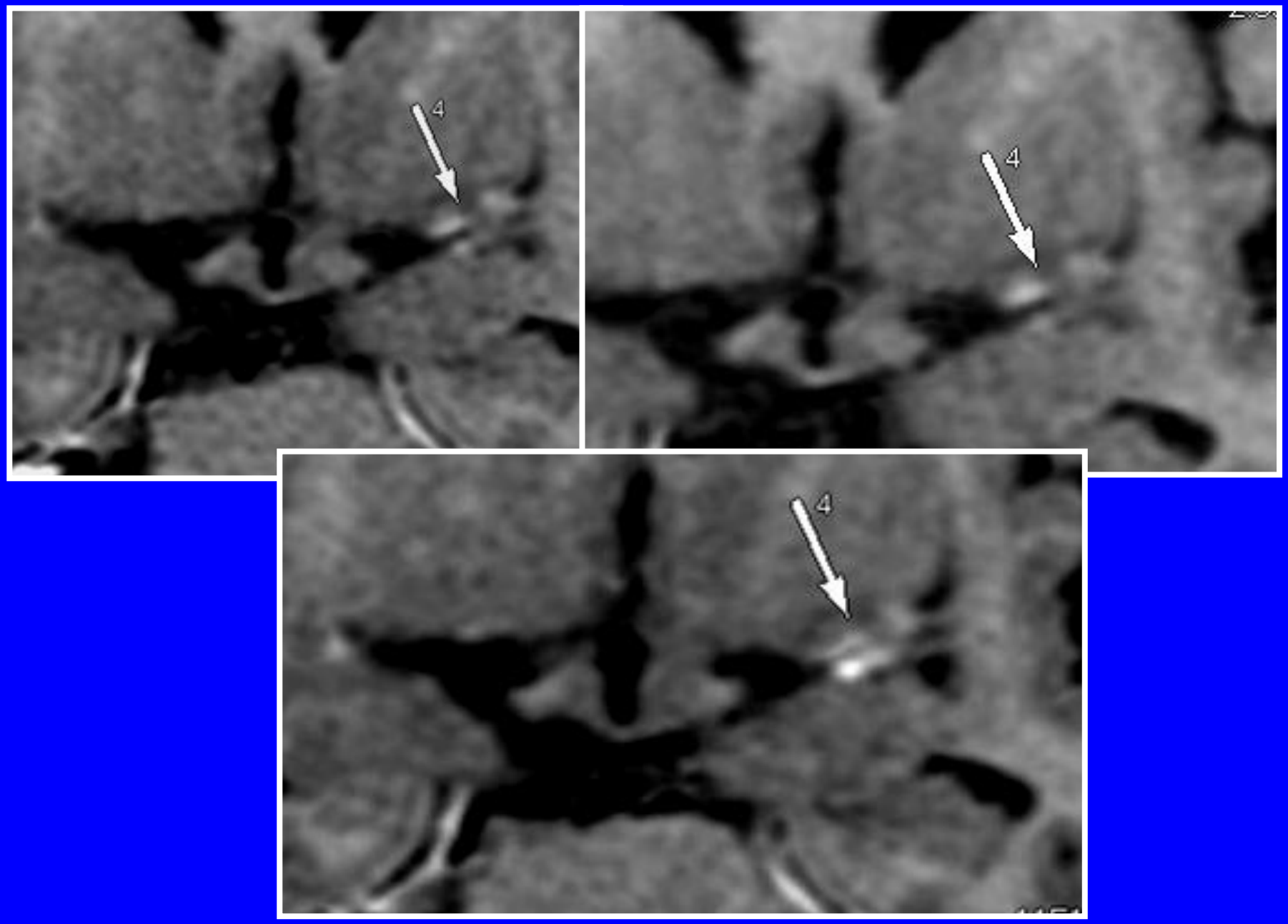


HIV. Meningitis por criptococo



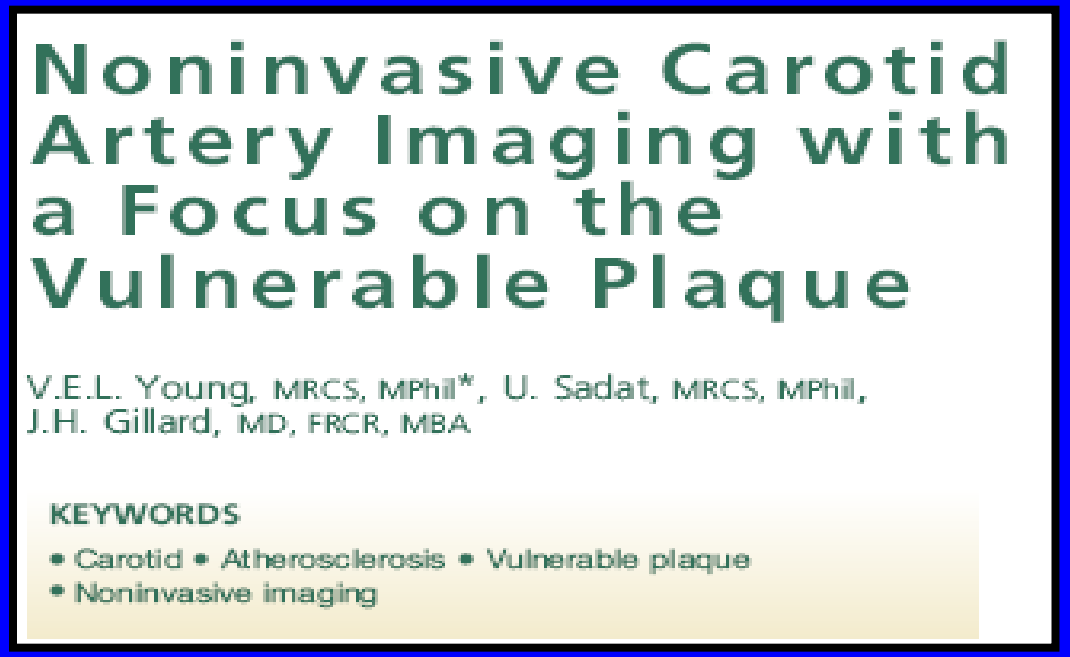





4
4
4

DEFINICIONES

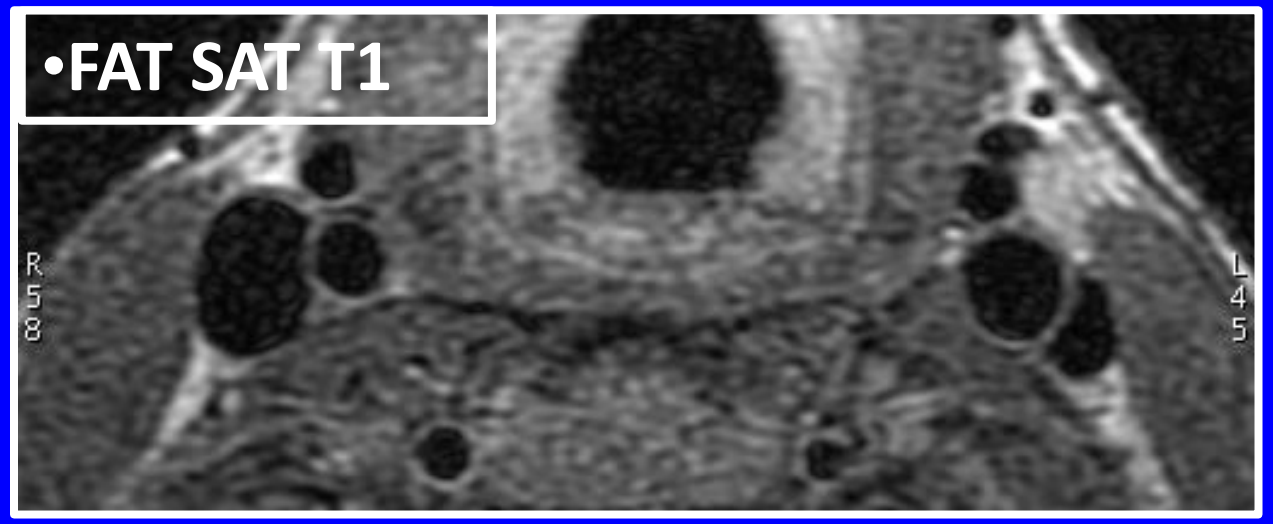
- **Placas vulnerables:**
- **- Gran core lipídico**
- **- Fina capa fibrosa**
- **- Hemorragia intraplaca**
- **- Ruptura de placa**
- **- Formacion de trombos**
- **- Subsecuente embolización y/trombosis en vasos**
- **distales**

