

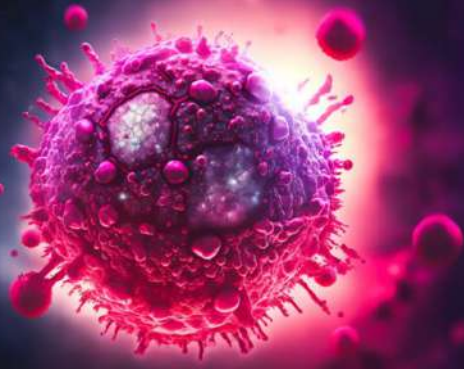
KARADENİZ HIV SİMPOZYUMU



26-27 Mayıs 2024 Omtel Hotel, SAMSUN



HIVÇG KLİNİK DERNEĞİ
HIV/AIDS ÇALIŞMA GRUBU



HIV ile İnfekte Bireylerde Santral Sinir Sistemi Görüntülemesinde Ayrıcı Tanı

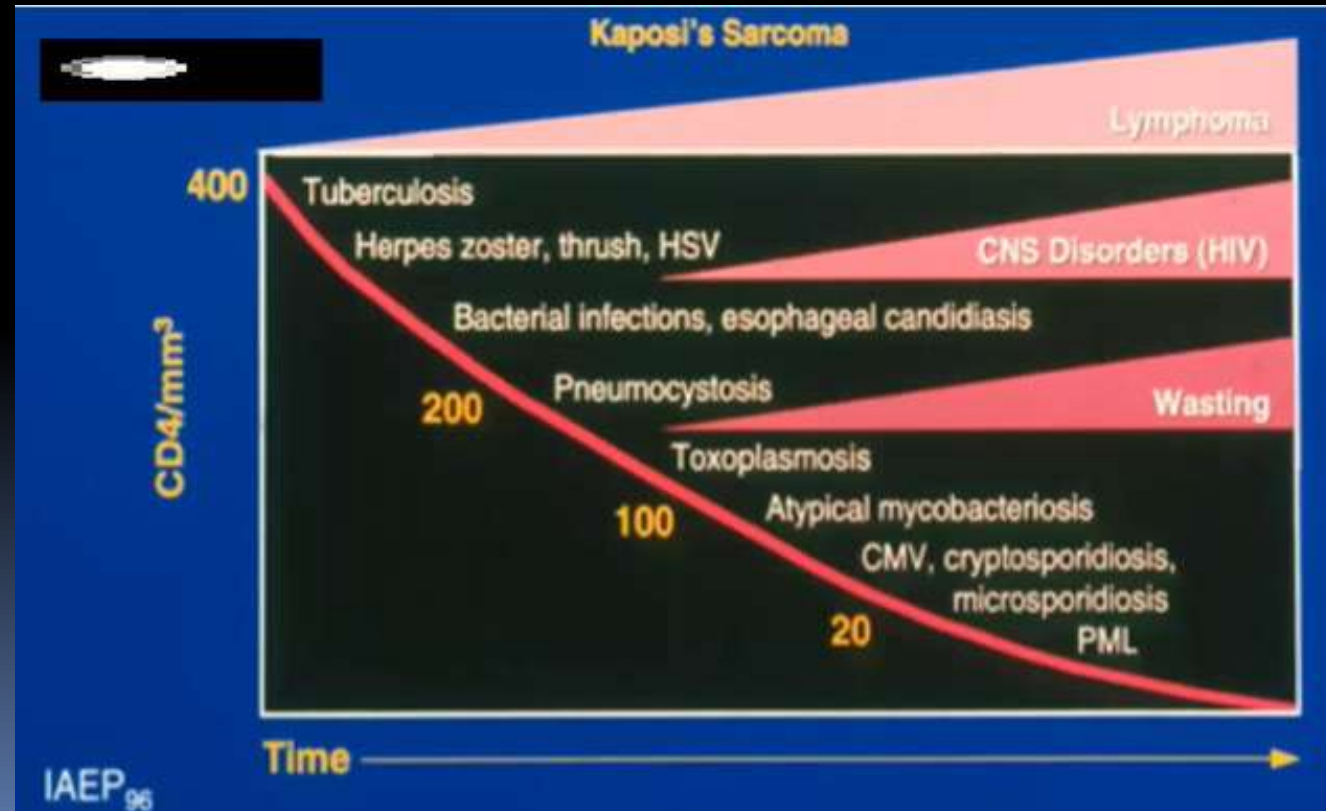
Doç. Dr. Kerim Aslan
Ondokuz Mayıs Üniversitesi Tıp Fakültesi
Radyoloji Anabilim Dalı

Sunu Akışı

- Fırsatçı Enfeksiyonlar
- Lenfoma
- Tedavi İlişkili Lezyonlar
- Primer HIV İnfeksiyonu

HIV hastalarının beyin lezyonlarının tanısında

- Klinik
- Seroloji (Toxo, CMV, JC gibi)
- CD4 sayısı



HIV ile İnfekte Bireylerde SSS Lezyonları

Fırsatçı Enfeksiyonlar

Toksoplazma
PML
Tüberküloz
CMV
VZV
Kriptokok
Aspergilloz
Sifiliz

Tümörler

Lenfoma

Tedavi İlişkili Lezyonlar

IRIS
CD8 Ensefaliti

Primer HIV İnfeksiyonu

HIV İlişkili
Nörokognitif
Bozukluk (HAND)

HIV
Ensefalopatisi

HIV İlişkili
Vakuoler
Miyelopati

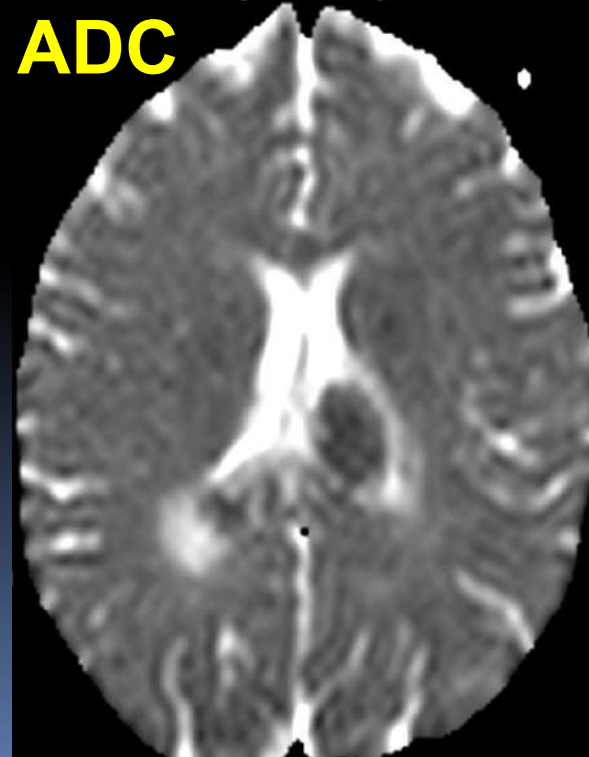
- HIV ile infekte bireylerdeki beyin lezyonlarının karakterize edilmesi tedaviye rehberlik etmek için önemlidir.
- Klinik ve laboratuvar bulguları
- Altın standart tanı histopatolojik değerlendirme
 - Cerrahi komplikasyonlar
 - Yetersiz örnekleme

- Bu nedenlerden dolayı lezyonların karakterizasyonu için noninvaziv bir yönteme ihtiyaç duyulmaktadır.
 - Konvansiyonel MRG lezyonların karakterizasyonunda başarılıdır.
 - Fakat bazı durumlarda yetersiz kalmakta ve lezyonların karakterizasyonunda ileri görüntülemeye ihtiyaç duyulmaktadır.
- ✓ Difüzyon MR
 - ✓ Perfüzyon MR
 - ✓ MRS

DAG



ADC

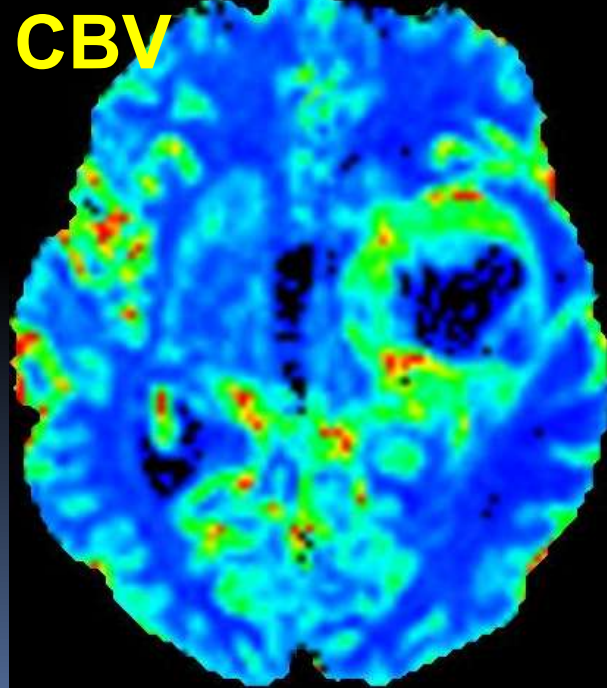
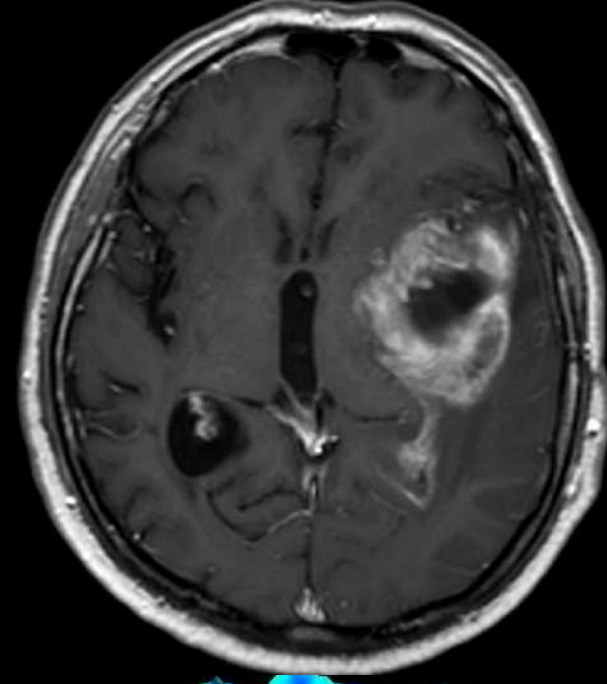


Difüzyon MR

- Dokudaki su moleküllerinin mikroskopik hareketlerini inceleyerek dokunun mikroyapısal özelliklerini gösteren bir görüntüleme yöntemidir.
- Difüzyonun kantitatif değerlendirilmesi görünür difüzyon katsayısı (ADC) ölçümleri ile mümkündür.
- **ADC** dokudaki su difüzyonunun toplam büyüklüğünü ölçerek **dokunun sellülaritesi** hakkında bilgi sağlar.

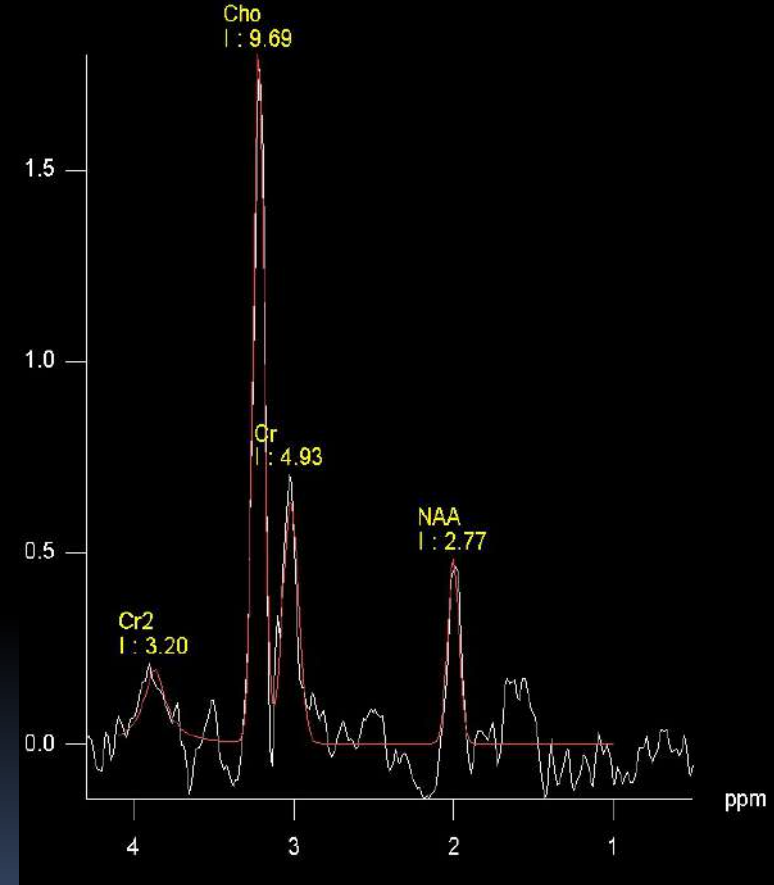
Perfüzyon MR

- Perfüzyon MRG, mikroskobik düzeyde doku kanlanmasını in-vivo tümör anjiogenezi ve tümör mikrodolaşımı hakkında bilgi veren non-invaziv tanı yöntemidir.
- Damar yoğunluğundaki artışın bir göstergesi olan **CBV'nin artması tümöral neo-anjiogenezin** dolaylı bir göstergesi olarak kabul edilmektedir.



MR Spektroskopisi

- MR spektroskopisi doku hakkında biyokimyasal ve metabolik yönden bilgi veren non-invaziv bir tekniktir.
- **Kolin pikininin** potansiyel olarak **tümöral dokuyu** göstermede duyarlı bir biyokimyasal belirteçdir.



- **N-asetilaspirtat (NAA) (2.2 ppm)**

Canlı nöron miktarı

- **Lipid (1.2 ppm)**

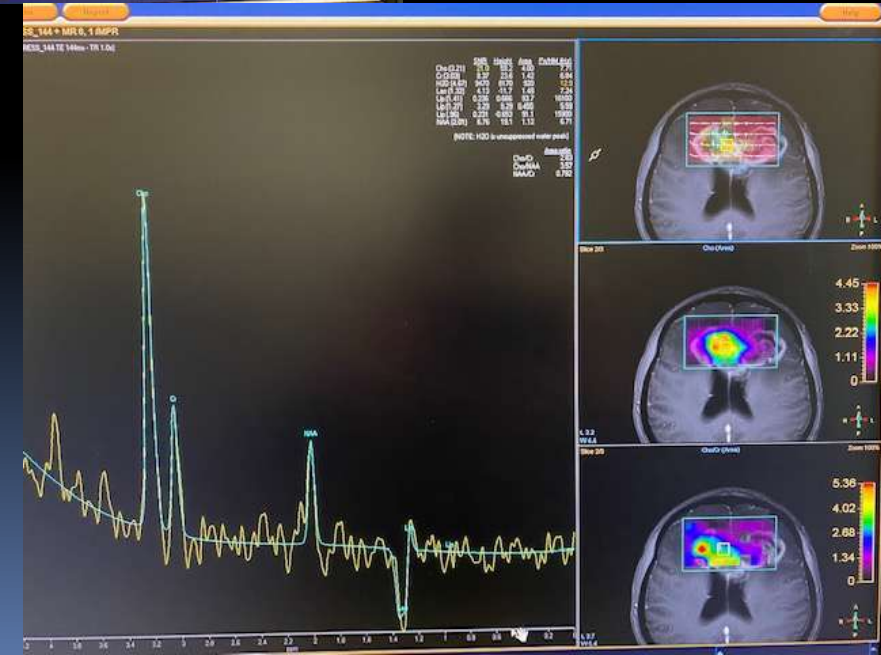
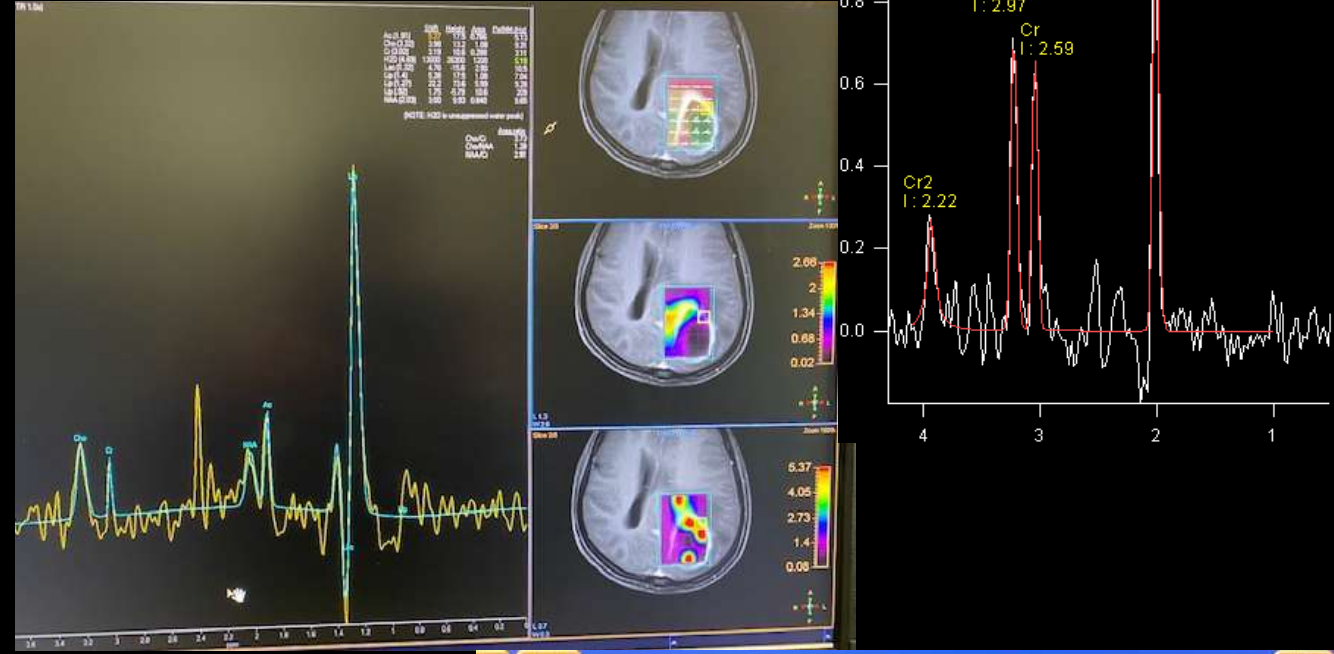
Normal beyin dokusunda yok
Tümör (Lenfoma, metastaz)
Enfeksiyon (Tüberküloom)

- **Laktat (1.3 ppm)**

Normal beyin dokusunda yok
İskemi, nekroz (tümör)

- **Asetat (1.9), suksinat (2.4), amino asitler (0.9)**

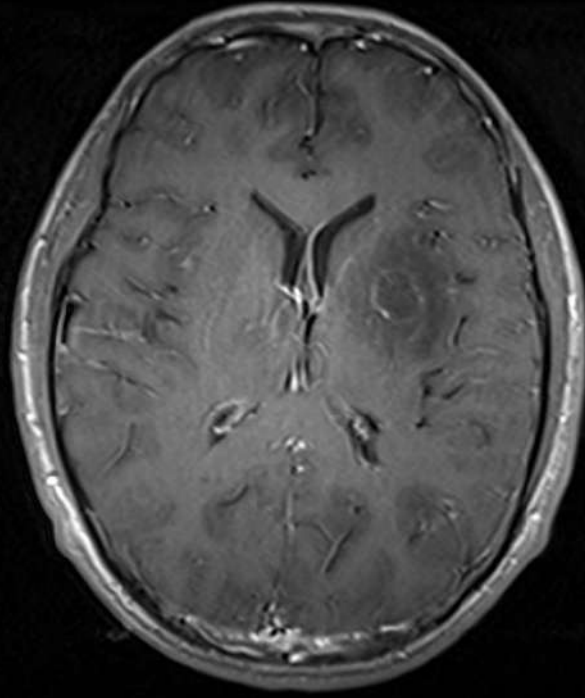
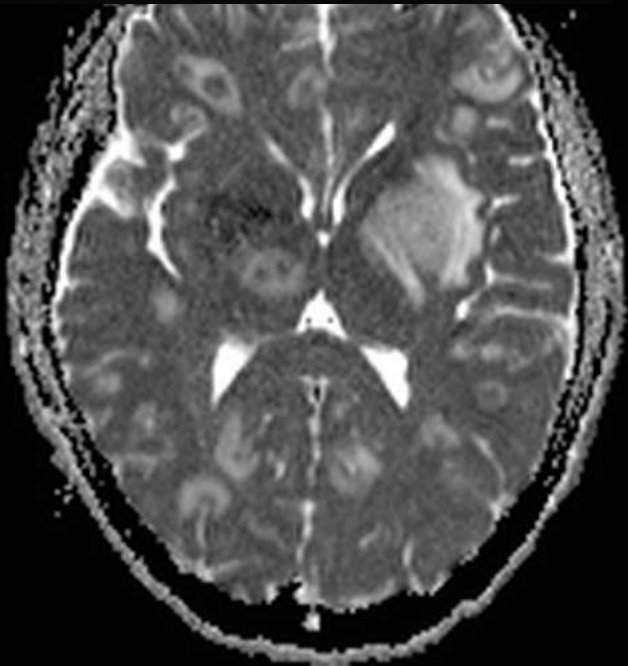
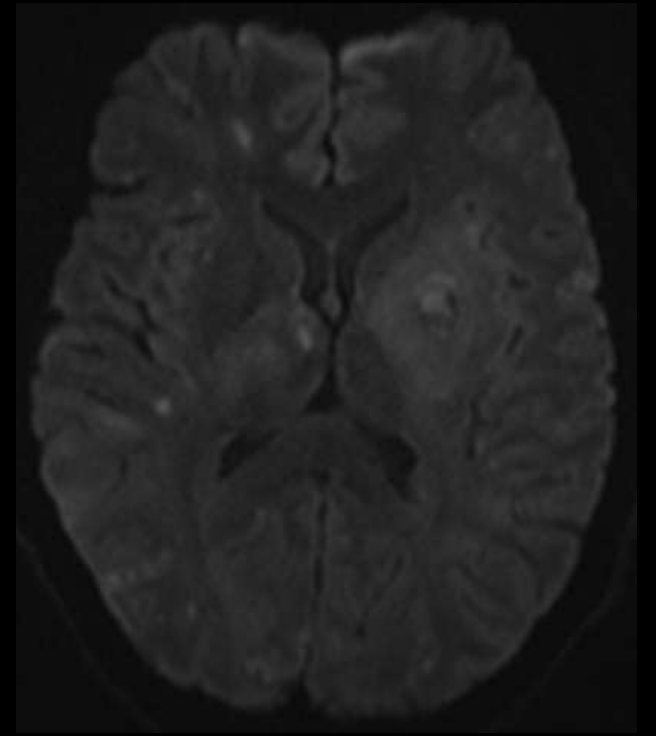
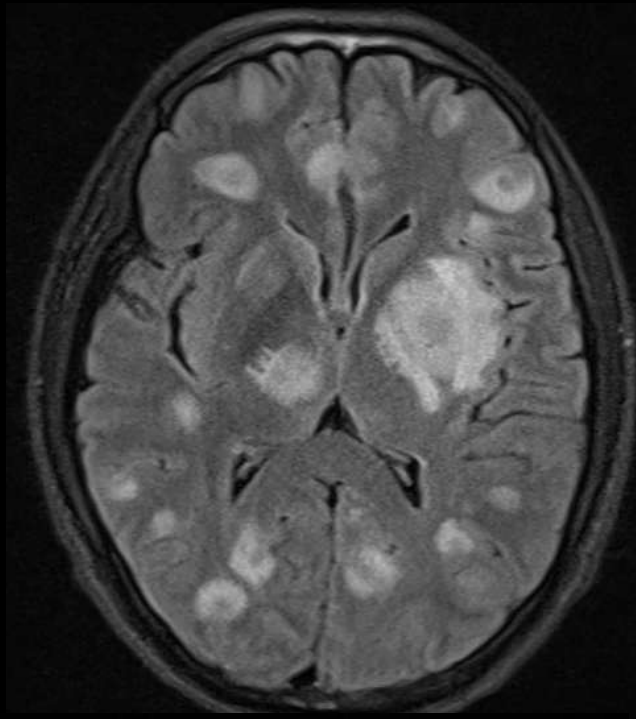
Enfeksiyon



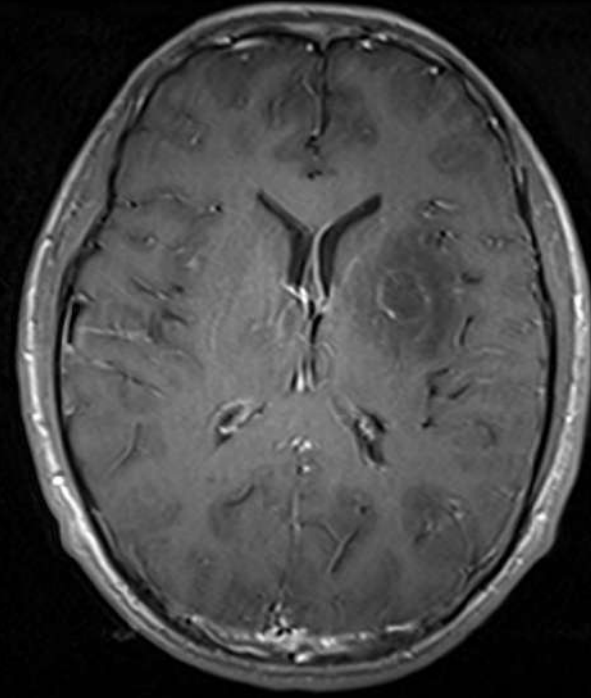
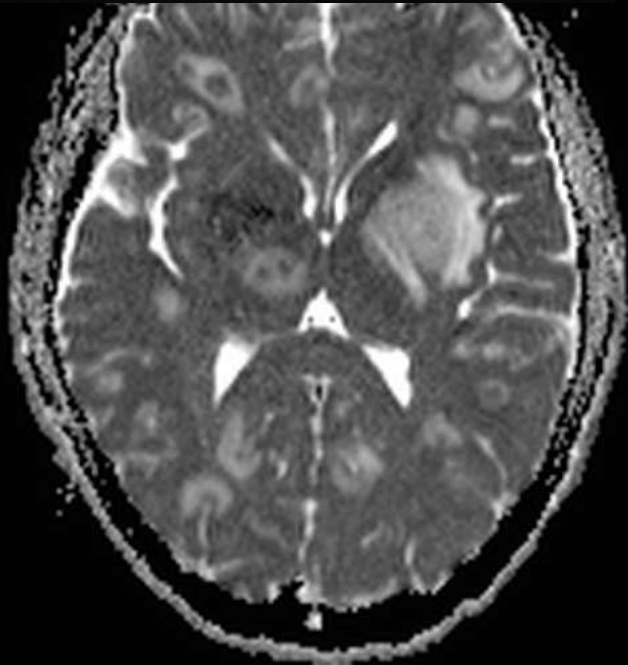
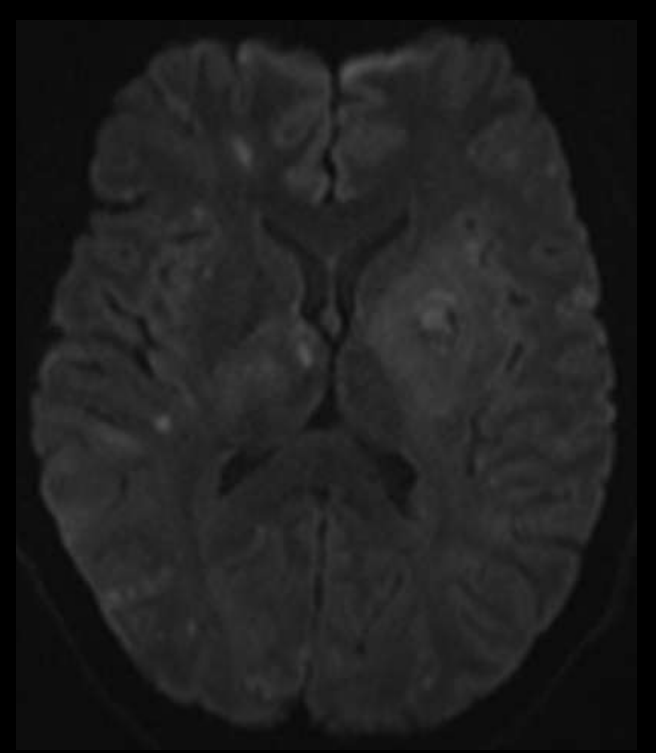
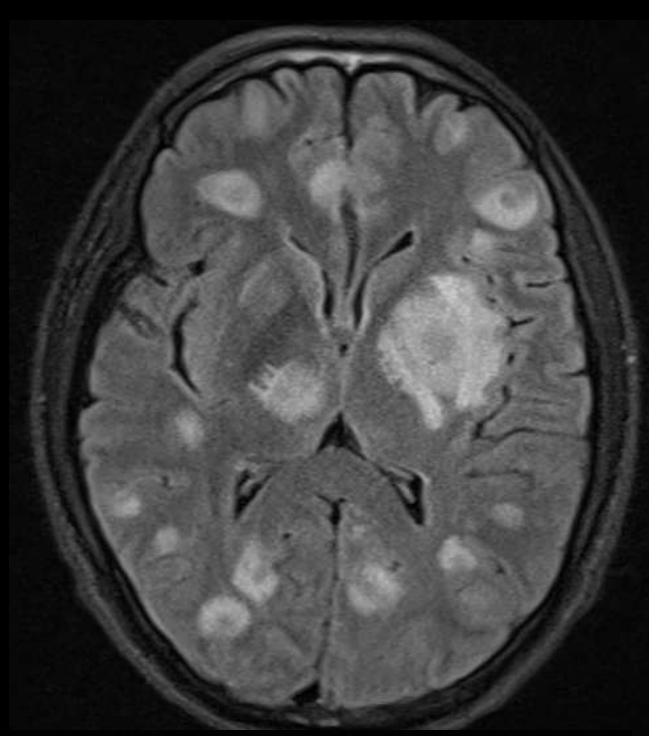
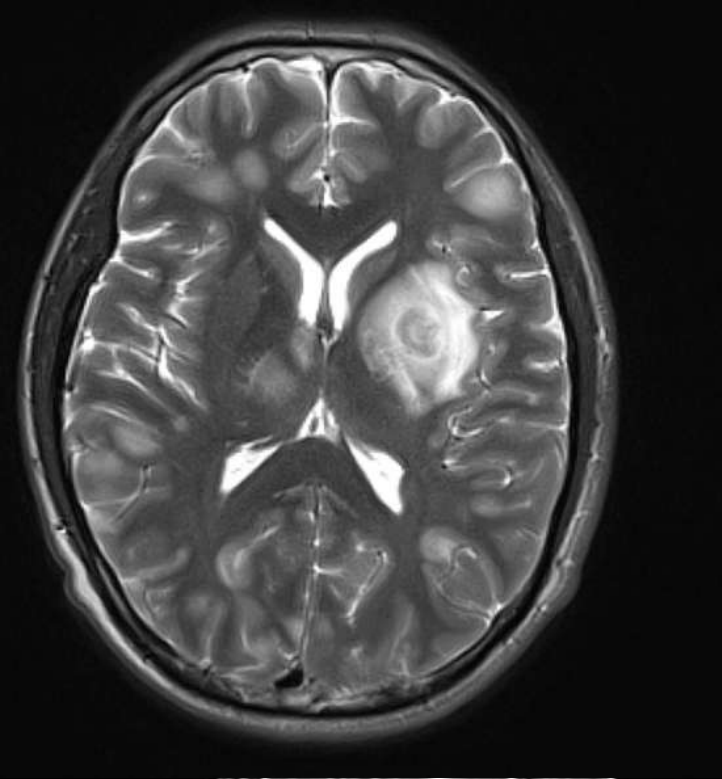
Fırsatçı Enfeksiyonlar

Toksoplazmozis

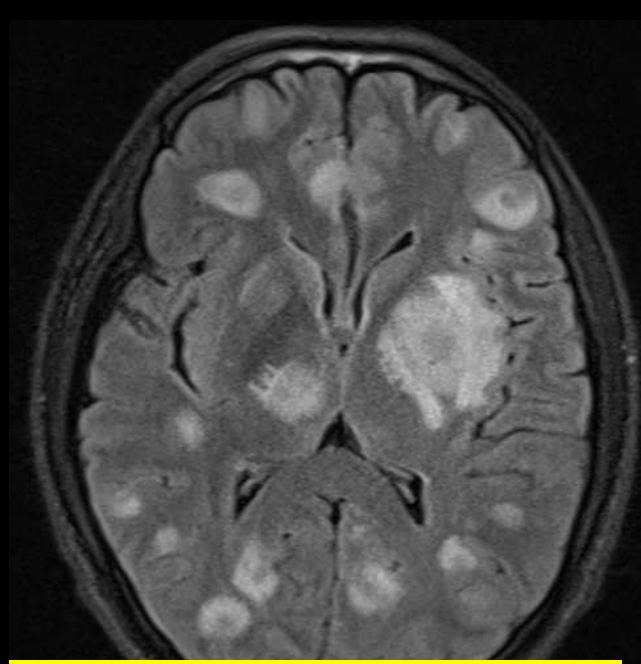
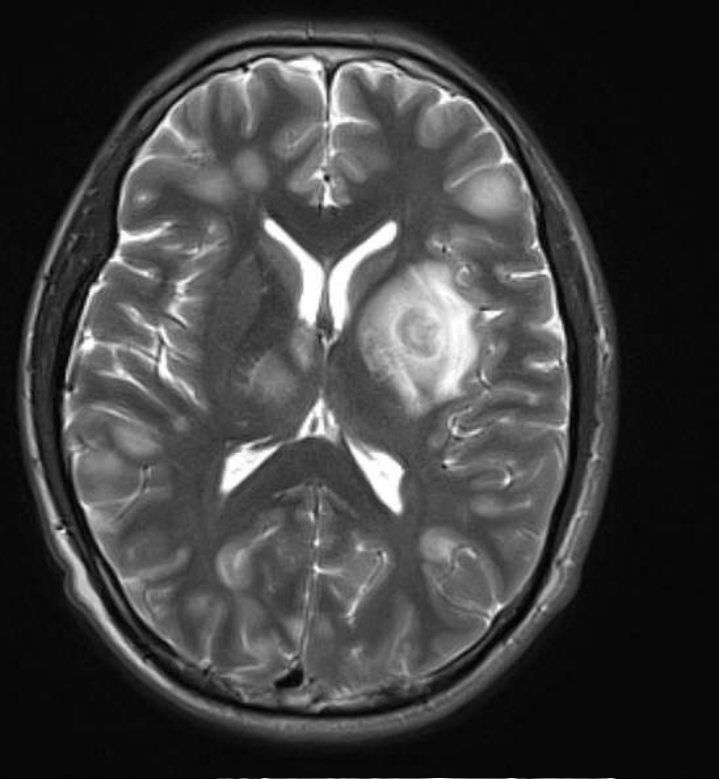
- Belirgin immünosupresyon ($CD4 < 100 \text{ hc/mm}^3$)
- Pozitif seroloji [TG IgG (+), PCR (+)]
- Yüksek oranda toksoplazmozisi düşündüren görüntüleme bulguları varsa ampirik tedavinin başlaması için yeterlidir.



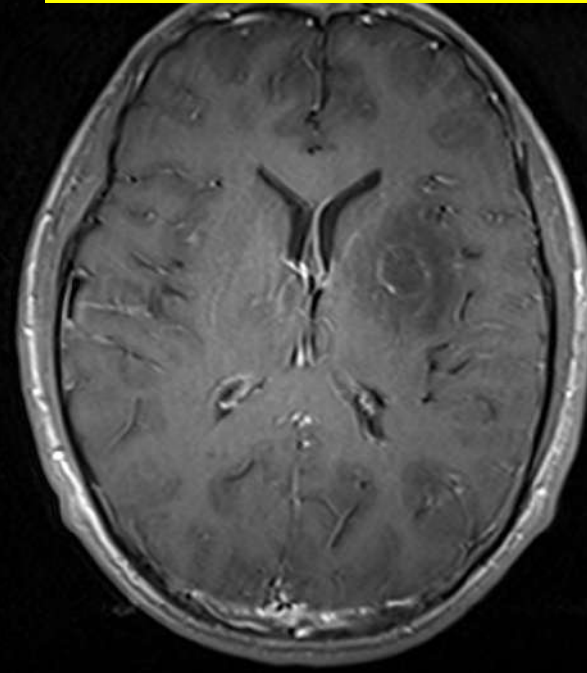
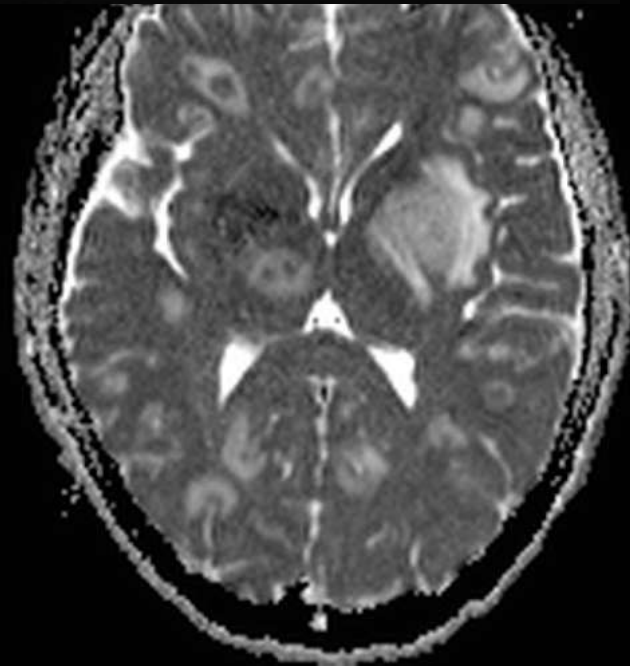
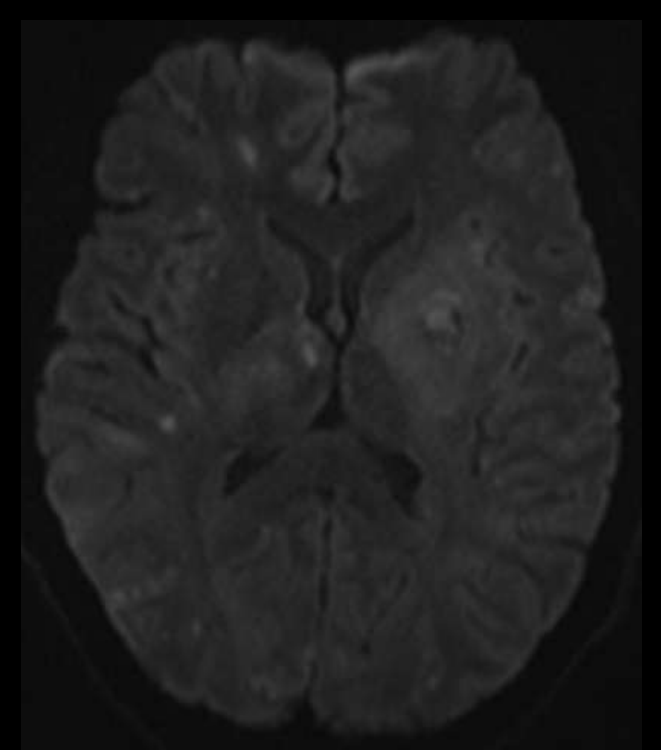
Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher



Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher

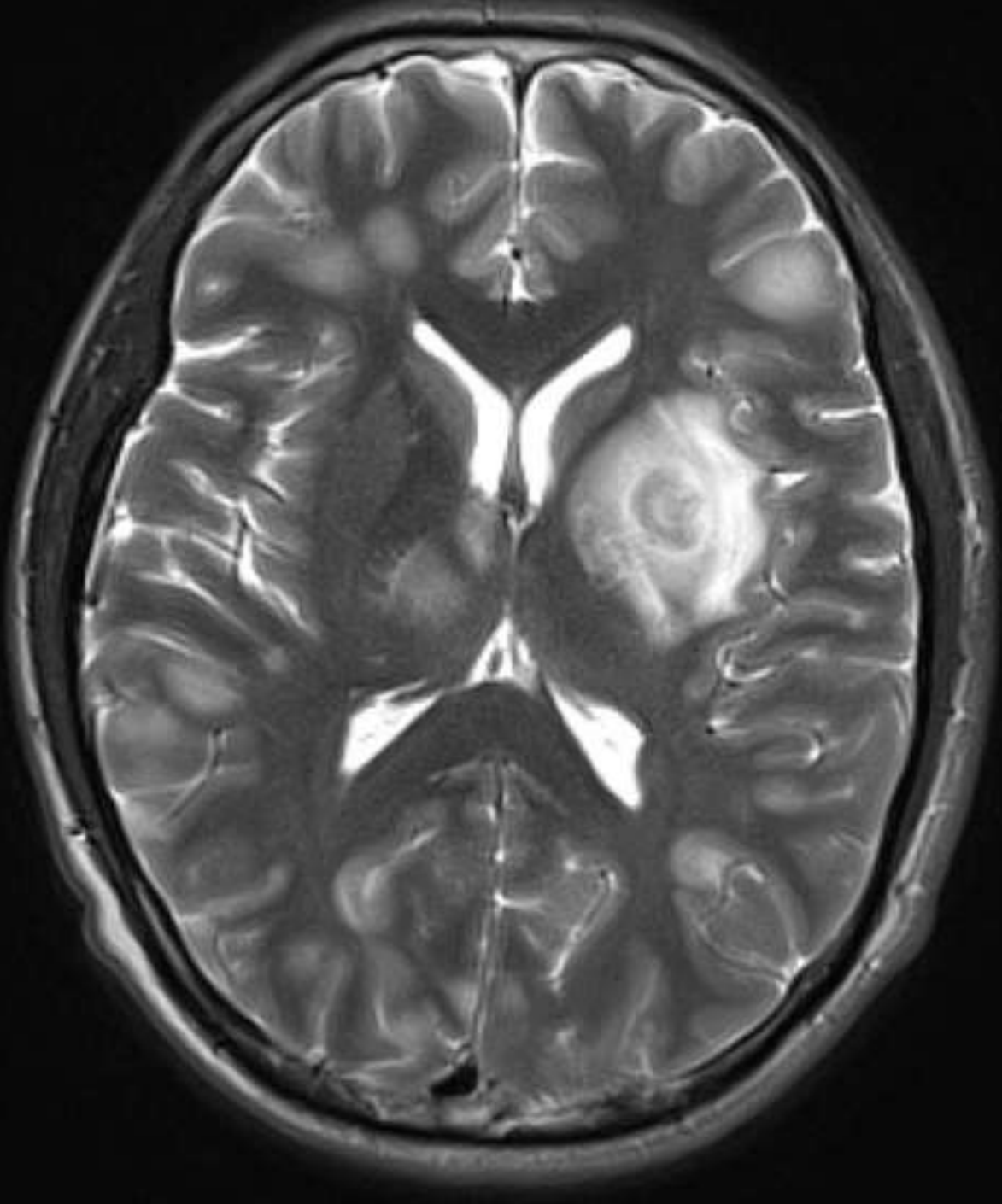


Toksoplazmzis



Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher

Toksoplazmozis
Konsantrik
hedef işareti



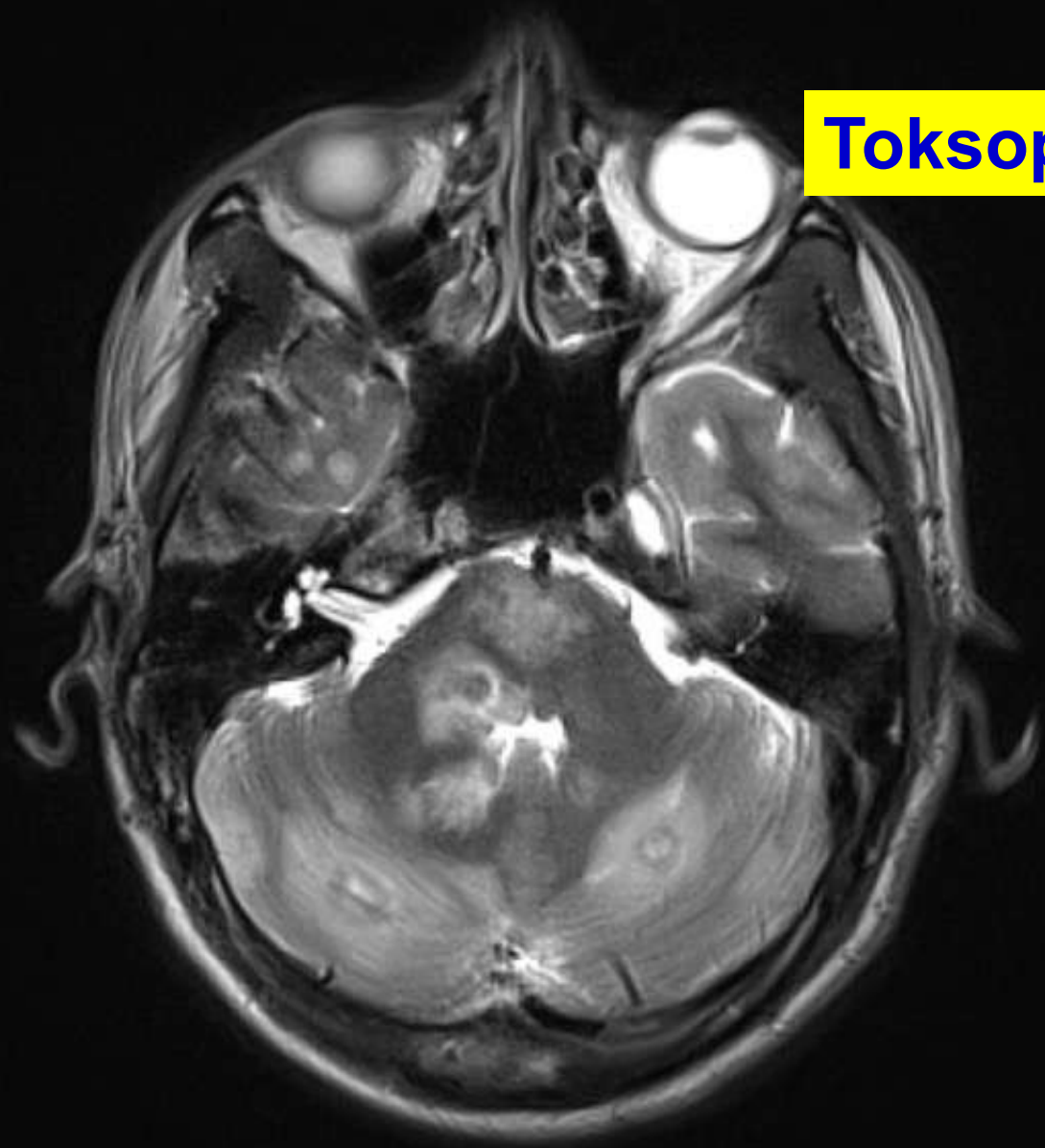
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Konsantrik
hedef işareti**

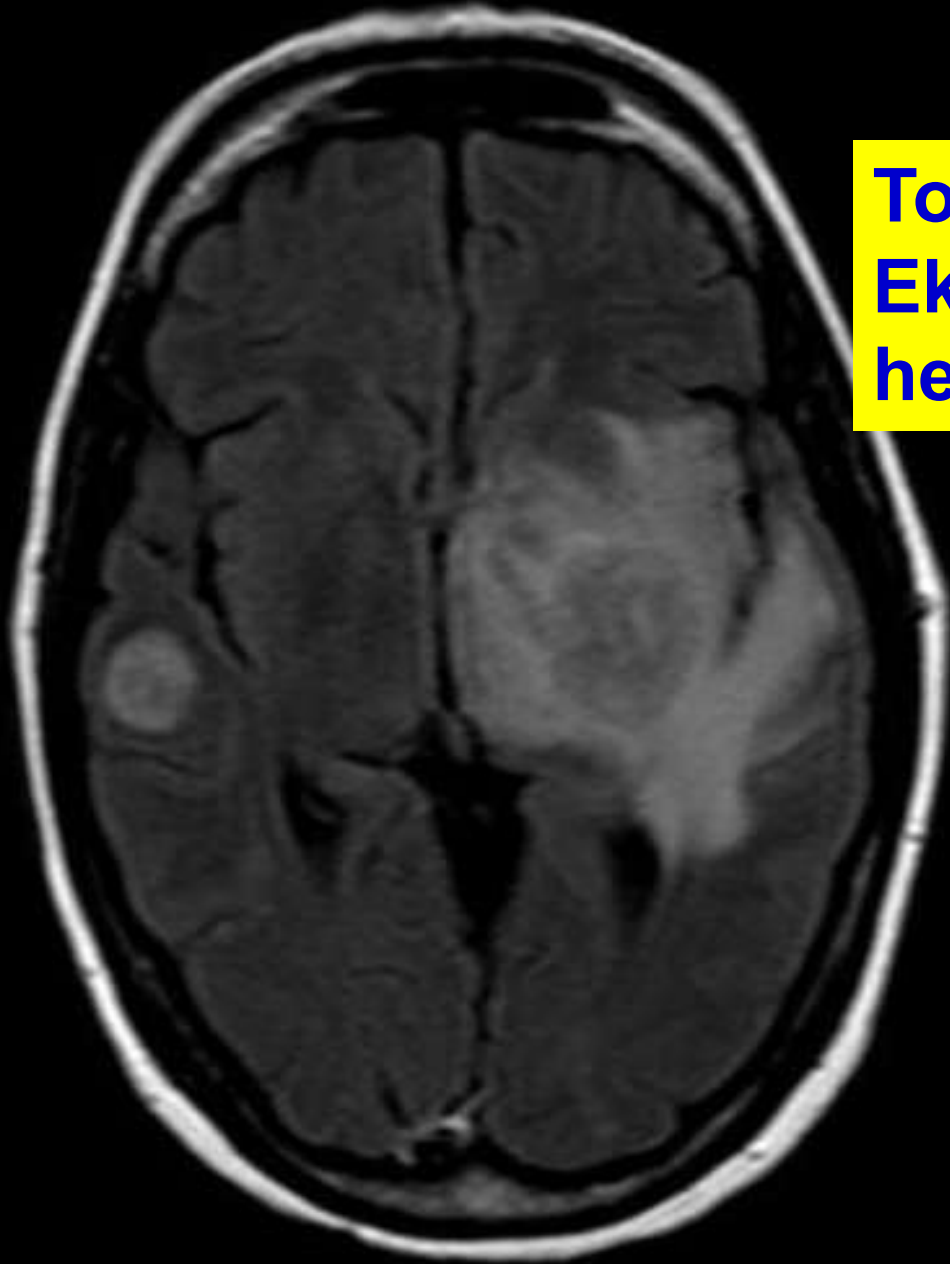


**Toksoplazmozis
Konsantrik
hedef işareti**

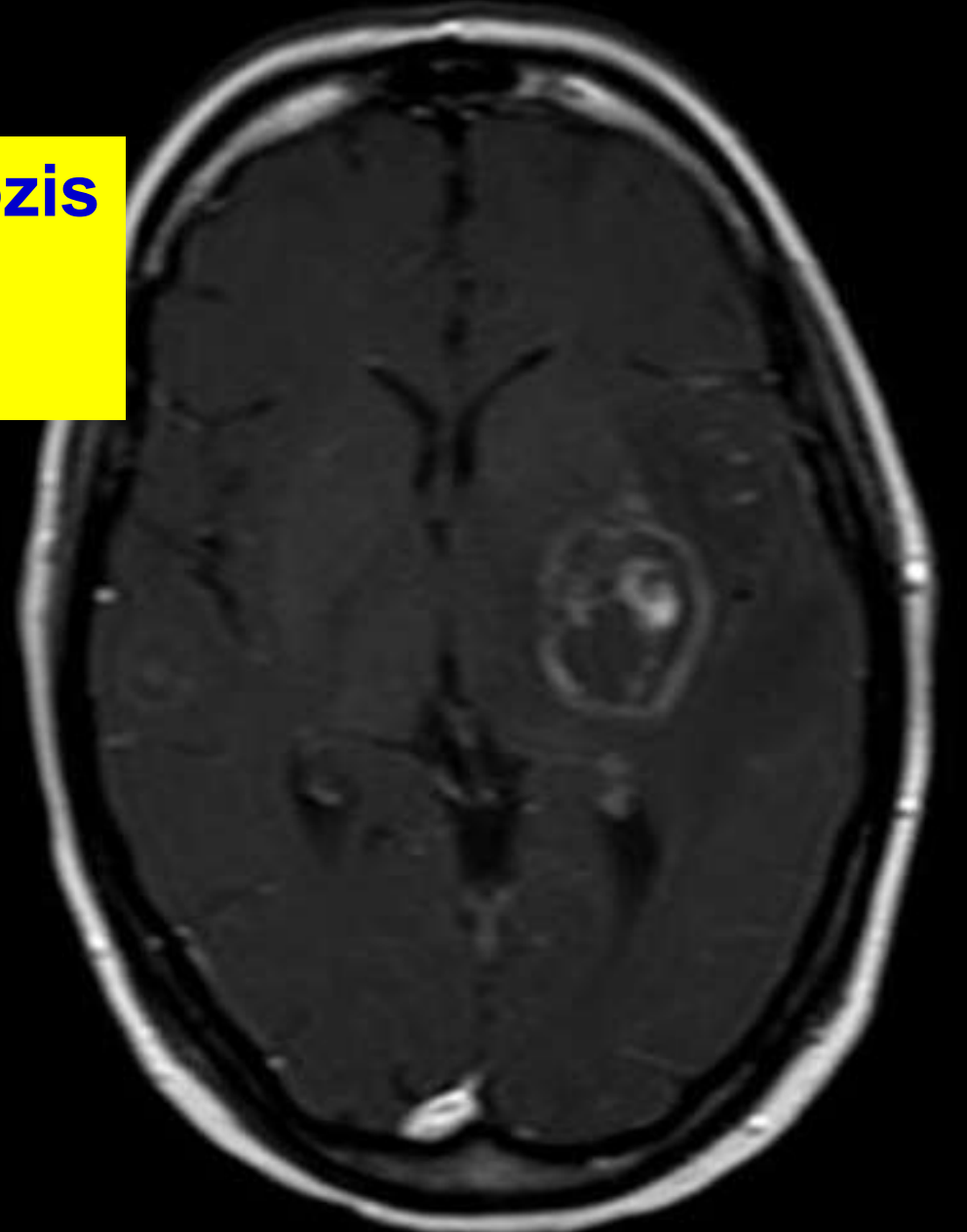


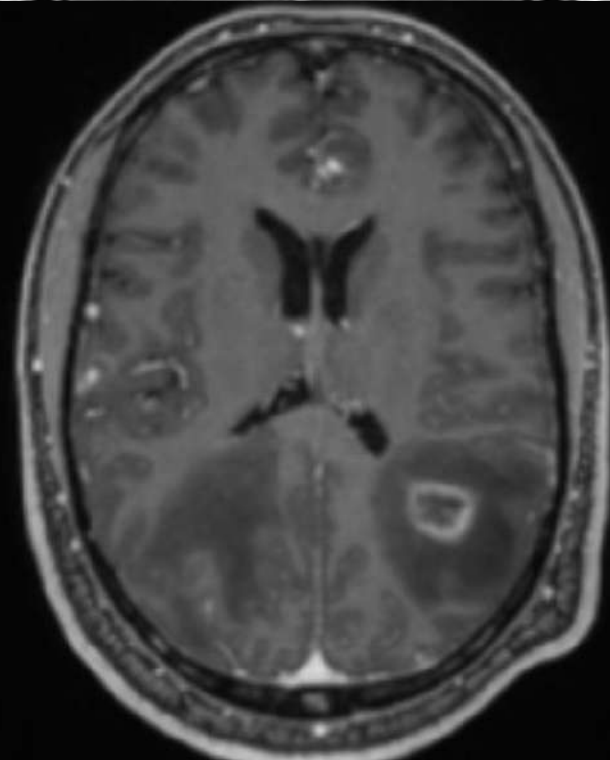
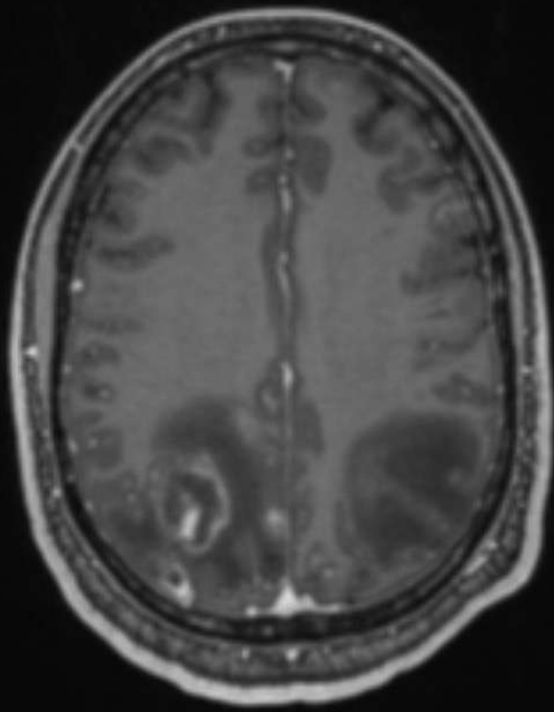
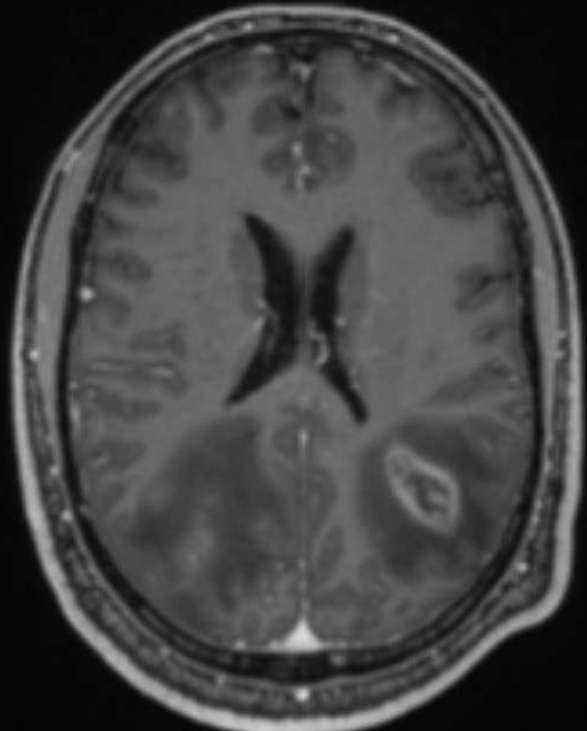
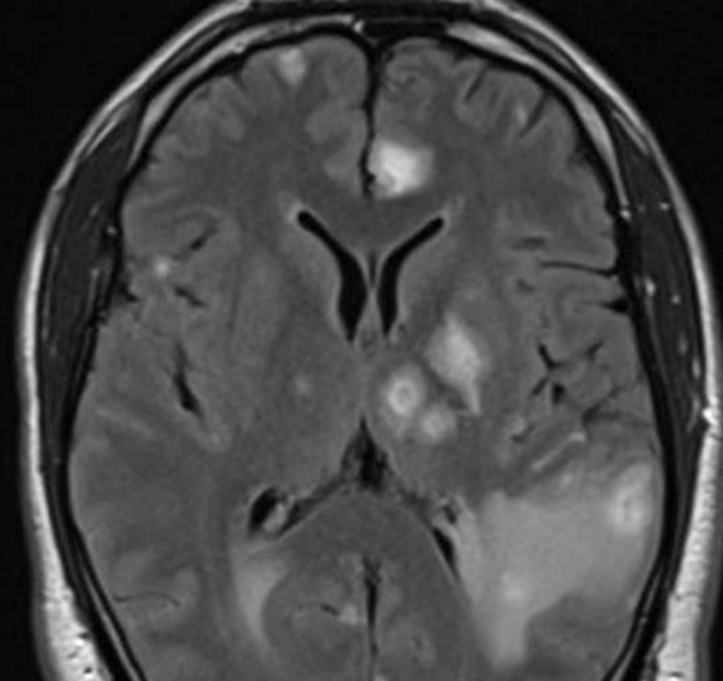
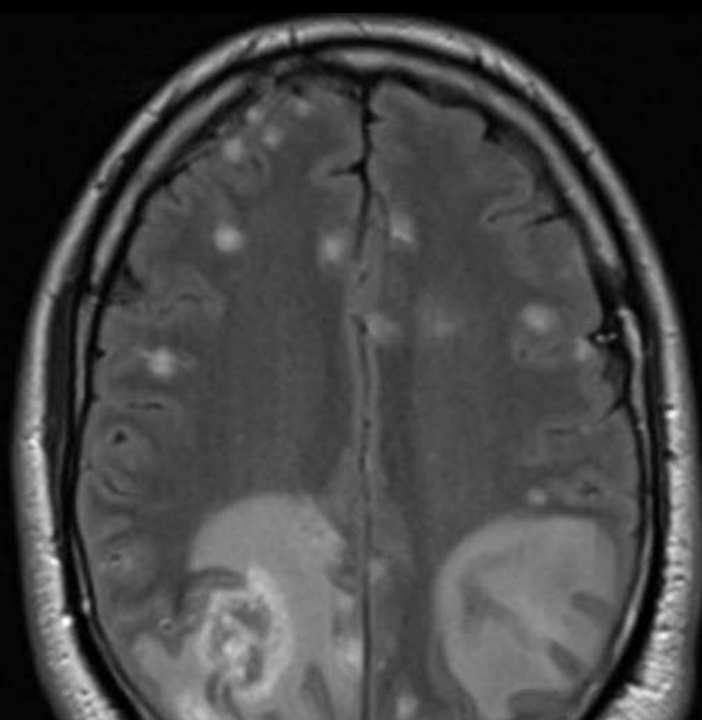
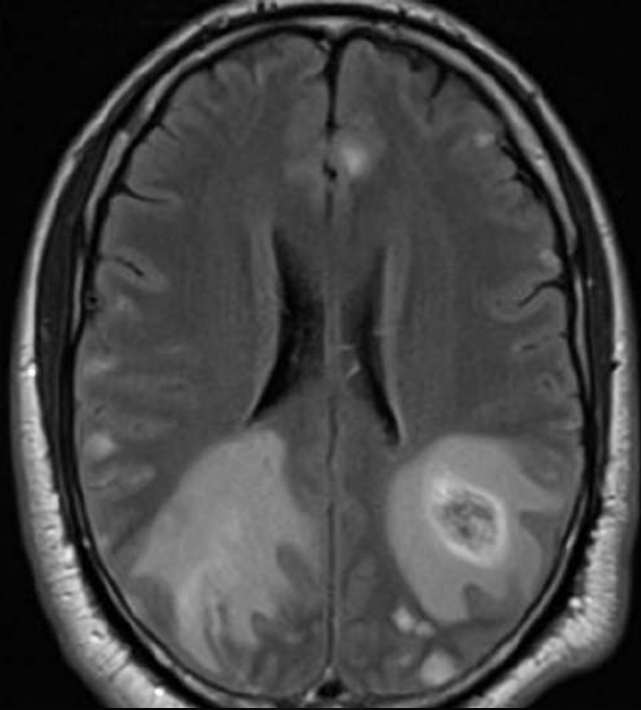
Toksoplazmozis



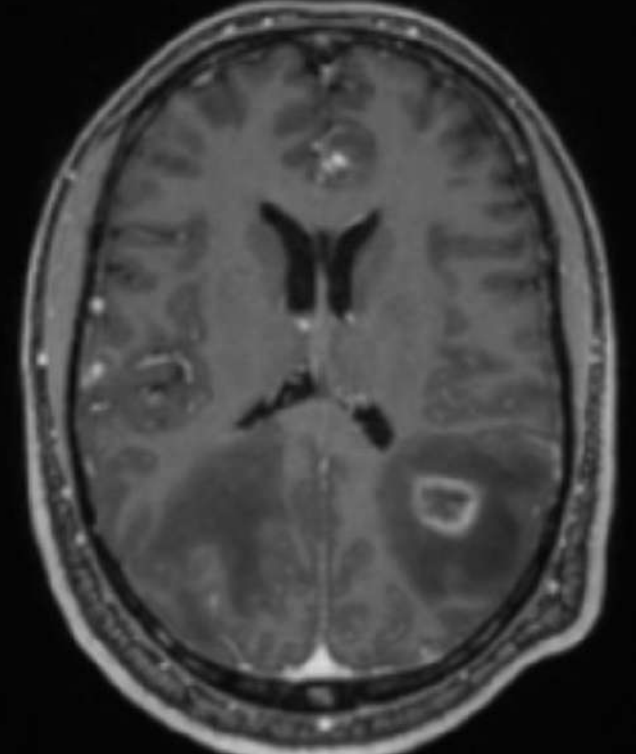
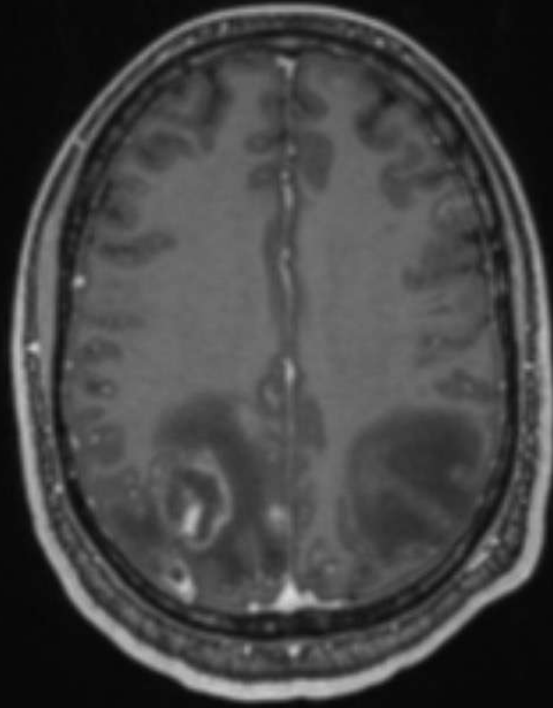
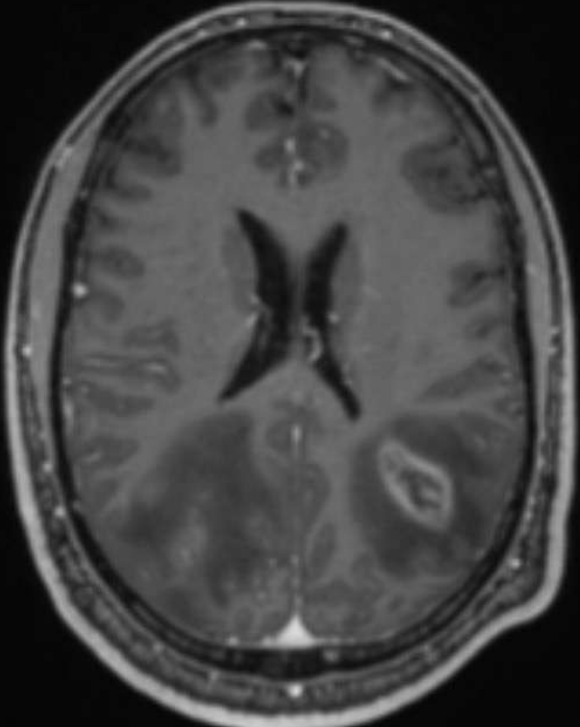
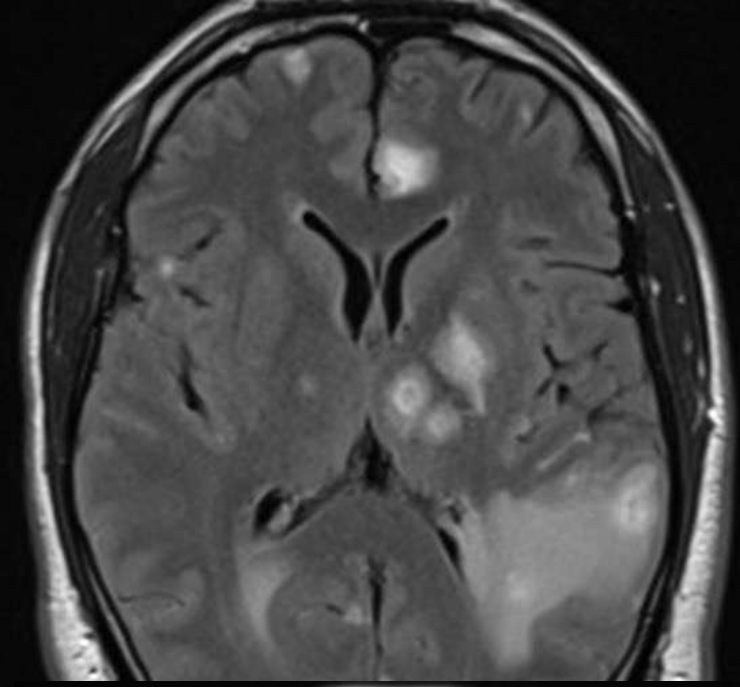
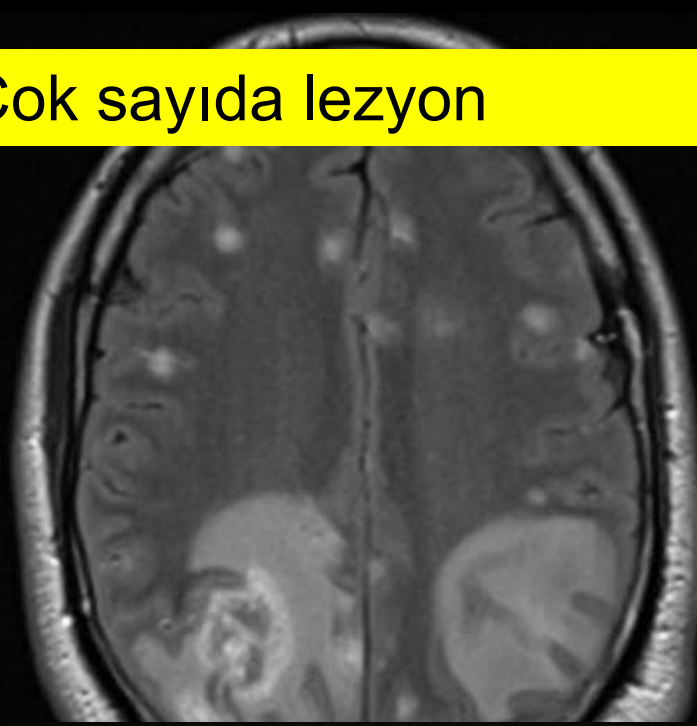
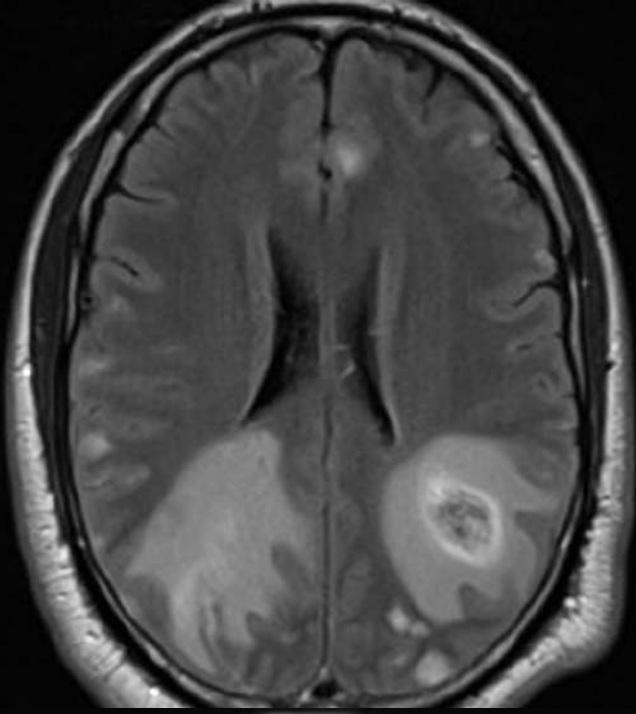


