

UPDATE MRT bei MS

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- 2021 MAGNIMS-CMSC-NAIMS consensus recommendations on the use of MRI in patients with multiple sclerosis.

The Lancet
published online June 14 2021

MAGNIMS Magnetic Resonance Imaging in Multiple Sclerosis study group

CMSC Consortium of Multiple Sclerosis Centres

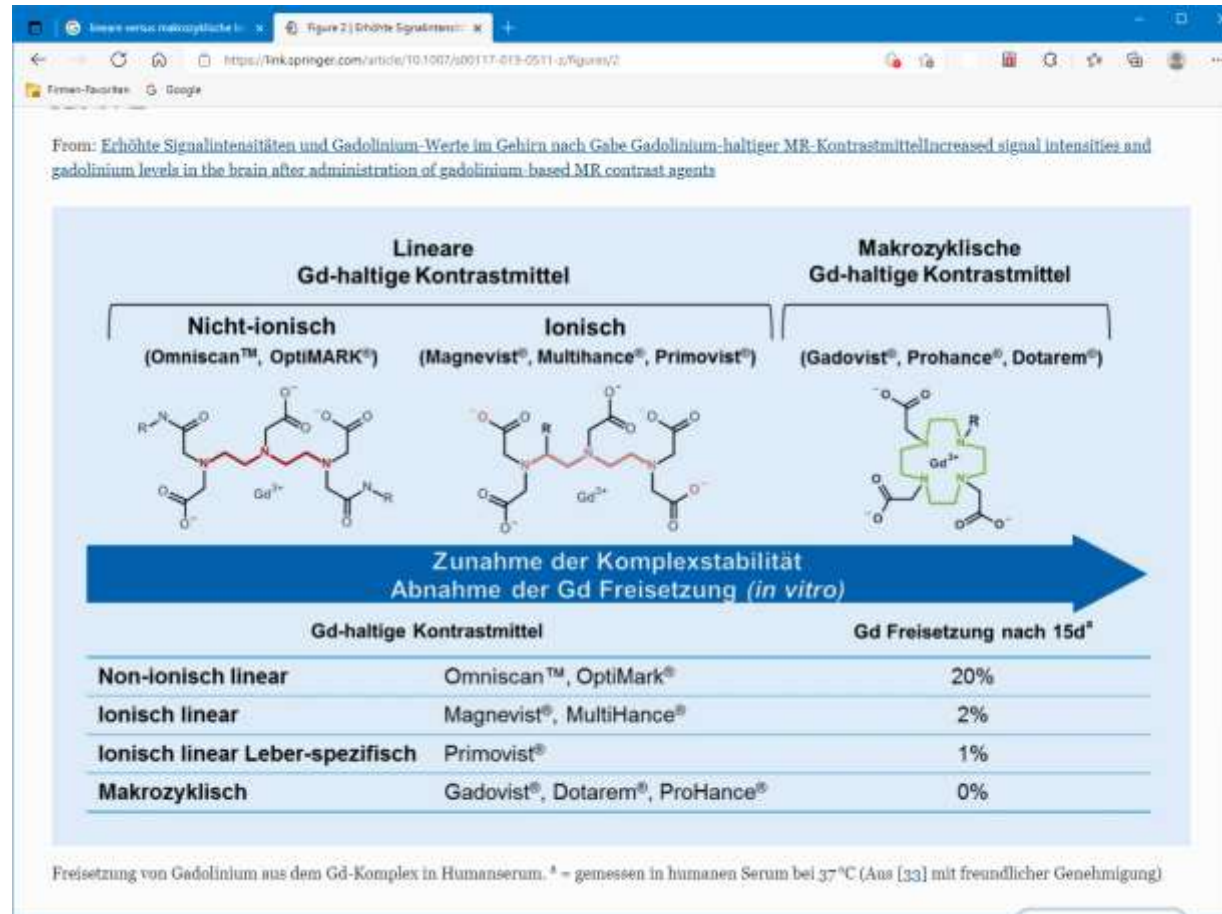
NAIMS North American Imaging in Multiple Sclerosis Cooperative

Empfehlungen

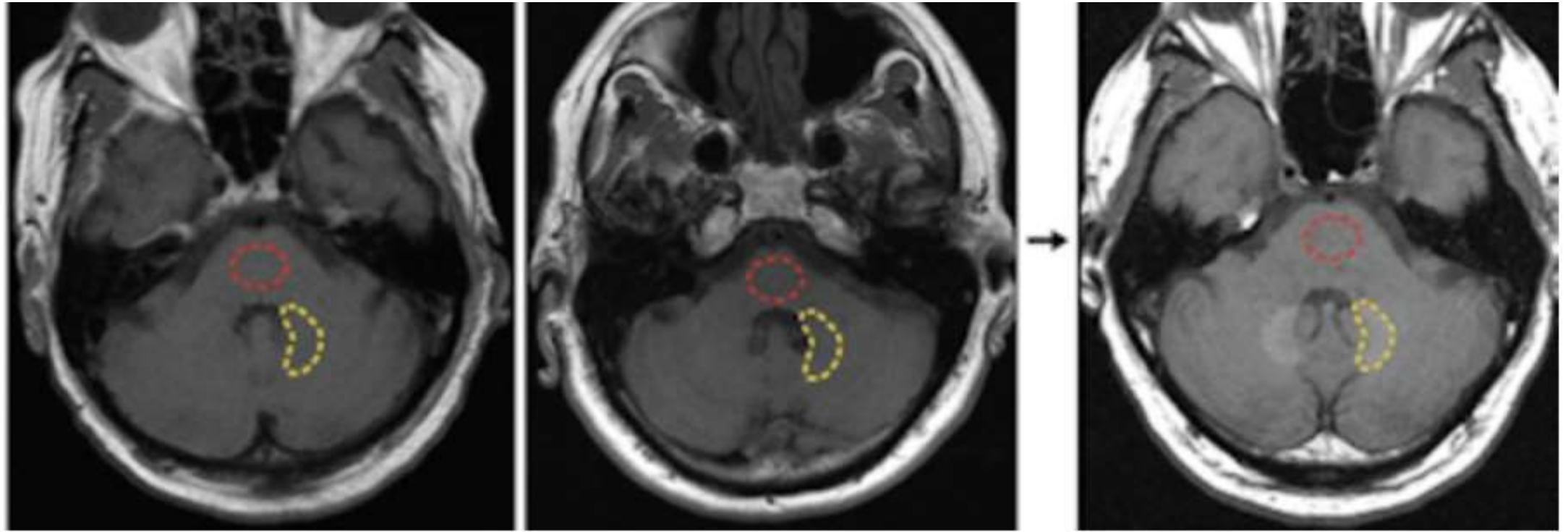
- Einsatz der MRT
 - wann
 - in welchem Intervall
 - welche Sequenzen

- Kontrastmittel Einsatz

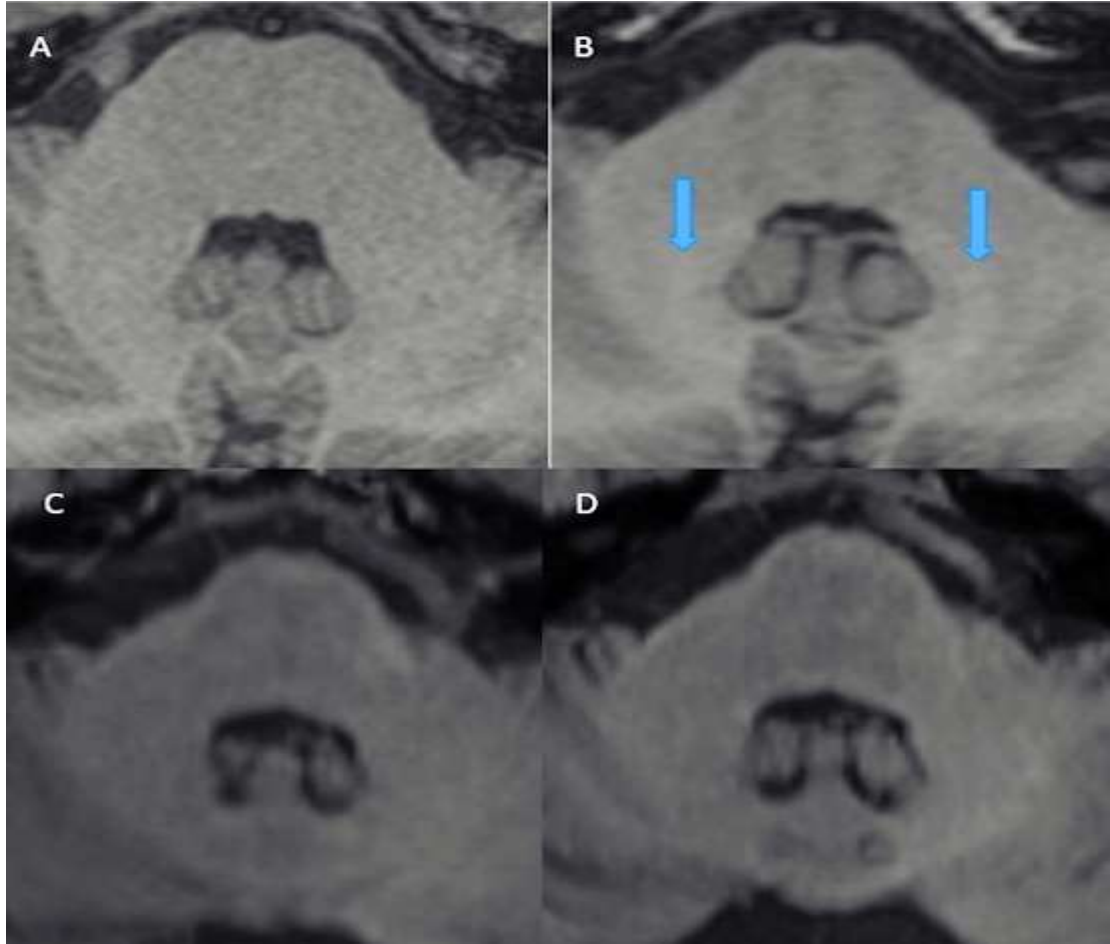




Frenzel T, Lengsfeld P, Schirmer H et al (2008) Stability of gadolinium-based magnetic resonance imaging contrast agents in human serum at 37 degrees C. Invest Radiol 43:817–828



Axial T1-weighted MR images show the posterior fossa at the level of the dentate nucleus. Image B is of a control group patient, while image D is the first MRI exam and F is the last MRI exam of a patient in the contrast group. Regions of interest used to quantify signal intensity are shown as dashed lines for the dentate nucleus (yellow) and pons (red). Images courtesy of Radiology



- Dentate nucleus prior to (A) and after nine serial injections (B) of the linear GBCA gadopentetate and prior to (C) and after 10 injections of the macrocyclic GBCA gadoterate dimeglumine (D). Clear hyperintensities are visible in the dentate nucleus in B (blue arrows), while no hyperintensities display in the dentate on D. Figure courtesy of Prof. Dr. Alexander Radbruch, JD.

