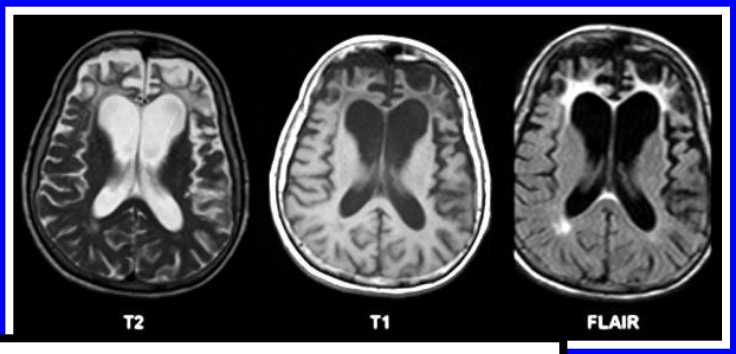
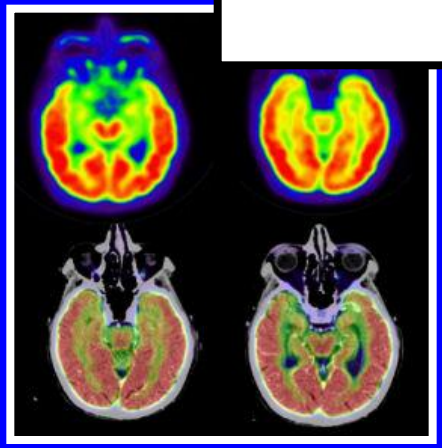
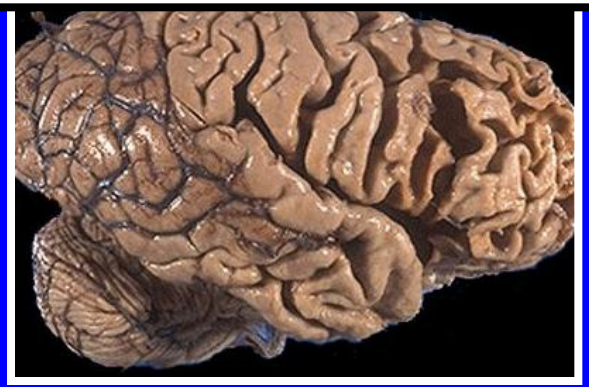
NEUROIMAGENES EN ENFERMEDADES NEURODEGENERATIVAS

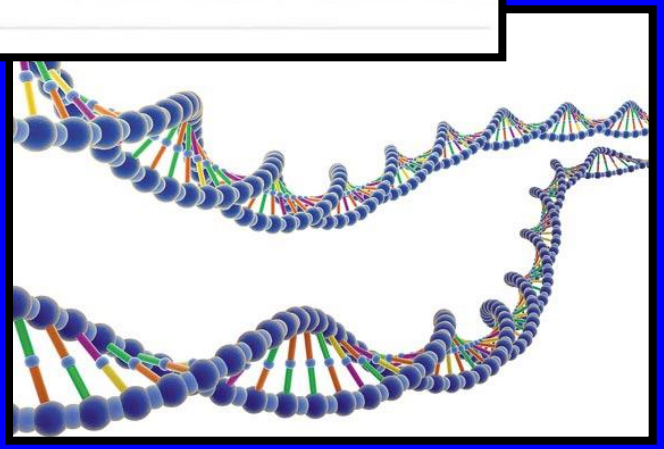


DASA

DIAGNOSTICO MAIPU







OBJETIVOS

- Forma… …nos neuro… relaci… …e Demencias.
- Neu… cue… el d…

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https://doi.org/10.1007/s00415-020-10040-0

NEUROLOGICAL UPDATE

Neurological update: neuroimaging in dementia

Timothy Rittman[1]

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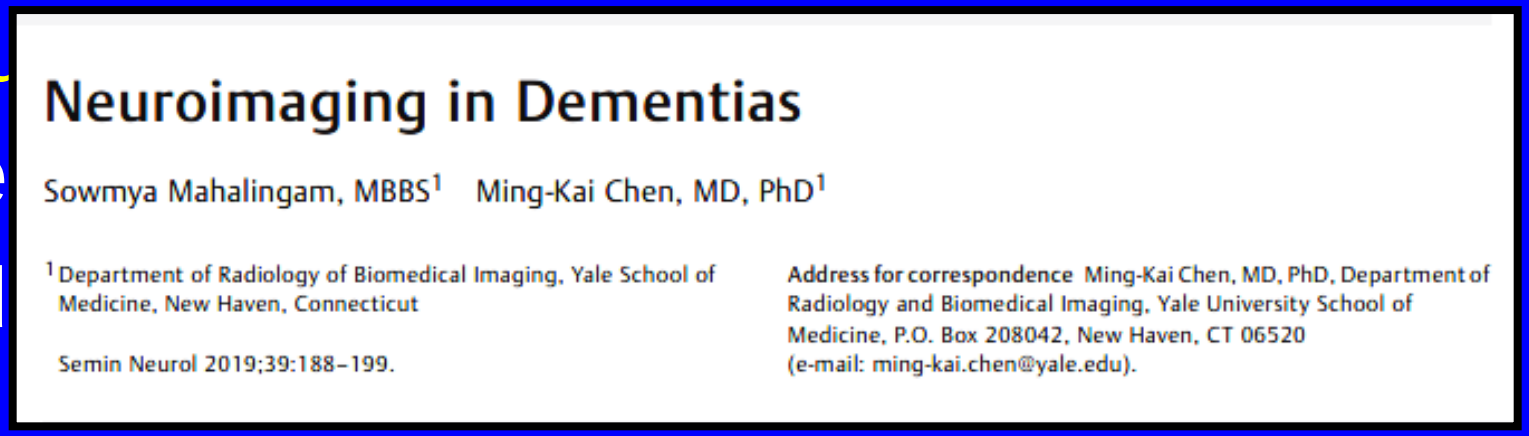

Neuroimaging in Dementias

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Semin Neurol 2019;39:188–199.

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DEMENCIAS

- **PRIMARIAS:**

- **a. Alzheimer (50-60%)**
- **b. Cuerpos de Lewy**
- **c. DFT**
- **d. Mixta**
- **e. Parkinson, PSP, Huntington**

- **SECUNDARIAS:**

- **a. Vascular**
- **b. CJD**
- **c. HPN**
- **d. VIH**

- **DEMENCIAS RAPIDAMENTE PROGRESIVAS**

Enfermedad de Alzheimer

- Lóbulo temporal mesial, cingulo posterior y precuneo (áreas de comienzo)
- Extensión hacia corteza temporal postero-superior.
- Aproximadamente 10/15% de los casos con DCL evolucionan a EA.
- Valoración morfológica a través de RM.
- Biomarcadores (beta amiloide, TAU hiperfosforilada)
- Evaluación metabolica (PET: FDG/amiloide/tau).
- Evaluación clínica: fundamental.

PROTOCOLOS DE IMAGENES

- **RESONANCIA MAGNETICA:**
  (ej:espectroscopia, RM funcional, RM-f en estado de reposo, conectividad cerebral).
- **S.P.E.C.T.**
- **P.E.T. (Beta-amiloide y Proteína Tau)**

RM Protocolo cognitivo

- **Agregar a las secuencias convencionales:**

A. Adquisición volumétrica T1

B. Adquisición volumétrica SWI (susceptibilidad magnética)

C) Coronal T2 Alta Resolución (*Perpendiculares al eje mayor del Hipocampo*)

TABLA 3. ESCALA DE EVALUACIÓN VISUAL DE ATROFIA DEL LÓBULO TEMPORAL MEDIAL (MTA-*SCALE*). VER FIGURA 1

PUNTAJE	Ancho de fisura coroidea	Ancho del cuerno temporal	Altura del hipocampo
0	N	N	N
1	↑	N	N
2	↑↑	↑	↓
3	↑↑↑	↑↑	↓↓
4	↑↑↑	↑↑↑	↓↓↓

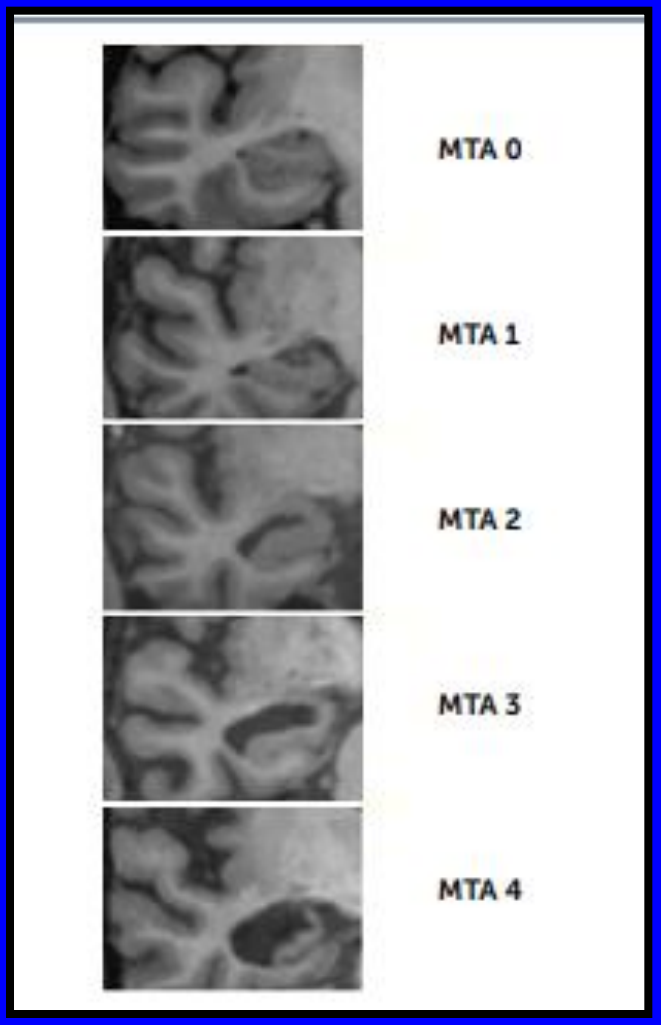


TABLA 5. ESCALA VISUAL DE ATROFIA POSTERIOR/PARIETAL A PARTIR DE MR MULTIPLANAR

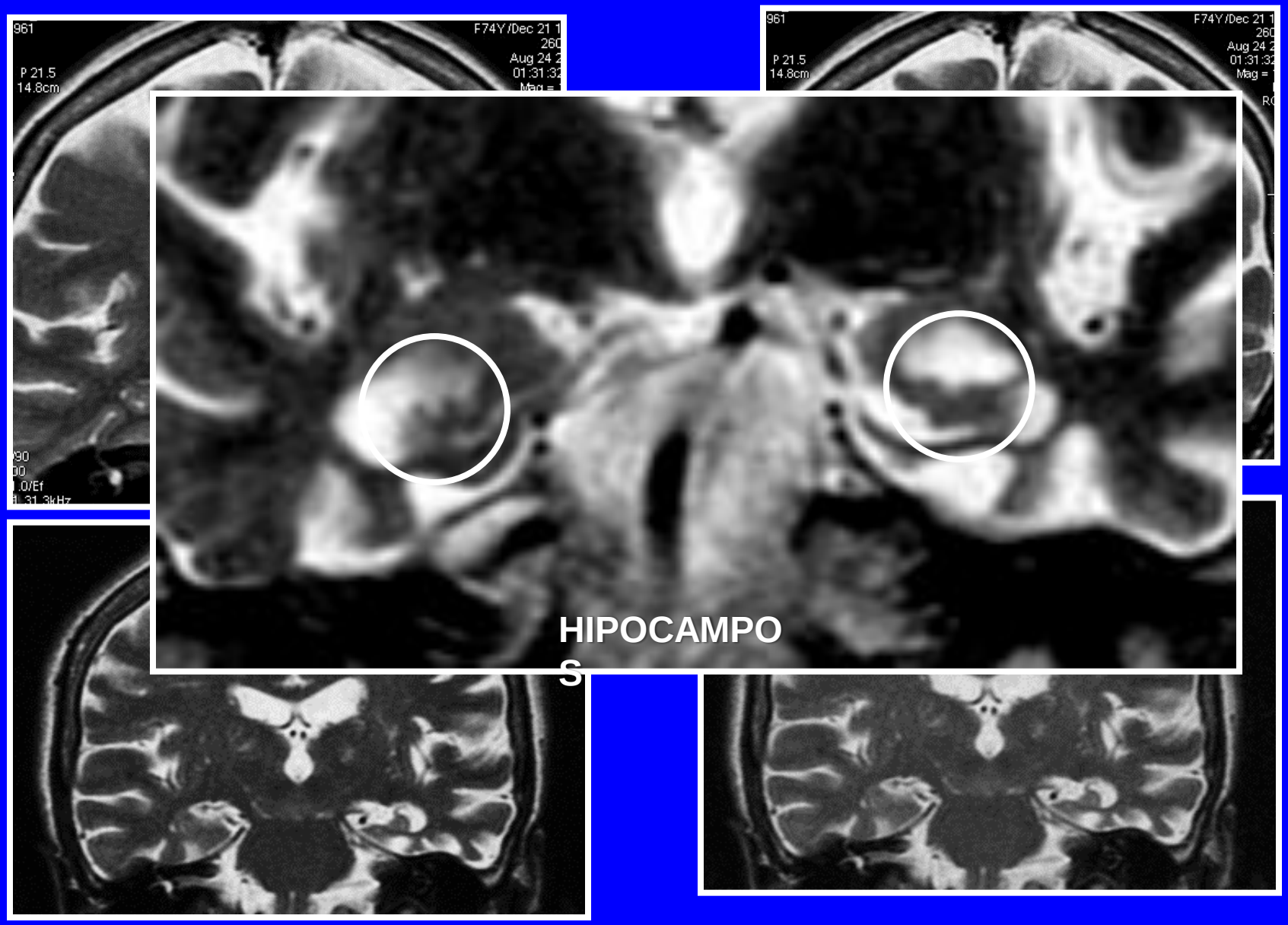
	SAGITAL	AXIAL	CORONAL
PUNTAJE	Ancho del surco cingulado posterior y el surco parieto-occipital, atrofia del precúneo	Amplitud del surco cingulado posterior y dilatación surcal en lóbulos parietales	Amplitud del surco cingulado posterior y dilatación surcal en lóbulos parietales
0	Normal	Normal	Normal
1	↑	↑	↑
2	↑↑	↑↑	↑↑
3	↑↑↑	↑↑↑	↑↑↑