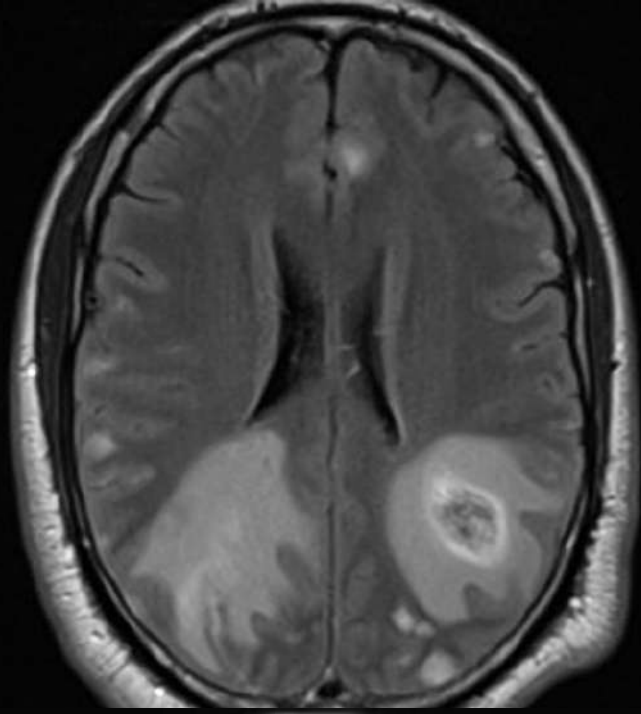
**Toksoplazmozis
Eksantrik
hedef işareti**



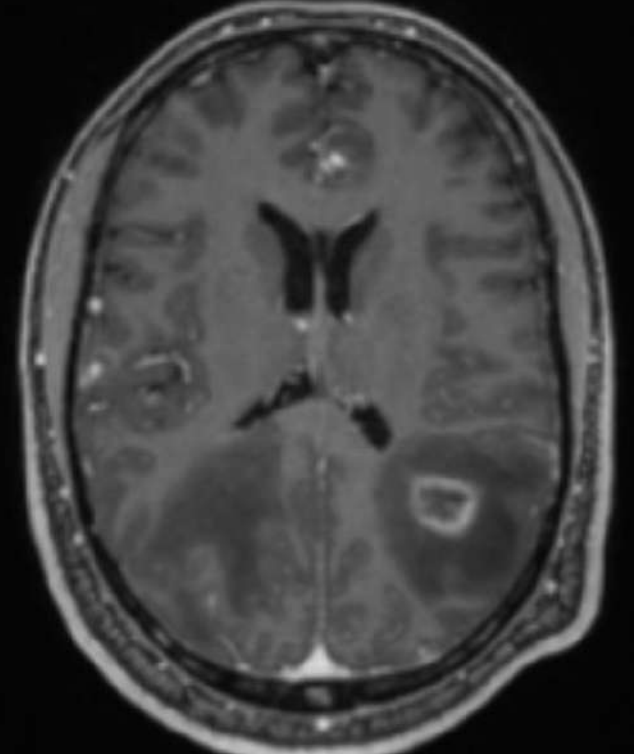
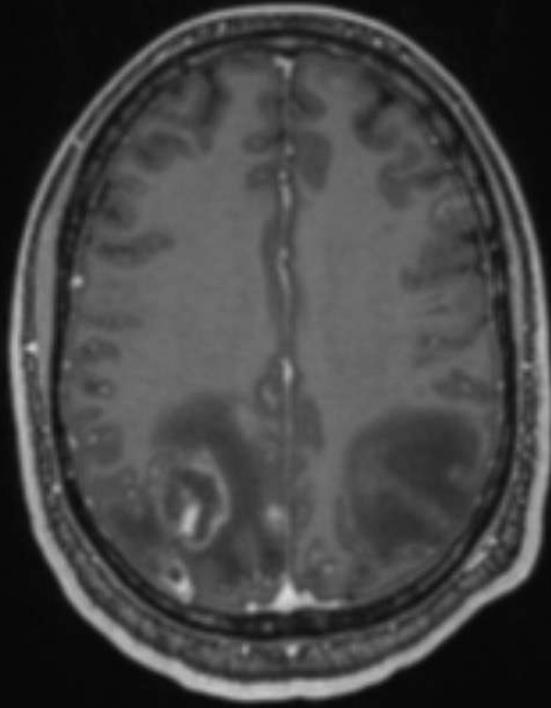
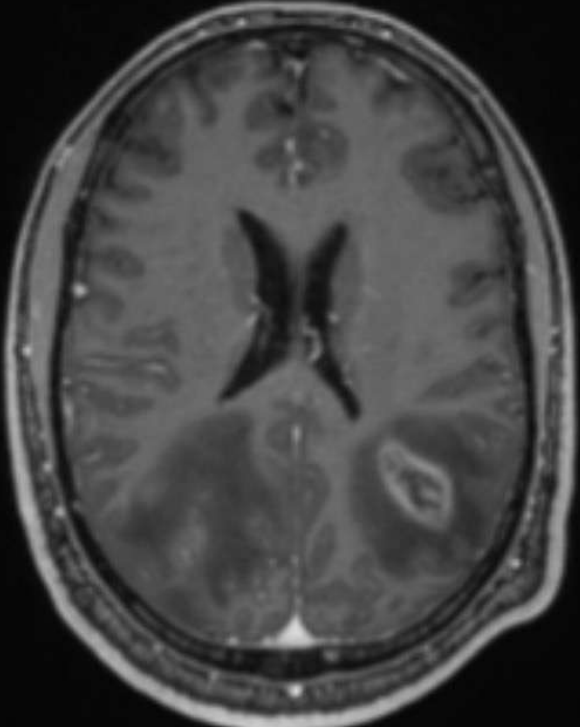
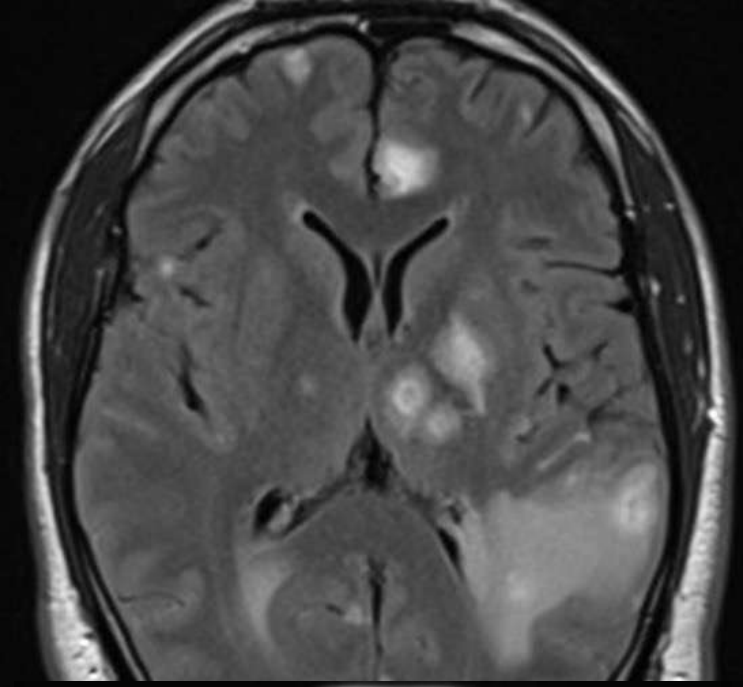
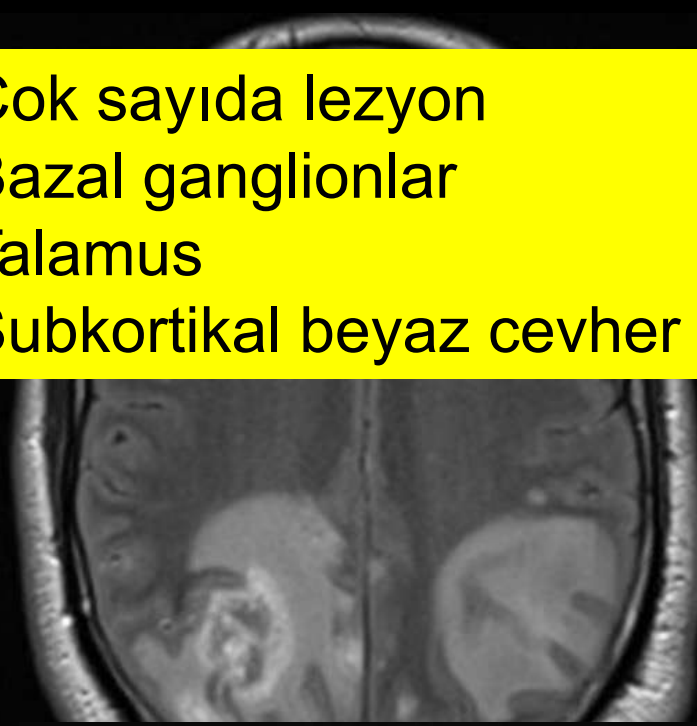


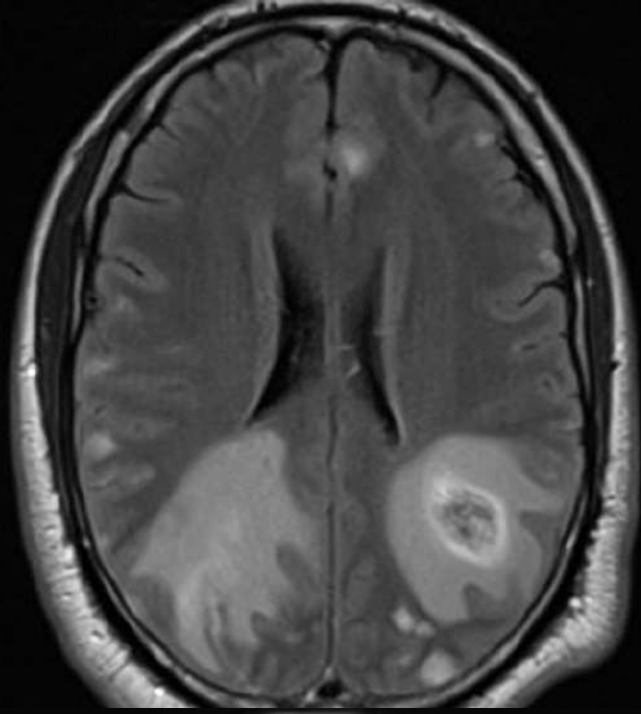
Çok sayıda lezyon



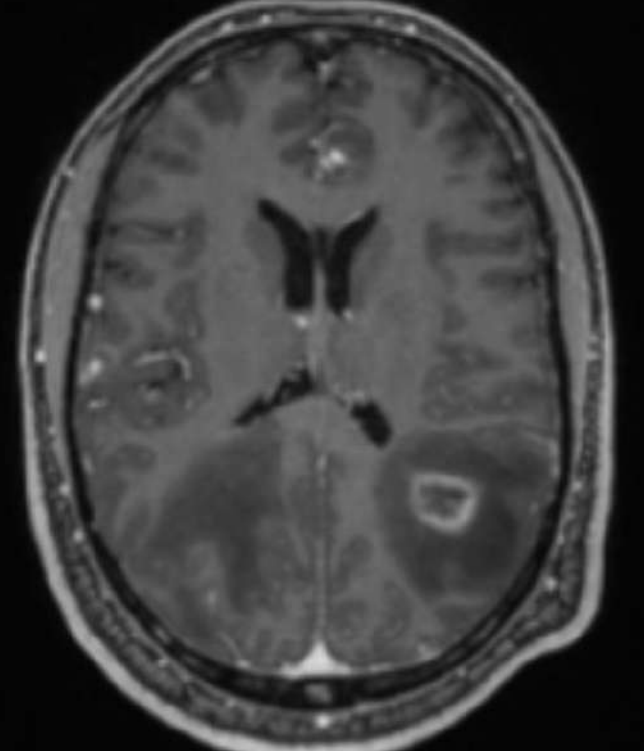
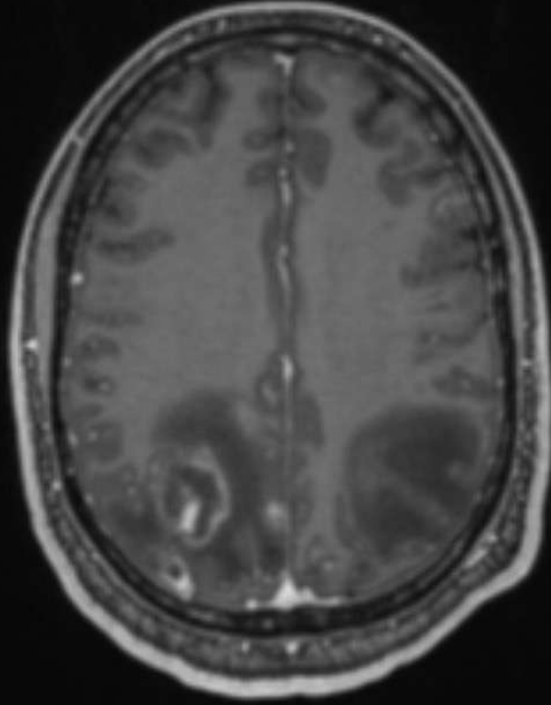
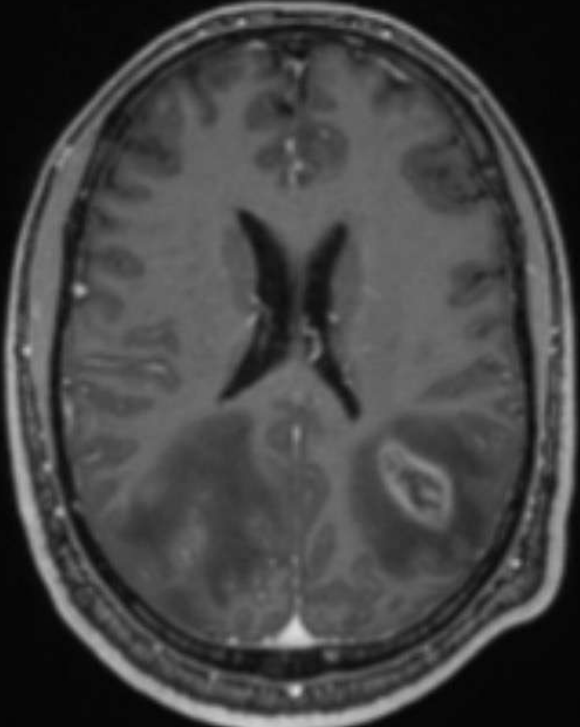
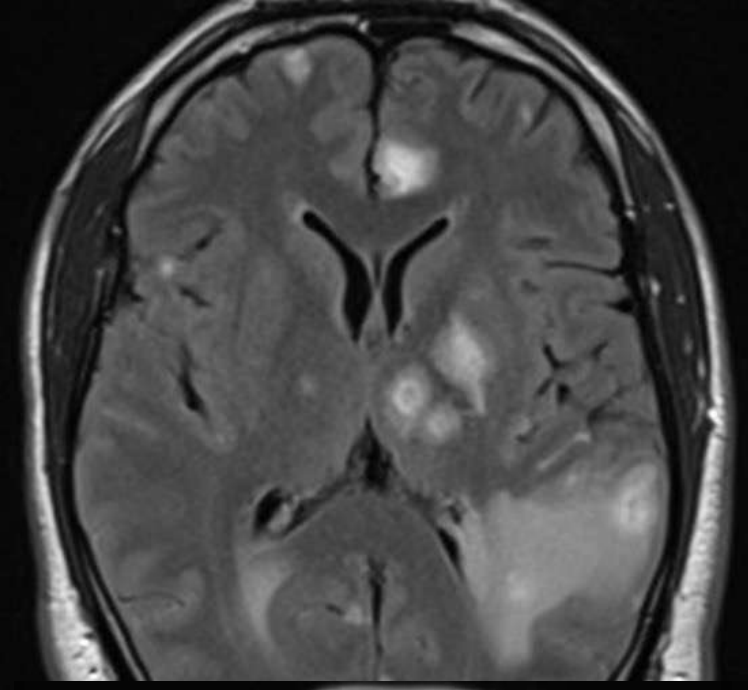
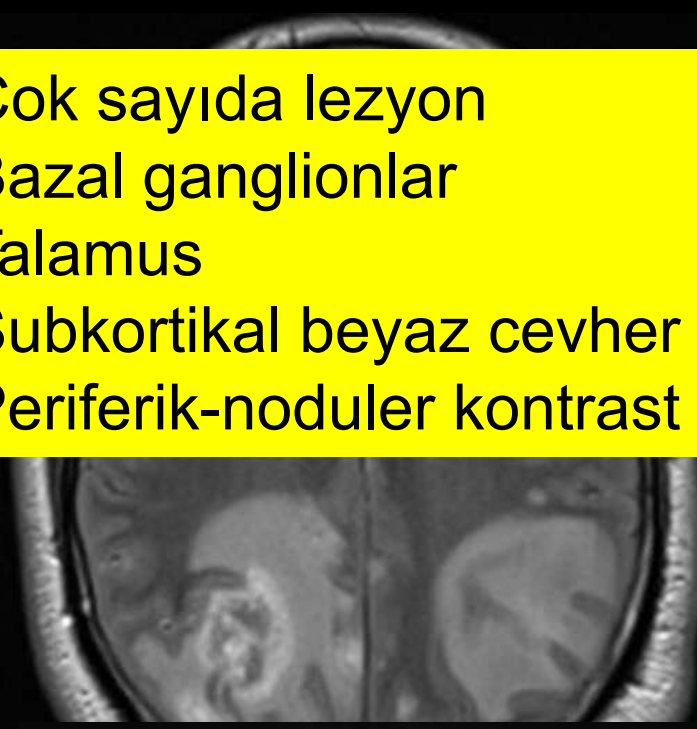


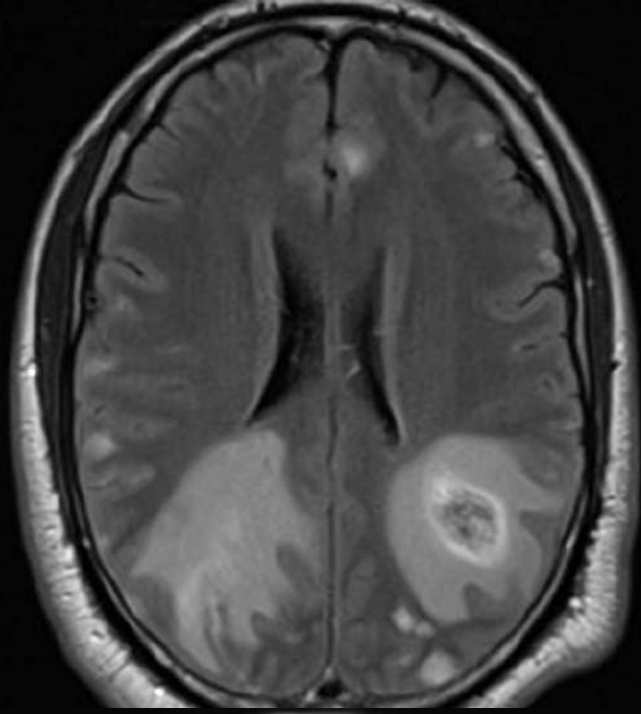
Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher



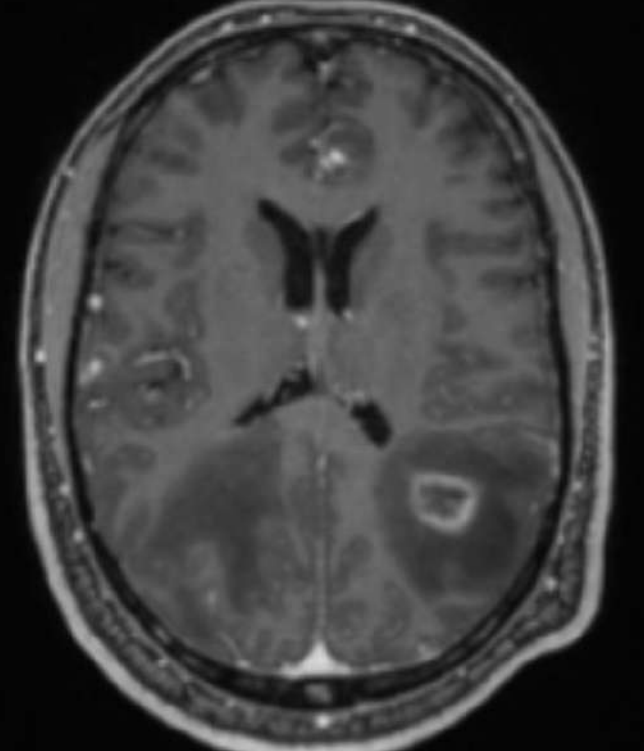
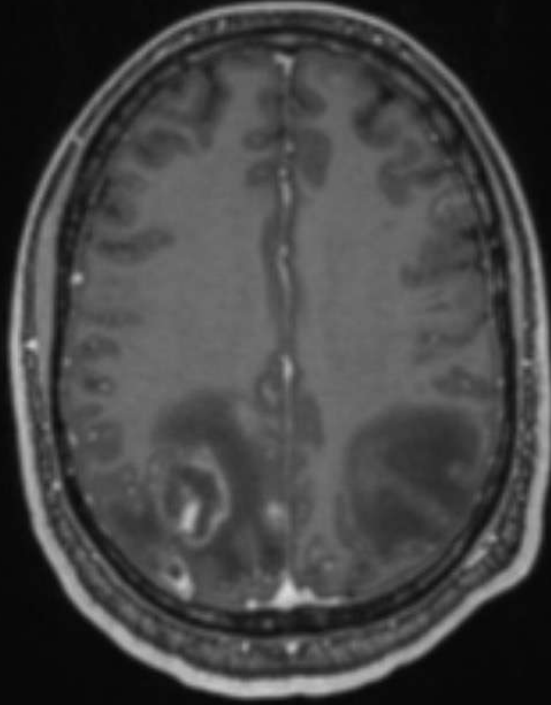
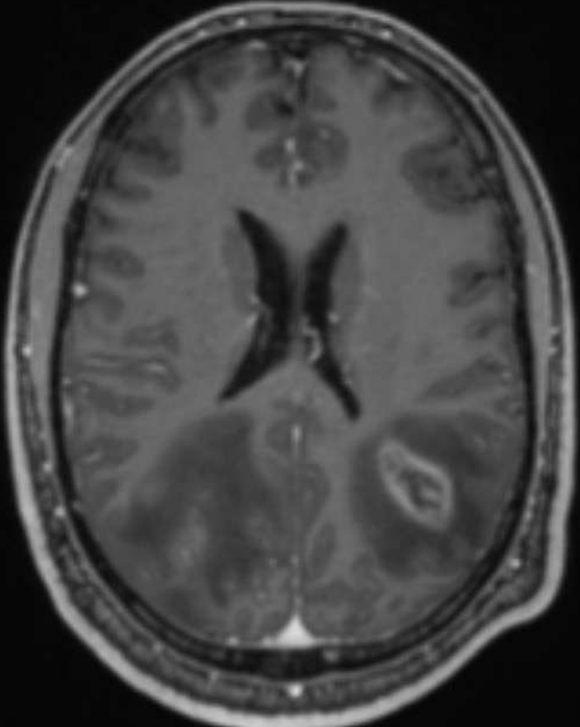
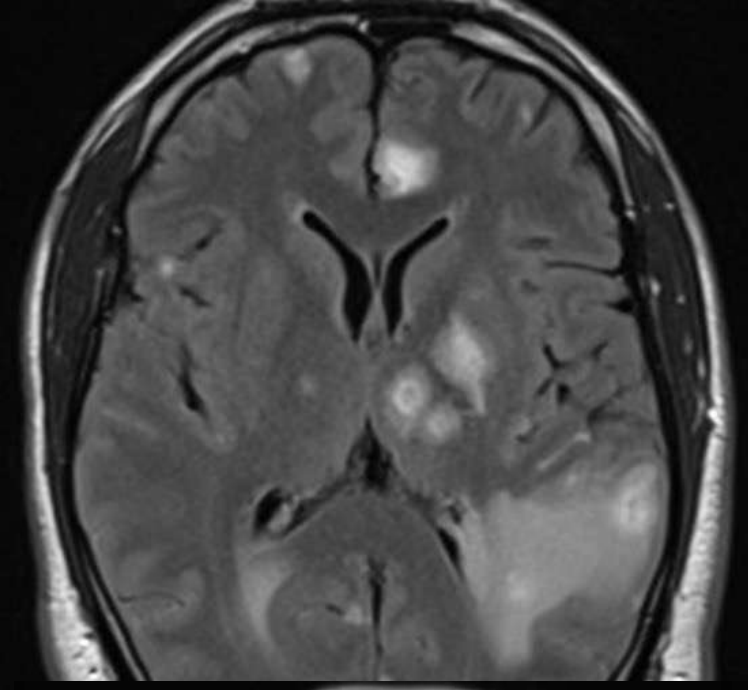


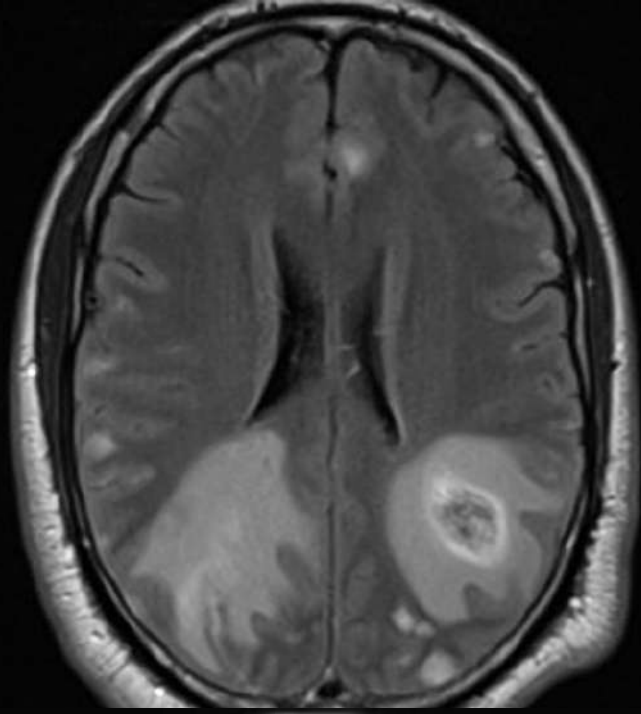
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Periferik-noduler kontrast



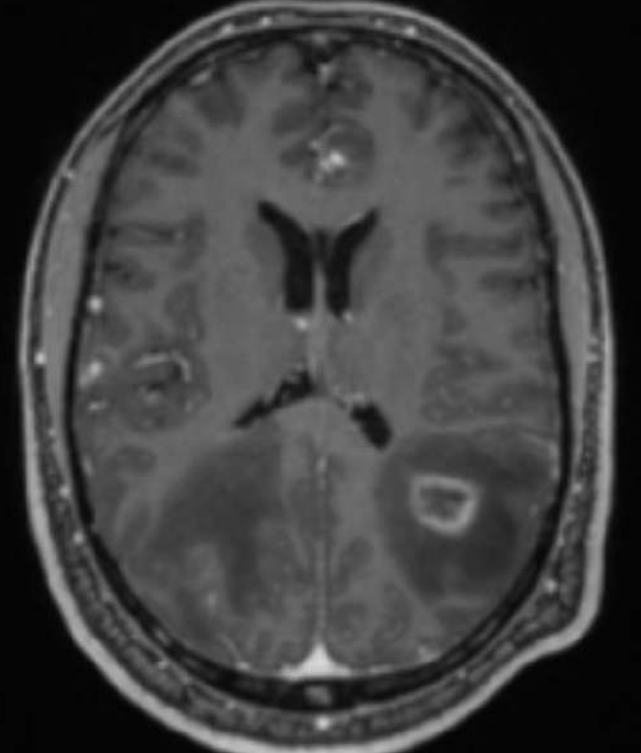
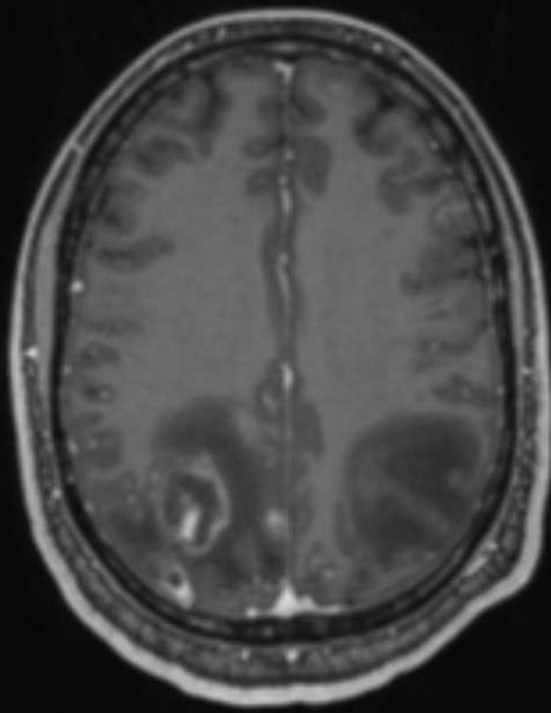
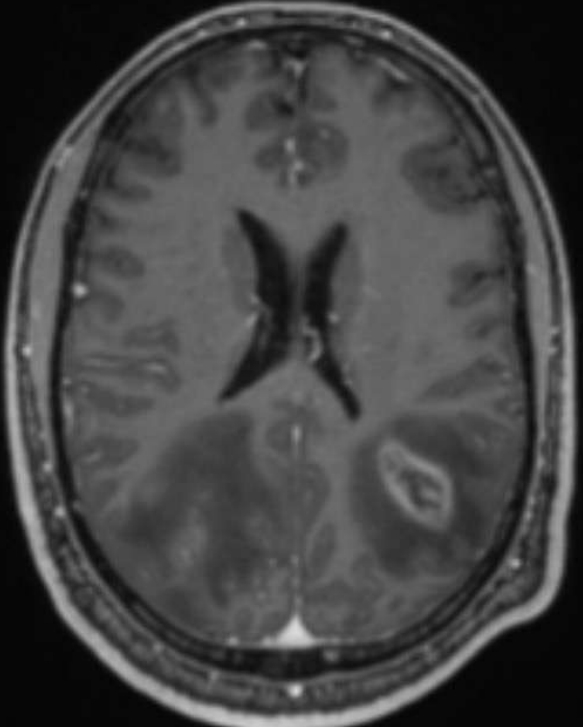
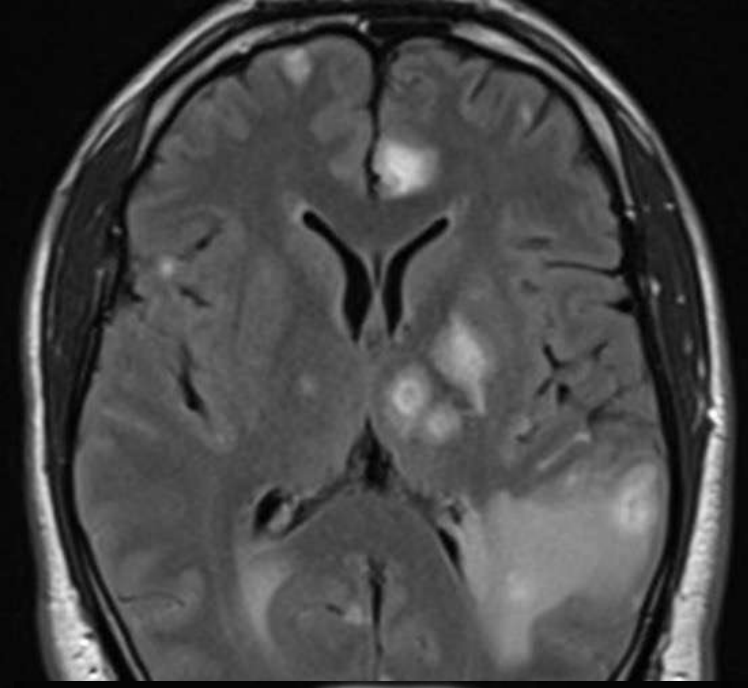
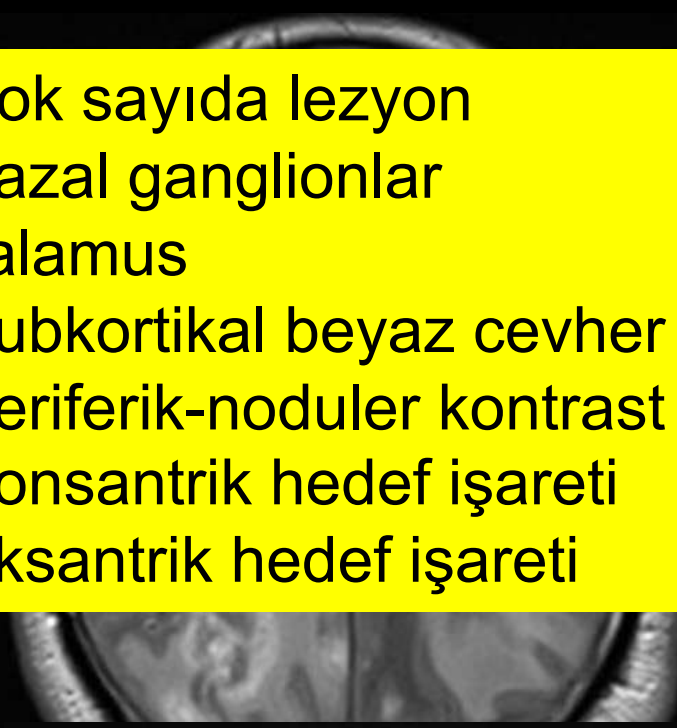


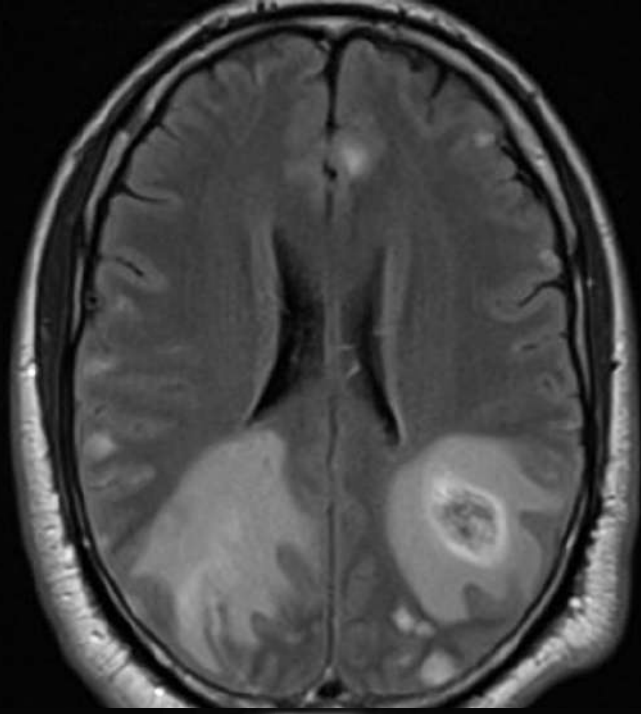
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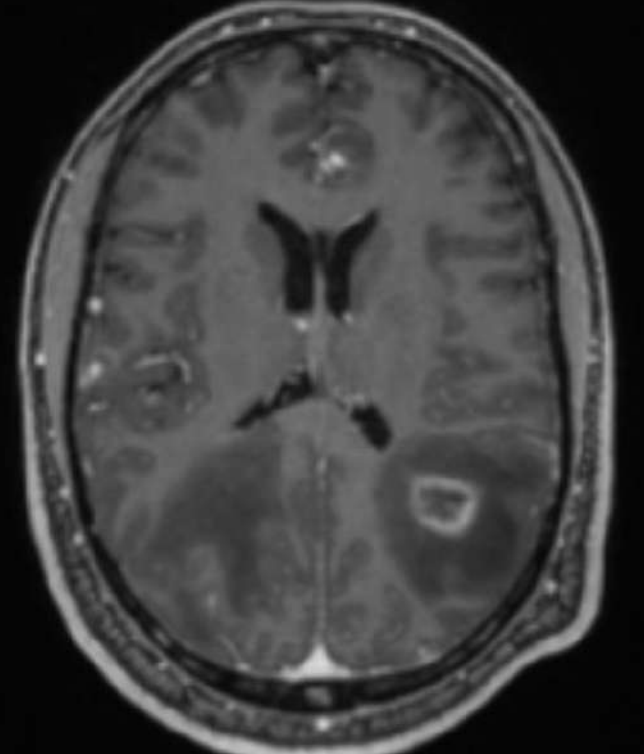
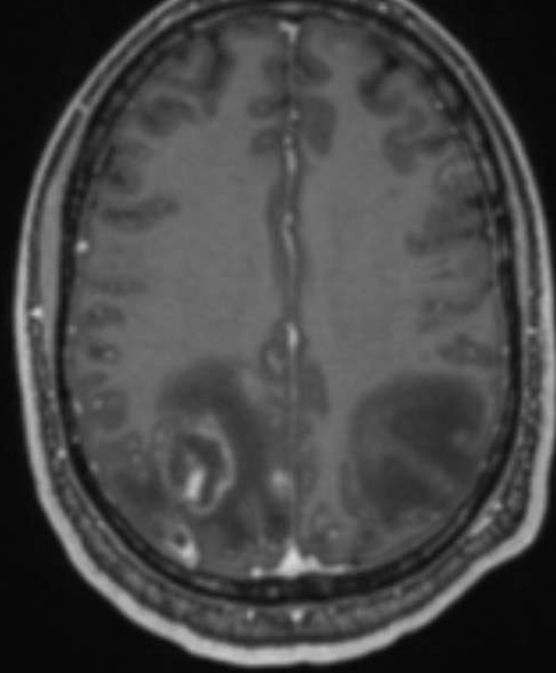
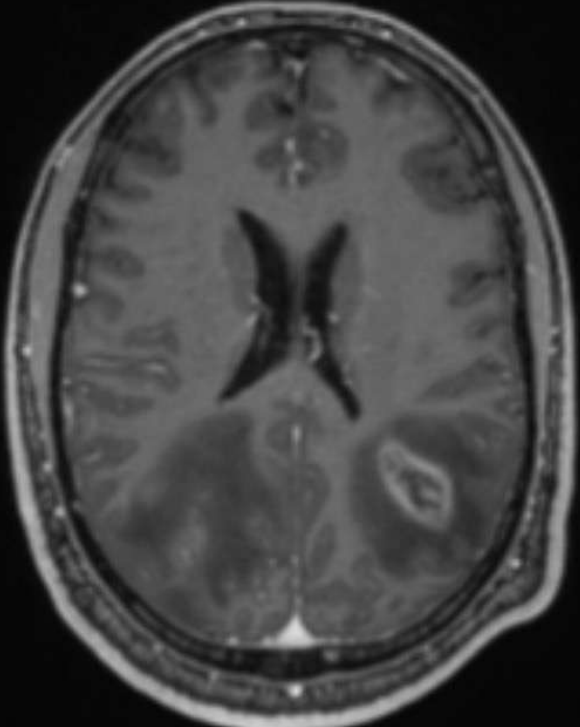
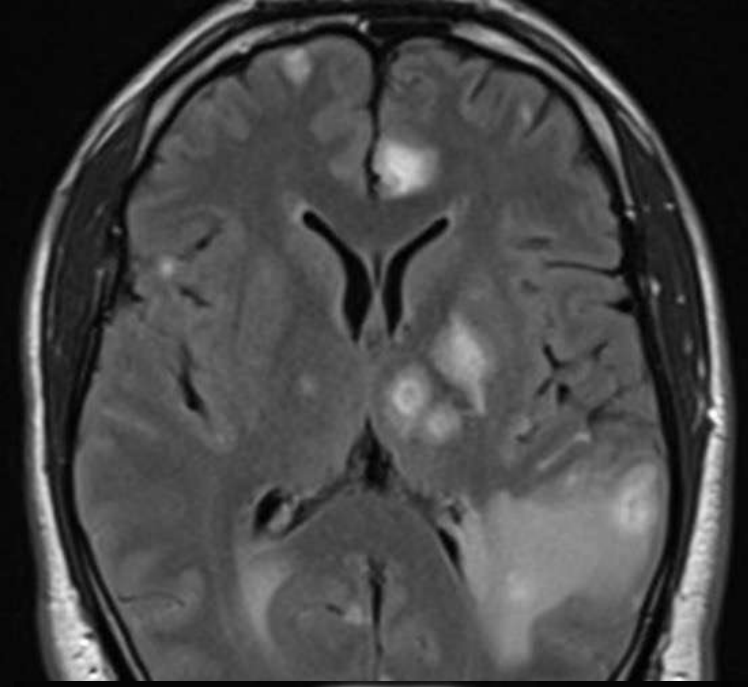
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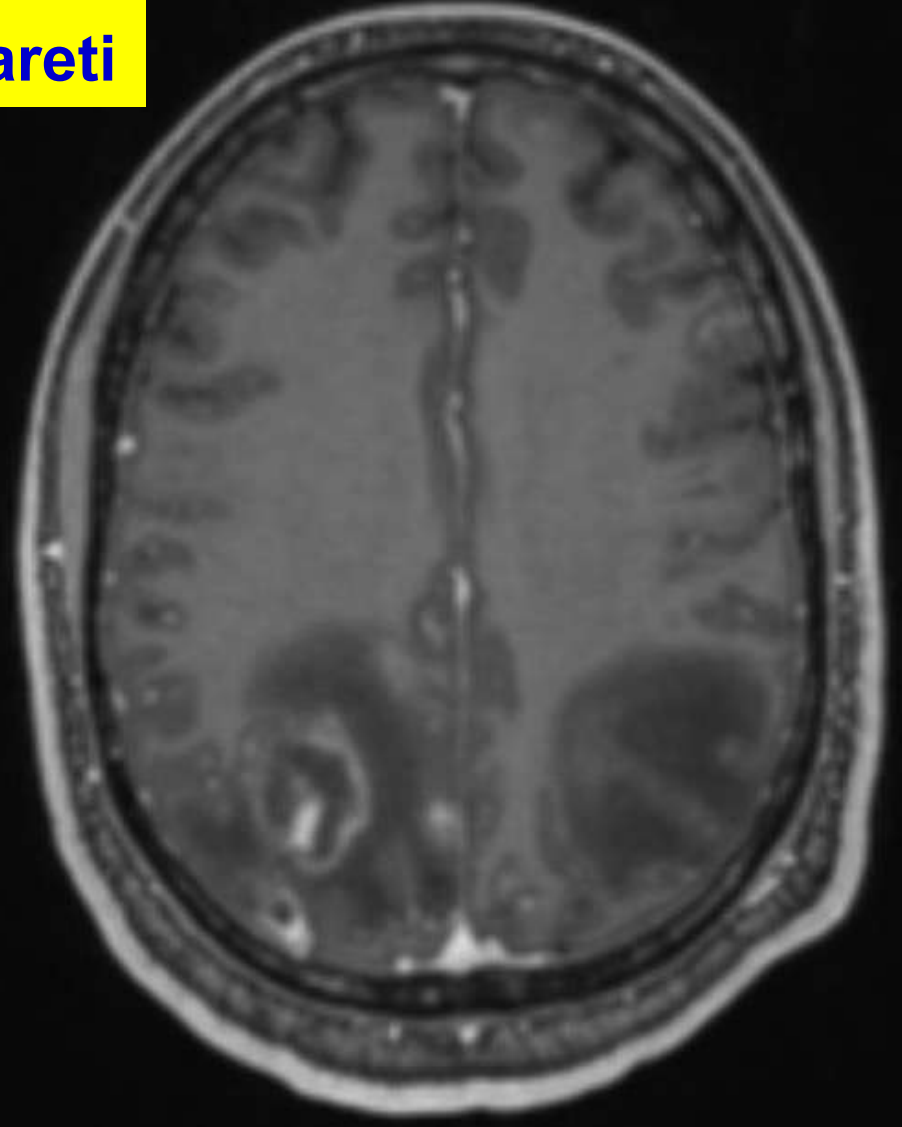
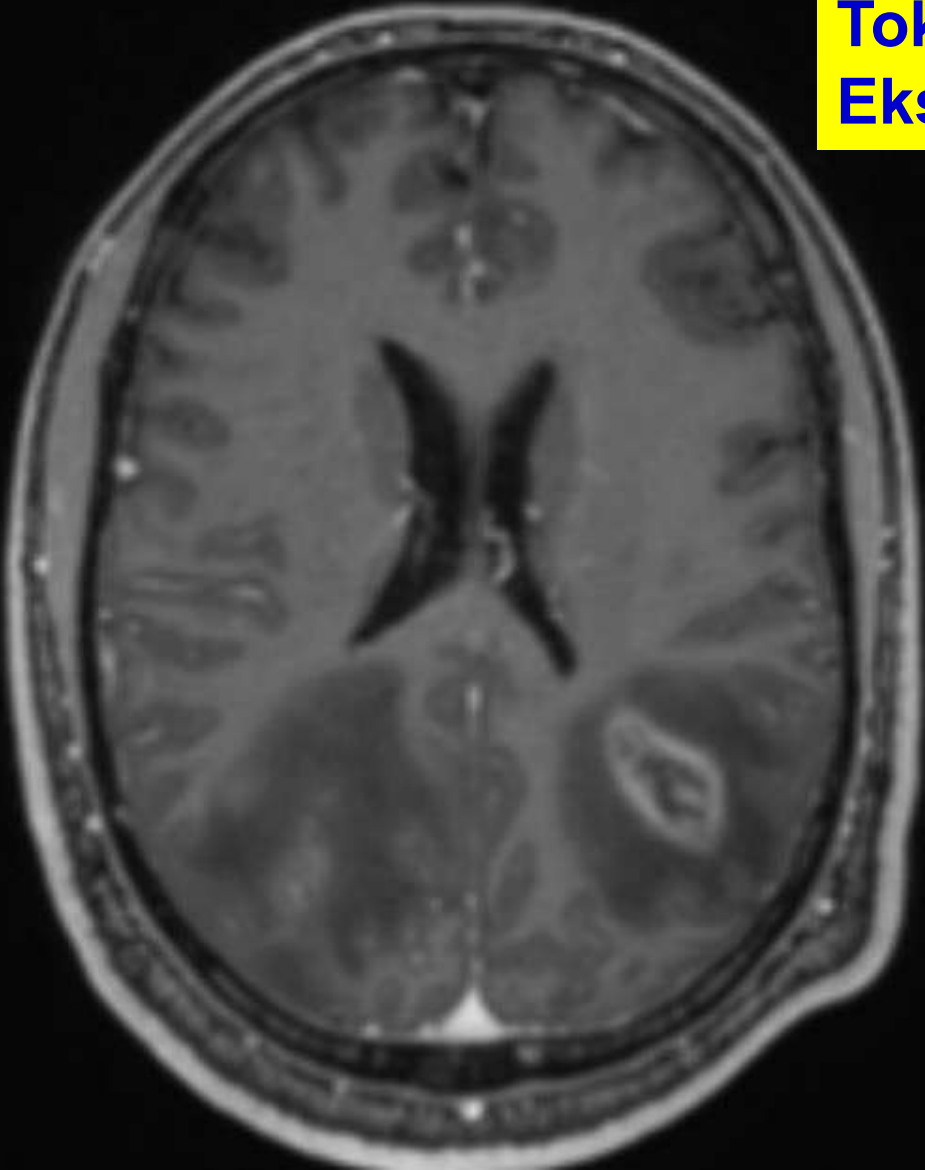


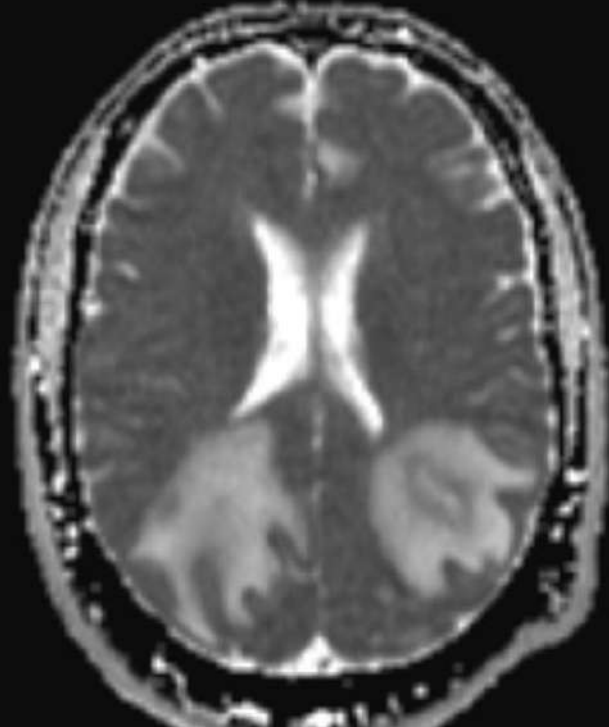
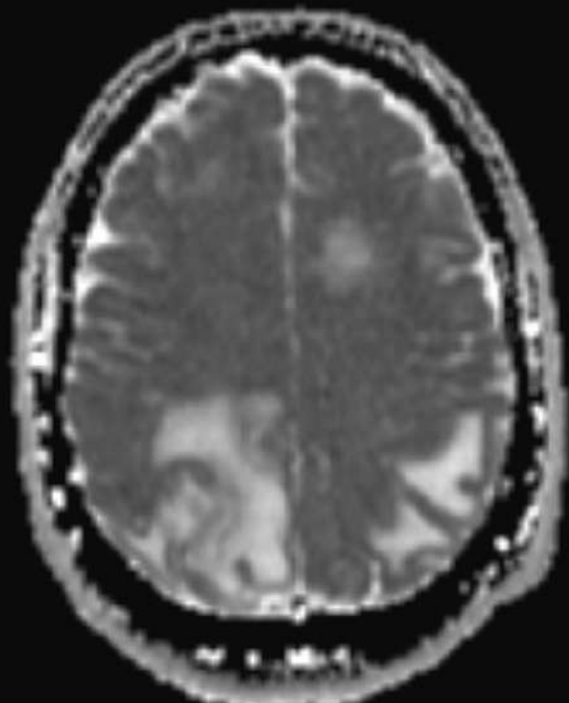
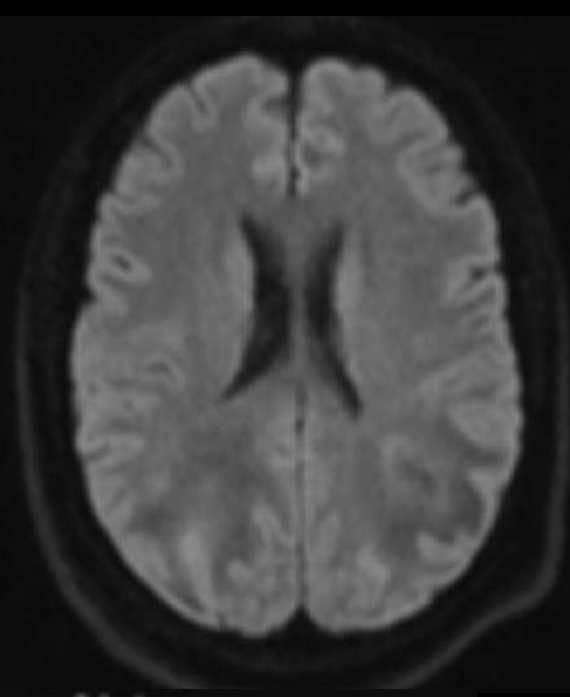
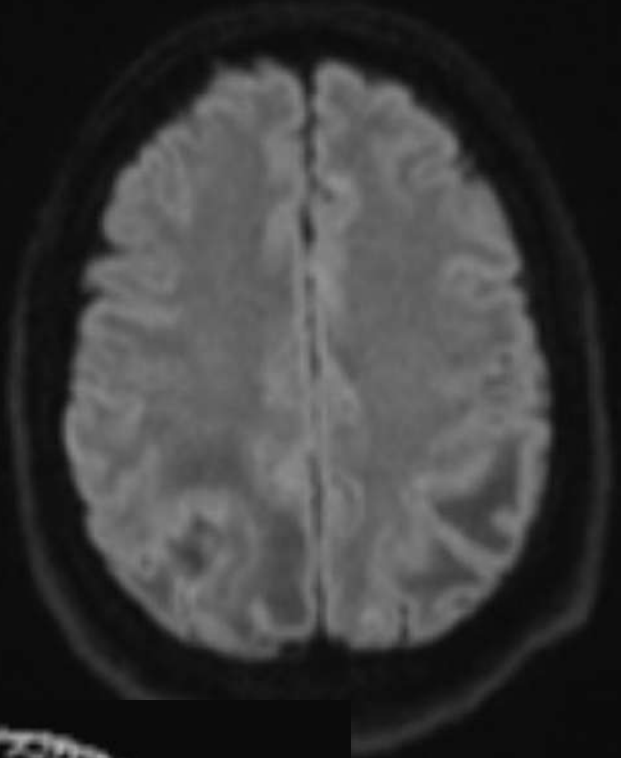
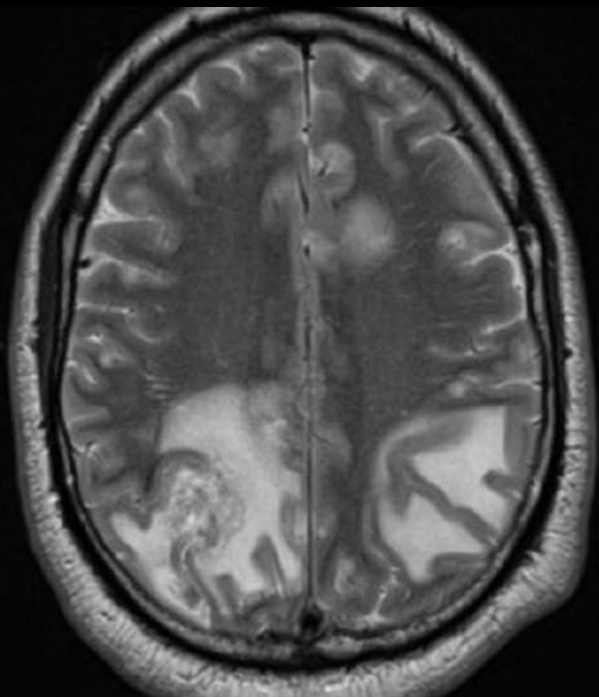
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Eksantrik hedef işareti

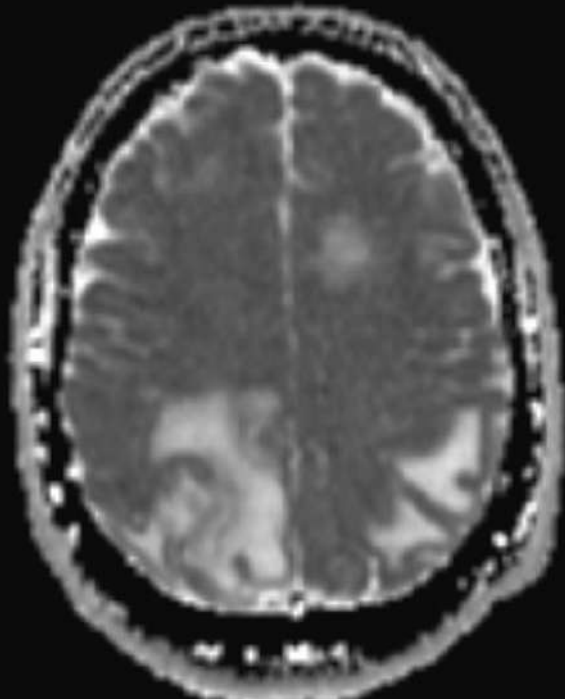
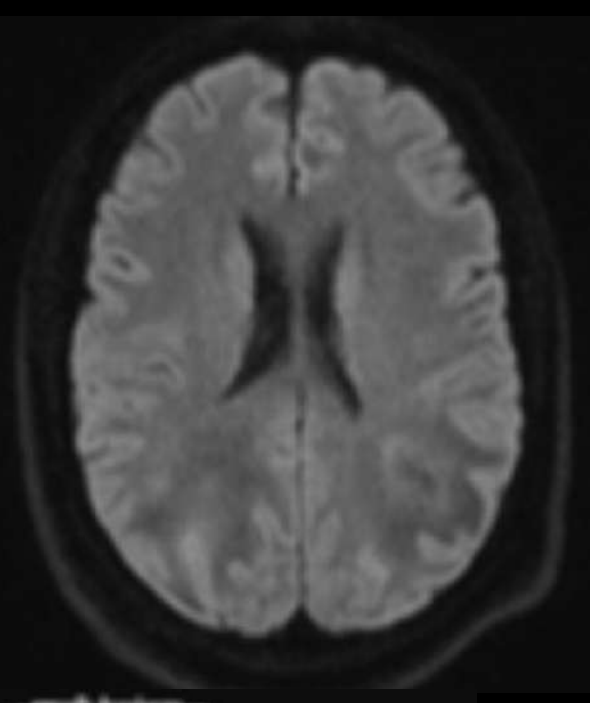
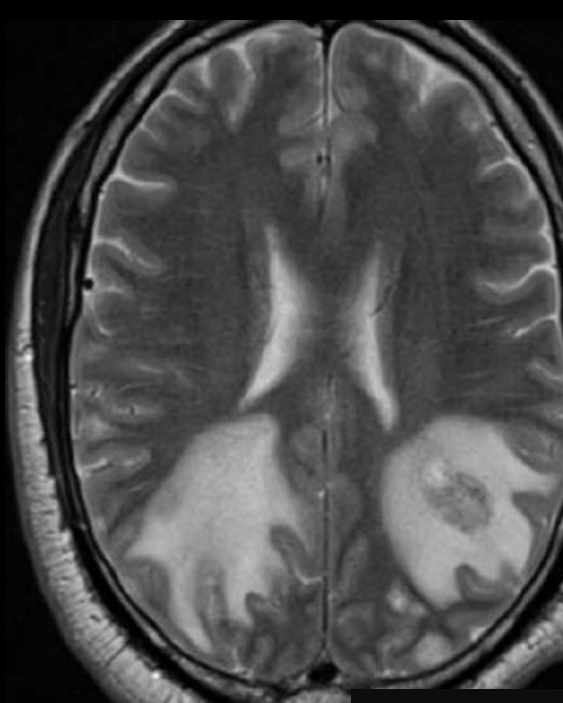
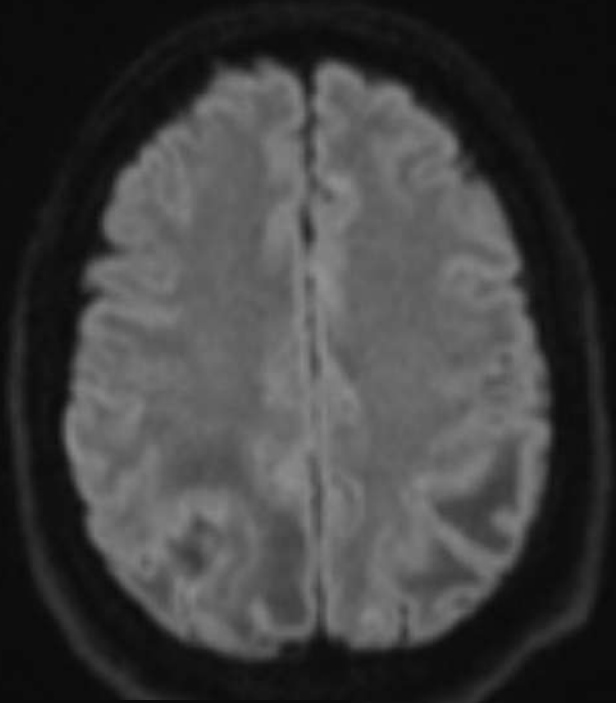
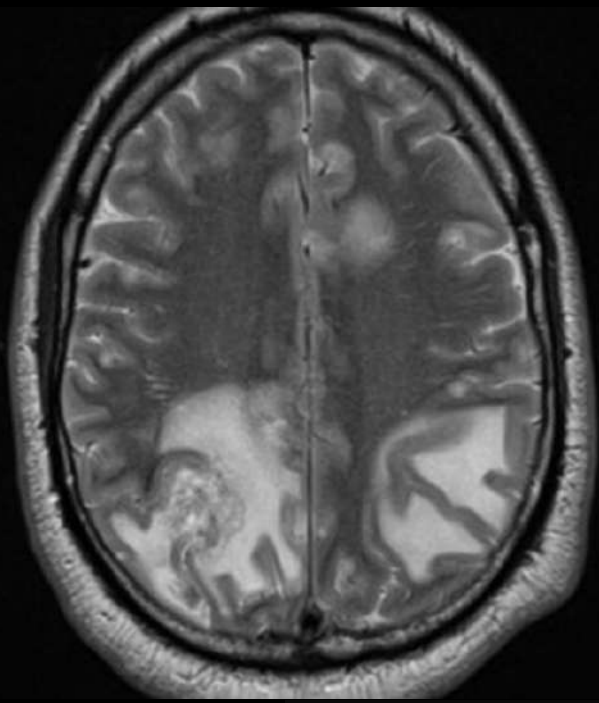
TOKSOPLAZMOZİS



Toksoplazmozis
Eksantrik hedef işareti





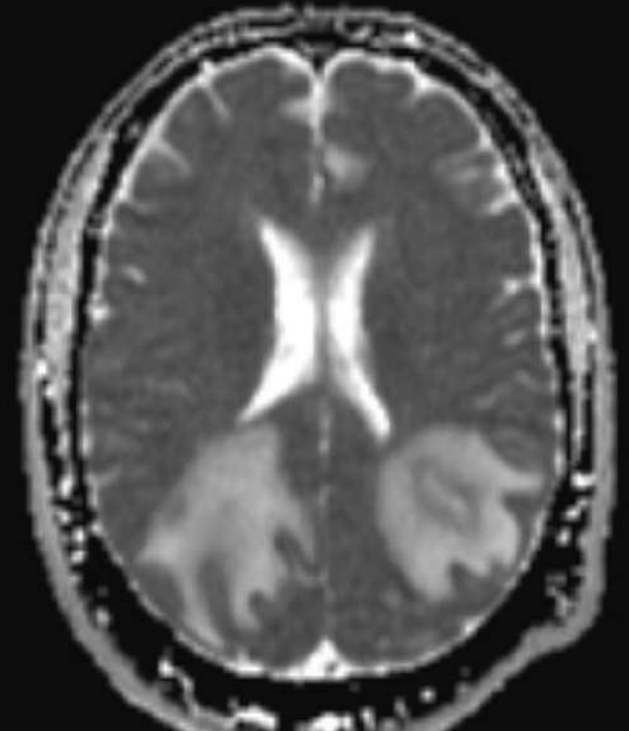


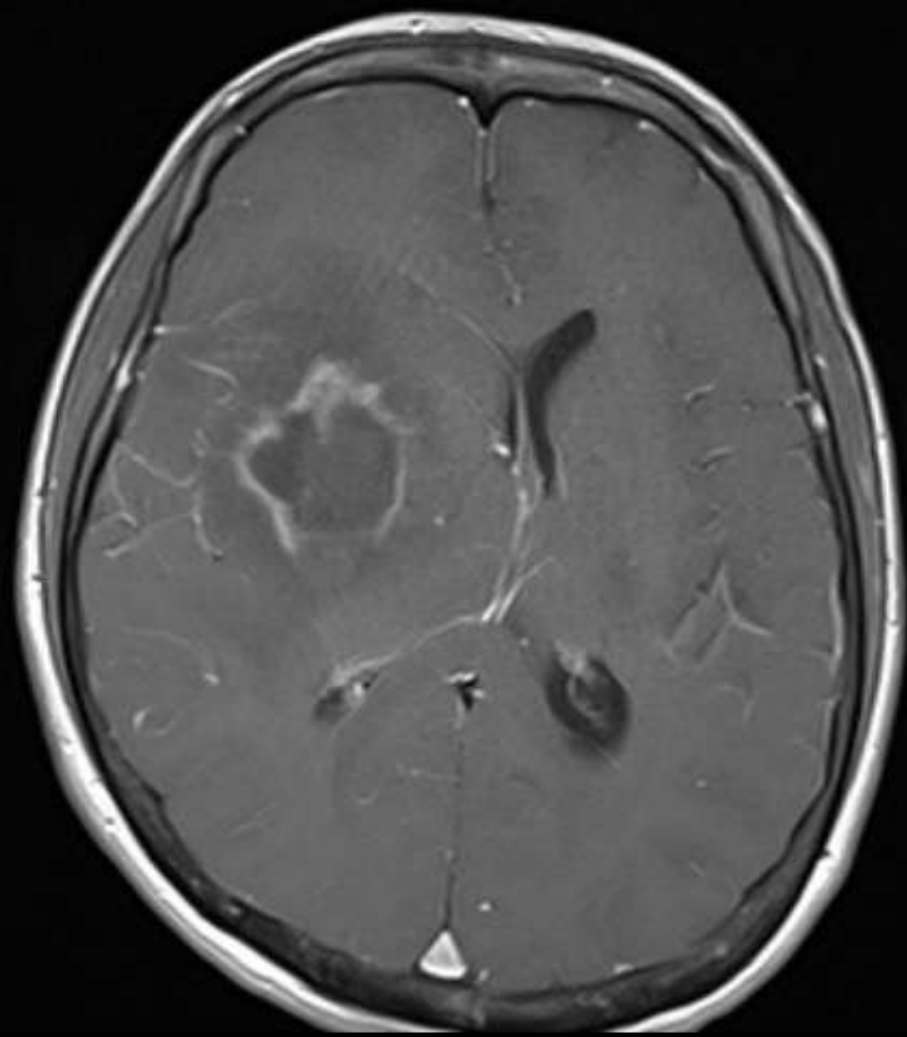
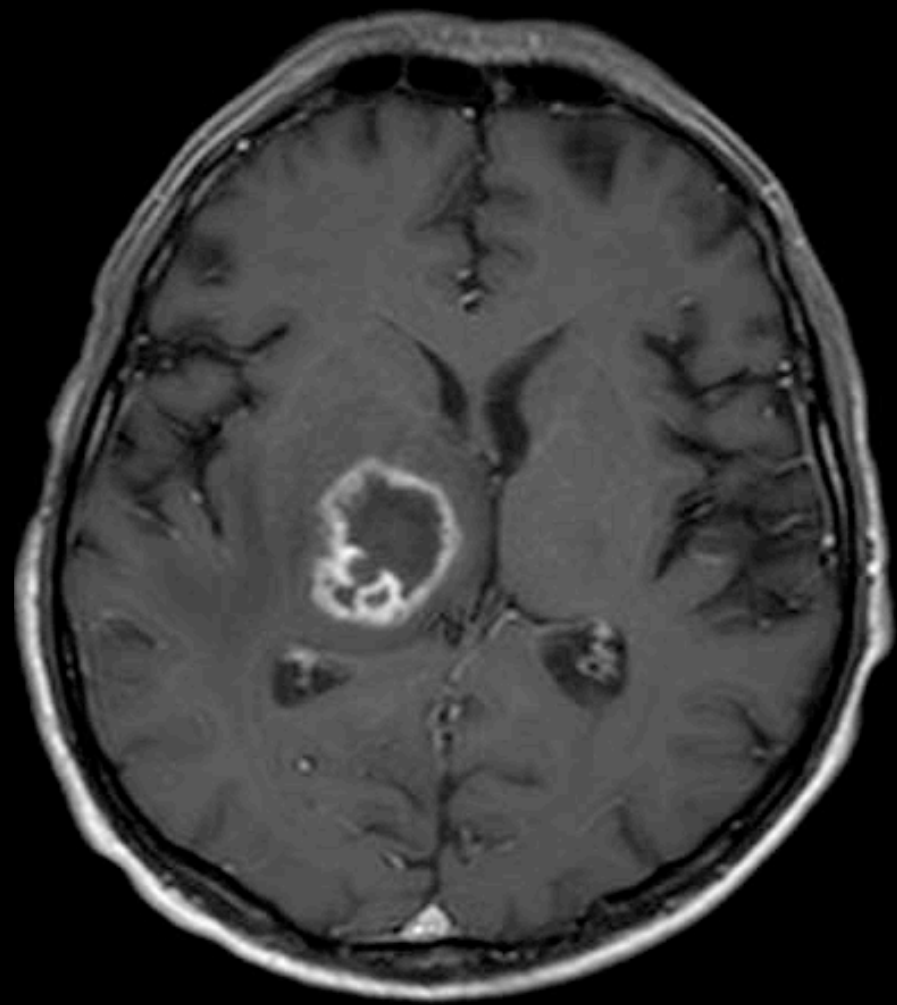
Toksoplazmzis