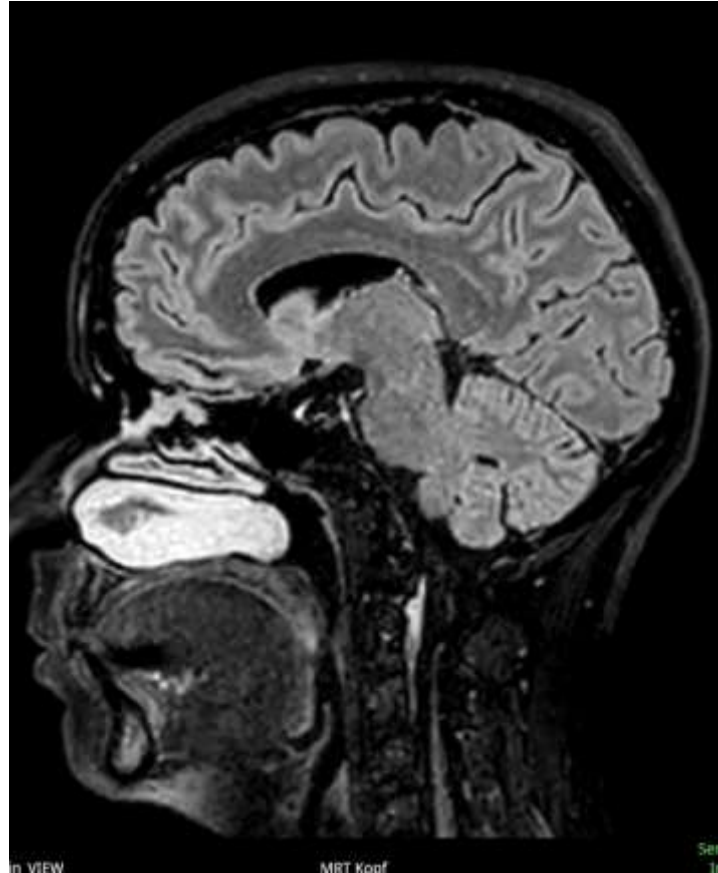
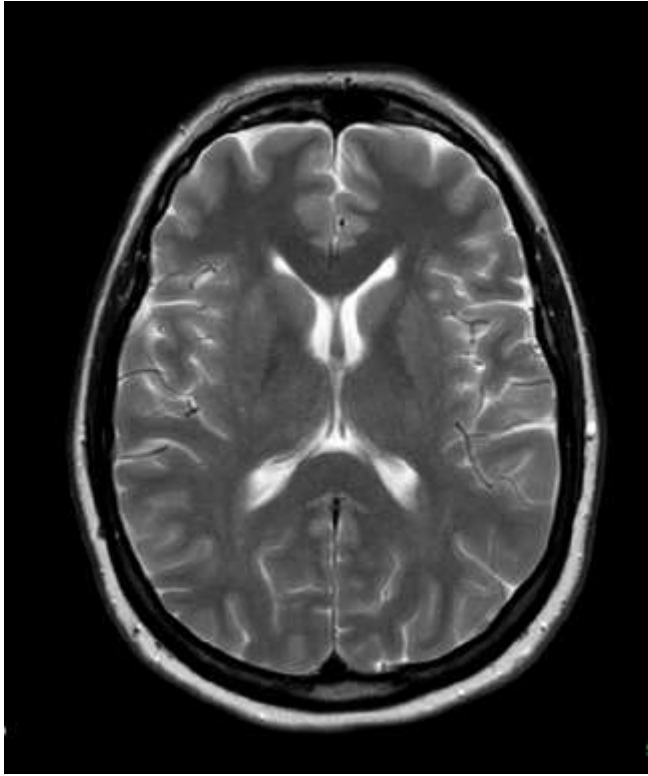
BASELINE MRT

T2 AXIAL

FLAIR 3D!

T1 3D POST KM (Mindestens 5 optimal nach 10 min)

BASELINE MRT

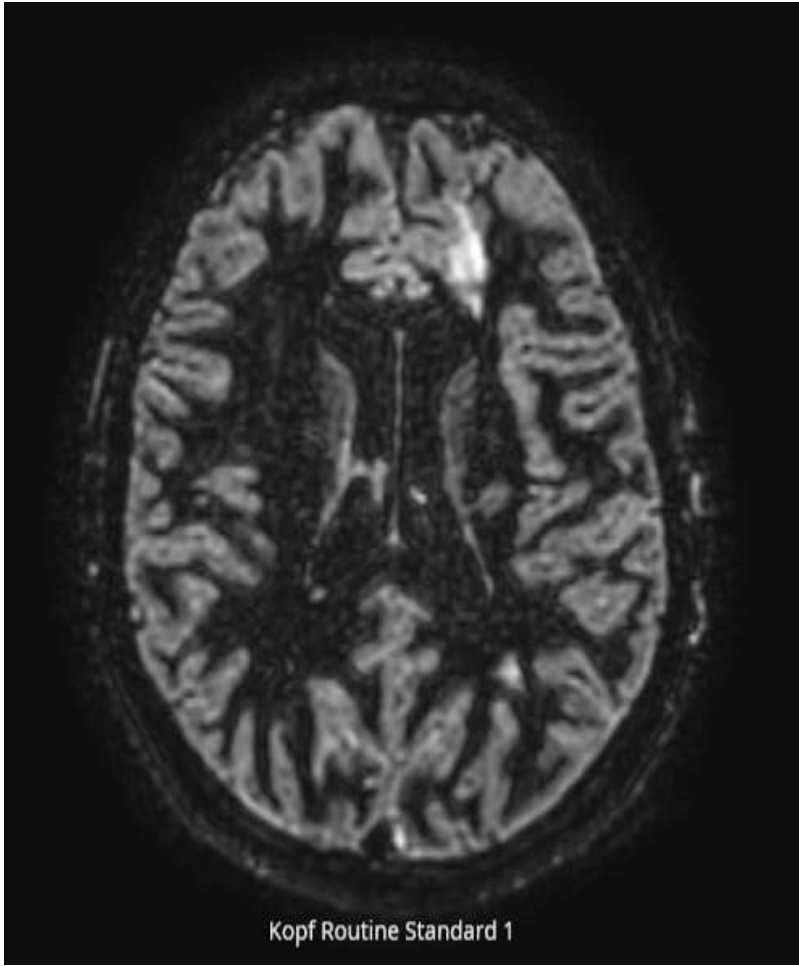


OPTIONALE BASELINE

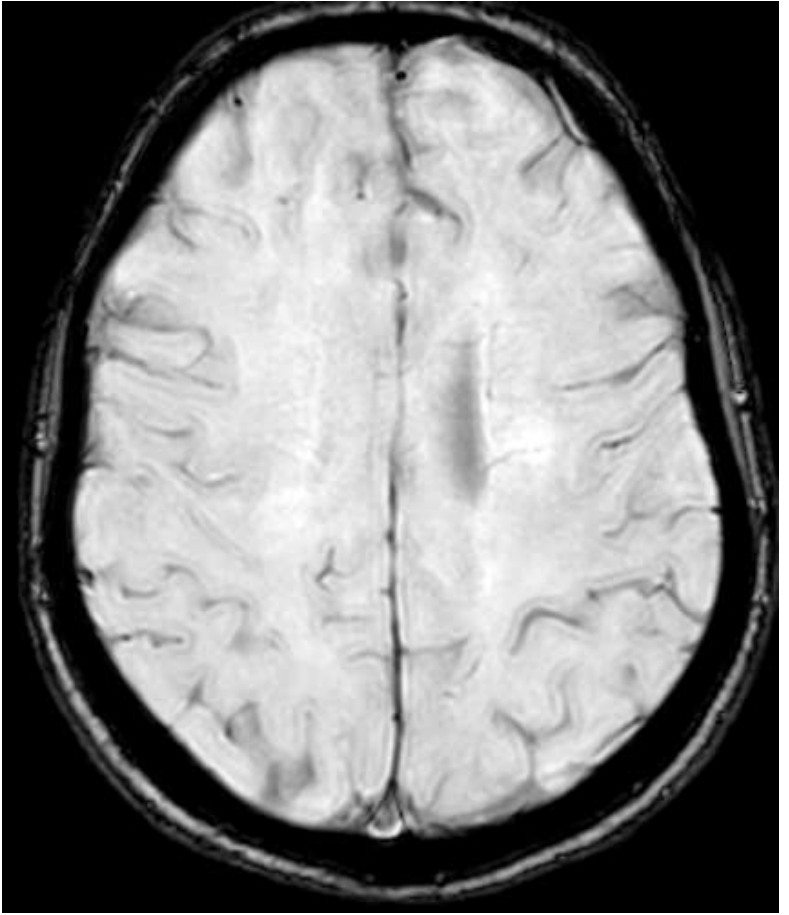
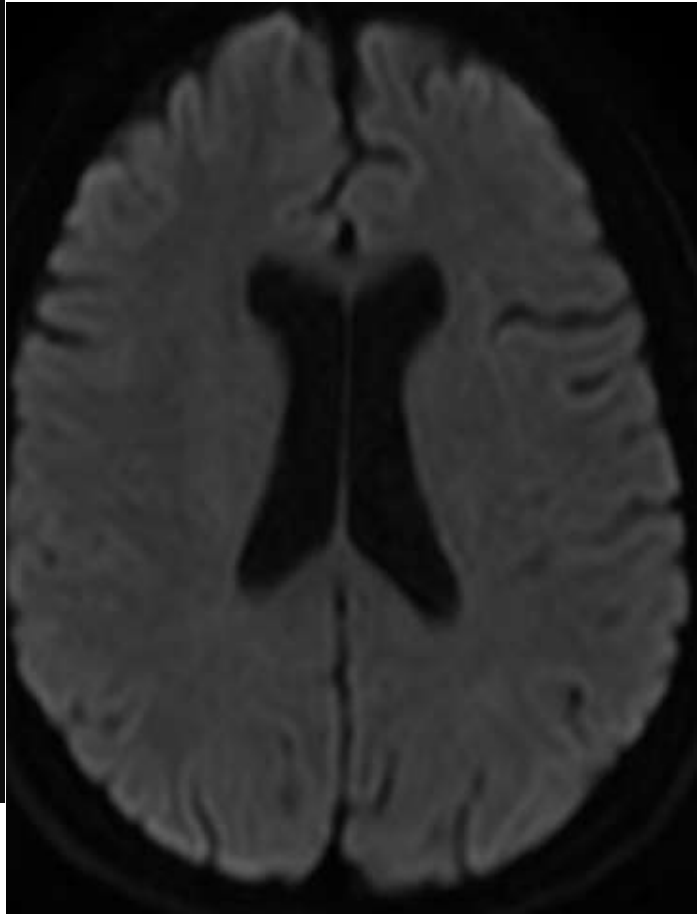
DIR