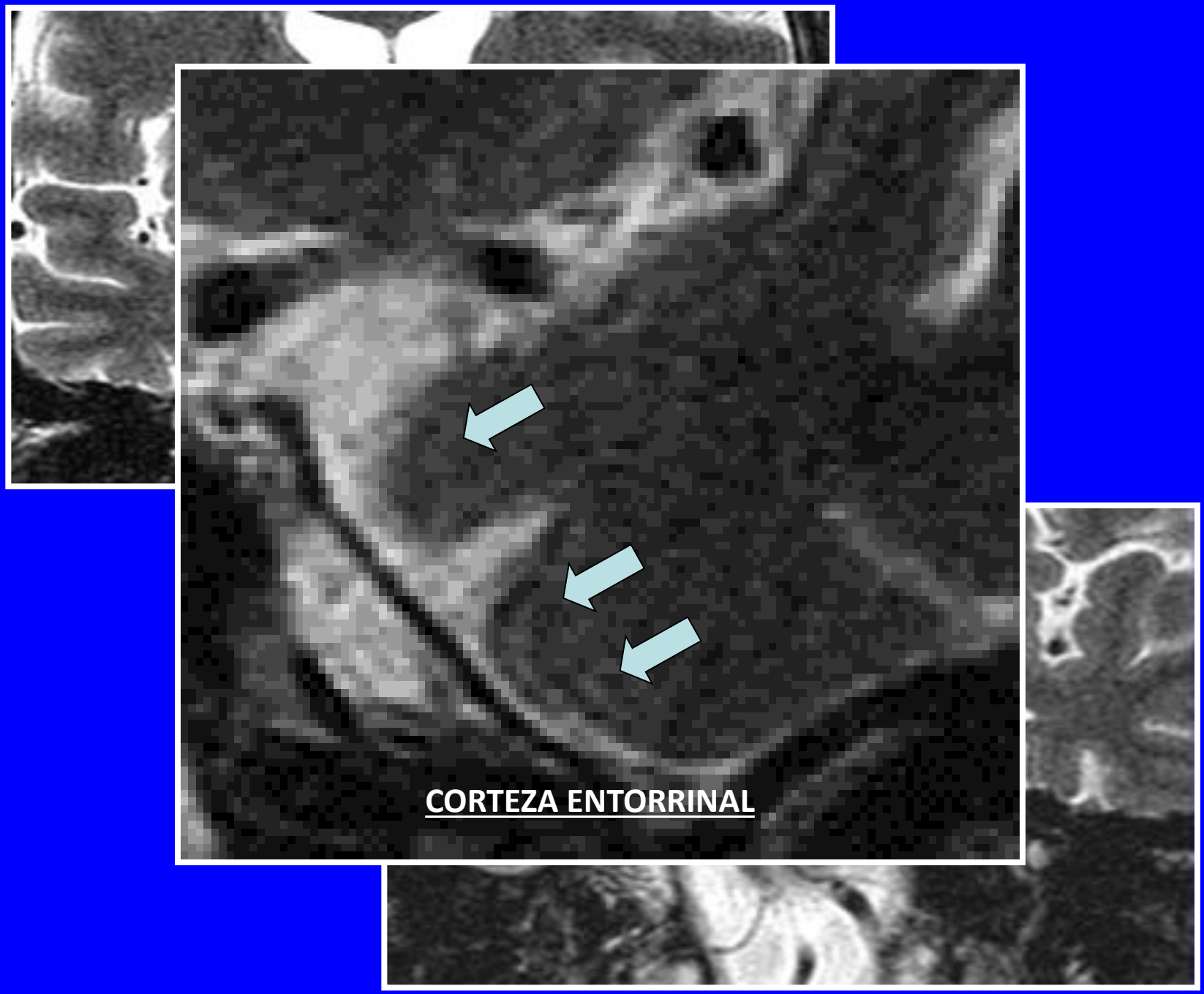
TABLA 6. ESCALA DE EVALUACIÓN VISUAL DE HIPERINTENSIDADES DE SUSTANCIA BLANCA (*FAZEKAS, 20*)

PUNTAJE	Característica
0	Ninguna lesión o una lesión única punteada
1	Lesiones punteadas múltiples
2	Comienzo de confluencia de lesiones (puentes)
3	Lesiones grandes confluentes

REV.MED.CLIN CONDES – 2016: 27 (338-356)