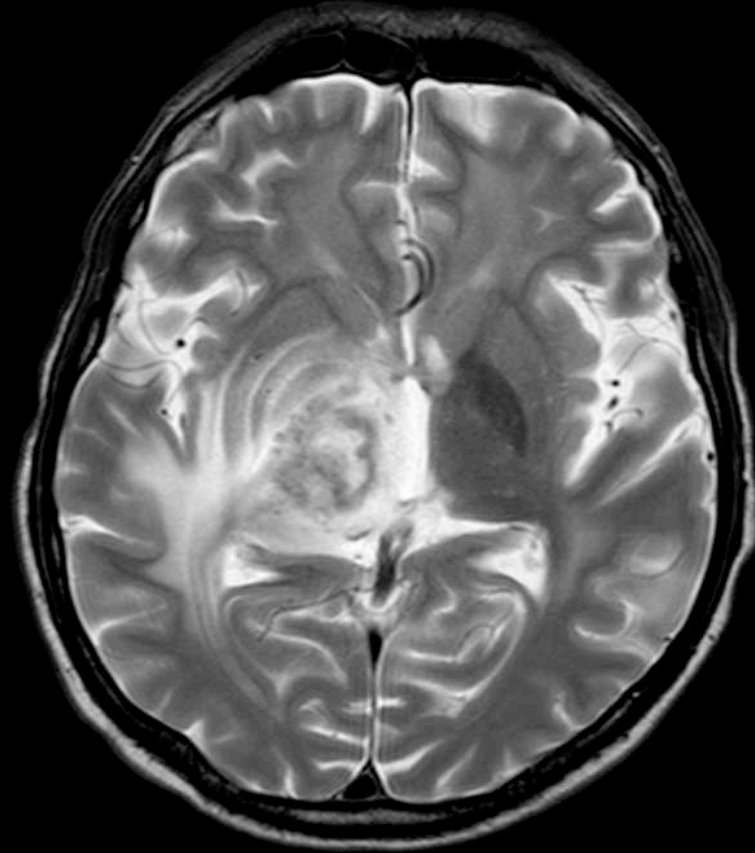
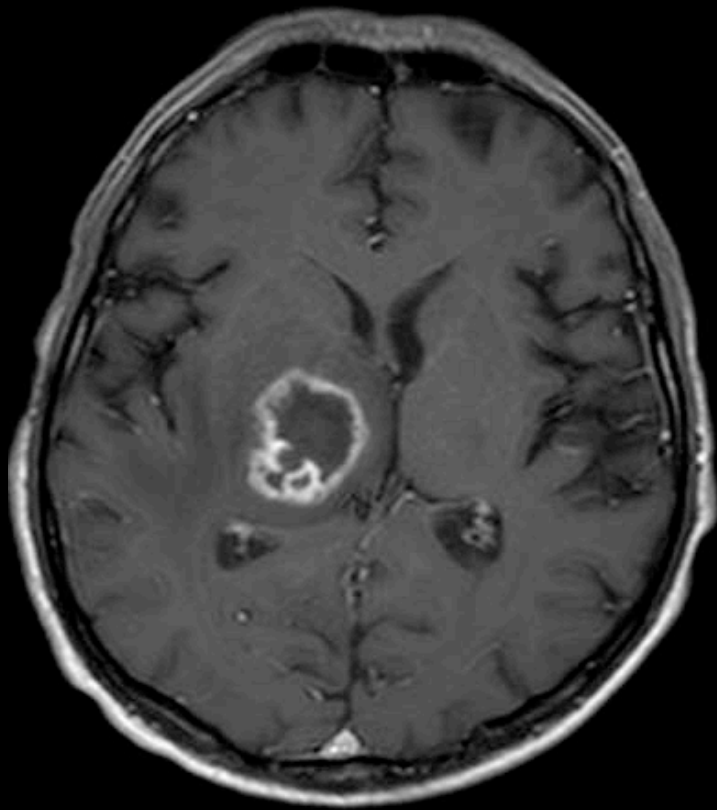
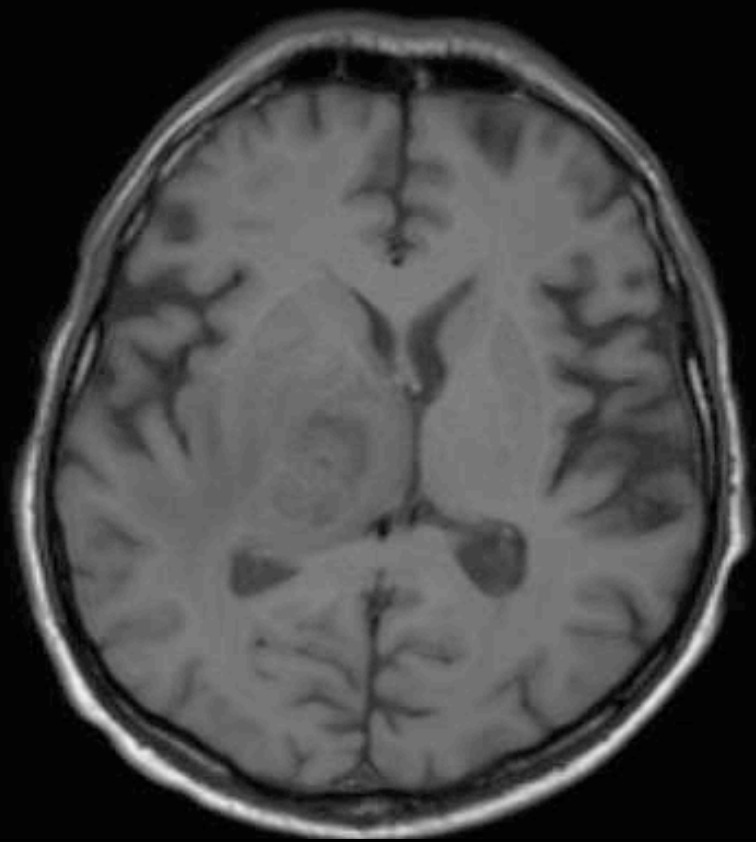
DAG da difüzyon
kistlaması genelde
olmaz. ADC > 1.6

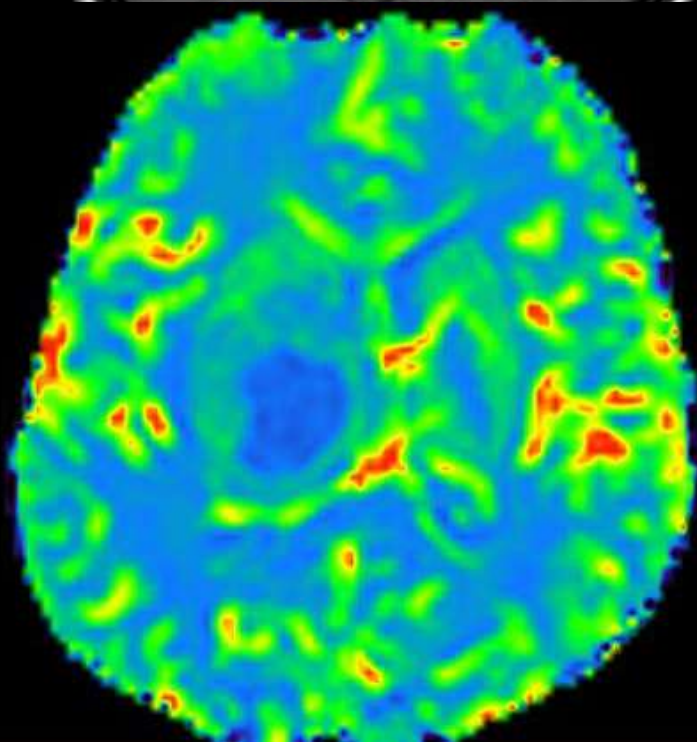
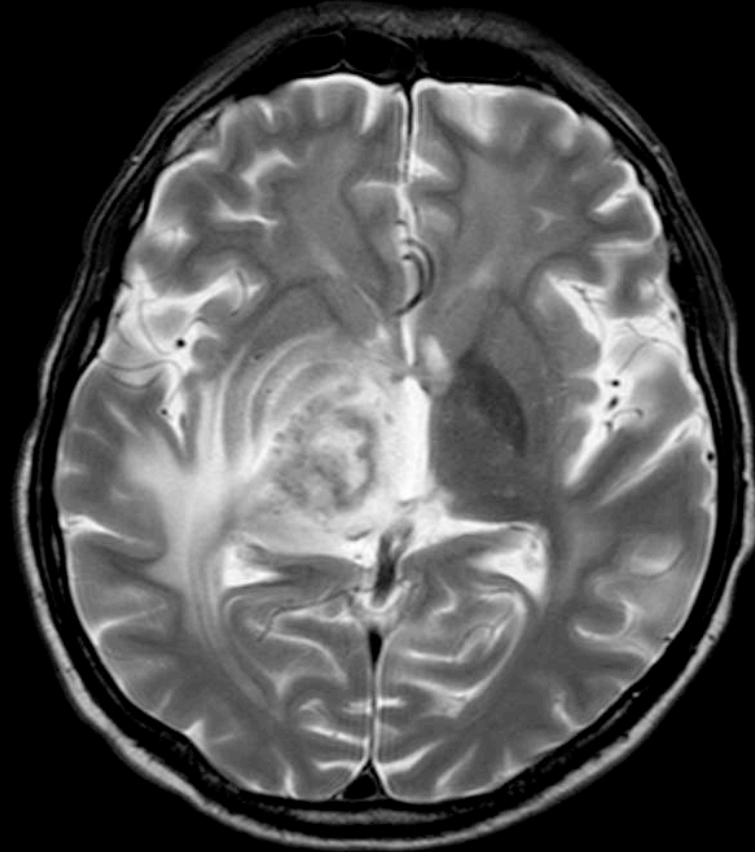
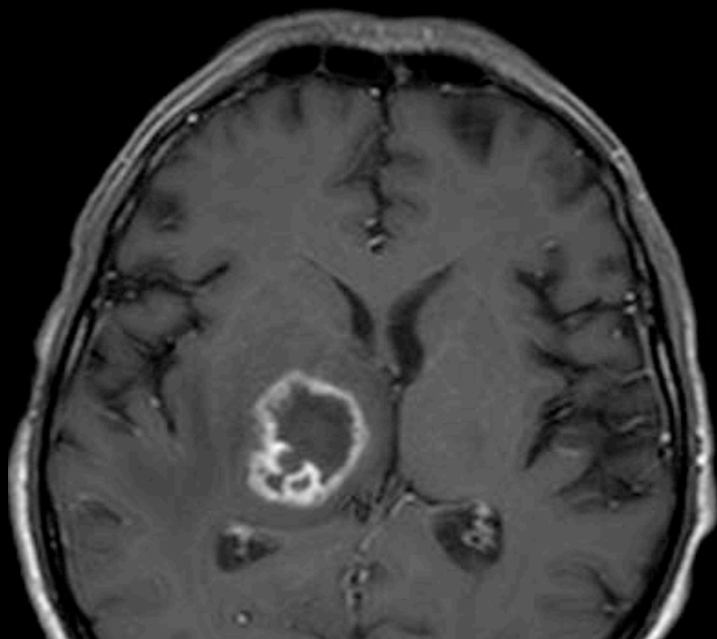
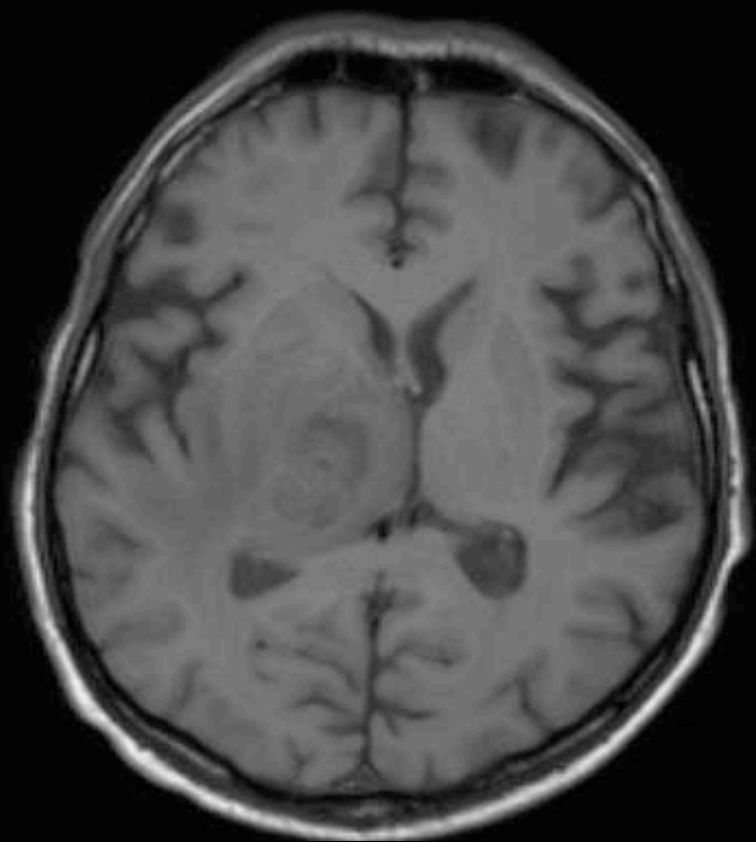
Pyojenik apse DAG(+)

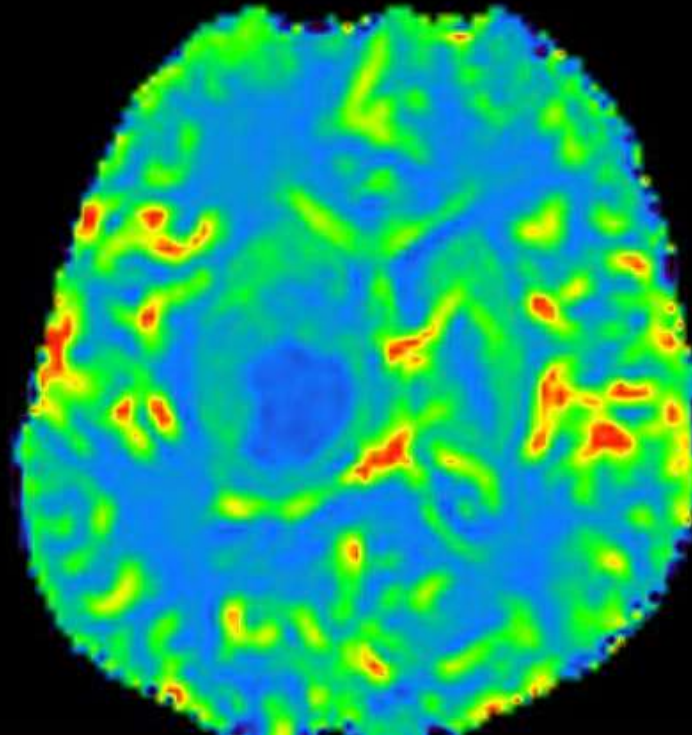
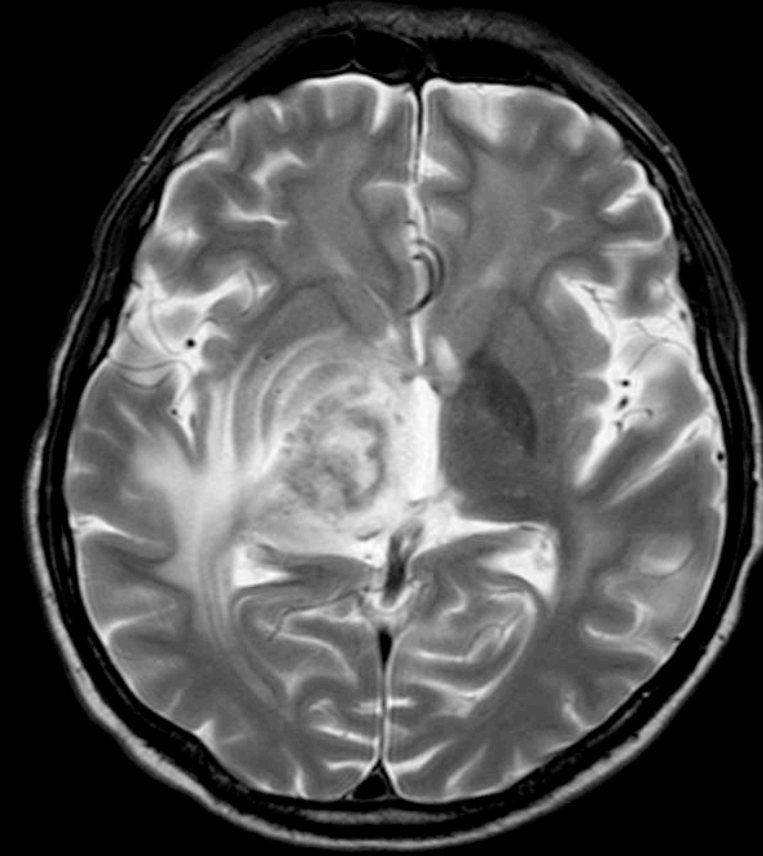
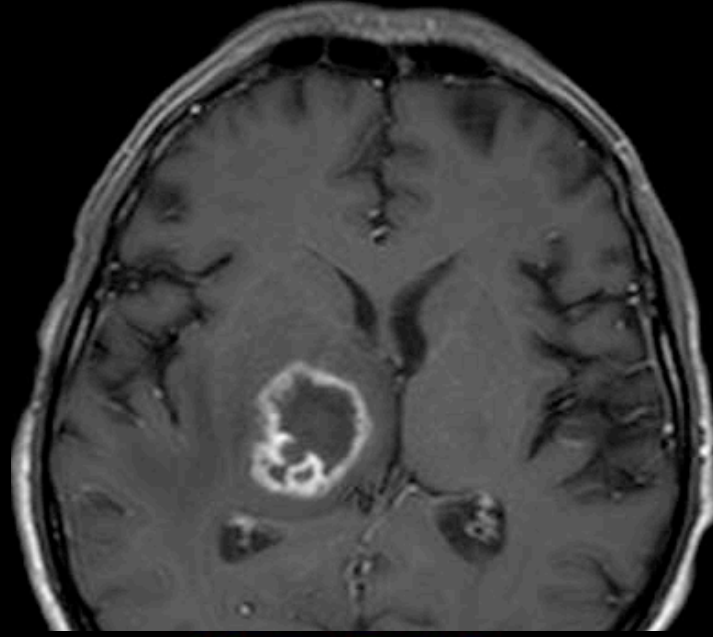
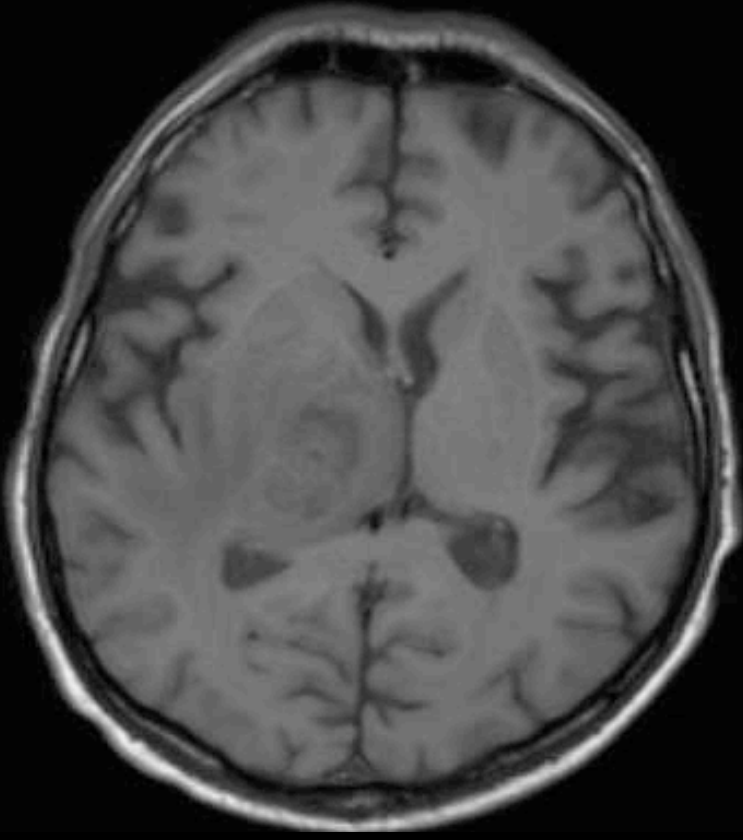
Lenfoma DAG(+)





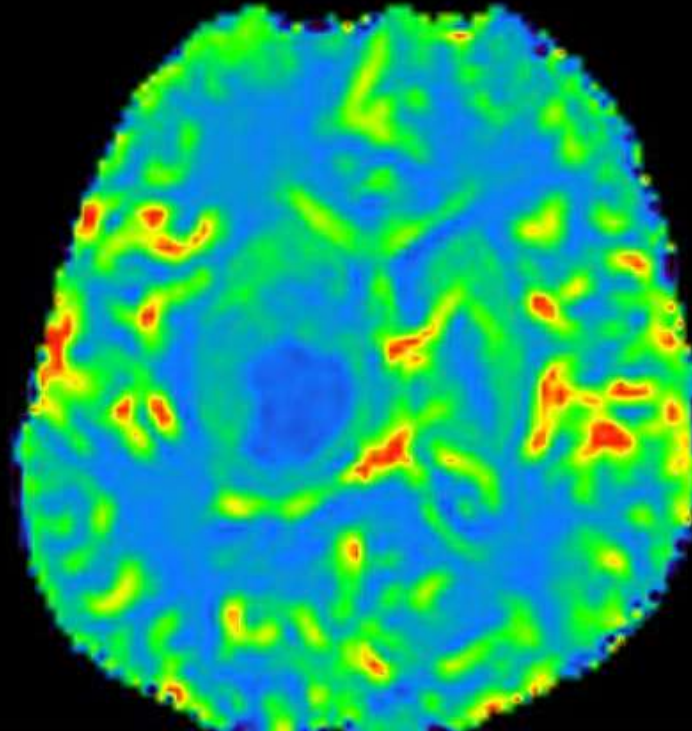
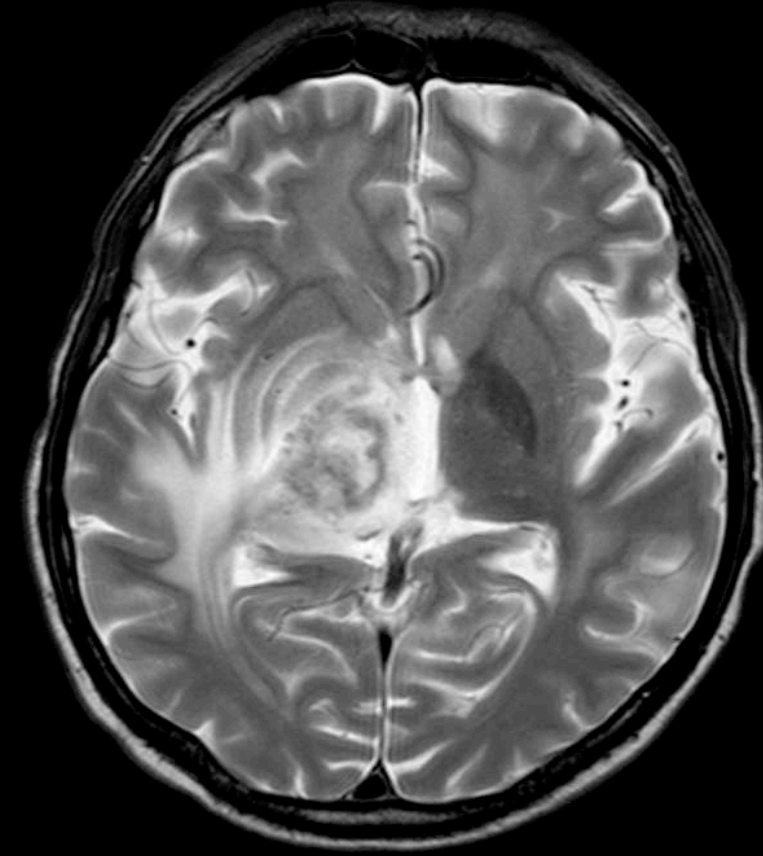
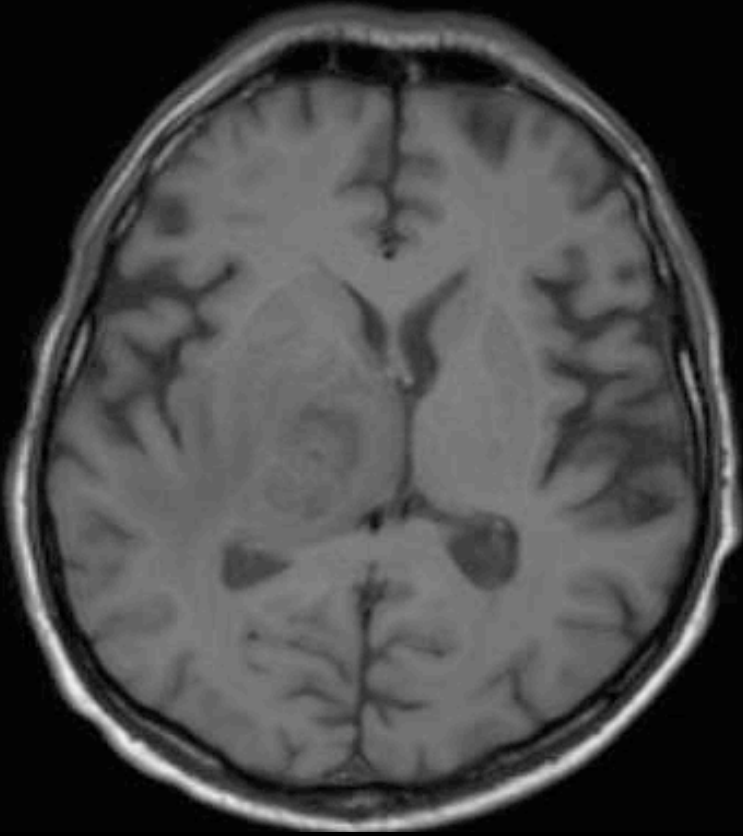




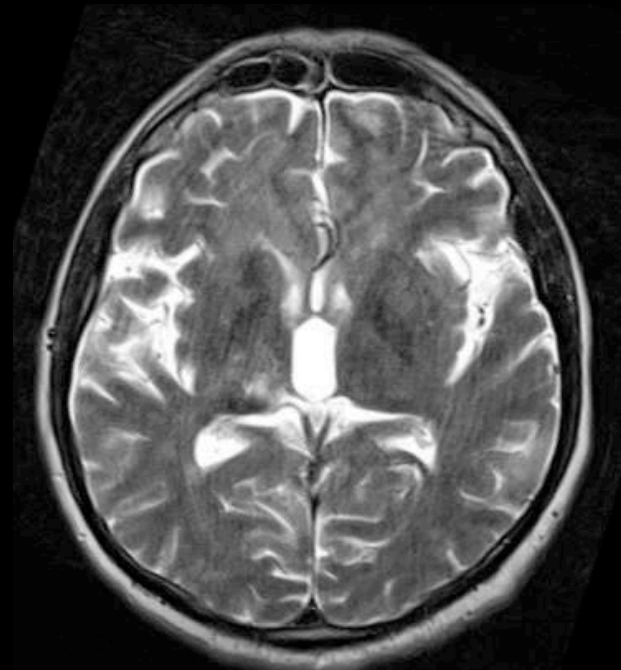


Konsantrik hedef işareti
Eksantrik hedef işareti
Hipoerfüzyon

TOKSOPLAZMOZİS

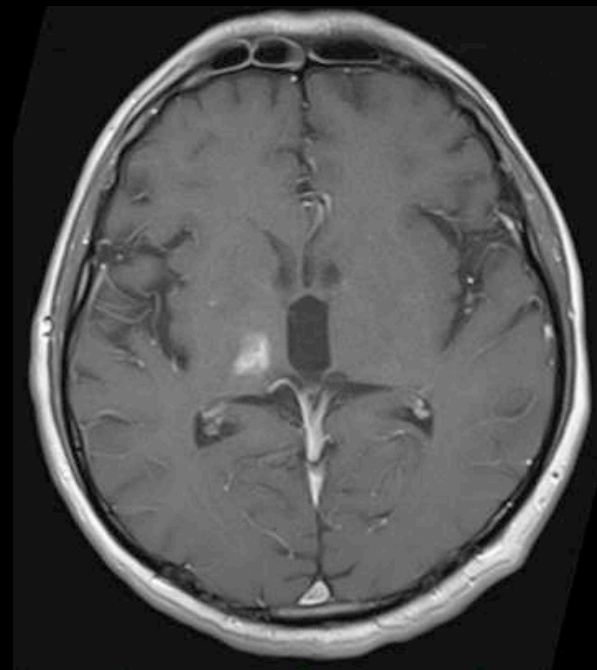


Konsantrik hedef işareti
Eksantrik hedef işareti
Hipoerfüzyon

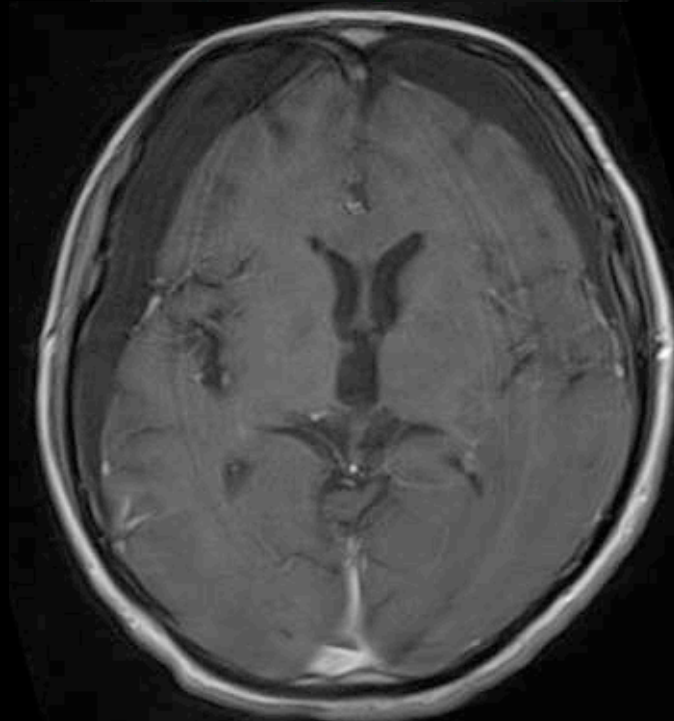


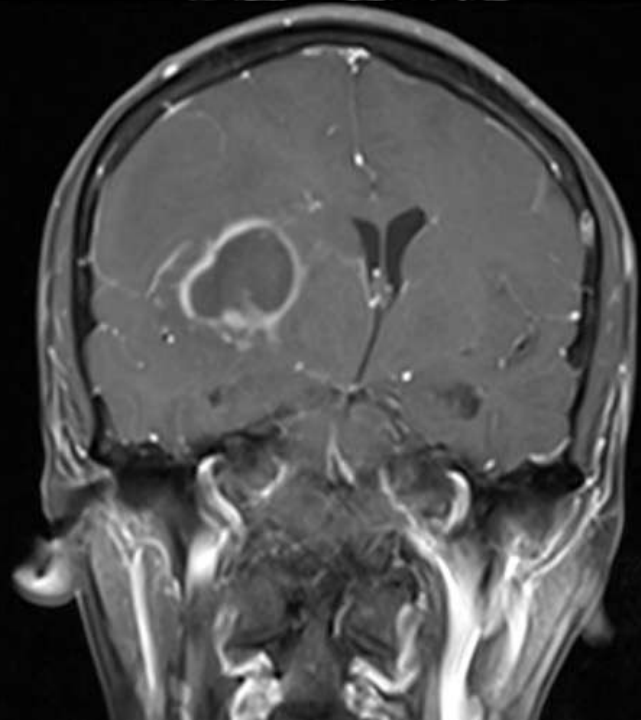
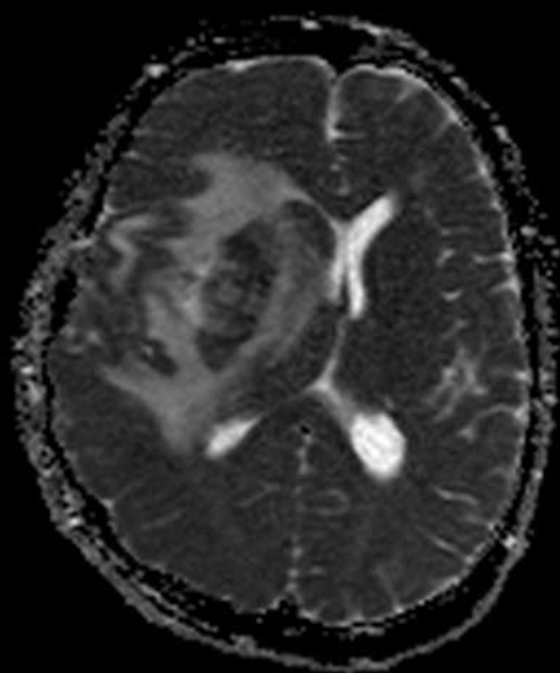
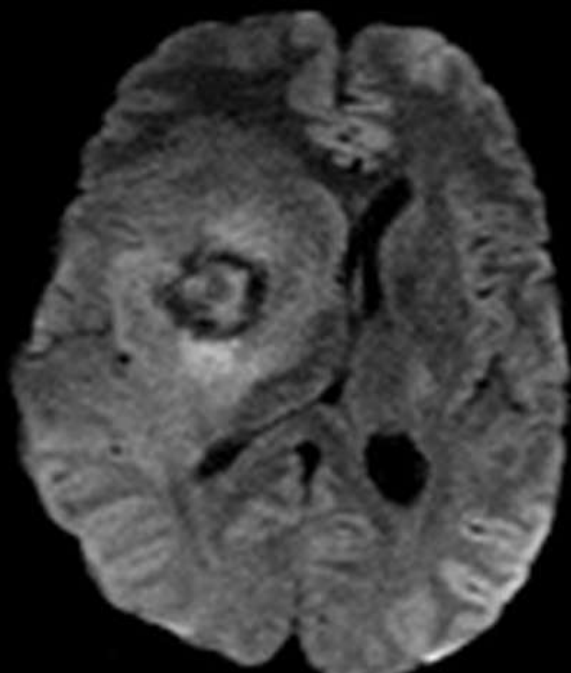
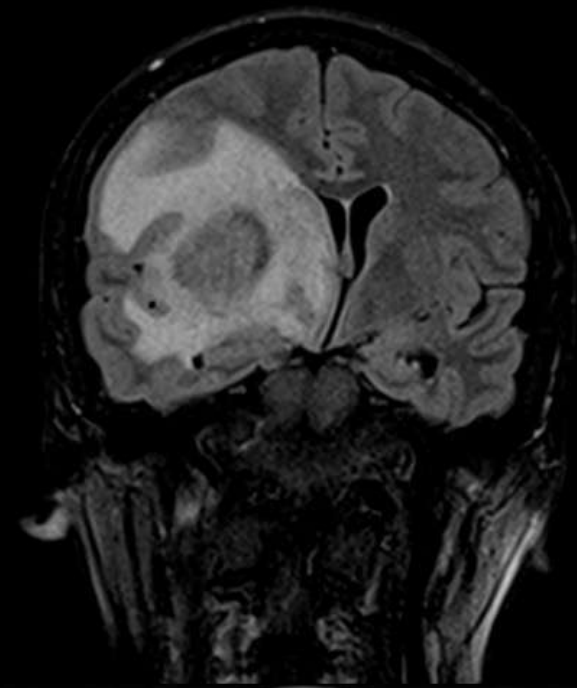
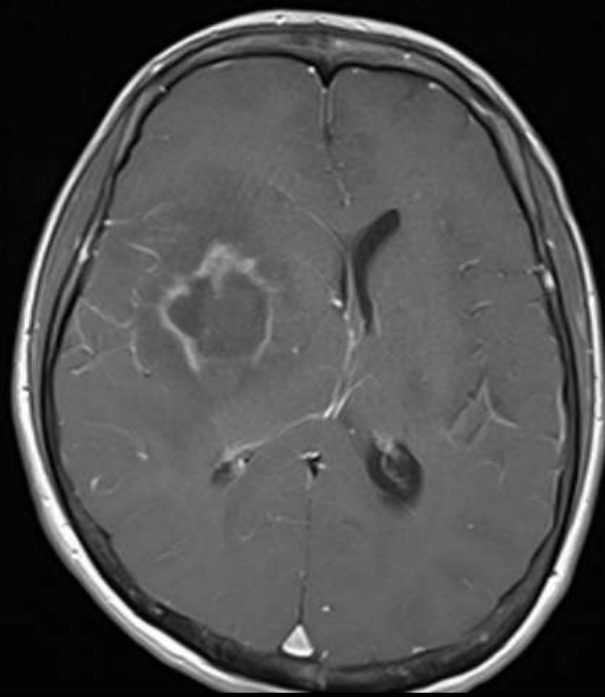
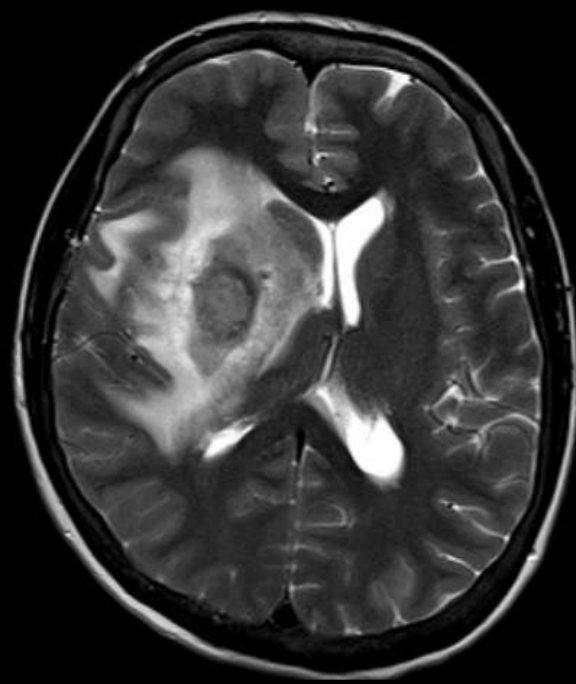
KONTROL

5 ay sonra

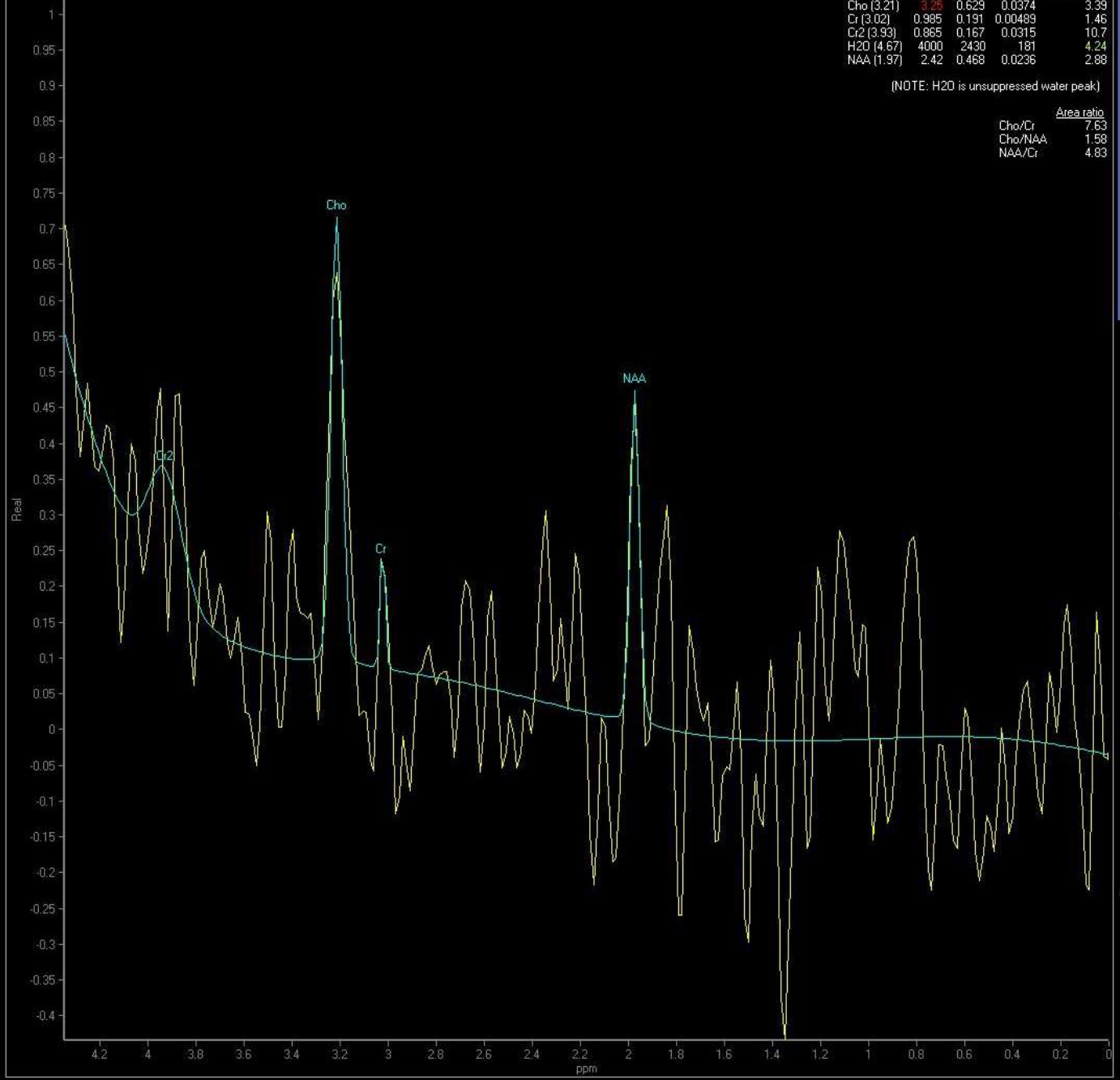


13 ay sonra





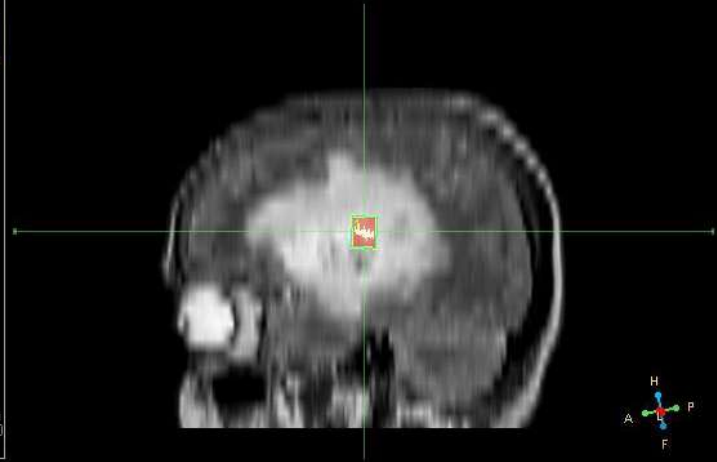
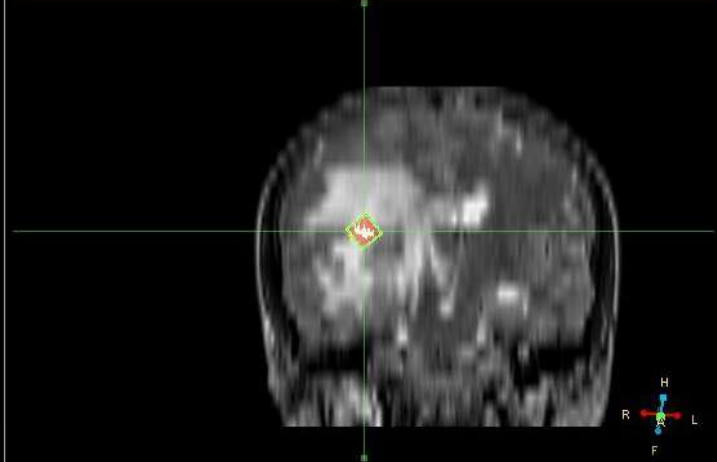
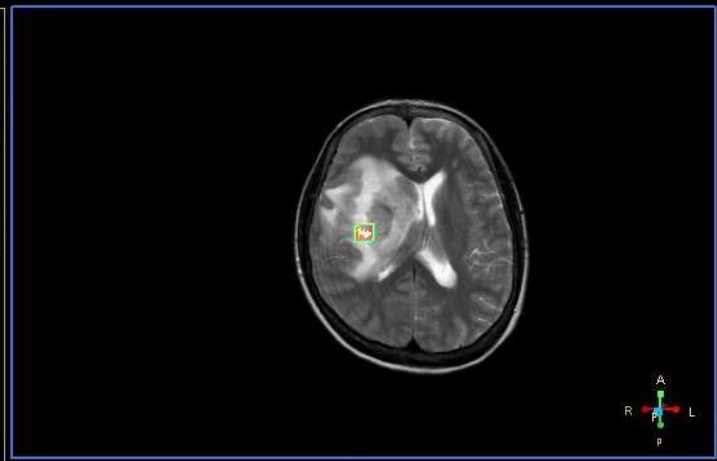
Voxel 1 (12, 1: SV_PRESS_144 TE 144ms - TR 2.0s)



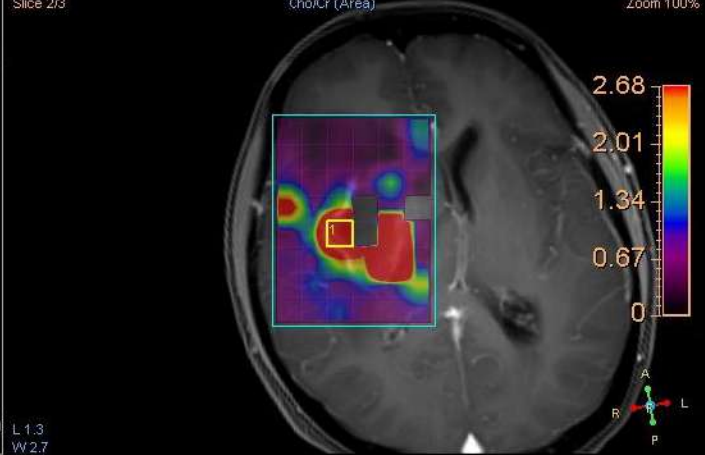
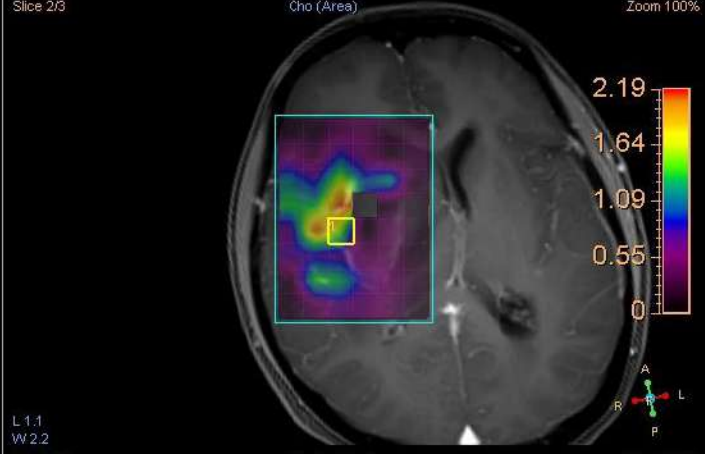
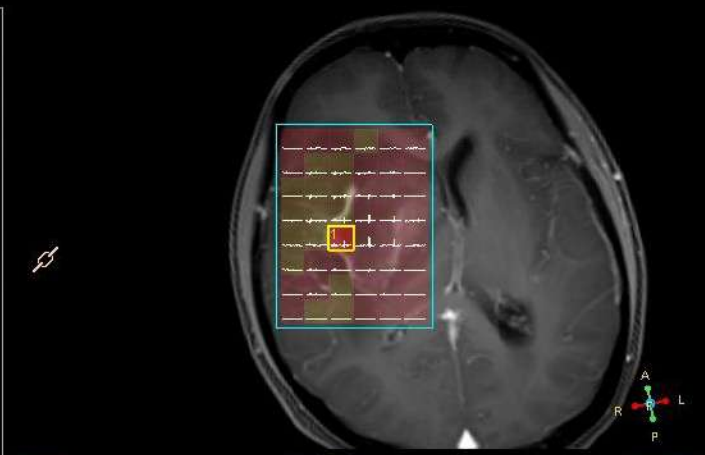
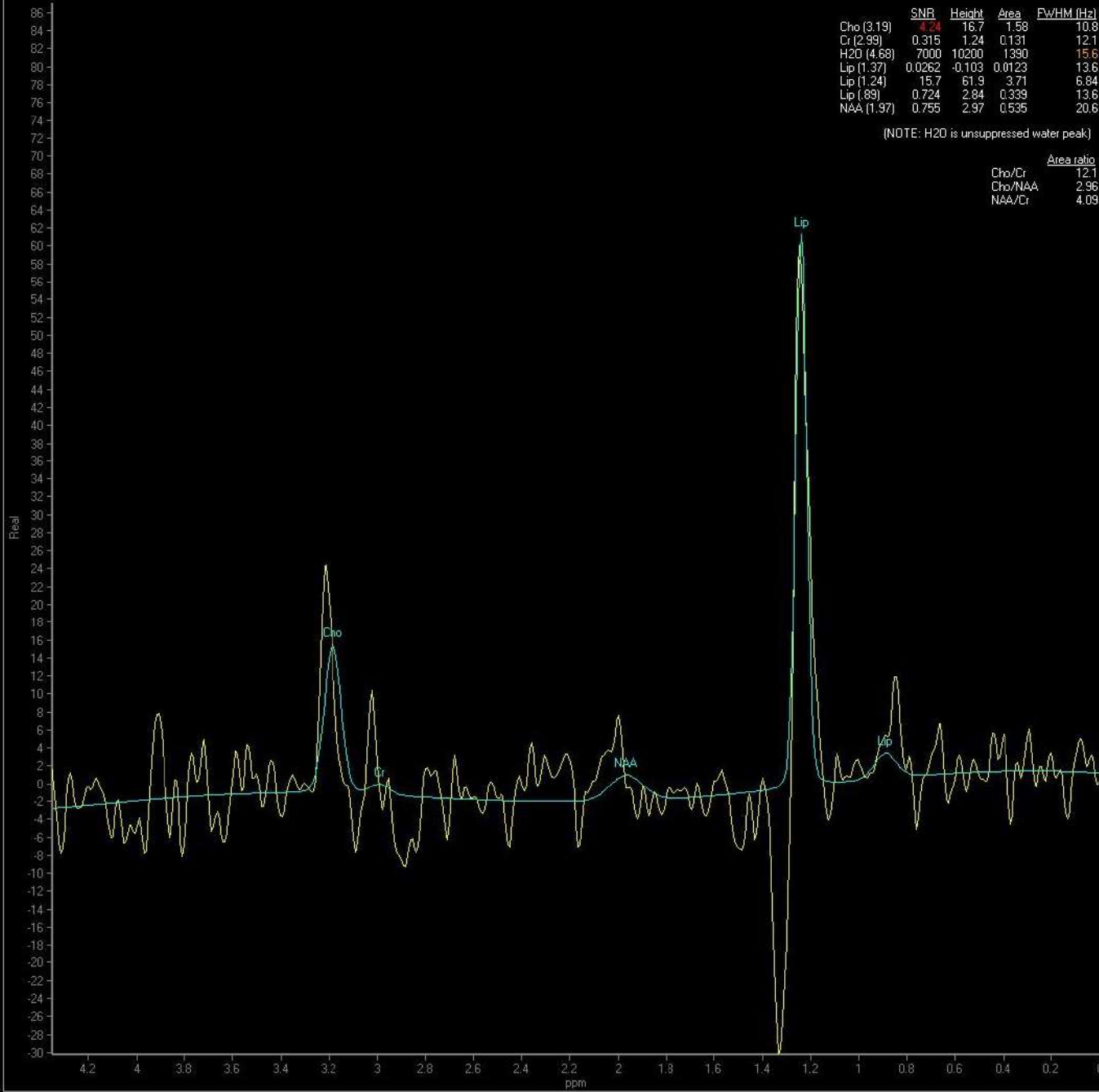
	SNR	Height	Area	FWHM [Hz]
Cho (3.21)	3.25	0.629	0.0374	3.39
Cr (3.02)	0.985	0.191	0.00489	1.46
C2 (3.93)	0.865	0.167	0.0315	10.7
H2O (4.67)	4000	2430	181	4.24
NAA (1.97)	2.42	0.468	0.0236	2.88

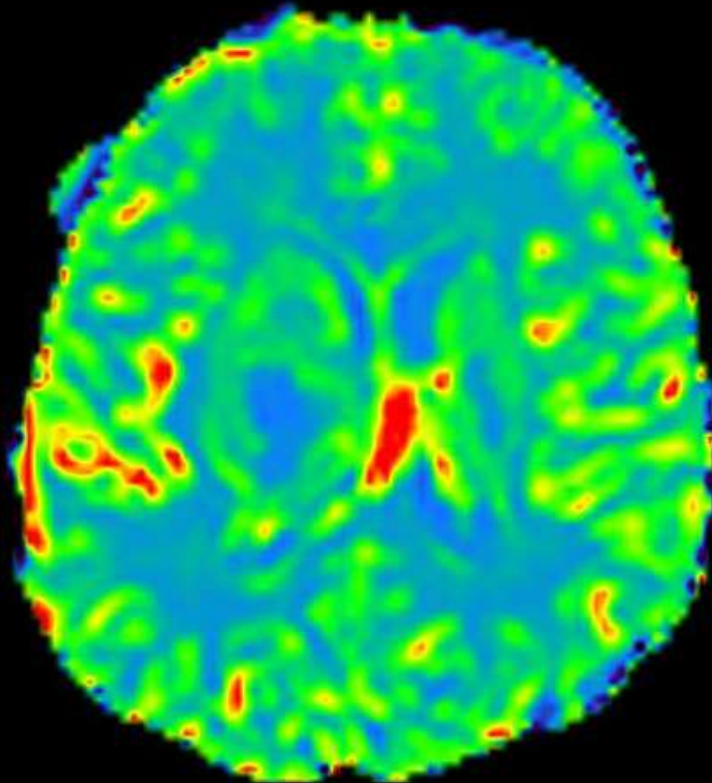
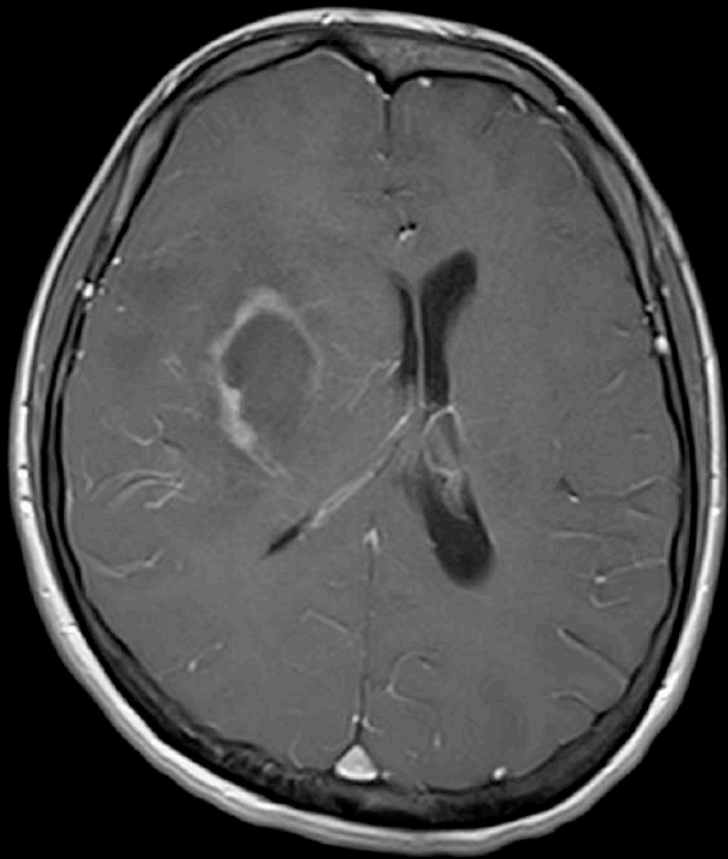
(NOTE: H2O is unsuppressed water peak)

	Area ratio
Cho/Cr	7.63
Cho/NAA	1.58
NAA/Cr	4.83

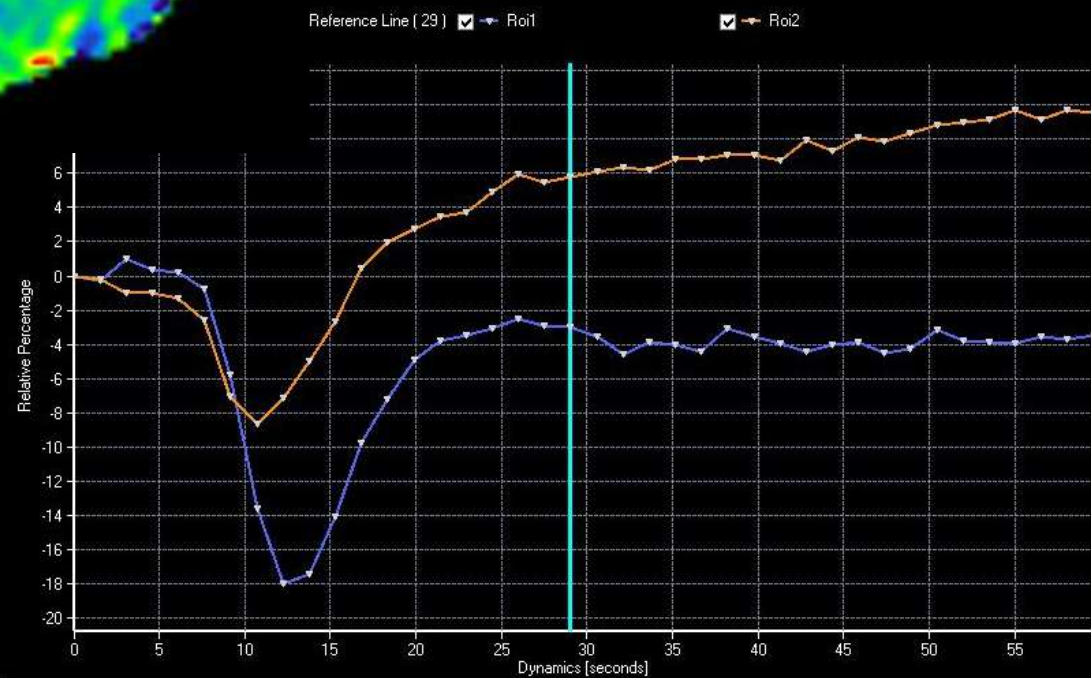


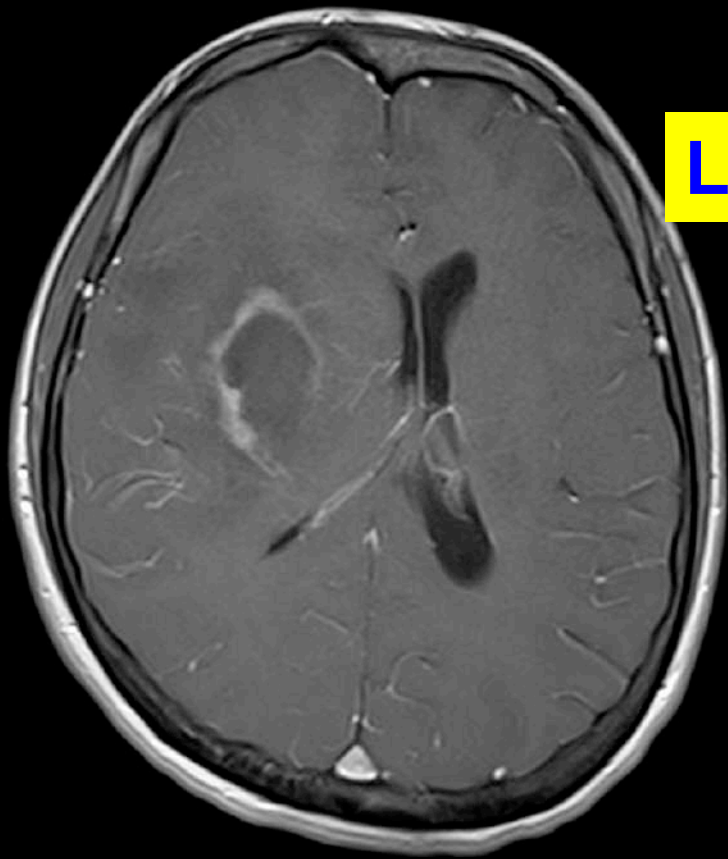
Voxel 1 (11, 1: s3D_PRESS_144 TE 144ms - TR 1.0s)



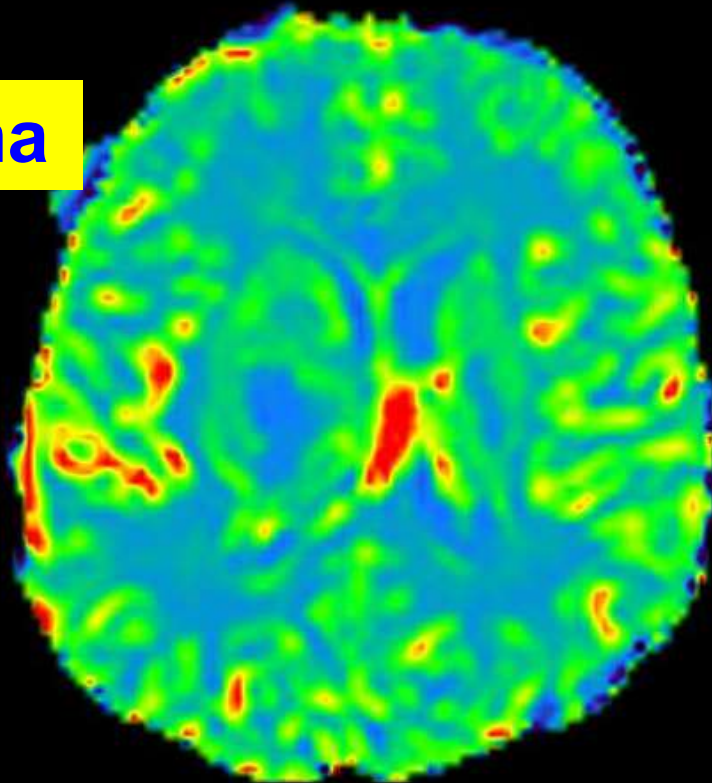


Cho yüksek
Lipid yüksek
CBV yüksek

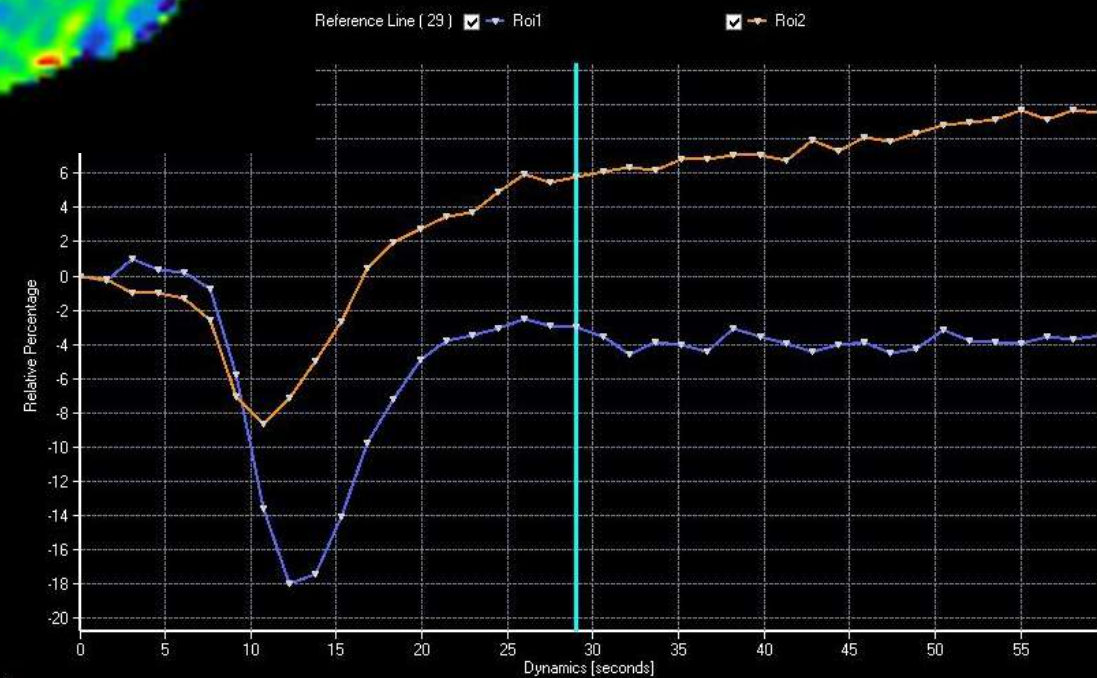


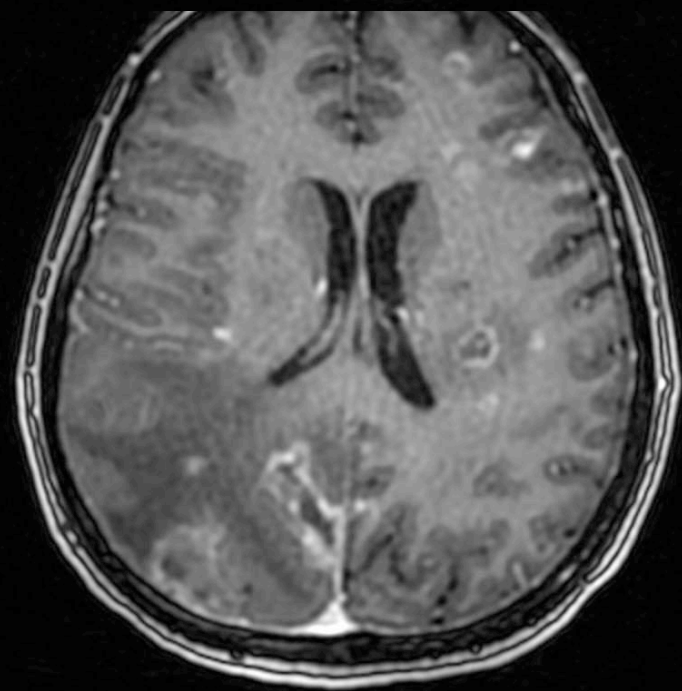
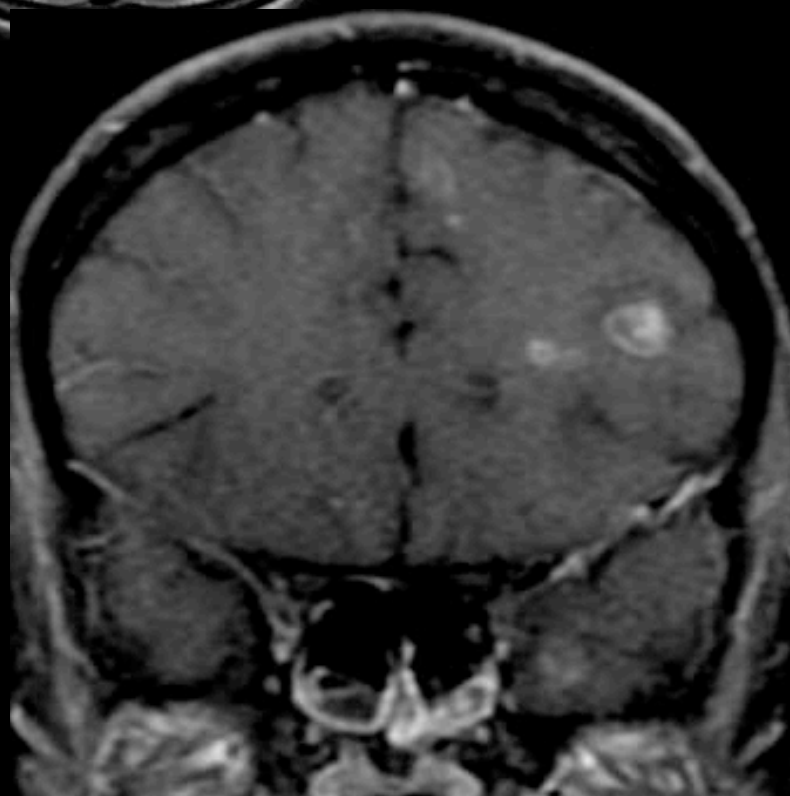
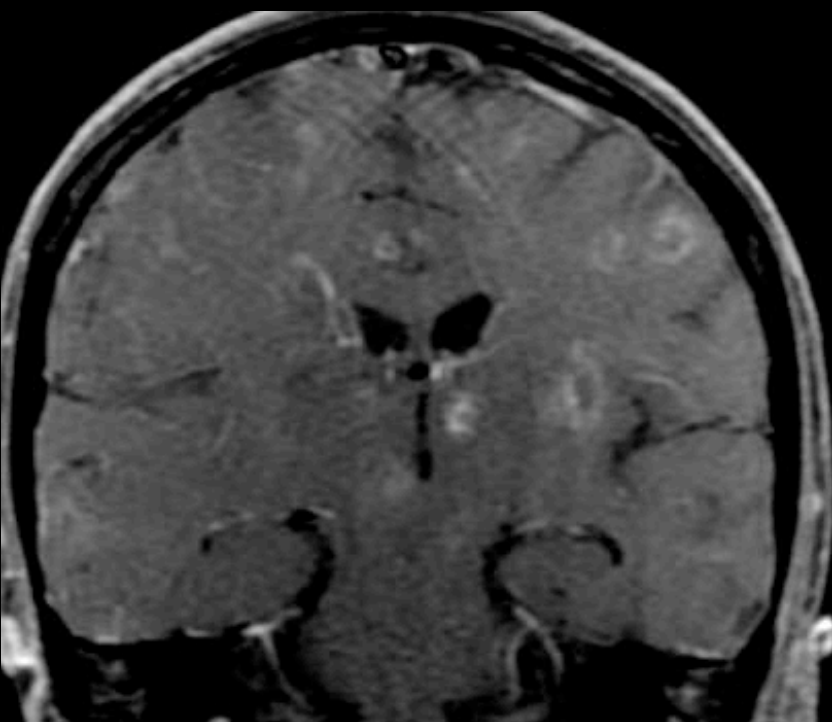
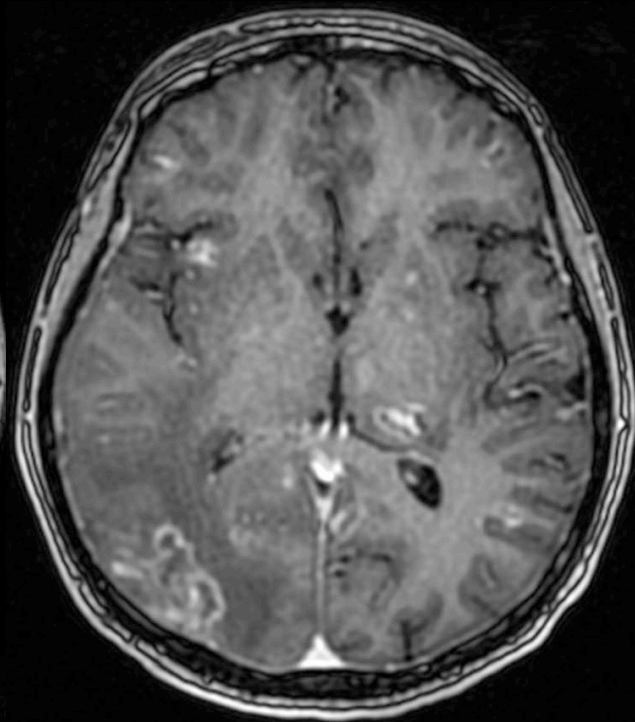
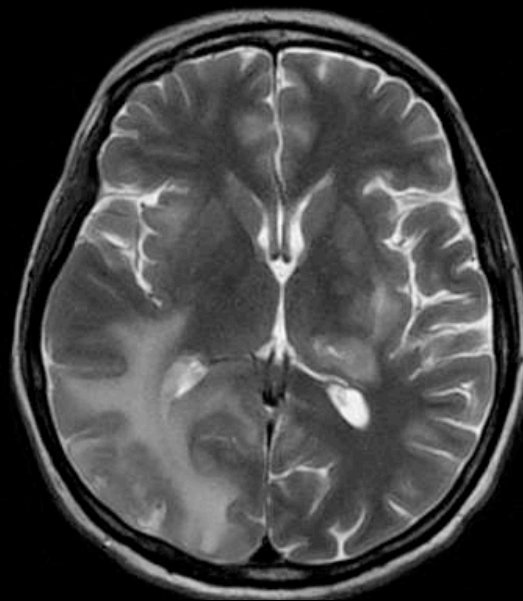
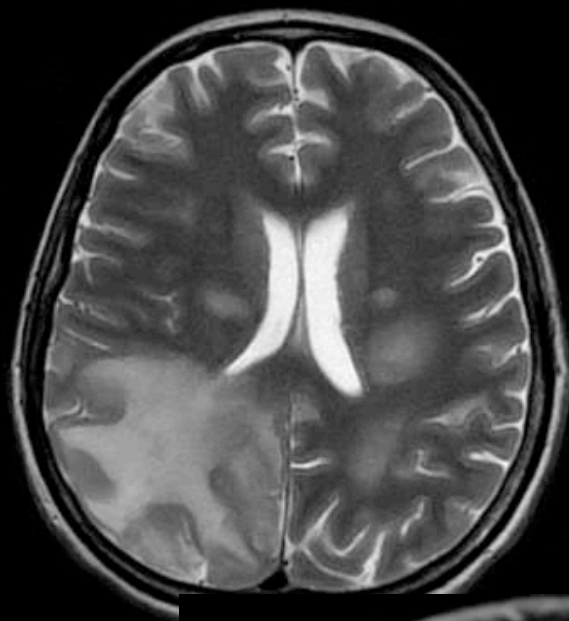
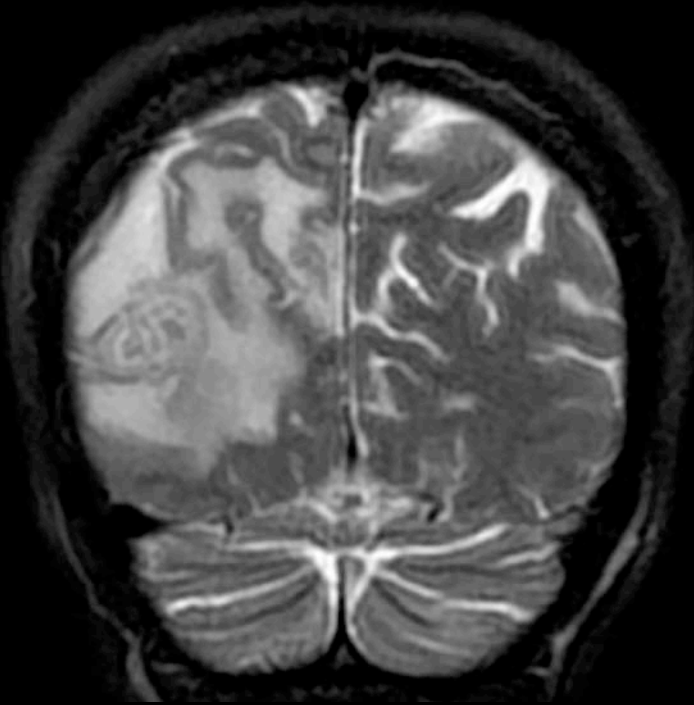