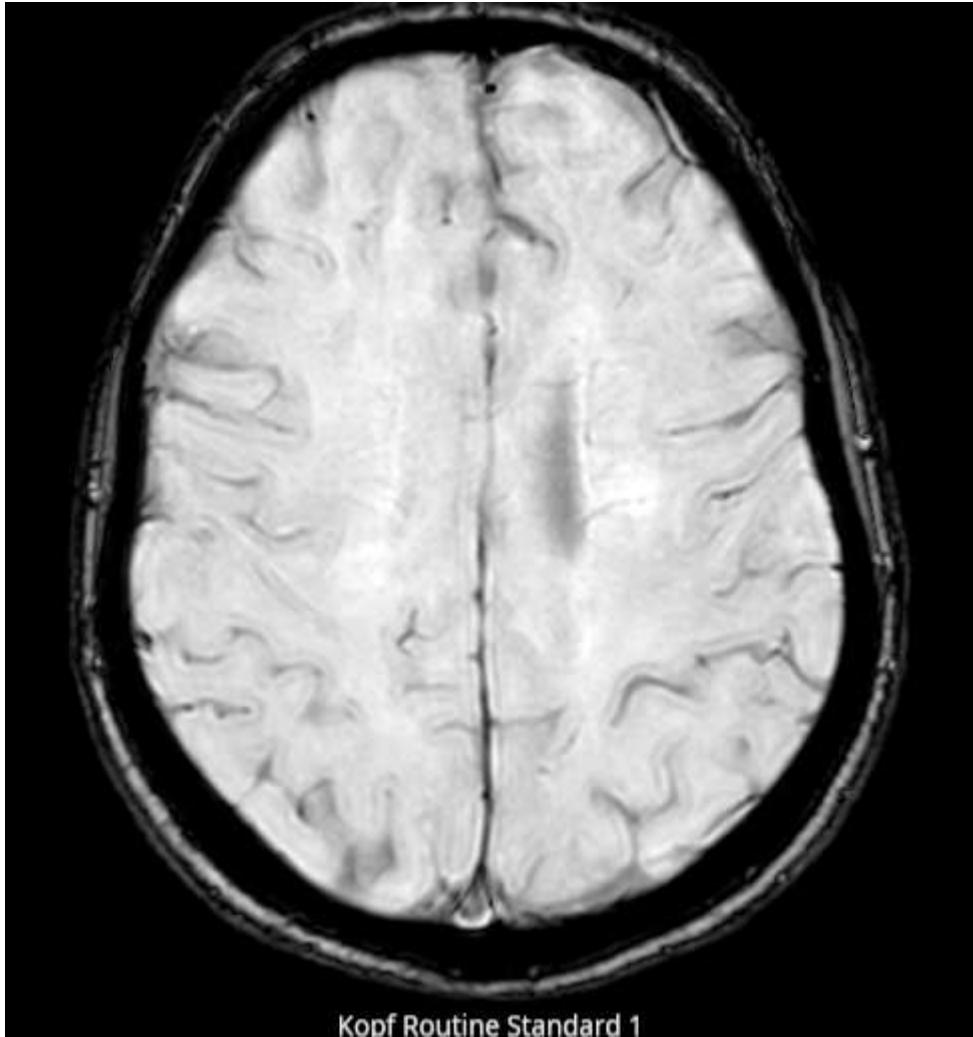
DWI

SWI

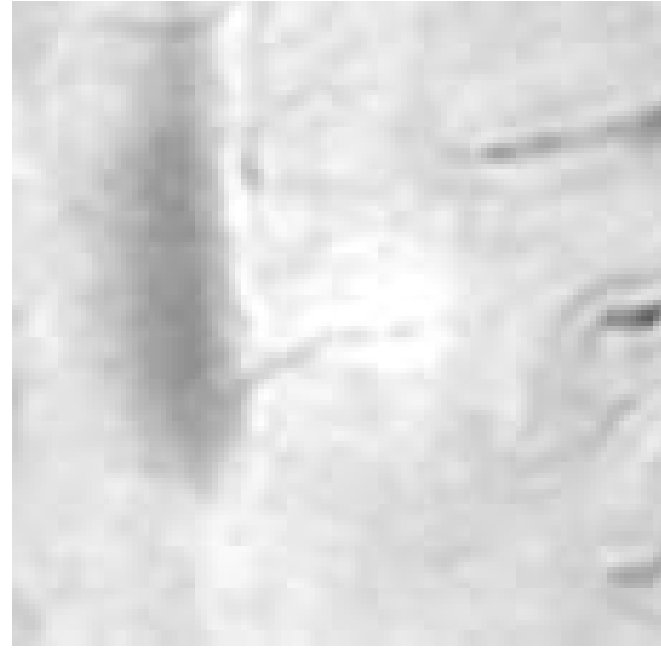


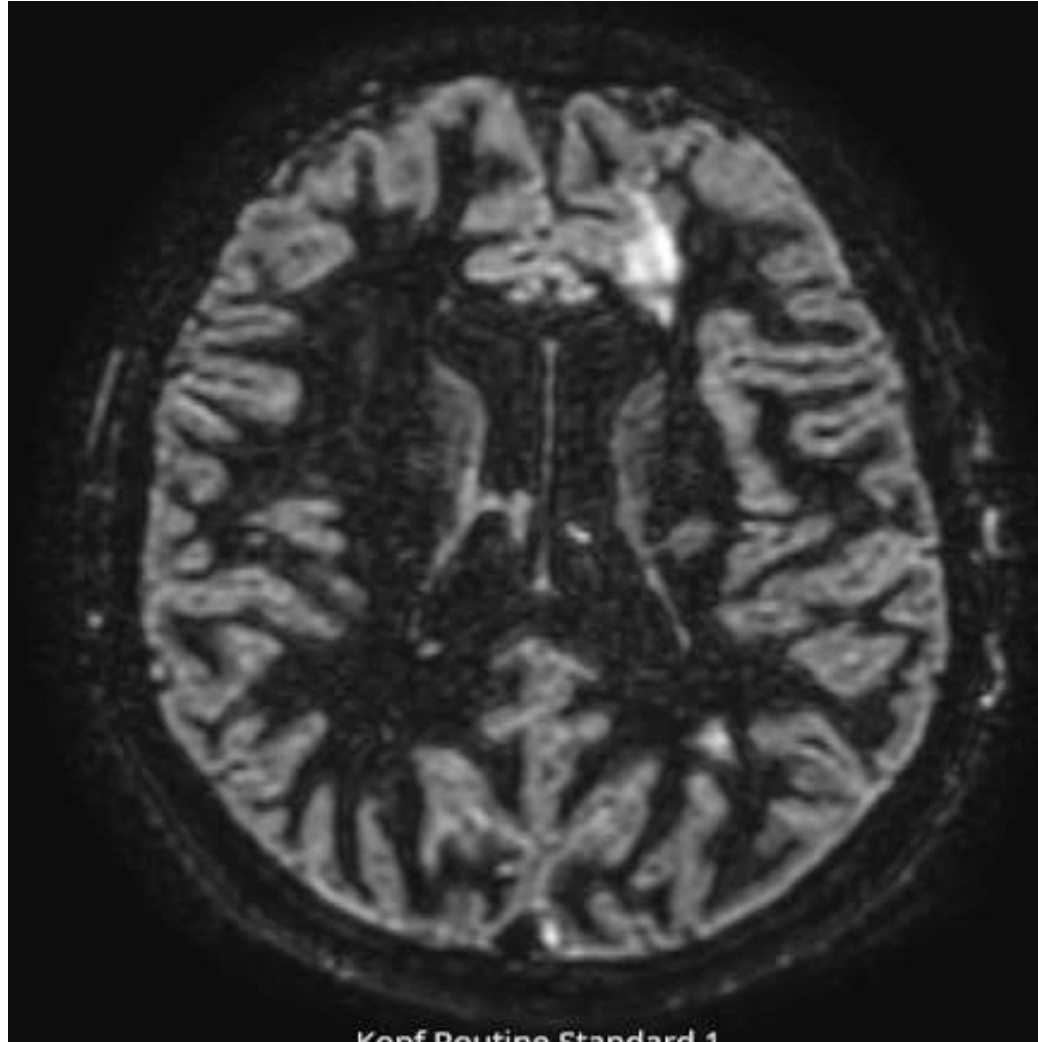
Kopf Routine Standard 1



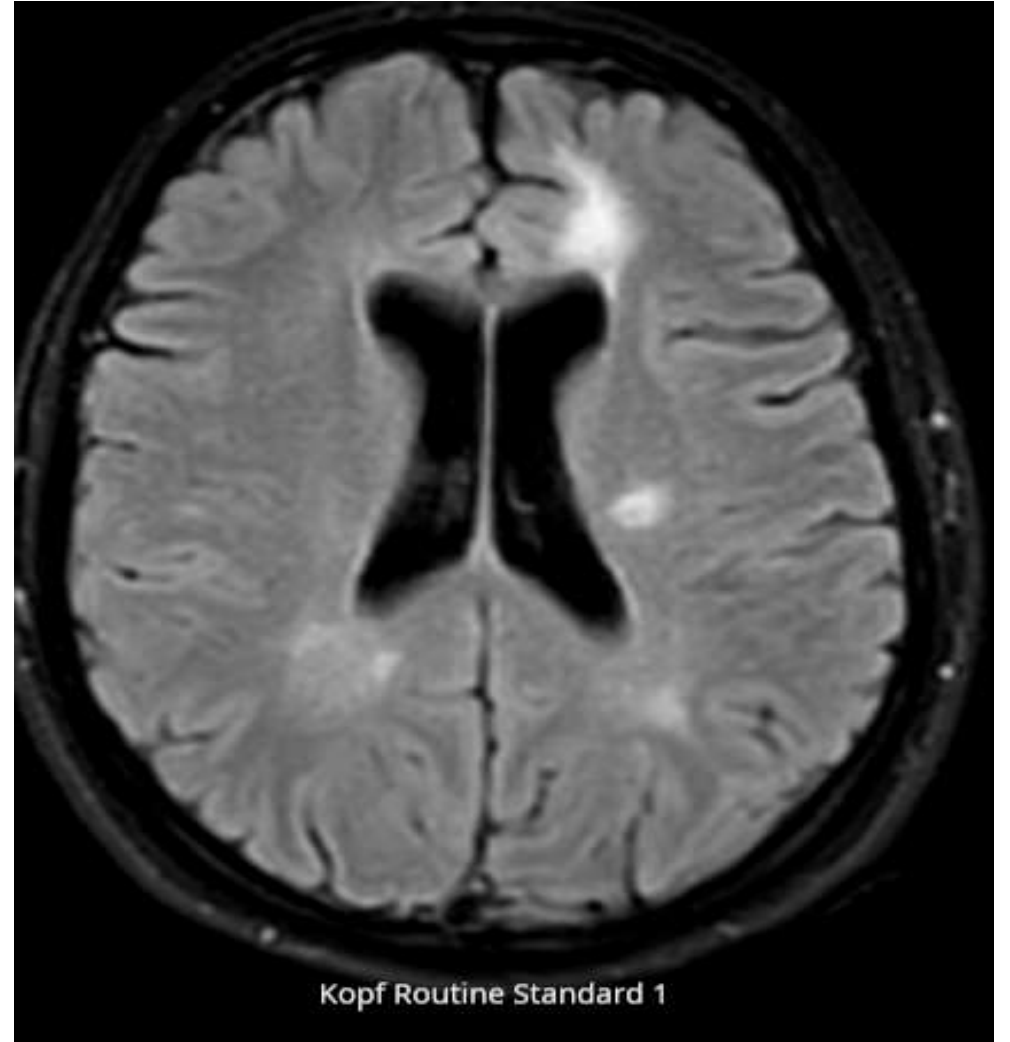


Kopf Routine Standard 1





Kopf Routine Standard 1



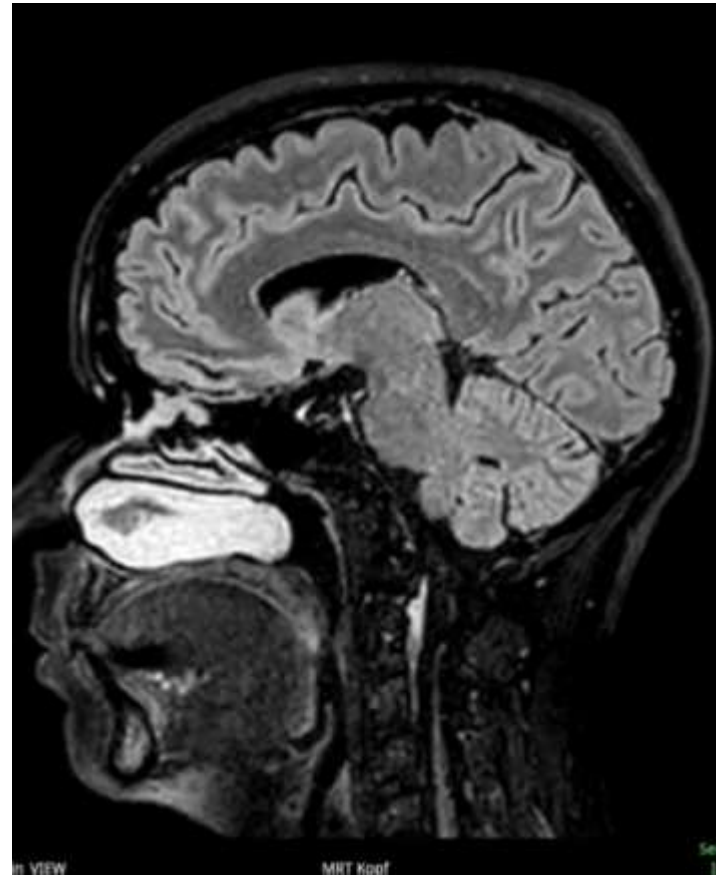
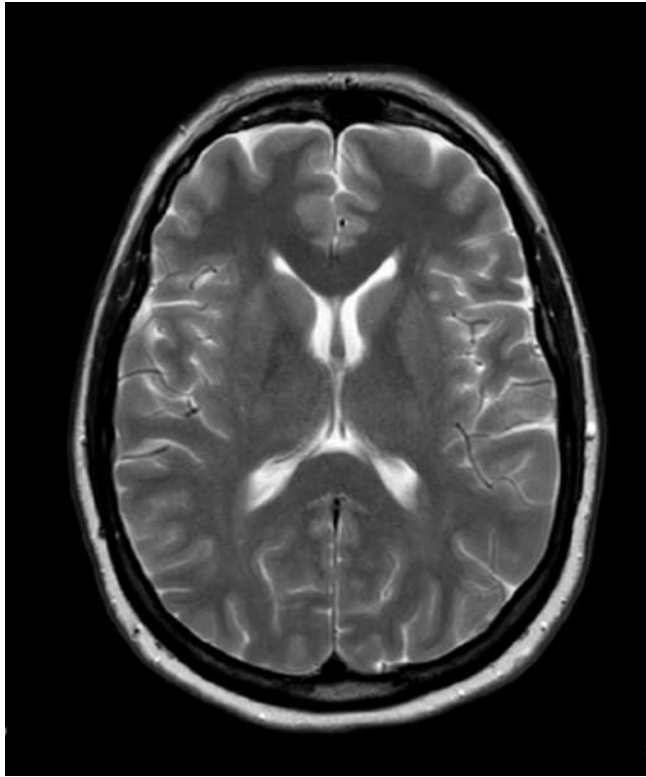
Kopf Routine Standard 1

