



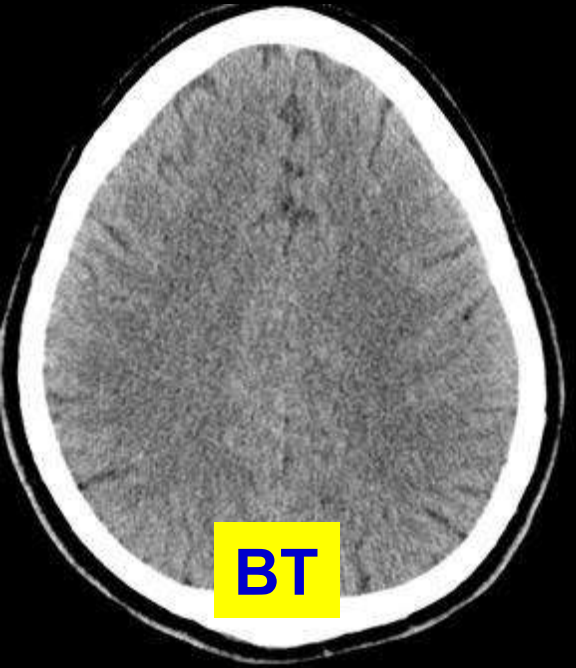
Santral Sinir Sistemi İnfeksiyonlarında Radyoloji

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

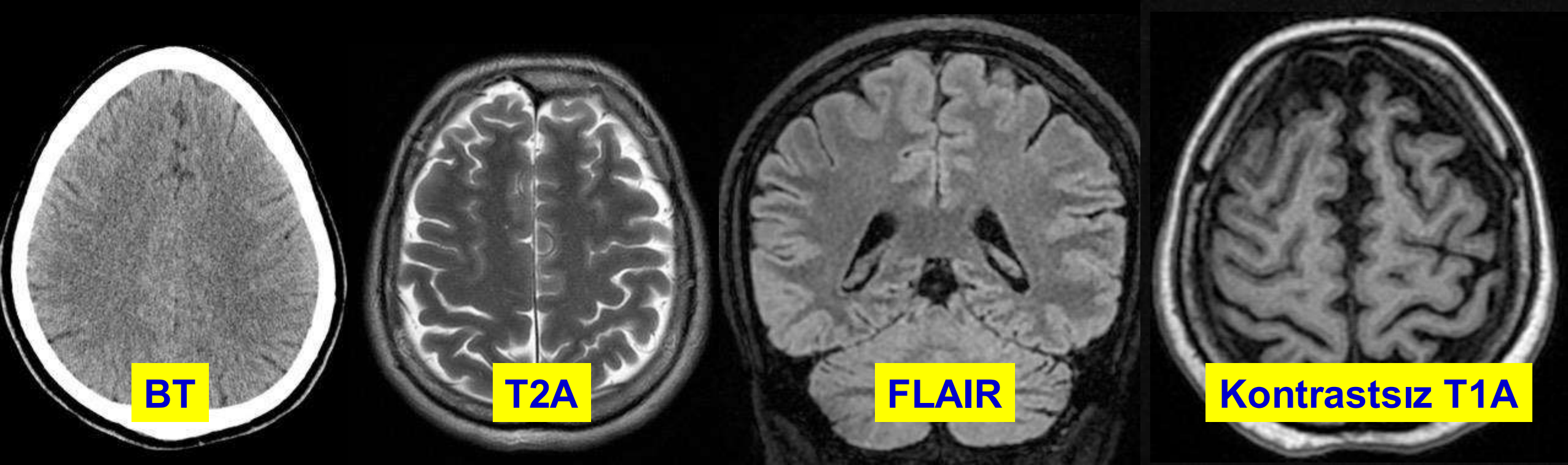
- Beyin lezyonlarının karakterize edilmesi tedaviye rehberlik etmek için önemlidir
- Klinik ve laboratuvar bulguları
- Altın standart tanı histopatolojik değerlendirme
 - Cerrahi komplikasyonlar
 - Yetersiz örnekleme

Gottumukkala RV, et al. Top Magn Reson Imaging. 2014

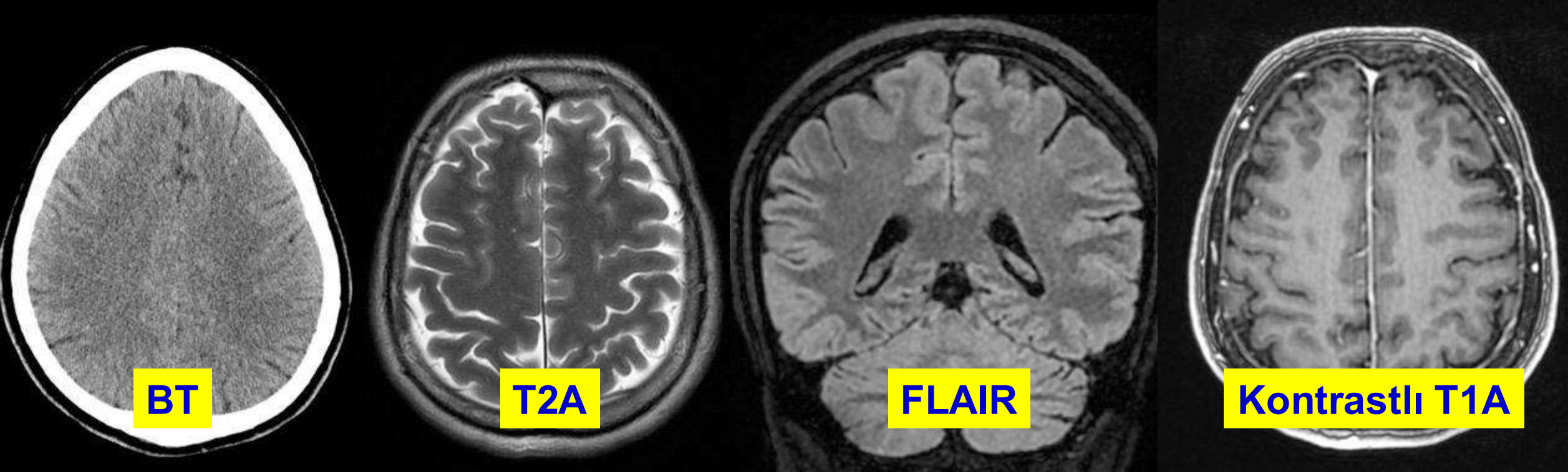
- Bu nedenlerden dolayı lezyonların karakterizasyonu için noninvaziv bir yönteme ihtiyaç duyulmaktadır.



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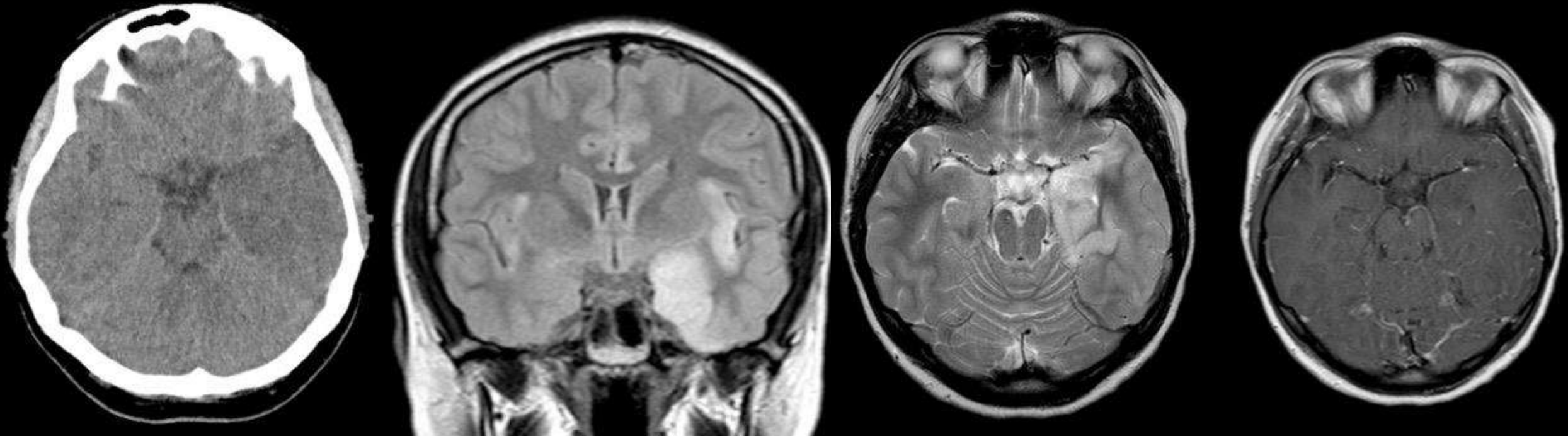
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- BT lezyon karakterizasyonunda oldukça yetersiz kalmaktadır.
- Konvansiyonel MRG lezyonların karakterizasyonunda başarılıdır.

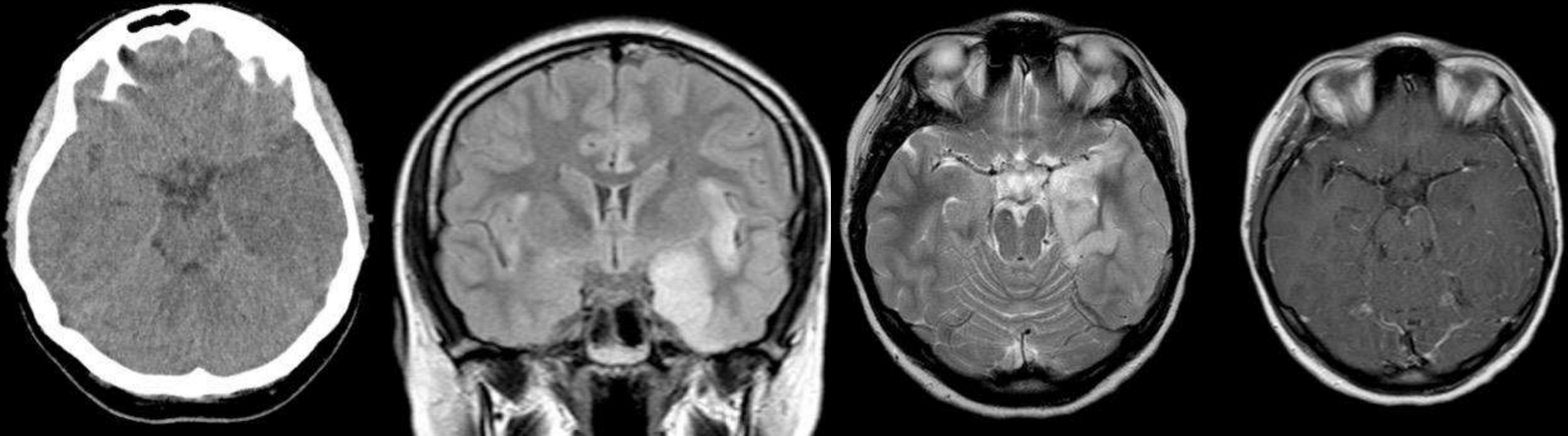


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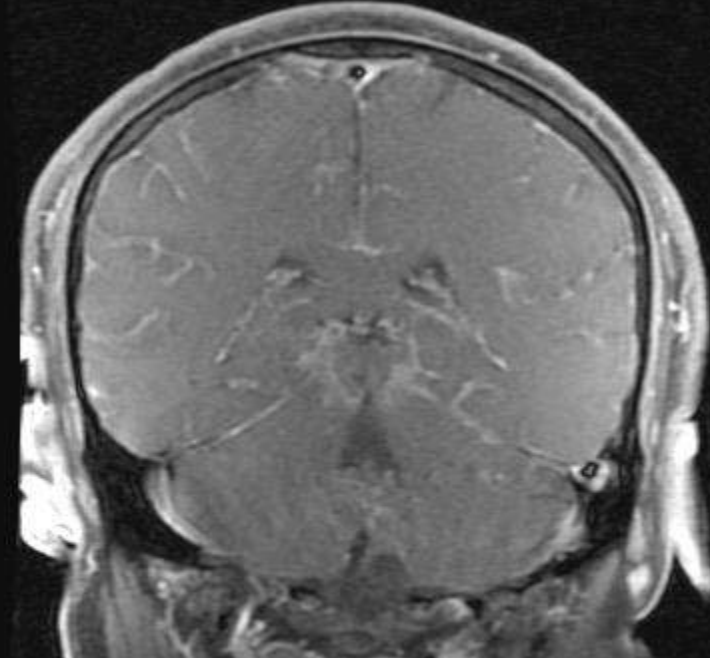
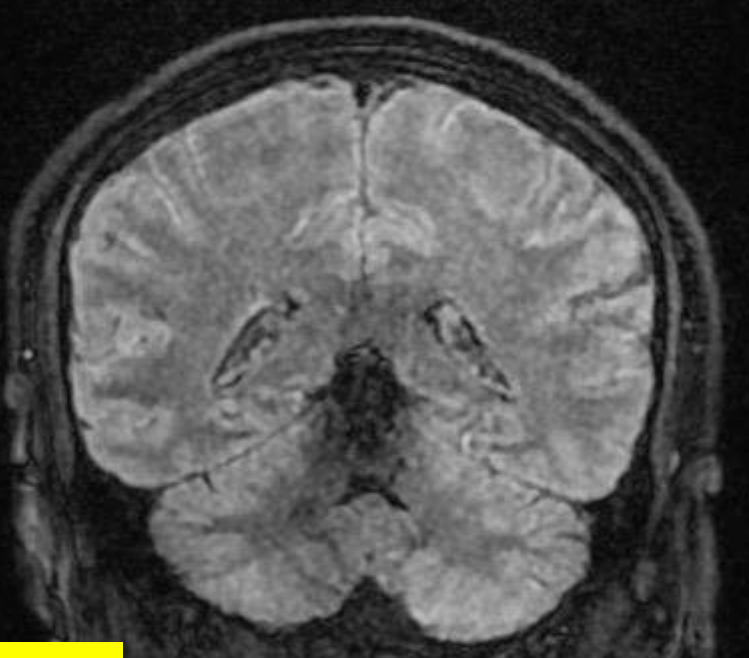
HSV-1 Ensefaliti



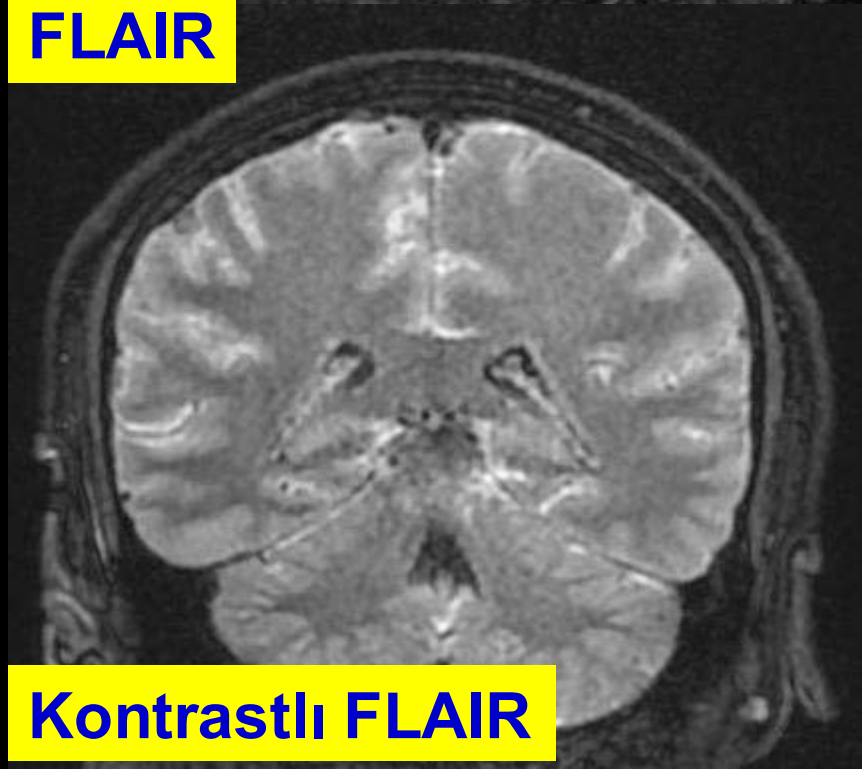




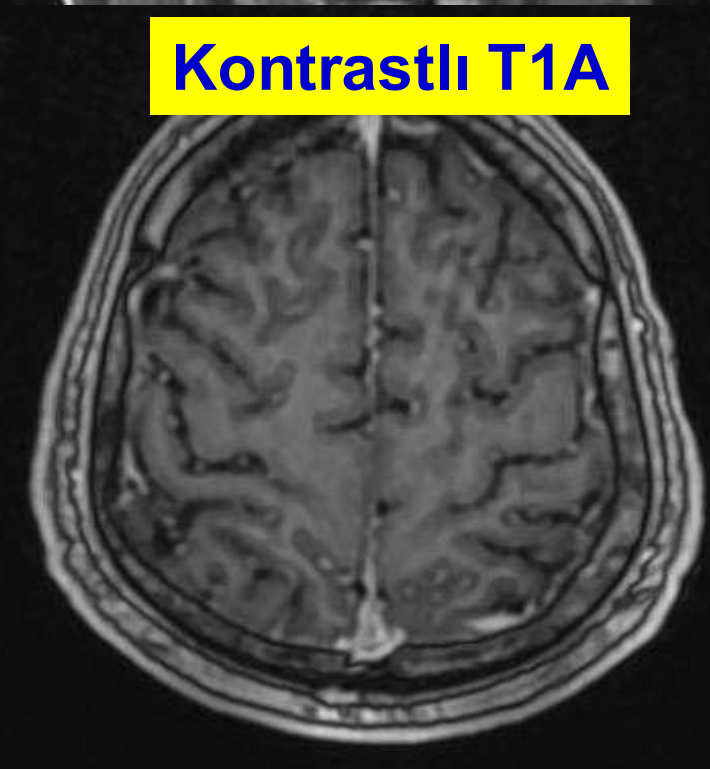
FLAIR

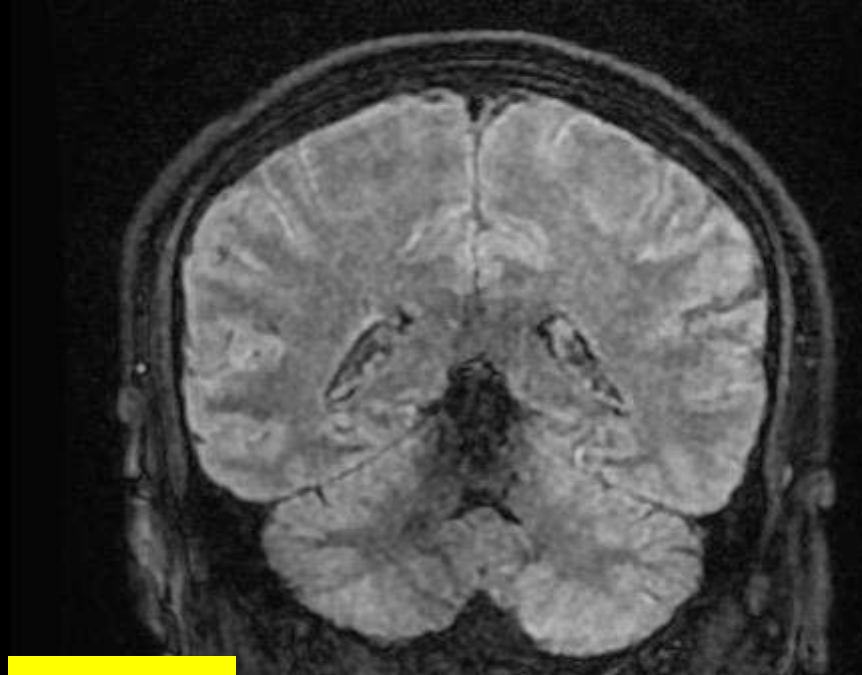


Kontrastlı T1A

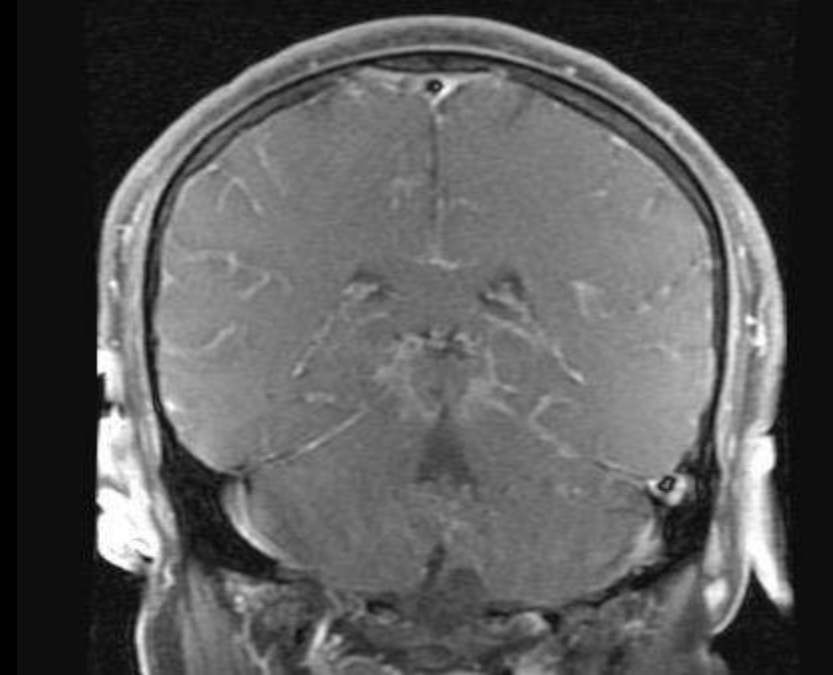


Kontrastlı FLAIR

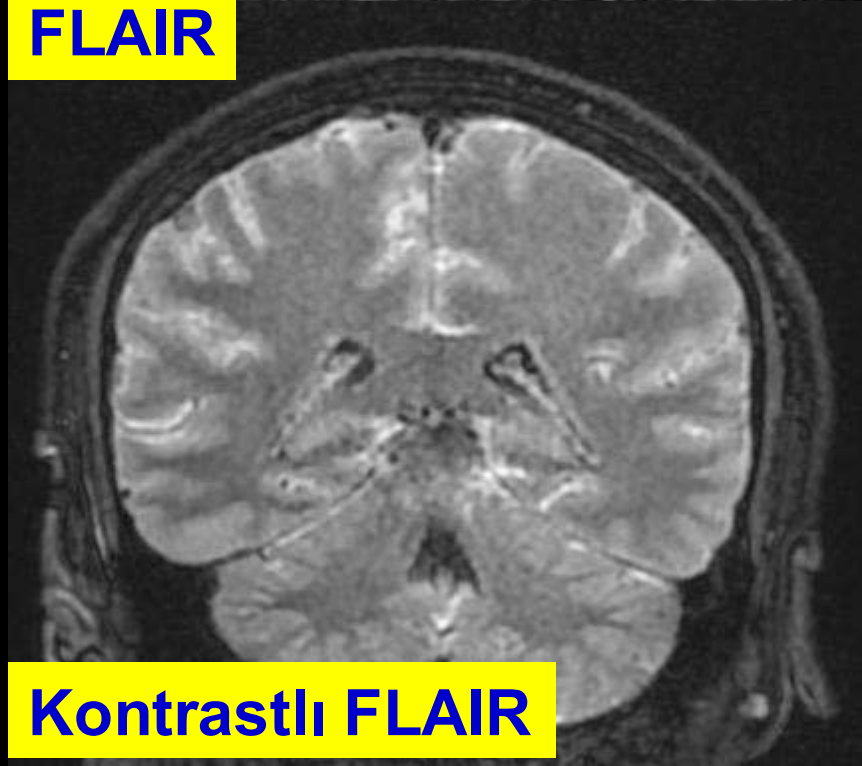




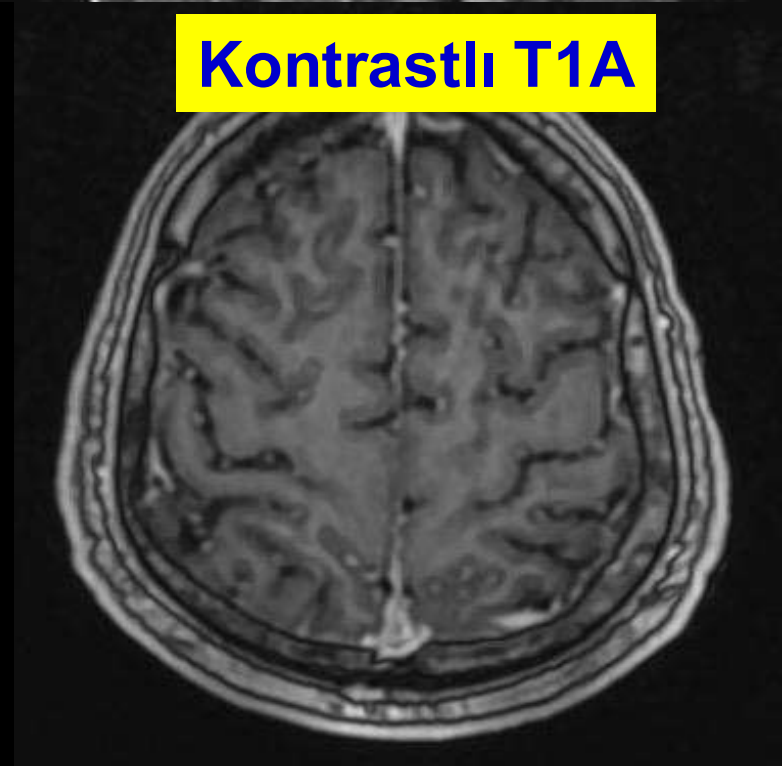
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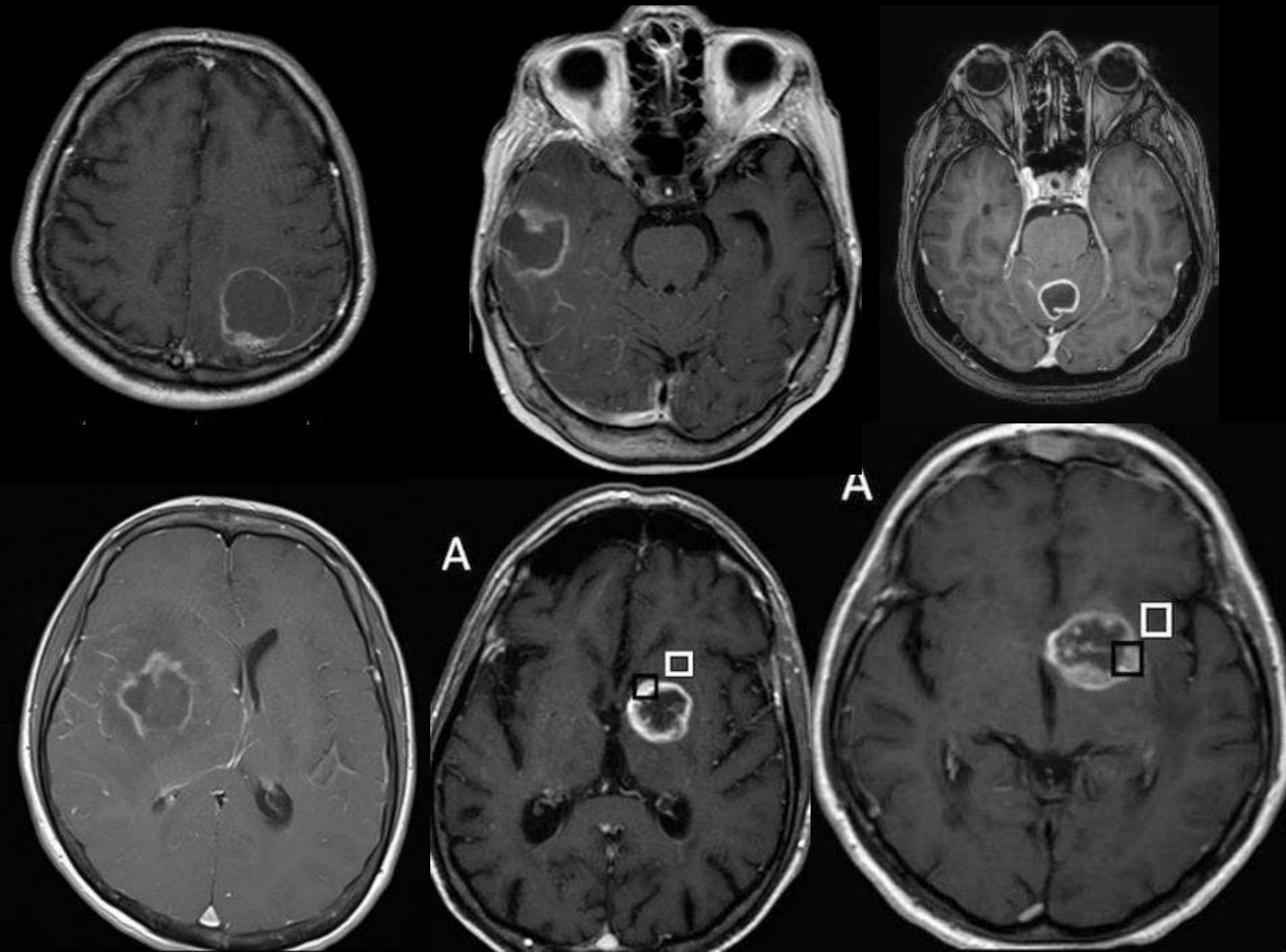
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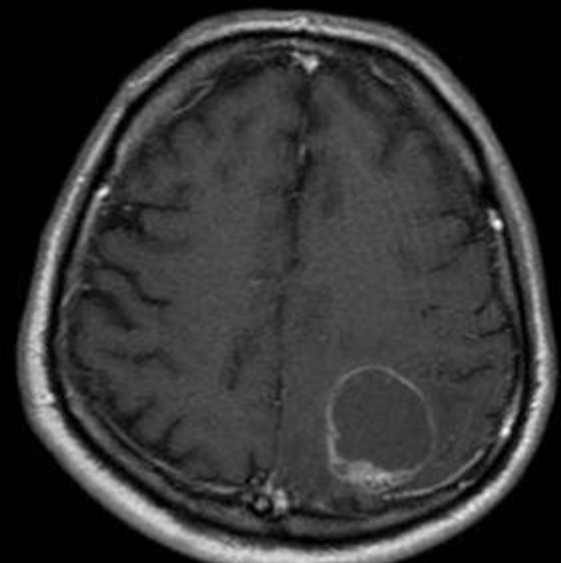


Kontrastlı FLAIR

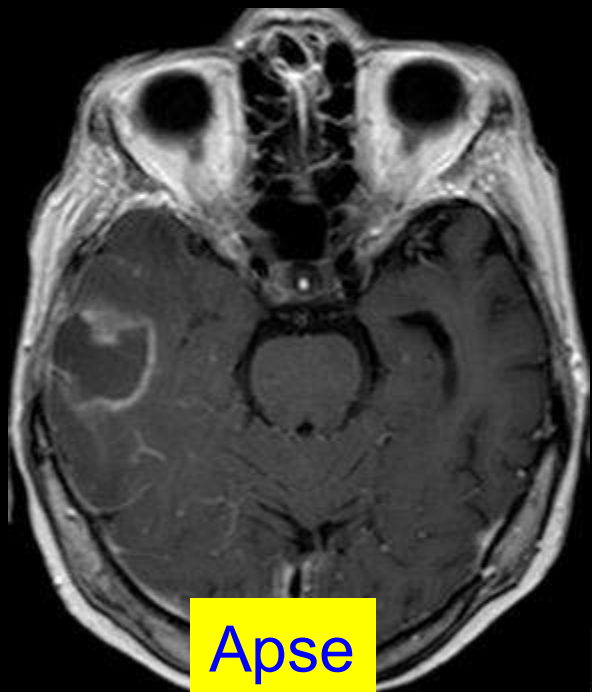


**Bakteriyel
Menenjit**

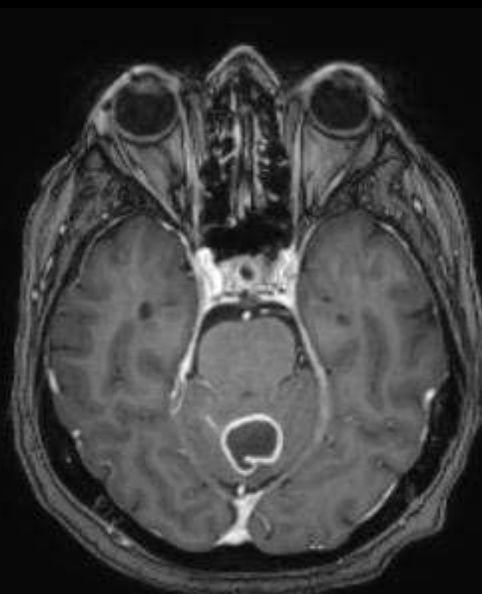




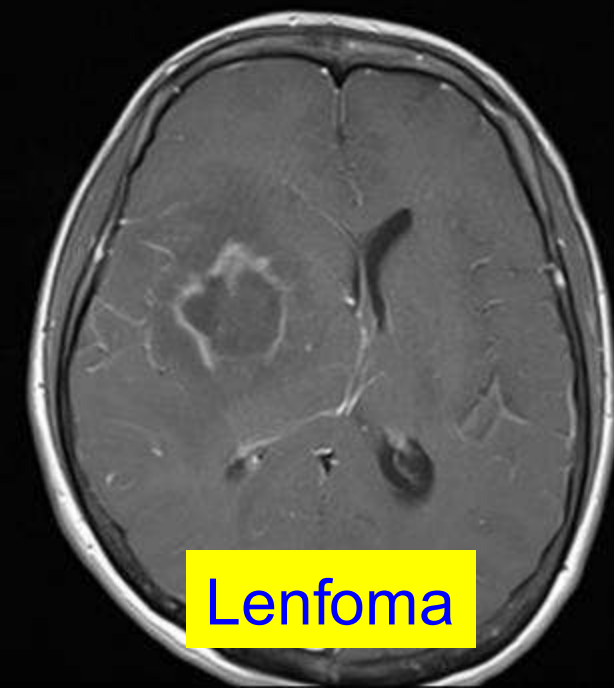
Glioblastoma



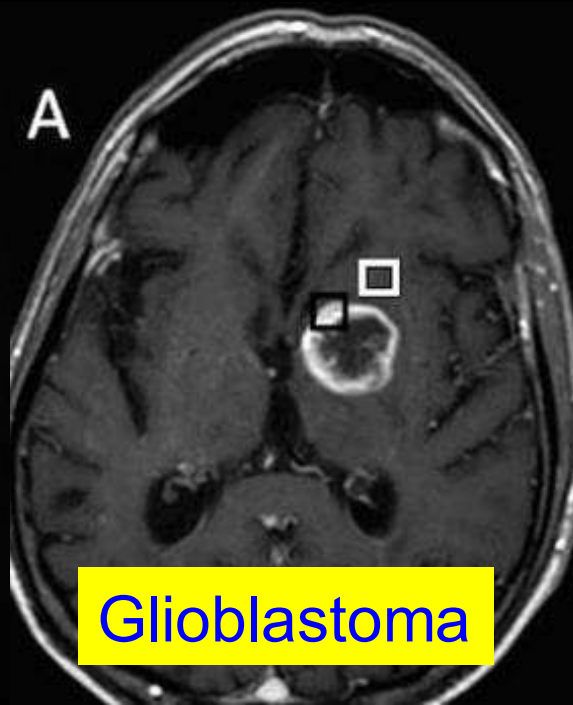
Apse



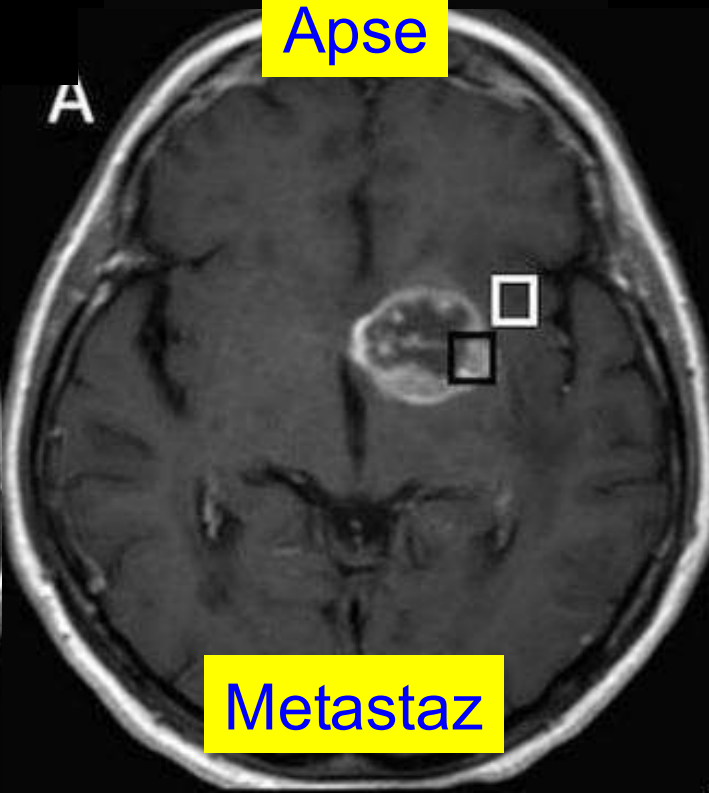
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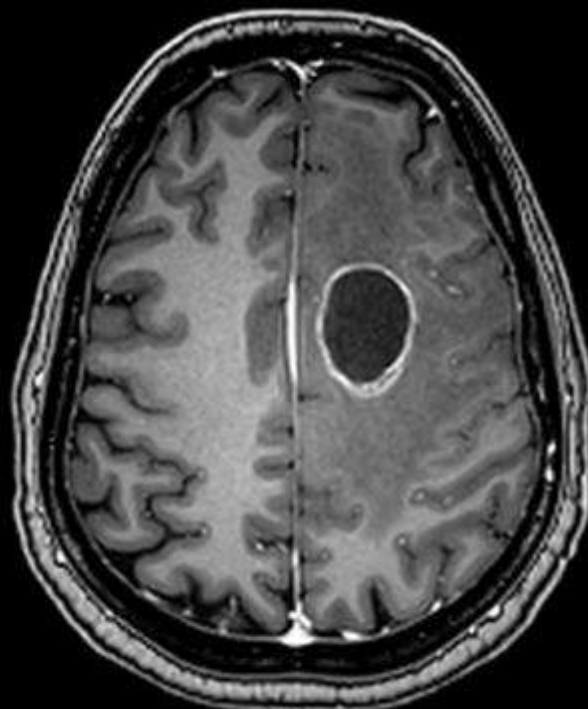
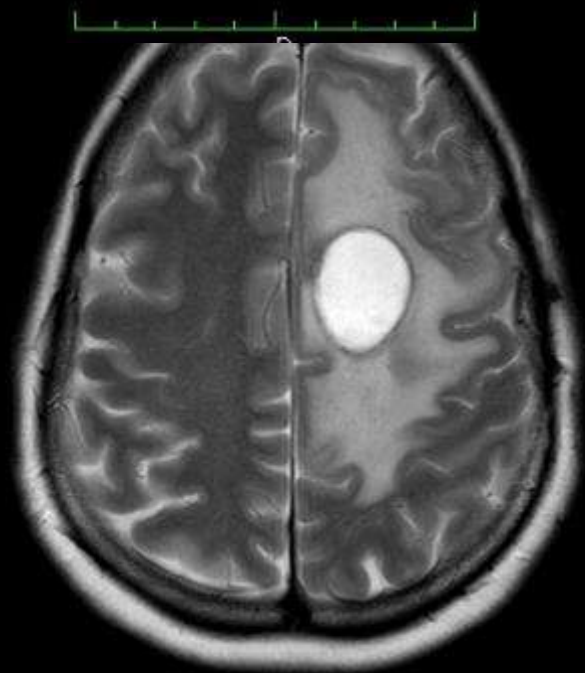
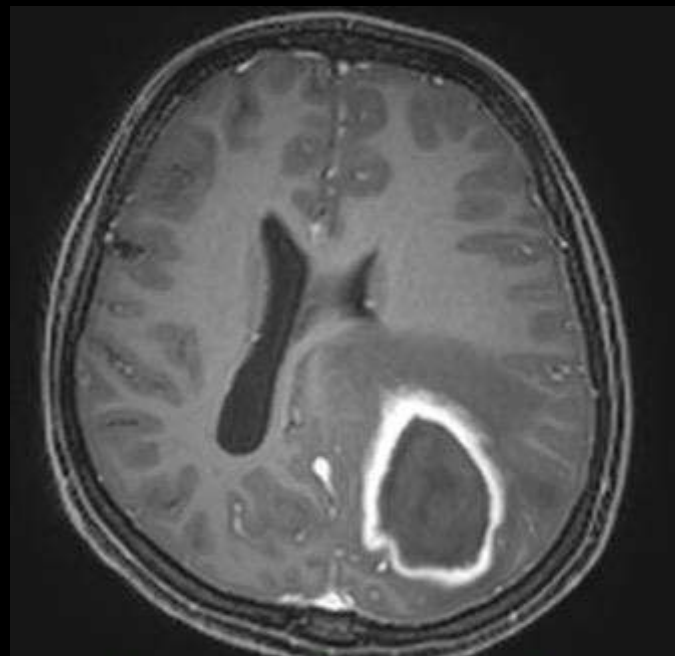
Lenfoma



Glioblastoma



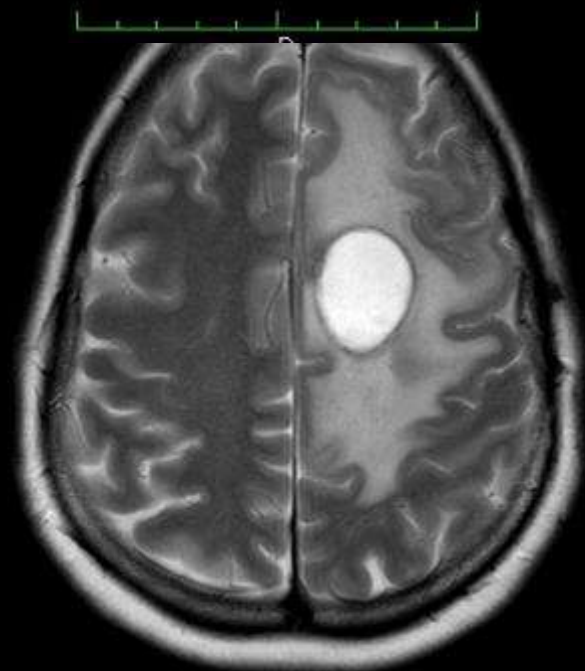
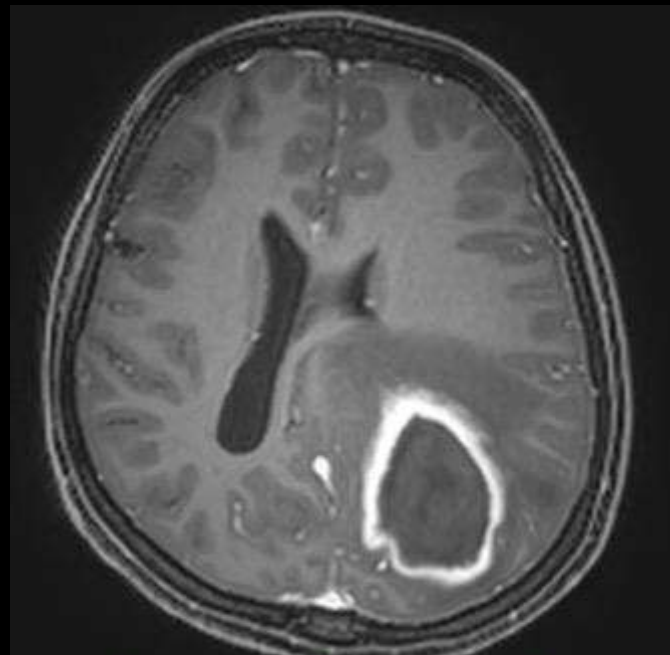
Metastaz



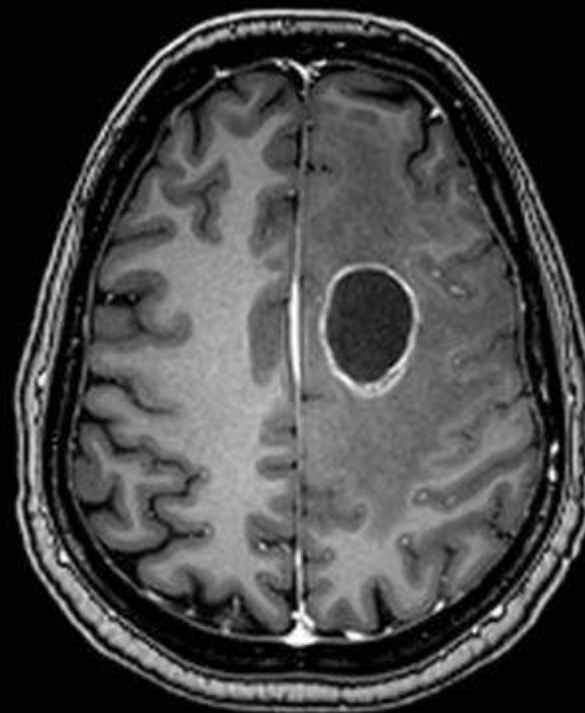
147
81
15



APSE



METASTAZ



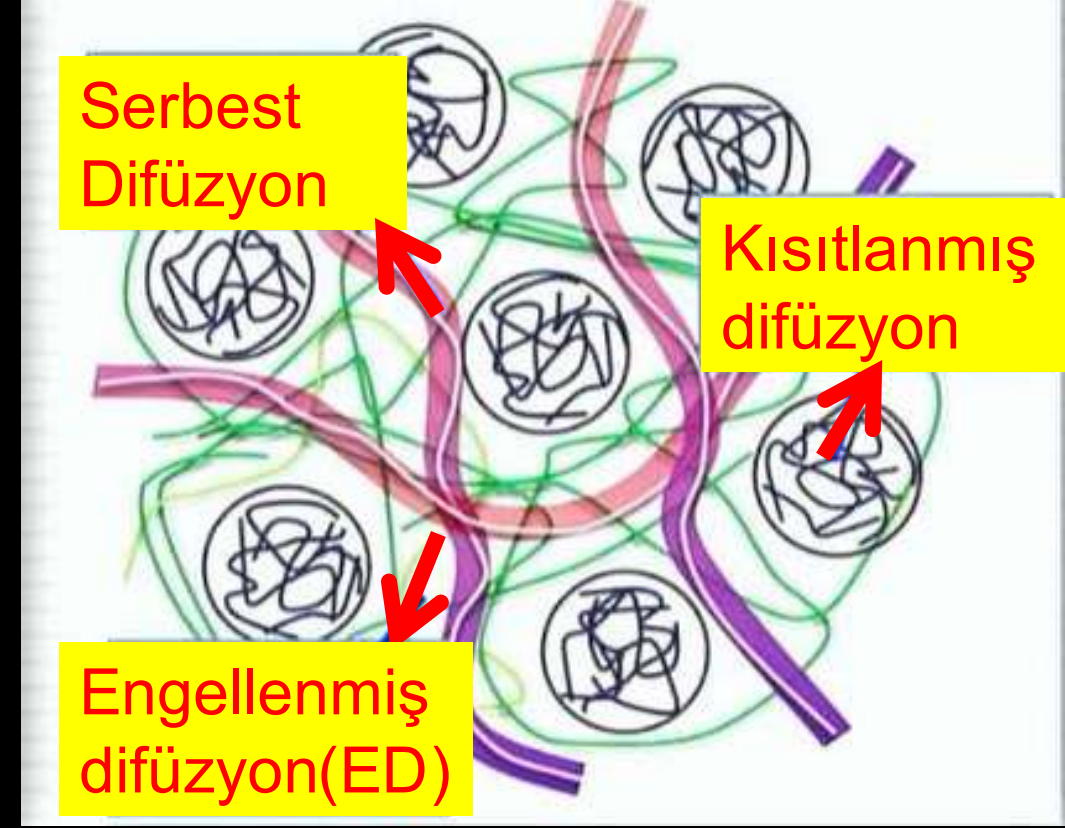
147
81
15

▪ Fakat bazı durumlarda konvansiyonel MRG yetersiz kalmakta ve lezyonların karakterizasyonunda multiparametrik MR görüntülemeye ihtiyaç duyulmaktadır.

- ✓ **Difüzyon MR**
- ✓ **Perfüzyon MR**
- ✓ **MR Spektroskopi**

Difüzyon MR

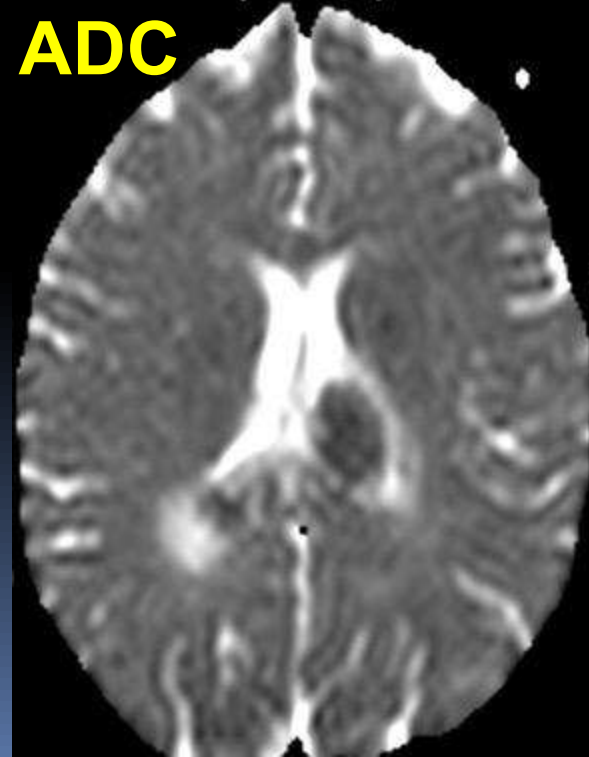
- Dokudaki su moleküllerinin mikroskopik hareketlerini inceleyerek dokunun mikroyapısal özelliklerini gösteren bir görüntüleme yöntemidir.



DAG



ADC

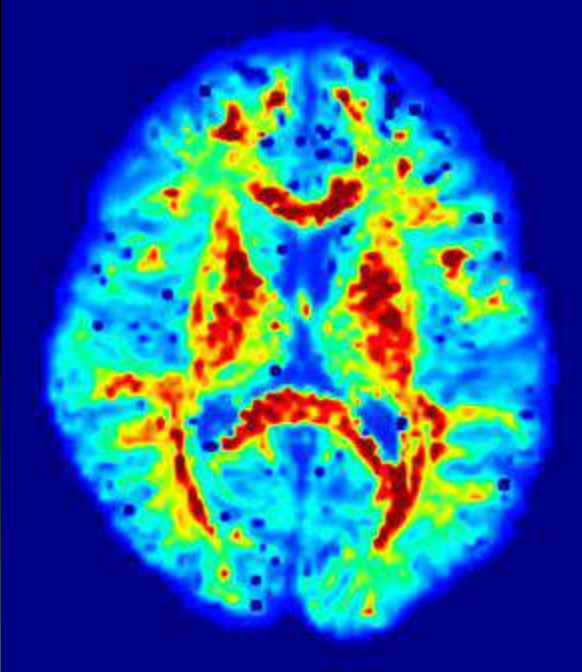


Difüzyon Ağırlıklı Görüntüleme

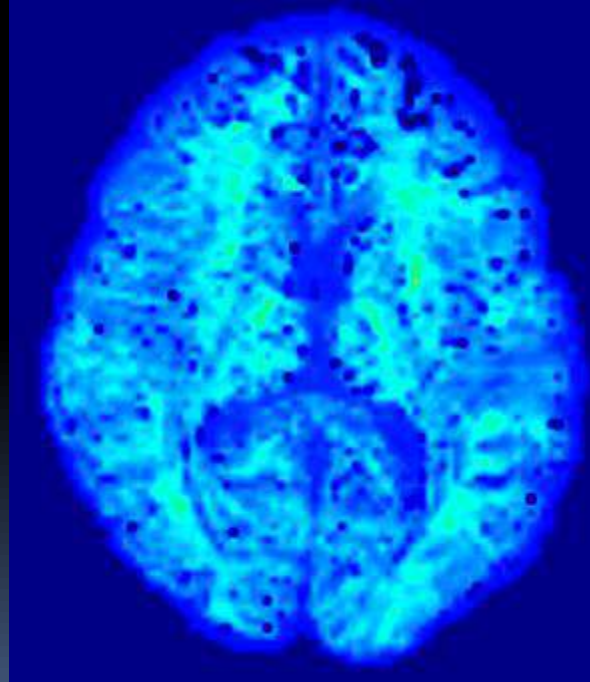
- **ADC = D* + ED + KD**
- Difüzyonun kantitatif değerlendirilmesi görünür difüzyon katsayısı (ADC) ölçümleri ile mümkündür.
- **ADC** dokudaki su difüzyonunun toplam büyüklüğünü ölçerek **dokunun sellülaritesi** hakkında bilgi sağlar.

Difüzyon Kurtozis Görüntüleme (DKG)

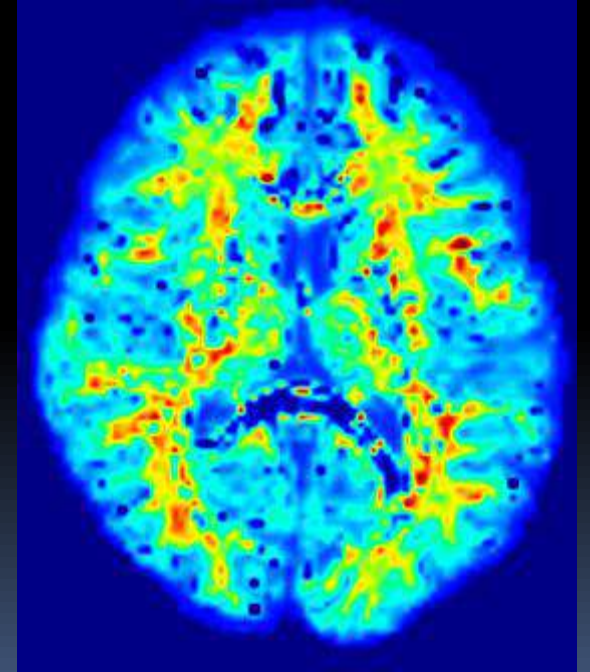
DKG, Gaussian dağılımdan sapmayı ölçerek doku heterojenitesi ve mikroyapısı hakkında bilgi verir.



MK



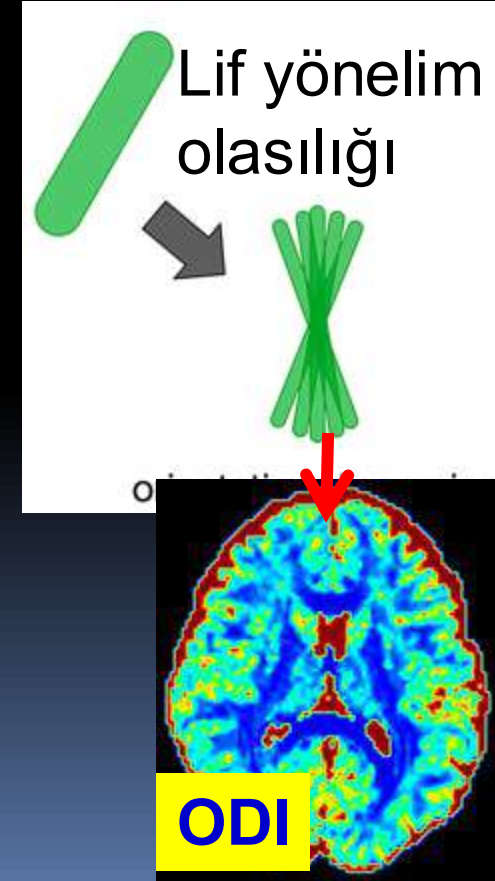
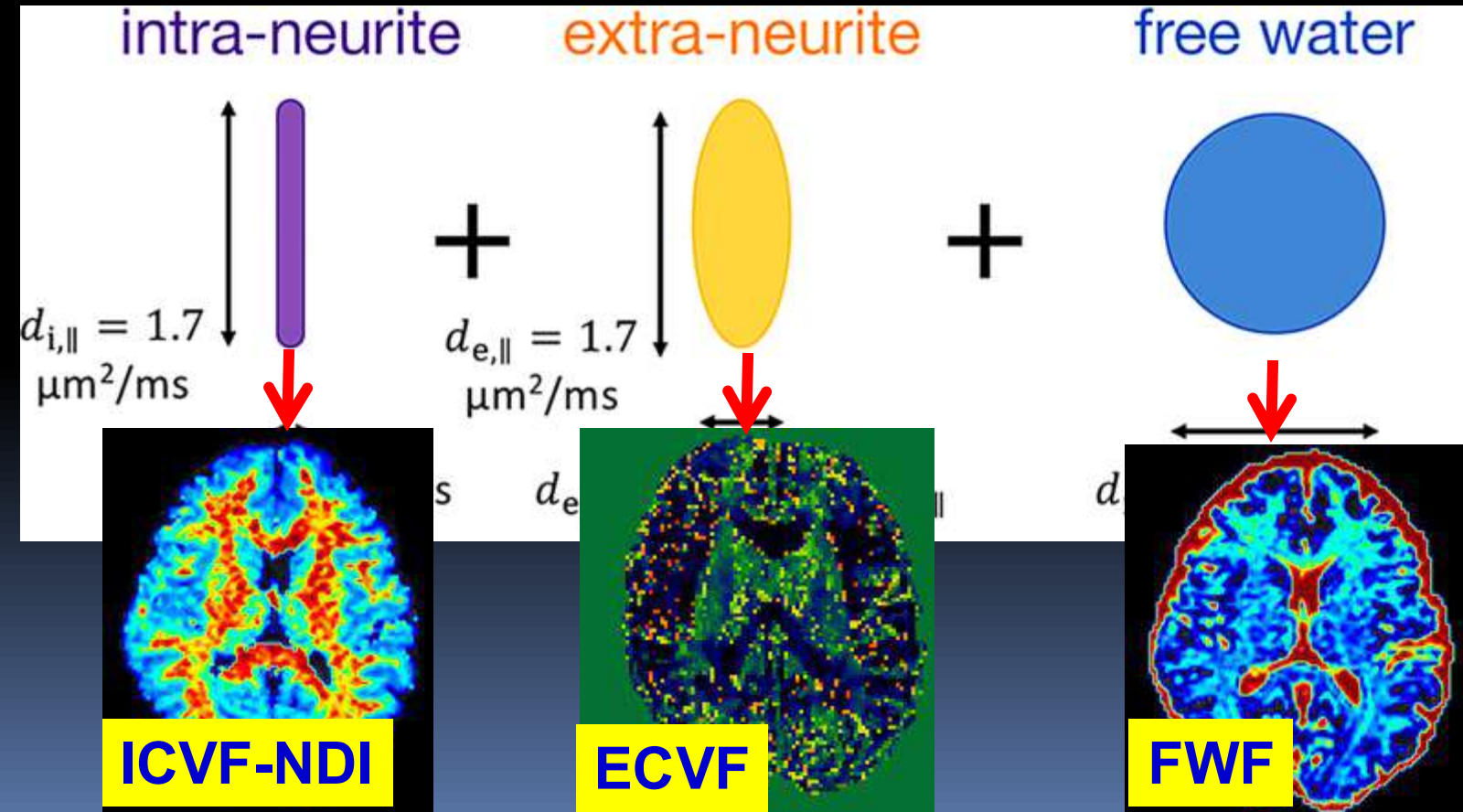
AK



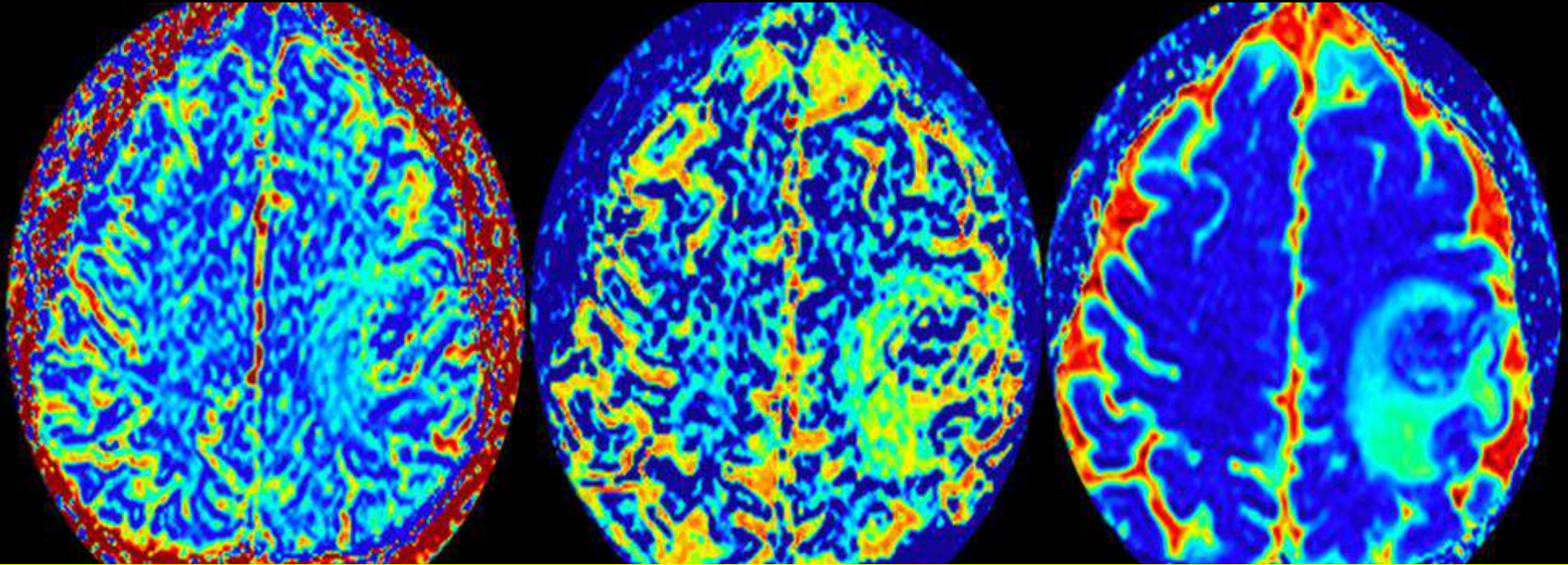
RK

NODDI (Nörit Yönelim Dağılımı ve Yoğunluğunu Görüntüleme)

- NODDI, tek bir voksel içinde su molekülü sinyalinin 3 ayrı alandan geldiğini varsayan biyofiziksel difüzyon tekniğidir ($b=0, 1000, 2500$)



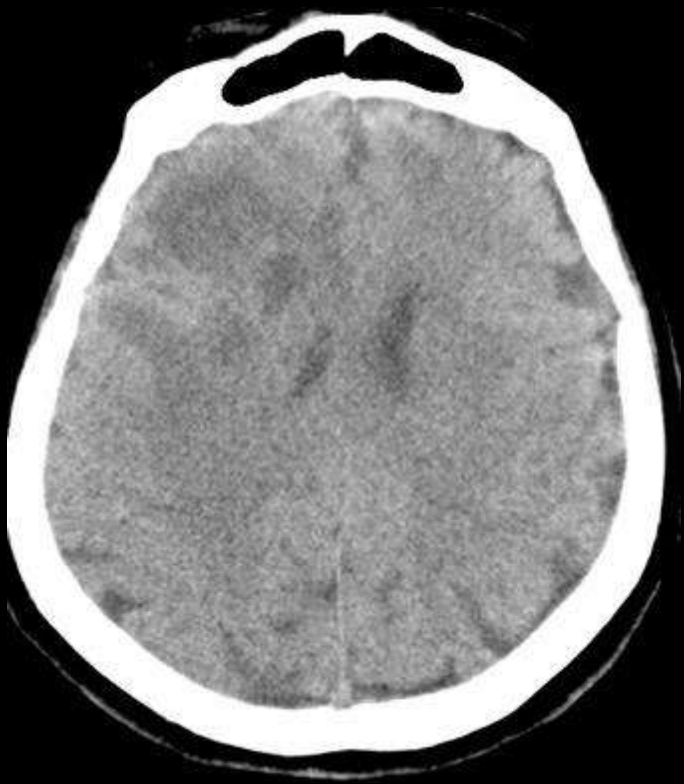
IVIM

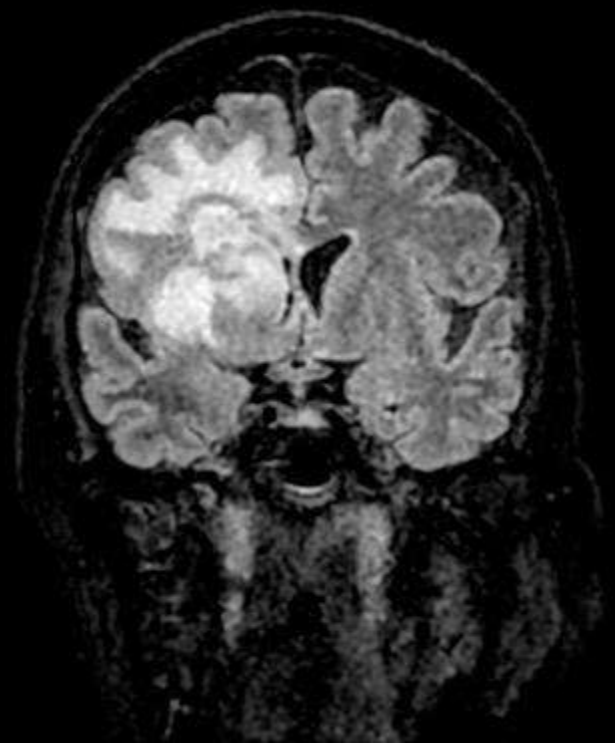
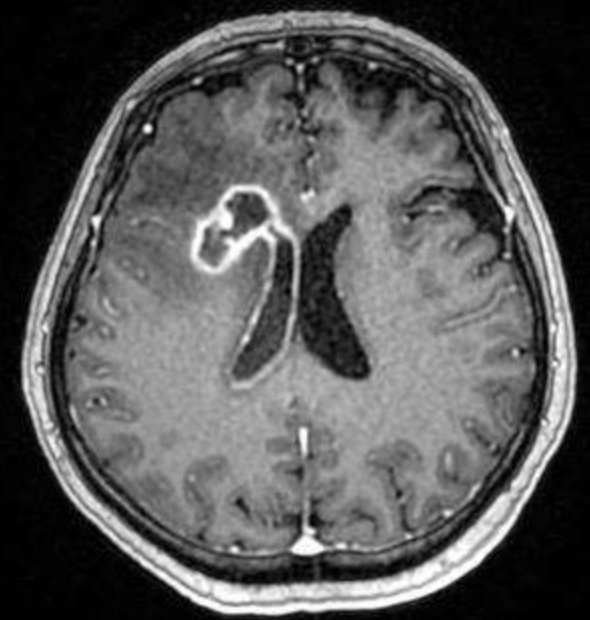


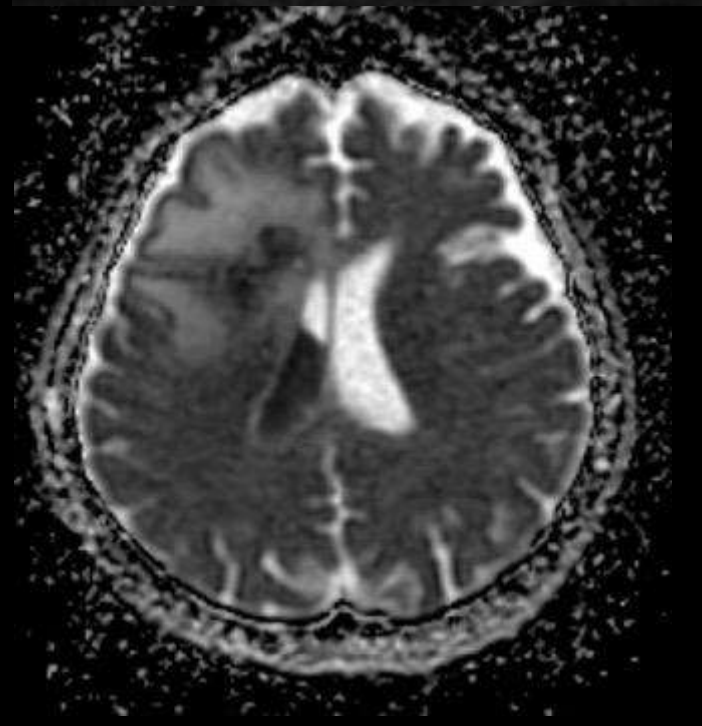
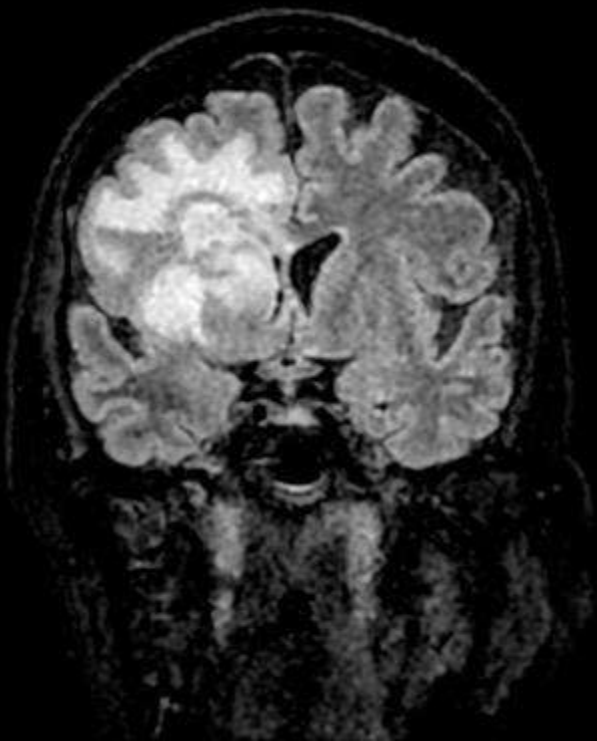
f Perfüzyon fraksiyonu

D* psododifüzyon.

D doku difüzyonu

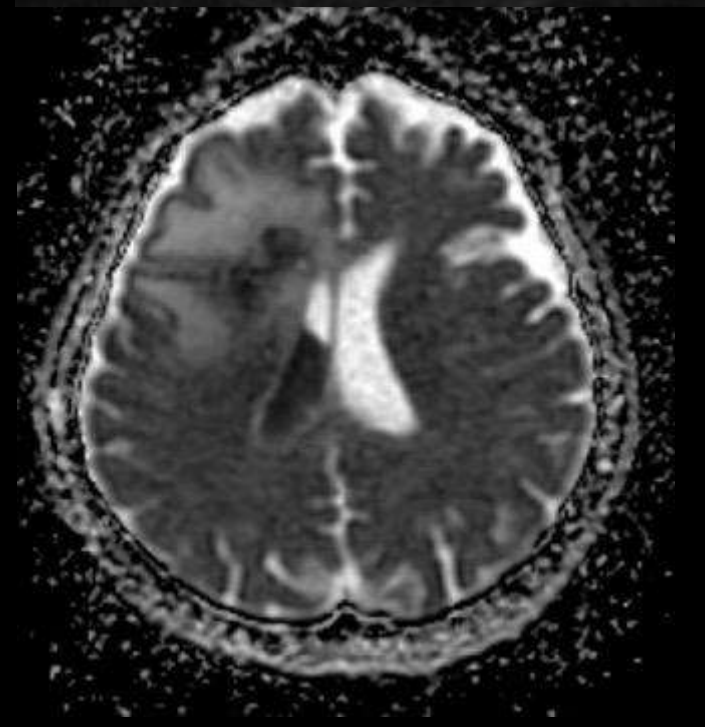
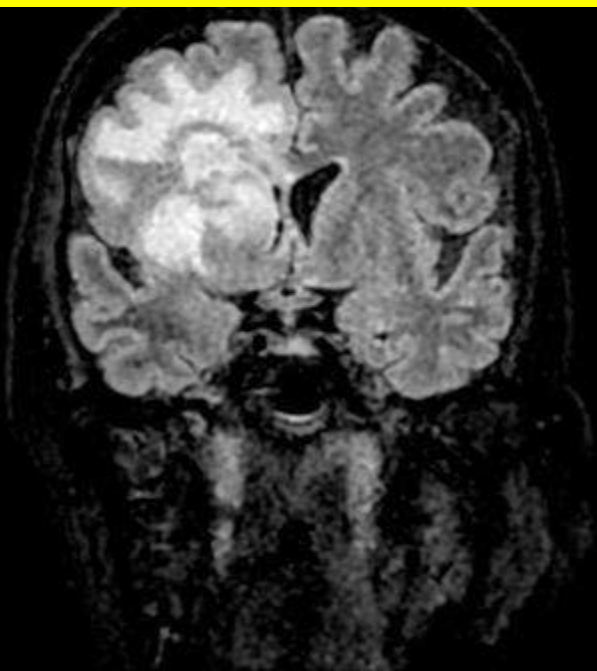




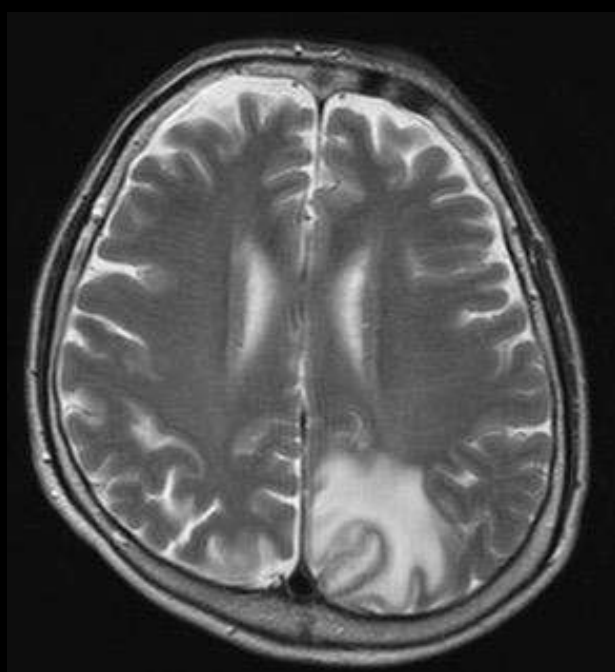


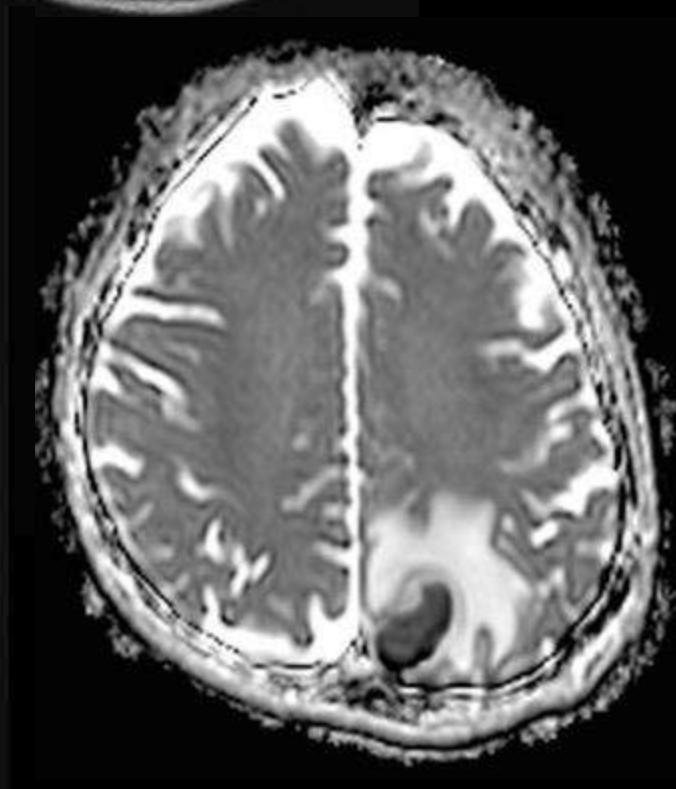
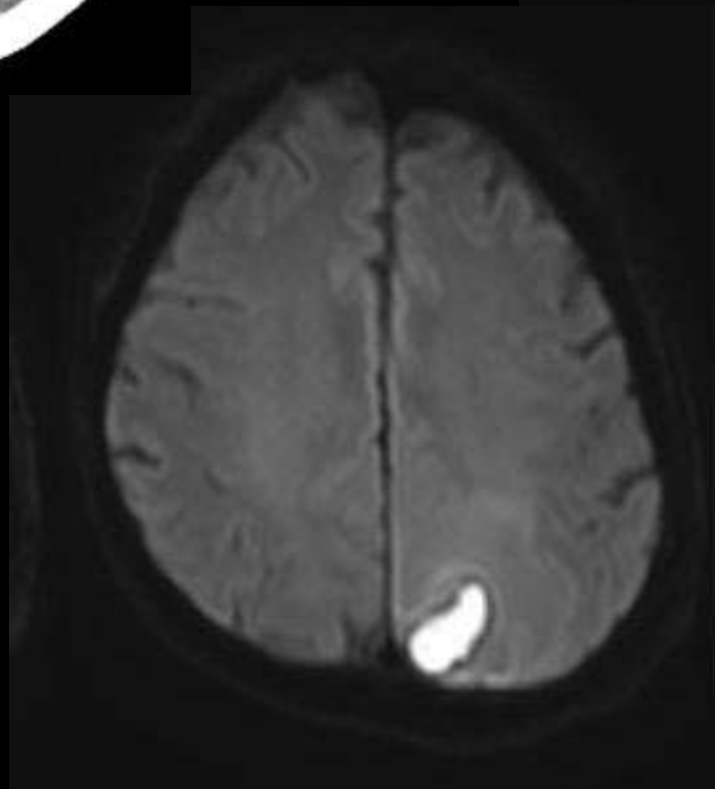
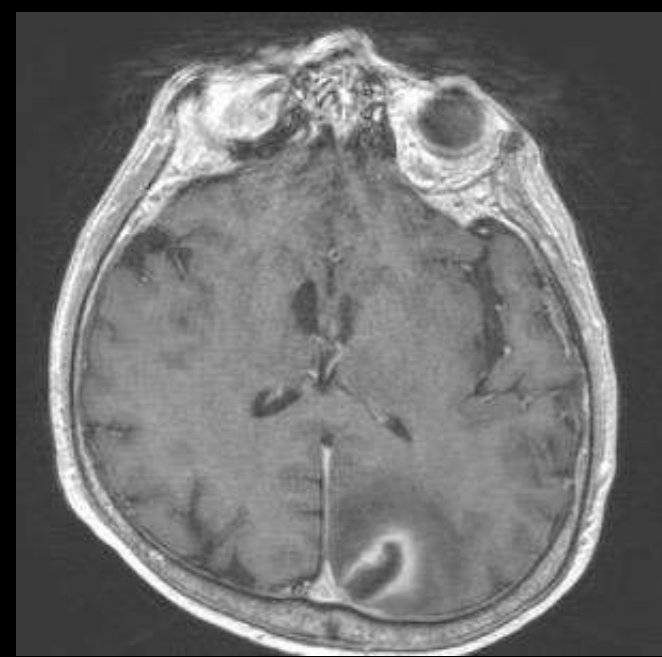
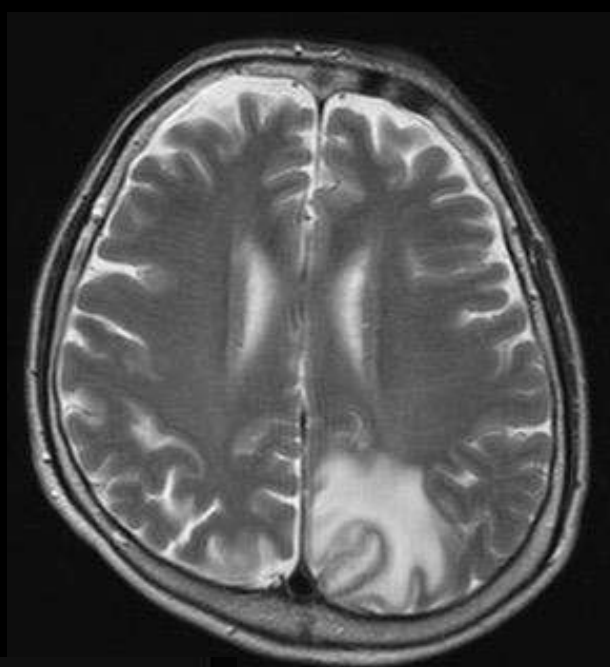


apse + ependimit + ventrikülit



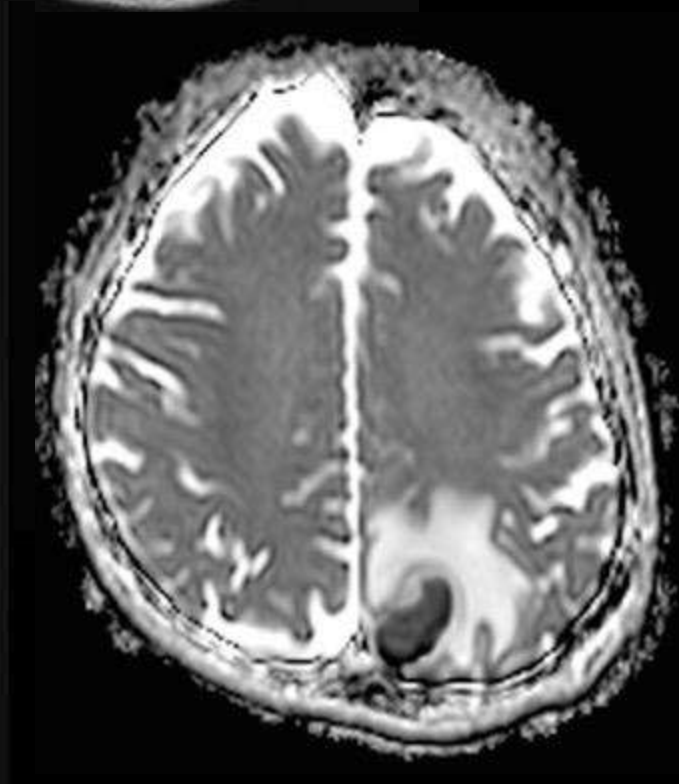
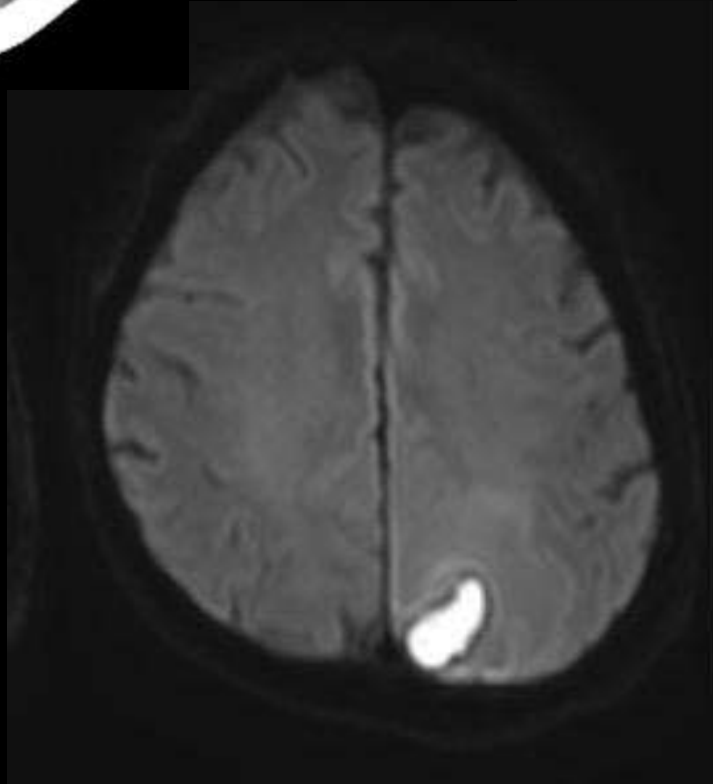
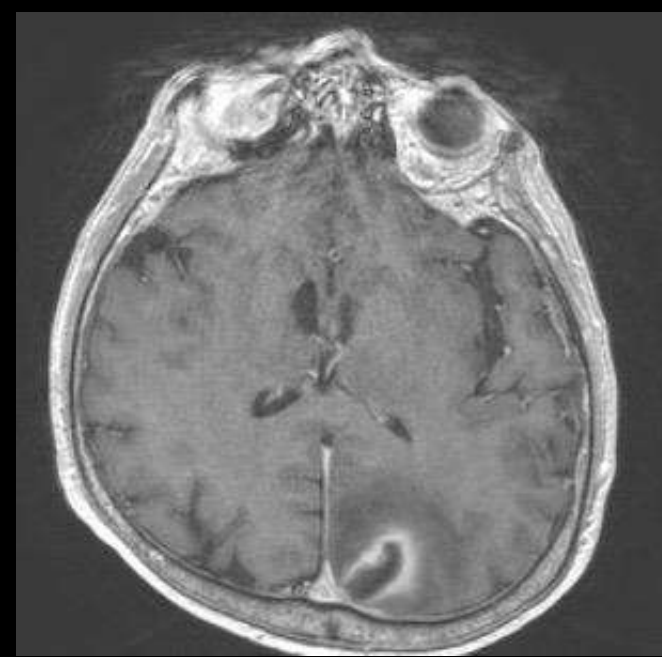
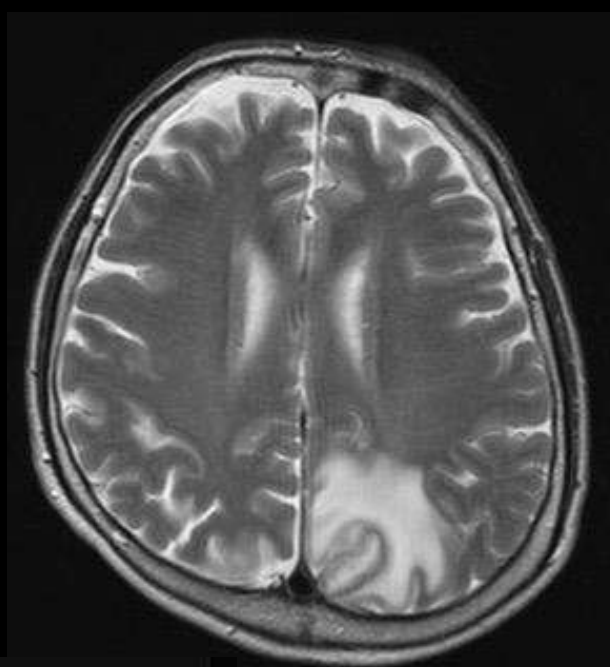


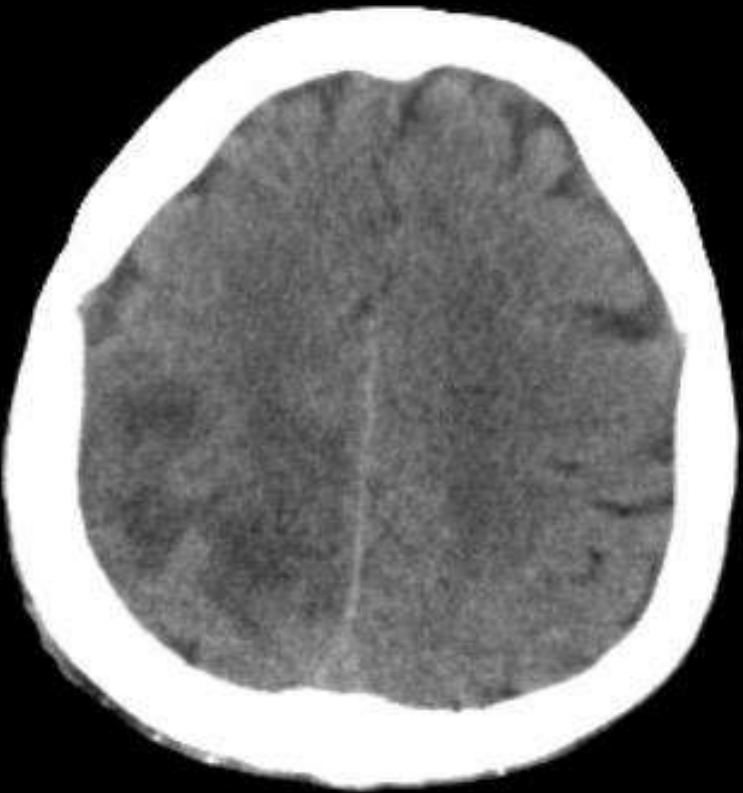


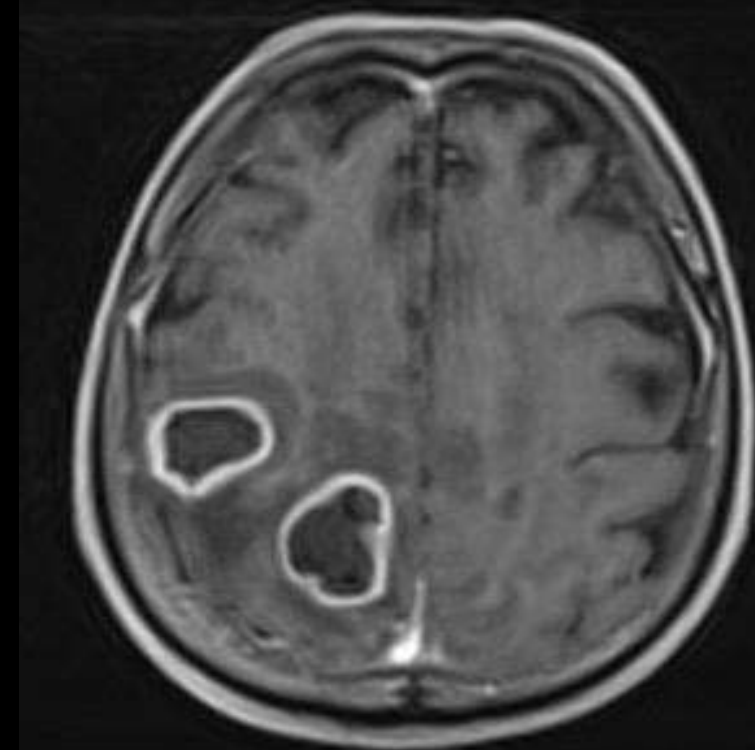
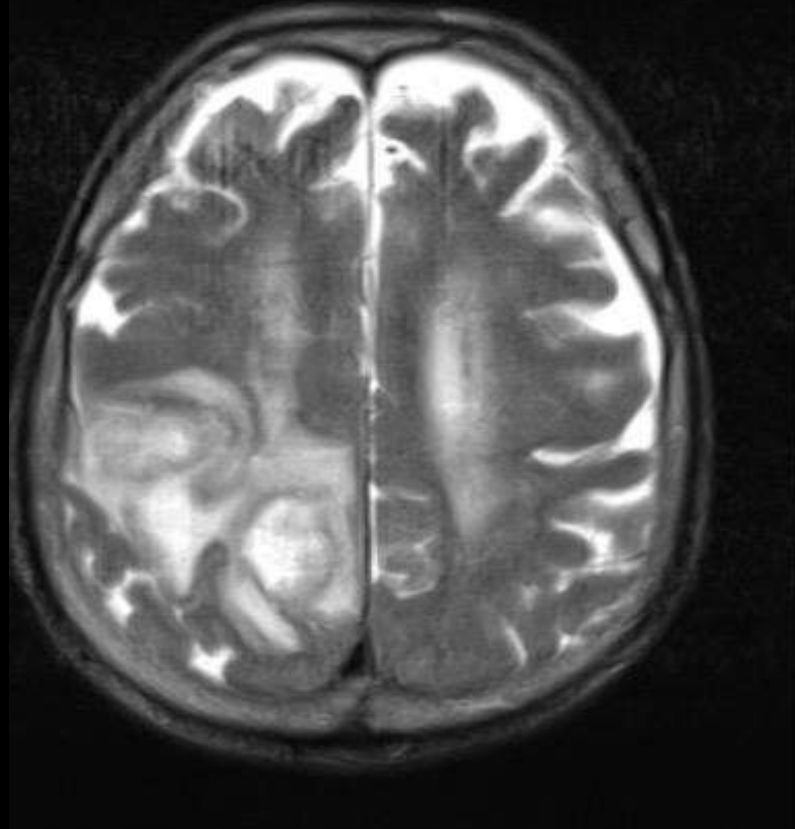
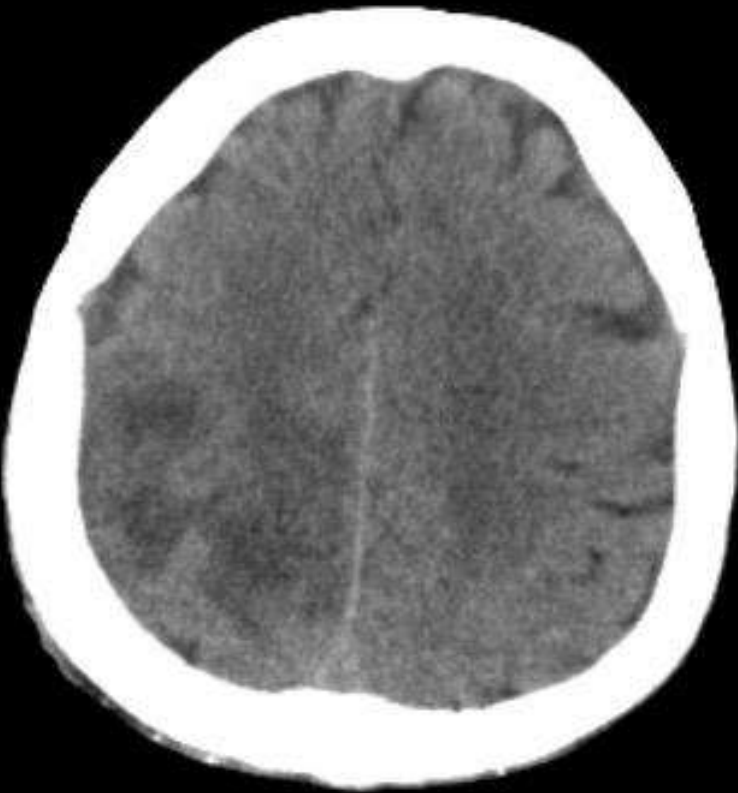


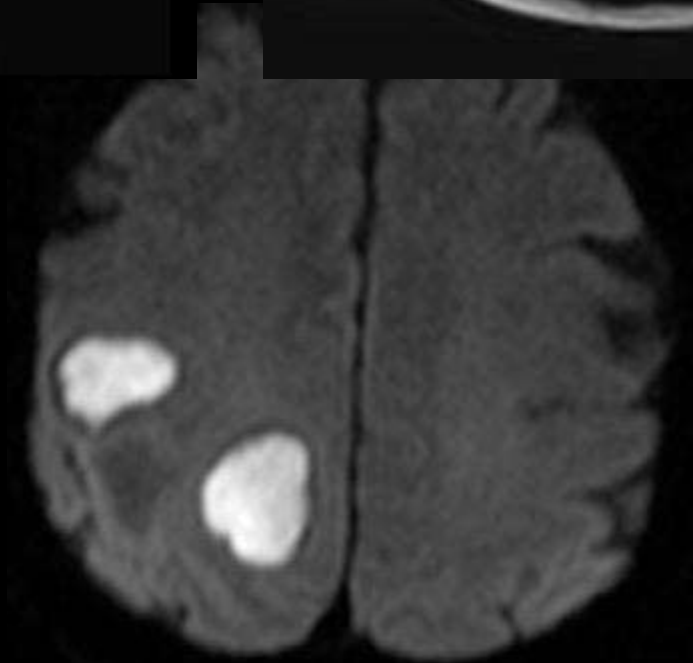
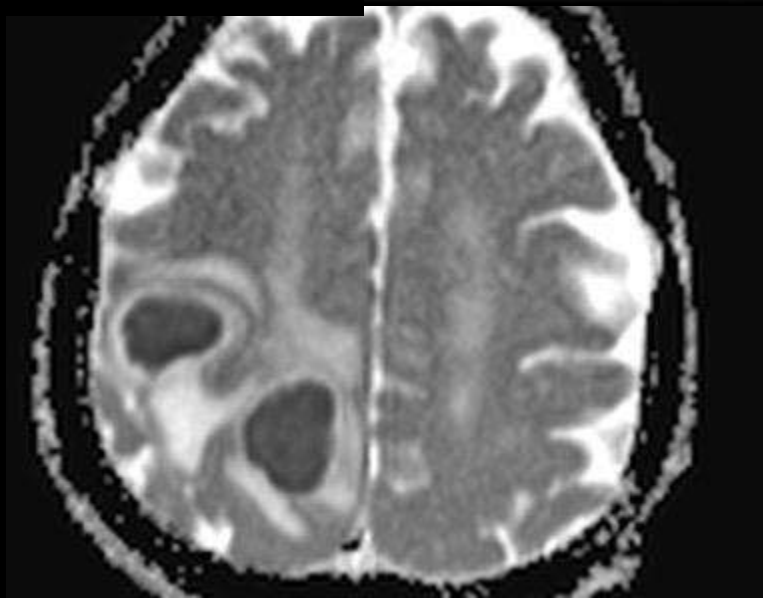
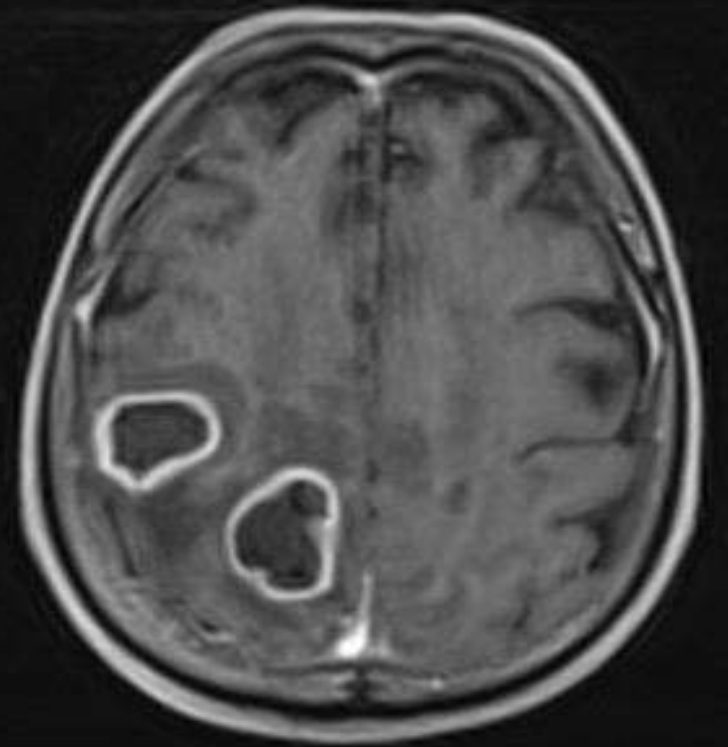
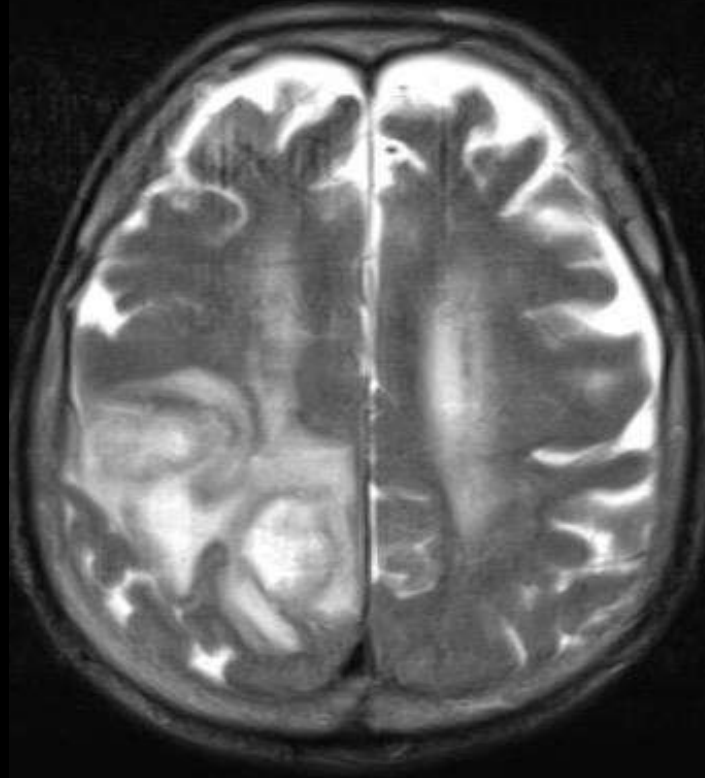
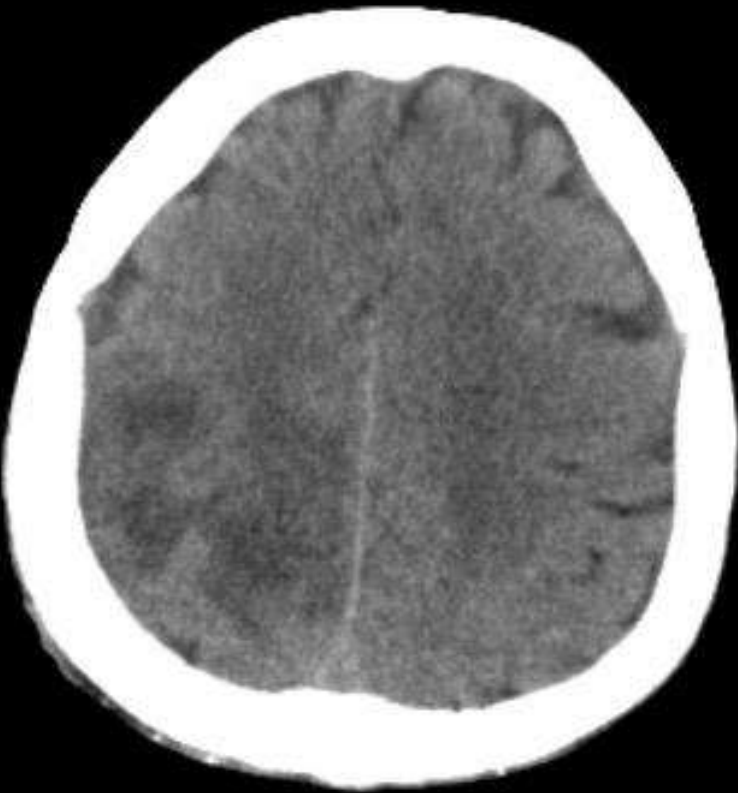


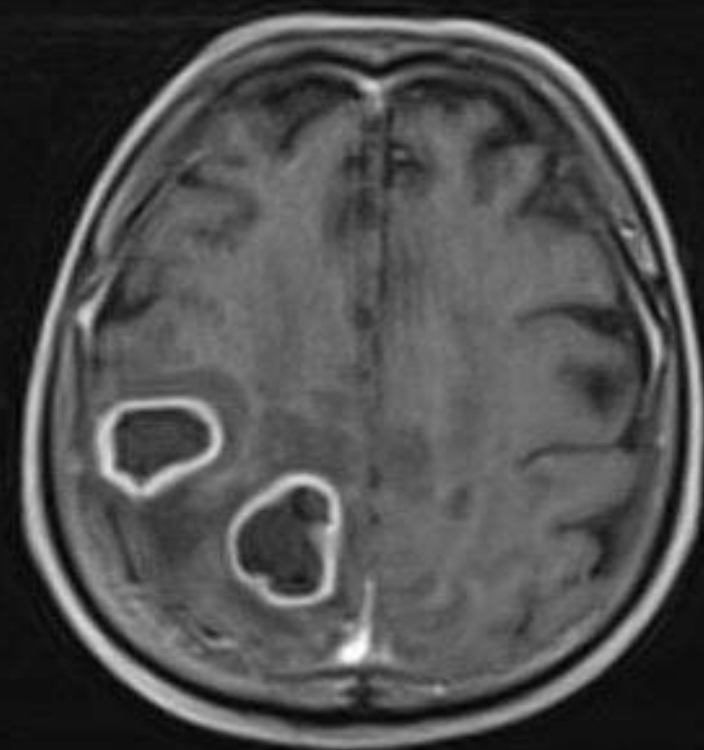
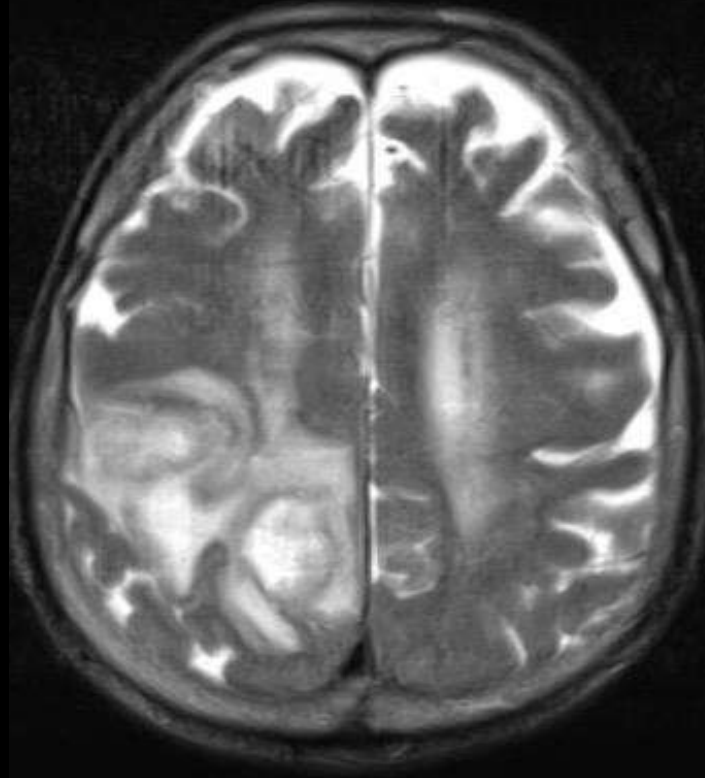
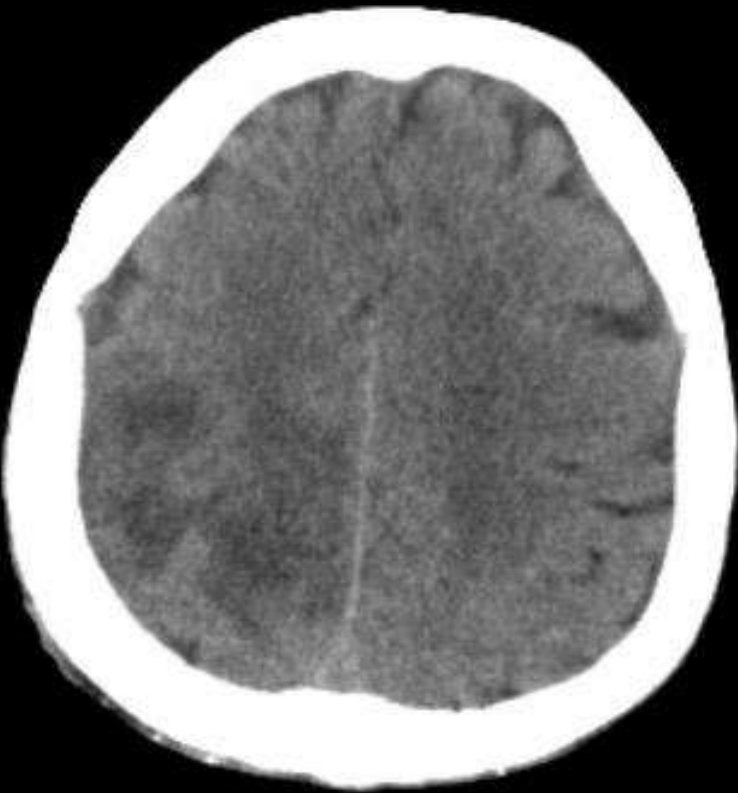
APSE



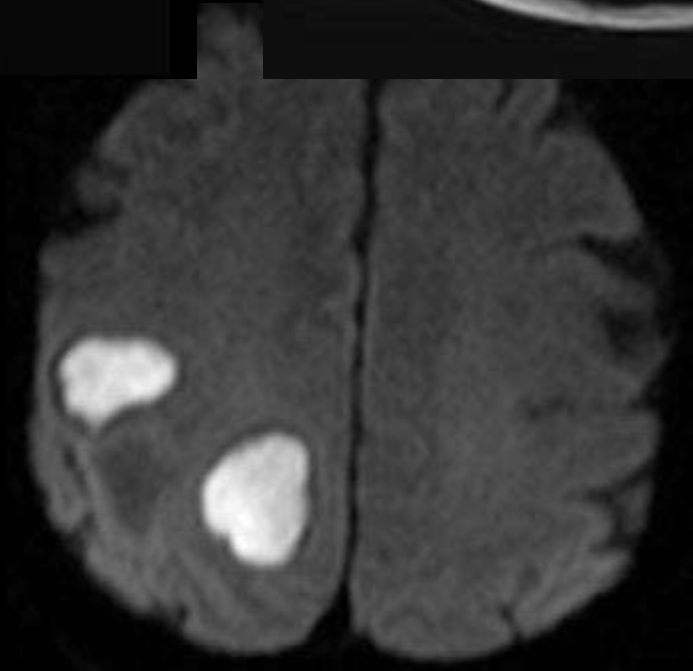
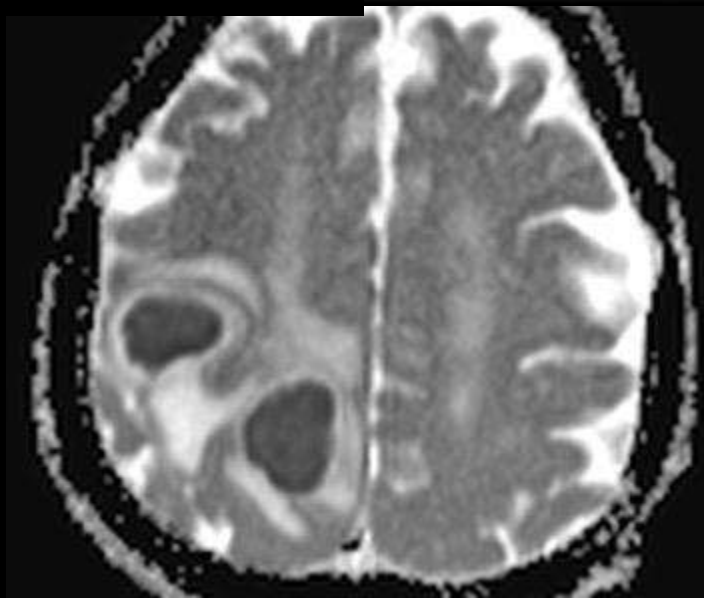


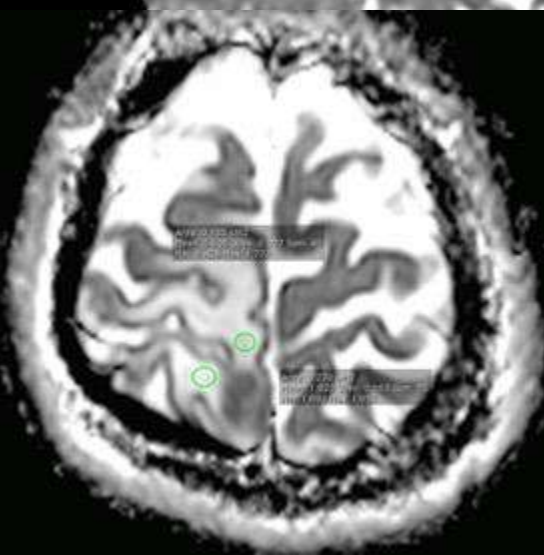
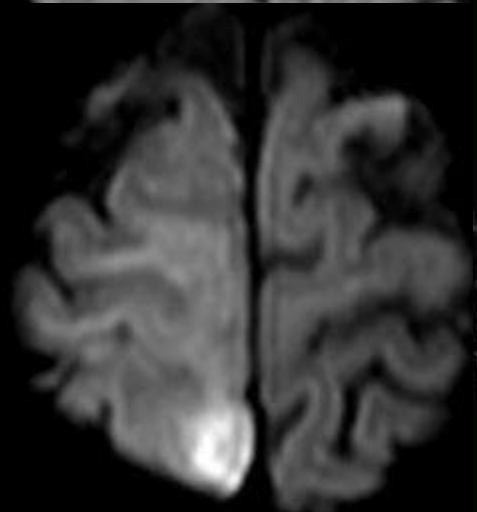
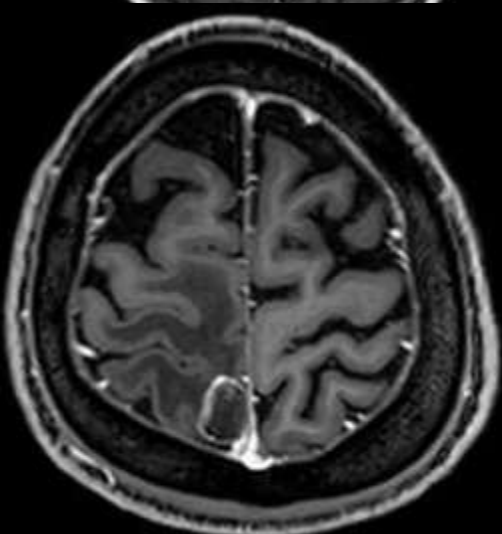
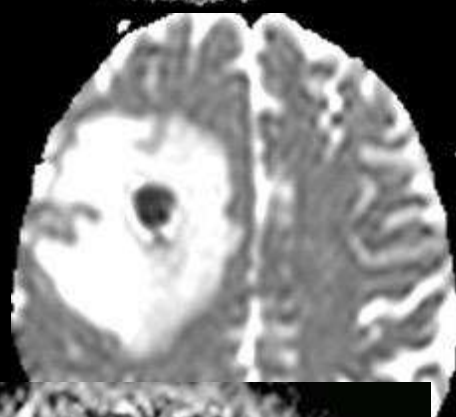
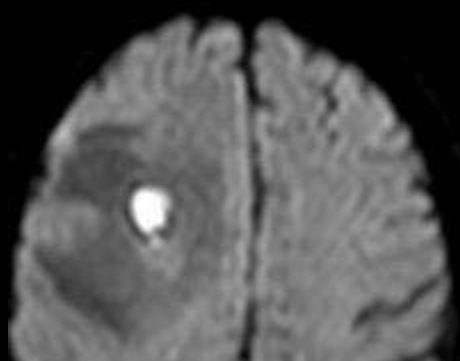
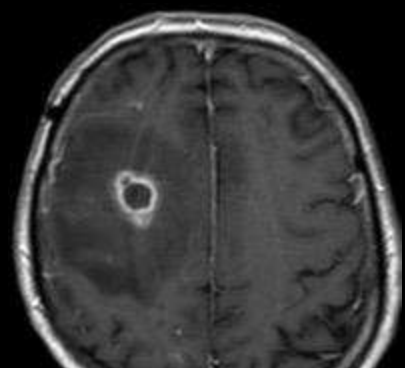
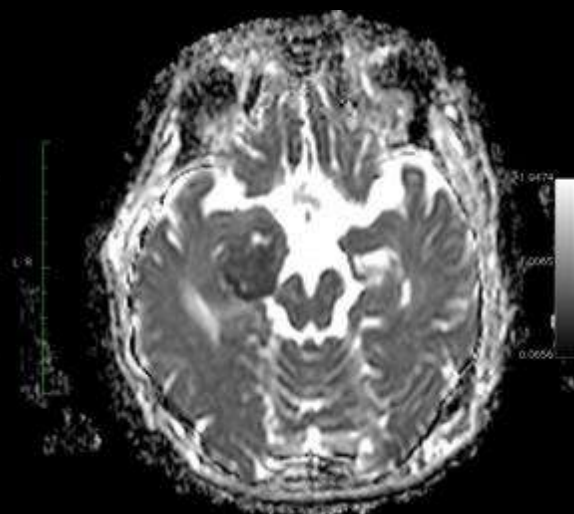
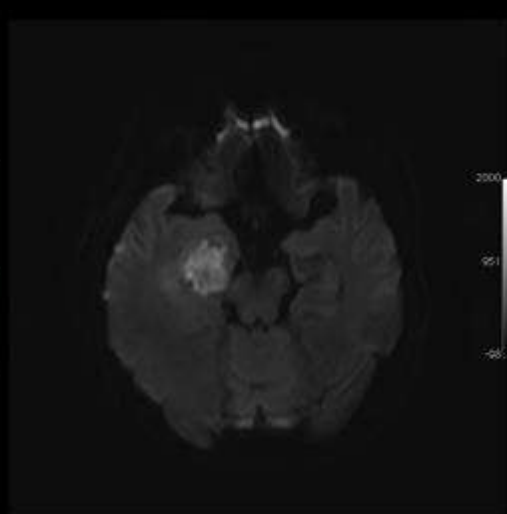
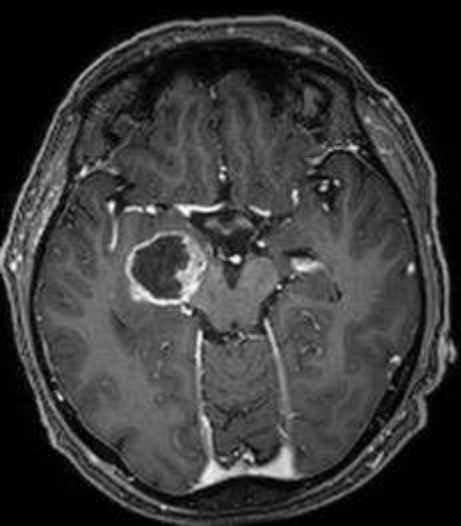


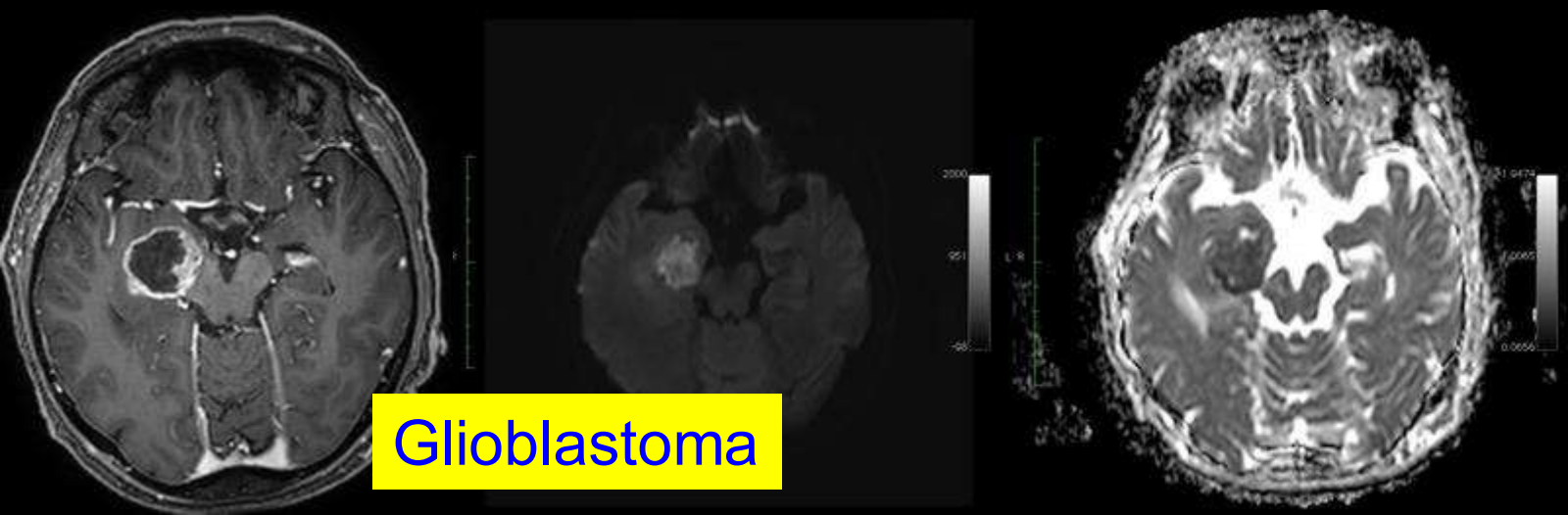




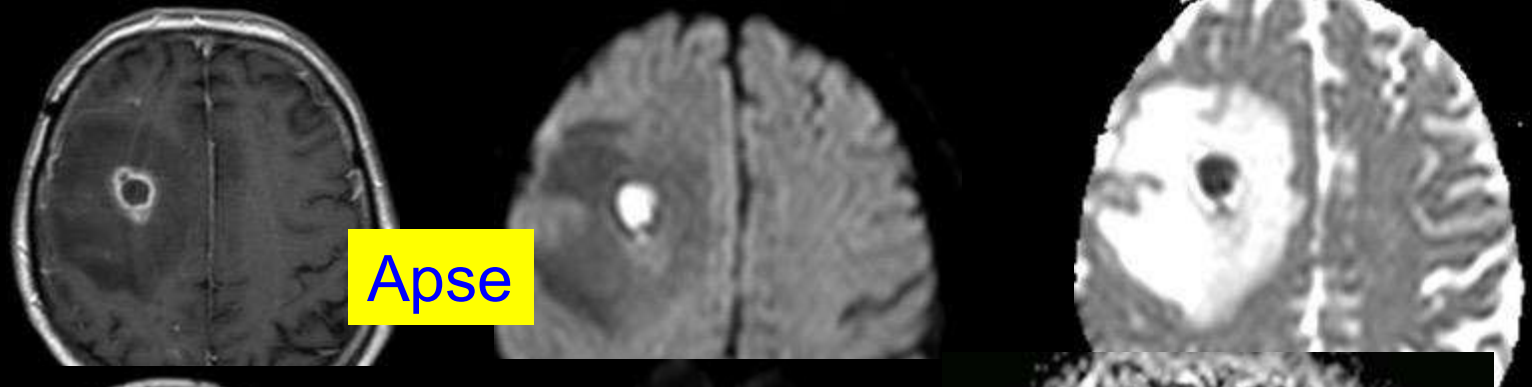
APSE







Glioblastoma



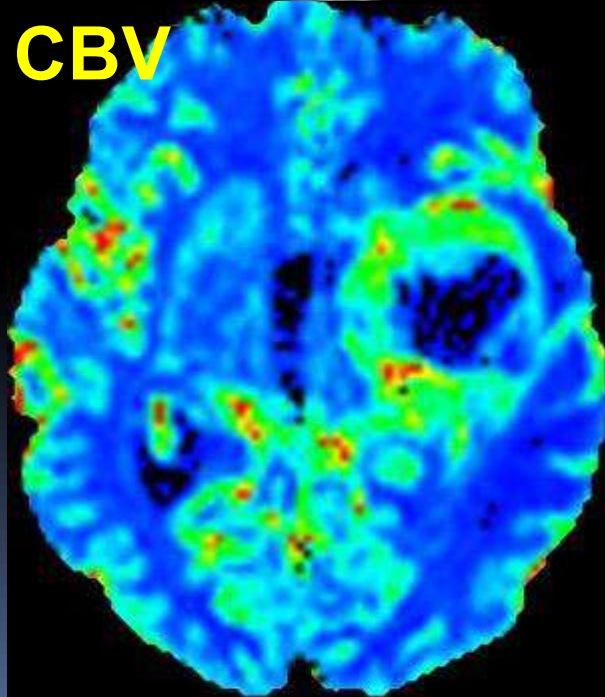
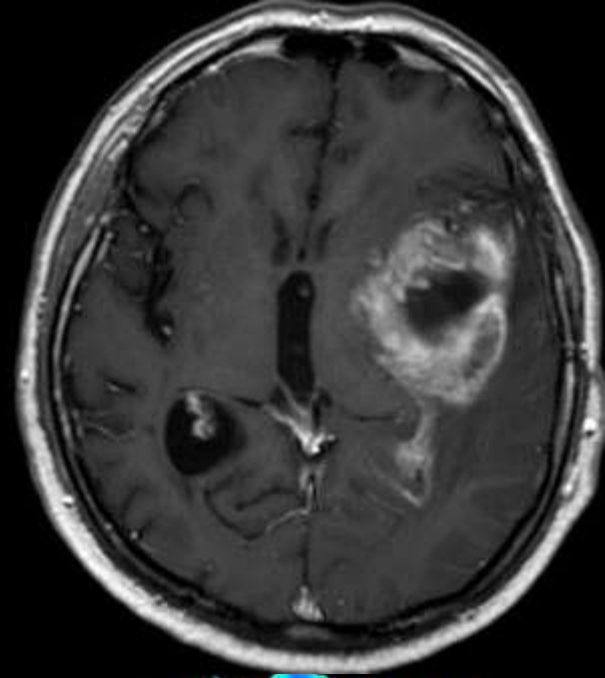
Abscess

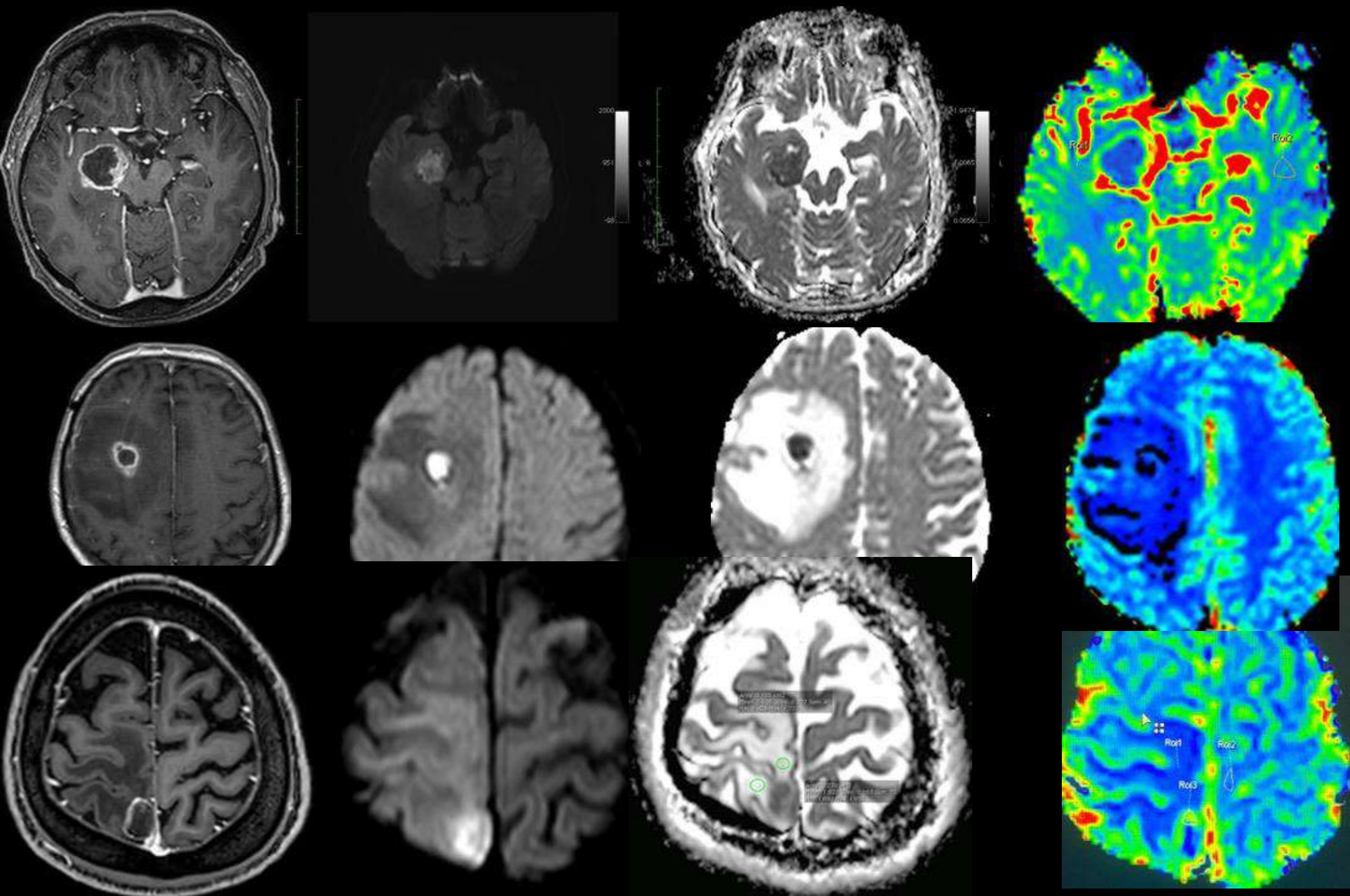


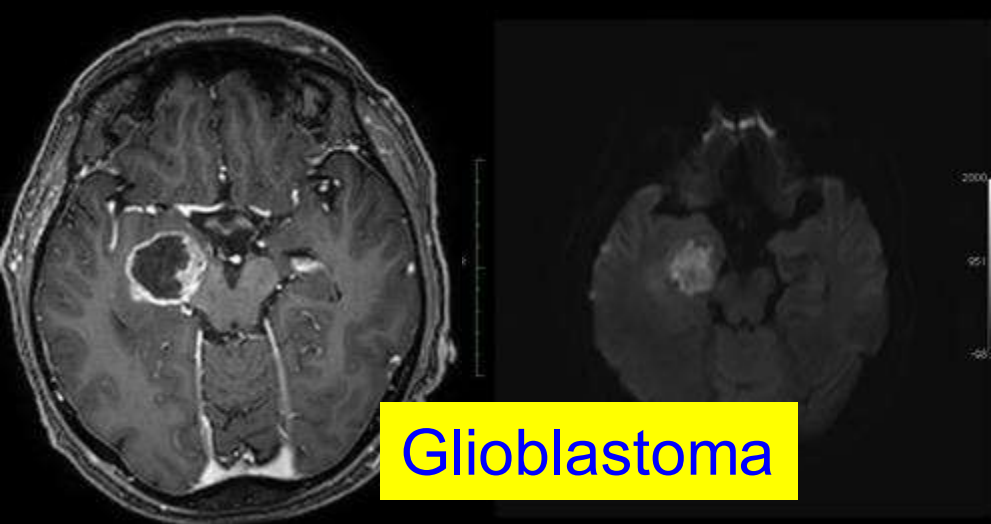
Metastasis

Perfüzyon MR

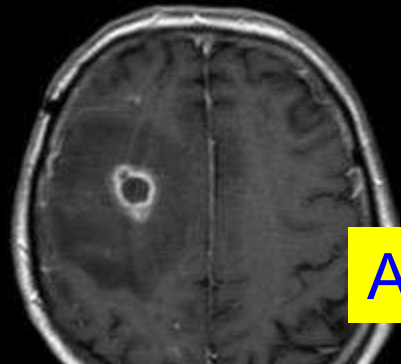
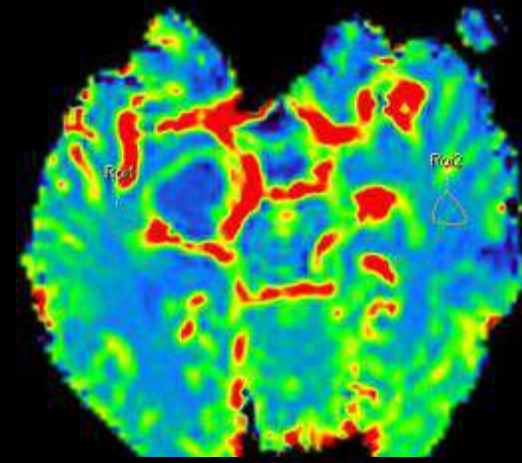
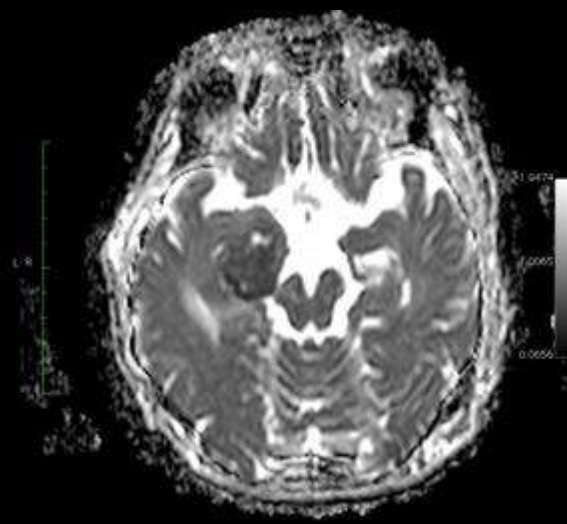
- Perfüzyon MRG, mikroskobik düzeyde doku kanlanmasını in-vivo tümör anjiogenezi ve tümör mikrodolaşımı hakkında bilgi veren non-invaziv tanı yöntemidir.
- Damar yoğunluğundaki artışın bir göstergesi olan **CBV'nin artması tümöral neo-anjiogenezin** dolaylı bir göstergesi olarak kabul edilmektedir.