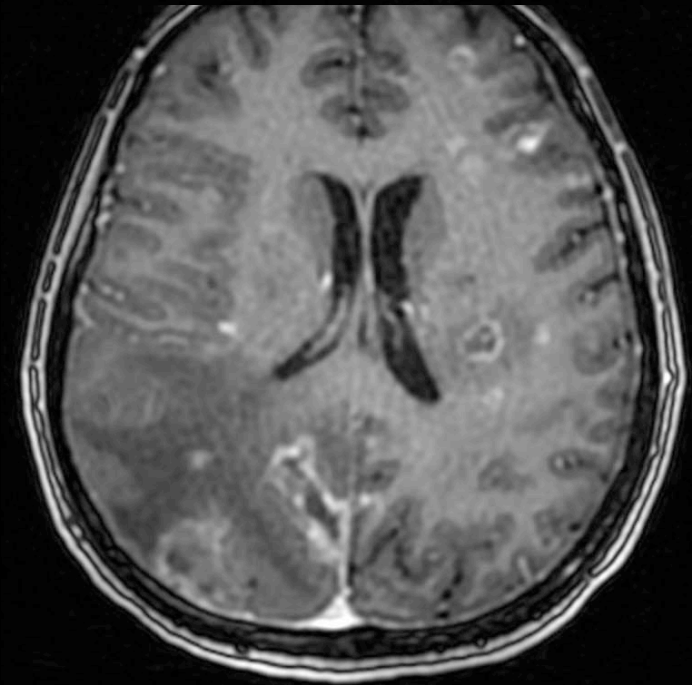
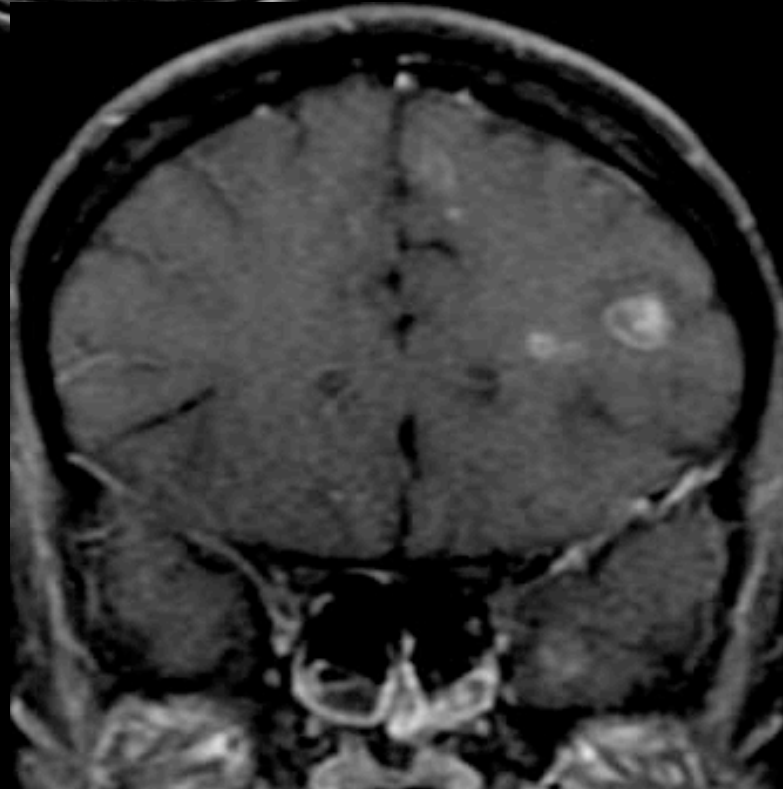
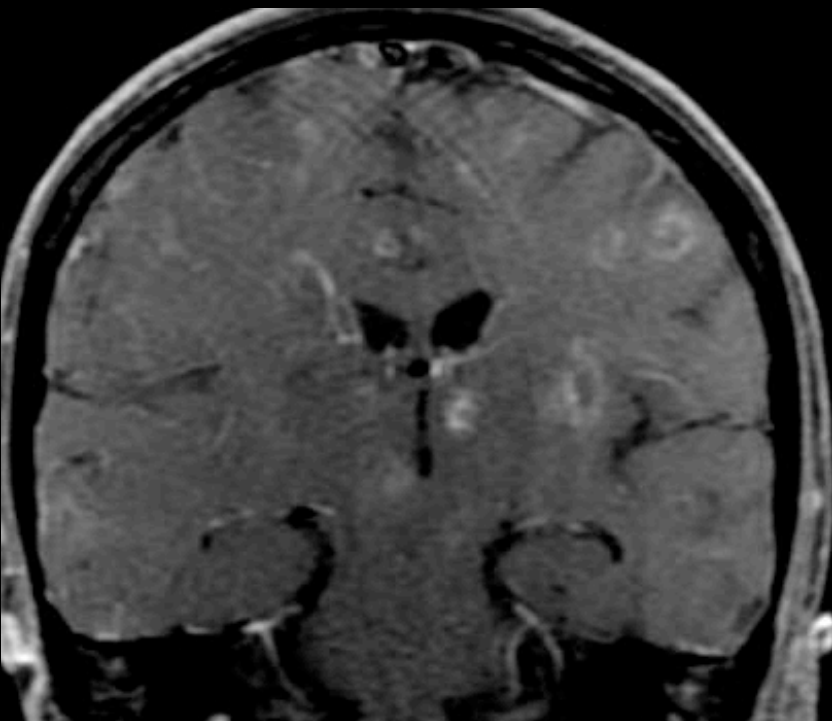
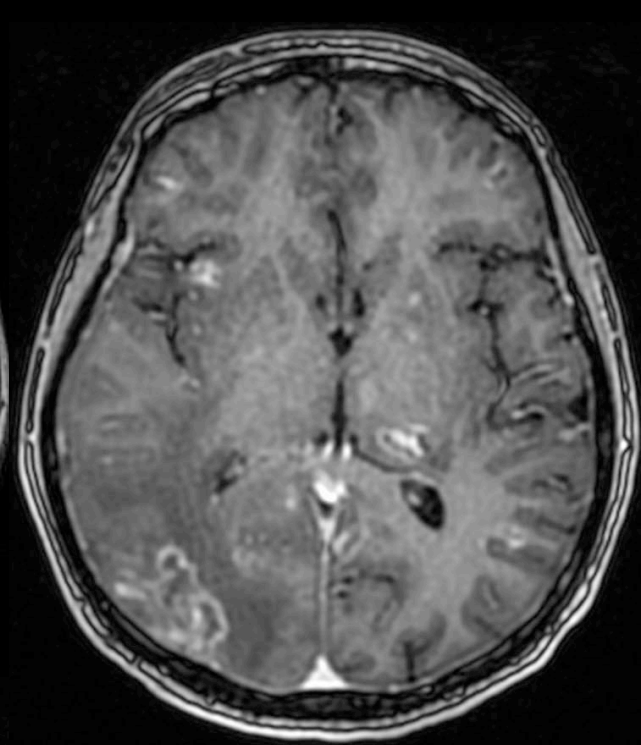
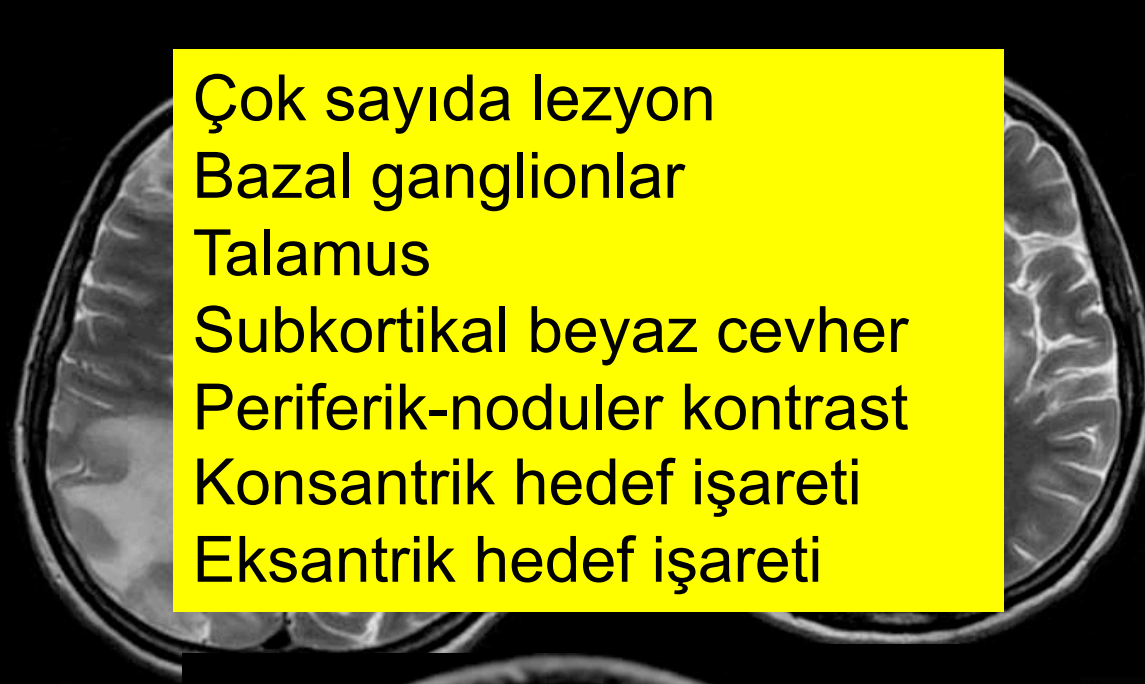
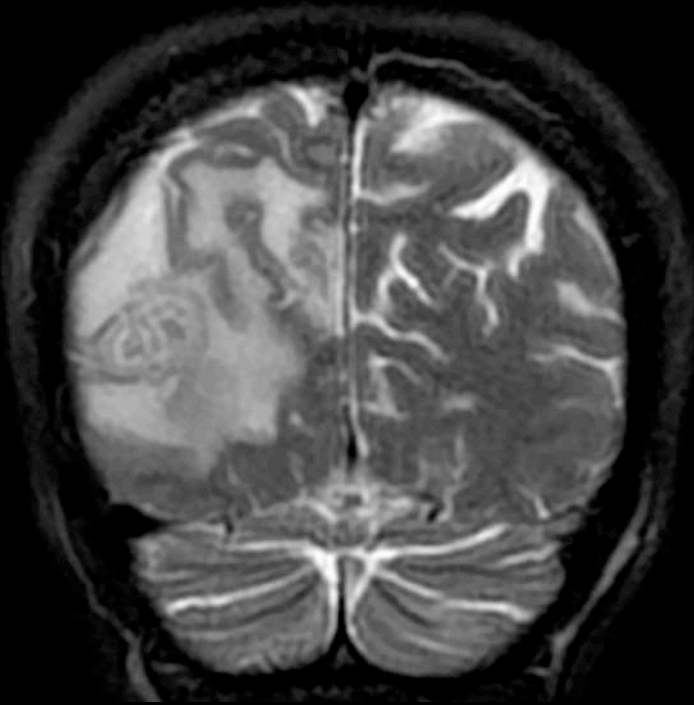
Lenfoma



Cho yüksek
Lipid yüksek
CBV yüksek







Çok sayıda lezyon

Bazal ganglionlar

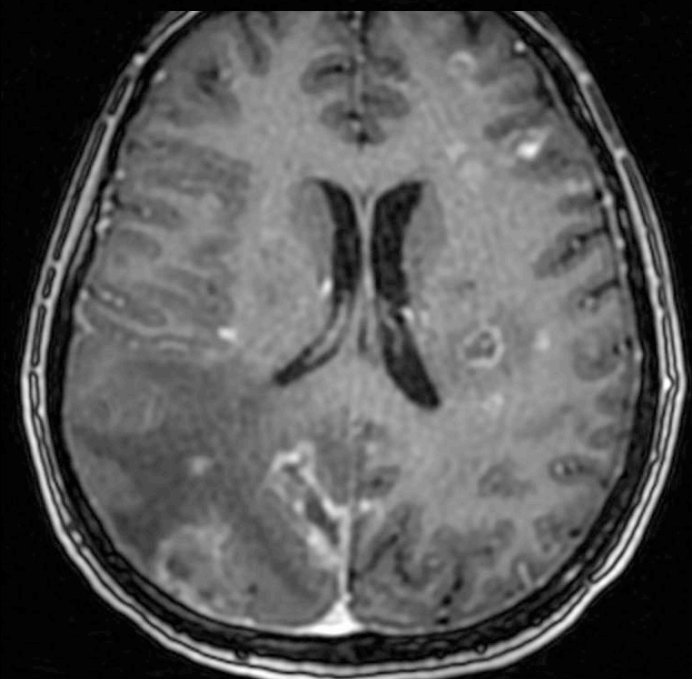
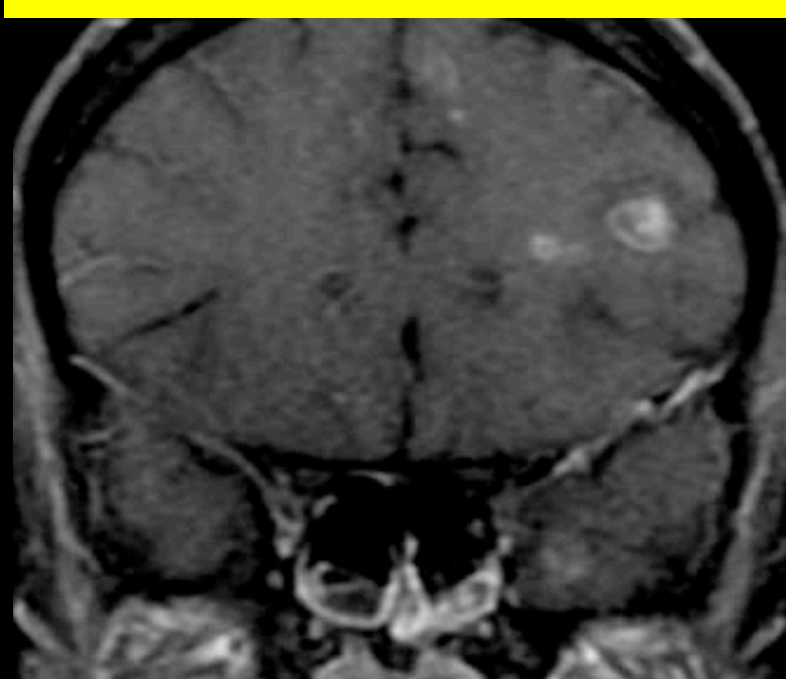
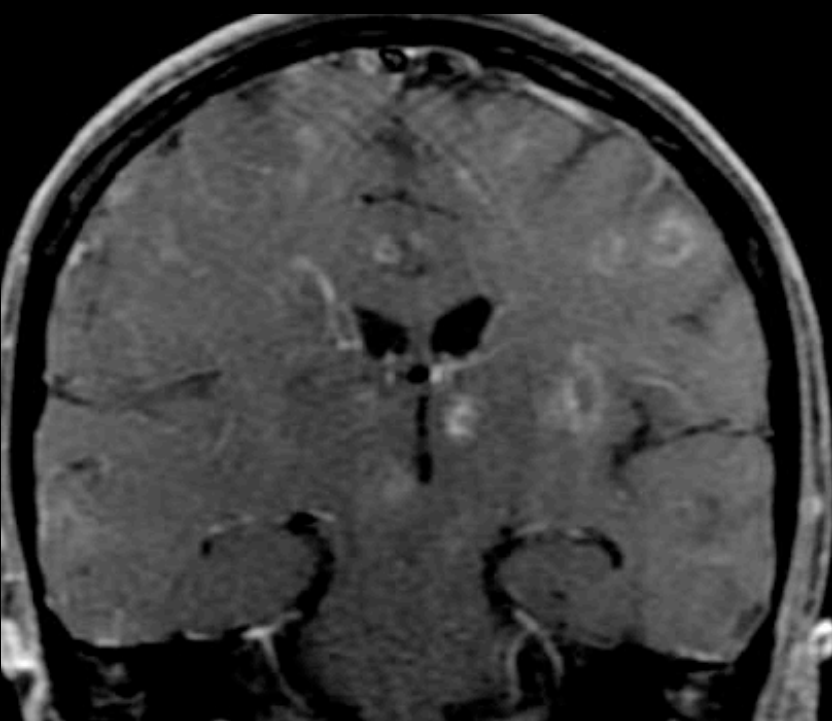
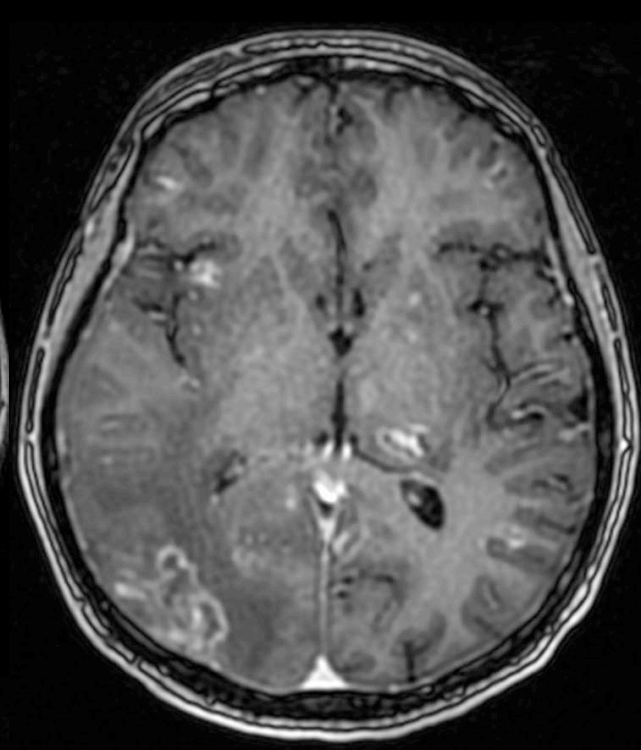
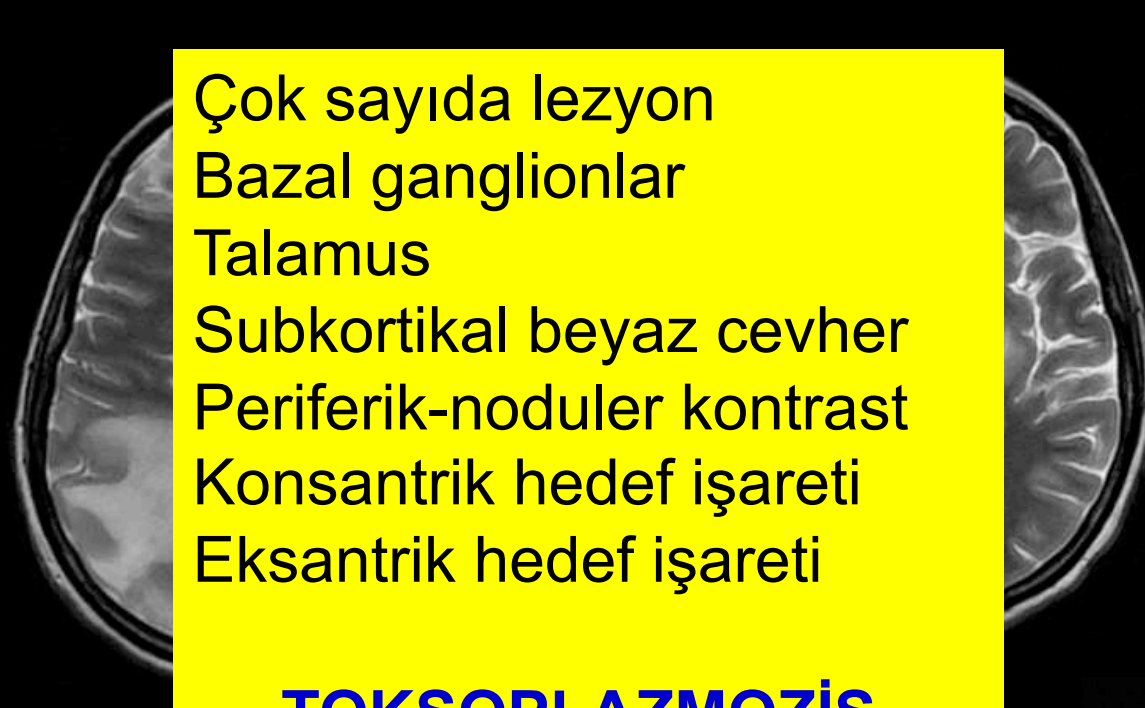
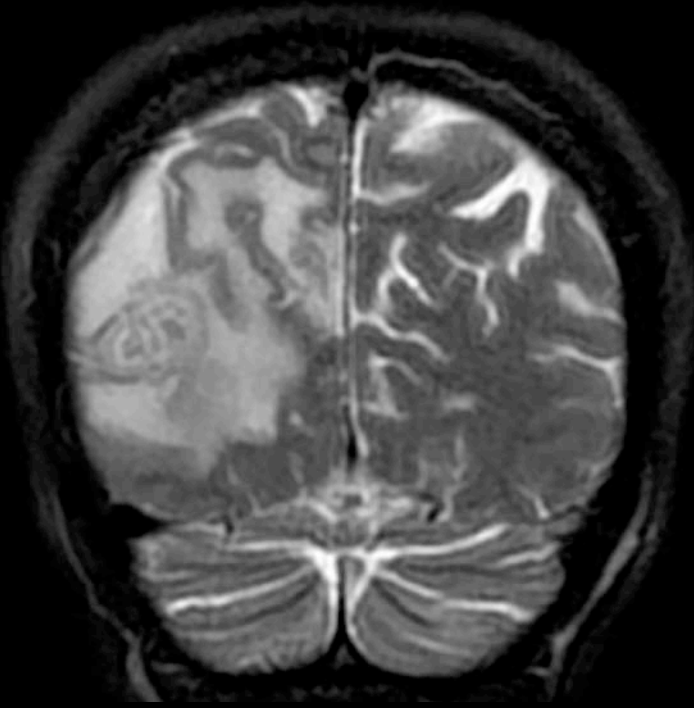
Talamus

Subkortikal beyaz cevher

Periferik-noduler kontrast

Konsantrik hedef işareti

Eksantrik hedef işareti



Çok sayıda lezyon

Bazal ganglionlar

Talamus

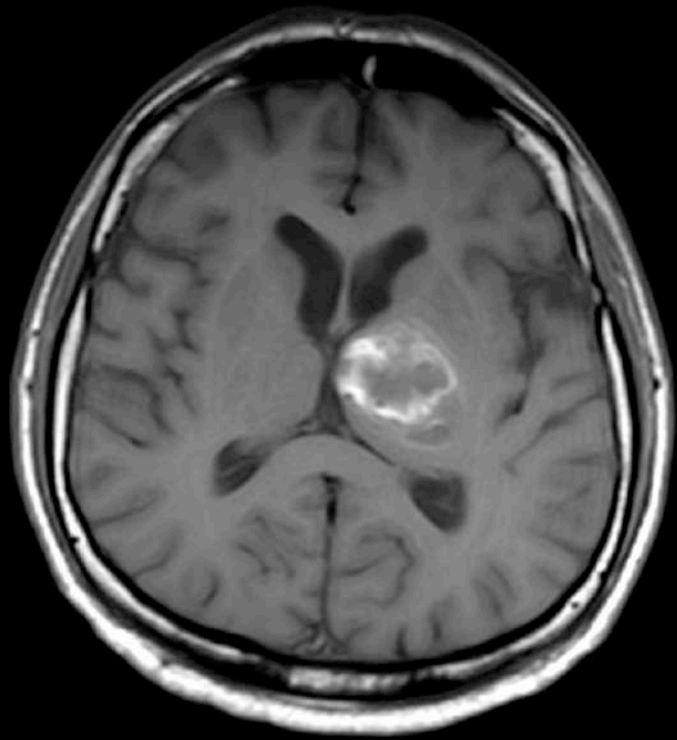
Subkortikal beyaz cevher

Periferik-noduler kontrast

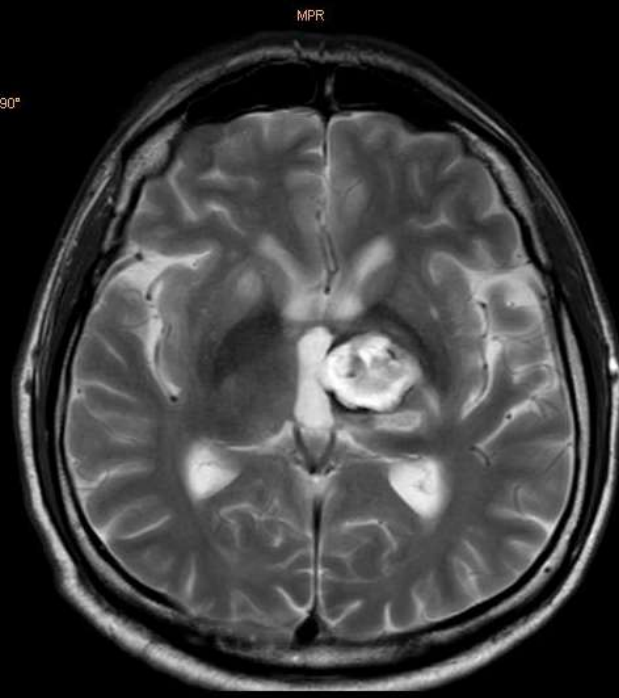
Konsantrik hedef işareti

Eksantrik hedef işareti

TOKSOPLAZMOZİS

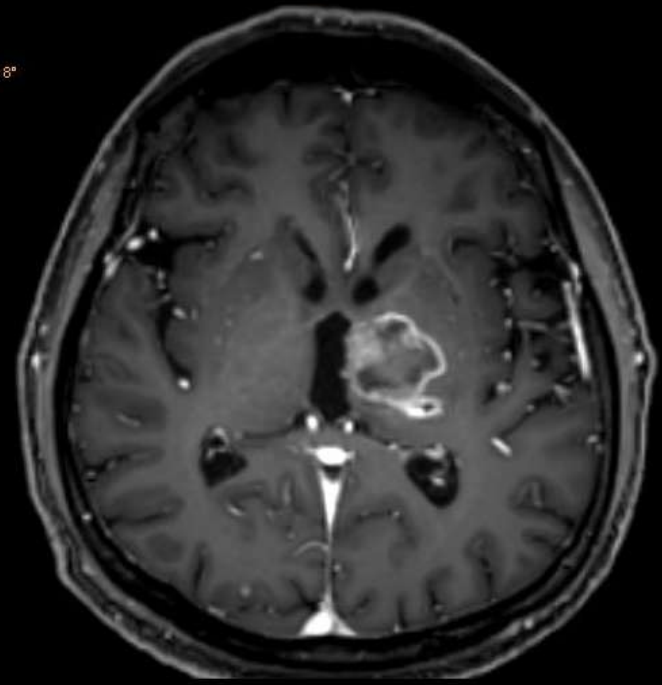


le 90°

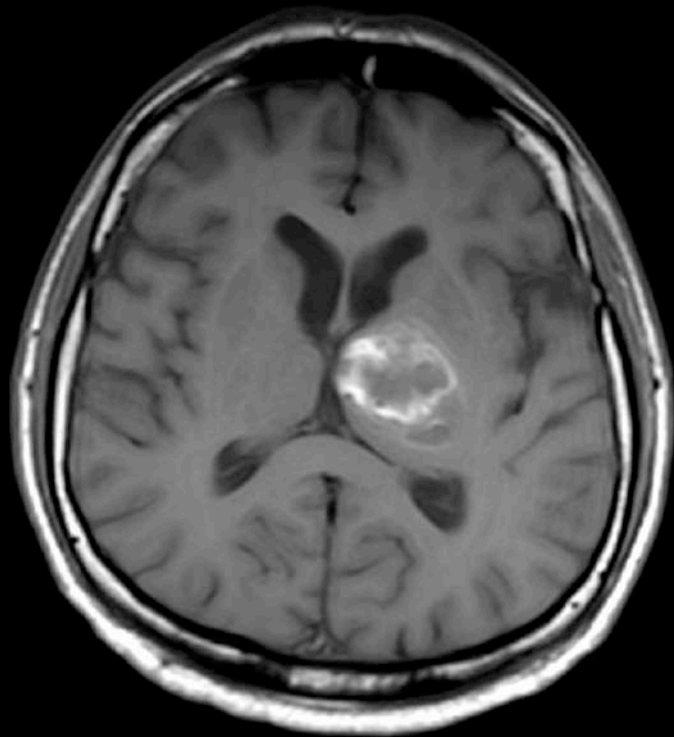


MPR

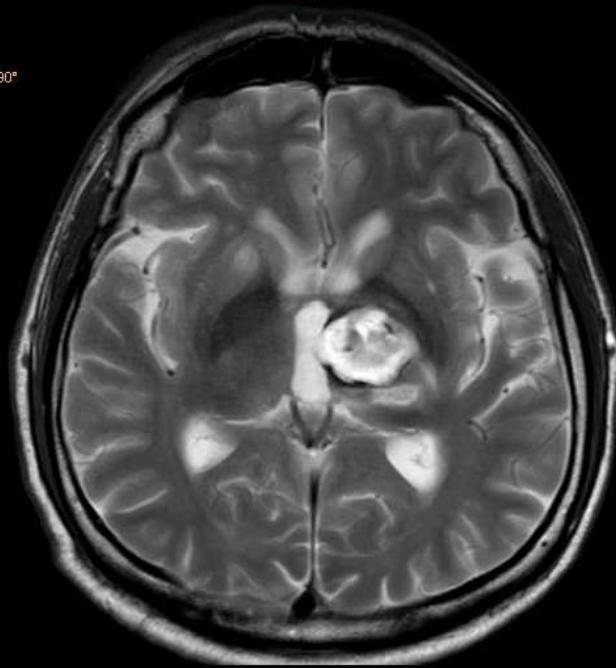
gle 8°



MPR

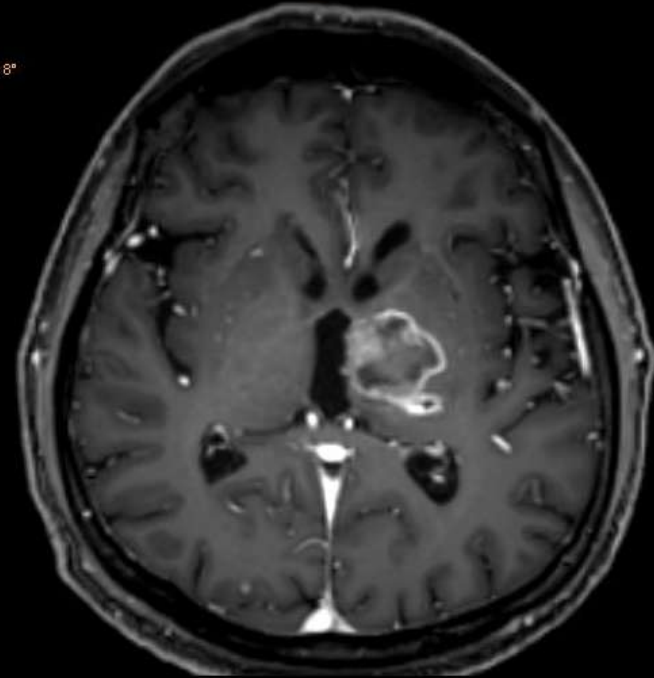


le 90°

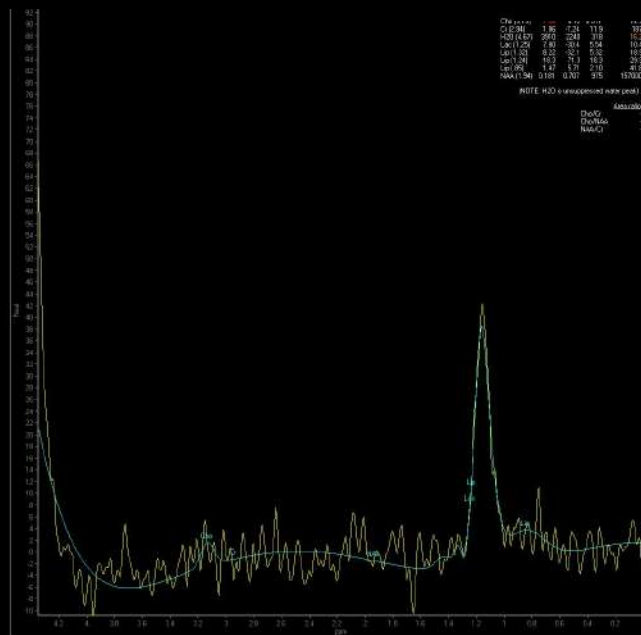
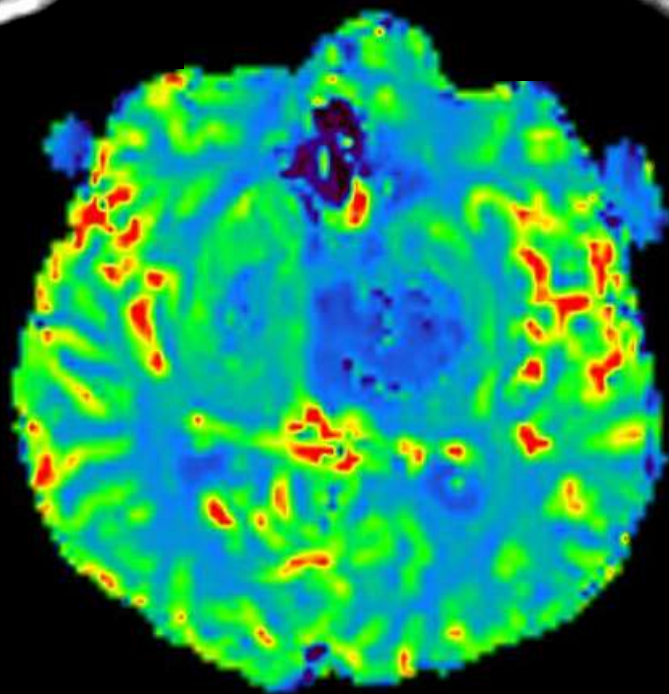


MPR

3le 8°

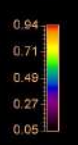
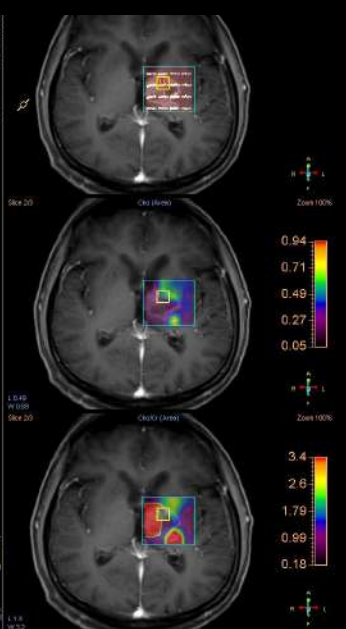


MPR

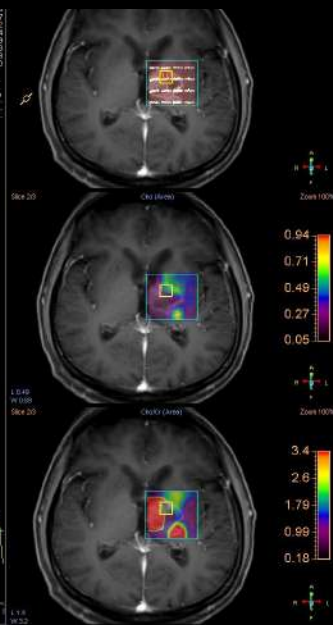
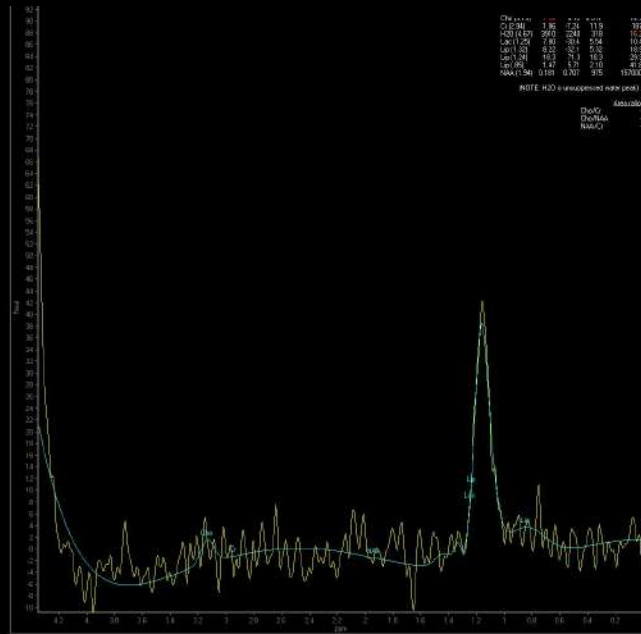
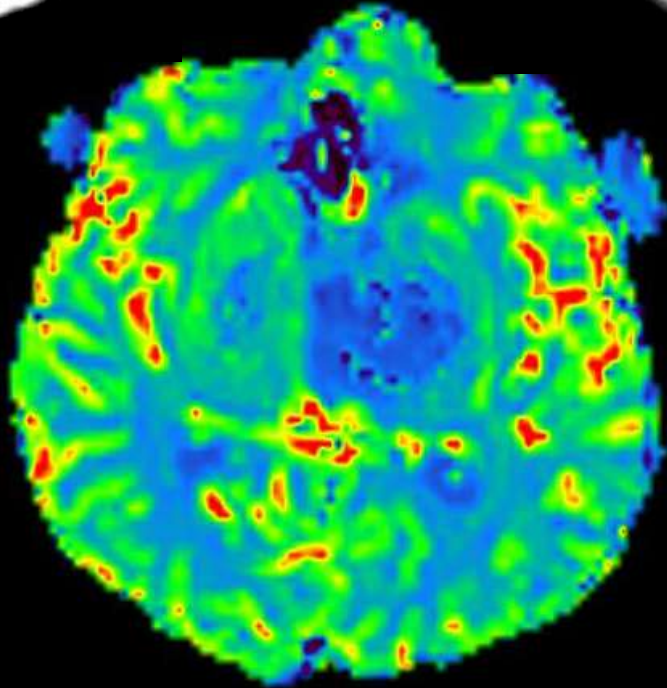
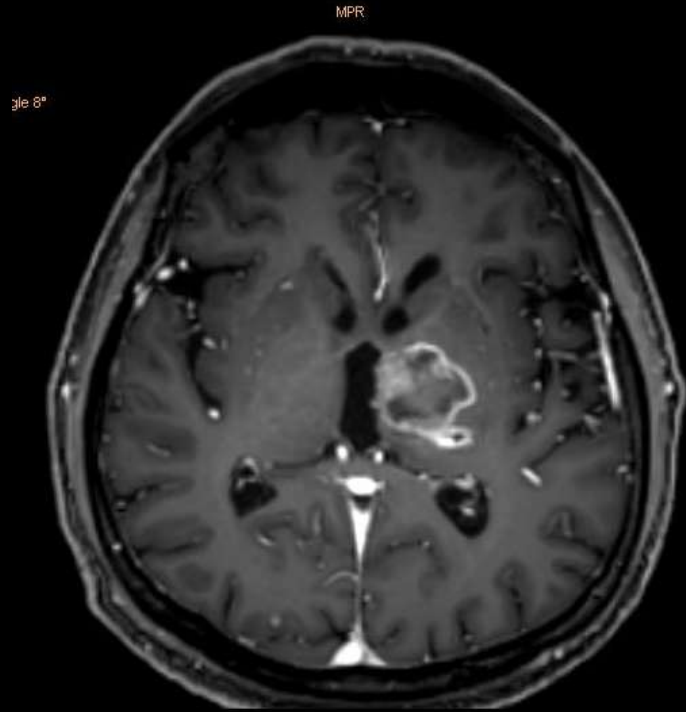
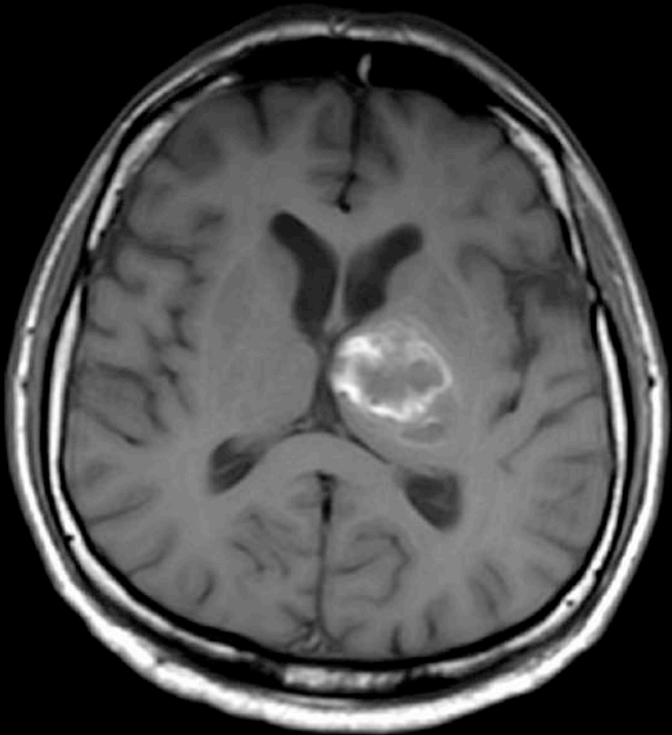


Chemical	ppm	Area	Intensity
Choline	3.2	1.0	100
Cr	3.0	1.0	100
Cho	2.9	1.0	100
Cho	2.8	1.0	100
Cho	2.7	1.0	100
Cho	2.6	1.0	100
Cho	2.5	1.0	100
Cho	2.4	1.0	100
Cho	2.3	1.0	100
Cho	2.2	1.0	100
Cho	2.1	1.0	100
Cho	2.0	1.0	100
Cho	1.9	1.0	100
Cho	1.8	1.0	100
Cho	1.7	1.0	100
Cho	1.6	1.0	100
Cho	1.5	1.0	100
Cho	1.4	1.0	100
Cho	1.3	1.0	100
Cho	1.2	1.0	100
Cho	1.1	1.0	100
Cho	1.0	1.0	100
Cho	0.9	1.0	100
Cho	0.8	1.0	100
Cho	0.7	1.0	100
Cho	0.6	1.0	100
Cho	0.5	1.0	100
Cho	0.4	1.0	100
Cho	0.3	1.0	100
Cho	0.2	1.0	100

NOTE: Cho is unsuppressed water peak



TOKSOPLAZMOZİS



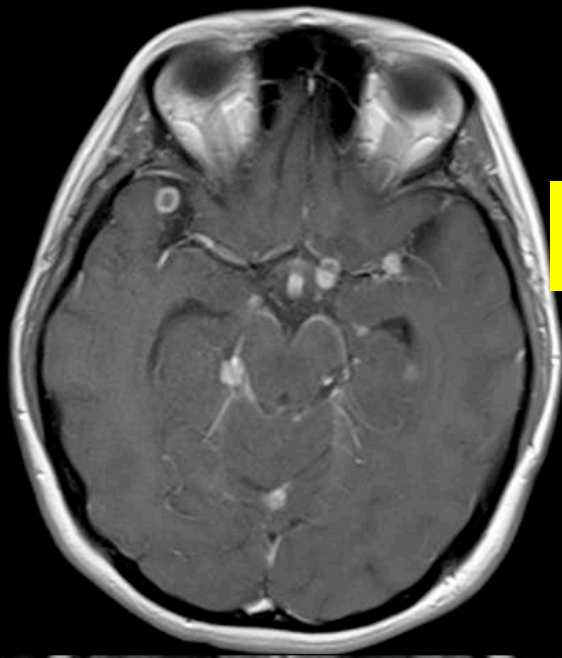
Chemical	1.35	1.35	1.35	1.35
Cho	1.85	7.25	11.5	10.7
Cho (1.35)	260	224	318	102
Cho (1.35)	1.81	7.21	11.4	10.4
Cho (1.35)	6.23	32.1	6.3	18.9
Cho (1.35)	10.2	7.1	18.2	29.3
Cho (1.35)	1.47	1.71	2.18	4.18
Cho (1.35)	11.88	0.787	8.5	137.0

NOTE: Cho is unassigned main peak

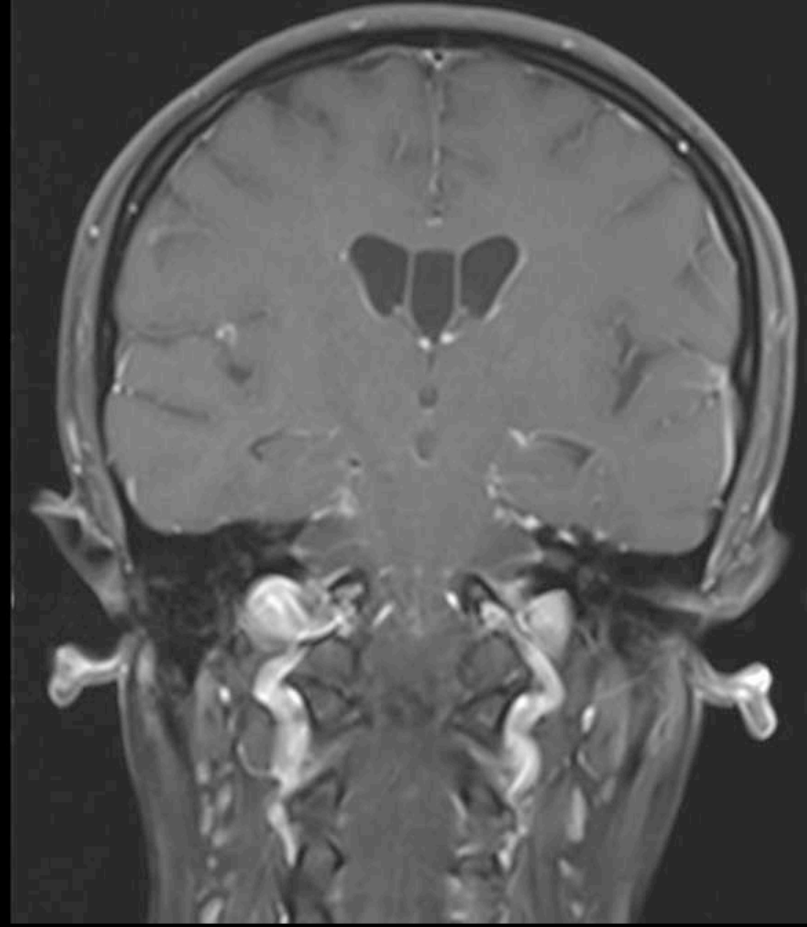
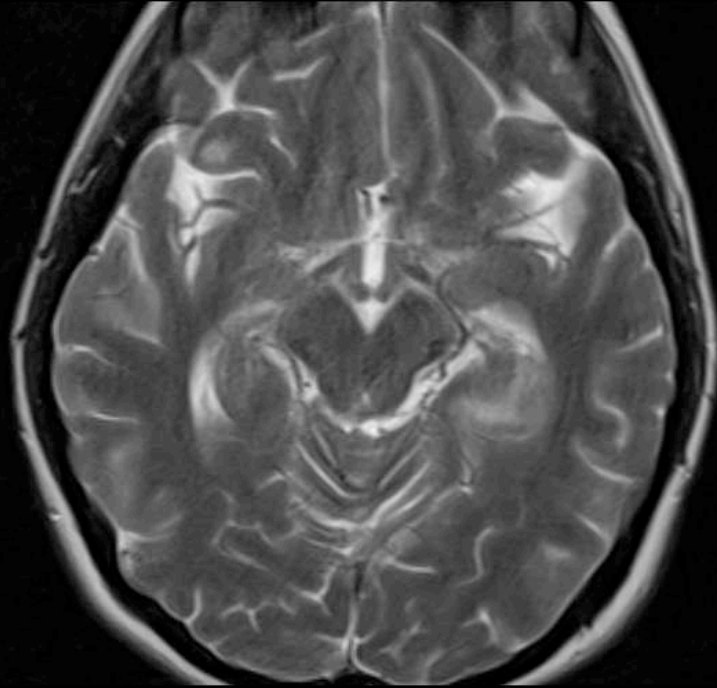
Abb: Cho
Cho (1.35)
Cho (1.35)

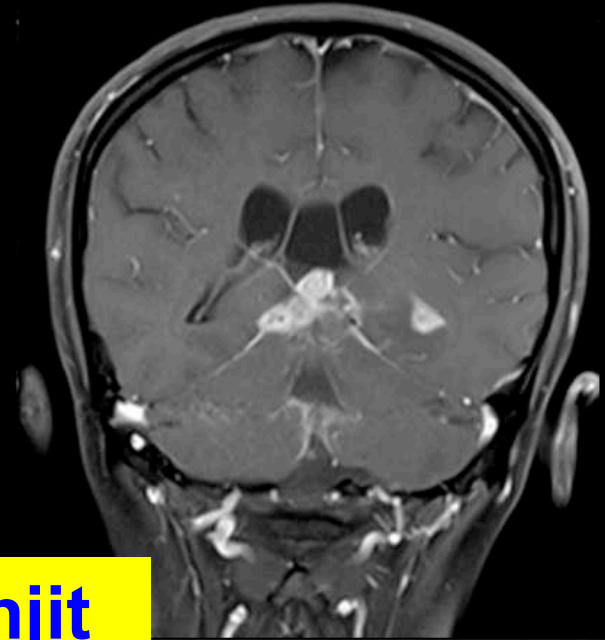
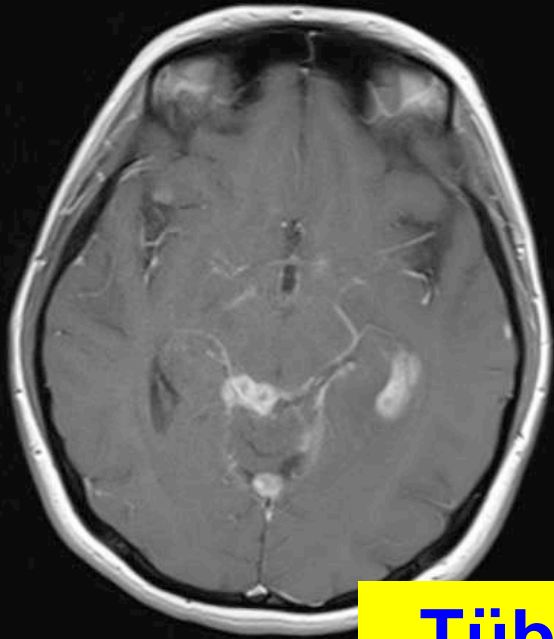
TÜBERKÜLOZ

- Bazal sisternaların çevresinde ve silviyan fissürlerde meningeal kontrastlanma **MENENJİT**
- Çok sayıda küçük (<1 cm), halka veya nodüler şekilde kontrastlanma gösteren **tüberkülom**
- Hidrosefali
- **MRS**, tüberkülozun karakteristik özelliği olan benzersiz **lipid piki**

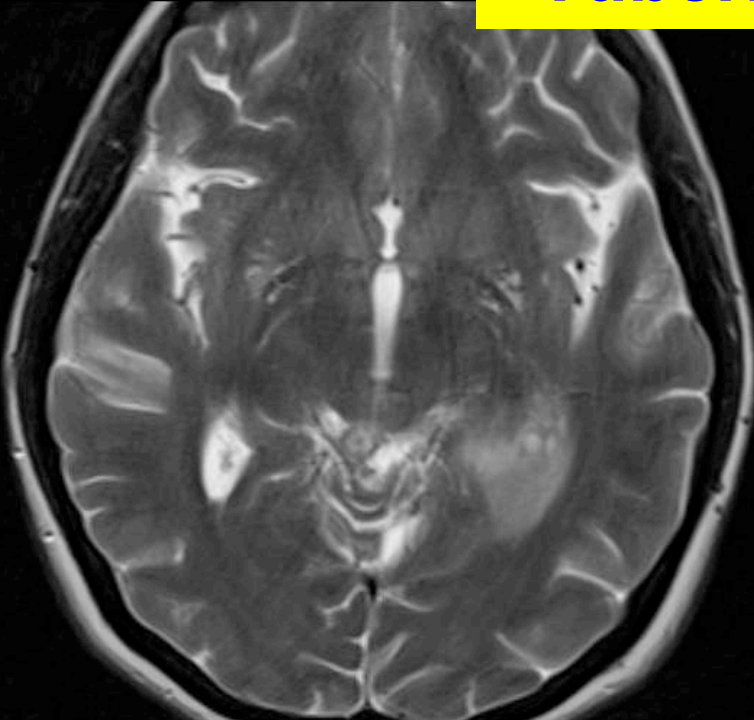


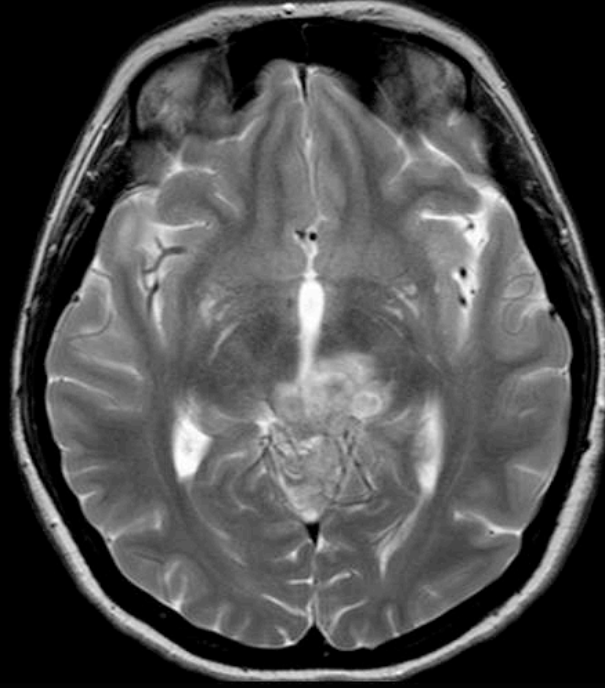
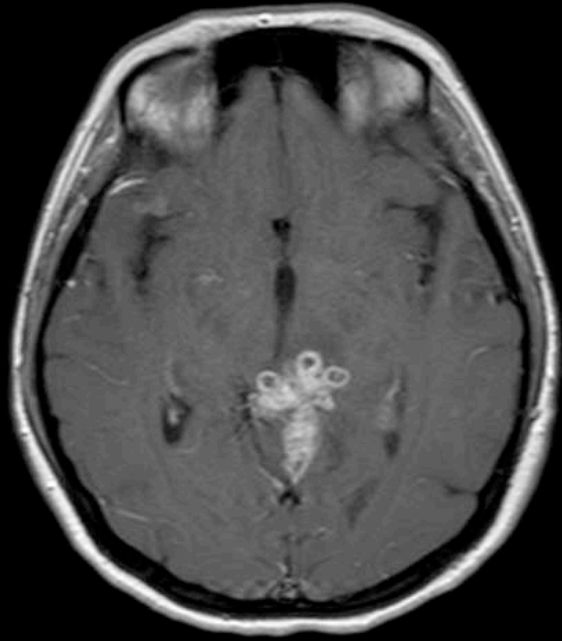
Tüberkülom + Meningenjt



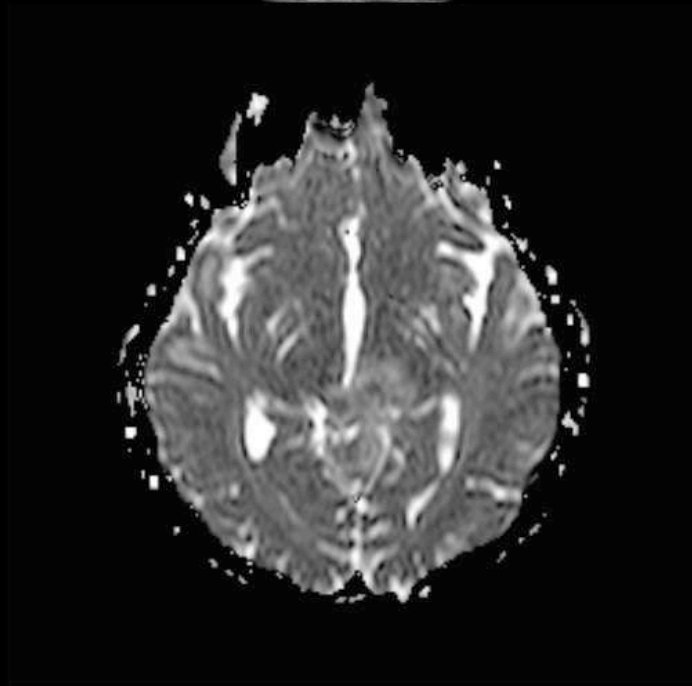
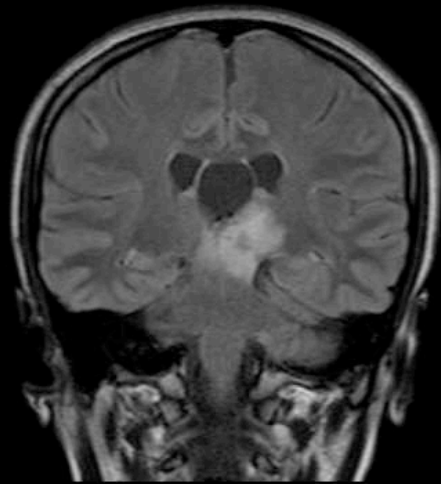
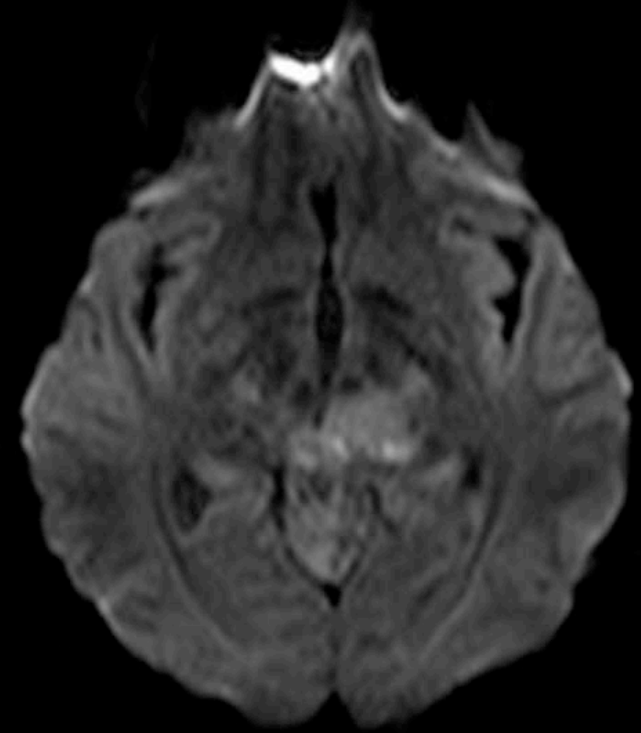


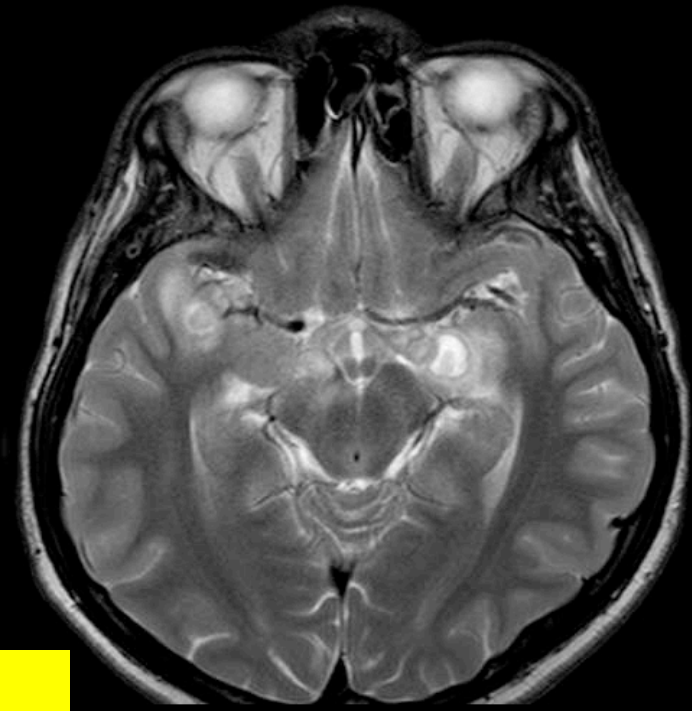
Tüberkülom + Meningenj



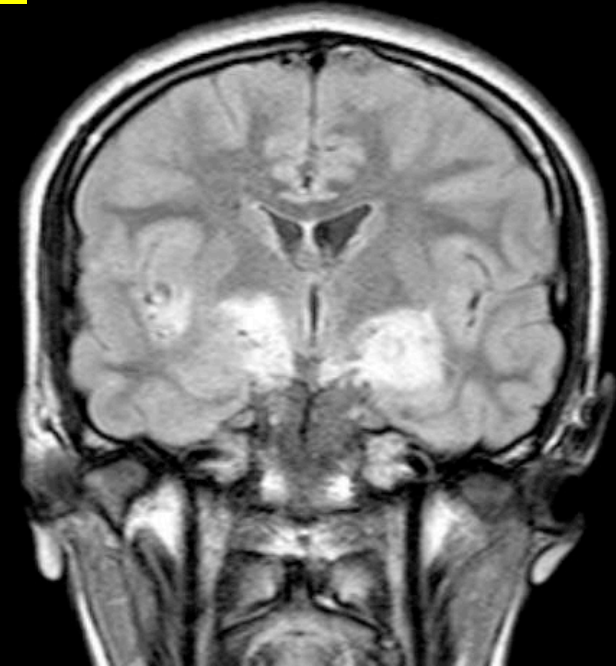
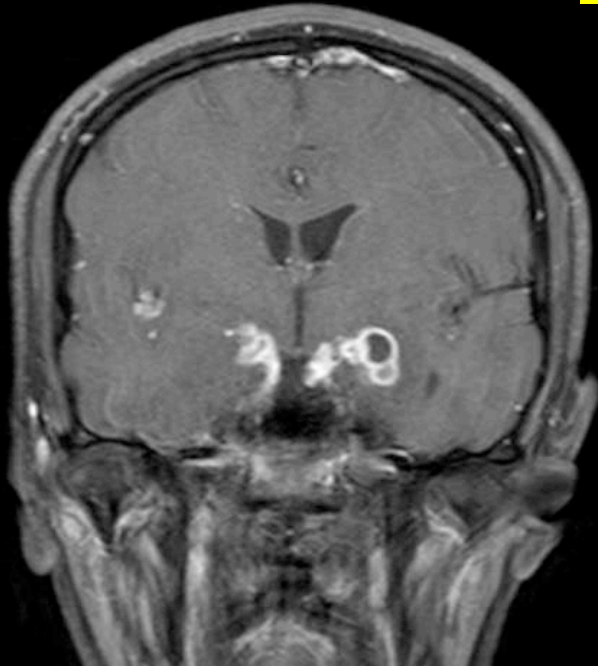


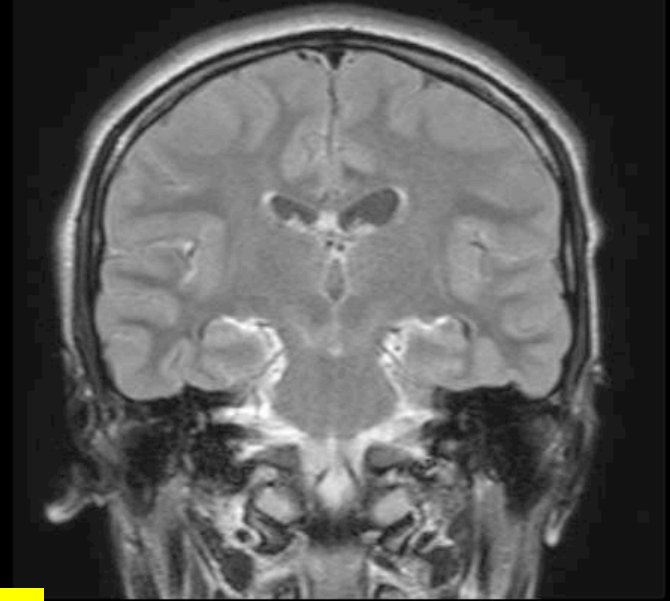
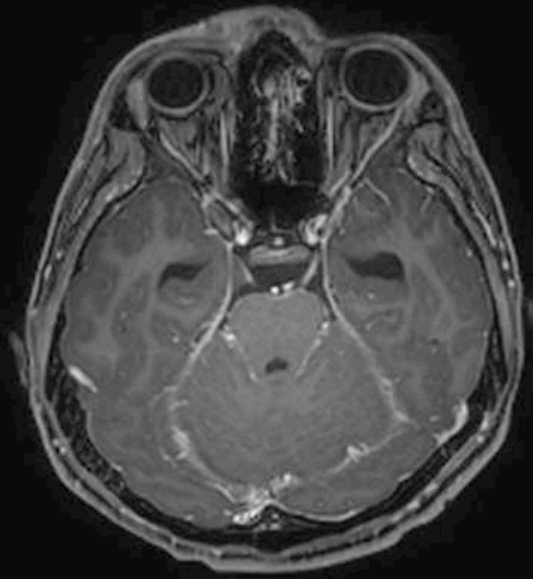
Tüberküлом



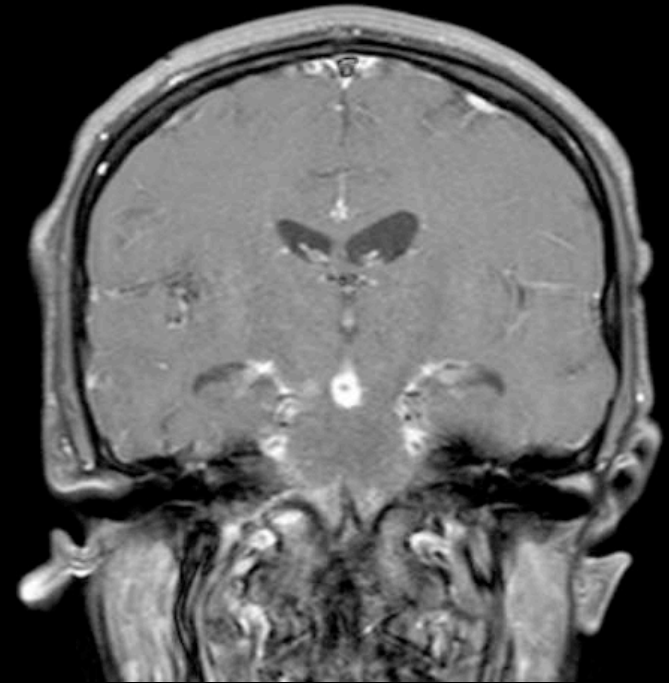
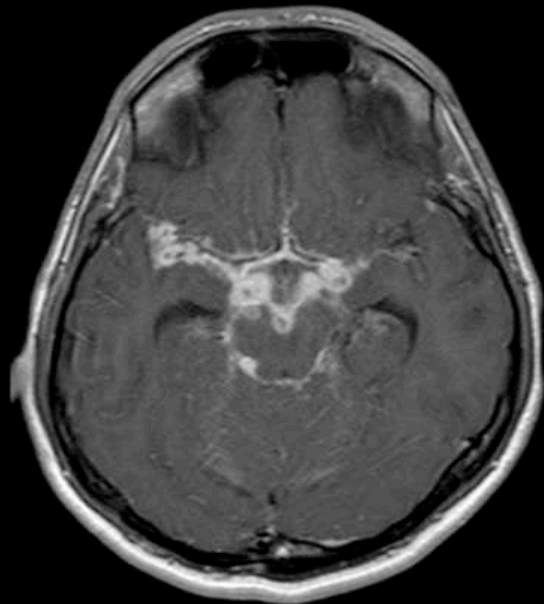