ERSTE THERAPIEKONTROLLE
nach Beginn der
Immunmod. Therapie

Identisch zur BASELINE

MIT KM

Erste Therapiekontrolle



MRT bei patienten ohne DIT

- DIT

51% nach 6 Monaten

71% nach 12 Monaten

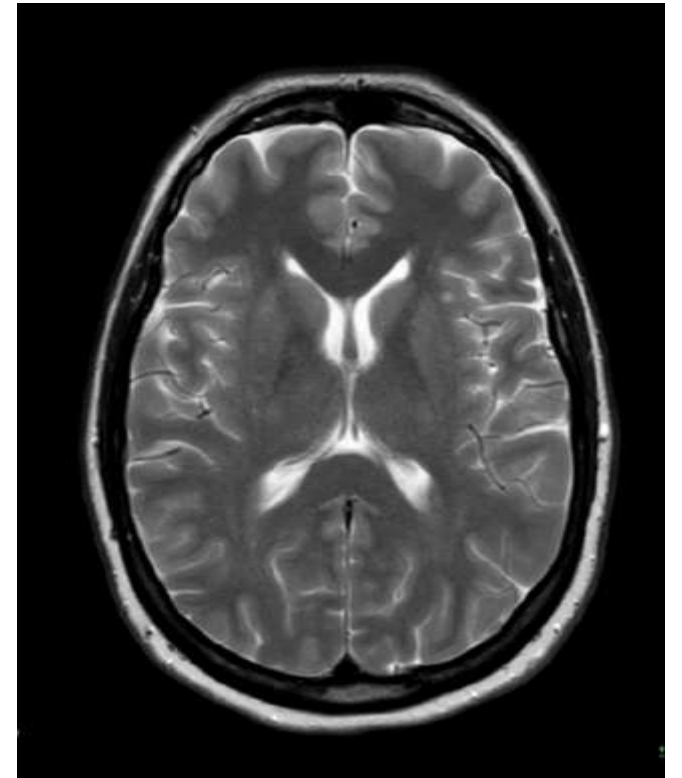
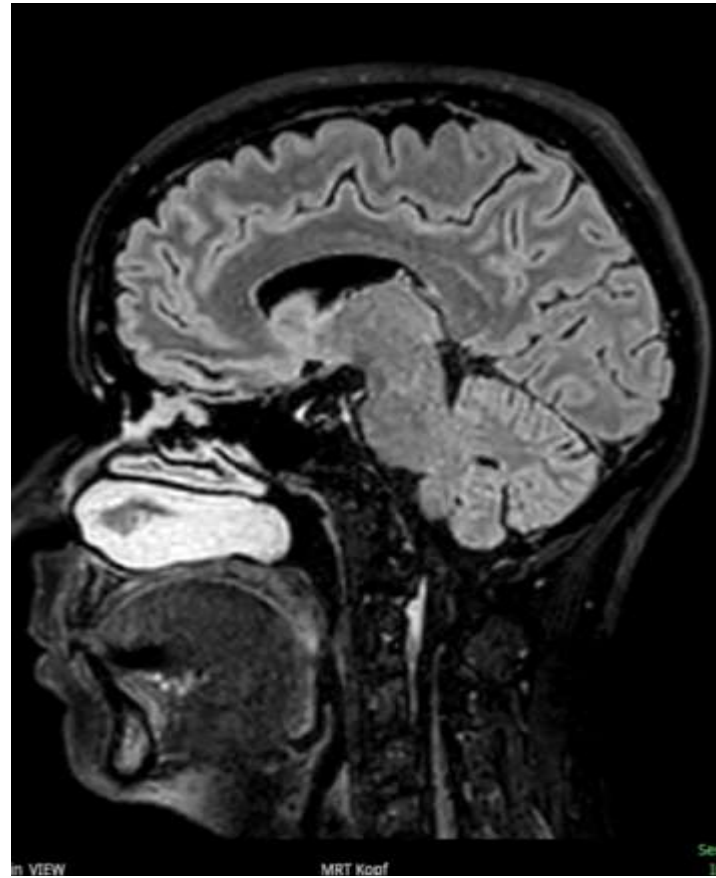
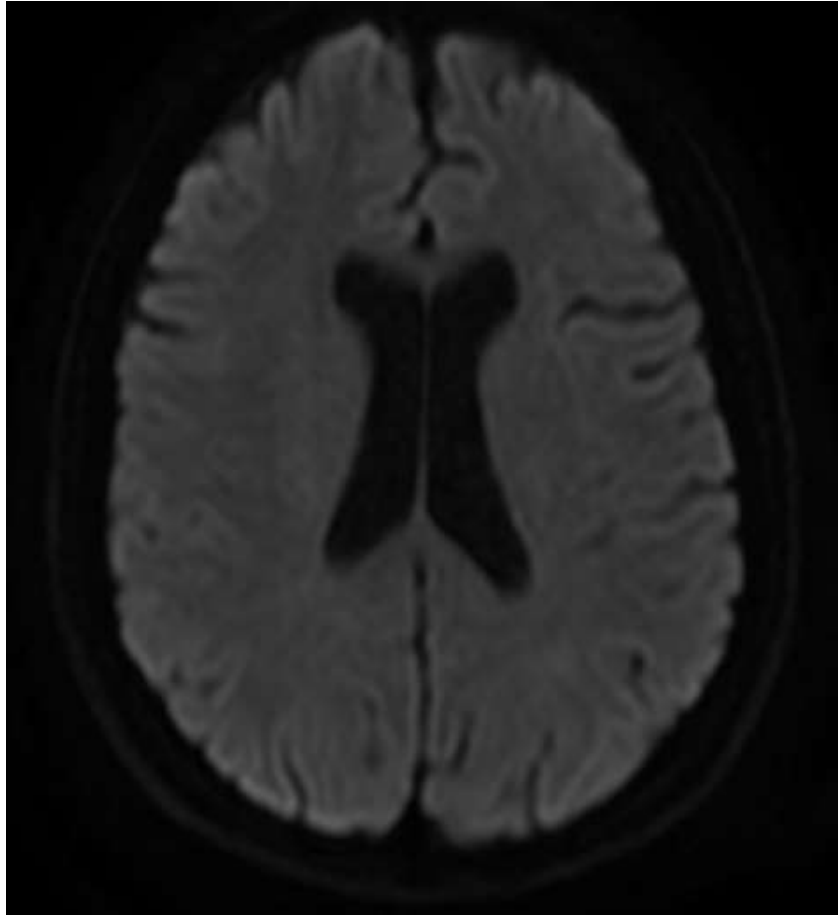
Spätere ROUTINE Kontrollen