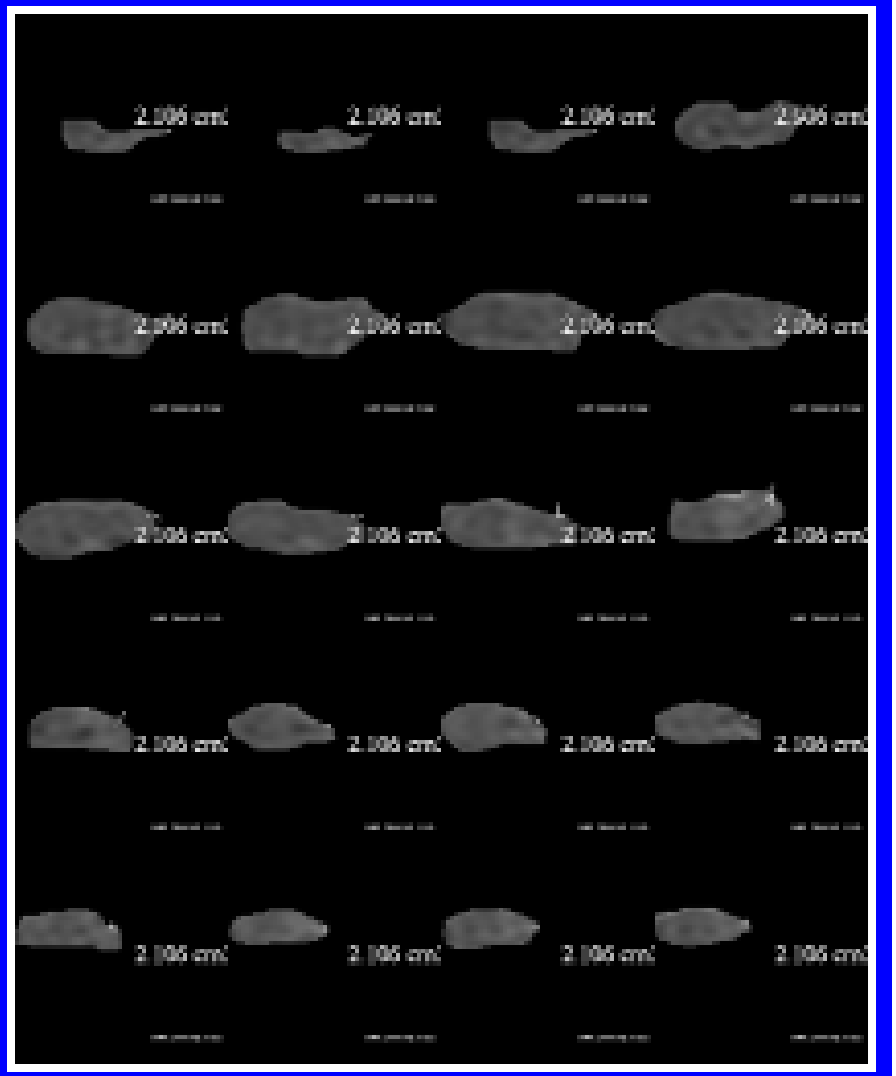
Deterioro cognitivo leve tipo amnésico

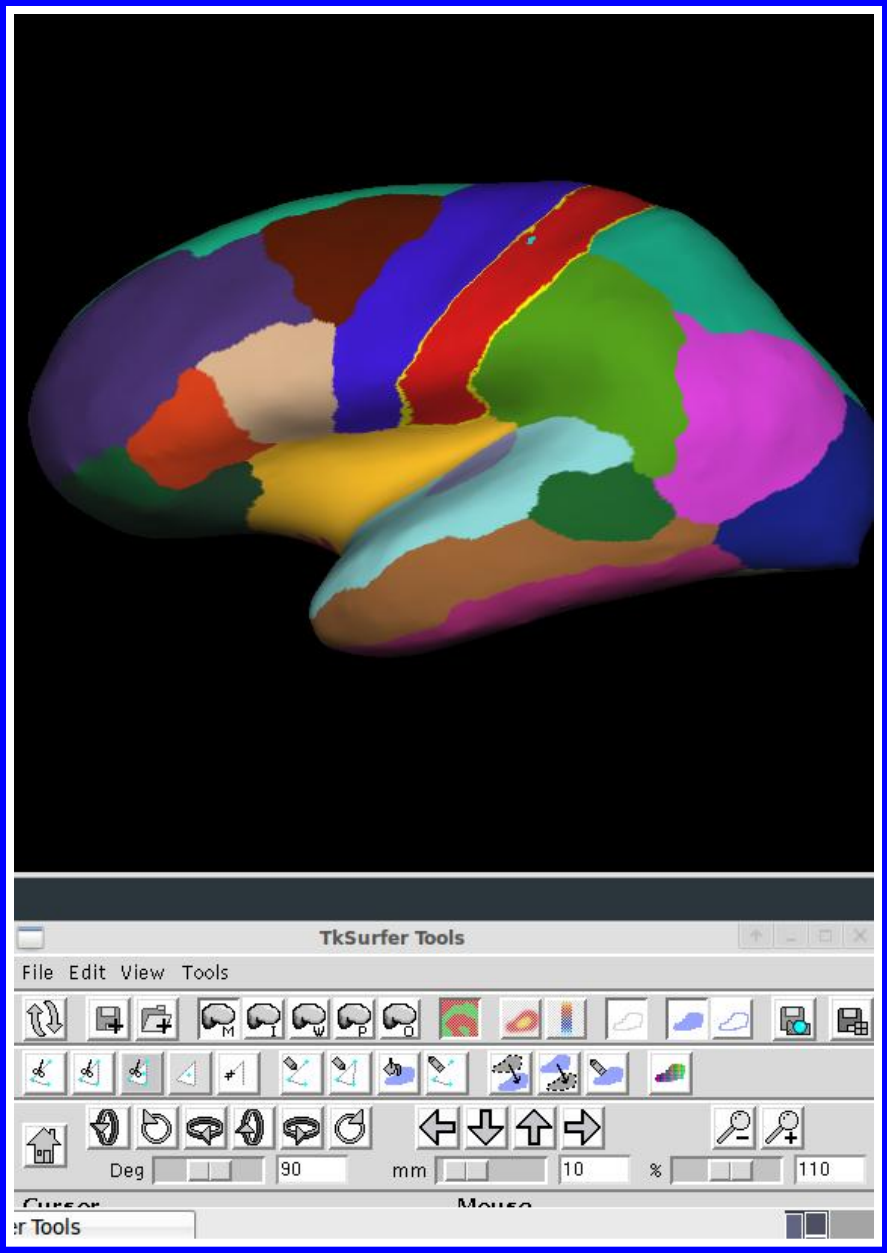



CORTEZA ENTORRINAL

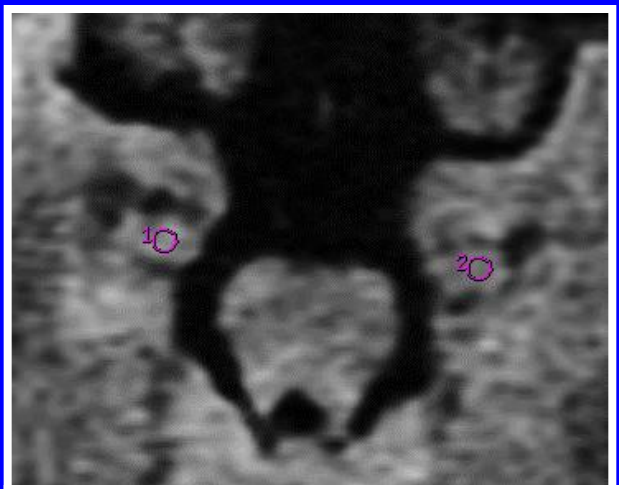
http://surfer.nmr.mgh.harvard.edu/

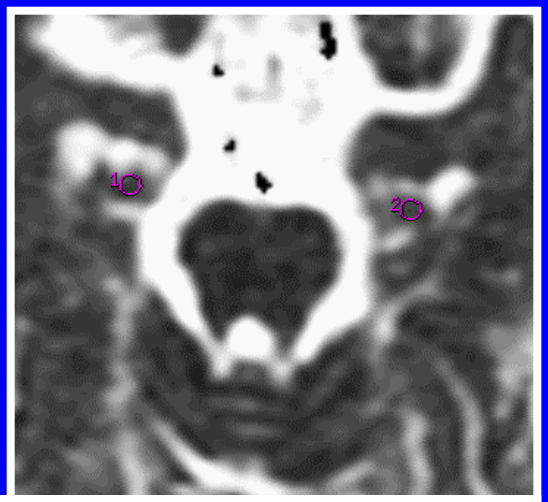
Método semi-automático

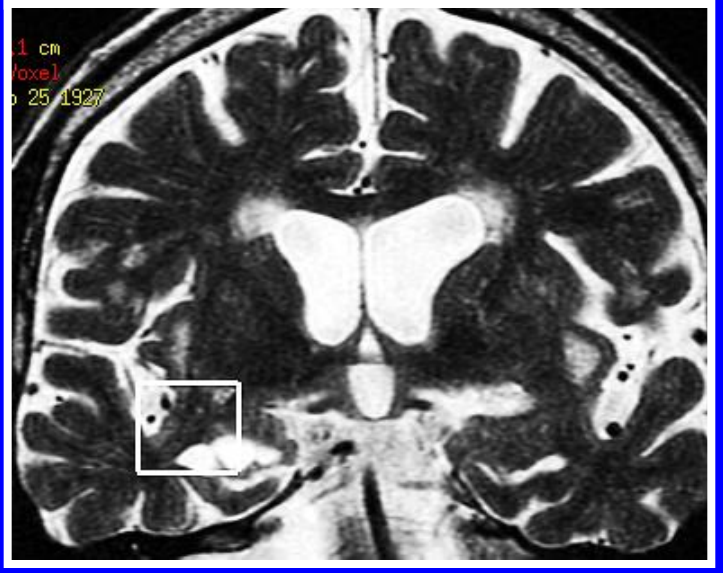


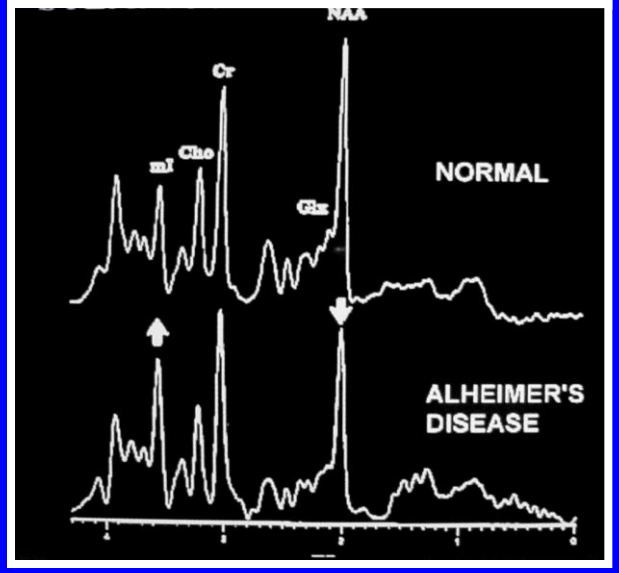


DWI y ADC



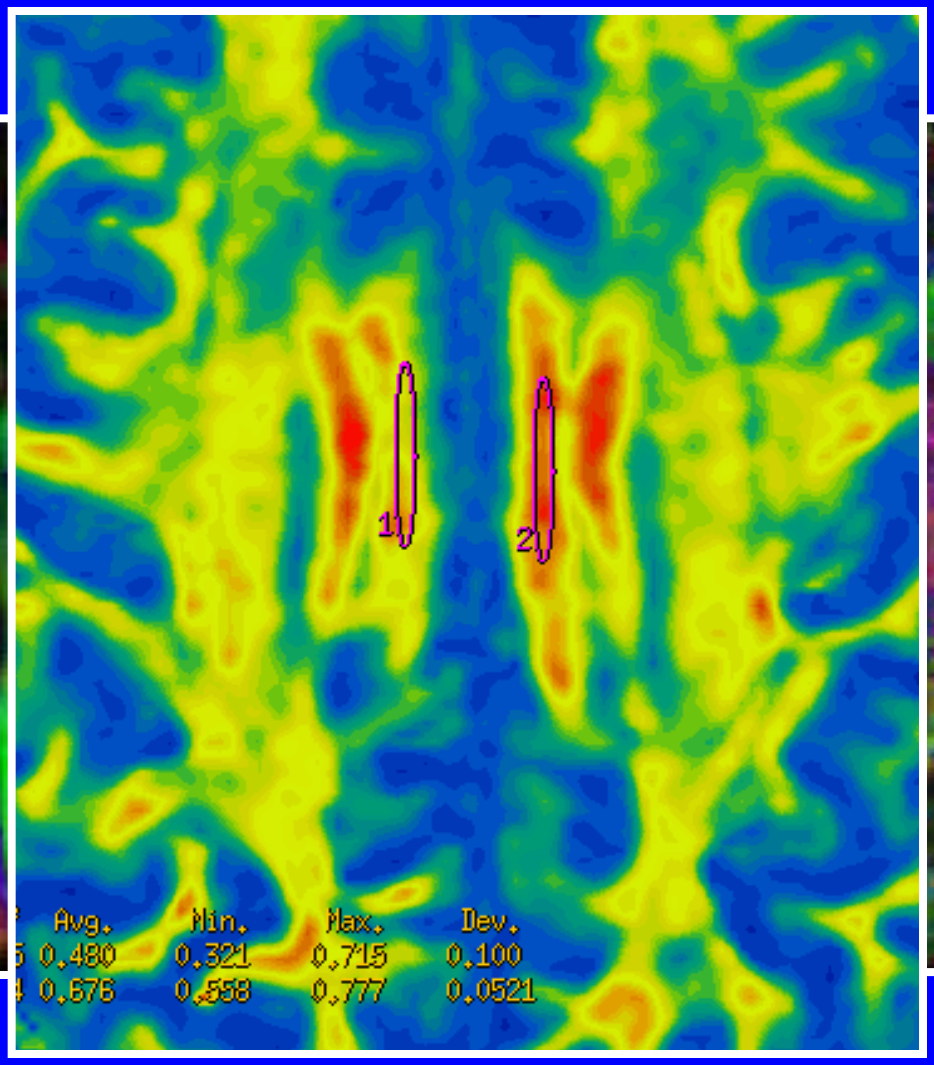


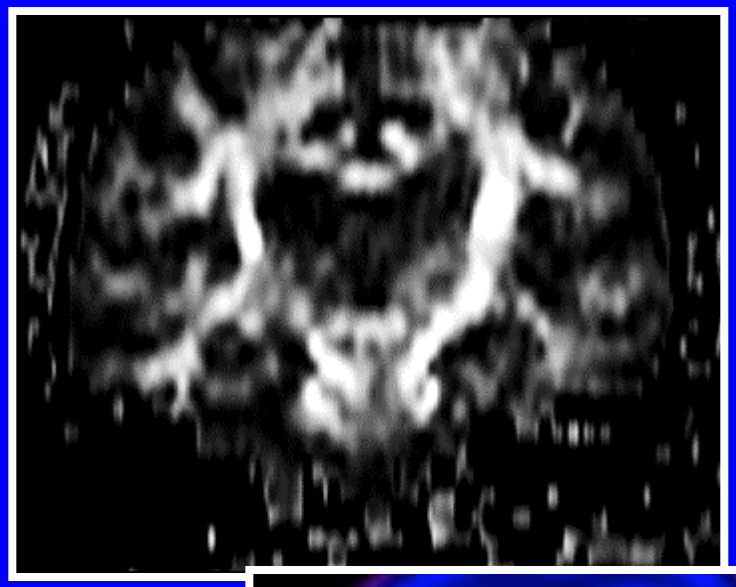


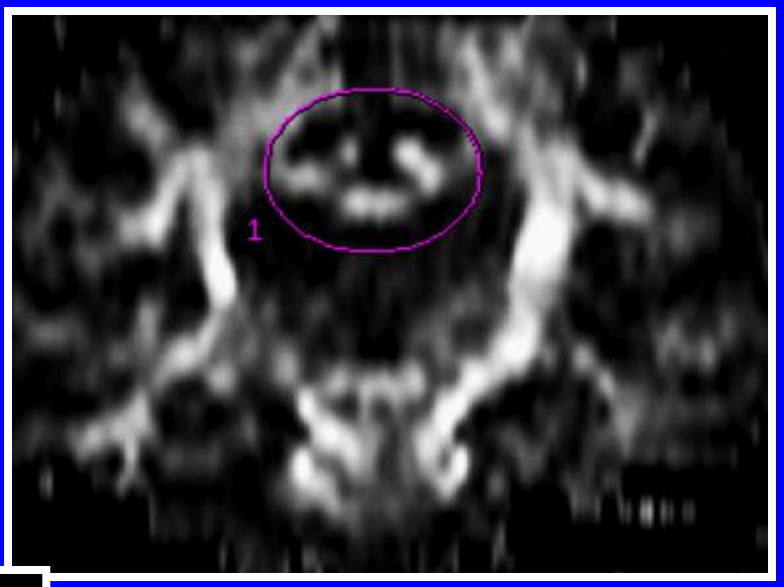


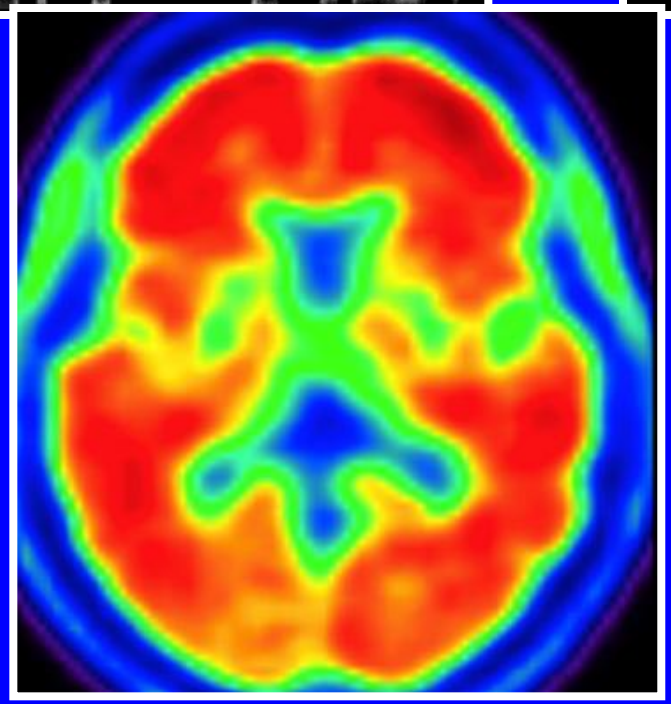
ESPECTROSCOPIA

DTI (Tensor de Difusión)









C-Pib-PET (b-AMILOIDE)

Enf Alzheimer:

Estructural:

Atrofia Lob. Temporal mesial (CA2 y CA3 del hipocampo), cingulo posterior y lóbulo parietal póstero-medial.

Molecular:

SPECT (Perfusión disminuida) y PET (Menor captación de glucosa).
Ambos en lóbulo temporal mesial (hipocampo)
***C-PiB Florbetapir* (captación por placas de amilode)**

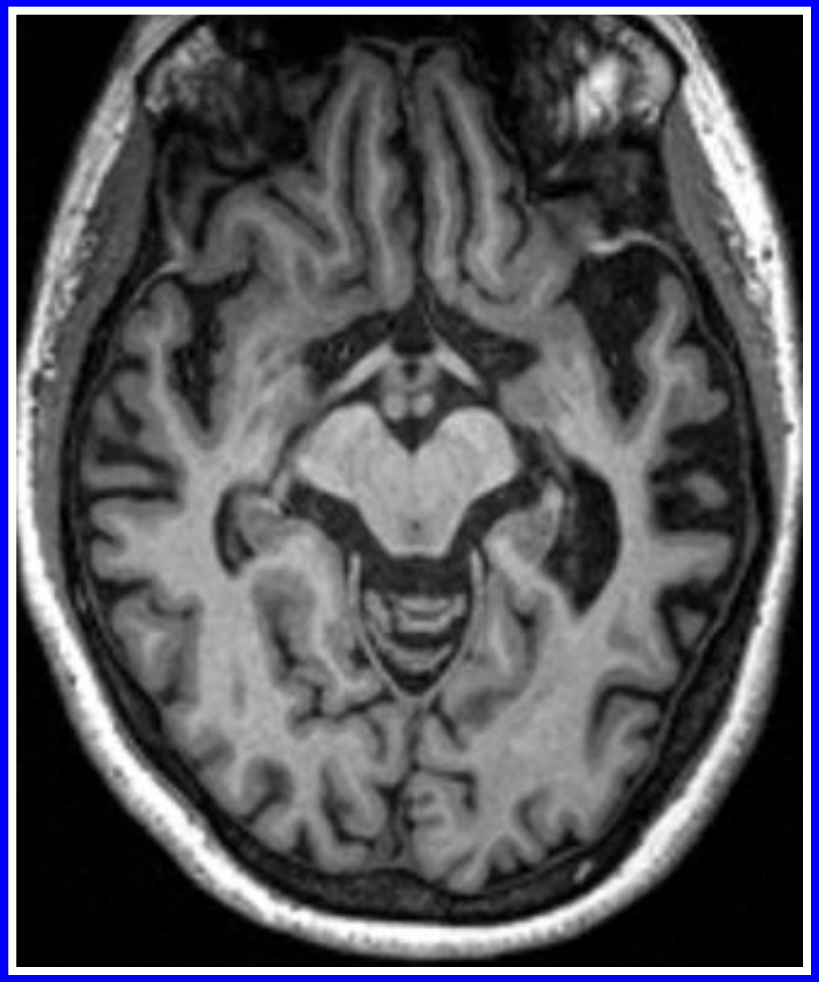
Demencia fronto-temporal

- **CLINICA:**

- **A. Variante conductual (bvFTD)**

- **B. Afasia progresiva primaria (PPA)**
- **b.1) Afasia progresiva NO fluente**
- **b.2) APP semántica**
- **b.3) Afasia logopénica**

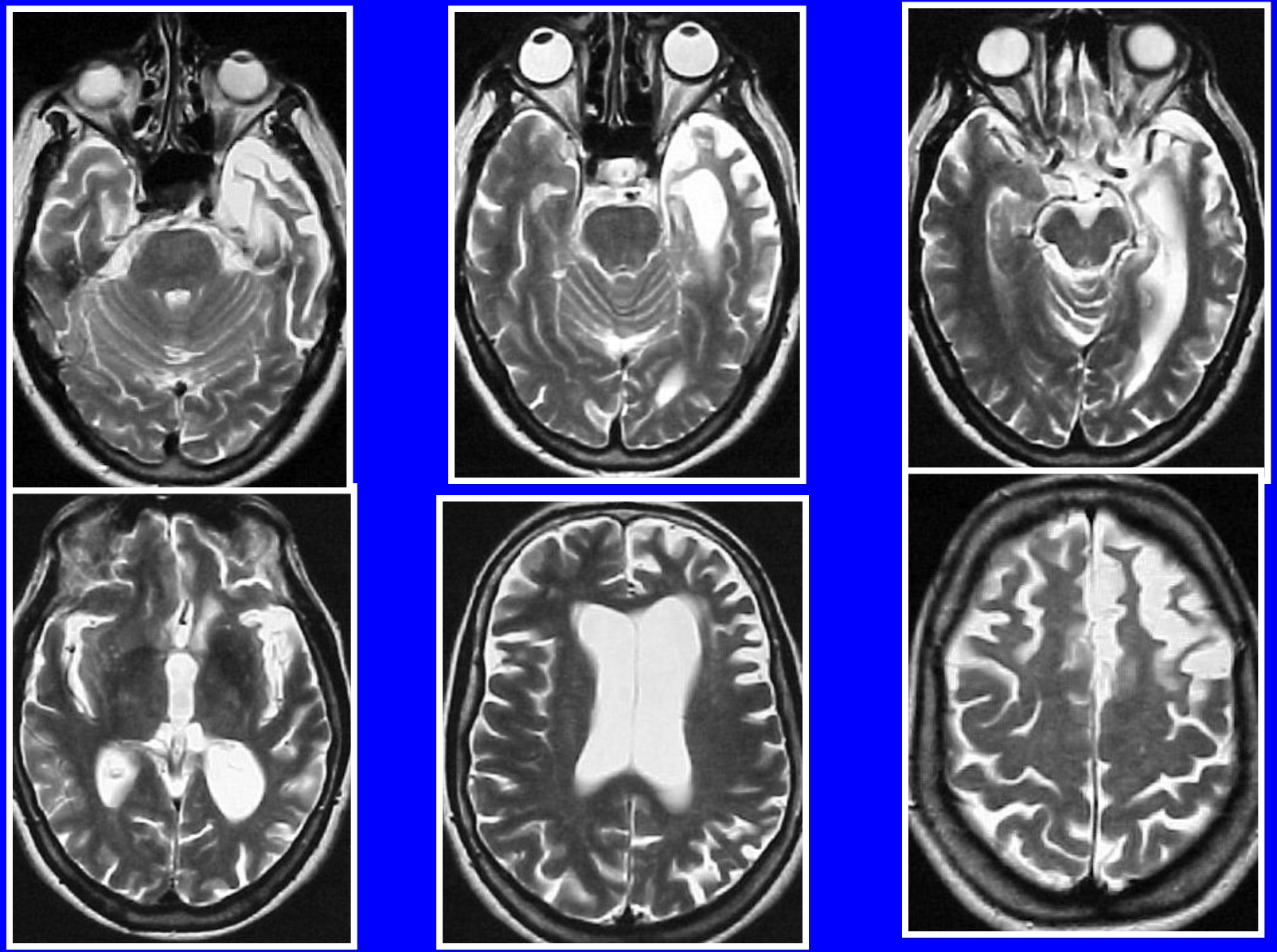
AFASIA PROGRESIVA PRIMARIA:



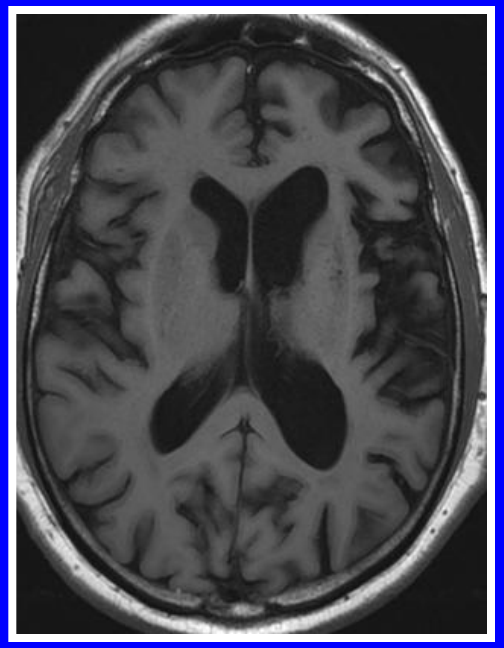
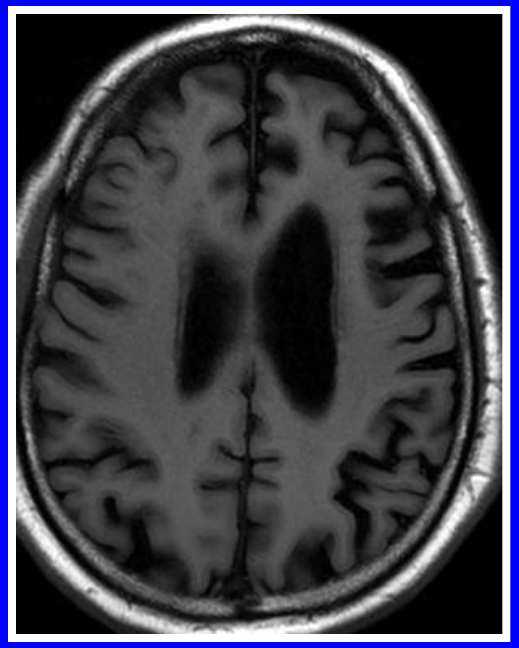
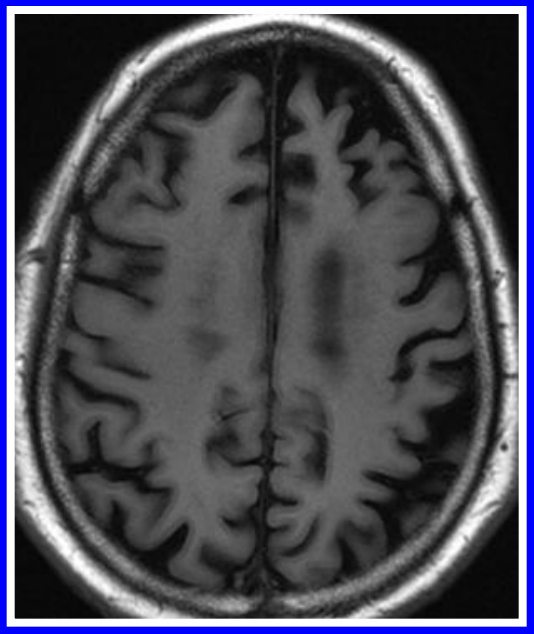
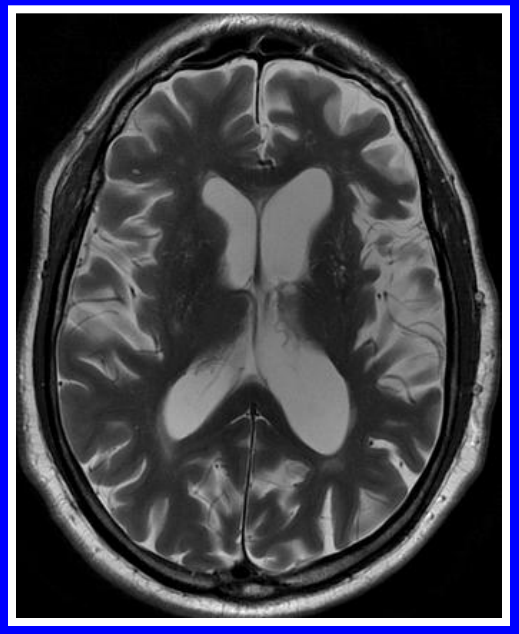
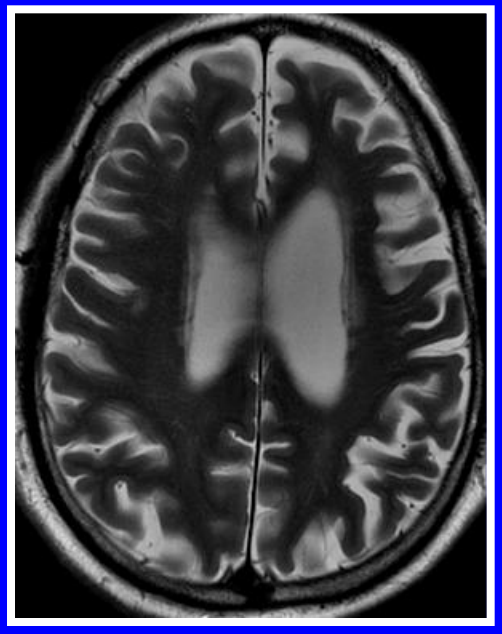
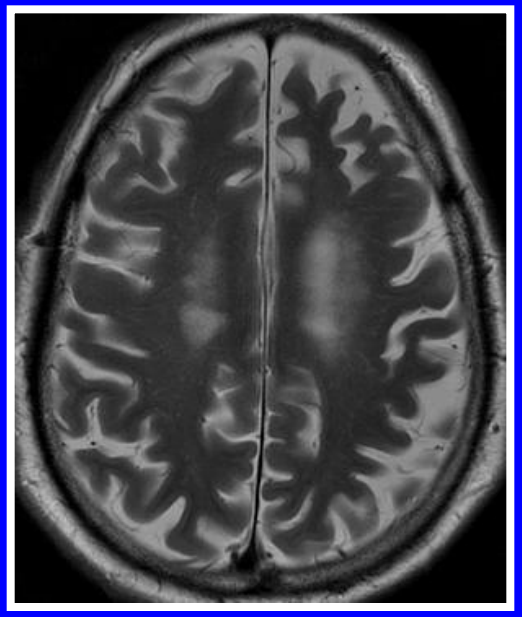
- **APP No Fluente: (tau)**

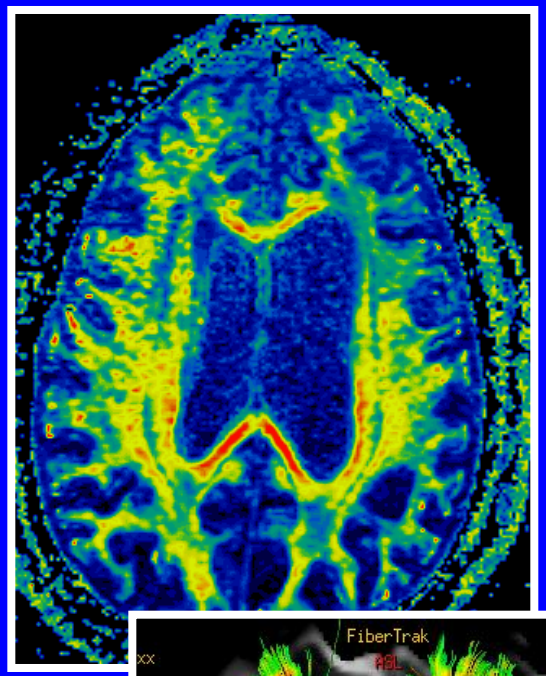
- **APP SEMANTICA : (TDP-43)**

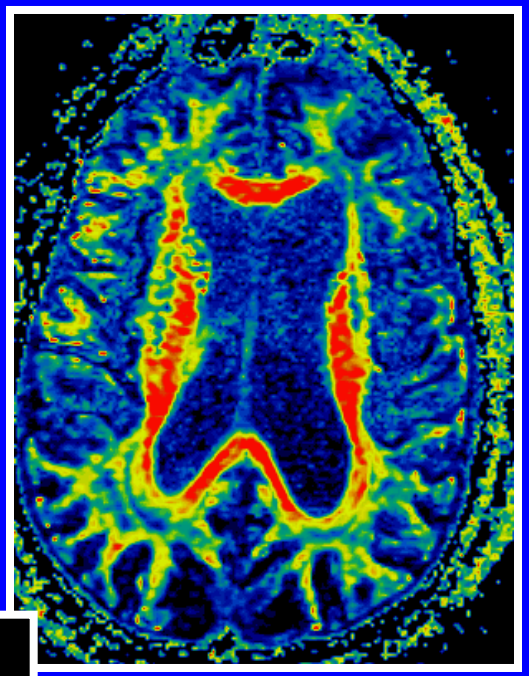
- **LOGOPÉNICA: (Alzheimer)**

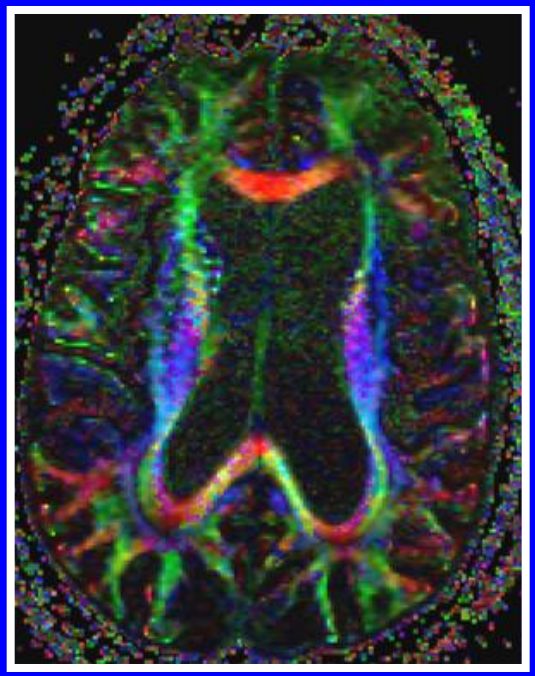


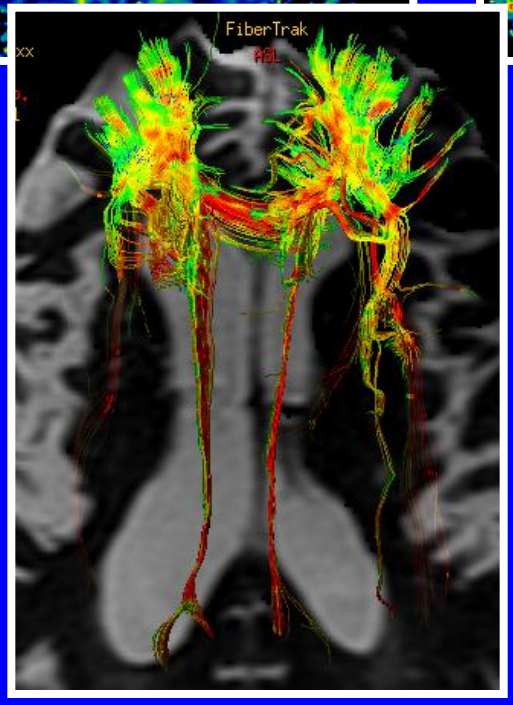
AFASIA PROGRESIVA PRIMARIA








FiberTrak
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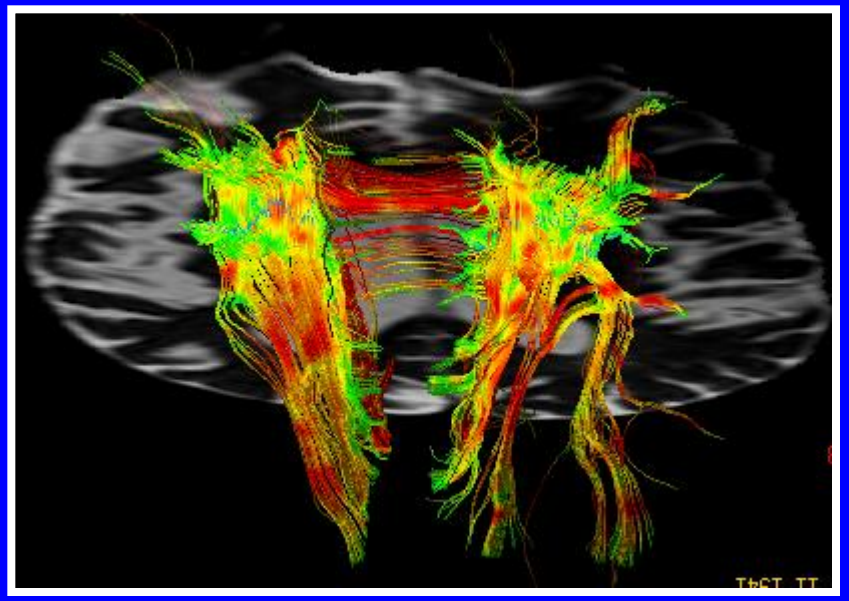
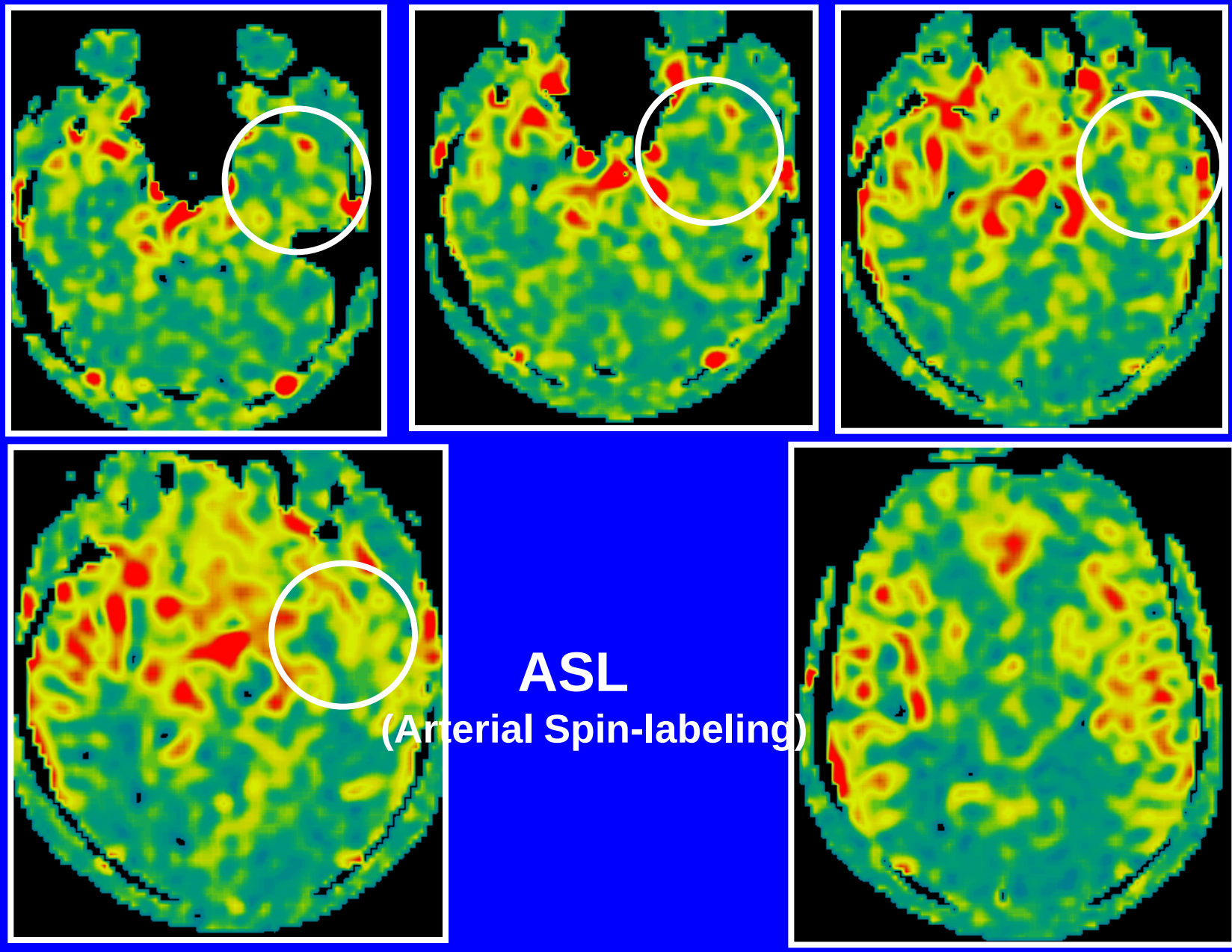
ASL