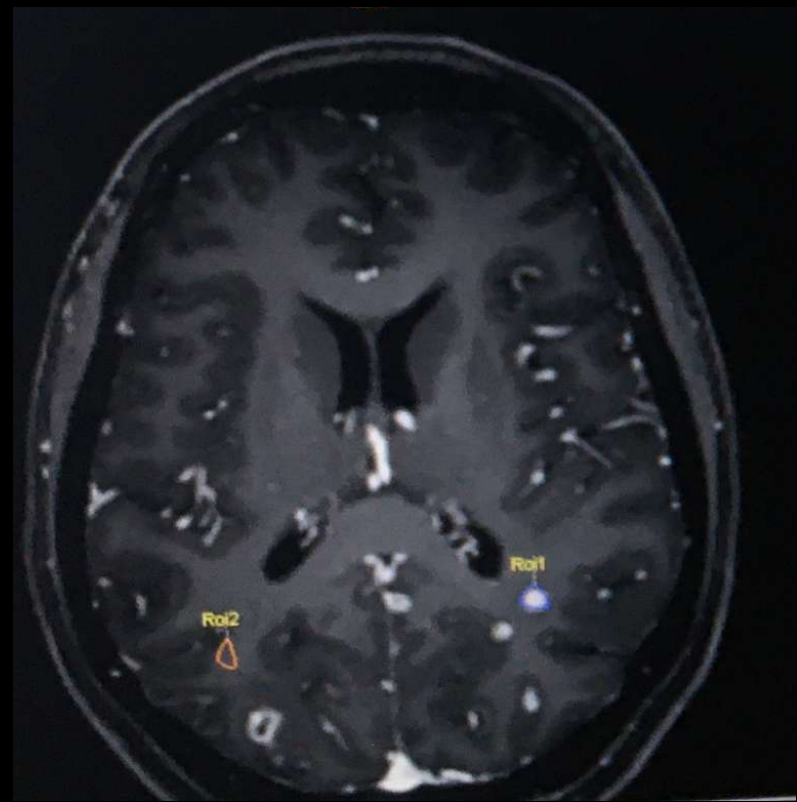
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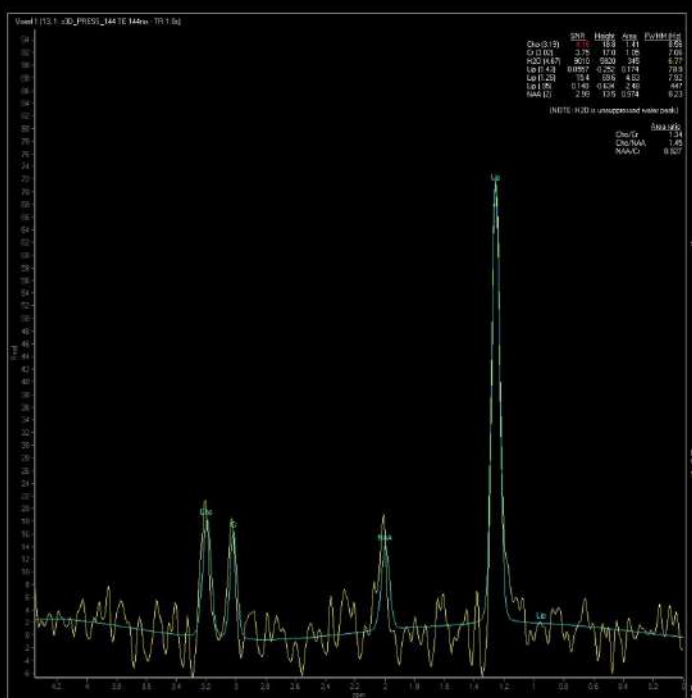
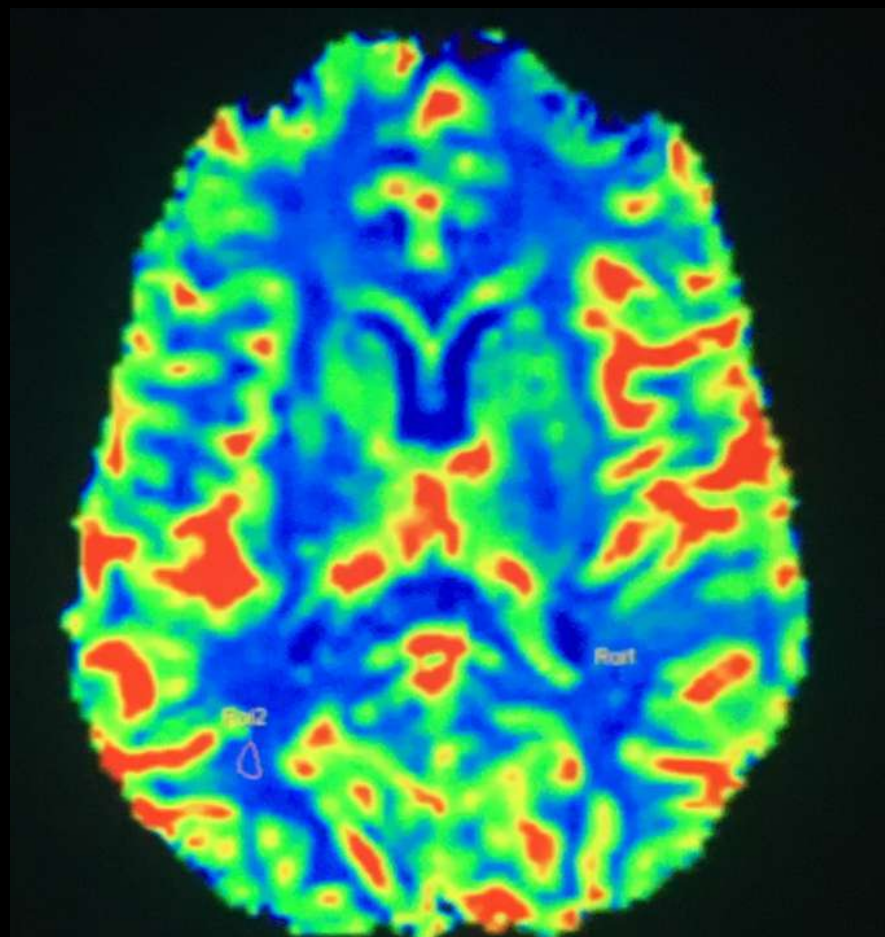
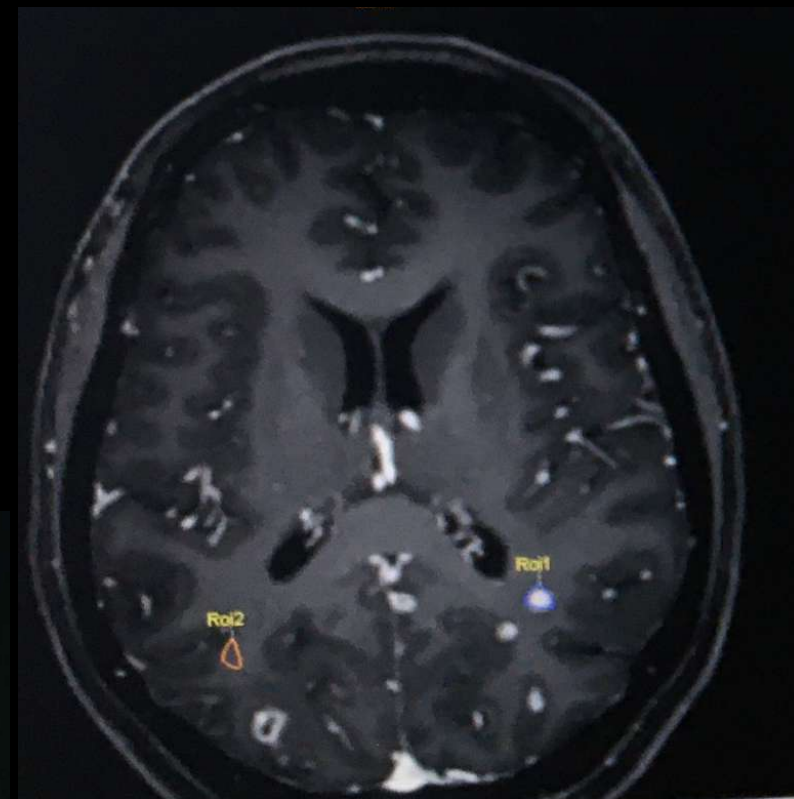




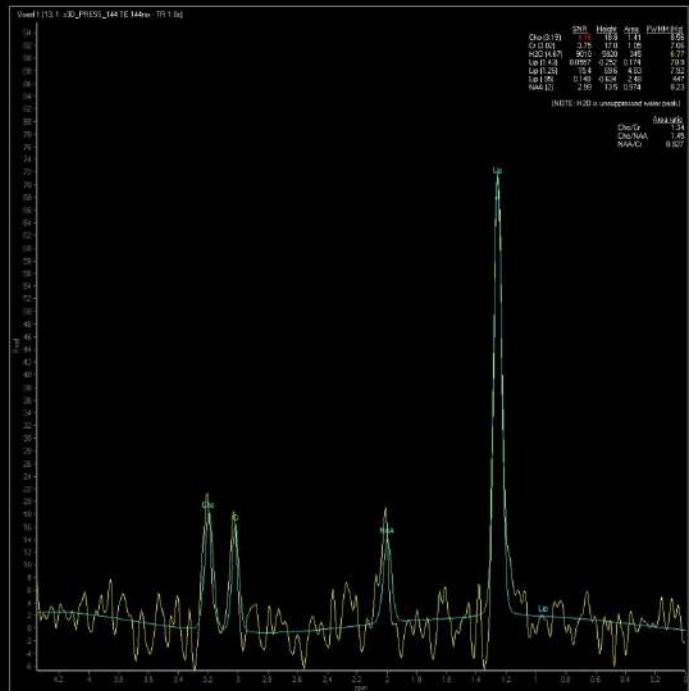
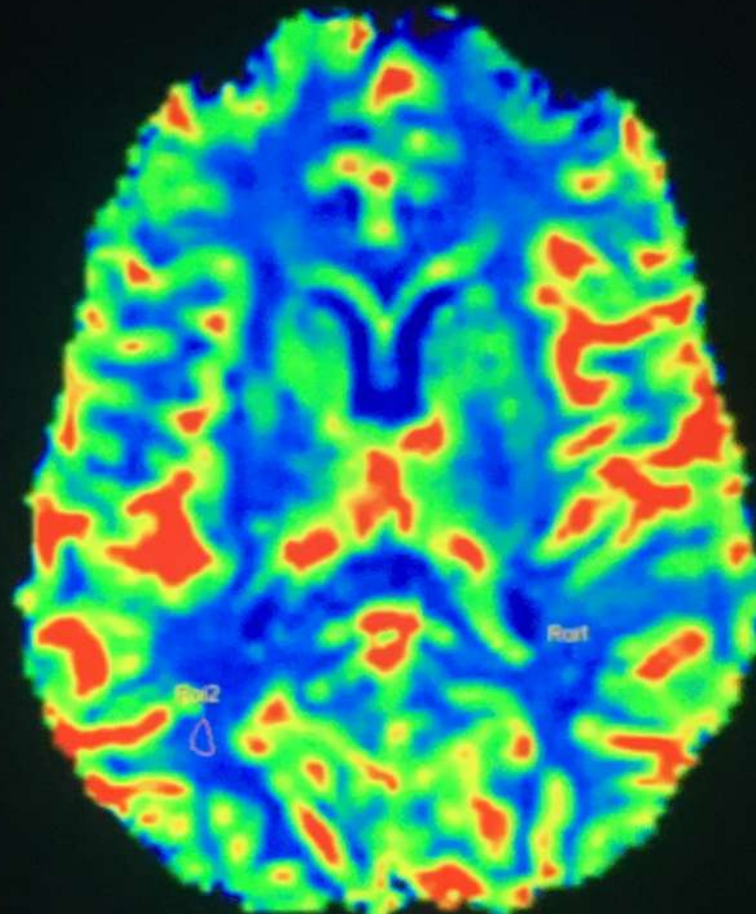
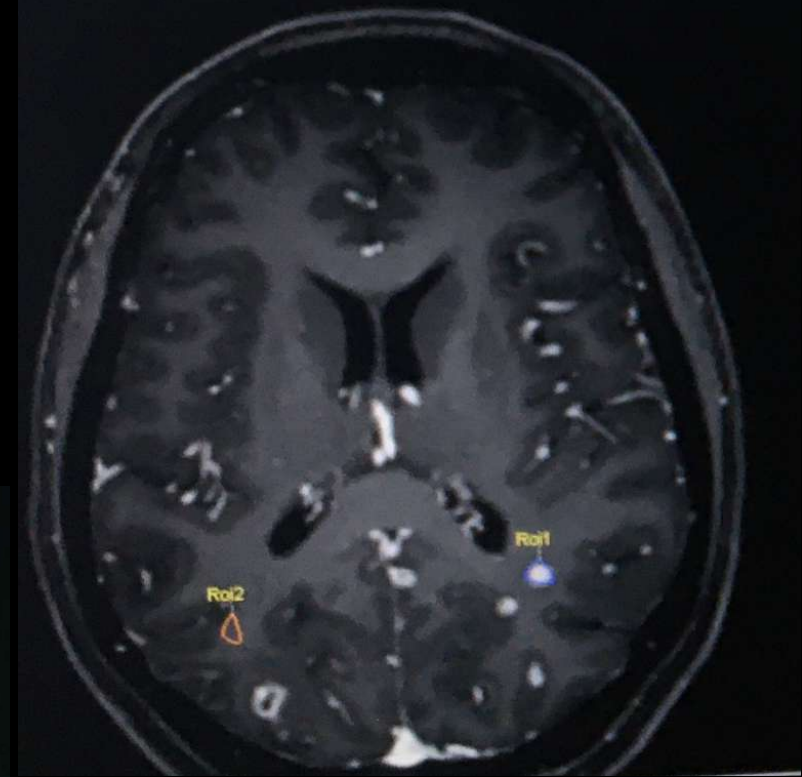
Tüberküлом + Meningenit







Tüberküлом

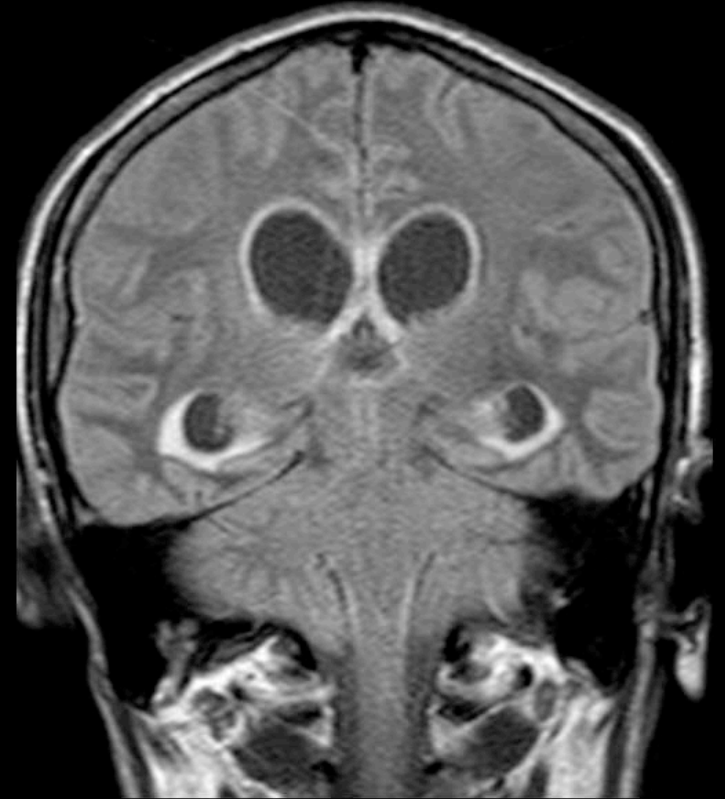
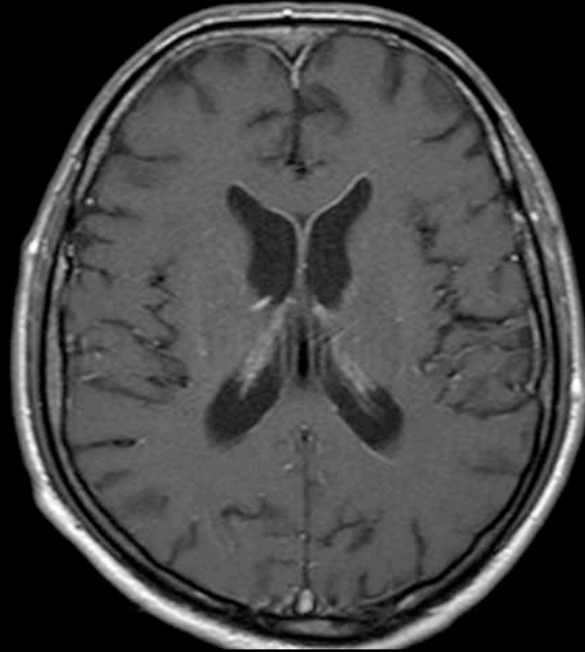
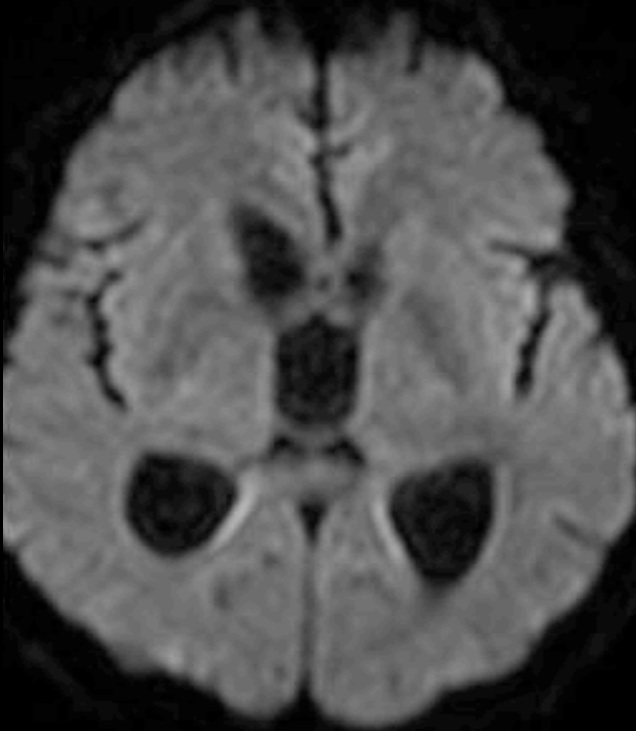
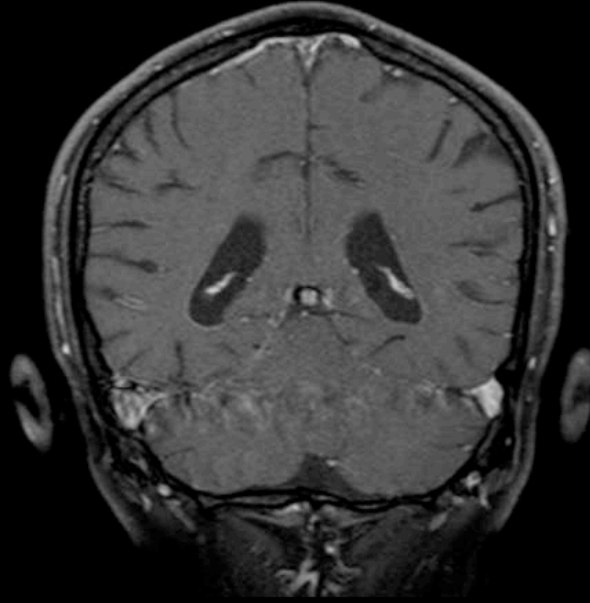
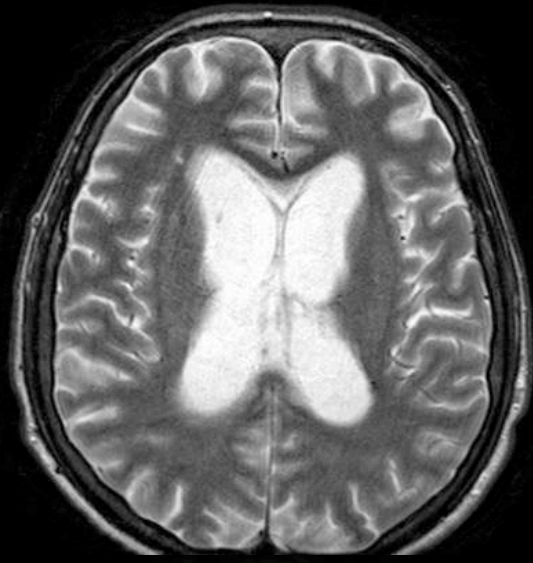


CMV Enfeksiyonu

- CMV meningoensefalit, ventrikülit, radikülit, hidrosefali
- Ependimal T2/FLAIR hiperintensitesi, ependimal kontrastlanma ve ependimal difüzyon kısıtlaması

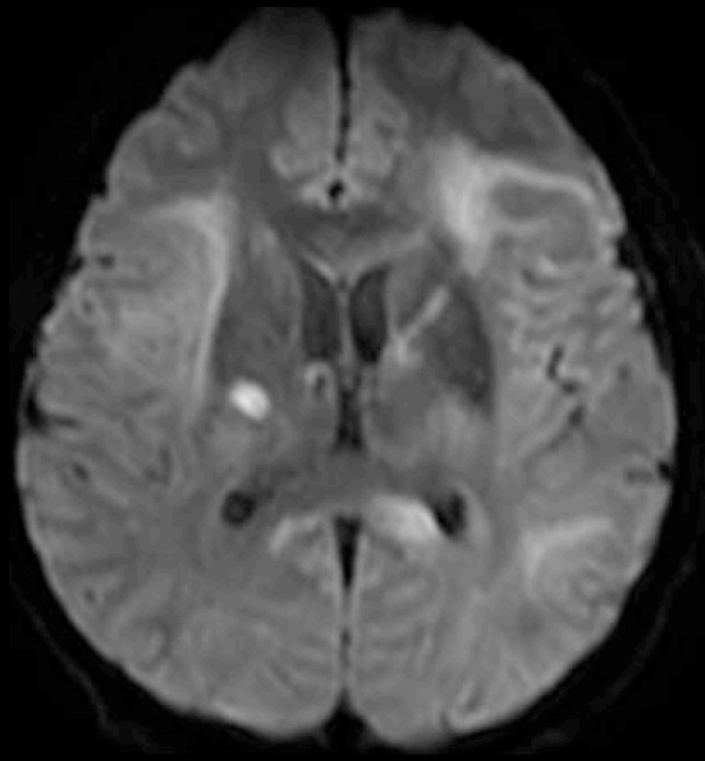
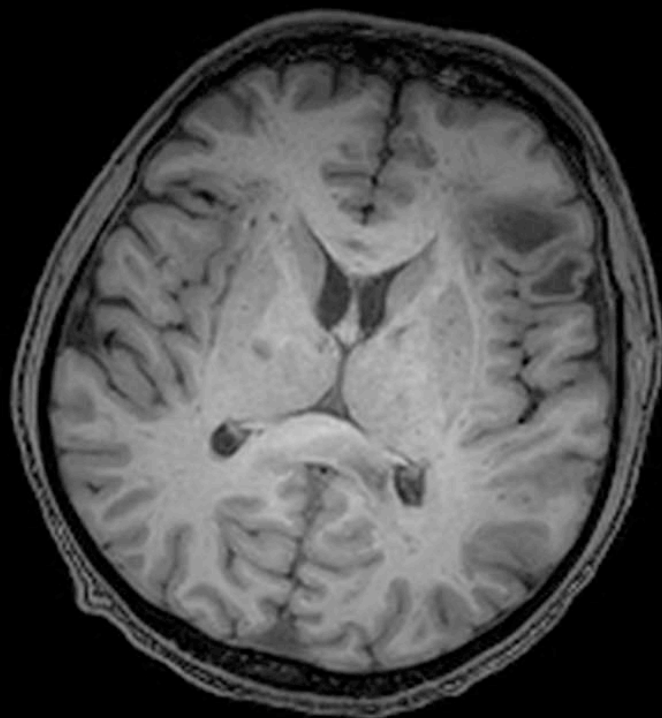
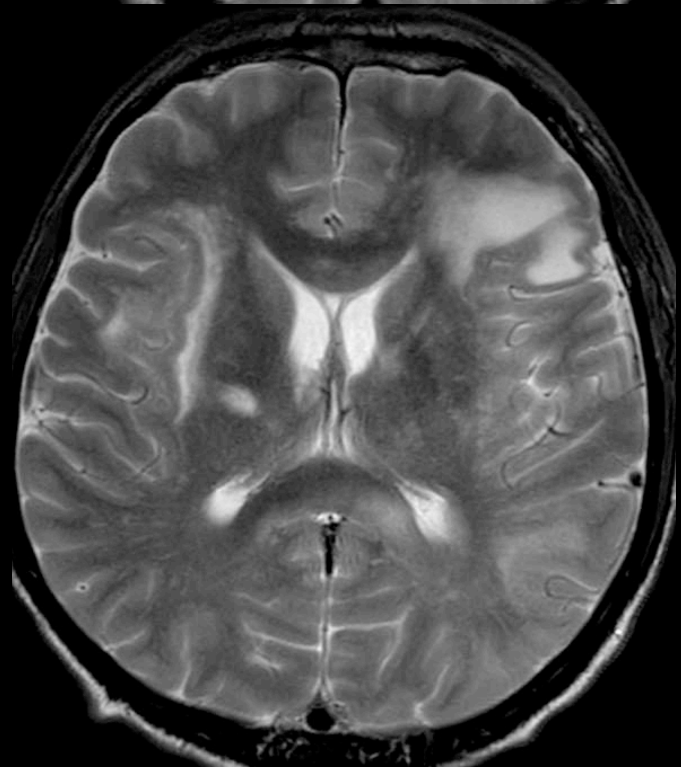
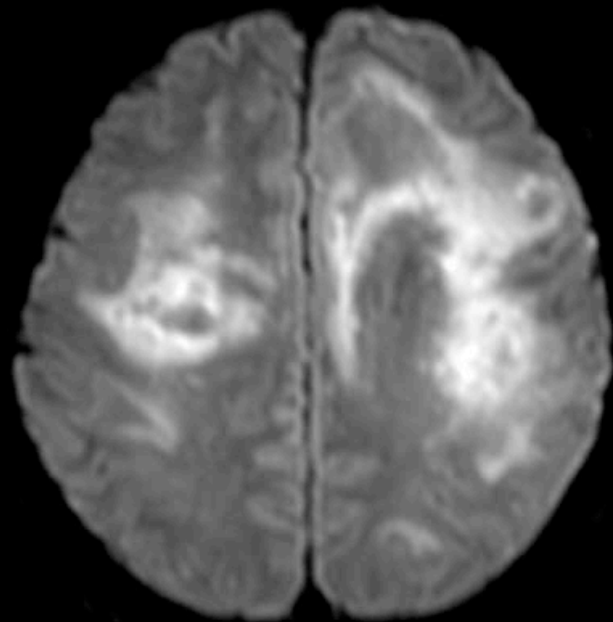
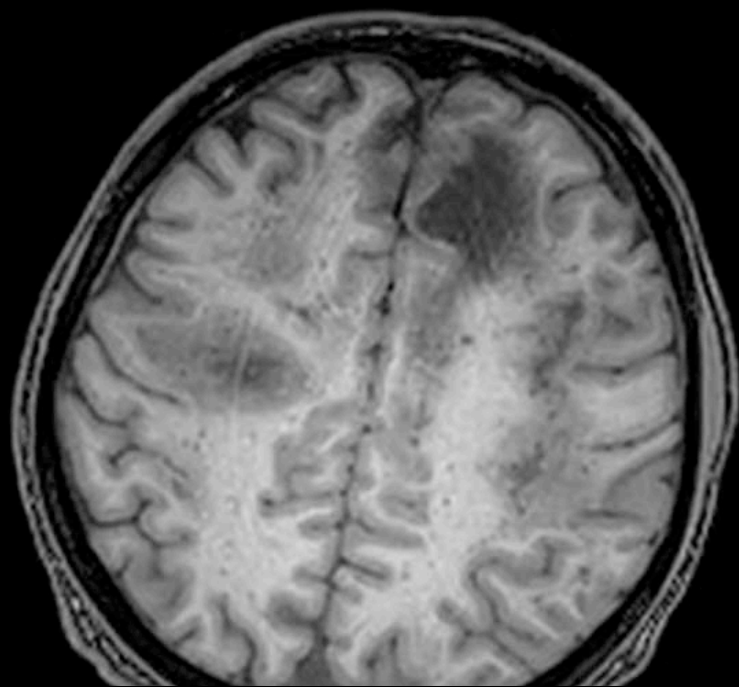
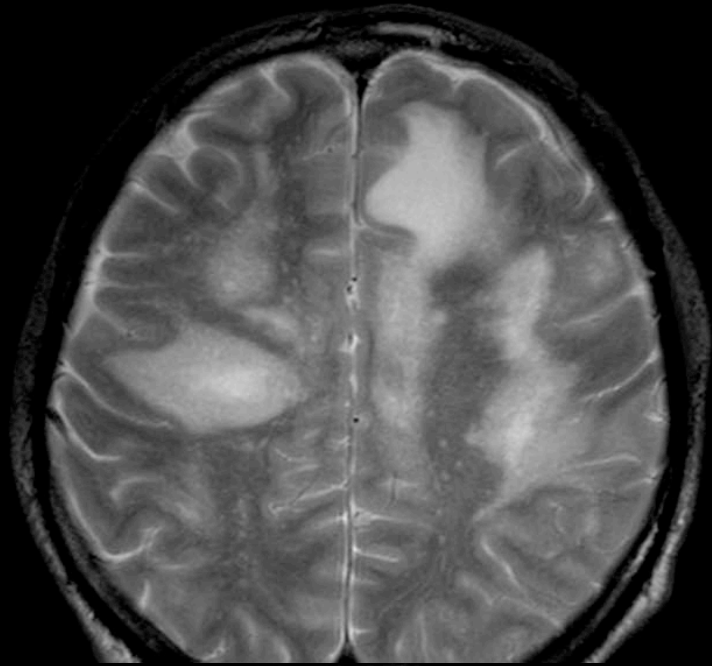
Elicer I. Curr Neurol Neurosci Rep. 2020
Smith AB, et al. Radiographics. 2008

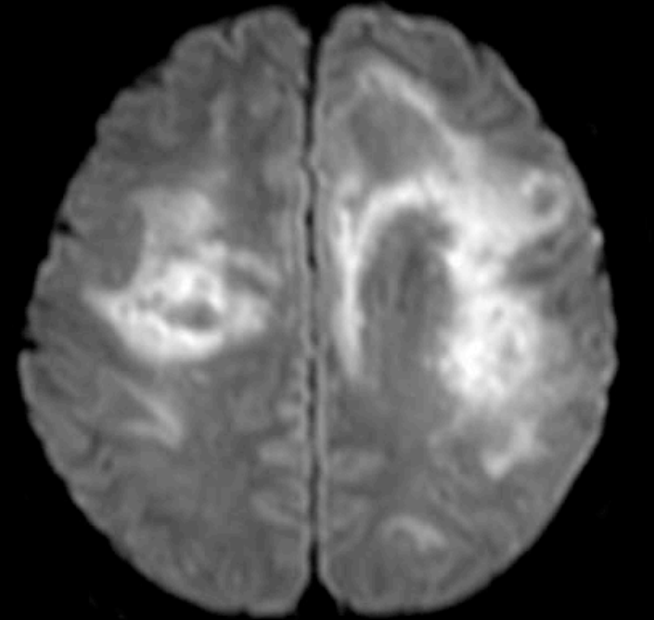
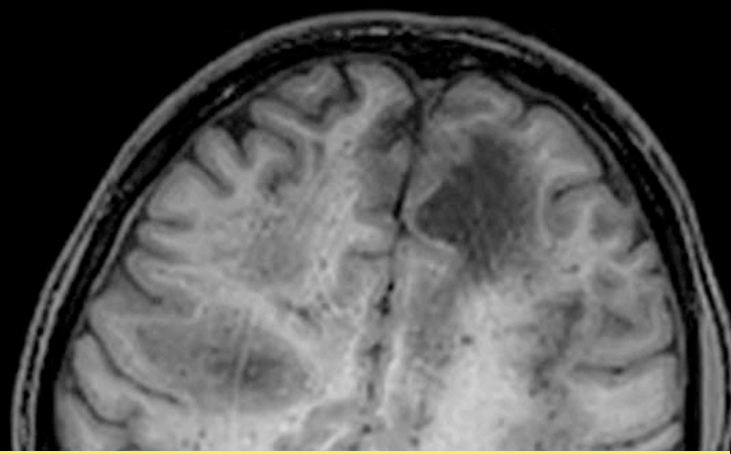
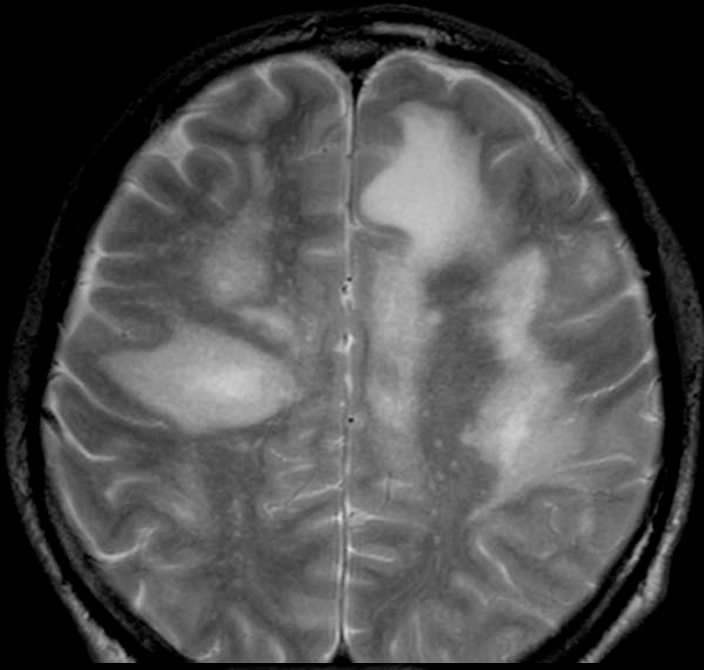
CMV + Ventrikülit



Progresif Multifokal L koensefalopati

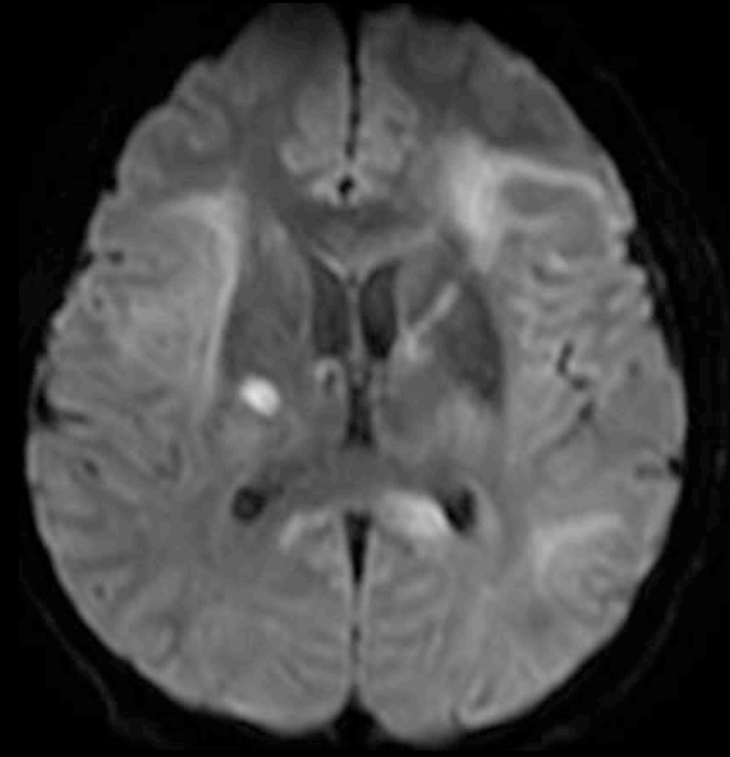
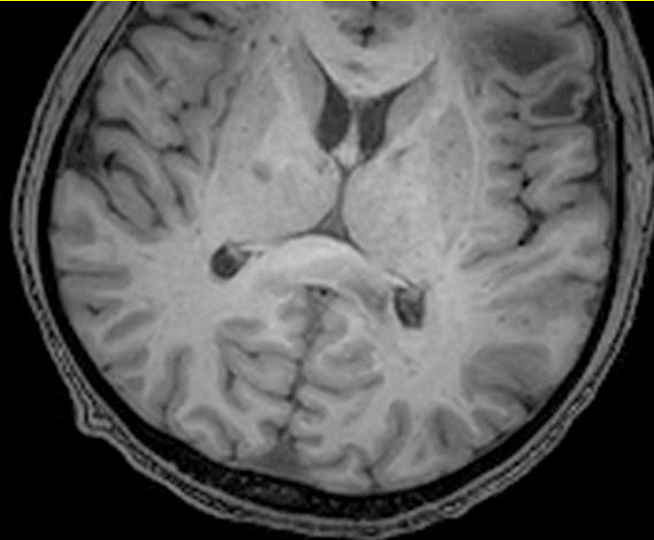
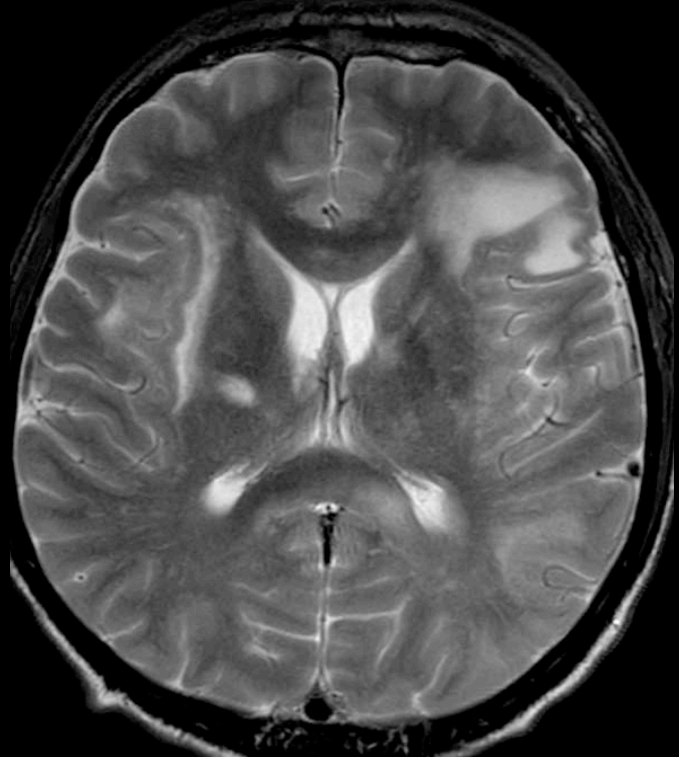
- PML, genelde imm nsuprese hastalarda g r len John Cunningham (JC) poliomavir s n n neden olduėu oligodendrositleri tutan ilerleyici bir demiyelinizan hastalıktır.
- oėunlukla subkortikal beyaz cevherde ve U fiberlerde, asimetrik, genelde kitle etkisi yapmayan ve kontrastlanmayan demiyelinizan lezyonlar g r l r. Korteks ve derin gri cevher tutulumu daha nadirdir.
- Kesin bir tanı iin, uyumlu klinik ve g r nt leme bulgularına ek olarak JCV iin pozitif bir BOS PCR zorunludur.

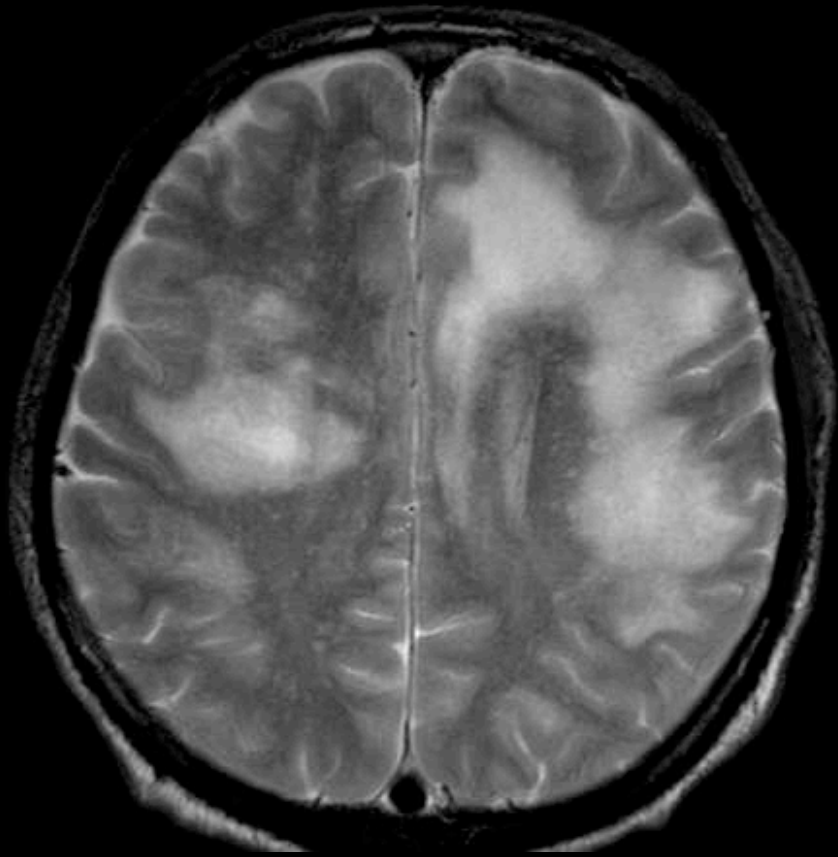




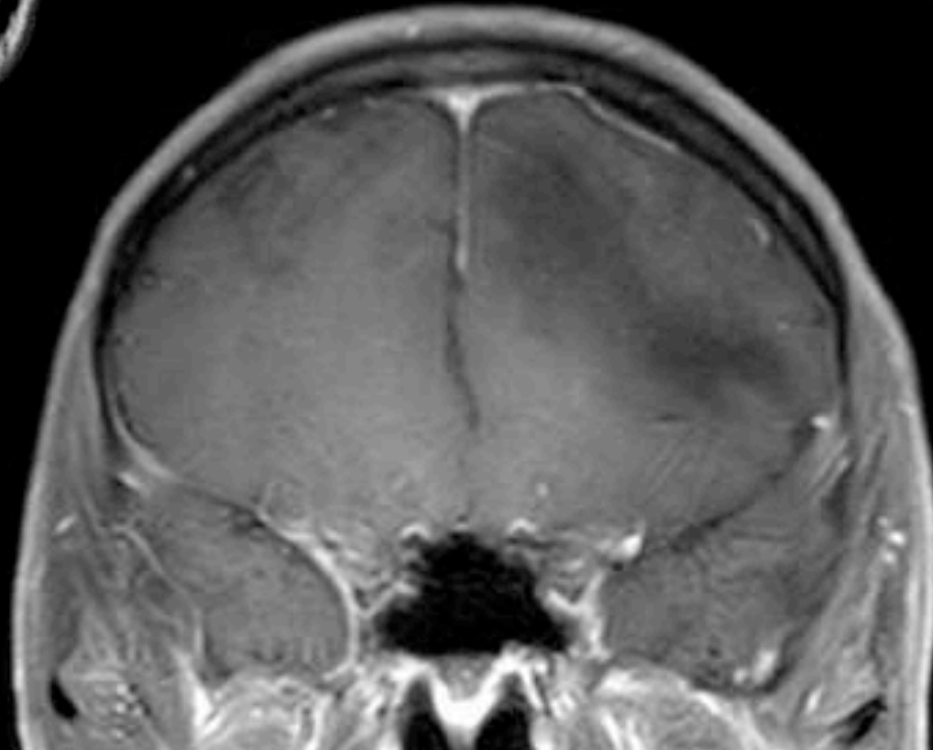
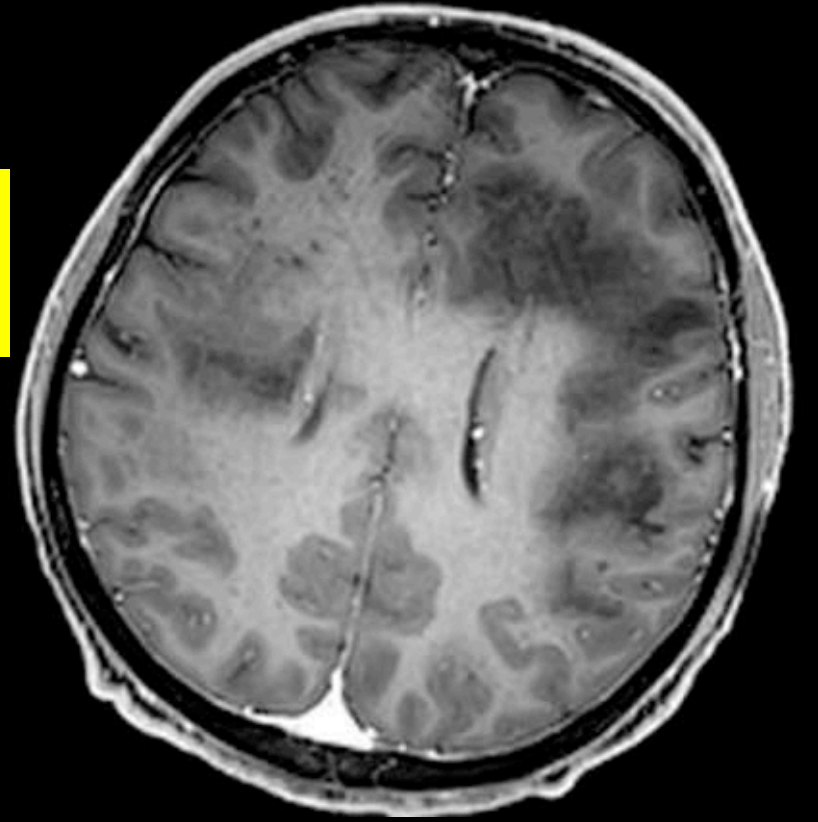
PML

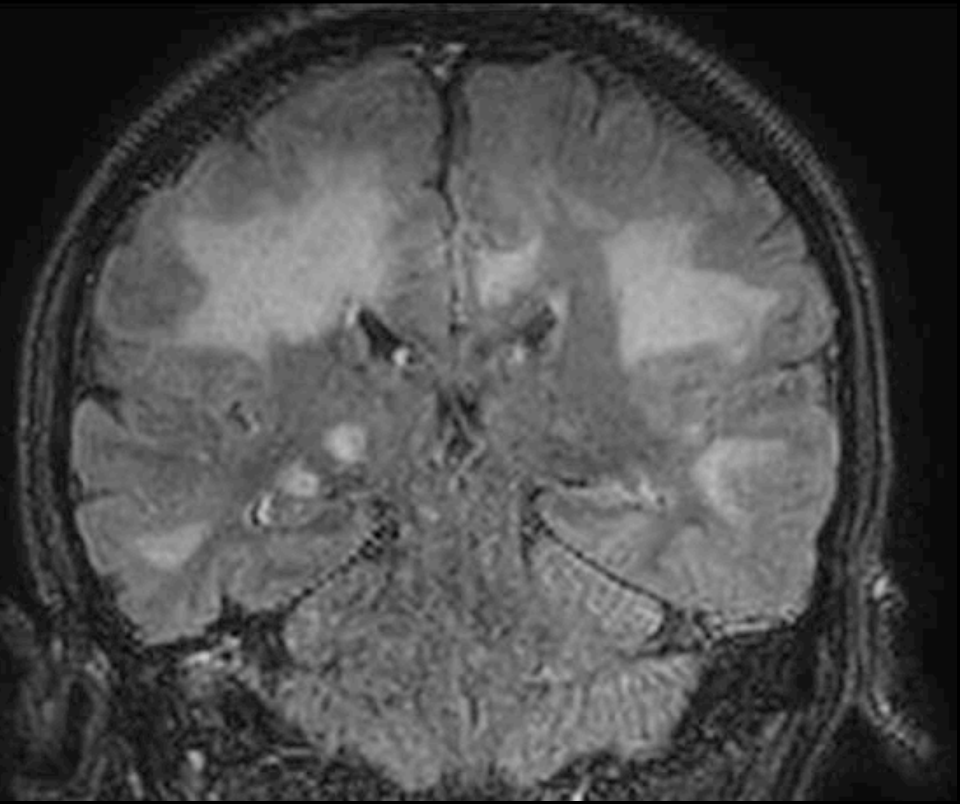
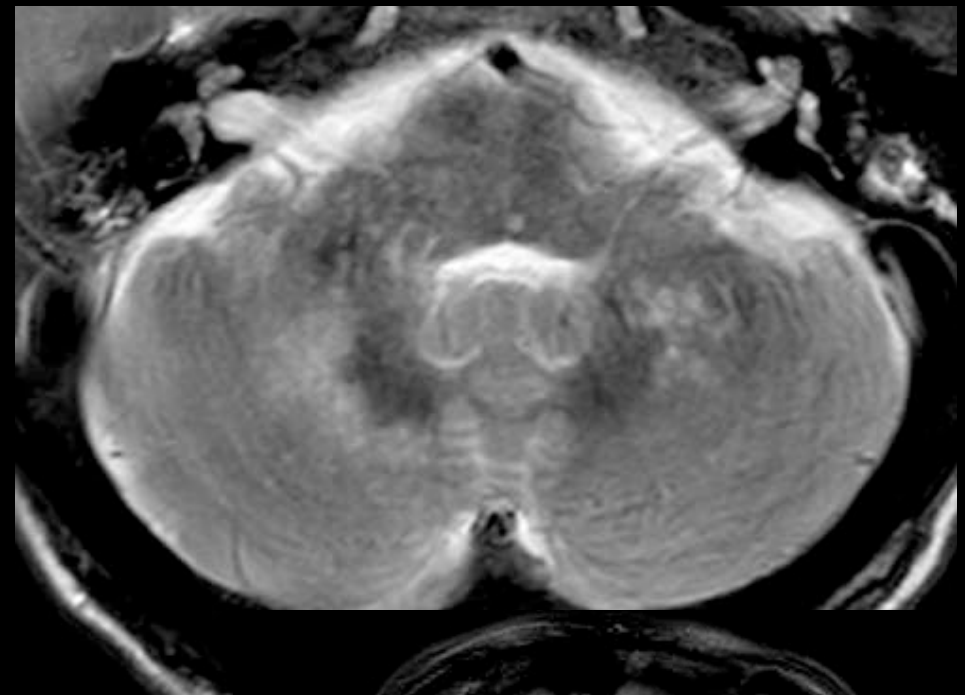
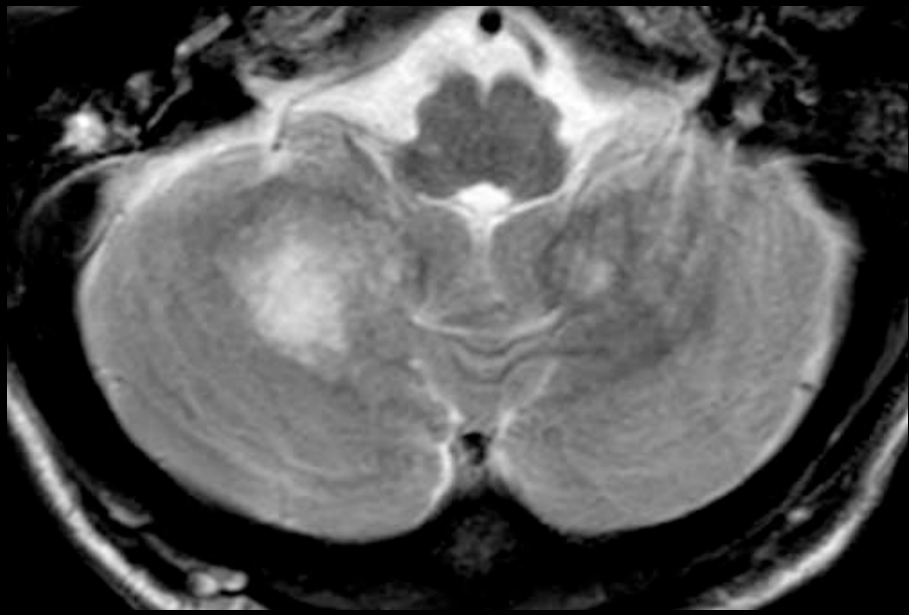
Asimetrik dağılım
Subkortikal beyaz cevherde
Kitle etkisi yok
T1A da hipointens



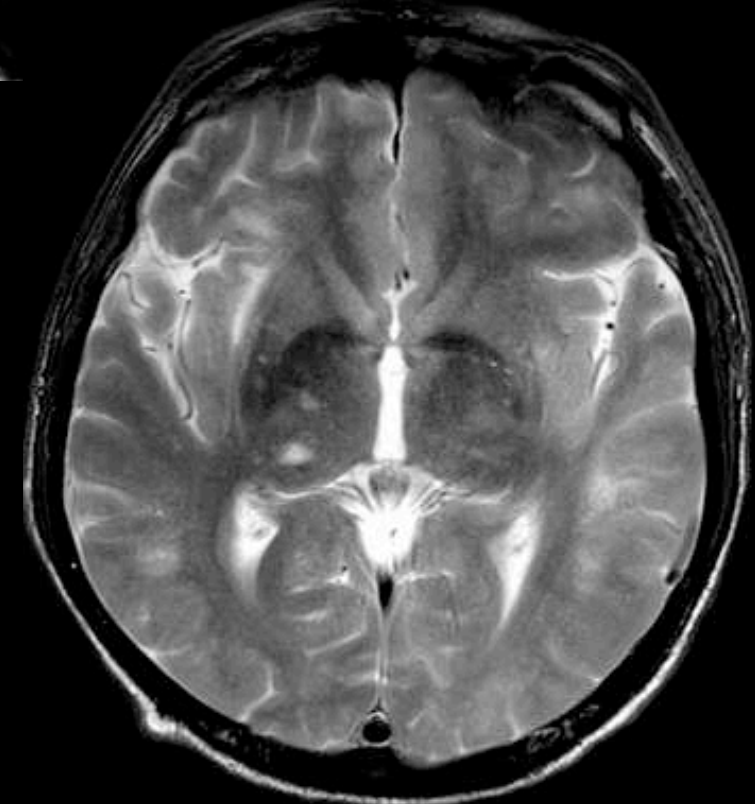


PML
Genelde kontrastlanmaz

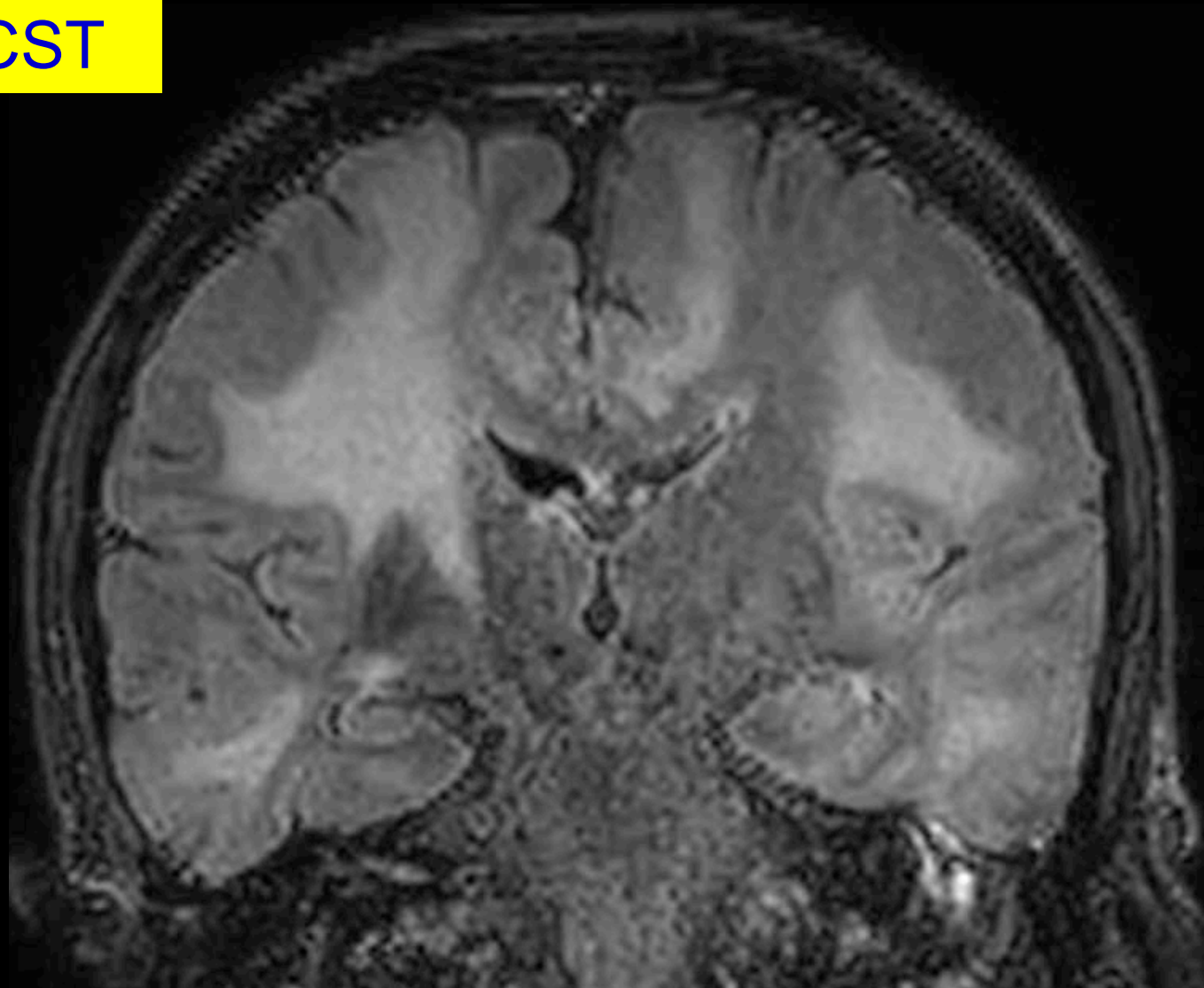
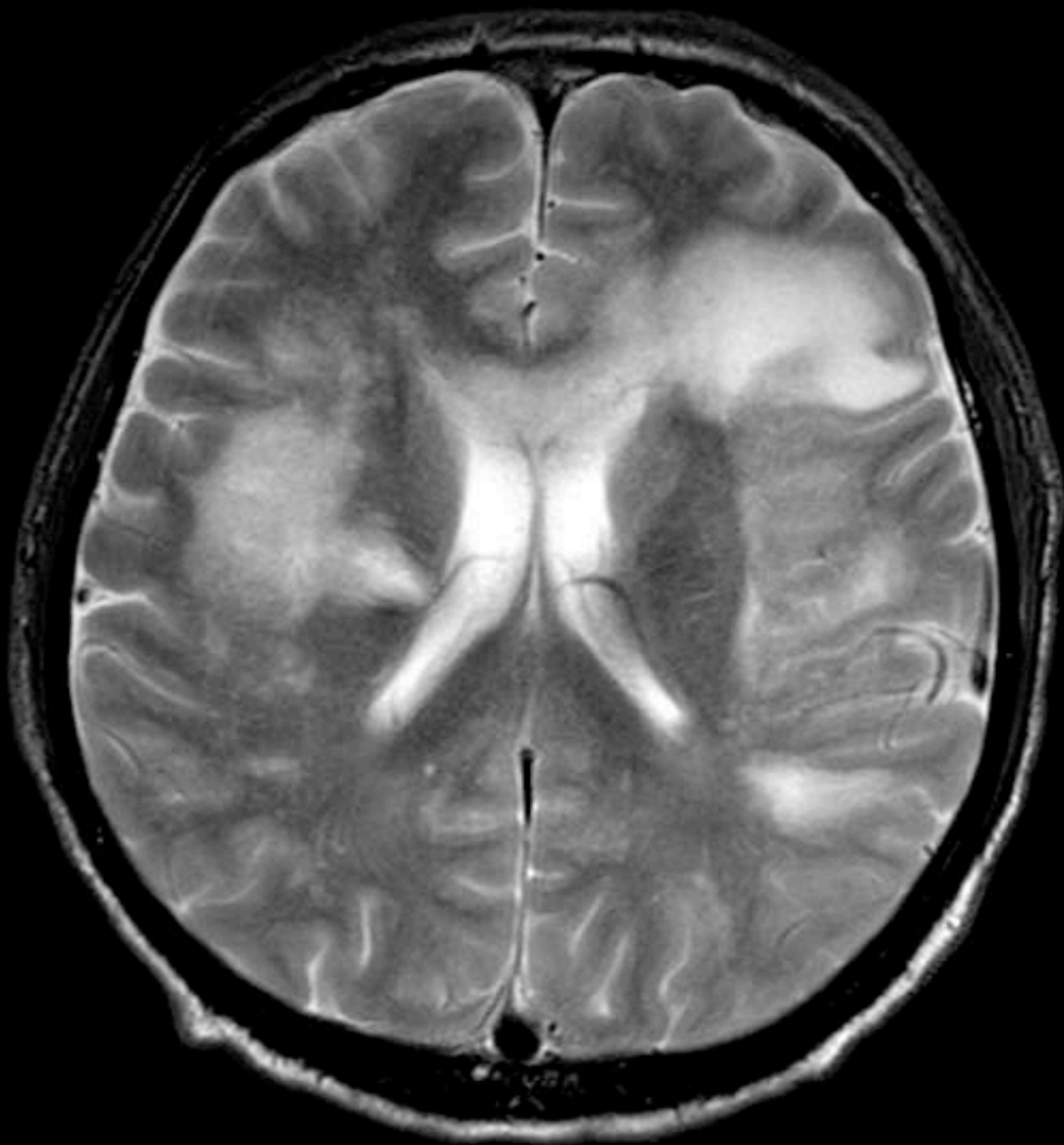


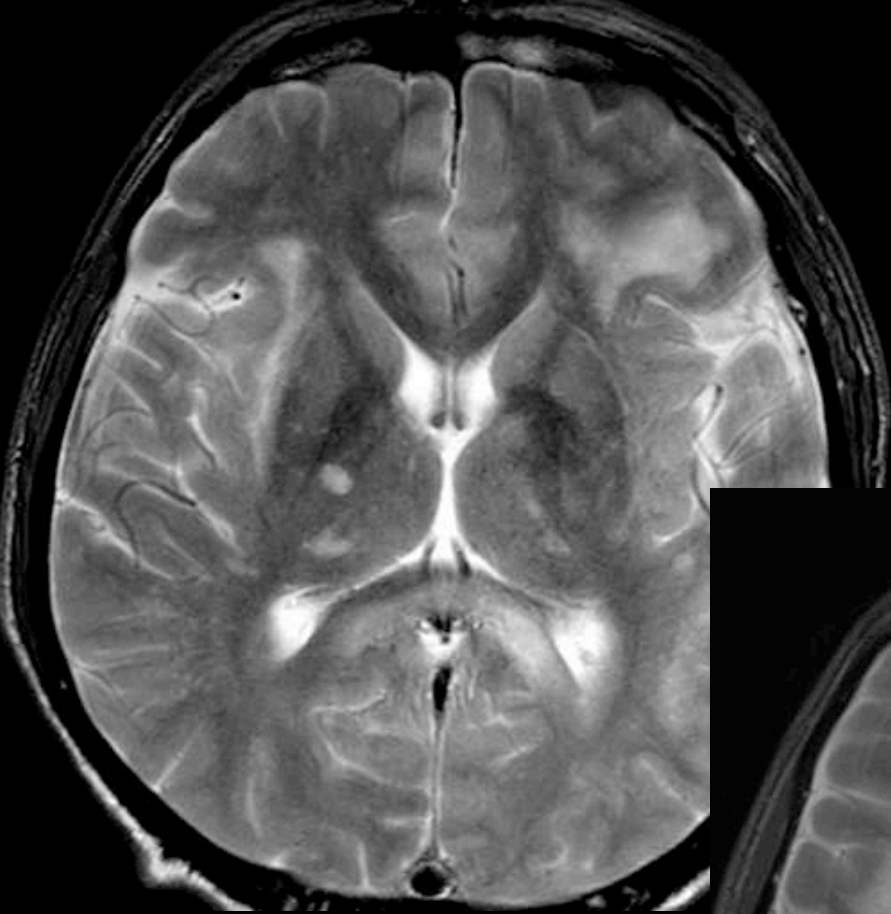


PML
Talamus
Infratentorial

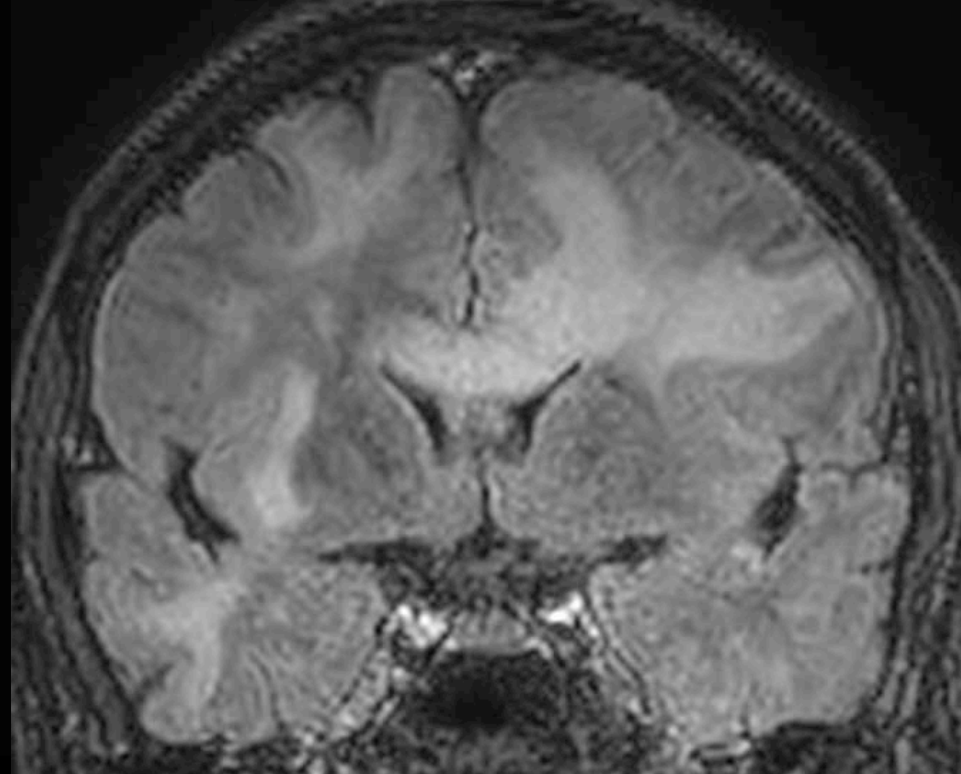
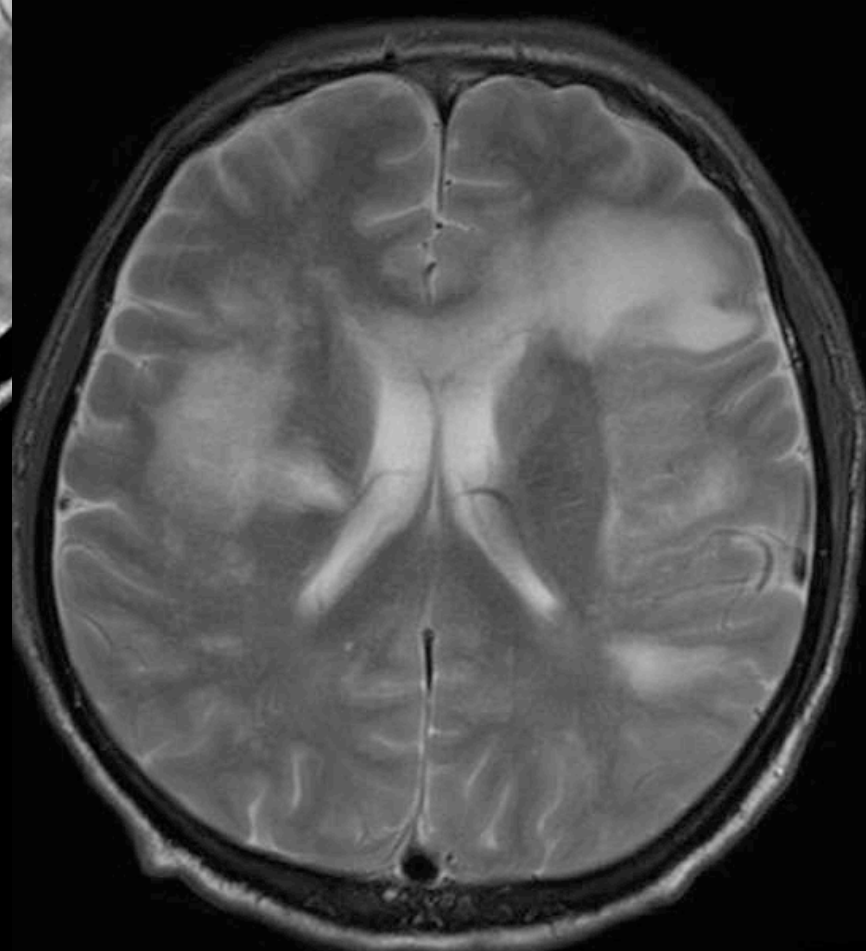
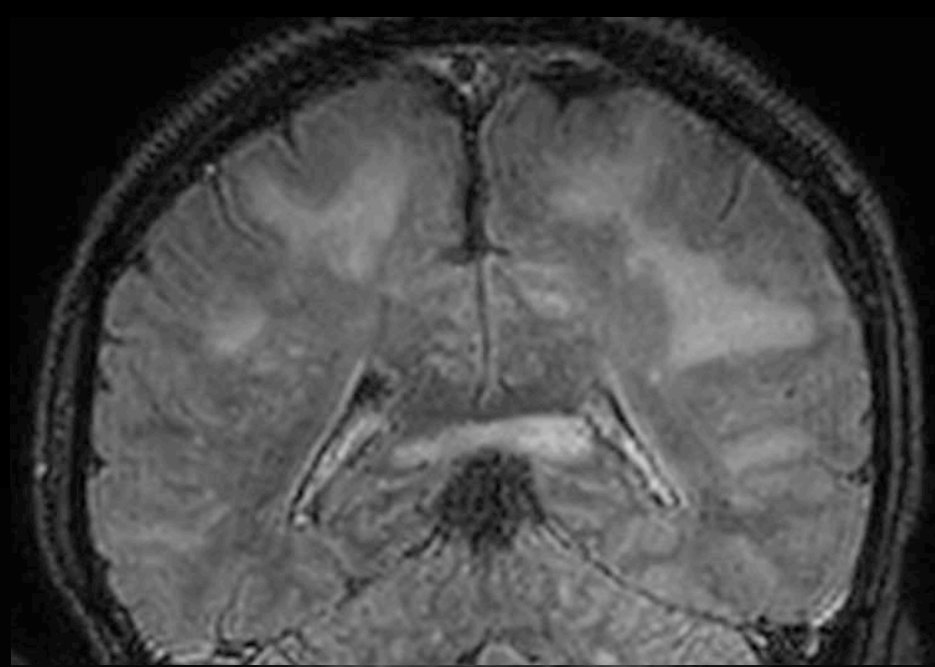