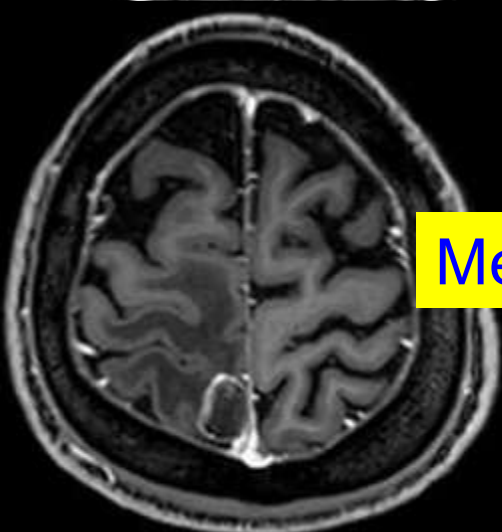
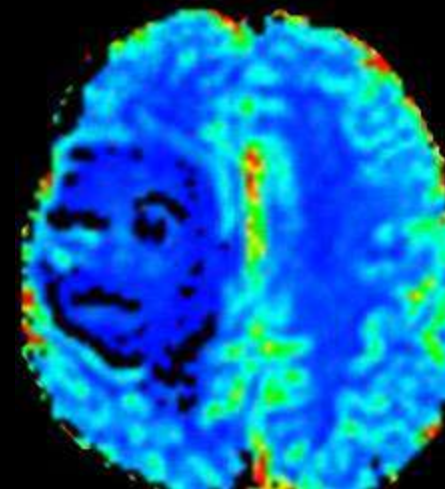
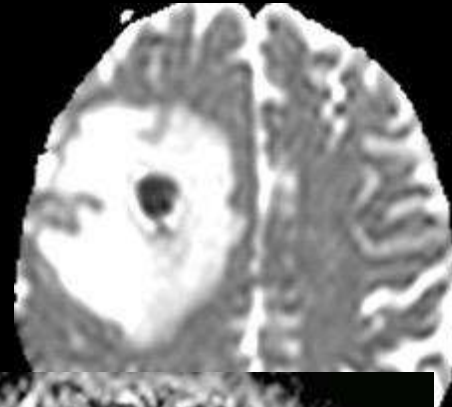
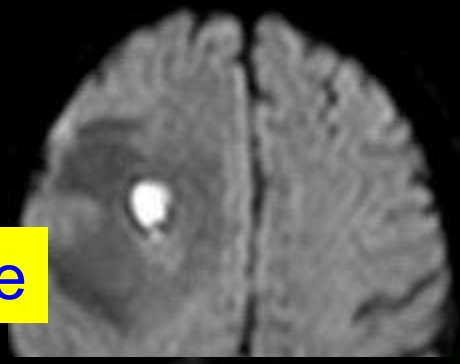




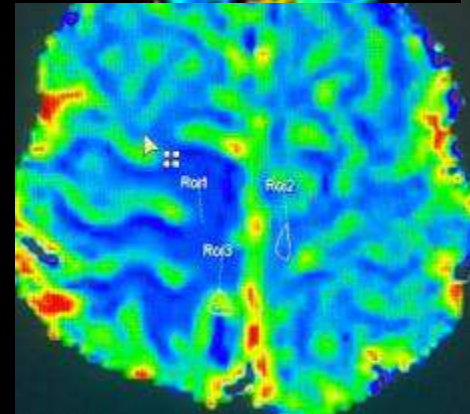
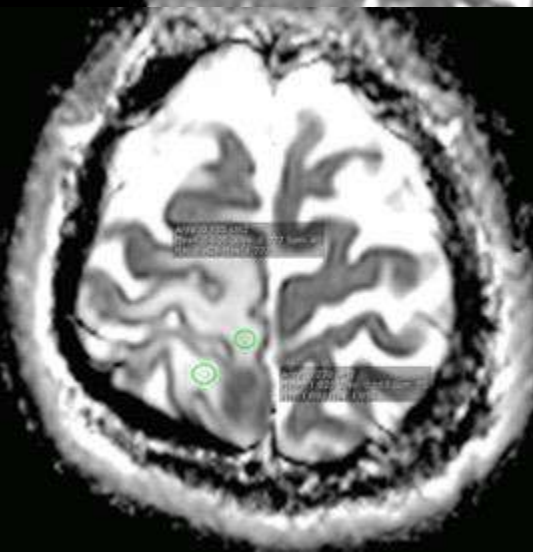
Glioblastoma

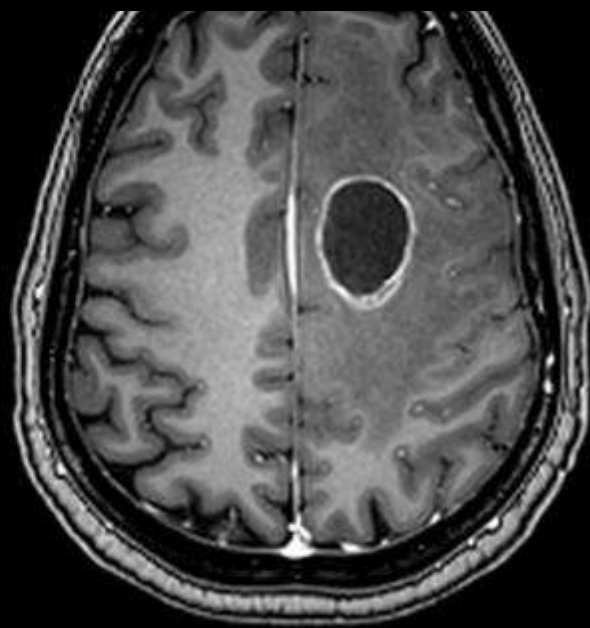
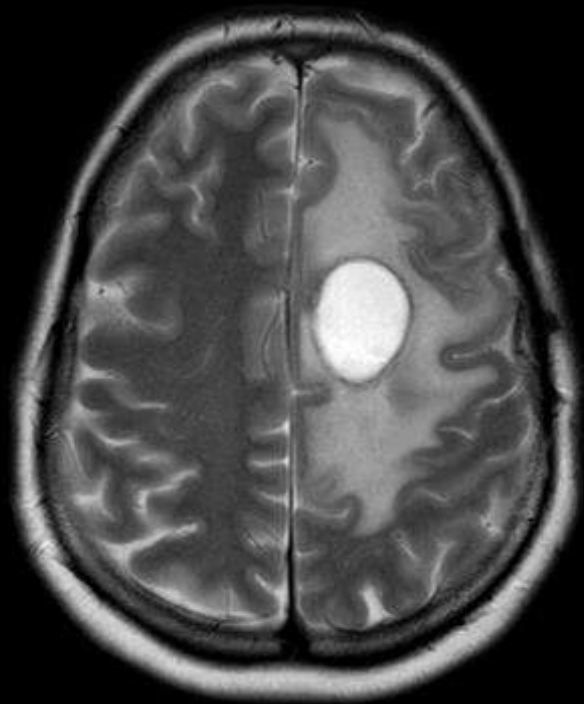
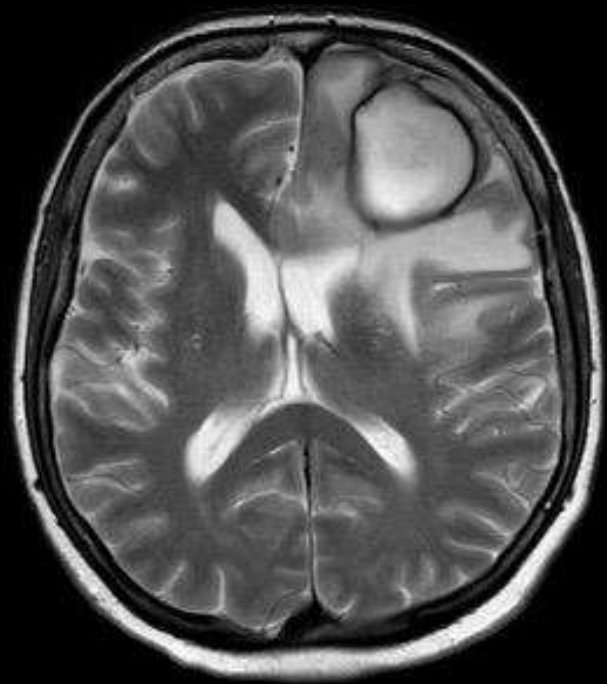


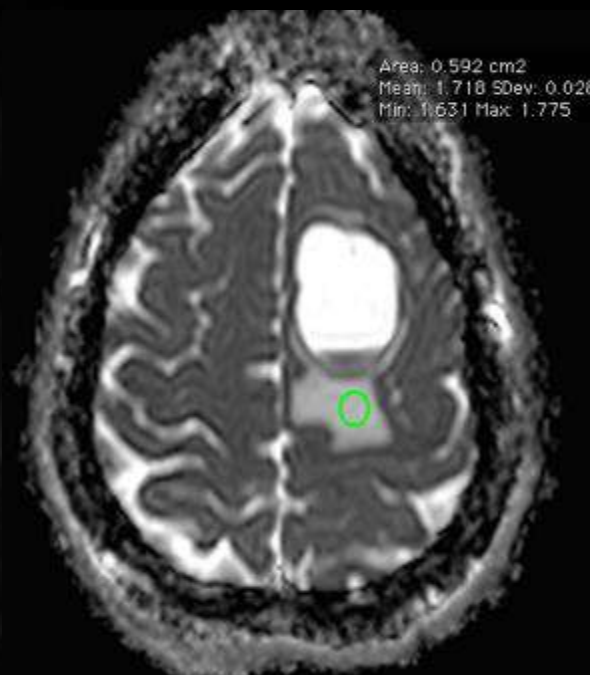
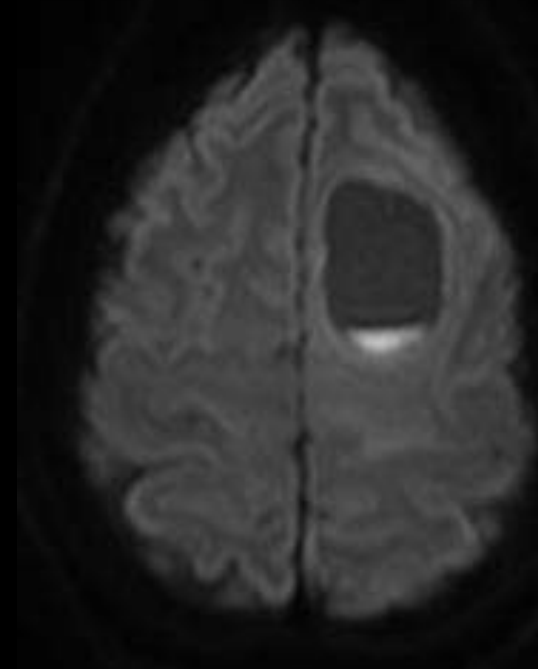
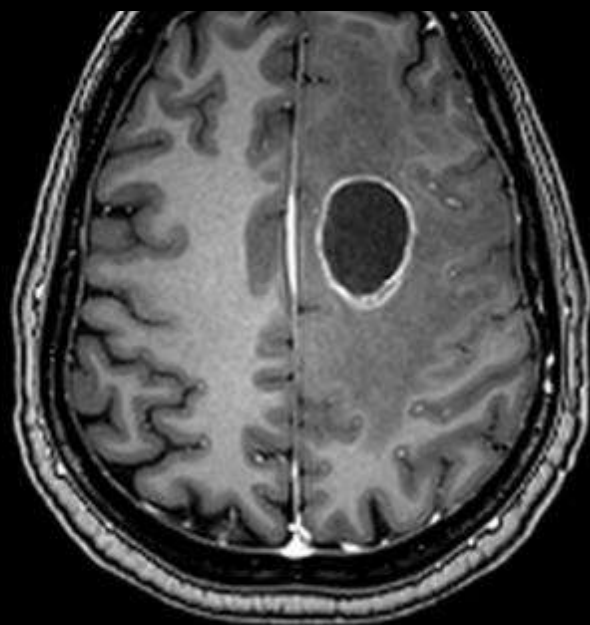
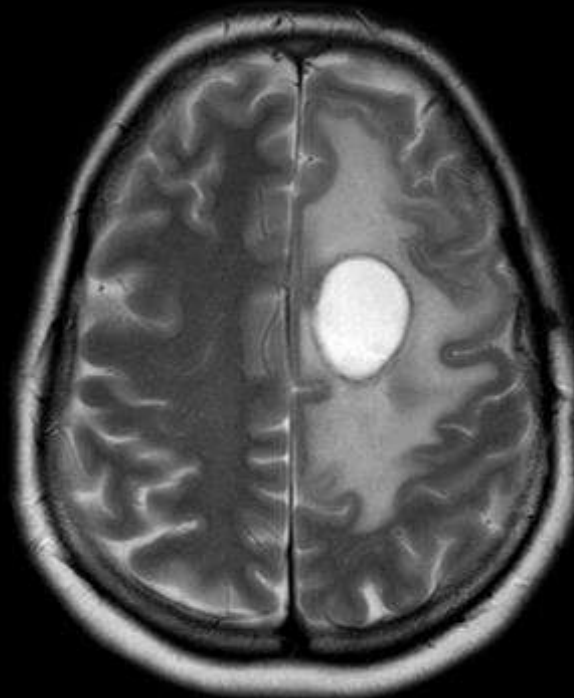
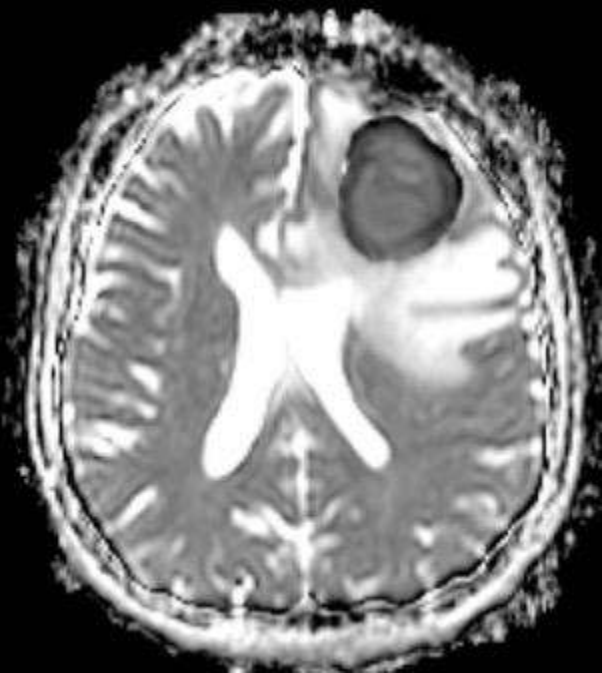
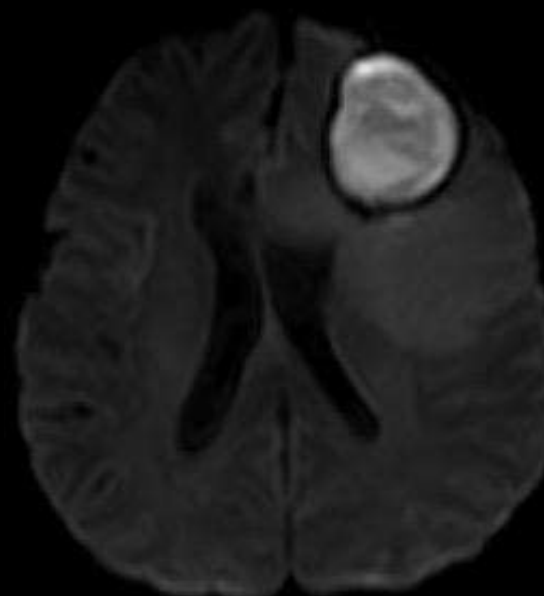
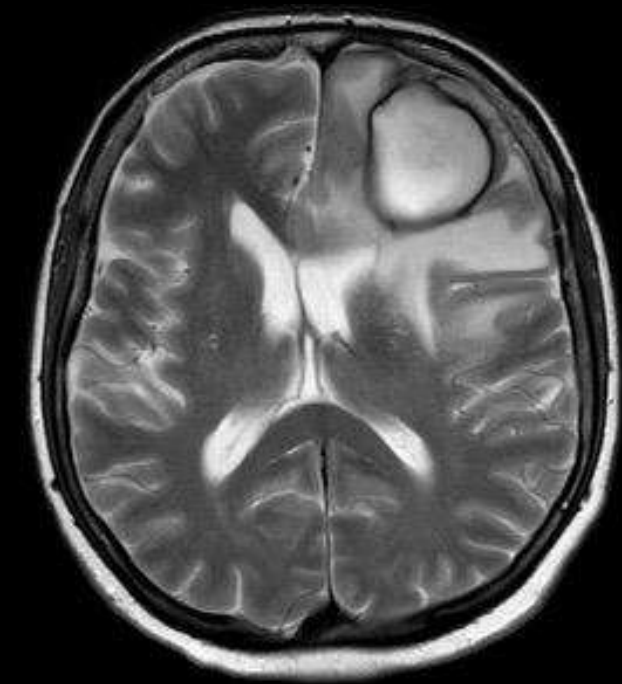
Apse



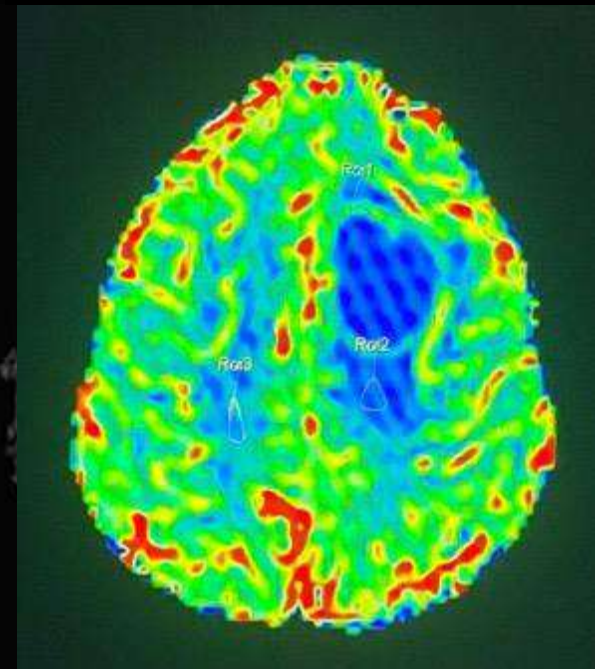
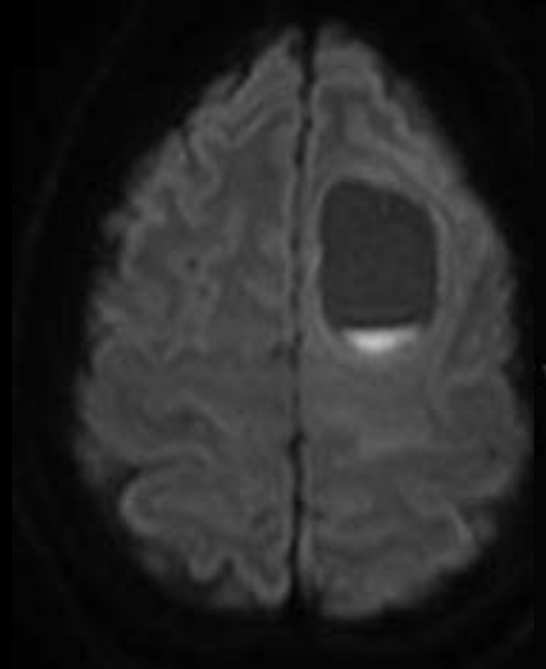
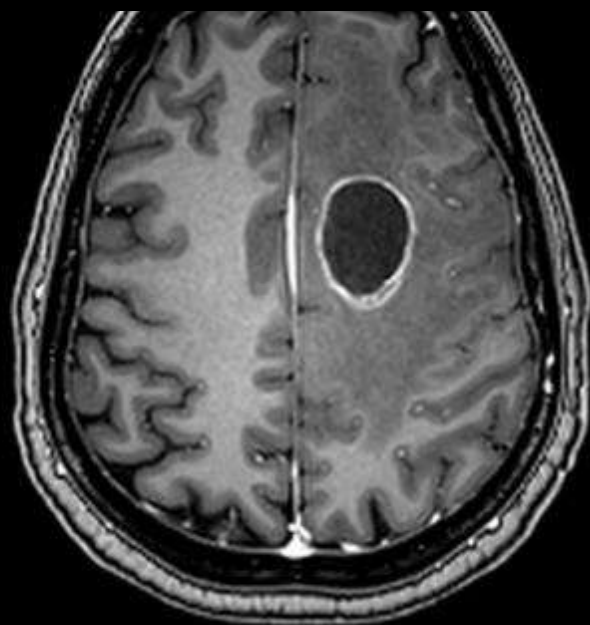
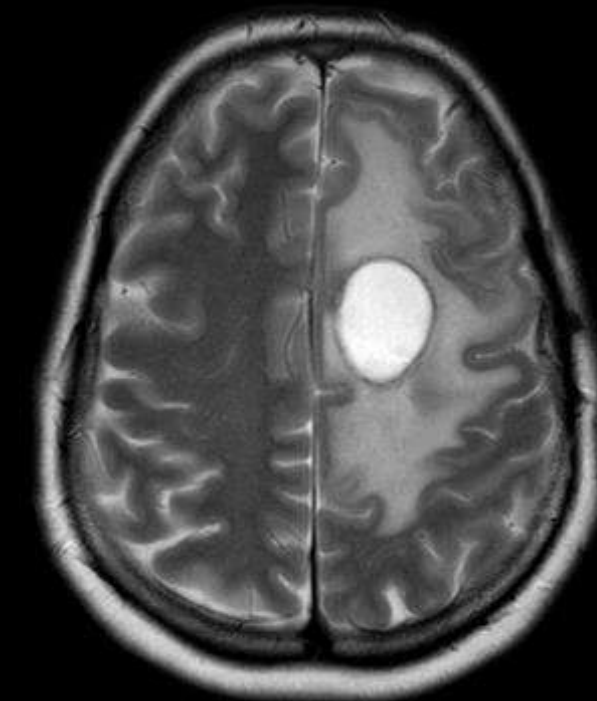
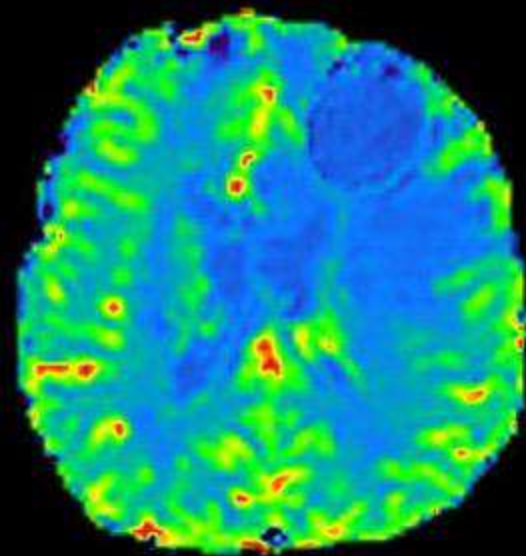
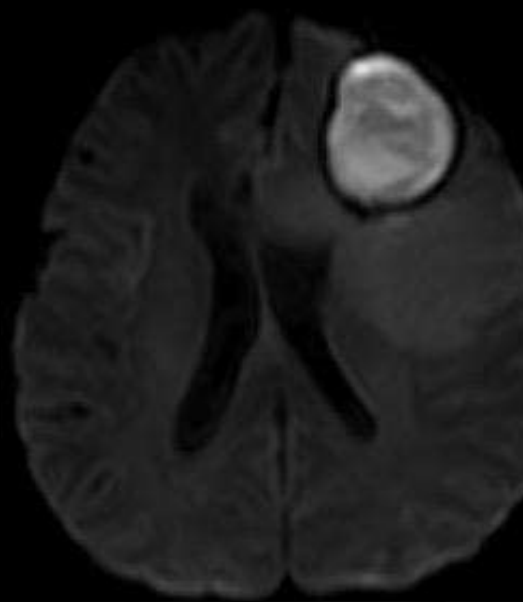
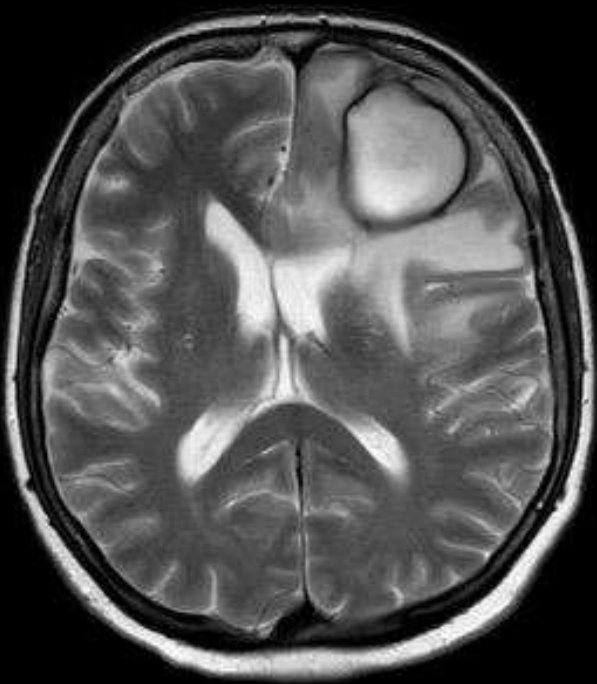
Metastaz

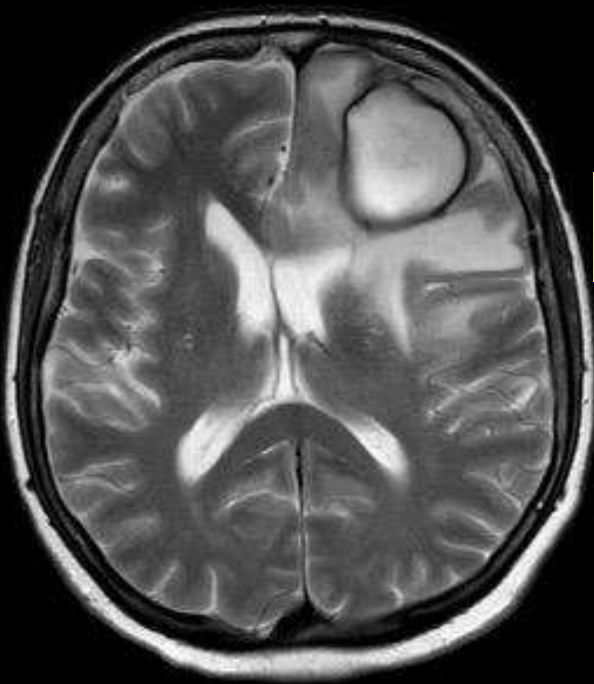




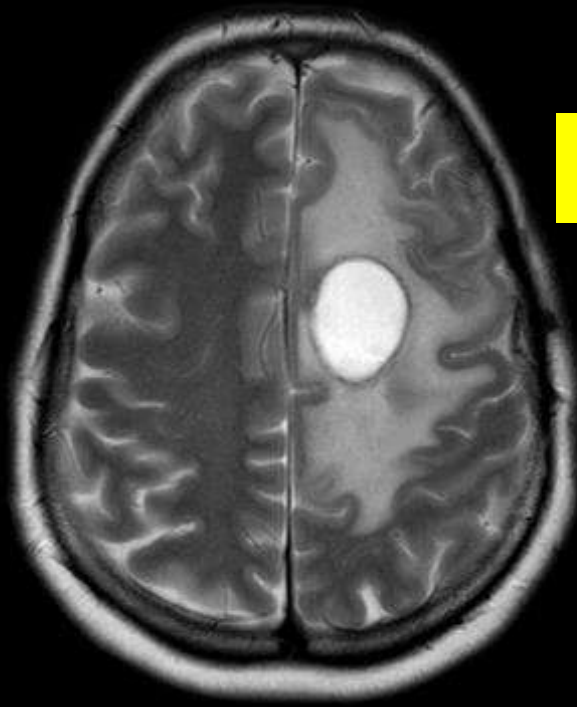
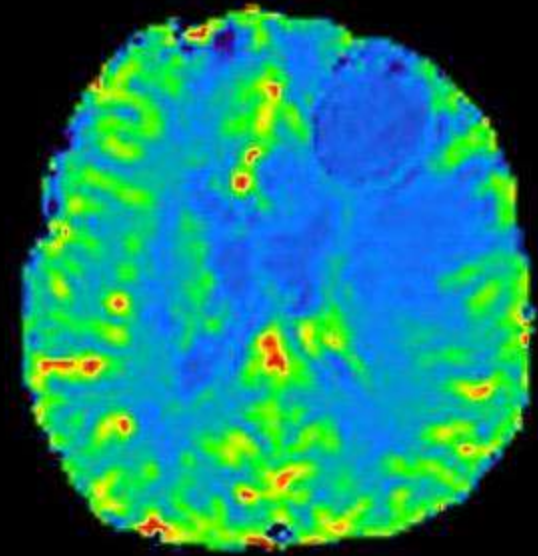
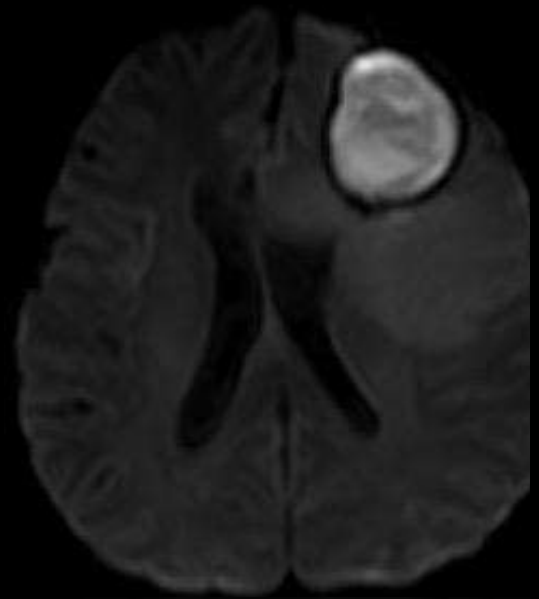


Area: 0.592 cm²
Mean: 1.718 SD: 0.021
Min: 1.631 Max: 1.775

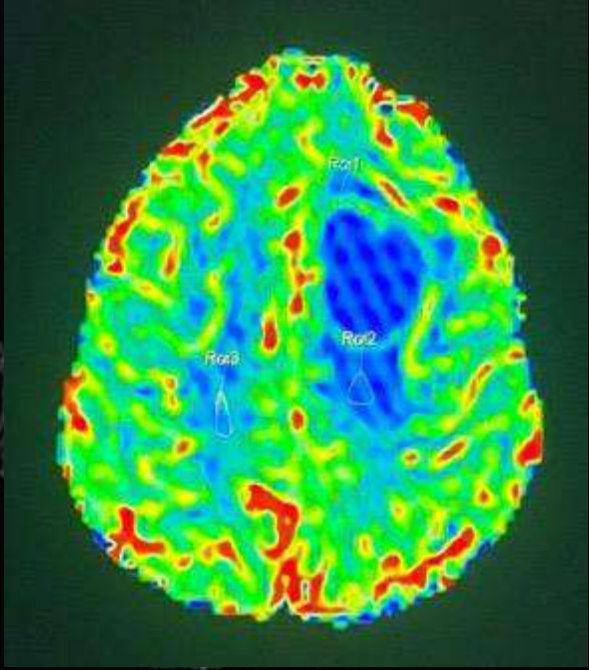
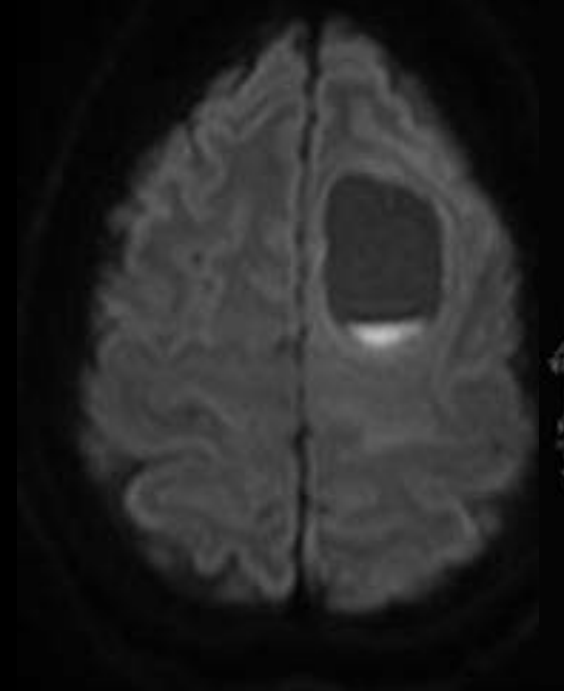




Apse

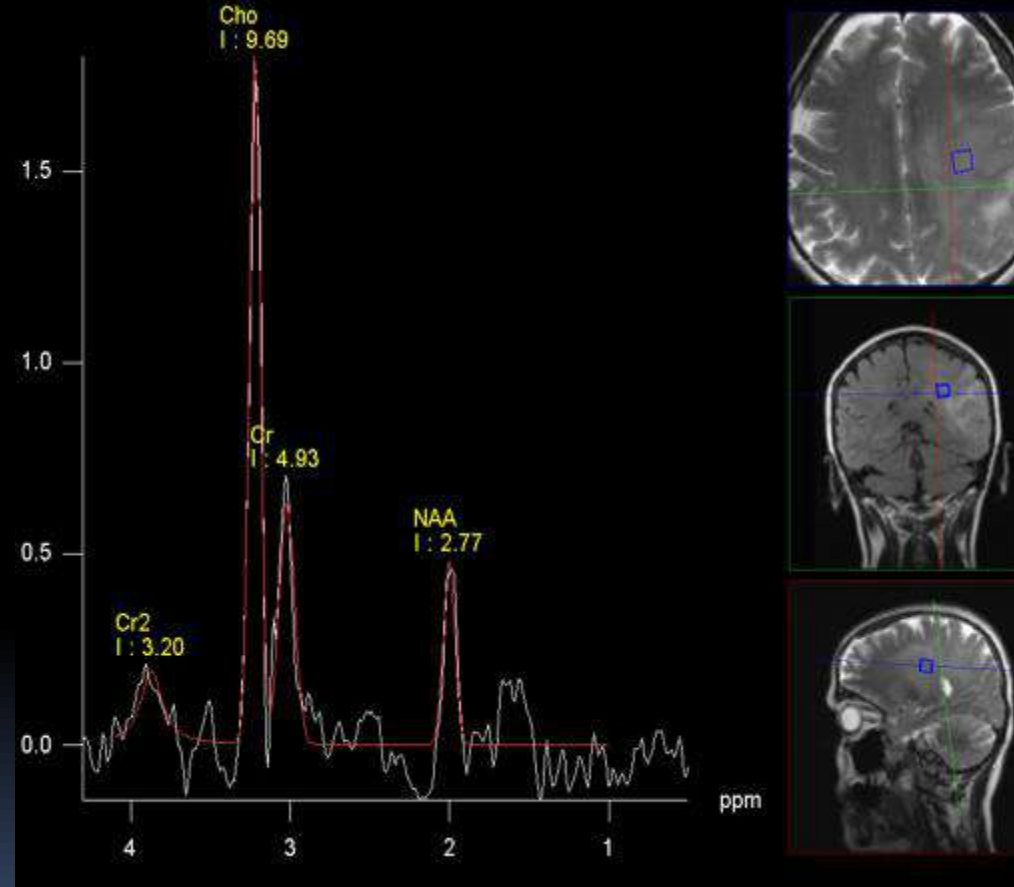


Metastaz



MR Spektroskopisi

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



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

Canlı nöron miktarı

- **Lipid (1.2 ppm)**

Normal beyin dokusunda yok

Tümör (Lenfoma, metastaz)

Enfeksiyon (Tüberküлом, toxo)

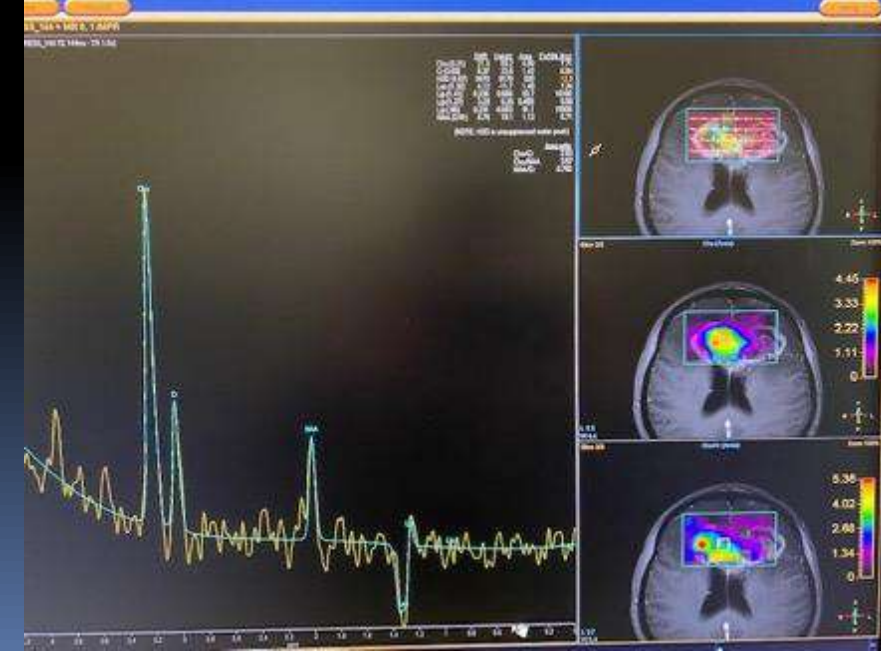
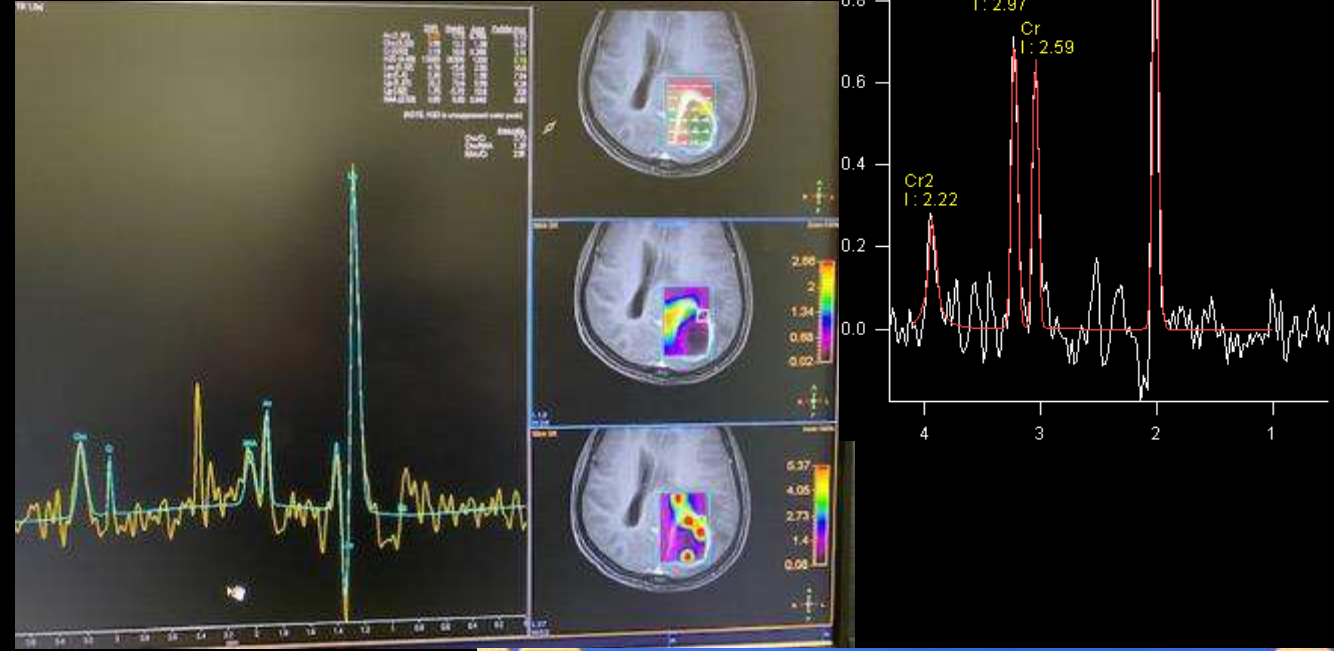
- **Laktat (1.3 ppm)**

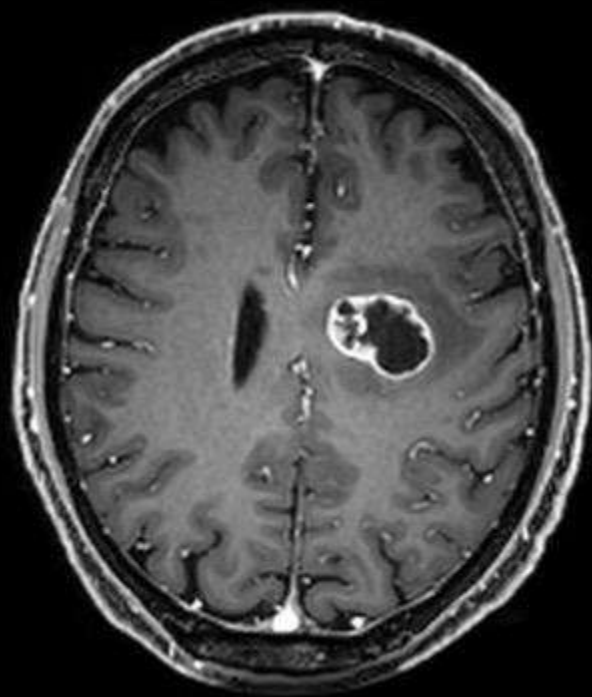
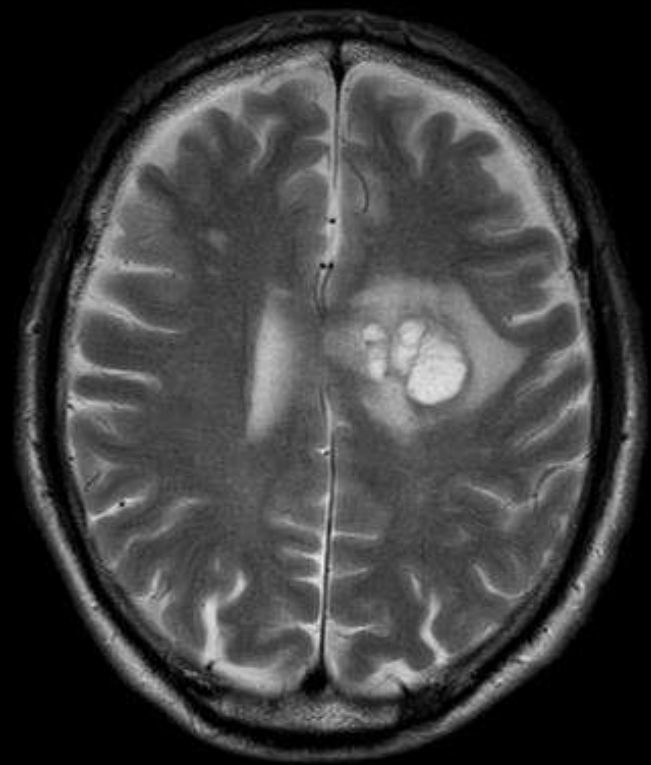
Normal beyin dokusunda yok

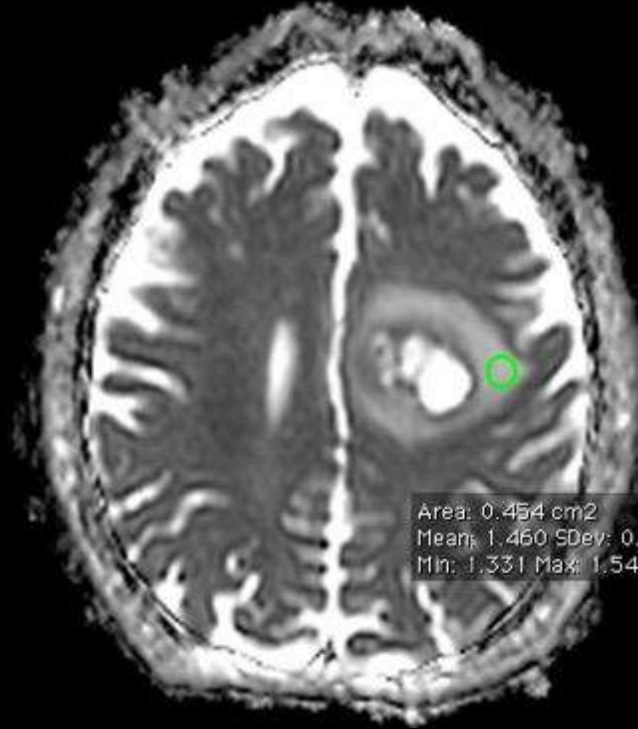
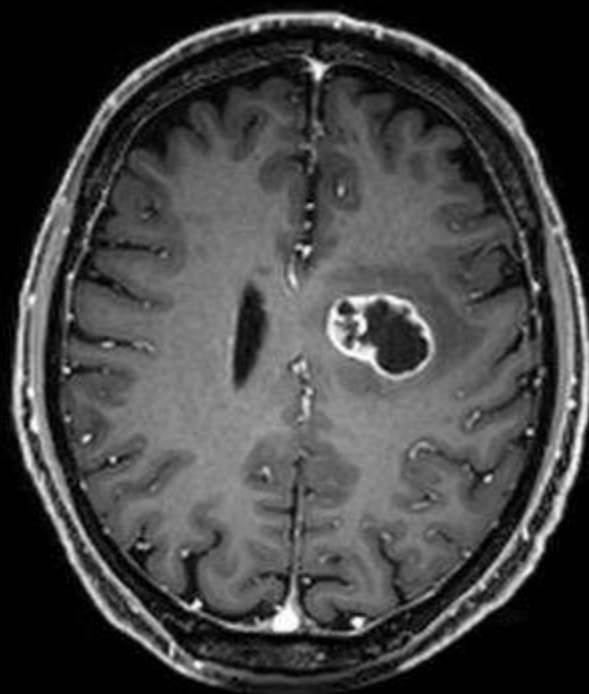
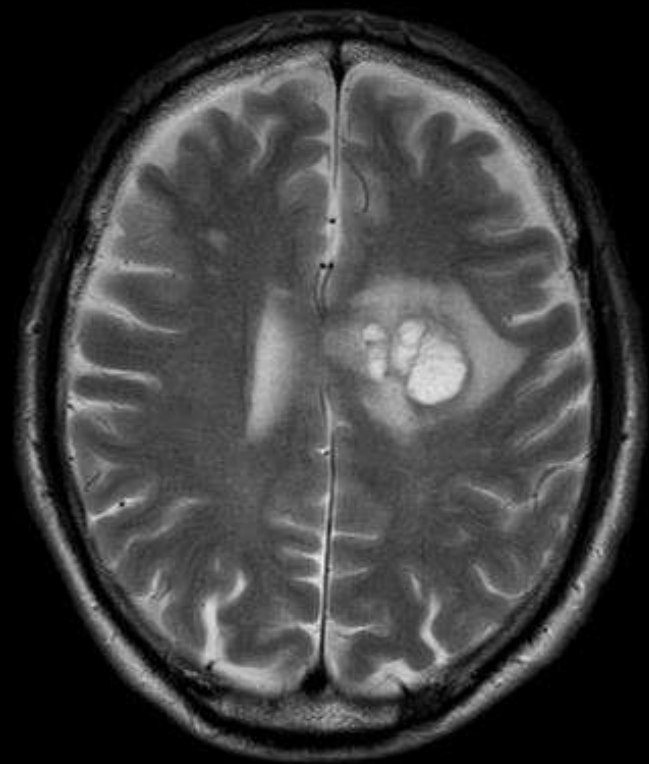
İskemi, nekroz (tümör, toxo)

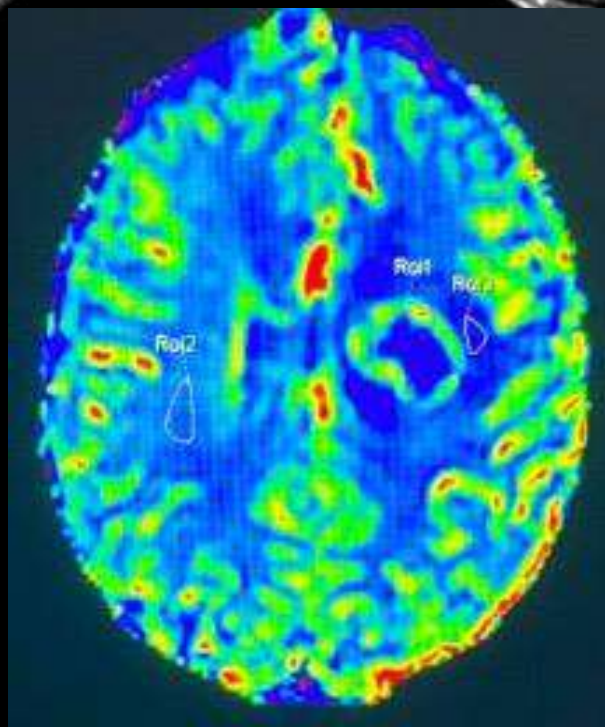
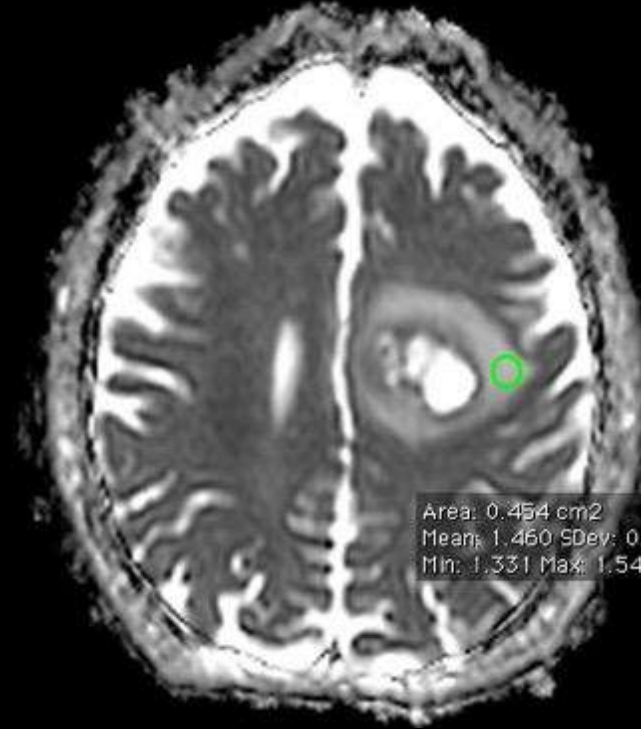
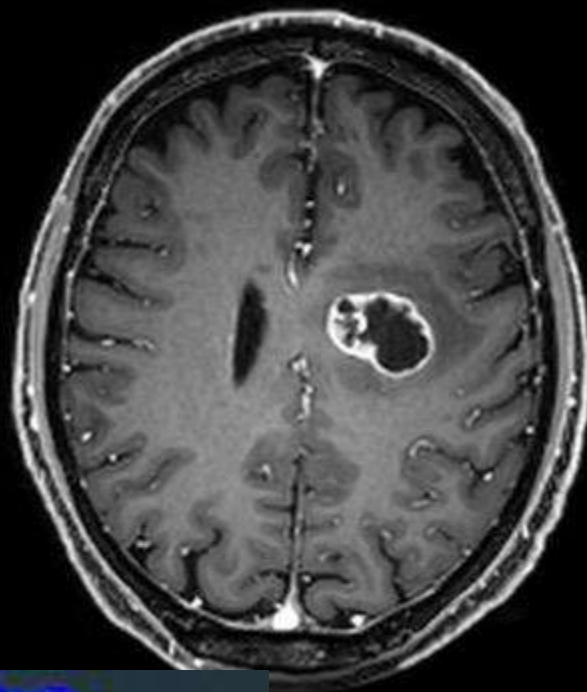
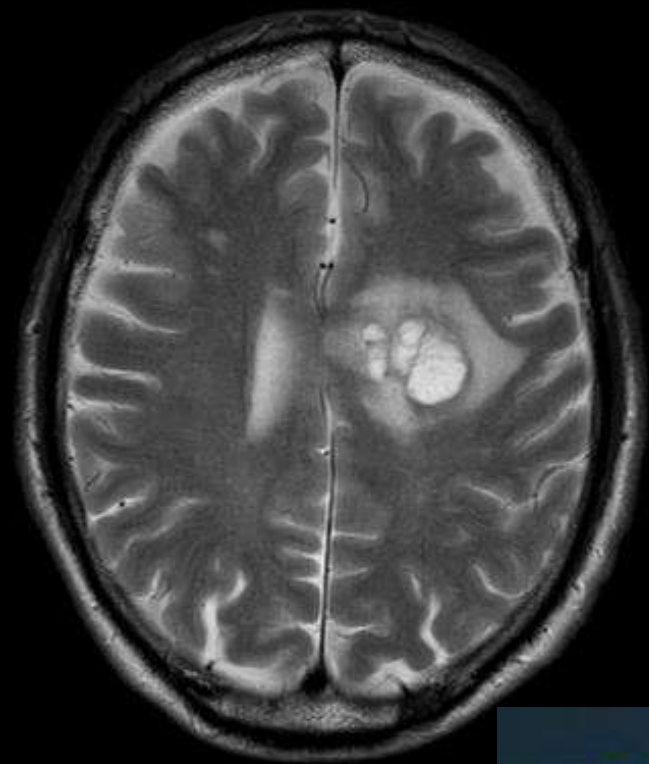
- **Asetat (1.9), suksinat (2.4), amino asitler (0.9)**

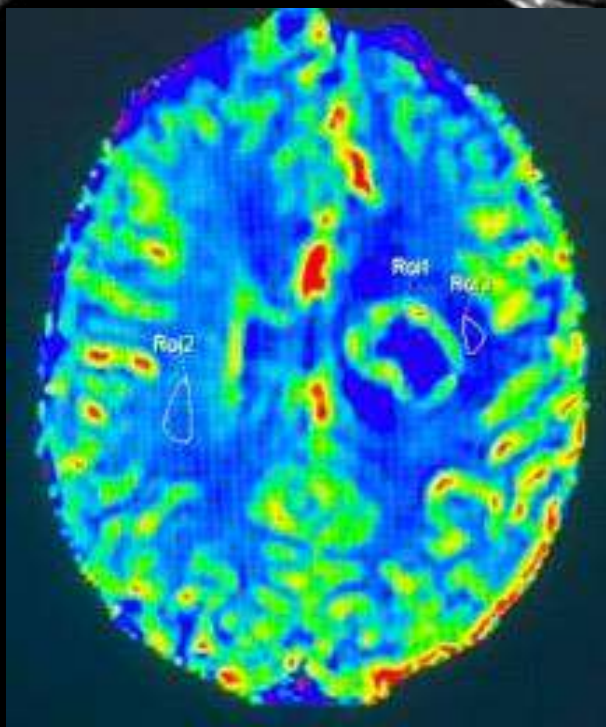
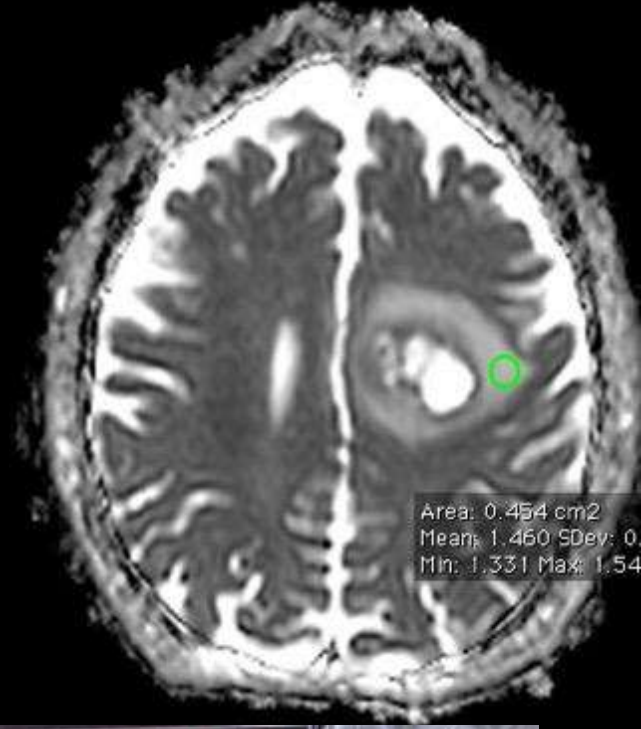
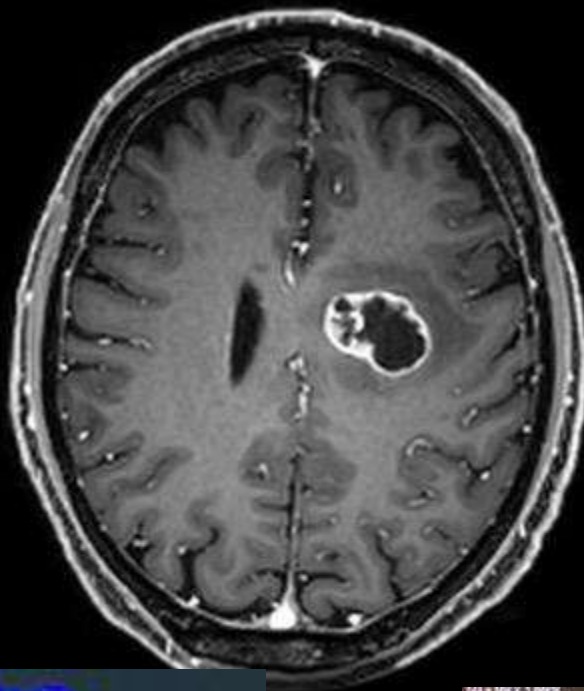
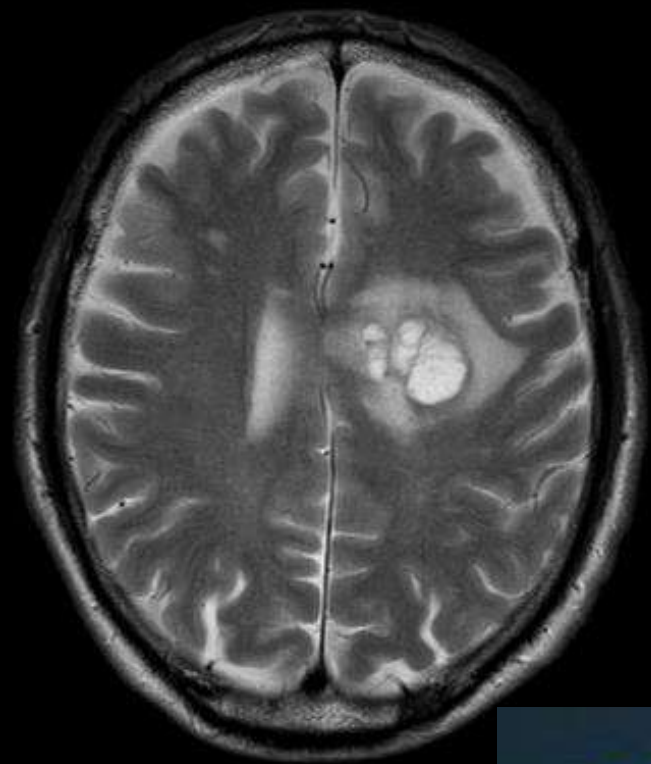
Enfeksiyon

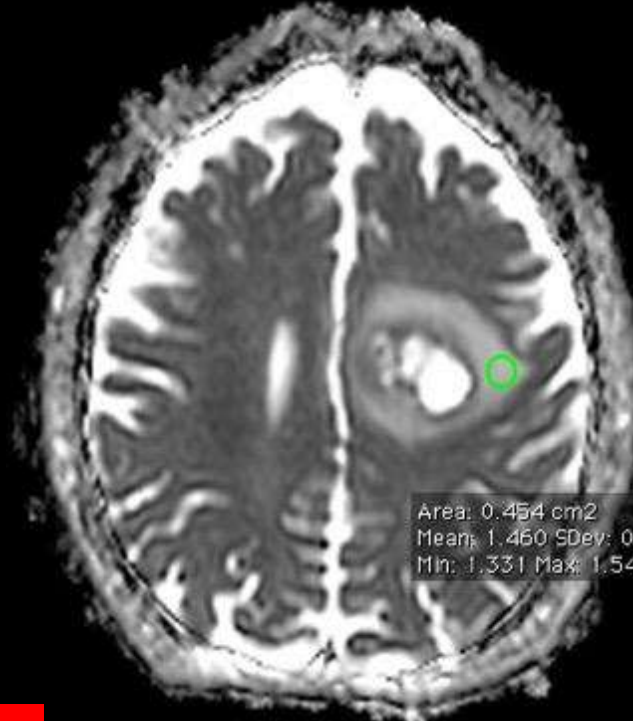
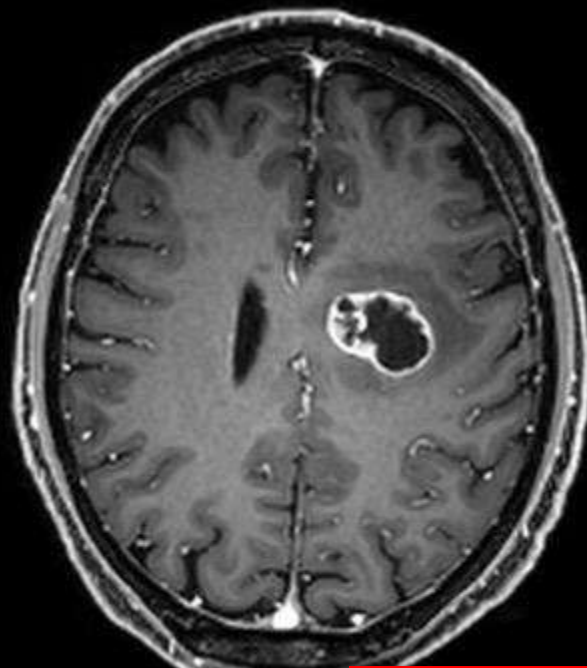
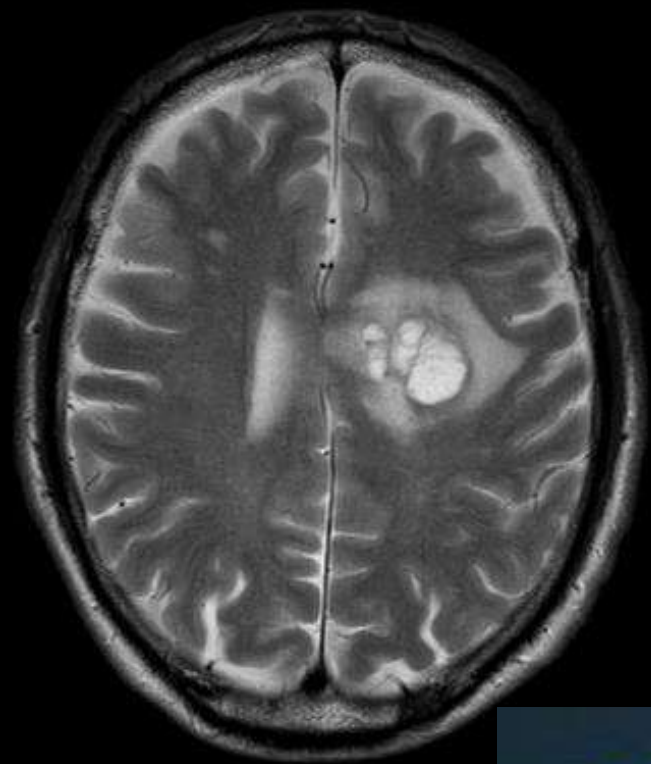




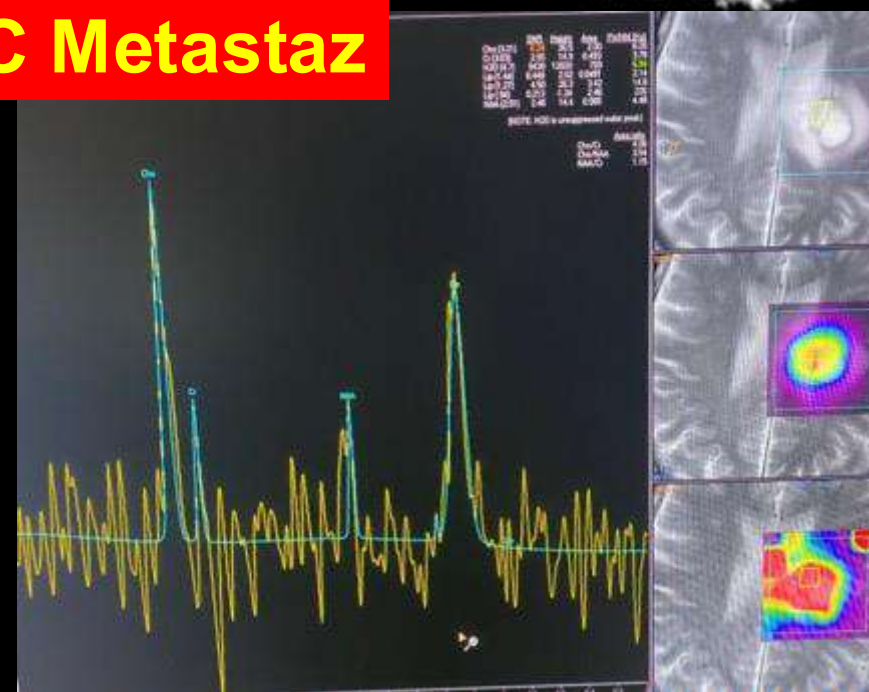
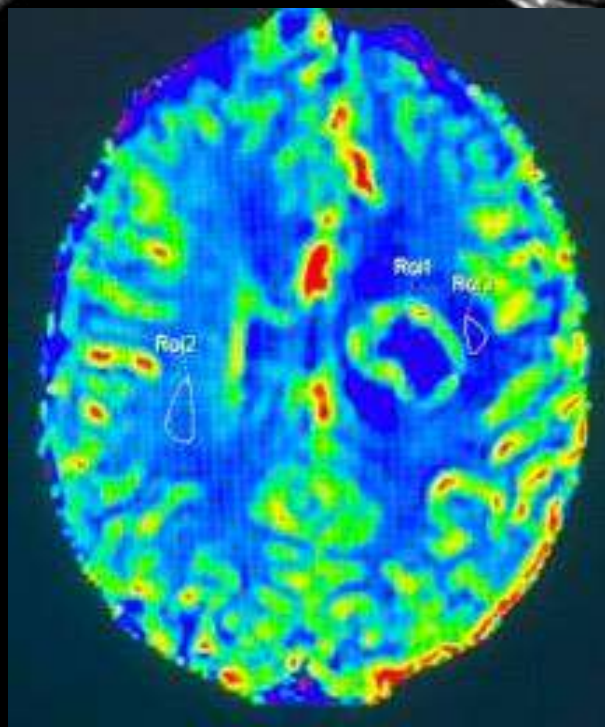


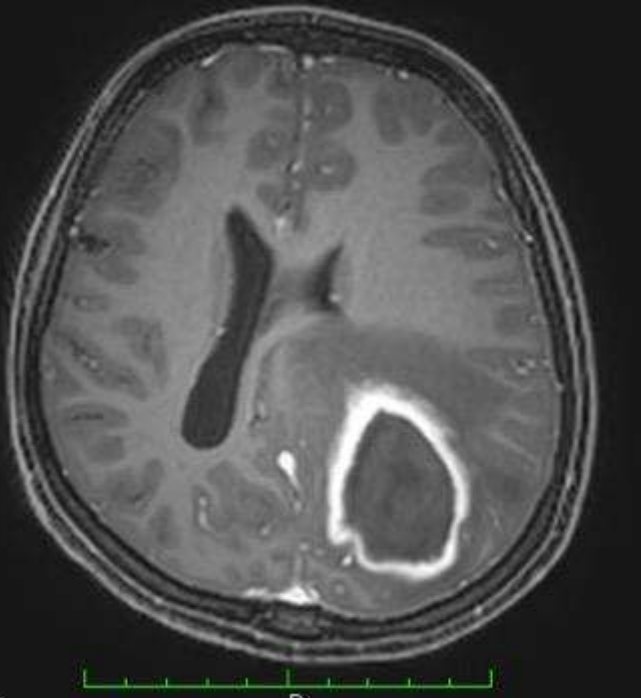






AC Metastaz





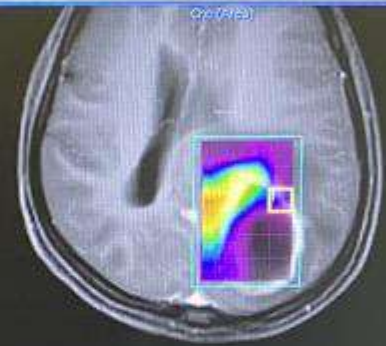
	SNR	Height	Area	FWHM (mm)
Ac (1.91)	5.27	17.5	0.766	5.13
Cho (3.22)	3.98	13.2	1.08	9.31
Cr (3.02)	3.19	10.6	0.288	3.11
H2O (4.68)	13600	26300	1200	5.19
Lac (1.32)	4.76	-15.8	2.90	10.5
Lp (1.4)	5.28	17.5	1.08	7.04
Lp (1.27)	22.2	73.6	5.99	9.28
Lp (1.92)	1.75	-5.79	10.6	209
NAA (2.03)	3.00	9.93	0.840	8.65

(NOTE: H2O is unsuppressed water peak)

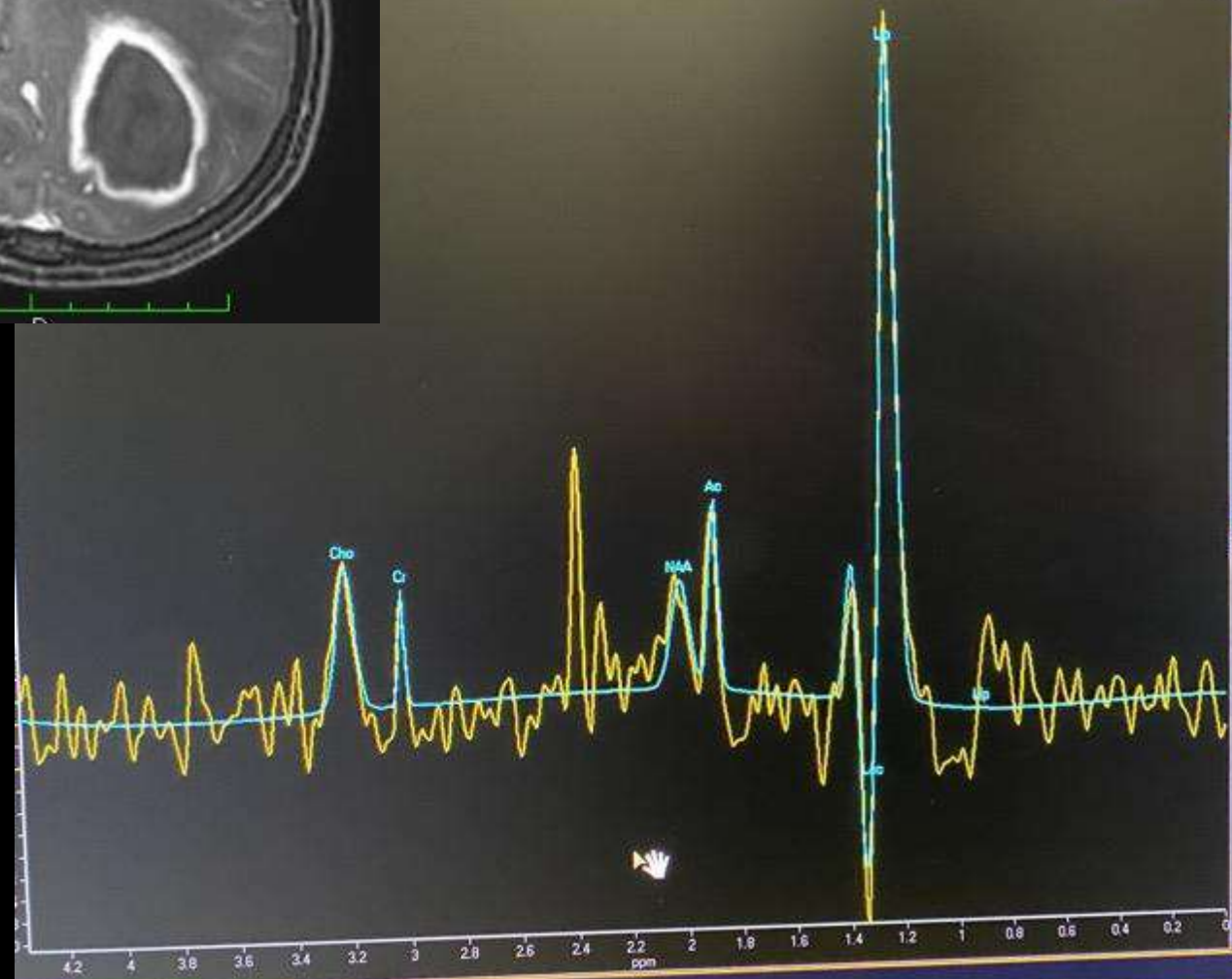
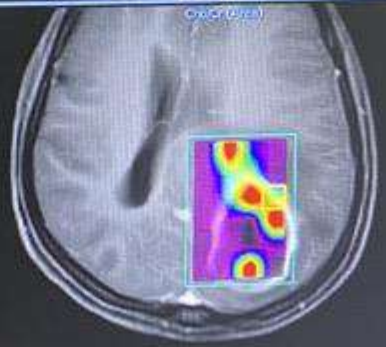
	Area ratio
Cho/Cr	3.73
Cho/NAA	1.28
NAA/Cr	2.91



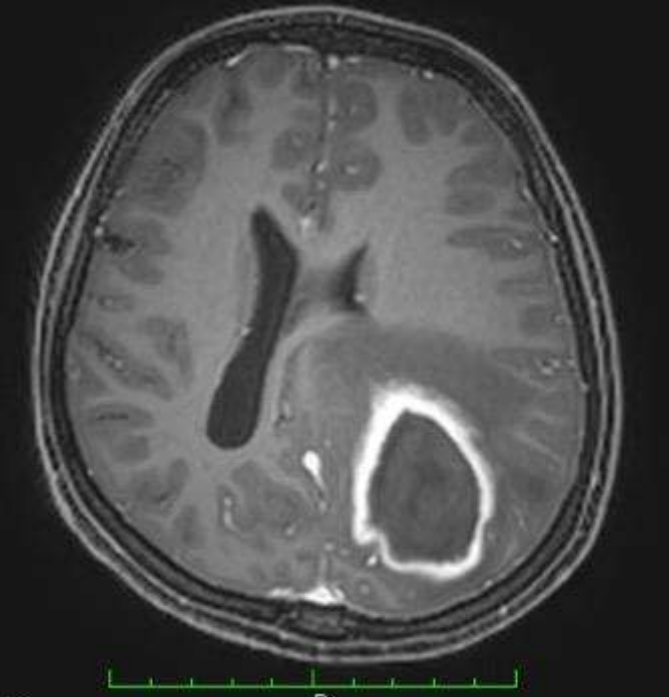
Slide 20 Cho (F1F2) Zoom 100%



L13 W28 Slide 20 Cho (F1F2) Zoom 100%



L27 W5.3

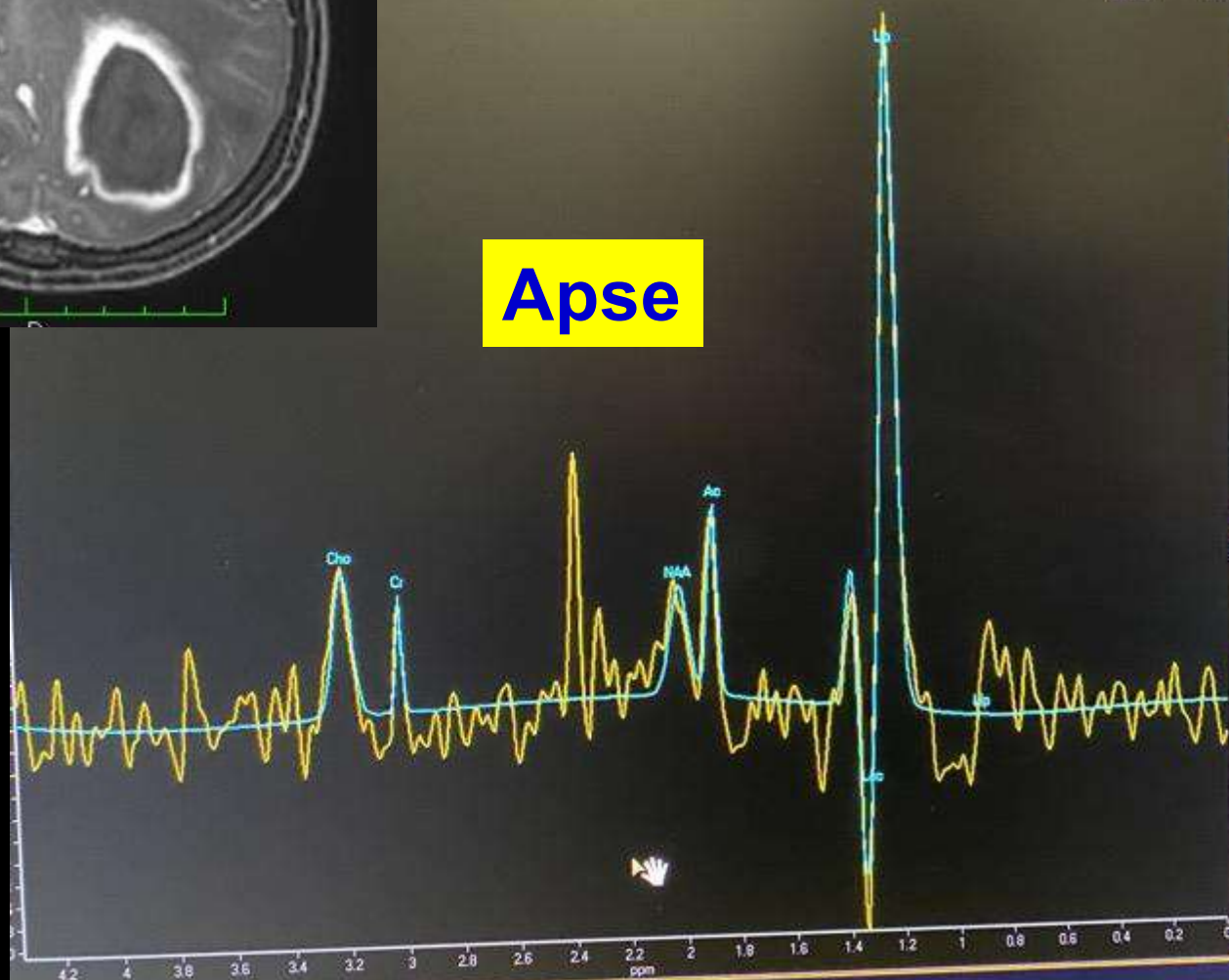
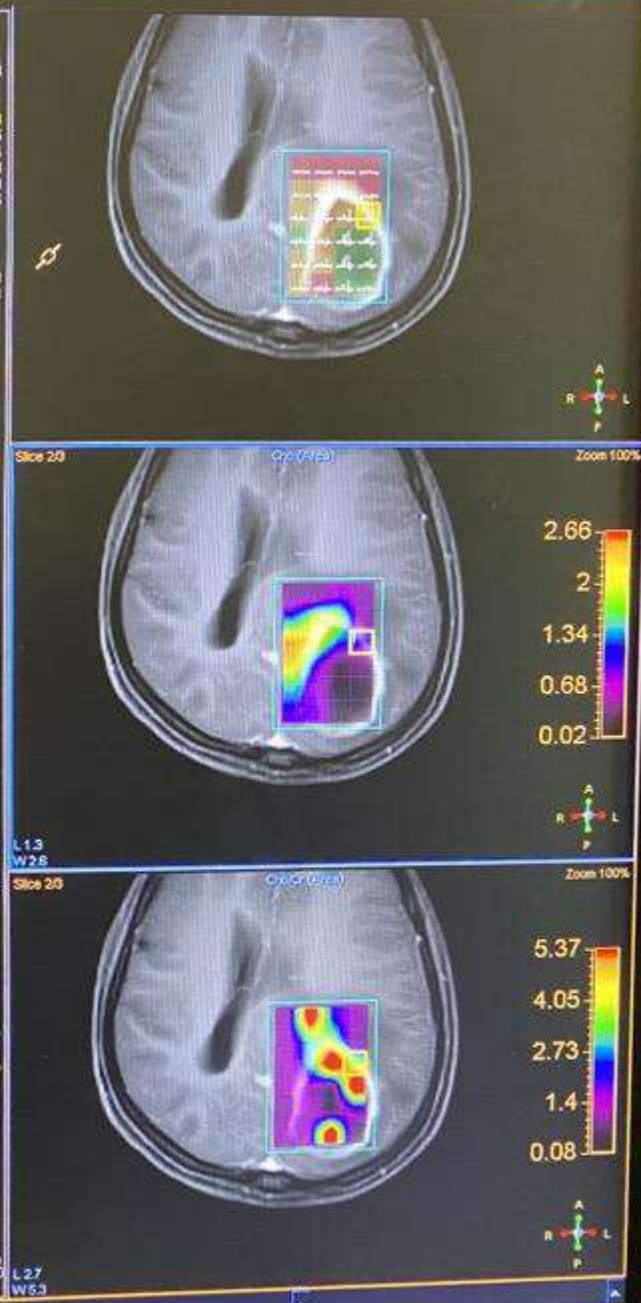


Apse

	SNR	Height	Area	FWHM (Hz)
Ac (1.91)	5.27	17.5	0.766	5.13
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(NOTE: H2O is unsuppressed water peak)

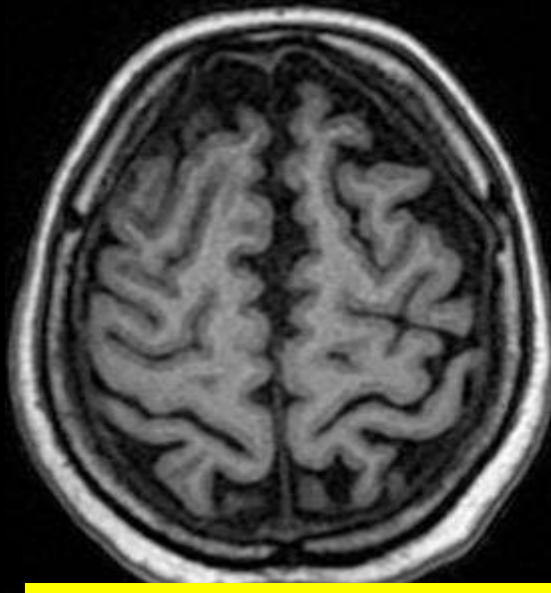
	Area ratio
Cho/Cr	3.73
Cho/NAA	1.28
NAA/Cr	2.91



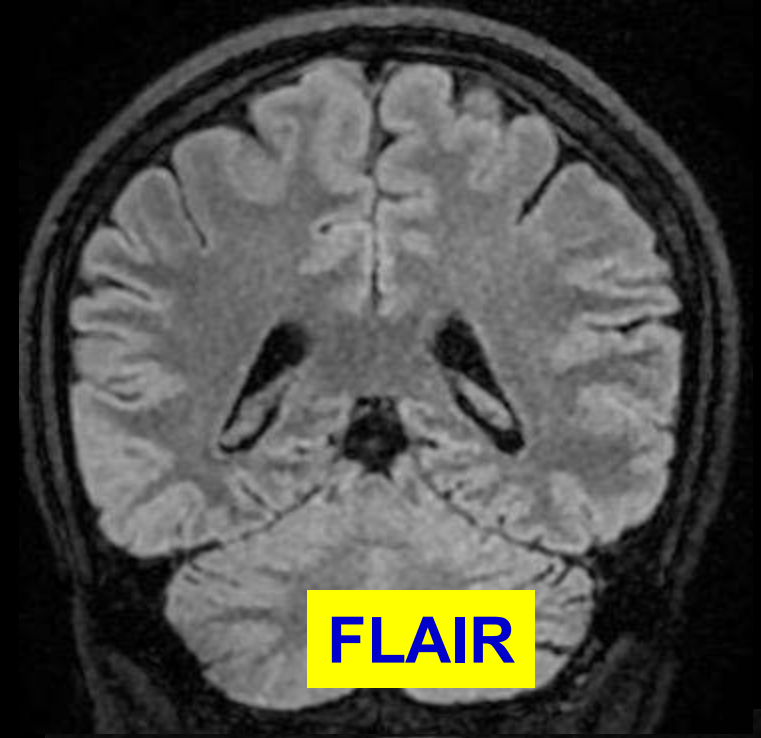
1. OLGU



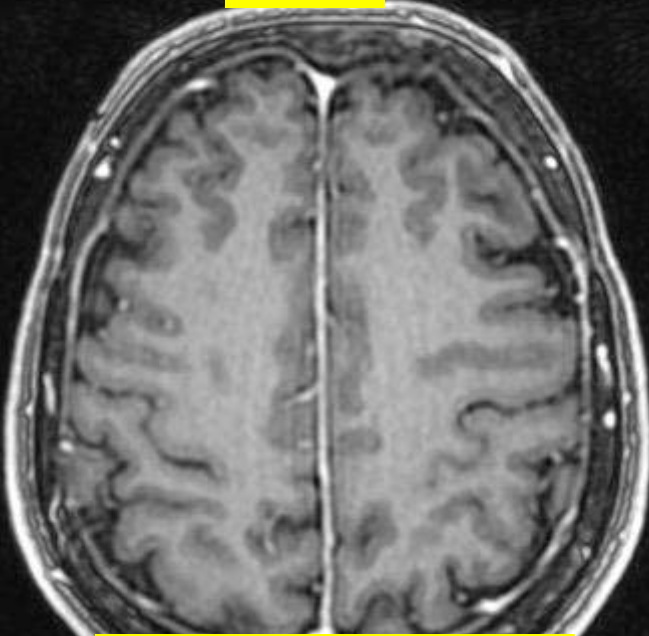
T2A



Kontrastsız T1A

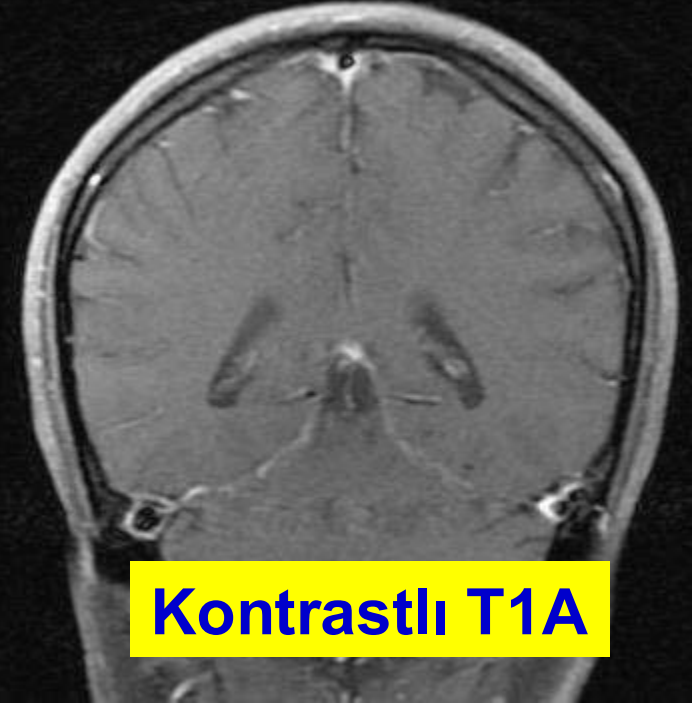


FLAIR



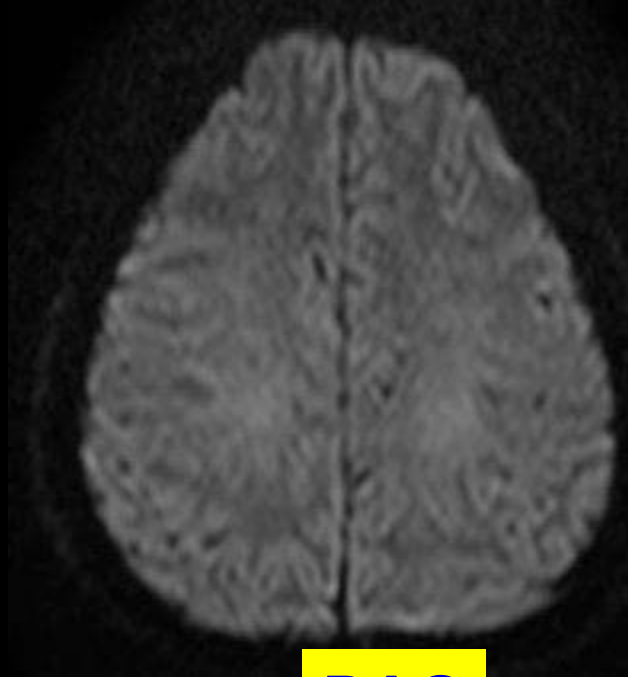
Kontrastlı T1A

**Normal Konvansiyonel
MRG Sekansları**

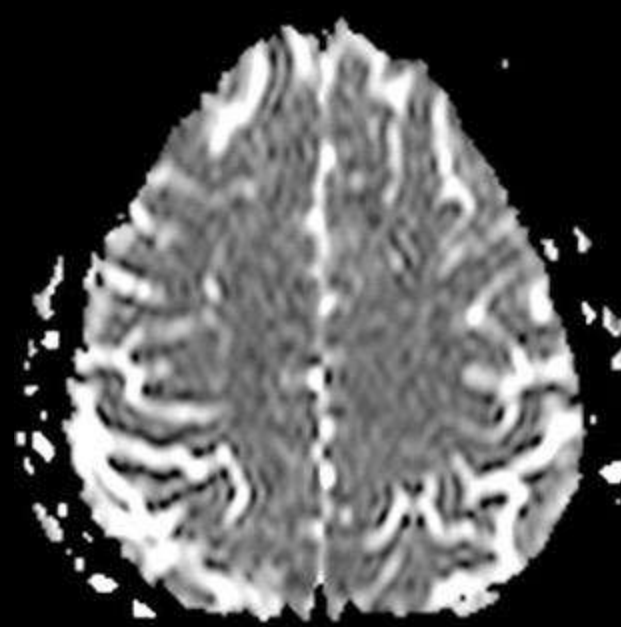


Kontrastlı T1A

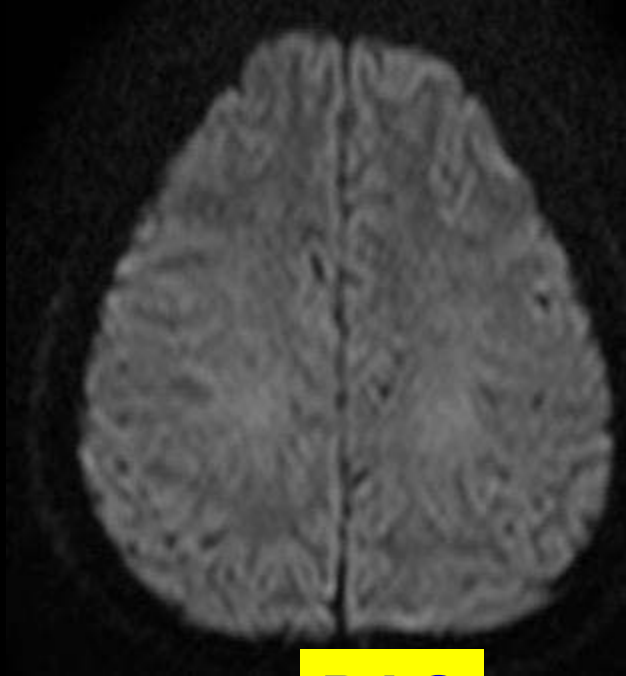




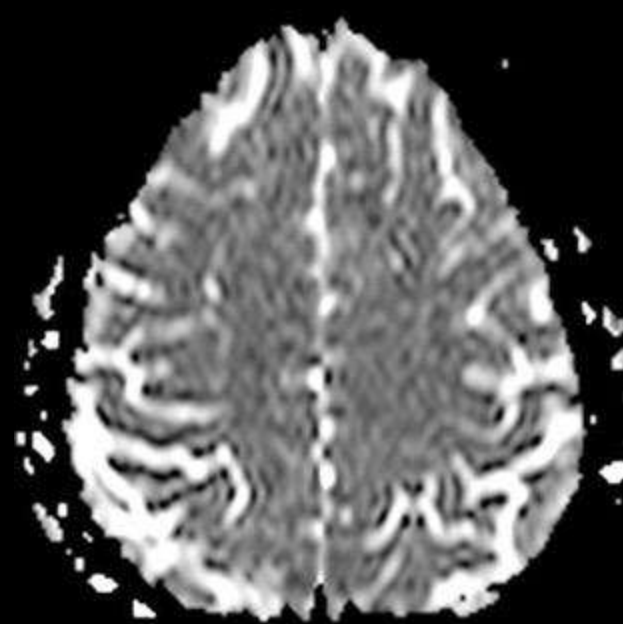
DAG



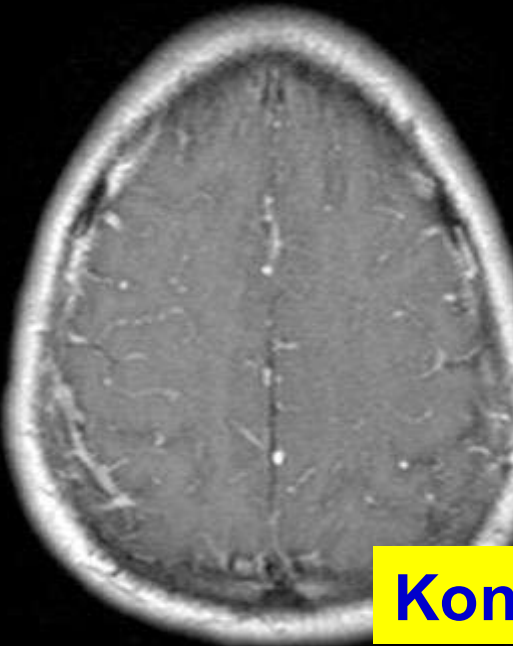
ADC



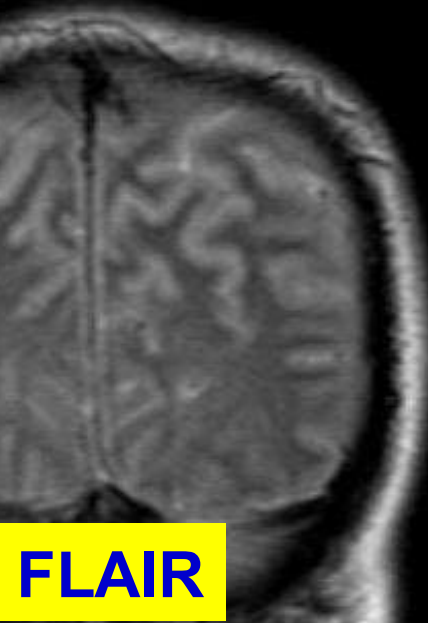
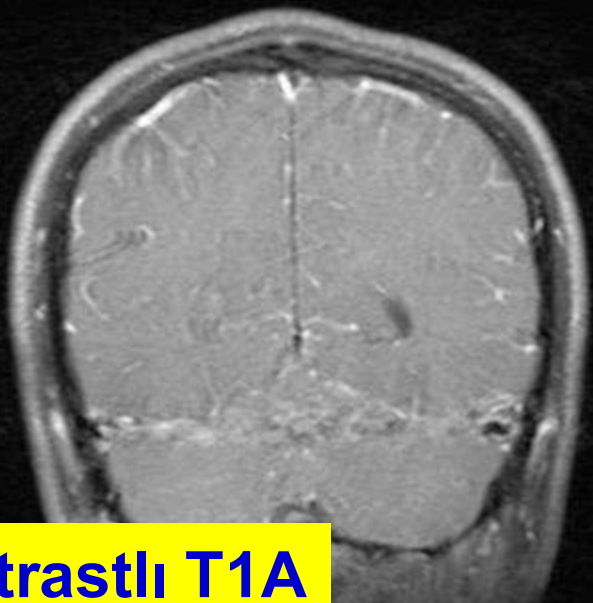
DAG



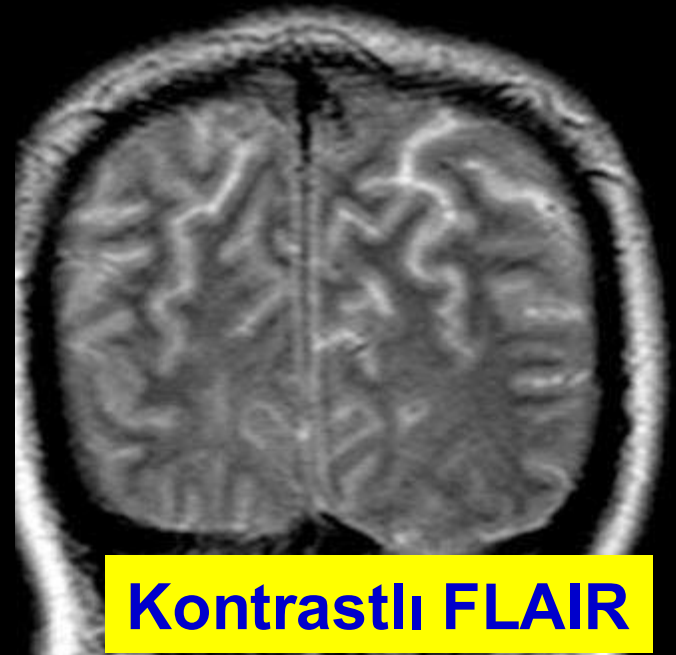
ADC



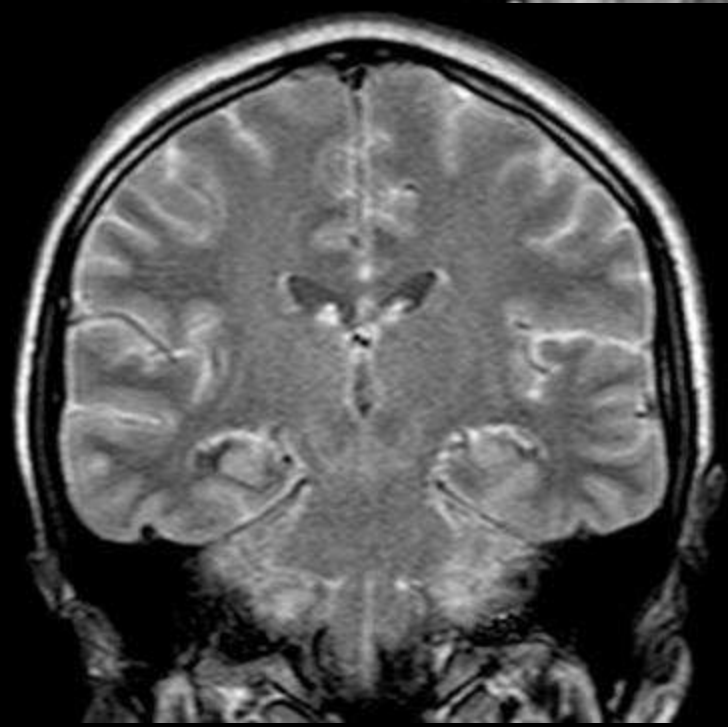
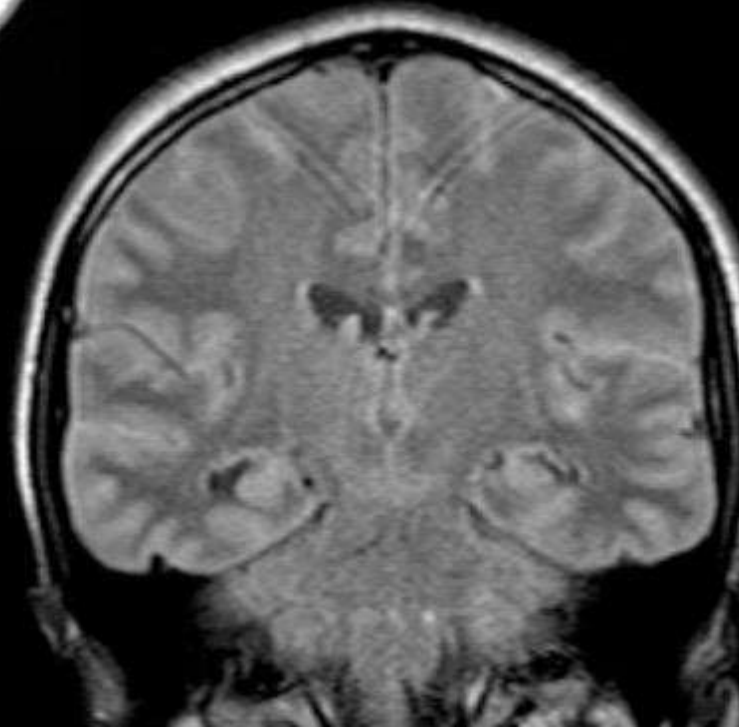
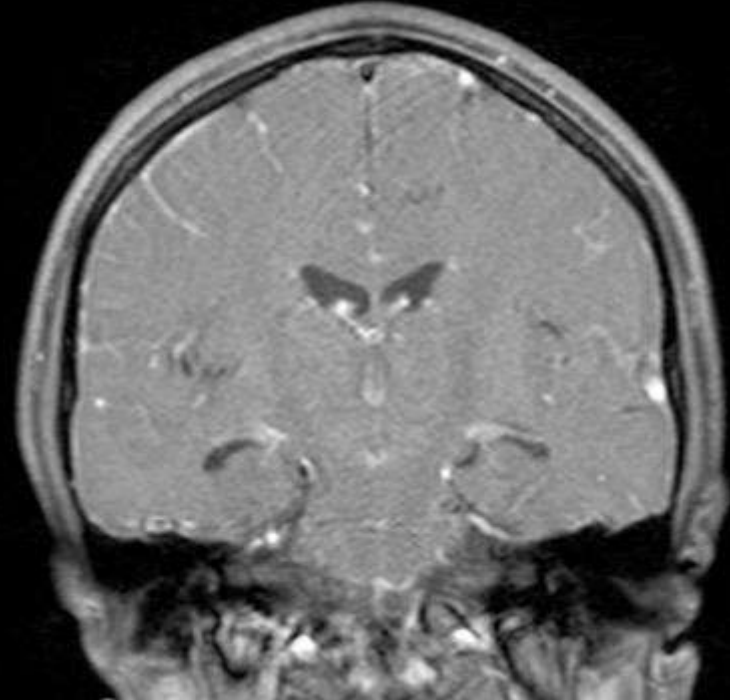
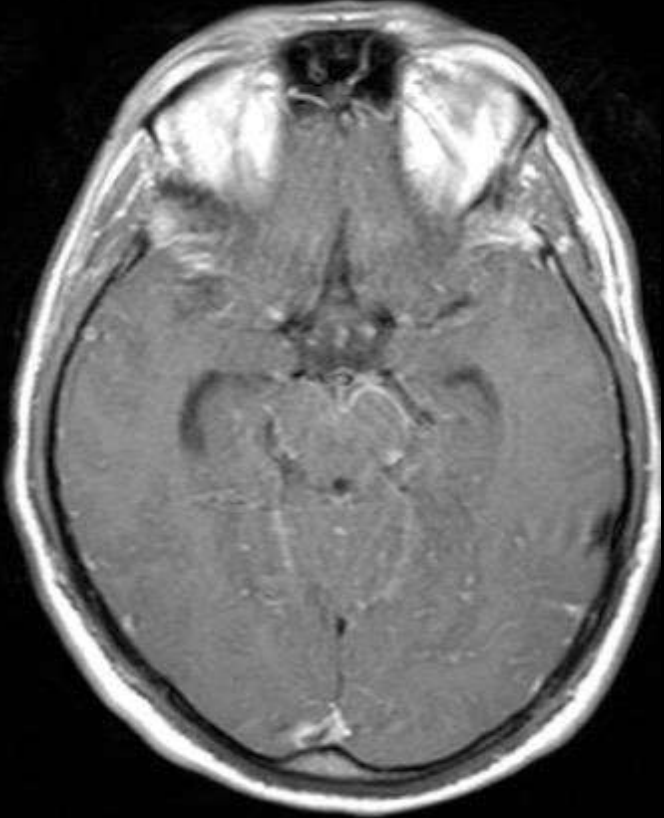
Kontrastlı T1A