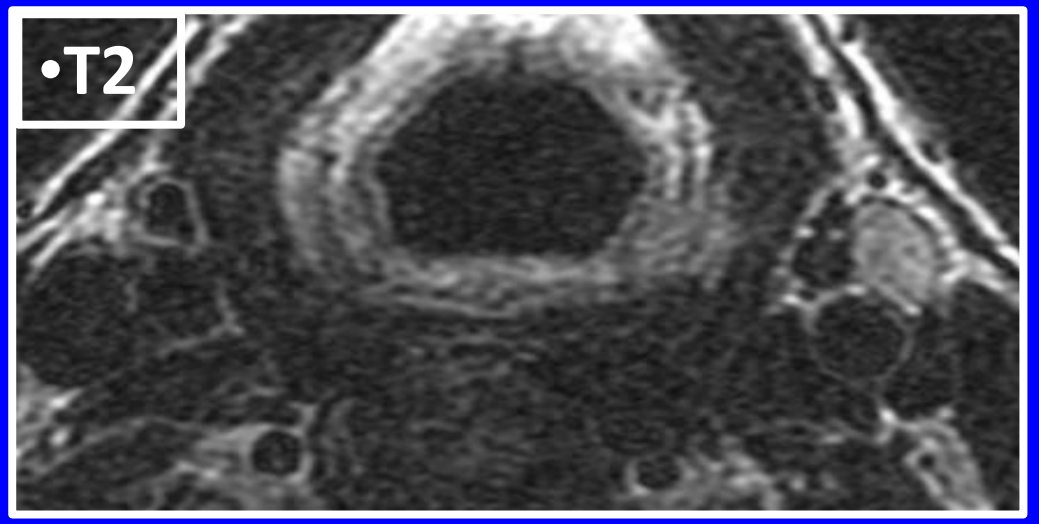


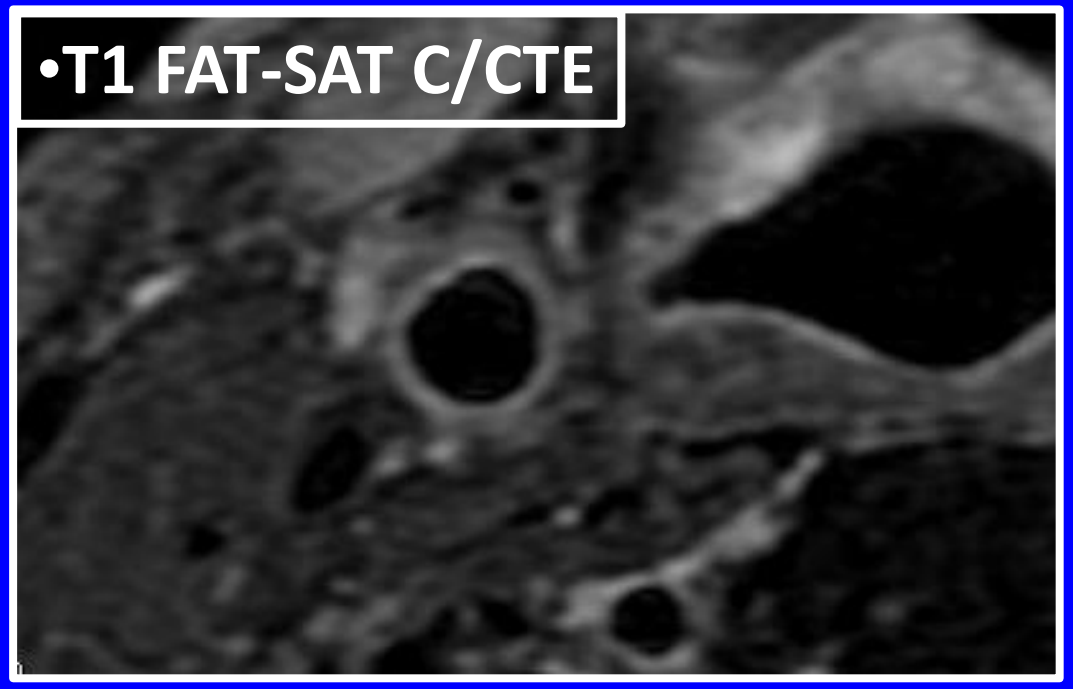
Noninvasive Carotid Artery Imaging with a Focus on the Vulnerable Plaque