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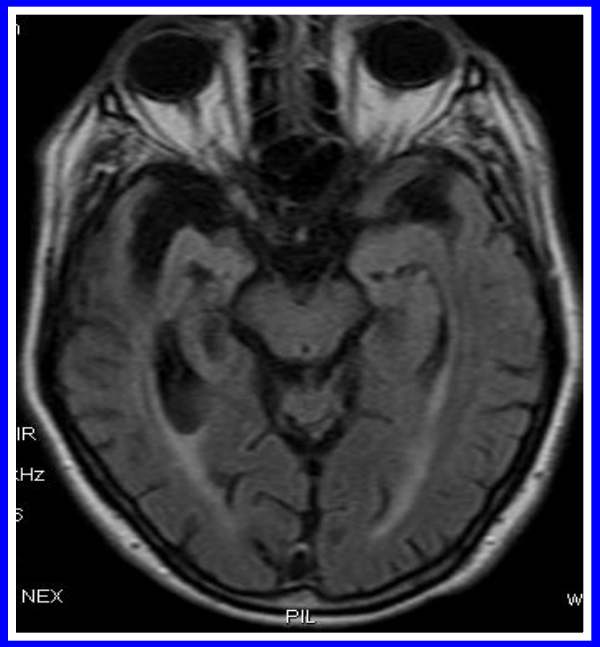
(Arterial Spin-labeling)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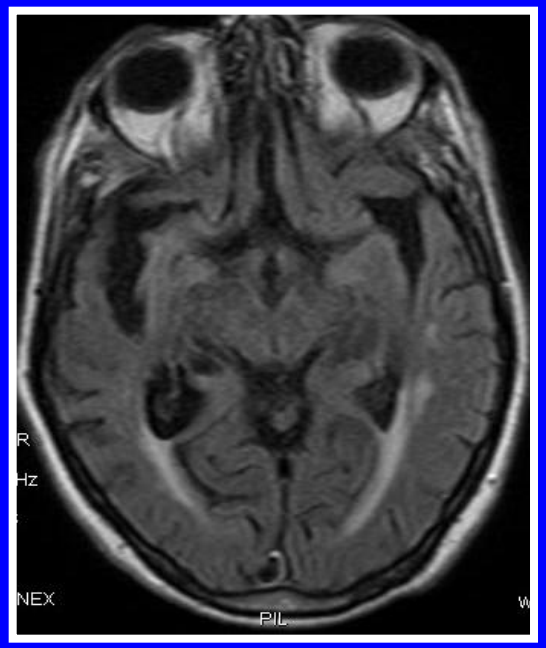
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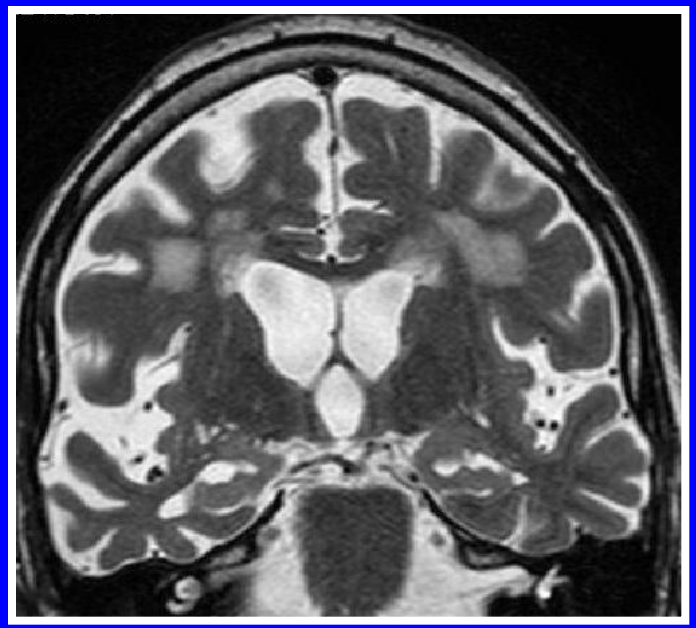
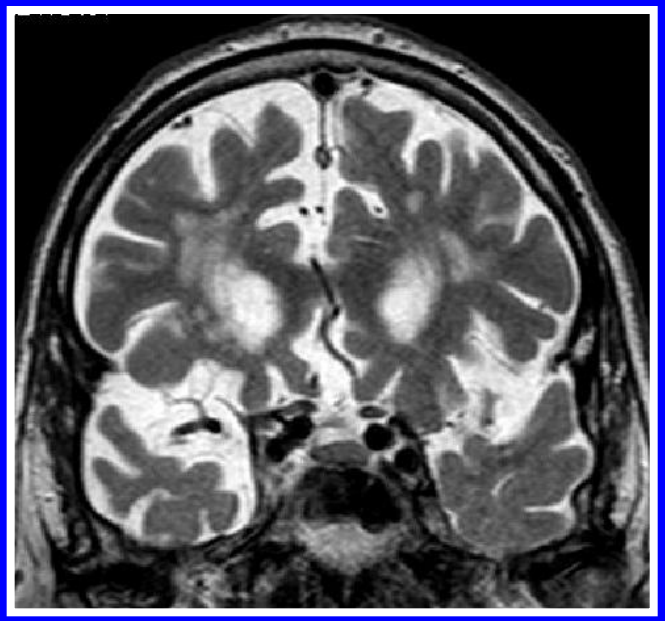
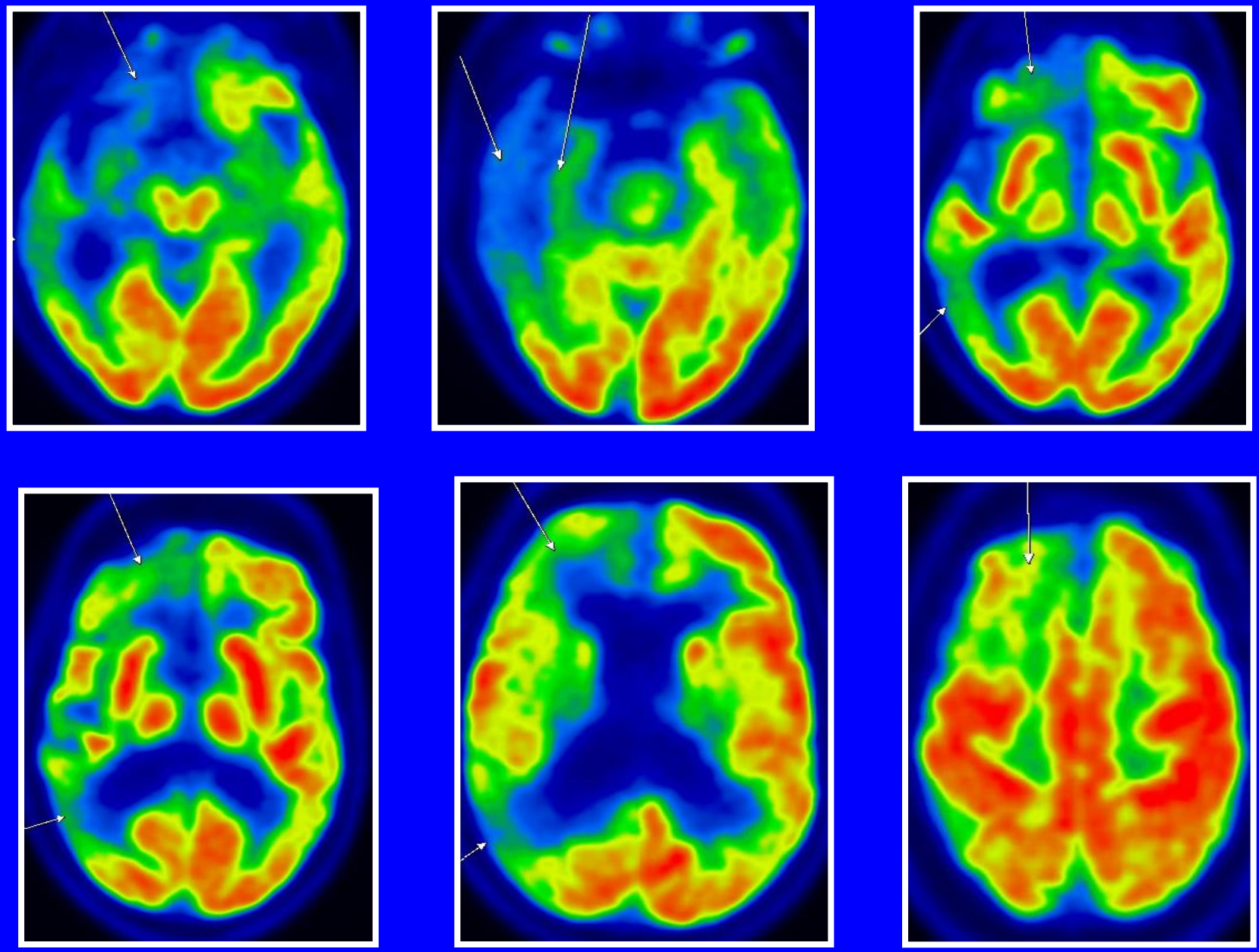
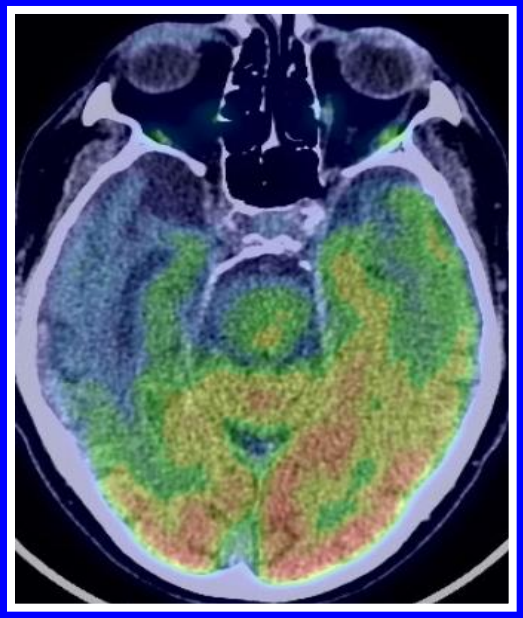
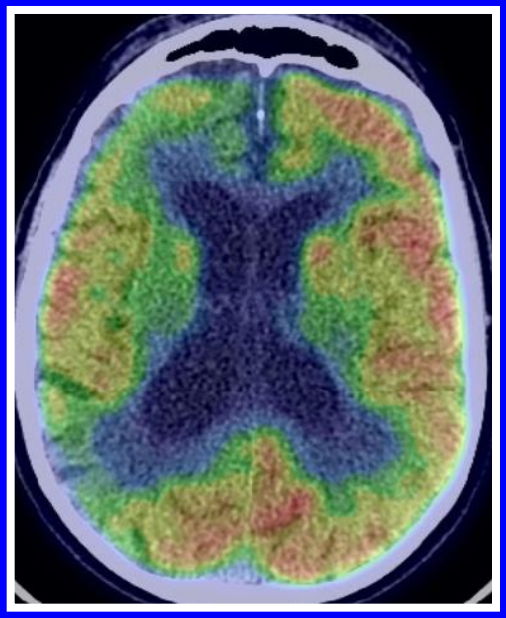


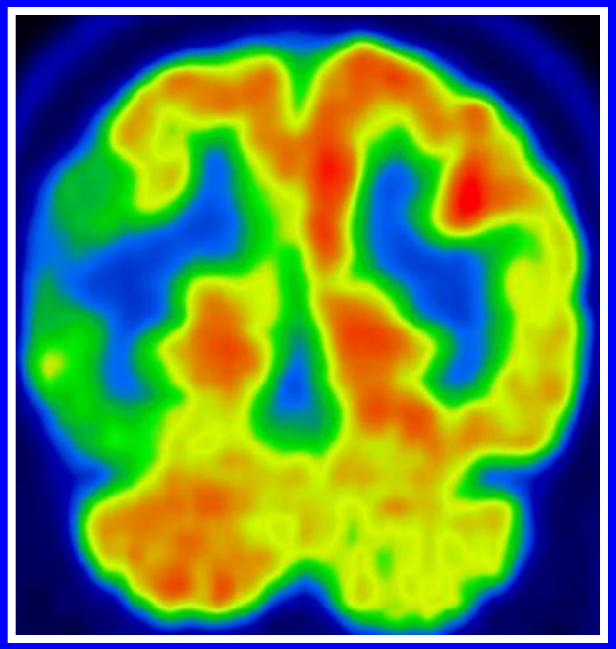


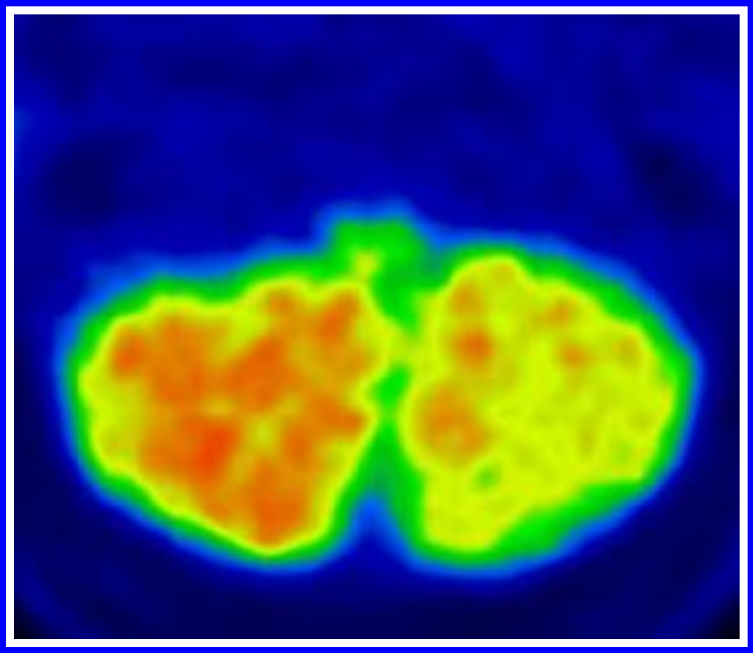
PET-FDG

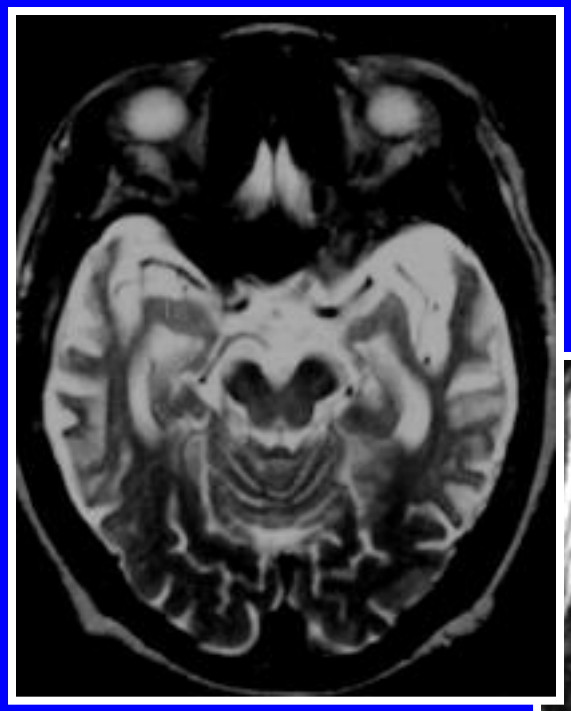


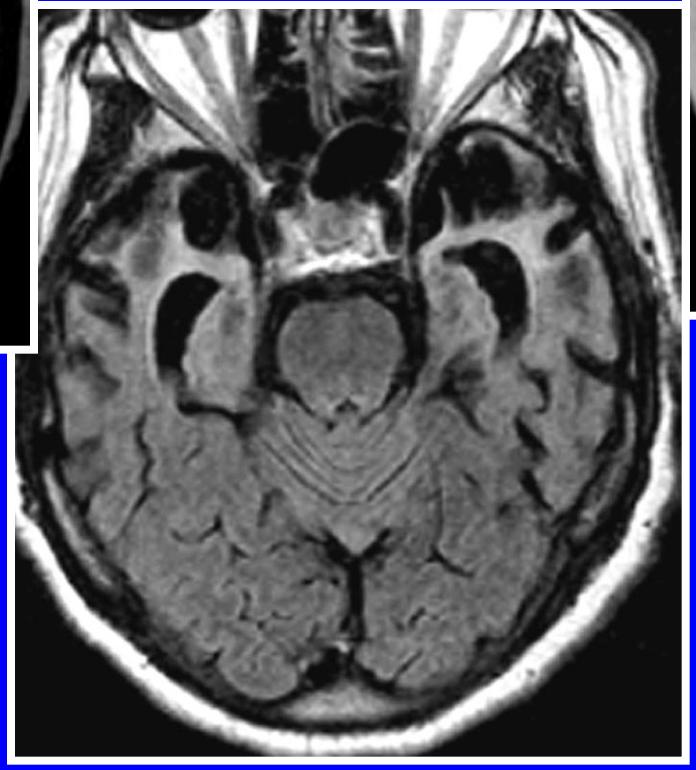


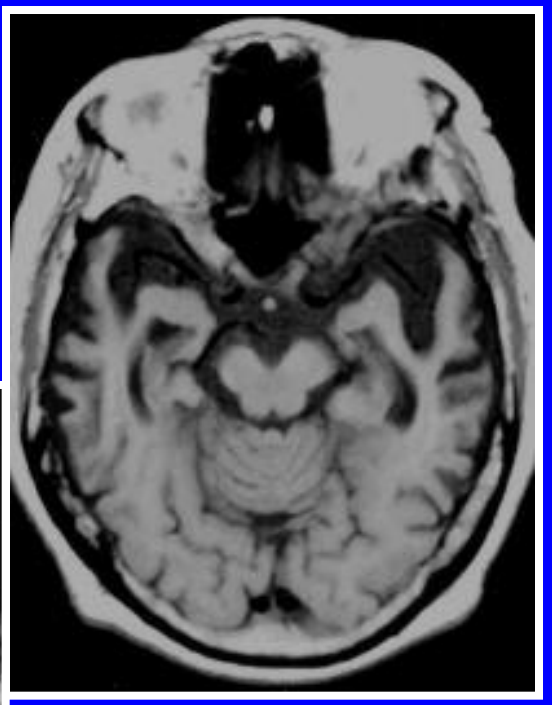












A.P. SEMÁNTICA

DFT:

Estructural:
Atrofia predominante en regiones frontal y temporal anterior.