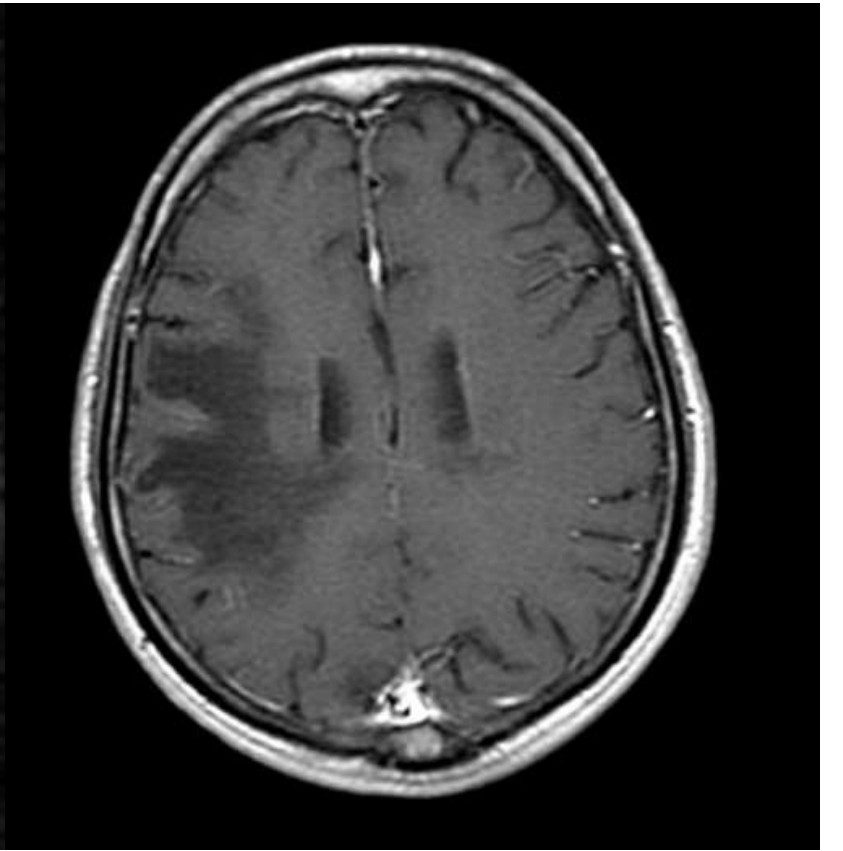
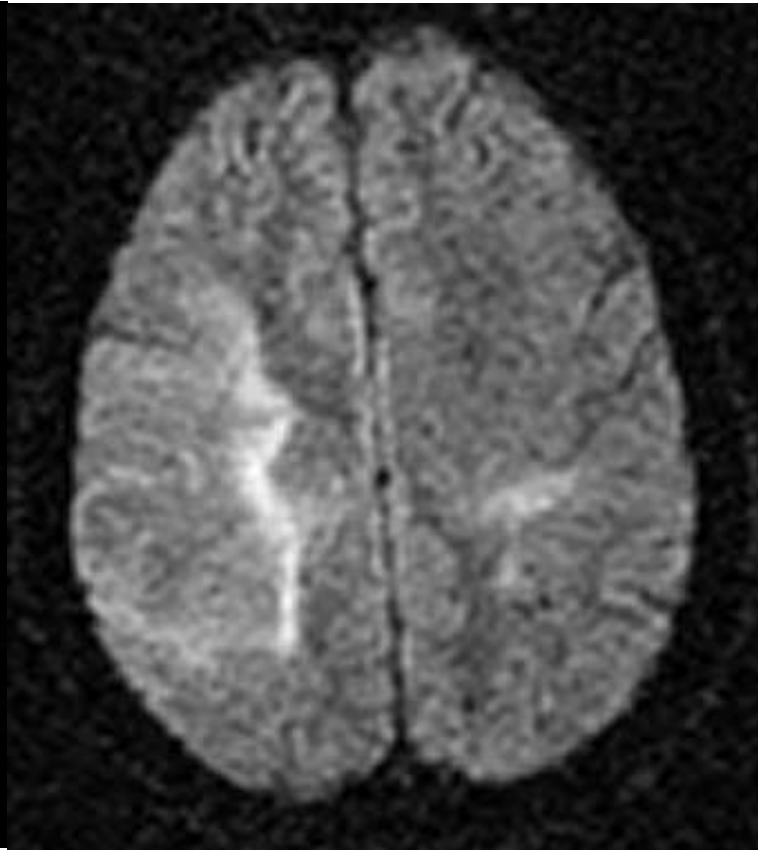
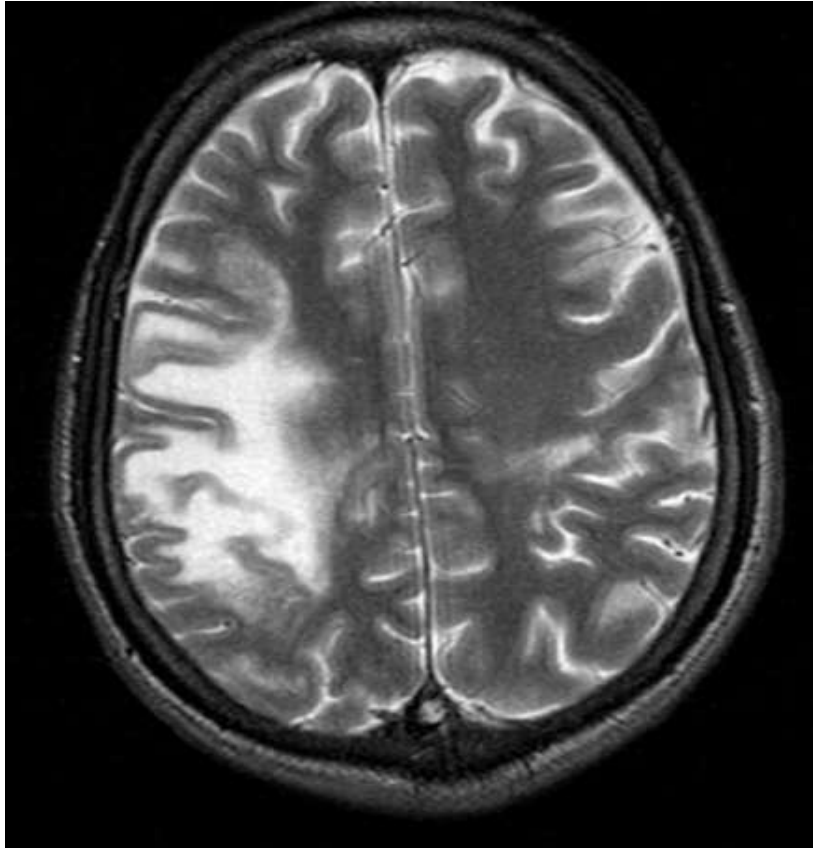
- **OHNE Kontrastmittel**

PML

- IMMER MIT DWI

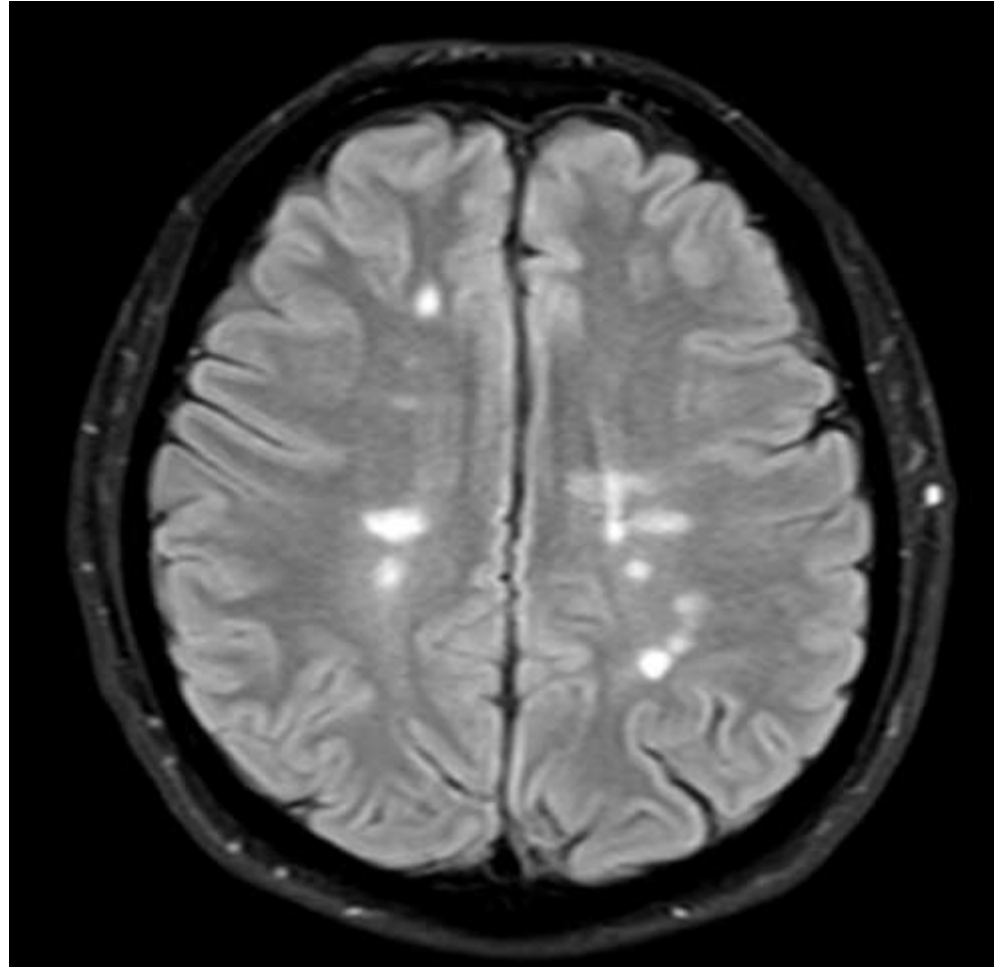
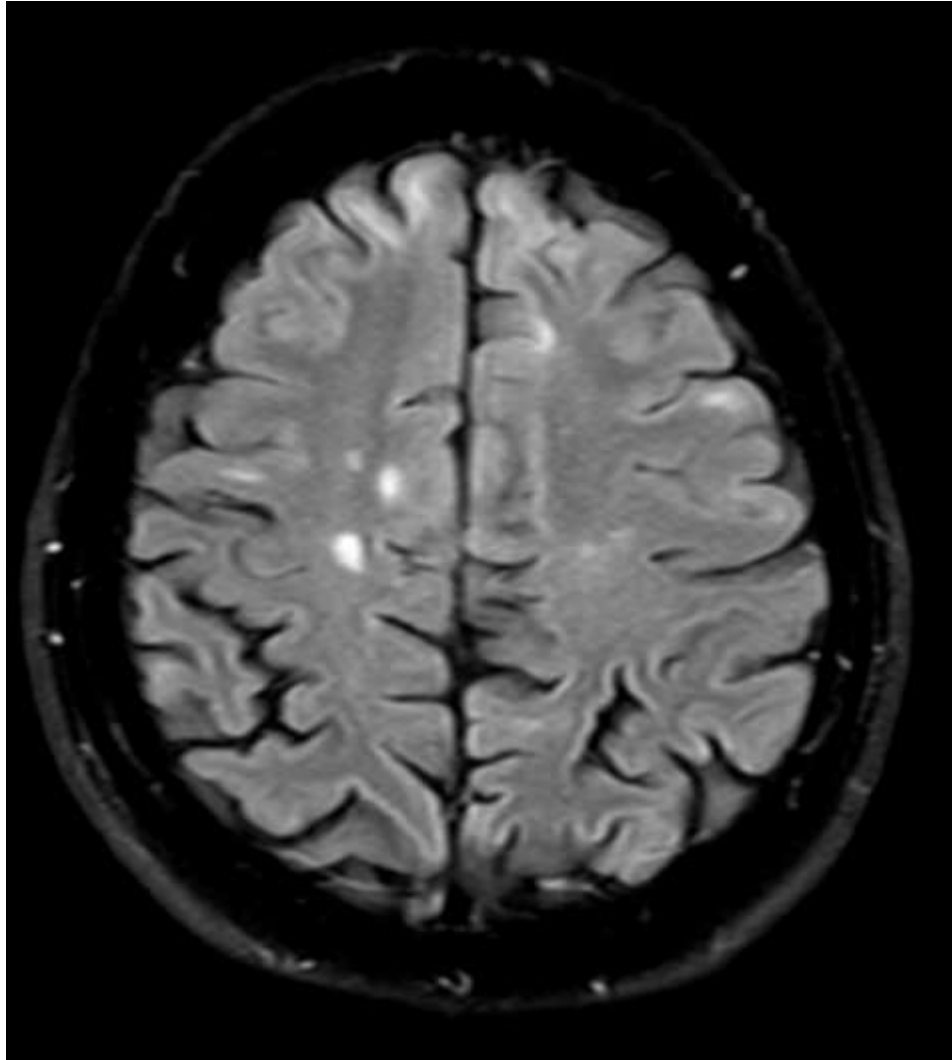
PML