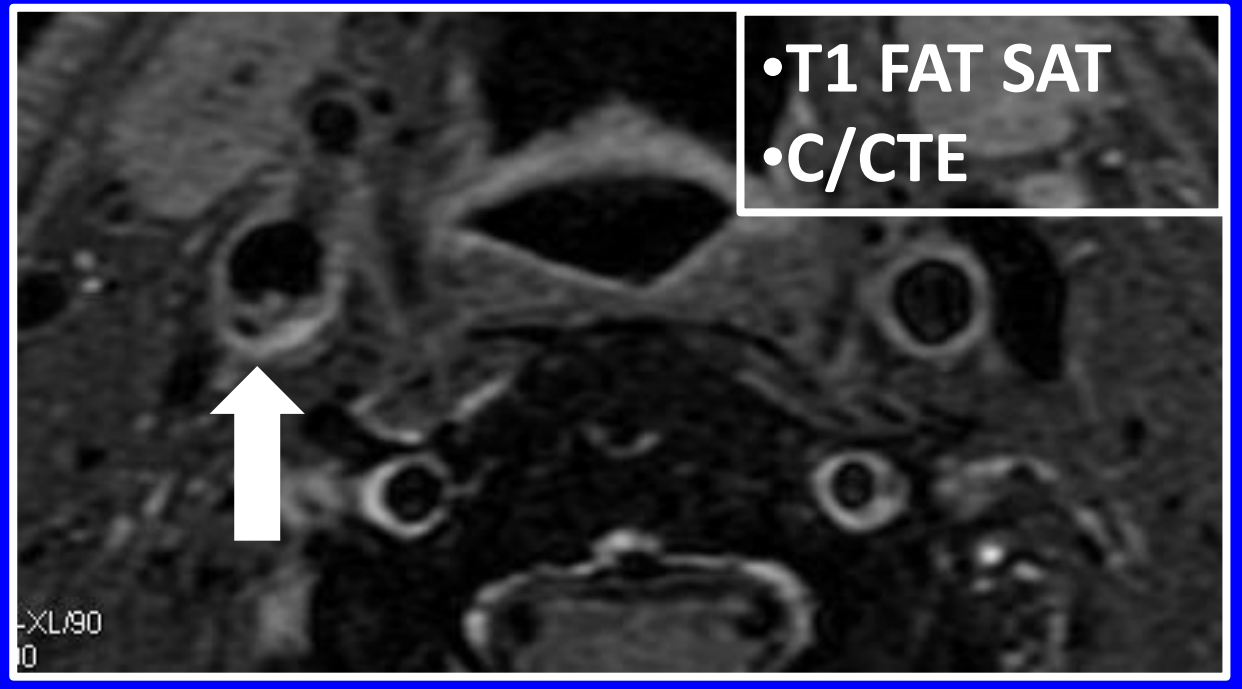
V.E.L. Young, MRCS, MPhil*, U. Sadat, MRCS, MPhil, J.H. Gillard, MD, FRCR, MBA