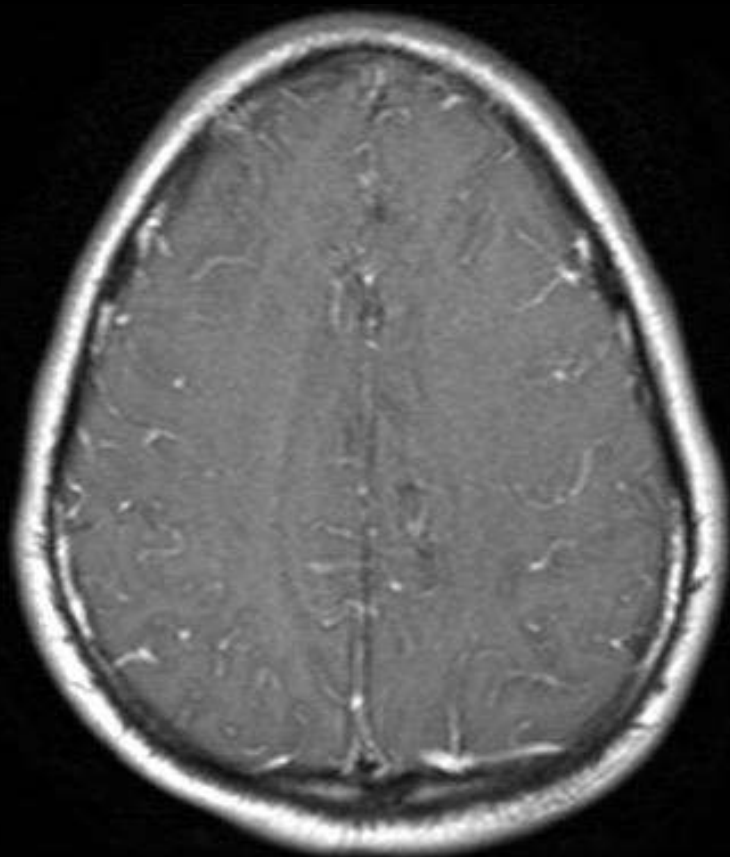
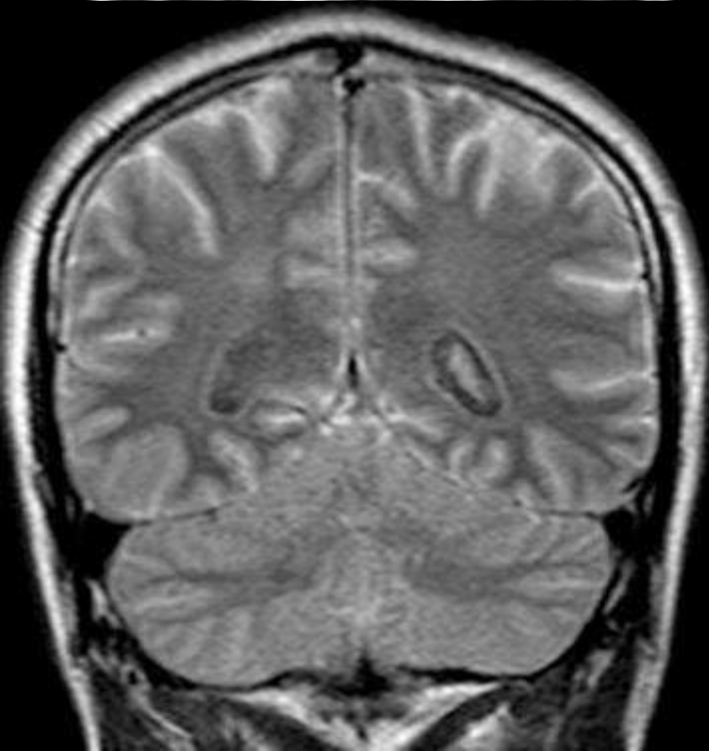
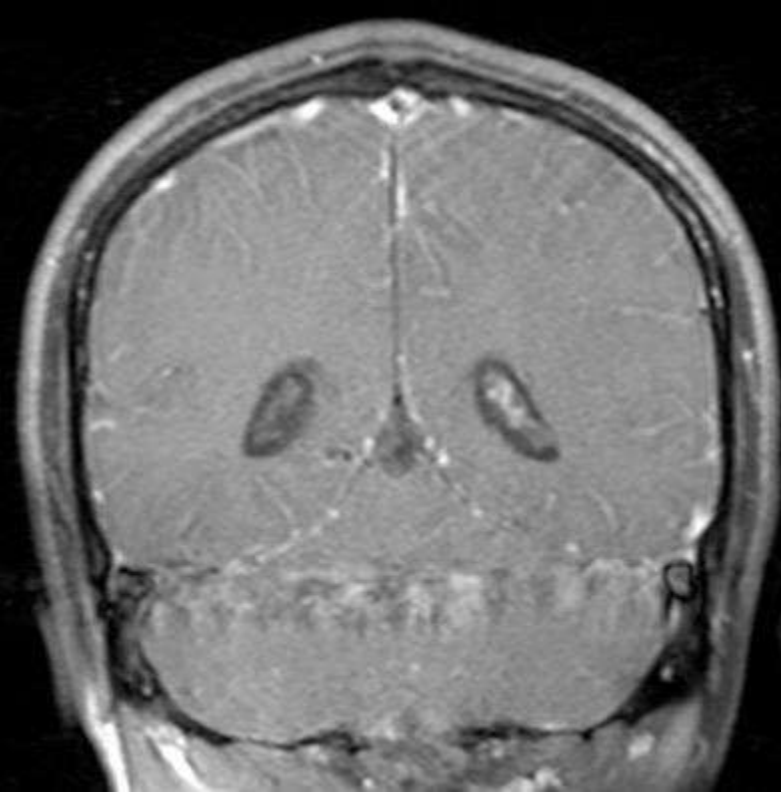
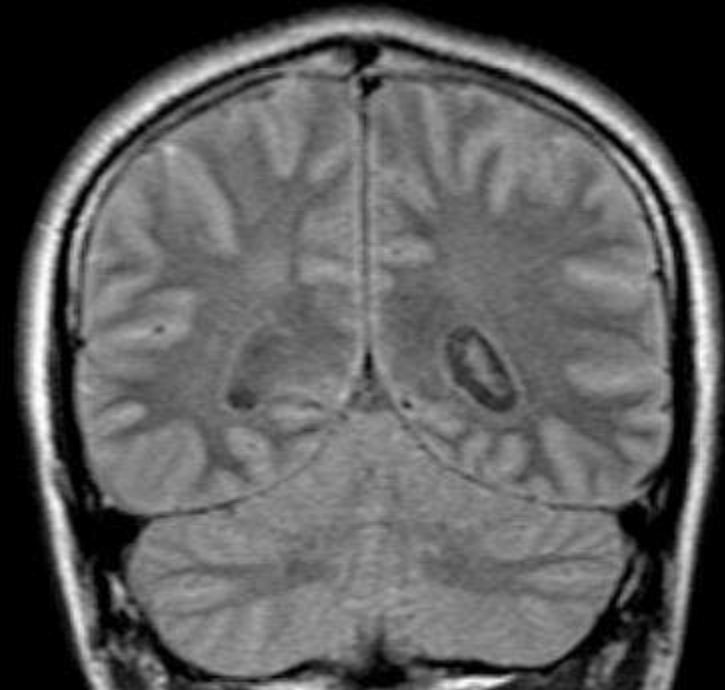


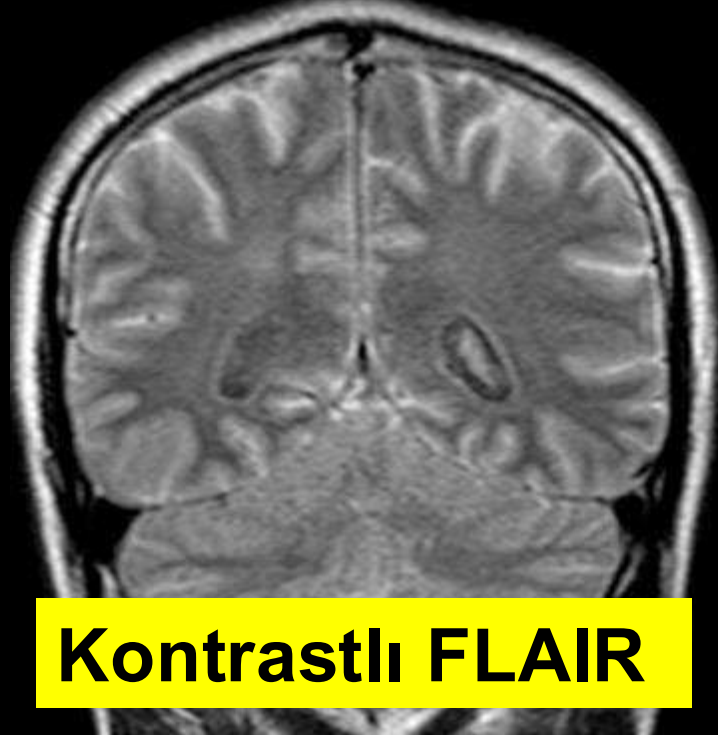
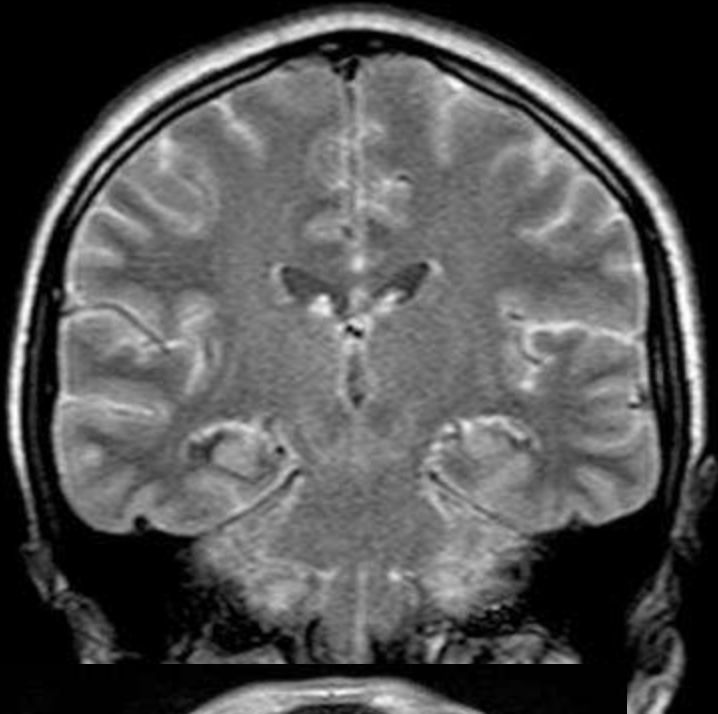
FLAIR



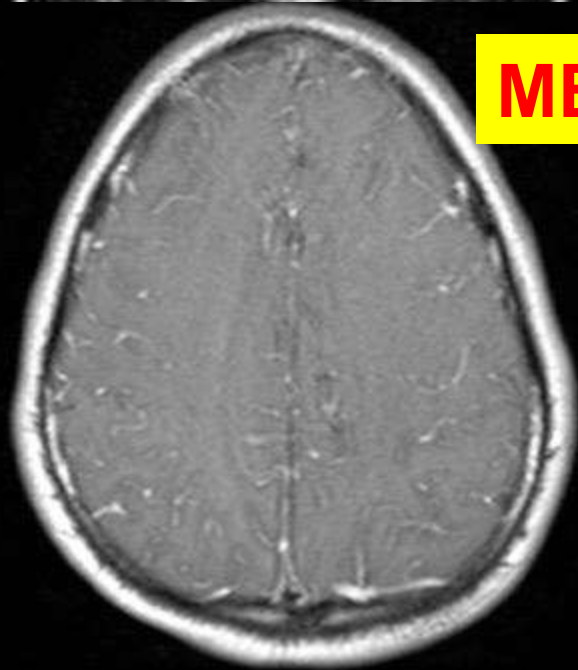
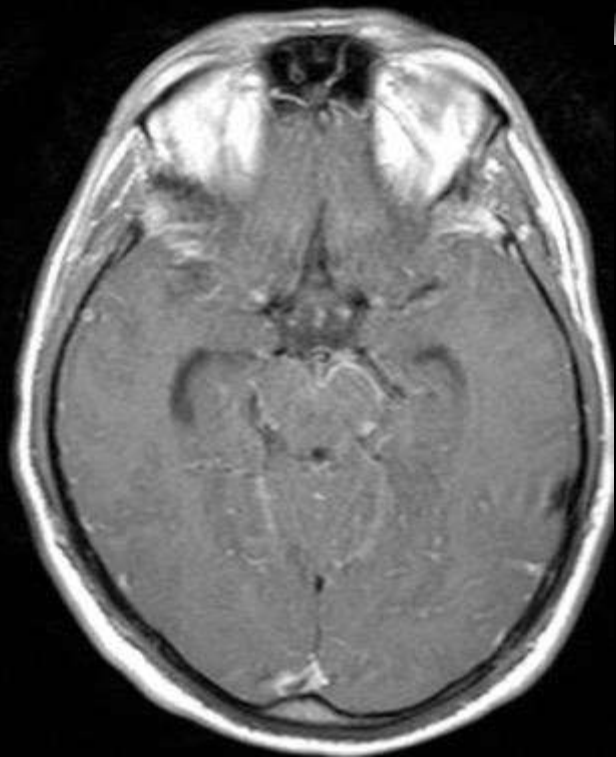
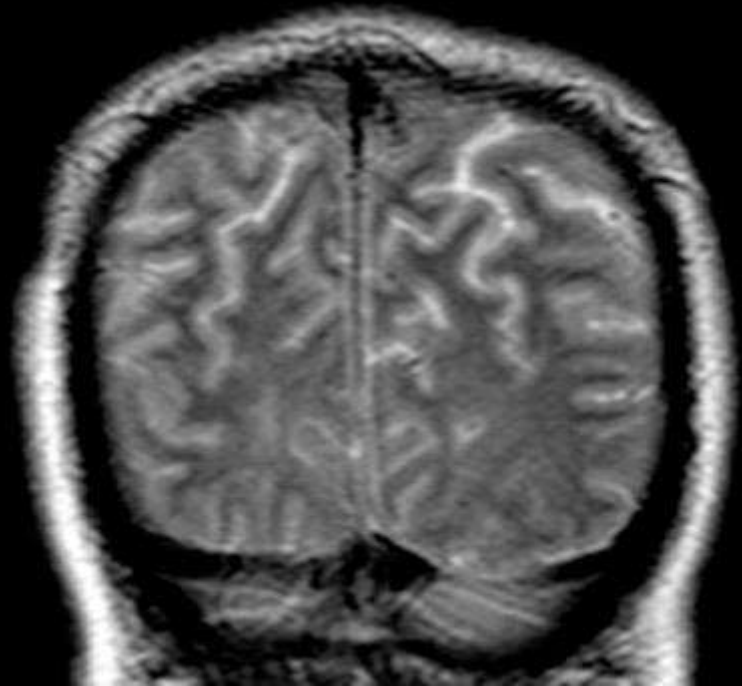
Kontrastlı FLAIR



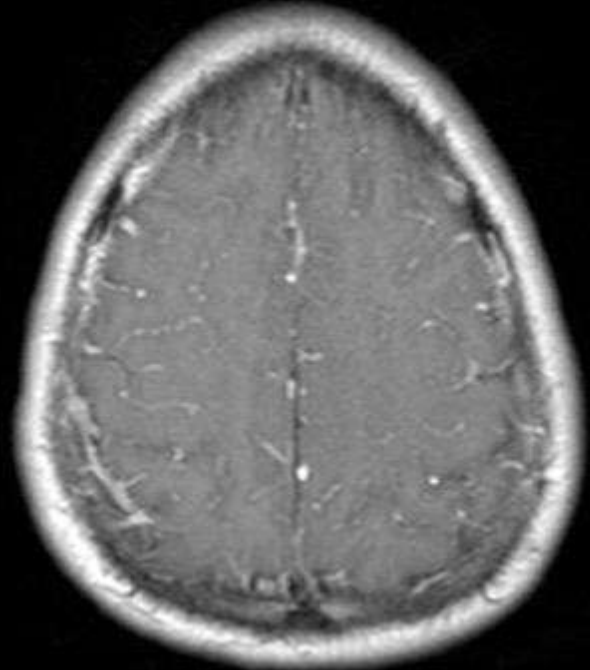


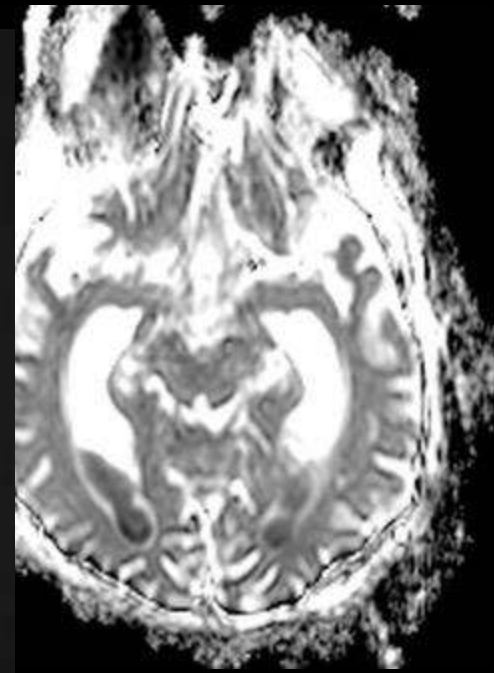
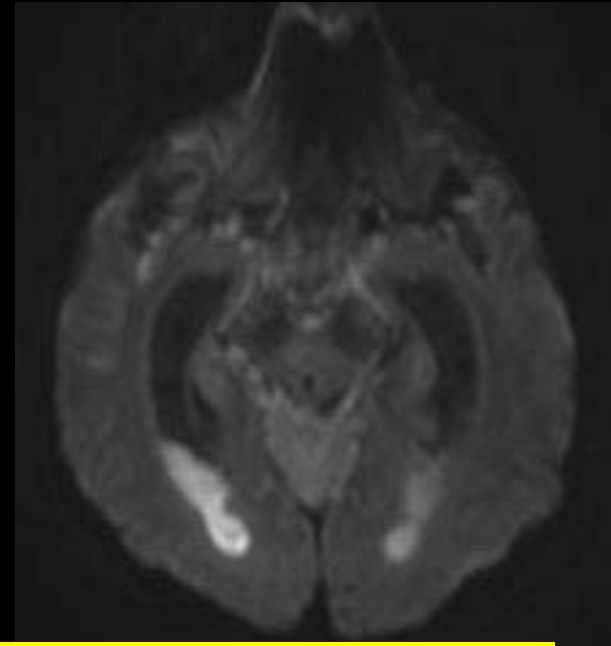
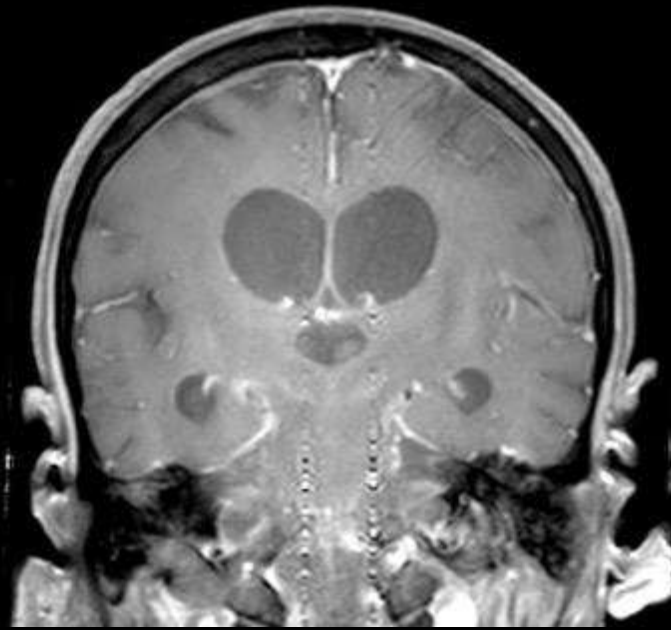
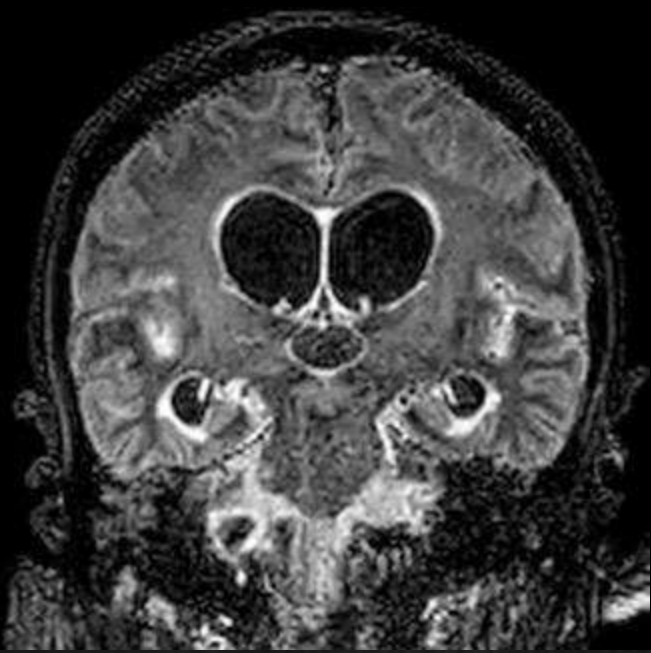


Kontrastlı FLAIR

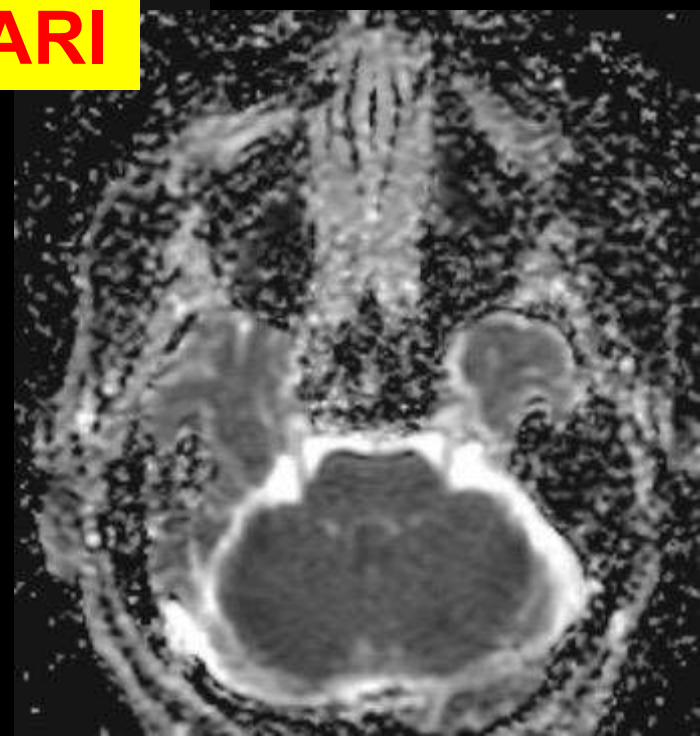
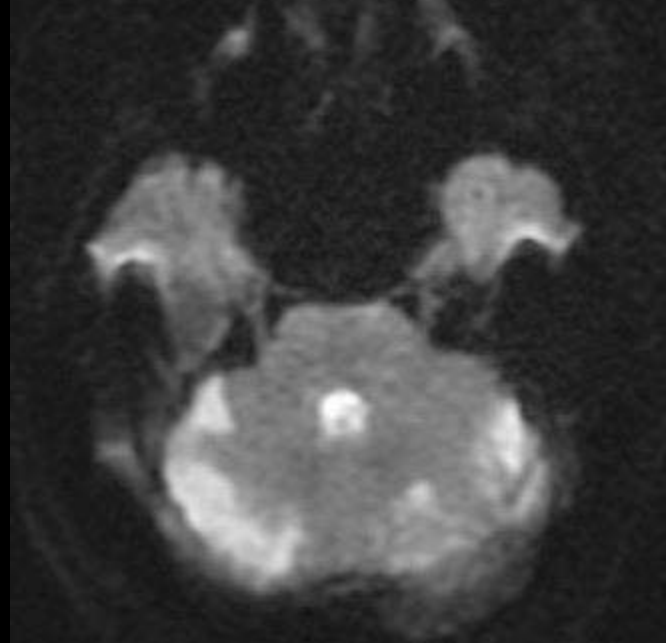
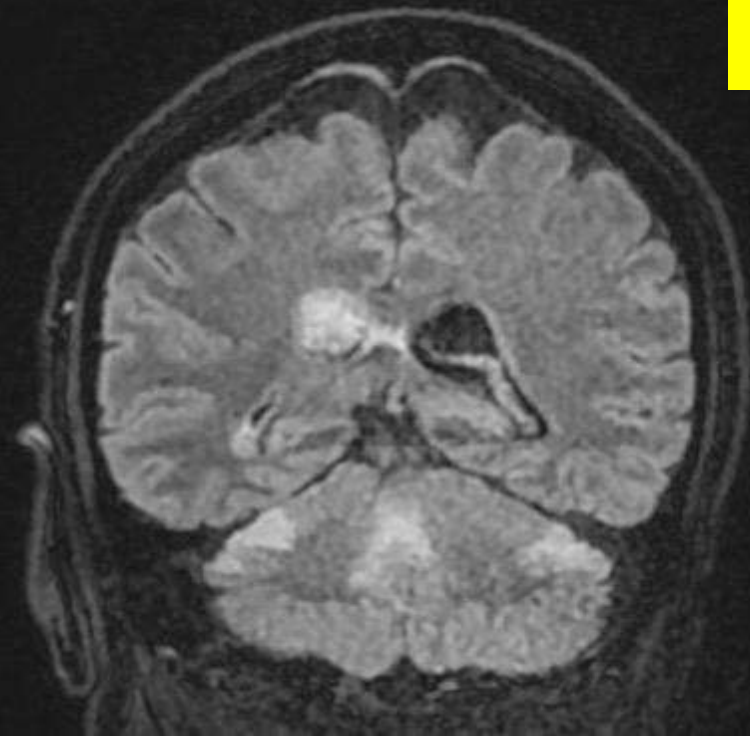


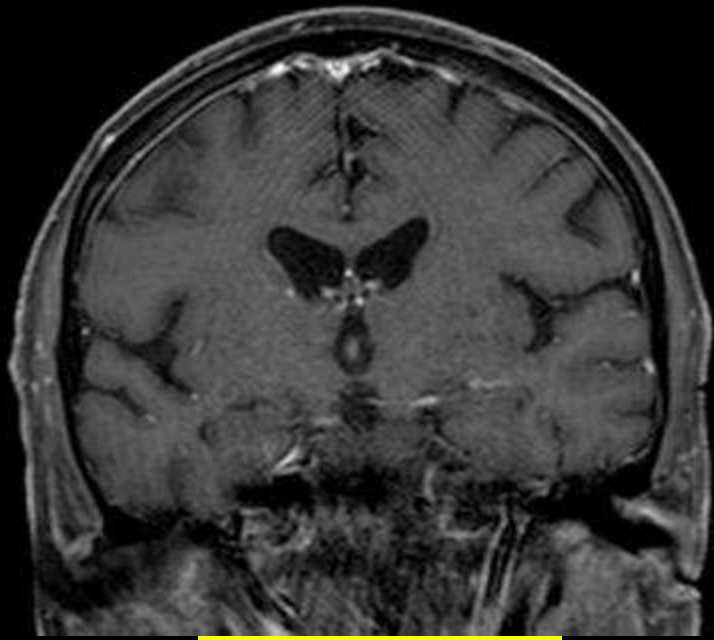
MENENJİT





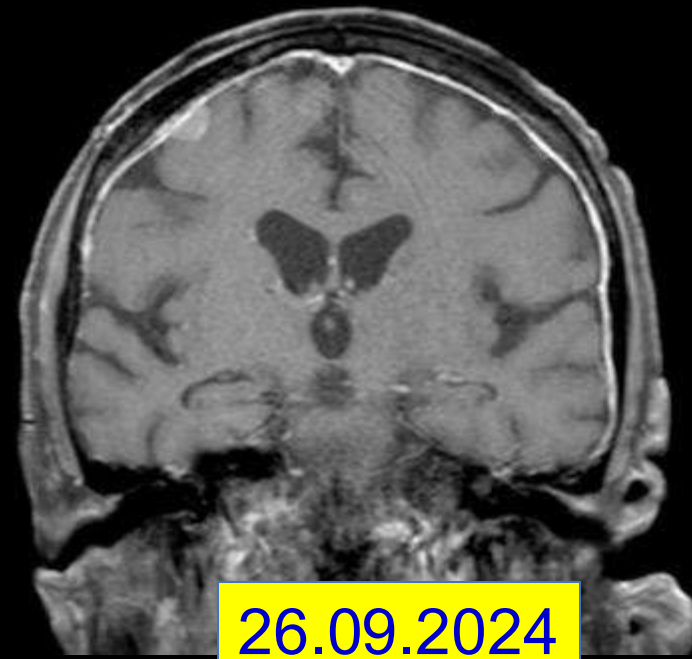
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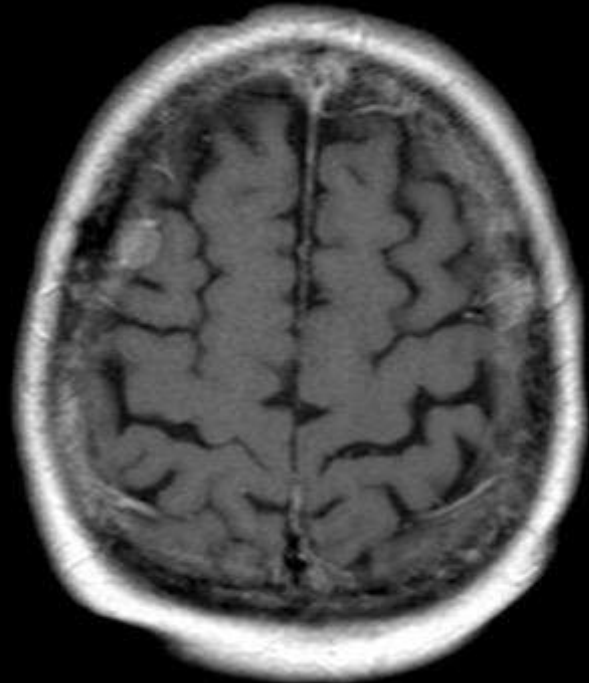
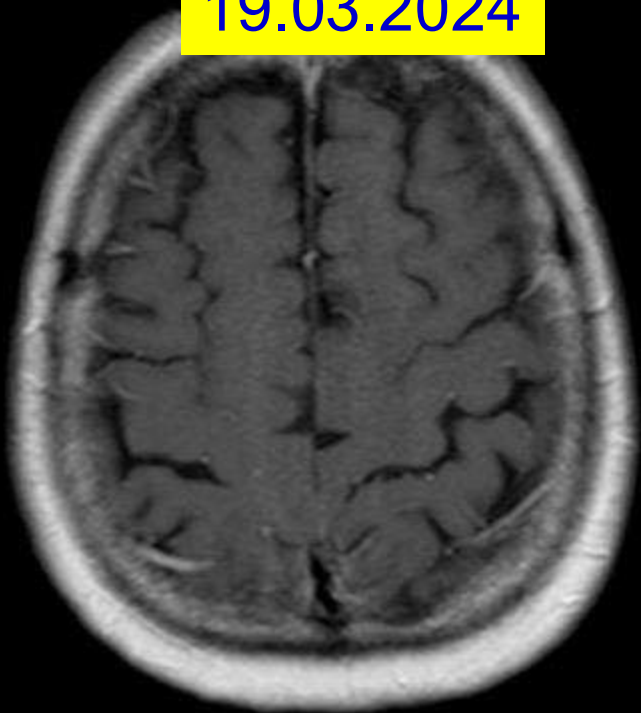


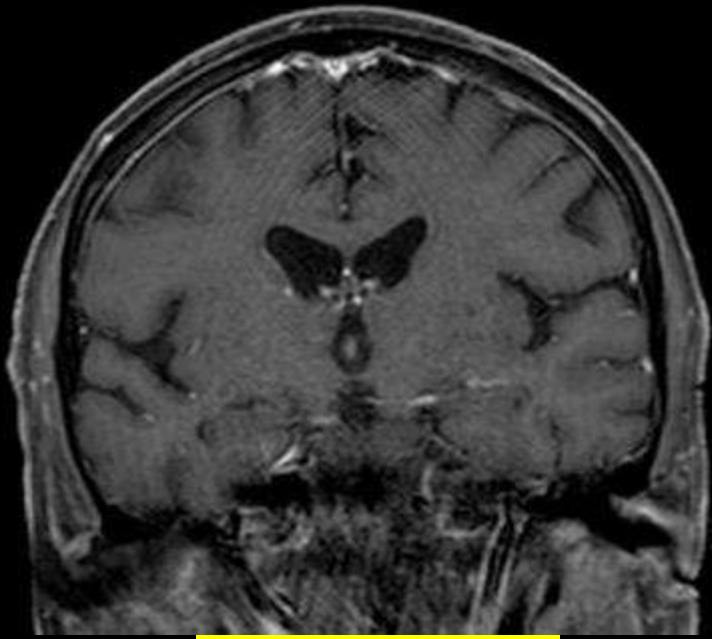
19.03.2024

AYIRICI TANI



26.09.2024

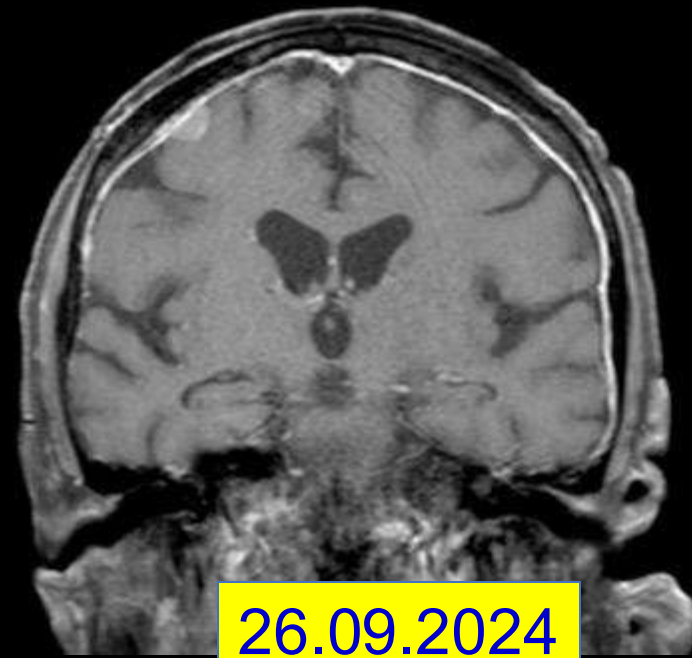




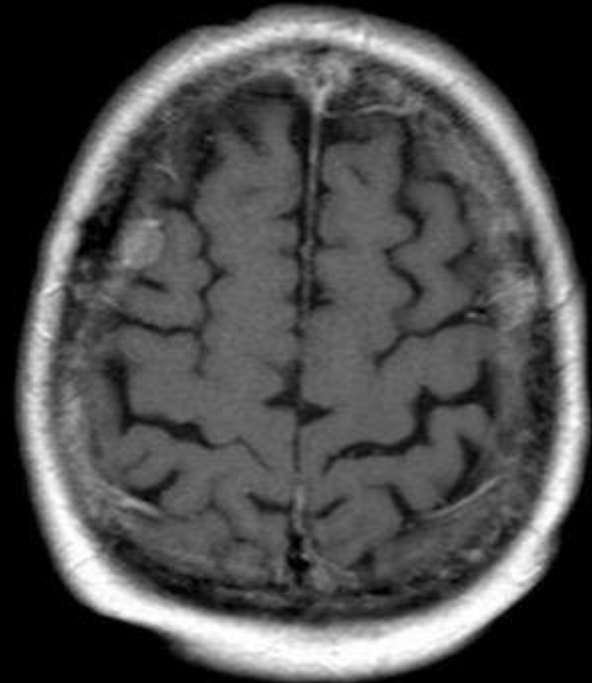
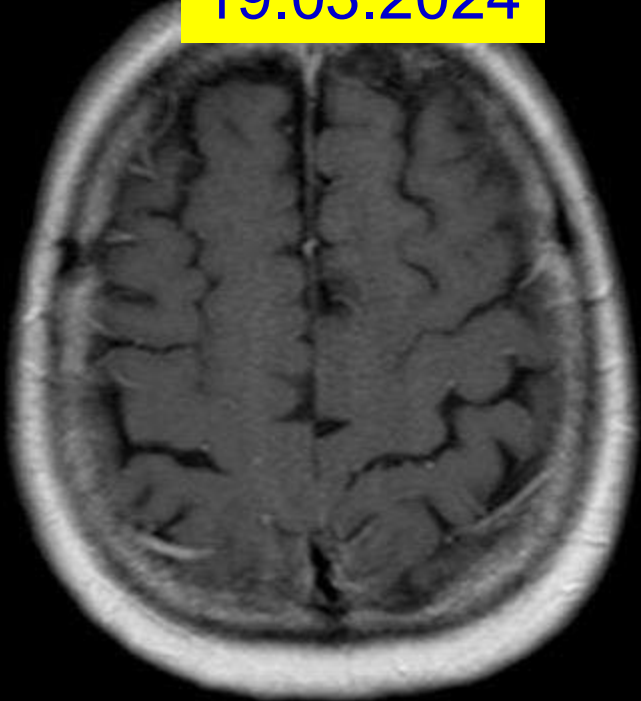
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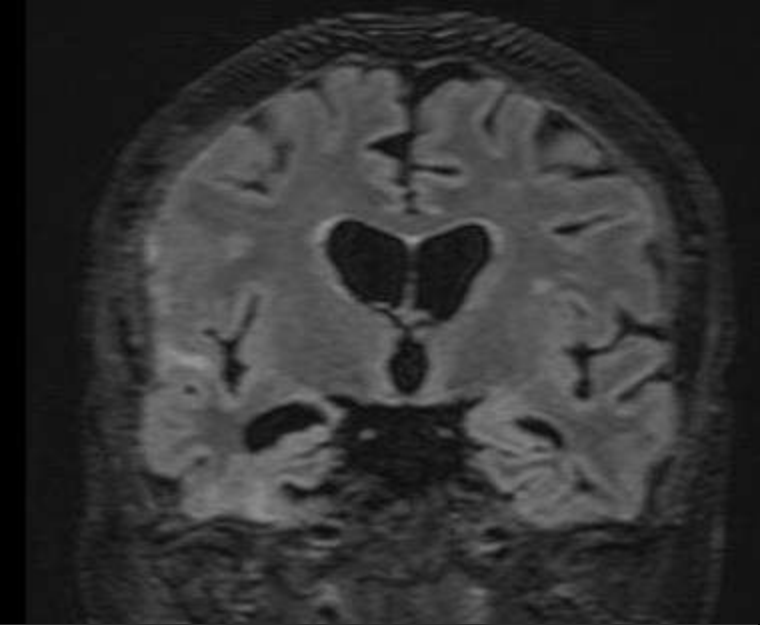
AYIRICI TANI

AC Ca dural metastaz

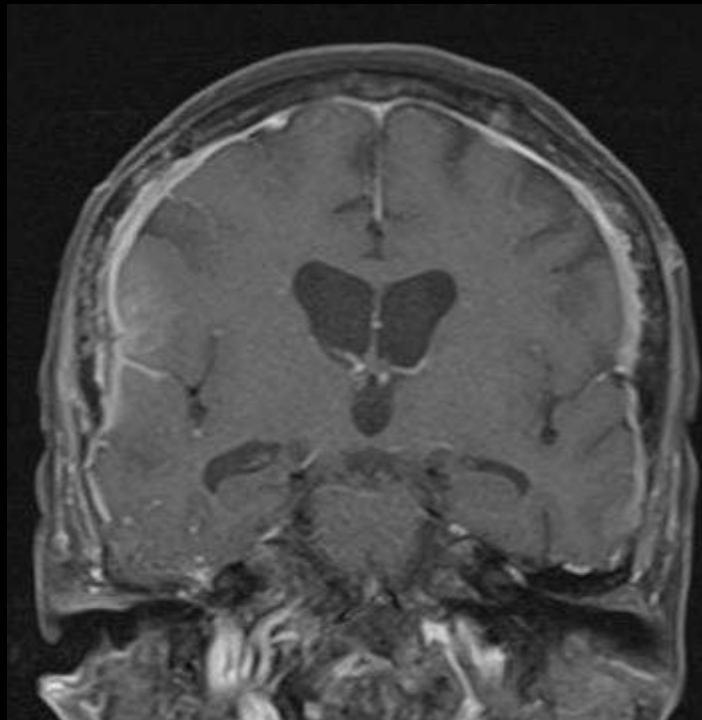


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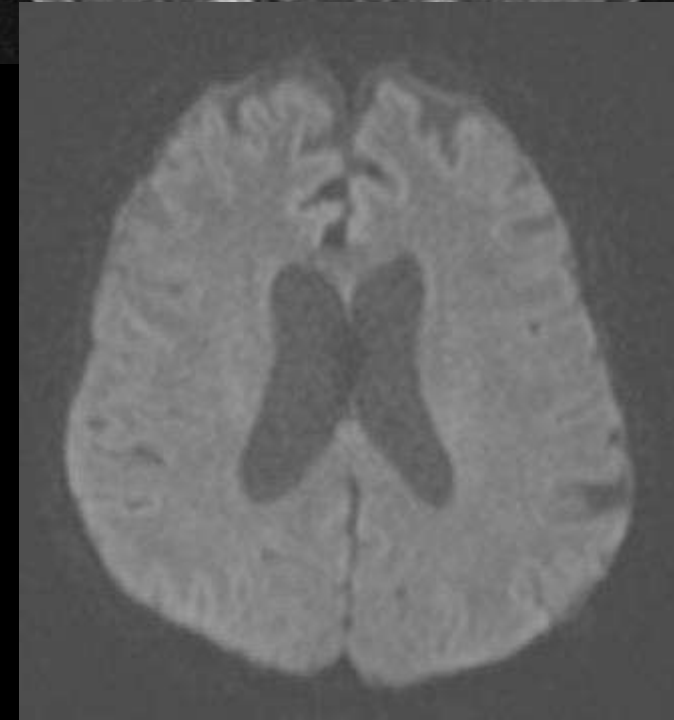
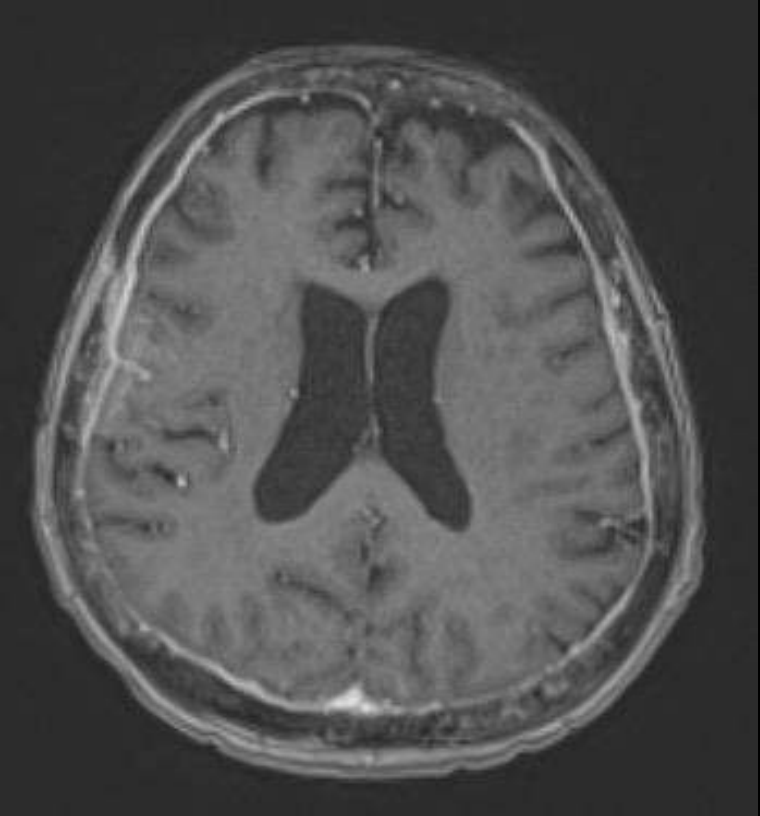


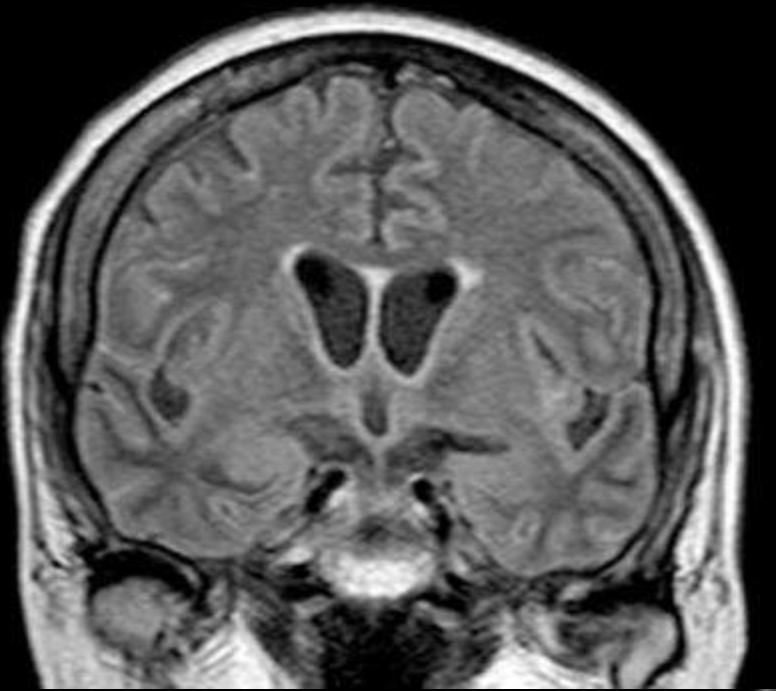


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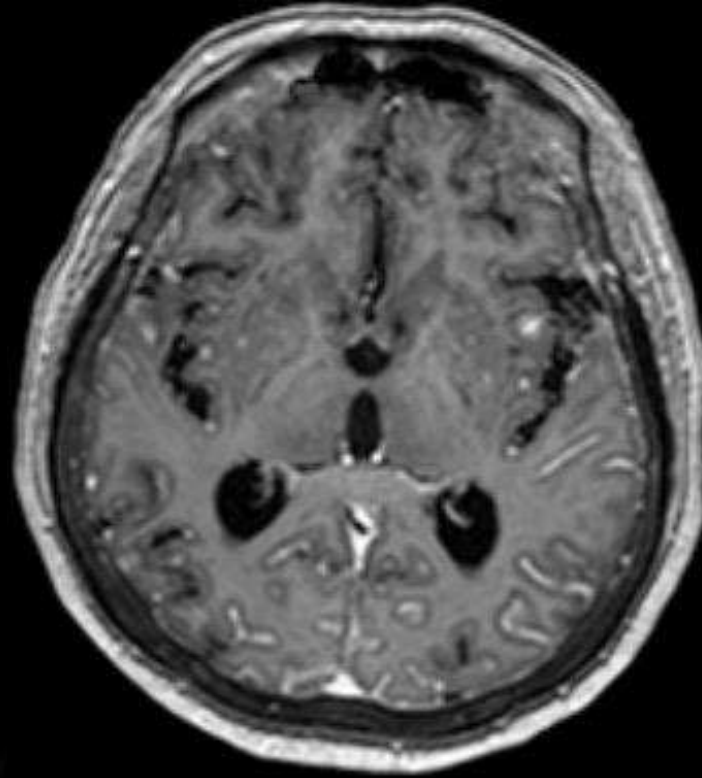


**AC Ca dural
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metastaz**

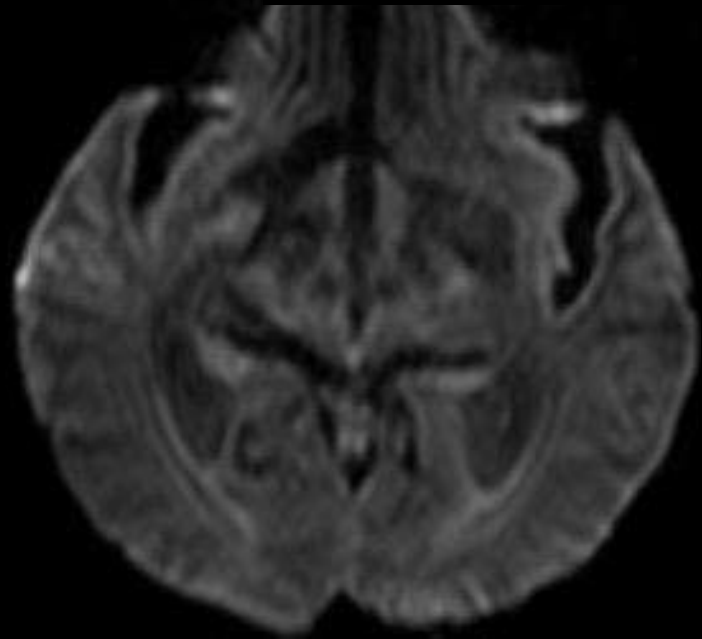


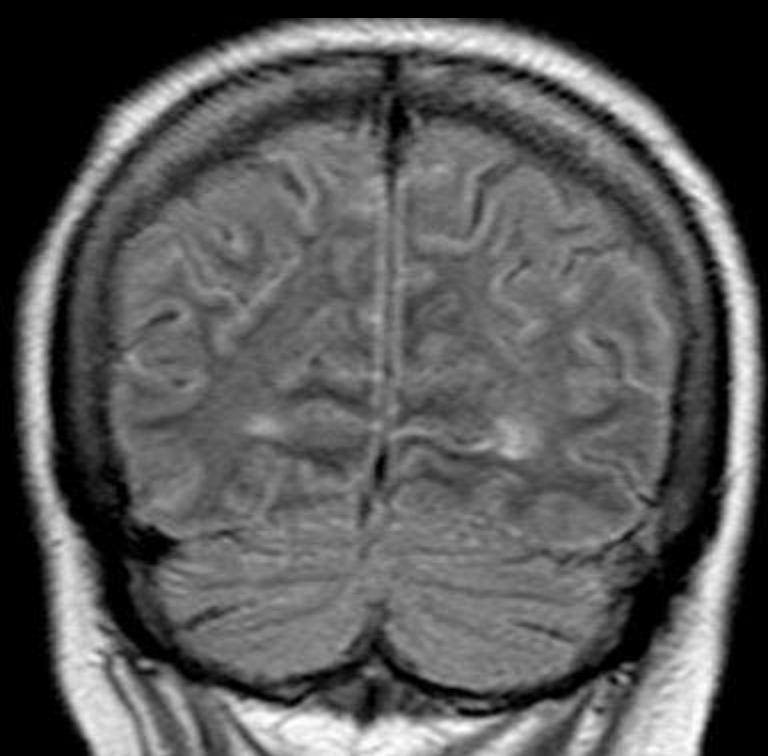


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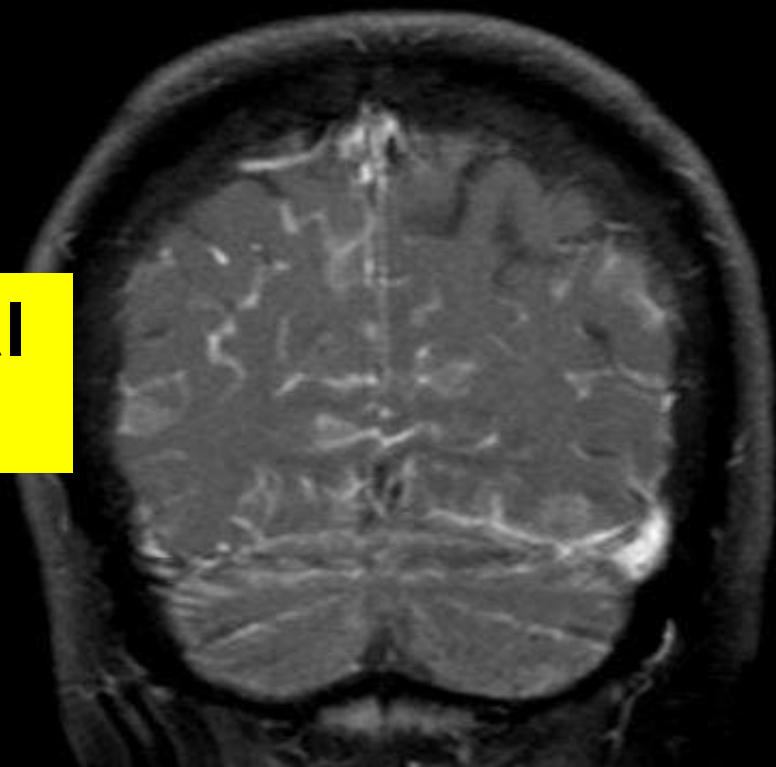


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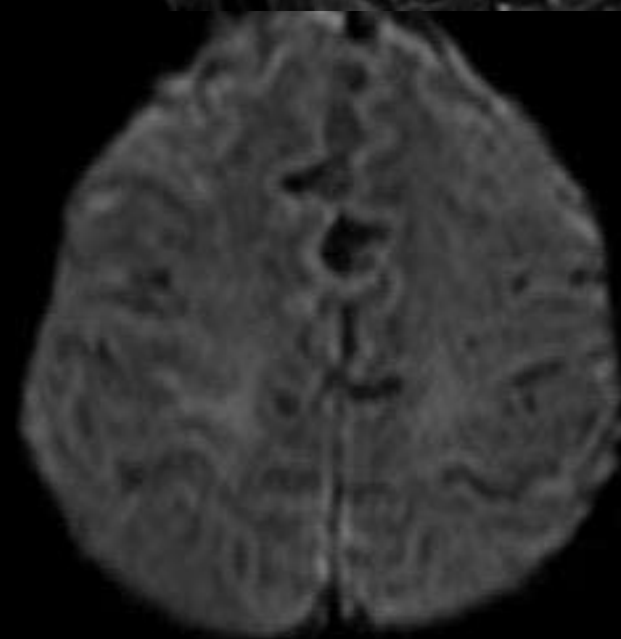
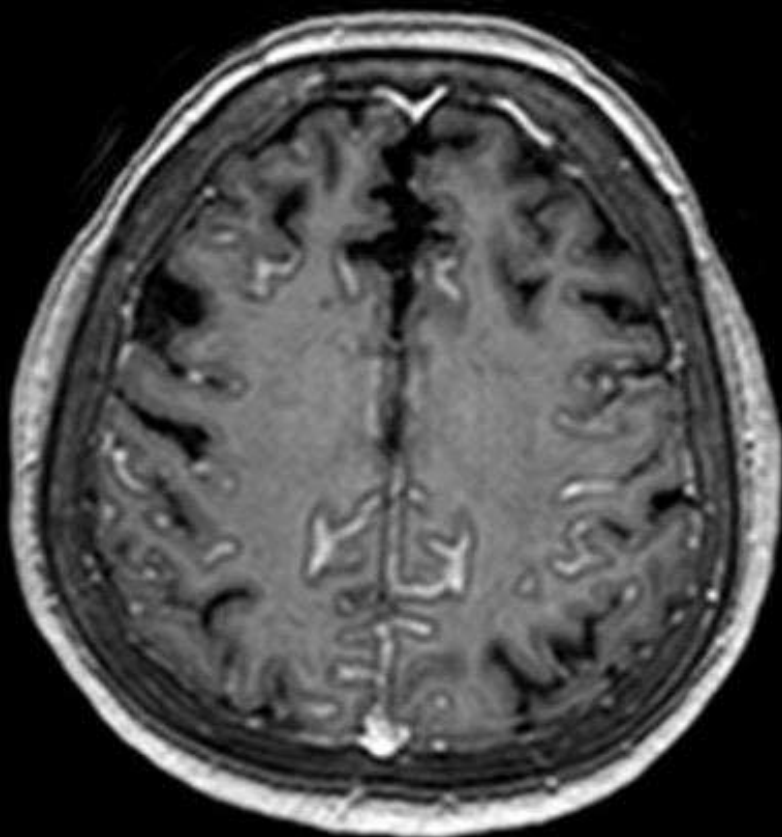




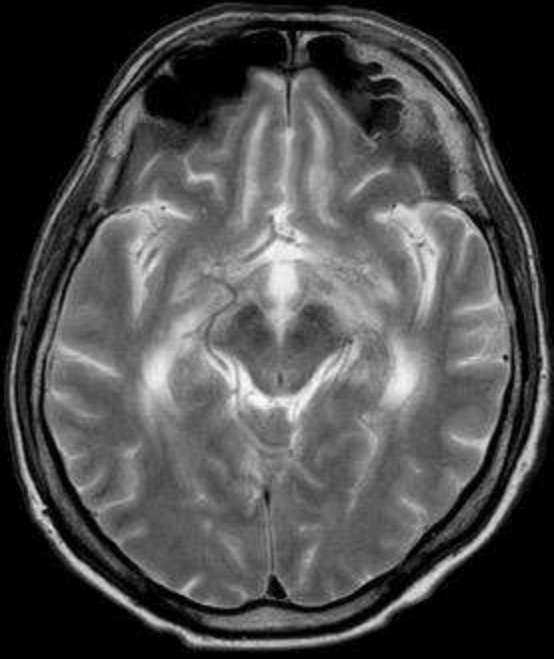
**Meme Ca leptomeningeal
metastaz**



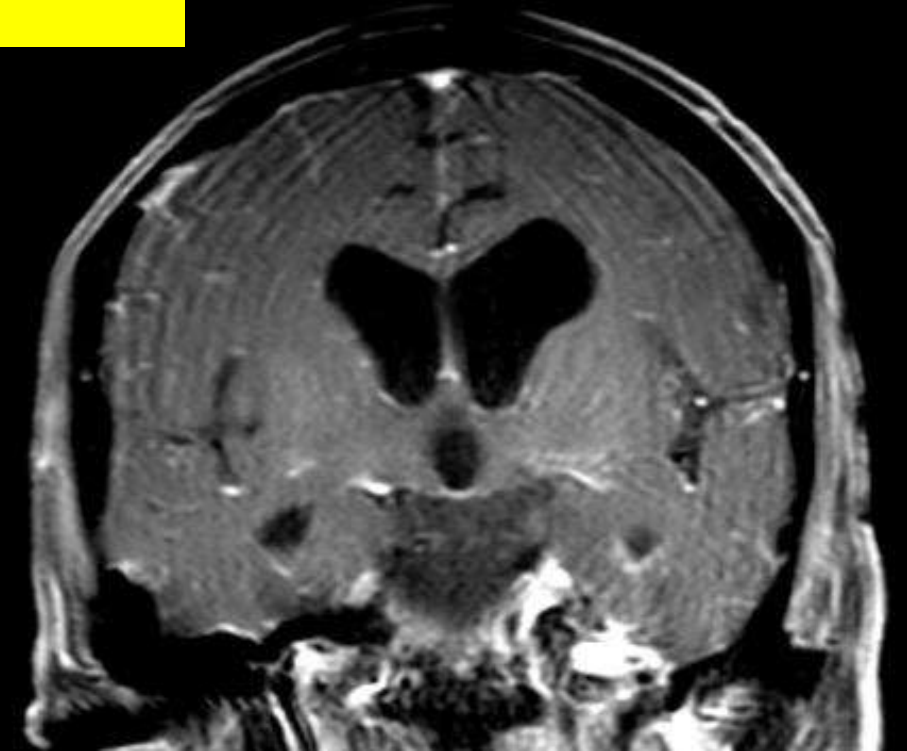
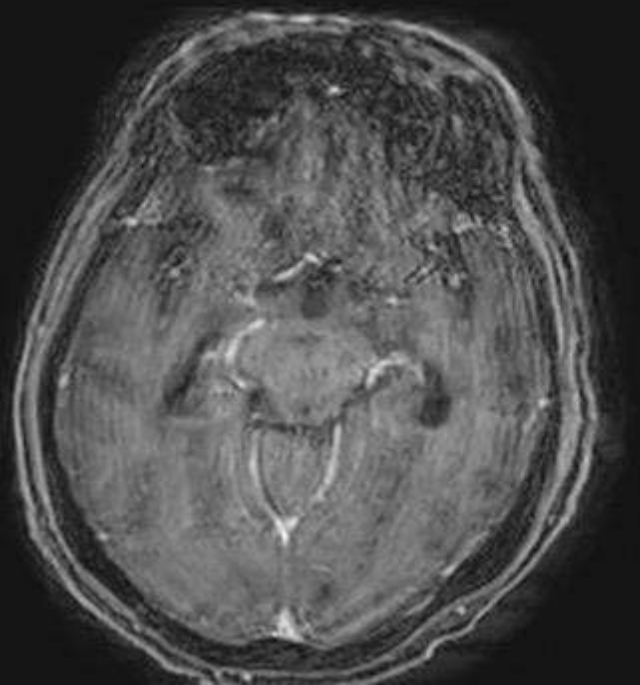
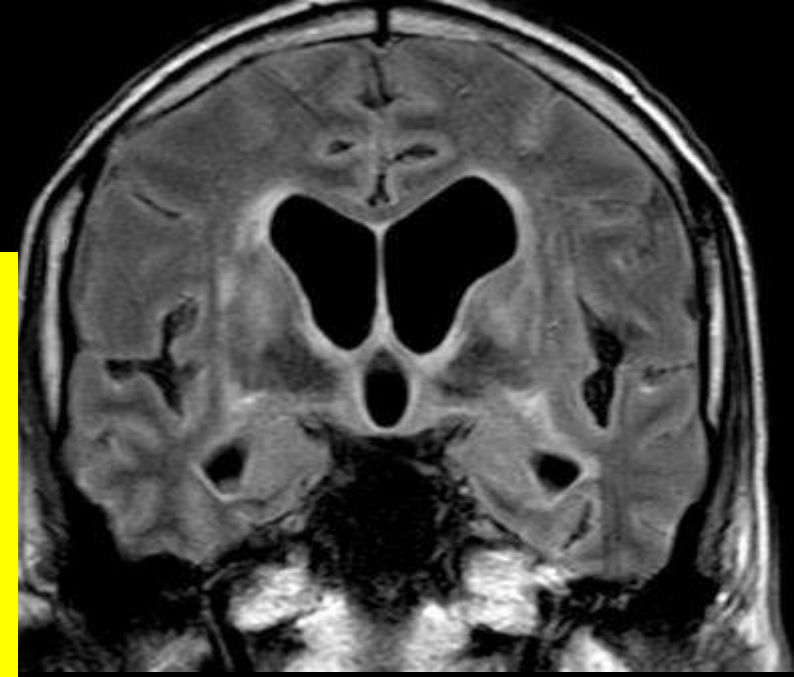
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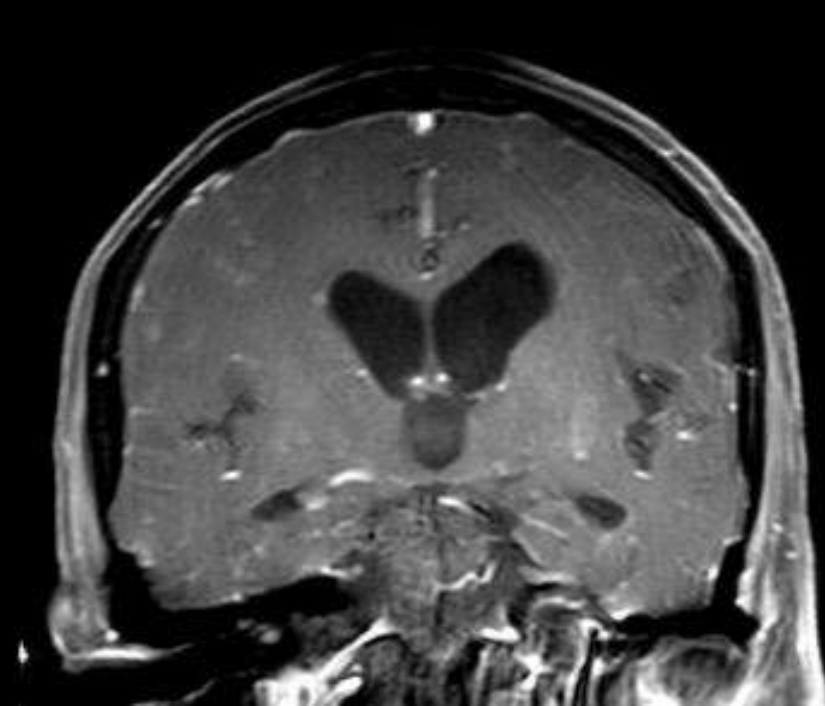
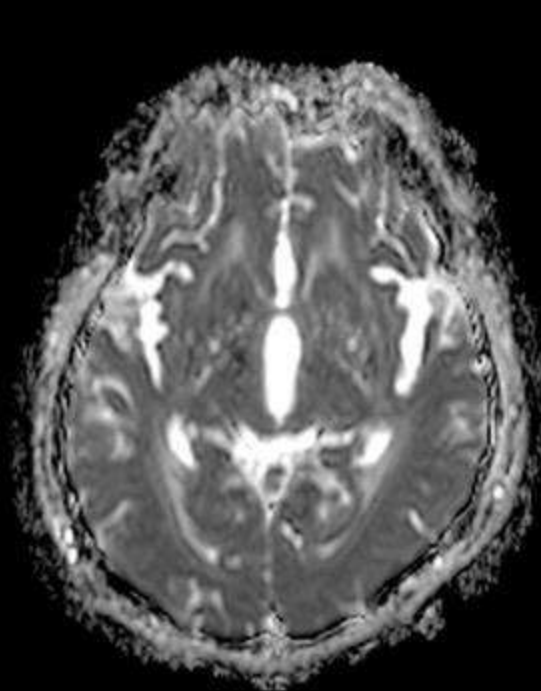
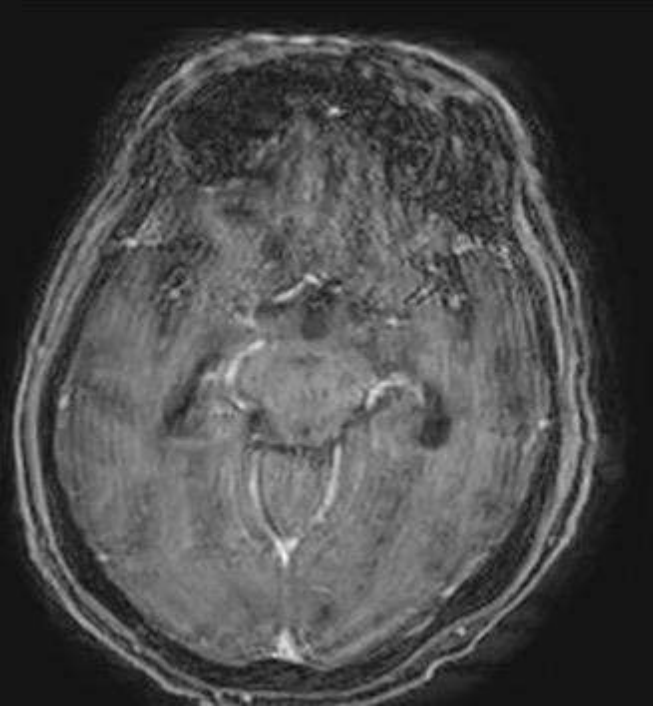
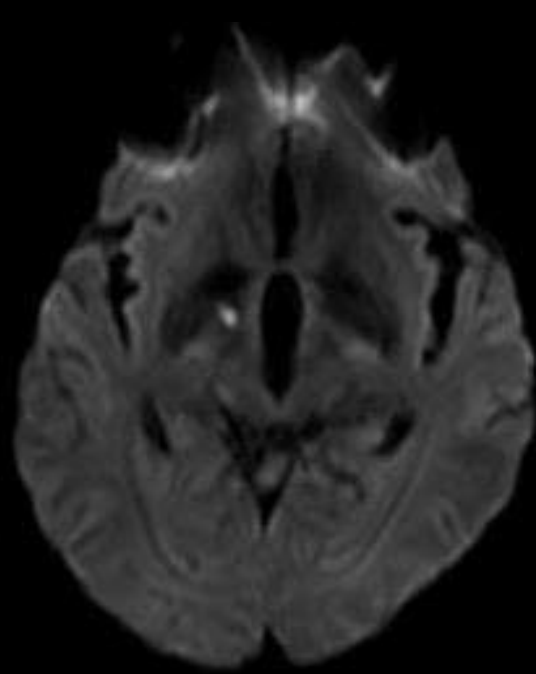
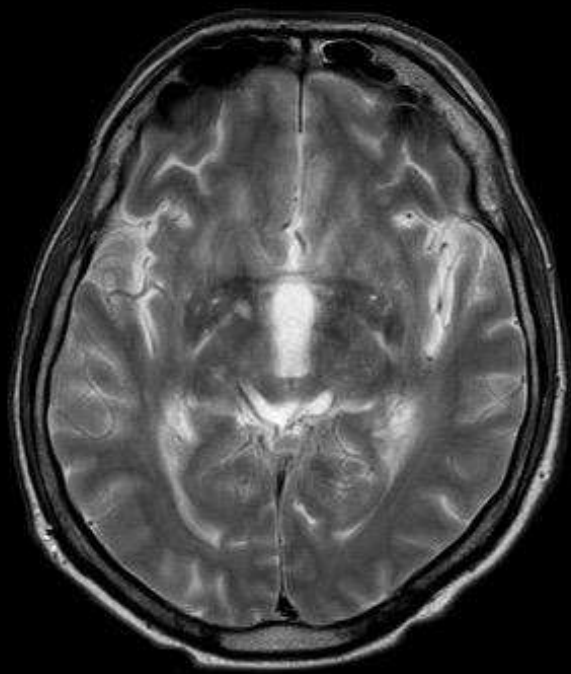


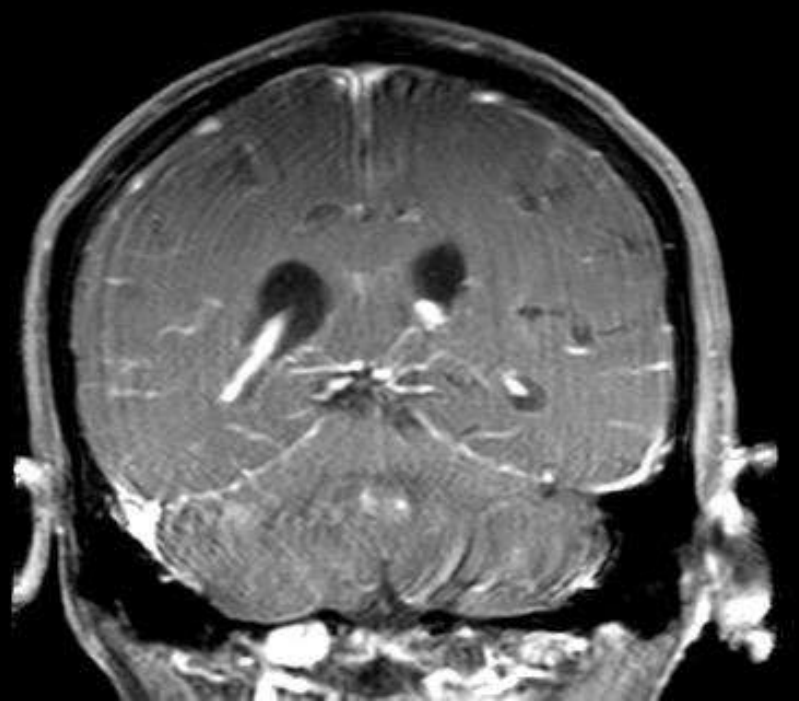
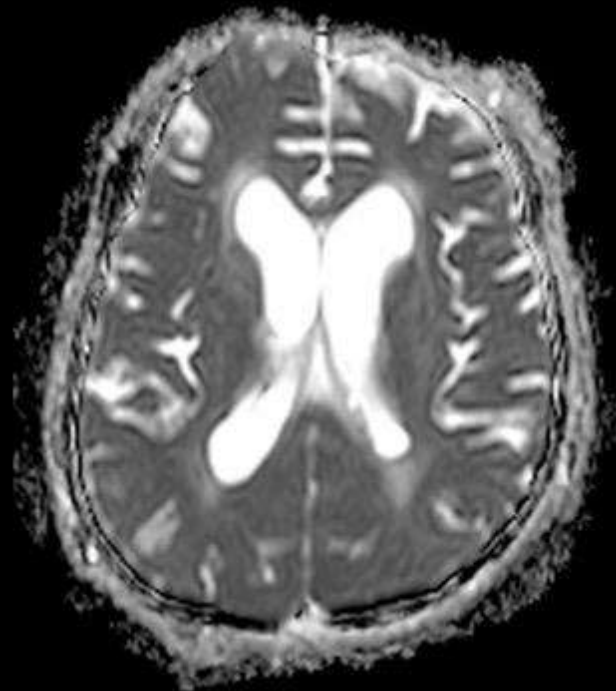
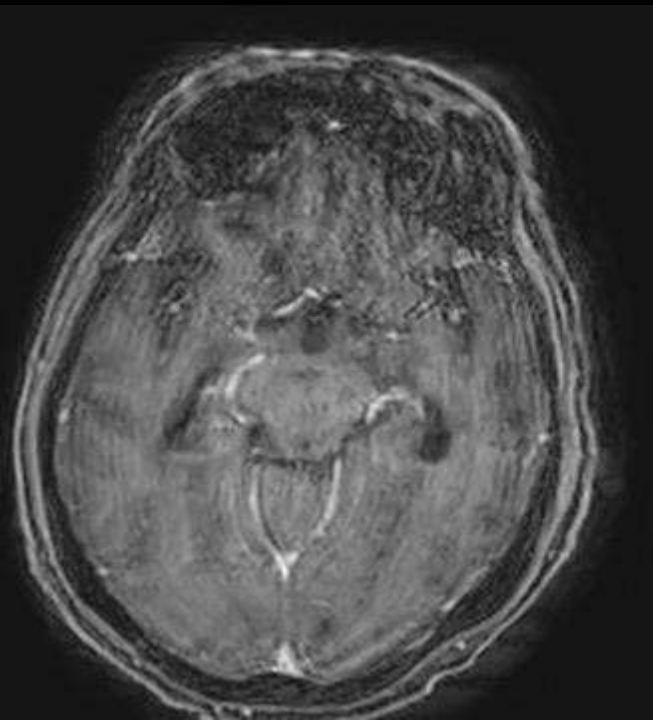
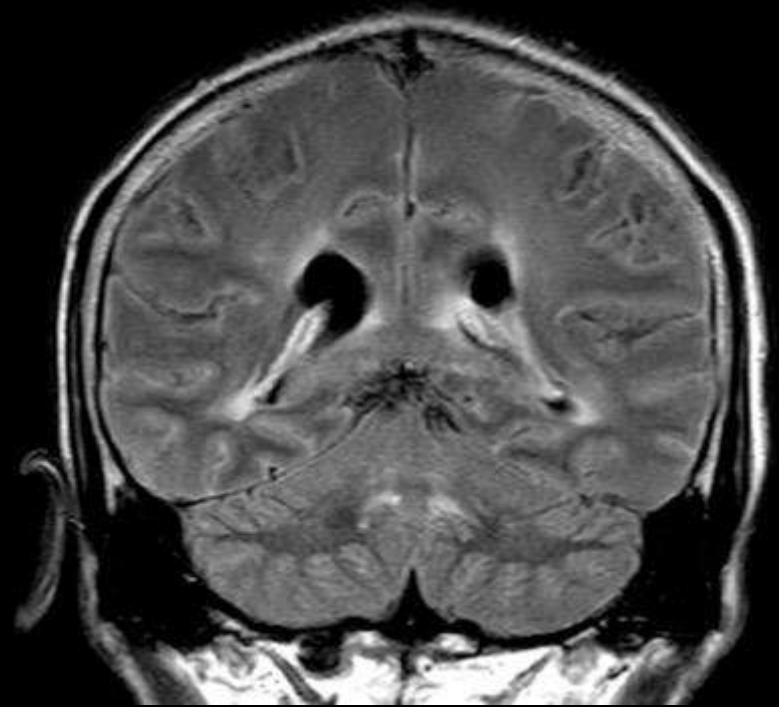
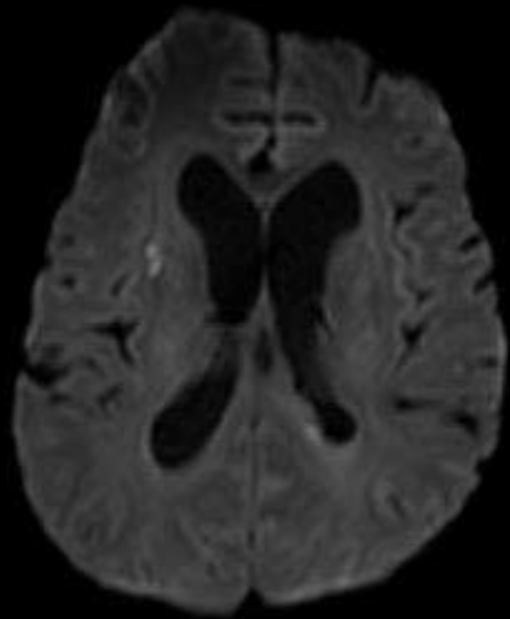
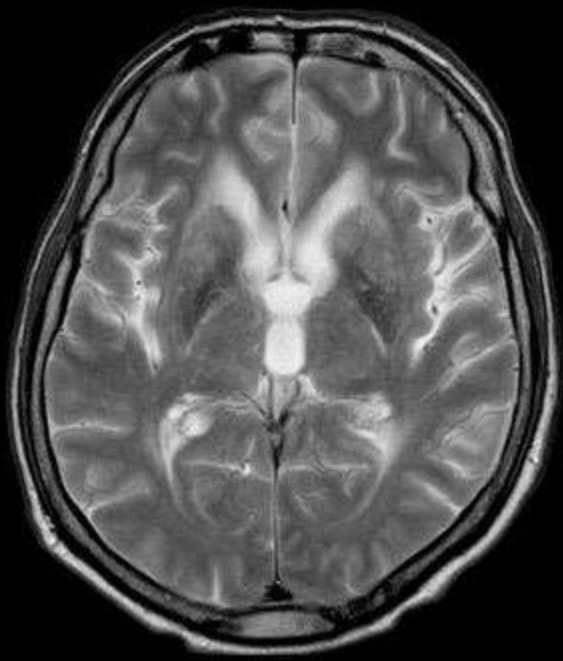
2. OLGU

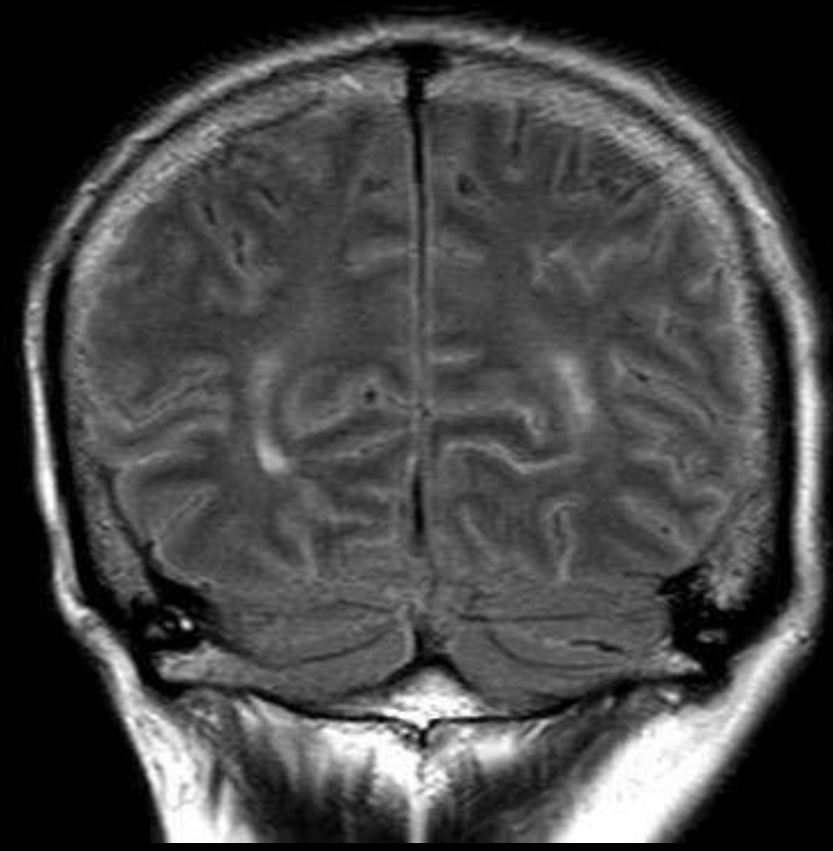
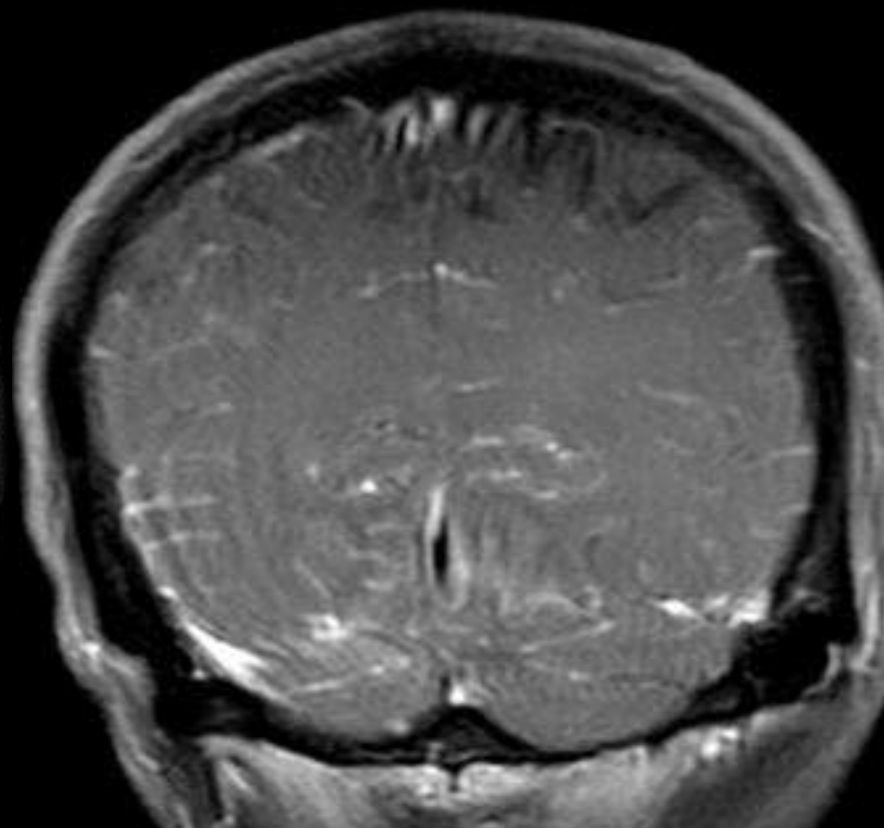
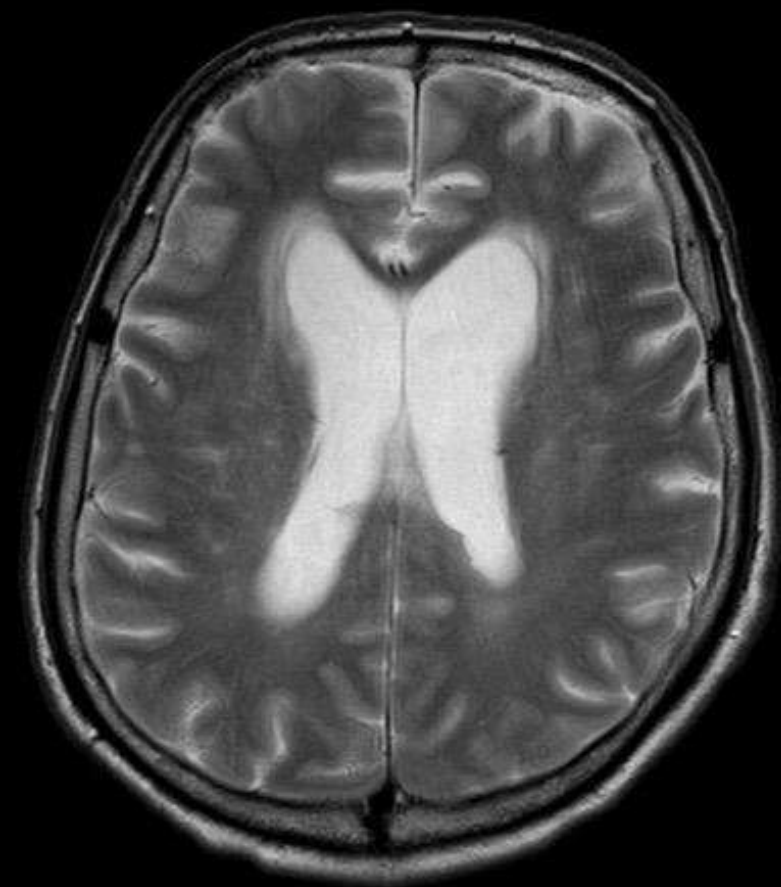


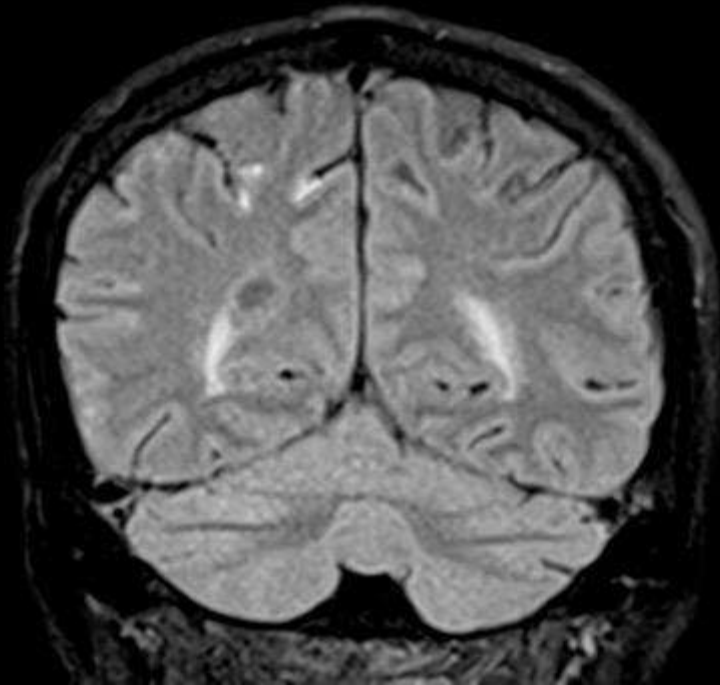
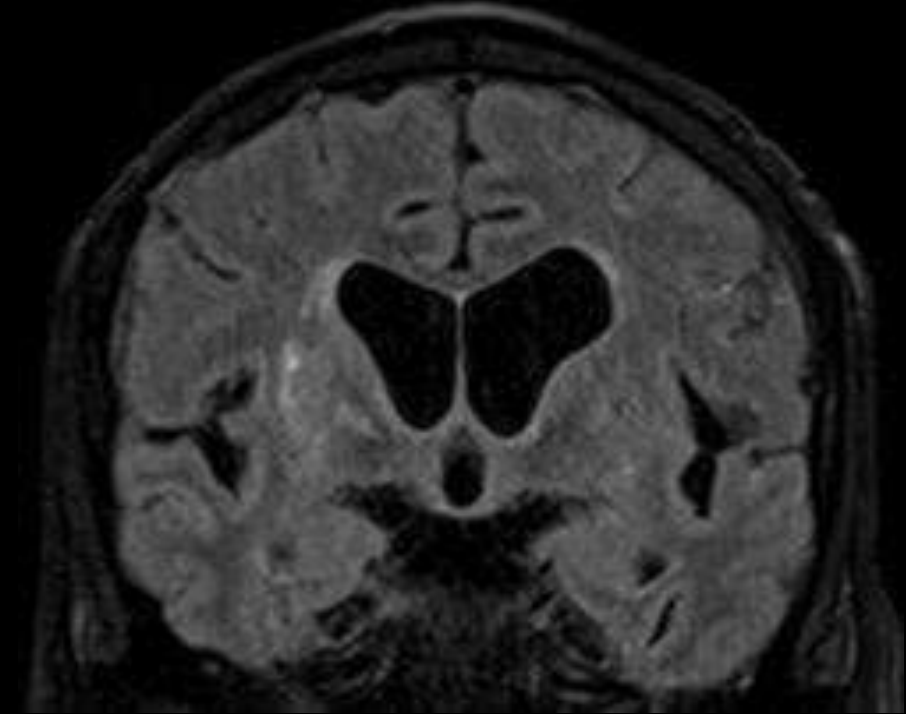
- ✓ Leptomeningeal ve pakimeningeal kontrastlanma
- ✓ Kriptokokoma
- ✓ Genişlemiş perivasküler boşluk
- ✓ Laküner enfarktlar
- ✓ Hidrosefali



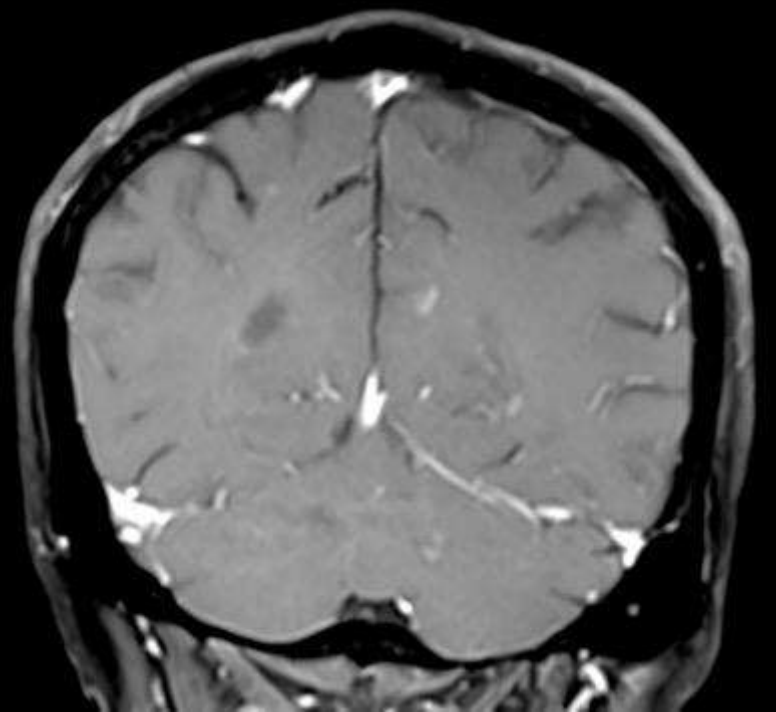
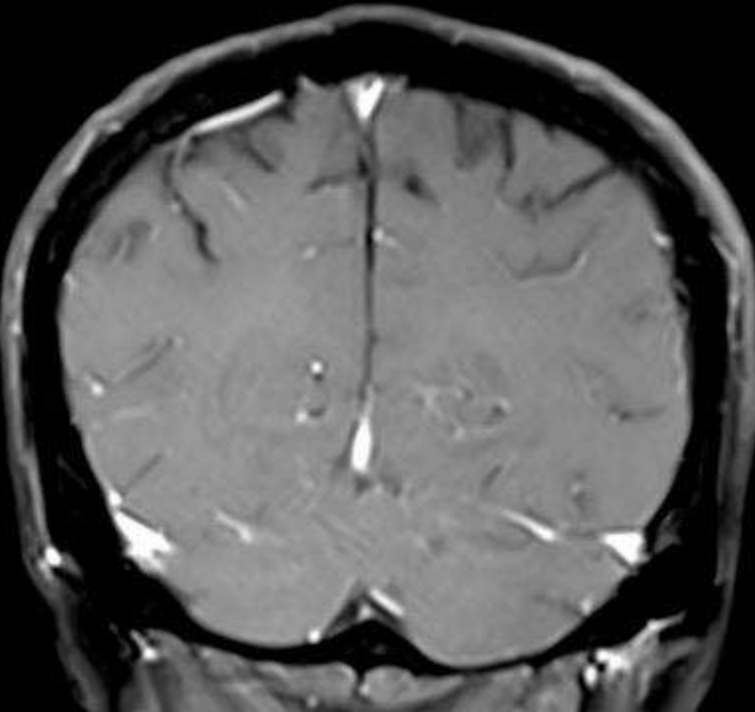
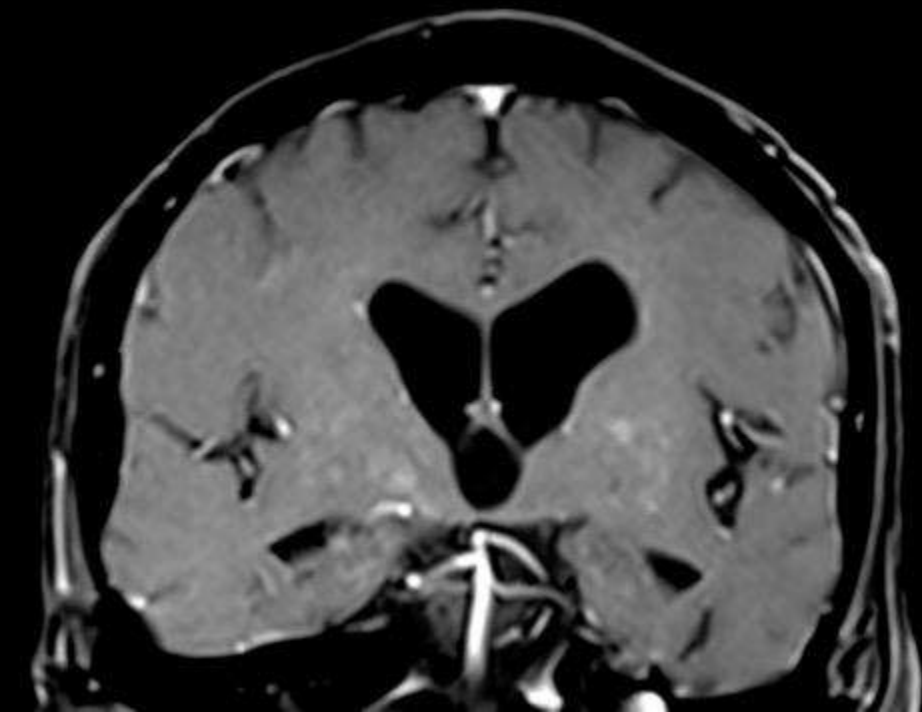


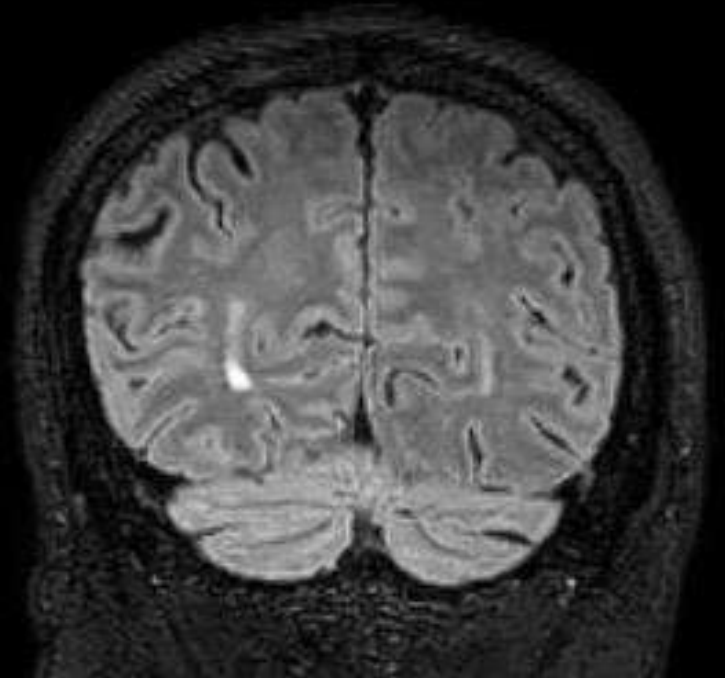
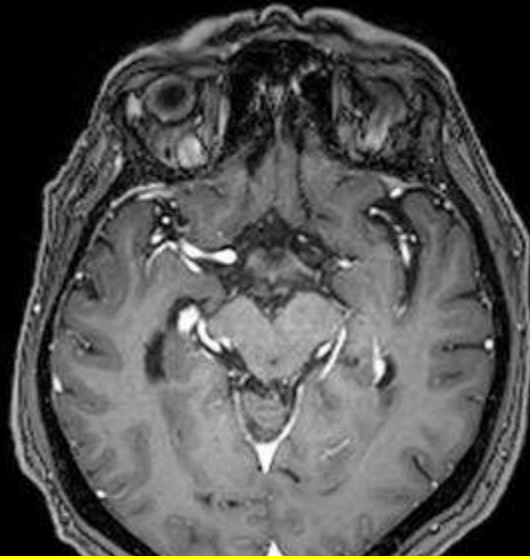
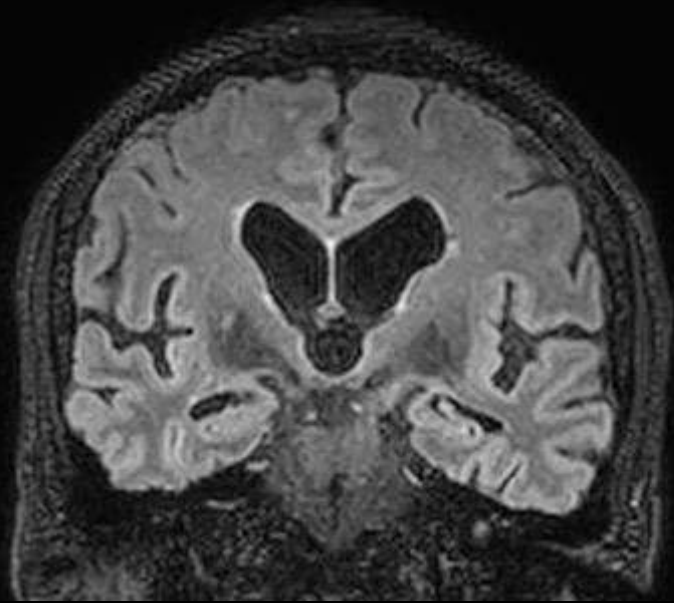




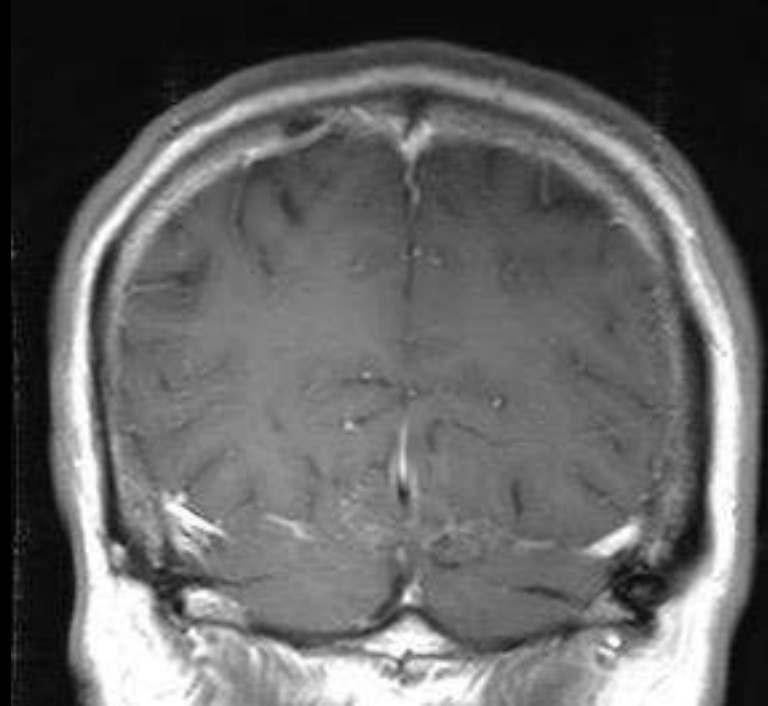
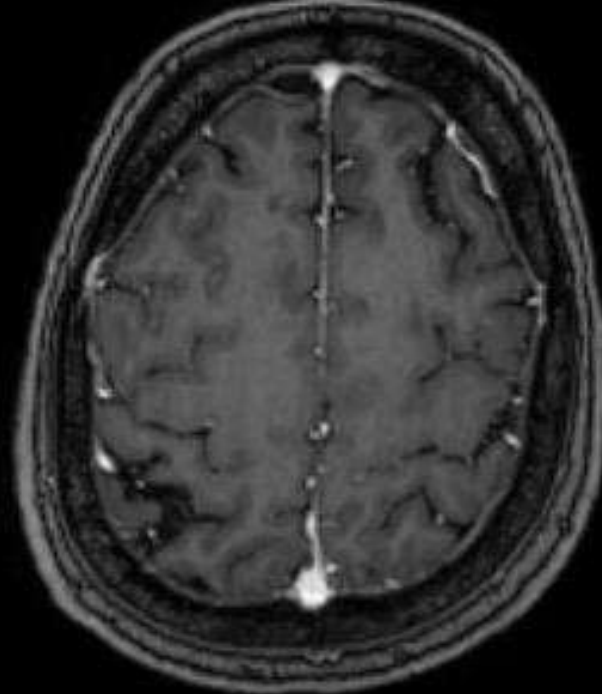
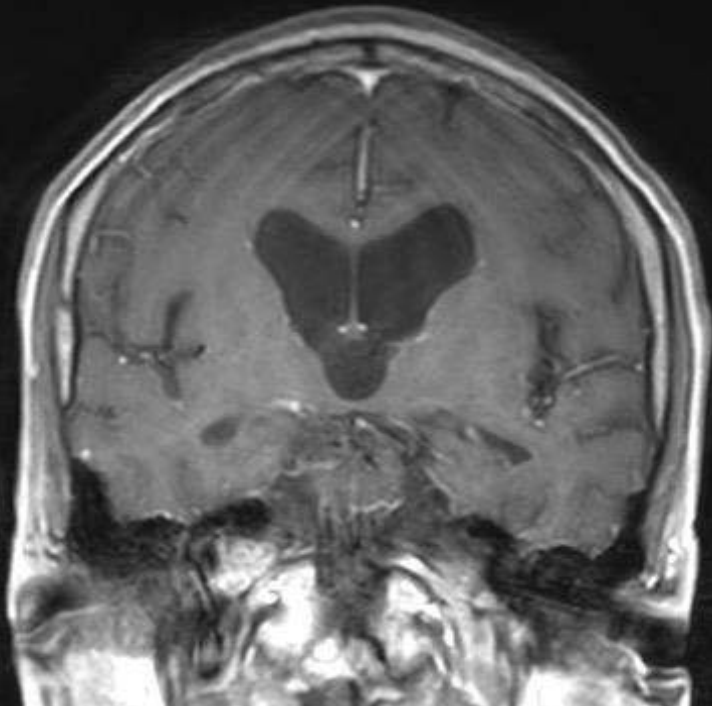


**23 gün sonra
kontrol**

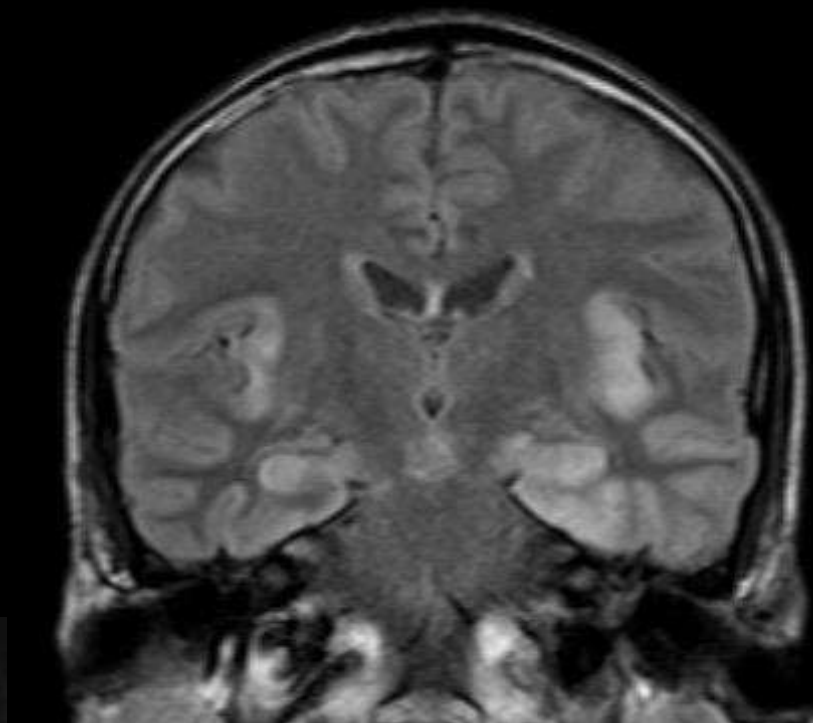
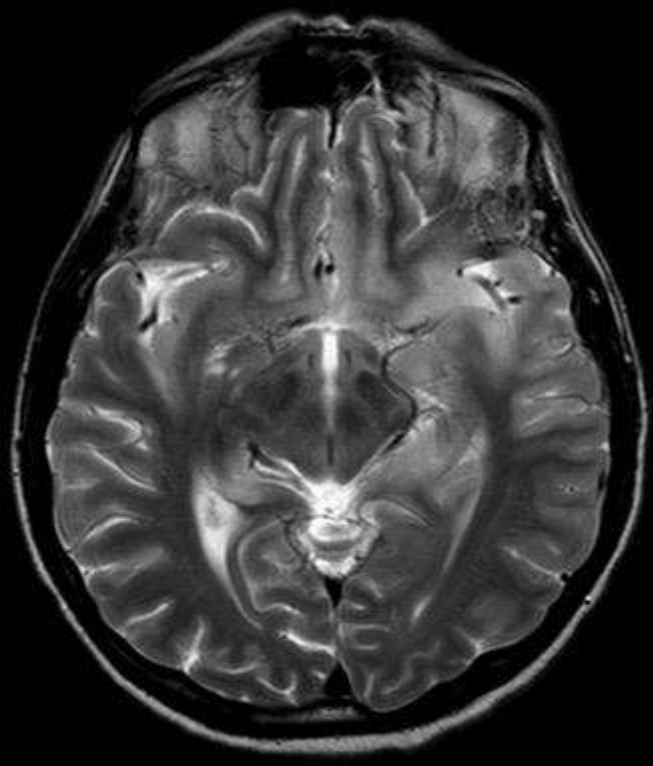




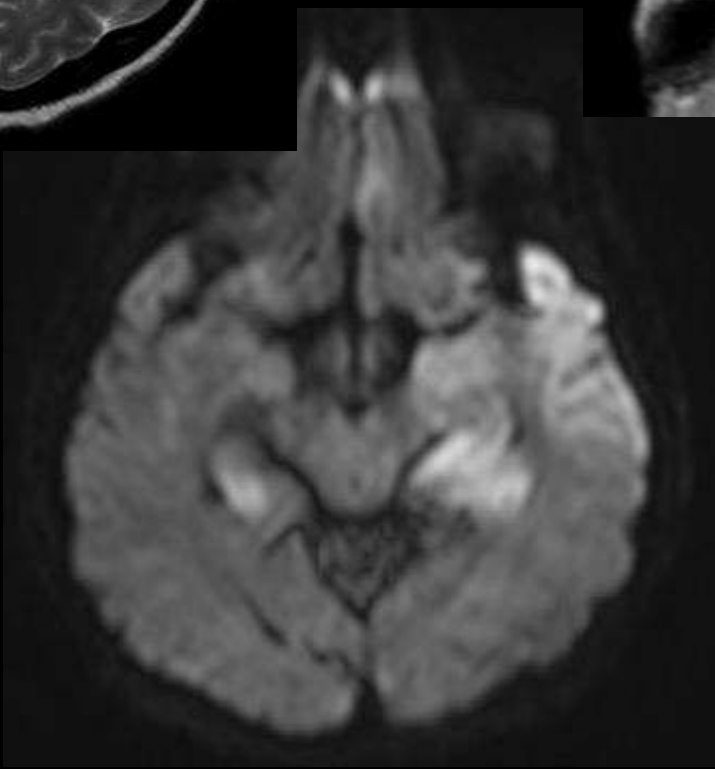
6 ay sonra kontrol



3. OLGU

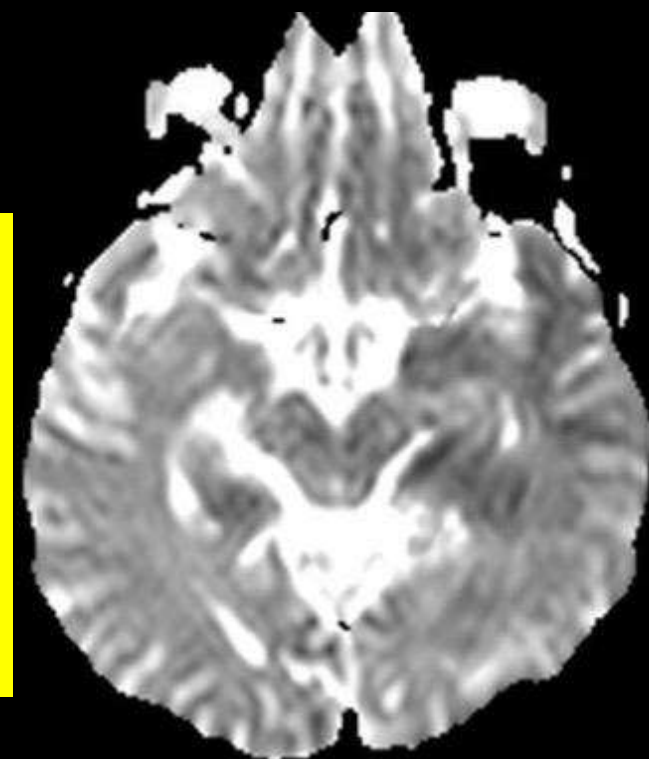


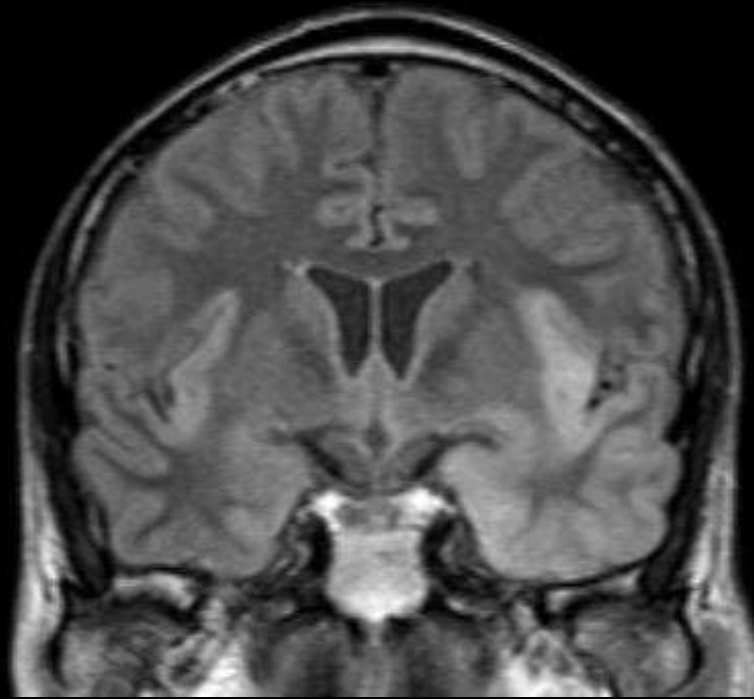
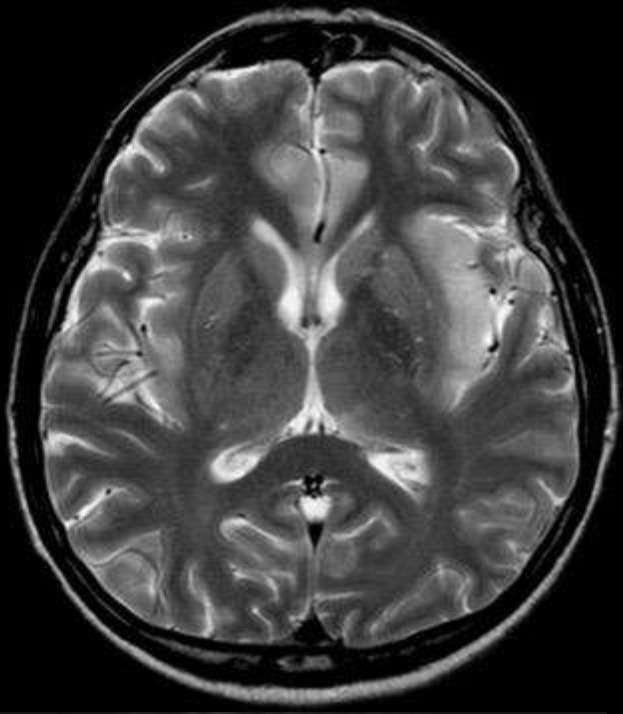
HSV-1 Ensefaliti



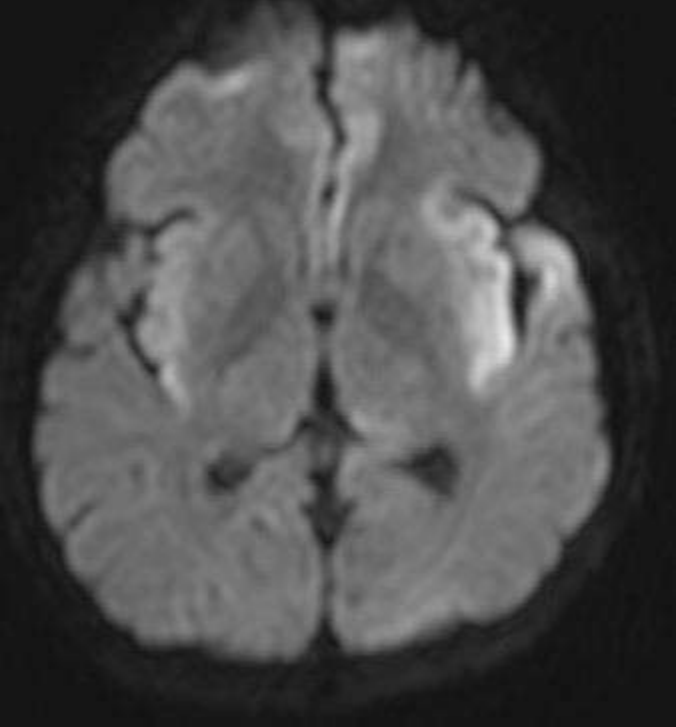
Bilateral asimetric

Limbik sistem
 Medial temporal lob
 Insular korteks
 inferior frontal, singulat g.
 Bazal g., thalamus



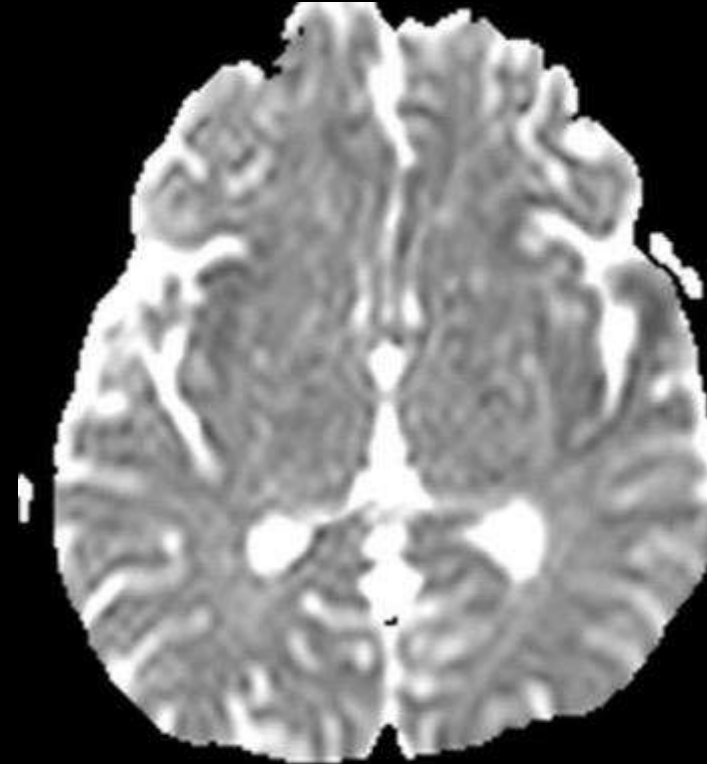


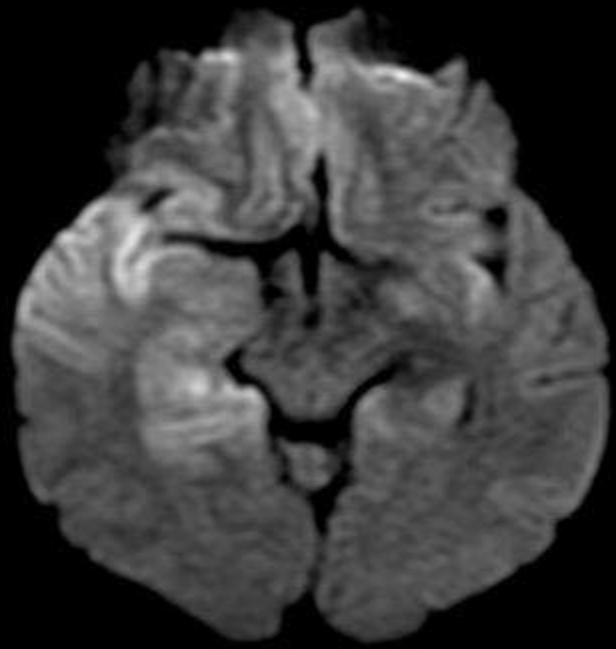
HSV-1 Ensefaliti



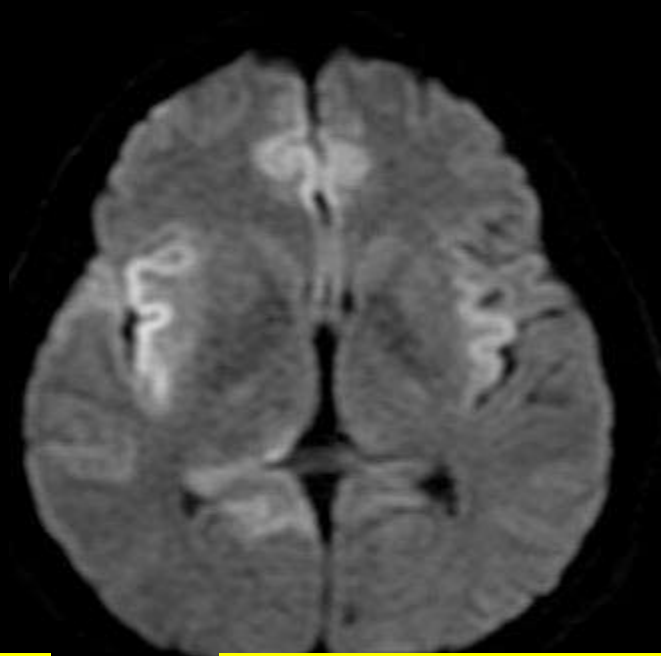
Bilateral asimetric

Limbik sistem
Medial temporal lob
İnsular korteks
inferior frontal, singulat g.
Bazal g., thalamus
Difüzyon kısıtlaması (hafif)

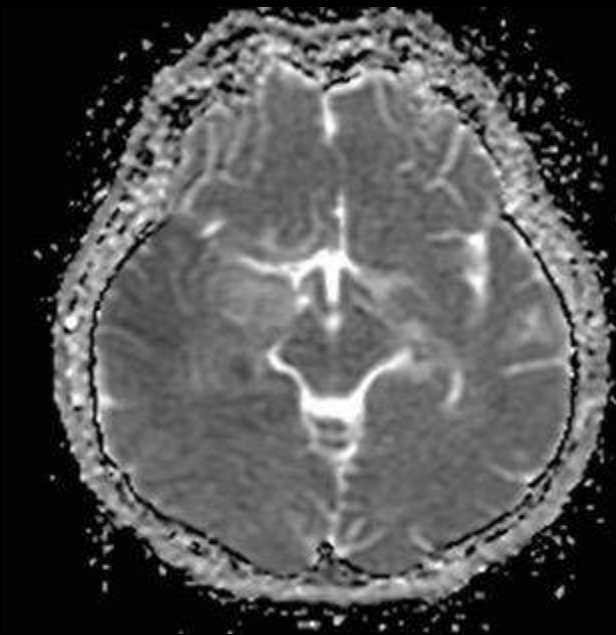
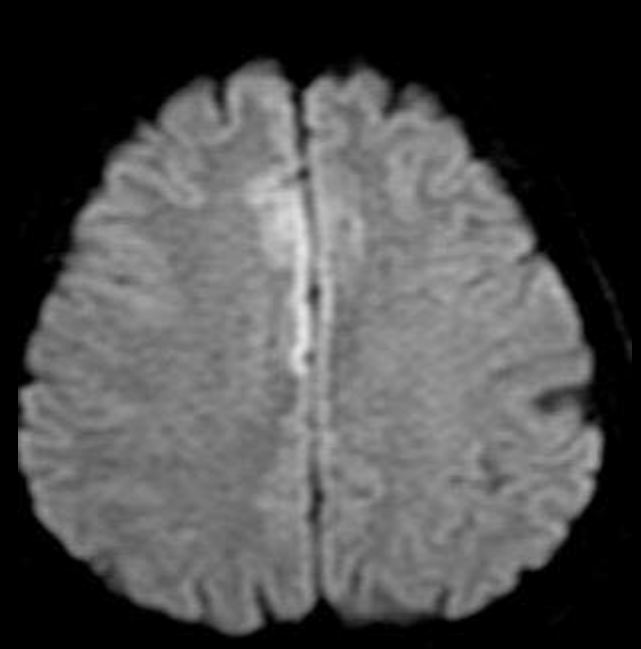