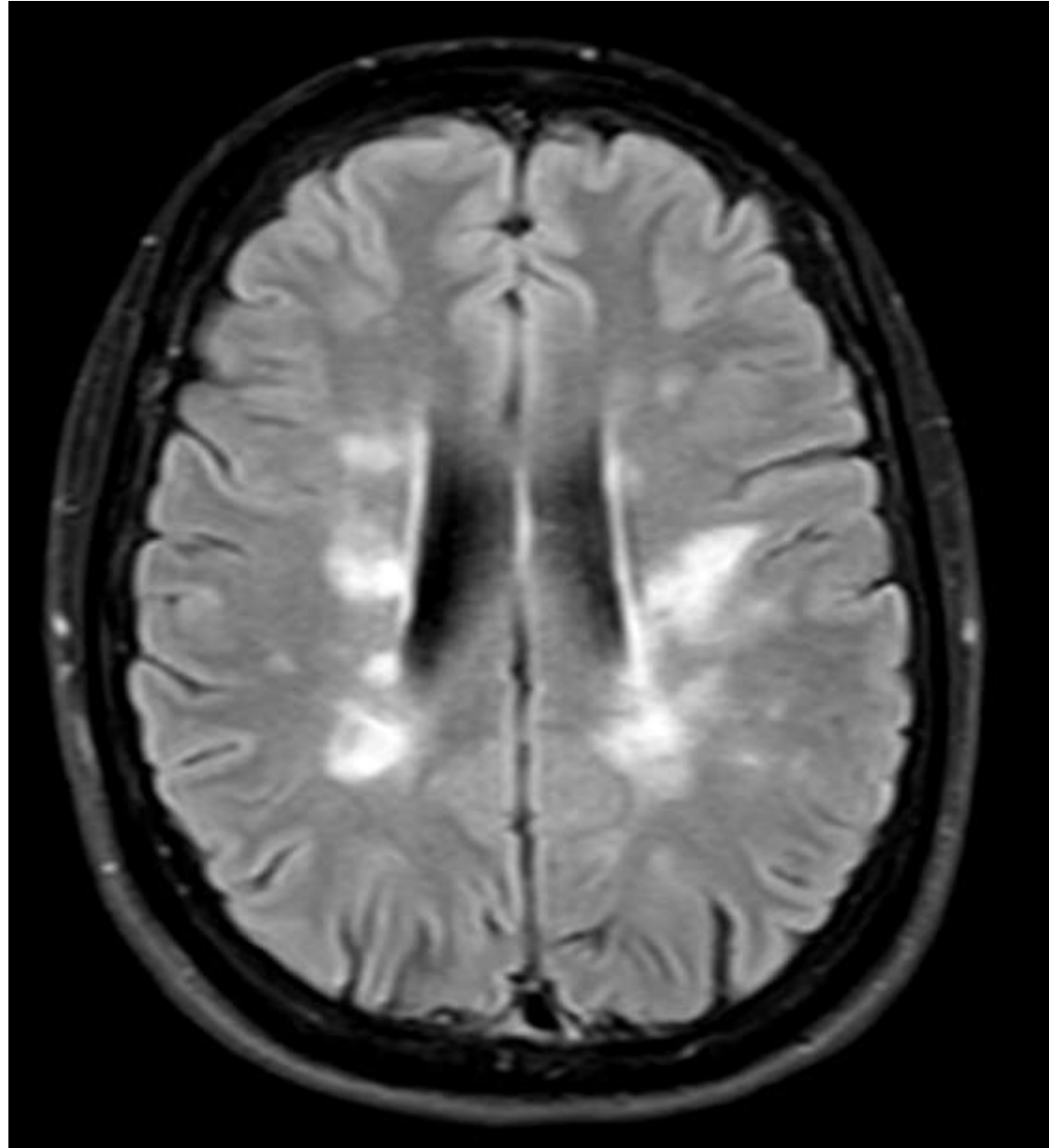


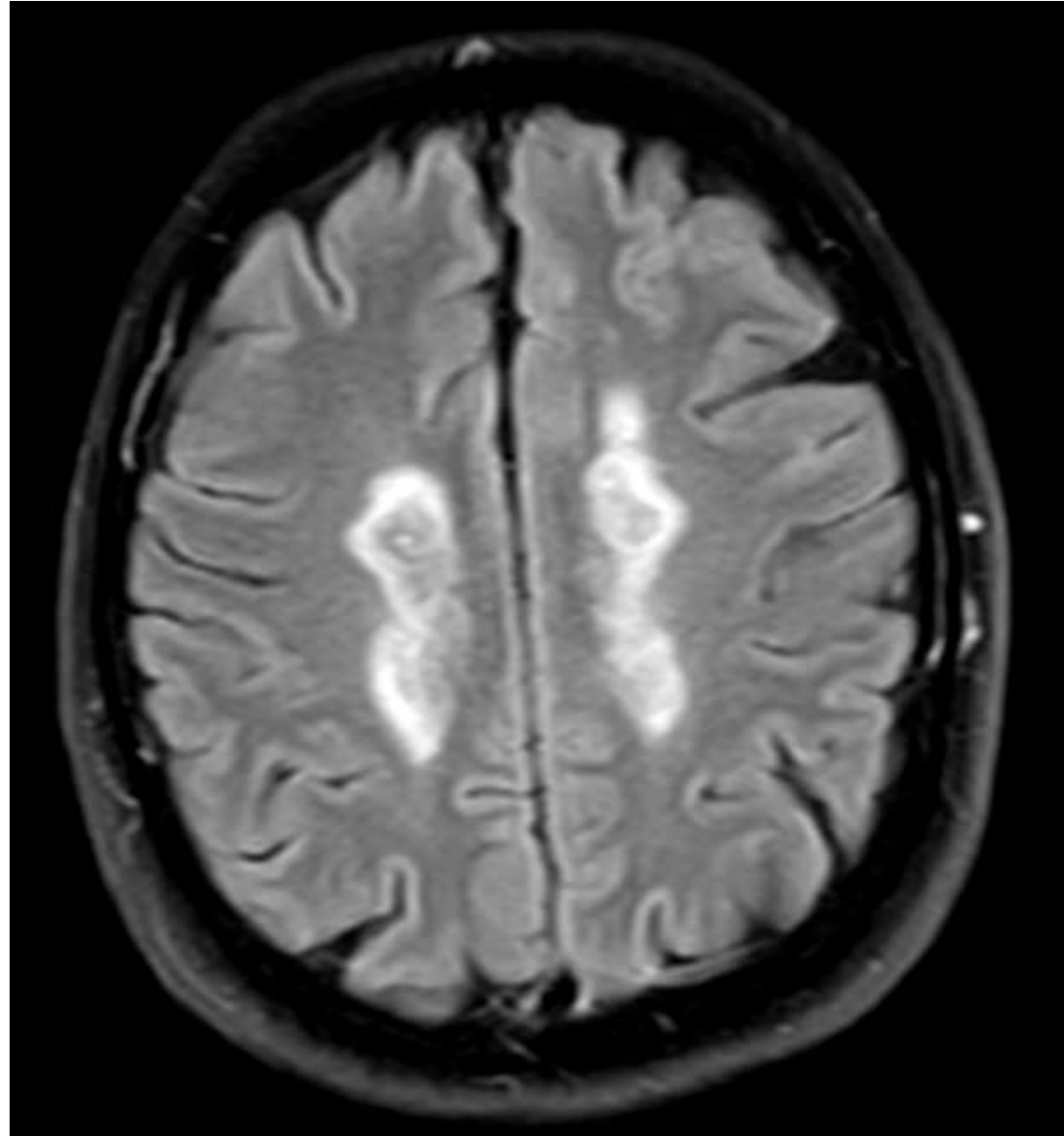


Standardisierte Befundung

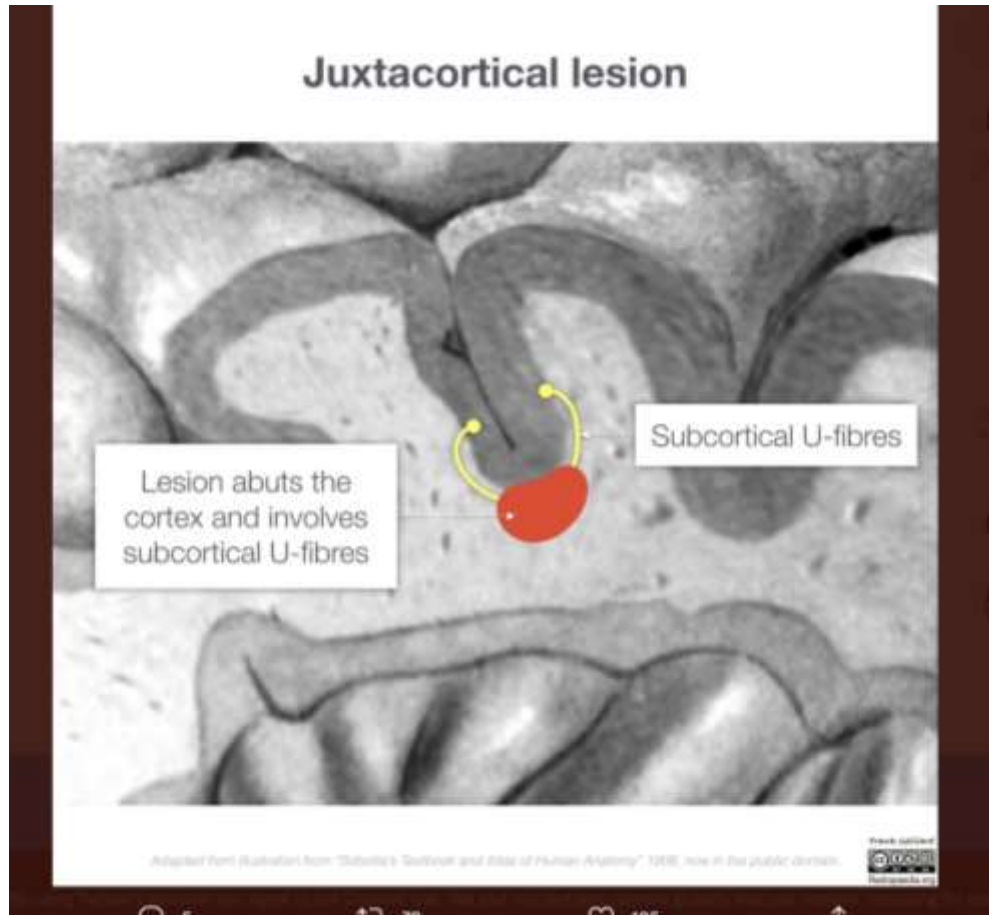
- Anzahl der Läsionen:
- Exakt wenn unter 20
- >20 Schätzung
- Unzählbar oder Konfluierend