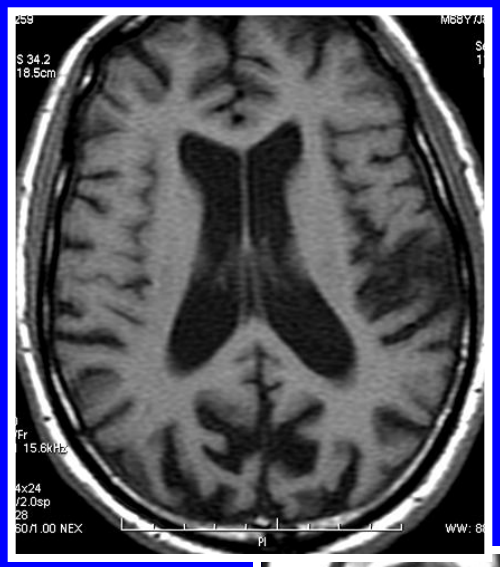
Molecular:
PET-FDG y SPECT (Disminuidos en flujo y captación de glucosa en similares regiones).

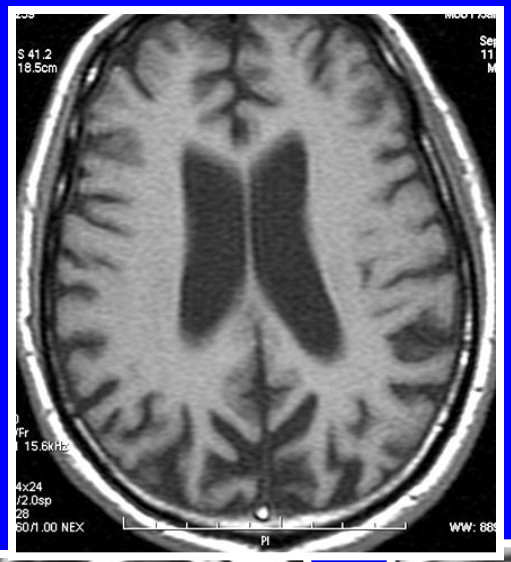
CUERPOS DE LEWY (DLB)

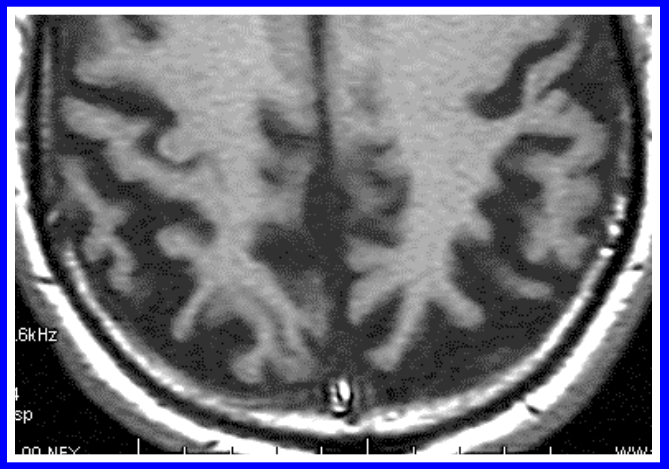
- **Leve atrofia cortical difusa (predomina a nivel insular y frontotemporal , como asi tambien en regiones parieto-occipitales: *Fibras de asociación.***
- **Atrofia Putaminal**
- ***Atrofia mesencefàlica***

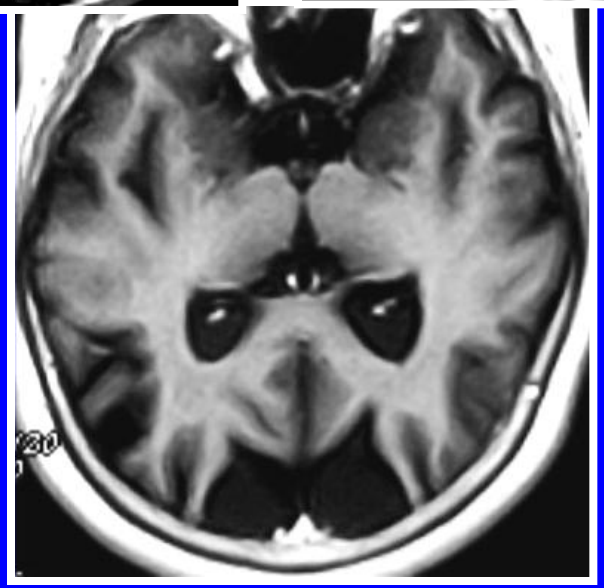
DD con EP.

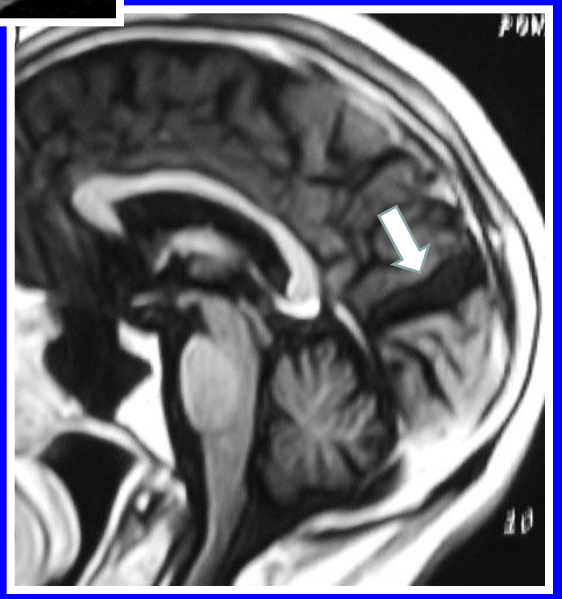
Demencia por Cuerpos de Lewy











DLB:

Estructural:

Atrofia lob frontal inferior, corteza visual, insula, región diencéfalo-mesencefálica, caudado, putámen e hipocampo anterior (CA1)

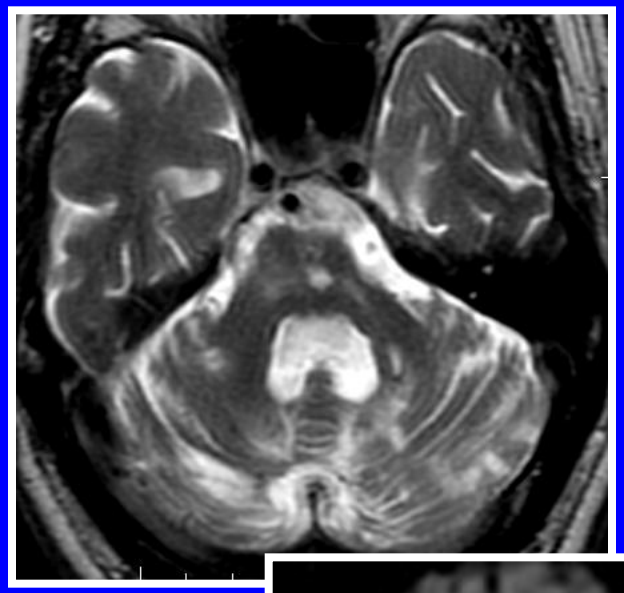
Molecular:

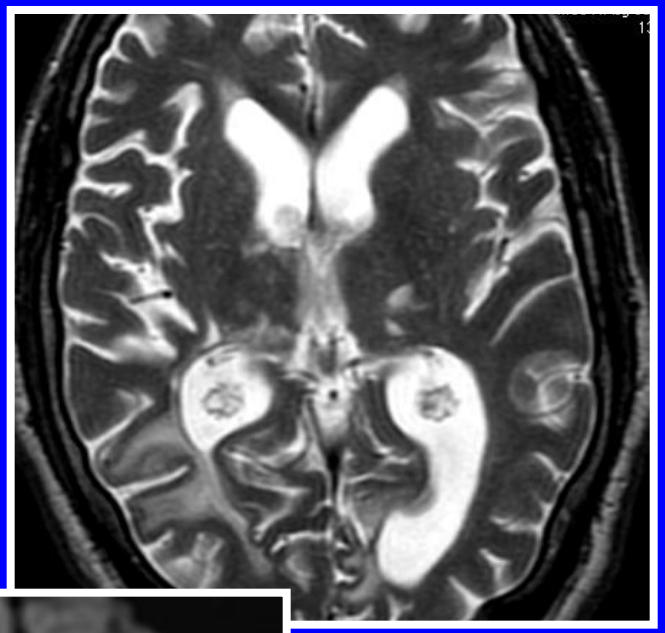
SPECT (Perf disminuida en putámen, caudado y corteza visual), PET-FDG (Menor captación en corteza visual)

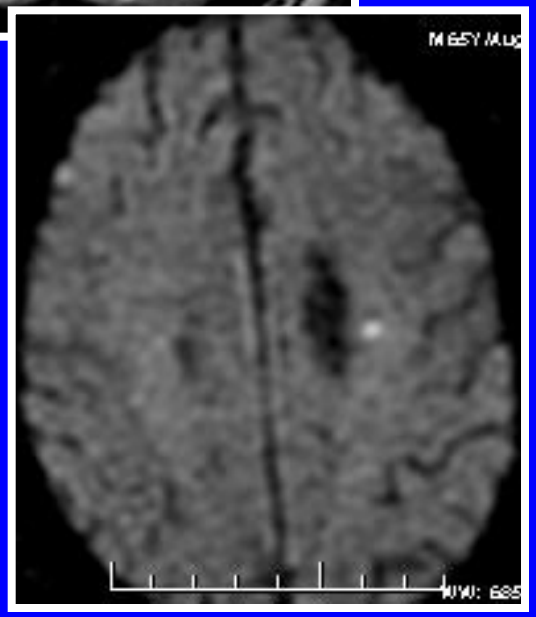
DEMENCIA VASCULAR

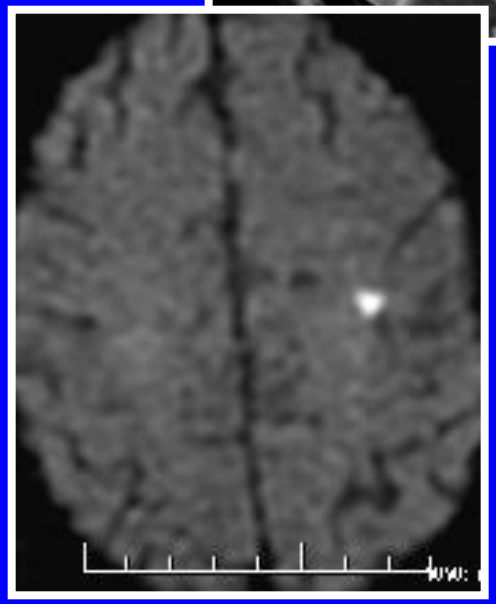
1) **Macroangiopática:**
   (30% de los casos: demencia)
2) **Microangiopática:**
   Leucoaraiosis
   Infartos lacunares
3) **Microhemorragias:**
   65% de casos de DV.
   18% cursan con aumento de b-amiloide y de ubicación cortico-subcortical fronto-parietal