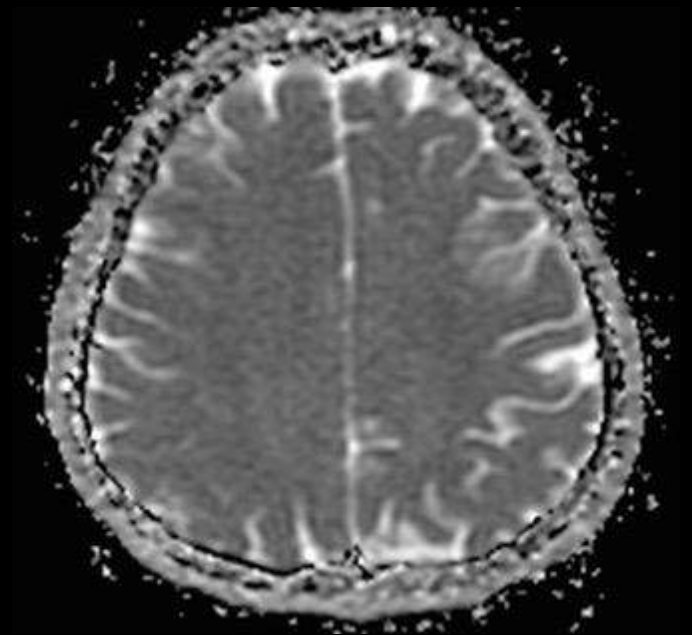
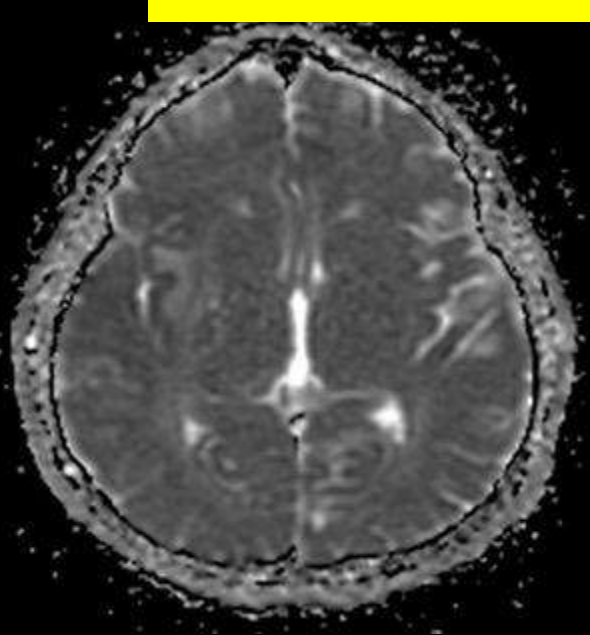
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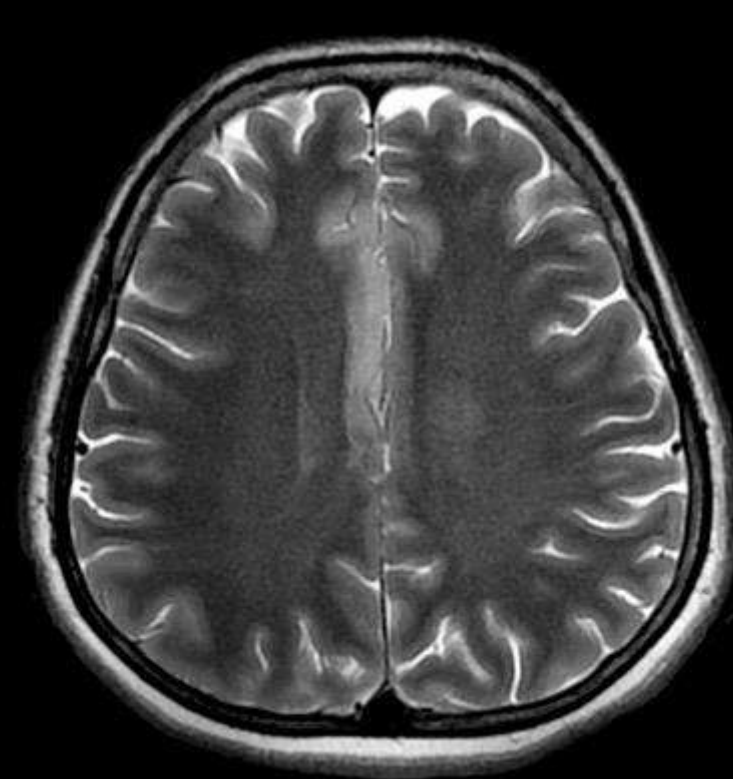
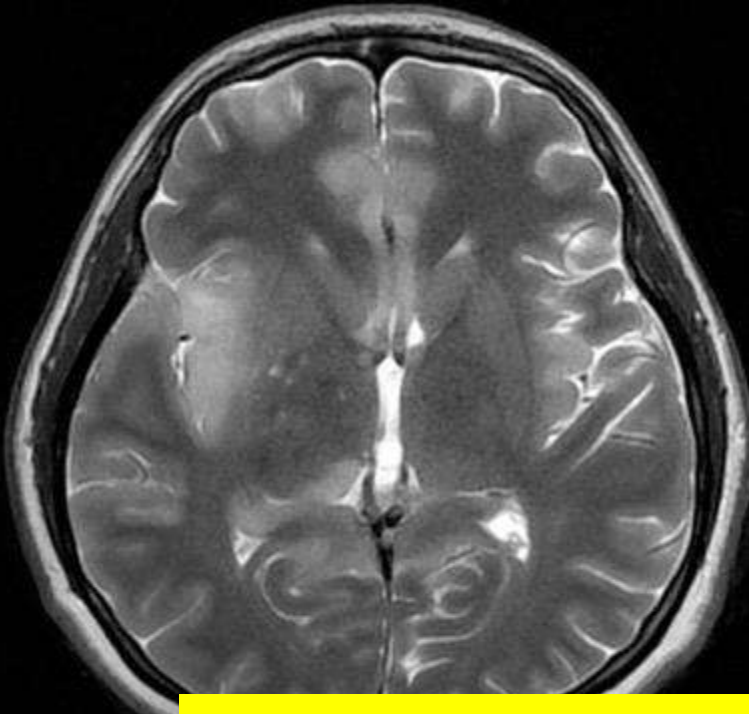
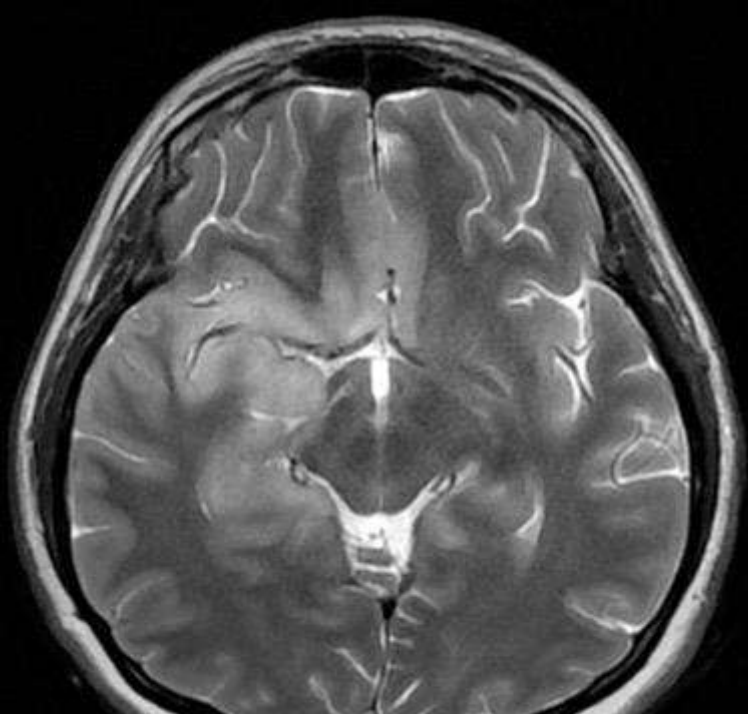


HSV-1 Ensefaliti

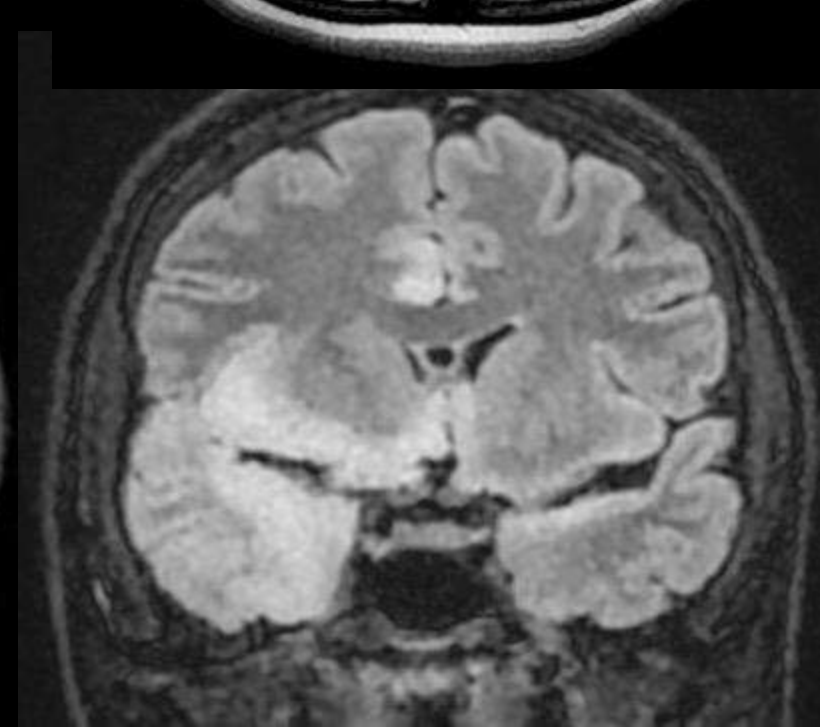
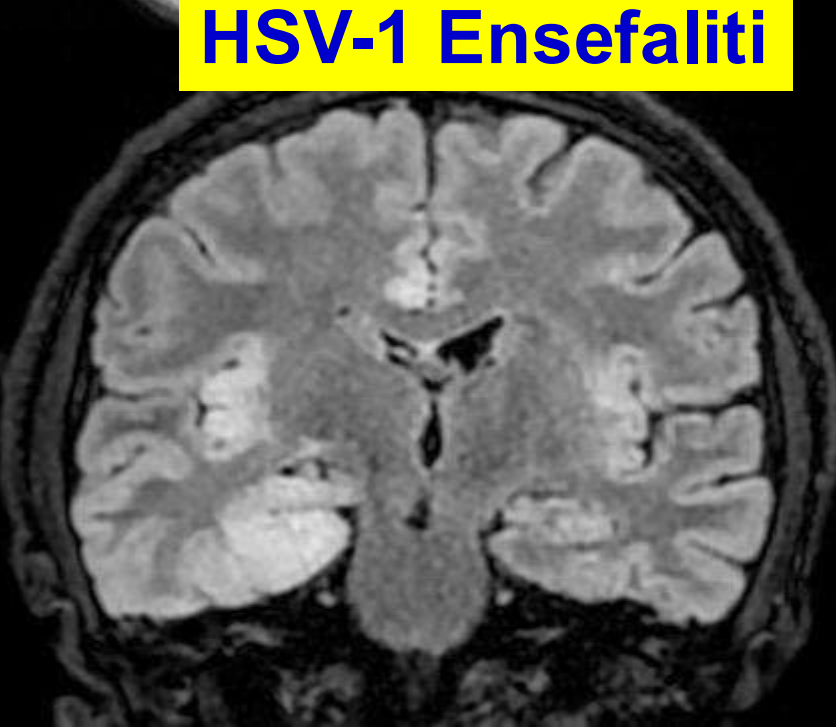
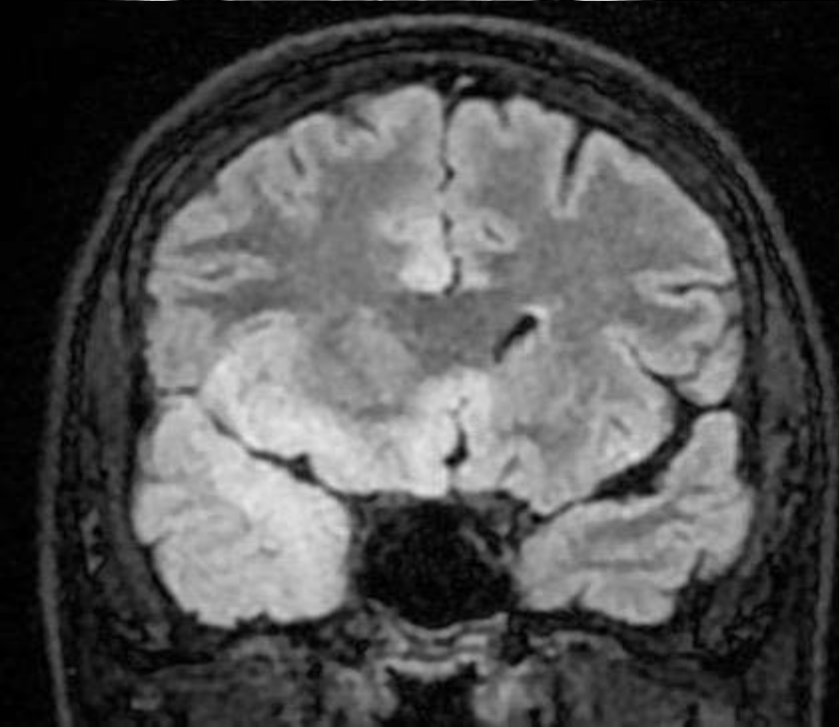


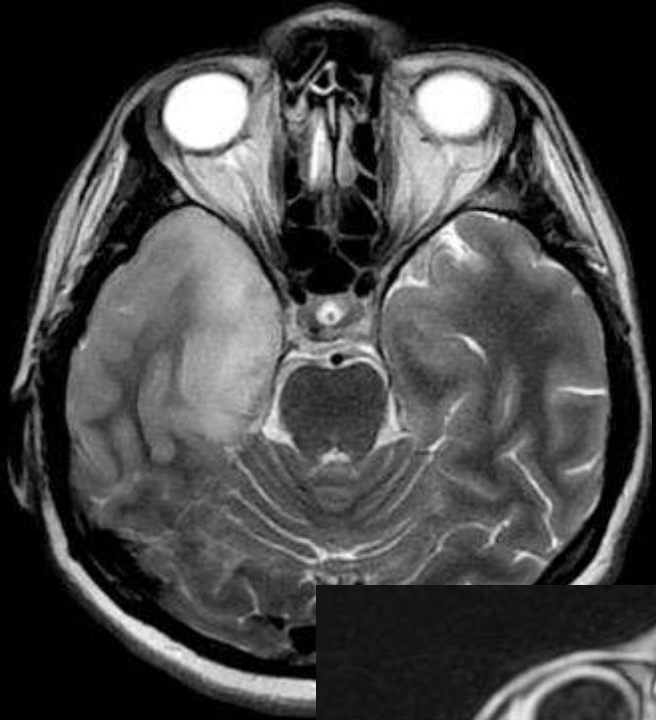
ADC





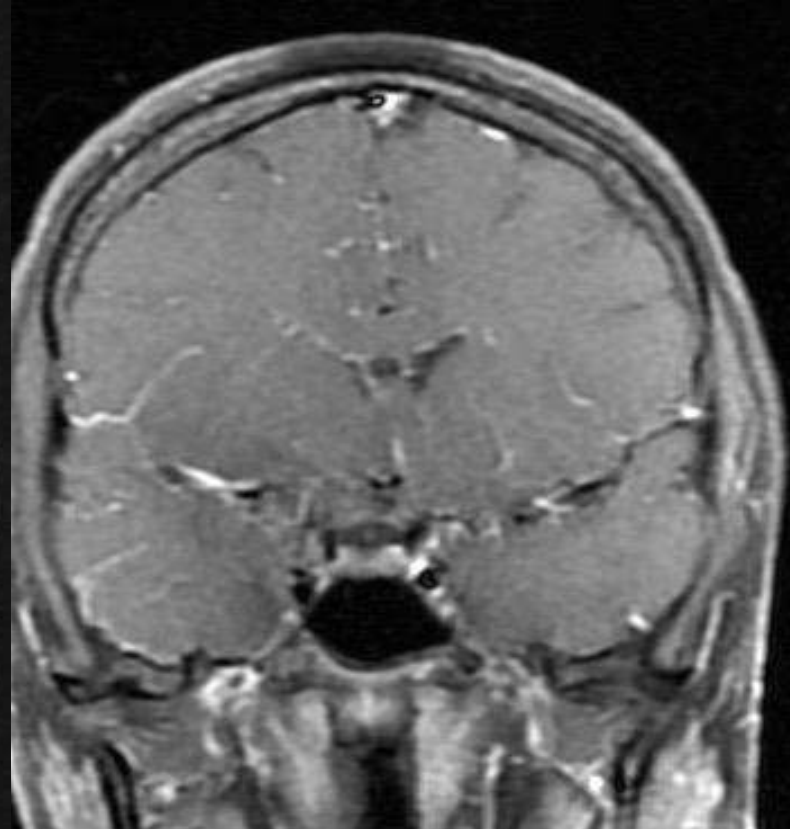
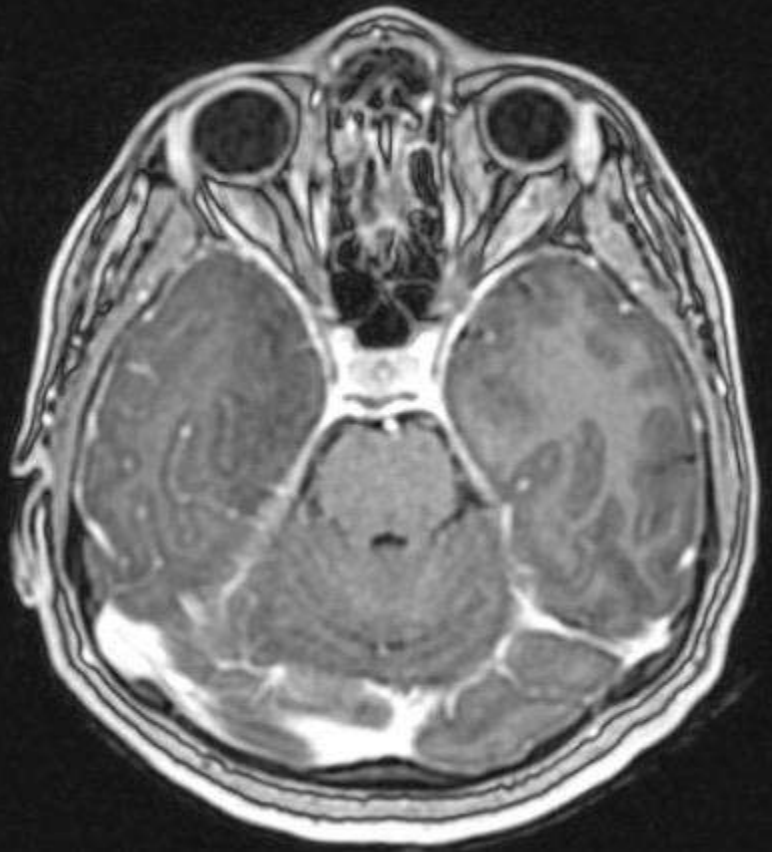
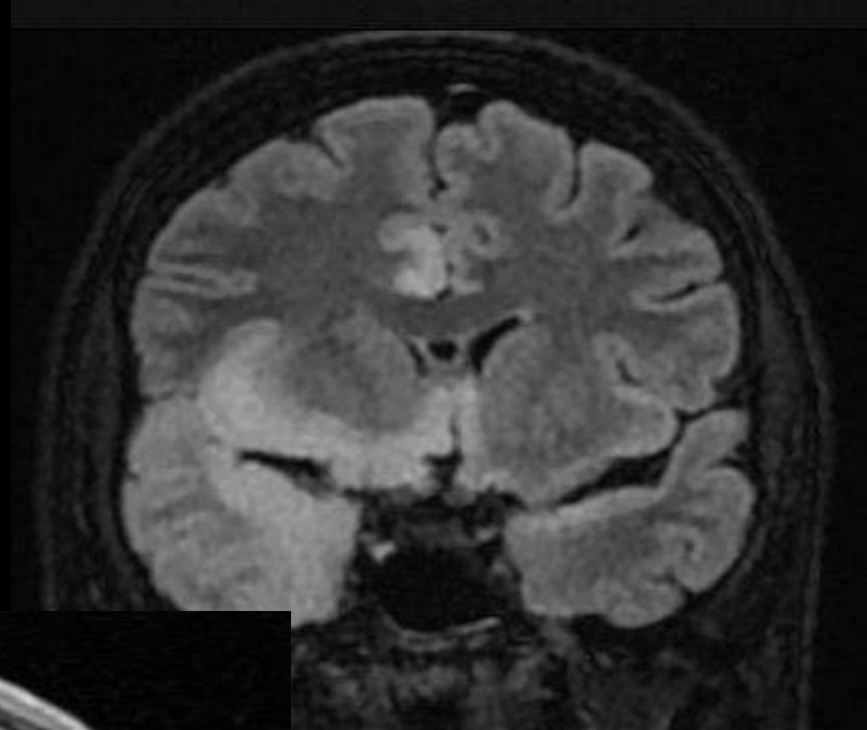
HSV-1 Ensefaliti

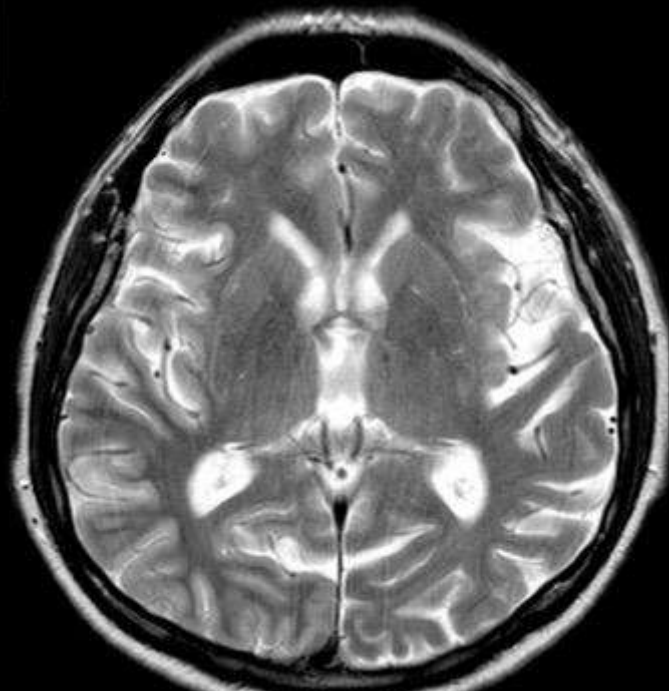




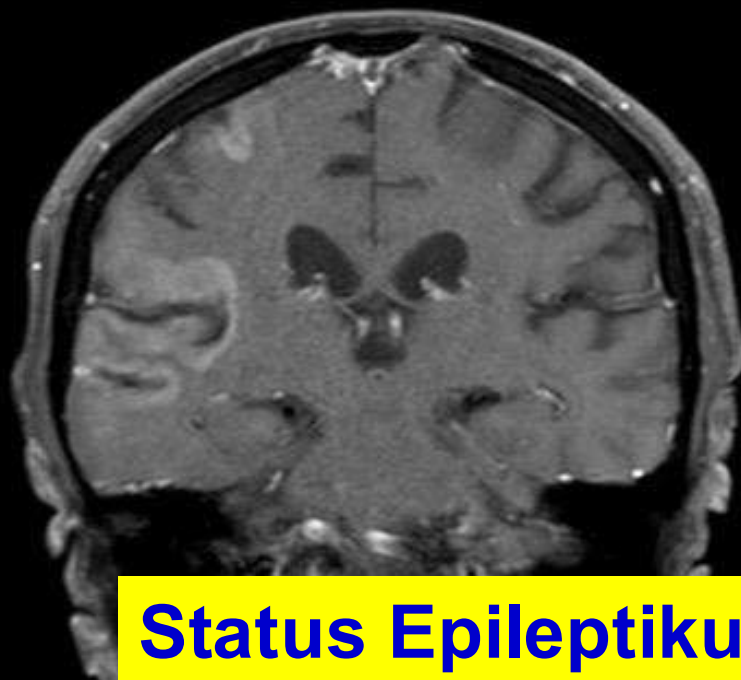
HSV-1 Ensefaliti

erken dönemde yok
gyral, leptomeningeal
dural, halkasal (nadir)

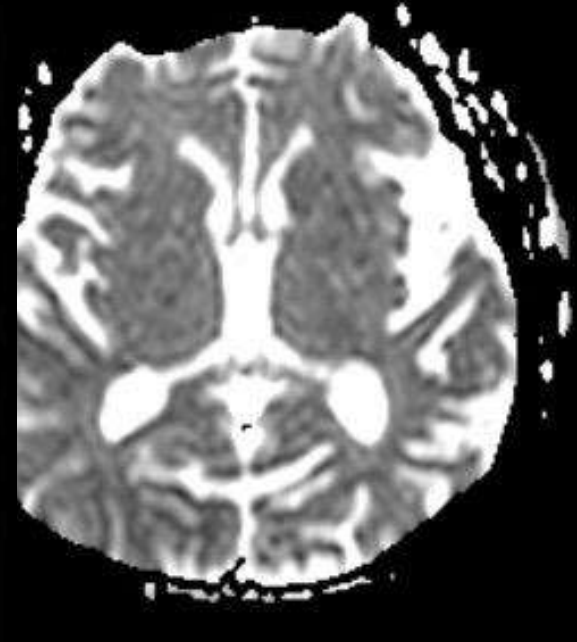
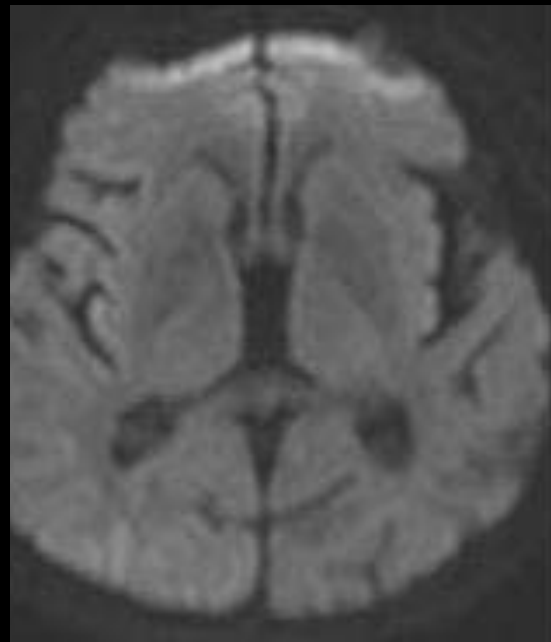
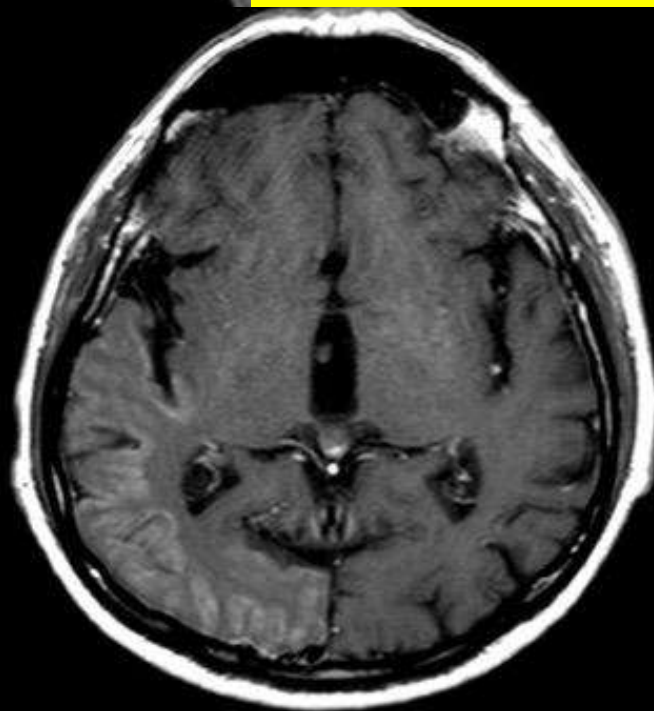
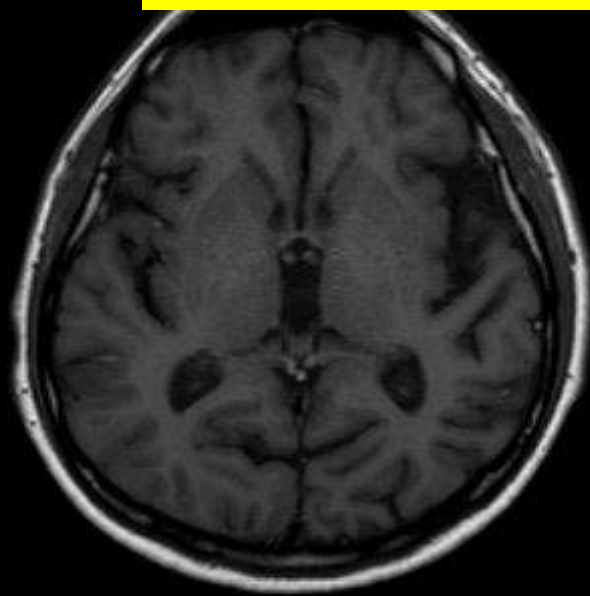
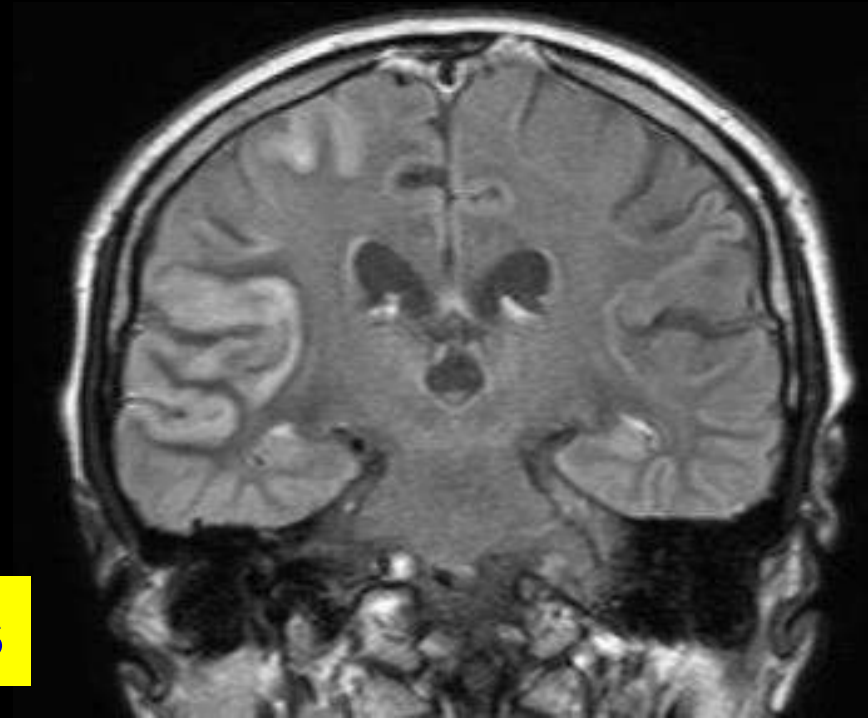




AYIRICI TANI

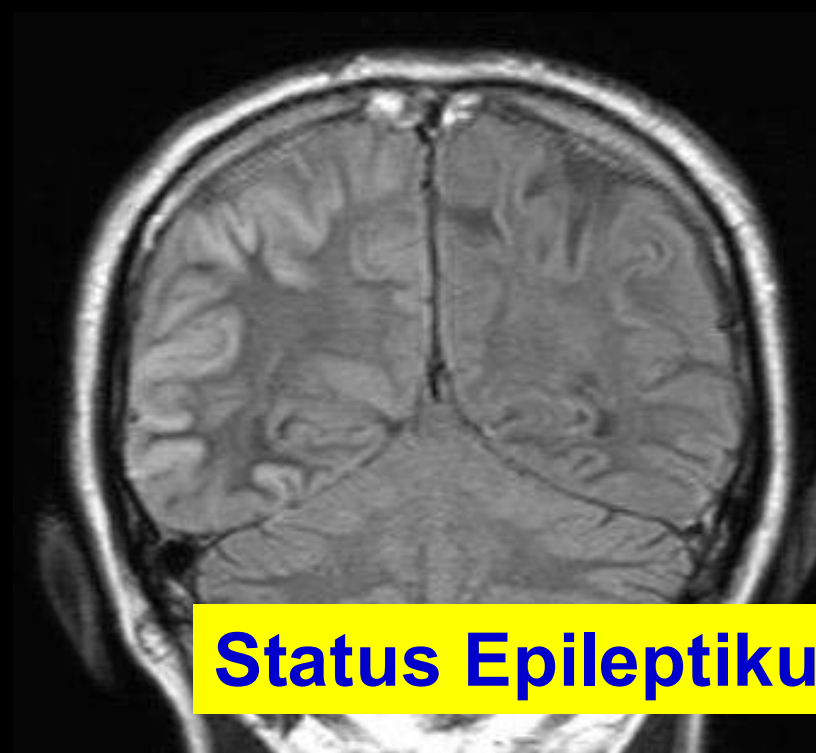


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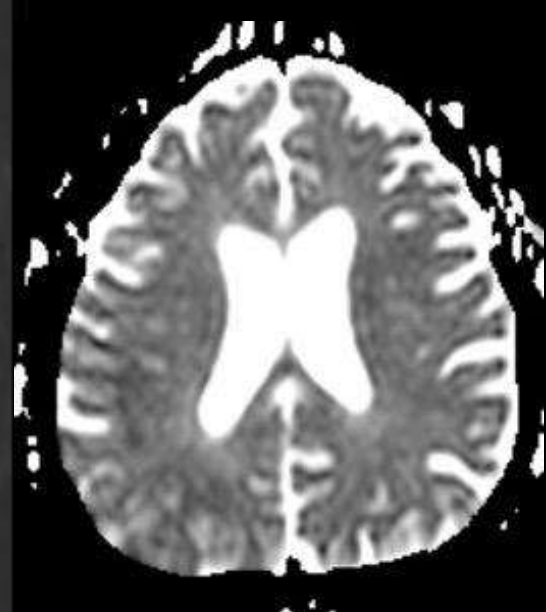
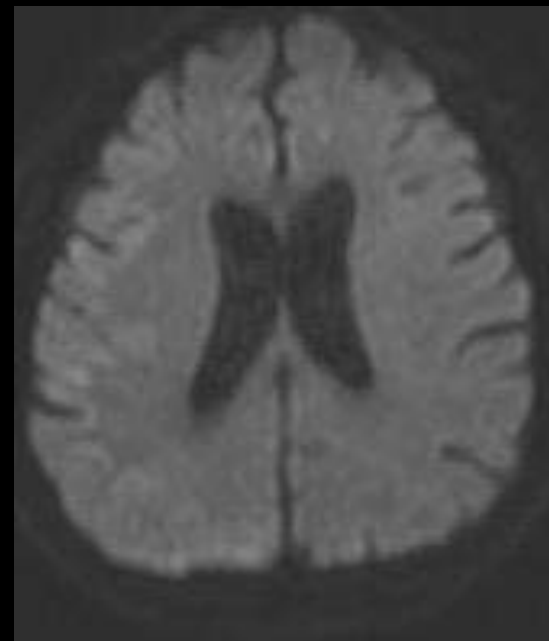
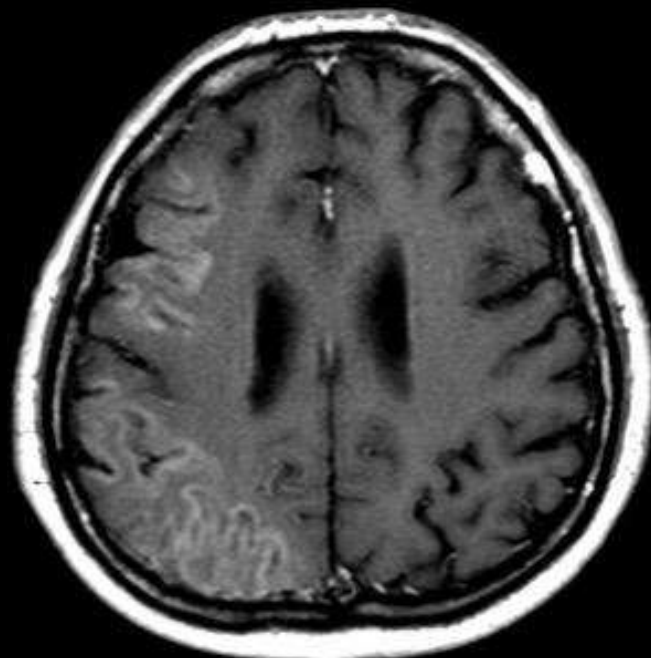
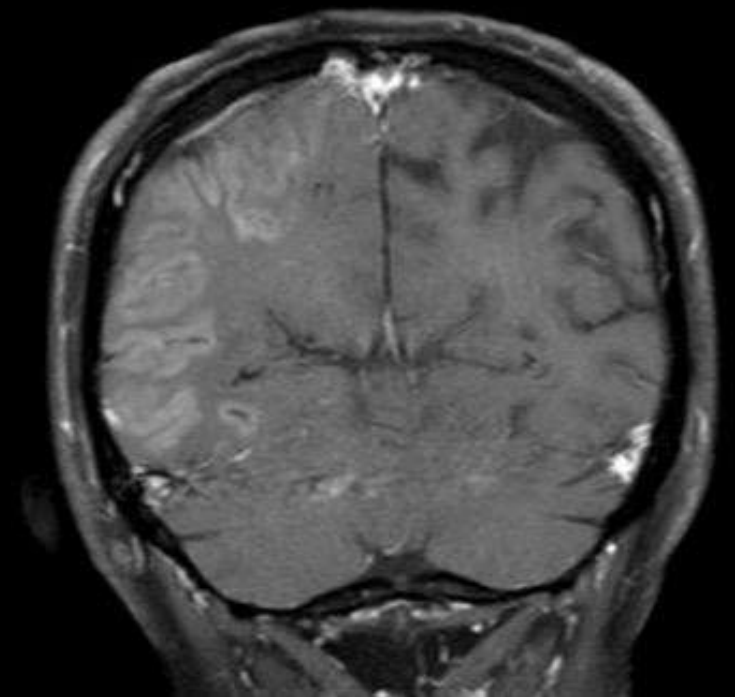


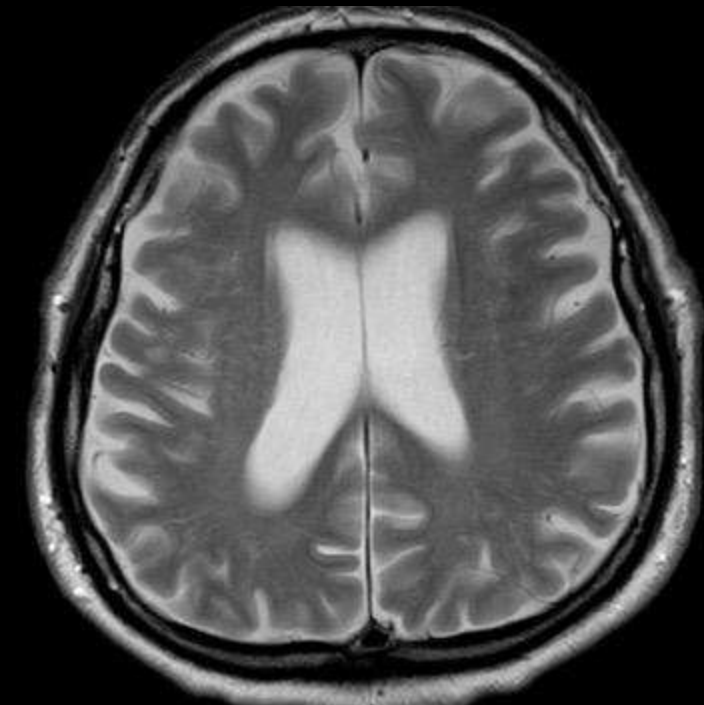


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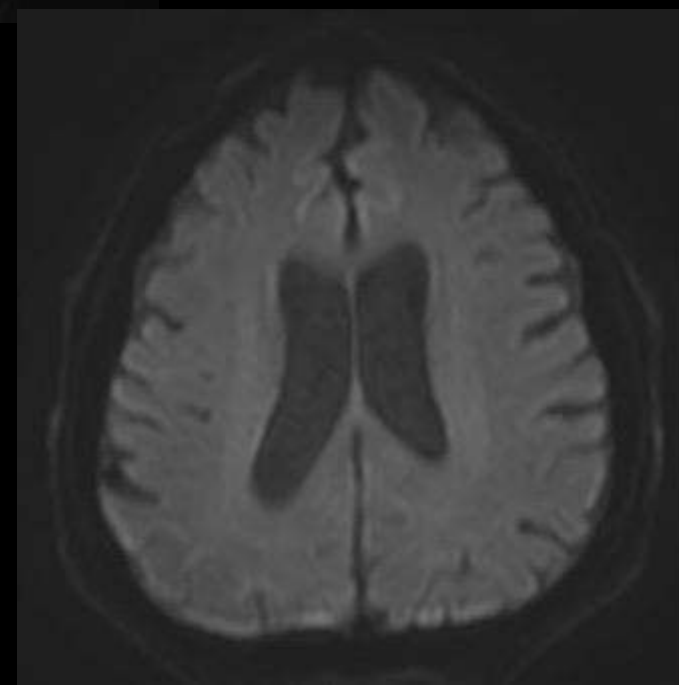
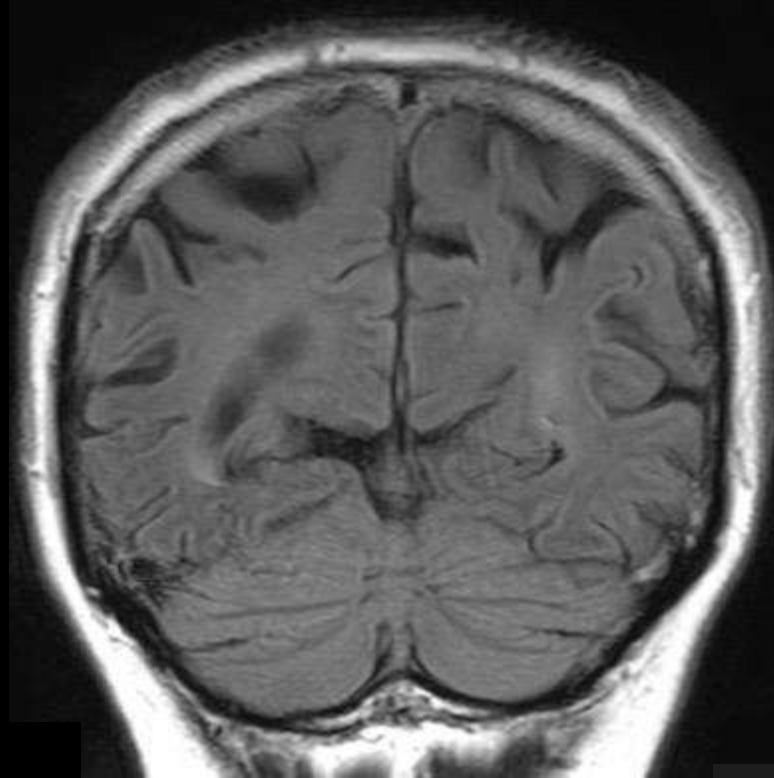


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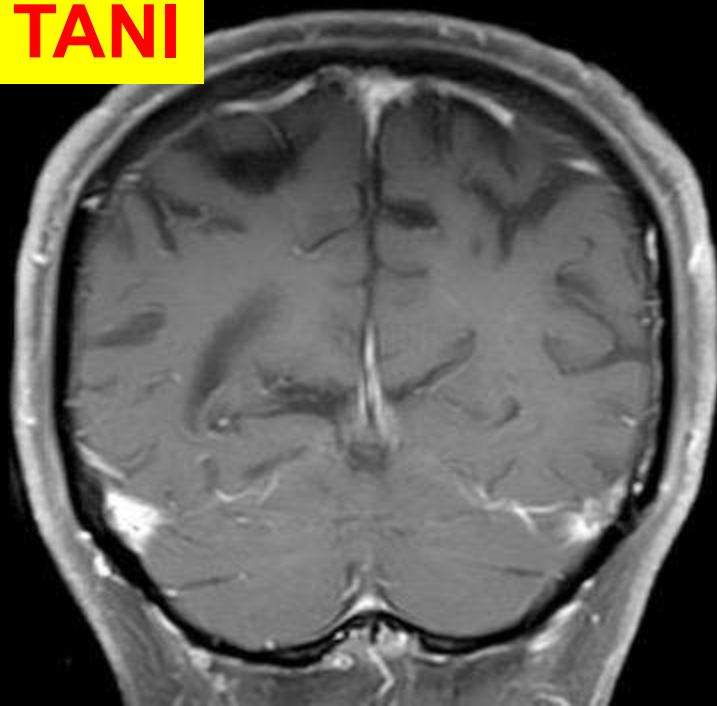




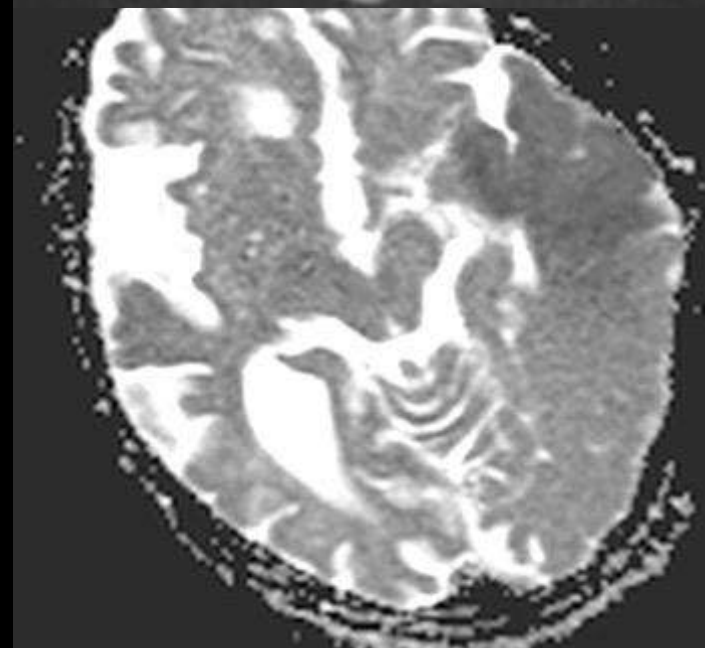
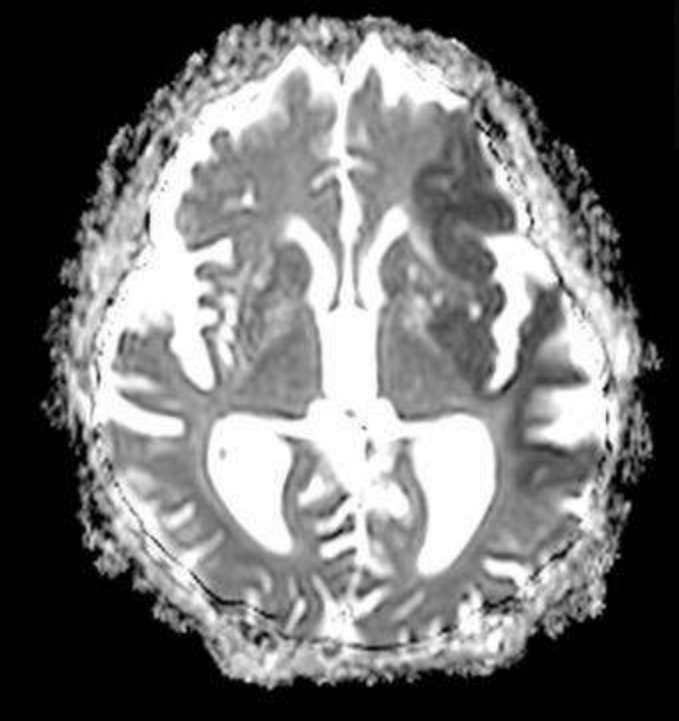
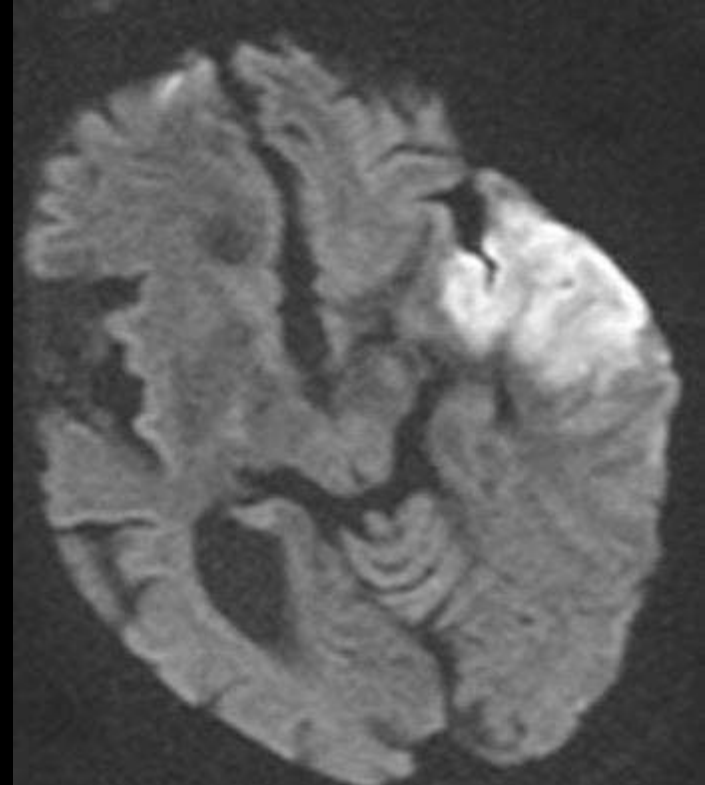
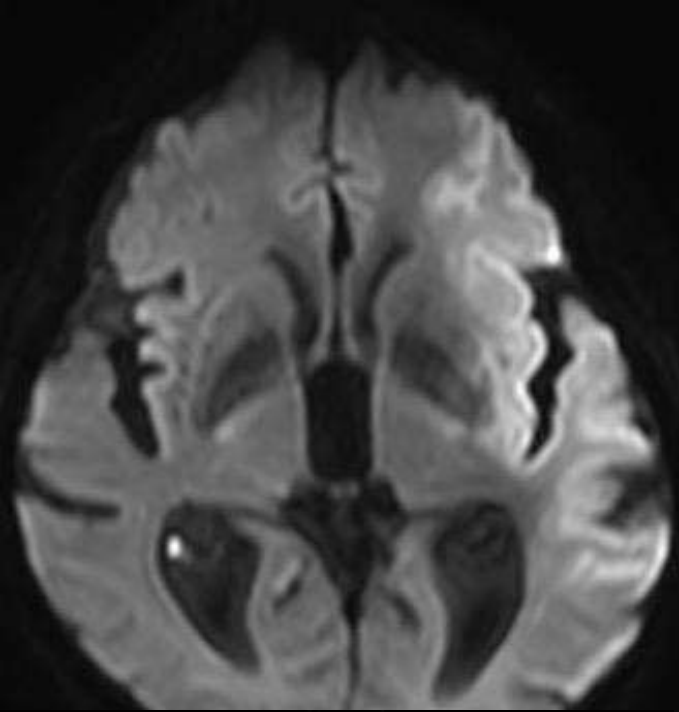
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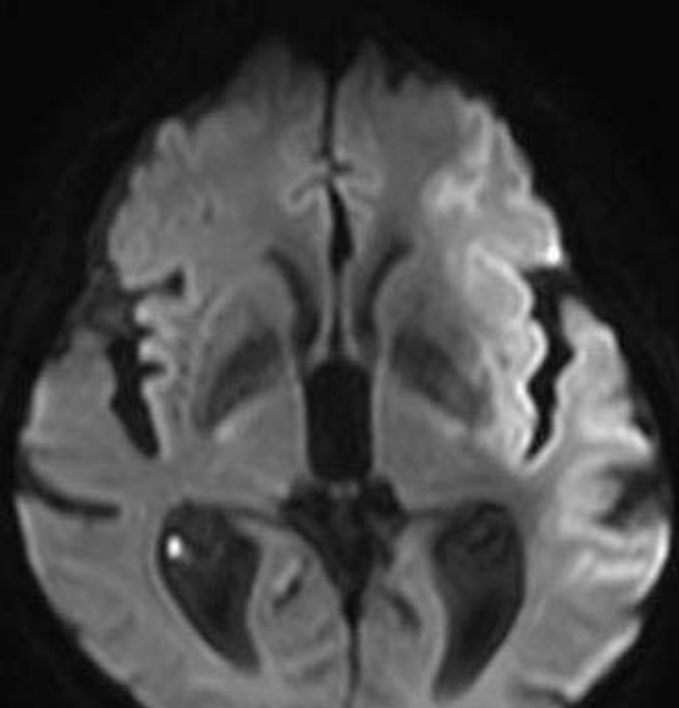


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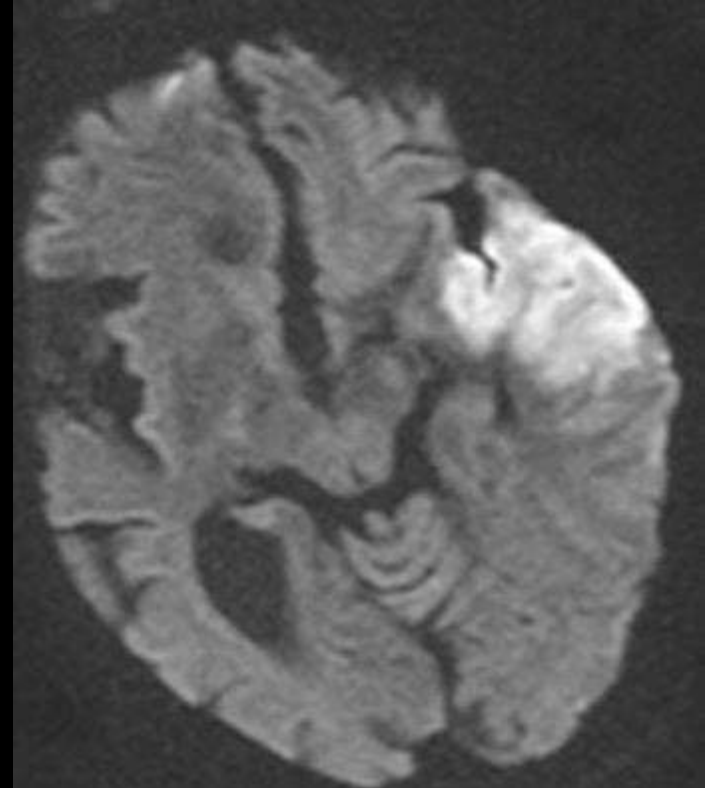


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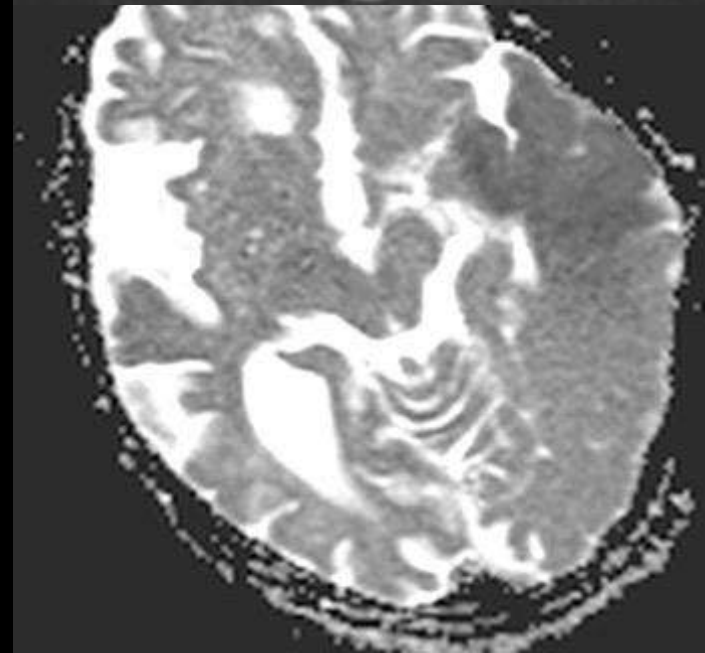
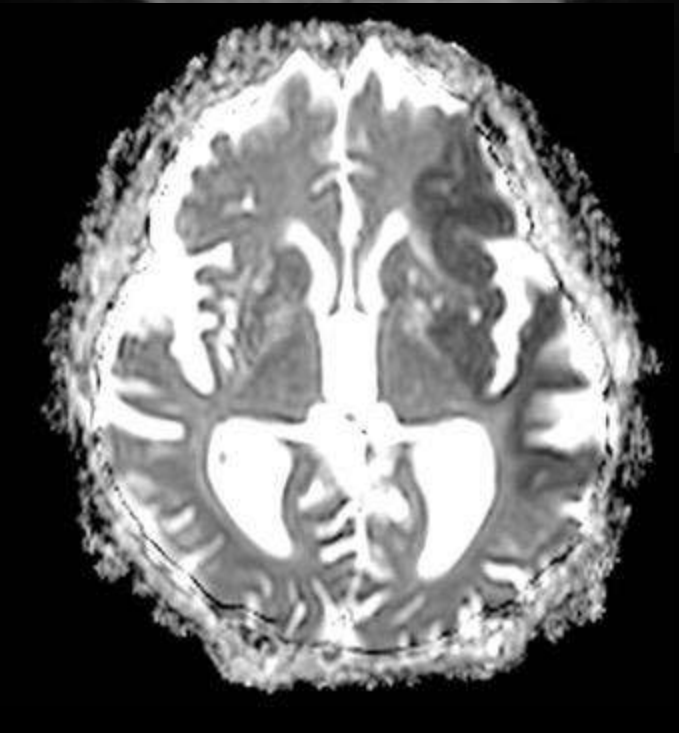


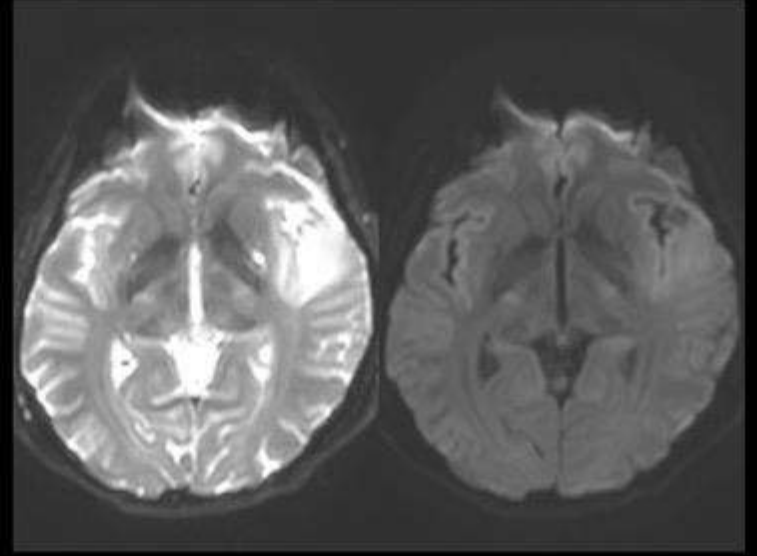
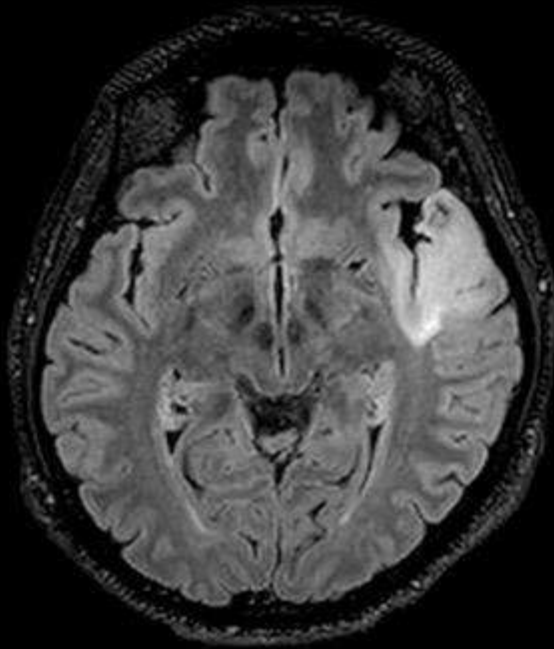
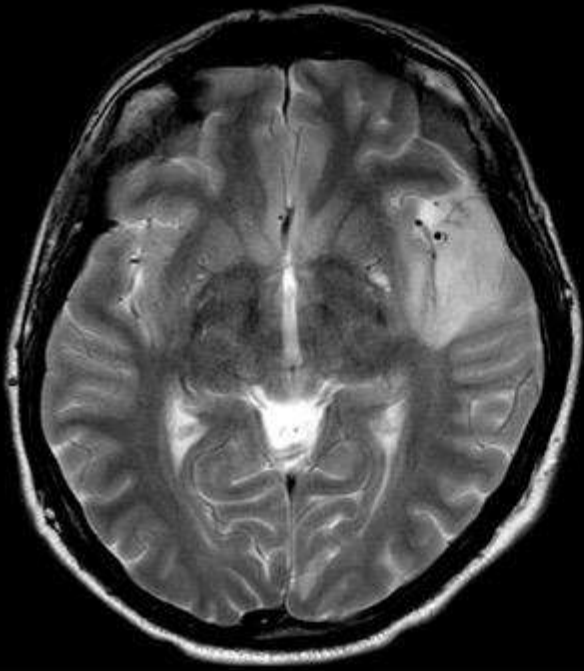


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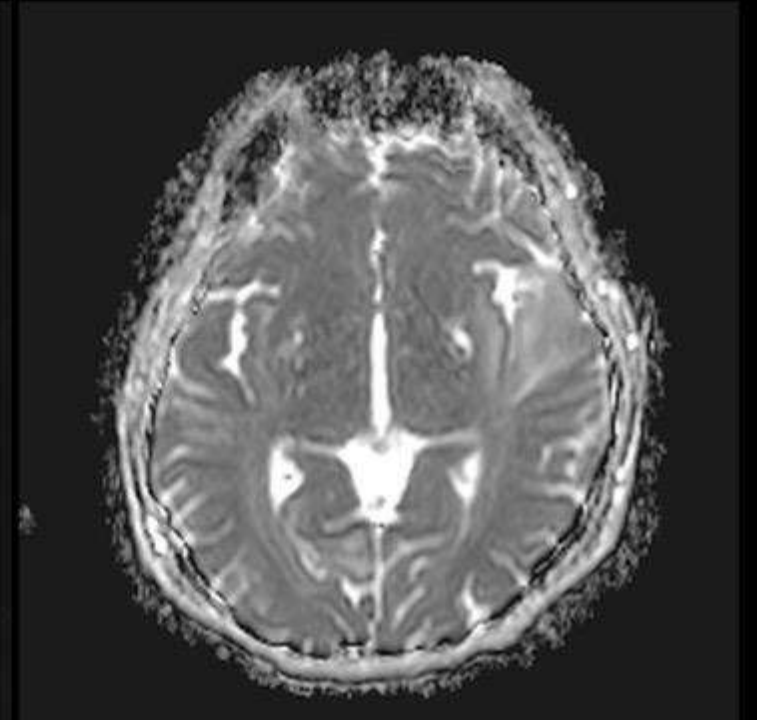


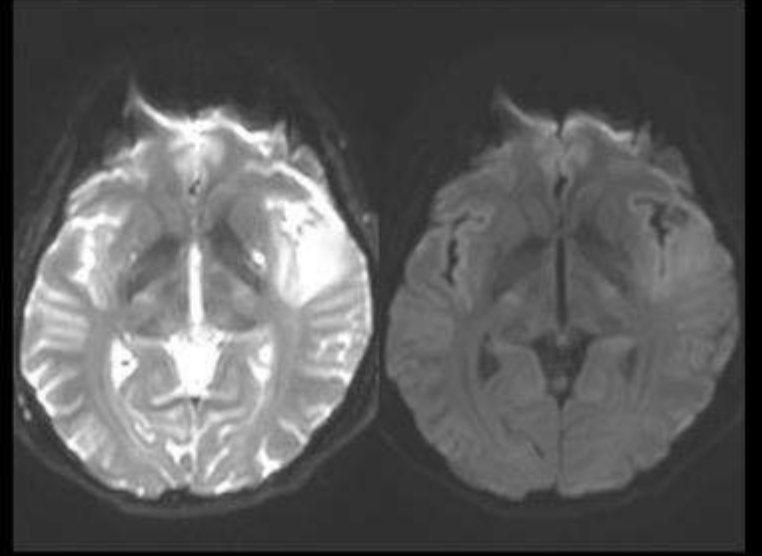
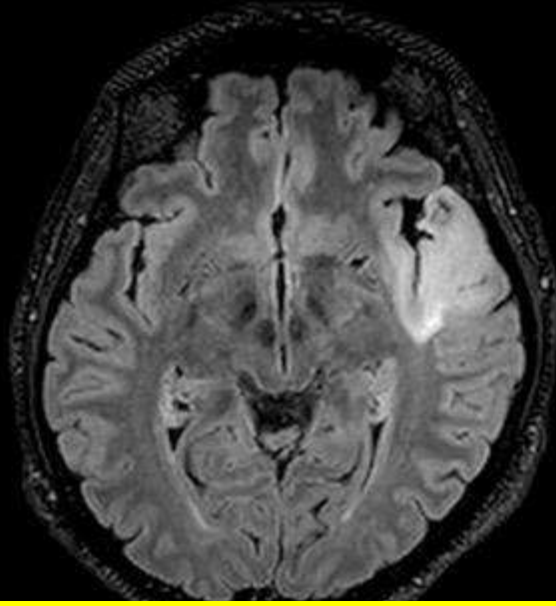
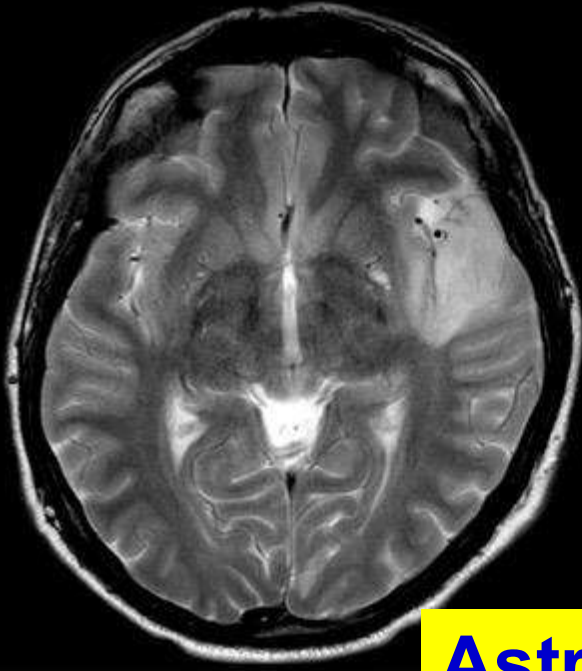
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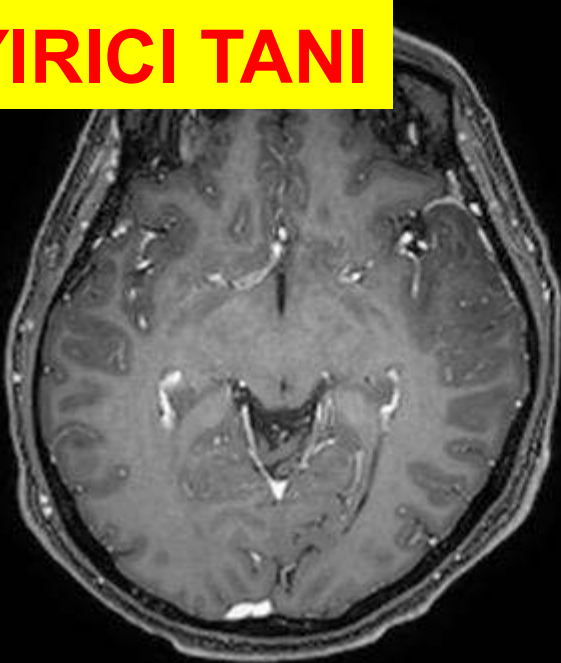
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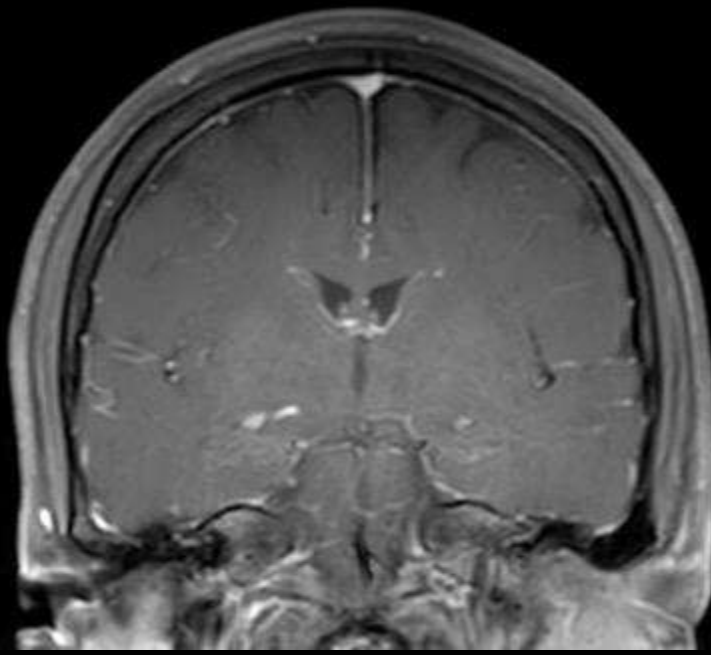
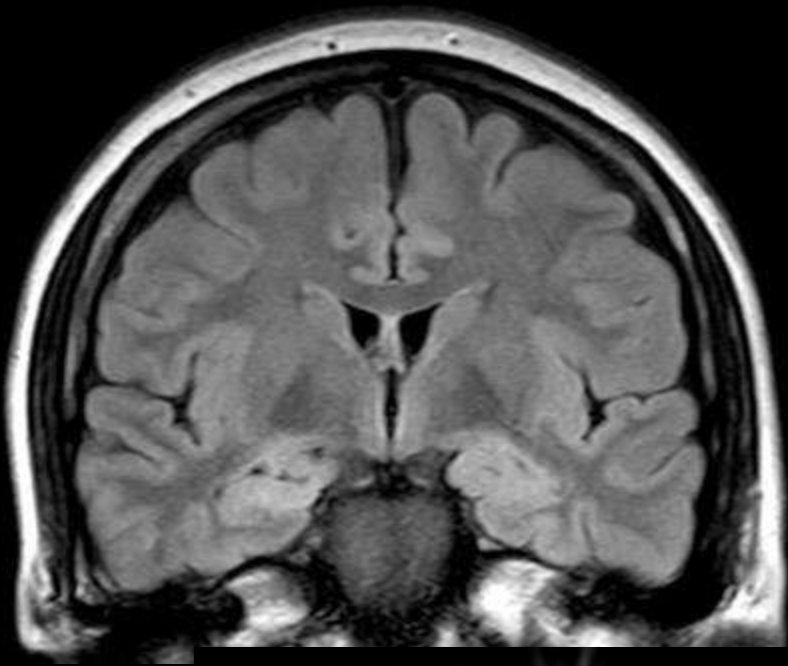




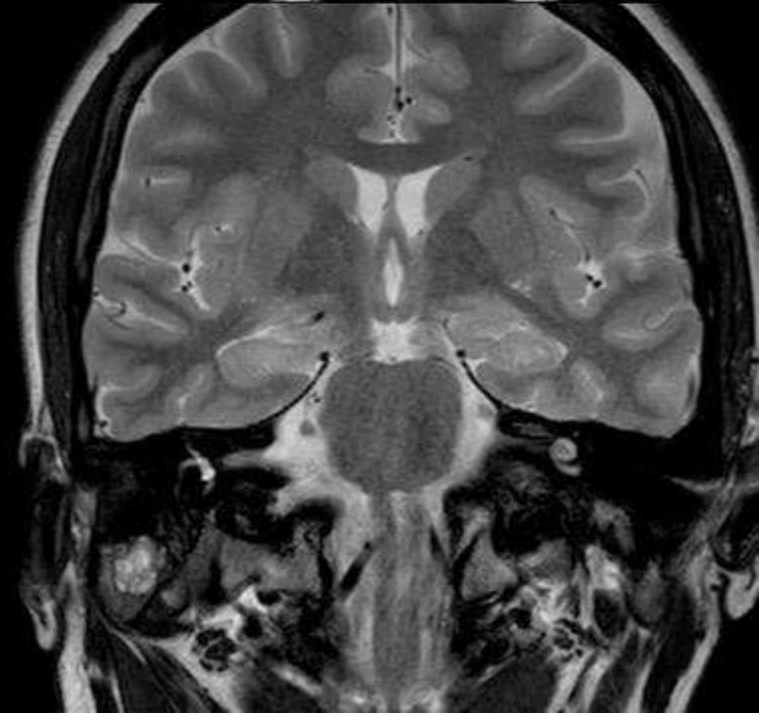
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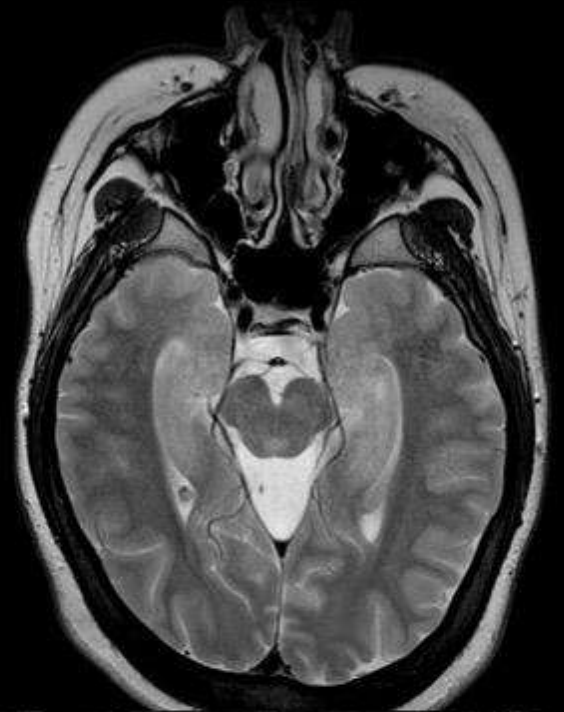
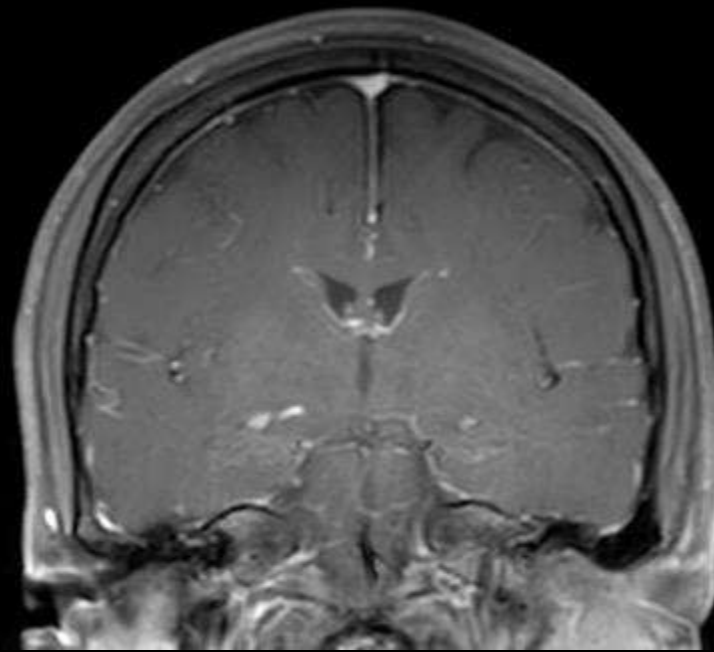
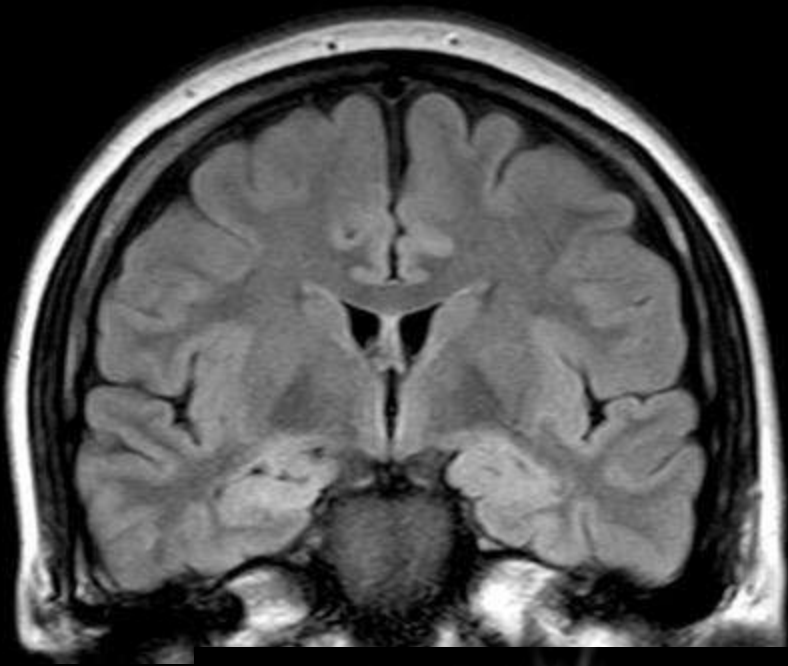
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AYIRICI TANI

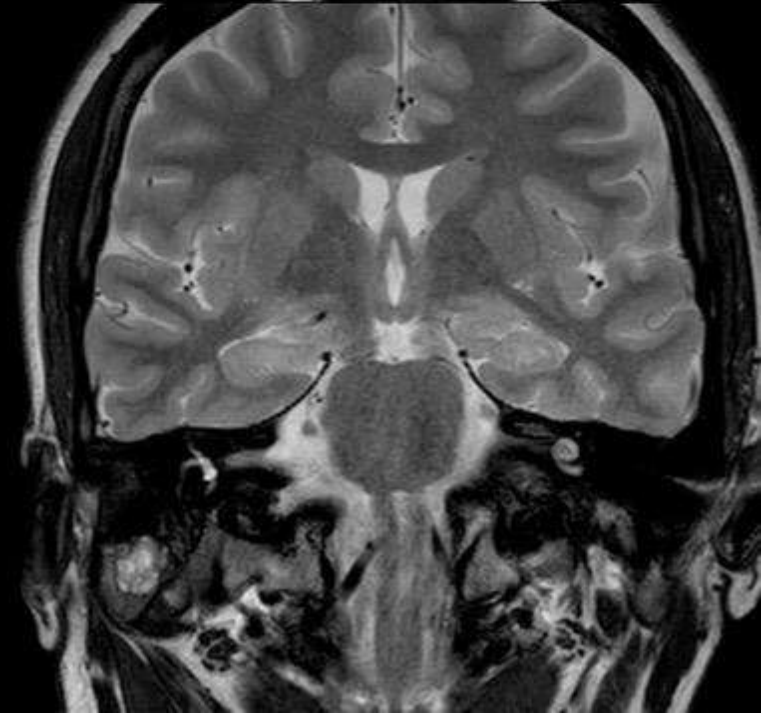




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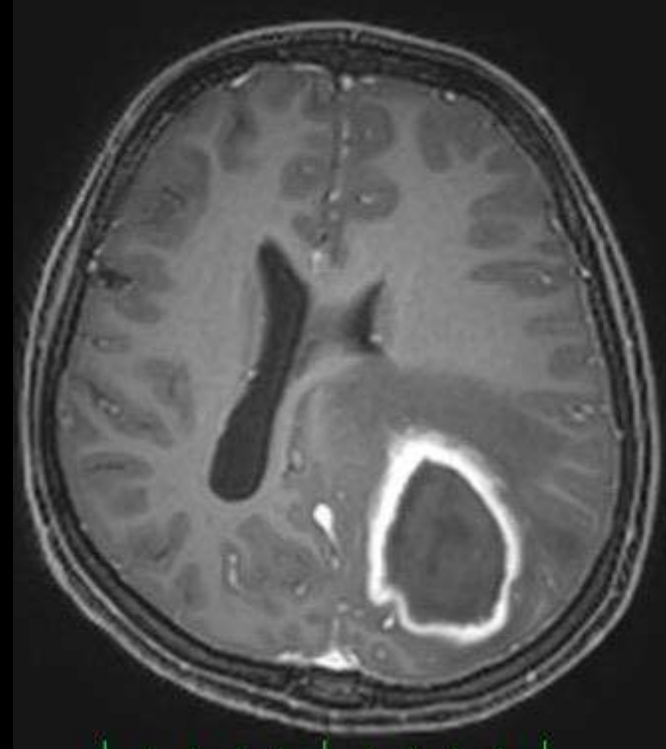
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4. OLGU

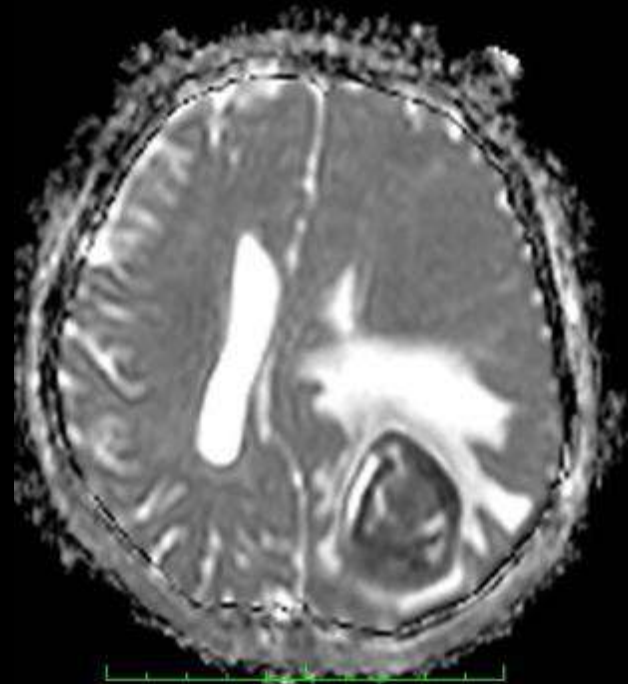
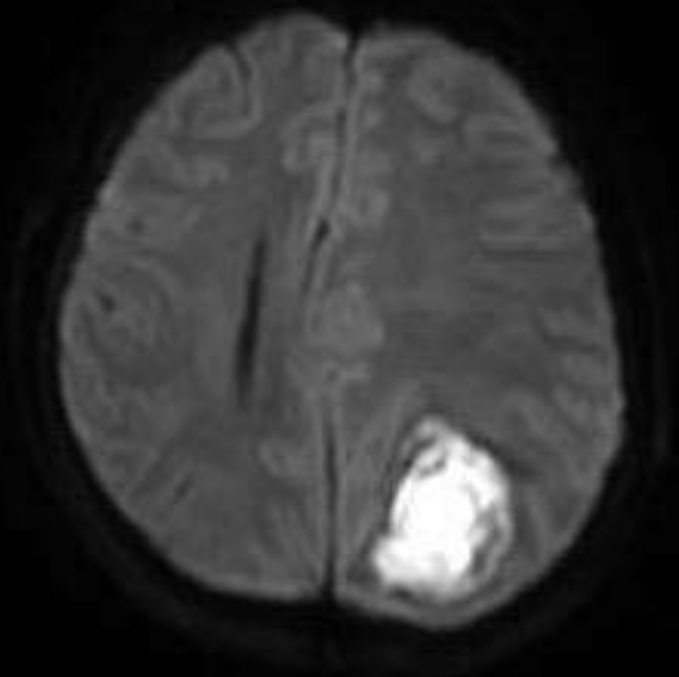
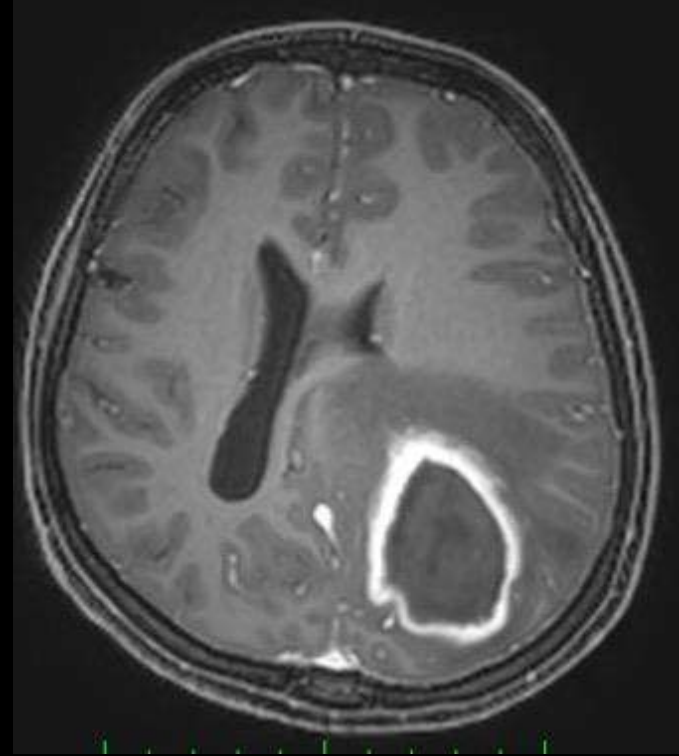


Periferik kontrastlanma



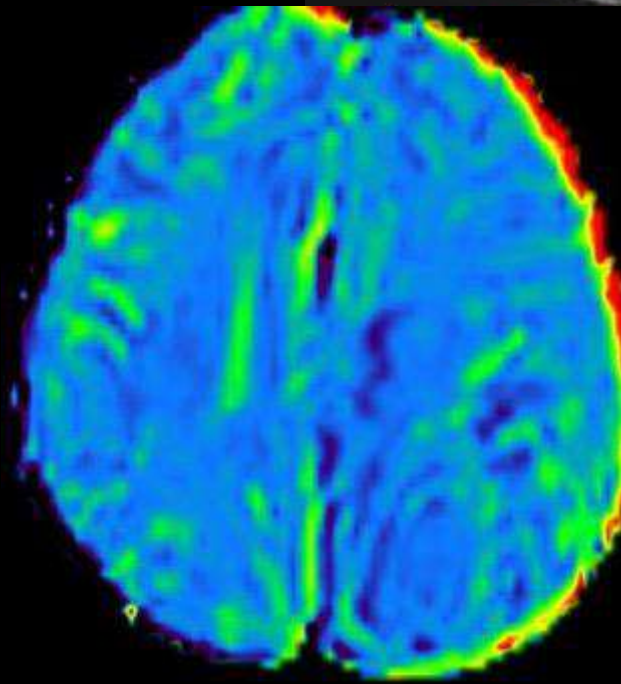
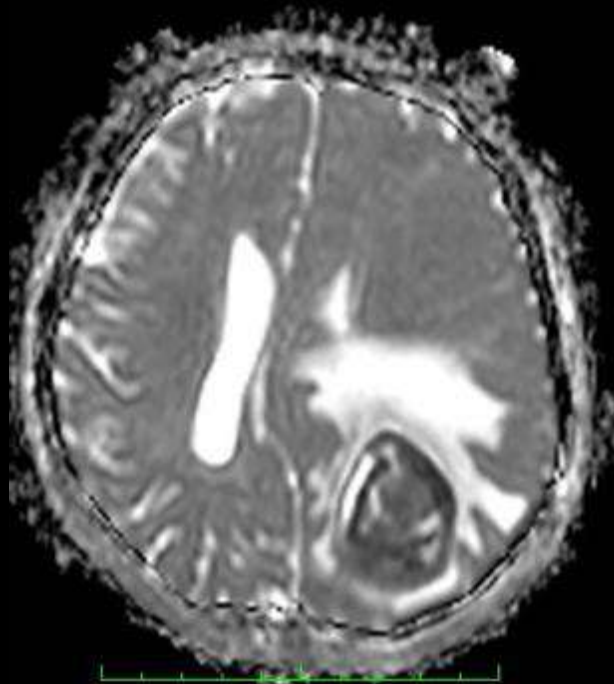
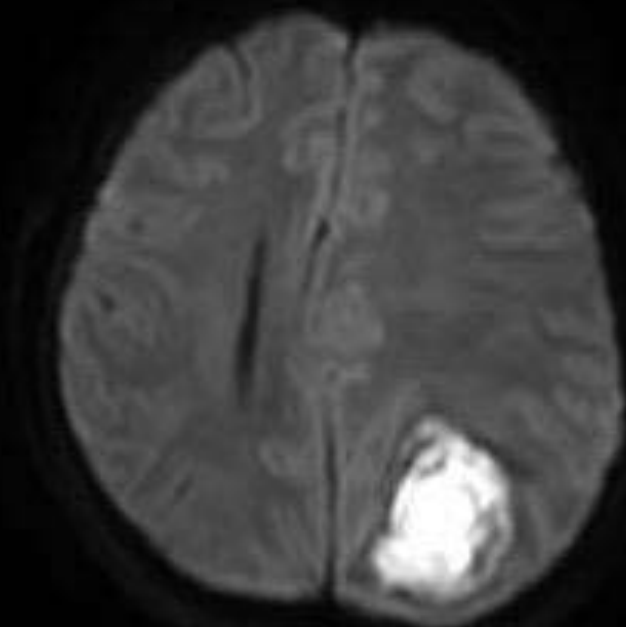
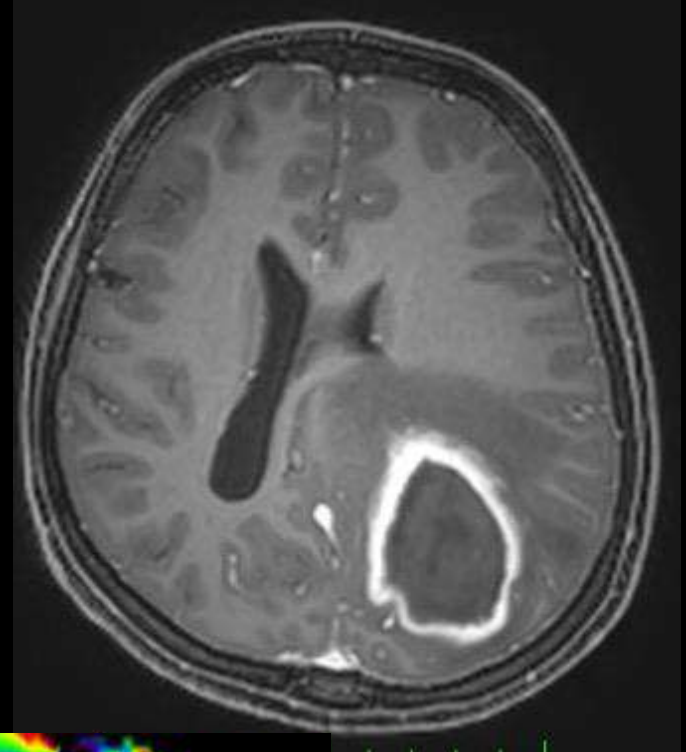


Periferik kontrastlanma
Difüzyon kısıtlama



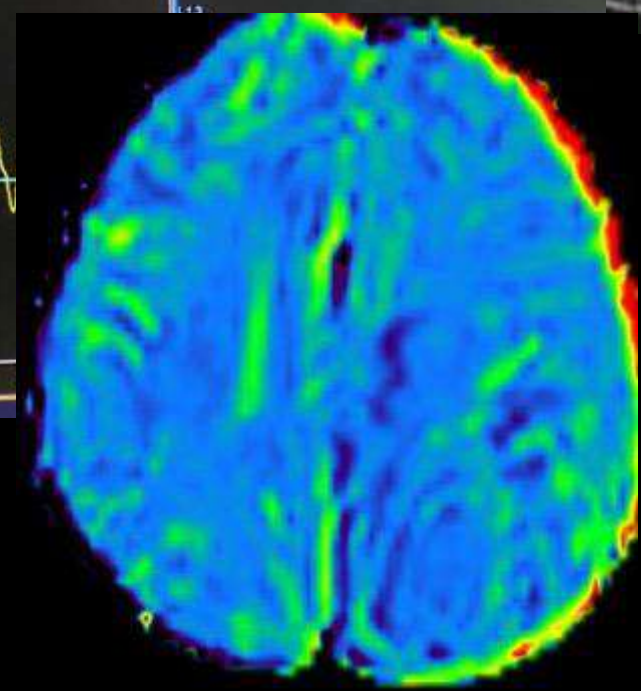
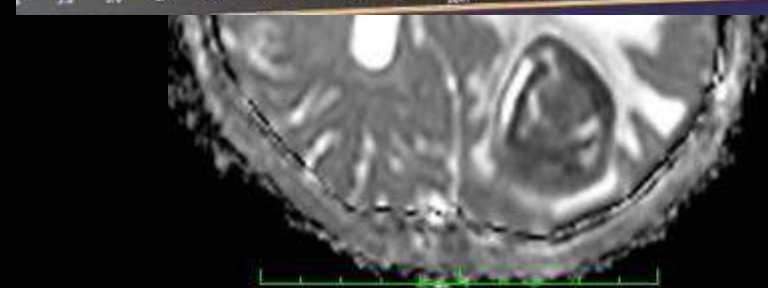
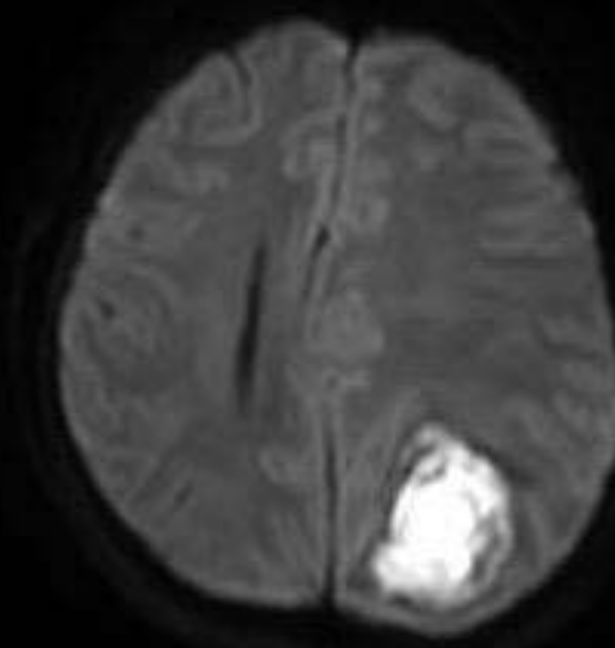
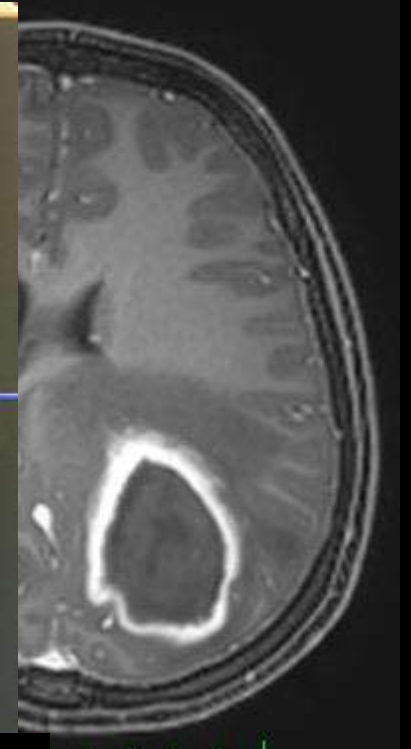
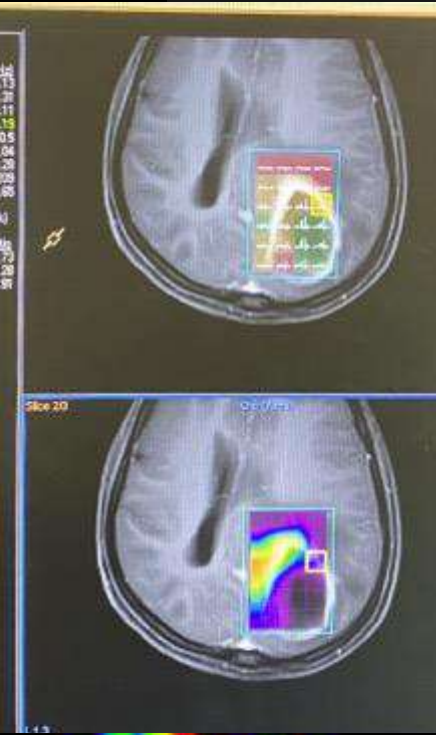


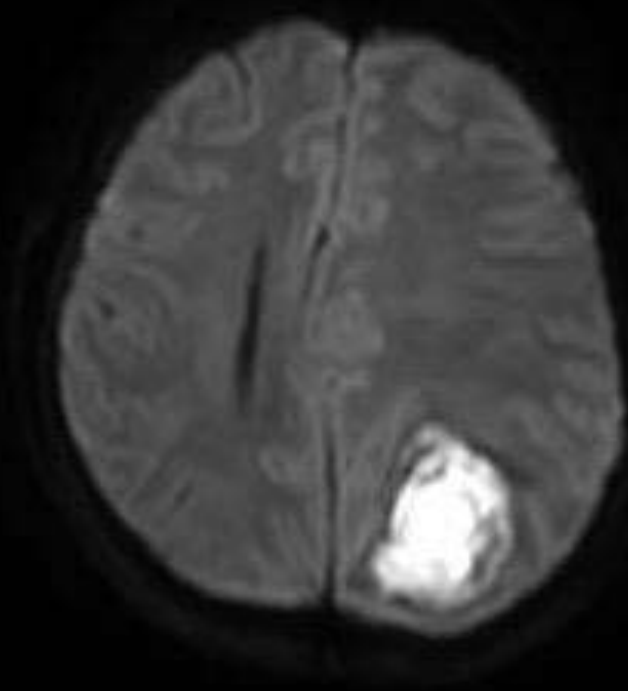
Periferik kontrastlanma
Difüzyon kısıtlama
Hipoperfüze



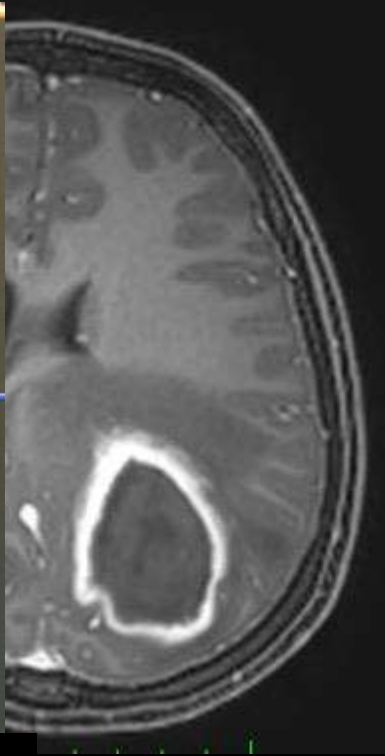
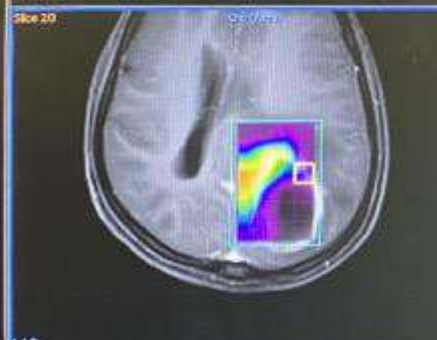
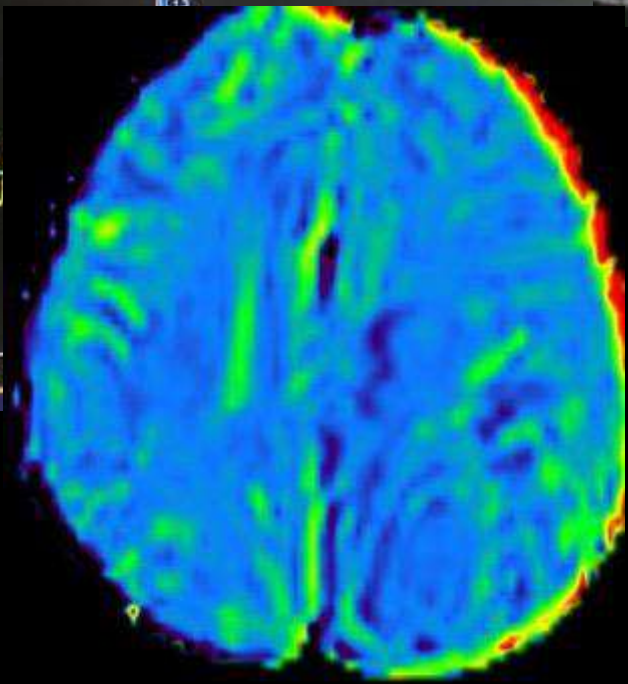
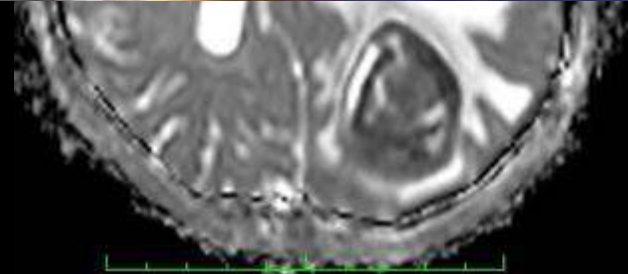
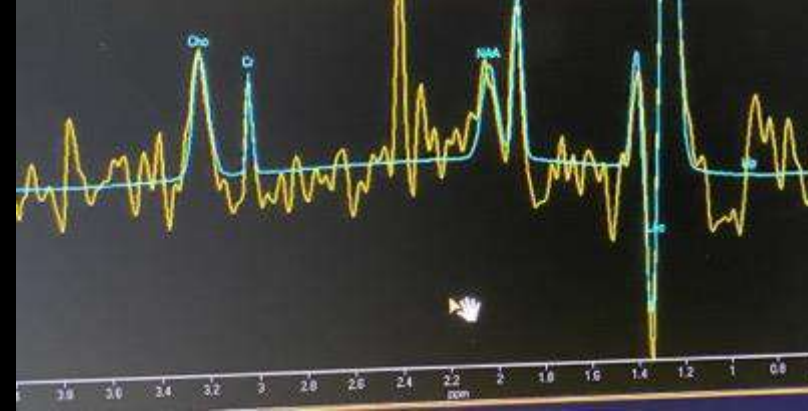


Periferik kontrastlanma
 Difüzyon kısıtlama
 Hipoperfüze
 Lipid, Asetat, suksinat



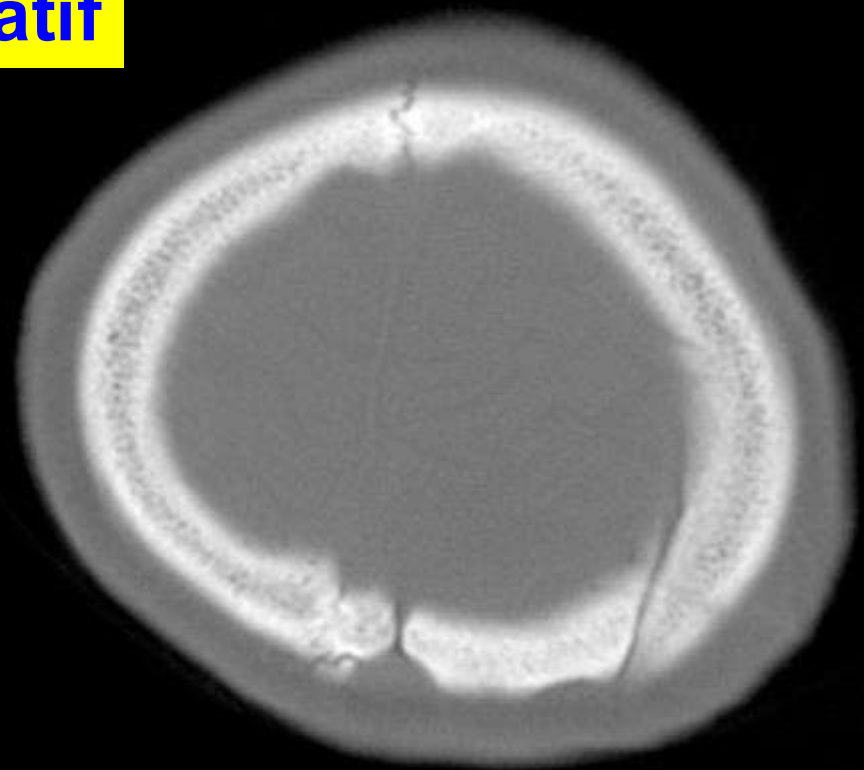
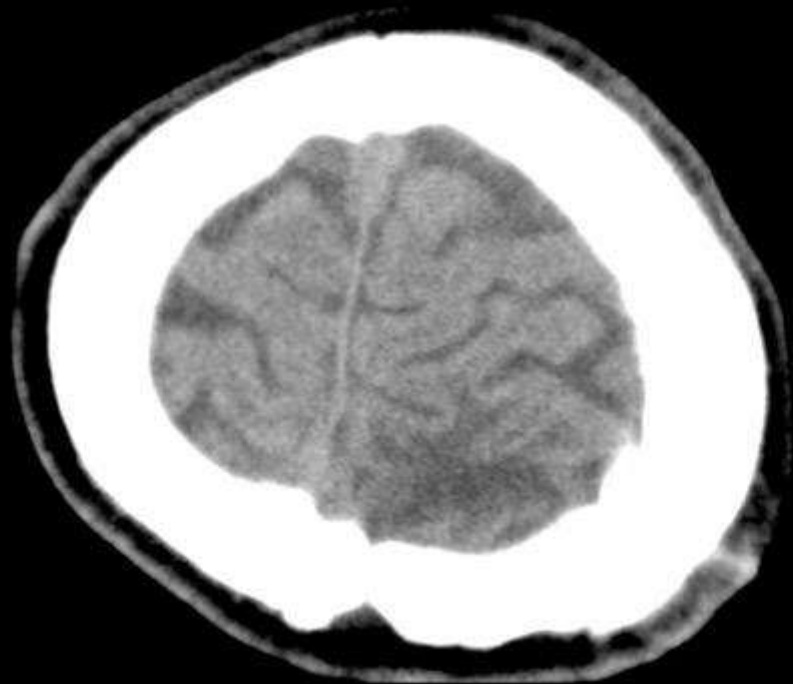


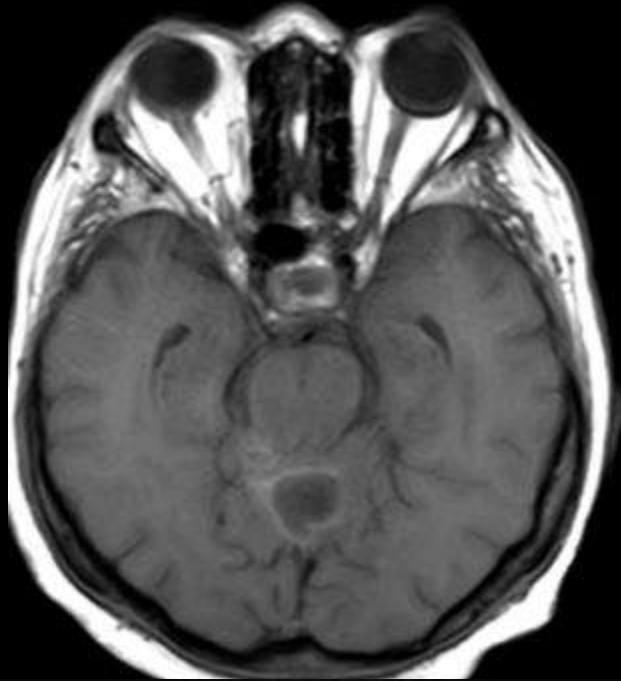
APSE



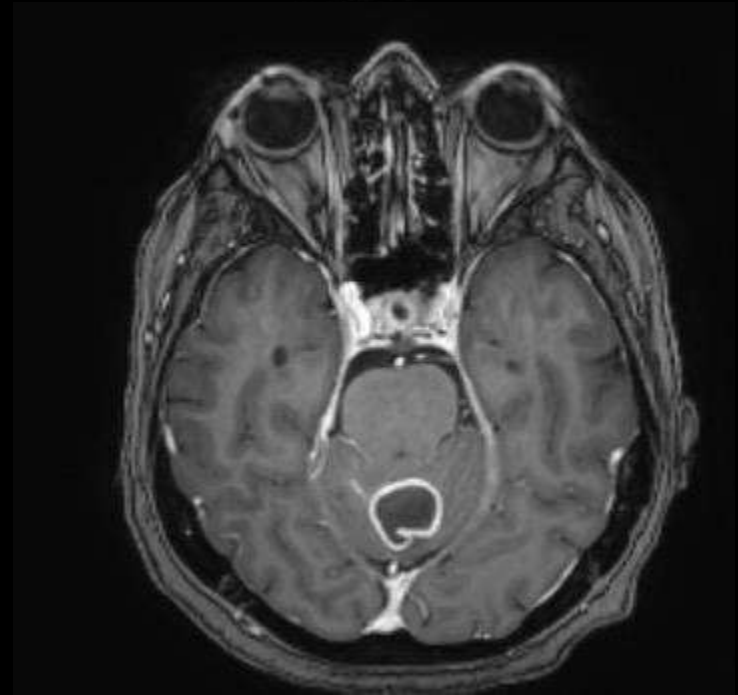
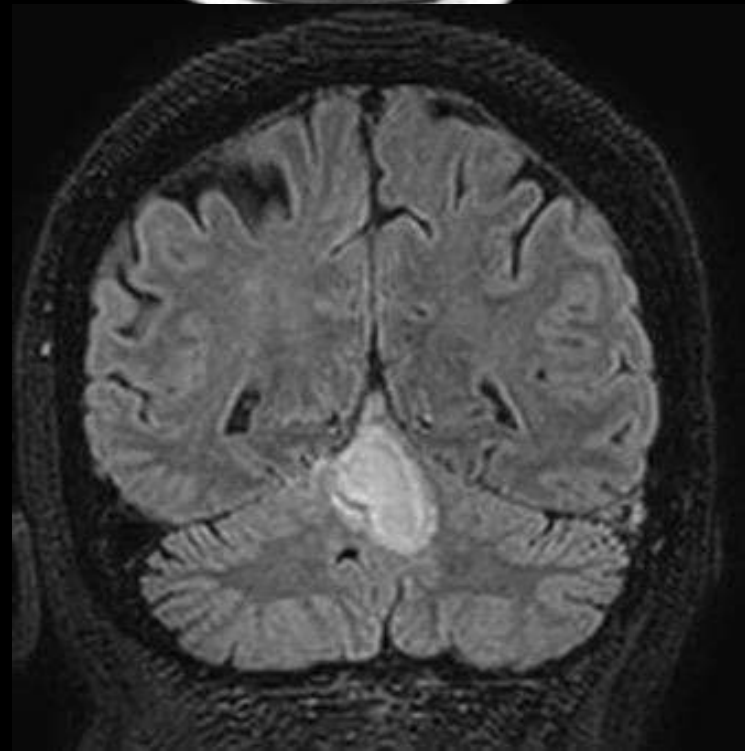


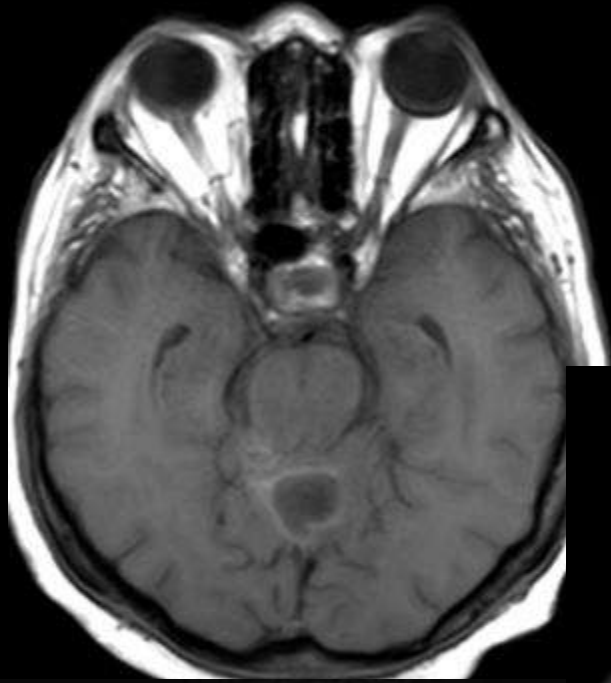
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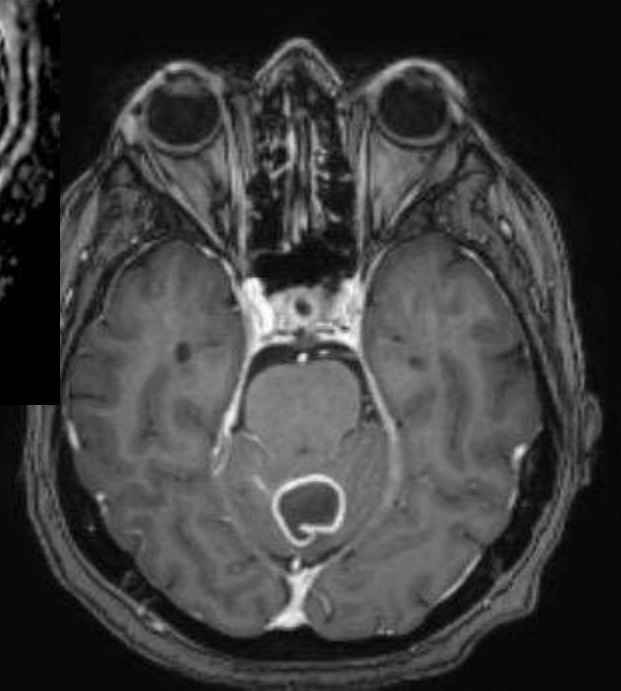
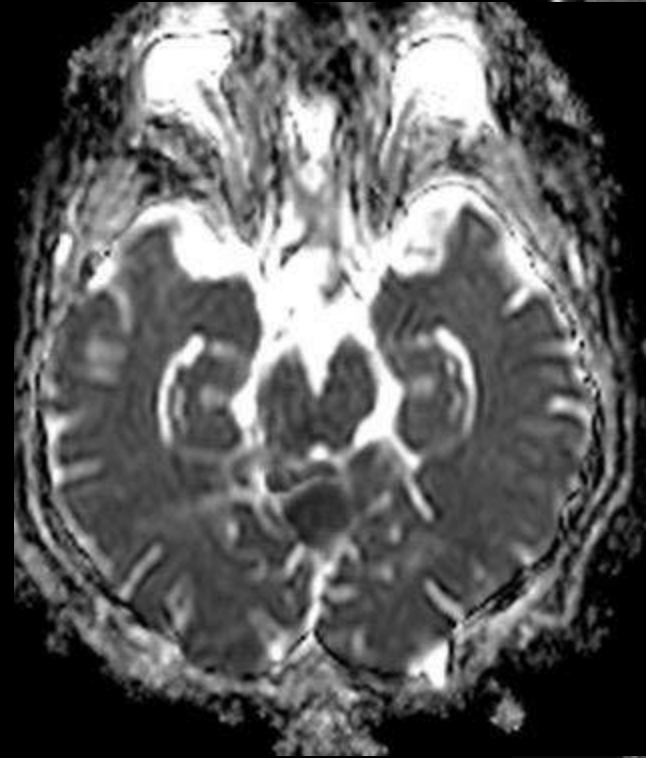
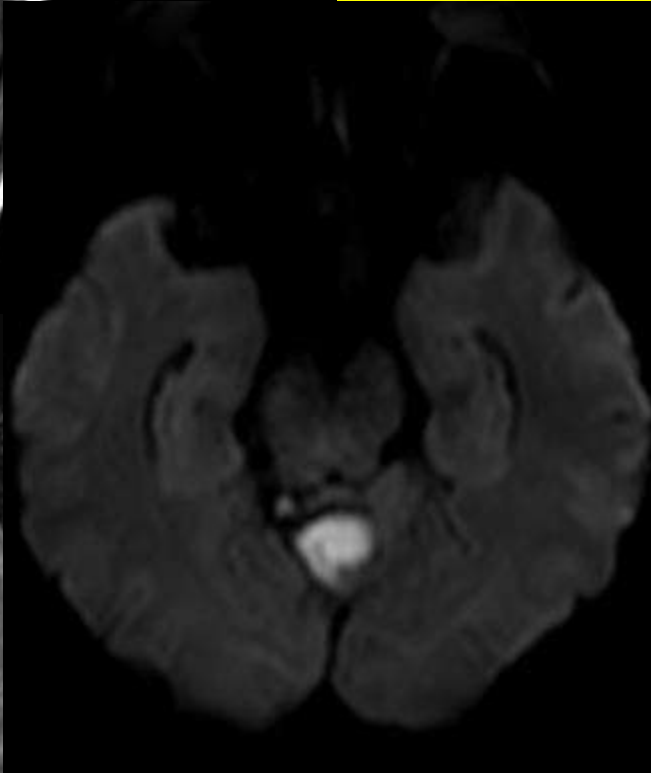
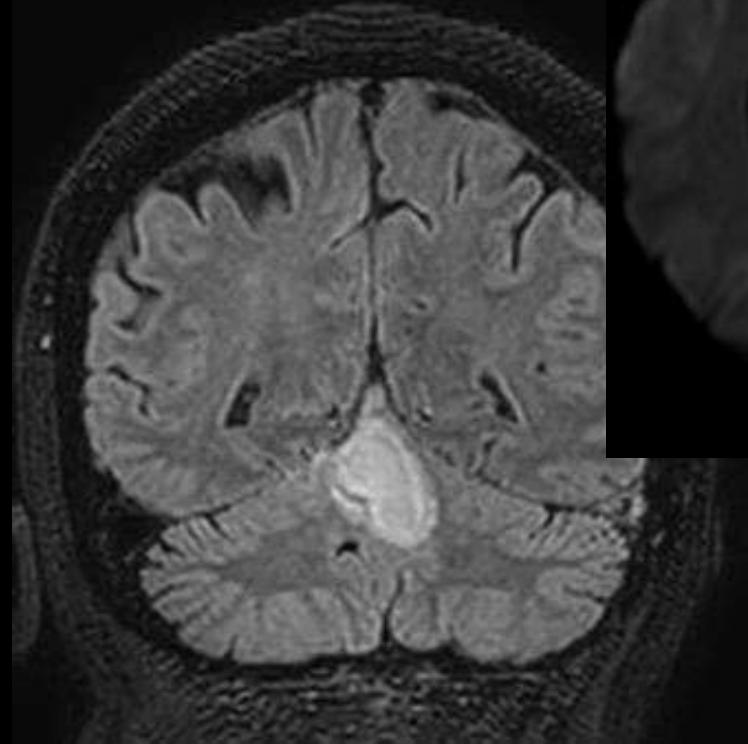