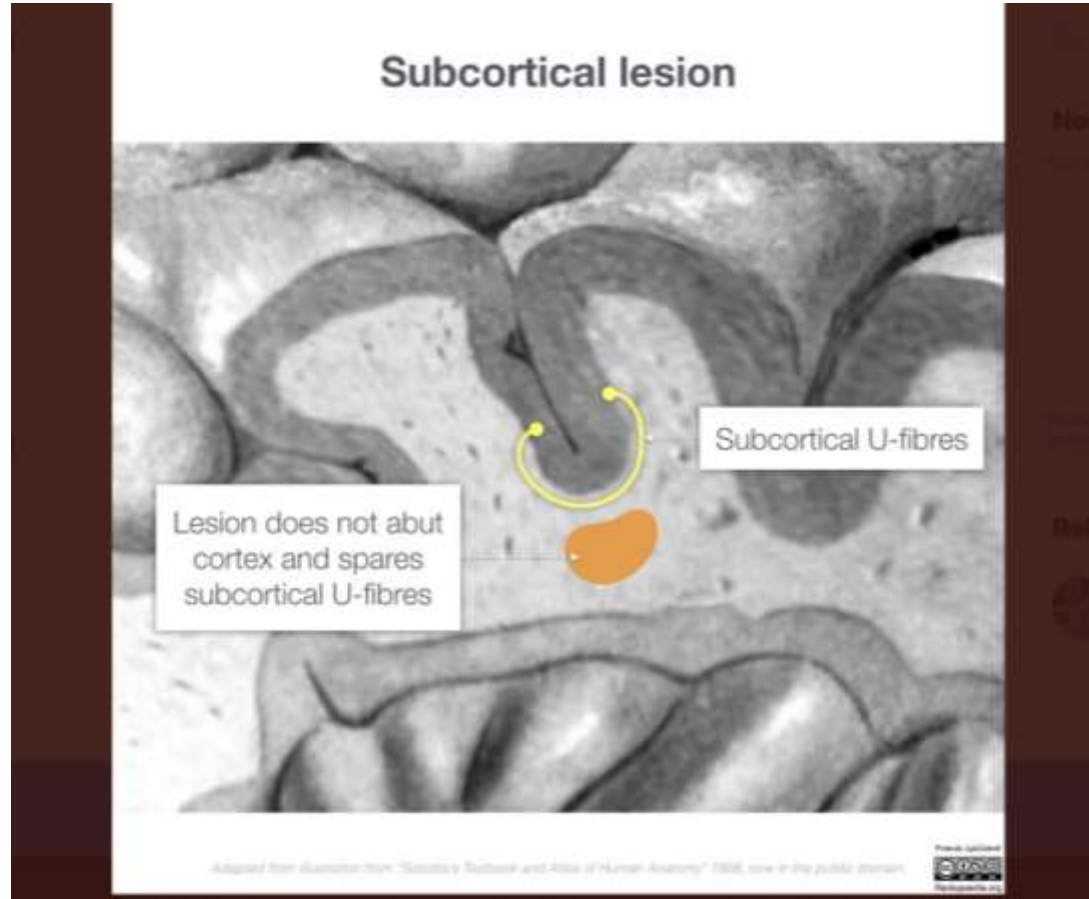


Juxtacortical



- Courtesy Dr Andrew Dixon

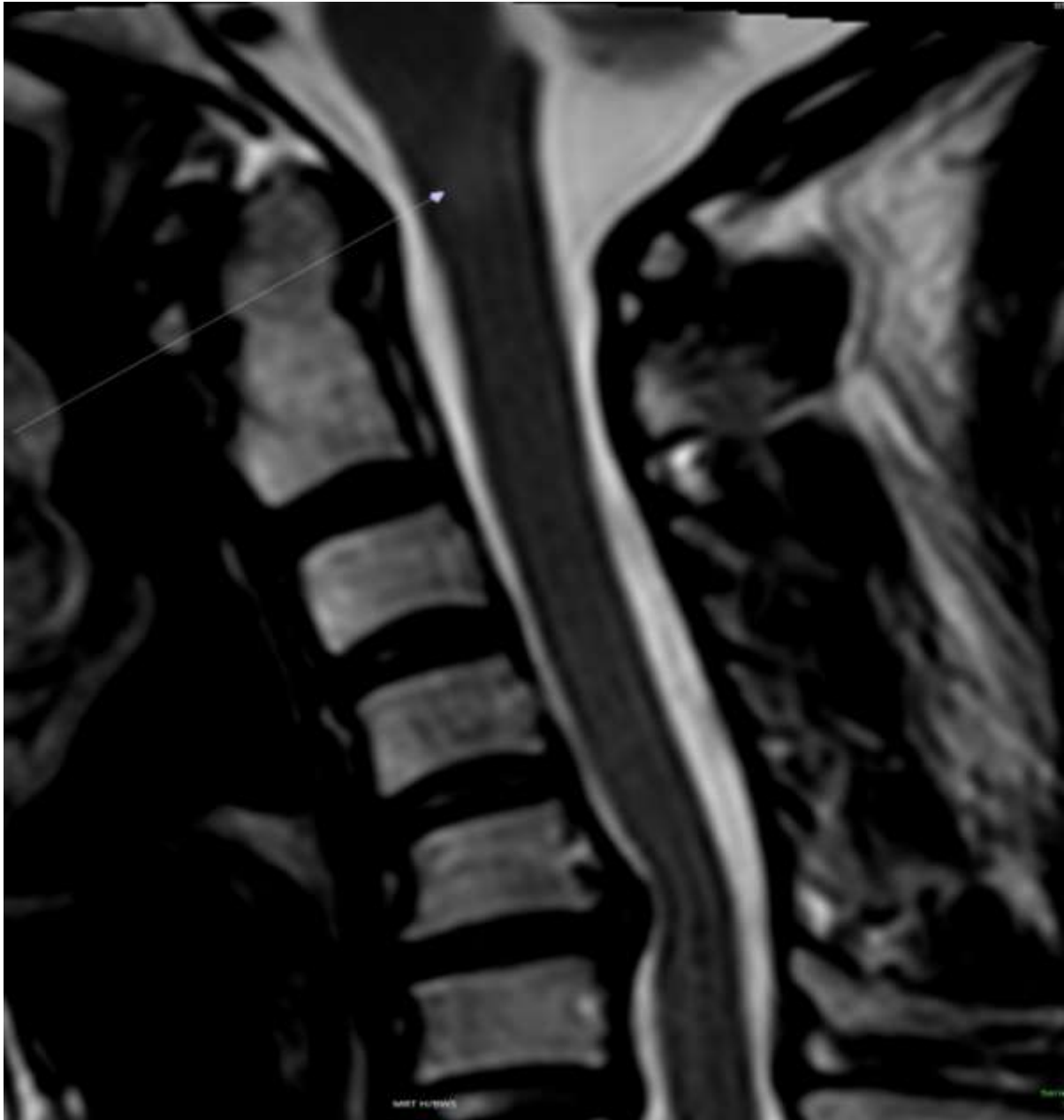
Subcortical



- Courtesy Dr Andrew Dixon

Bildegebung Rückenmark







Rückenmark optional

- Transversale T2
3D PSIR (HWS)
T1 prä Contrast
Axiale t1 nach Kontrast

Standardisierte Implementierung Spinale Achse

- DIS und DIT

Ausschluss andere Patholgien

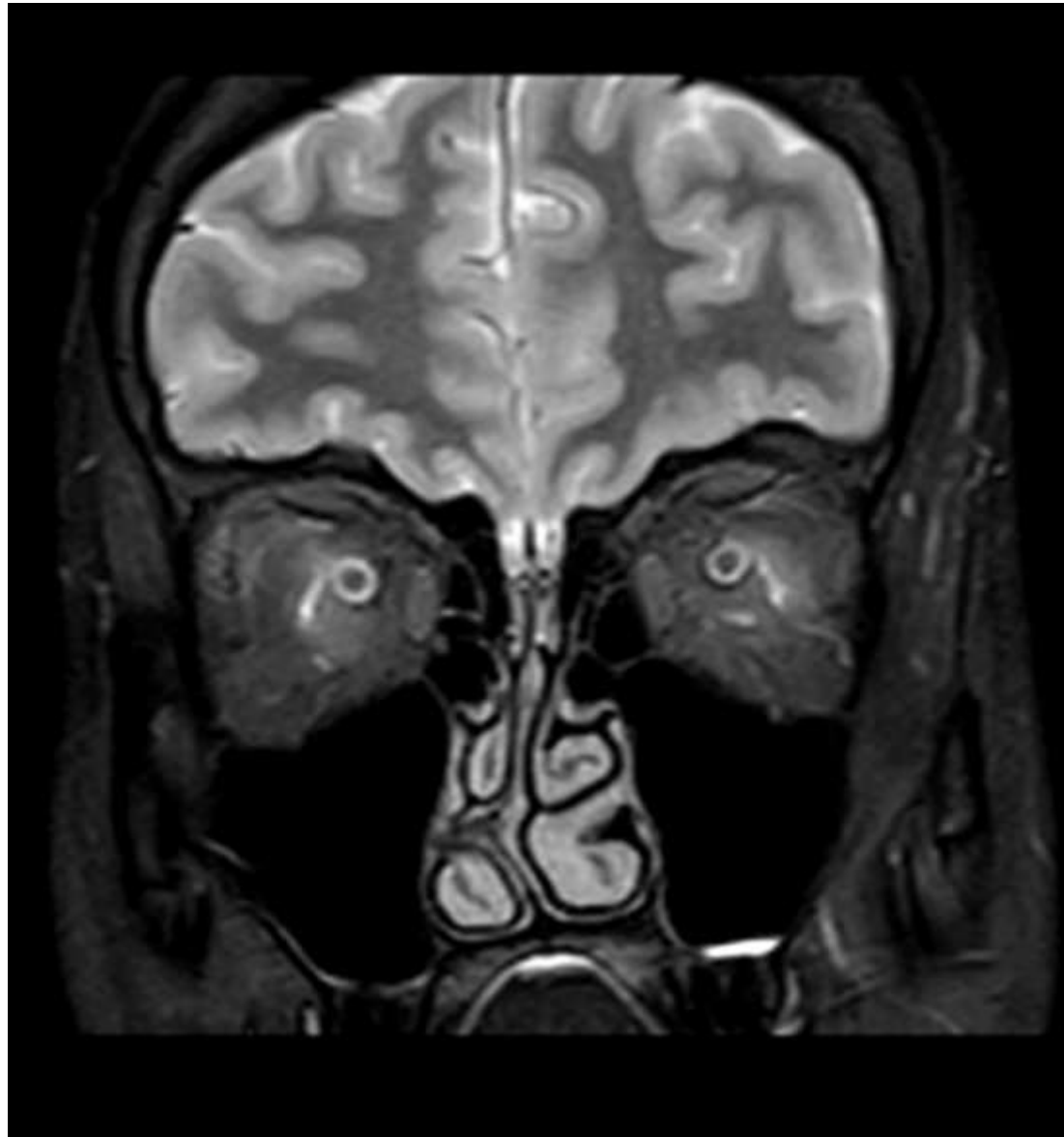
20% Läsionen im unteren thorakalen Segment

30% bis Konus

- Asymptomatische Läsionen

in ca **10%** der Fälle von unveränderten cerebralen Scans
bei Patienten mit Schubförmiger Form