Demencia Multi-infarto

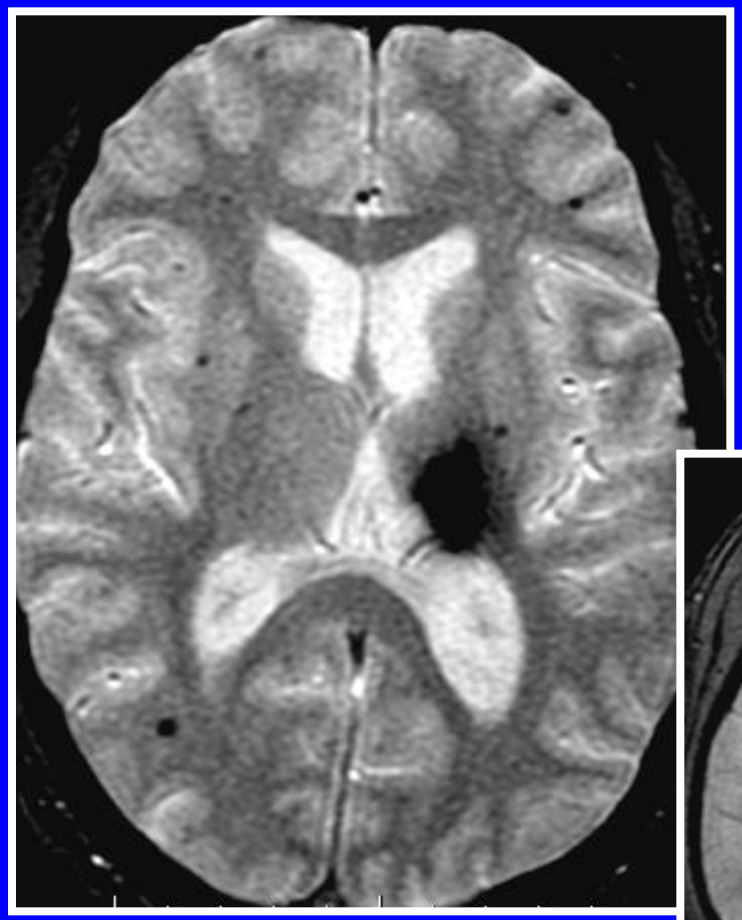


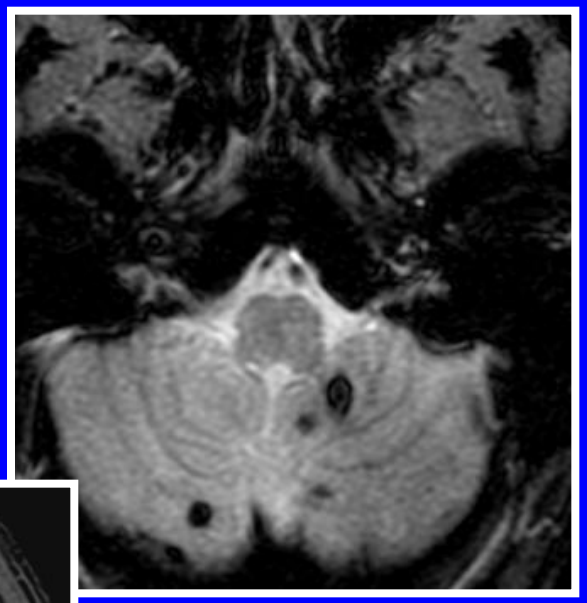


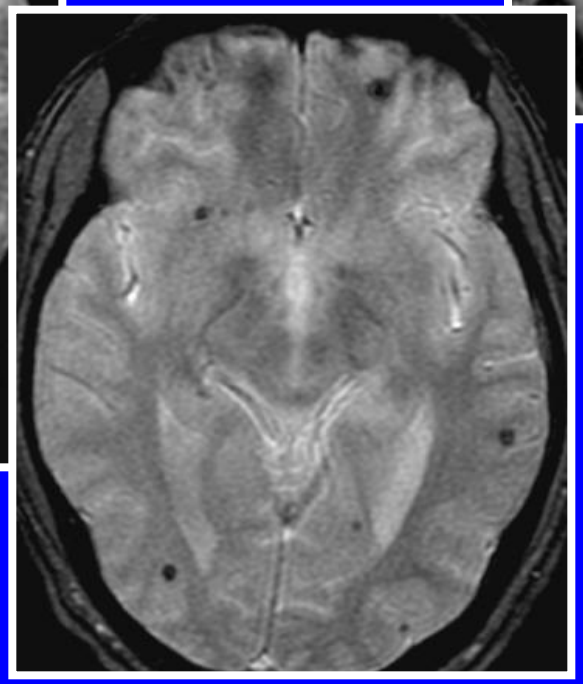




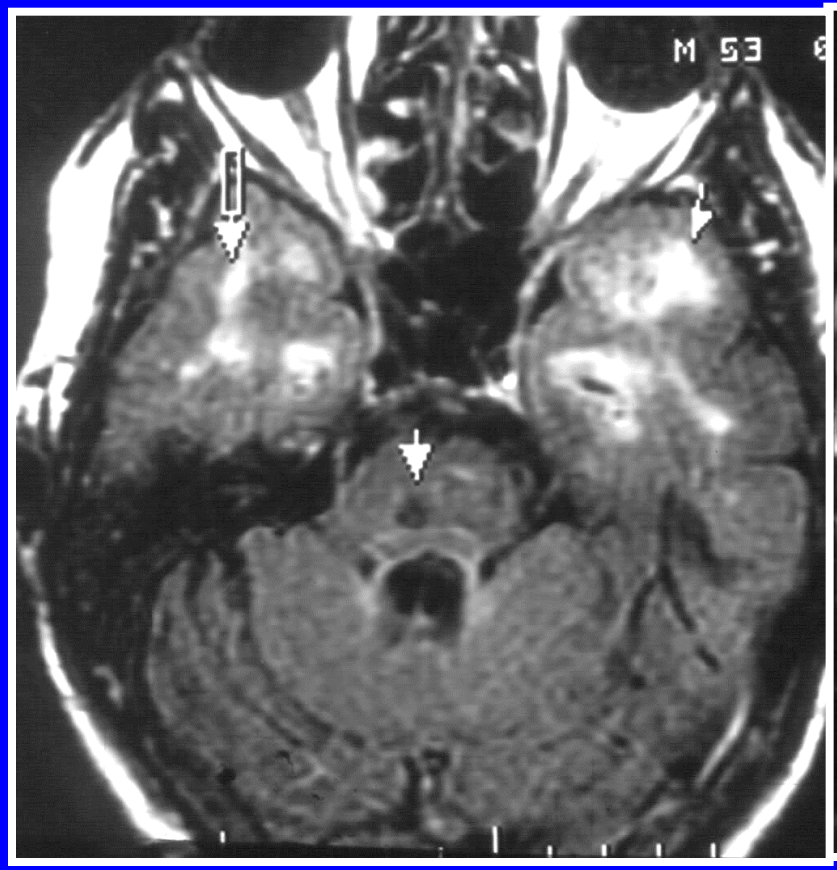
Micro/Macrosangrados crónicos en HTA

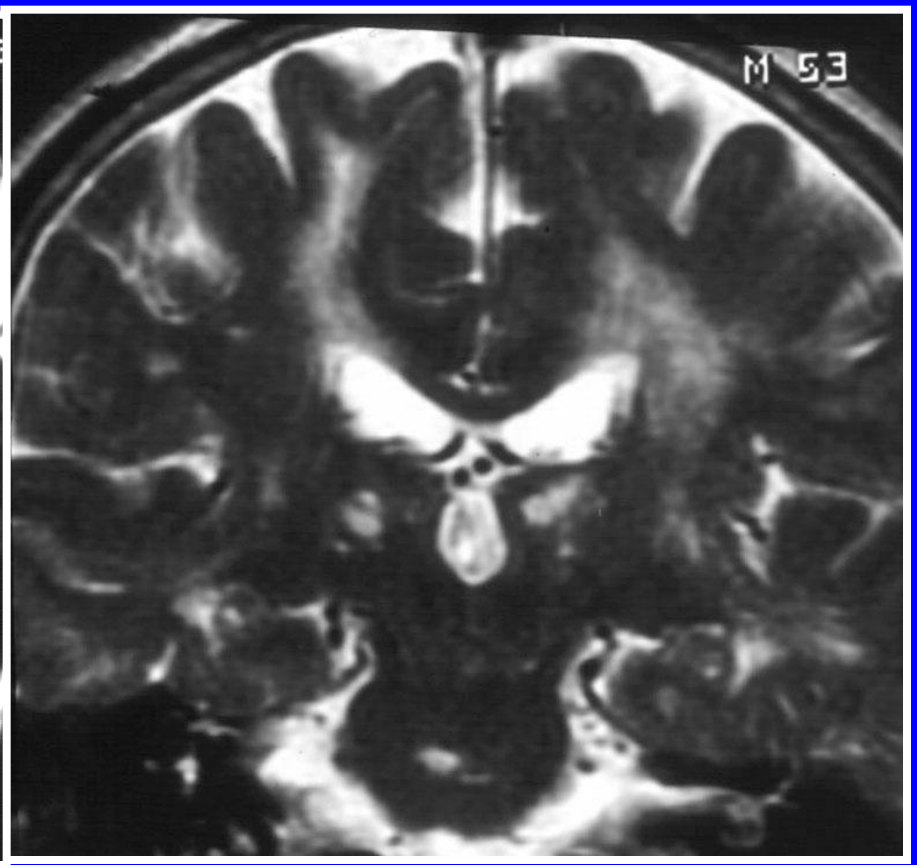






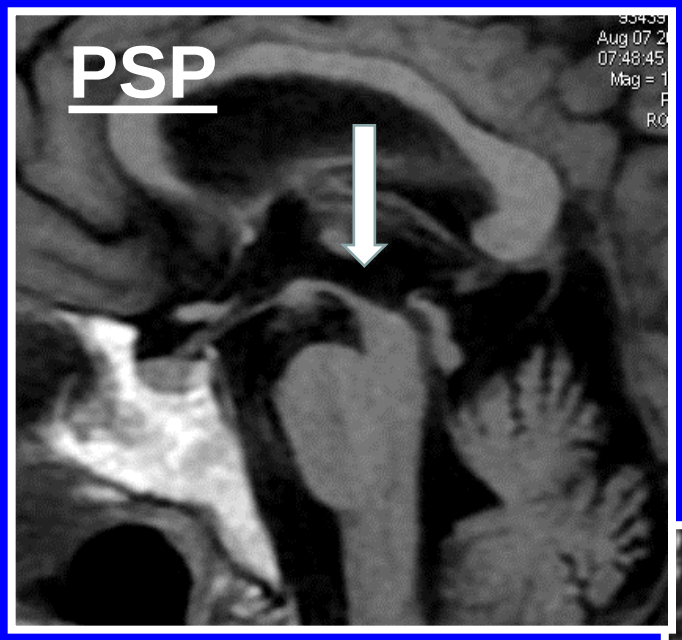
CADASIL

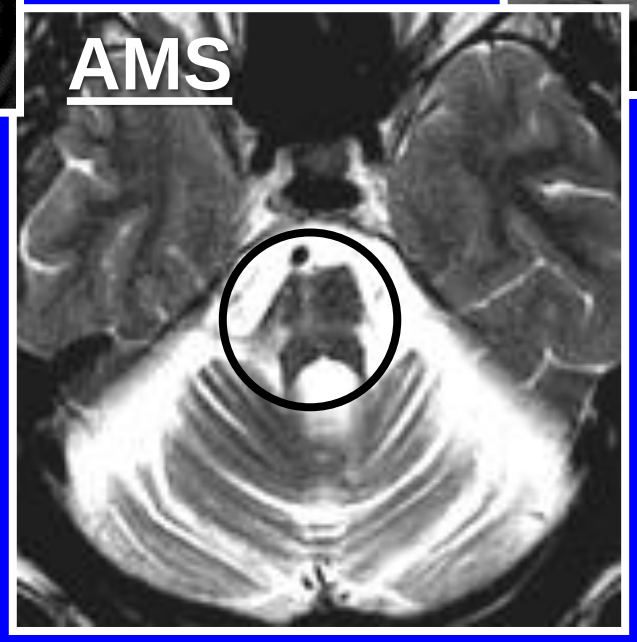




SINDROMES PARKINSONIANOS ATIPICOS

- Parálisis Supranuclear Progresiva (PSP)
- Atrofia multisistémica (AMS)
- Degeneración córtico-basal (DCB)
- Demencia cuerpos de Lewy (DCL)





De Diego S, Meli F., Diagnóstico Maipú, Buenos Aires, Argentina.
AJNR, Noviembre 8, 2010. Case of the week

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PLOS ONE

The 'Swallow Tail' Appearance of the Healthy Nigrosome – A New Accurate Test of Parkinson's Disease: A Case-Control and Retrospective Cross-Sectional MRI Study at 3T

Stefan T. Schwarz[1]*, Mohammed Afzal[2], Paul S. Morgan[3], Nin Bajaj[4], Penny A. Gowland[5], Dorothee P. Auer[1]

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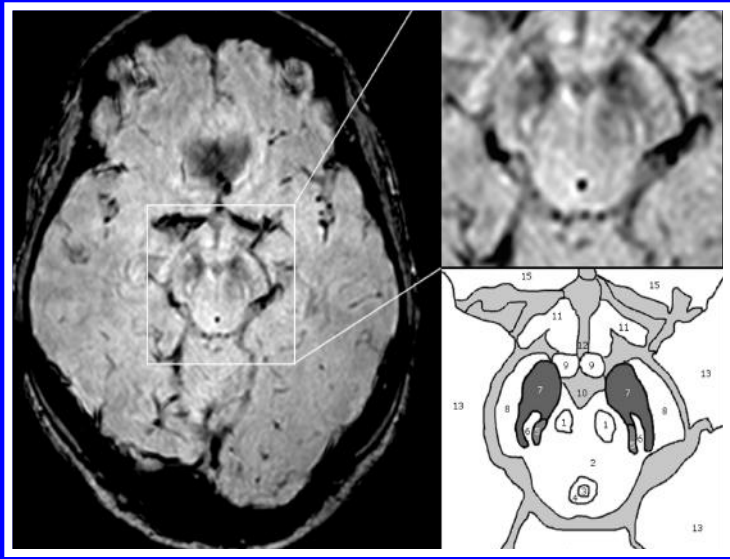
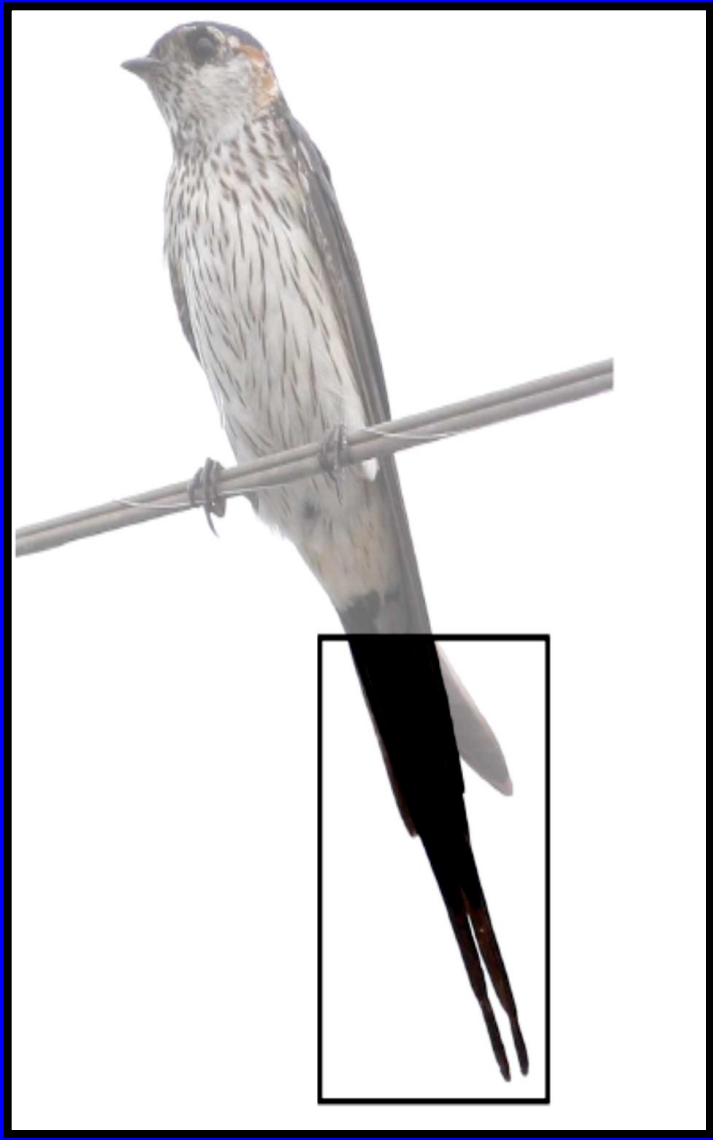
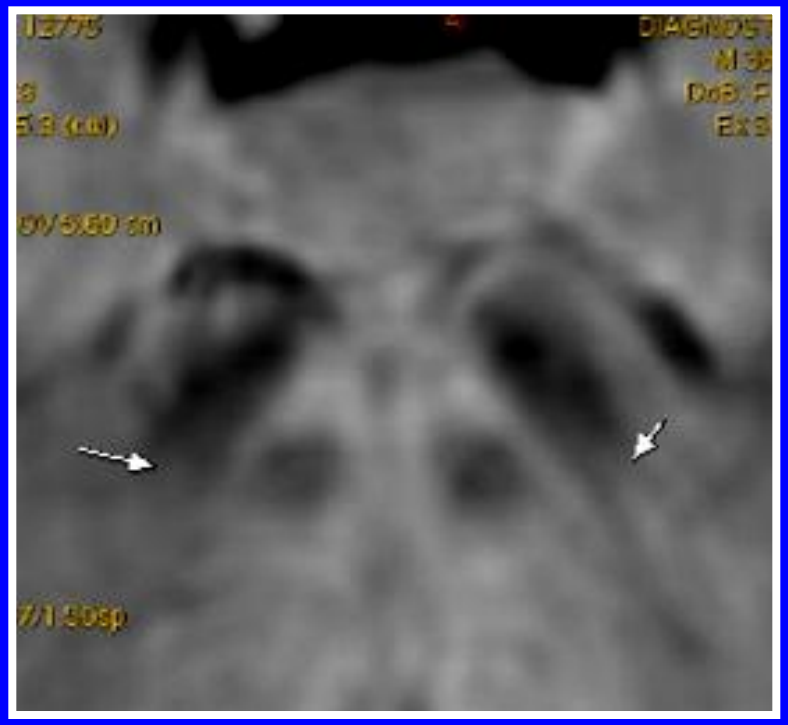
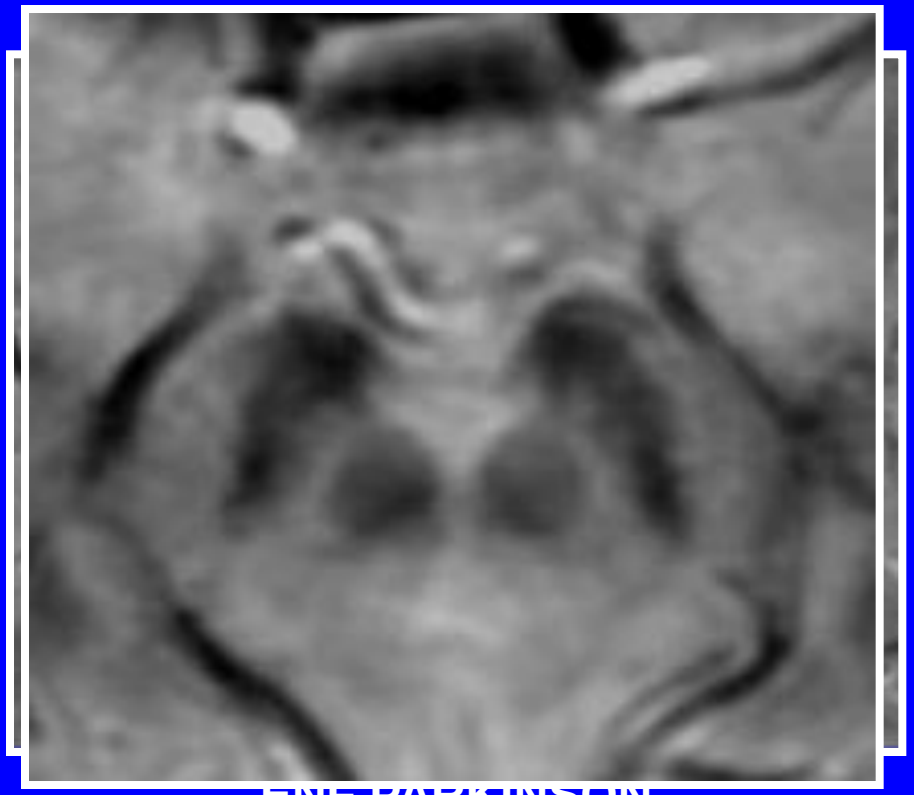