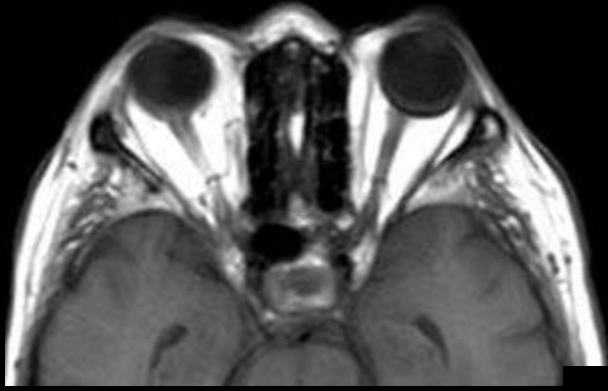
Periferik kontrastlanma



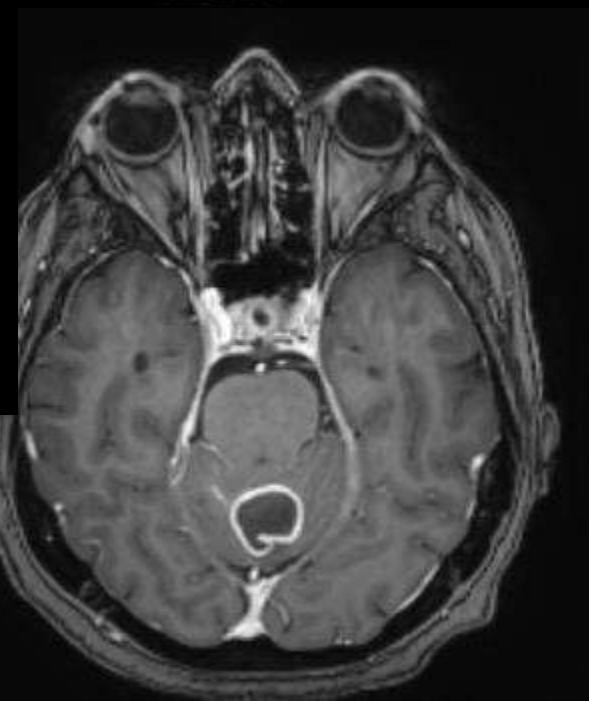
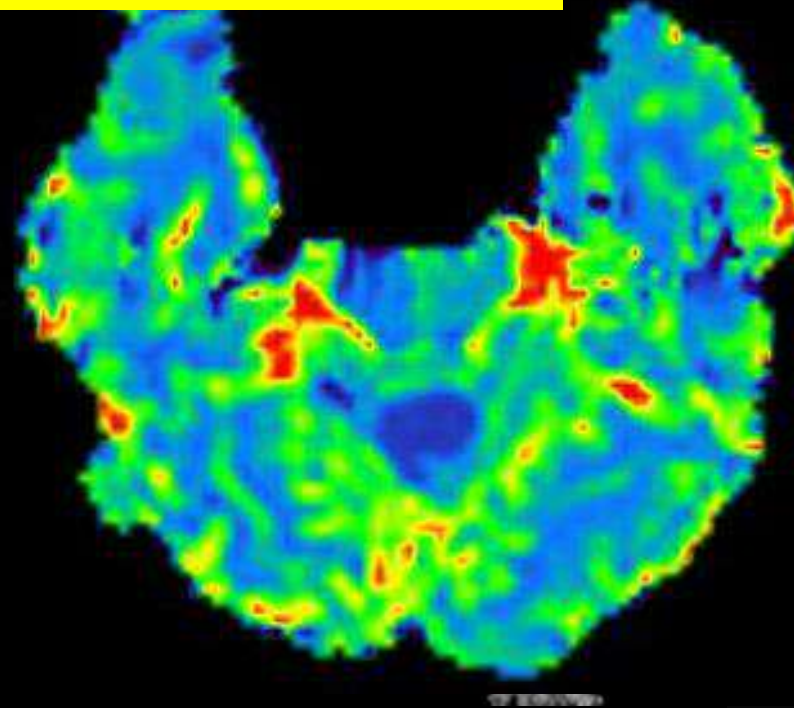
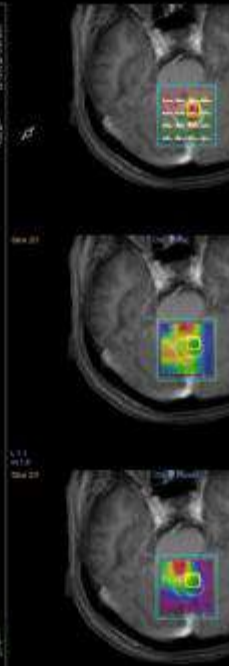
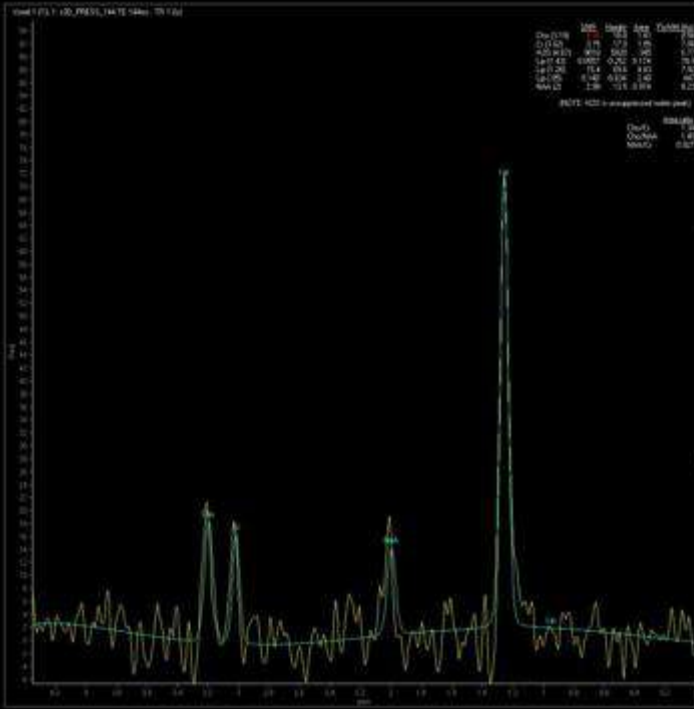
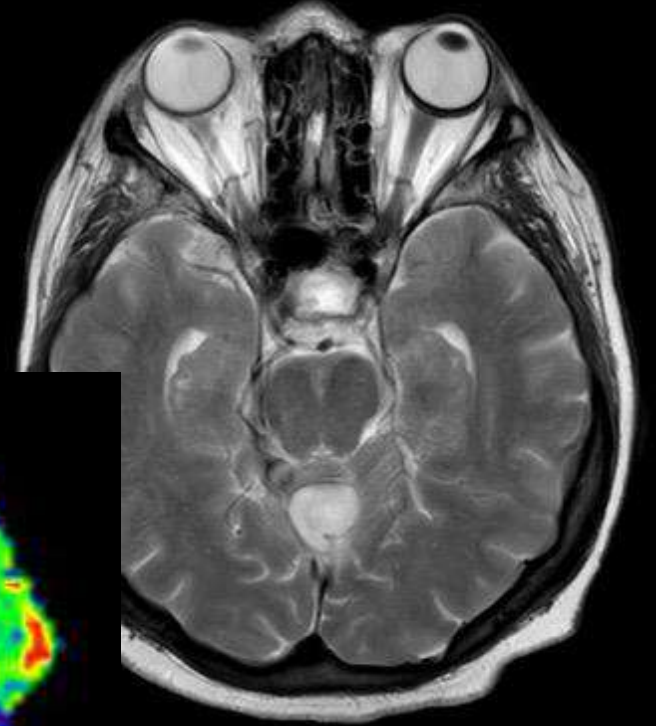


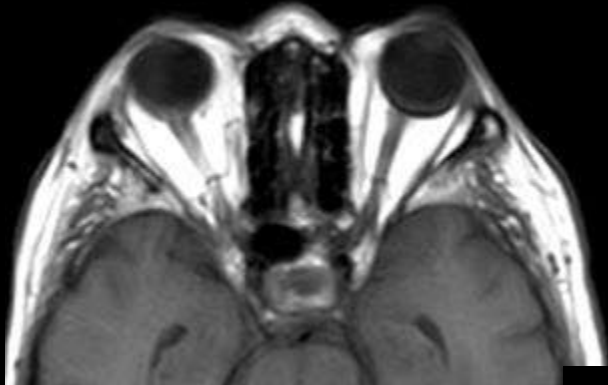
Periferik kontrastlanma
Difüzyon kısıtlama



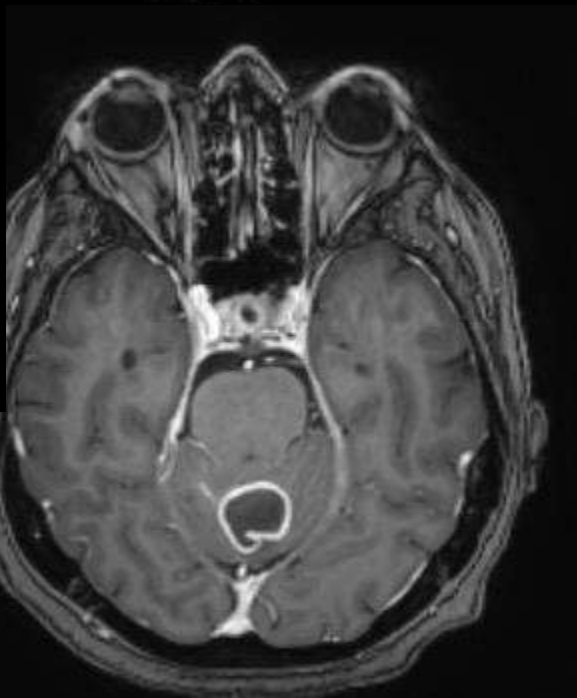
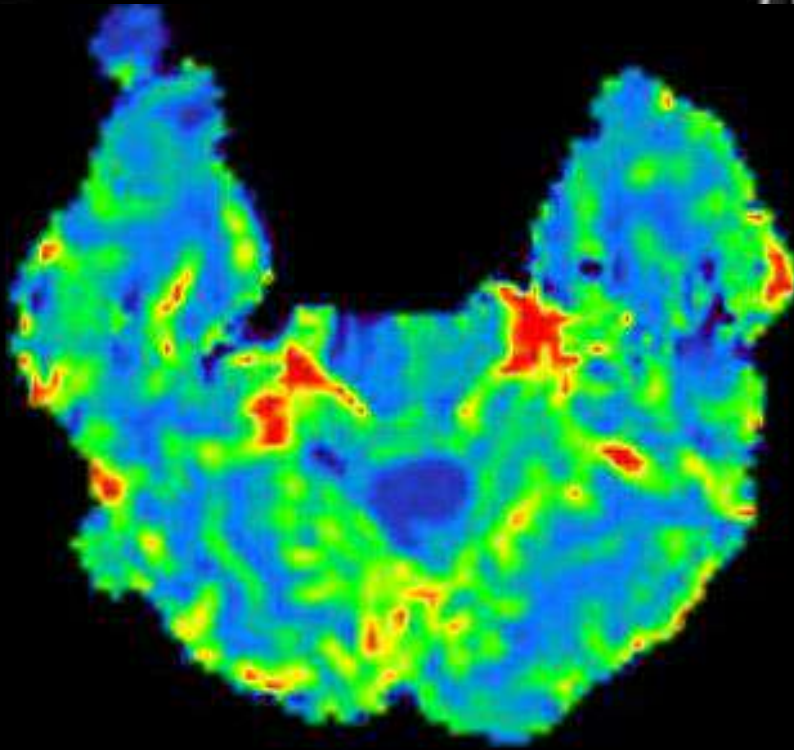
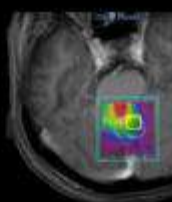
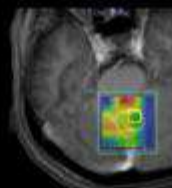
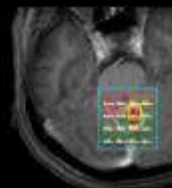
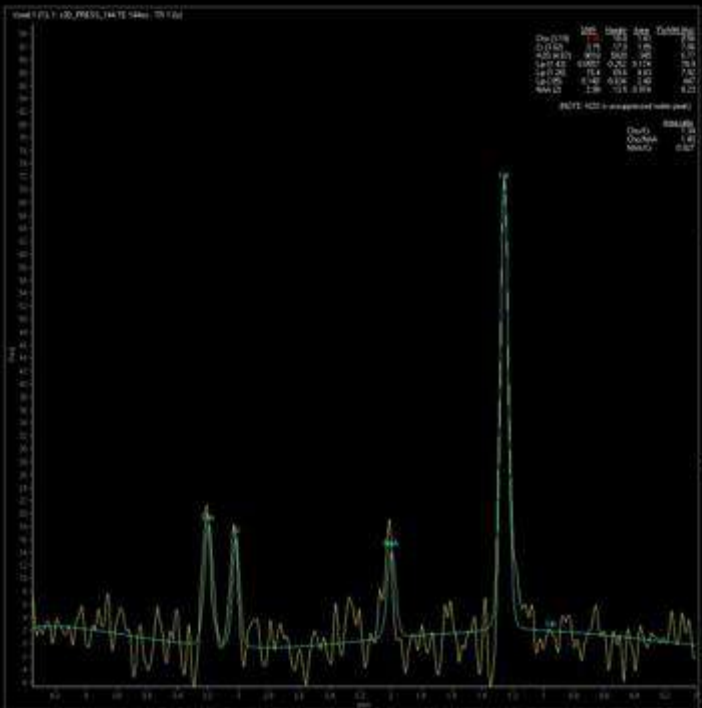
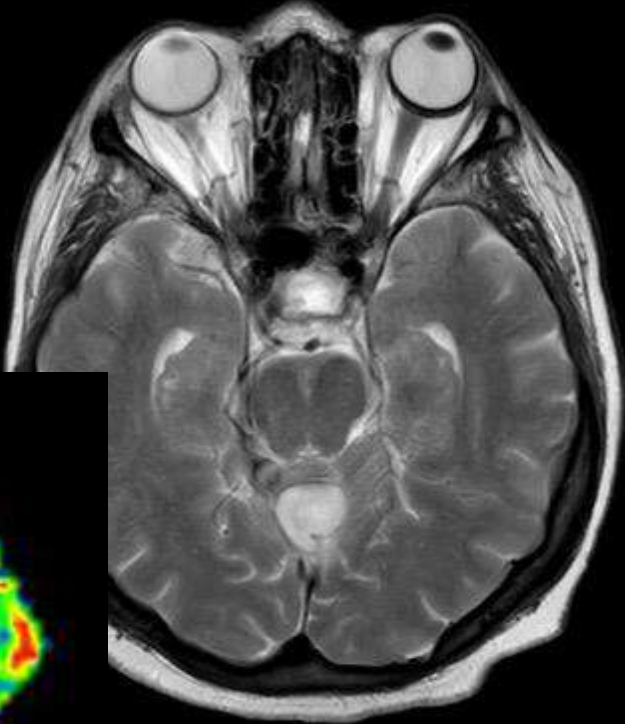


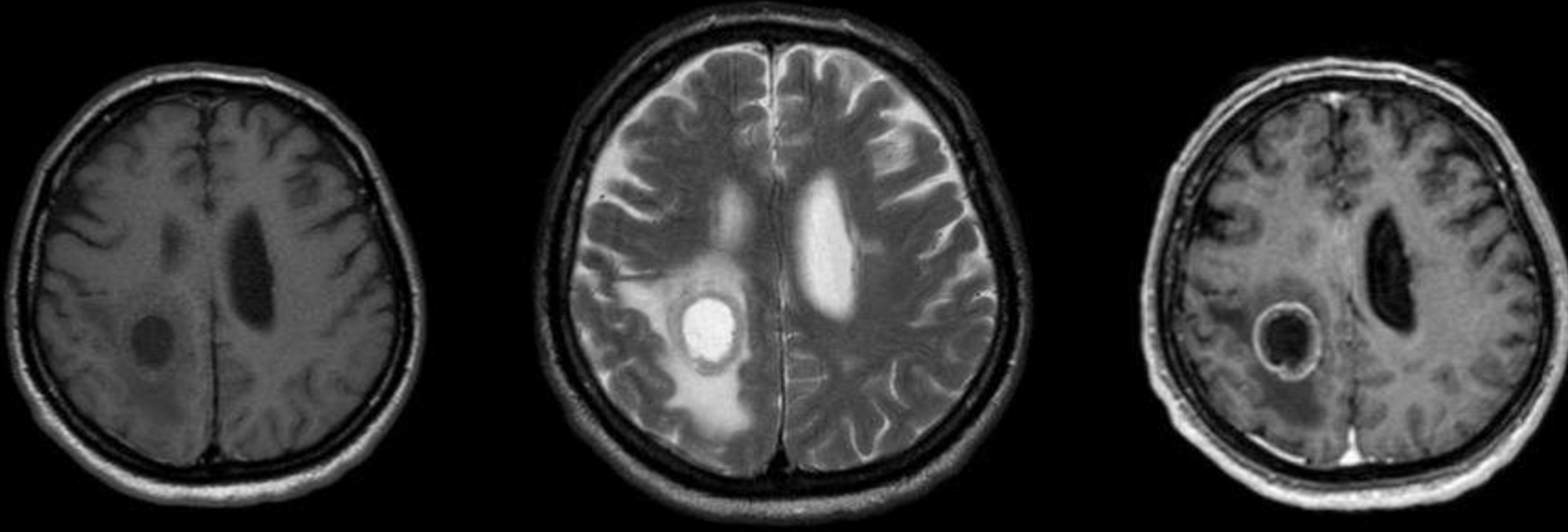
Periferik kontrastlanma
Difüzyon kısıtlama
Hipoperfüze



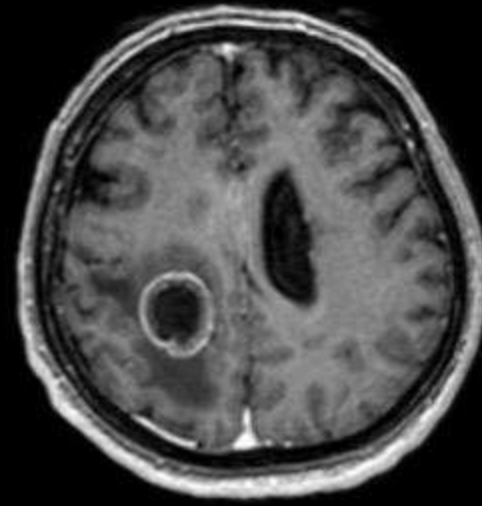
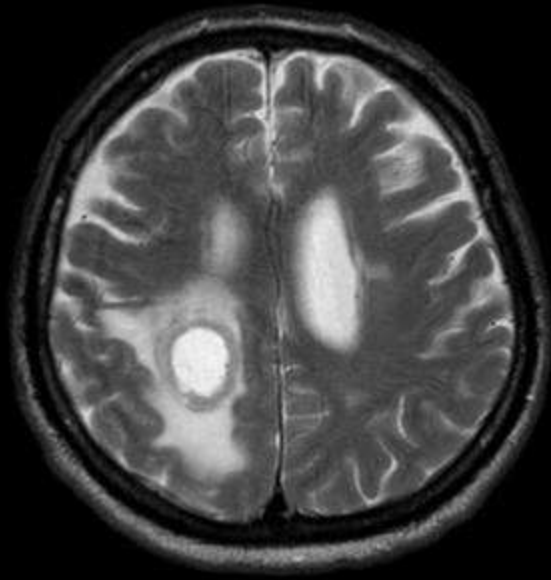
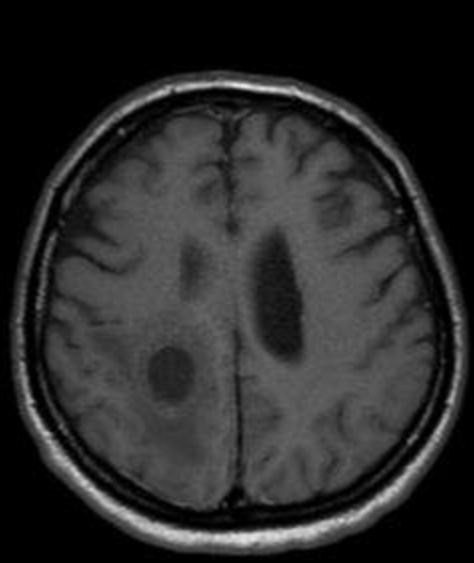


APSE

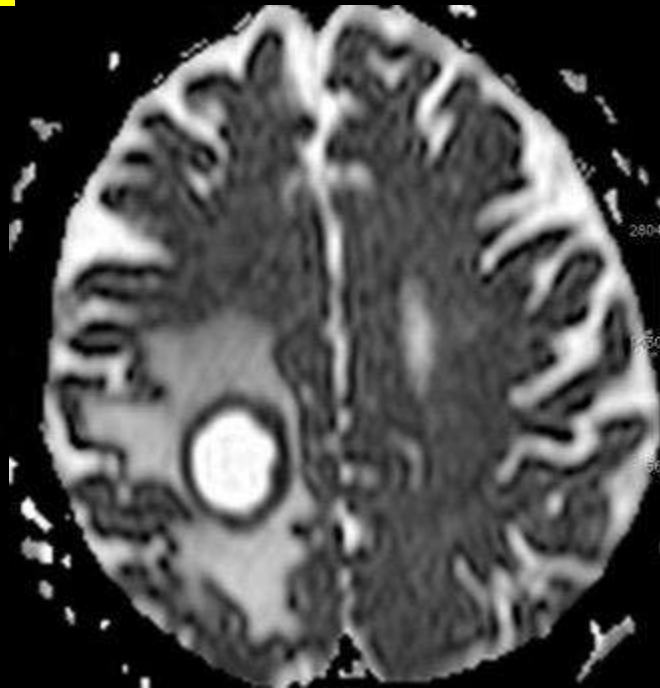
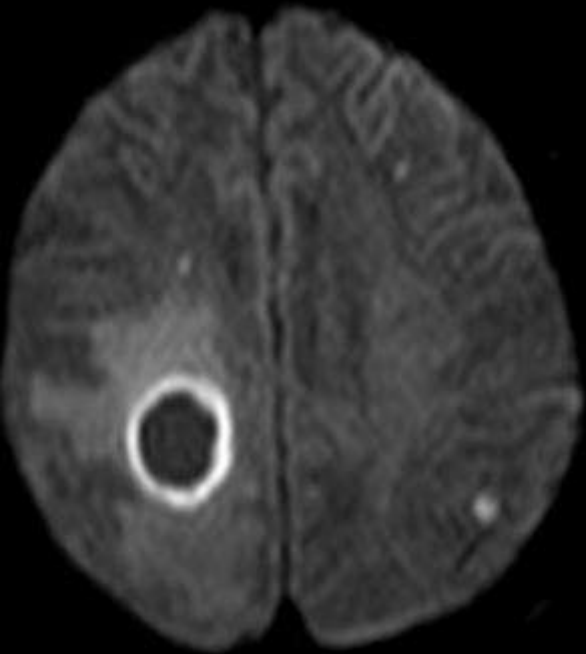


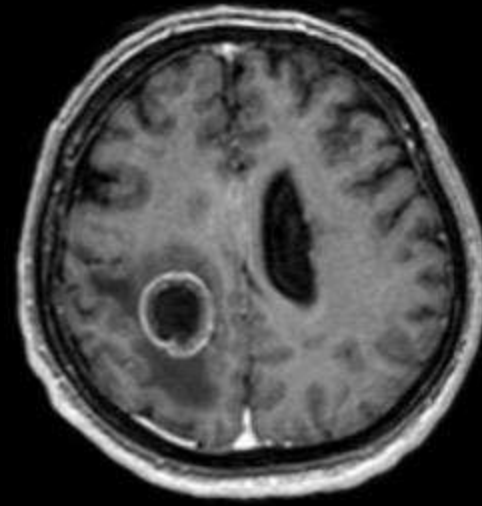
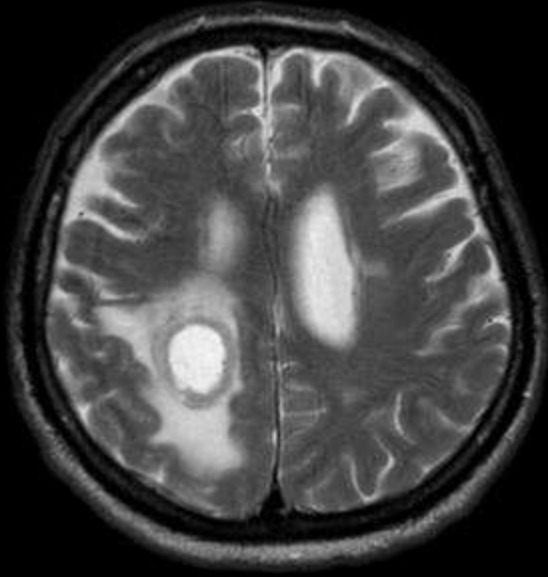
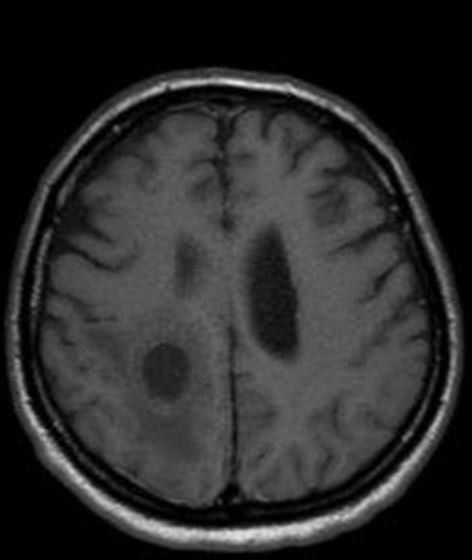


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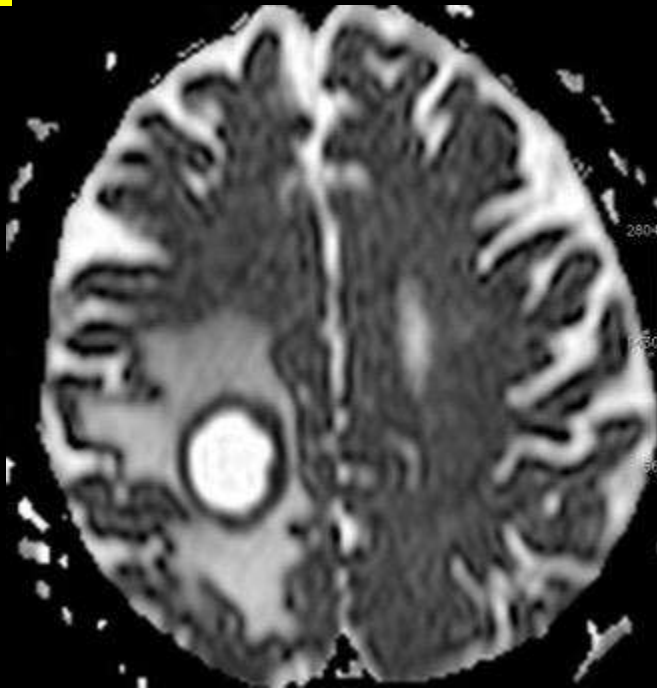
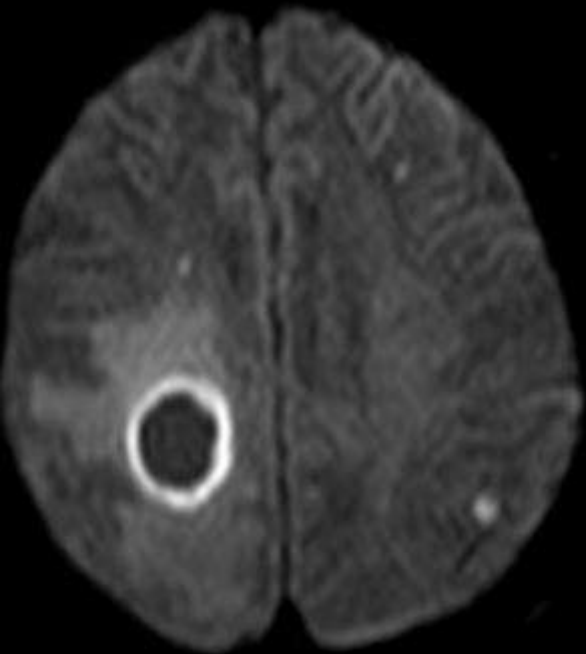
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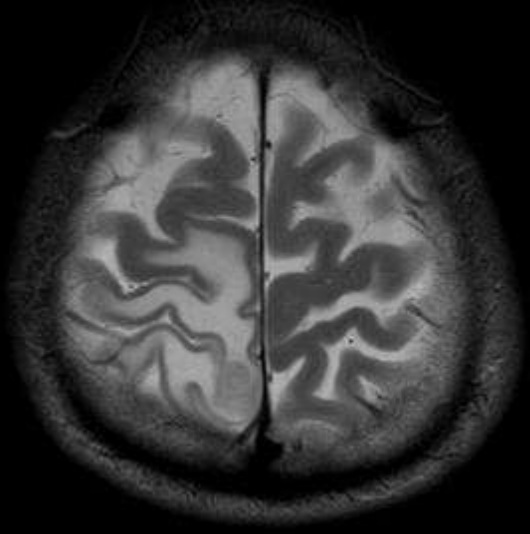




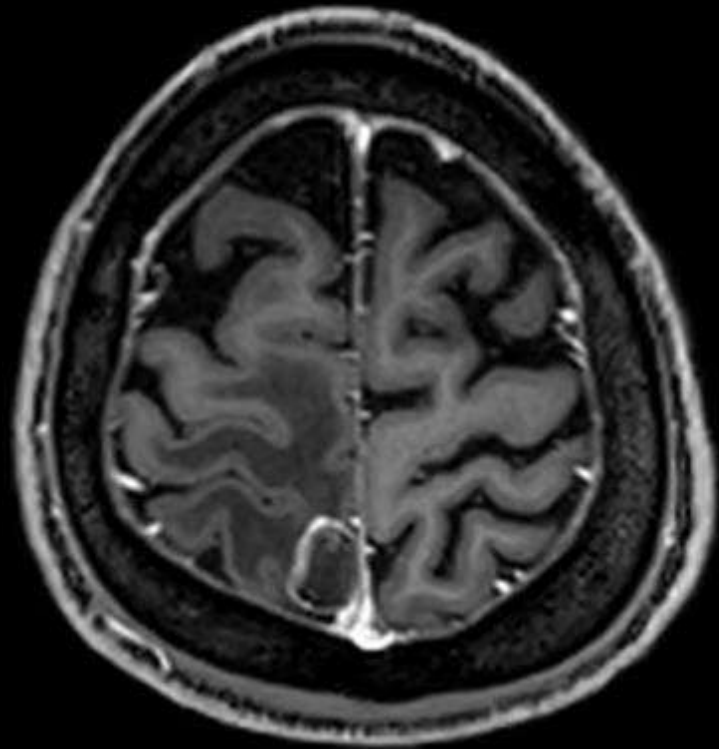
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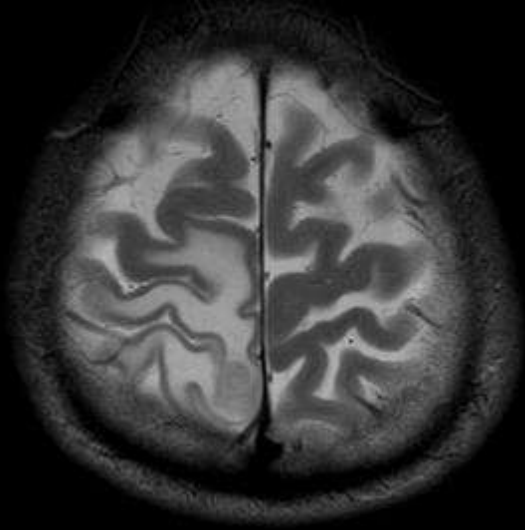
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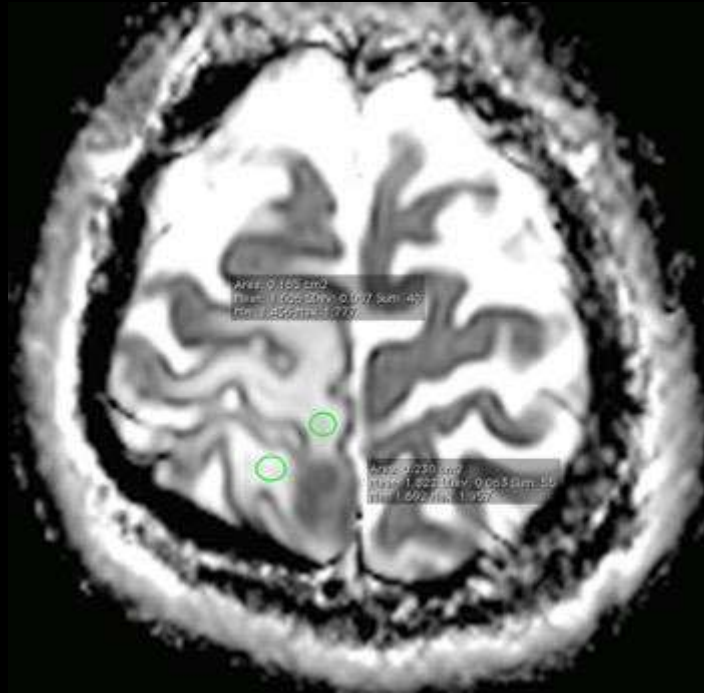
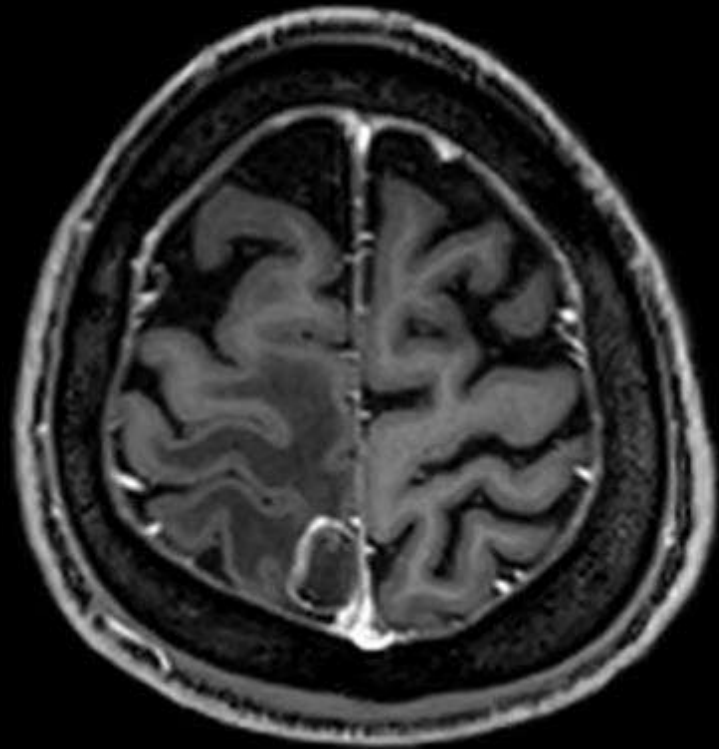
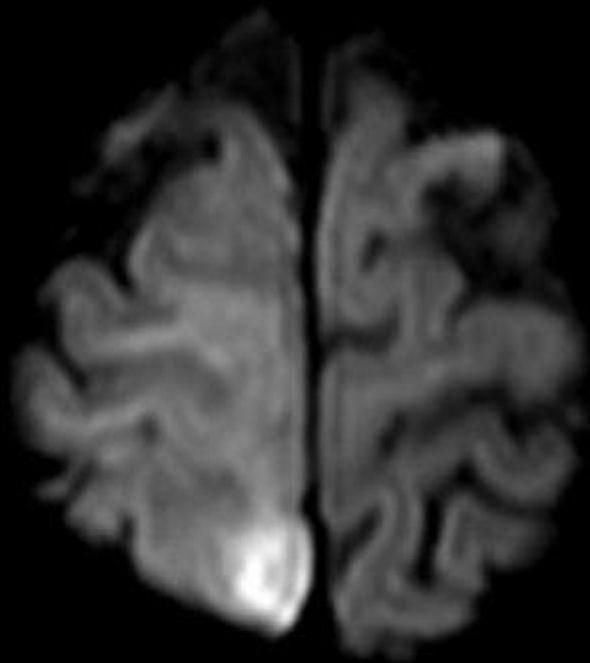


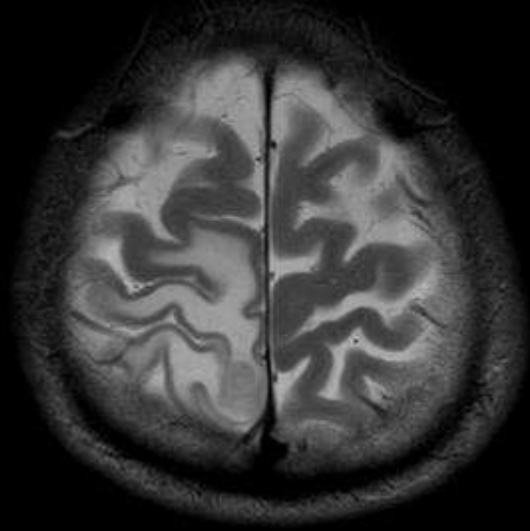
AYIRICI TANI



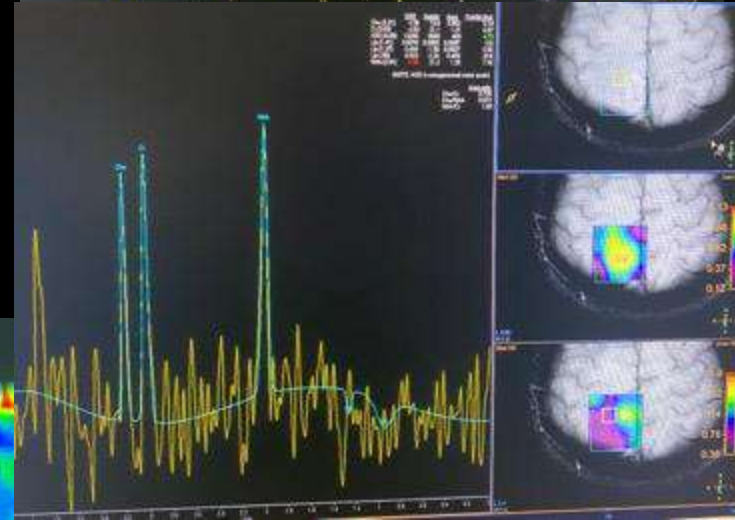
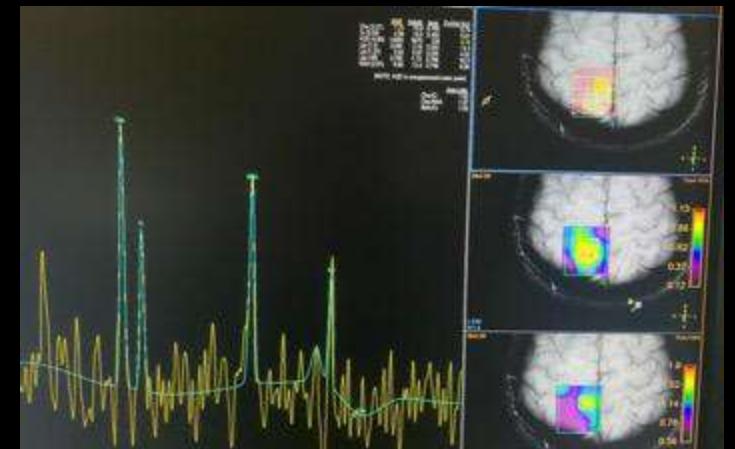
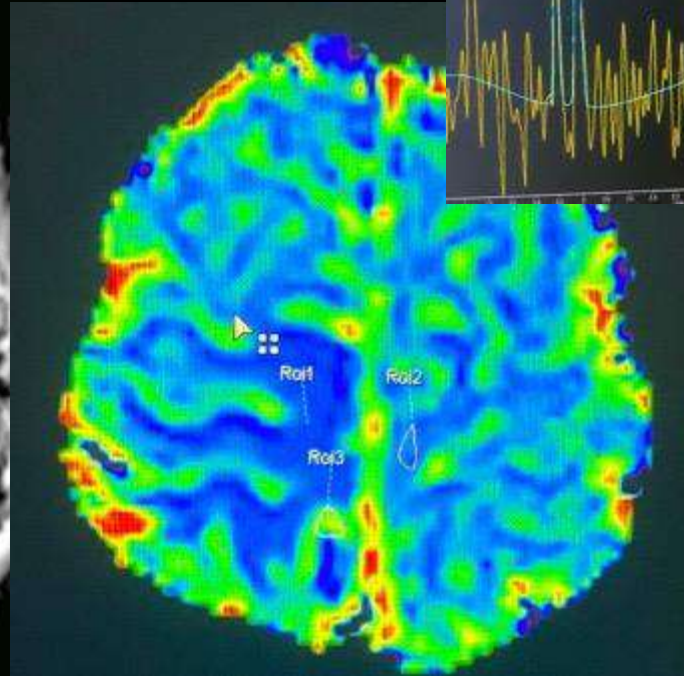
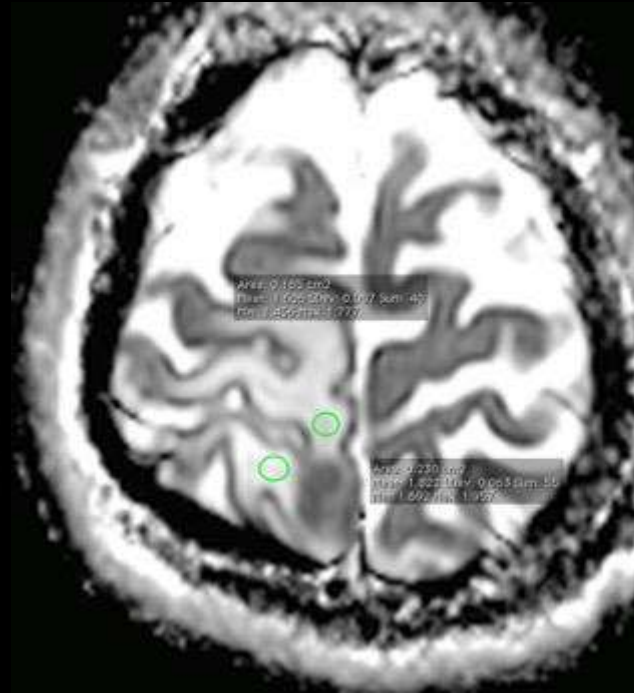
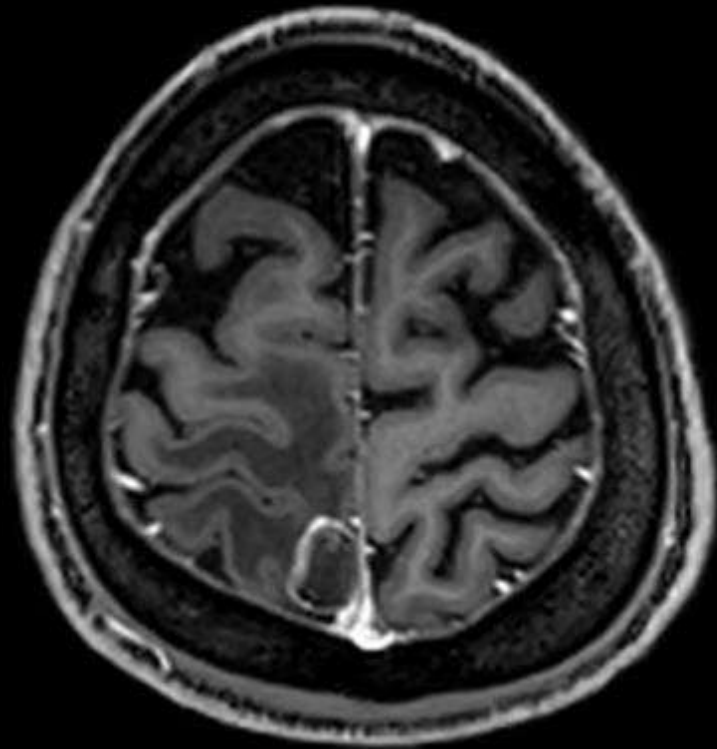
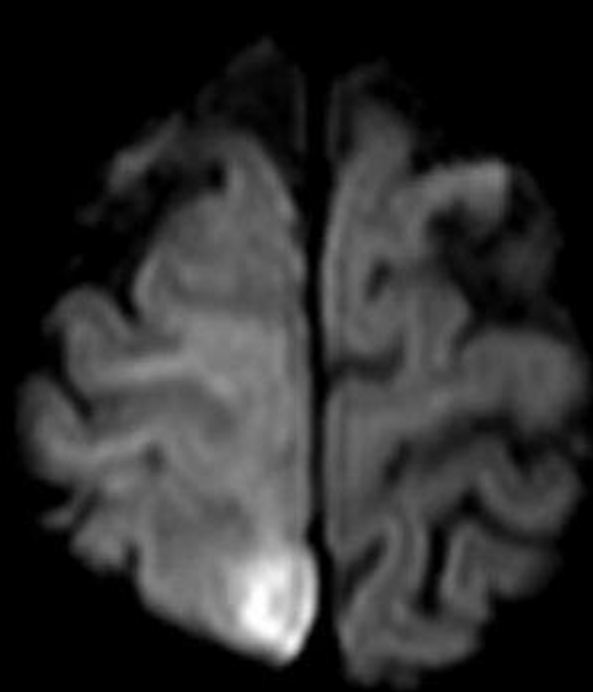


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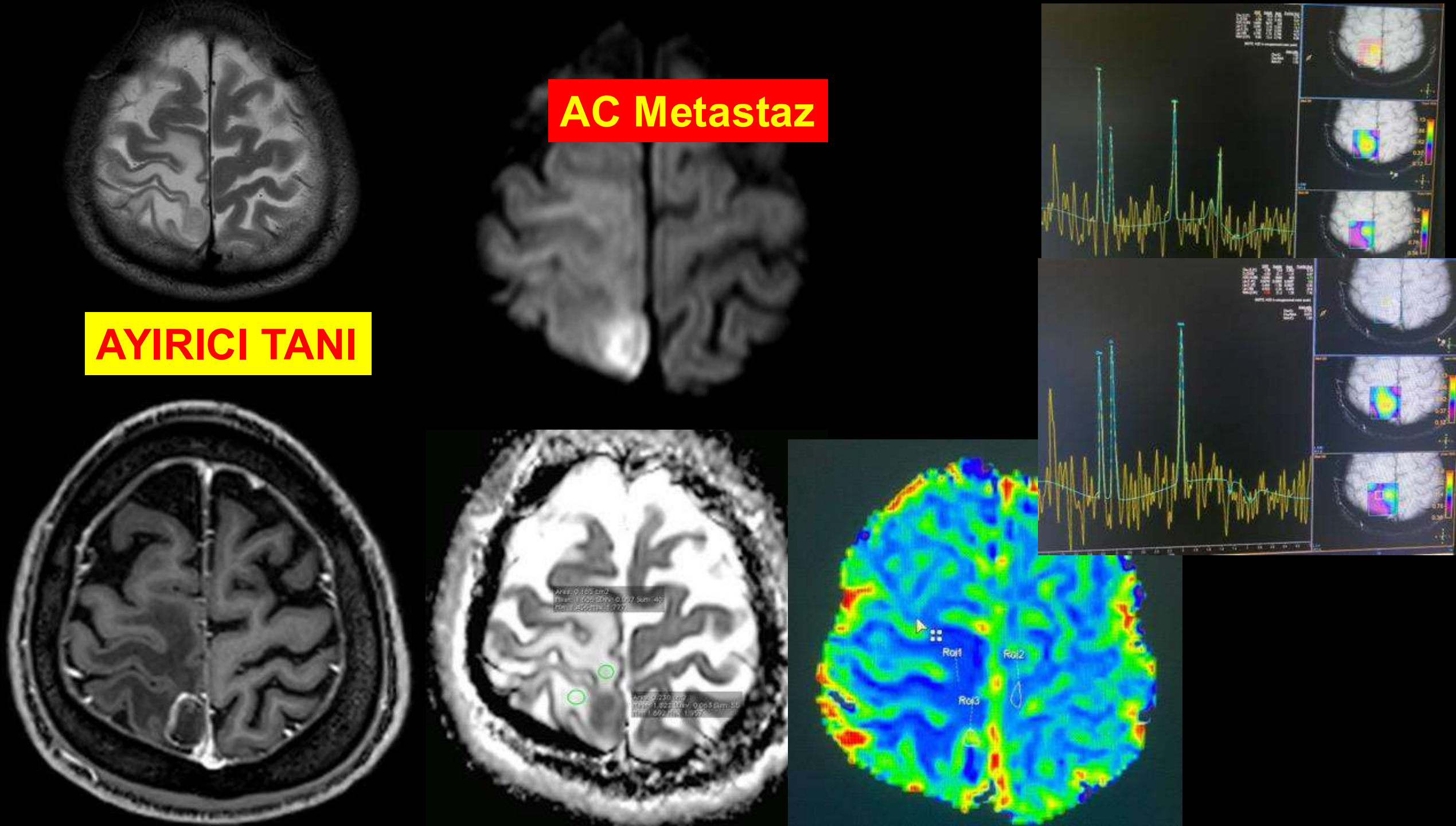


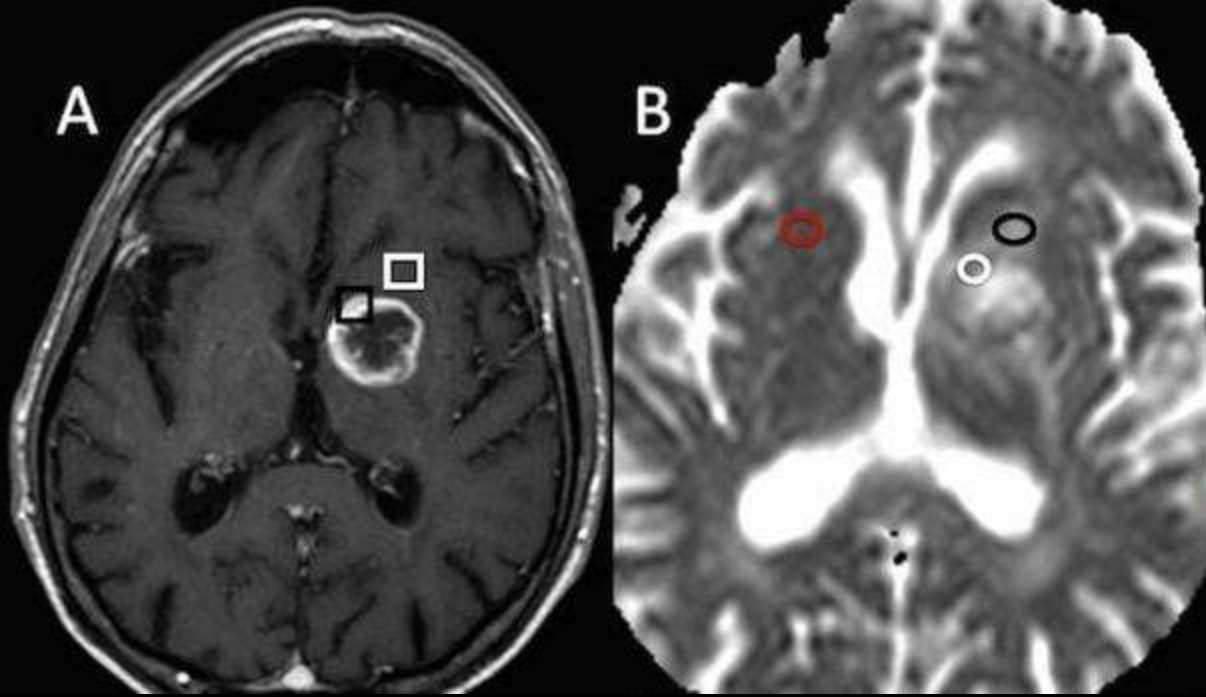
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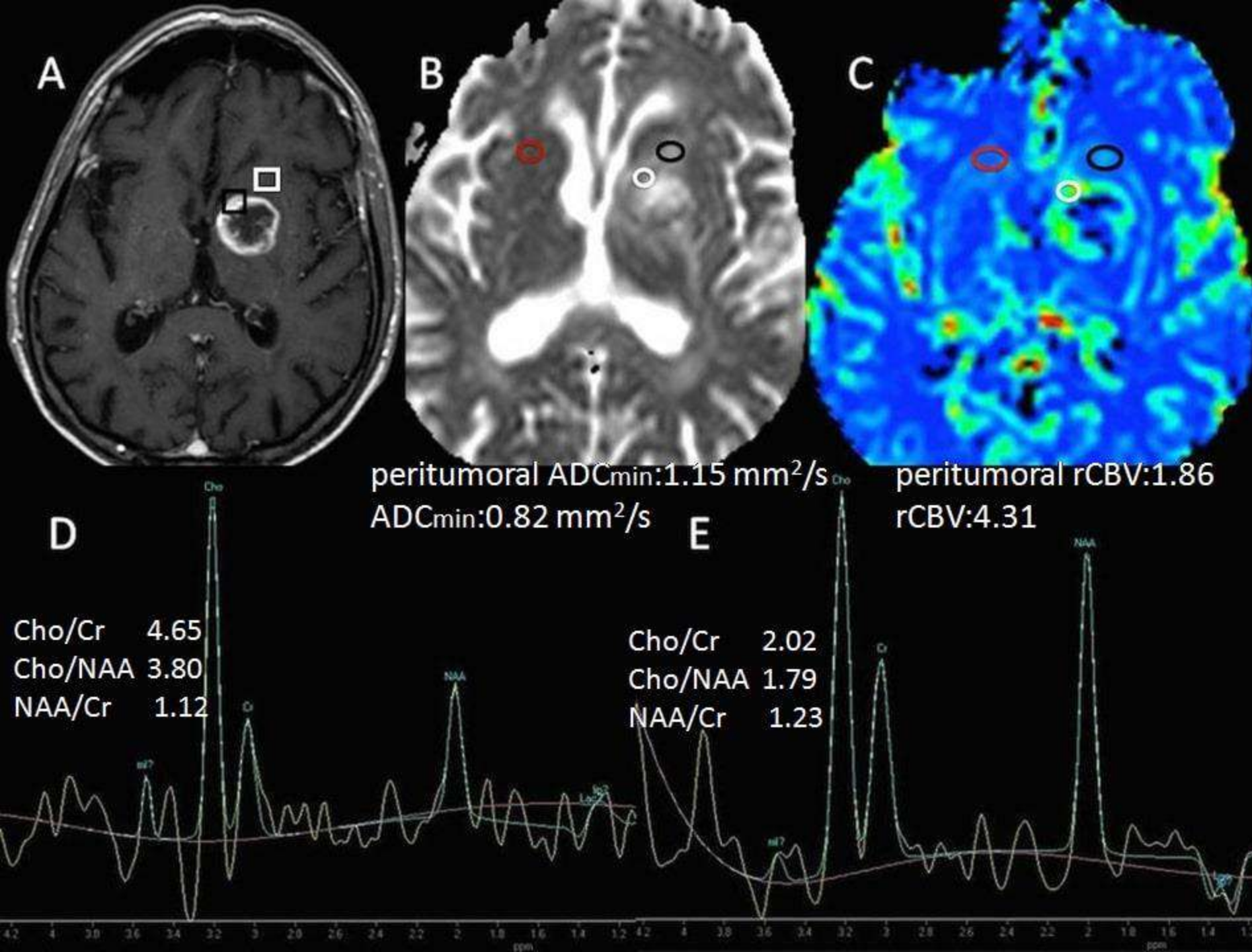
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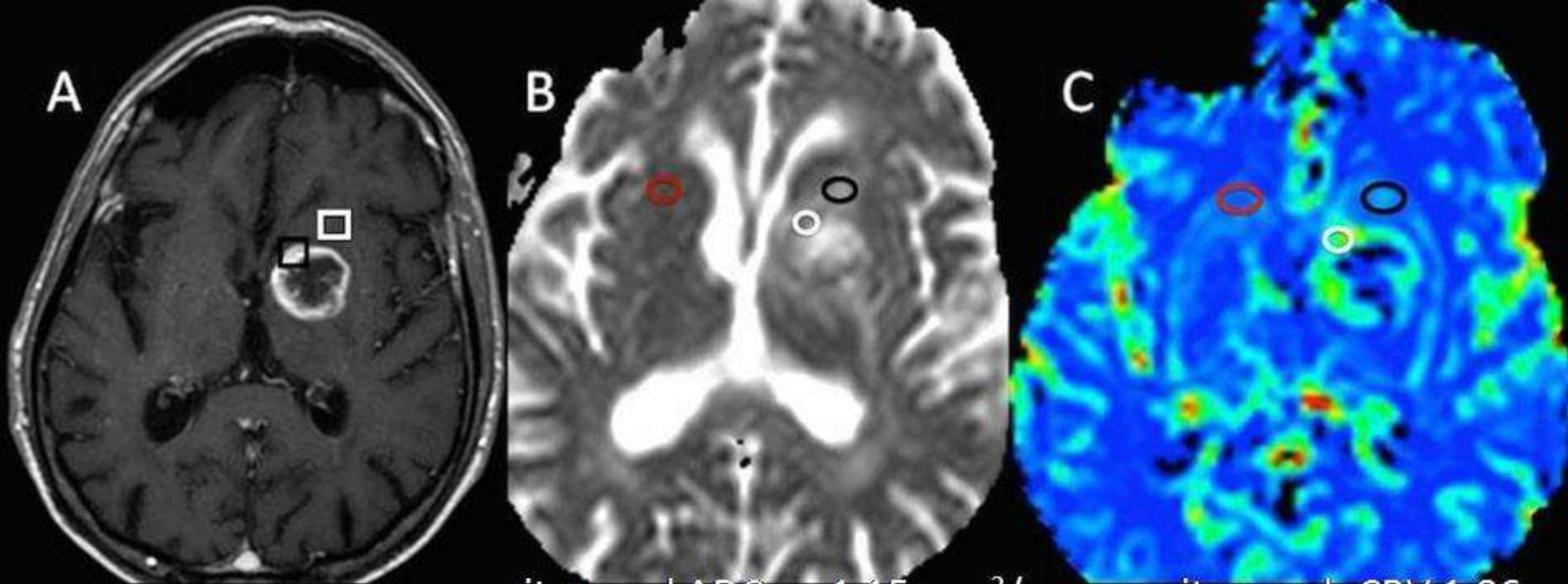




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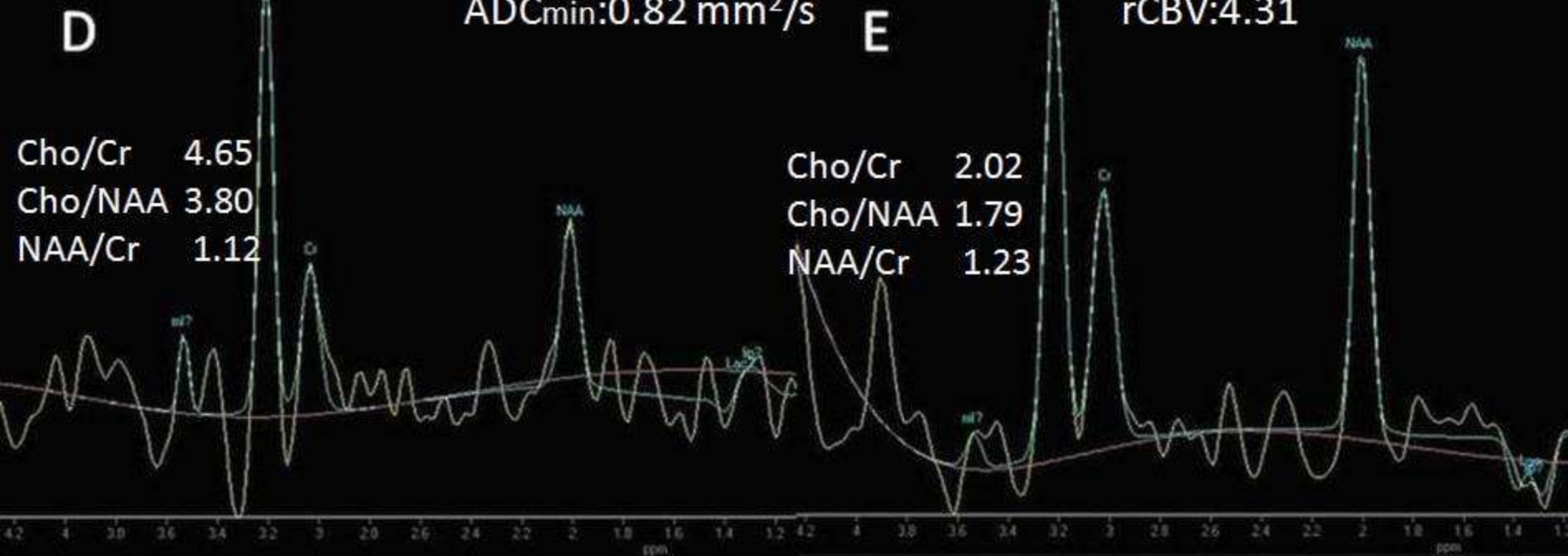


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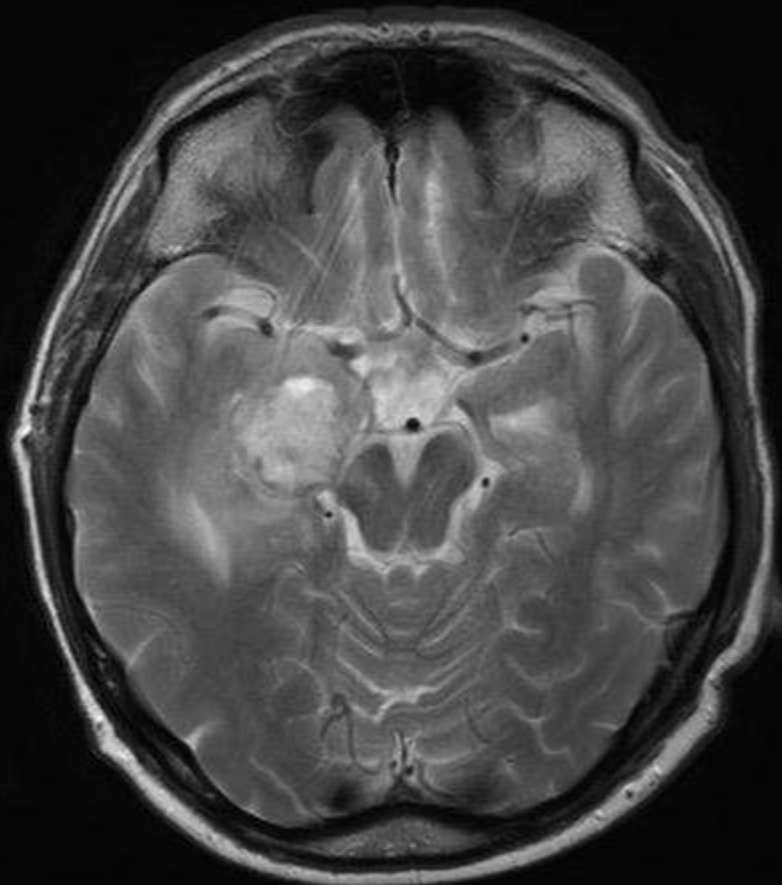
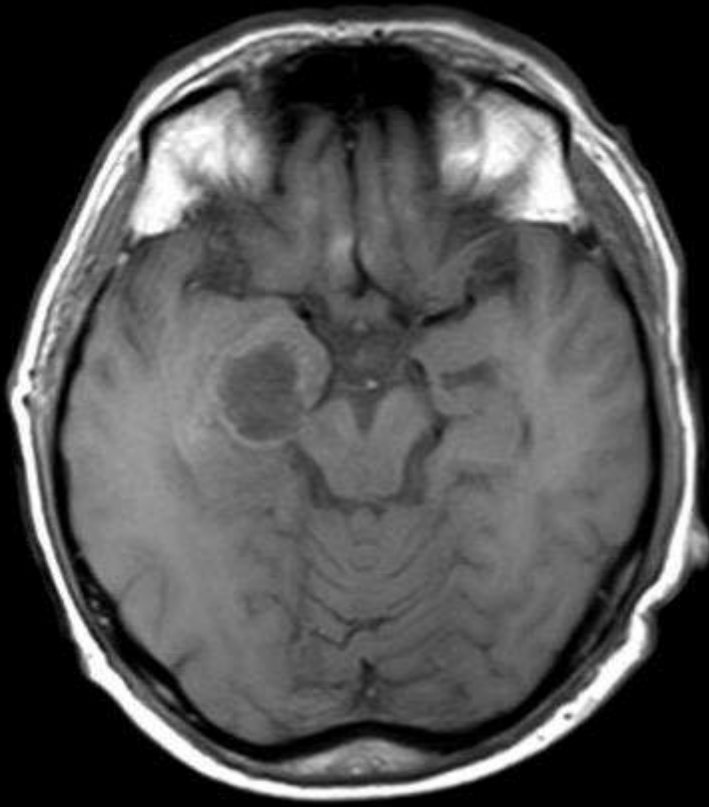
peritumoral ADCmin: $1.15 \text{ mm}^2/\text{s}$
 ADCmin: $0.82 \text{ mm}^2/\text{s}$

peritumoral rCBV: 1.86
 rCBV: 4.31

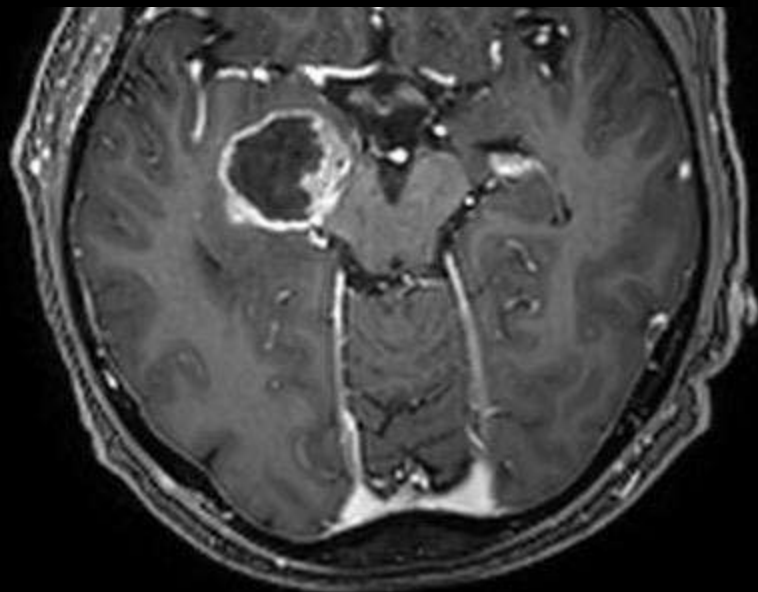


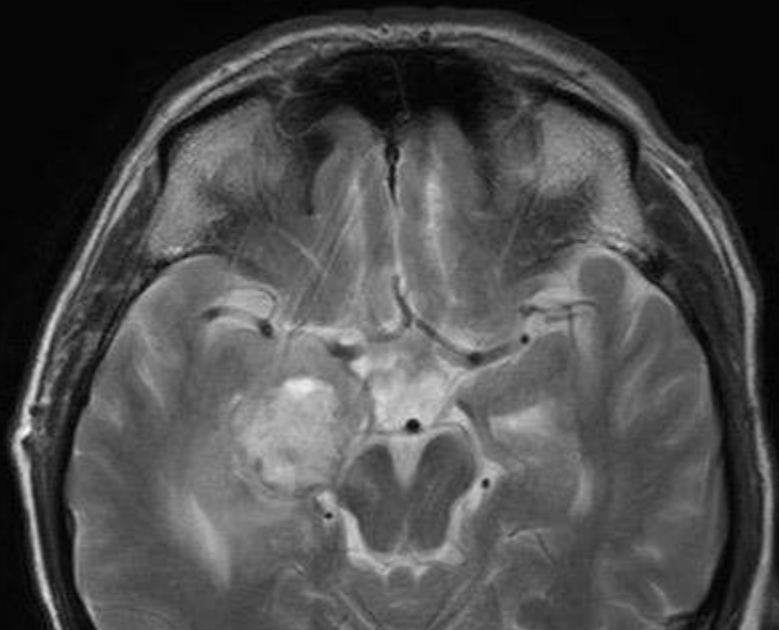
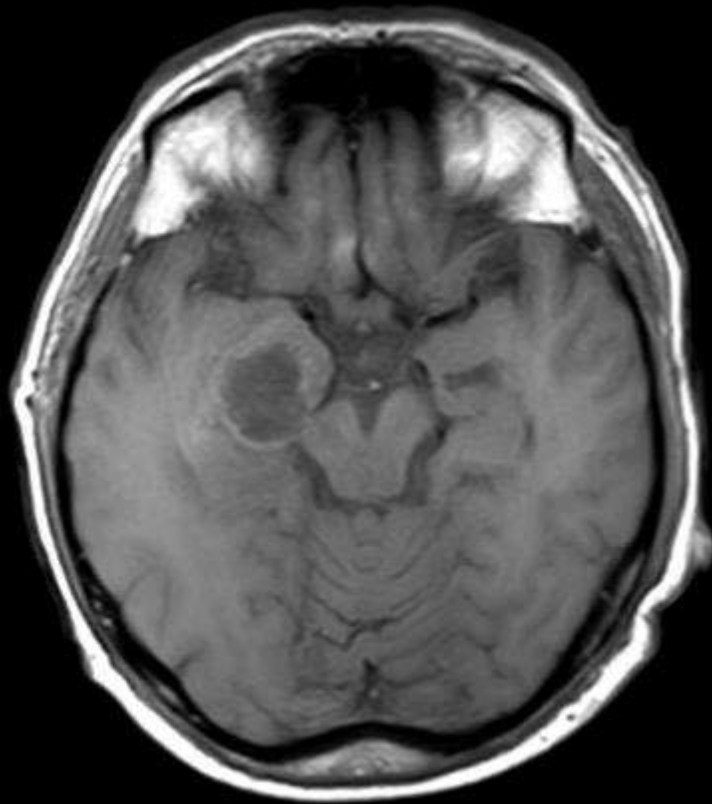
Glioblastoma

AYIRICI TANI

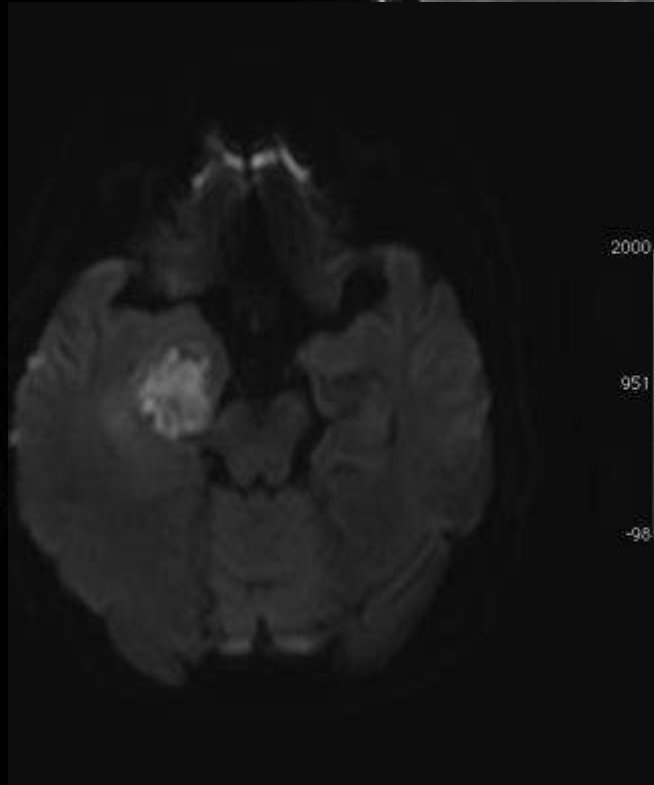
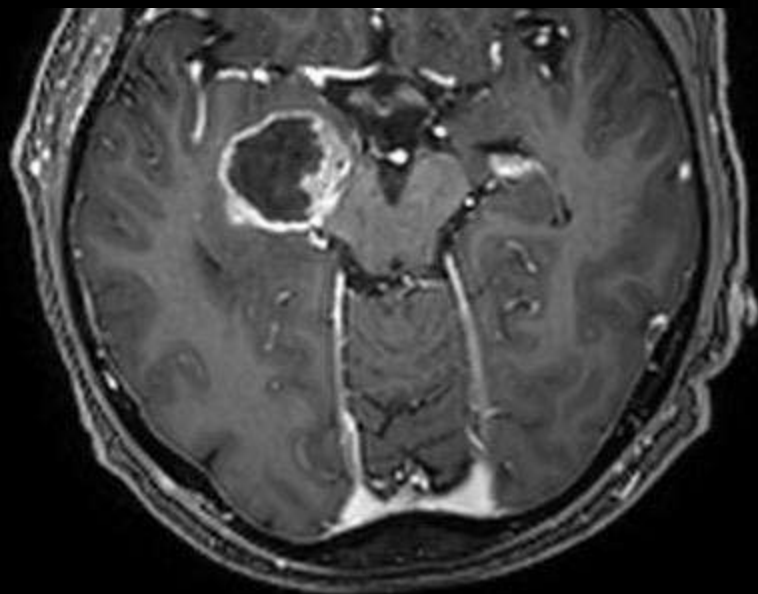


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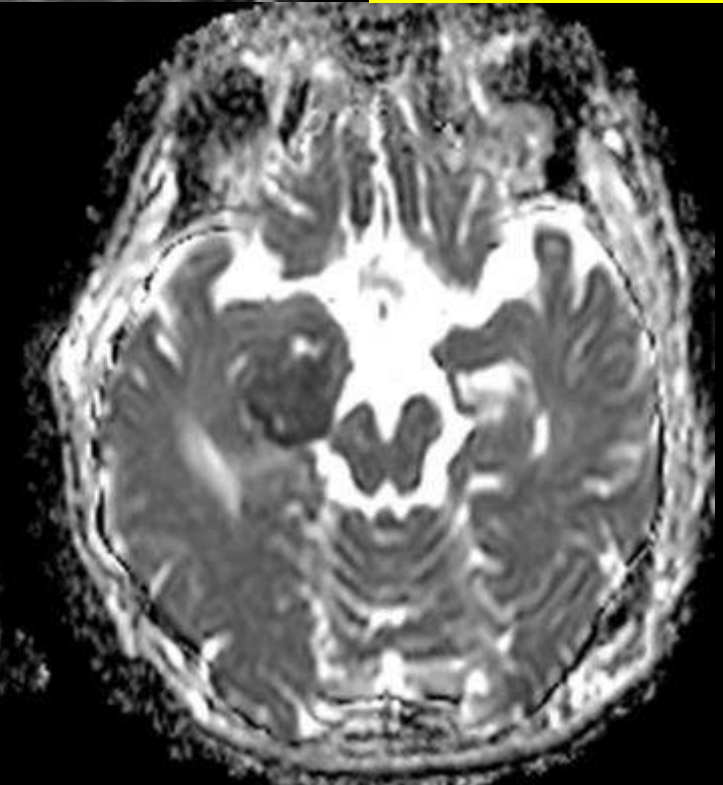


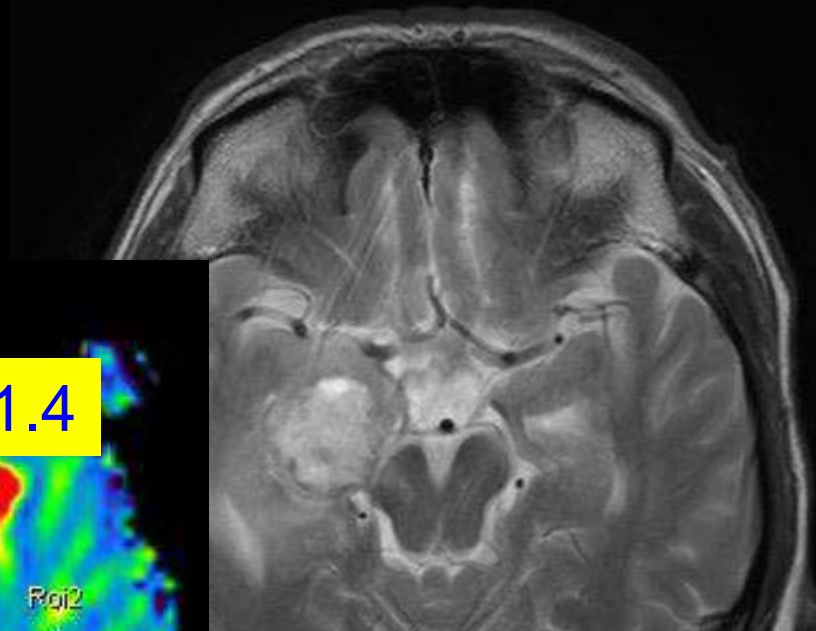
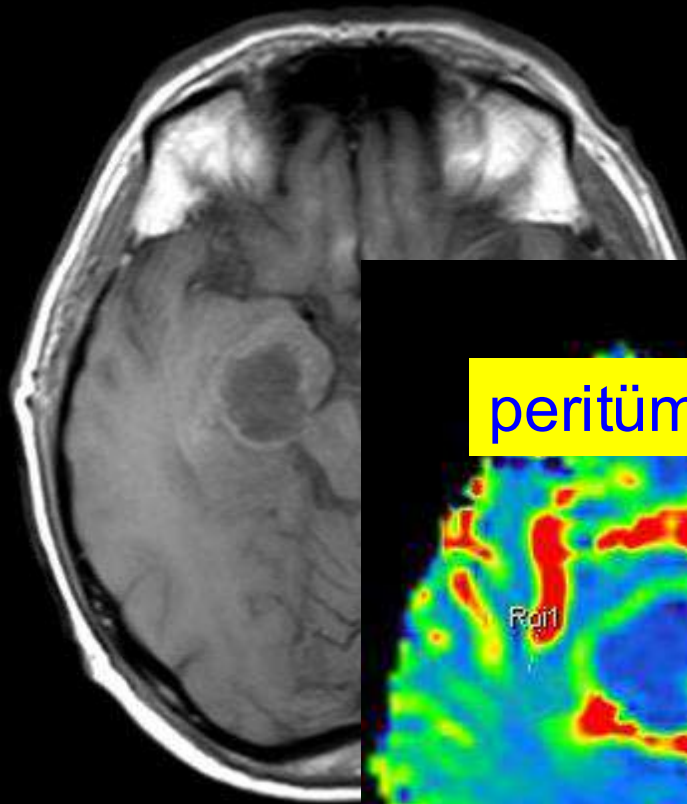


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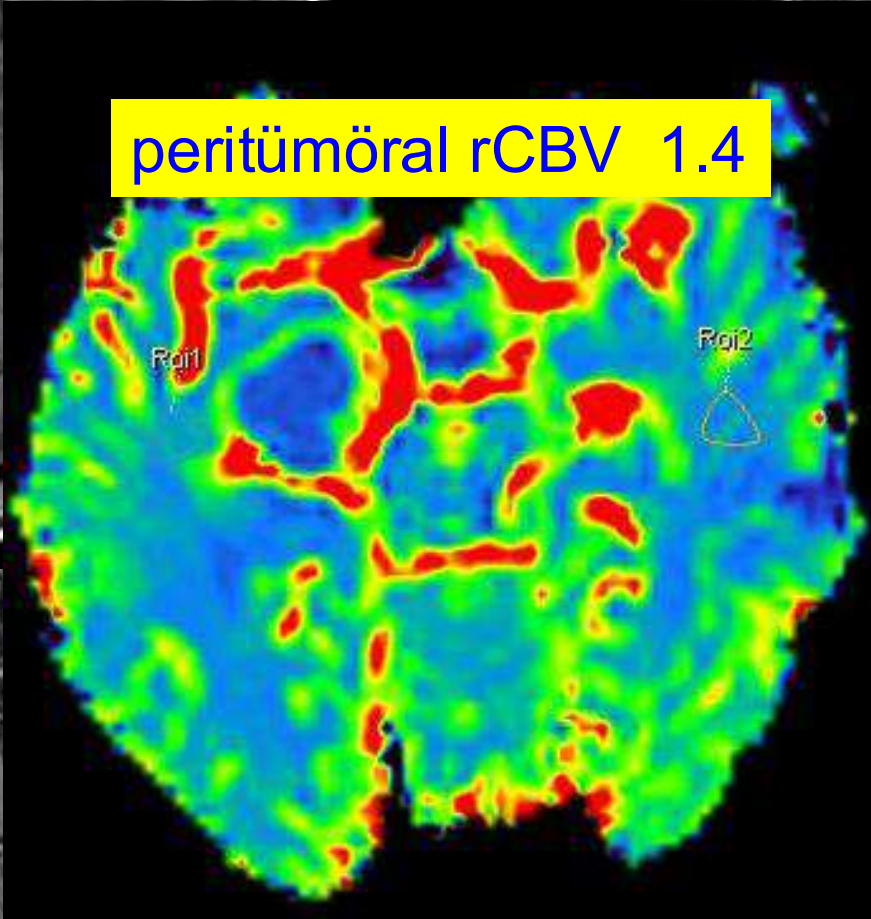


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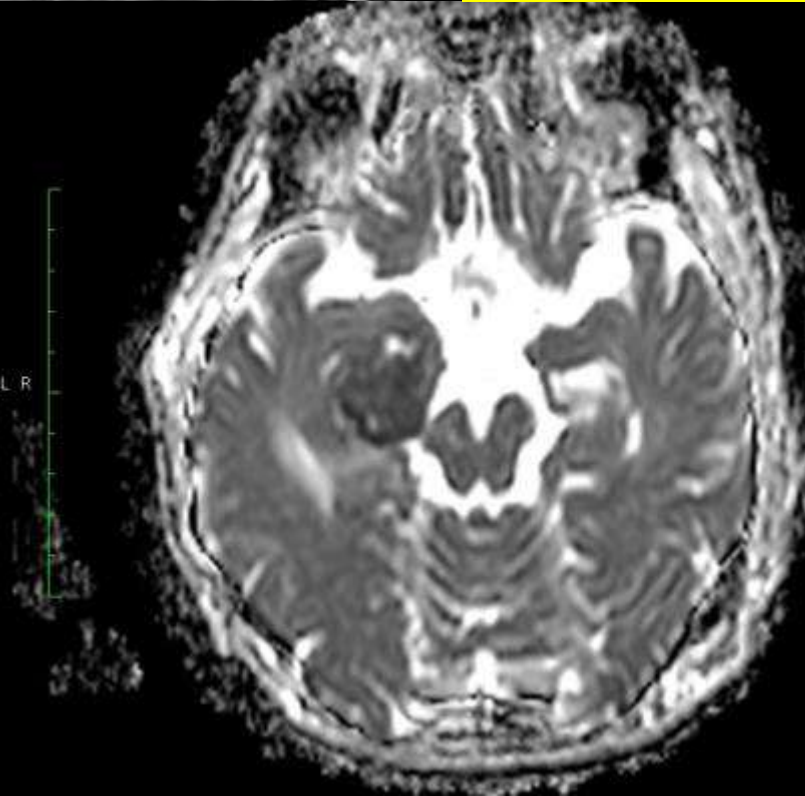
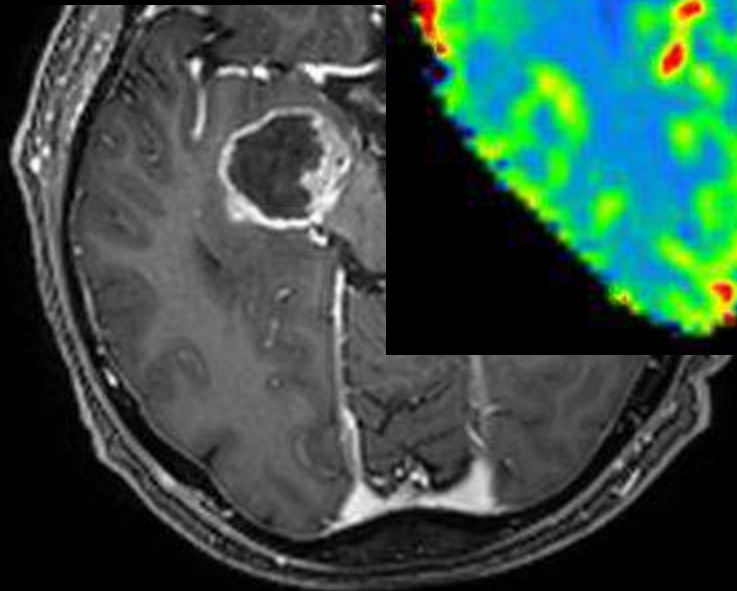


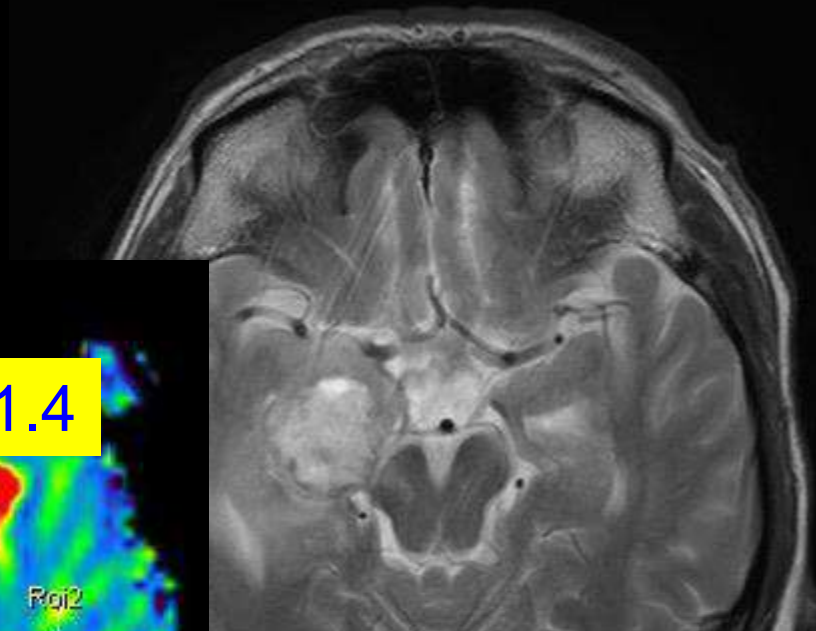
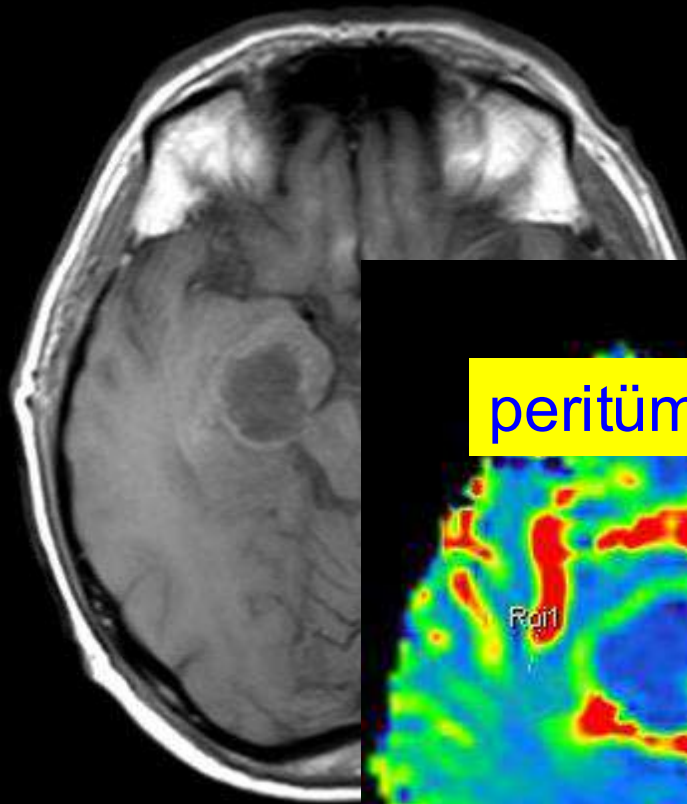


peritümöral rCBV 1.4



AYIRICI TANI

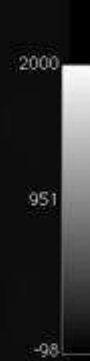
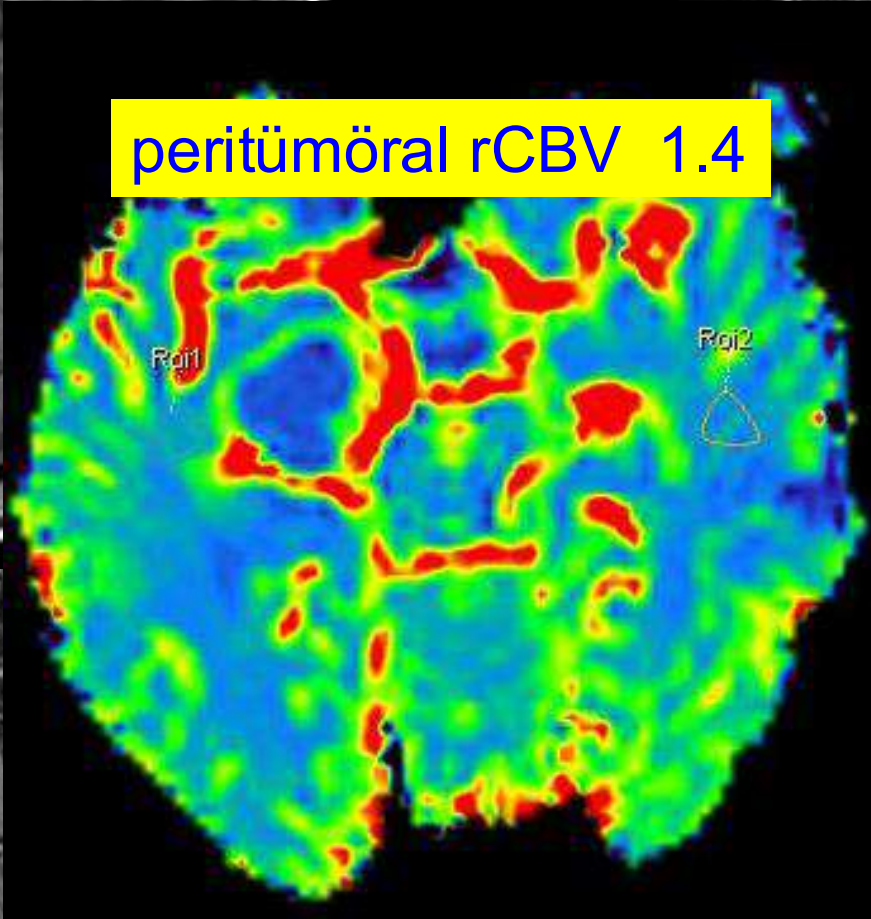




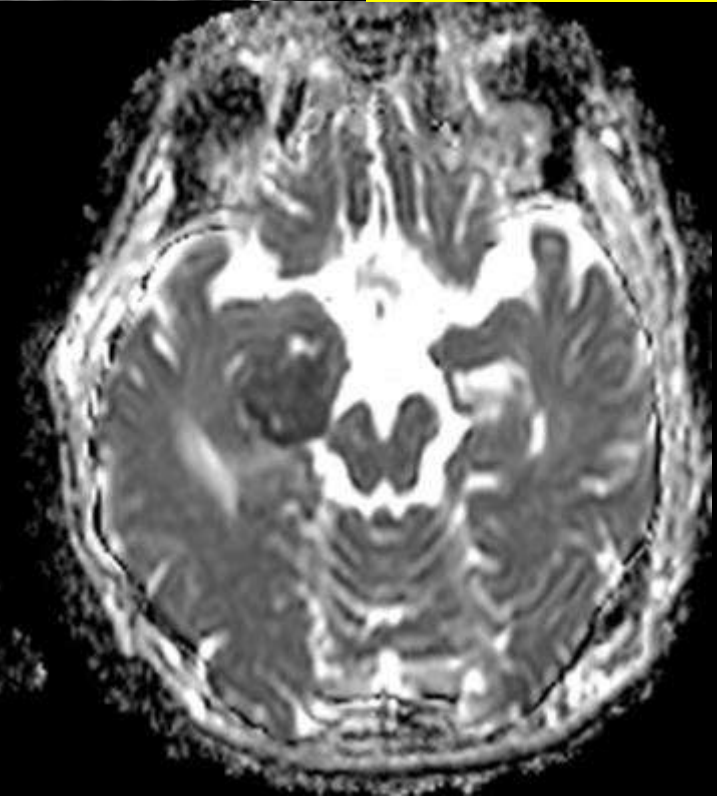
Glioblastoma

AYIRICI TANI

peritümöral rCBV 1.4



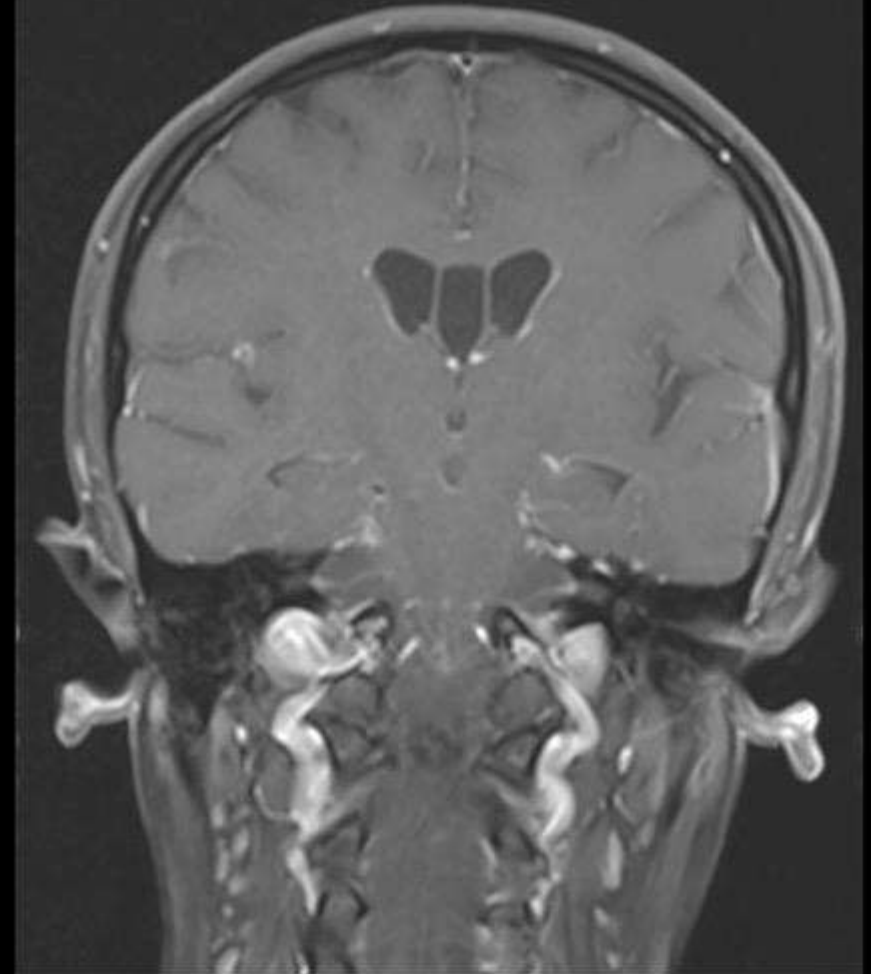
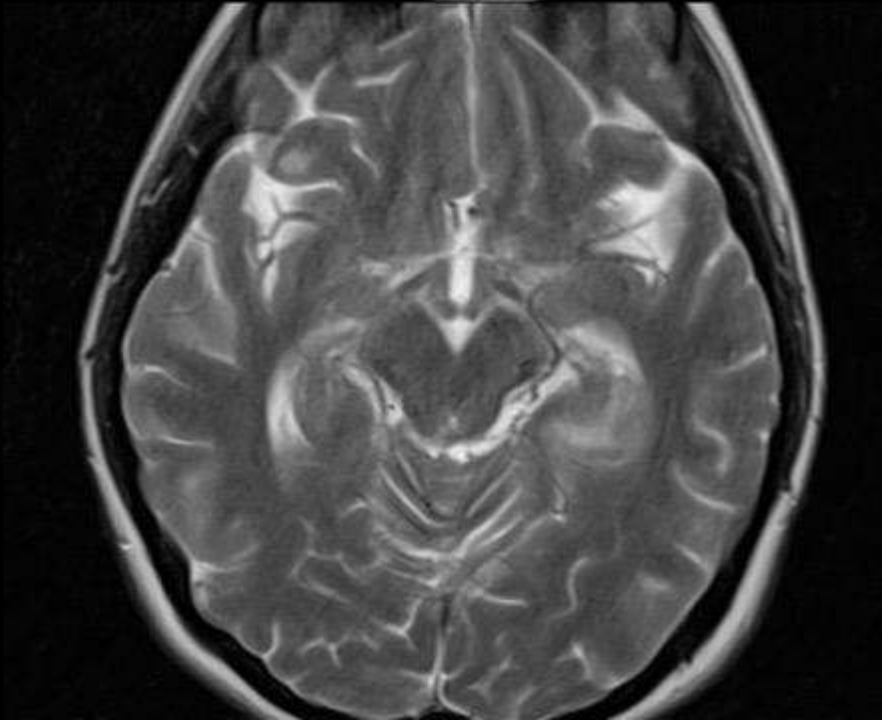
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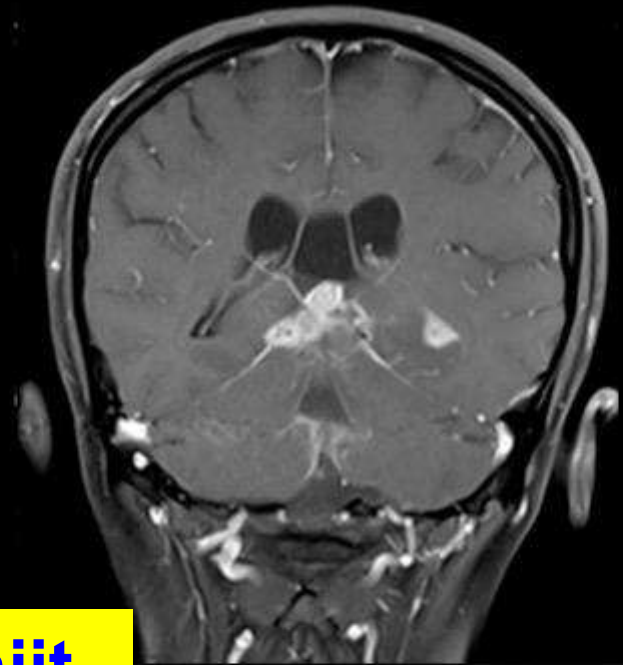
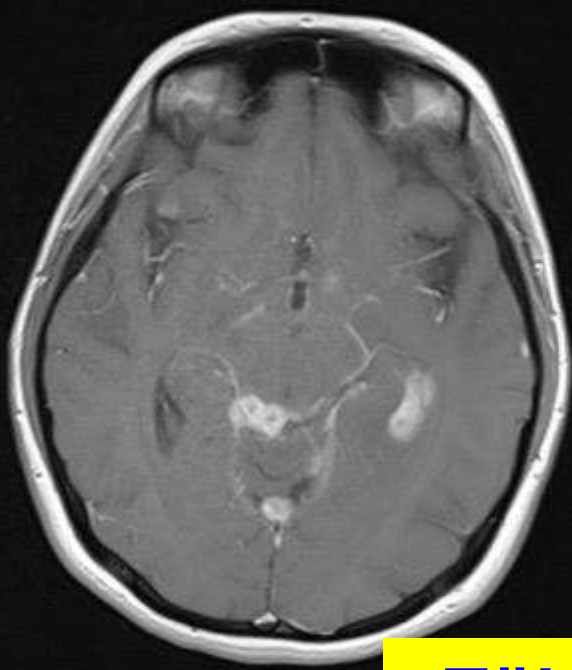


5. OLGU

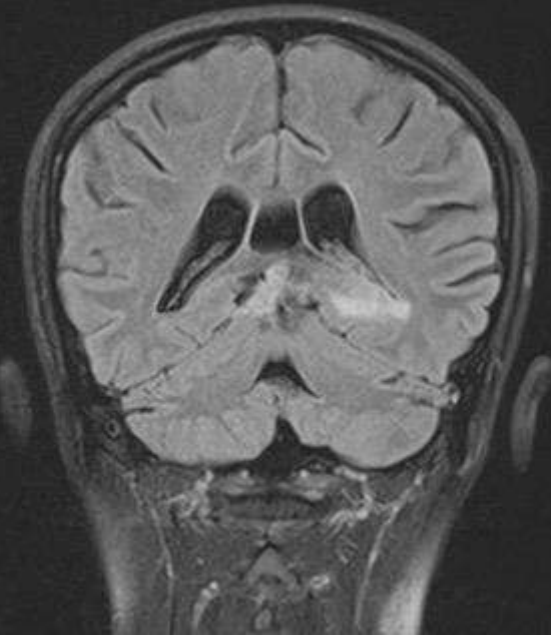
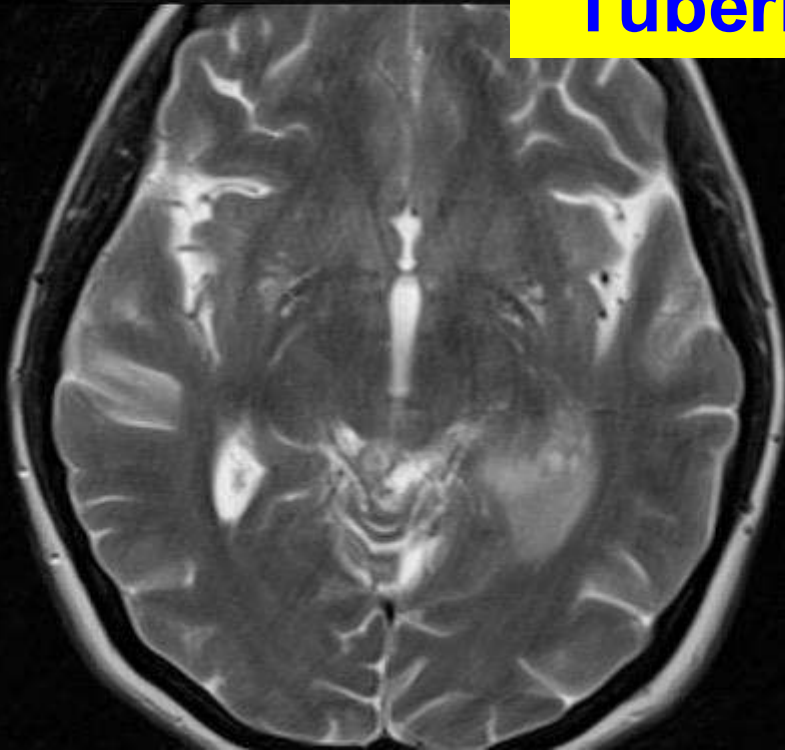


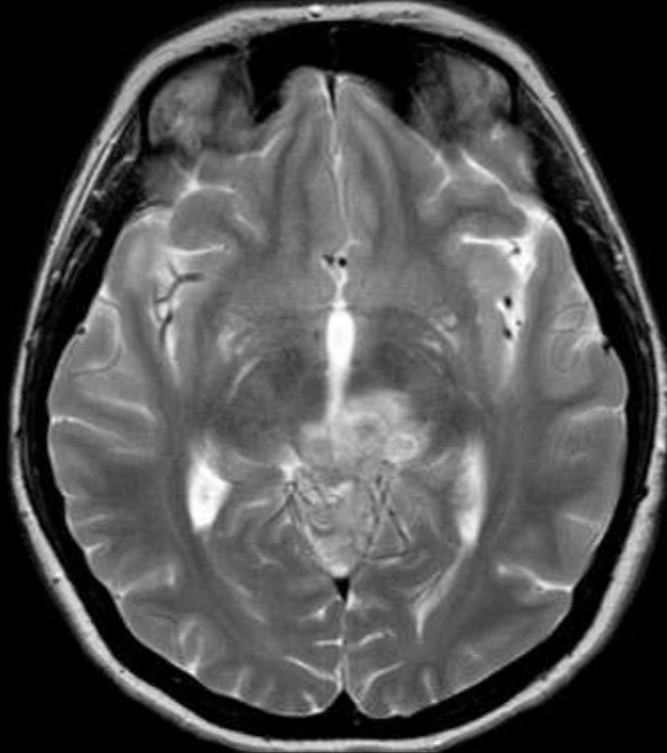
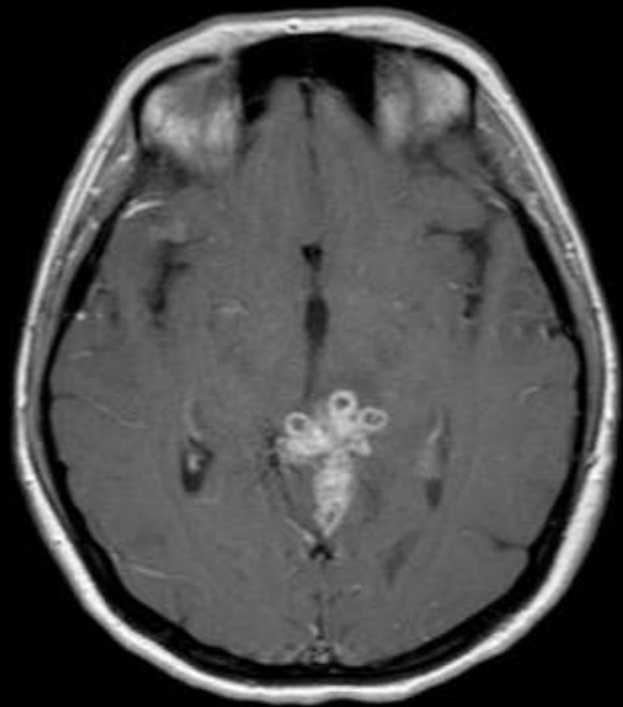
Tüberküлом + Menenjit



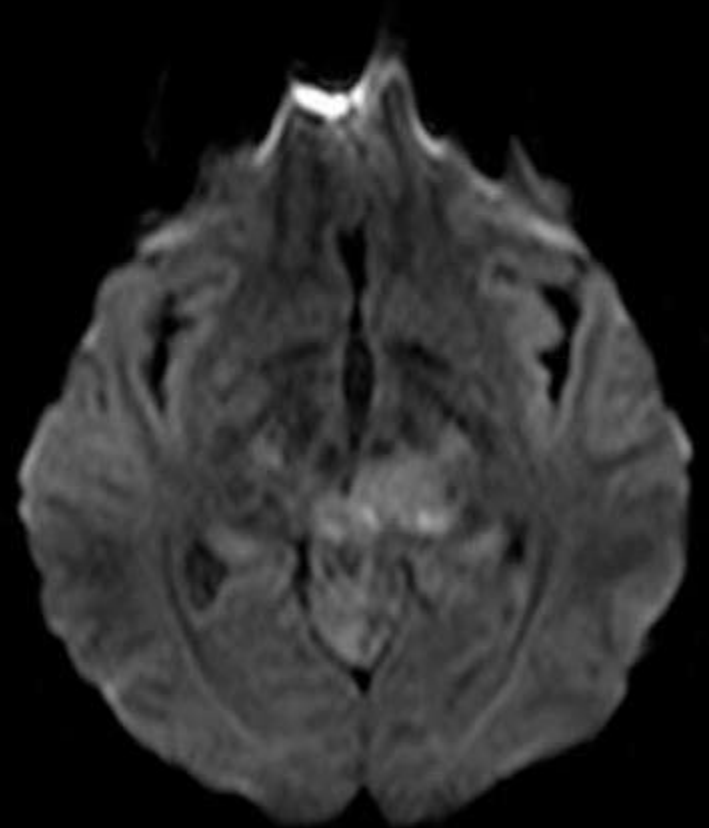
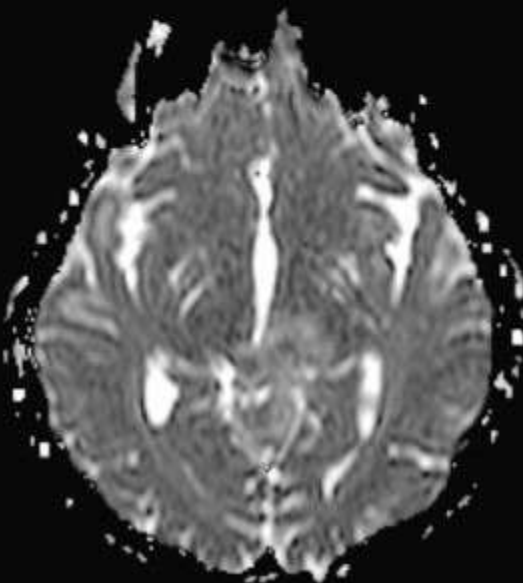
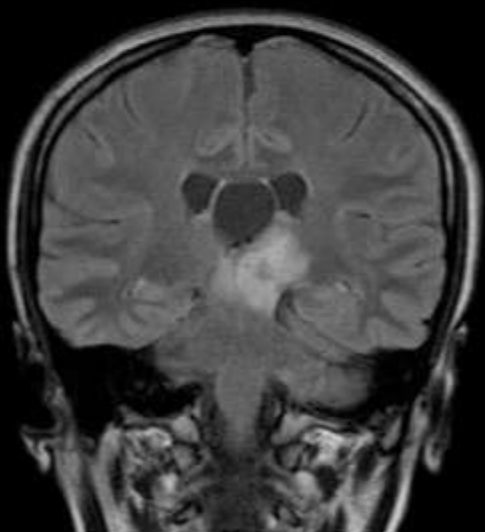


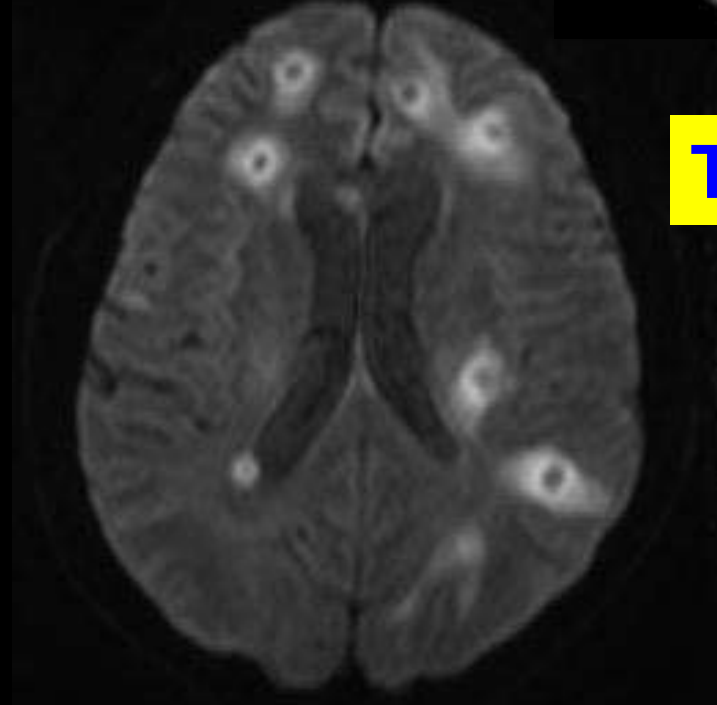
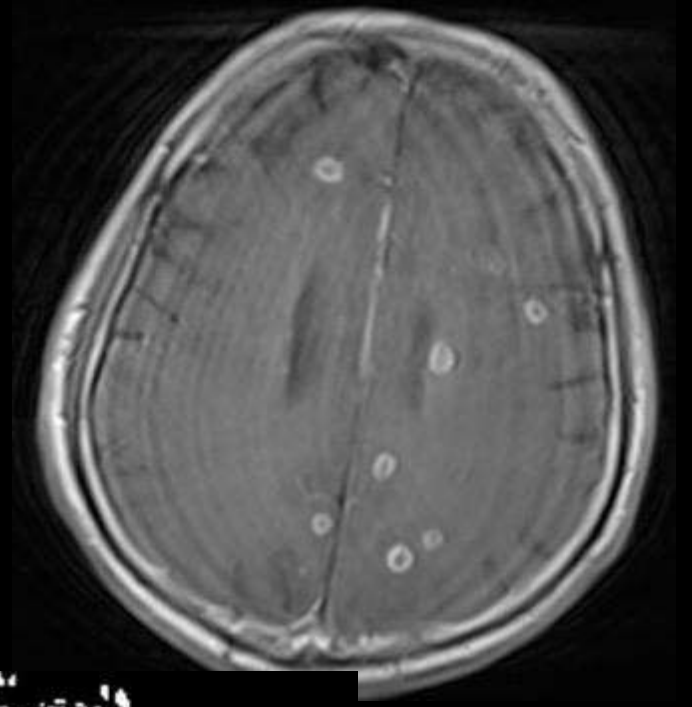
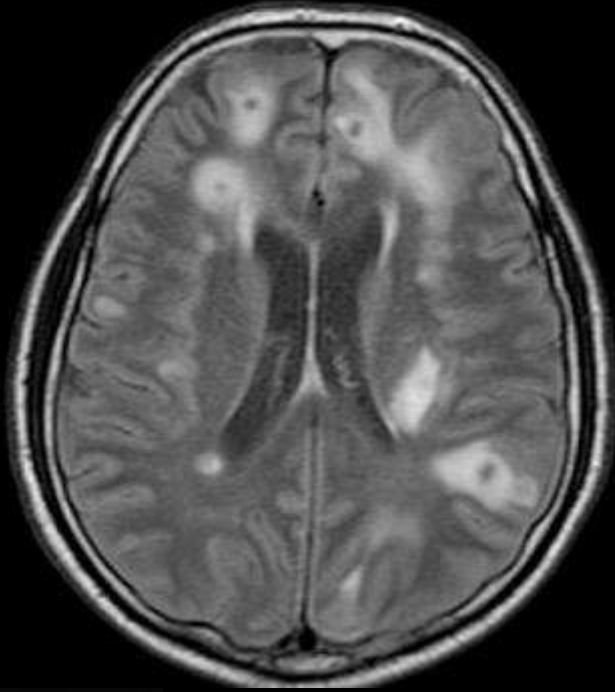
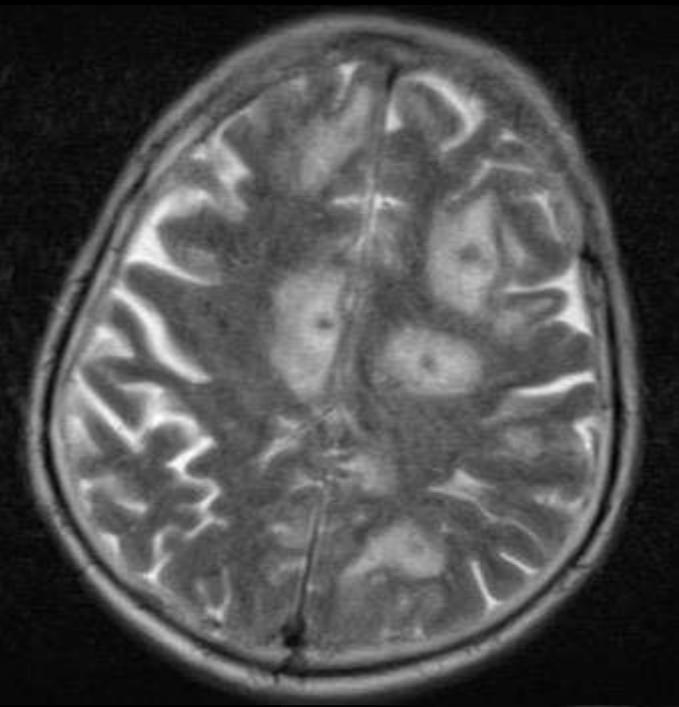
Tüberkülom + Menenjit



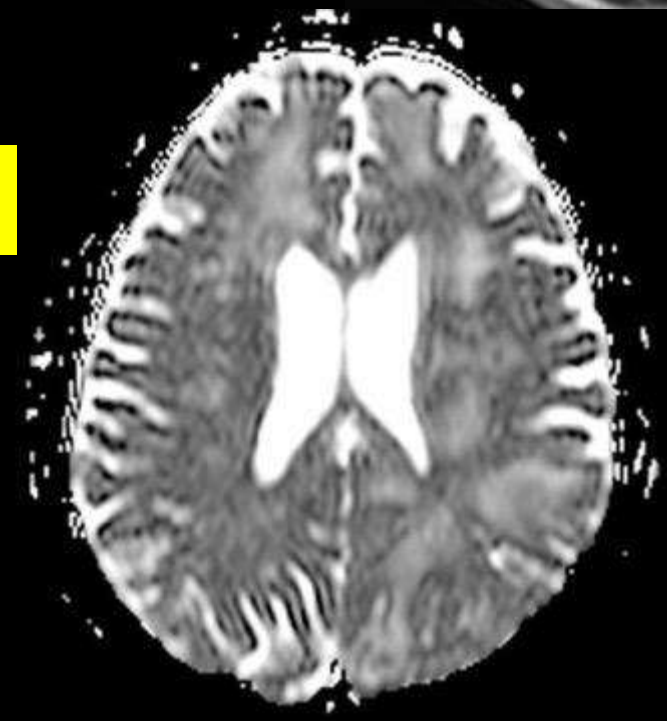


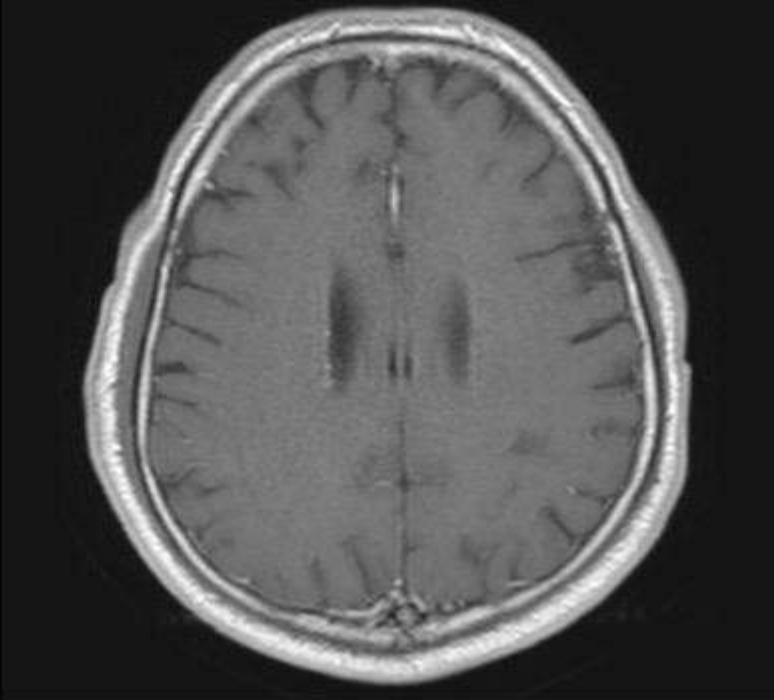
Tüberküлом



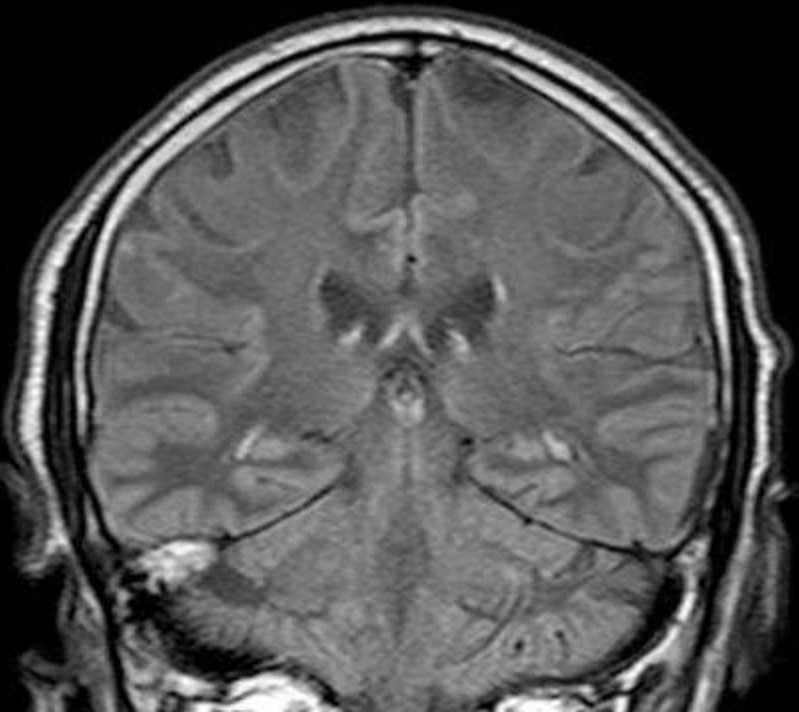


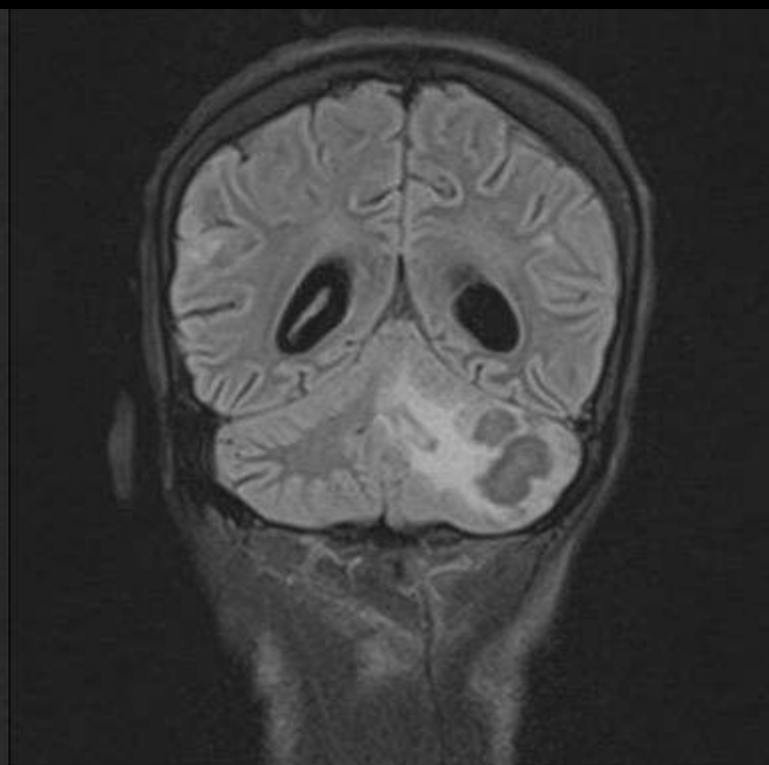
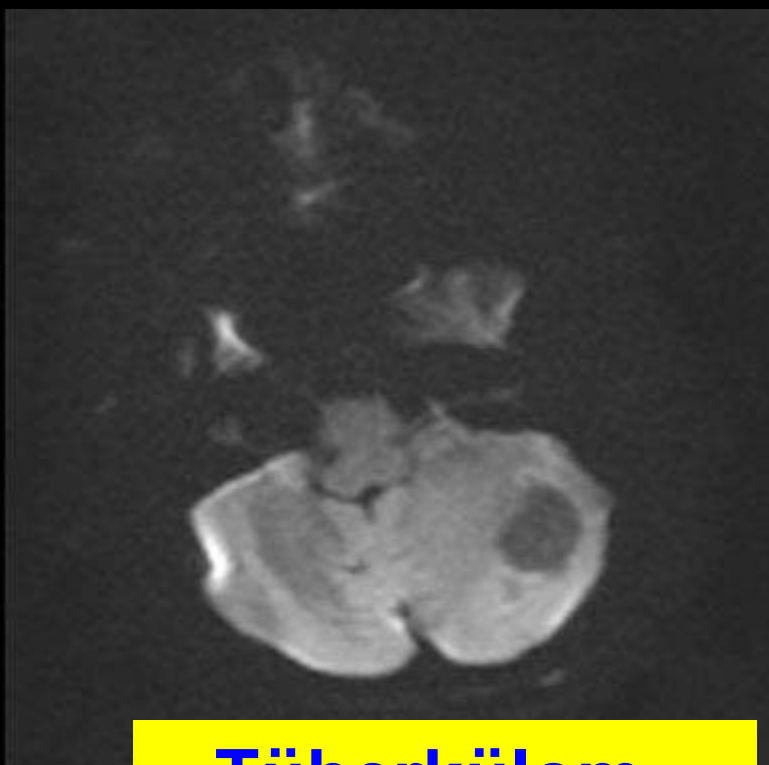
Tüberküлом