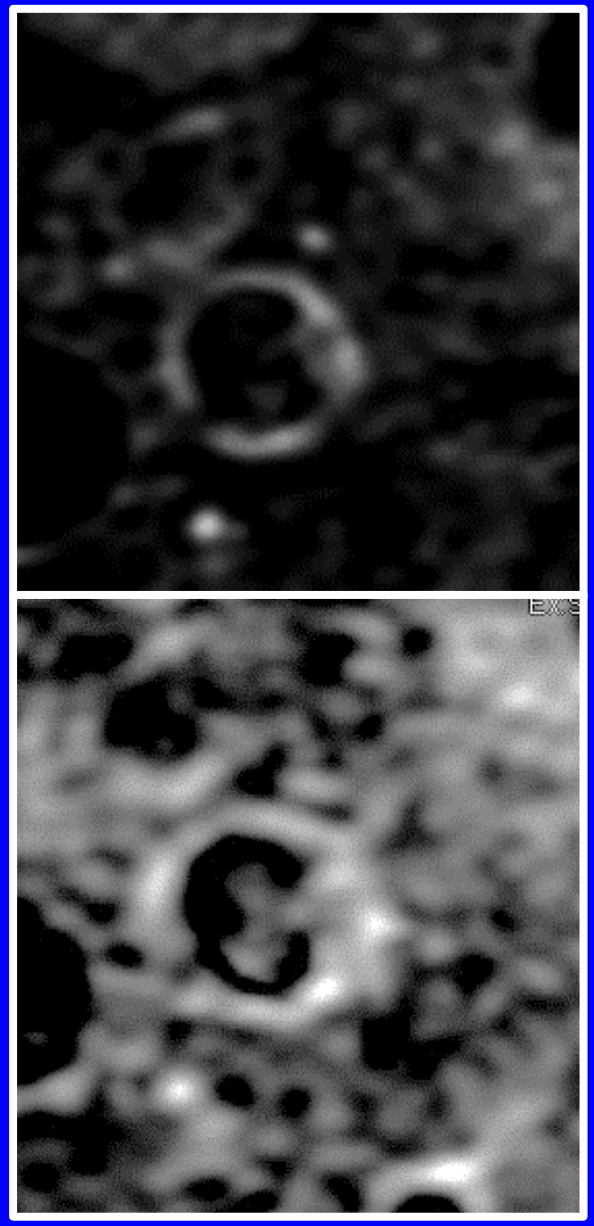
KEYWORDS
• Carotid • Atherosclerosis • Vulnerable plaque
• Noninvasive imaging