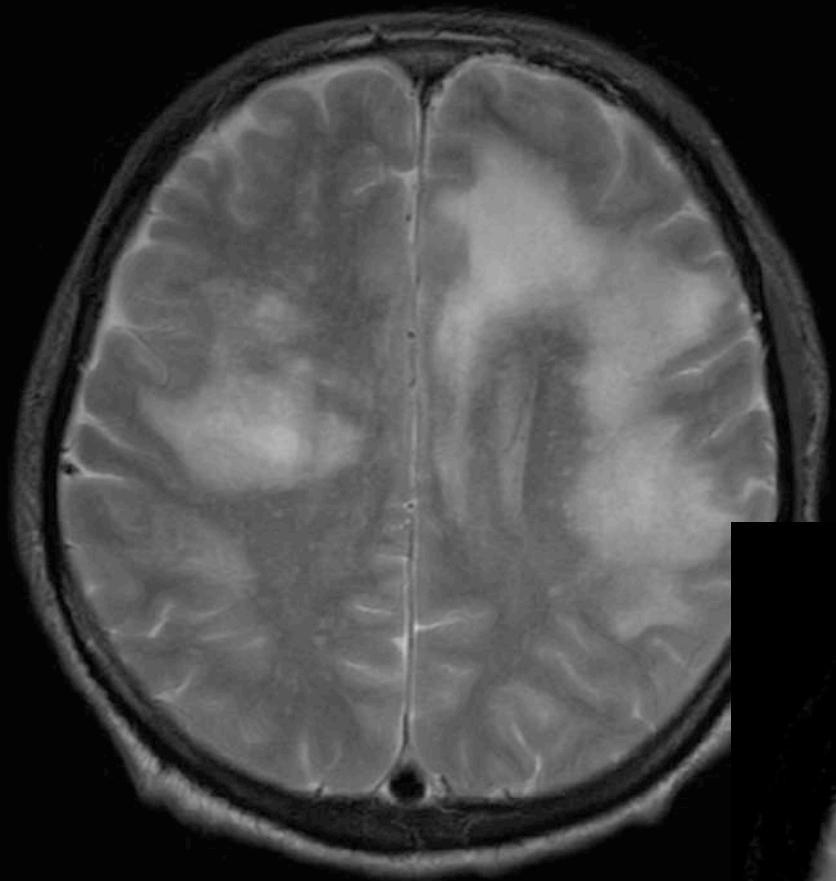
PML
CST



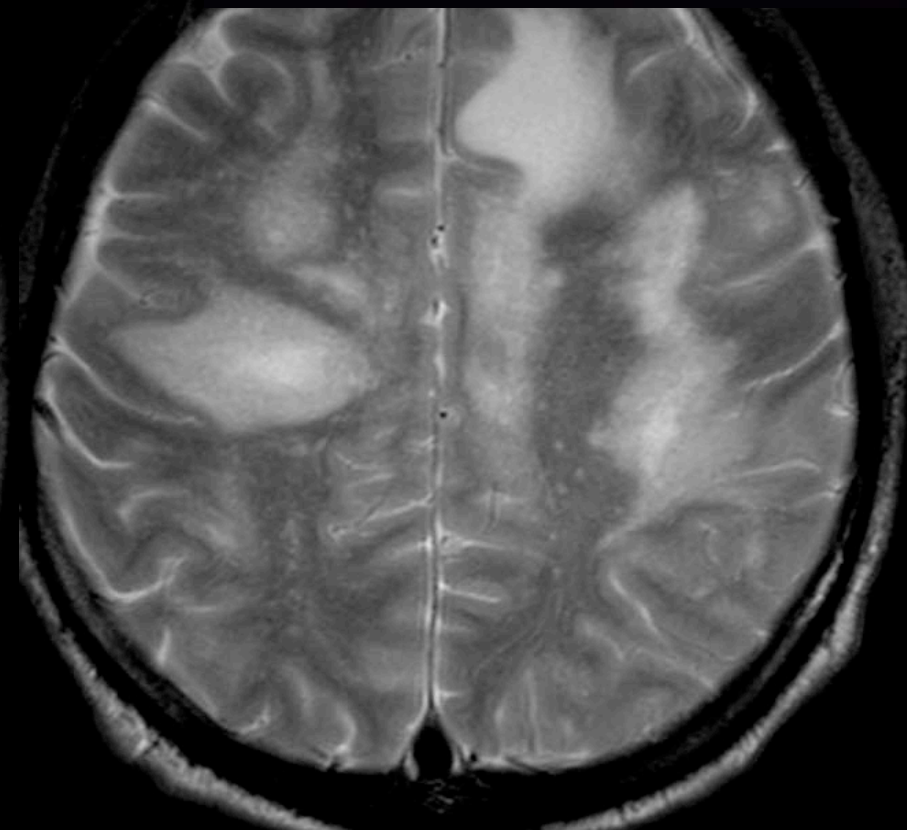
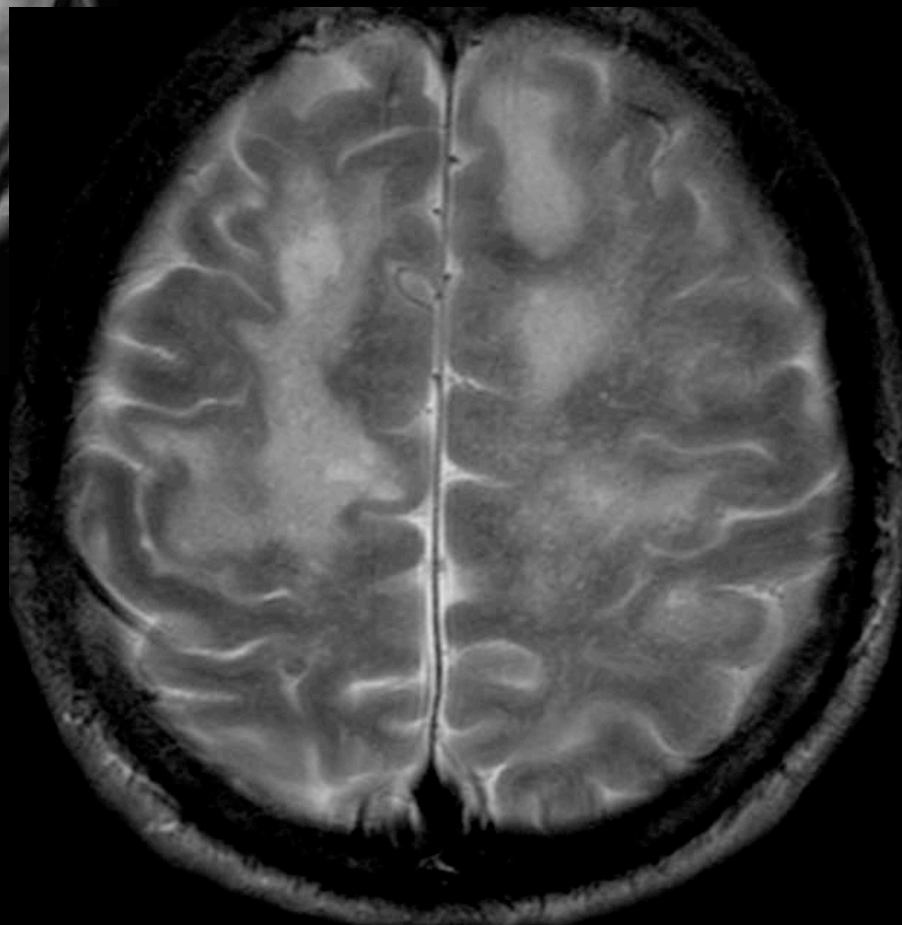


PML
Korpus
kallozum



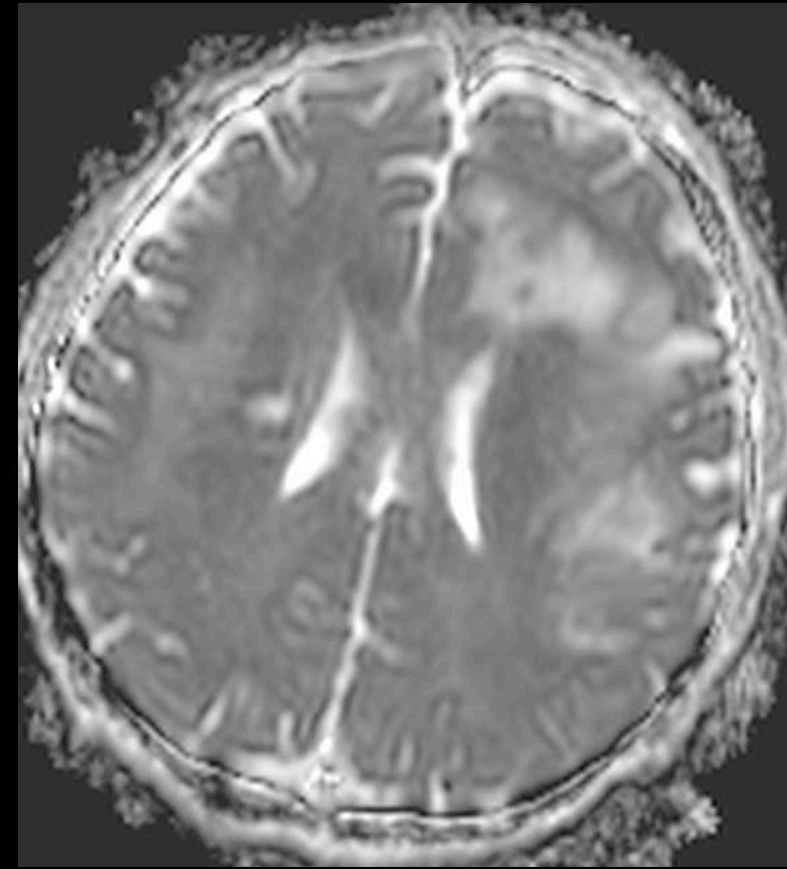
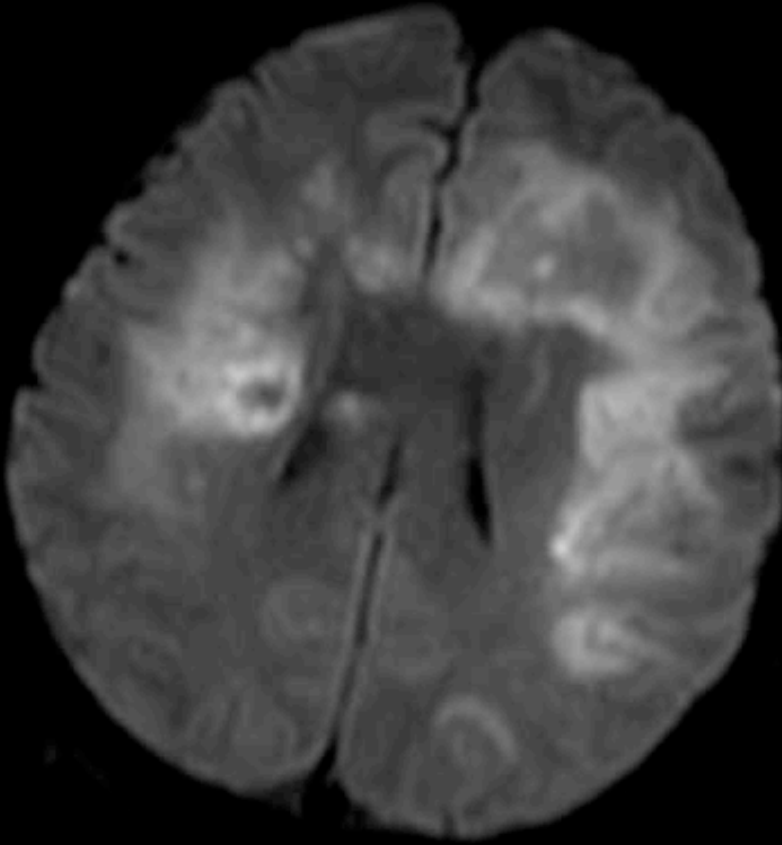
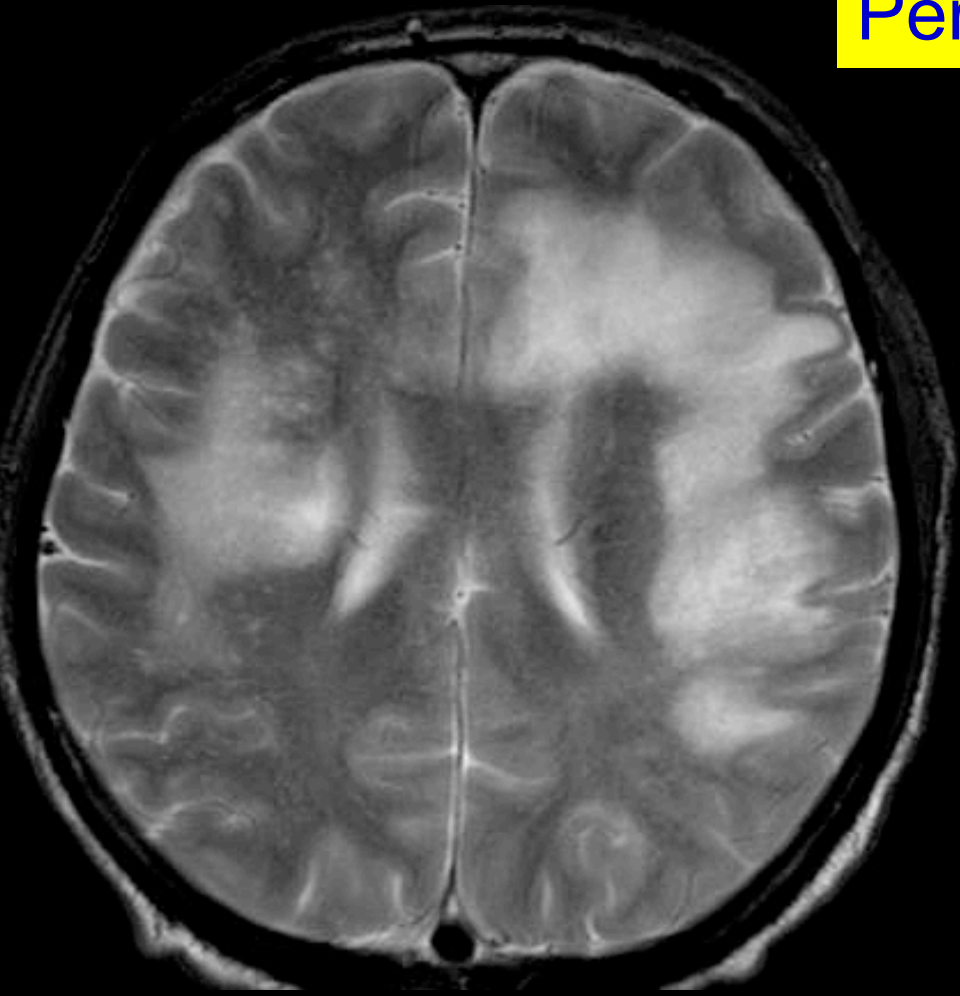


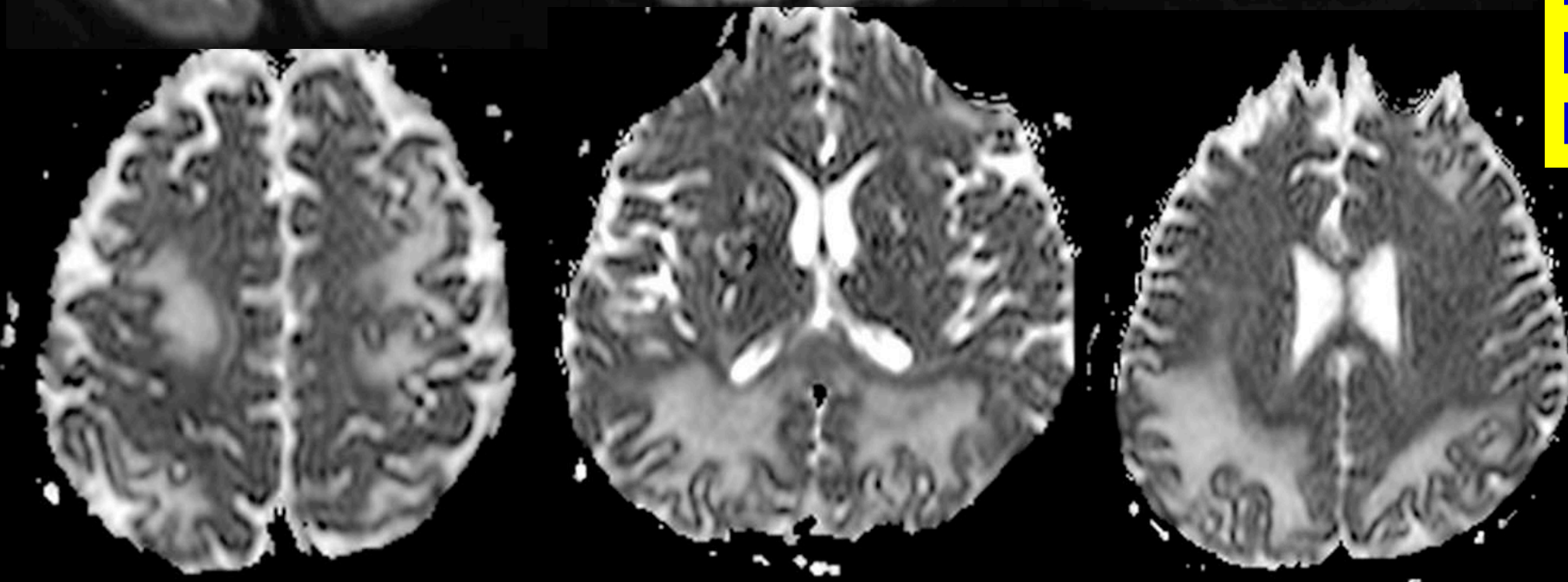
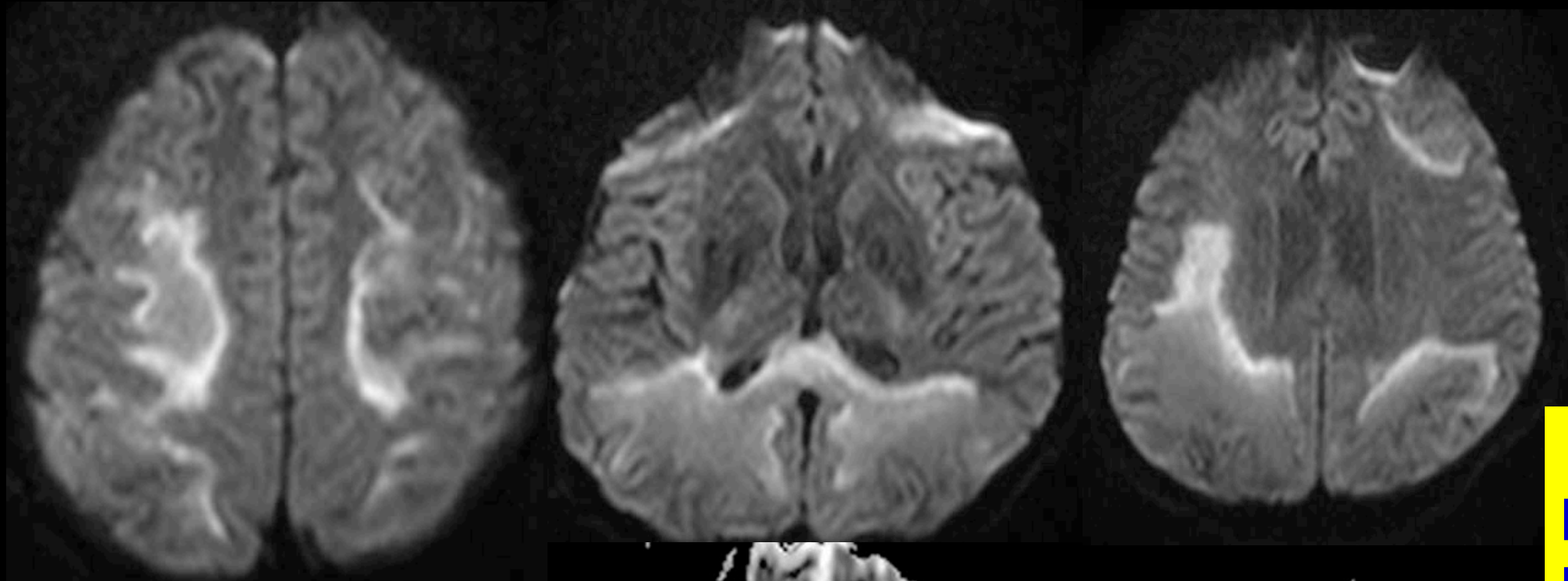
PML
Milky Way



PML

Periferal DAG Hiperintensitesi

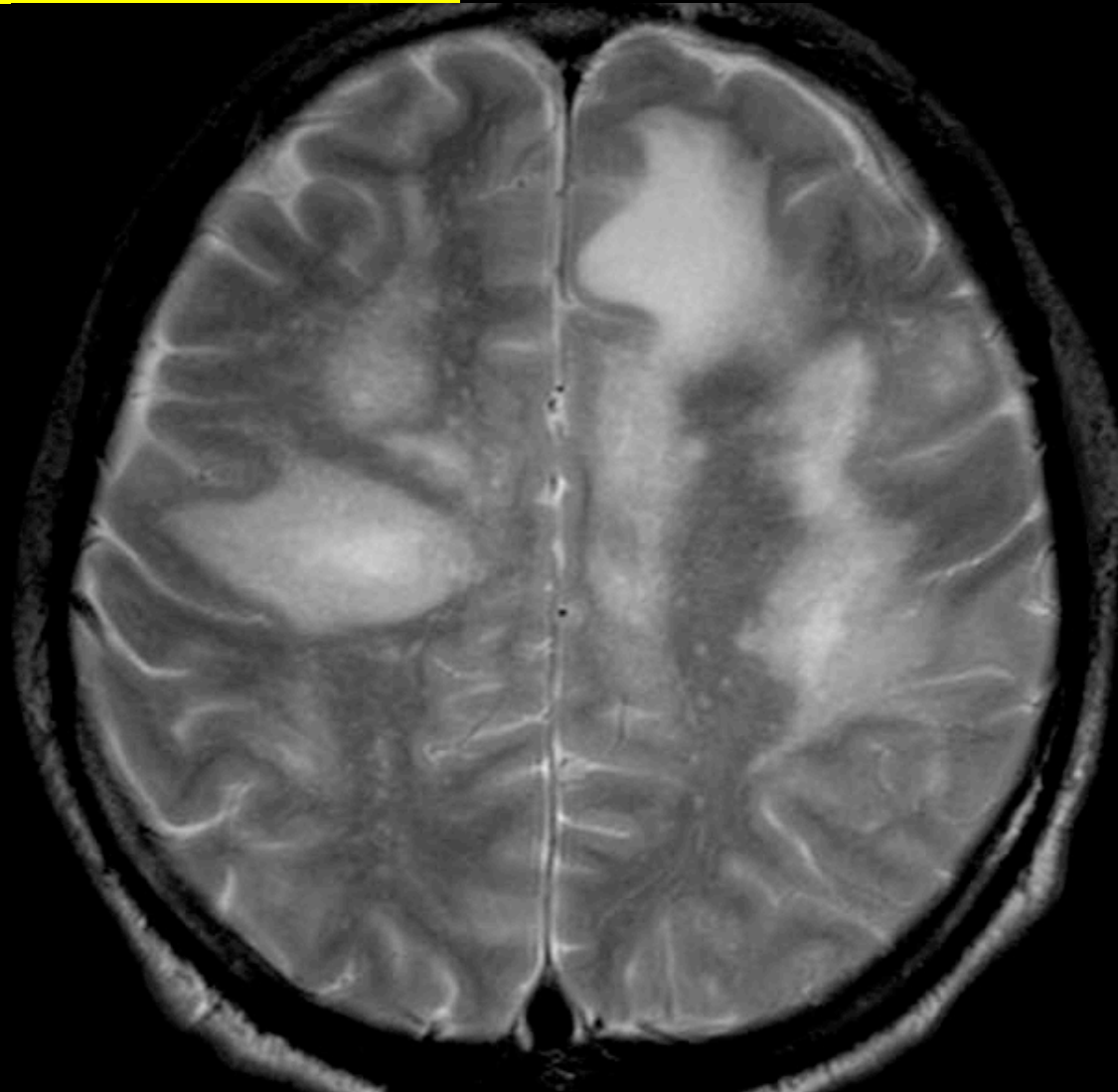
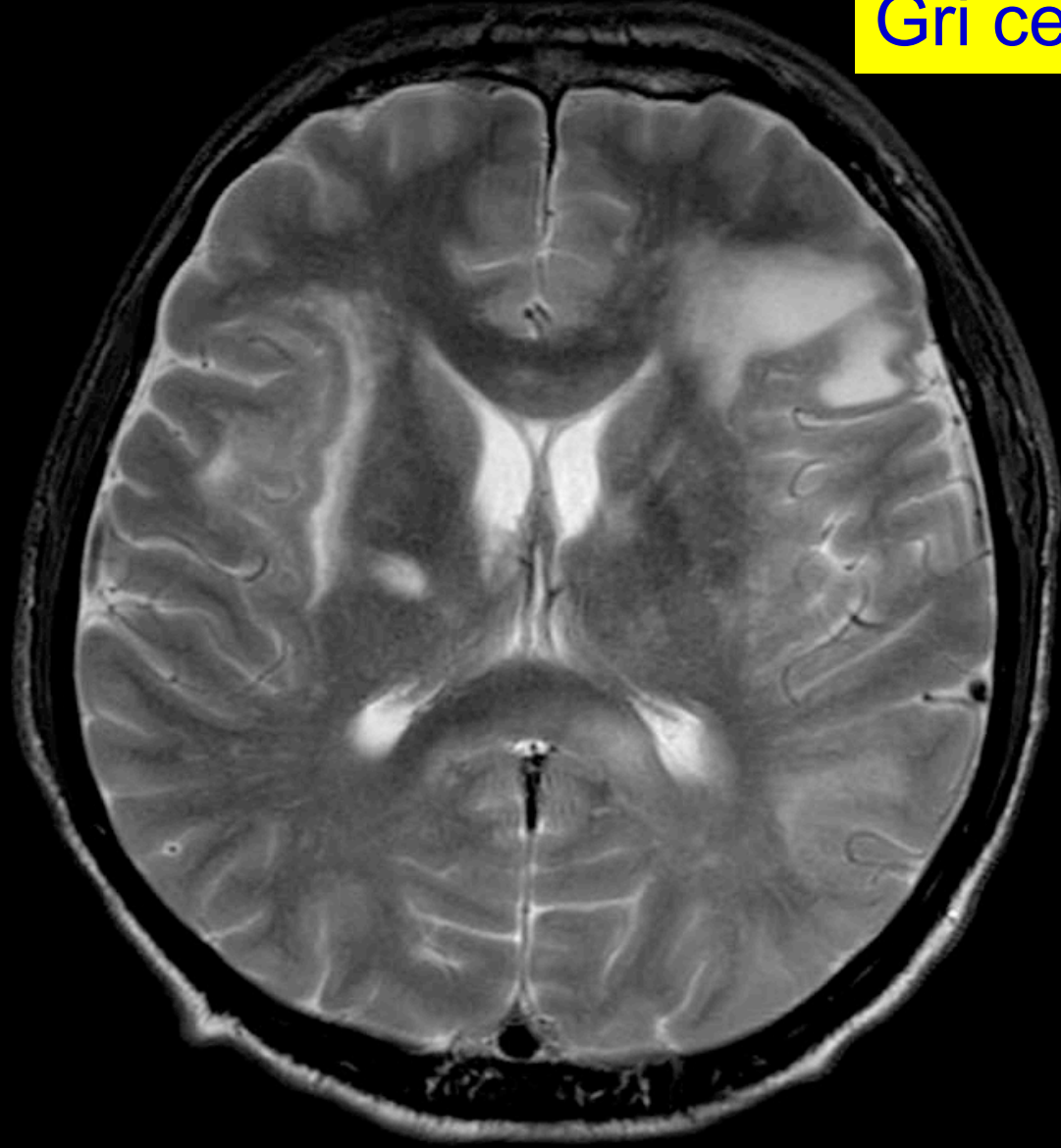




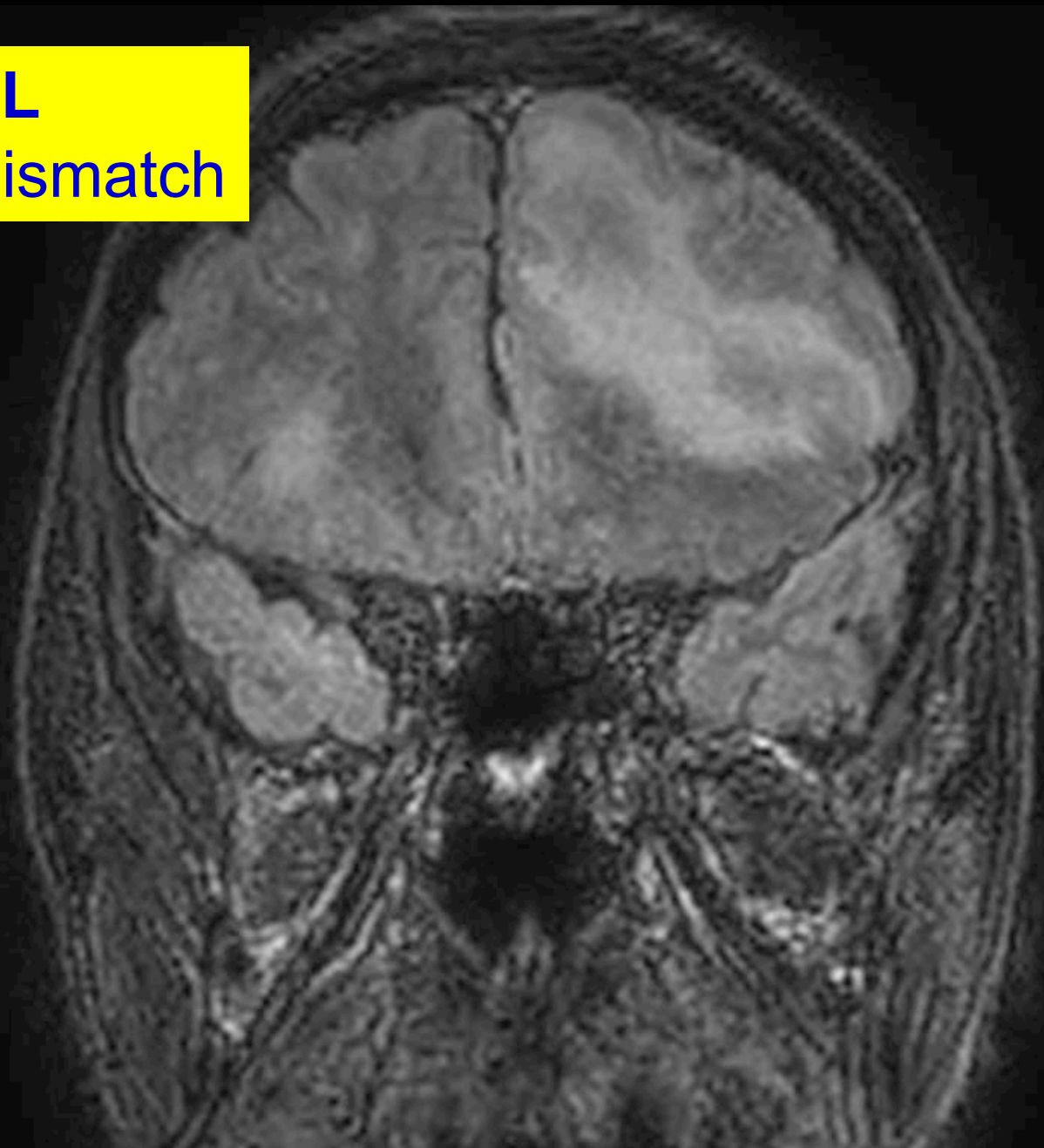
PML
Periferal
DAG
Hiperintensitesi

PML

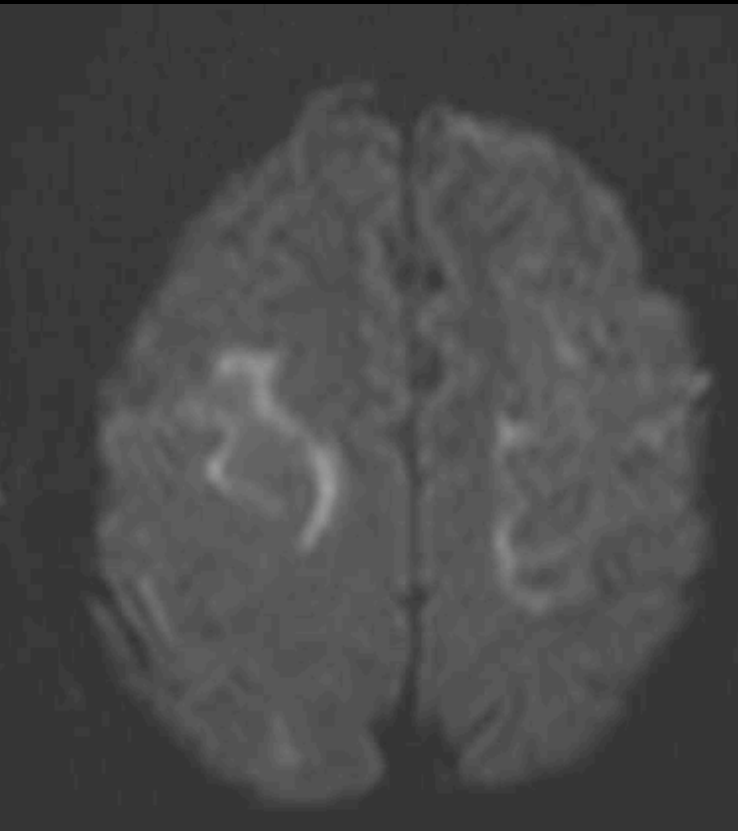
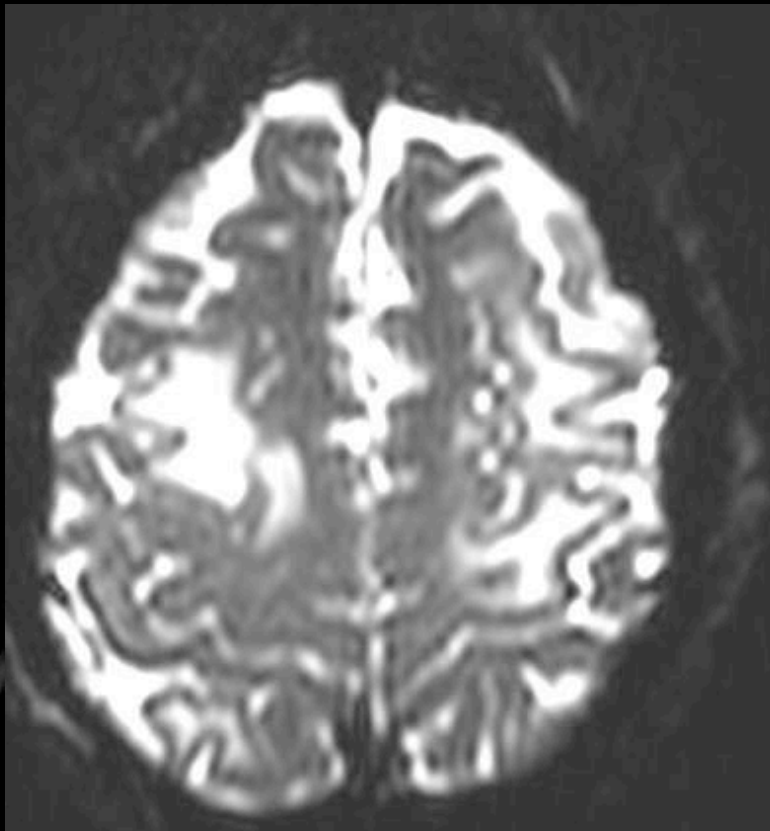
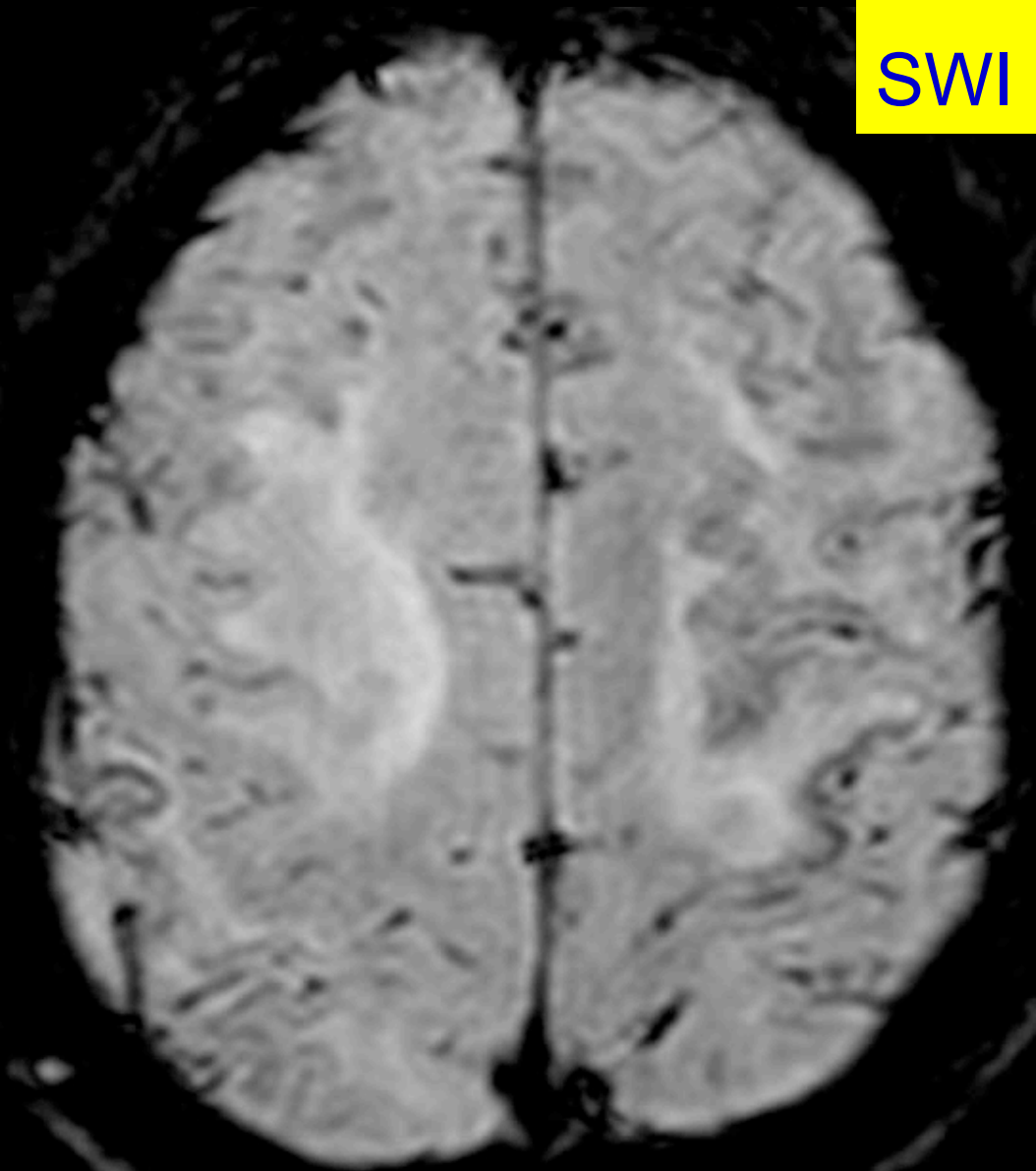
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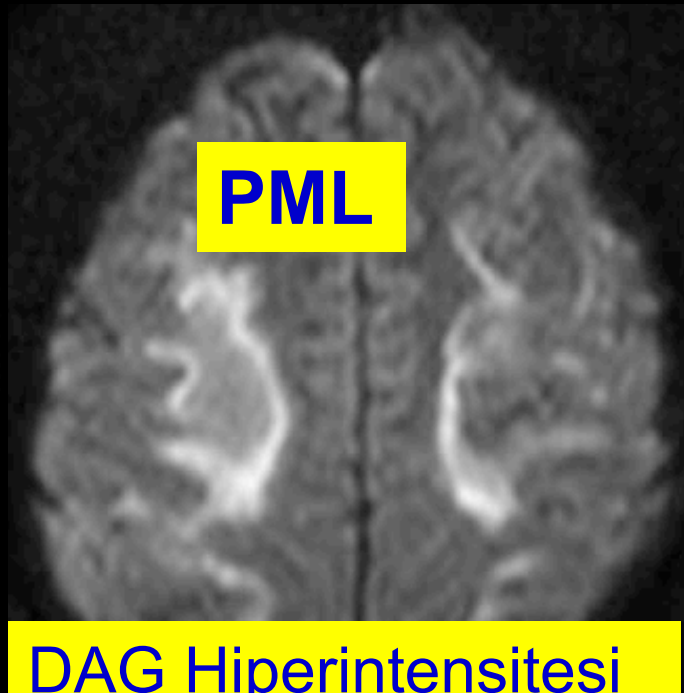


PML
T2/FLAIR Mismatch

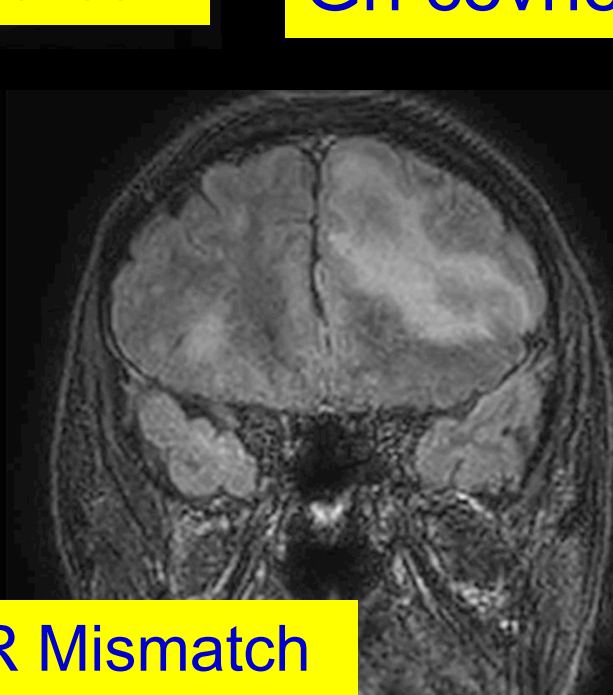


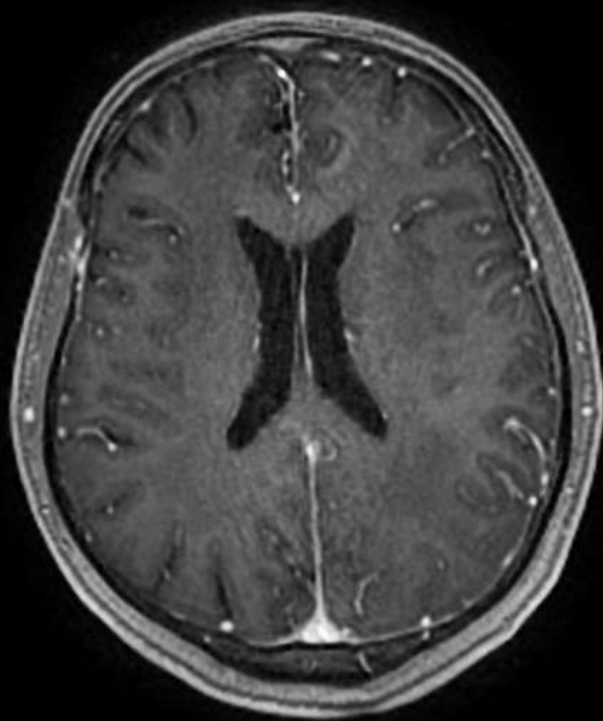
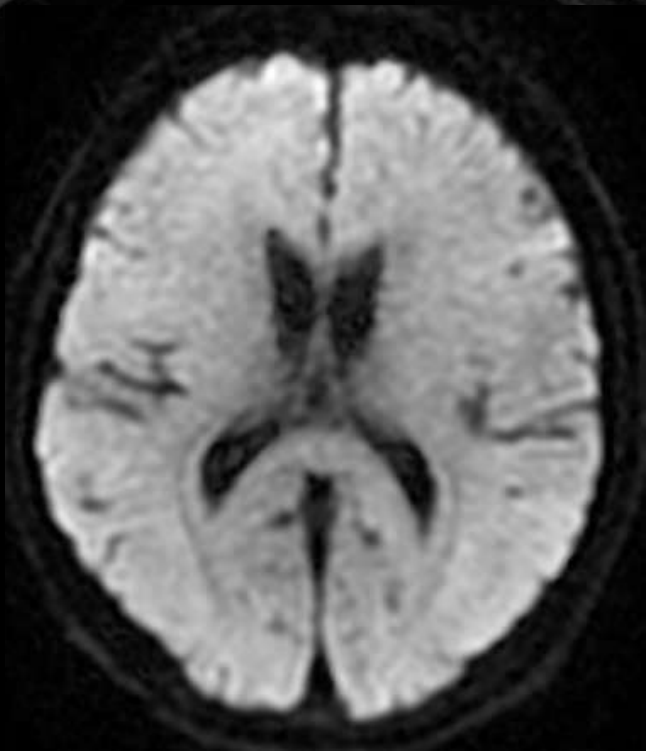
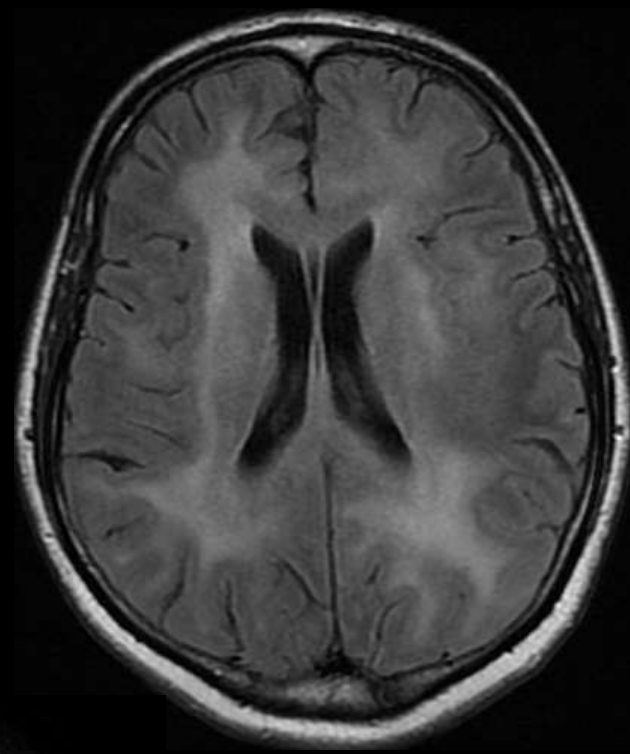
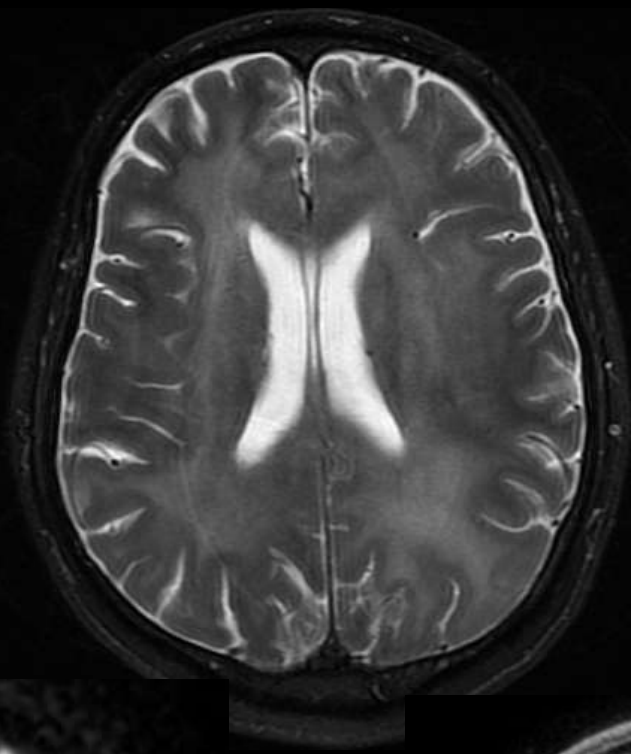
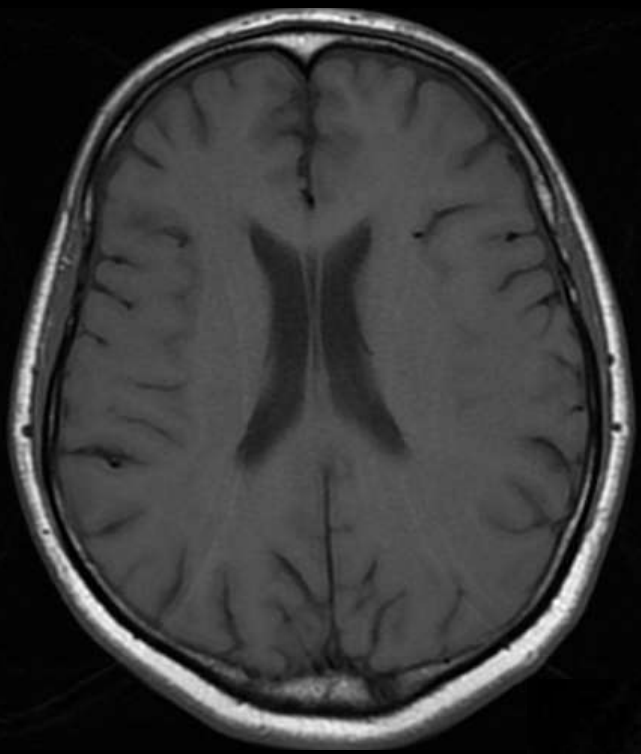
PML
SWI Hypointens



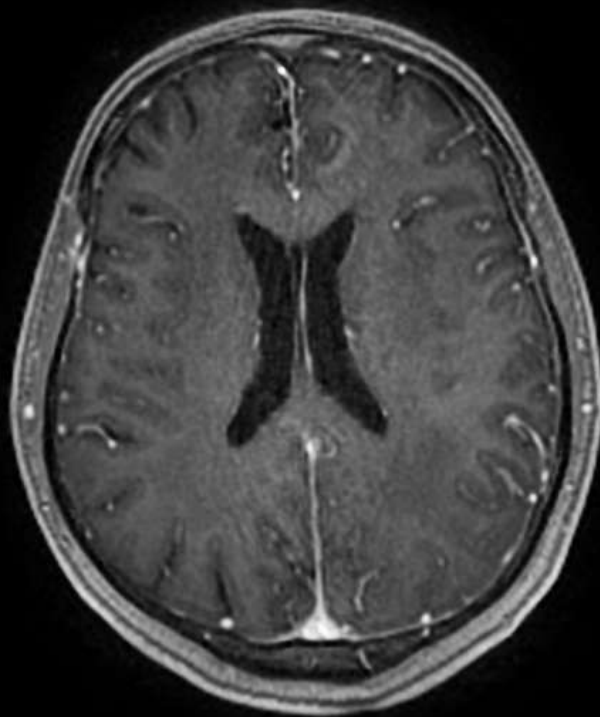
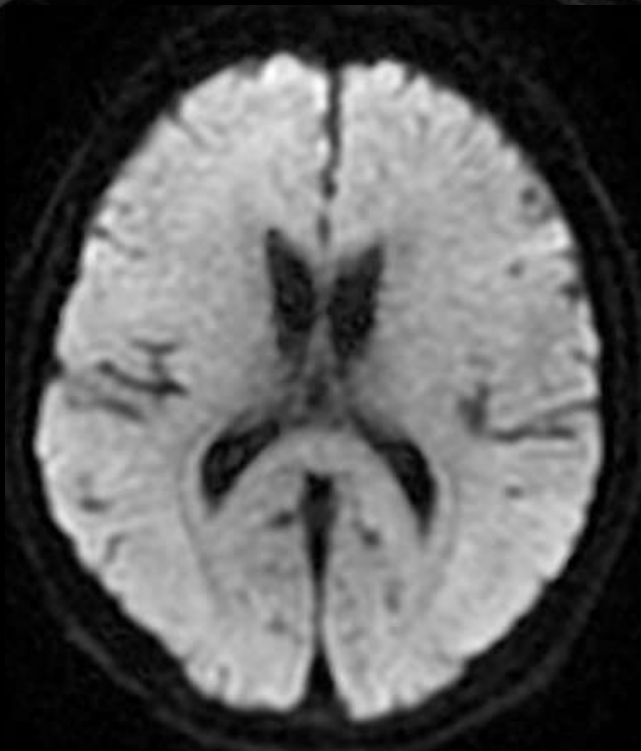
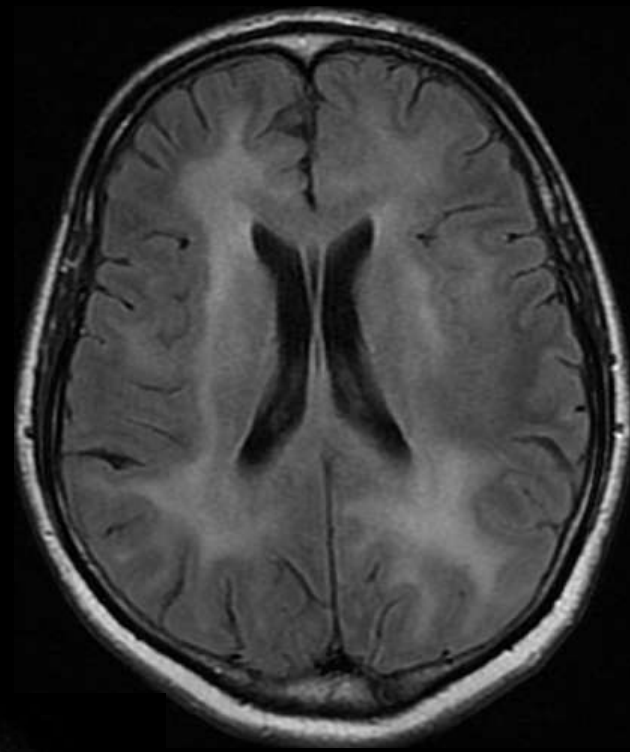


DAG Hiperintensitesi



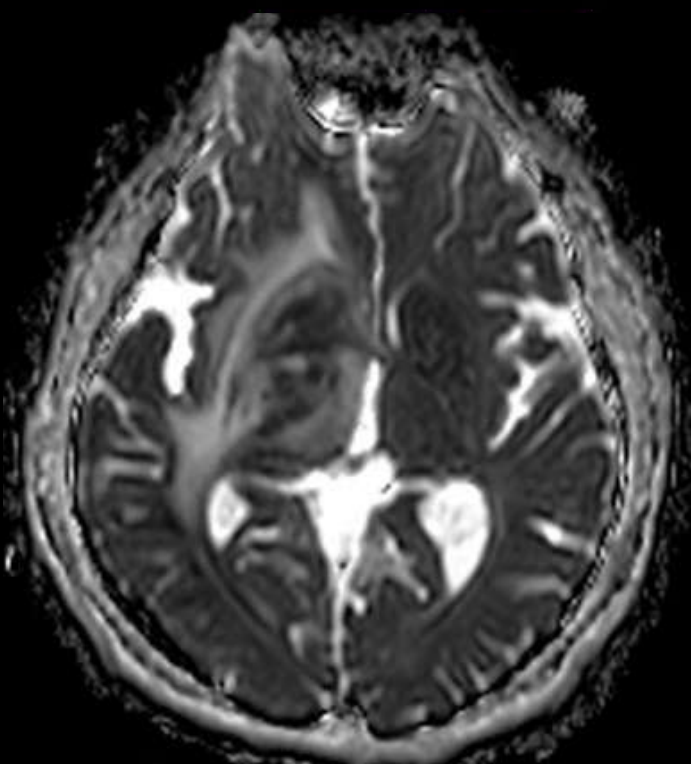
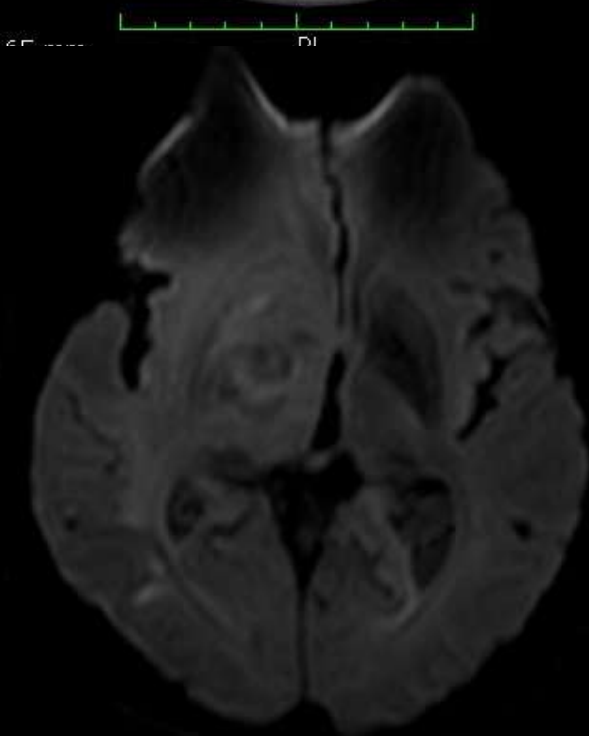
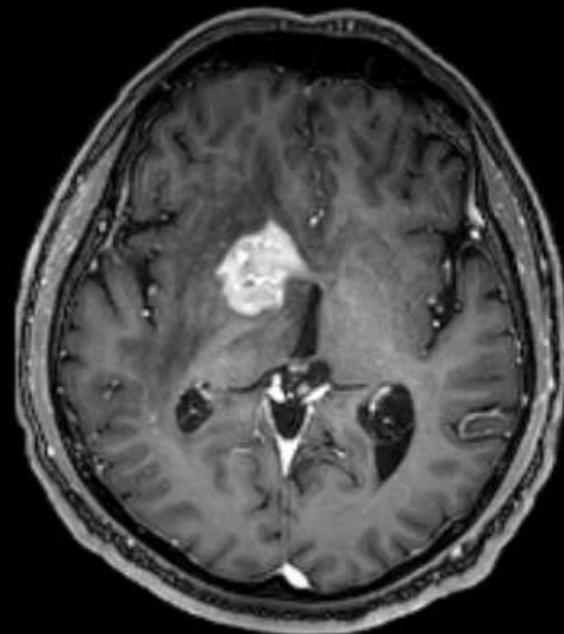
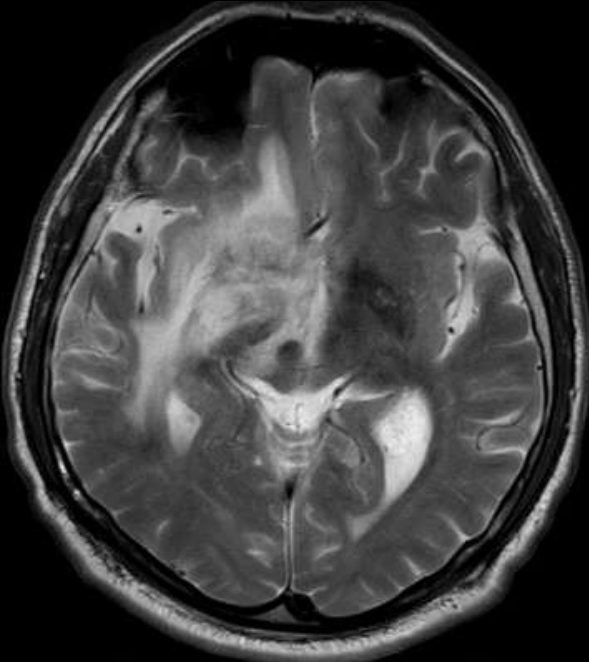


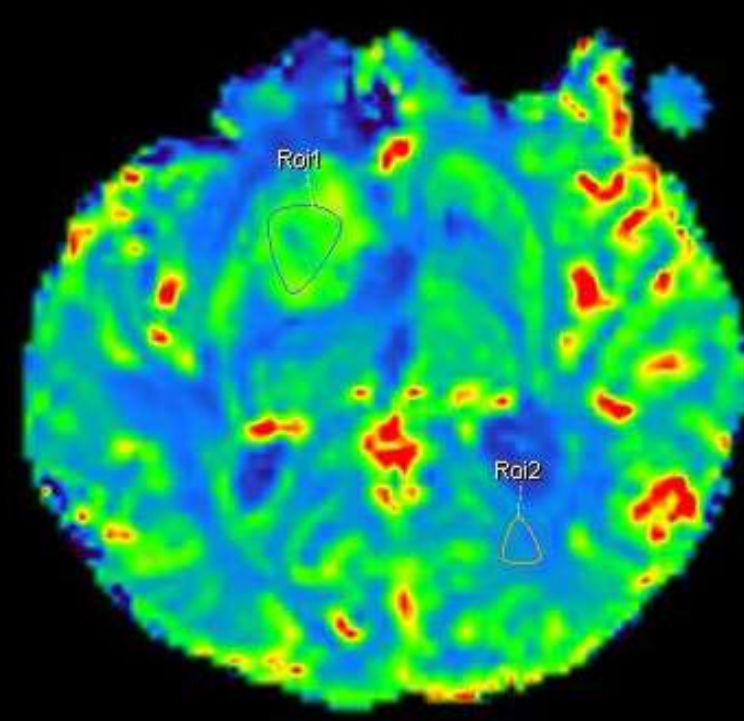
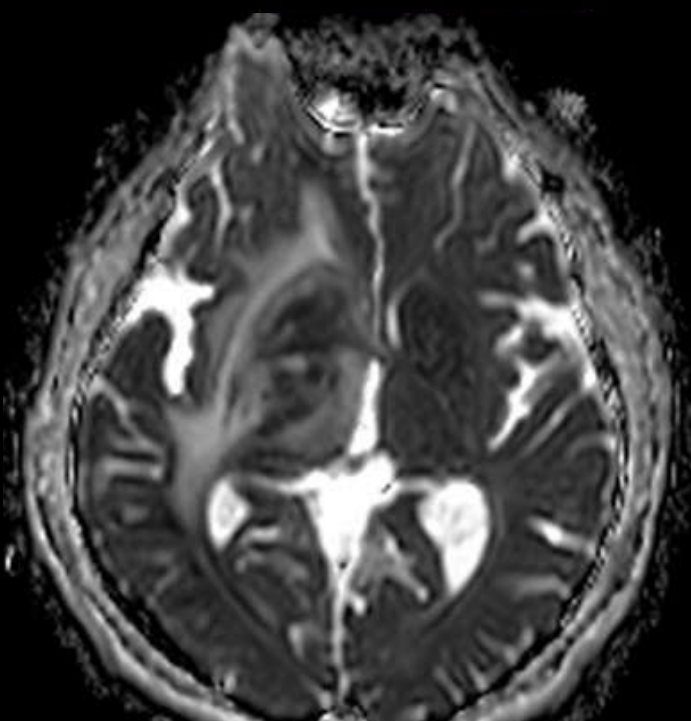
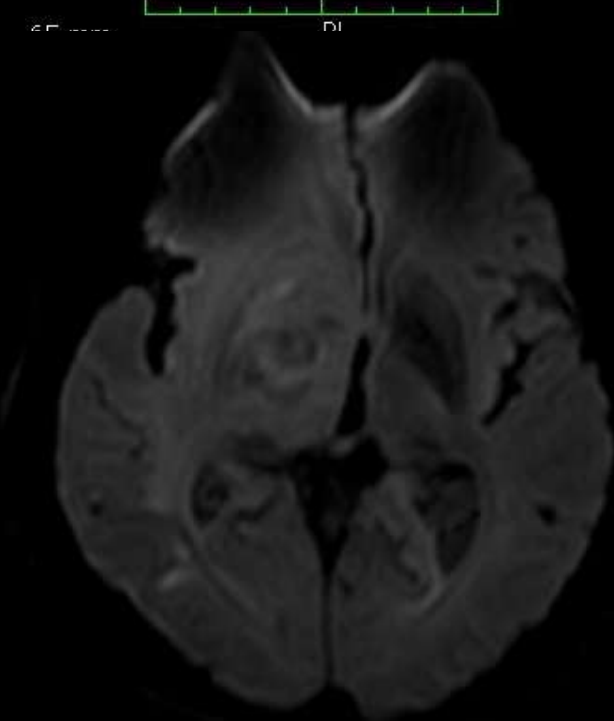
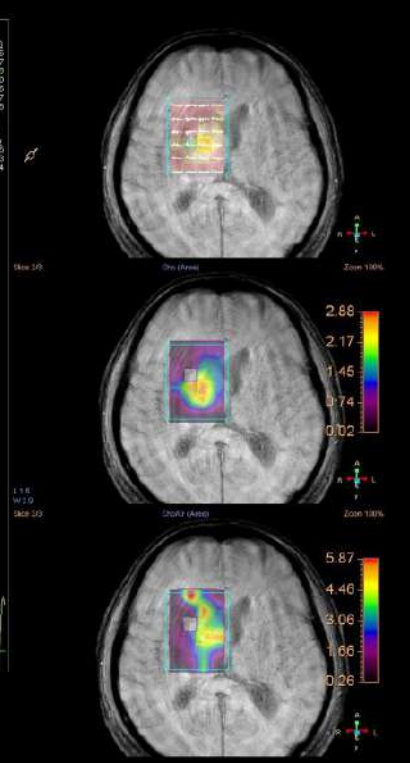
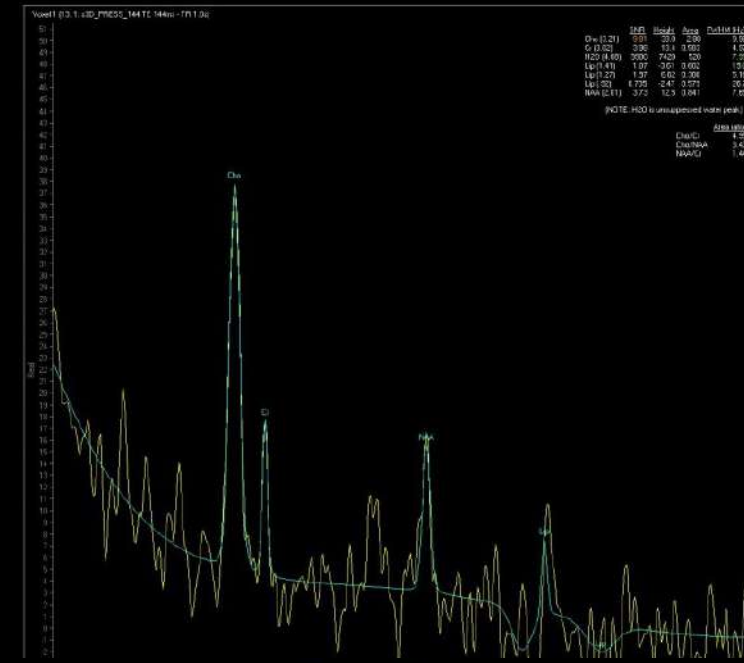
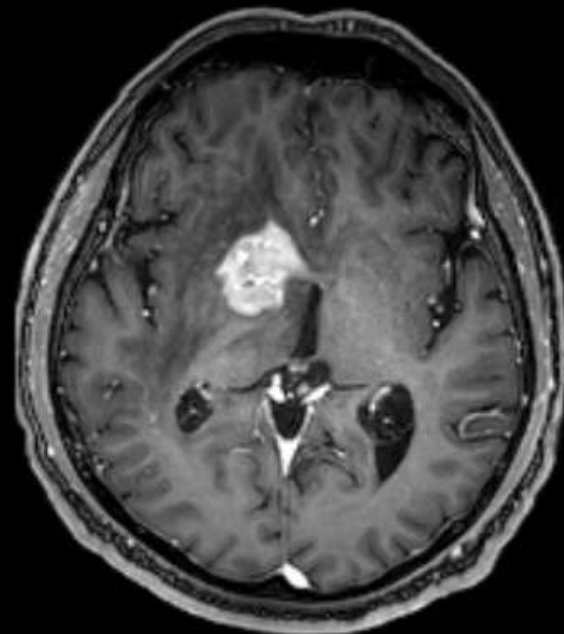
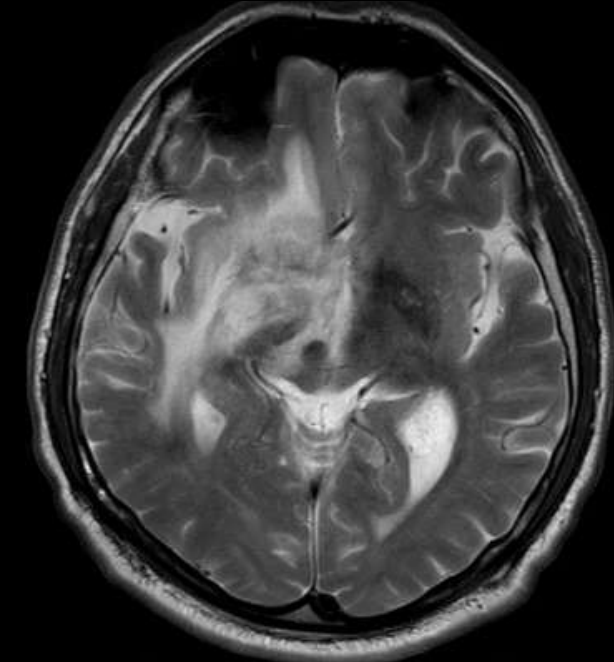
HIV Ensefalopatisi