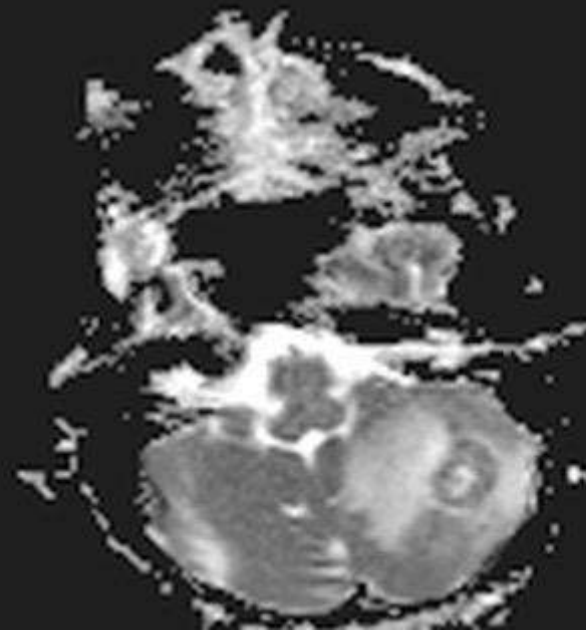
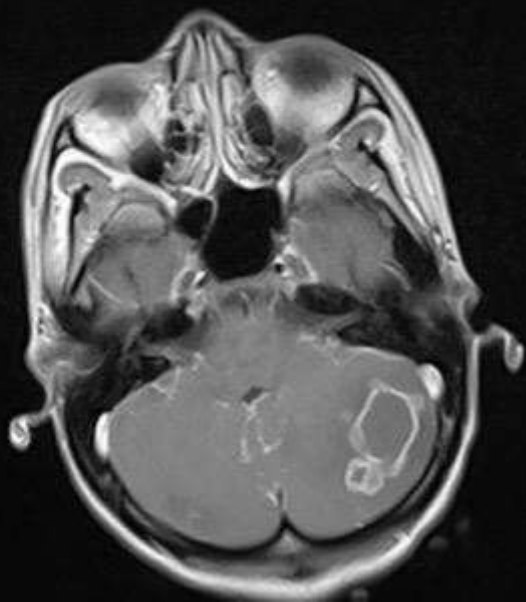


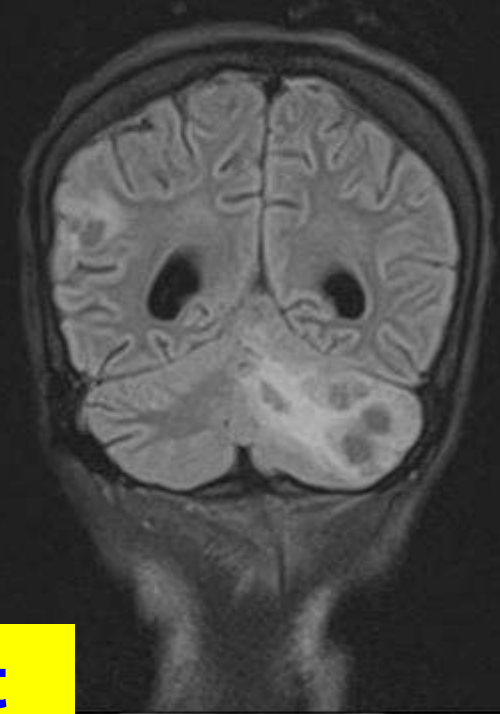
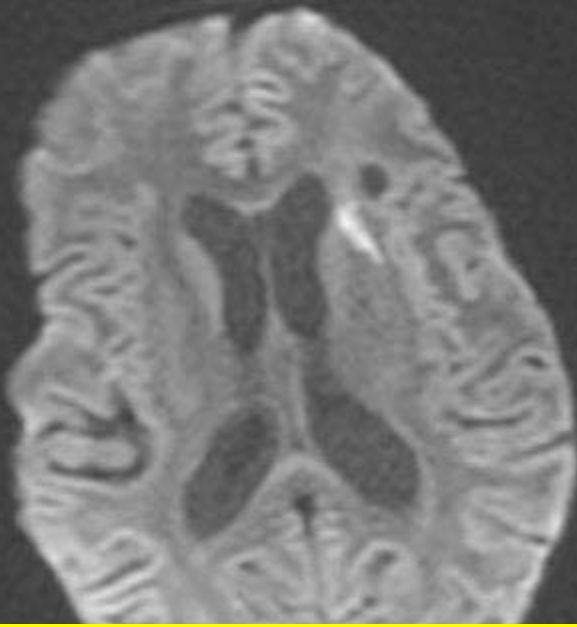
Kontrol



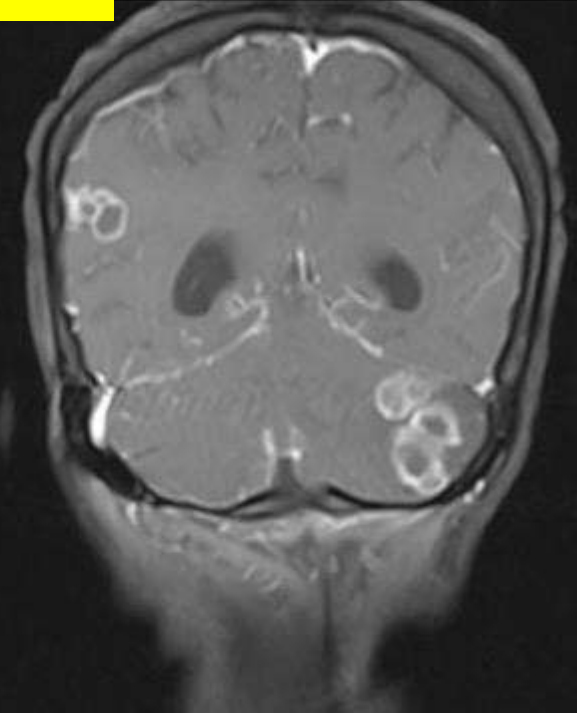
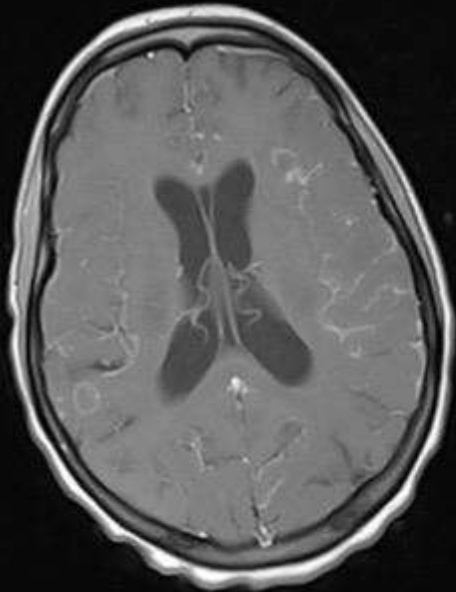


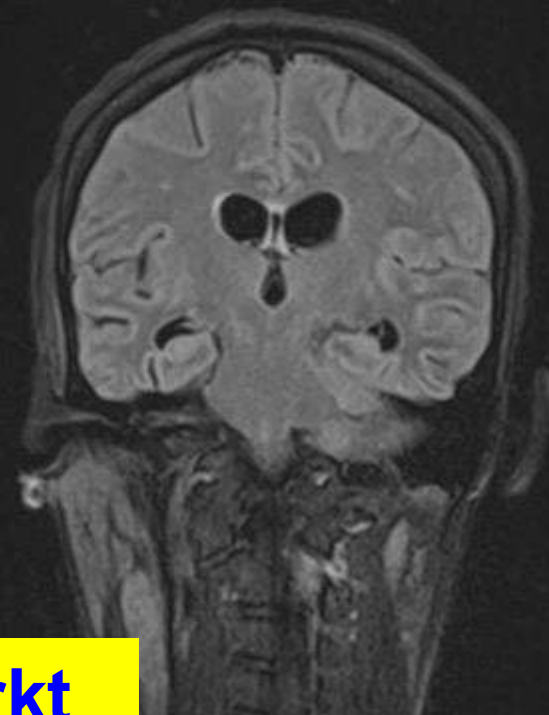
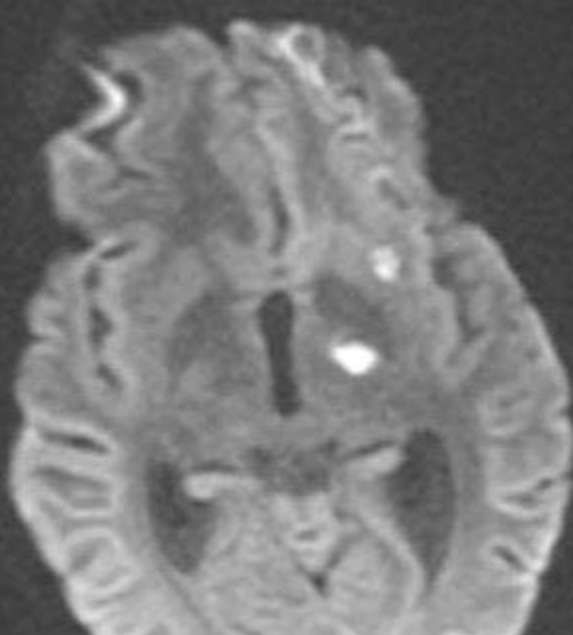
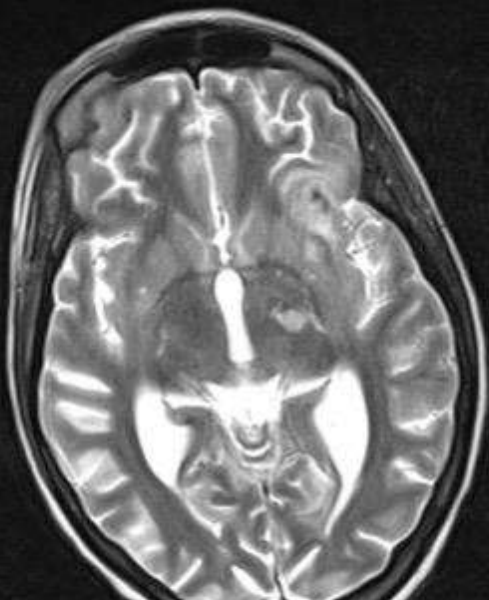
Tüberküлом



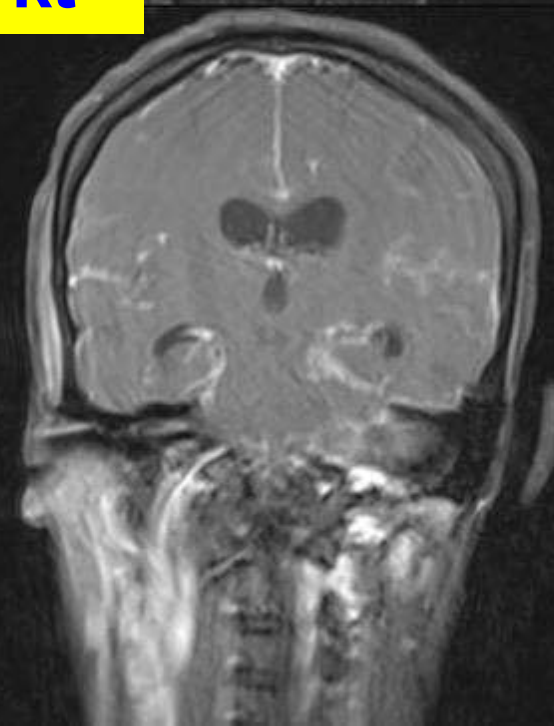
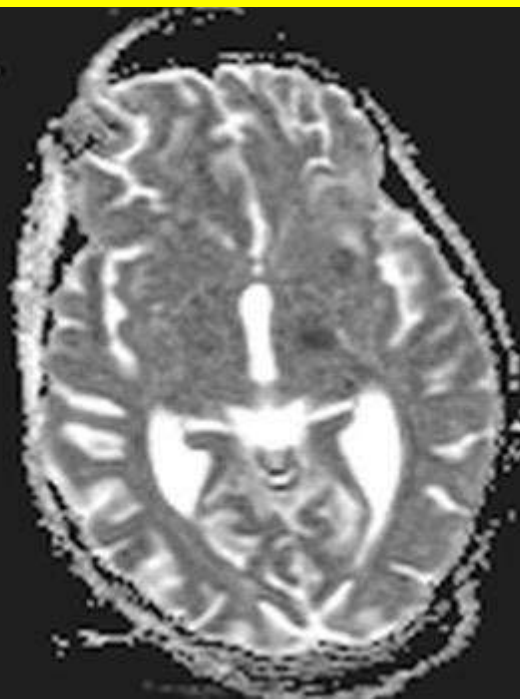
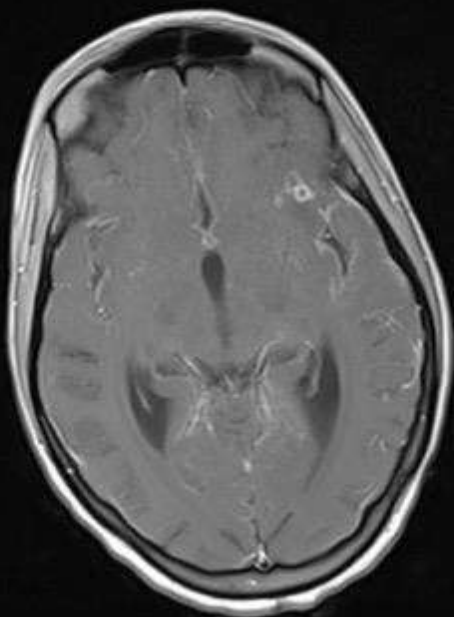


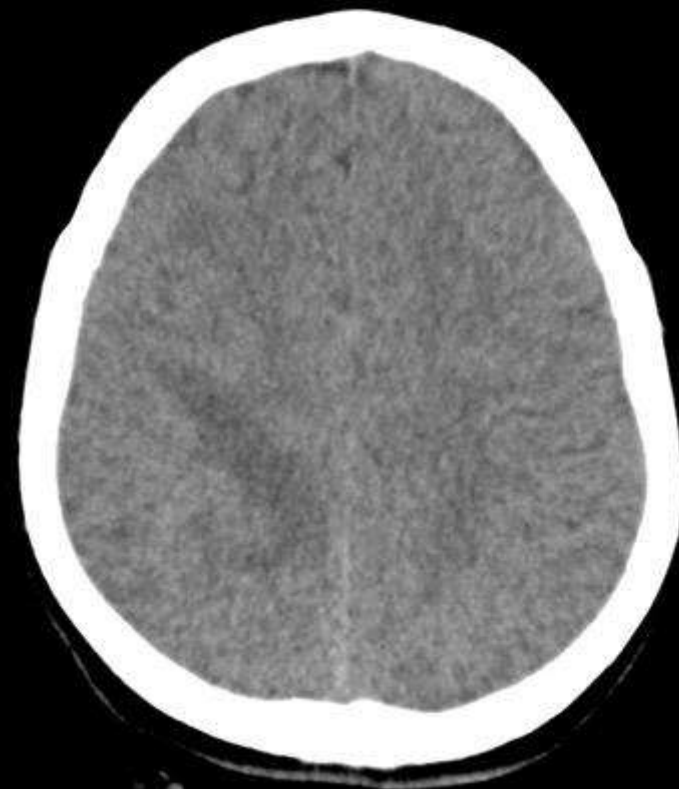
Tüberküлом + Menenjit + akut enfarkt

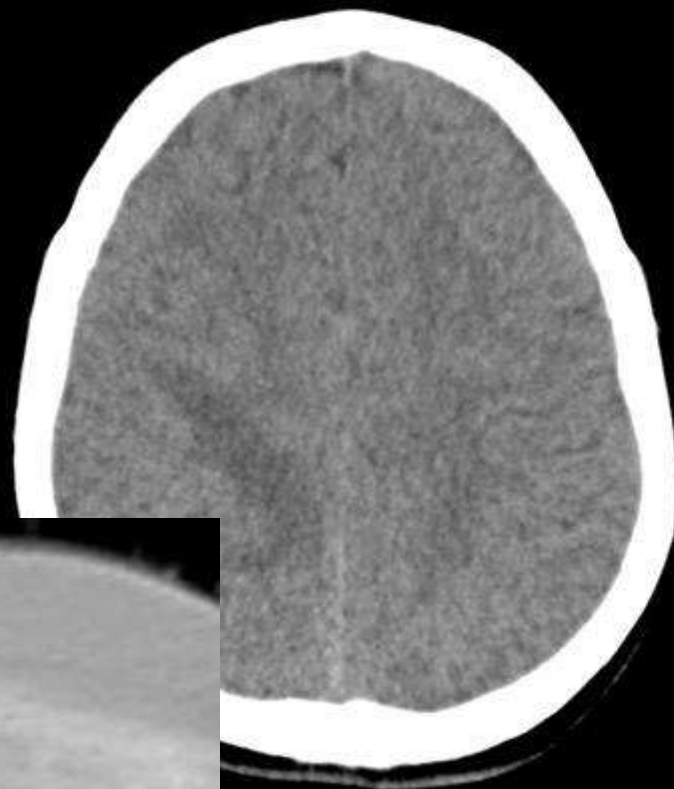


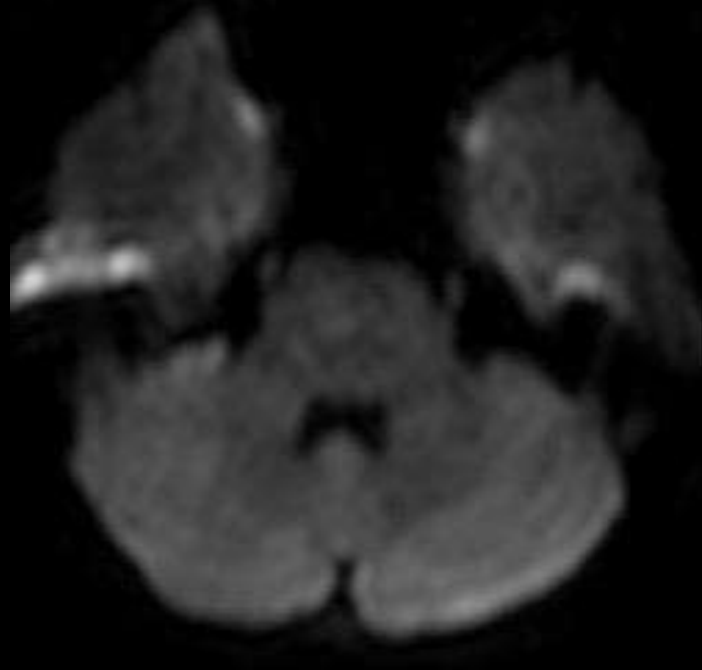
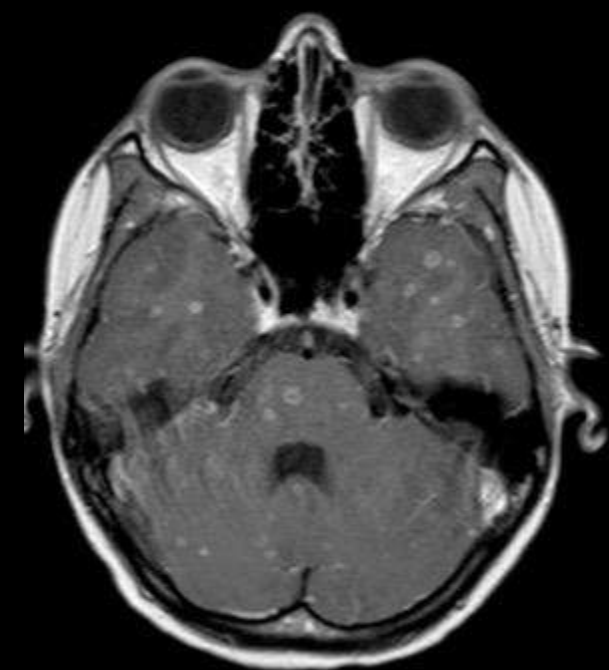
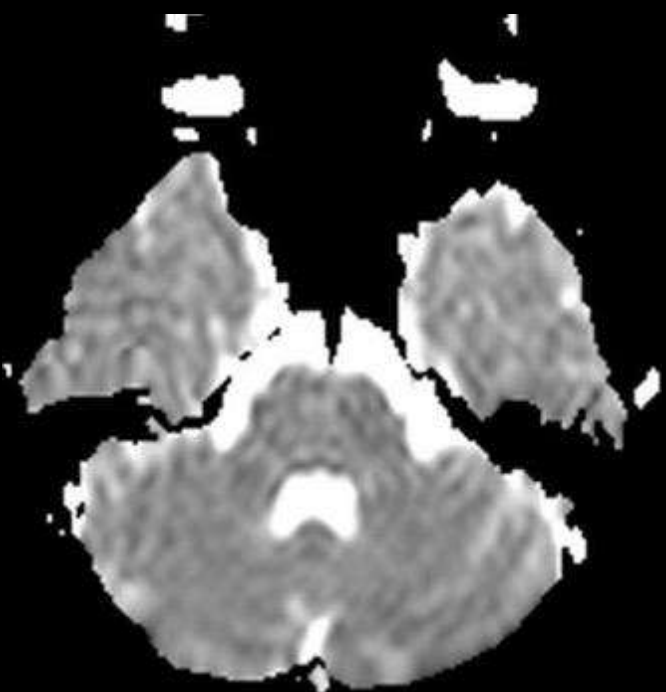
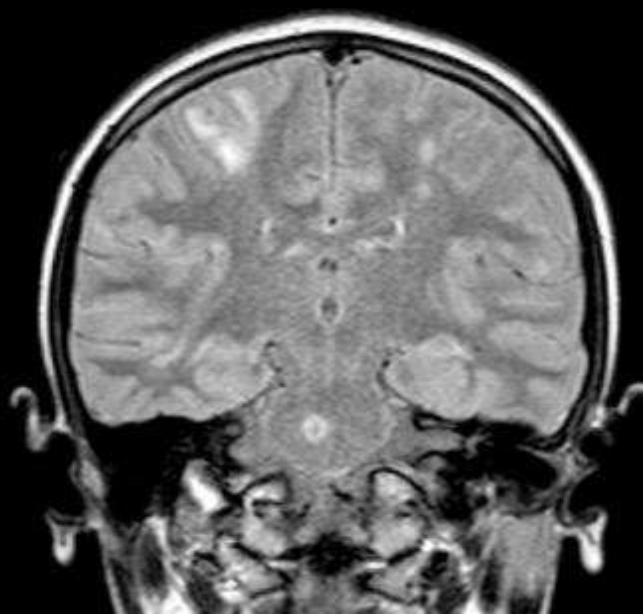


Tüberküлом + Menenjit + akut enfarkt

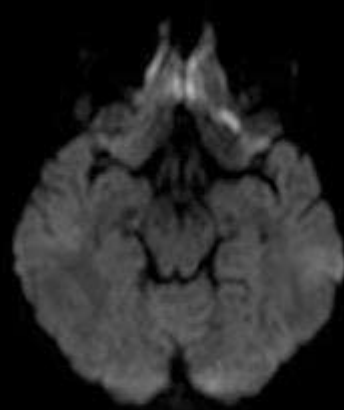
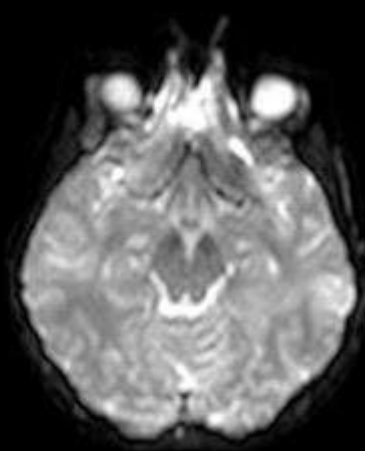
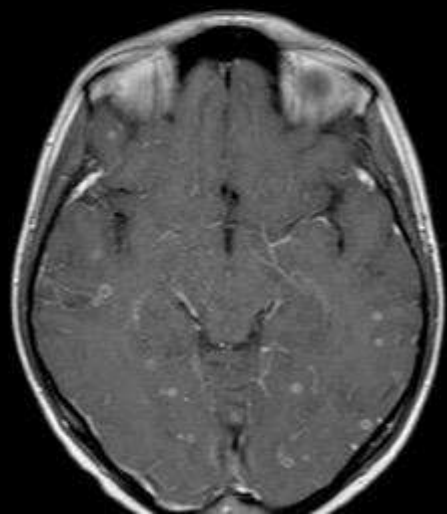
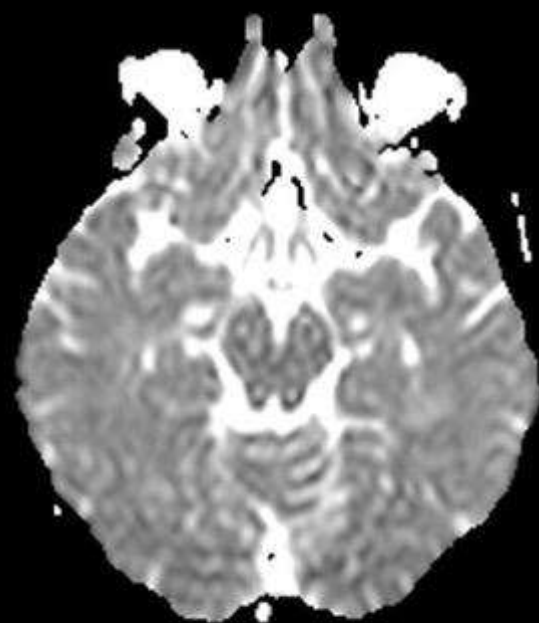
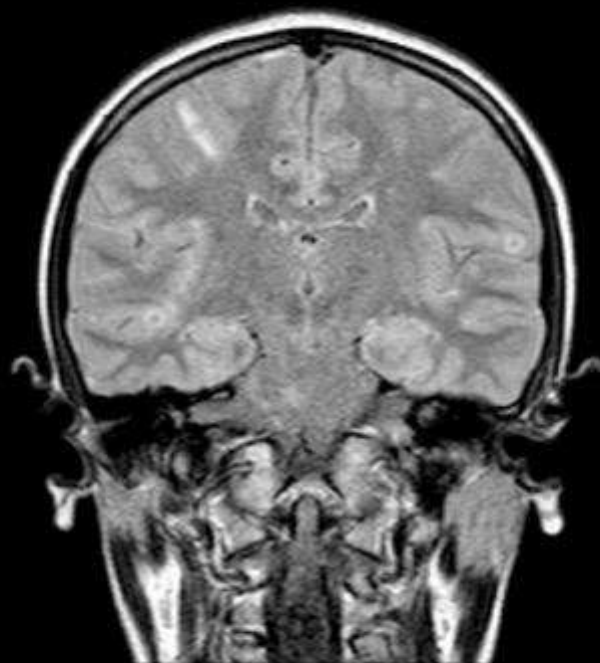
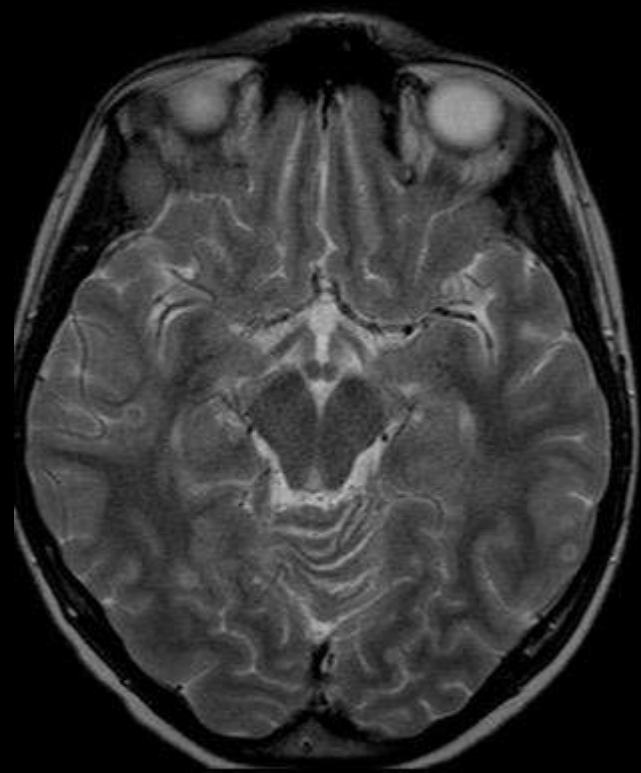


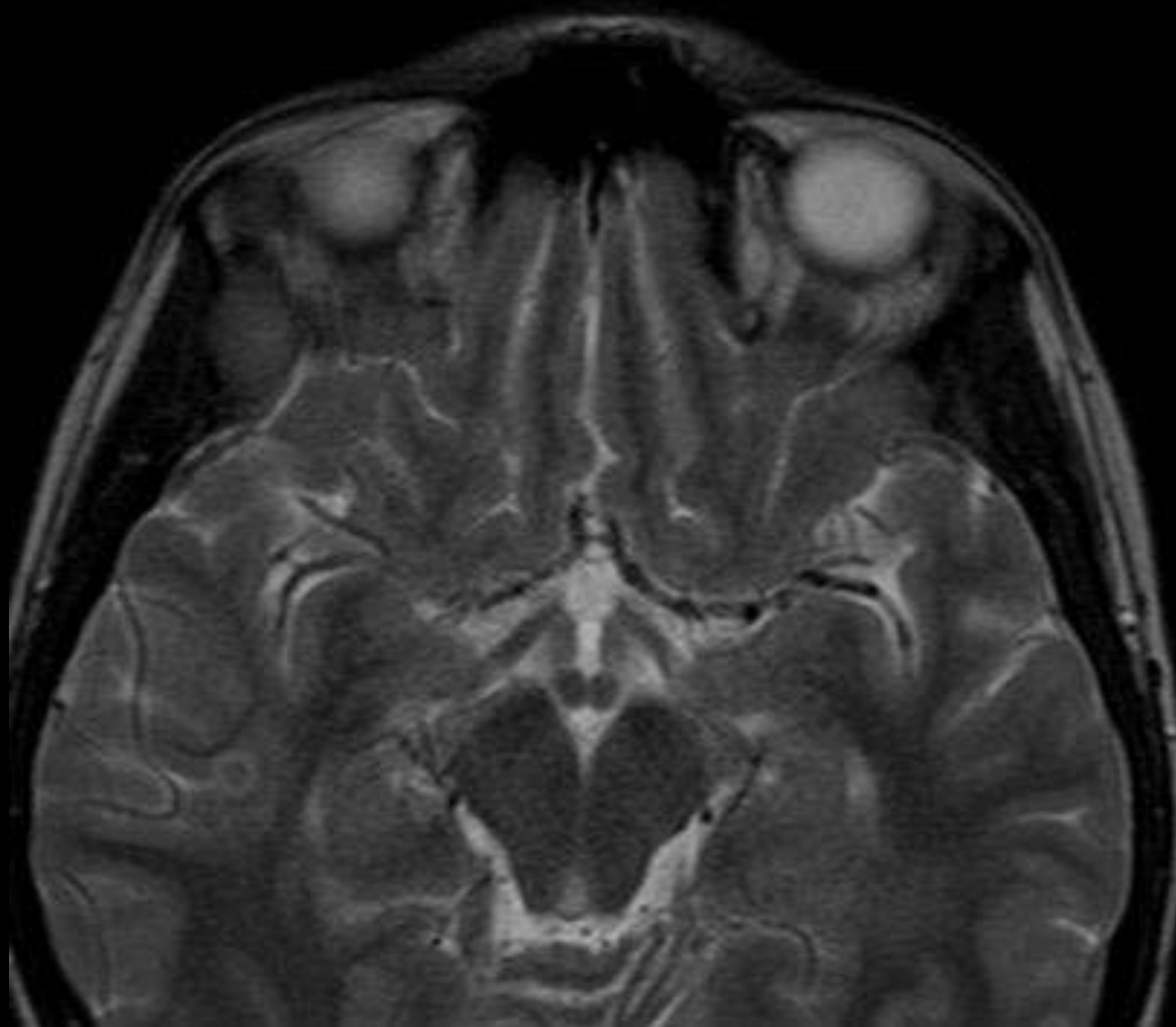


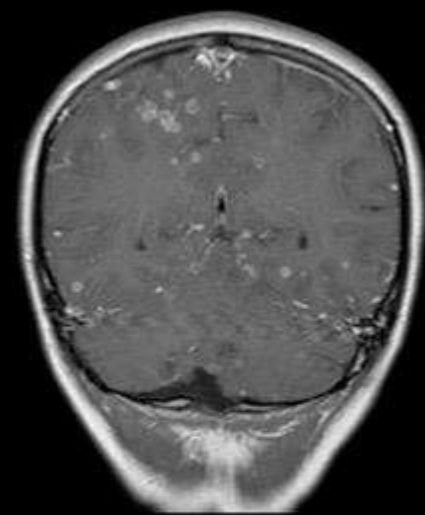
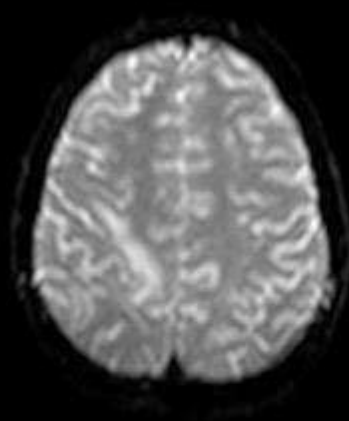
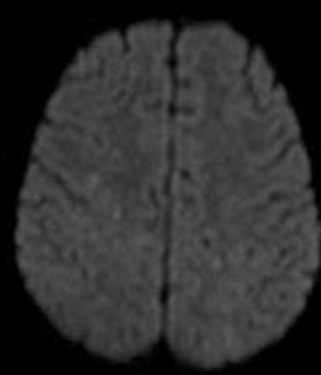
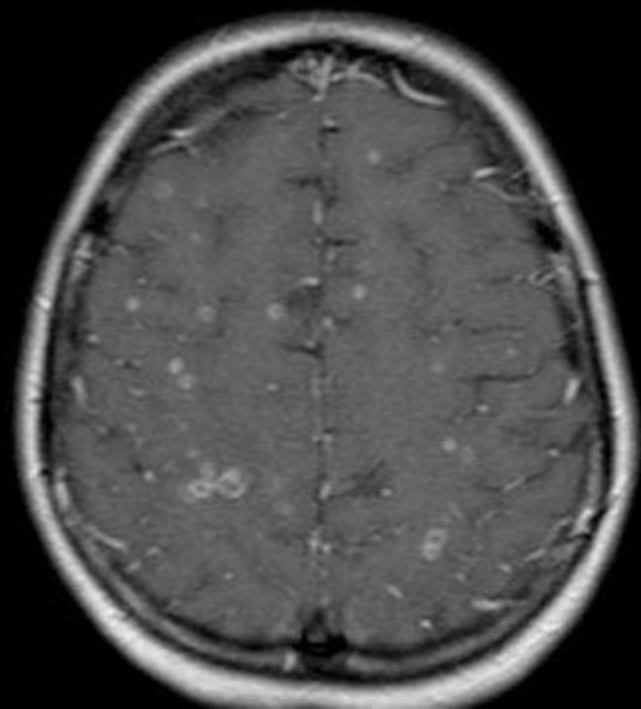
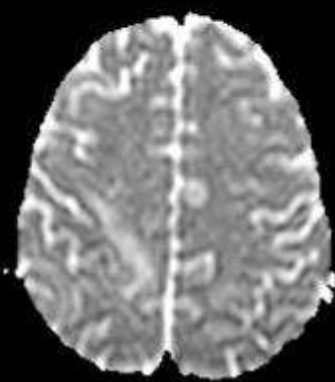
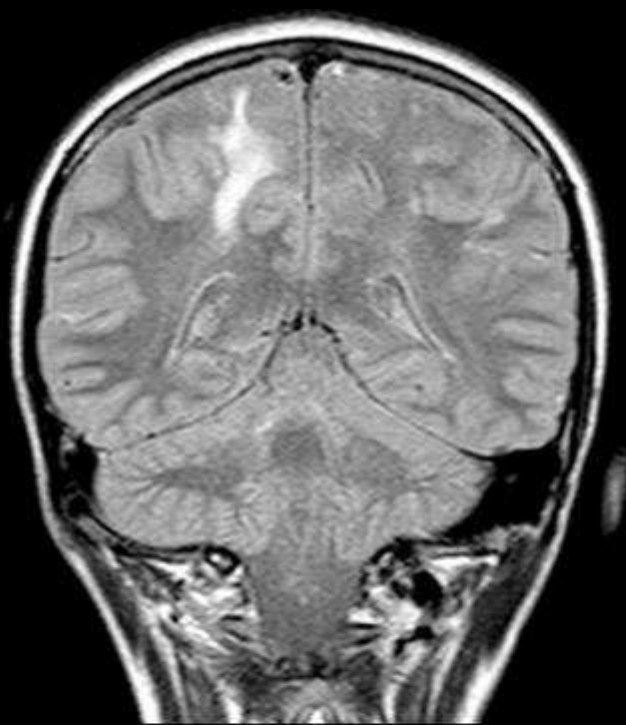
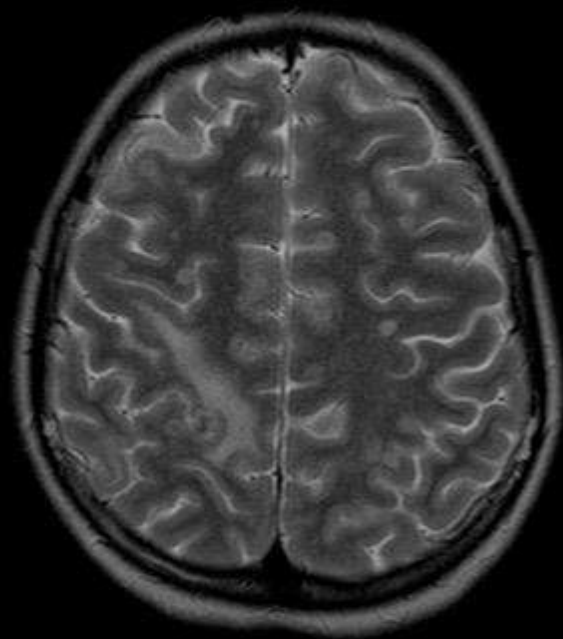


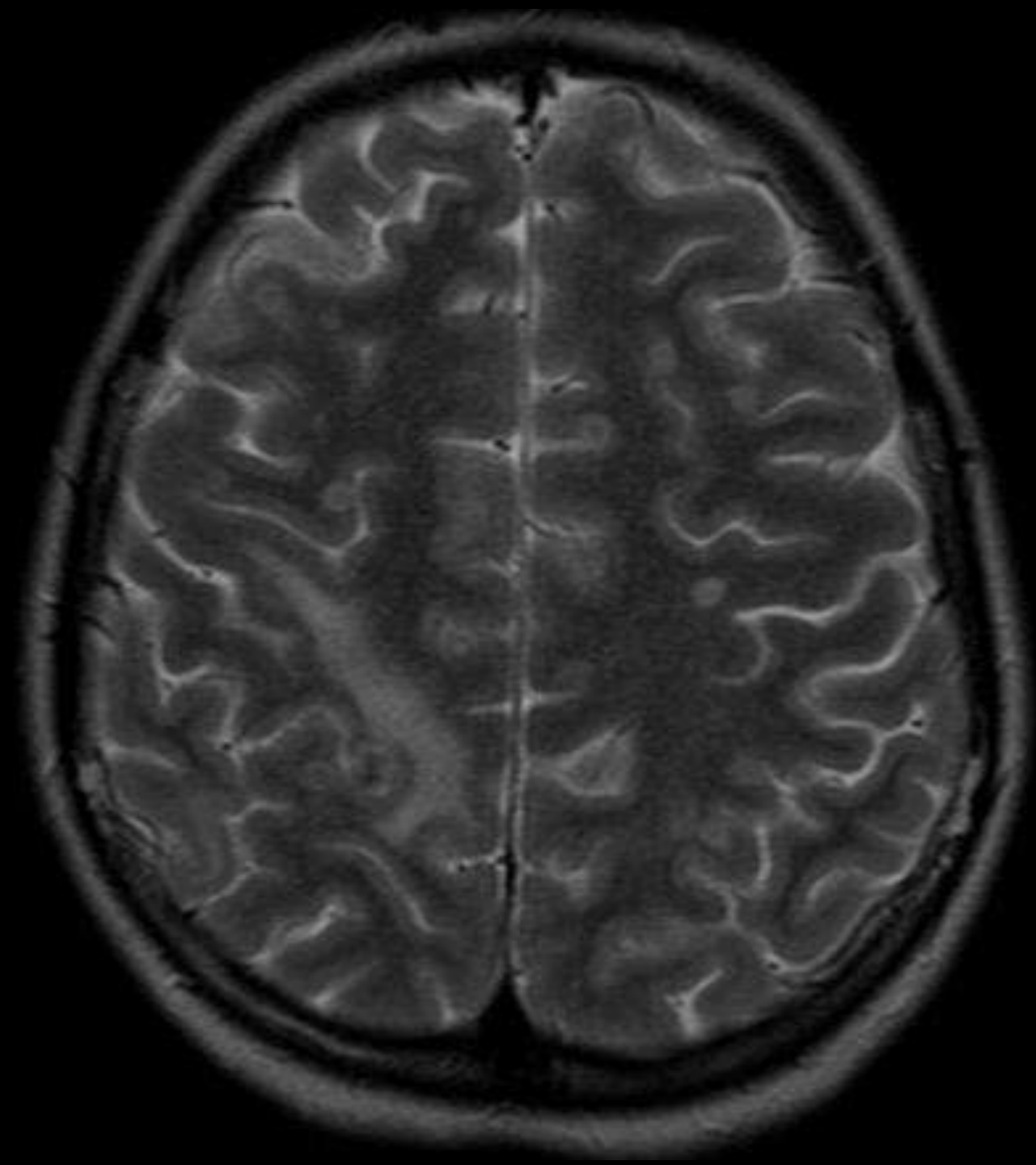


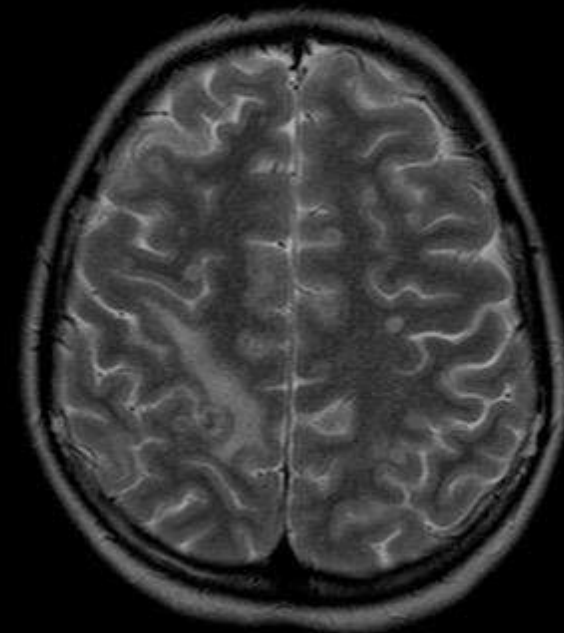




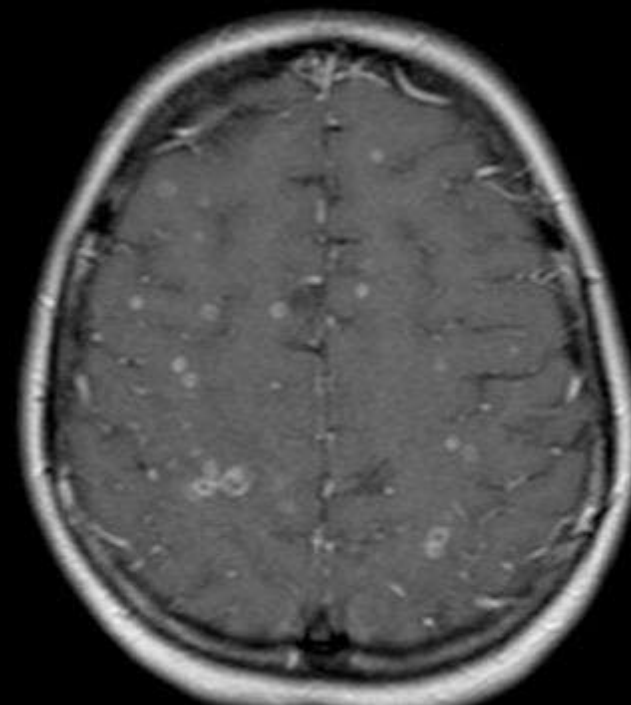
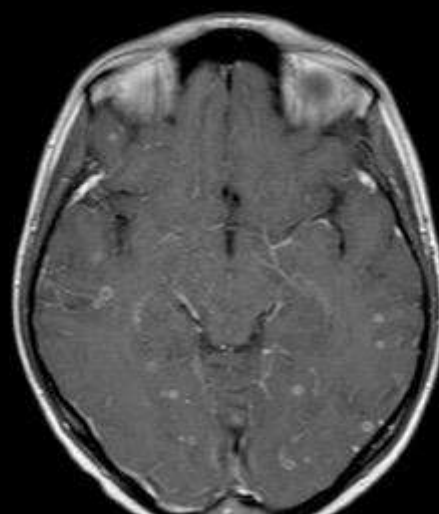
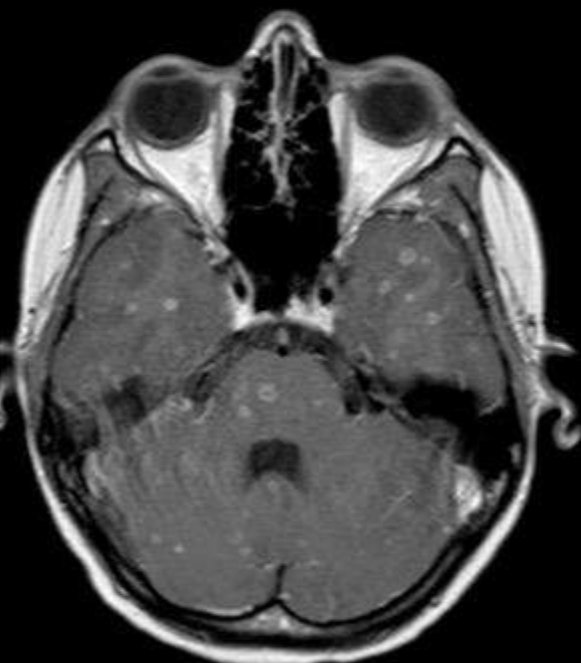


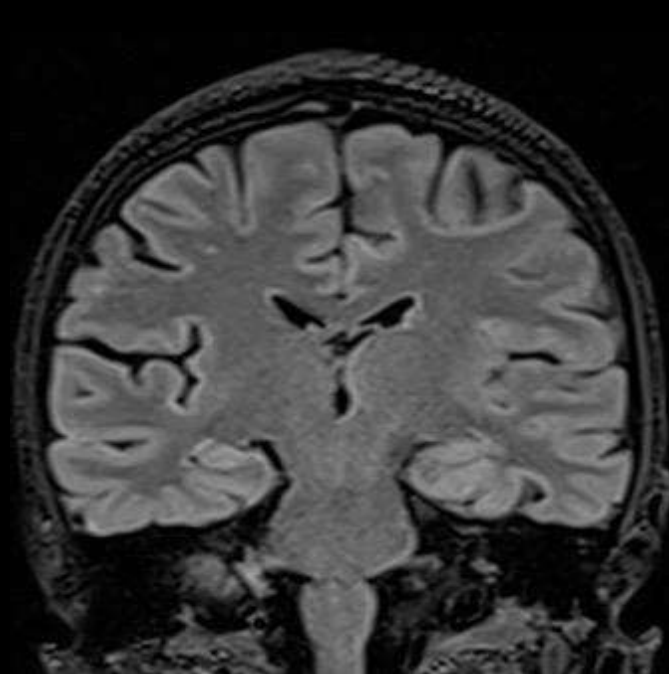




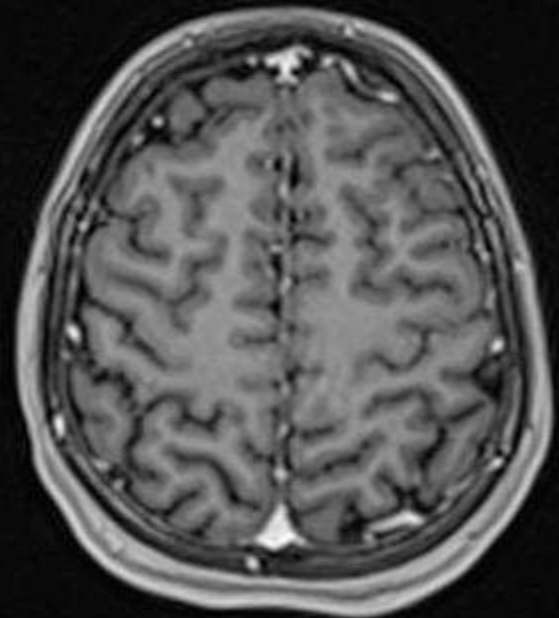
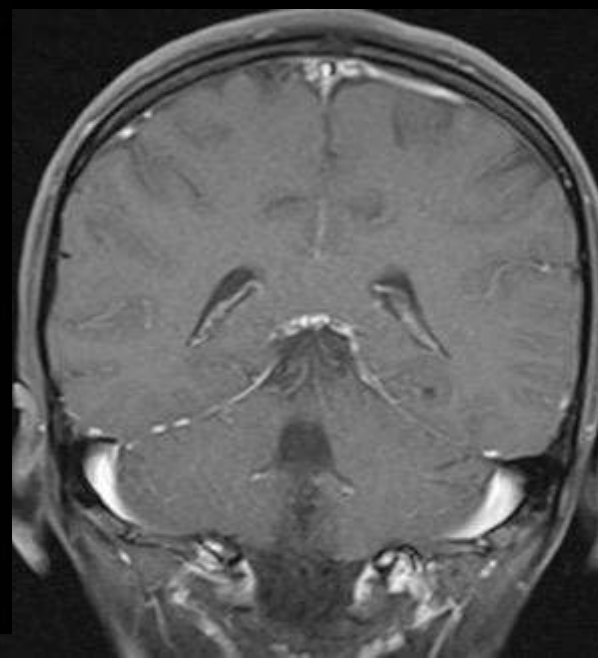
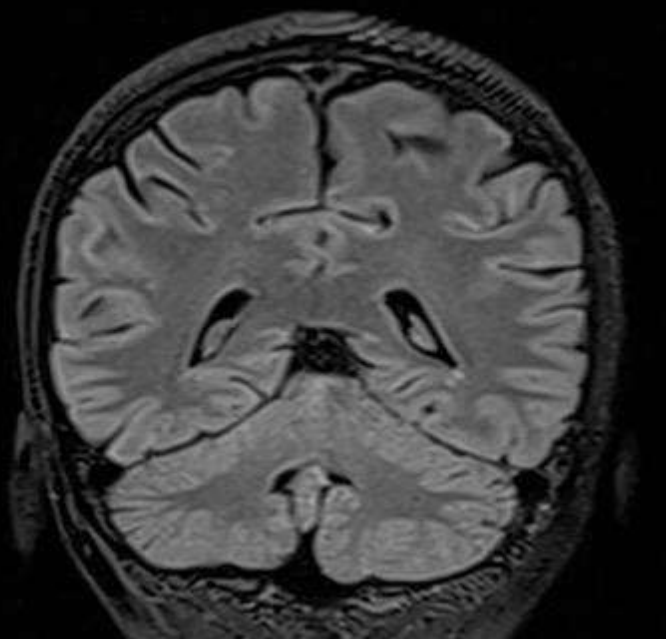
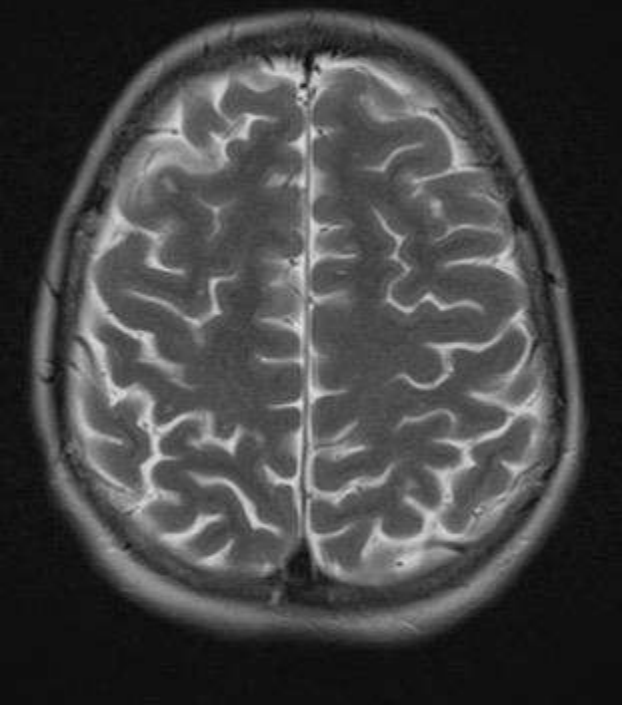
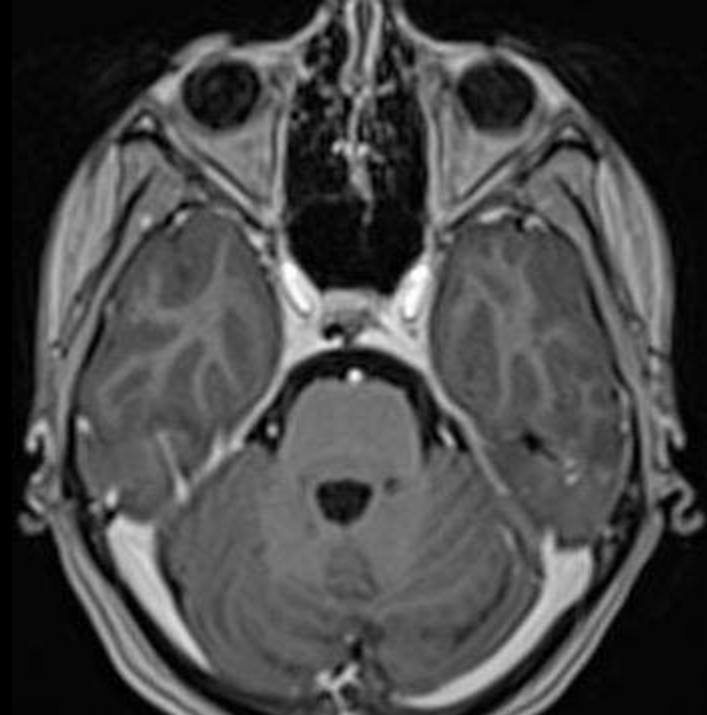


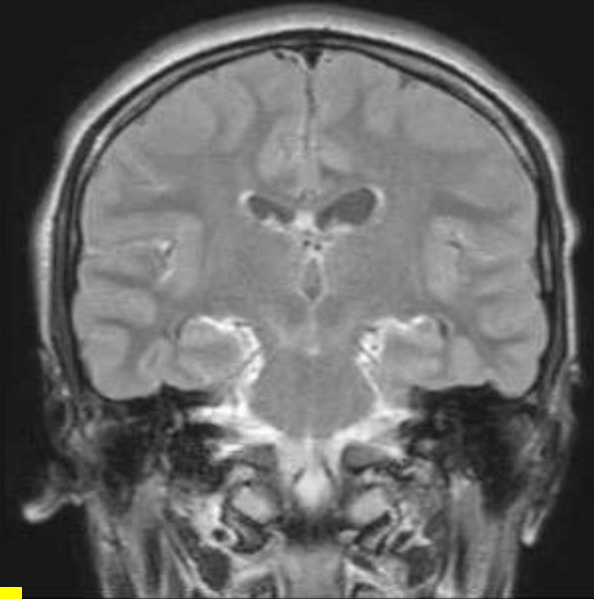
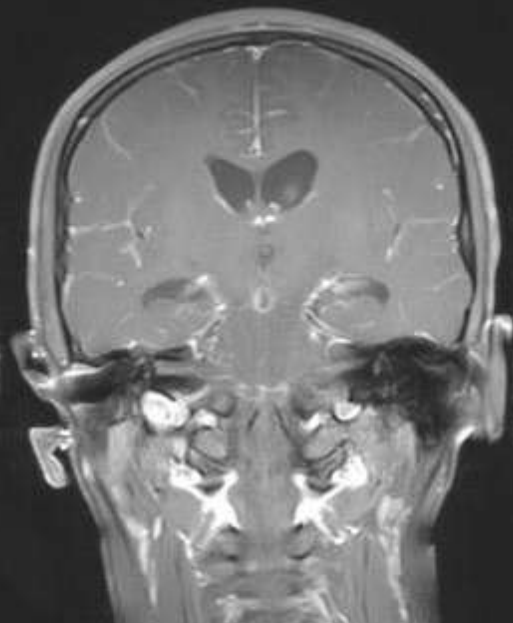
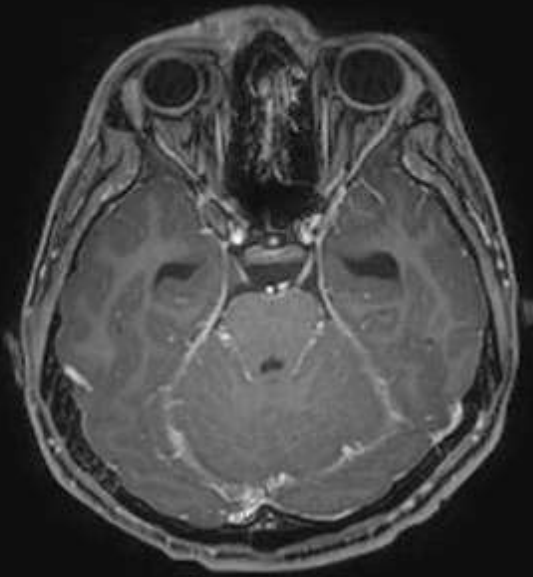
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Tuberkulom**



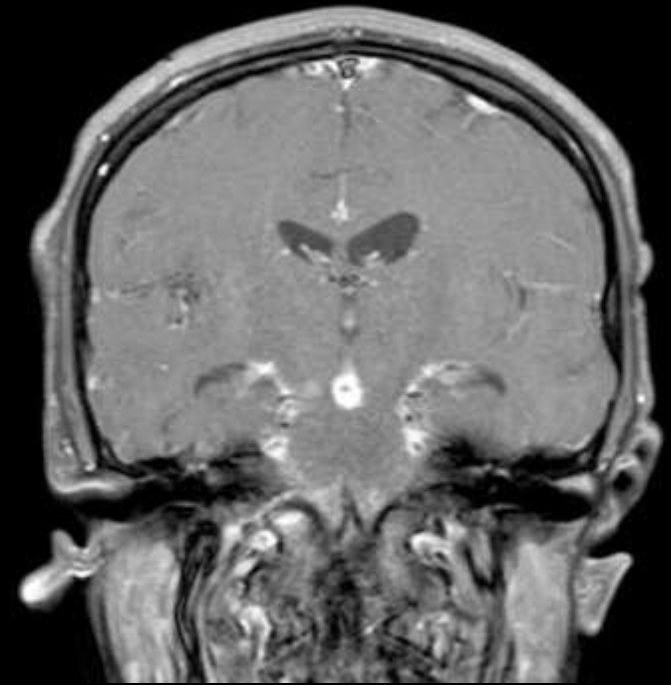
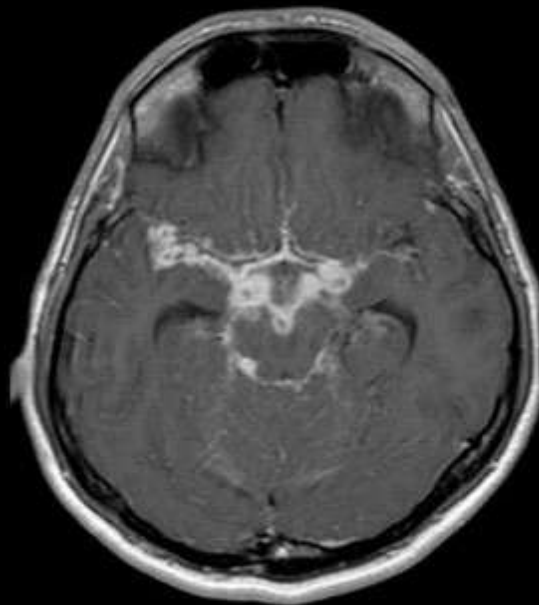


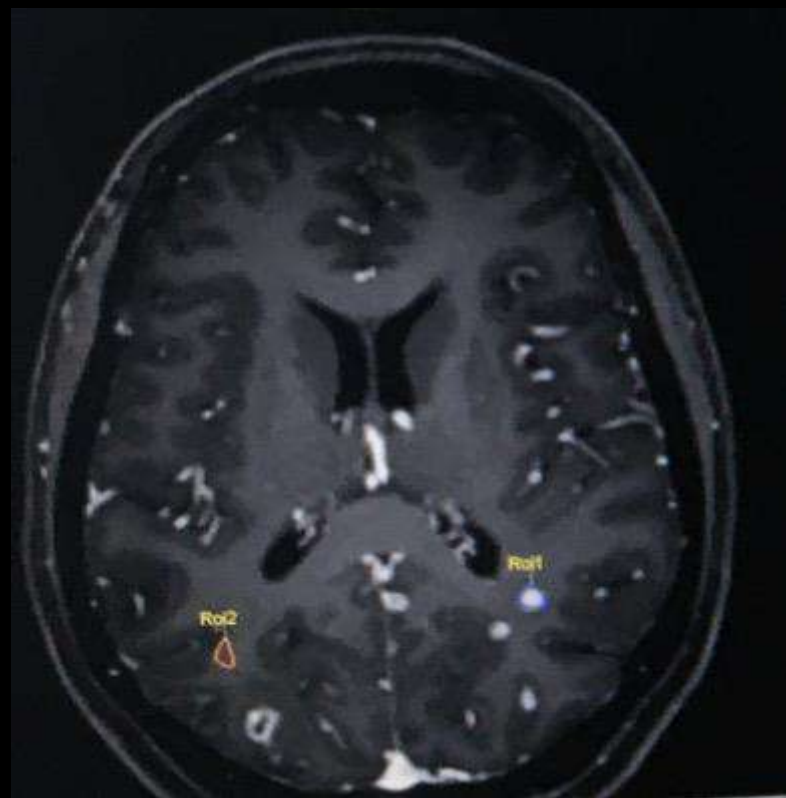
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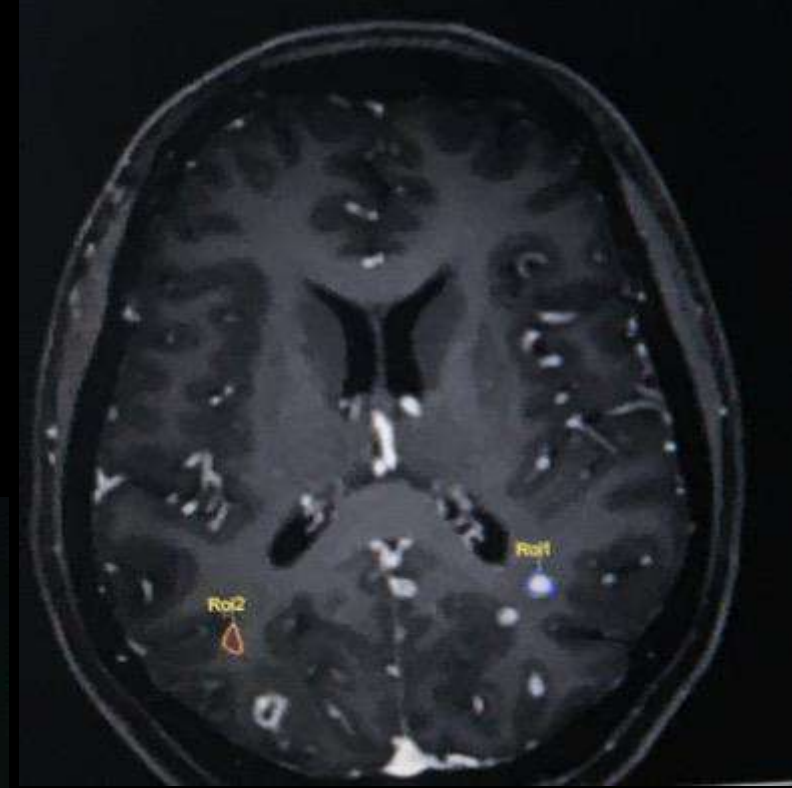
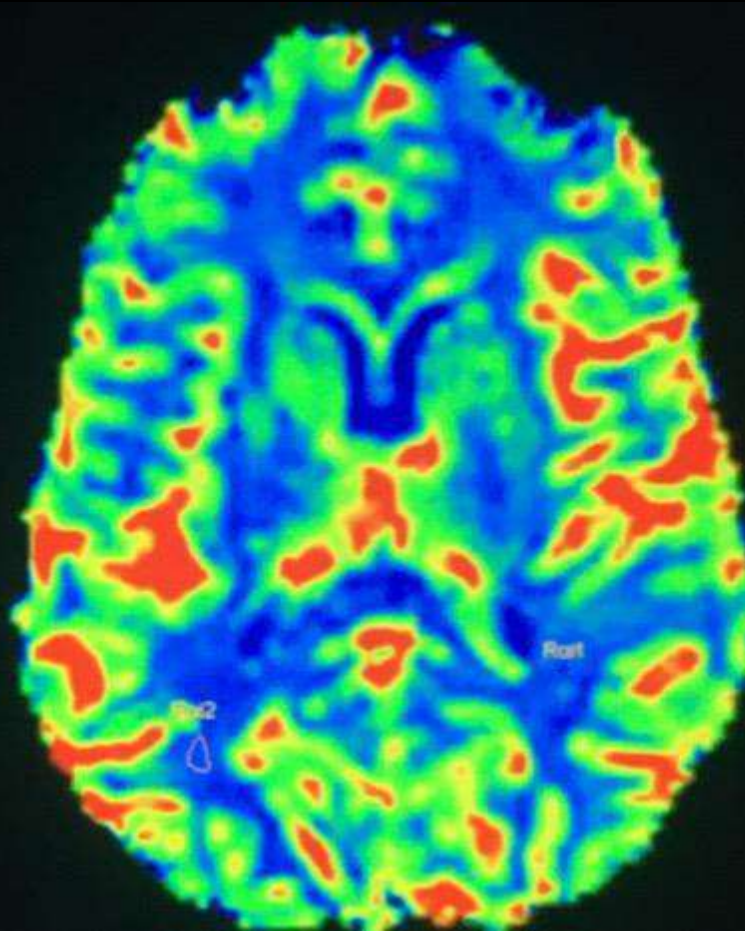
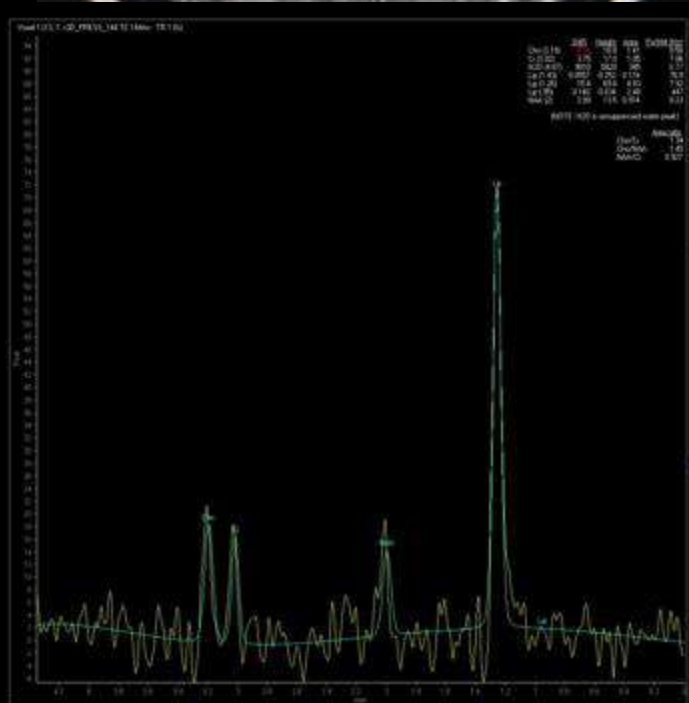


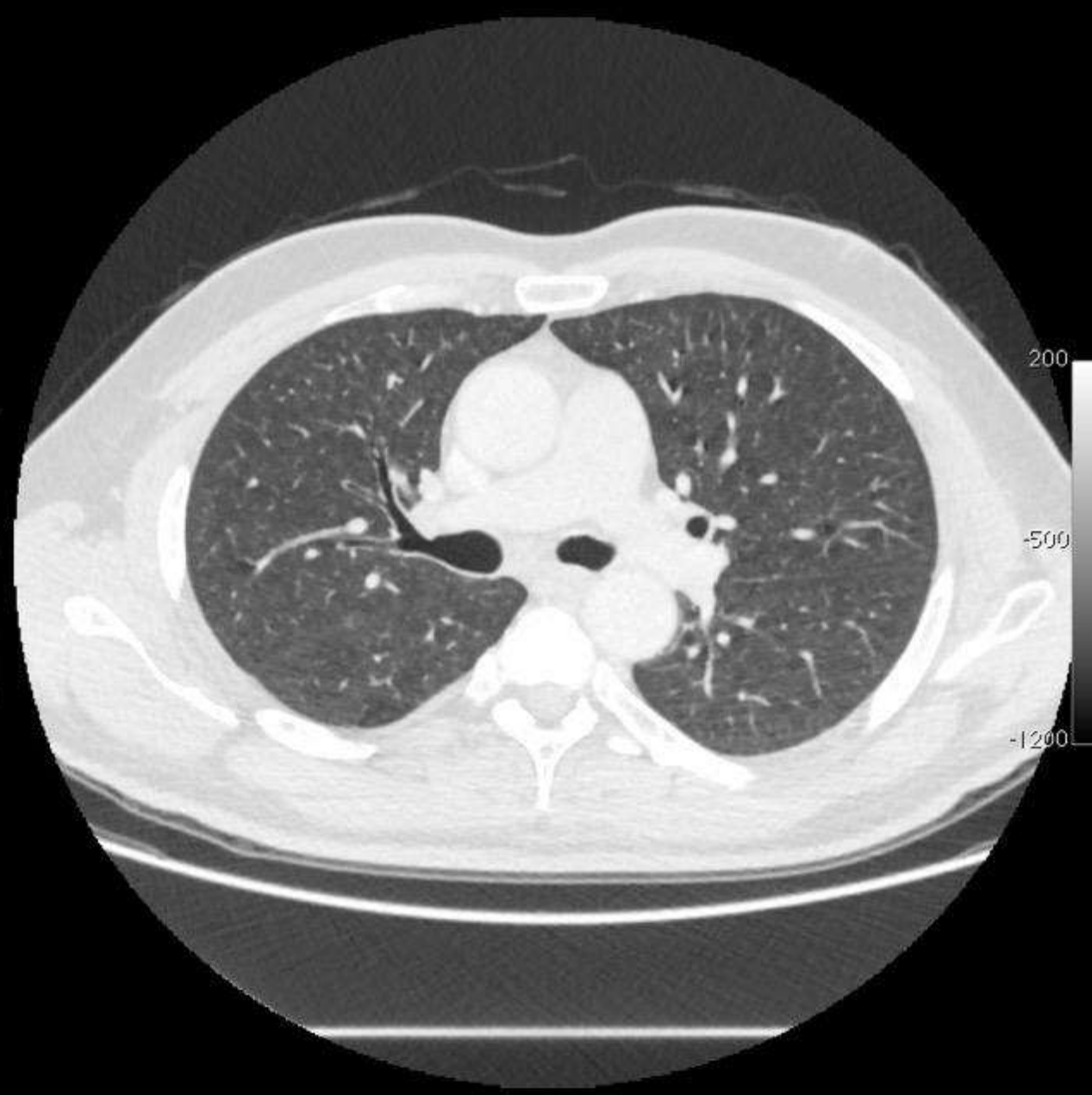
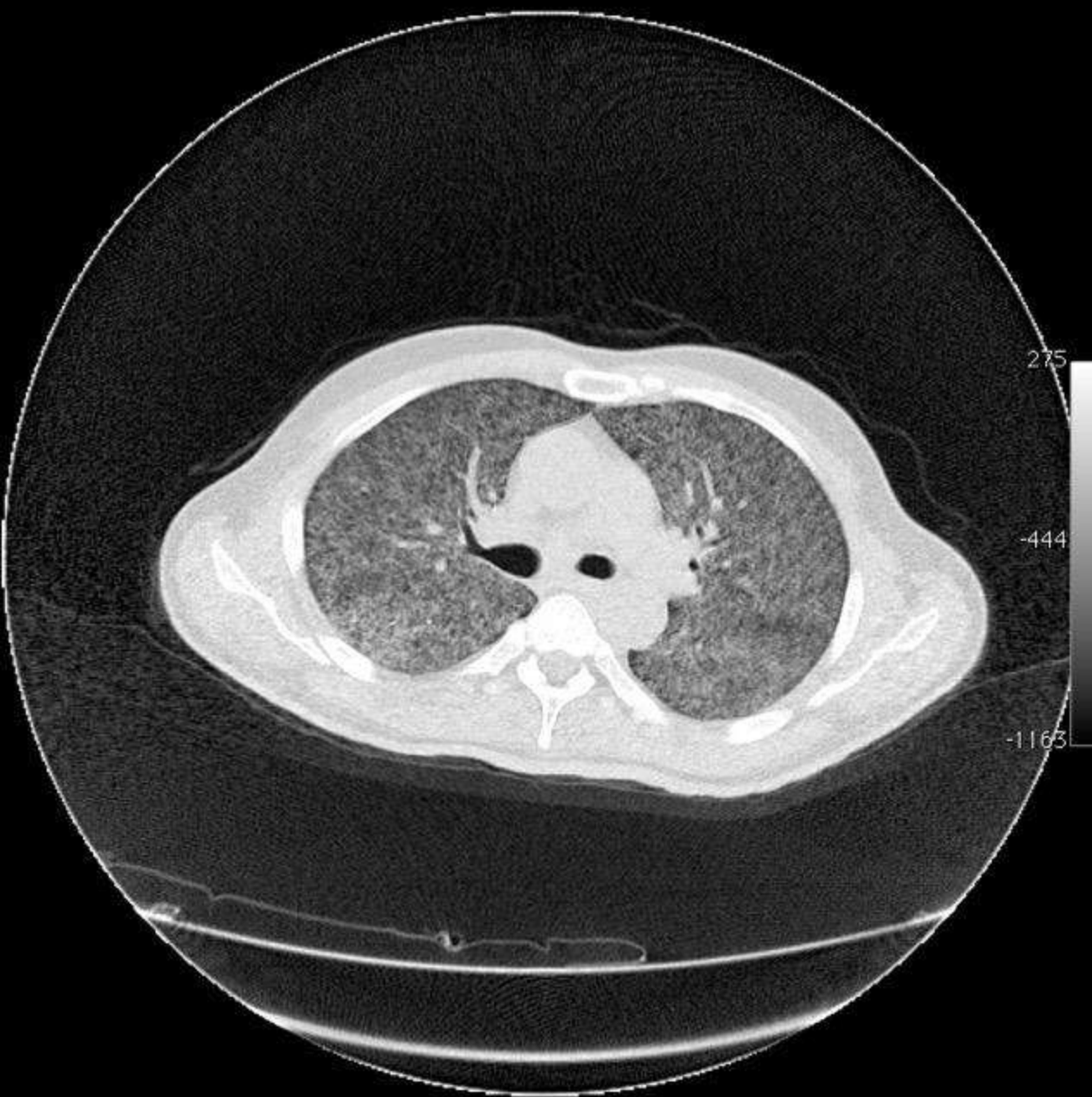
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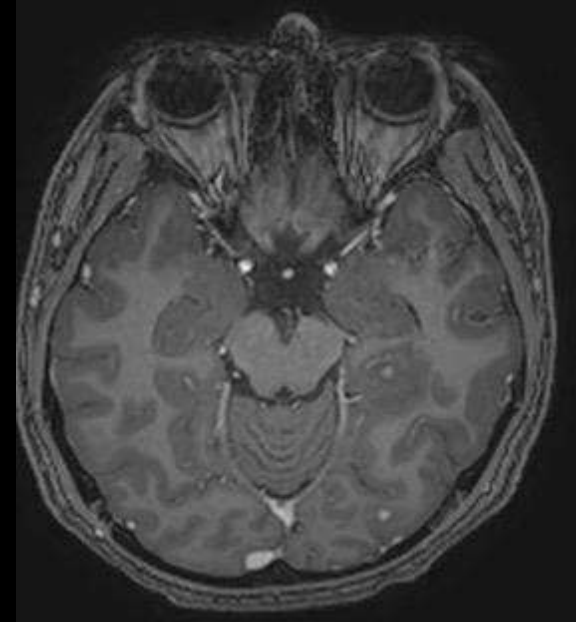
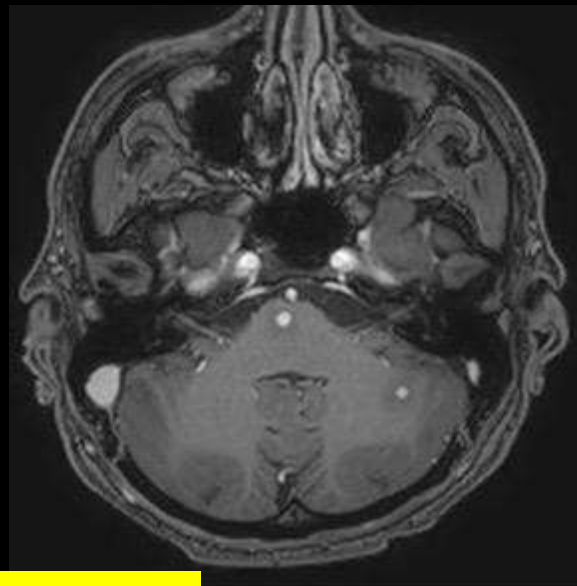
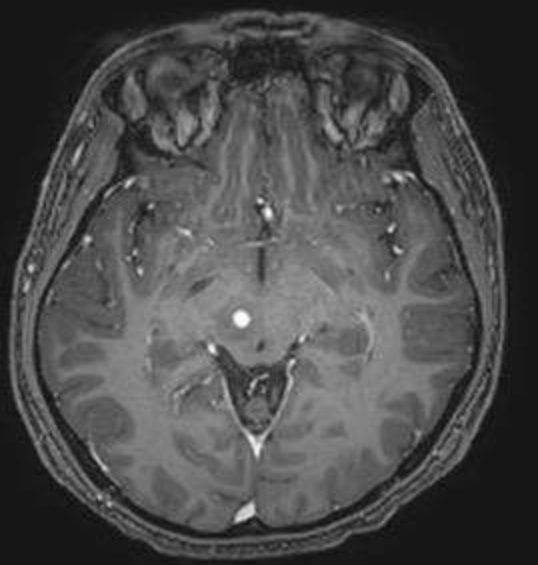
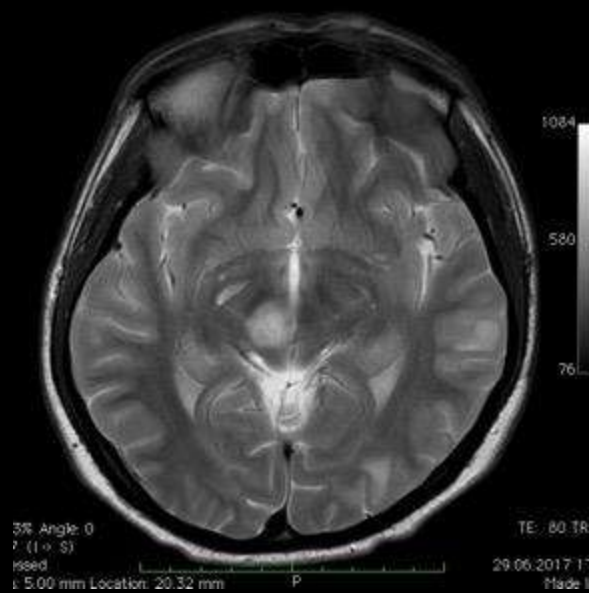




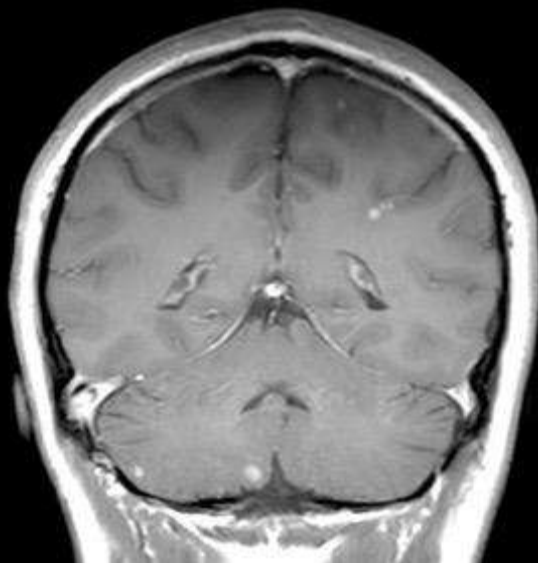
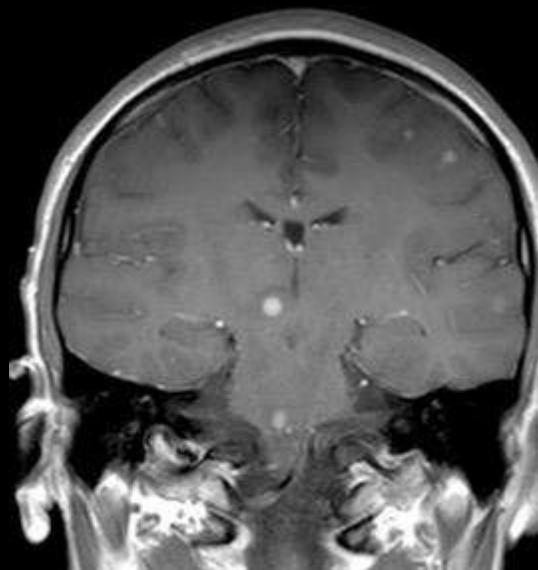
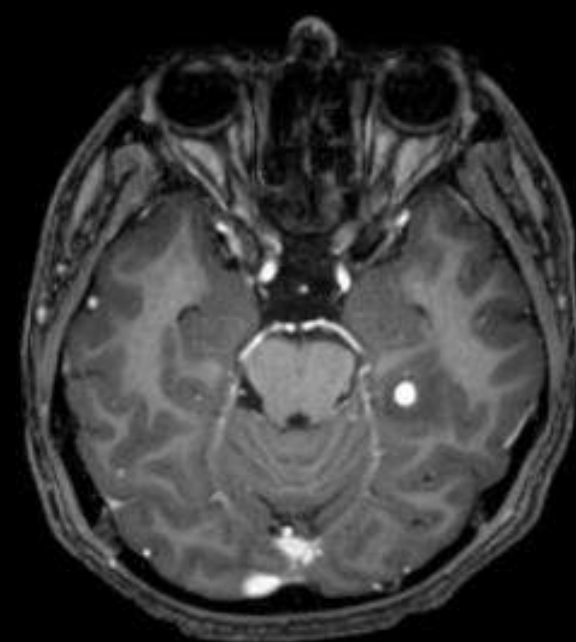
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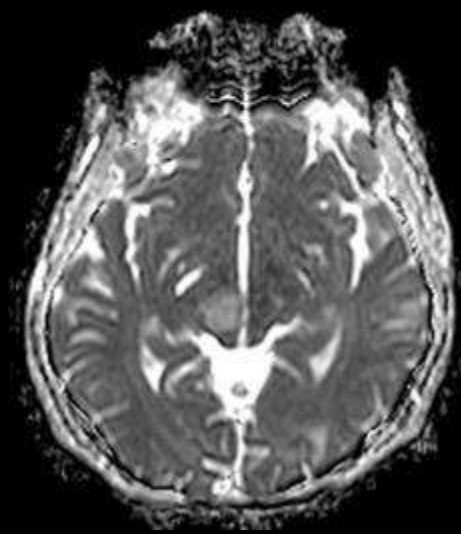
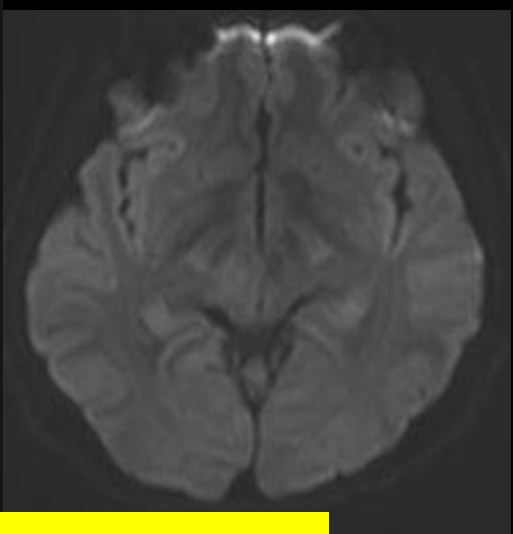
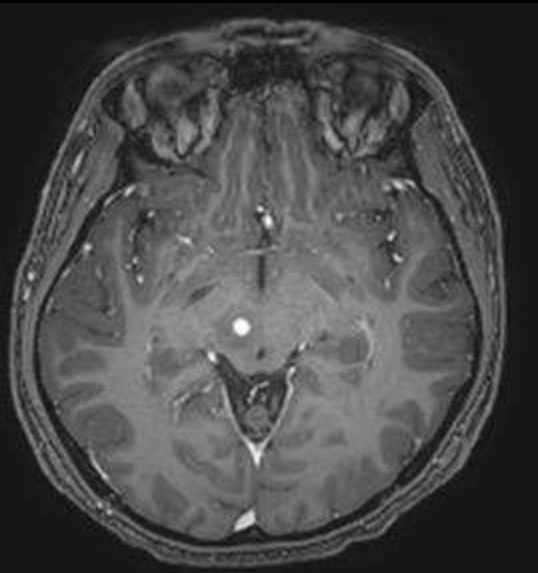
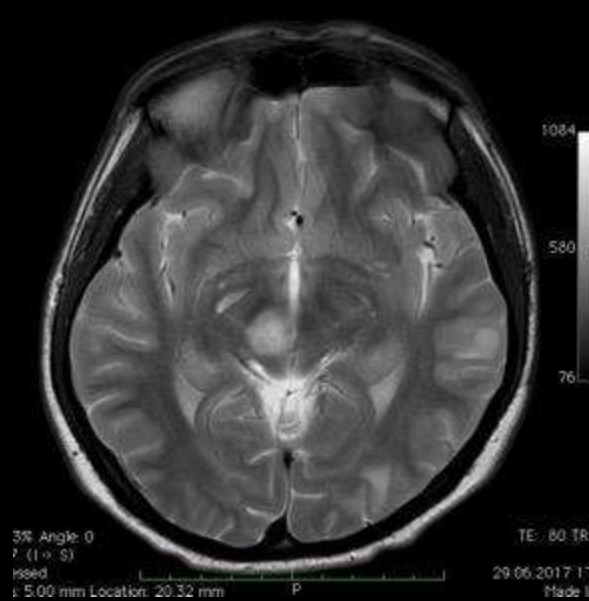




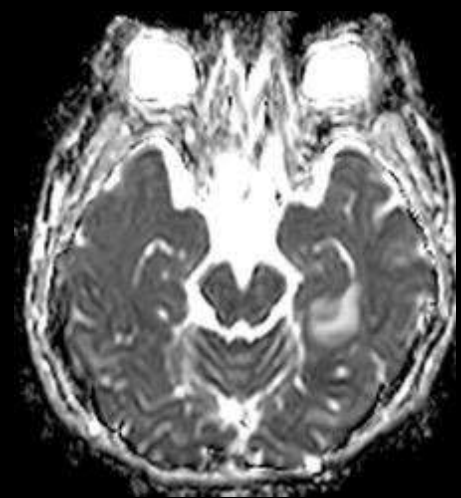
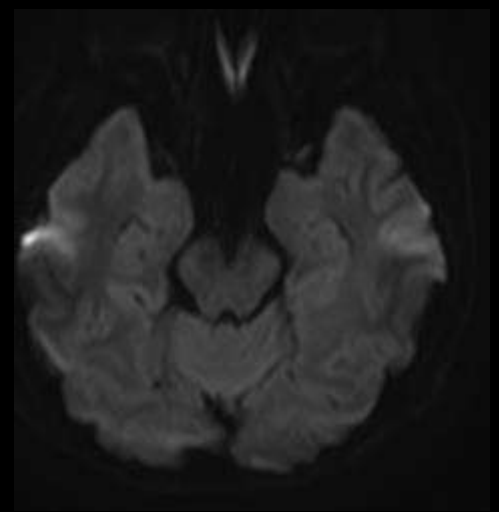
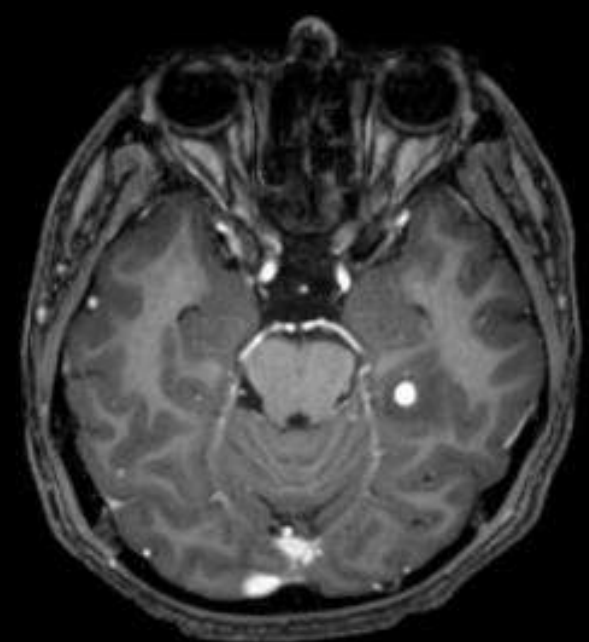


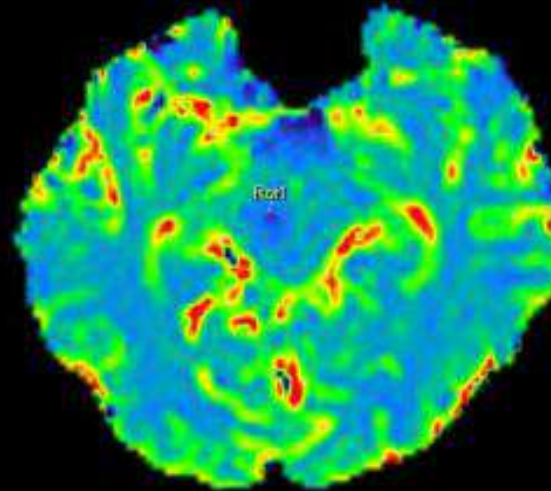
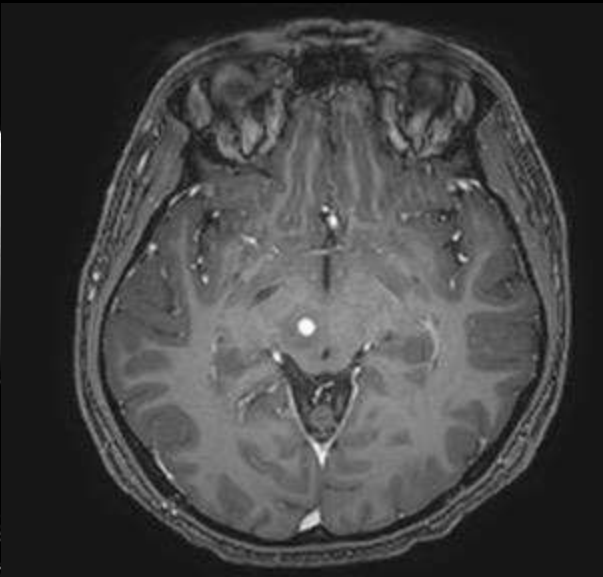
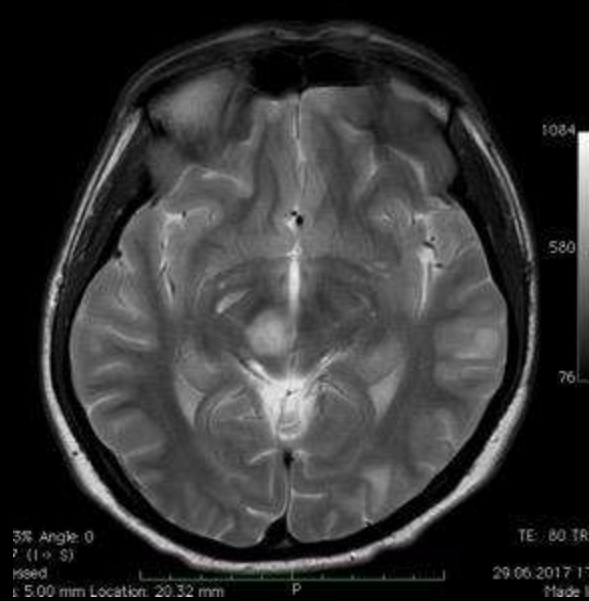
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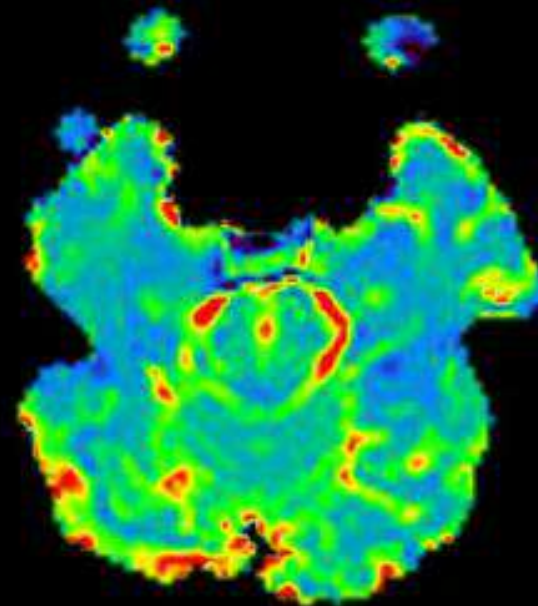
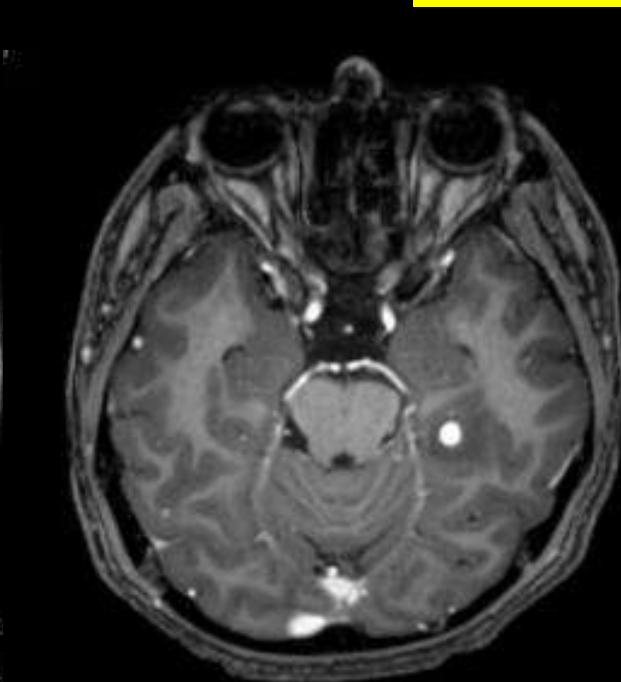


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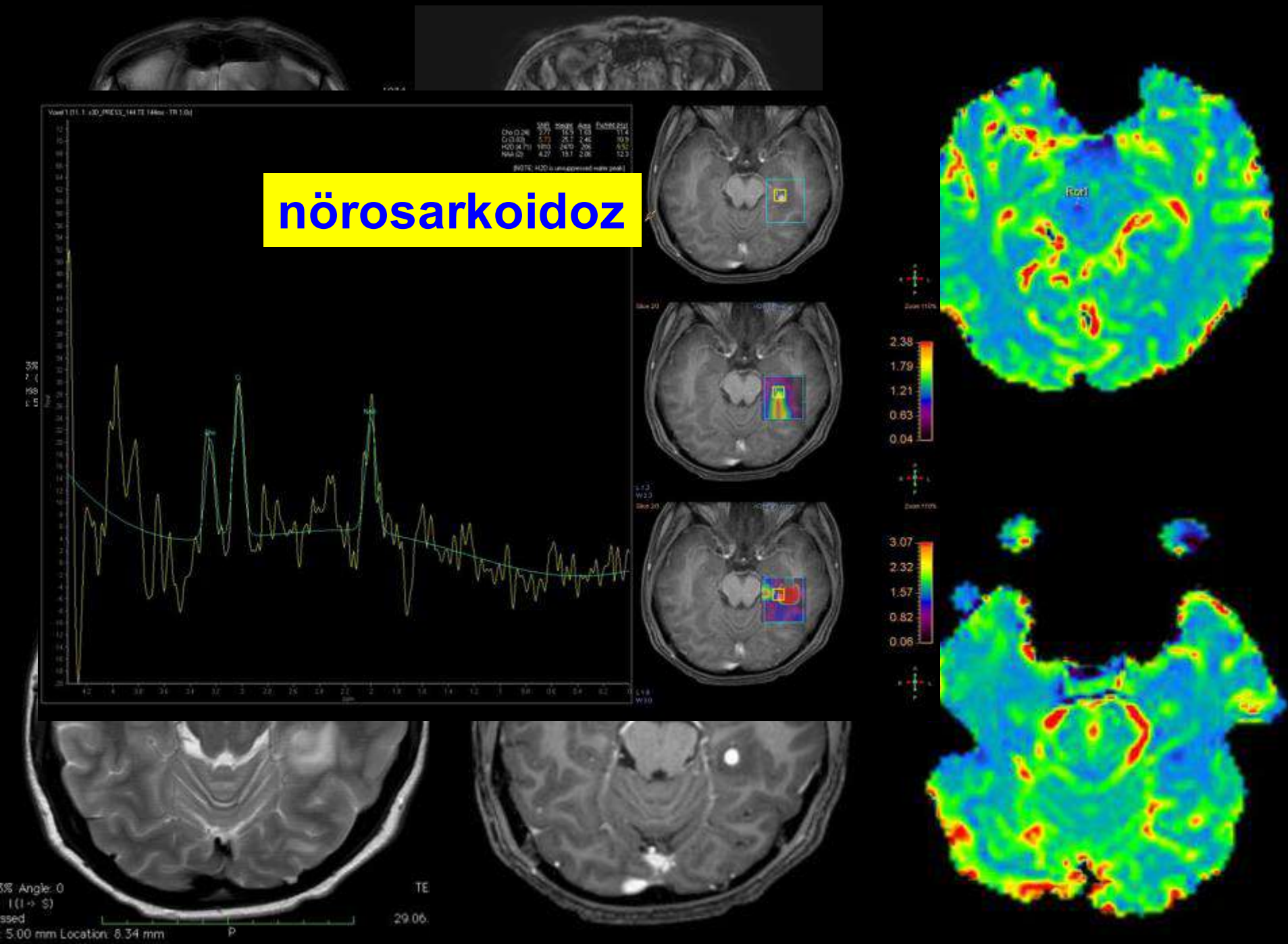


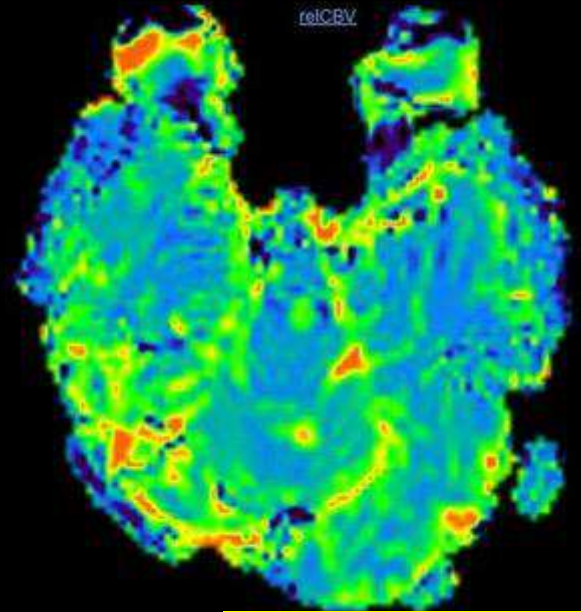
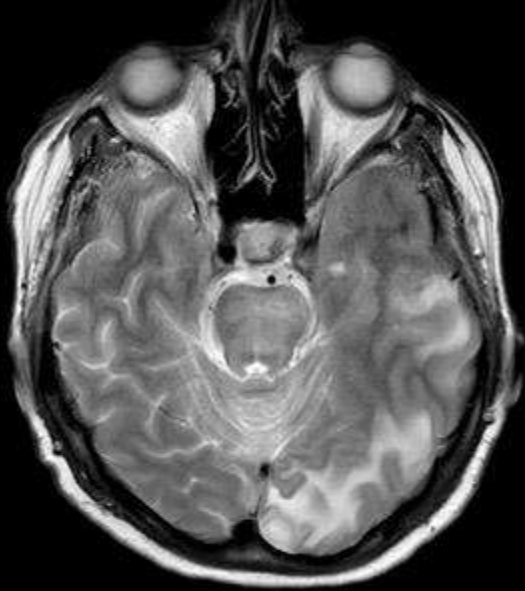
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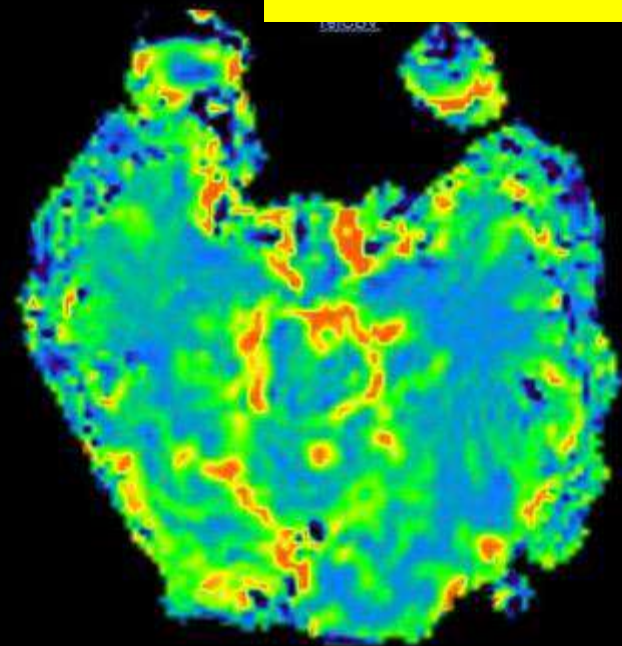
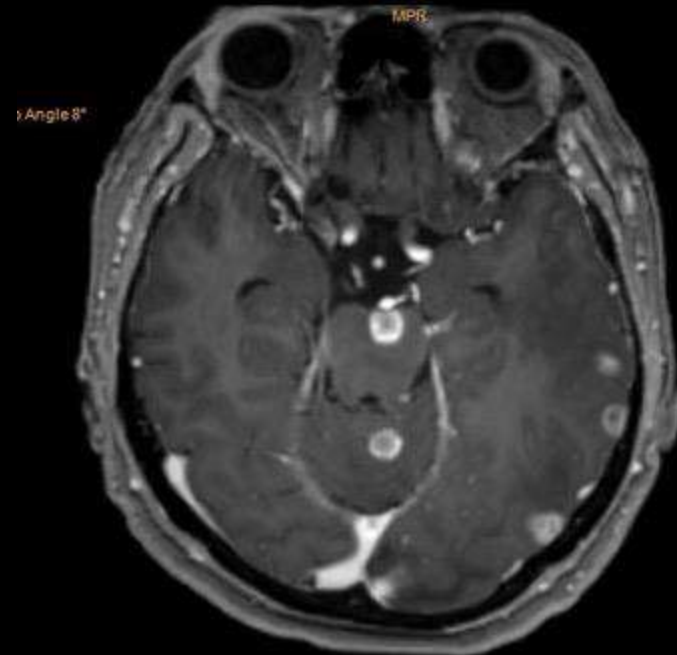
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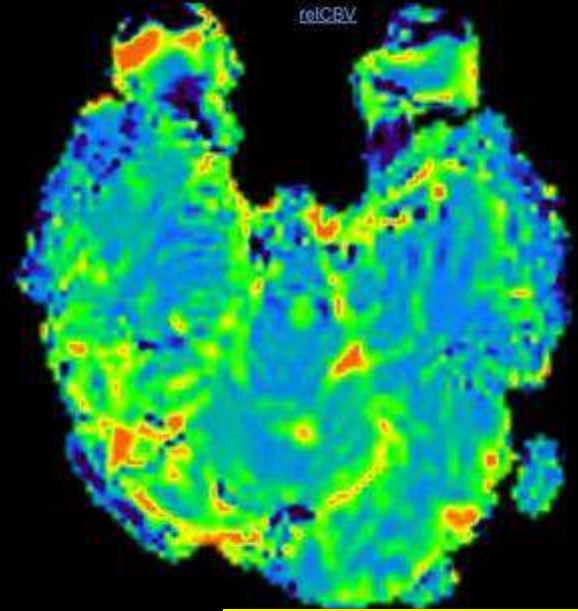
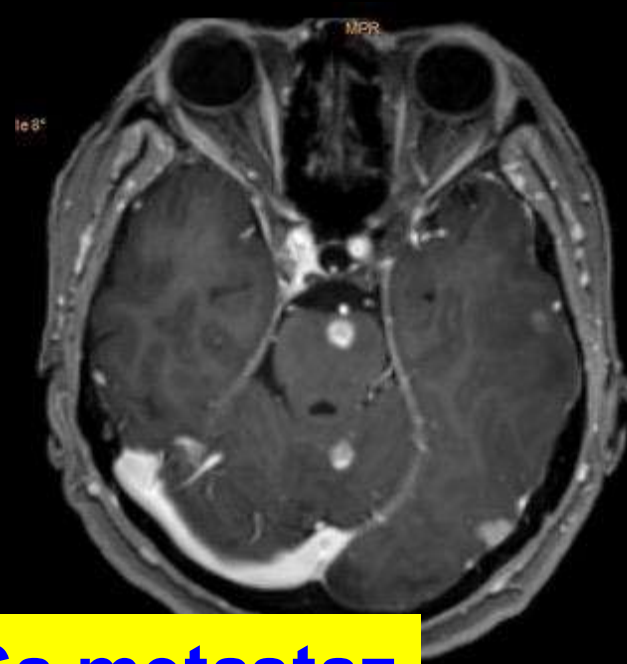
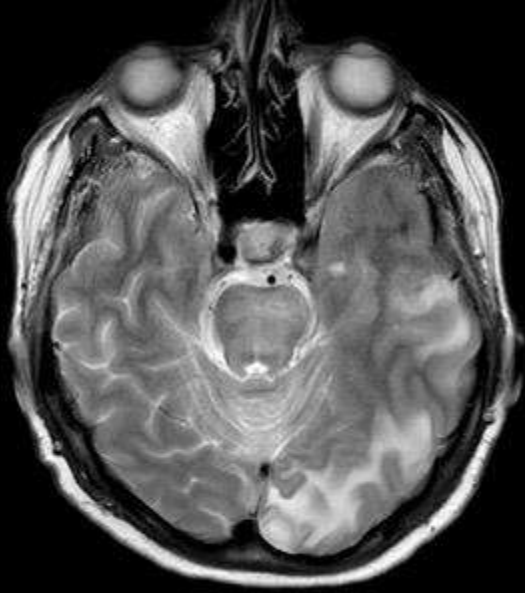
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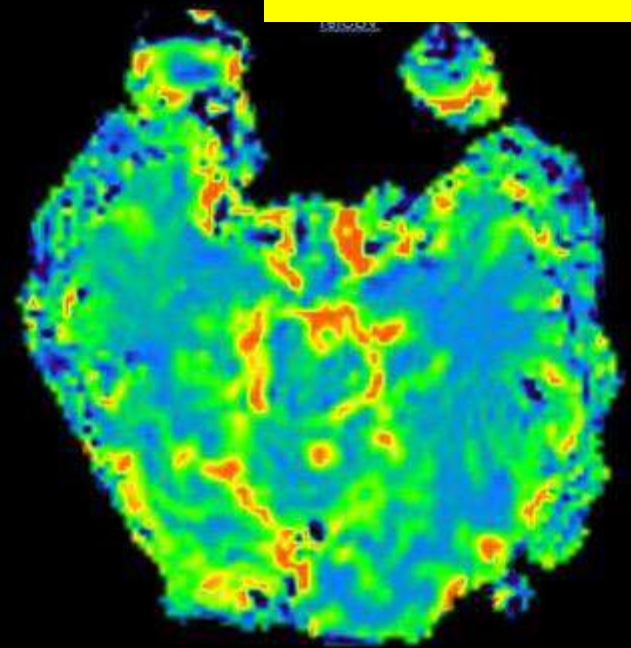
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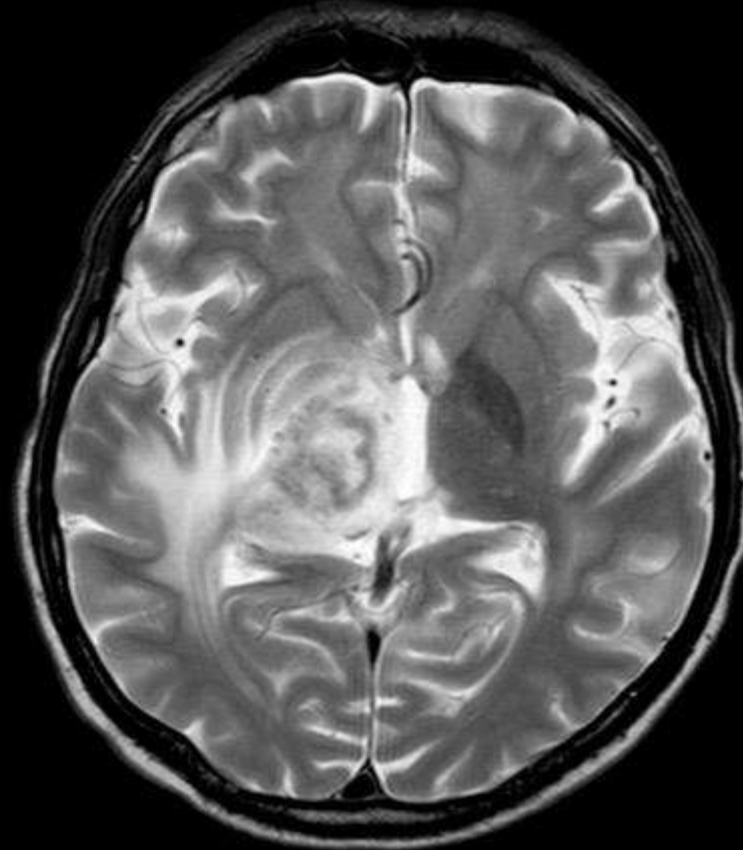
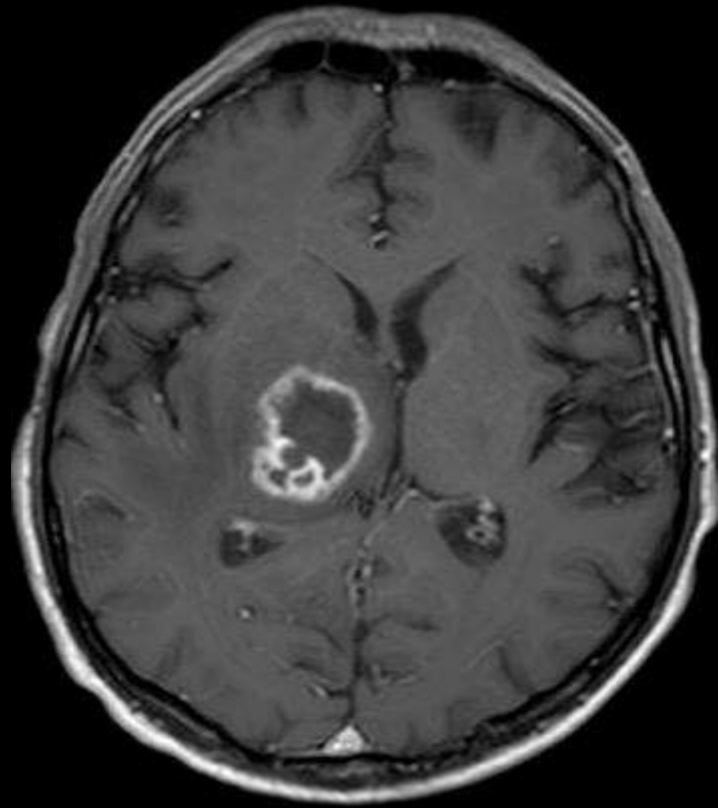
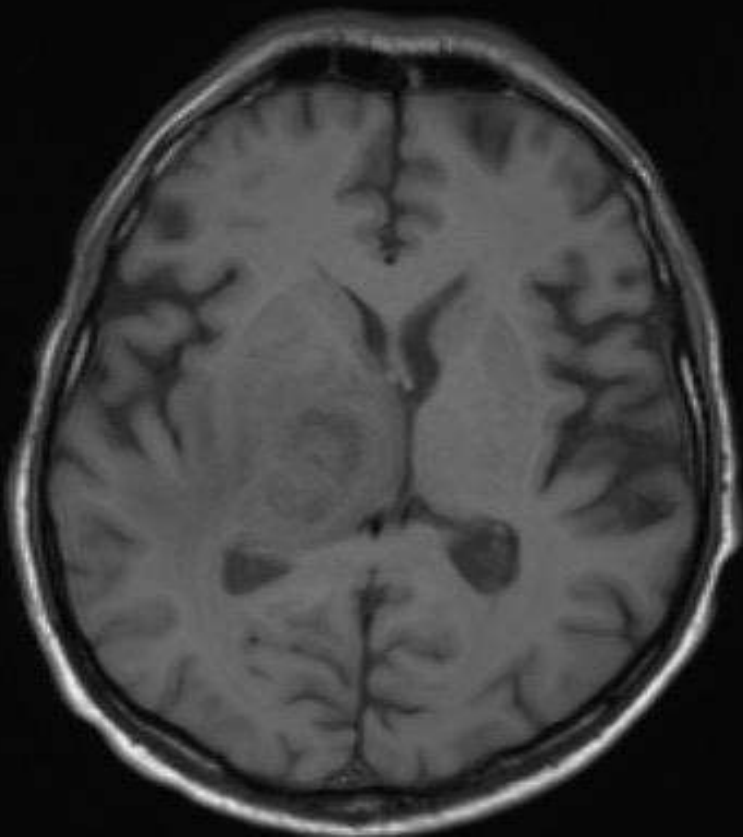
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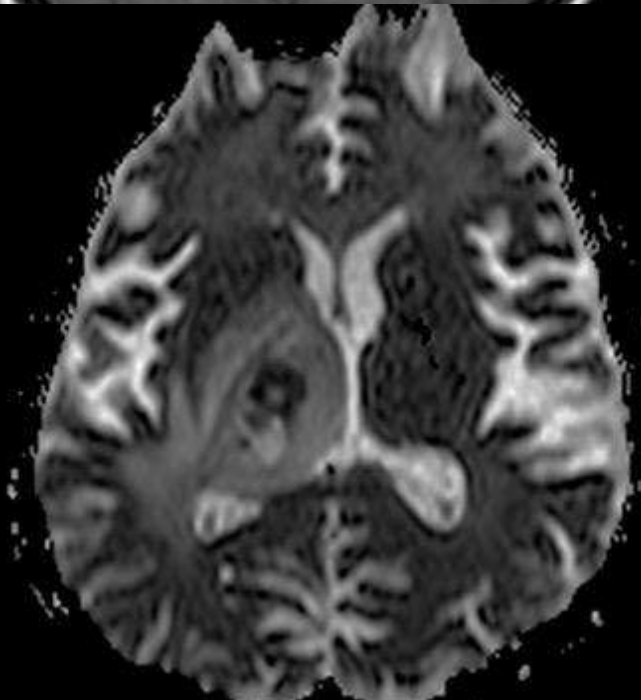
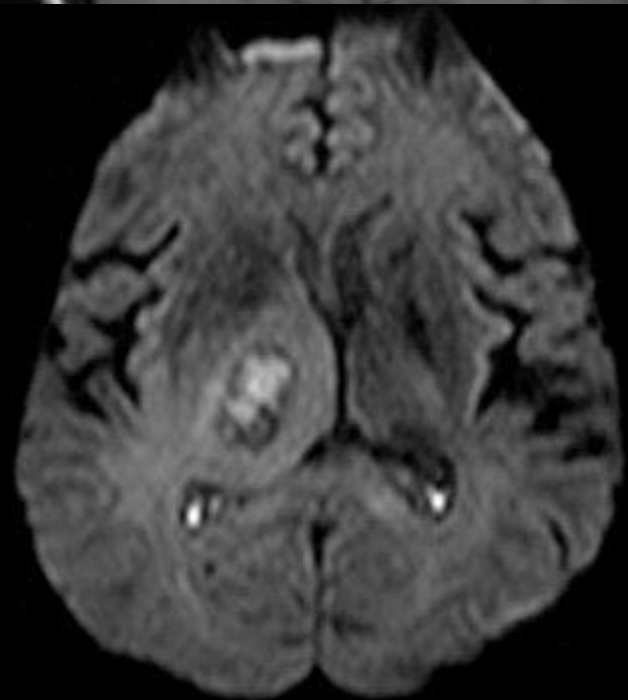
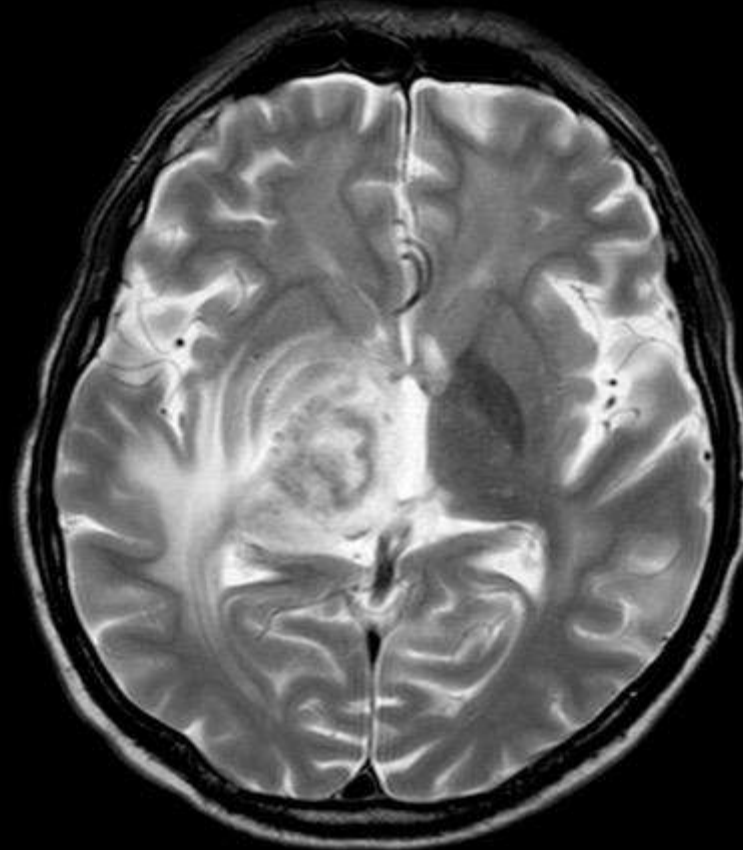
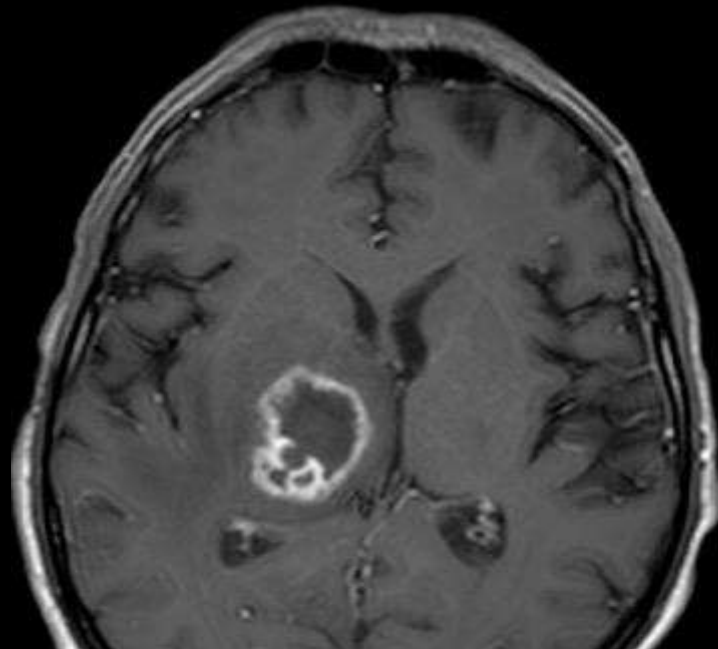
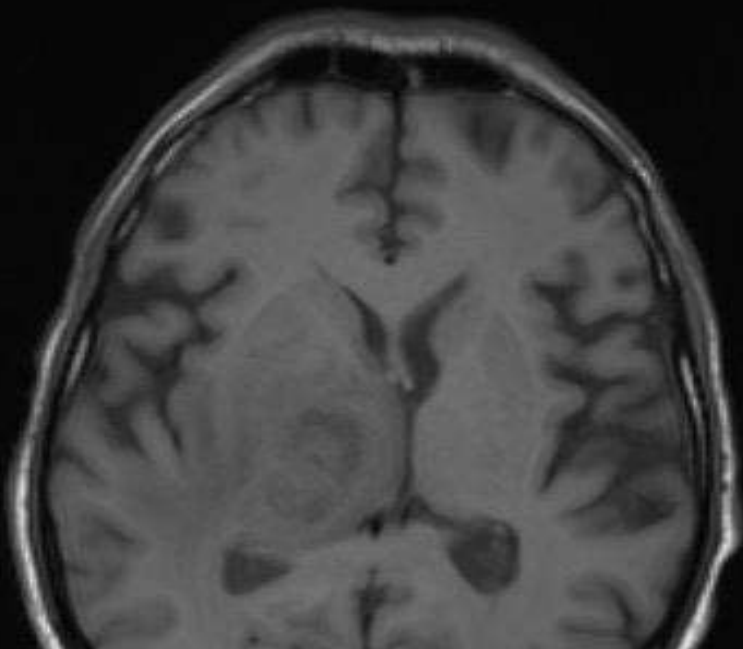
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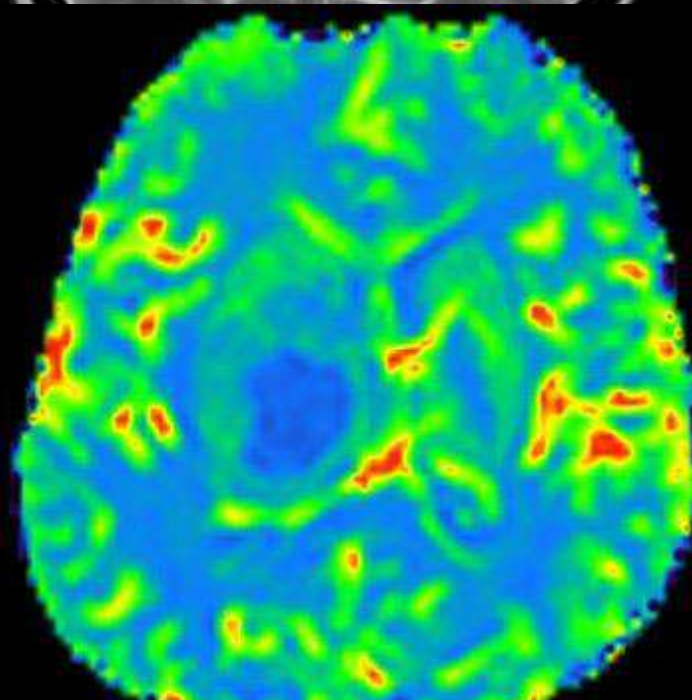
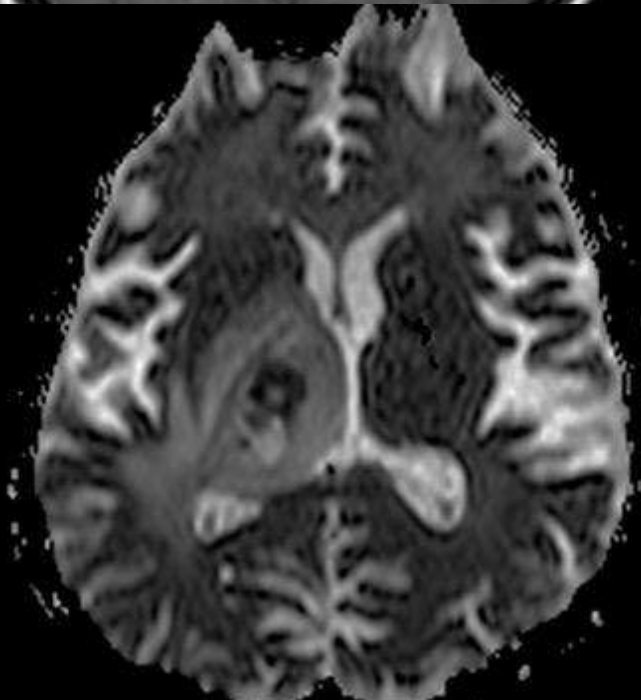
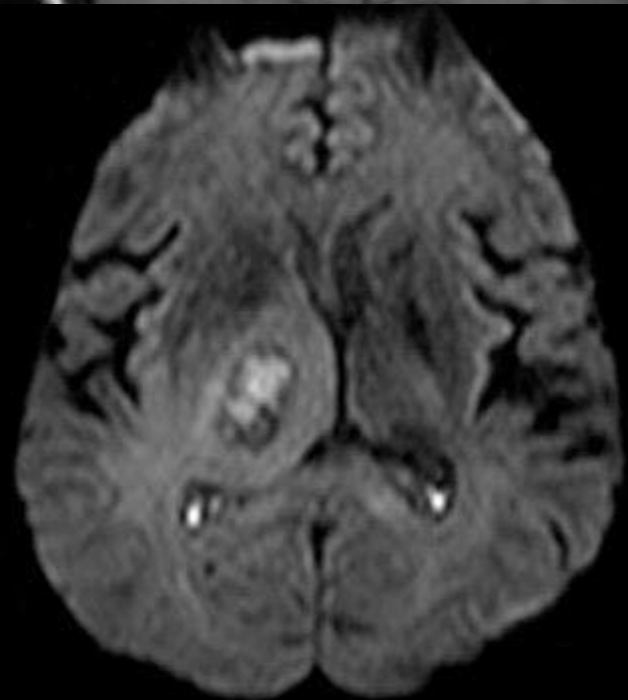
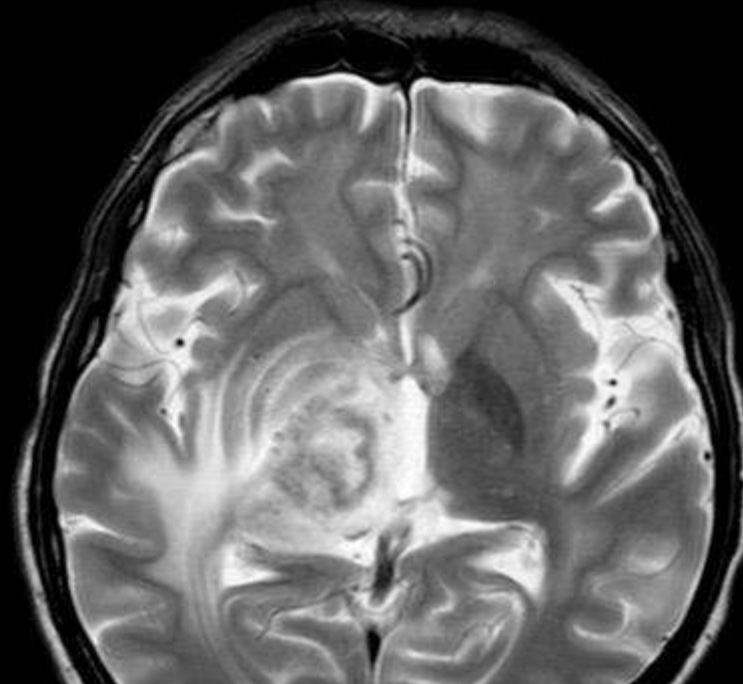
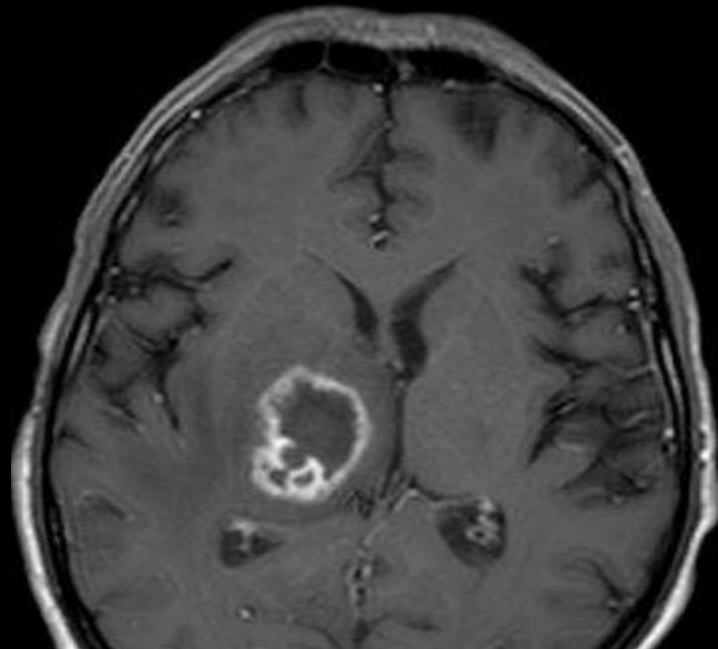
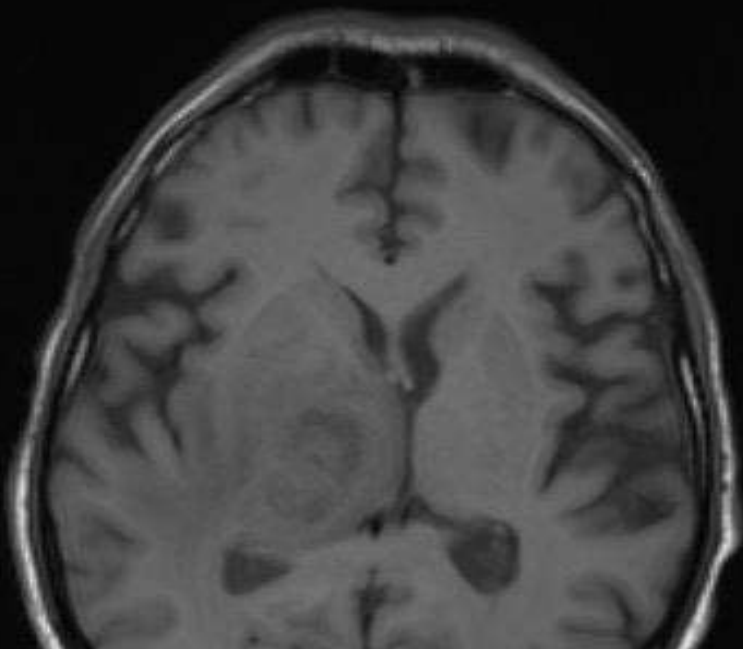