•FAT SAT T1

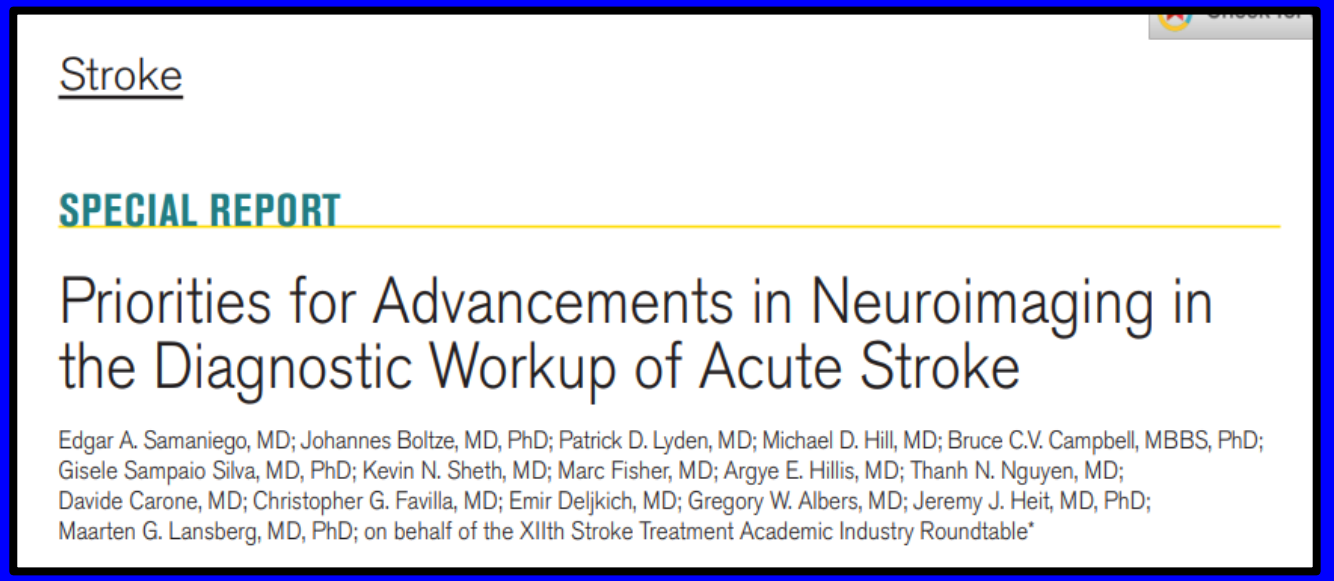

•T2


•T1 FAT-SAT C/CTE


•T1 FAT SAT
•C/CTE



DIEZ AREAS CRITICAS EN LA PRIORIDAD PARA EL AVANCE EN LAS IMÁGENES DEL ACV AGUDO (STAIR XII)



Stroke

SPECIAL REPORT

Priorities for Advancements in Neuroimaging in the Diagnostic Workup of Acute Stroke

Edgar A. Samaniego, MD; Johannes Boltze, MD, PhD; Patrick D. Lyden, MD; Michael D. Hill, MD; Bruce C.V. Campbell, MBBS, PhD; Gisele Sampaio Silva, MD, PhD; Kevin N. Sheth, MD; Marc Fisher, MD; Argye E. Hillis, MD; Thanh N. Nguyen, MD; Davide Carone, MD; Christopher G. Favilla, MD; Emir Deljkich, MD; Gregory W. Albers, MD; Jeremy J. Heit, MD, PhD; Maarten G. Lansberg, MD, PhD; on behalf of the XIIth Stroke Treatment Academic Industry Roundtable*

Stroke, diciembre 2023

STAIR XII:

1.Capacidad de imágenes en centros 1ríos y complejos de atención.
2. Análisis y caracterización del coagulo (Radiomica).
3. Capacidad de imágenes en predecir la respuesta a la reperfusión.
4. Score TICI en respuesta efectiva a la reperfusión.
5. Predicción por FPE.
6. Imágenes post-reperfusión.
7. TC sin contraste en isquemia precoz.
8. TC “cone beam”. Su utilidad
9. Imágenes en MSU.
10. WWI en la evaluación de la causa del ACV (patología).

CONCLUSIONES. STAIR XII

1) **SELECCIÓN DE IMÁGENES:**

- CT y CTA (evaluación de área isquémica y grado de reperfusión)
- RM (Core y Penumbra: Trombectomia mas allá de las 6 hs).

2) RADIOMICA:

- Características del trombo (localización, tamaño, márgenes, etc).

3) PRONOSTICO:

- Evaluación de procedimiento de reperfusión (ej: colateralizacion).
- Alteracion de barrera H-E (edema)
- Imágenes de pared vascular (etiología).
- Características del trombo (I.A, algoritmos “ad hoc”)-

CONCLUSIONES

- Realizar un estudio de imagen a todos los pacientes con sospecha de ACV agudo en el momento de su llegada.
- En muchos casos la TC provee la información necesaria para la toma de decisiones.
- El sistema debería asegurar realizar el estudio de imagen dentro de los 20 minutos del arribo.
- Tiempo “puerta-aguja” entre 45/60 minutos (Unidades móviles de ACV equipadas con TC)
- CTP y/o RM-DWI: selección de pacientes para EVT en las 6-24 hs luego del comienzo del ACV.
- Evaluación de arterias carótidas y vertebrales intra/extracraneanas para visualizar grado de colateralizacion (ATC/RMA).

CONCLUSIONES

1) ACV agudo (TC, Angio TC, RM, Angio RM)

2) El "mejor método" es aquel que obtenga el mejor resultado en el menor tiempo.

3) Acelerar el tiempo "puerta-aguja"

4) Definir etiologia (ej: cardioembolismo, vasculitis, ateromatosis, etc)

MUCHAS GRACIAS