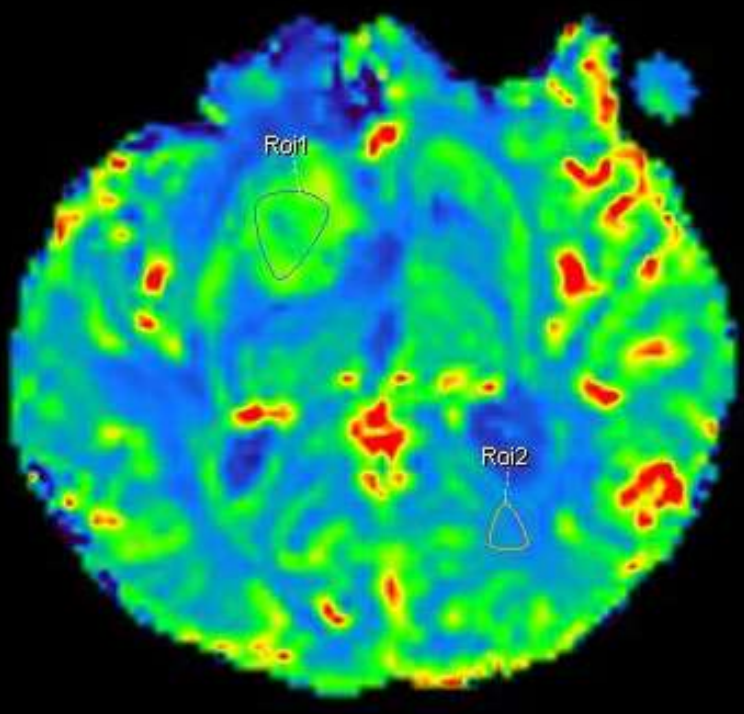
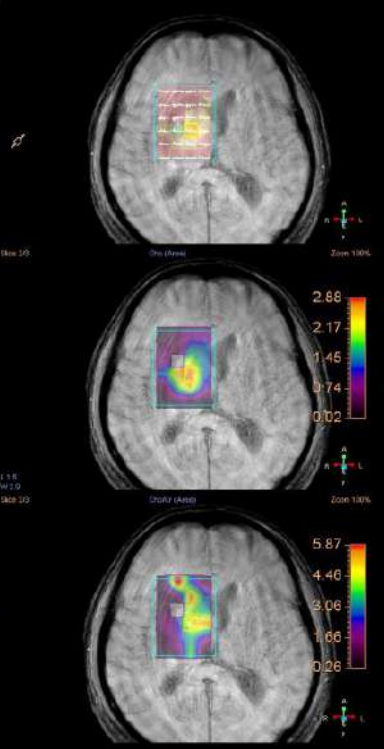
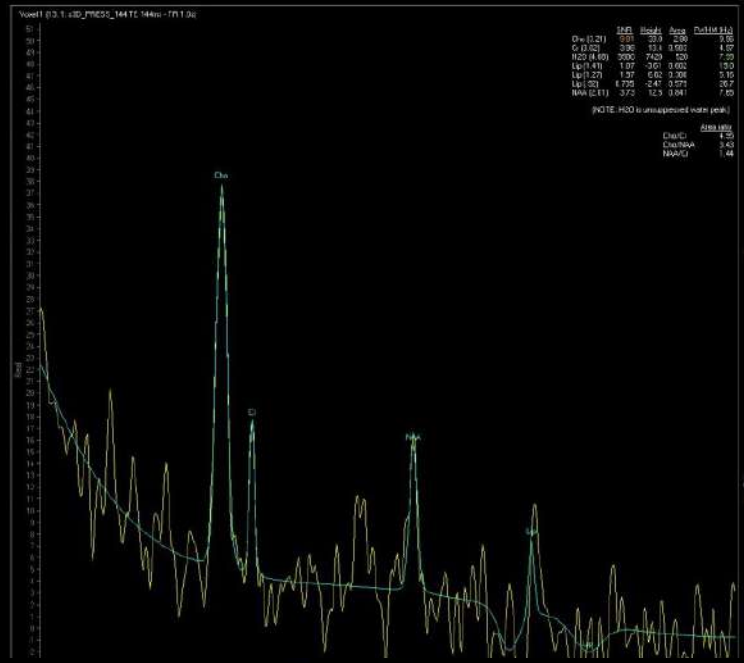
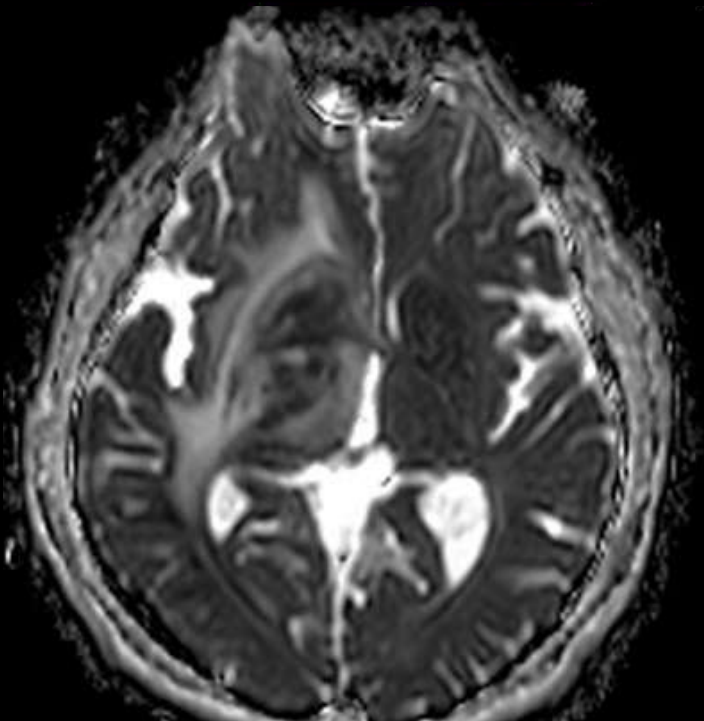
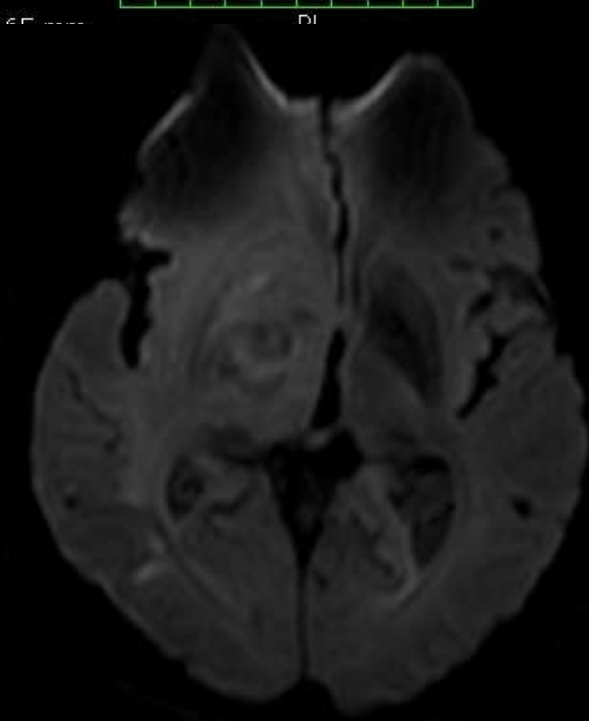
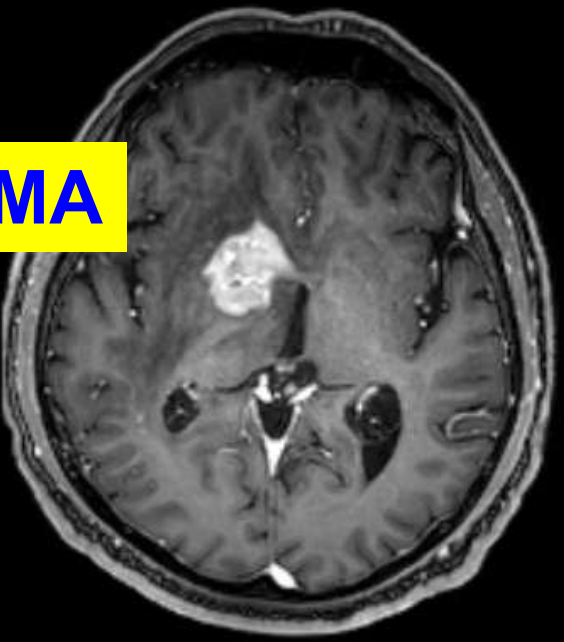
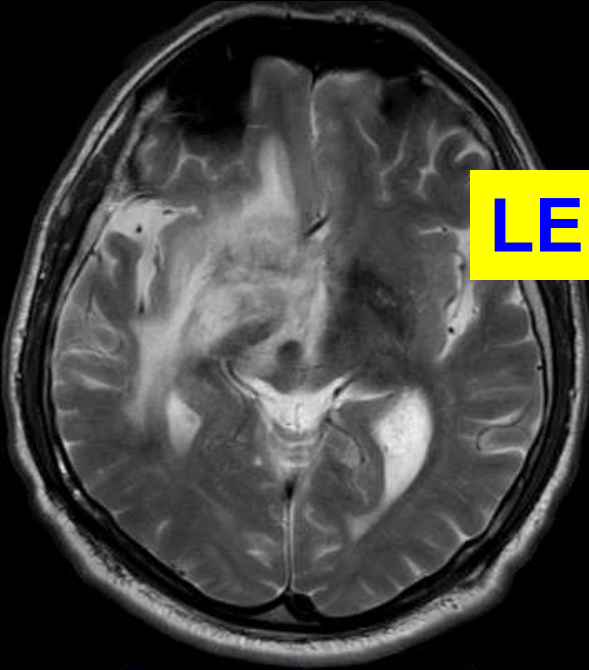
Primer SS Lenfoması

- KBB destrüksiyonu nedeni ile yoğun kontrastlanma ancak immünsuprese hastalarda periferik kontrastlanma
- Tipik periventriküler, subependimal ve korpus kallozum yerleşimi gösterir.
- **Perfüzyon MRG** \longrightarrow ılımlı rCBV \uparrow
- **DAG** de yüksek selülariteye bağlı tipik difüzyon kısıtlar
(ADC 0.6 mm/sn²)
- **MRS** \longrightarrow Lipid piki ve Cho \uparrow





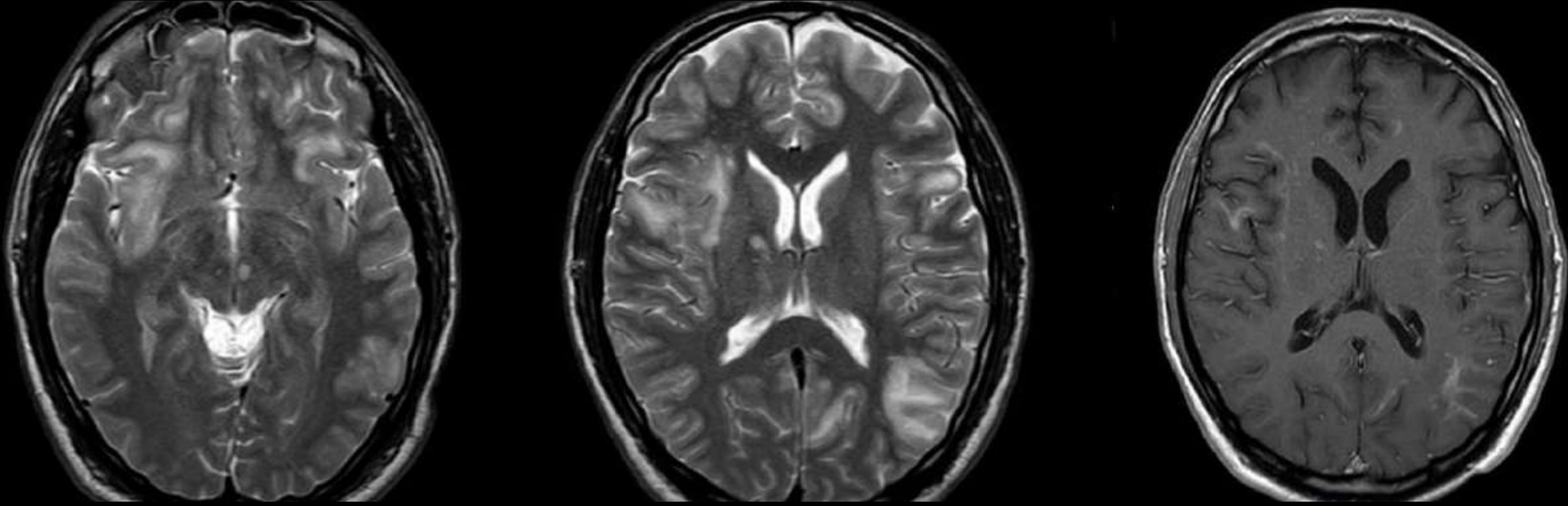
LENFOMA



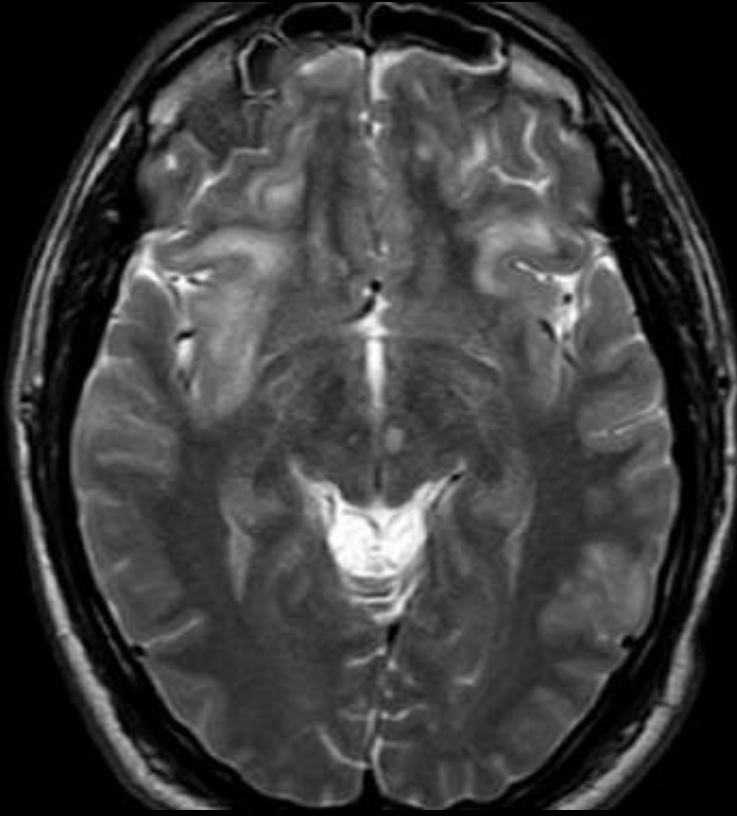
Tedavi İlişkili Lezyonlar

IRIS

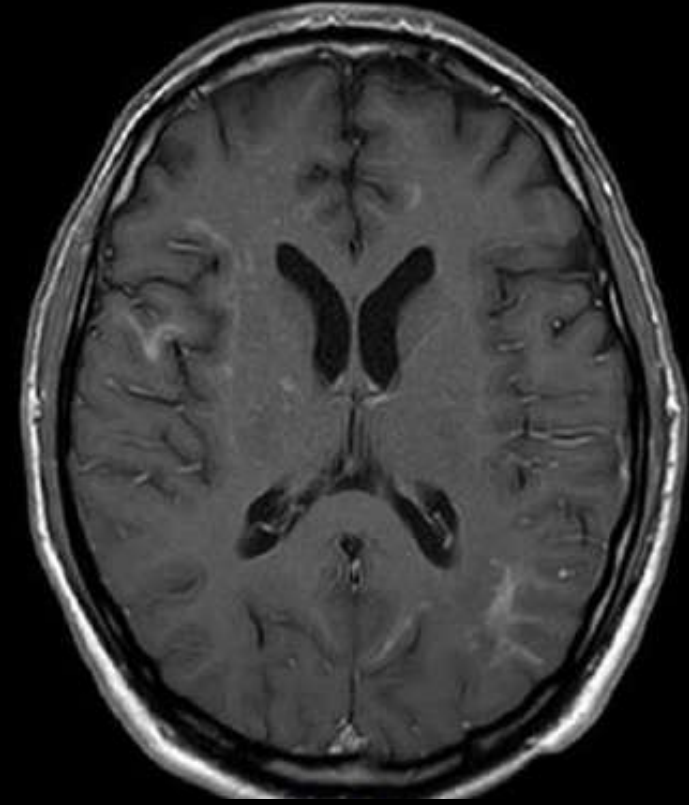
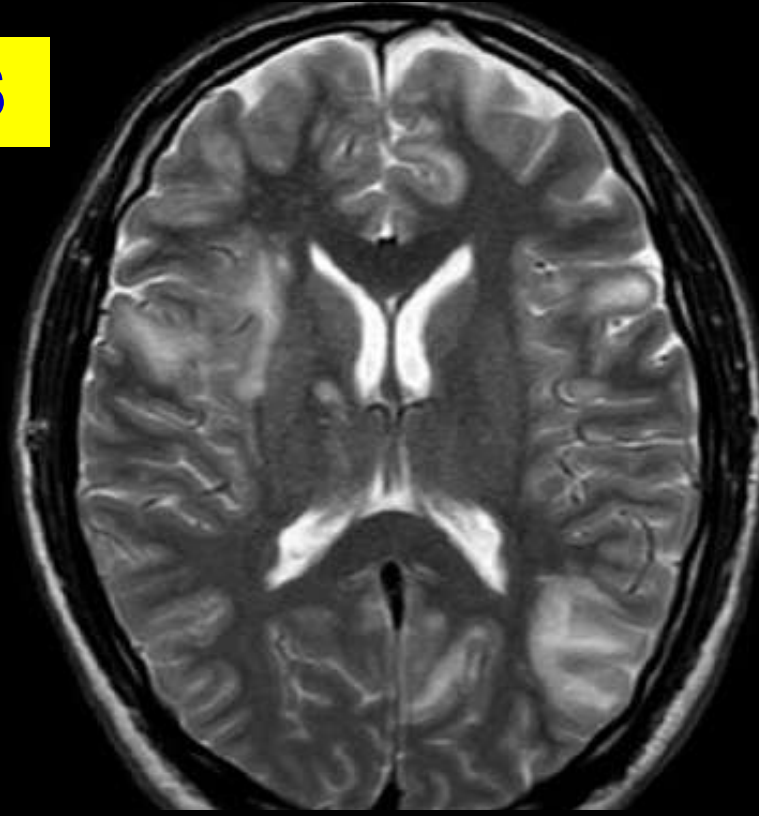
- Daha önce immün sistemi baskılanmış hastalarda immün sistemin kısmen veya tamamen yeniden oluşturulması, mevcut klinik semptomların kötüleşmesi ile karakterize inflamatuvar bir yanıtı açabilir.
- Klasik olarak antiretroviral tedaviye (ART) başlanmasının ardından HIV hastalarında görülür.
- MRG de kontrastlanma ve mevcut PML lezyonlarının ödem ve ortaya çıkan kitle etkisi ile hızlı ilerlemesi



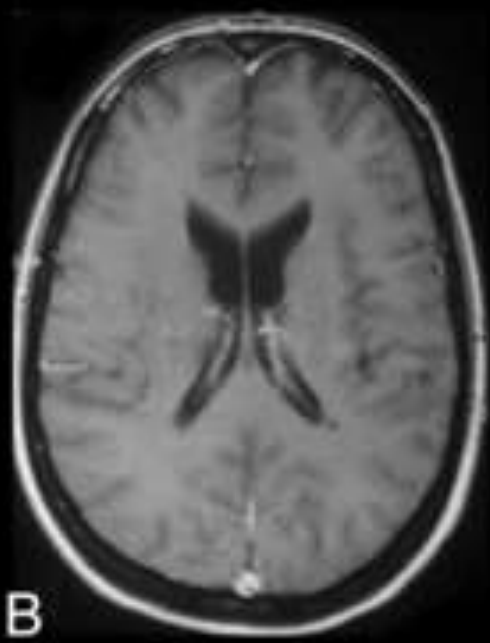
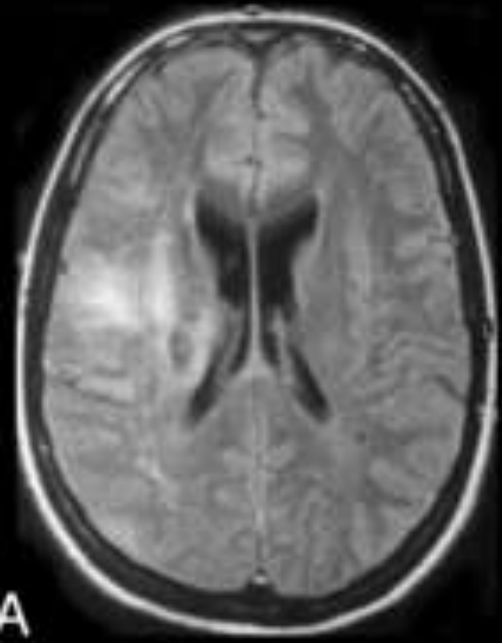
- Başvurudan 2 ay önce ART başlayan ve başlangıçtaki T-CD4+ sayısı 74 hücre/ μ L olan, 32 yaşındaki HIV(+), BOS çalışmaları negatif.



IRIS

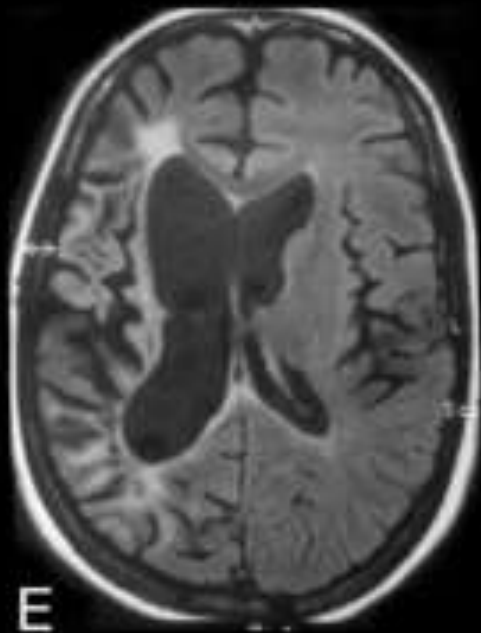
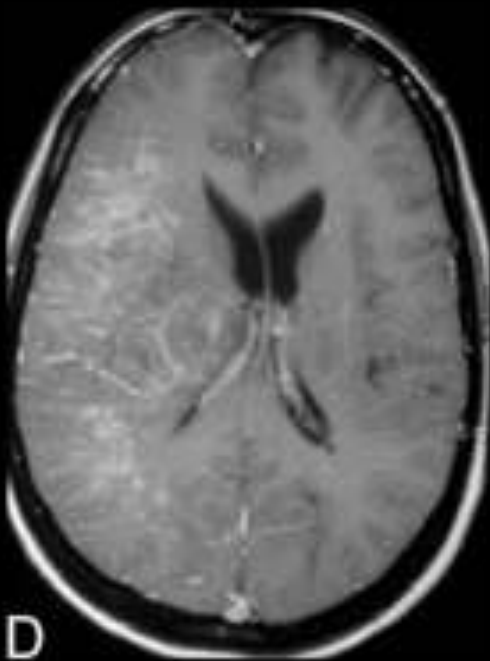
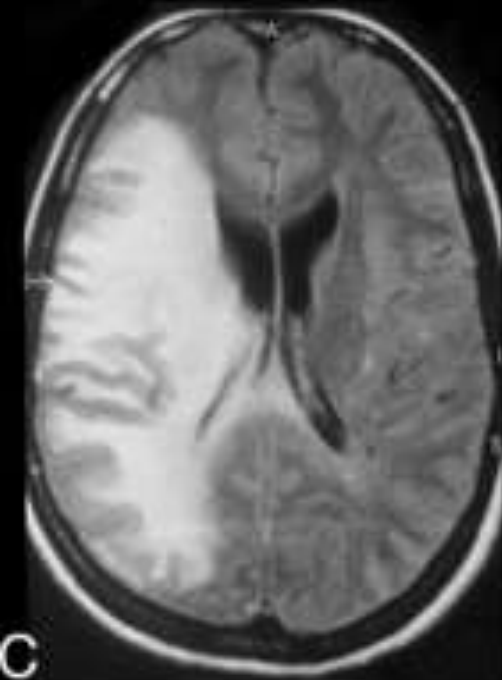


- Başvurudan 2 ay önce ART başlayan ve başlangıçtaki T-CD4+ sayısı 74 hücre/ μ L olan, 32 yaşındaki HIV(+), BOS çalışmaları negatif.



PML

Bir ay sonra, HAART başlandıktan sonra



PML-IRIS

Post MJD , et al.
AJNR Am J Neuroradiol. 2013

Primer HIV İnfeksiyonu

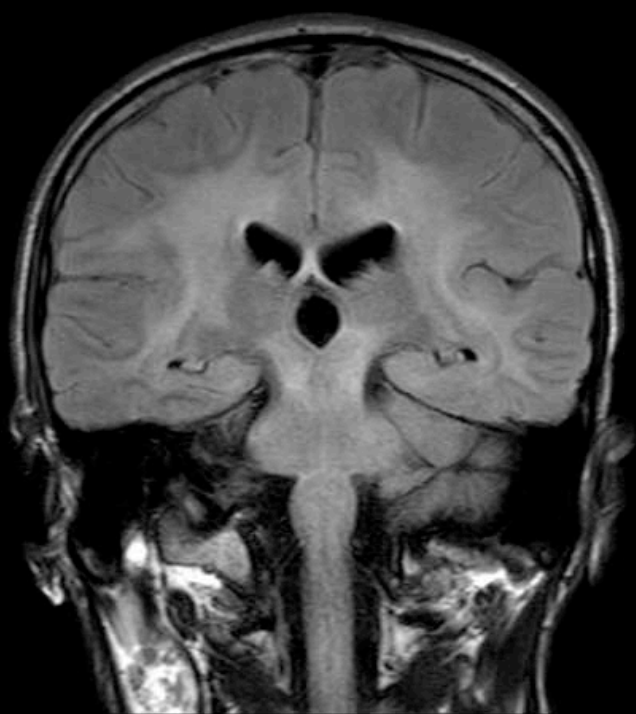
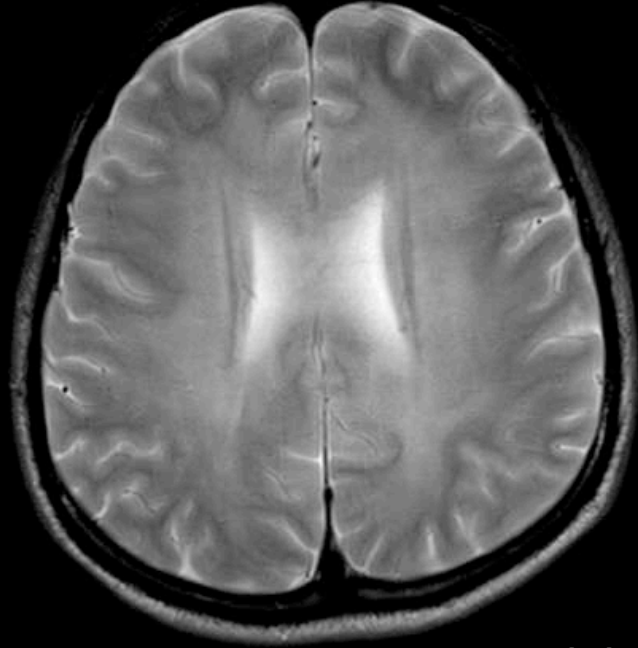
HIV İlişkili Nörokognitif Bozukluk (HAND)

▪ HAND sinir sistemi hücrelerindeki HIV enfeksiyonu ile ilişkili, farklı derecelerdeki kognitif bozukluğu ifade eden bir grup klinik sendroma karşılık gelmektedir. Üç farklı klinik durum tanımlanmıştır.

1. Asemptomatik nörobilişsel bozukluk

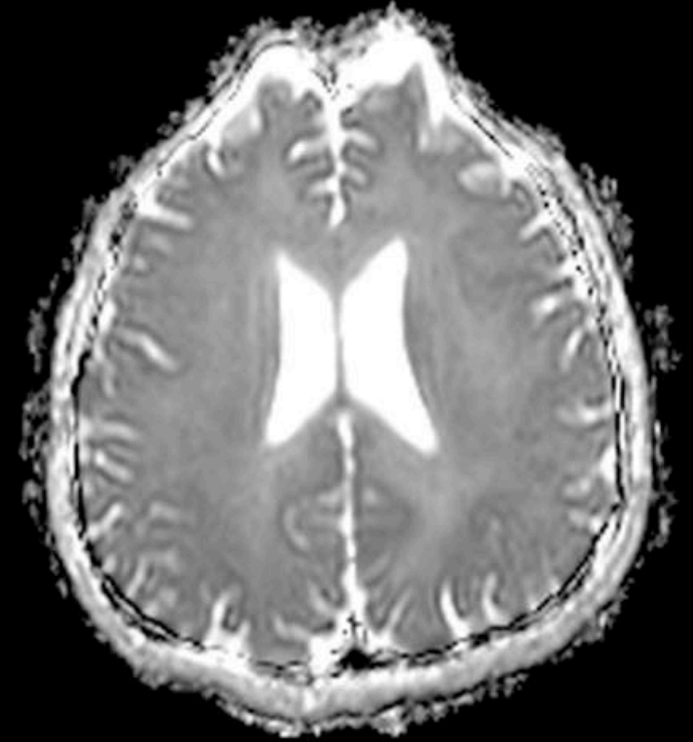
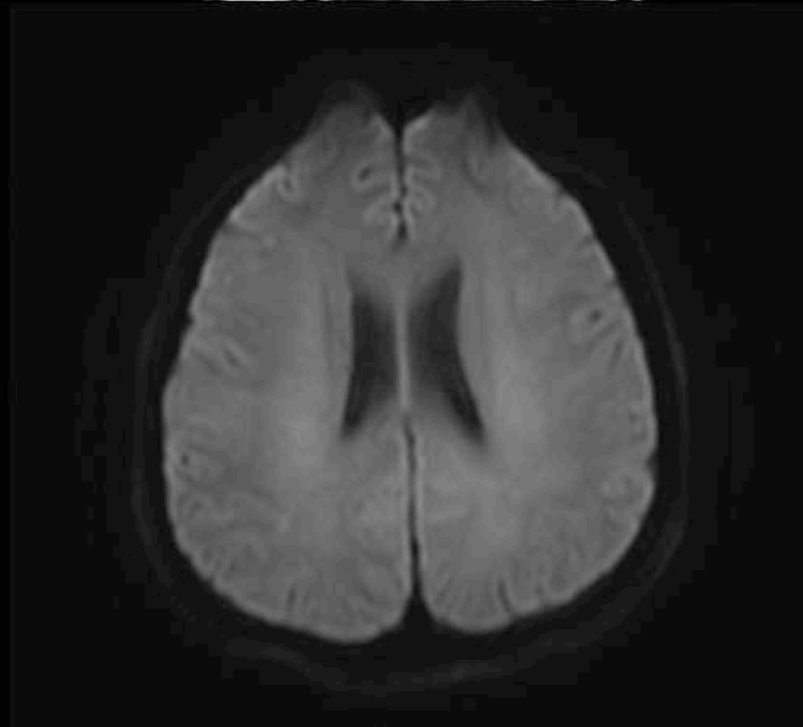
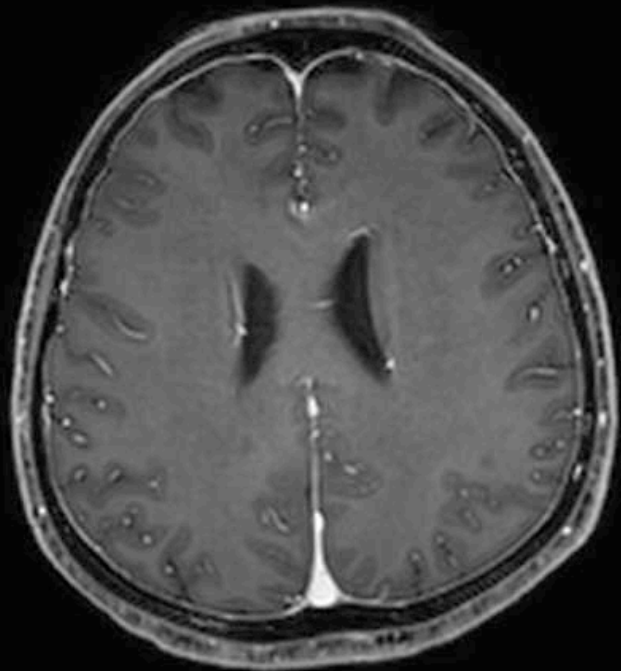
2. Hafif nörobilişsel bozukluk

3. HIV ile ilişkili demans (HAD): MRG'de HIV ensefalopatisinin açıkça tanınabilir özelliklerini gösteren tek durumdur.



HIV ENSEFALOPATİSİ

36 y, E



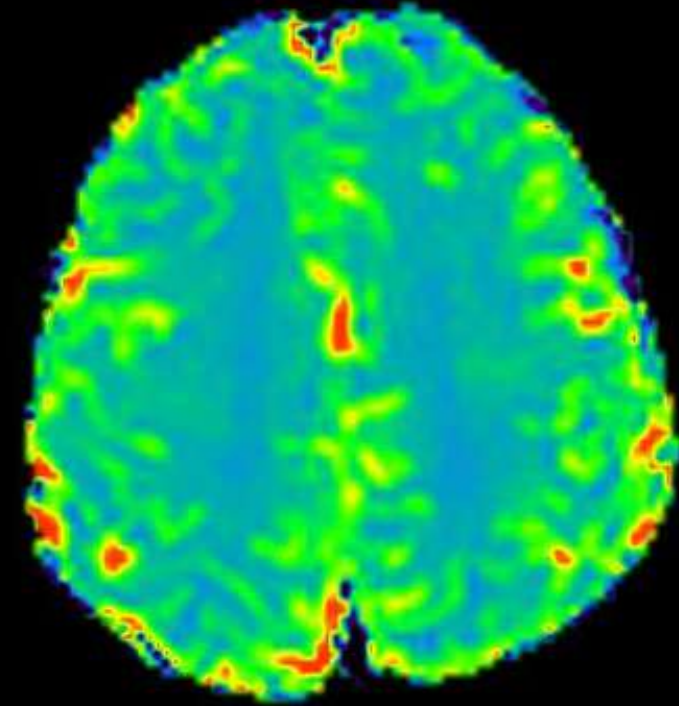
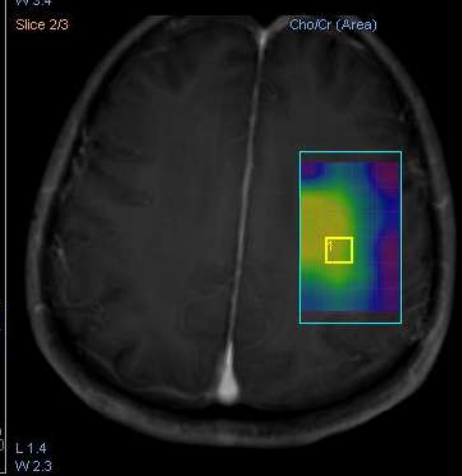
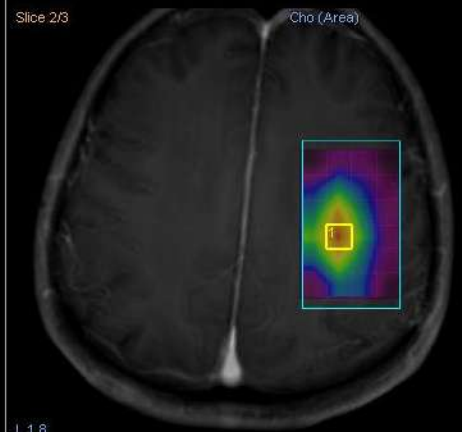
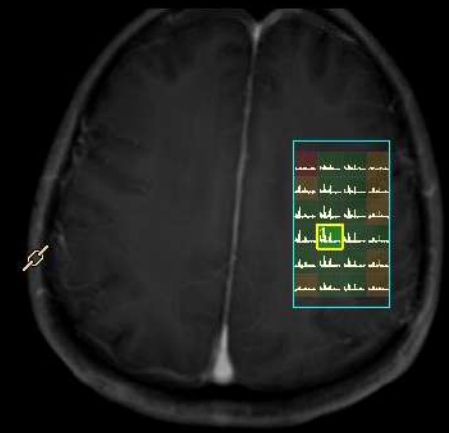
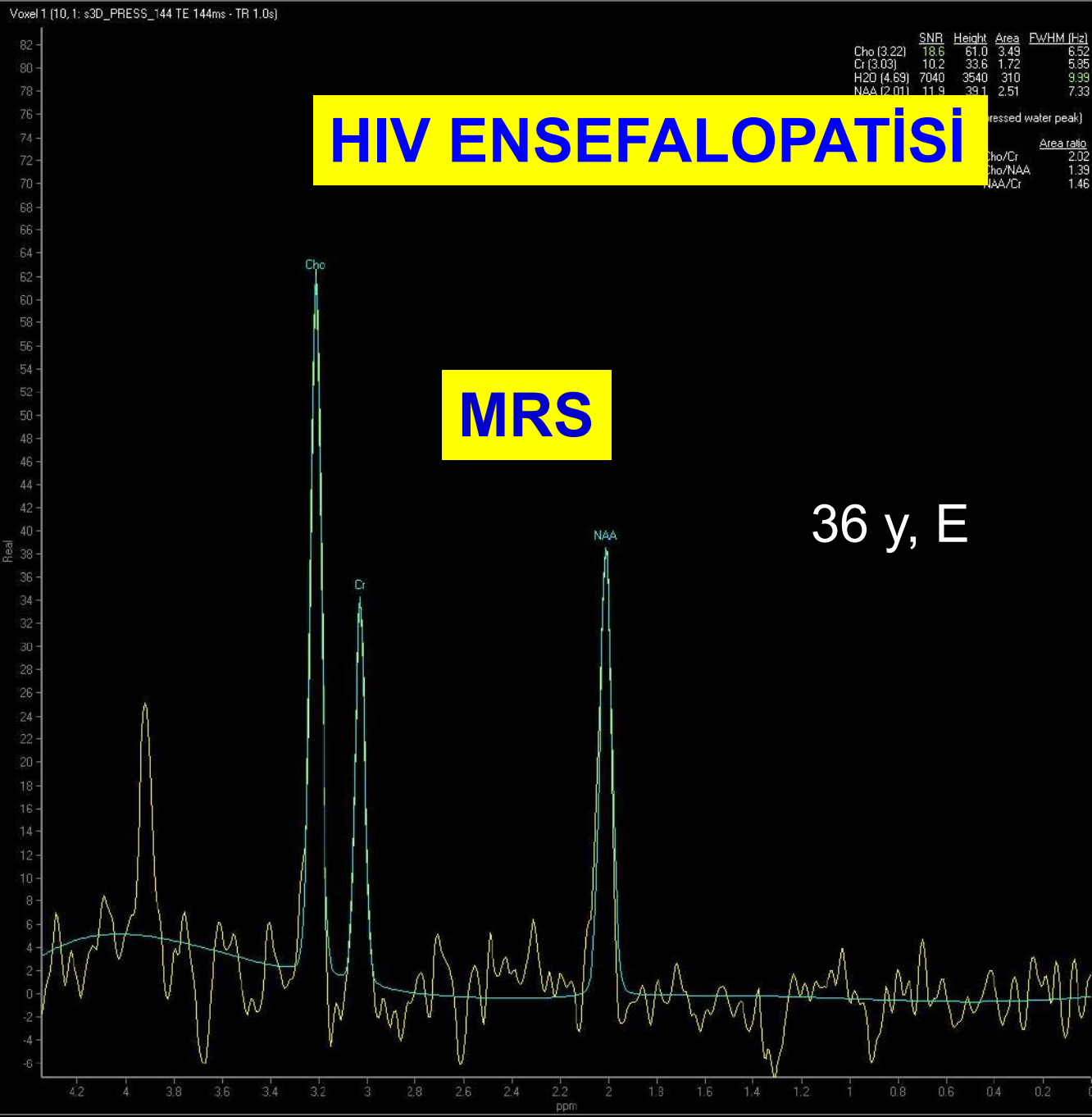
HIV ENSEFALOPATİSİ

MRS

36 y, E

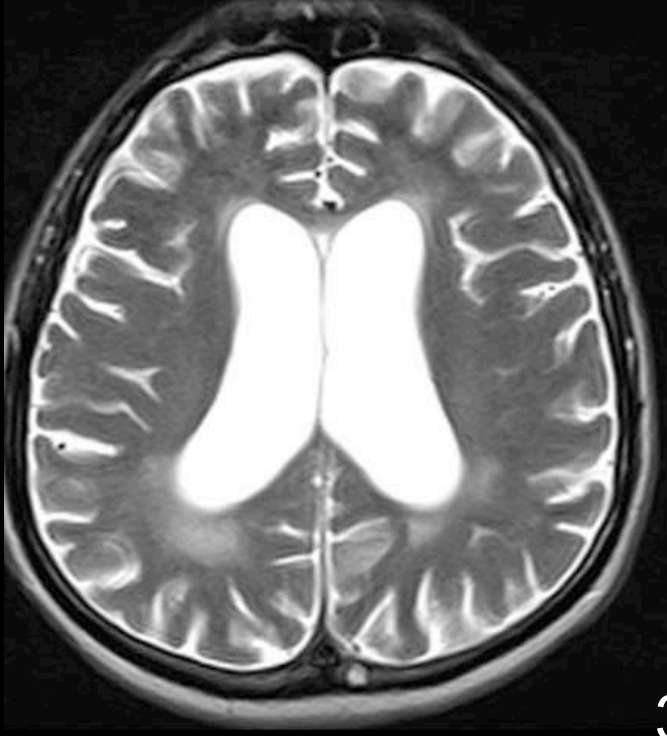
	SNR	Height	Area	FWHM (Hz)
Cho (3.22)	18.6	61.0	3.49	6.52
Cr (3.03)	10.2	33.6	1.72	5.95
H2O (4.69)	7040	3540	310	9.99
NAA (2.01)	11.9	39.1	2.51	7.33

	Area ratio
Cho/Cr	2.02
Cho/NAA	1.39
NAA/Cr	1.46

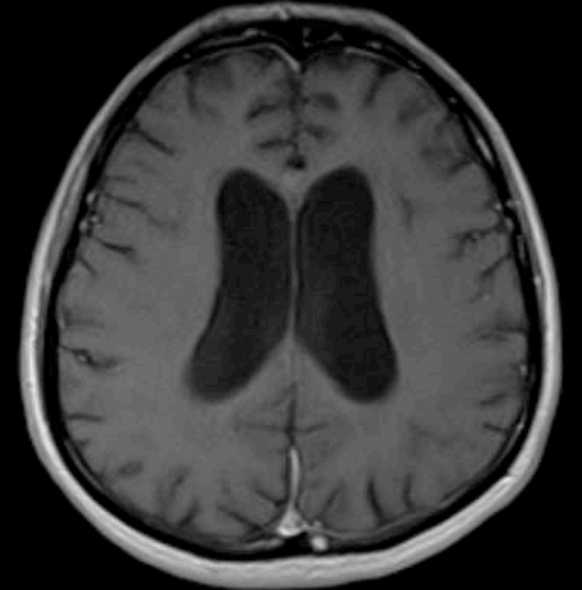
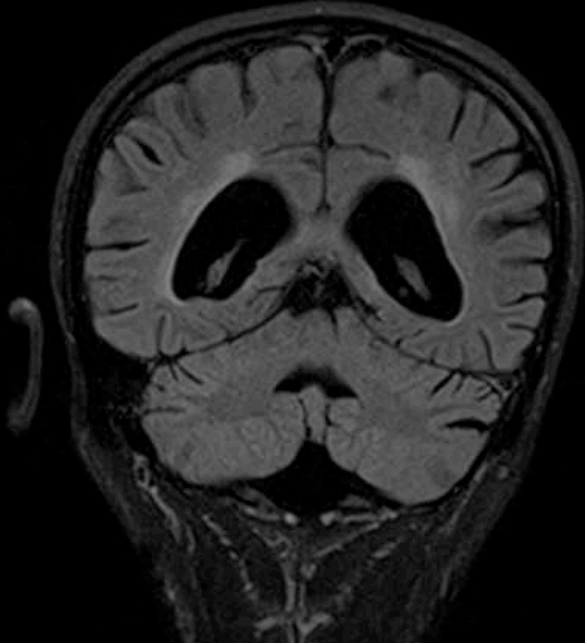


CBV

L 1.4 W 2.3



3 yıl sonra kognitif fonksiyonlarda
belirgin bozulma



Difüzyon Tensör Görüntüleme

▪ Dokudaki su moleküllerinin anizotropik difüzyonun yönünü ve büyüklüğünü kantitatif ölçerek BC nin mikroyapısal değişikliklerini değerlendiren noninvaziv tekniktir.

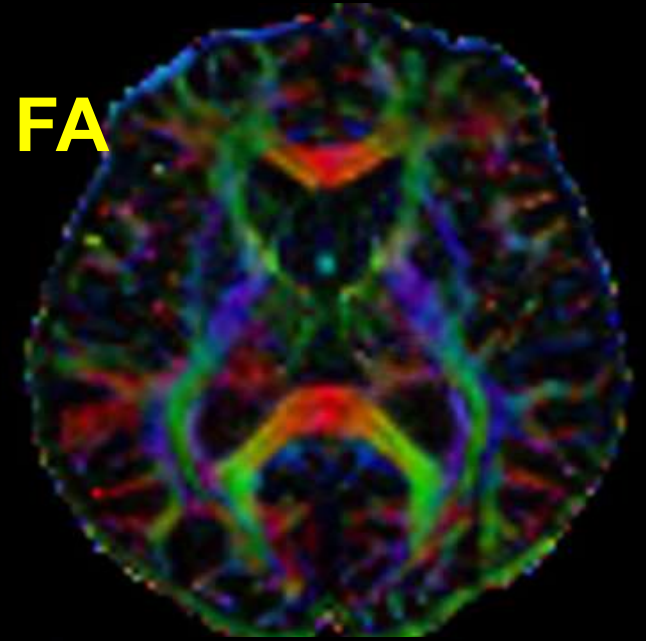
✓ FA

✓ MD

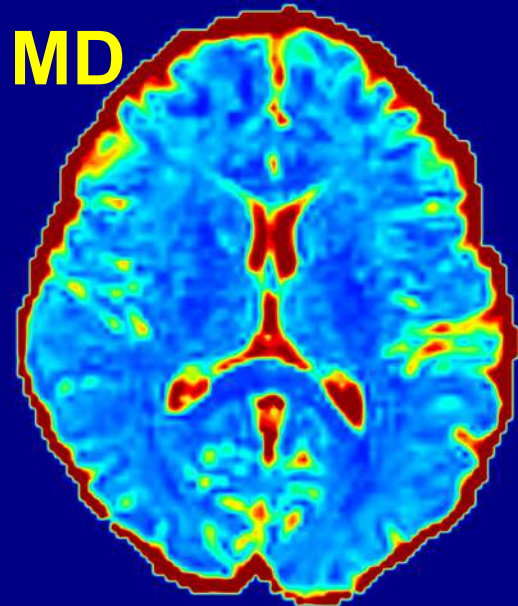
✓ AD

✓ RD

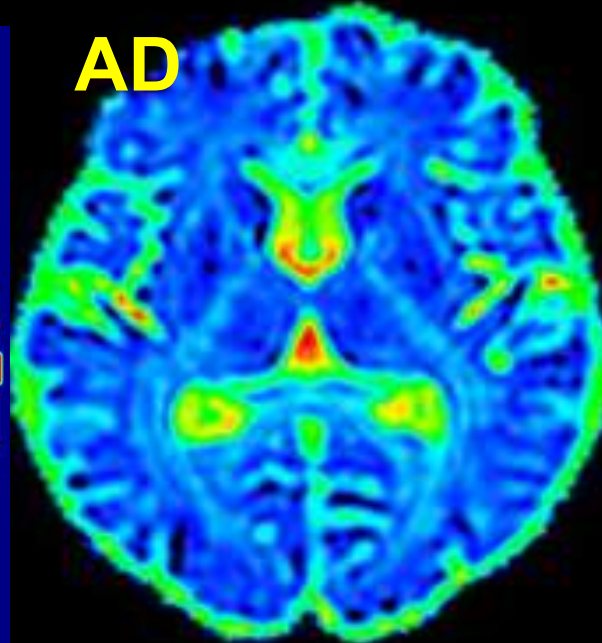
FA



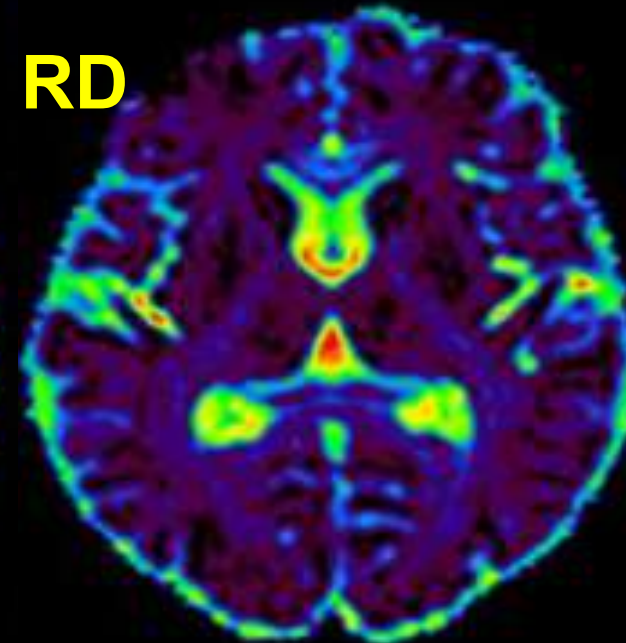
MD

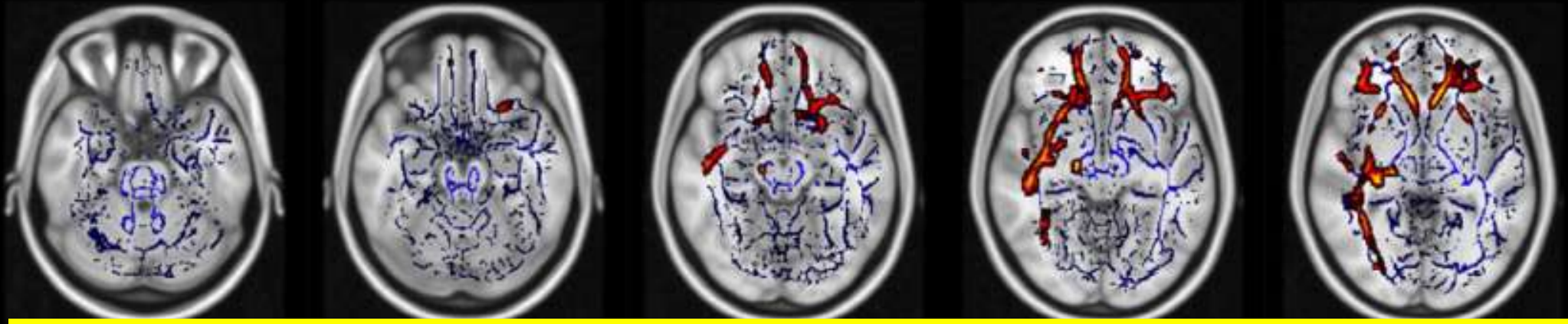


AD

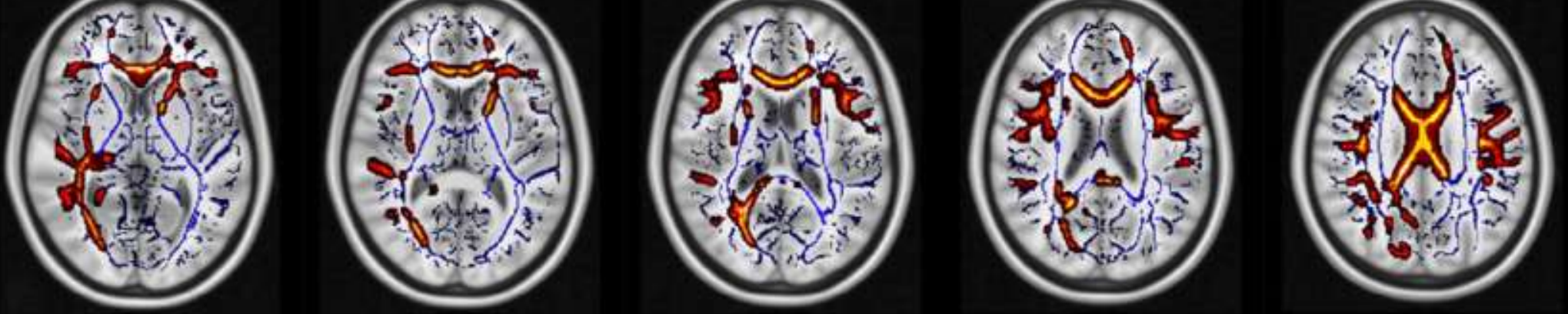


RD

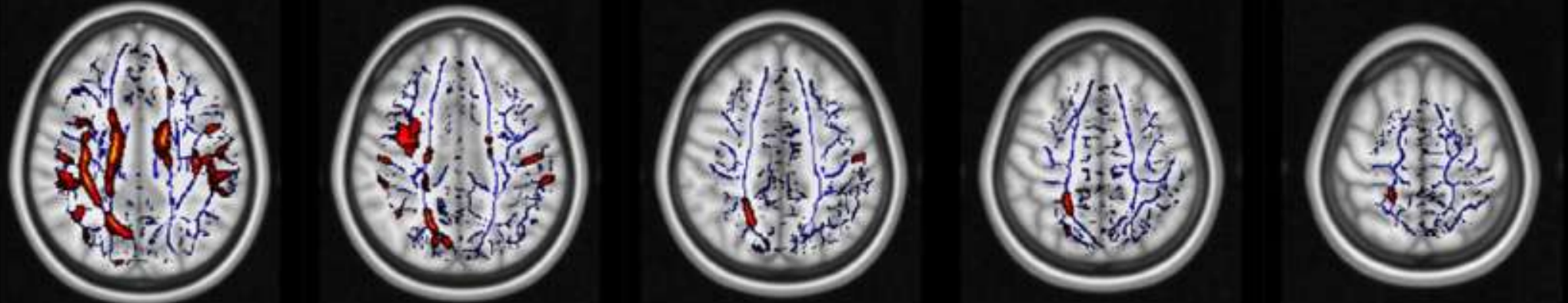


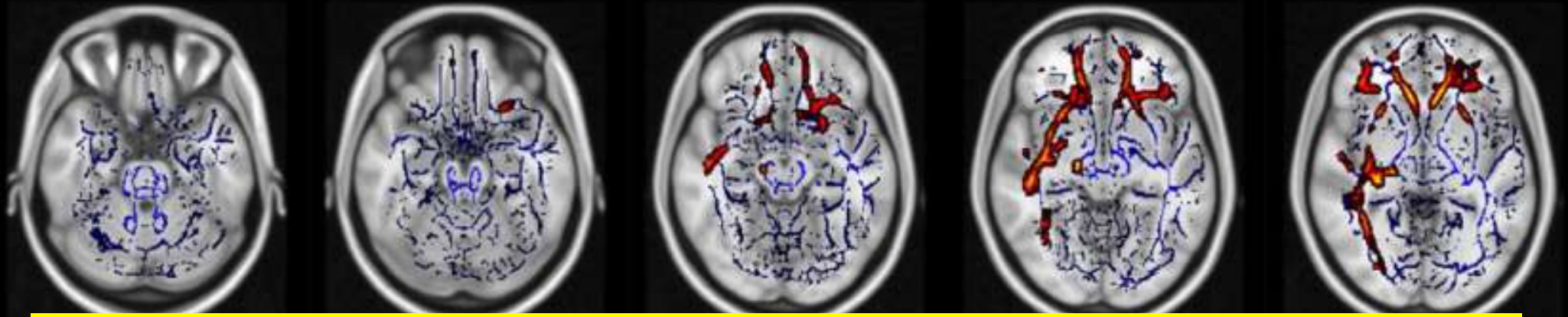


nörolojik bozukluğu olmayan 35 HIV pozitif hasta-sağlıklı kontrol grubu

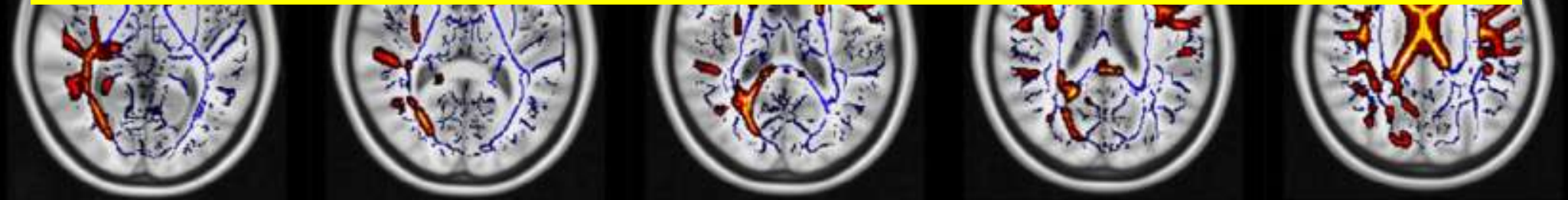


Minosse S, et al. Hum Brain Mapp. 2023

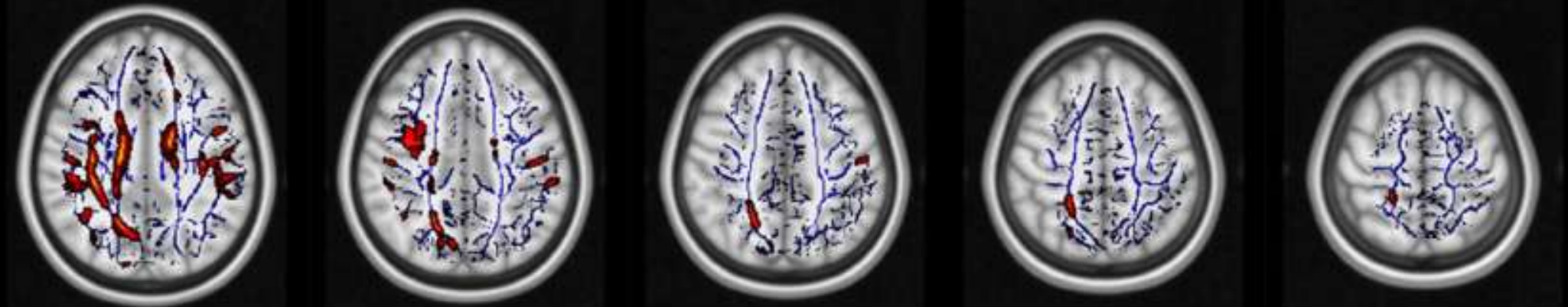




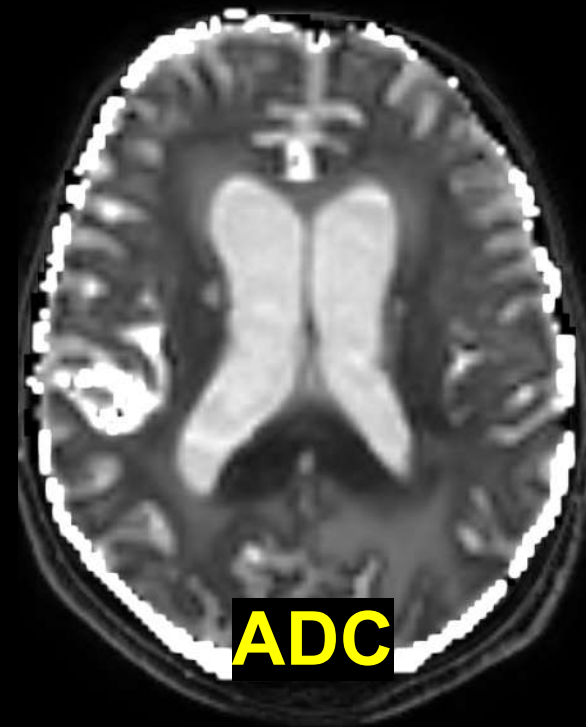
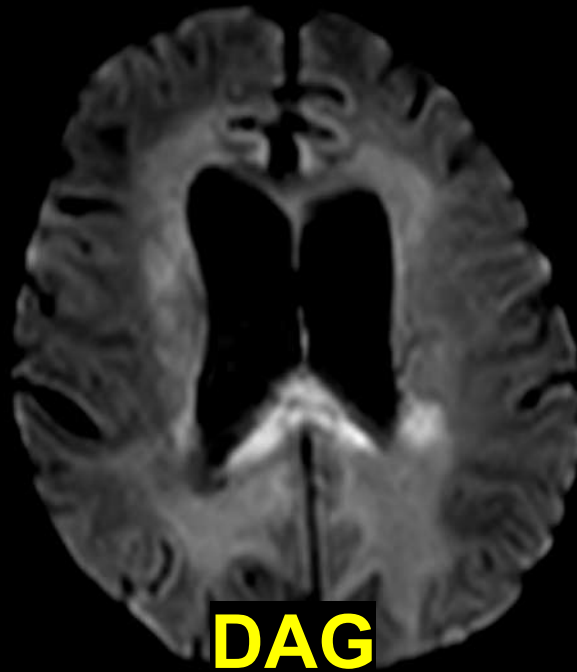
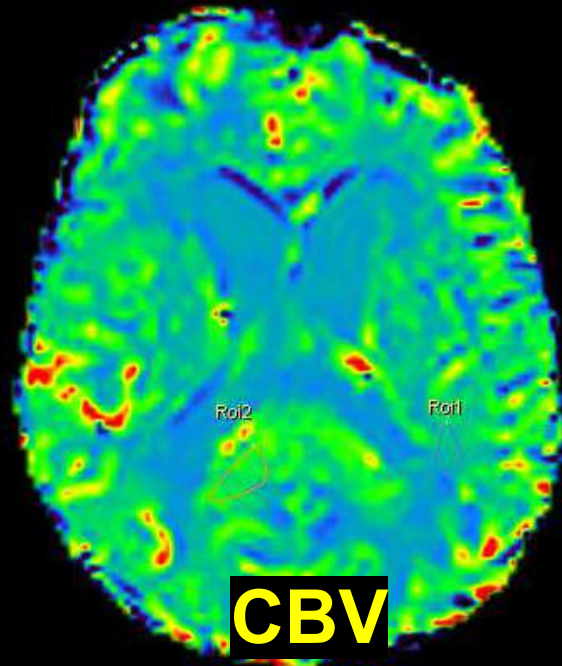
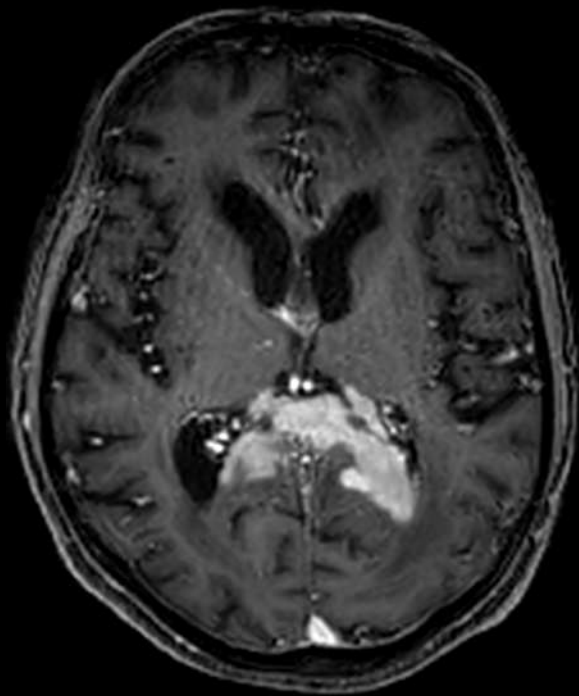
HIV hastalarında sıklıkla bozulan dikkat, duygusal ve hafıza ile ilgili beyaz cevher traktlarındaki mikroyapısal deęişiklikler hakkında daha fazla bilgi sağladığını göstermektedir.