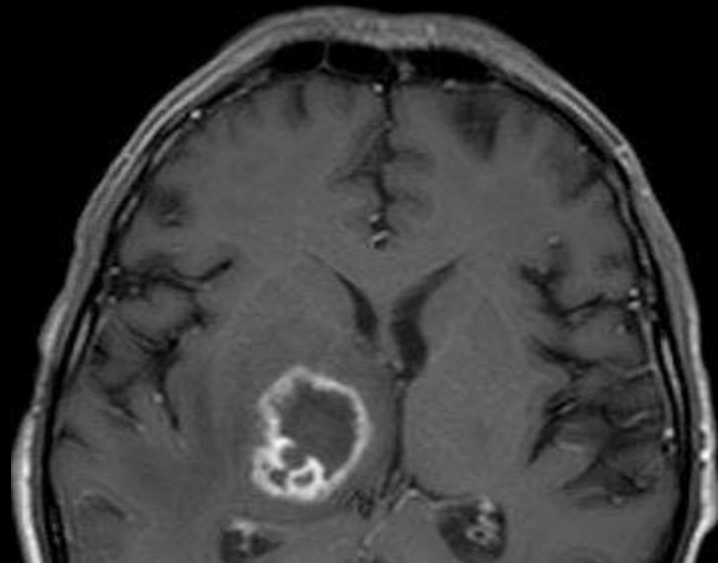
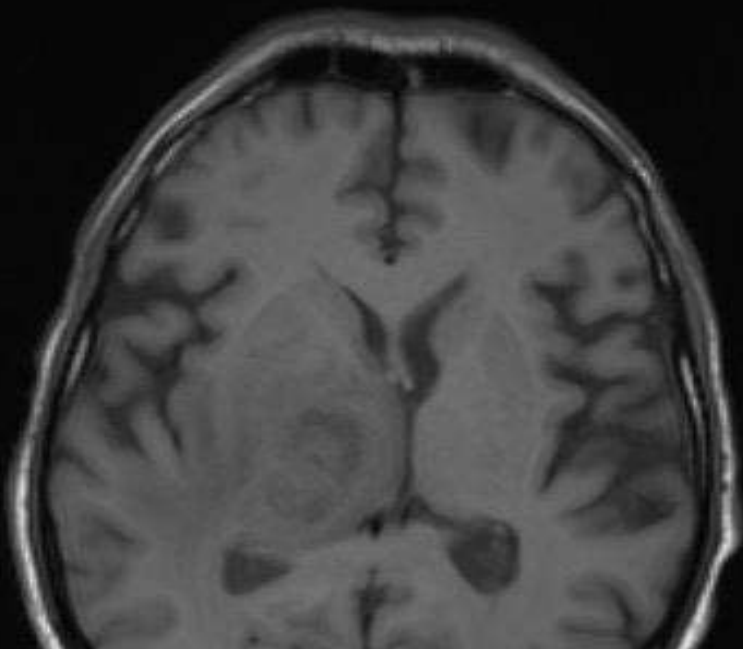
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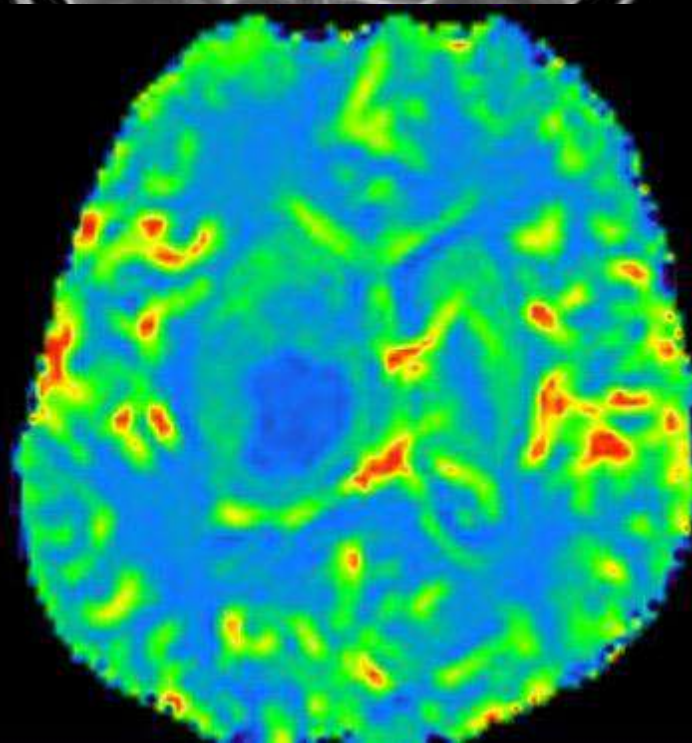
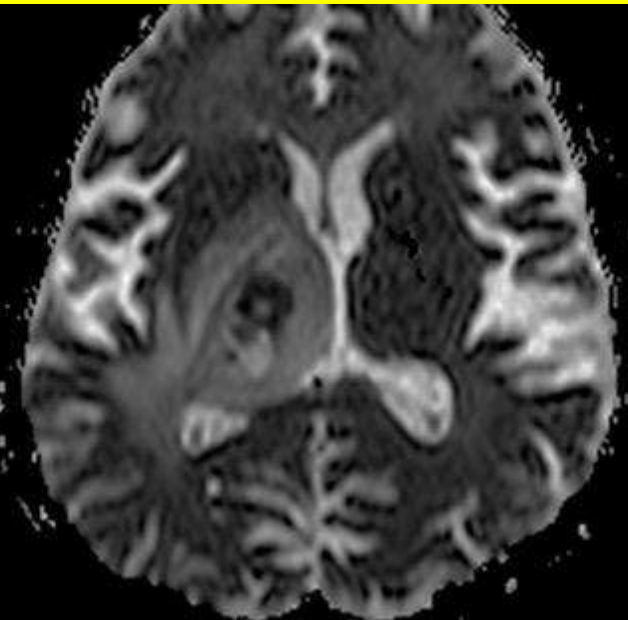
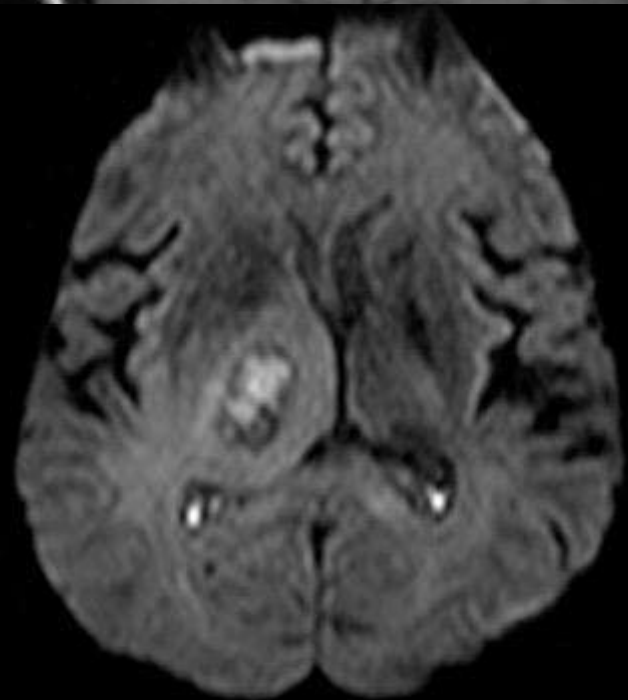
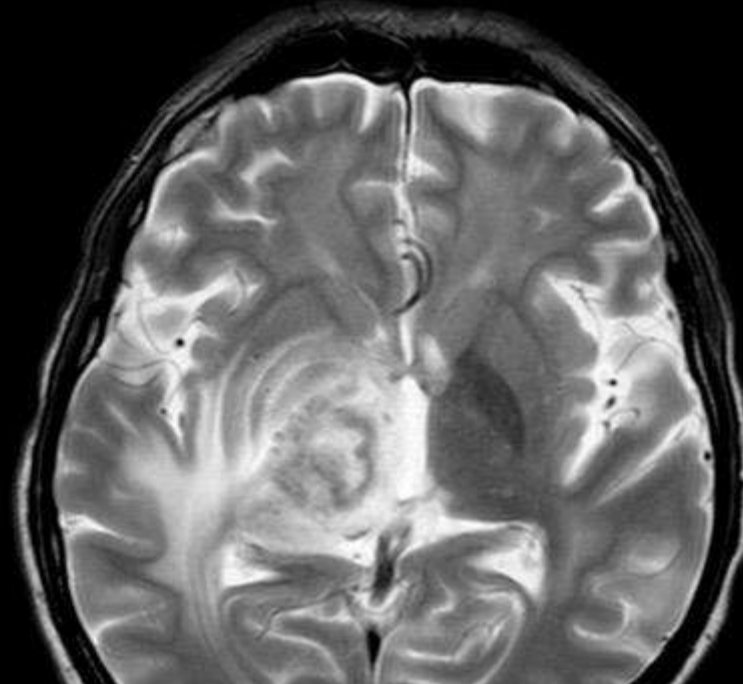


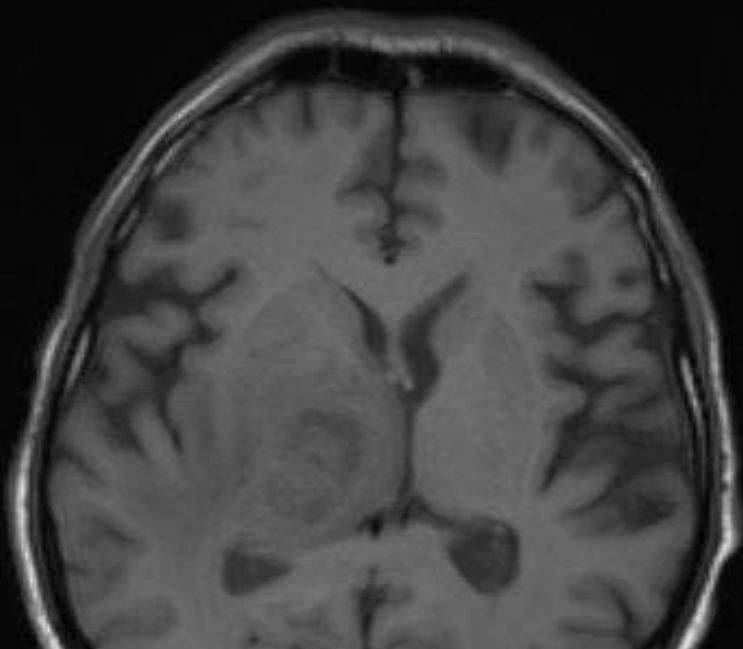






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Hipoperfüzyon

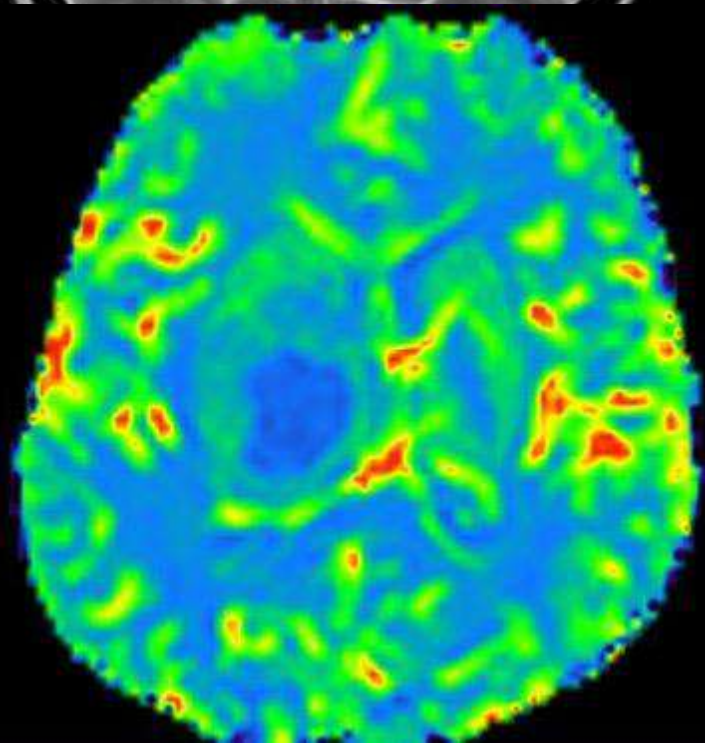
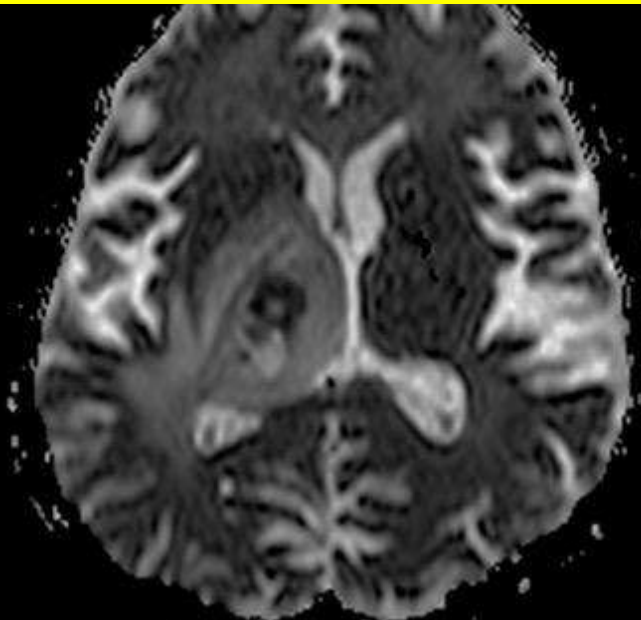
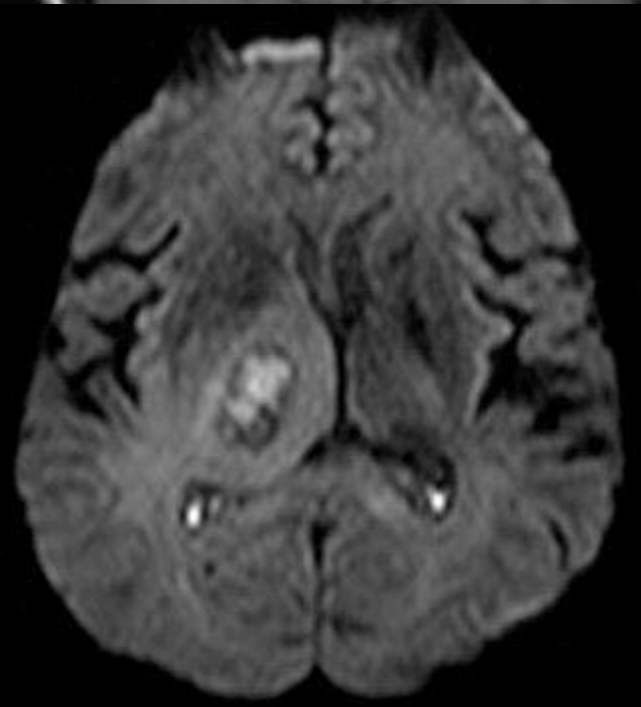
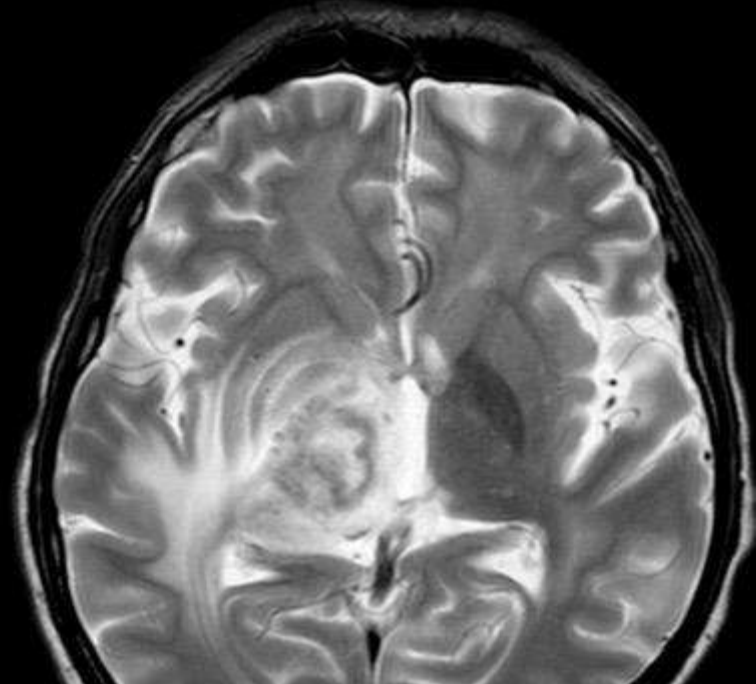


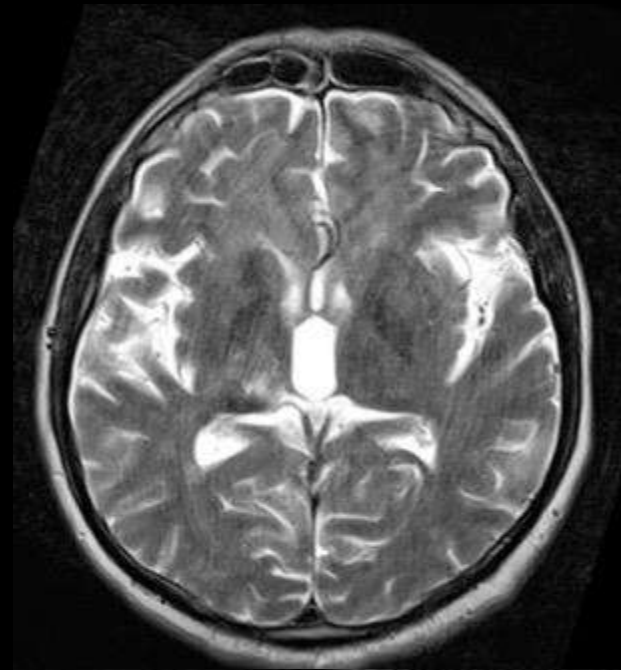


TOKSOPLAZMOZİS



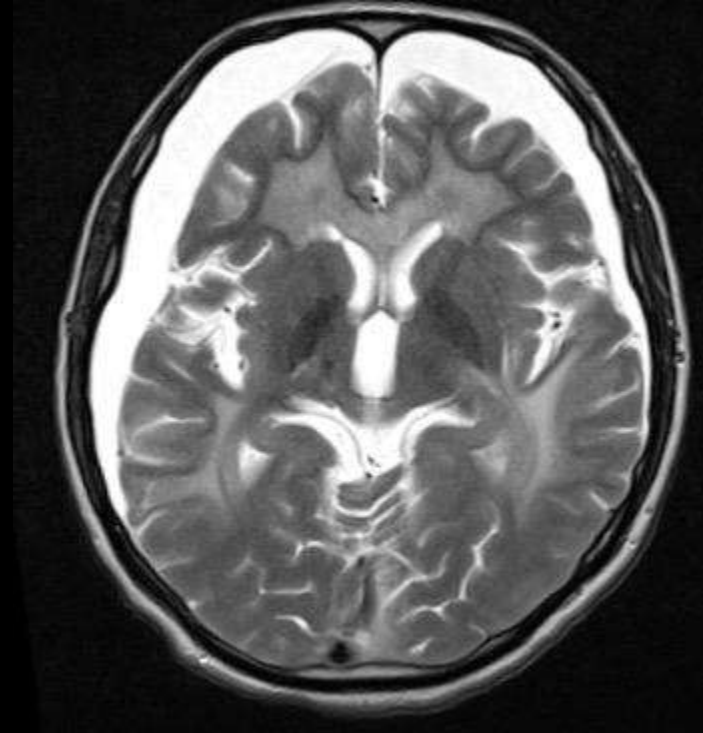
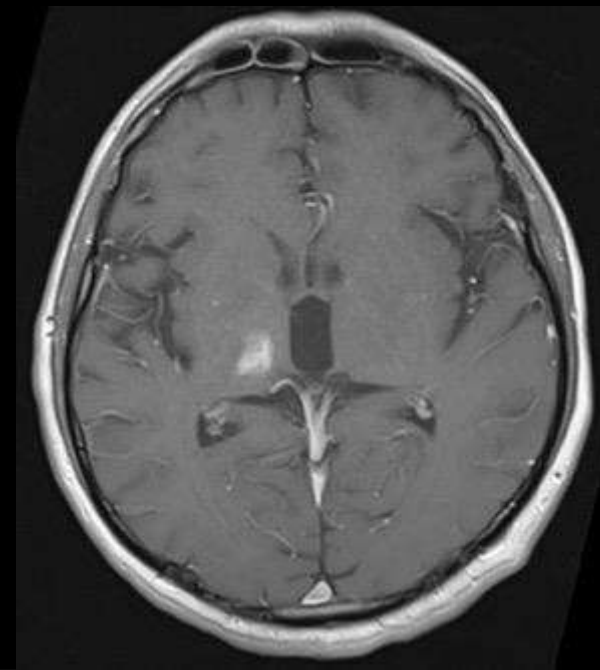
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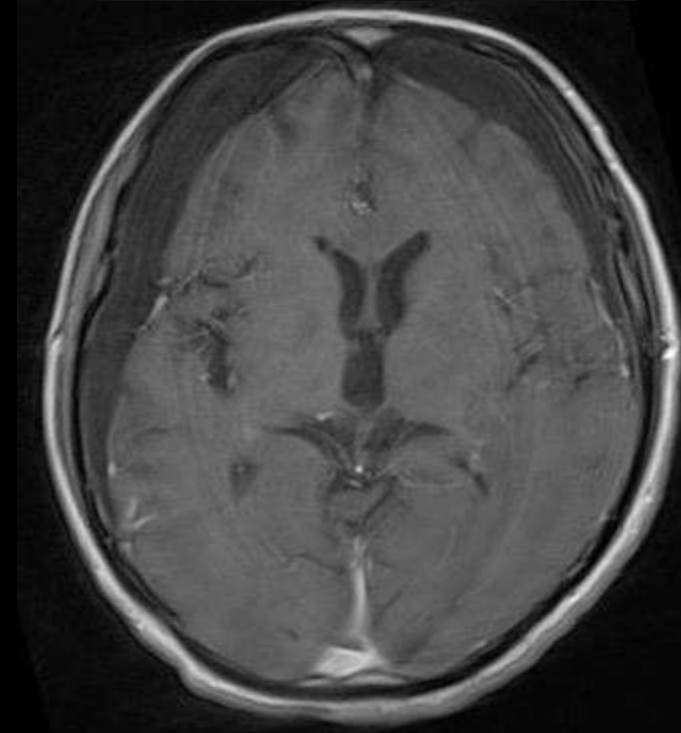


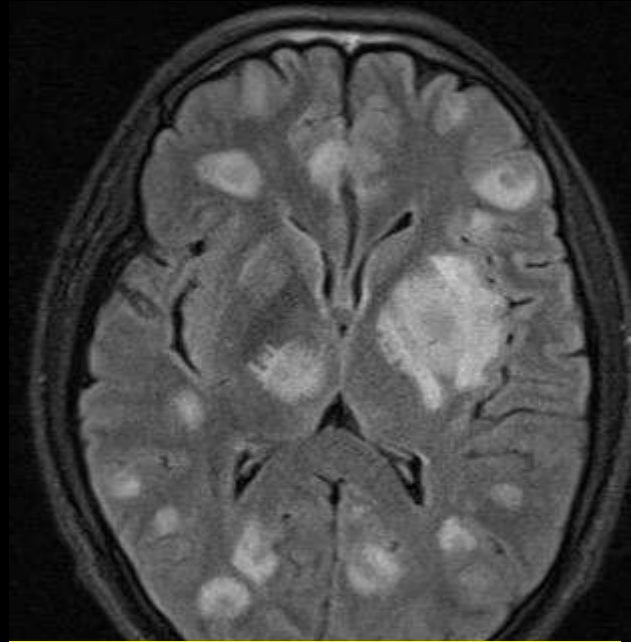
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5 ay sonra

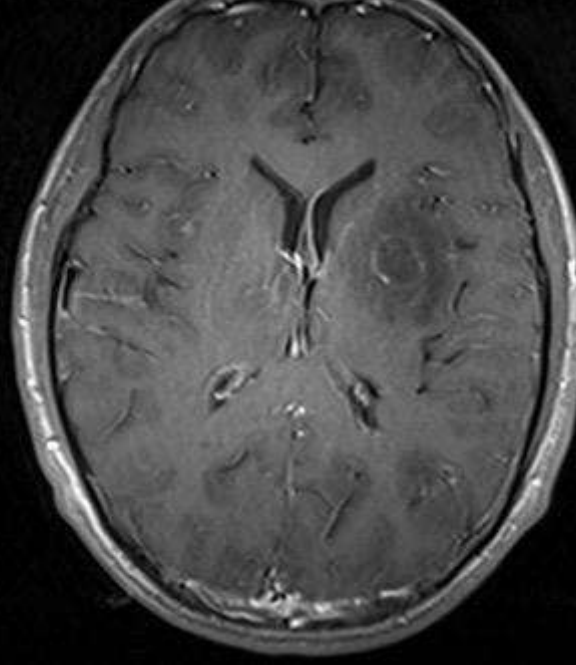
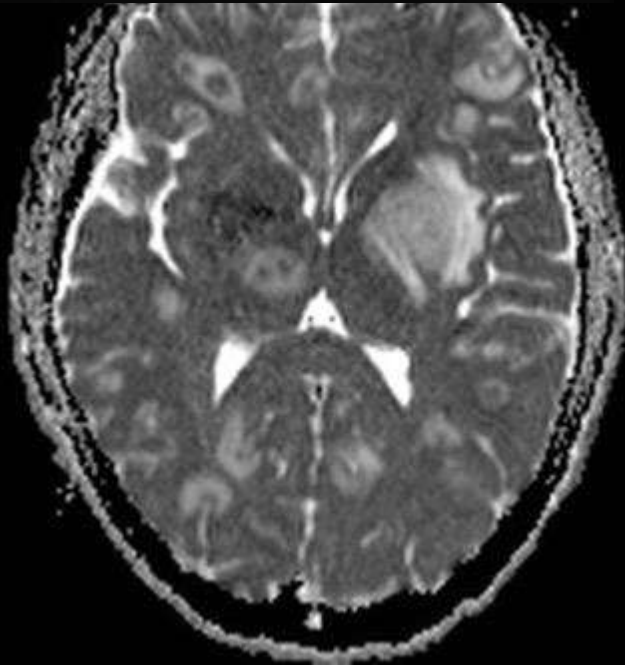
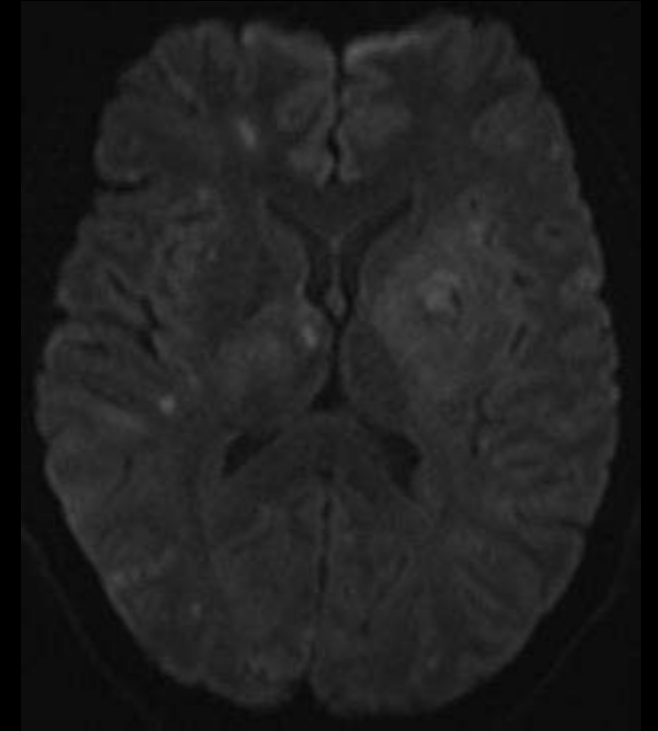


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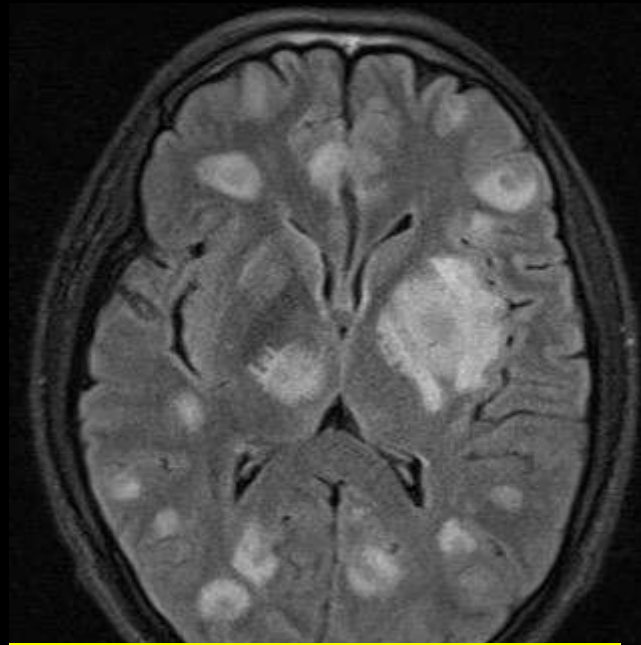
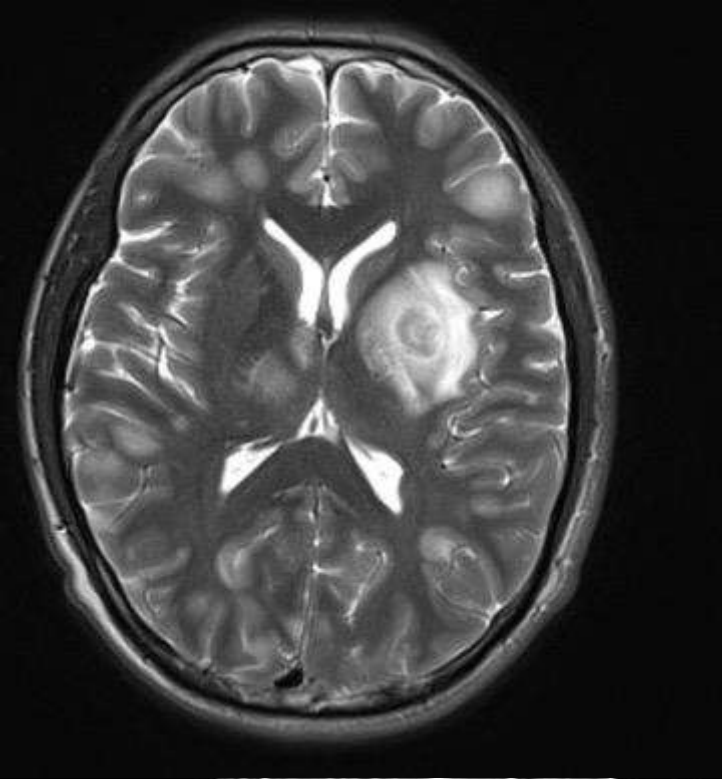




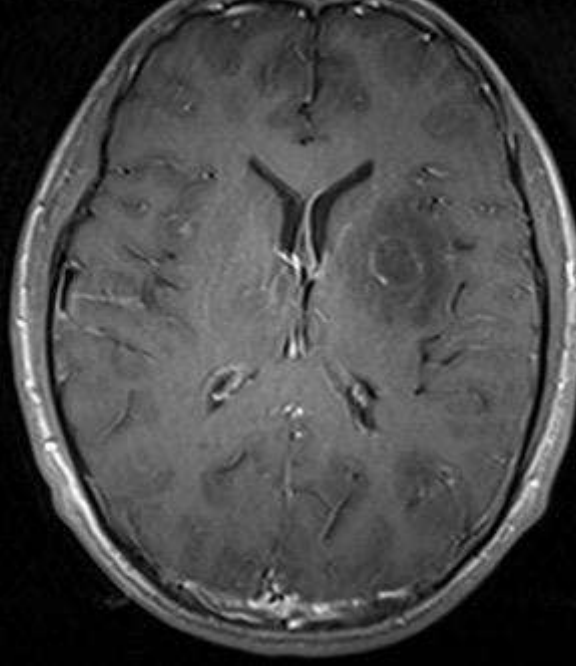
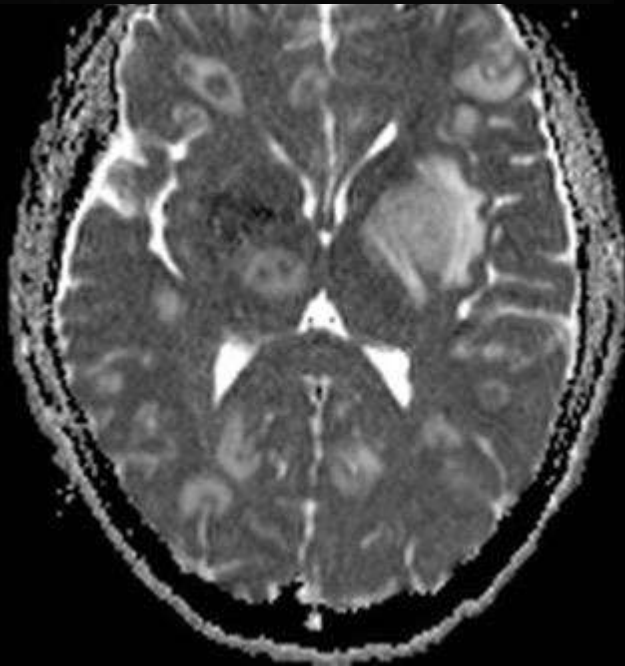
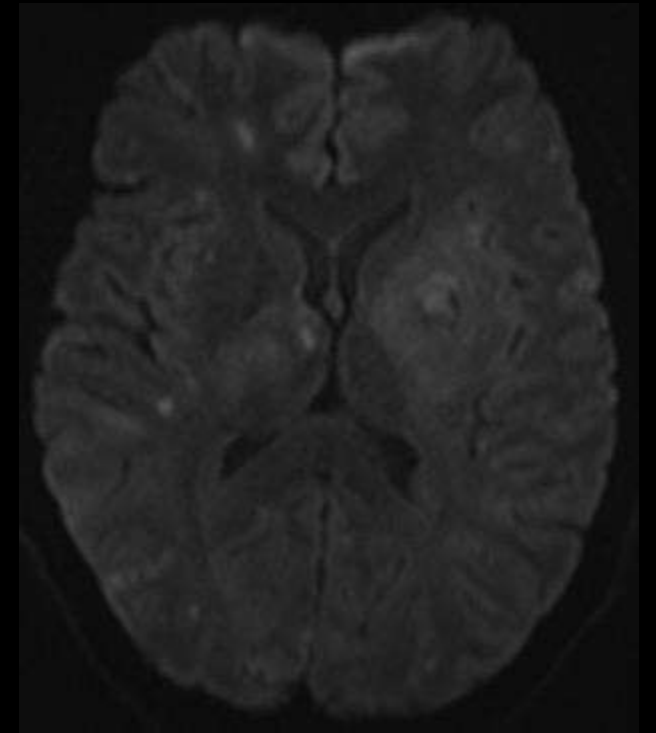
Toksoplazmazis



Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher

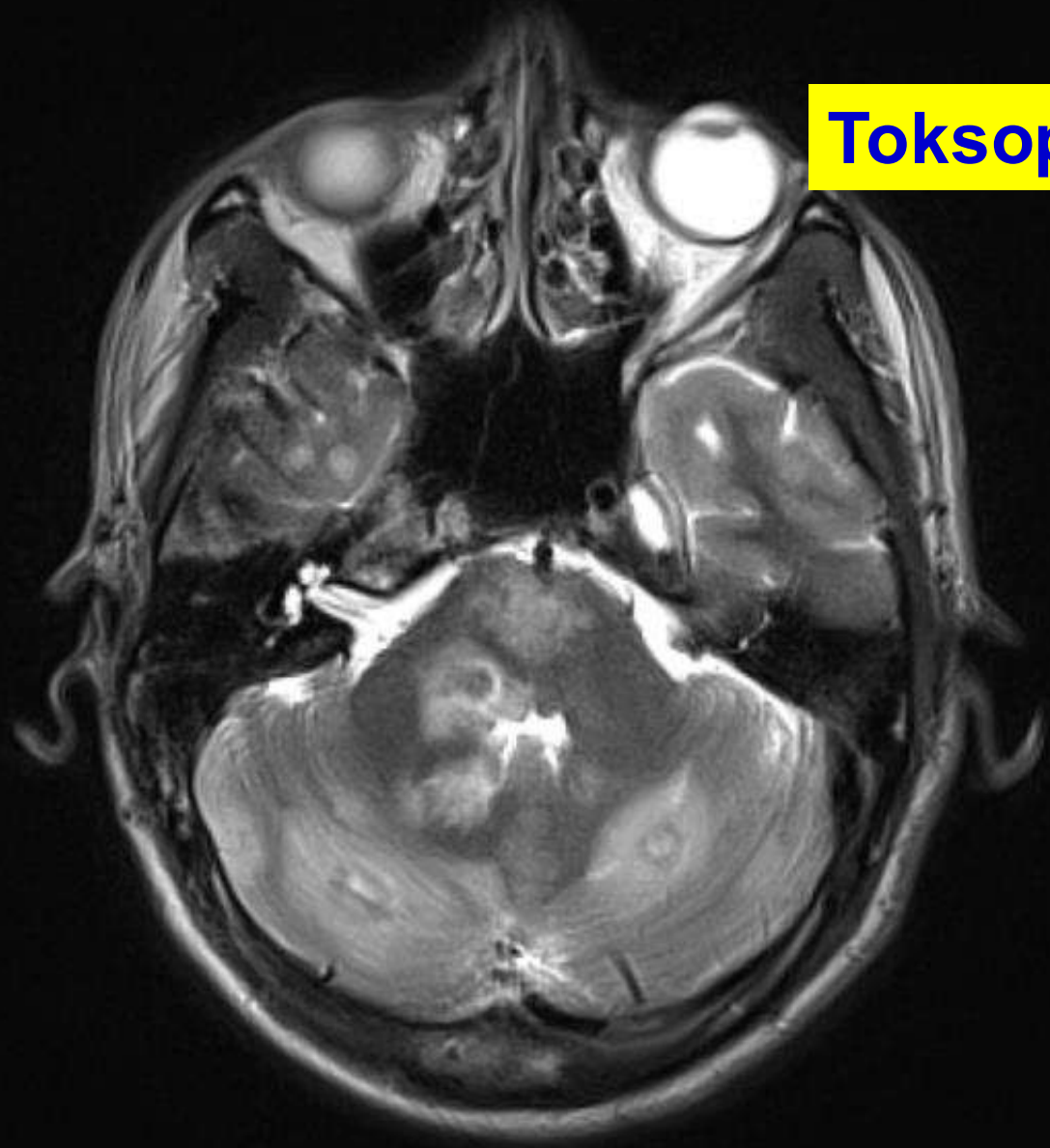


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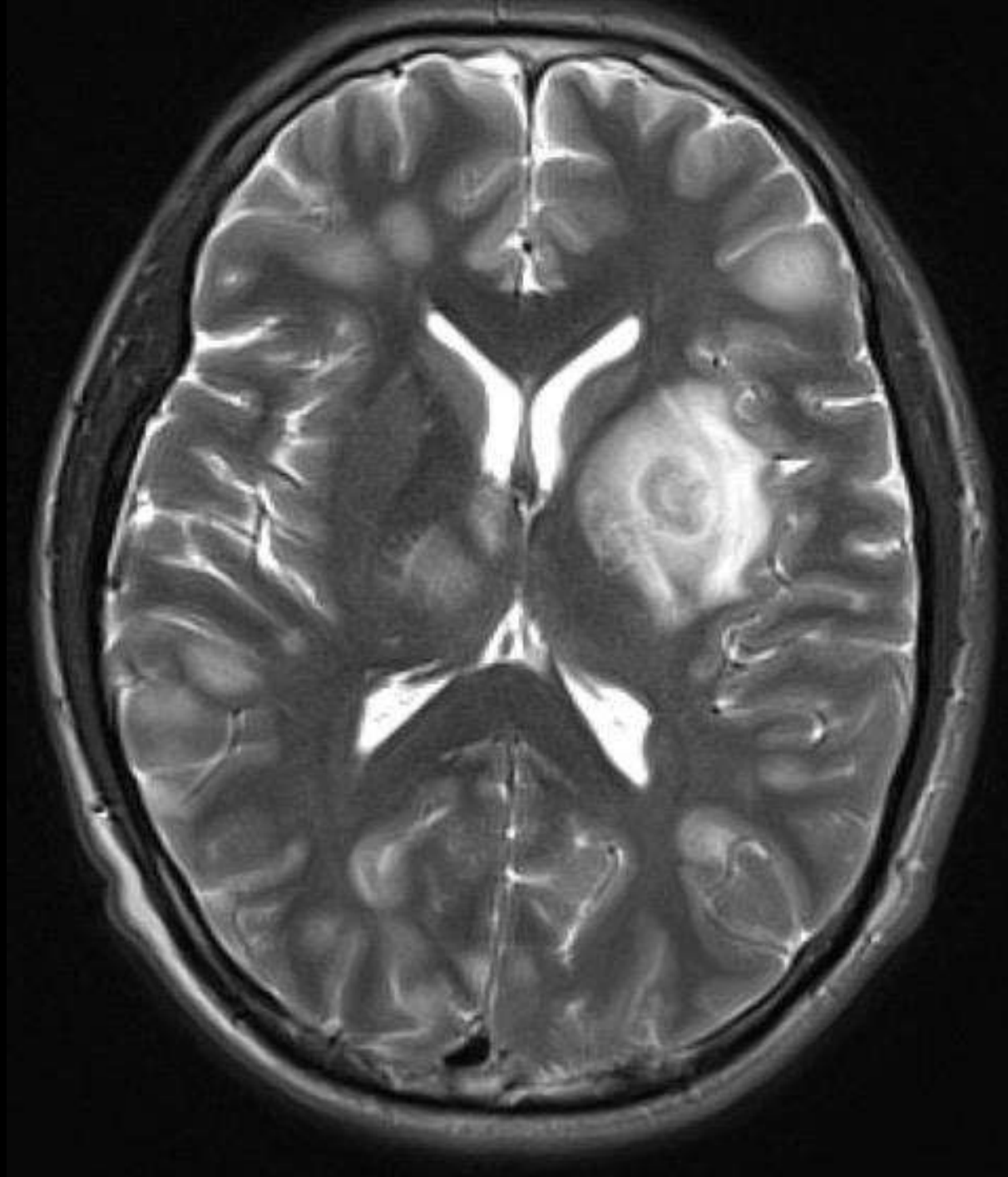


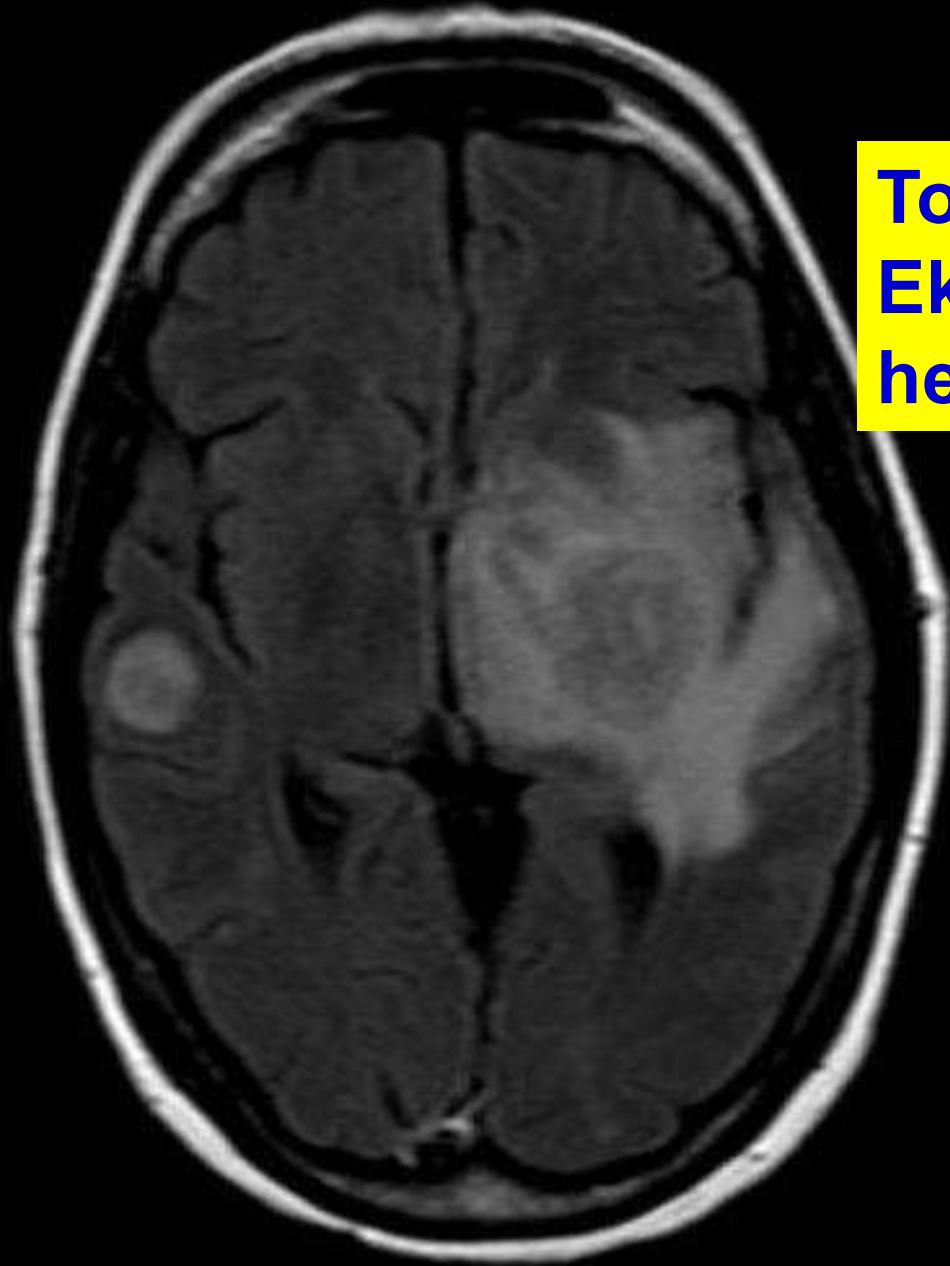
Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher

Toksoplazmozis

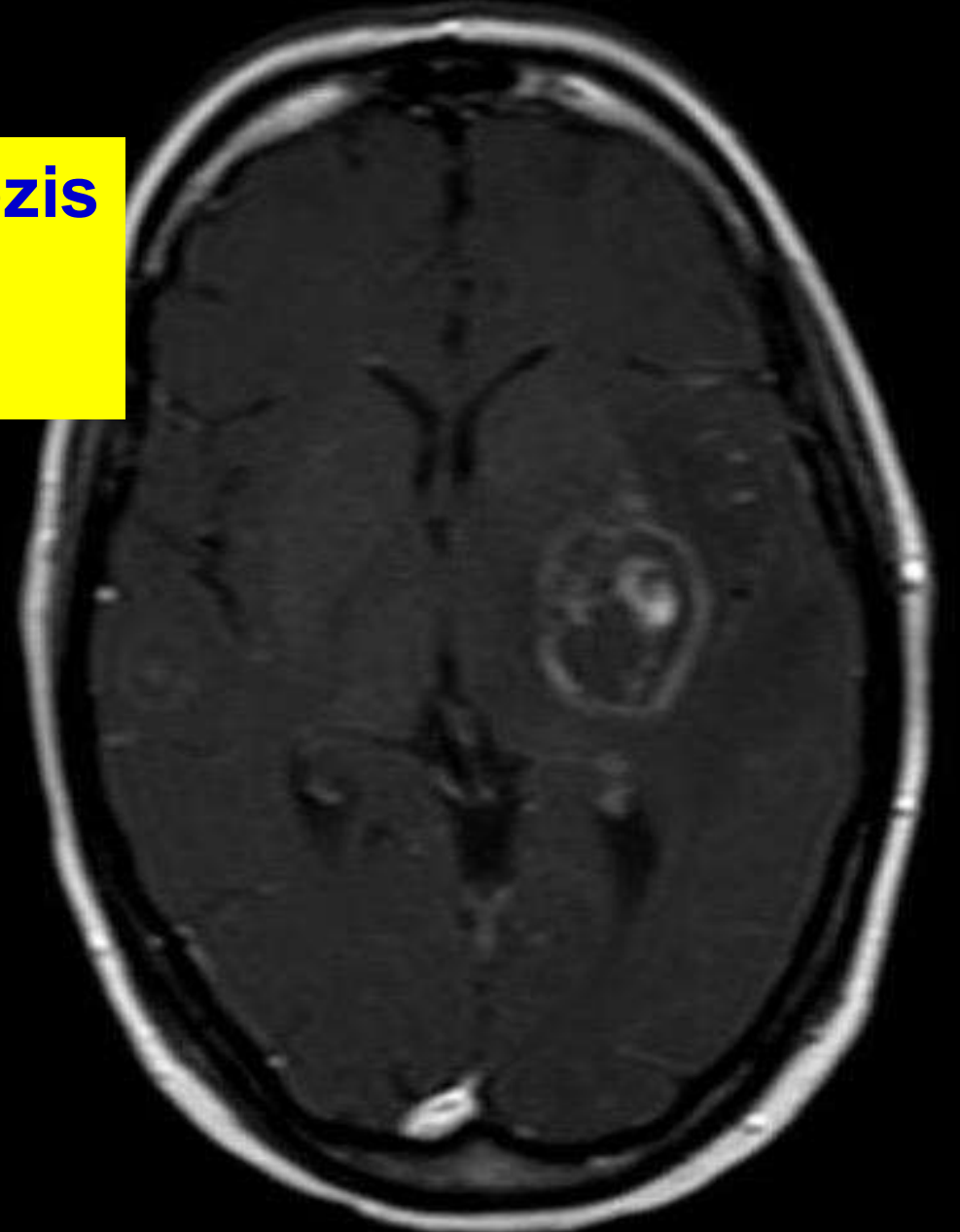


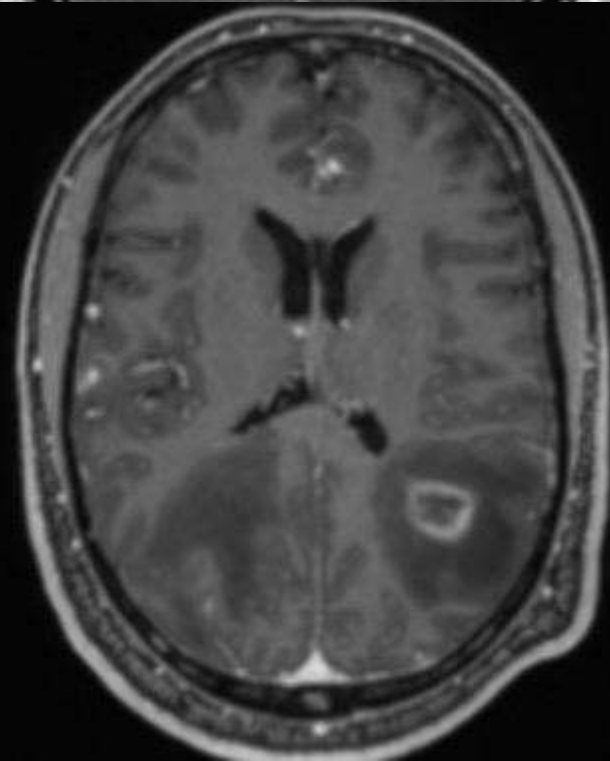
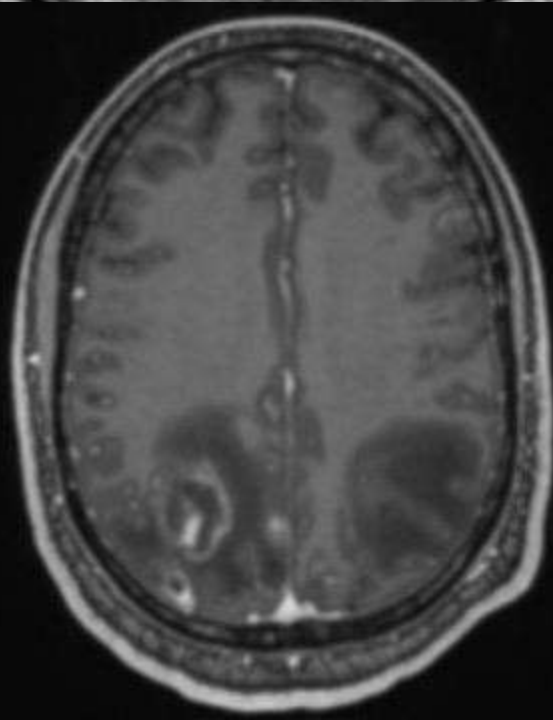
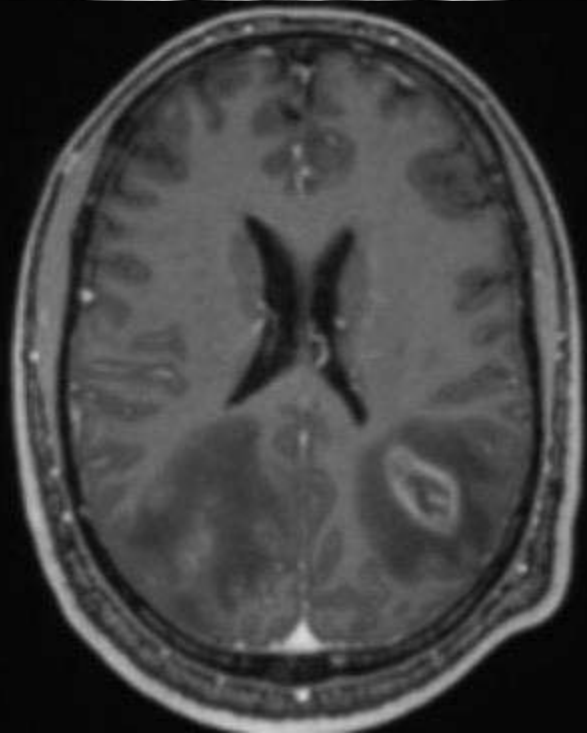
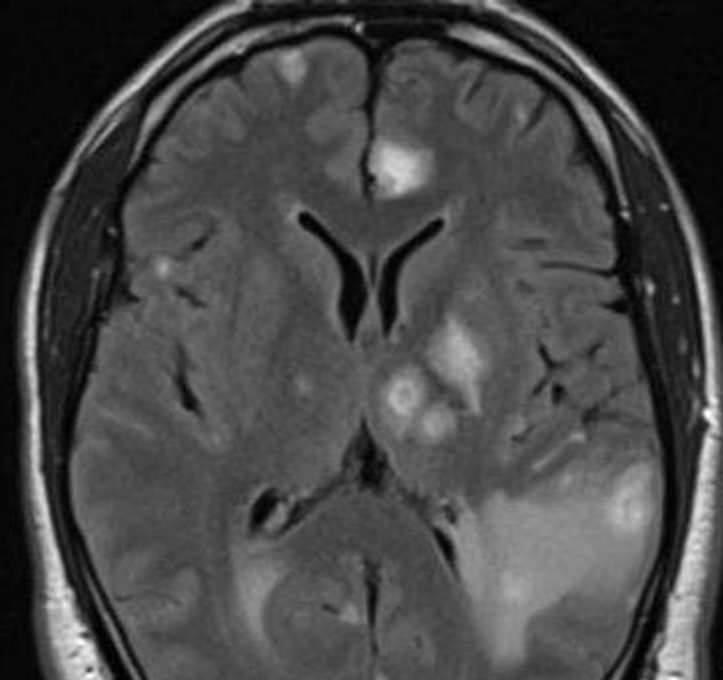
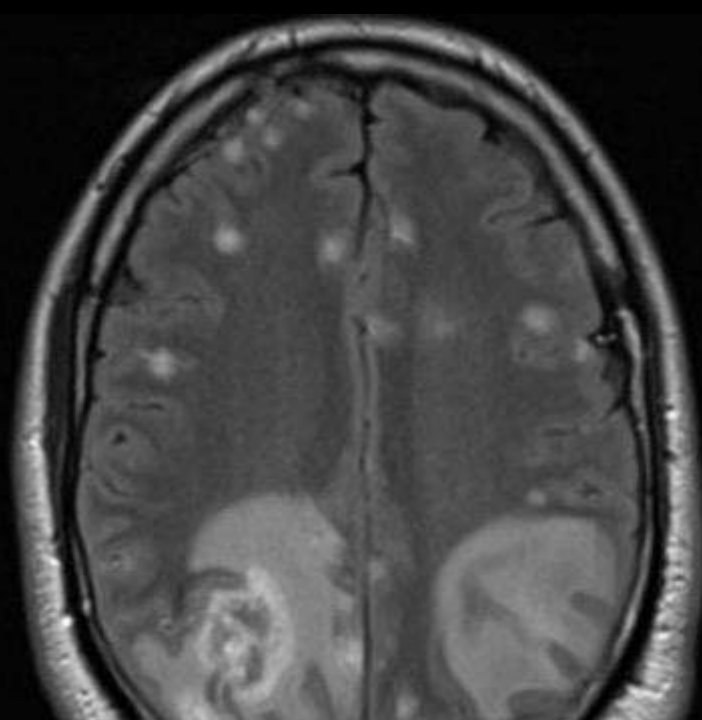
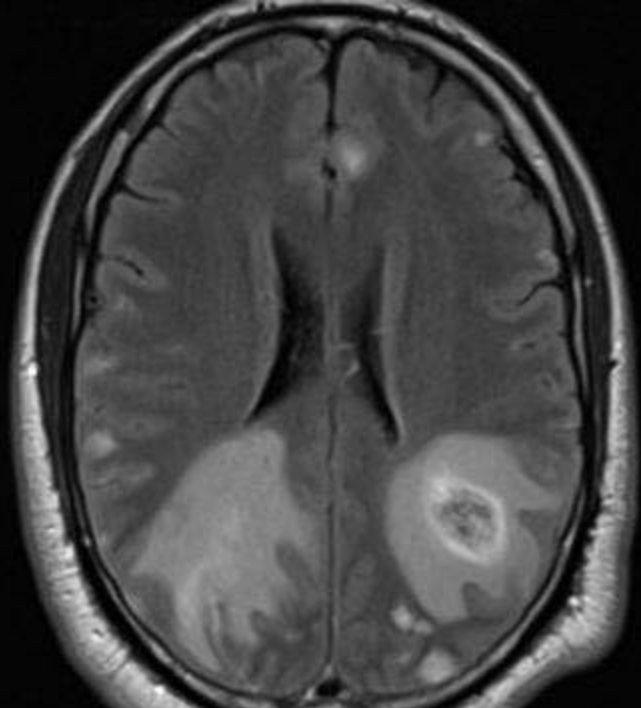
Toksoplazmozis
Konsantrik
hedef işareti



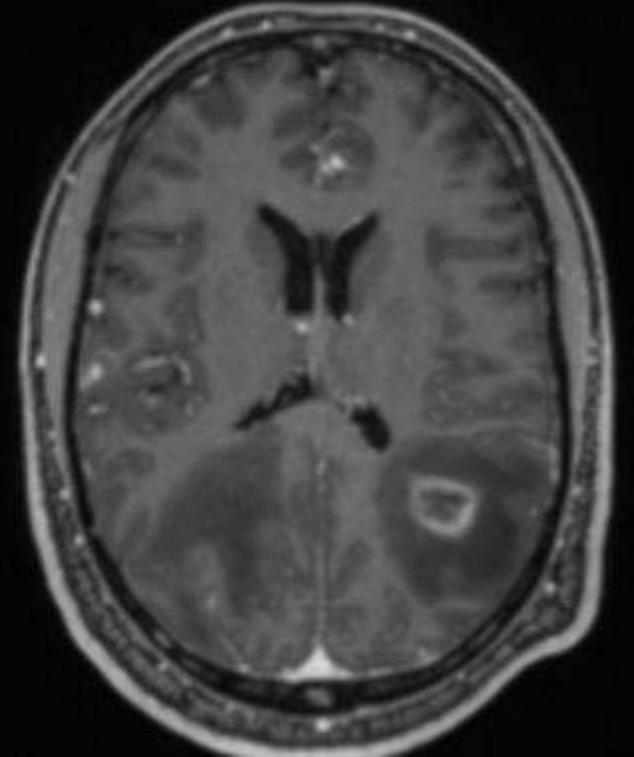
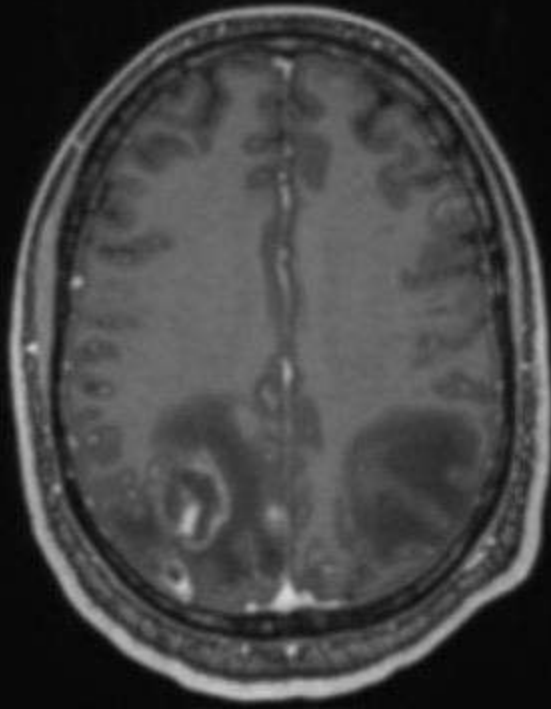
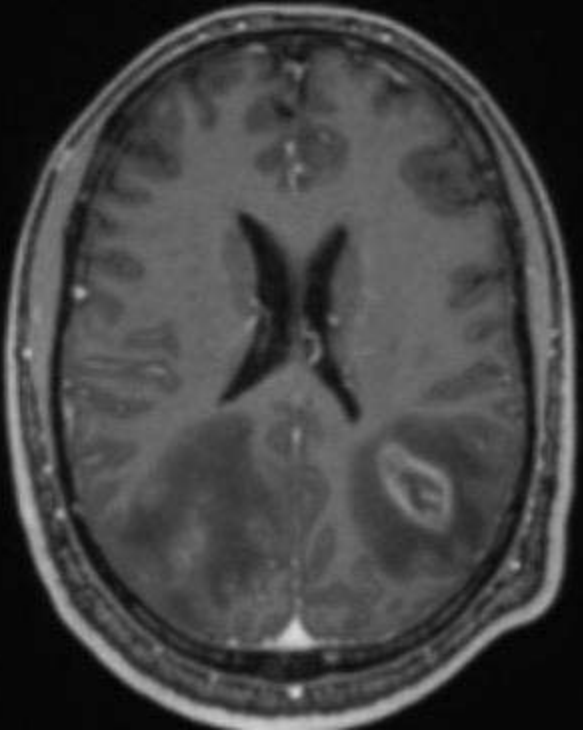
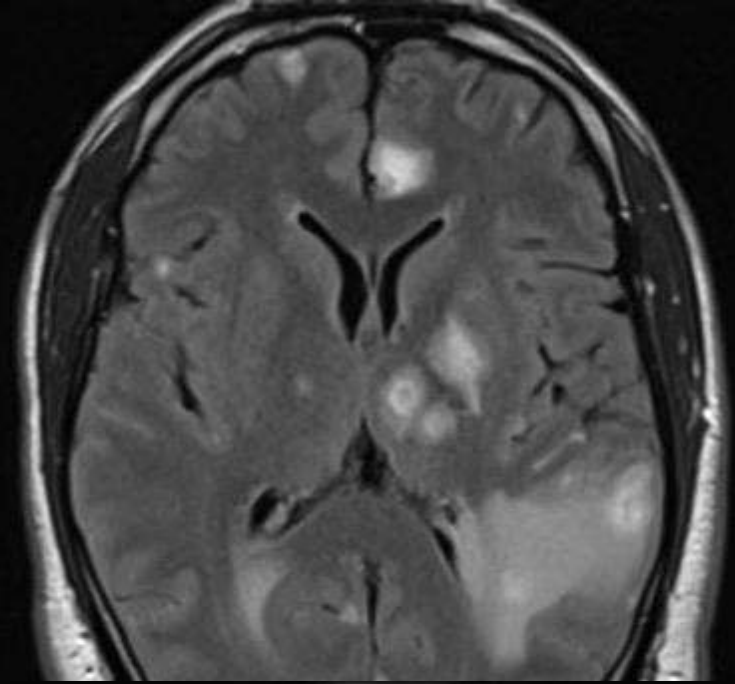
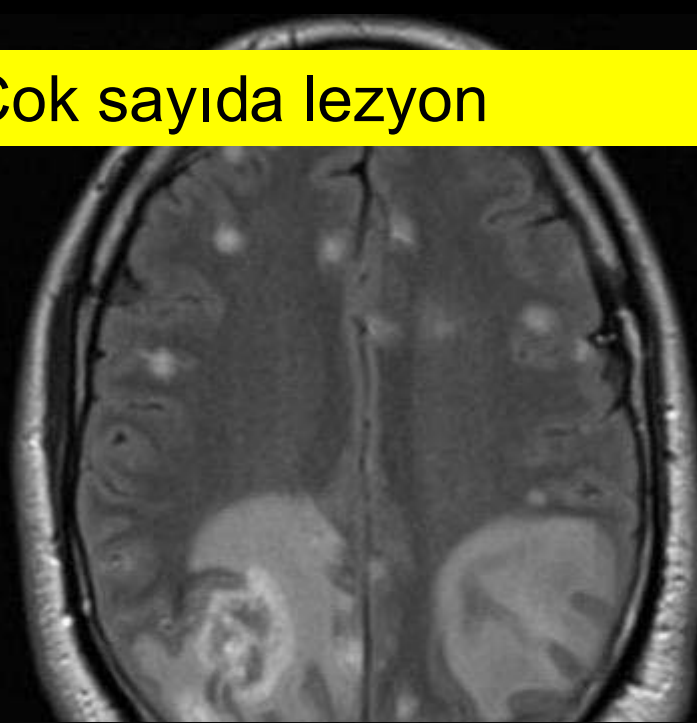
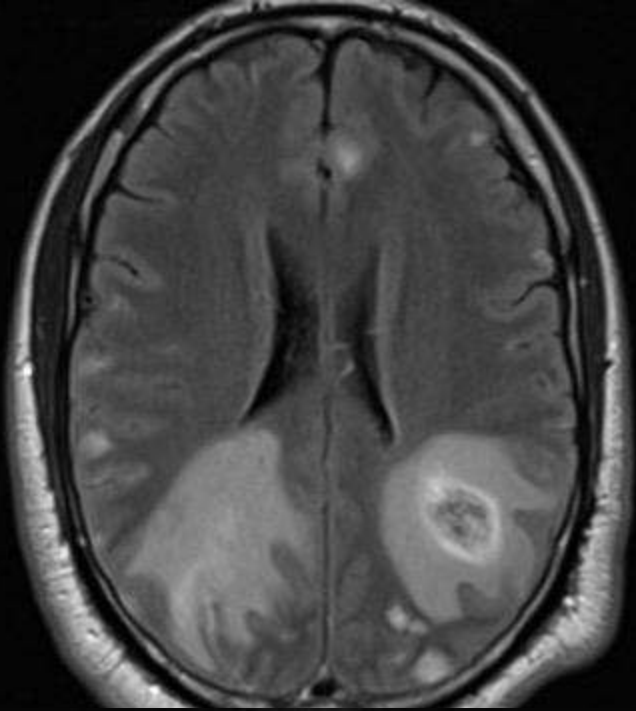


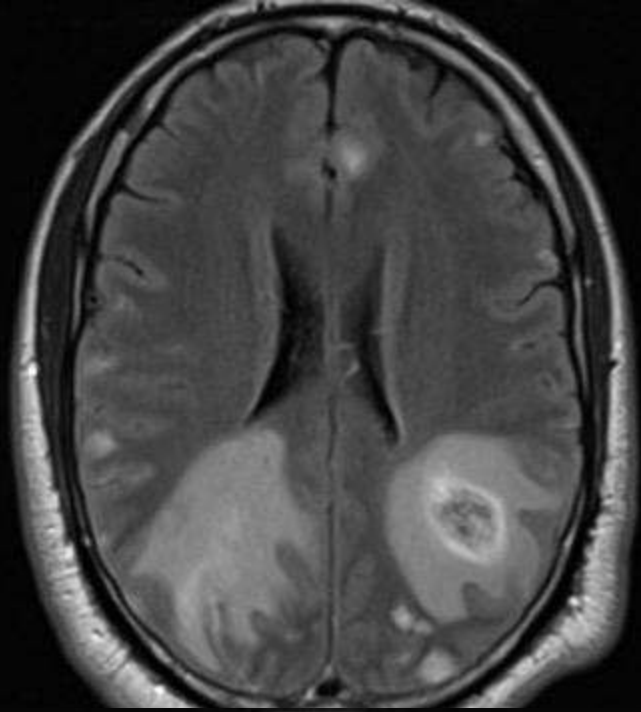
Toksoplazmozis
Eksantrik
hedef işareti



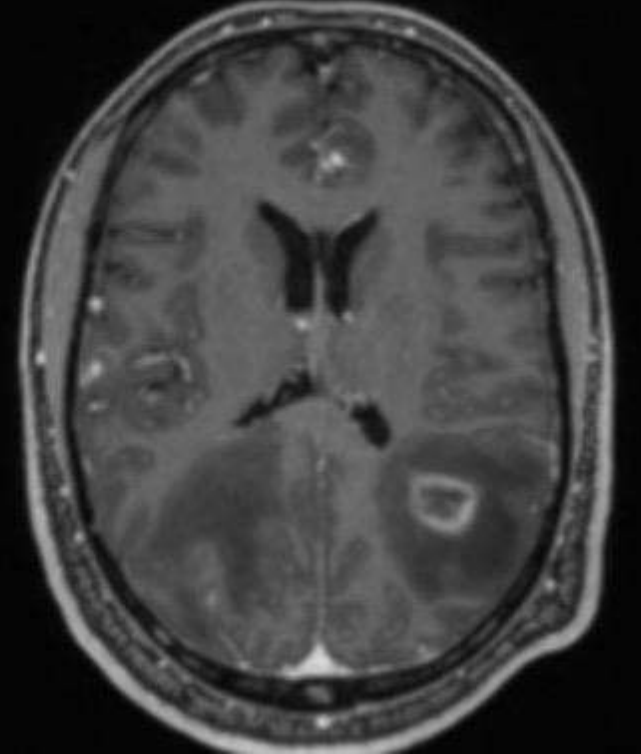
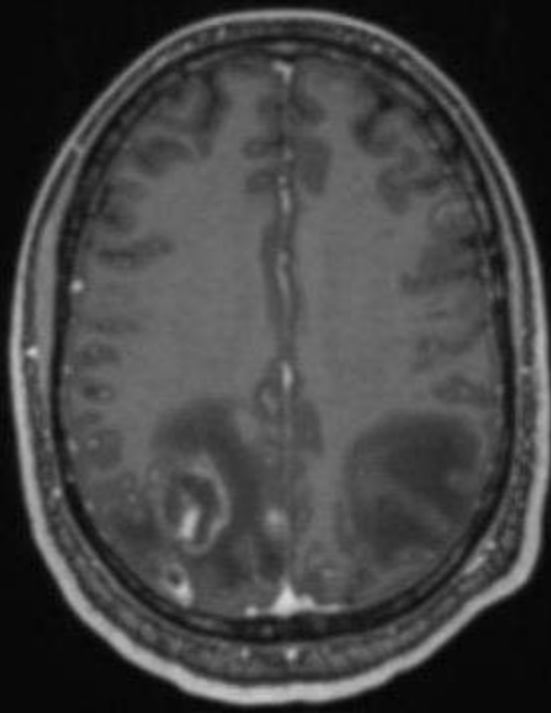
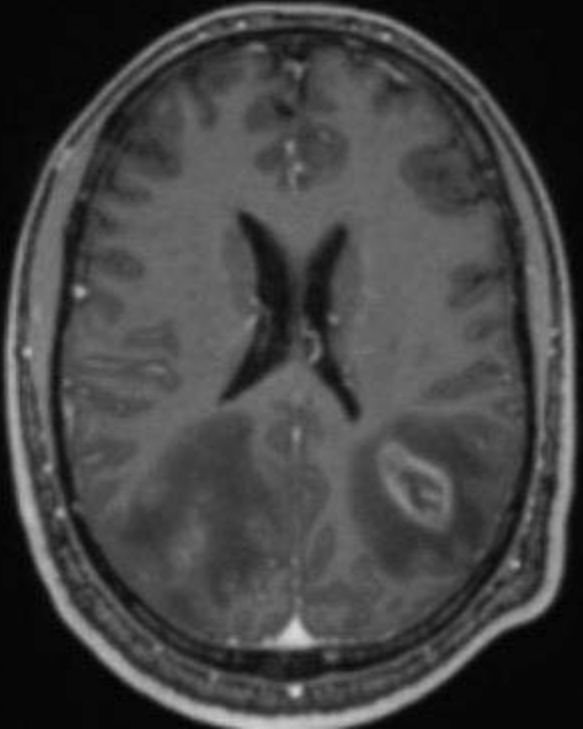
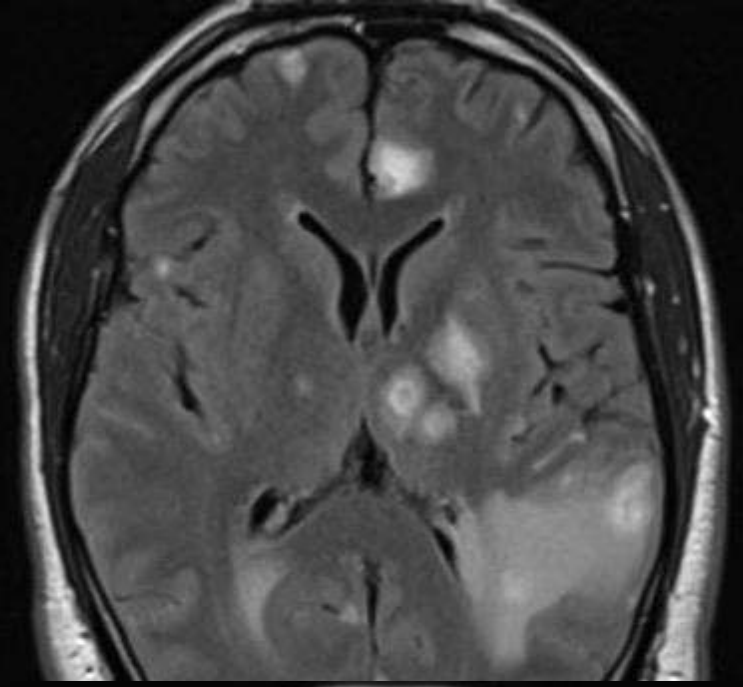


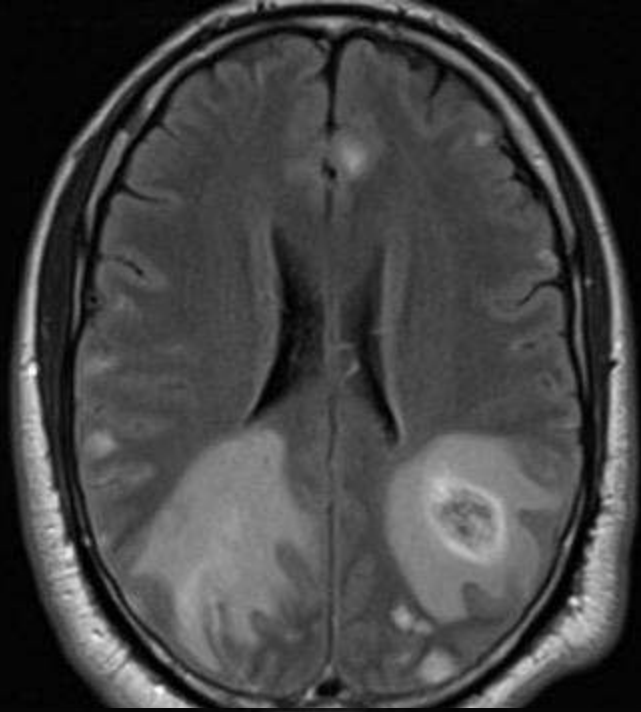
Çok sayıda lezyon



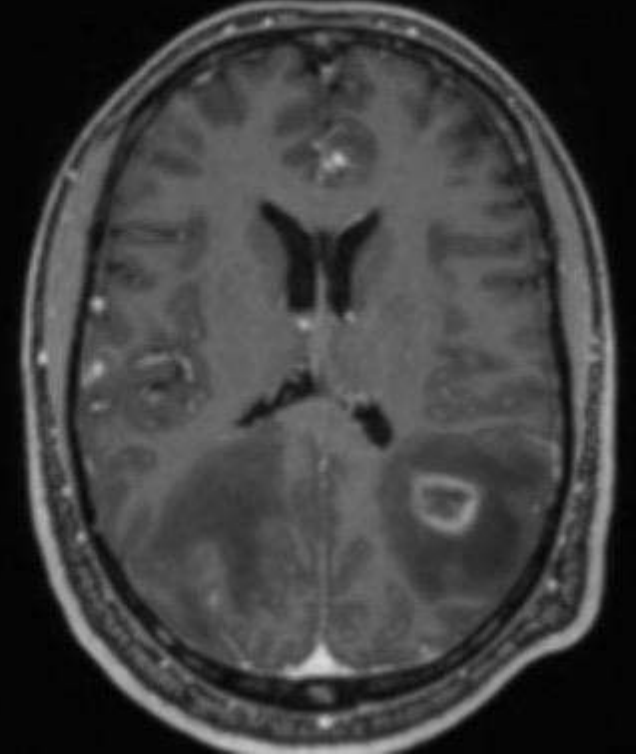
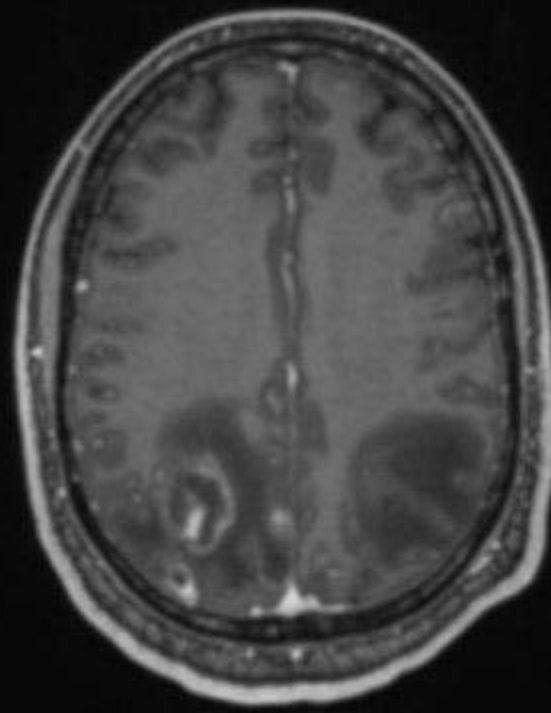
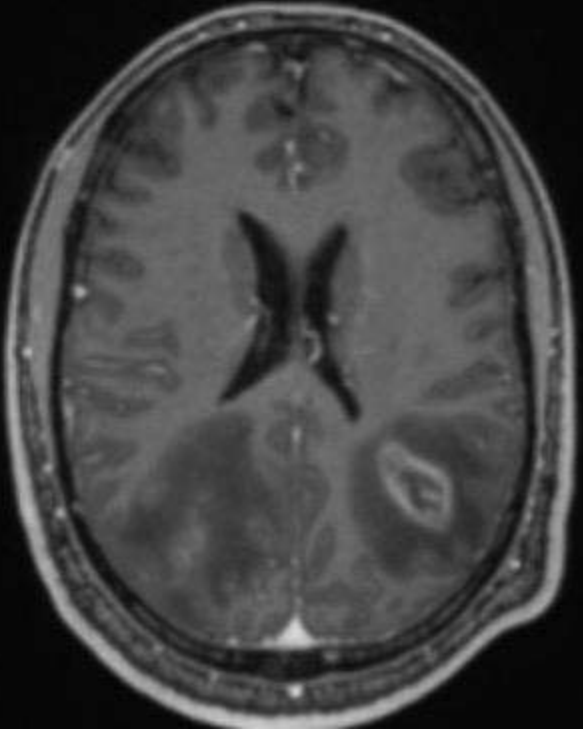
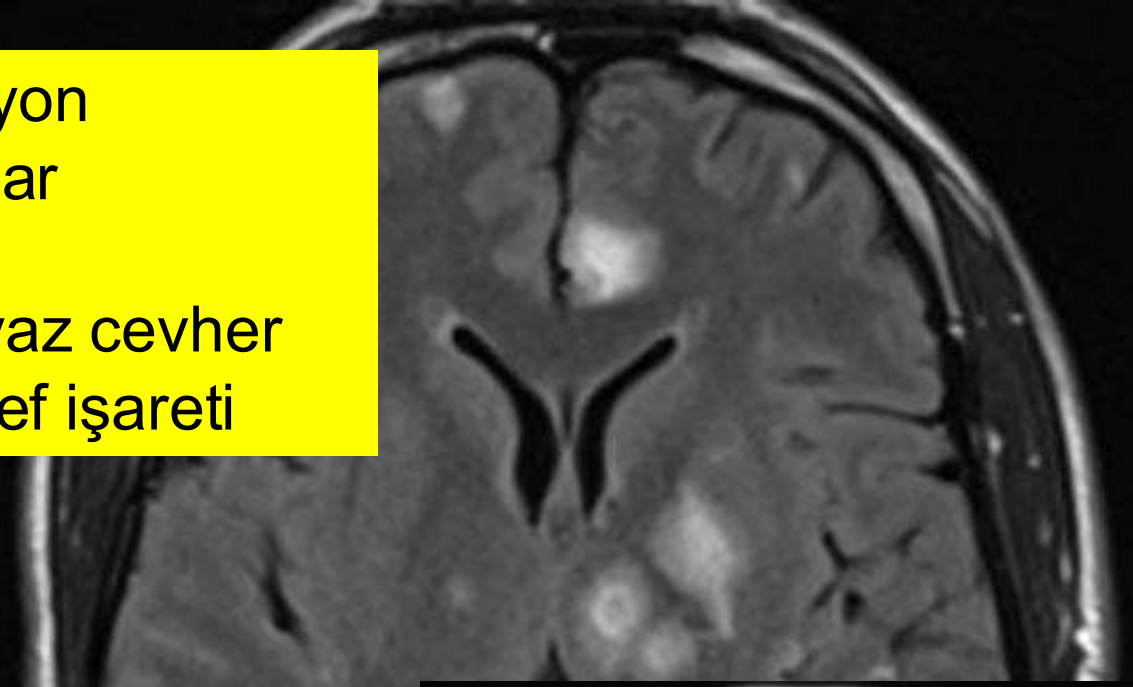
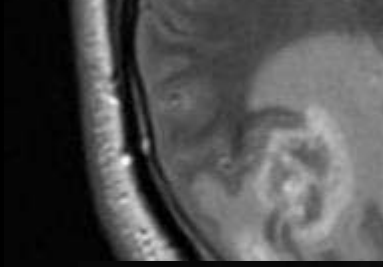


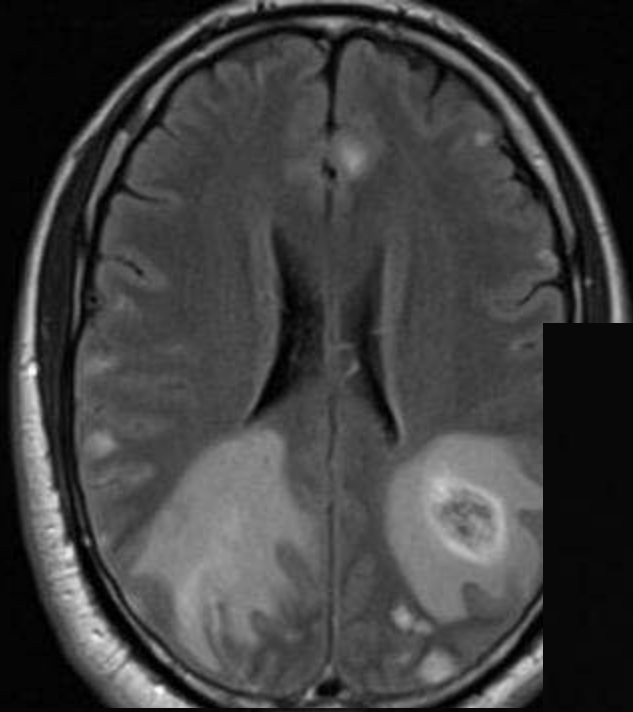
Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher



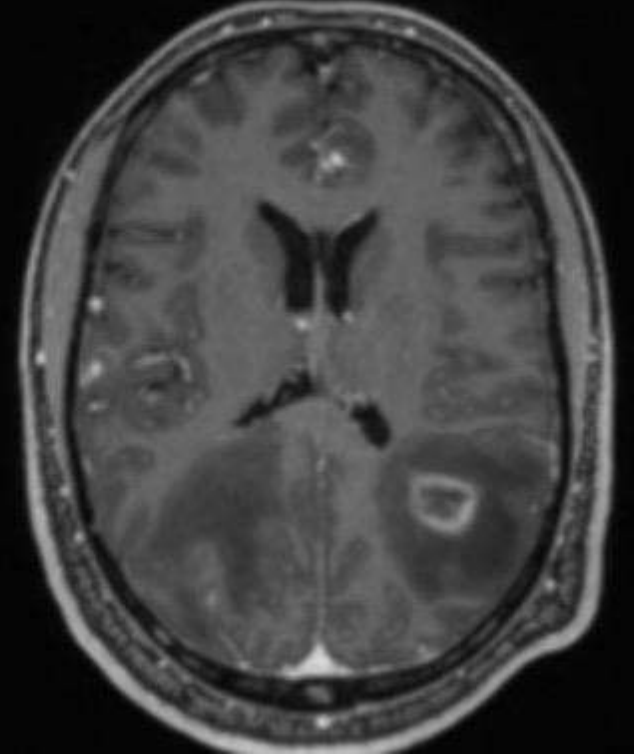
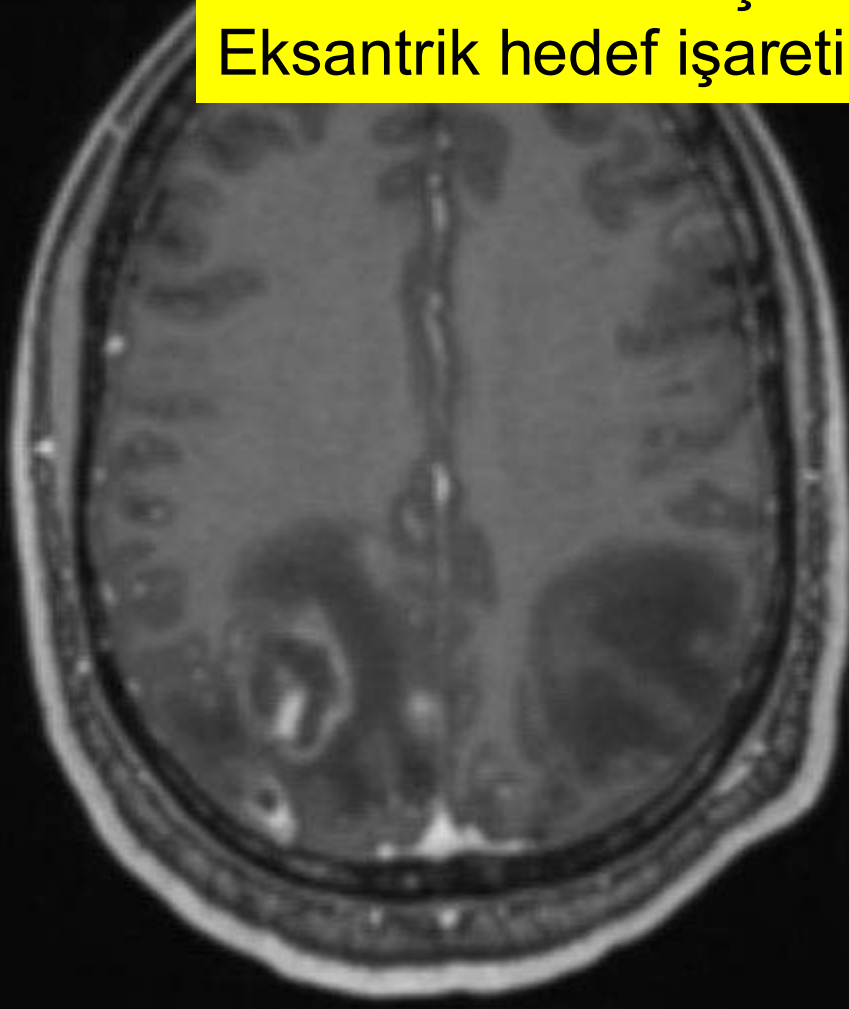
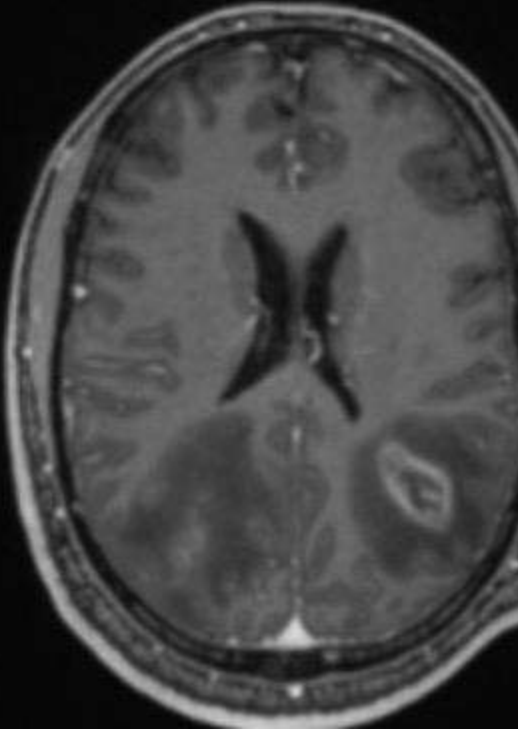
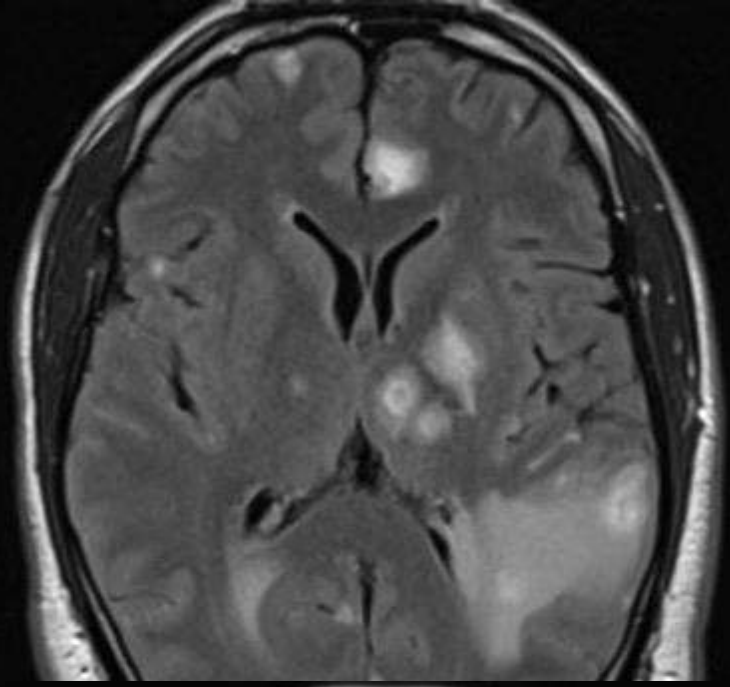


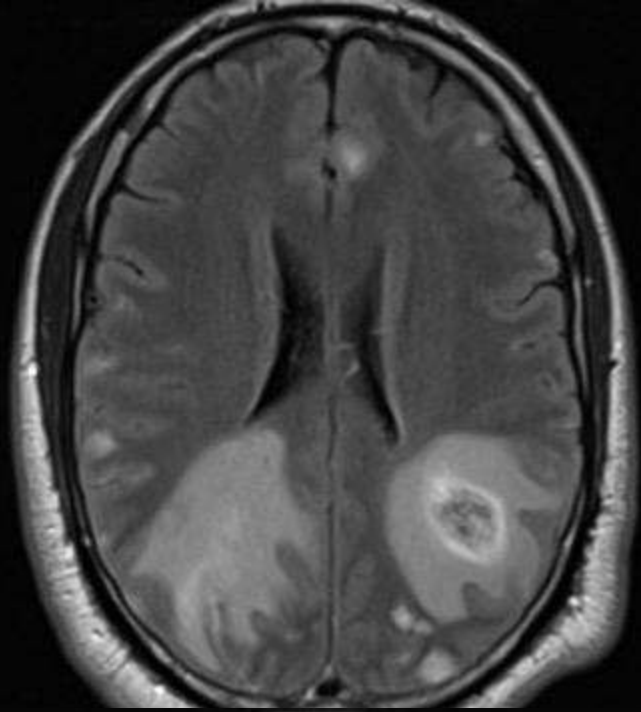
Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher
Konsantrik hedef işareti





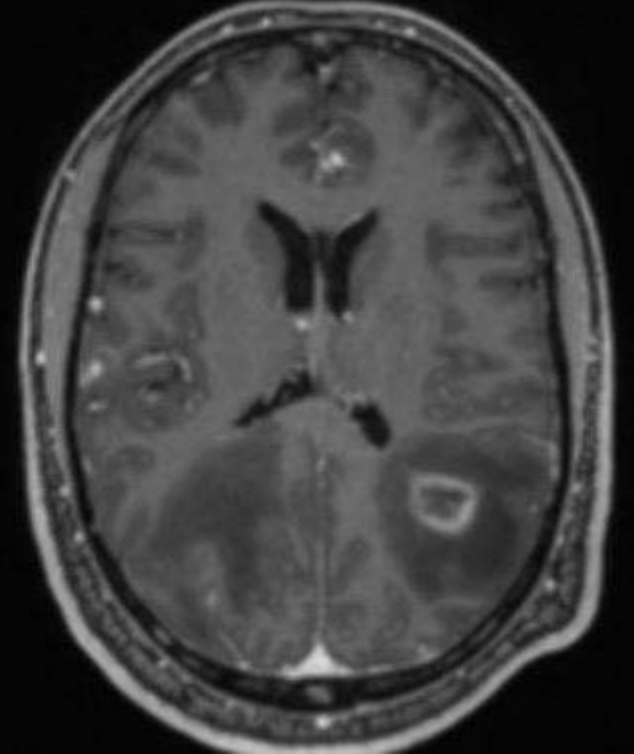
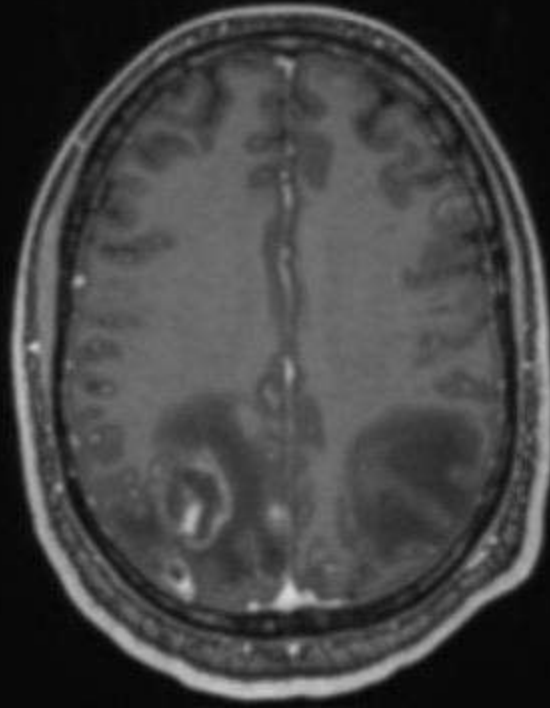
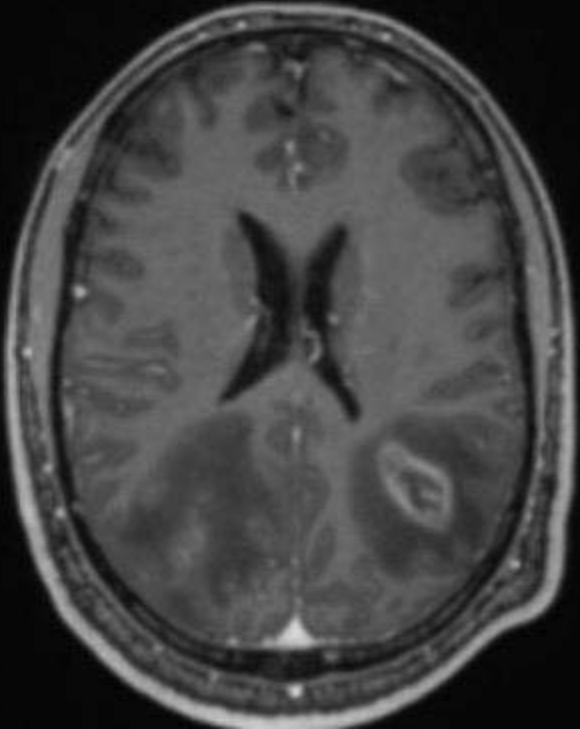
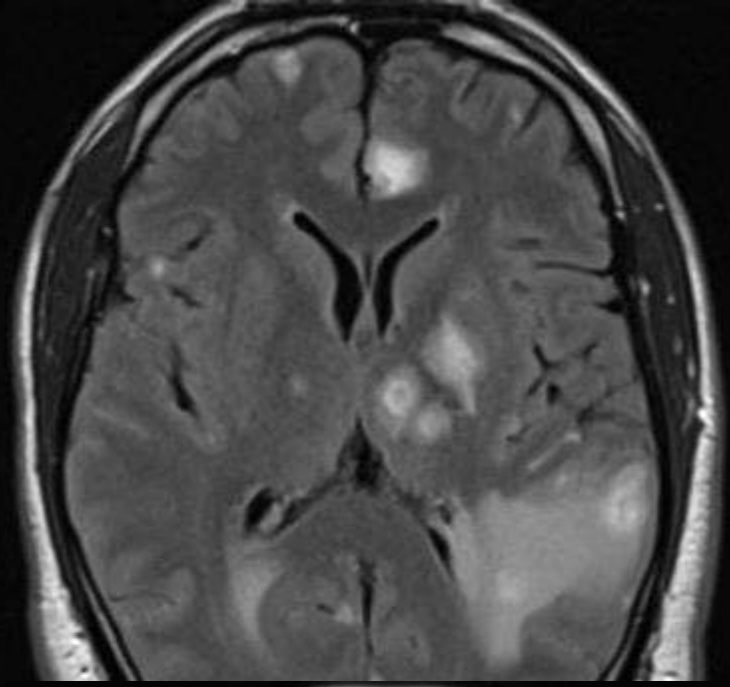
Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher
Konsantrik hedef işareti
Eksantrik hedef işareti

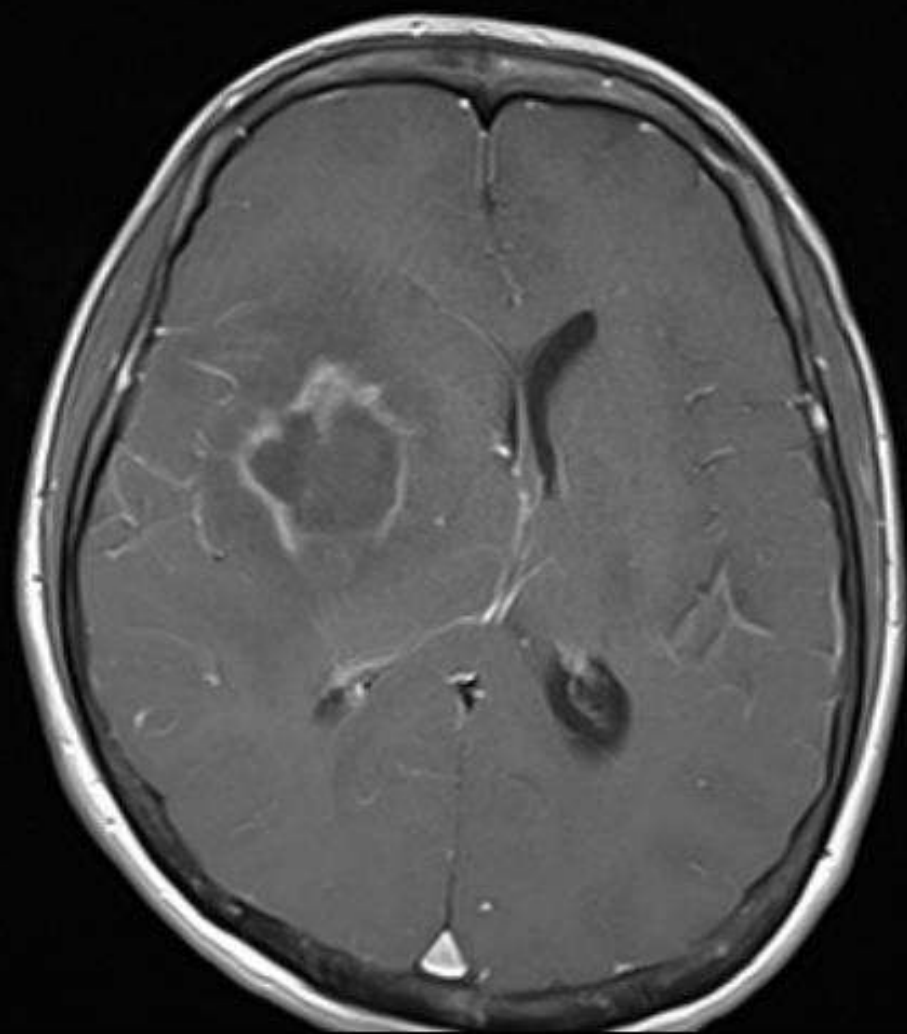
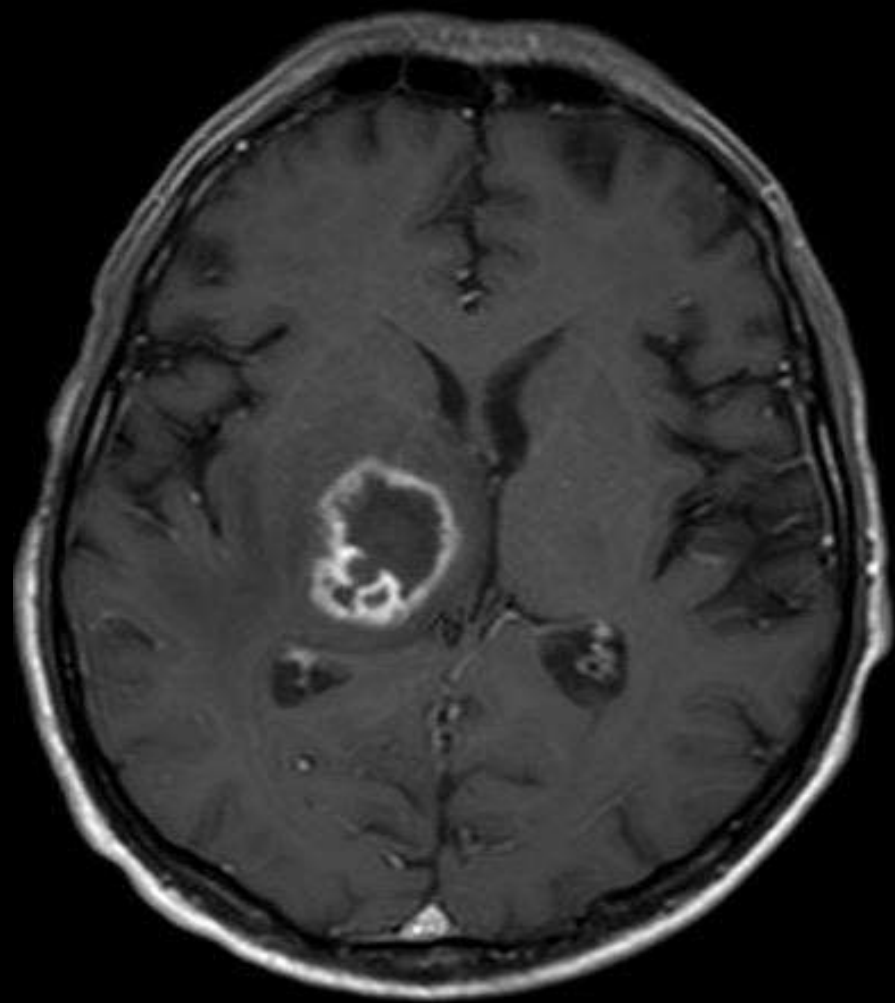