Nervus Opticus



Monitoring während Der Schwangerschaft

- Erstes Trimester keine MRT

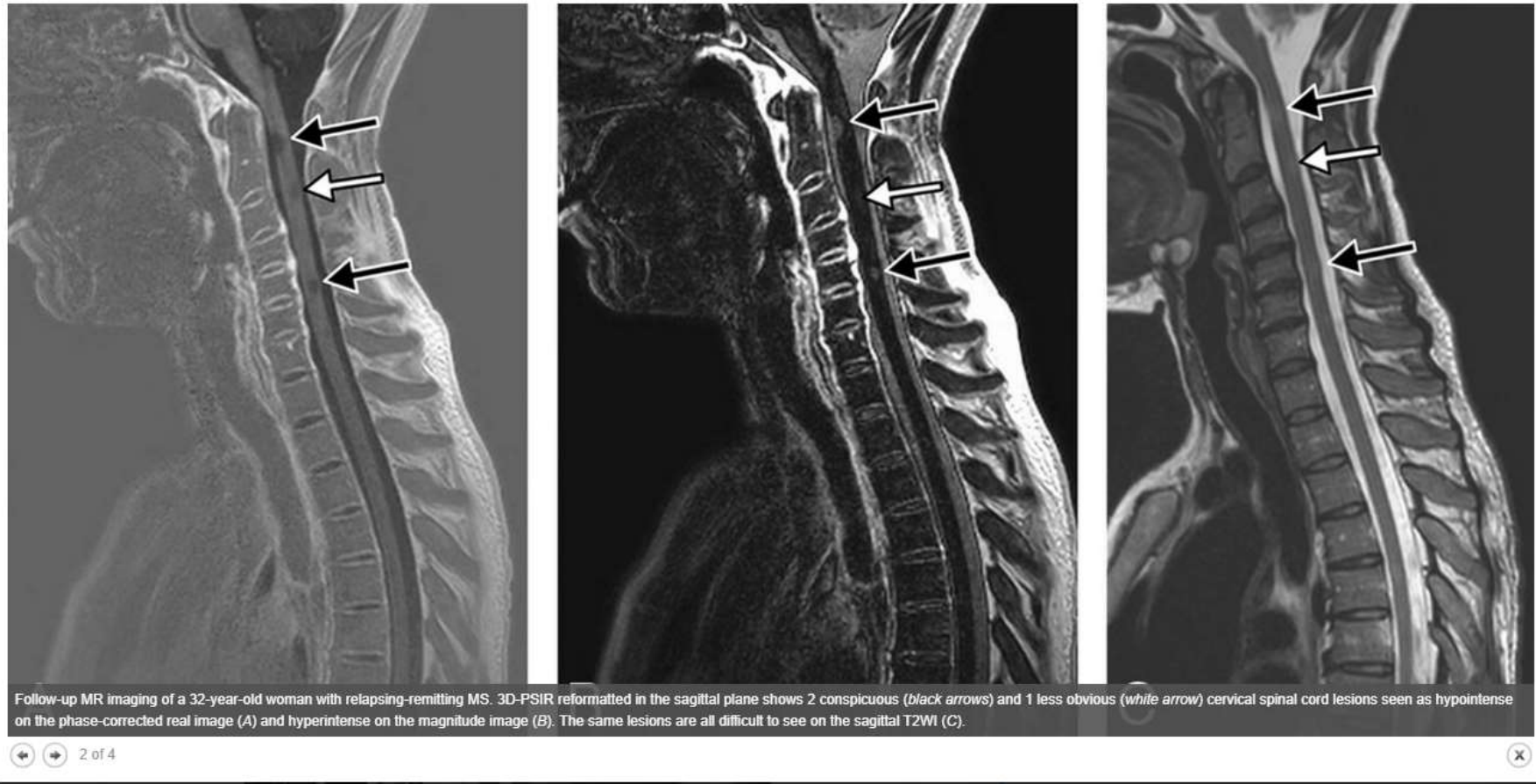
Gadoliniumhaltige KM während der gesamten Schwangerschaft kontraindiziert.

Gadolinium und Stillen

- 0.04%

MRT Ausblick

- Quantitative MRT mit Volumetrie
DIR für Cortcale Läsionen
Subtraktionsmessungen
Flair* (3T)
SWI (3T)

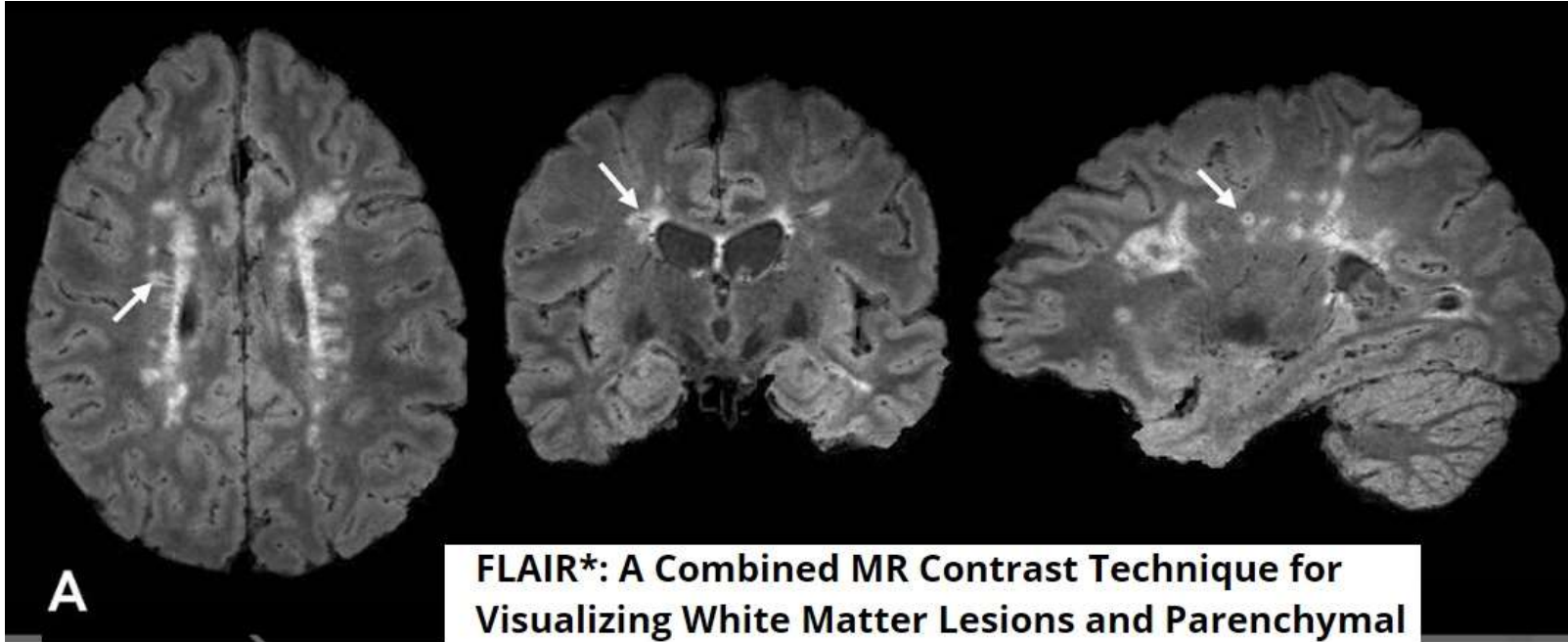


A 3T Phase-Sensitive Inversion Recovery MRI Sequence Improves Detection of Cervical Spinal Cord Lesions and Shows Active Lesions in Patients with Multiple Sclerosis


A. Fechner, J. Savatovsky, J. El Methni, J.C. Sadik, O. Gout, R. Deschamps, A. Gueguen and A. Lecler
American Journal of Neuroradiology January 2019, DOI: <https://doi.org/10.3174/ajnr.A5941>



Follow-up MR imaging of a 32-year-old woman with relapsing-remitting MS. 3D-PSIR reformatted in the sagittal plane shows 2 conspicuous (*black arrows*) and 1 less obvious (*white arrow*) cervical spinal cord lesions seen as hypointense



FLAIR*: A Combined MR Contrast Technique for Visualizing White Matter Lesions and Parenchymal Veins

Pascal Sati , Ilana C. George, Colin D. Shea, Maria I. Gaitán, Daniel S. Reich

▼ [Author Affiliations](#)

Published Online: Dec 1 2012 | <https://doi.org/10.1148/radiol.12120208>

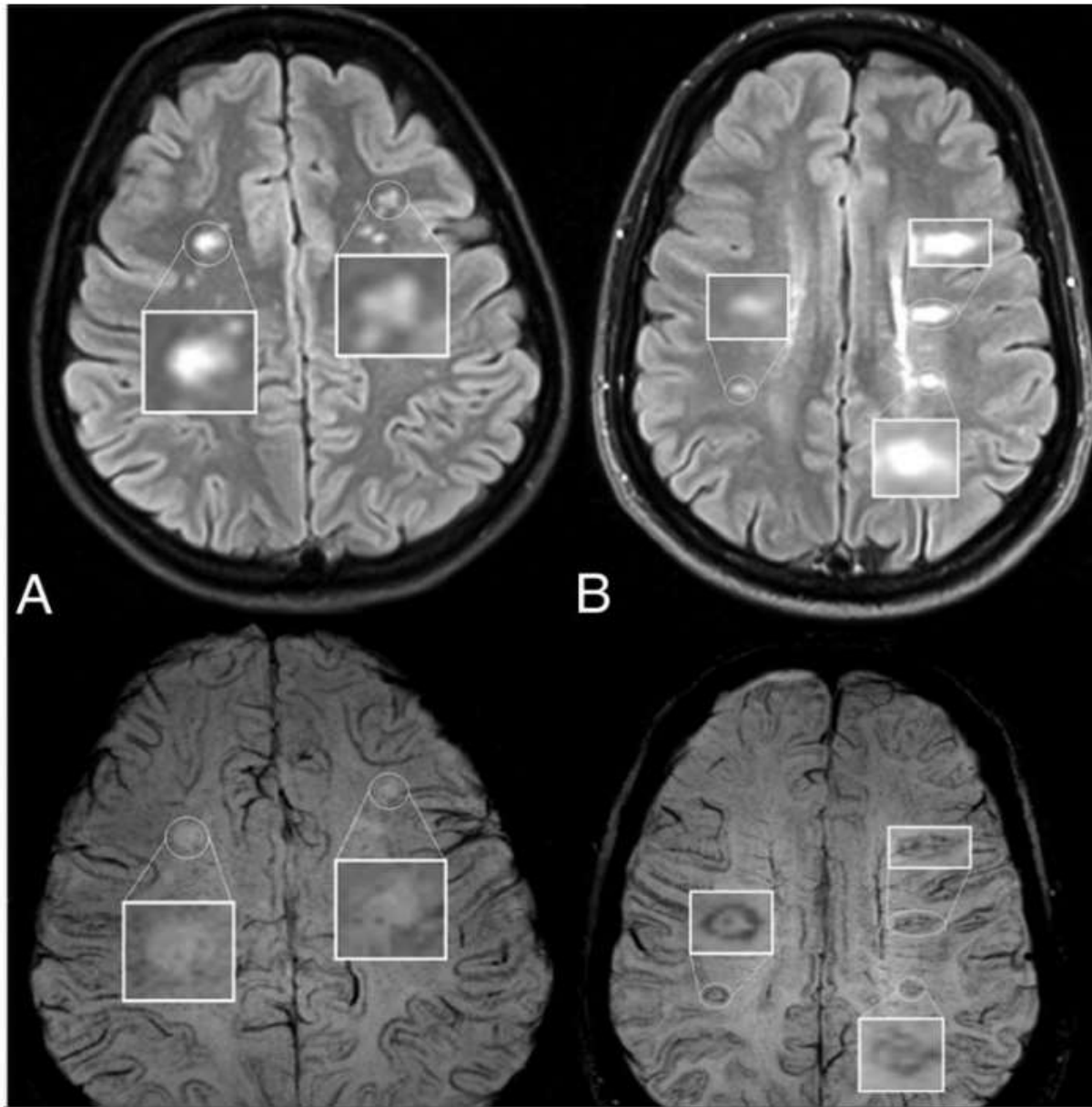


Research Article | ADULT BRAIN

Value of 3T Susceptibility-Weighted Imaging in the Diagnosis of Multiple Sclerosis

M.A. Clarke, D. Pareto, L. Pessini-Ferreira, G. Arrambide, M. Alberich, F. Crescenzo, S. Cappelle, M. Tintoré, J. Sastre-Garriga, C. Auger, X. Montalban, N. Evangelou and À. Rovira

American Journal of Neuroradiology May 2020, DOI: <https://doi.org/10.3174/ajnr.A6547>



Lesion appearance on axial T2-FLAIR (*upper row*) and the corresponding susceptibility-weighted (*lower row*) images in patients with Sjögren disease (A and C) and MS (B and D). The patient with Sjögren disease has no visible CVs or IRs on the SWI. The patient with MS has clearly visible IRs, which correspond to the lesion edges visible on the T2-FLAIR. CVs are also visible inside the lesions as *hypointense dots or lines*.