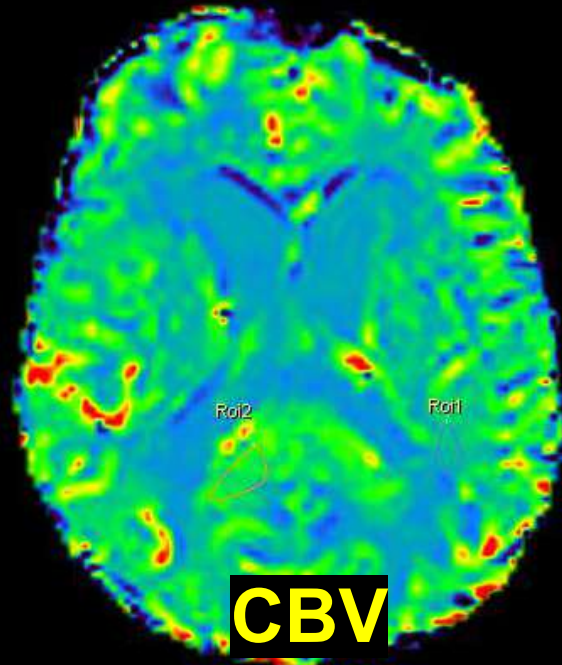
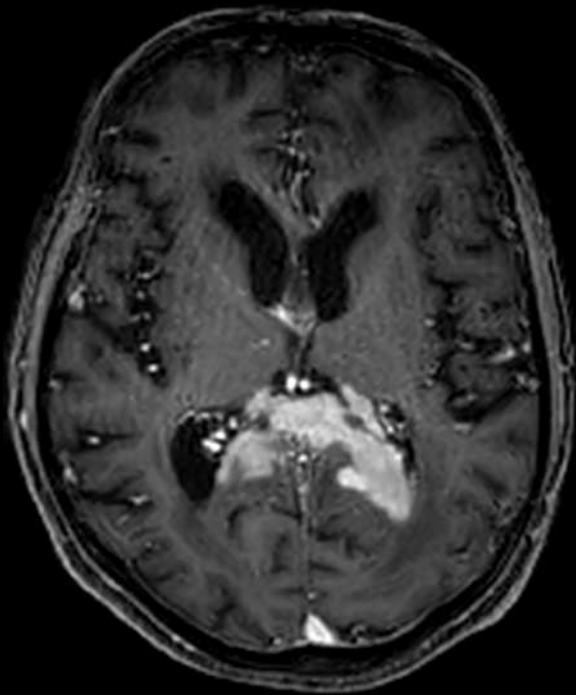


Minosse S, et al. Hum Brain Mapp. 2023

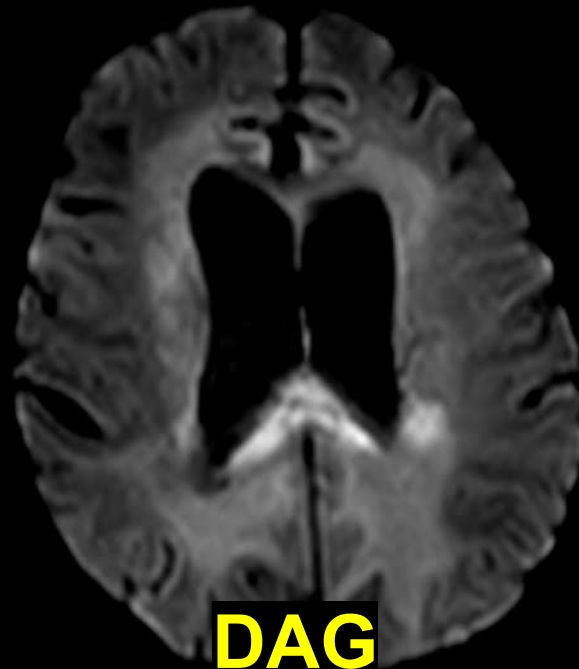


ÖZET VAKALAR

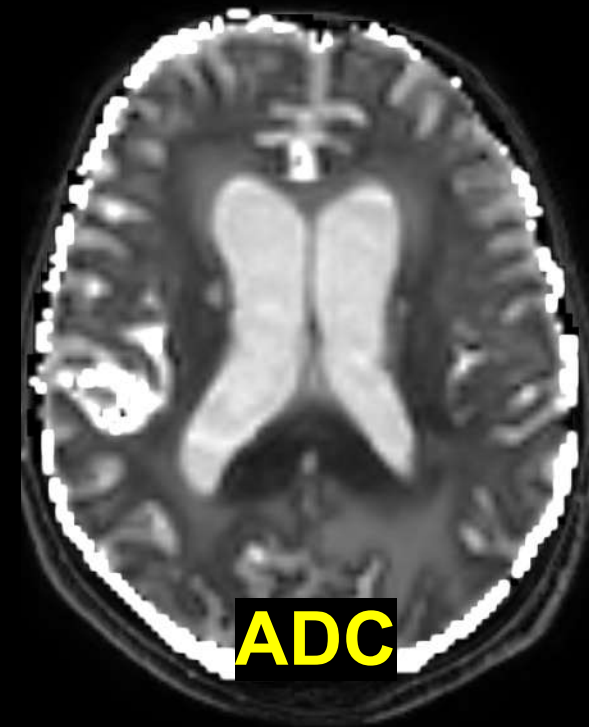




CBV

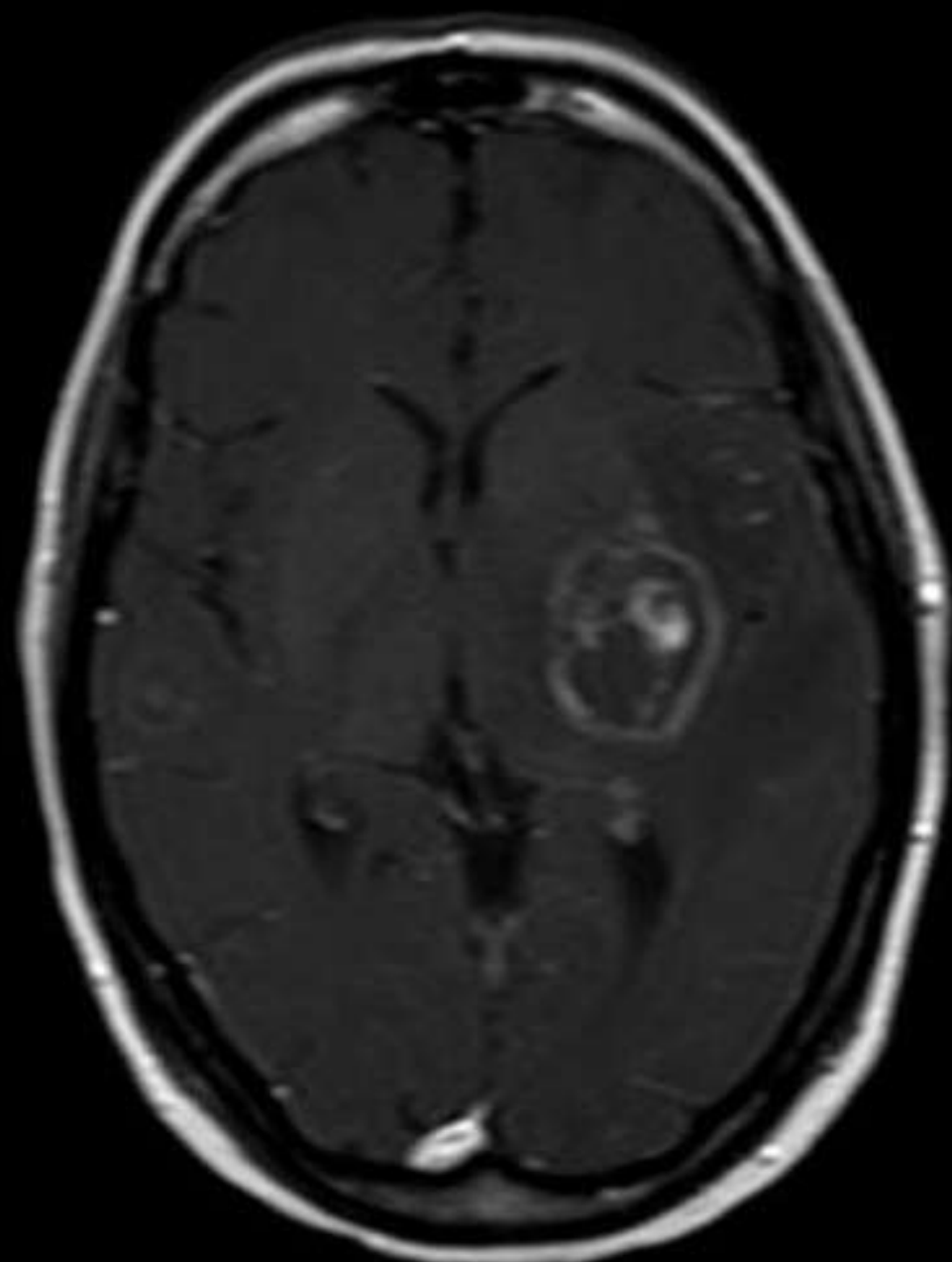
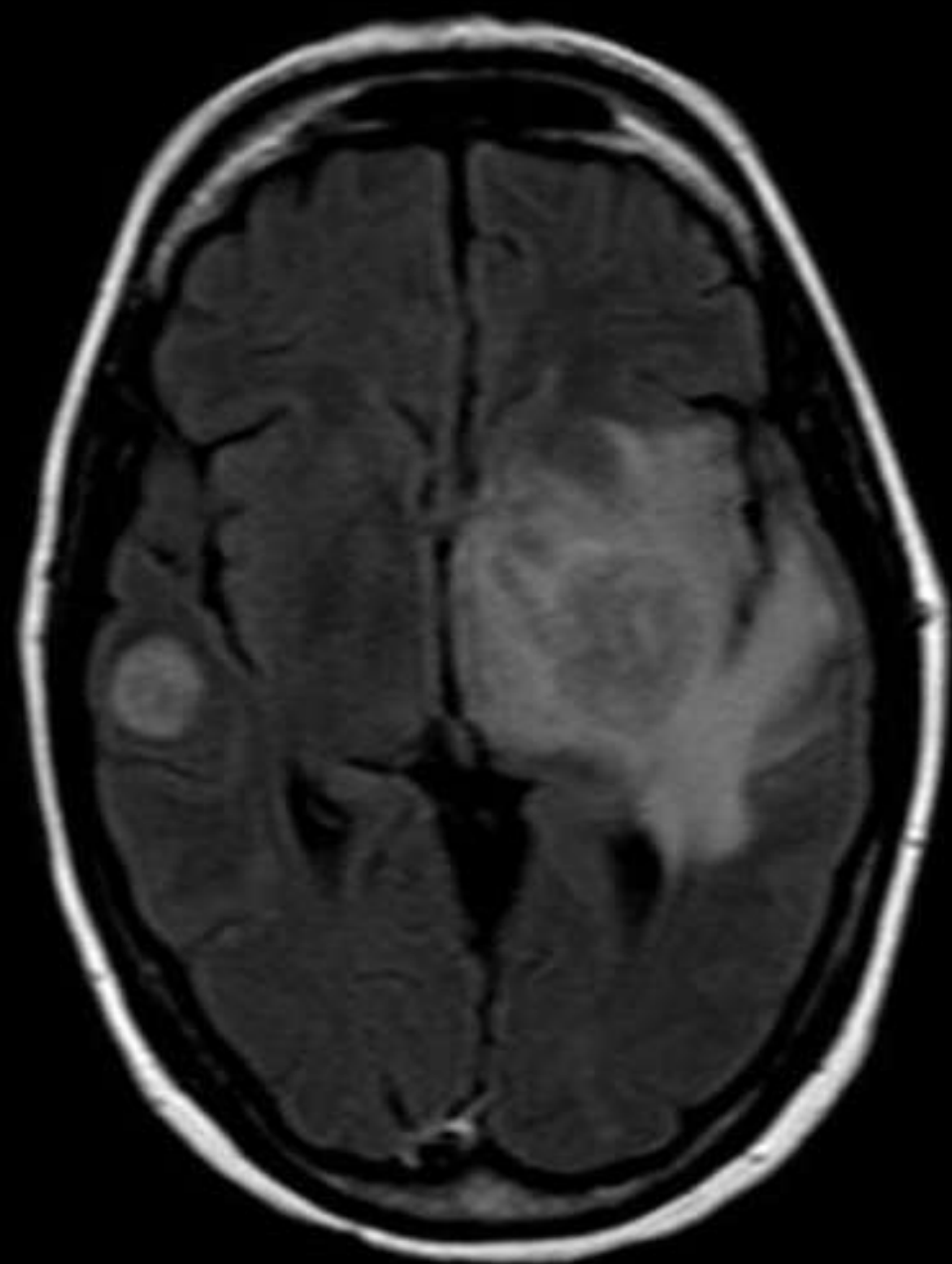


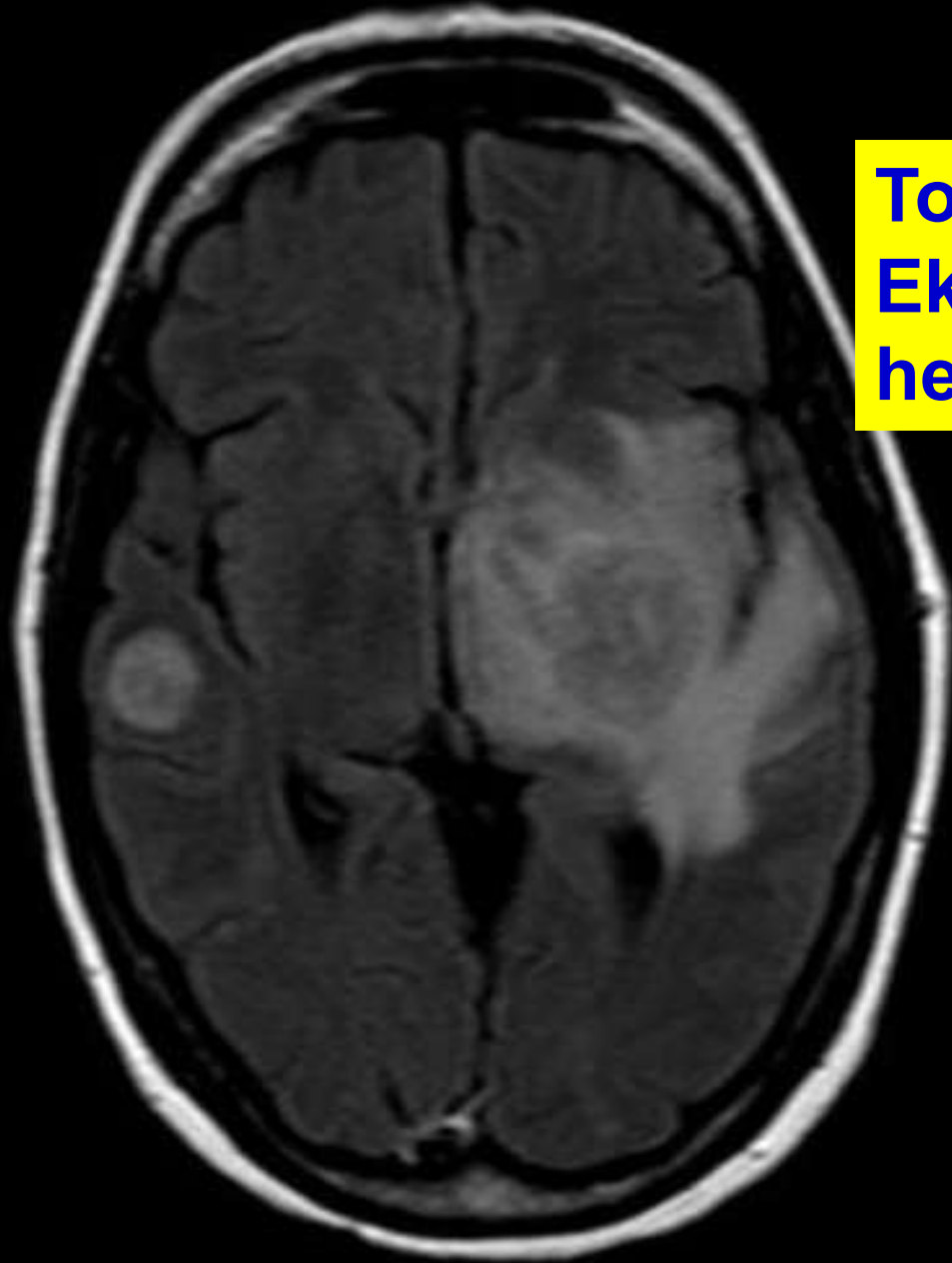
DAG



ADC

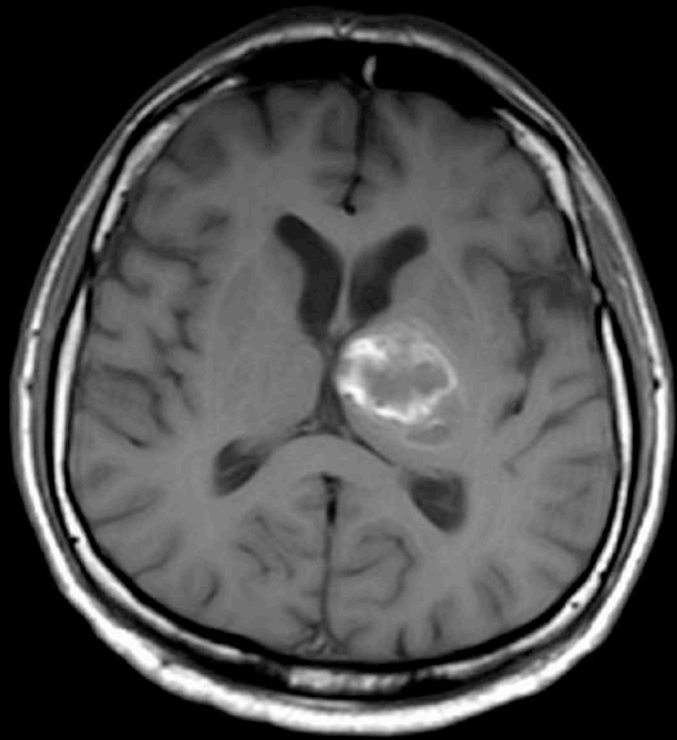
LENFOMA



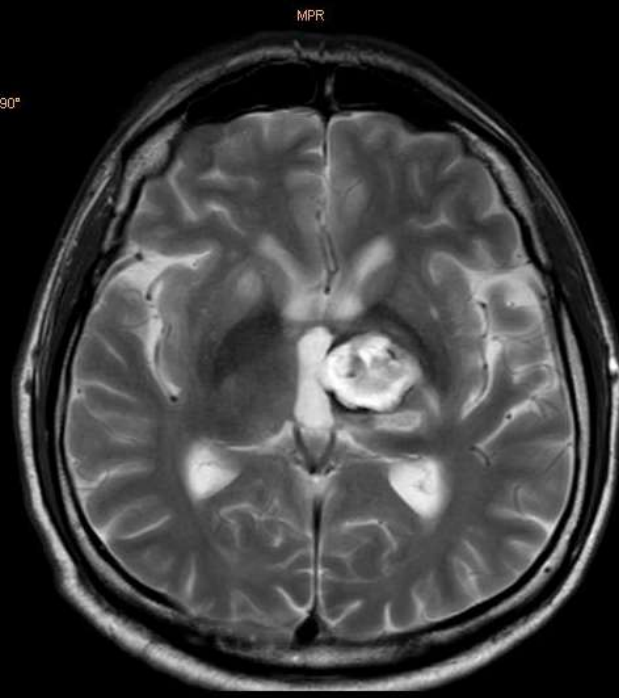


**Toksoplazmozis
Eksantrik
hedef işareti**



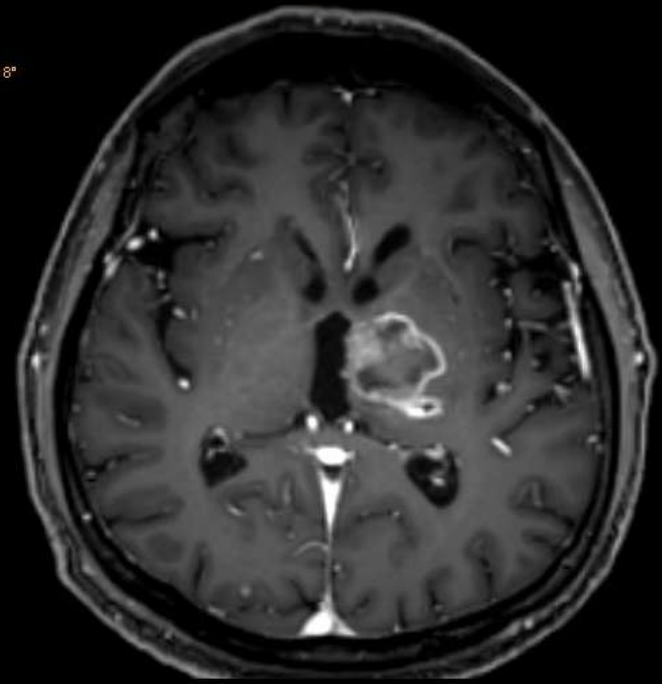


le 90°

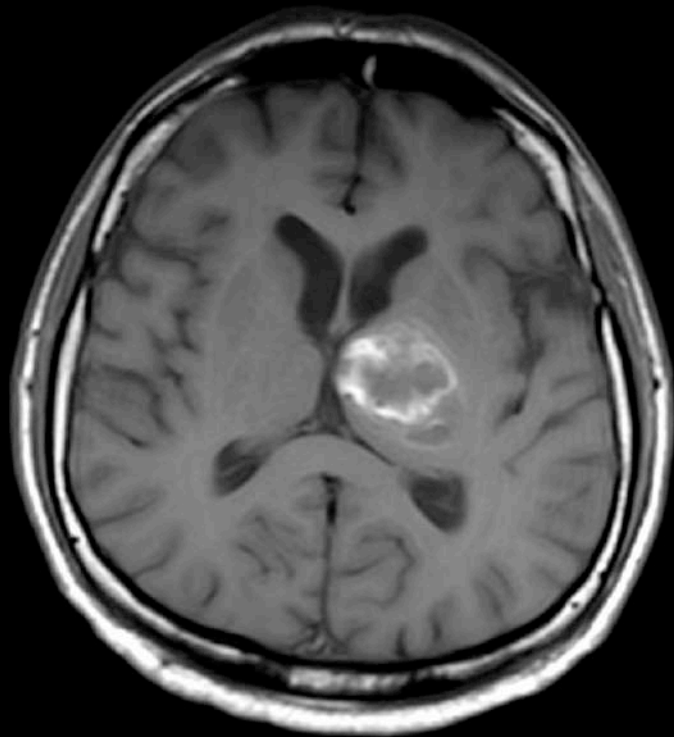


MPR

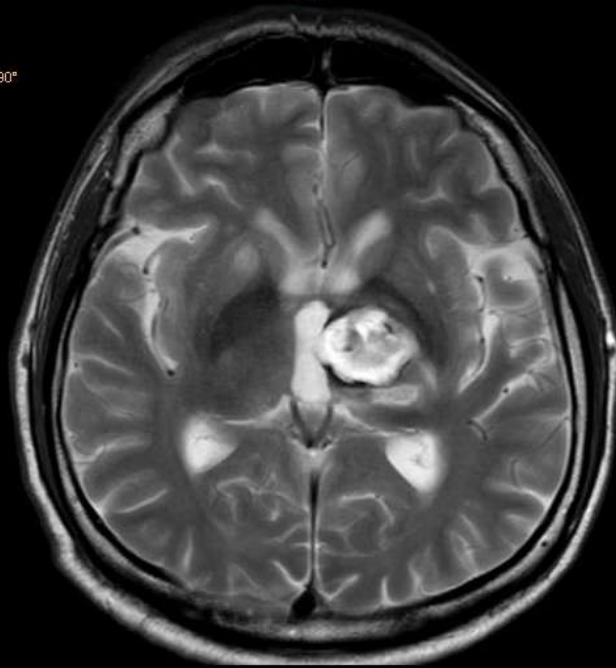
gle 8°



MPR

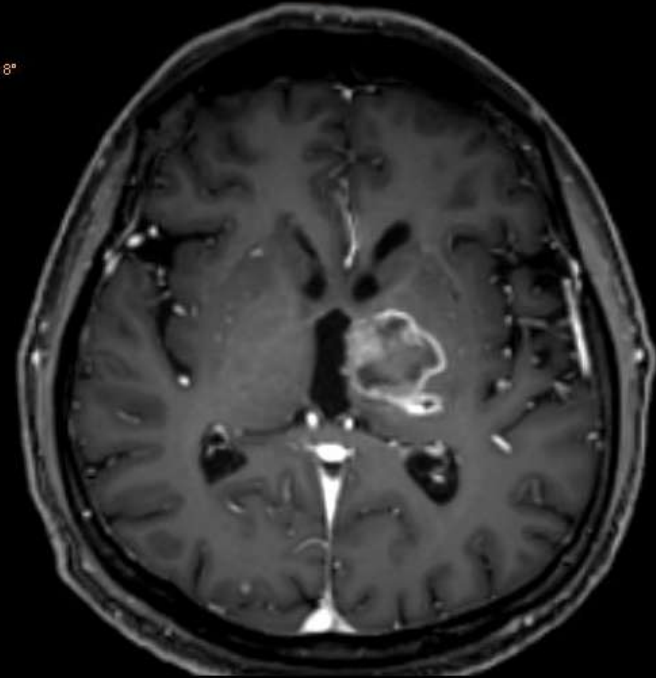


le 90°

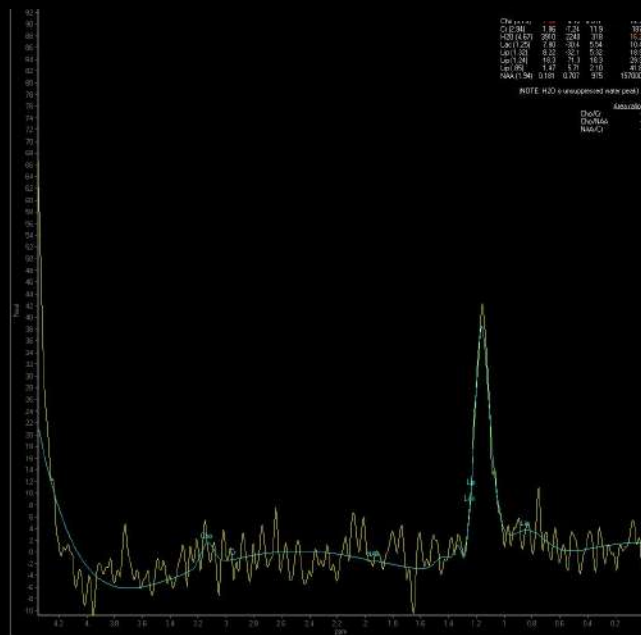
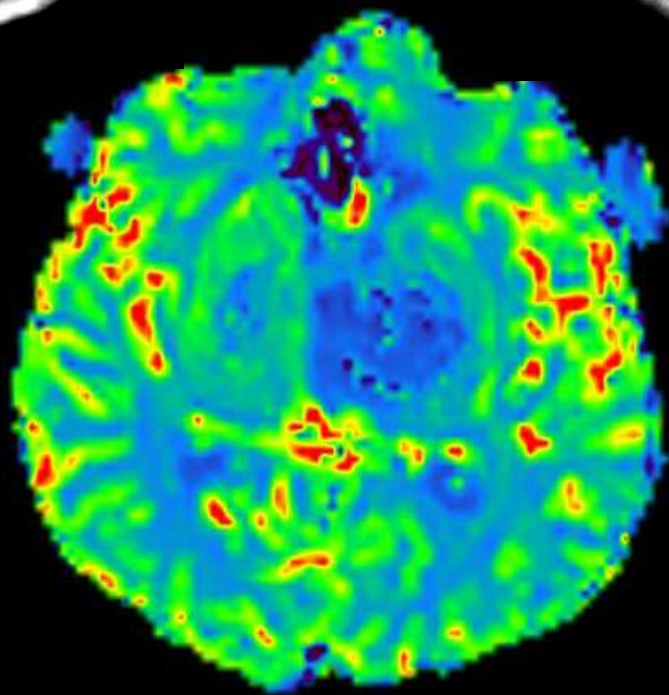


MPR

3le 8°

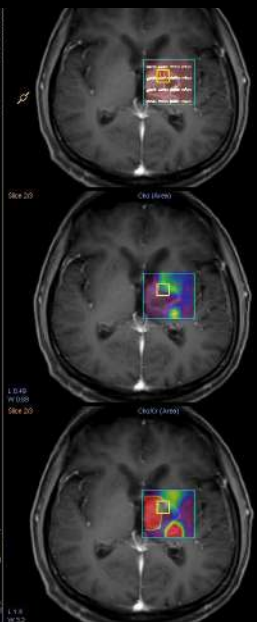


MPR

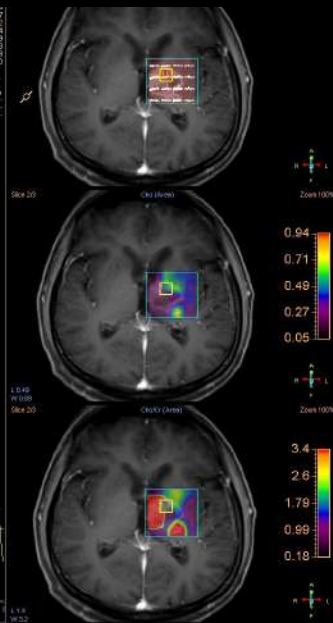
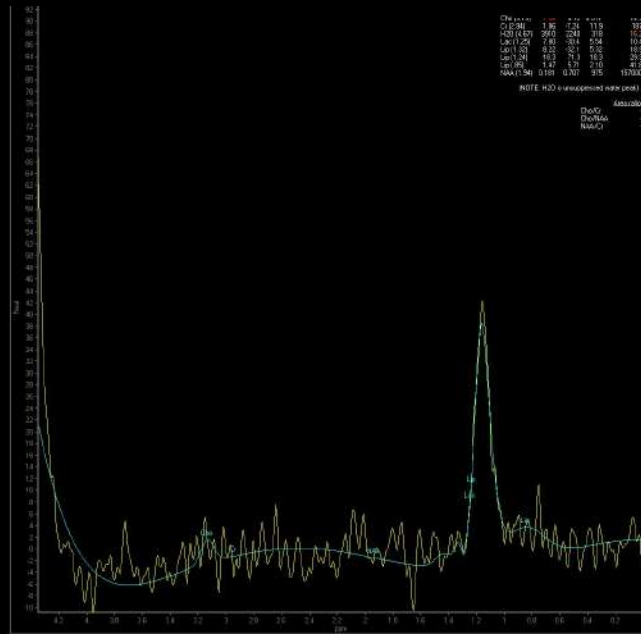
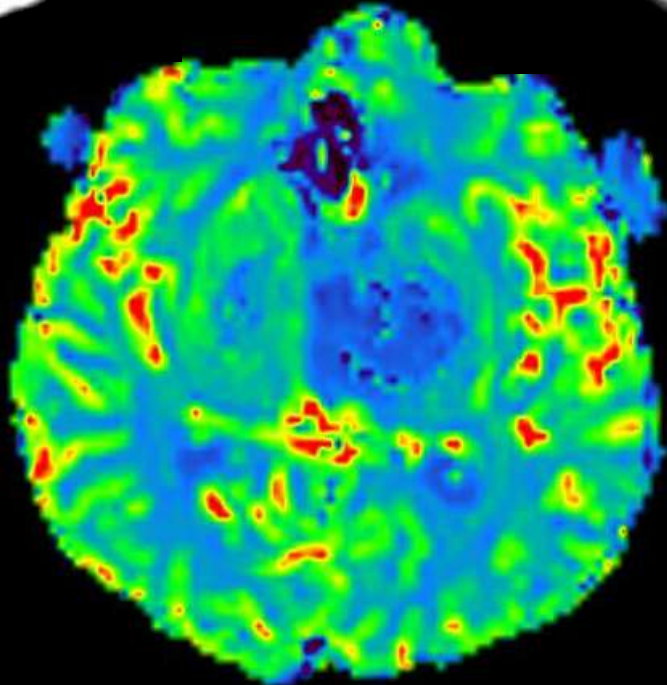
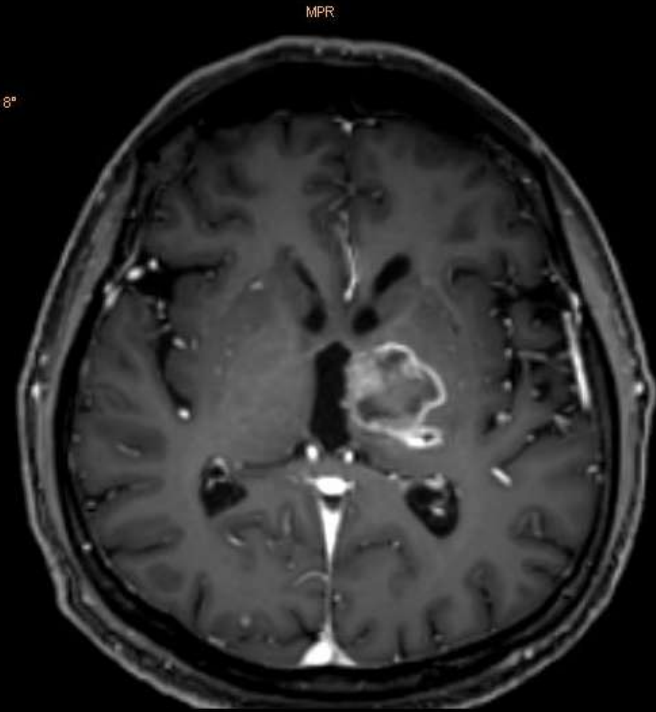
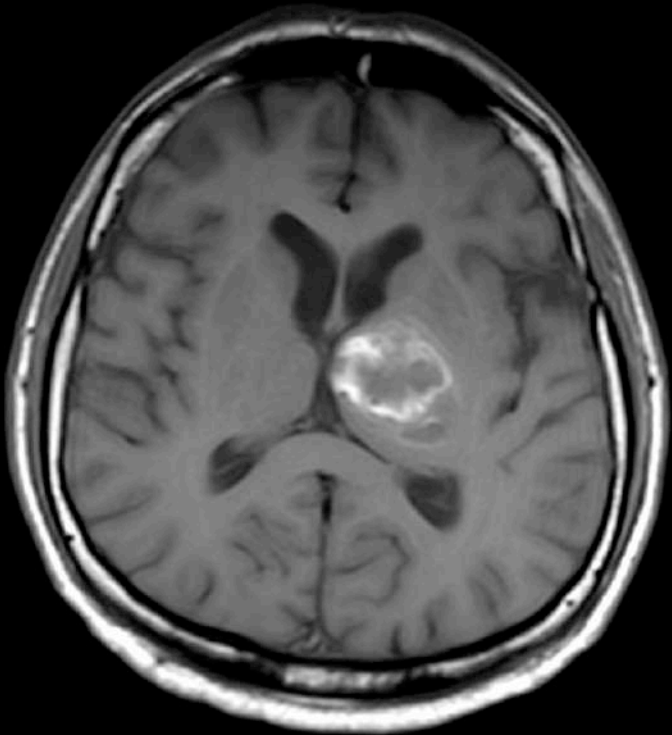


Chemical	Area	Height	Width	Volume
CHOL	1.85	7.75	1.15	377
CHOL (57)	2.60	2.48	0.18	102
CHOL (59)	2.81	2.51	0.24	104
CHOL (31)	3.23	3.21	0.23	109
CHOL (32)	3.52	2.11	0.24	293
CHOL (33)	3.47	1.71	0.18	410
CHOL (34)	3.68	0.70	0.15	137.00

NOTE: CHOL is unassigned water peak!



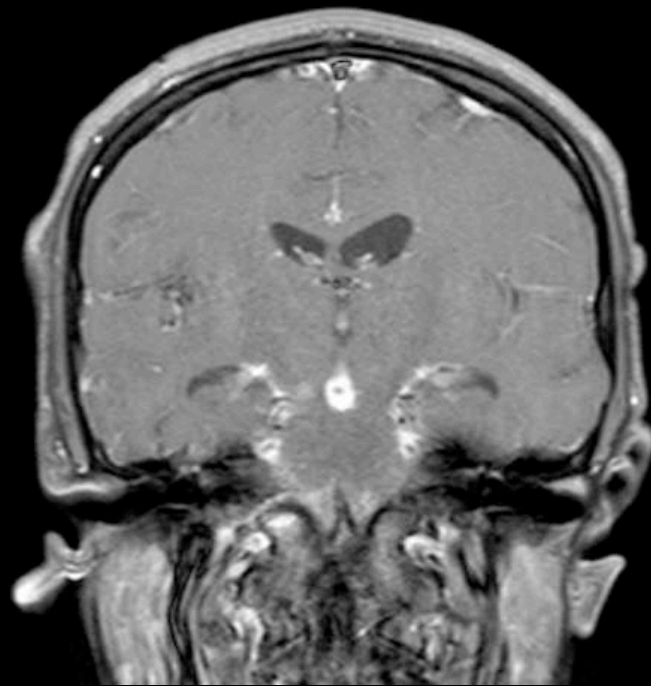
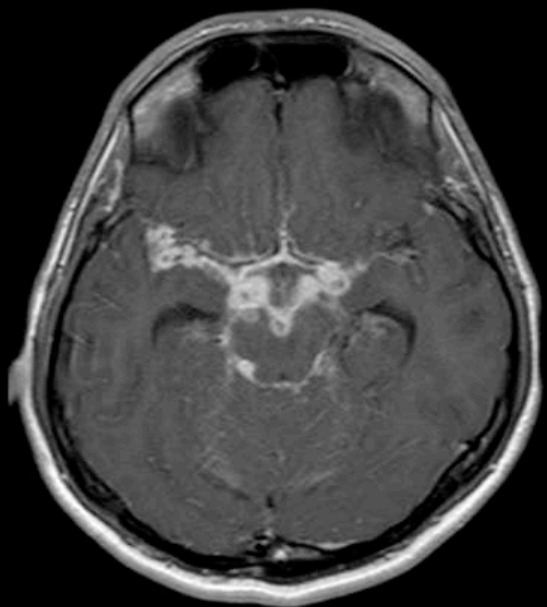
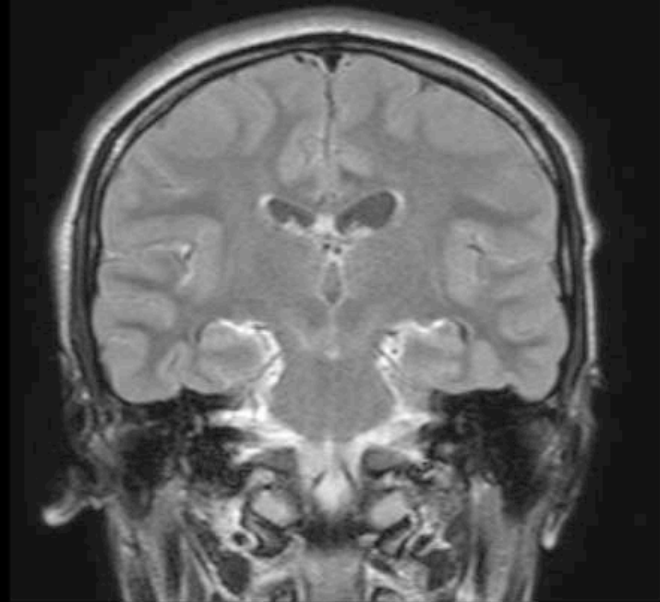
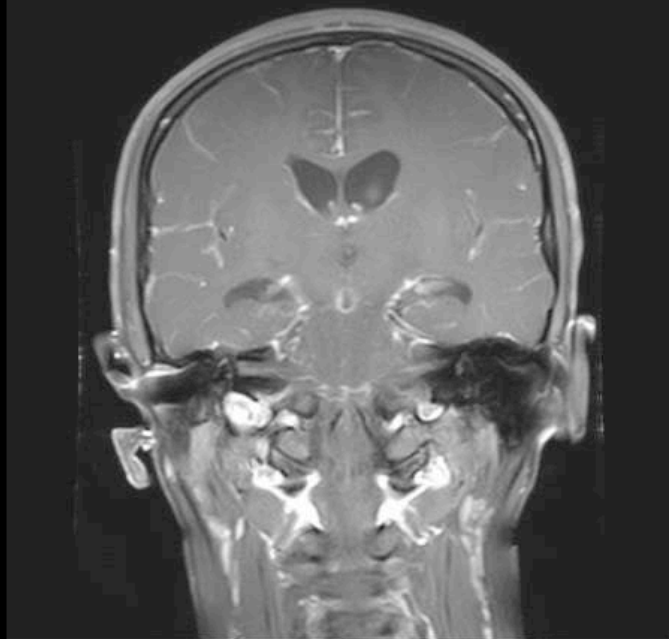
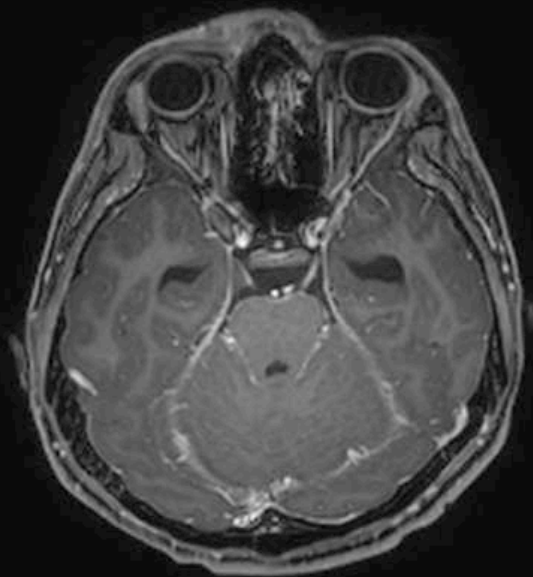
TOKSOPLAZMOZİS

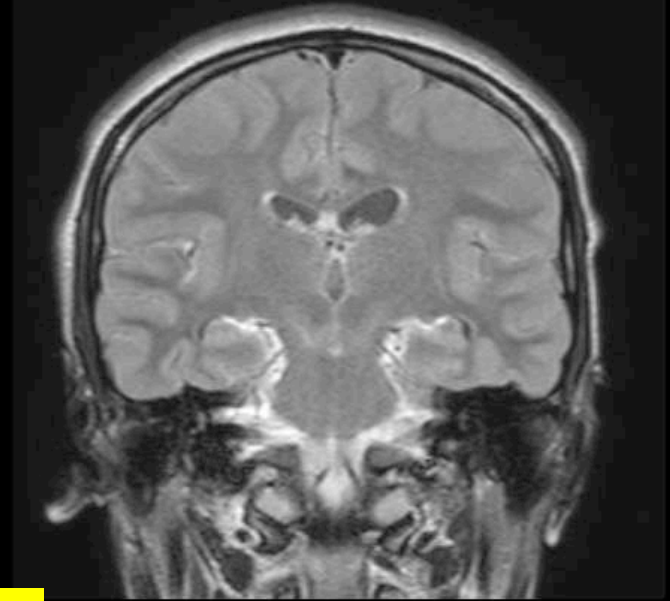
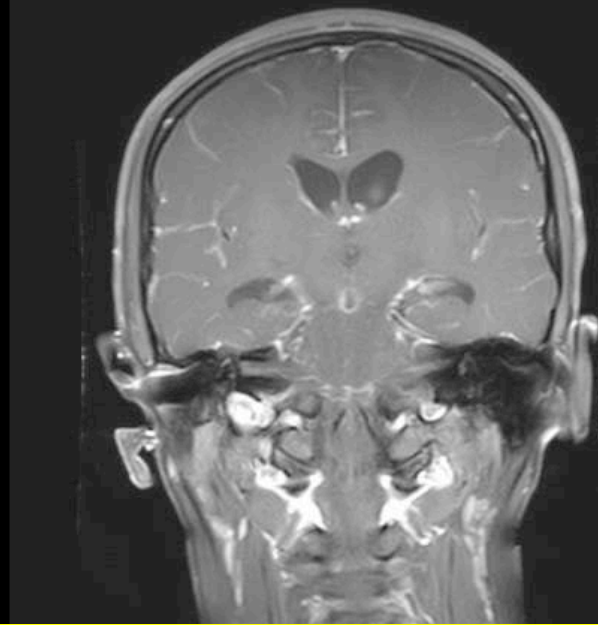
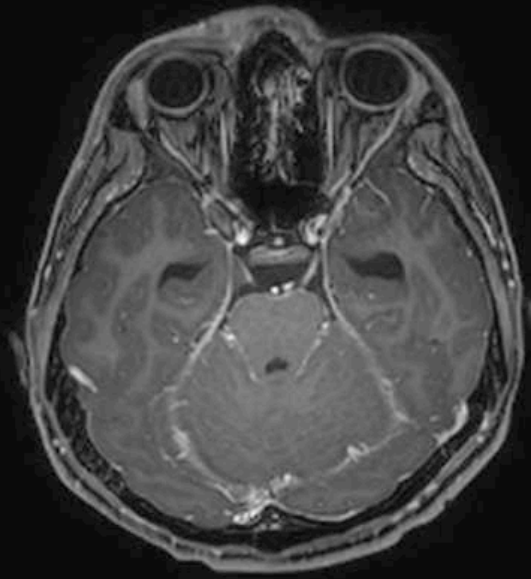


MPR
31e 8°

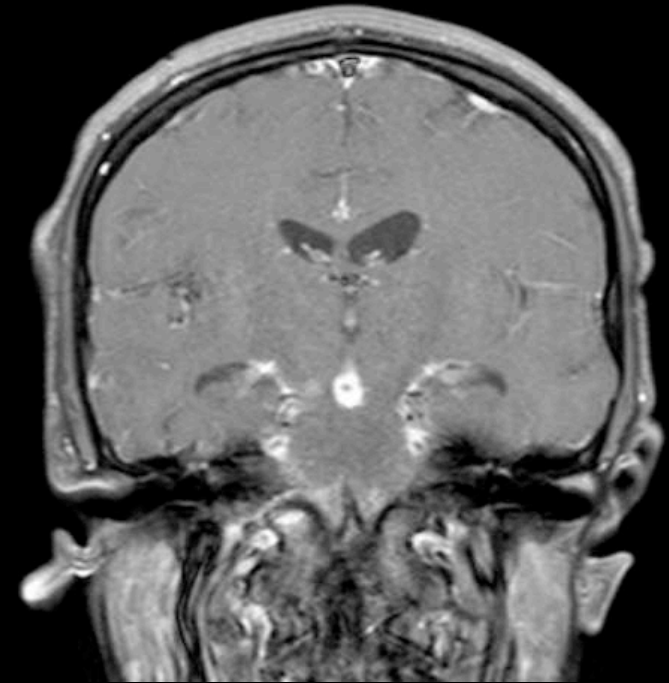
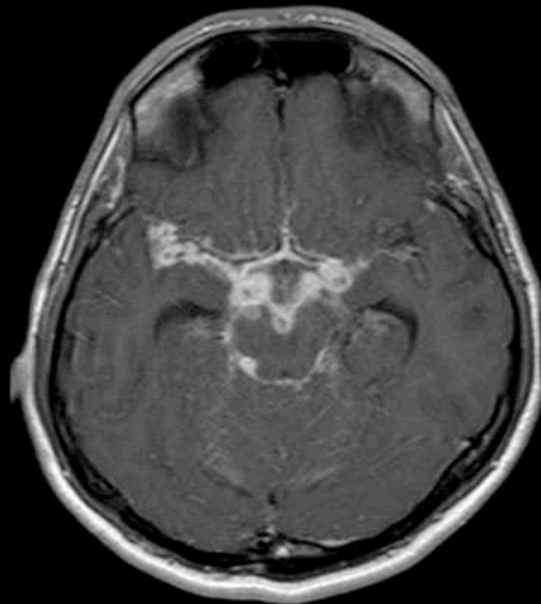
MPR

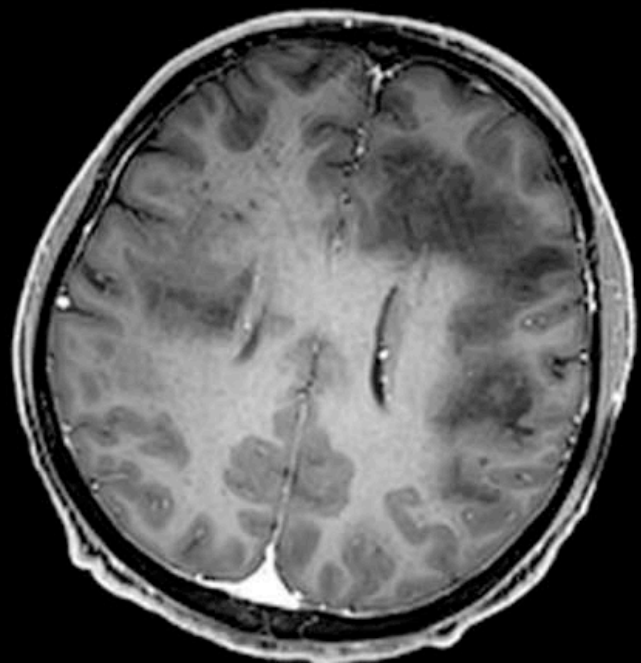
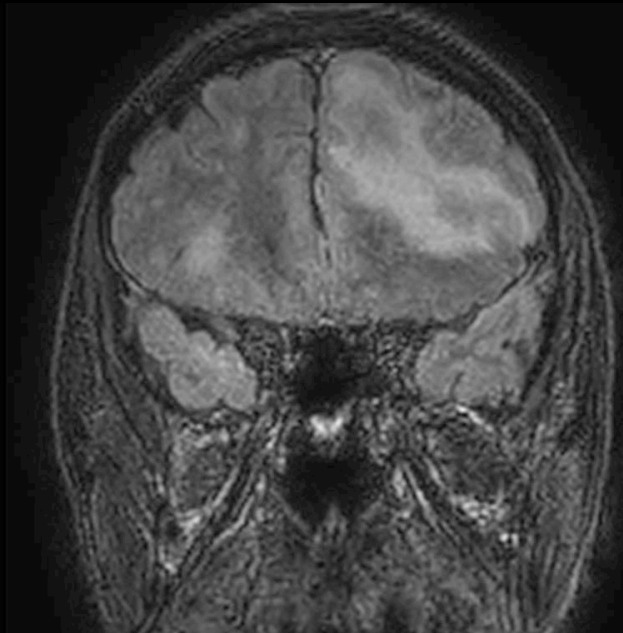
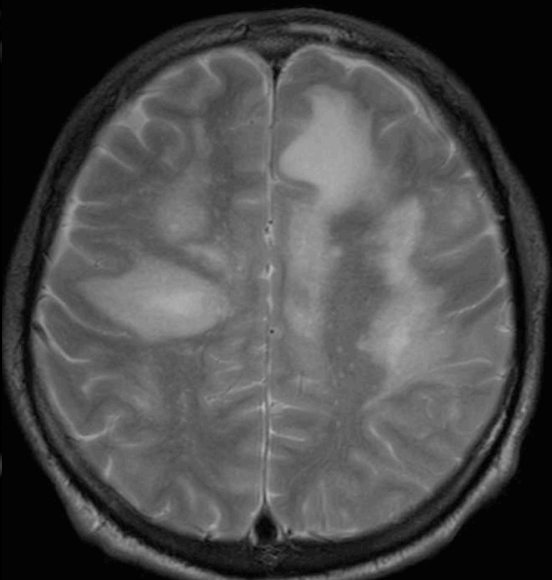
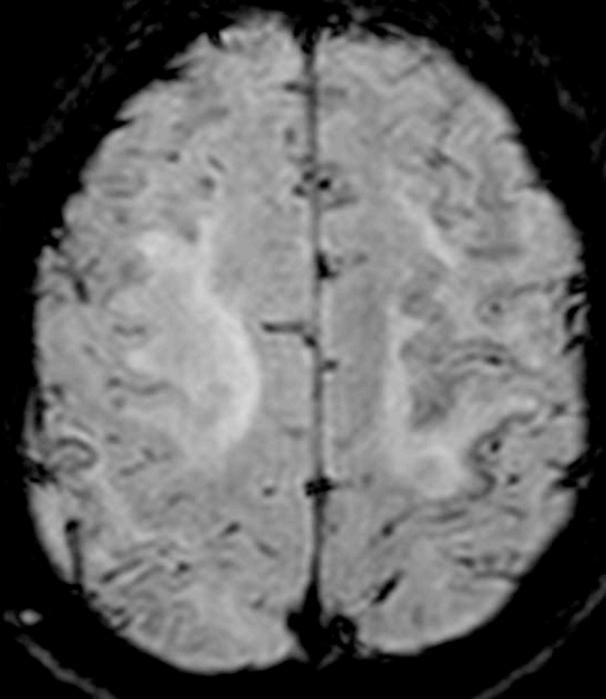
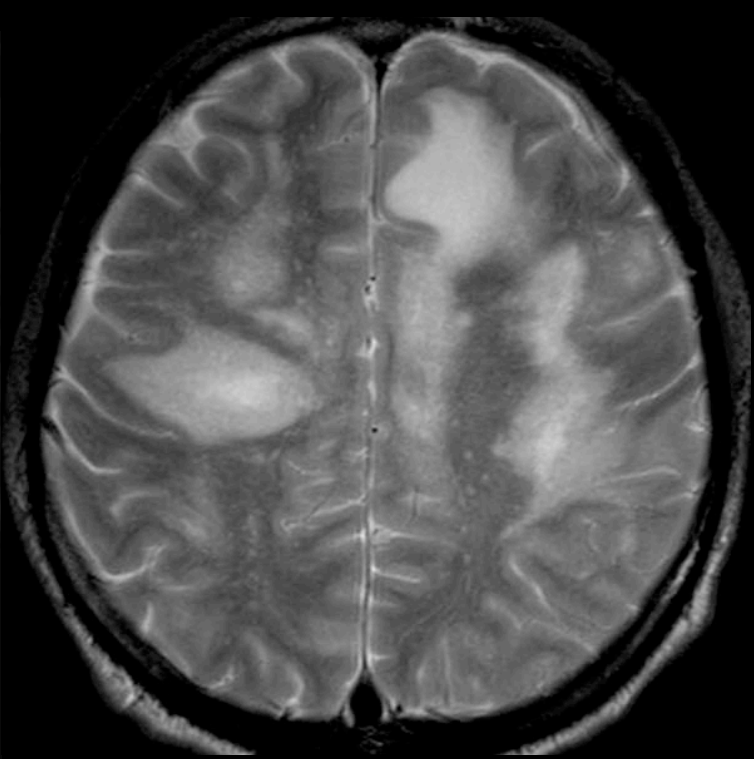
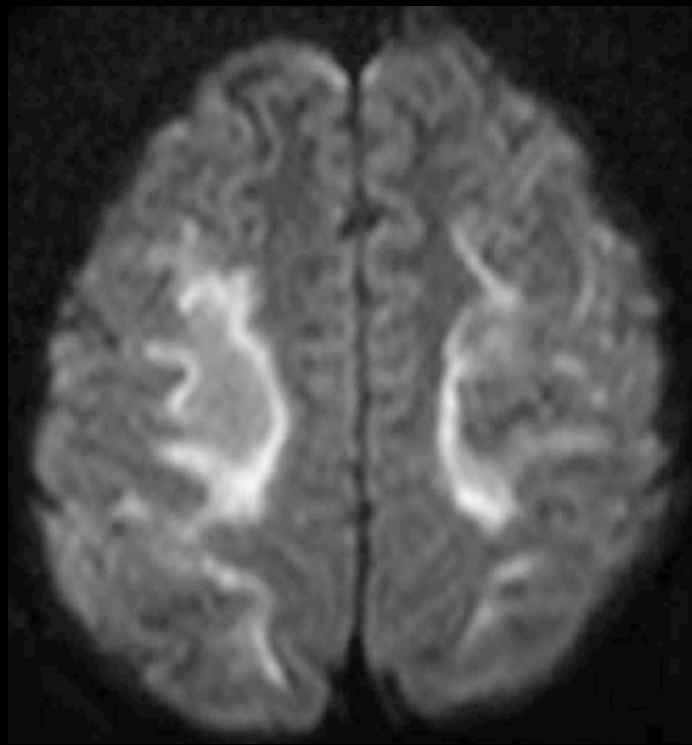
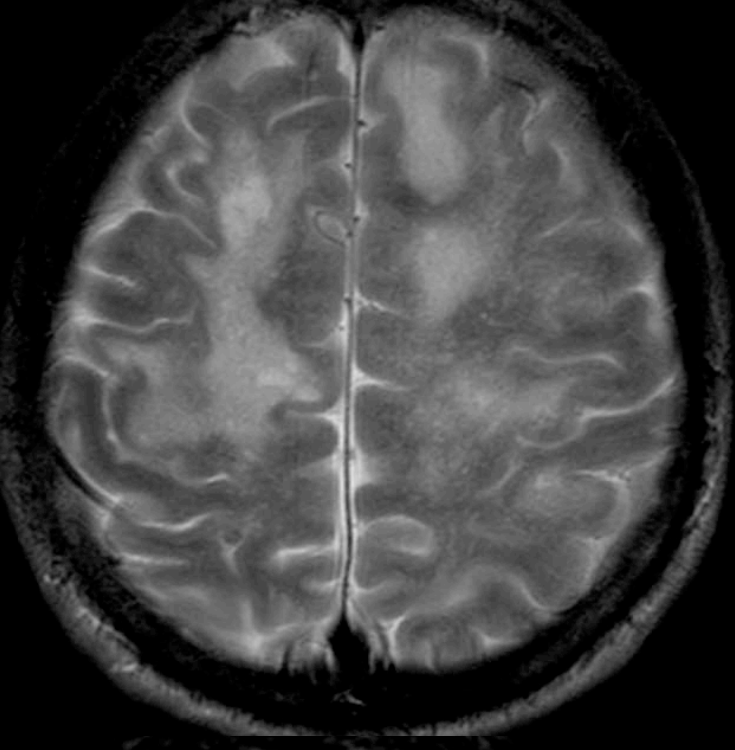
MPR





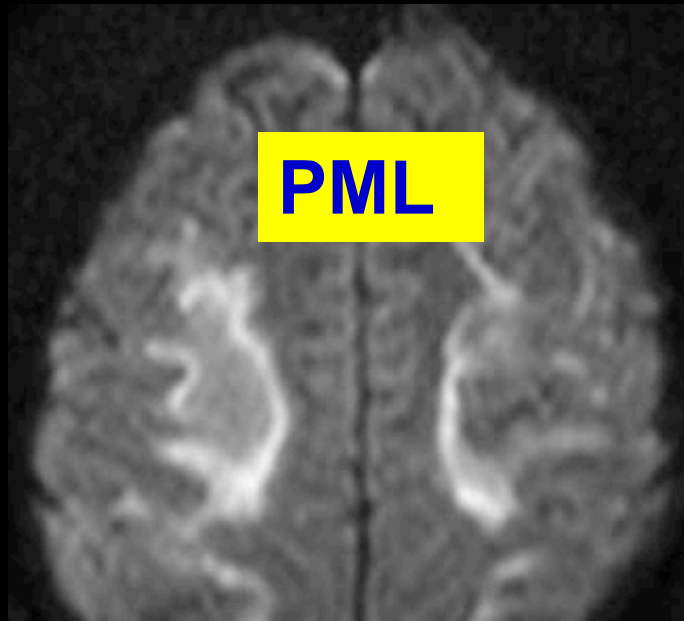
Tüberküloom + Meningenit





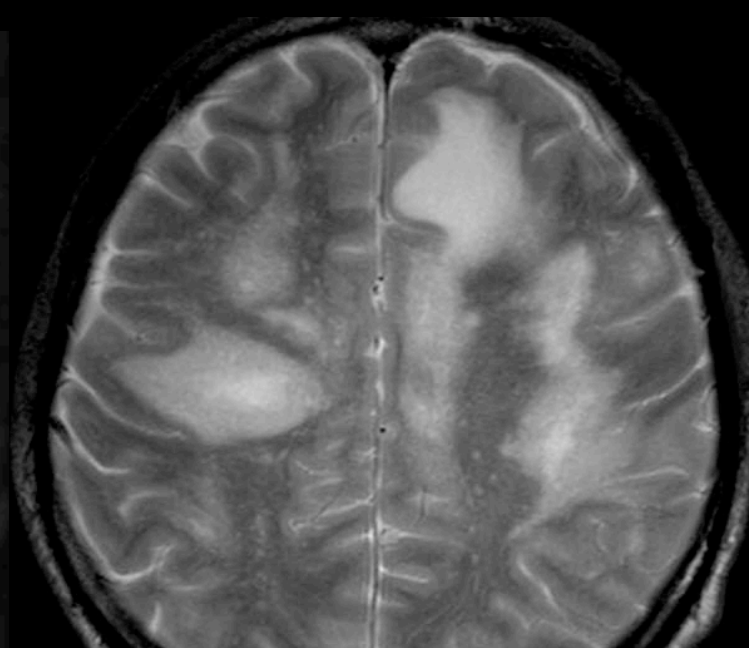


Milky Way

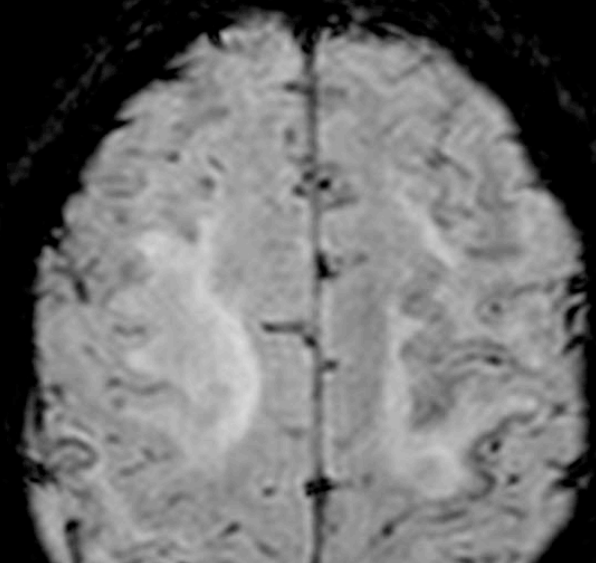


PML

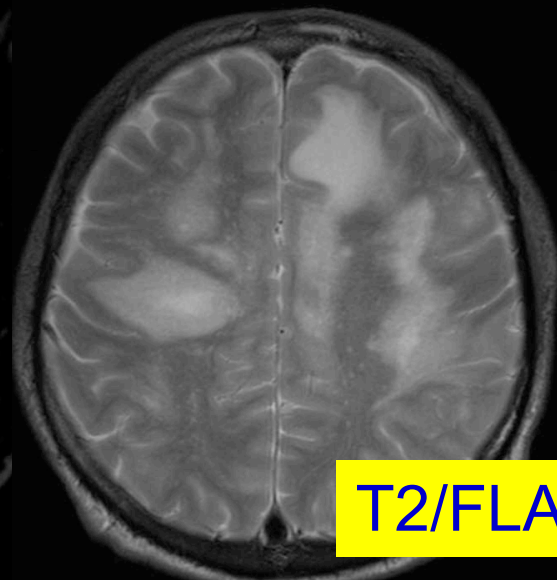
DAG Hiperintensitesi



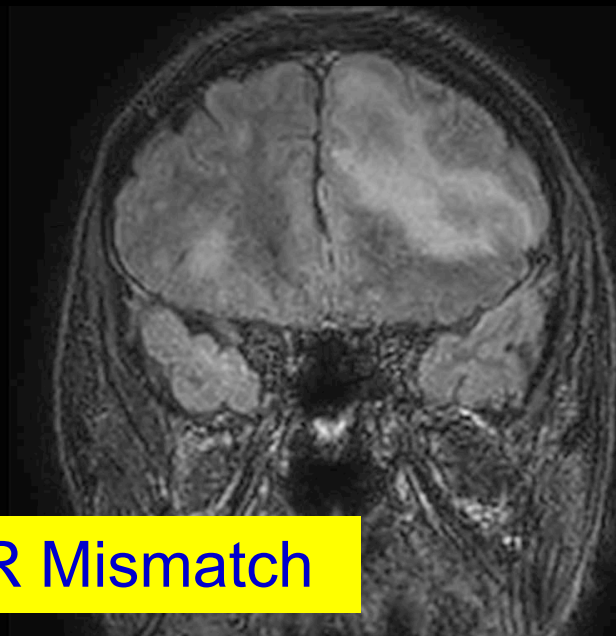
Gri cevher keskin



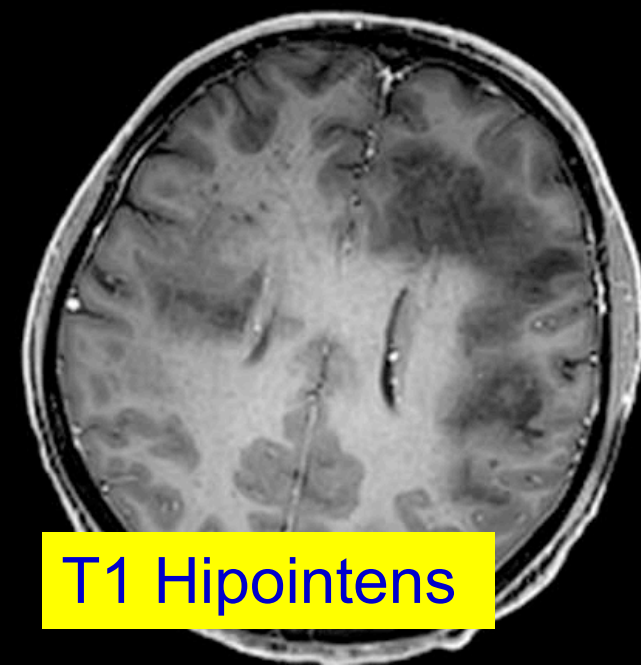
SWI Hipointens

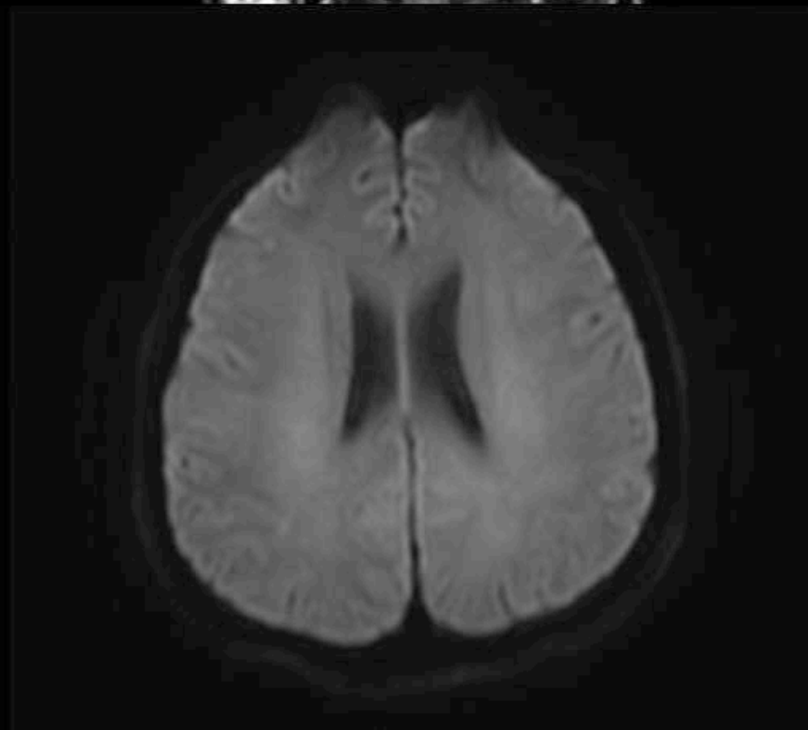
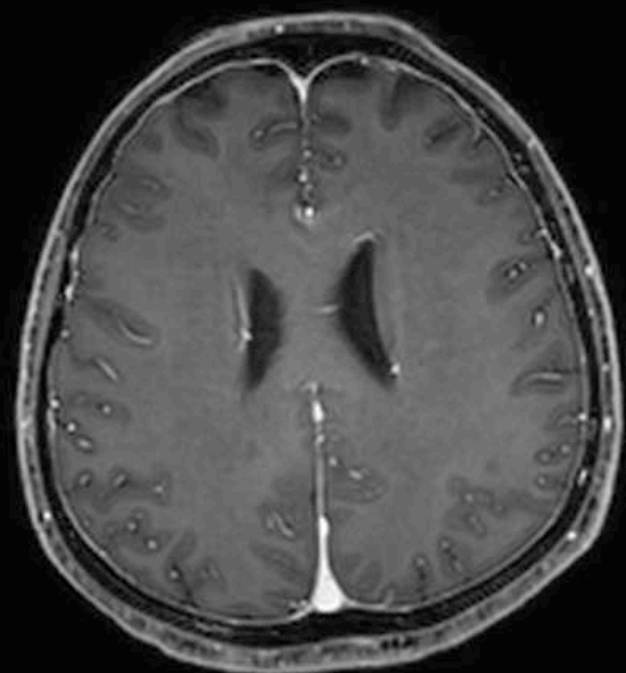
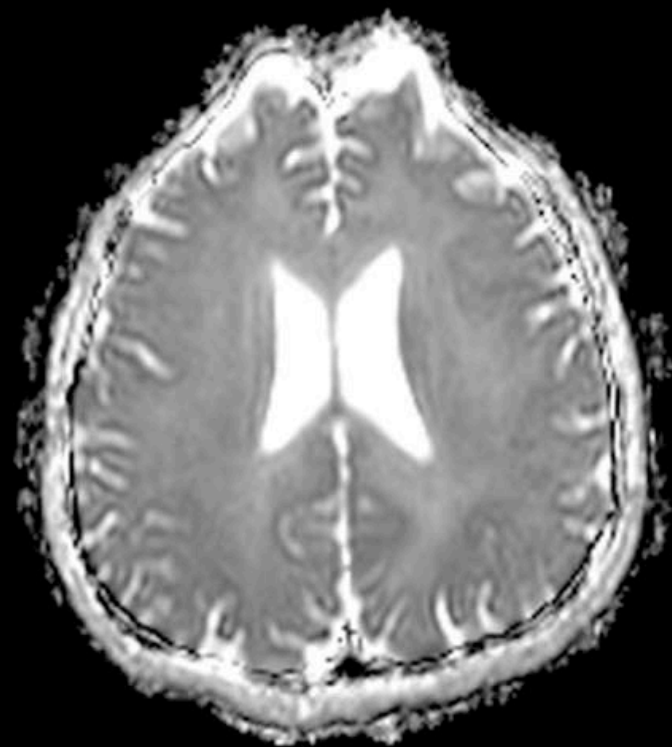
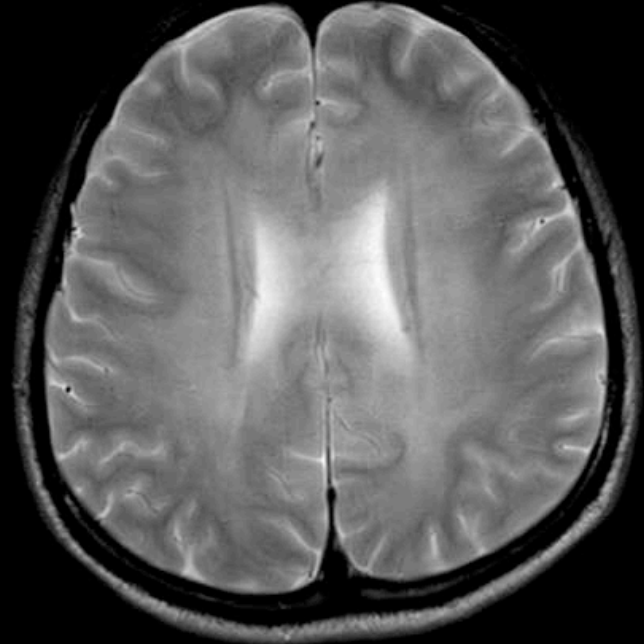


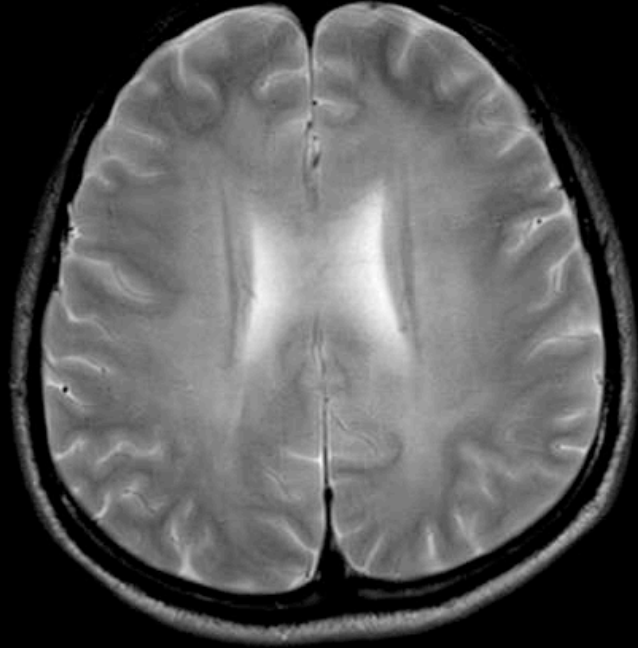
T2/FLAIR Mismatch



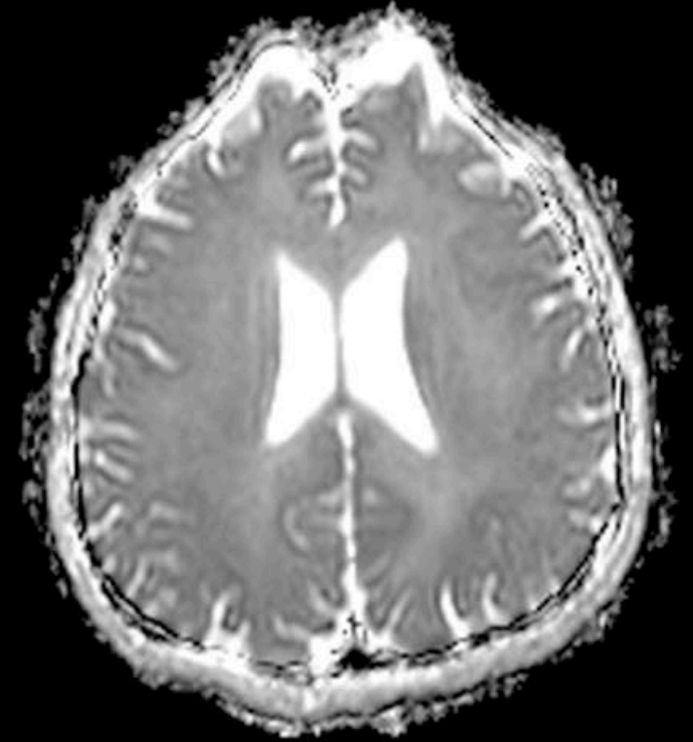
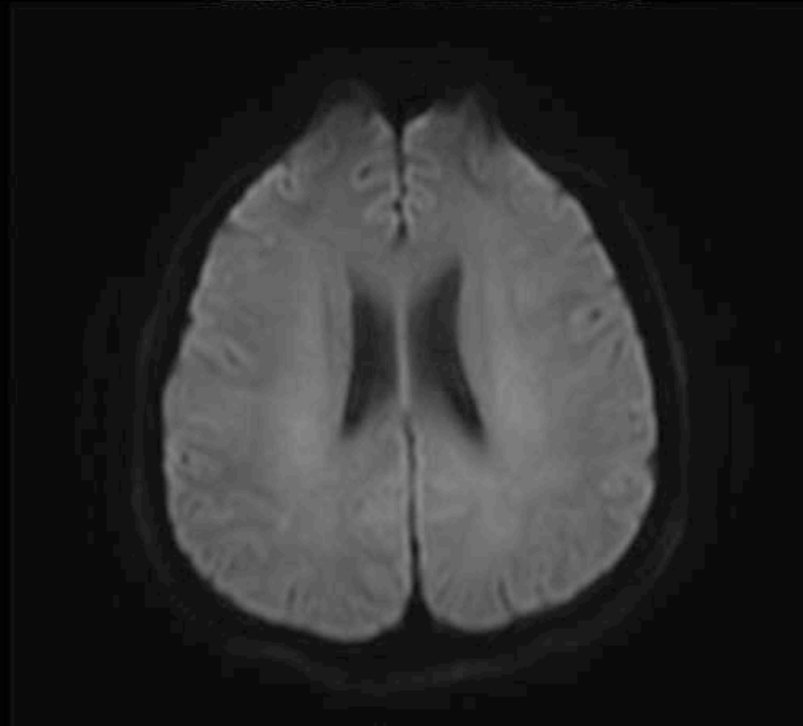
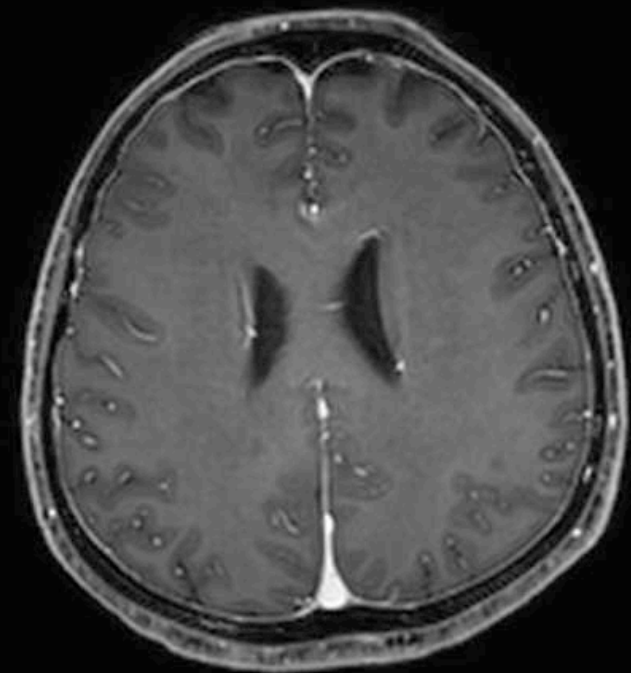
T1 Hipointens







HIV ENSEFALOPATİSİ





Teşekkürler