NIGROSOMA 1



NORMAL

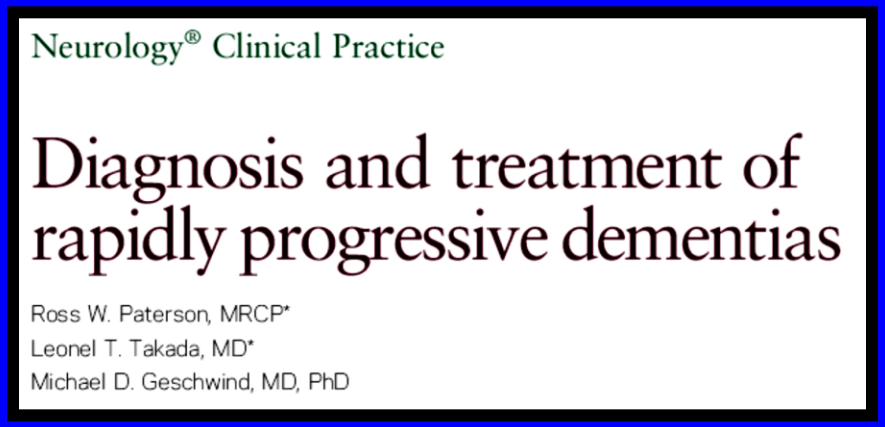


ENF PARKINSON

DEMENCIAS RAPIDAMENTE PROGRESIVAS (RPD)

- **Curso subagudo**
- **Declinacion progresiva menor a 2 años**
- **Trastornos neurodegenerativos**
- **Enfermedades autoinmunes**
- **Enfermedades infecciosas**
- **Enfermedades metabólicas**

DEMENCIAS RAPIDAMENTE PROGRESIVAS (RPD)



- **Enf por priones: 62%**
- **Otras enf. ND: 15%**
- **Autoinmunes: 8%**
- **Infecciones: 4%**
- **Otras: 2% (tox, metab, cancer, vascular)**
- **Indeterminadas: 4% (leucoencefalopatias)**
- ***(UCSF, Memory and aging center), Sep 2012)***

DEMENCIAS RAPIDAMENTE PROGRESIVAS (RPD)

- **Regla “mnemotécnica clinica”:**

- ***V*** **: Vascular**
- ***I*** **: Infecciones**
- ***T*** **: Tóxicas-metabólicas**
- ***A*****: Autoinmunes**
- ***M*****: Mtts/neoplasias**
- ***I:*** **Iatrogenia/errores cgtos del metabolismo**
- ***N*****: Neurodegenerativas**
- ***S*****: Enfermedades sistémicas/ status**

DEMENCIAS RAPIDAMENTE PROGRESIVAS

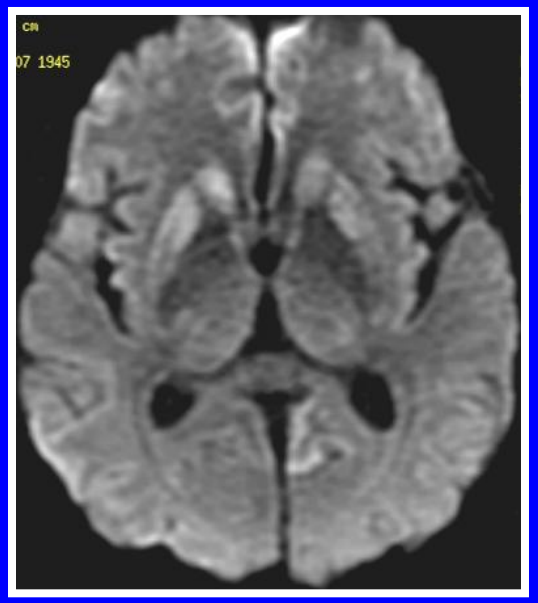
1) **PRIONICAS: CJD.**
2) **NO PRIONICAS:**

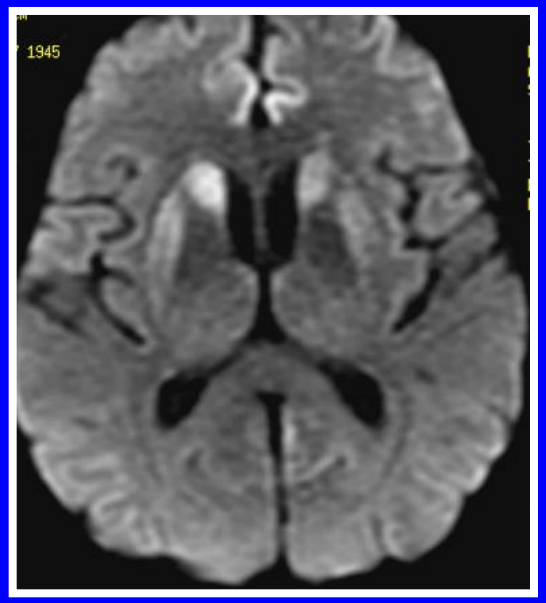
- **Encefalitis límbica :**

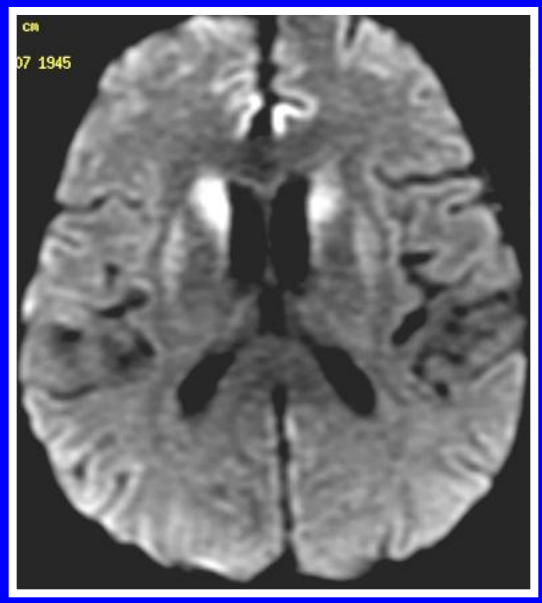
  - Autoinmune.
  - Paraneoplásica
  - Infecciosa (Herpes)

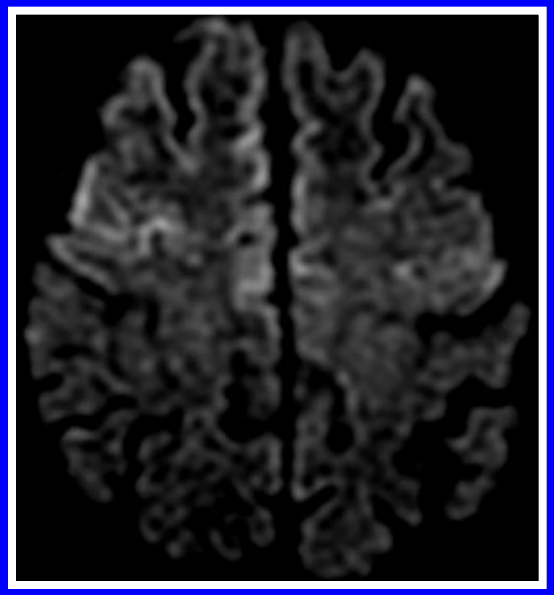
- **Encefalitis anti NMDA *(N-metil-D-aspartato)***
- **Encefalitis anti AMPA-R *(alfa-amino-3-hidroxi-5-metil-4acido isoxazolepropionic)***
- **Encefalitis anti canales de K**
- **Encefalopatia respondedora a corticoides o encefalopatia de Hashimoto.**

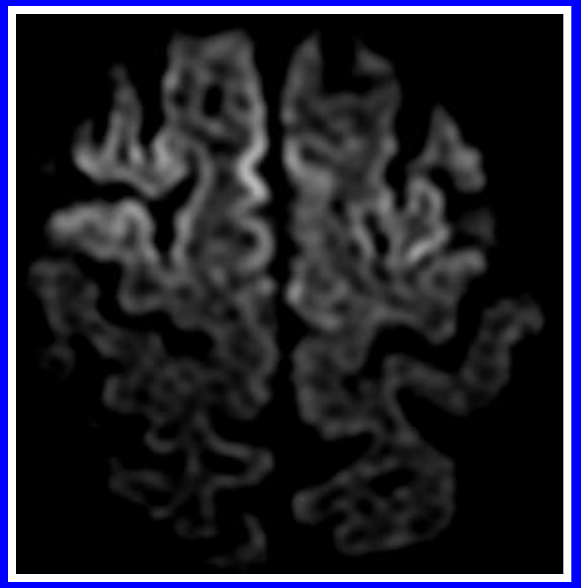
Enfermedad de Creutzfeldt-Jakob (CJD)











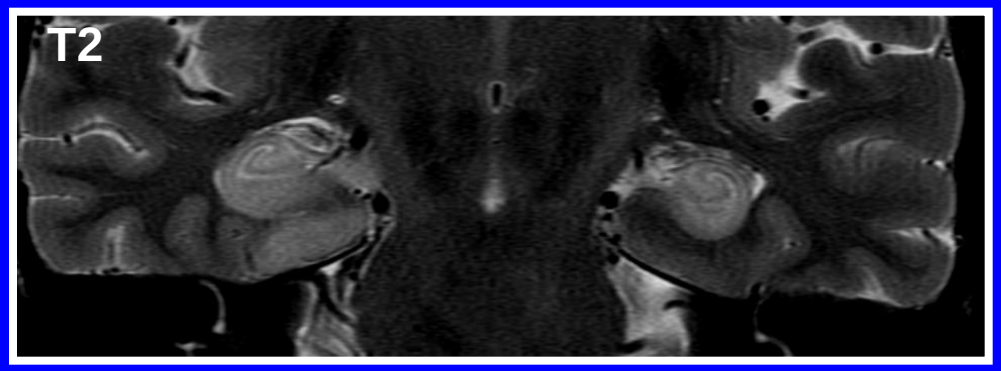
Características encontradas en RM con secuencias DWI y FLAIR

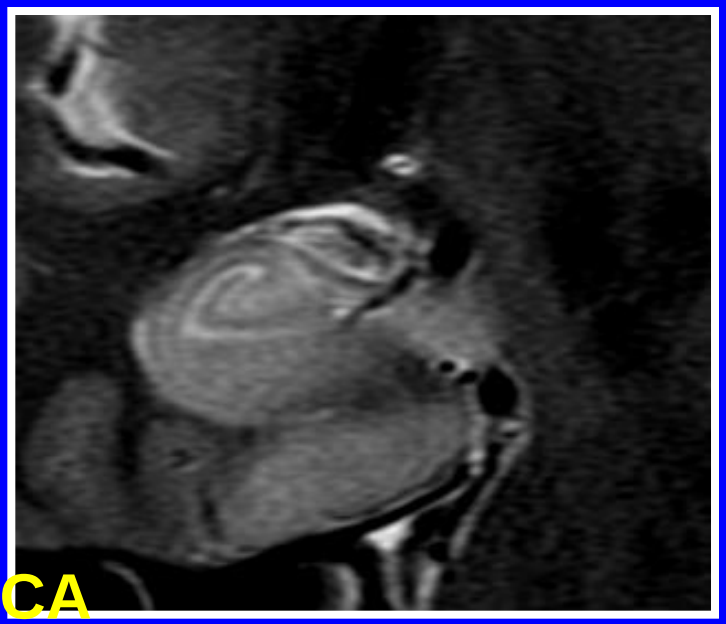
1. **HIPER DWI en sCJD mayor que en FLAIR.**
2. **HIPER en FLAIR mayor que DWI en DRPnp.**
3. **HIPER DWI subcortical en sCJD con ADC descendido (siempre).**
4. **Compromiso límbico NO se encontró en sCJD. Frecuente en DRP.**

CASO 1

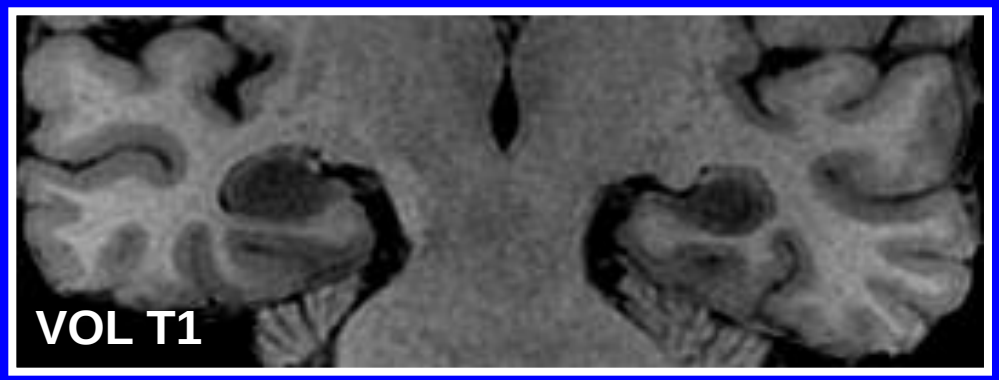
PACIENTE FEMENINA, 42 AÑOS DE EDAD

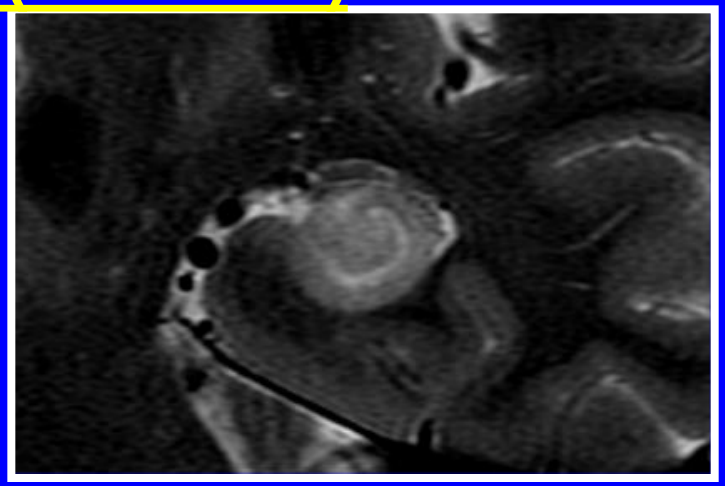
- CRISIS CONVULSIVA TCG
- POSTERIORMENTE COMIENZA CON MARCADA ALTERACION EN LA MEMORIA ANTEROGRADA.
- REPITE EN FORMA AISLADA CRISIS PARCIALES COMPLEJAS SECUNDARIAMENTE GENERALIZADAS.





ENCEFALITIS LÍMBICA PARANEOPLÁSICA (Ca. Mama)





OTRAS DEMENCIAS

- LMP
- LEUCODISTROFIAS
- ENFERMEDADES MITOCONDRIALES
- HIDROCEFALIA NORMOTENSIVA
- LINFOMA

CONCLUSIONES:

- Las imágenes disponibles (RM, PET, SPECT) podrían llegar a ser indispensables en el diagnostico y tratamiento de estas enfermedades, especialmente cuando haya tratamientos definitivos.

- Hipoflujo/hipometabolismo (SPECT/PET) simétrico parieto-temporal bilateral (precuneo/cingulo post) → **ALZHEIMER.**
- Compromiso anterior y asimetrico → **DFT.**
- Distribucion mas posterior (Lób. Occipital) → **DLB.**

MUCHAS GRACIAS