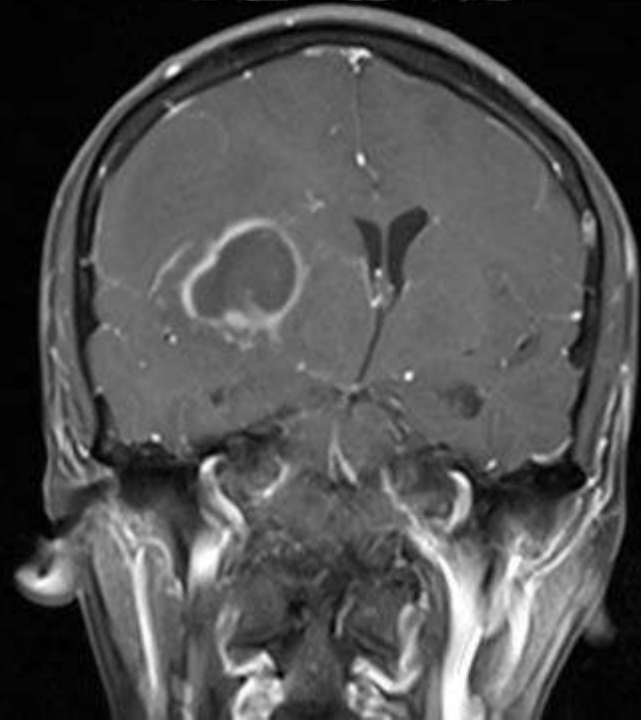
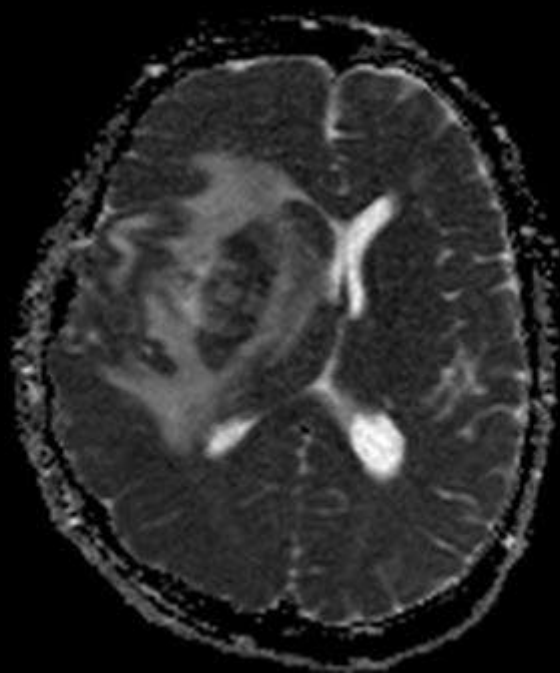
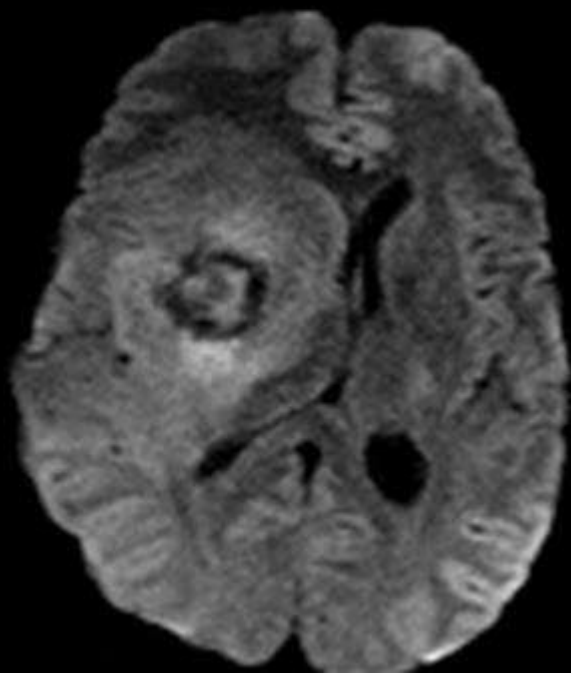
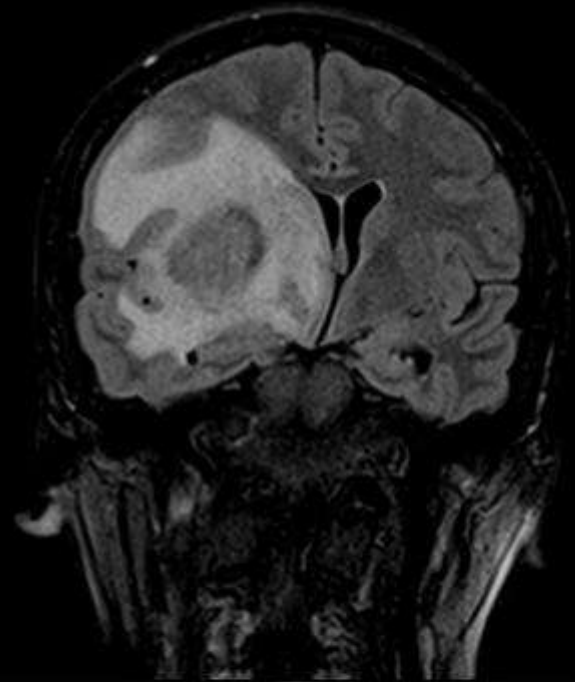
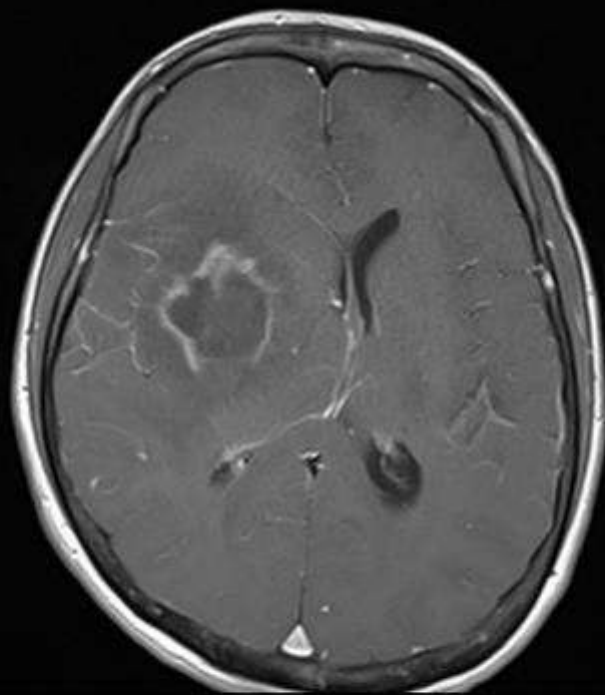
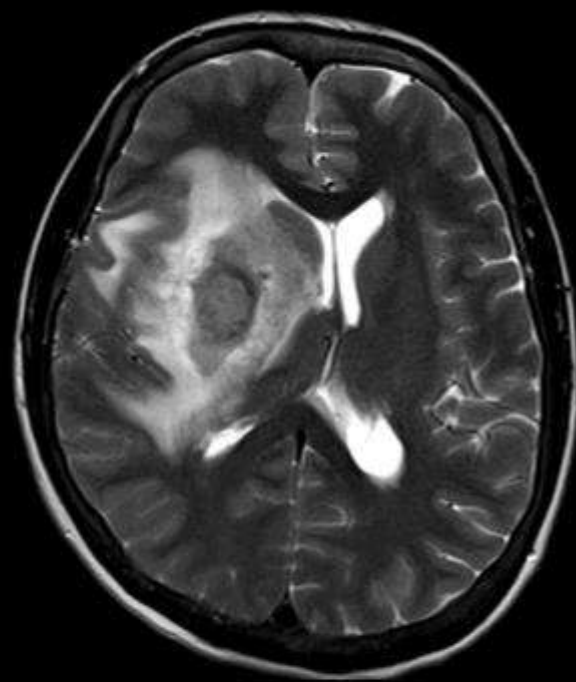


Çok sayıda lezyon
Bazal ganglionlar
Talamus
Subkortikal beyaz cevher
Konsantrik hedef işareti
Eksantrik hedef işareti

TOKSOPLAZMOZİS





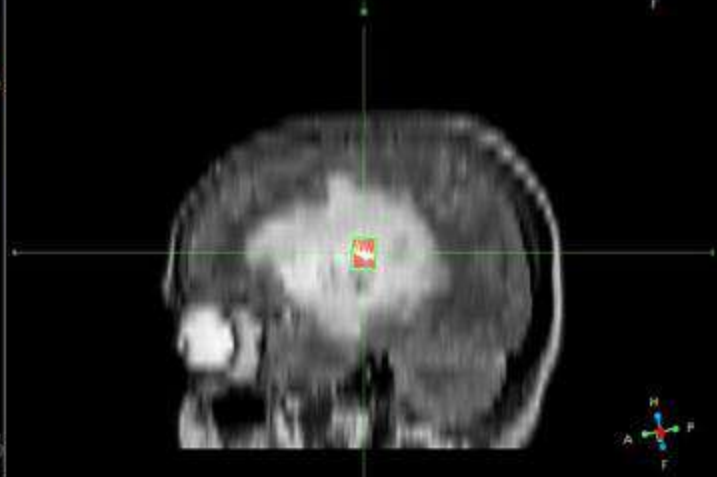
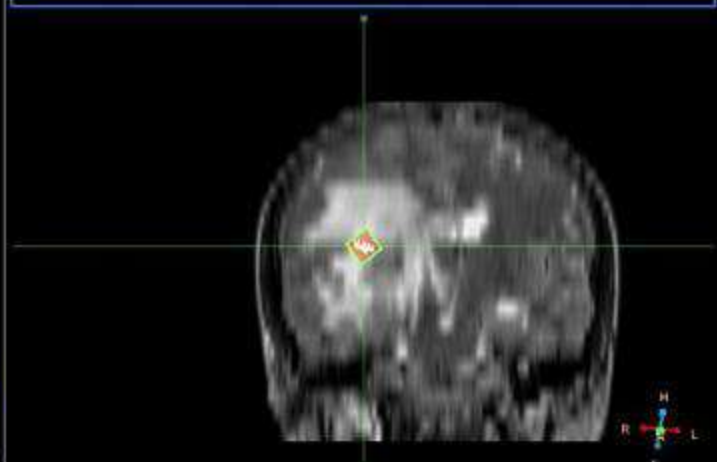
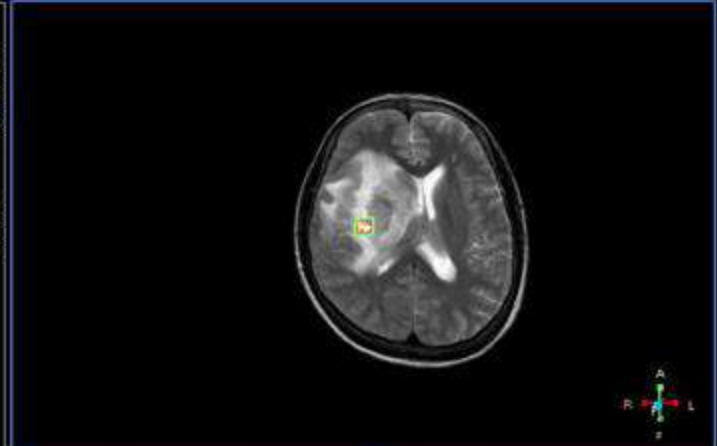
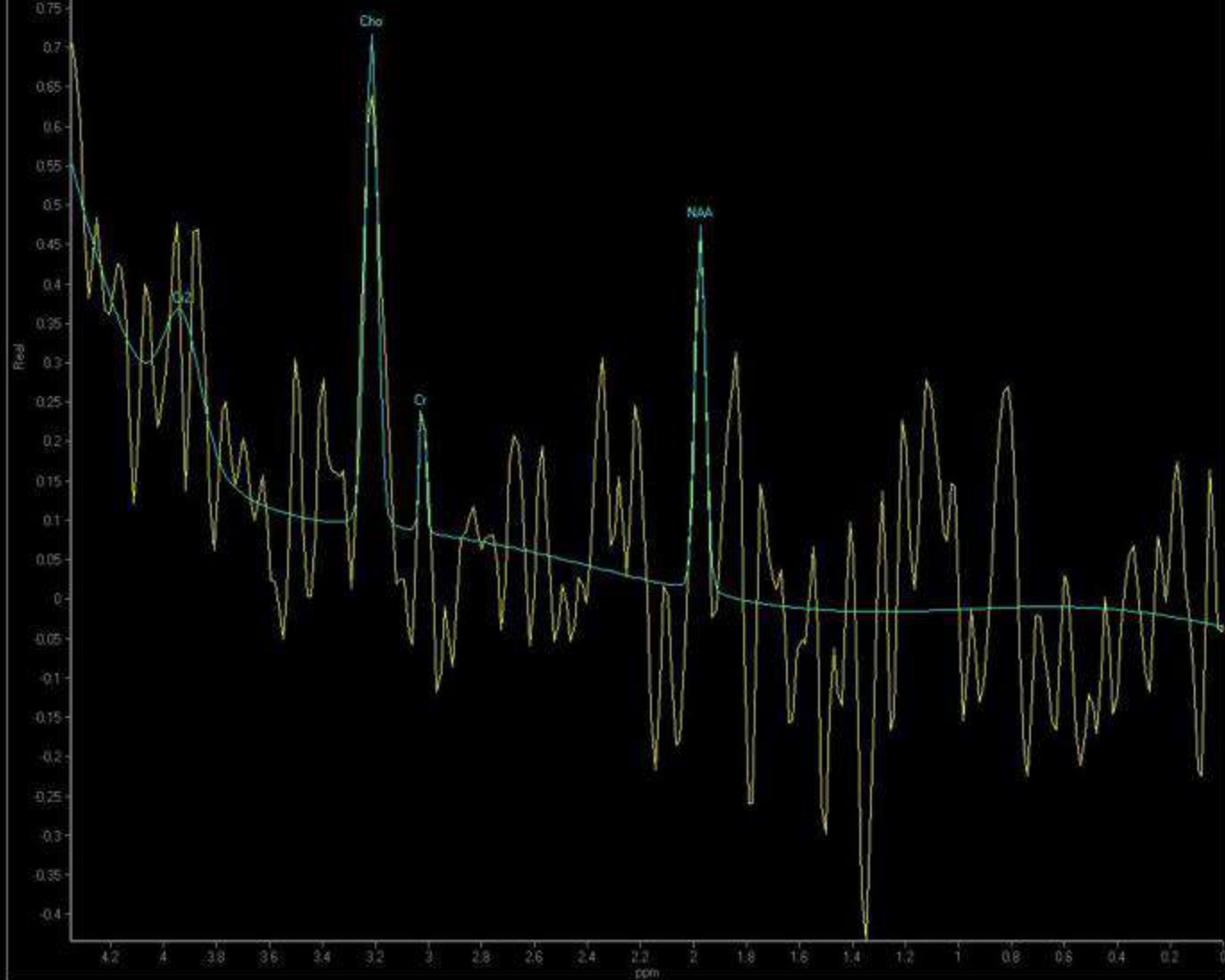


Voxel 1 (12, 1: SV_PRESS_144 TE 144ms - TR 2.0s)

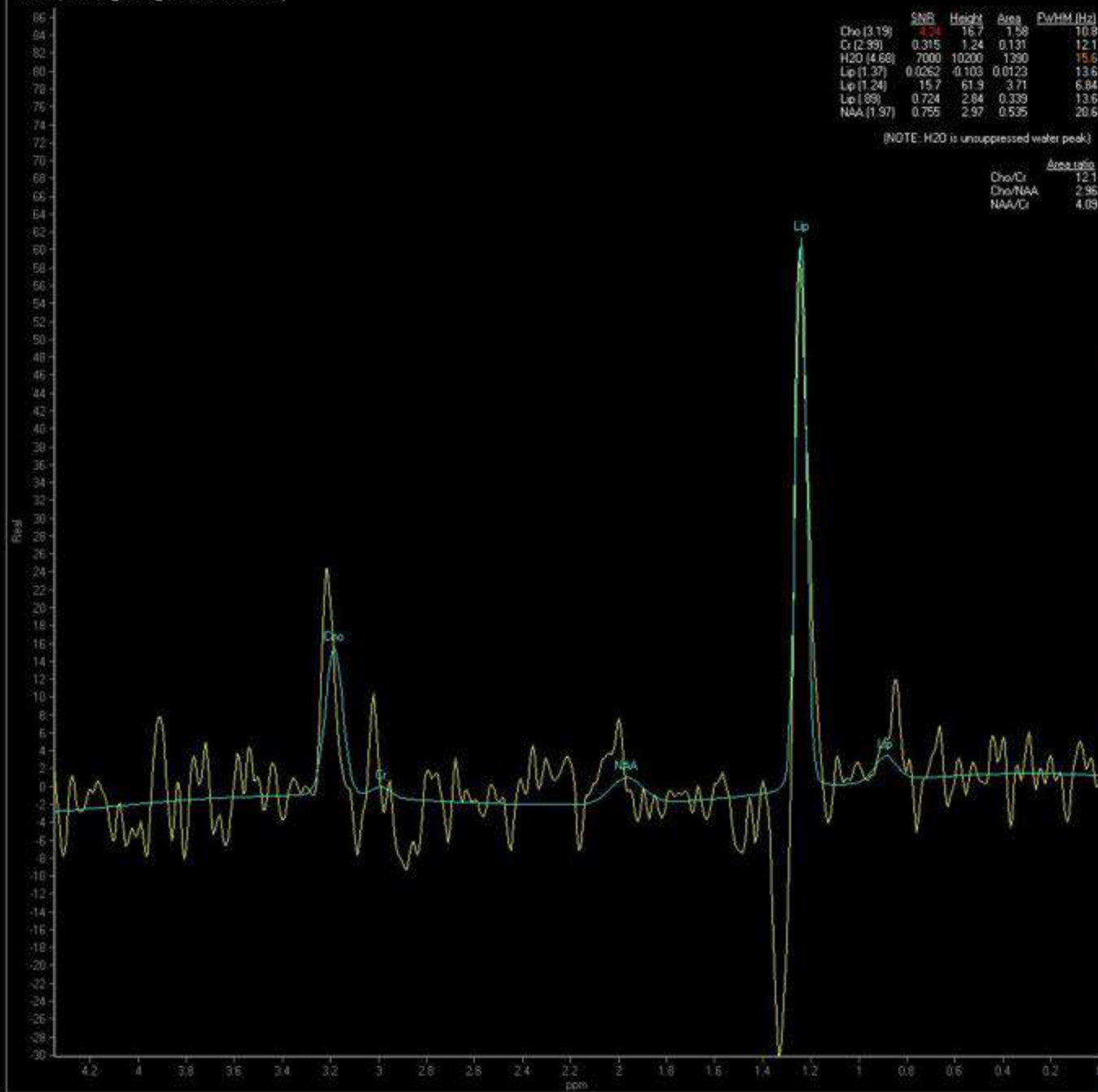
	SNR	Height	Area	FWHM (Hz)
Cho (3.21)	3.75	0.629	0.0274	3.39
Cr (3.02)	0.965	0.191	0.00489	1.46
C-2 (3.93)	0.865	0.167	0.0215	10.7
H2O (4.67)	4000	2430	181	4.24
NAA (1.97)	2.42	0.468	0.0236	2.88

(NOTE: H2O is unsuppressed water peak)

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



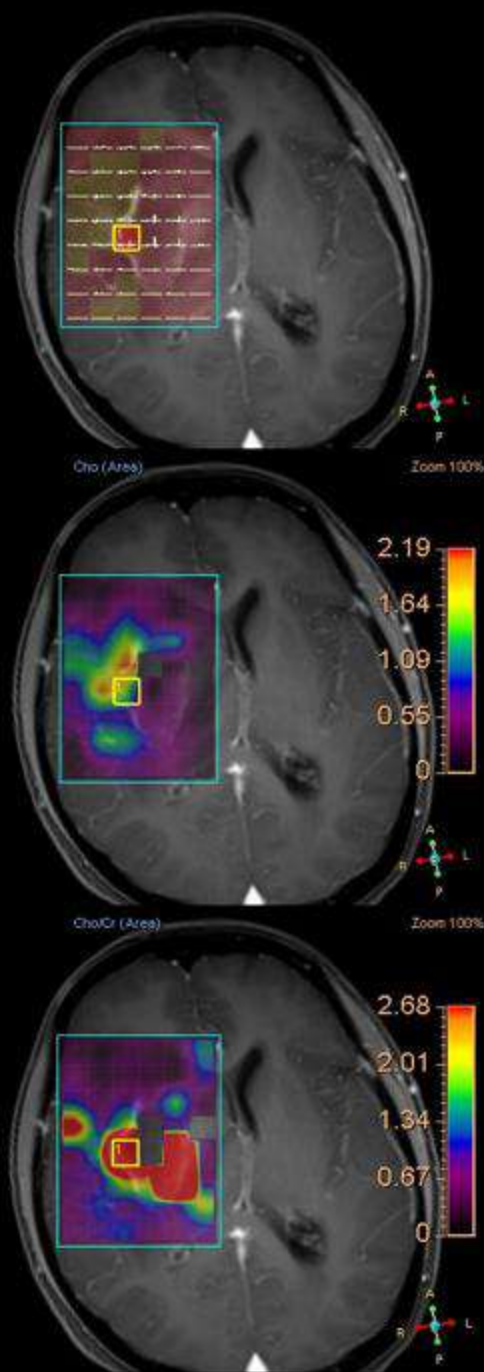
Voxel 1 (I1.1: s3D_PRESS_144 TE 144ms - TR 1.0s)

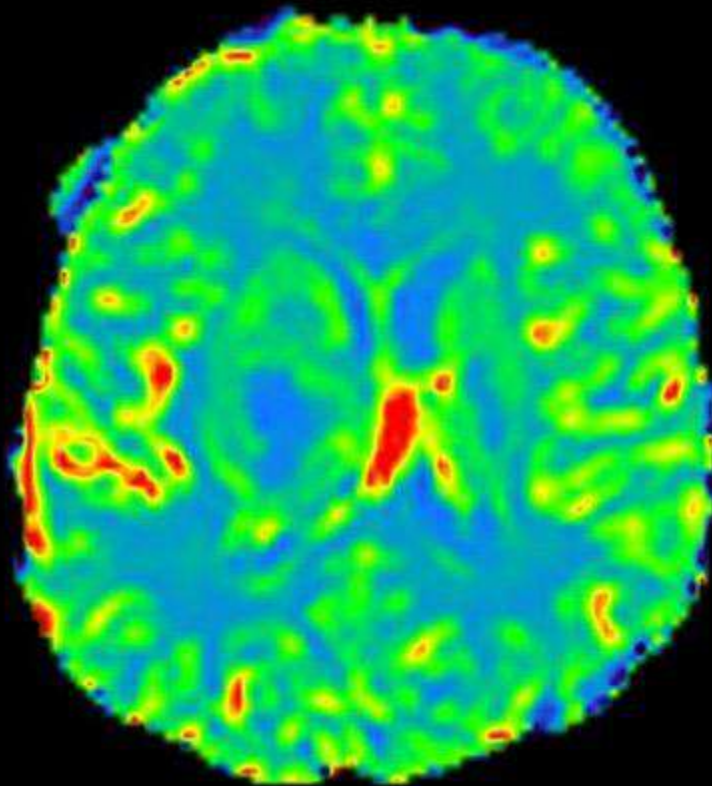
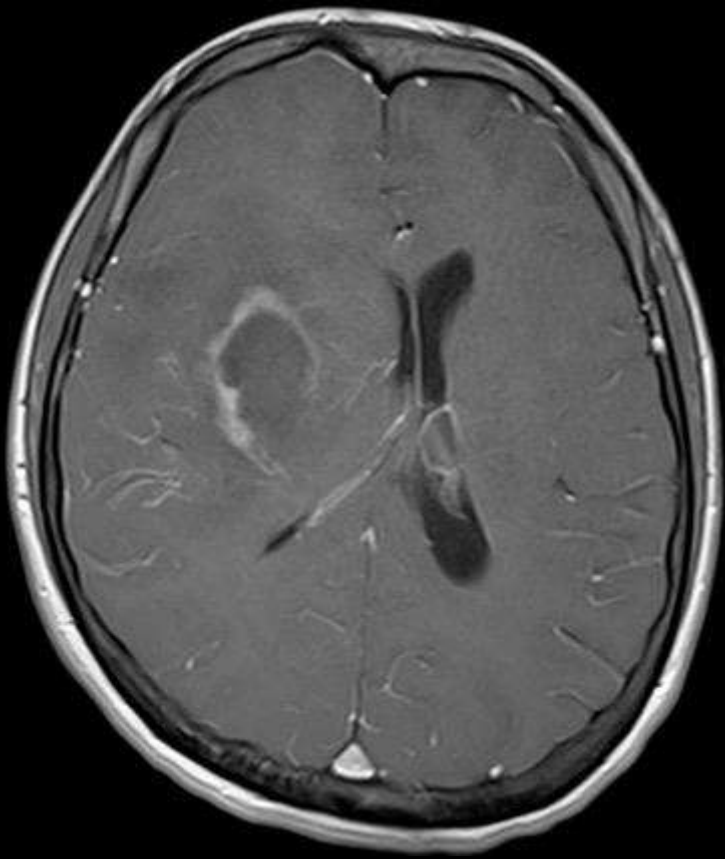


Slice 2/3

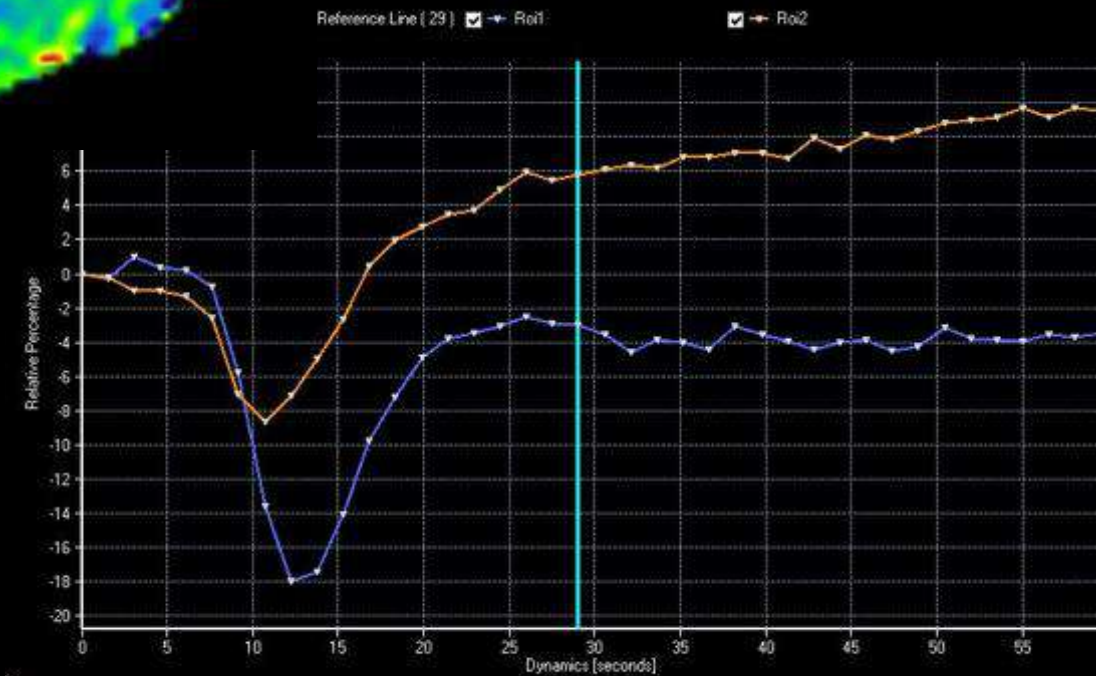
L1.1
W2.2
Slice 2/3

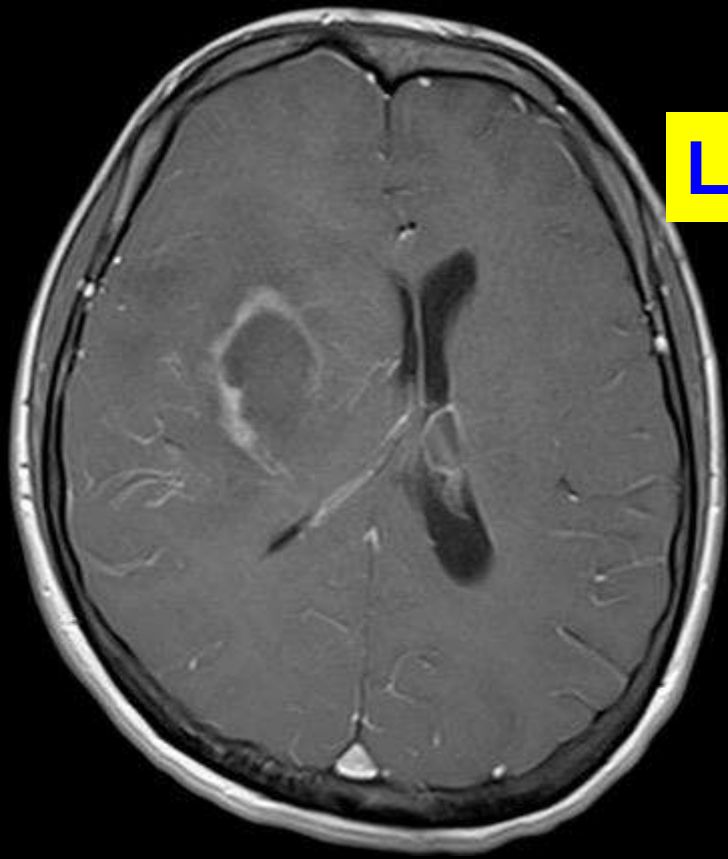
L1.3
W2.7



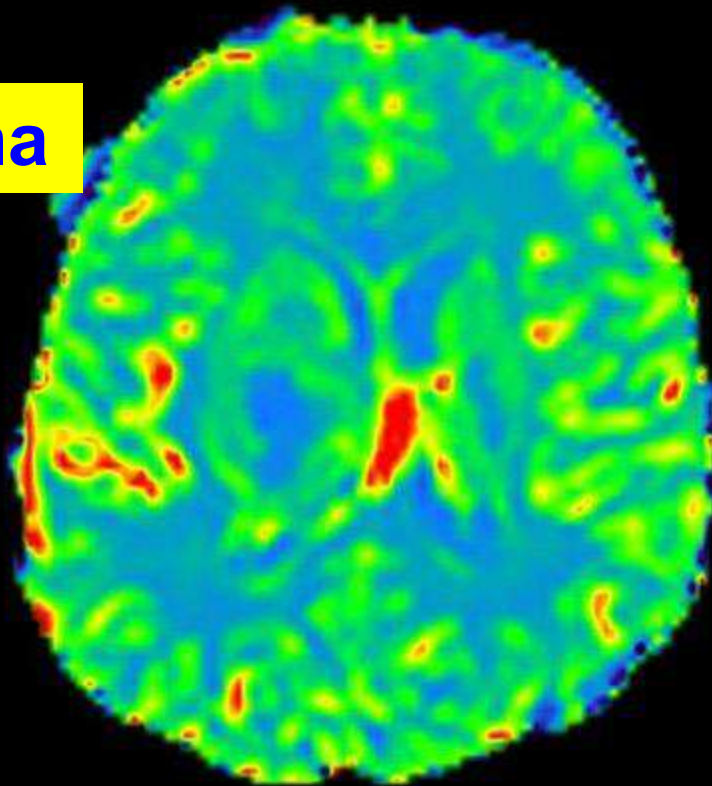


Cho artışı
Lipid yüksek
CBV ılımlı artış

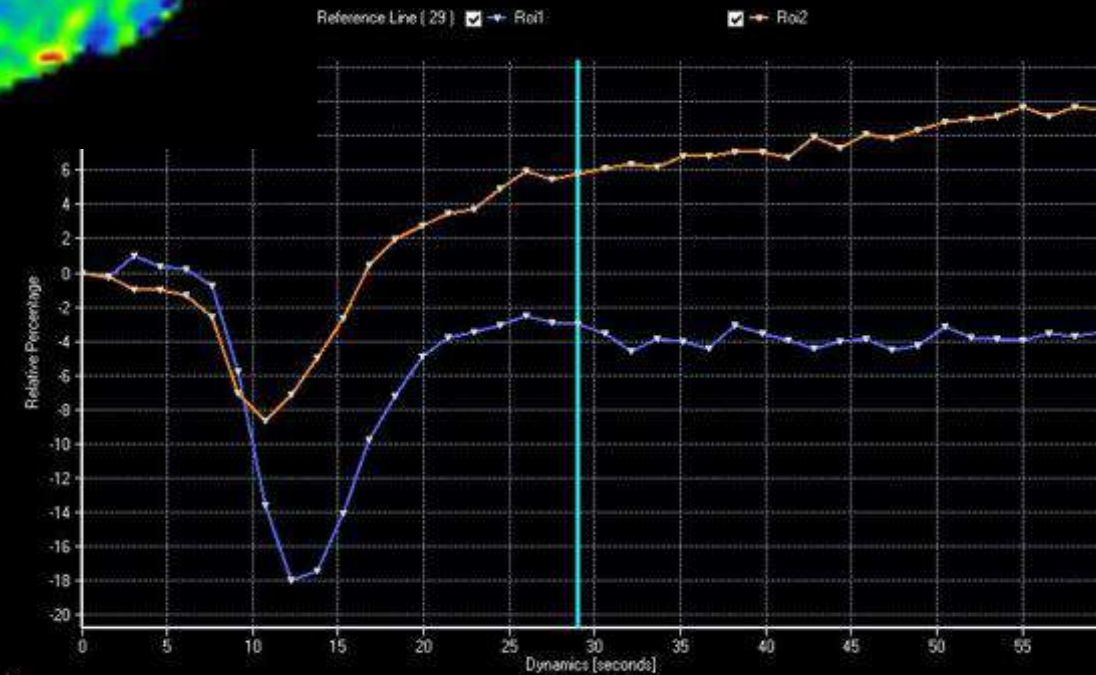


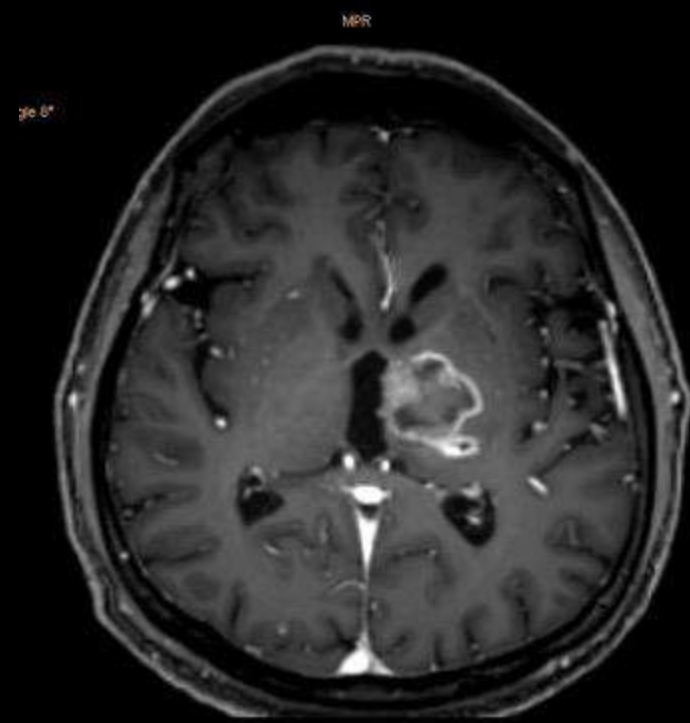
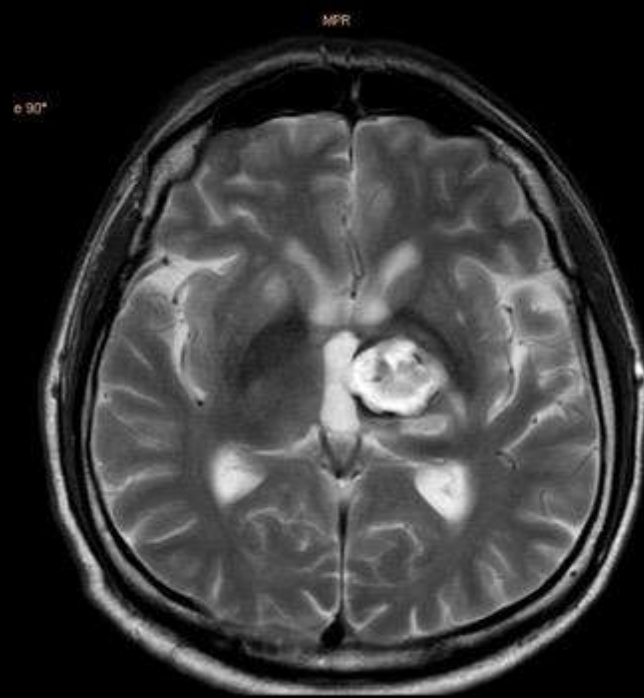
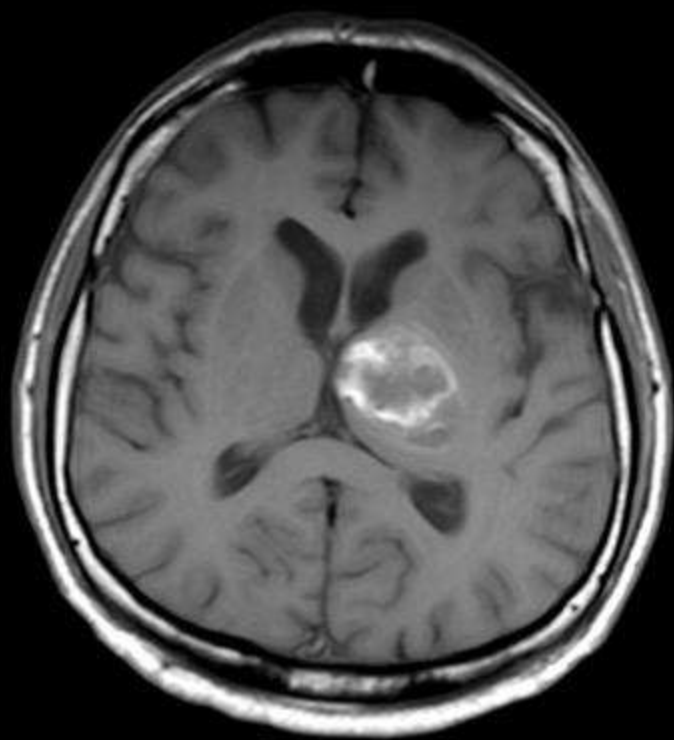


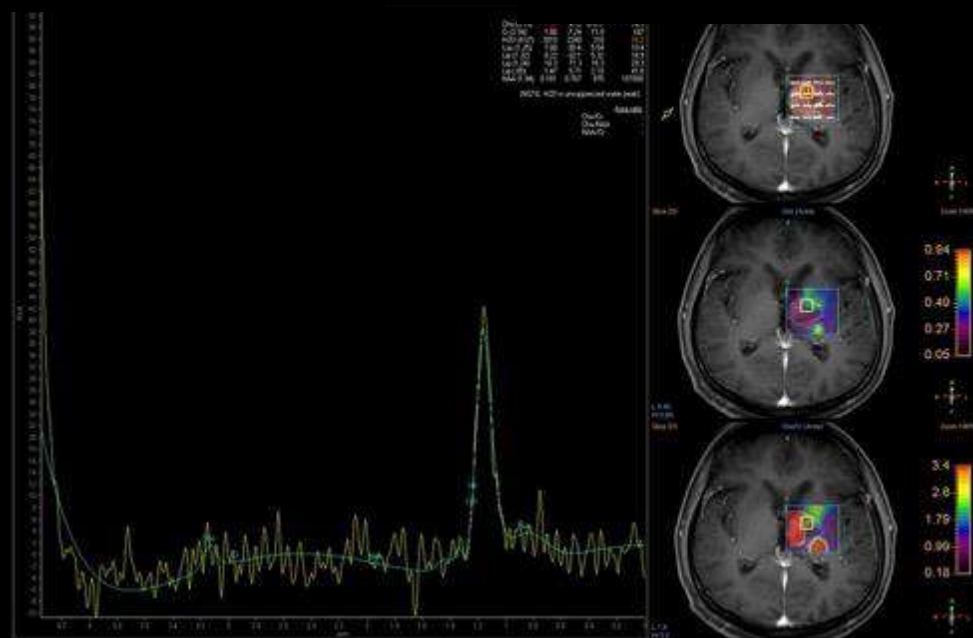
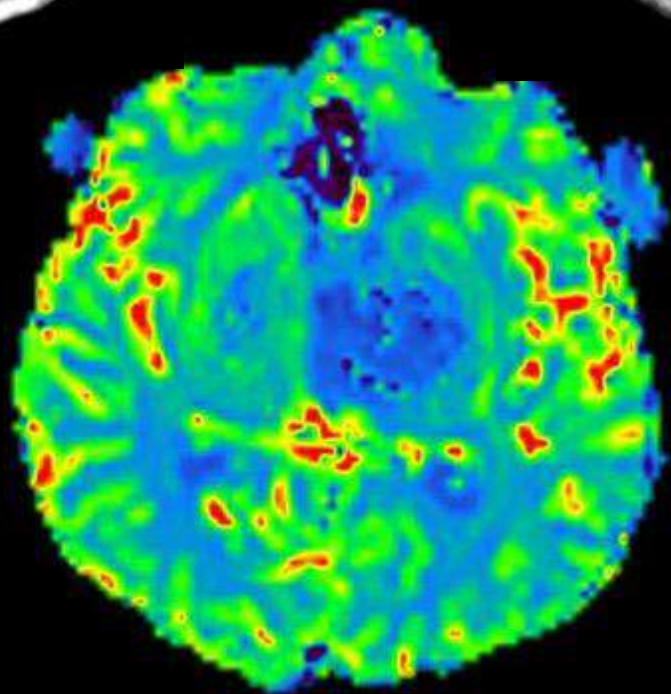
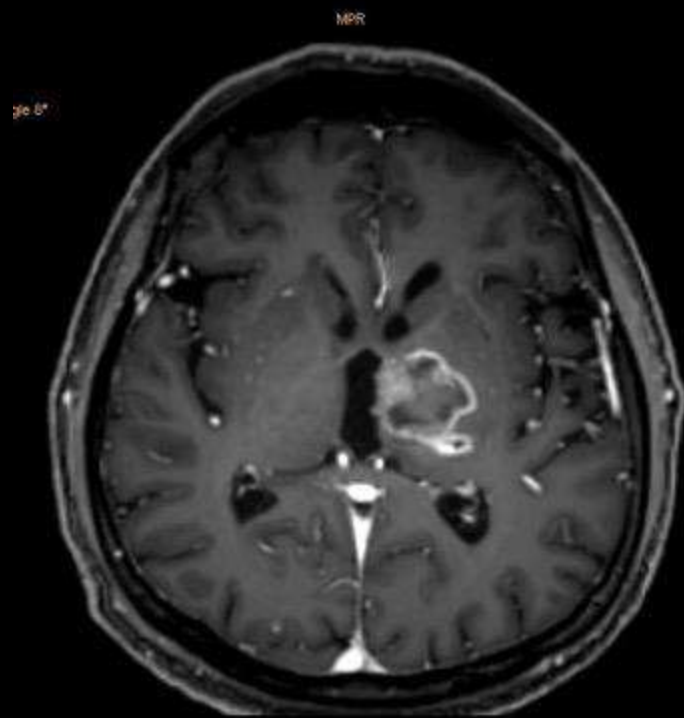
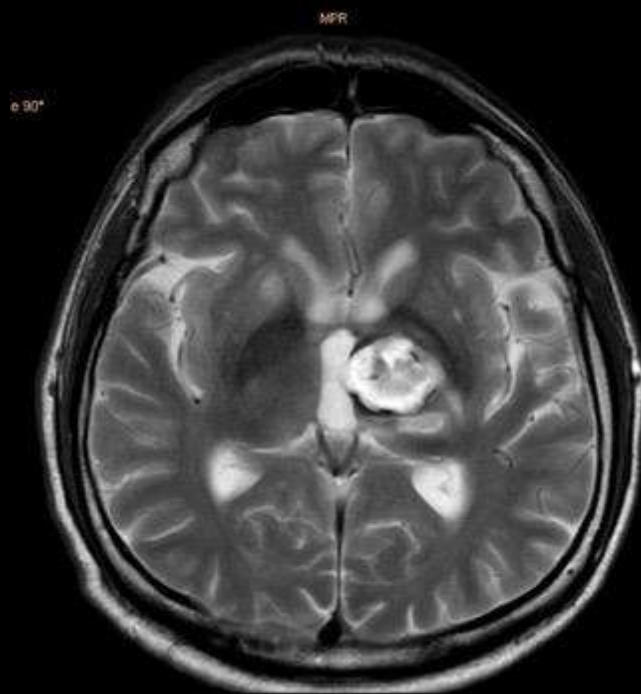
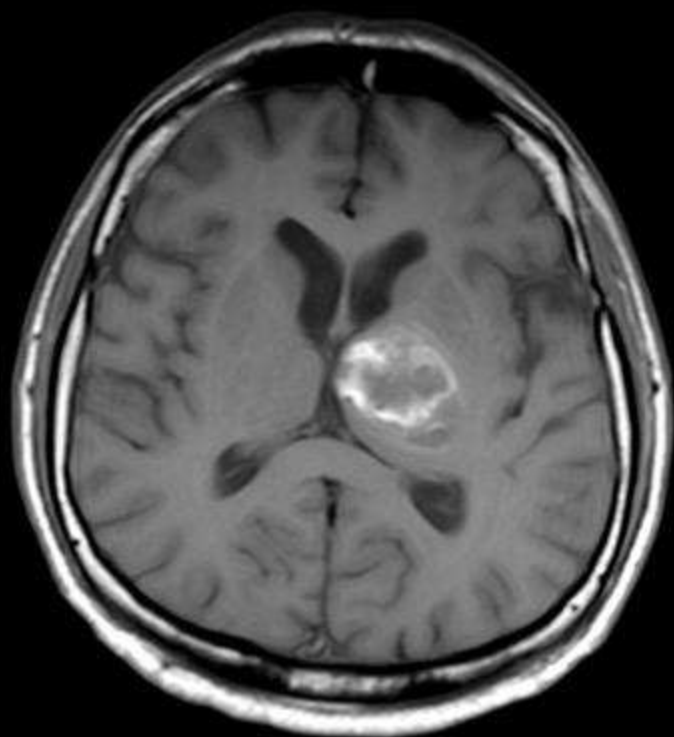
Lenfoma



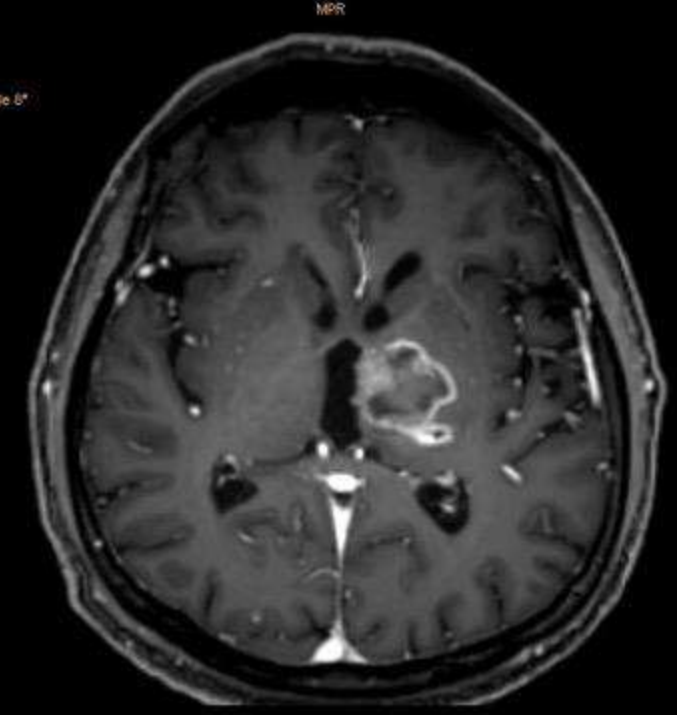
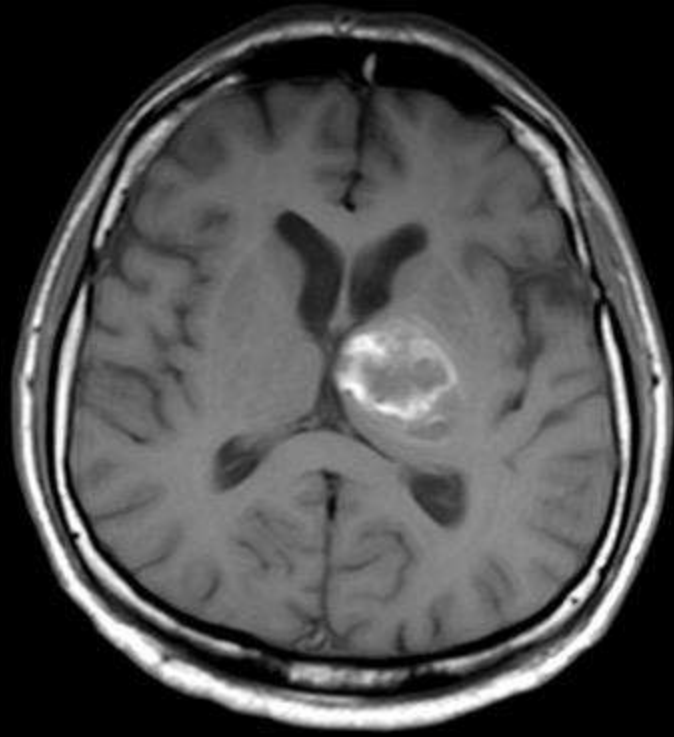
Cho artışı
Lipid yüksek
CBV ılımlı artış



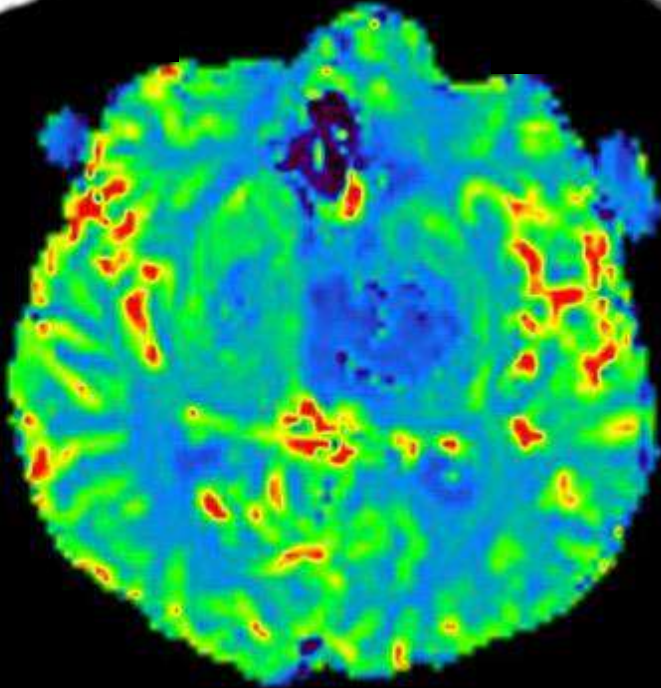




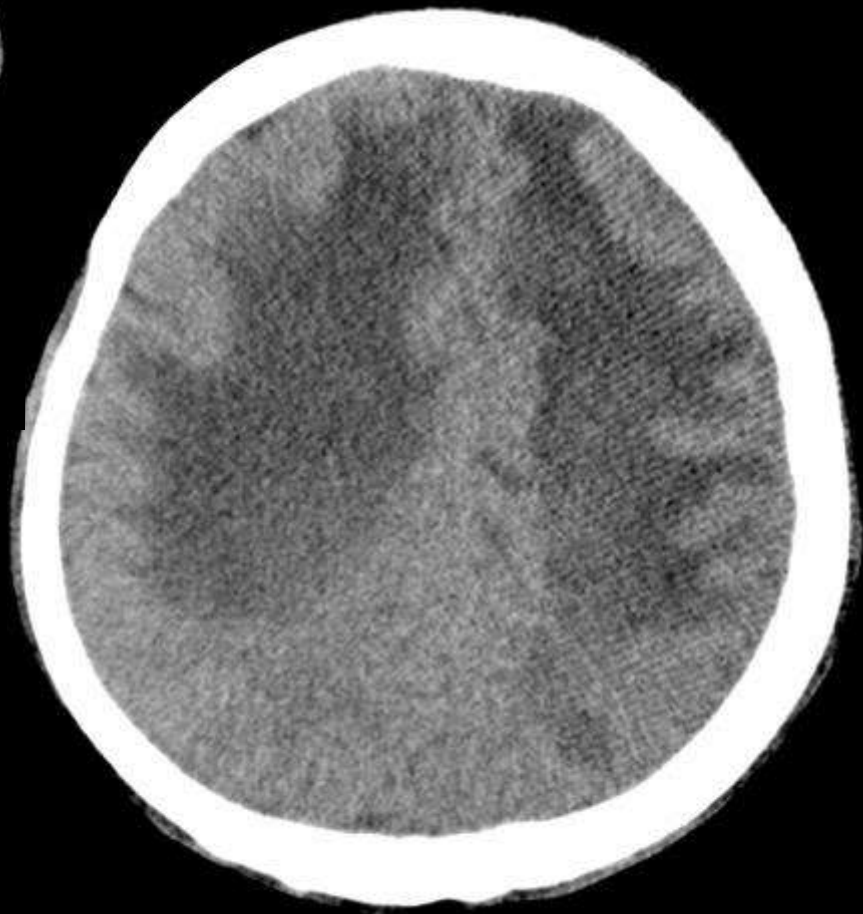
TOKSOPLAZMOZİS

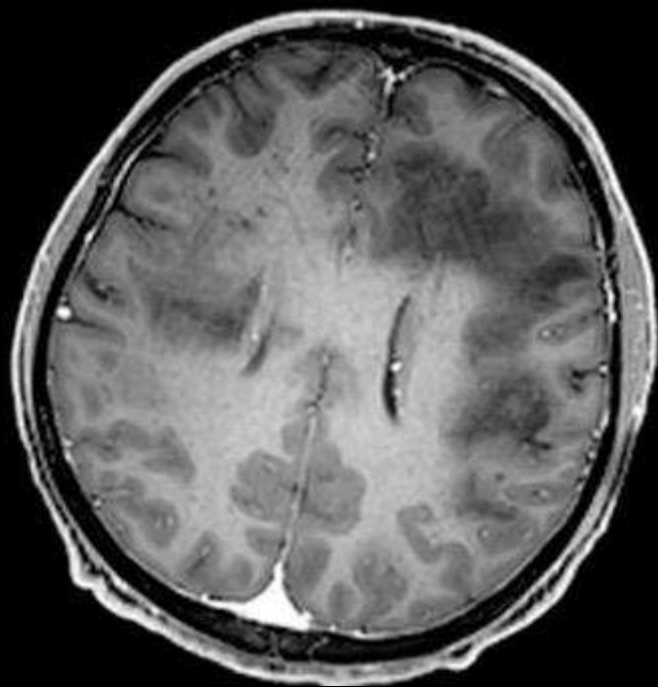
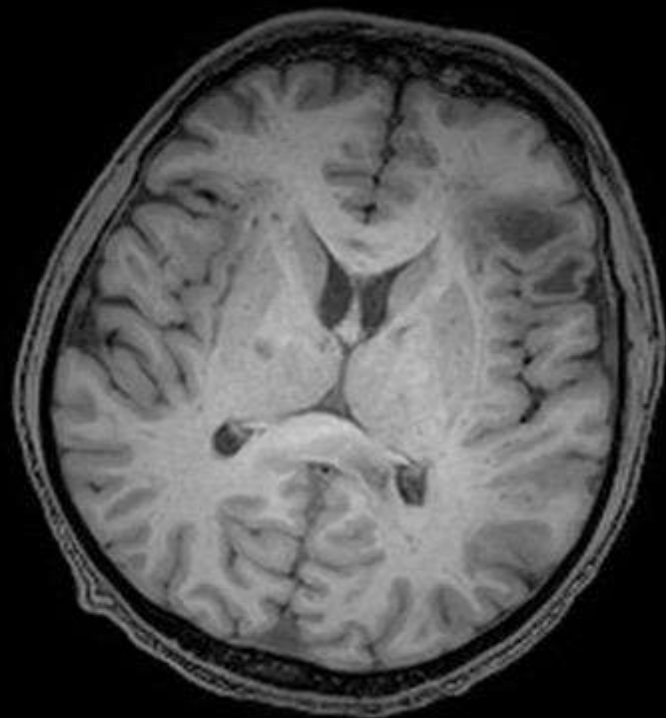
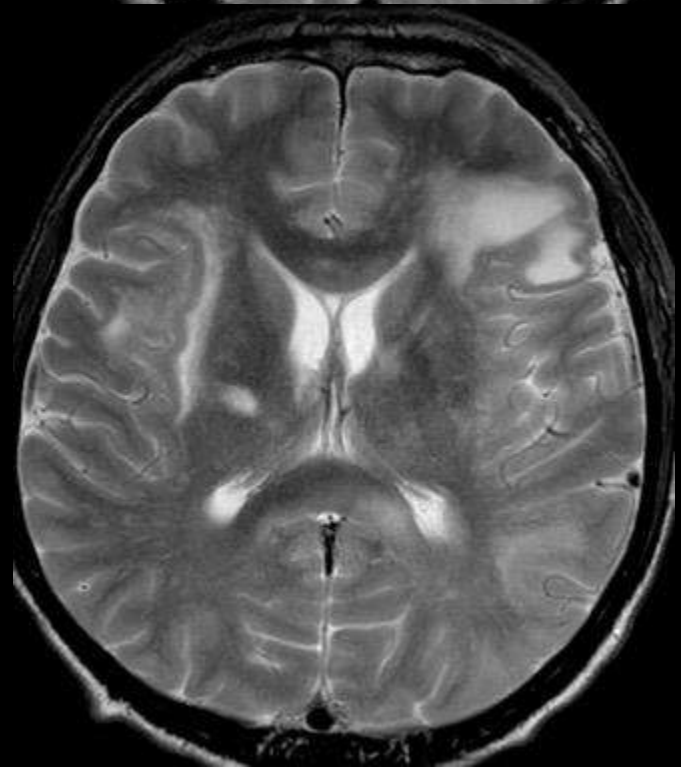
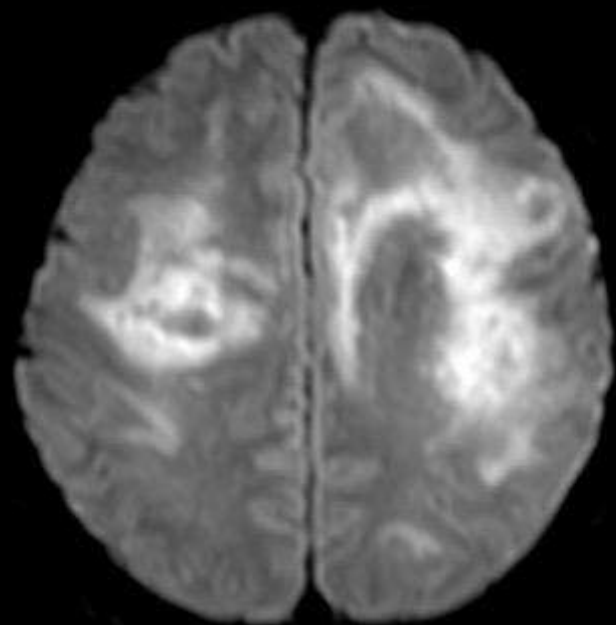
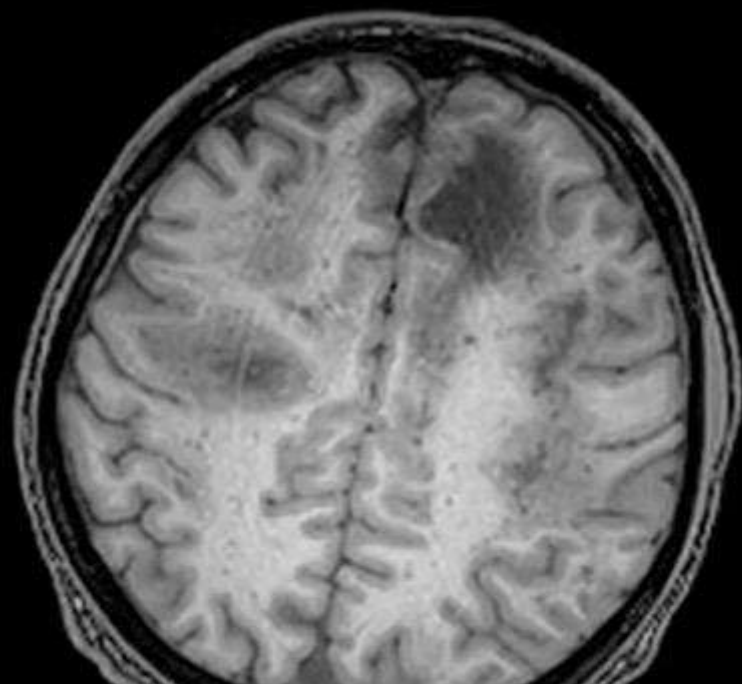
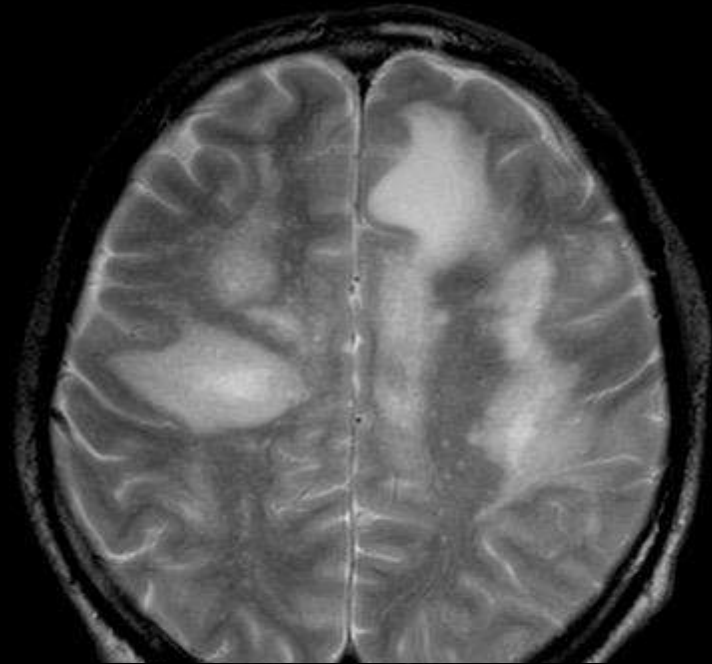


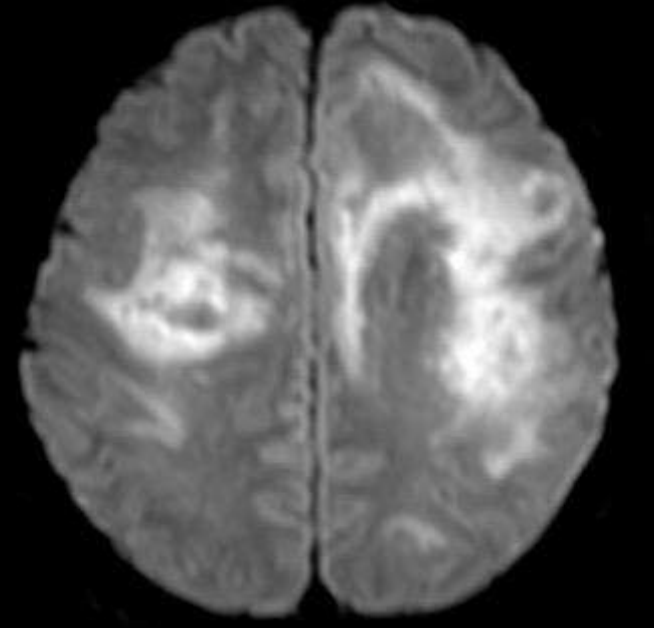
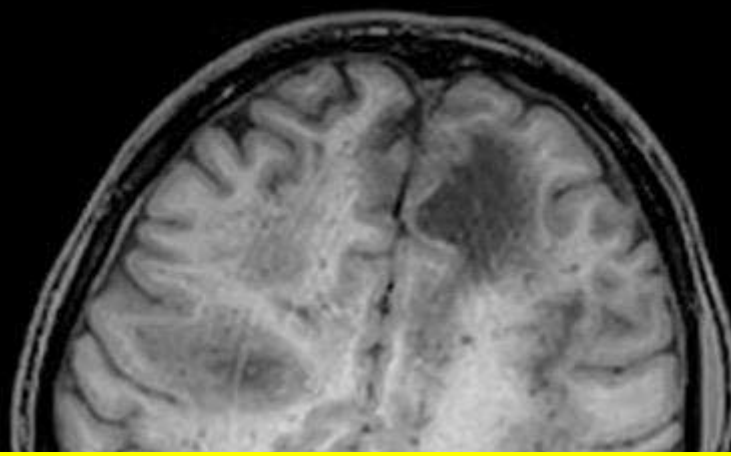
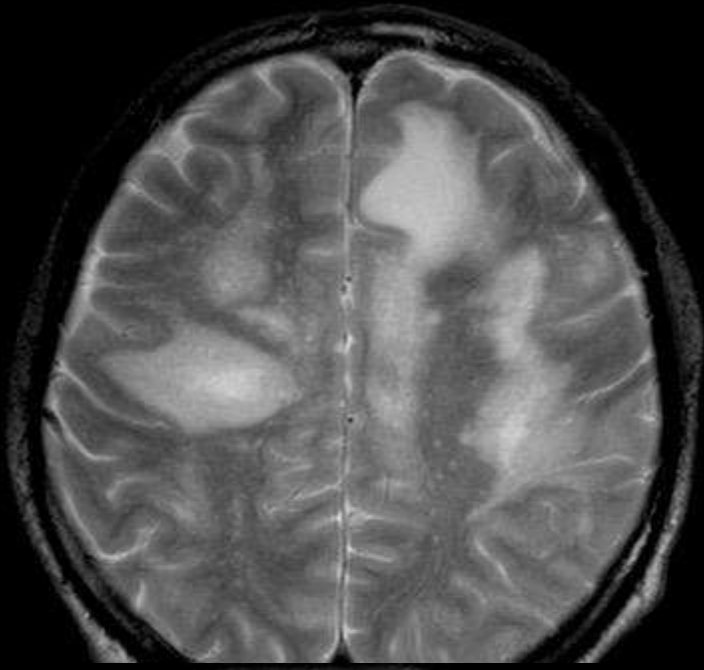
HİPOPERFÜZE
Cho artışı yok
Lipid piki var



7. OLGU

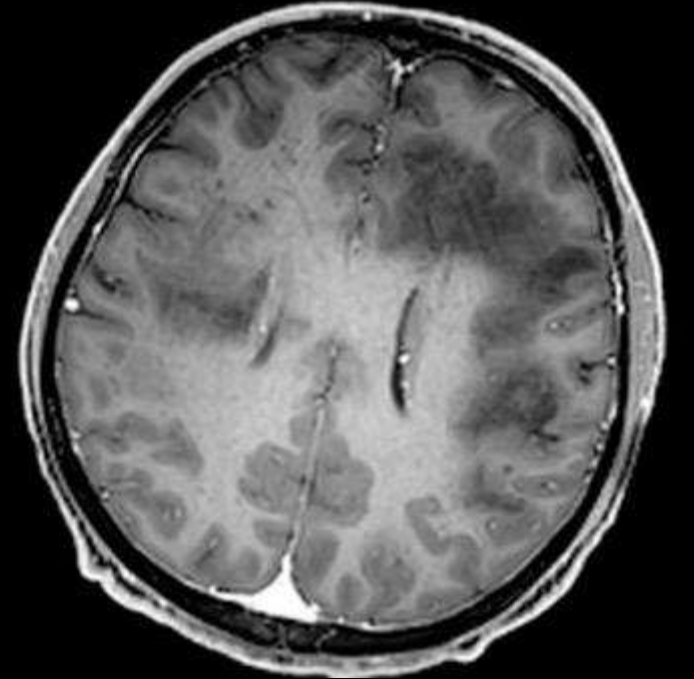
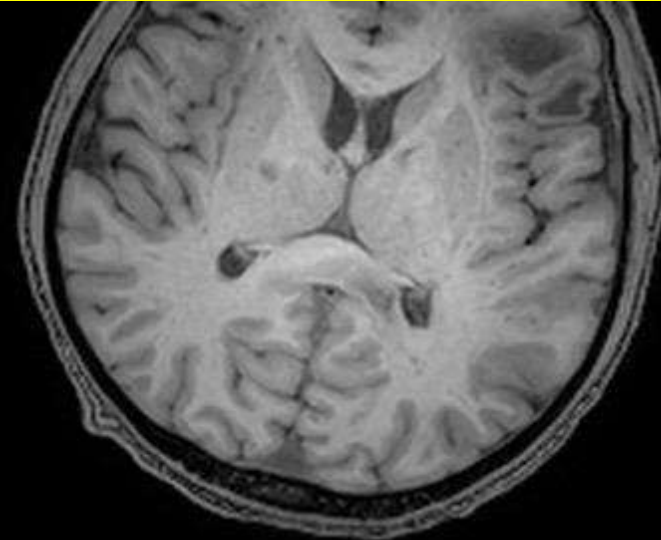
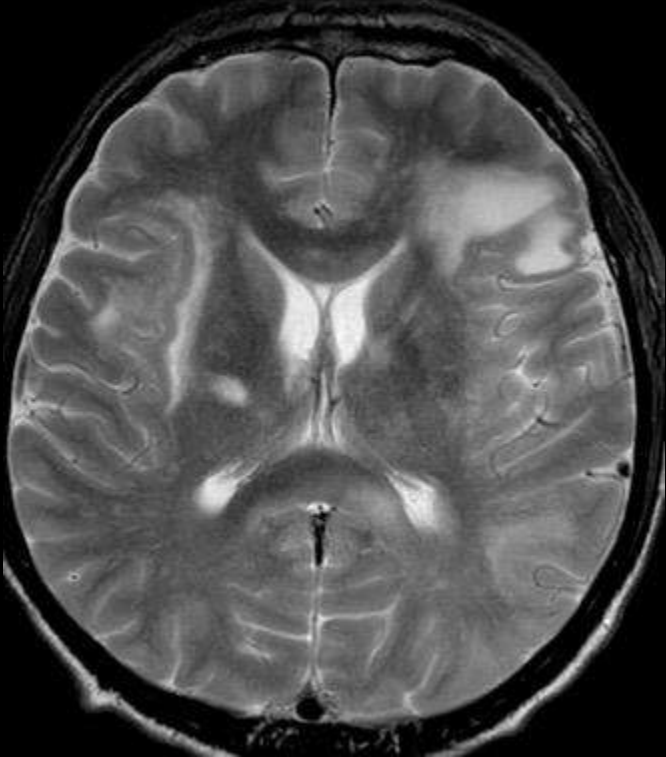


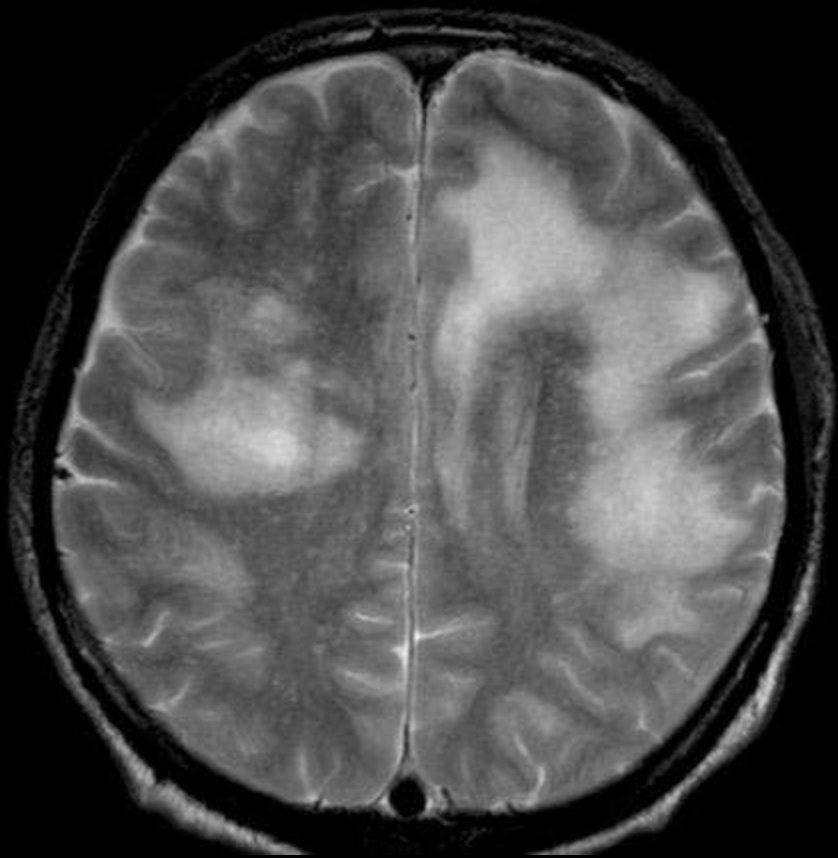




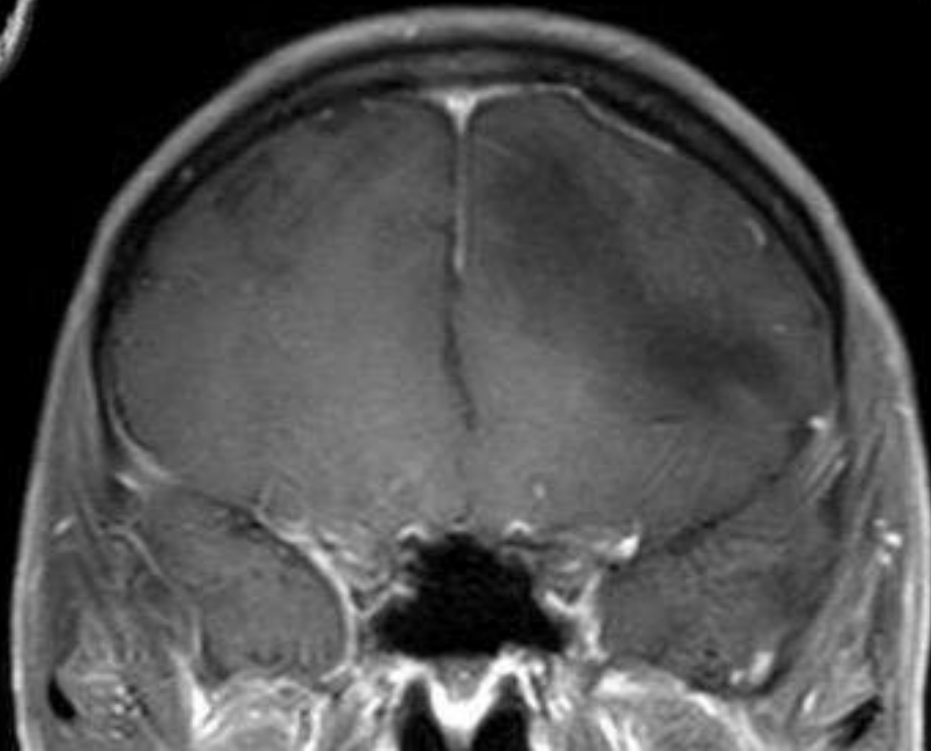
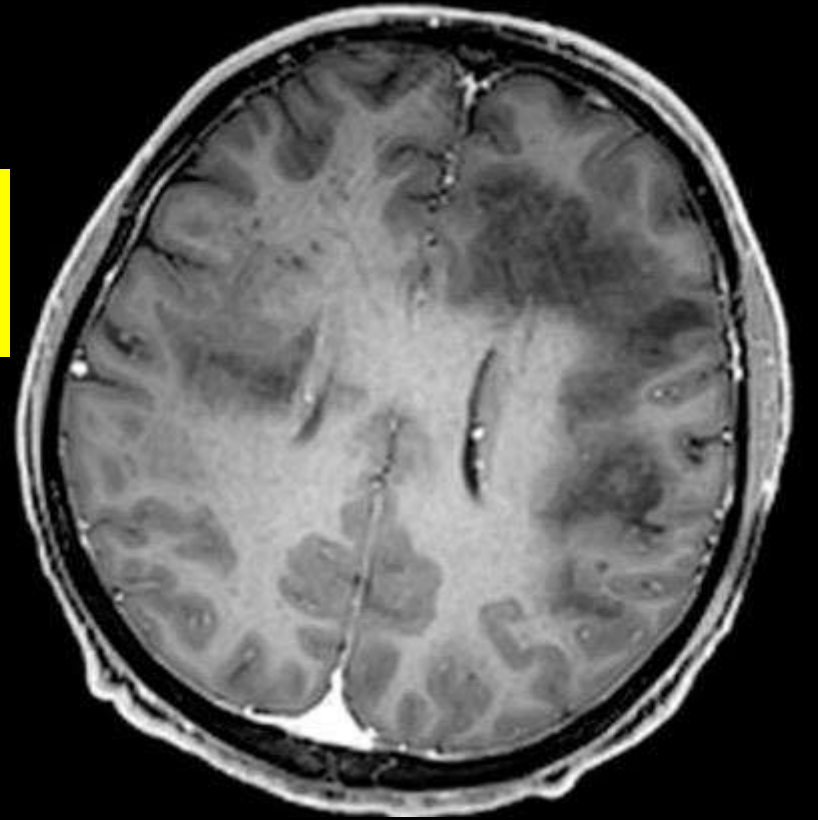
PML

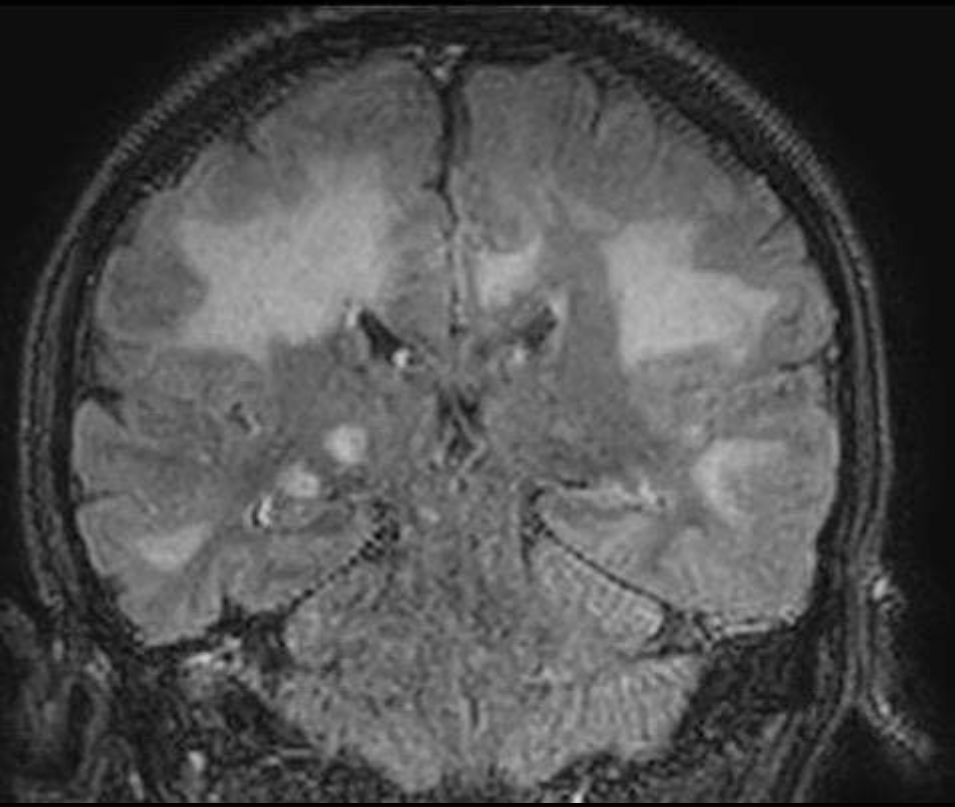
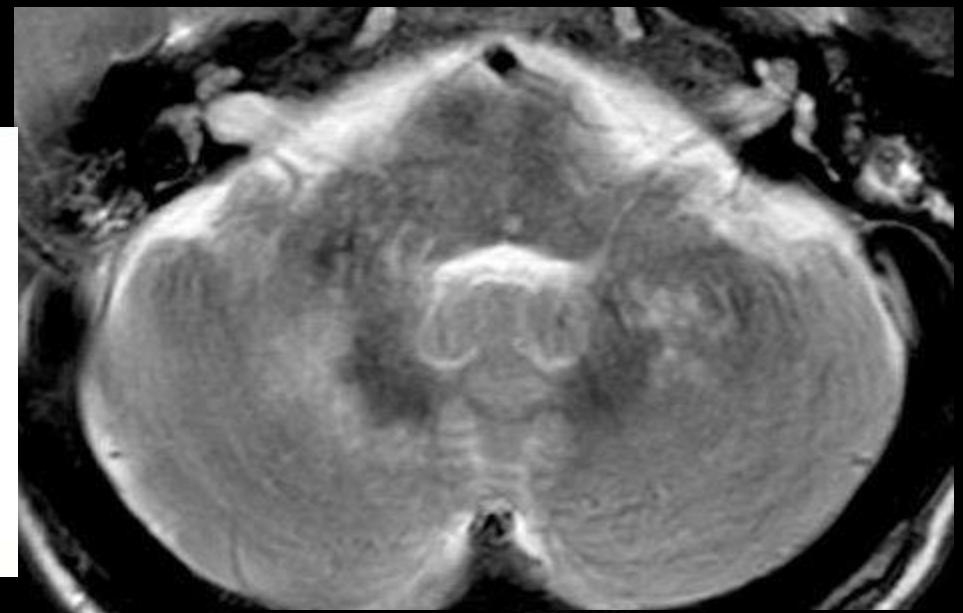
Asimetrik dağılım
Subkortikal beyaz cevherde
Kitle etkisi yok
T1A da hipointens



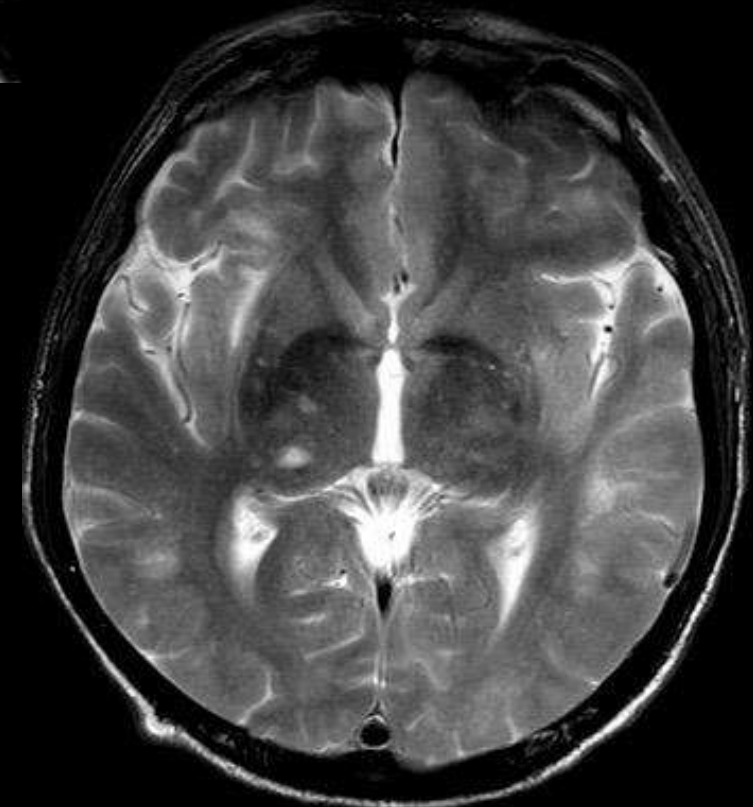


PML
Genelde kontrastlanmaz

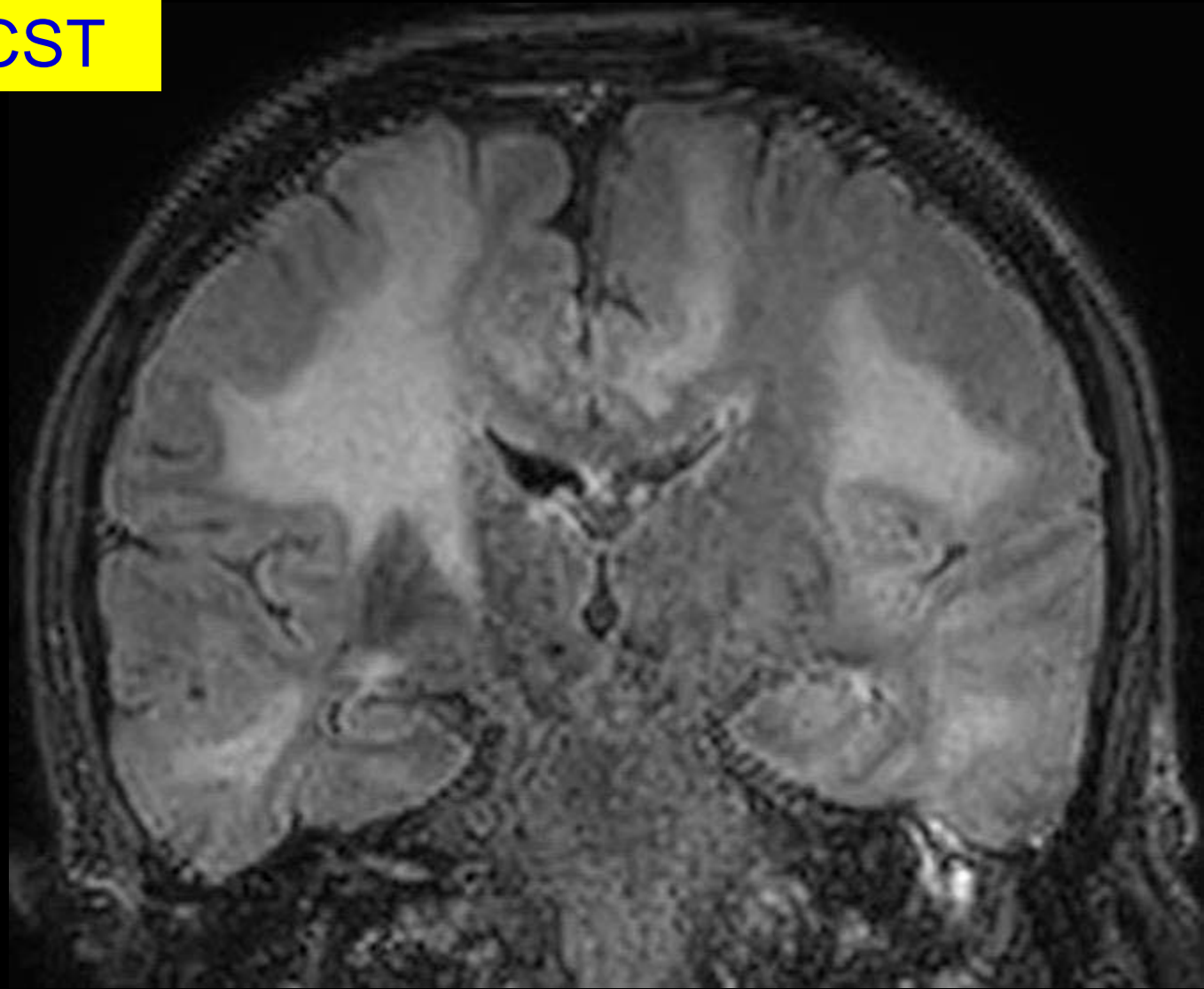


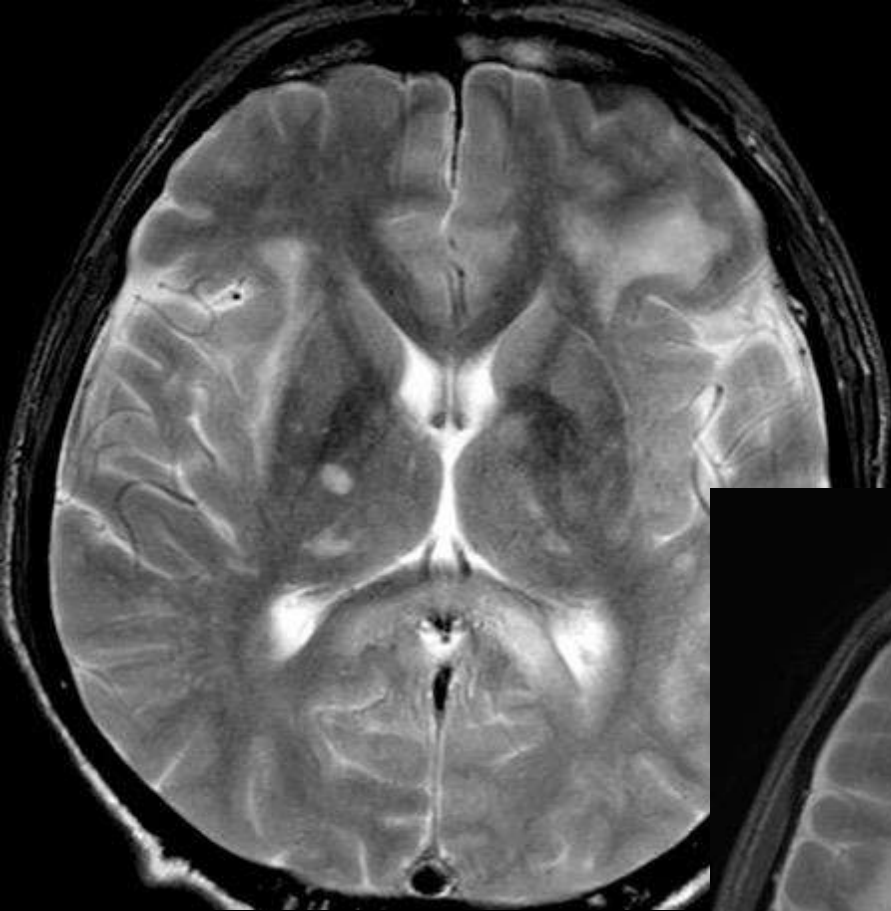


PML
Talamus
Infratentorial

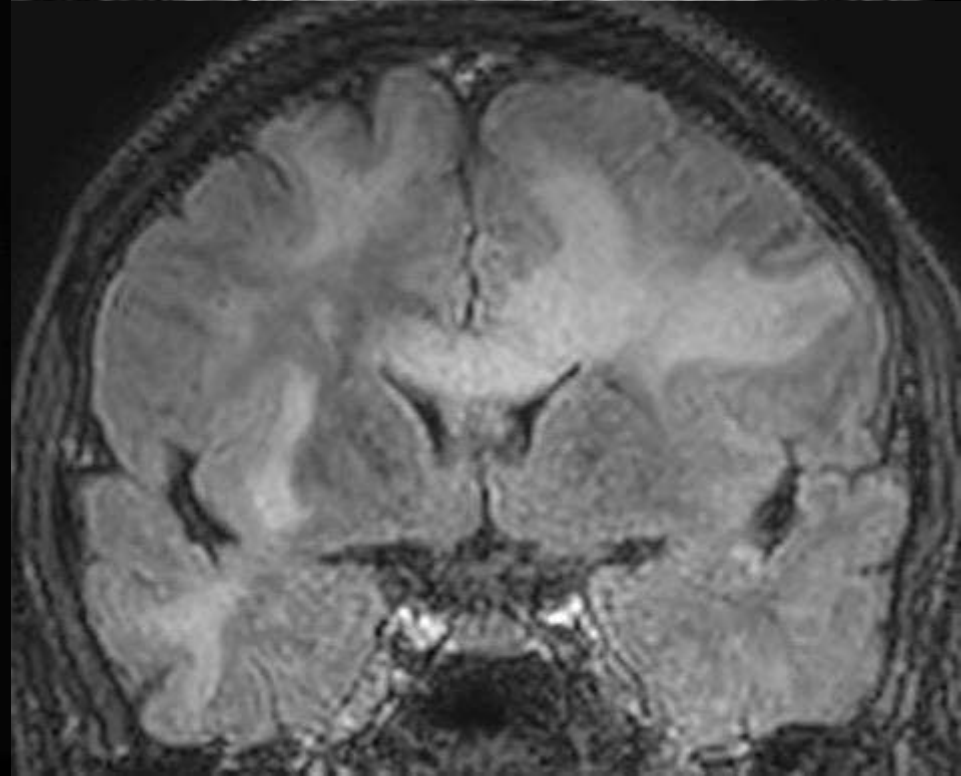
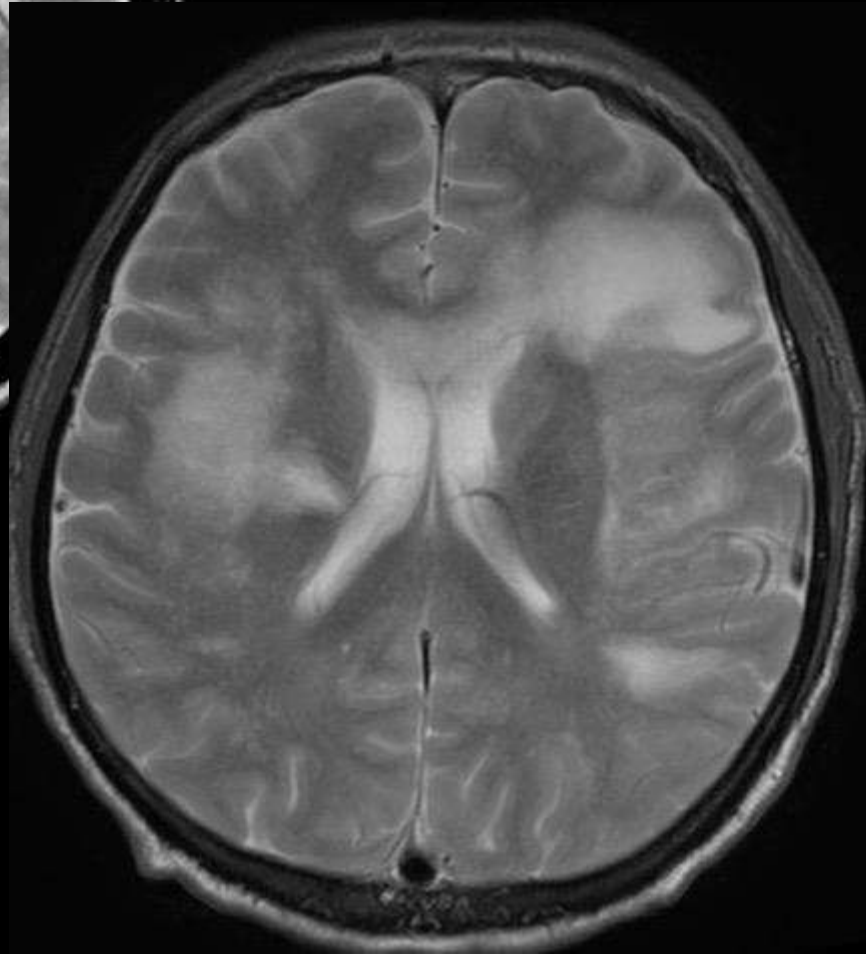
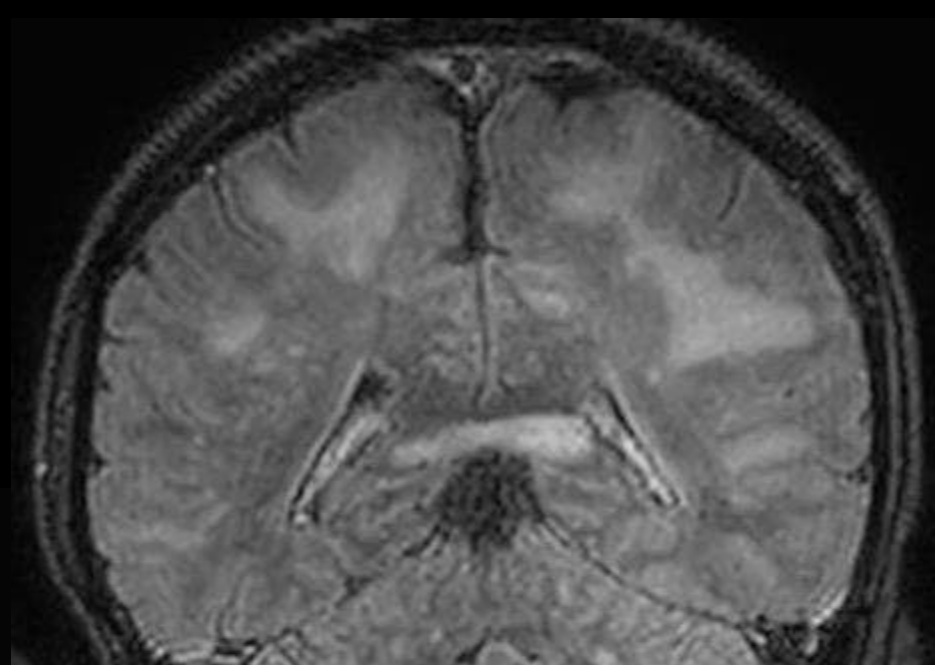


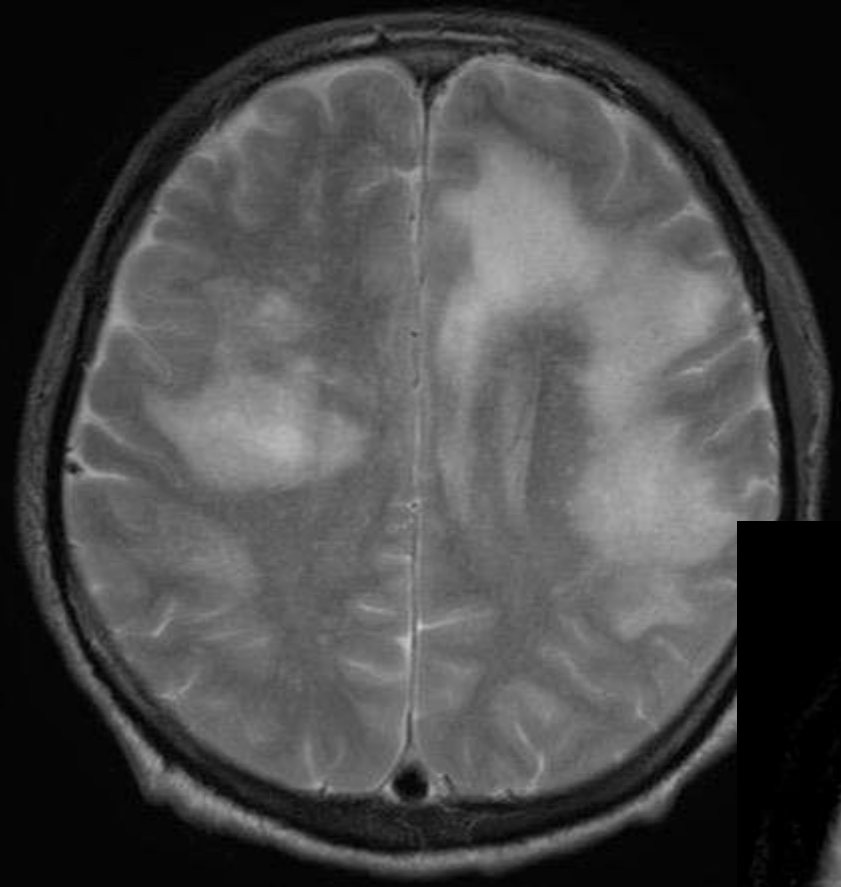
PML
CST



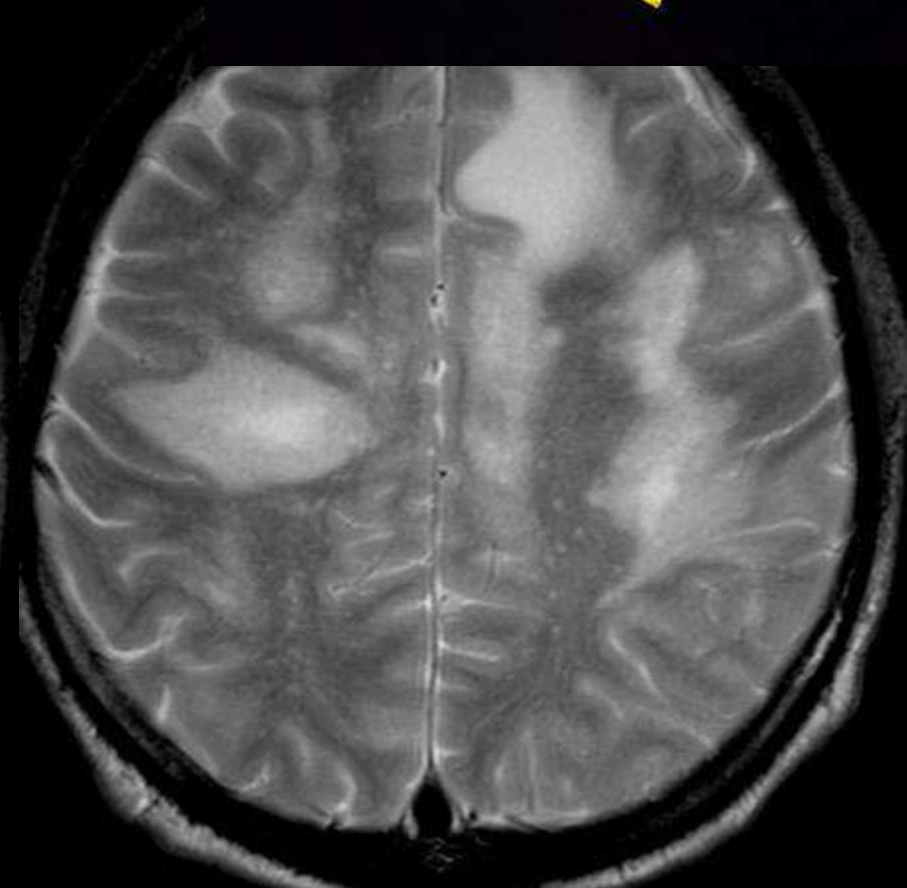
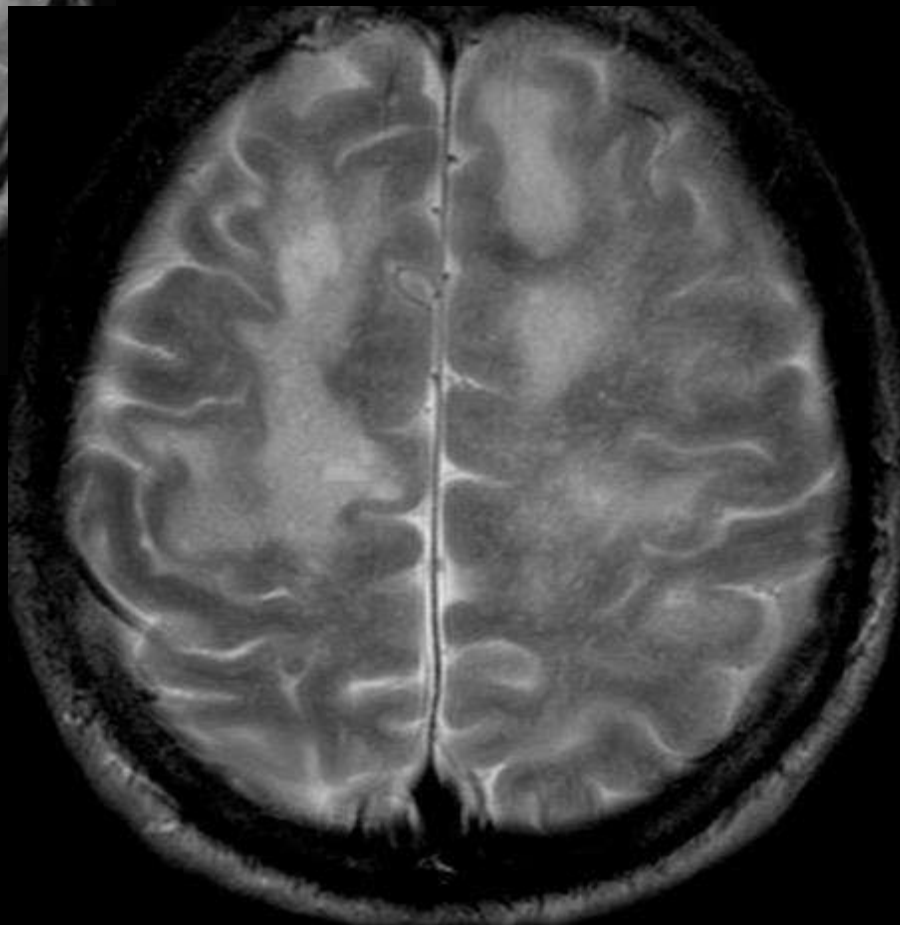


PML
Korpus
kallozum

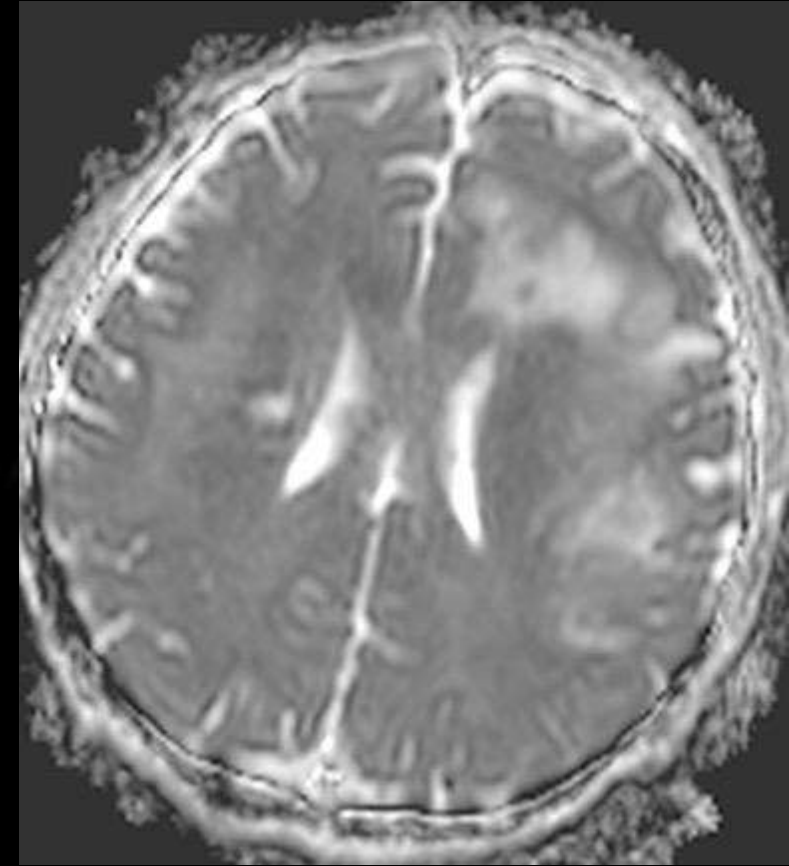
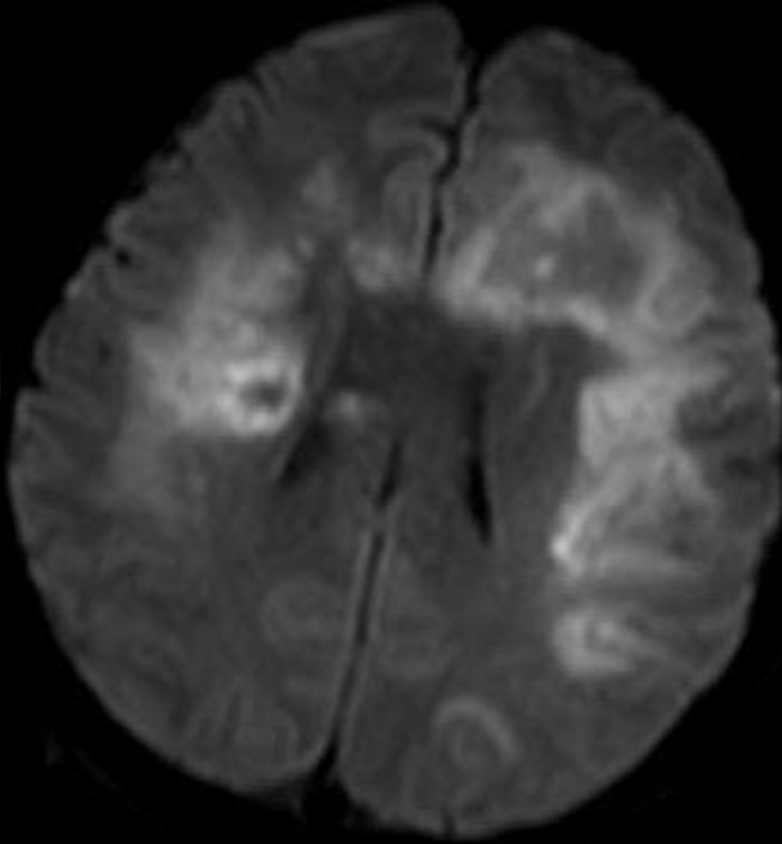
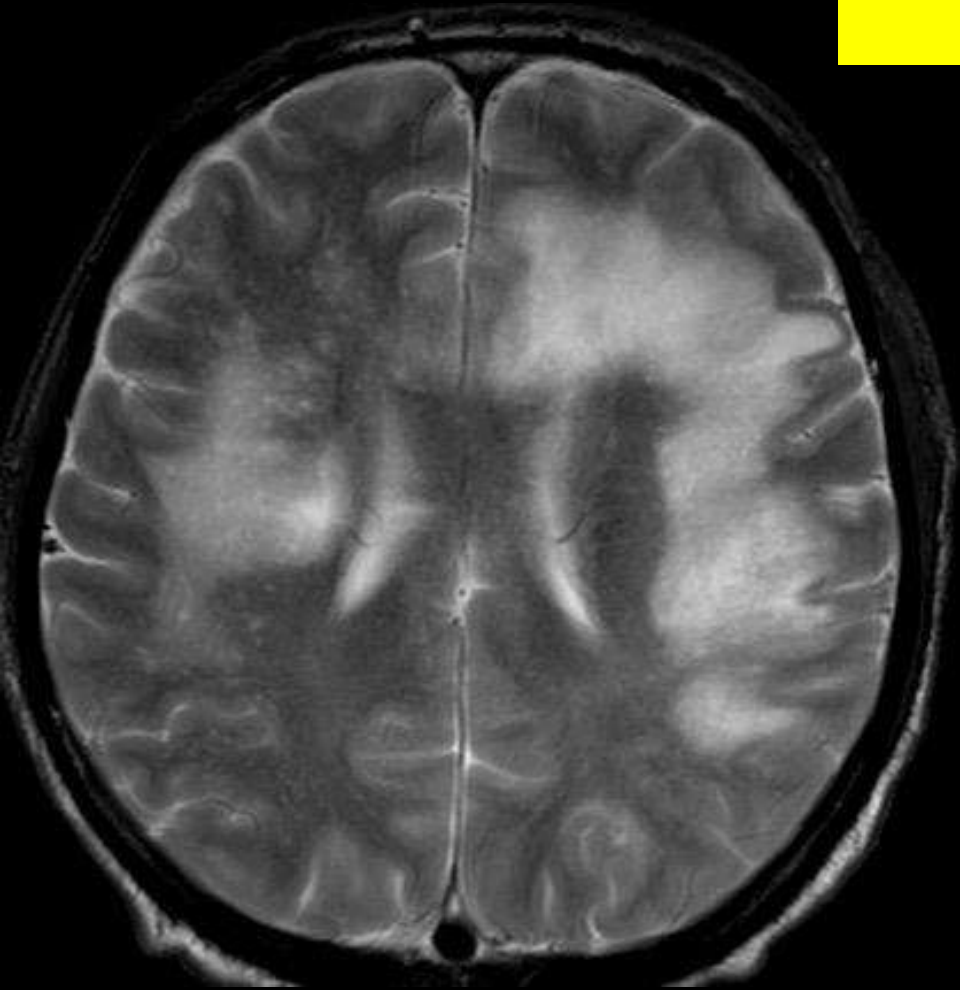




PML
Milky Way

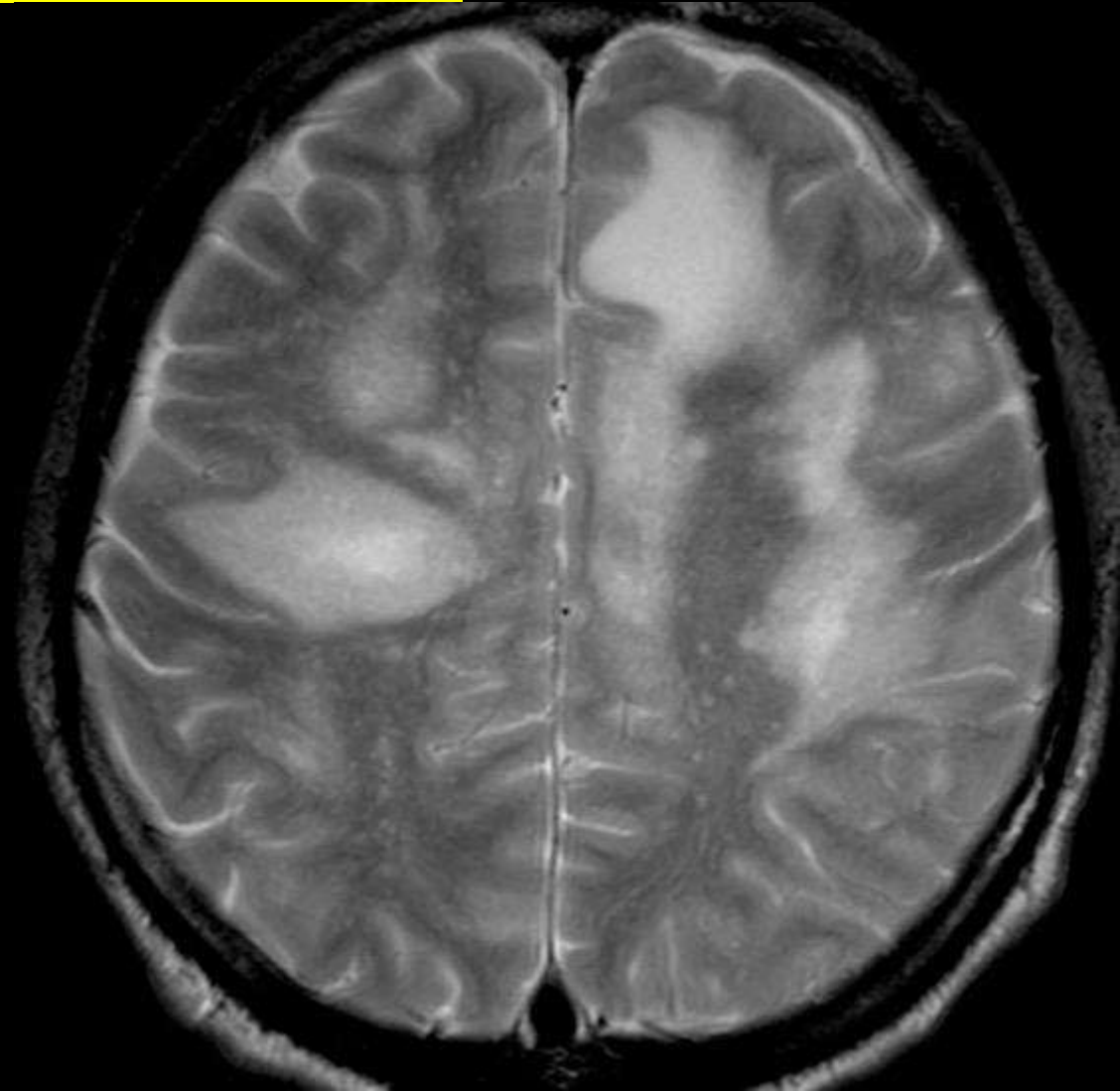
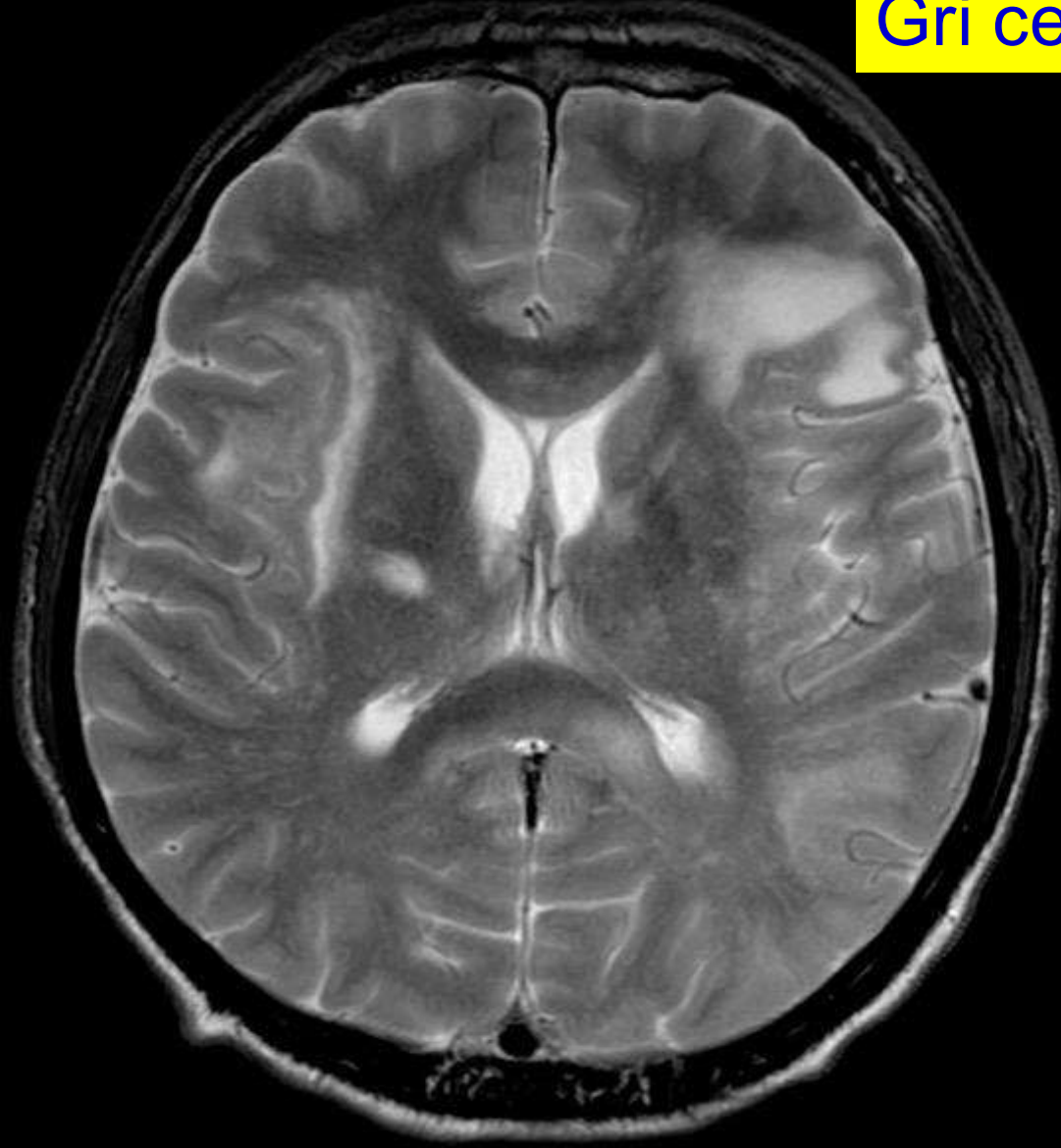


PML
DAG Hiperintensitesi

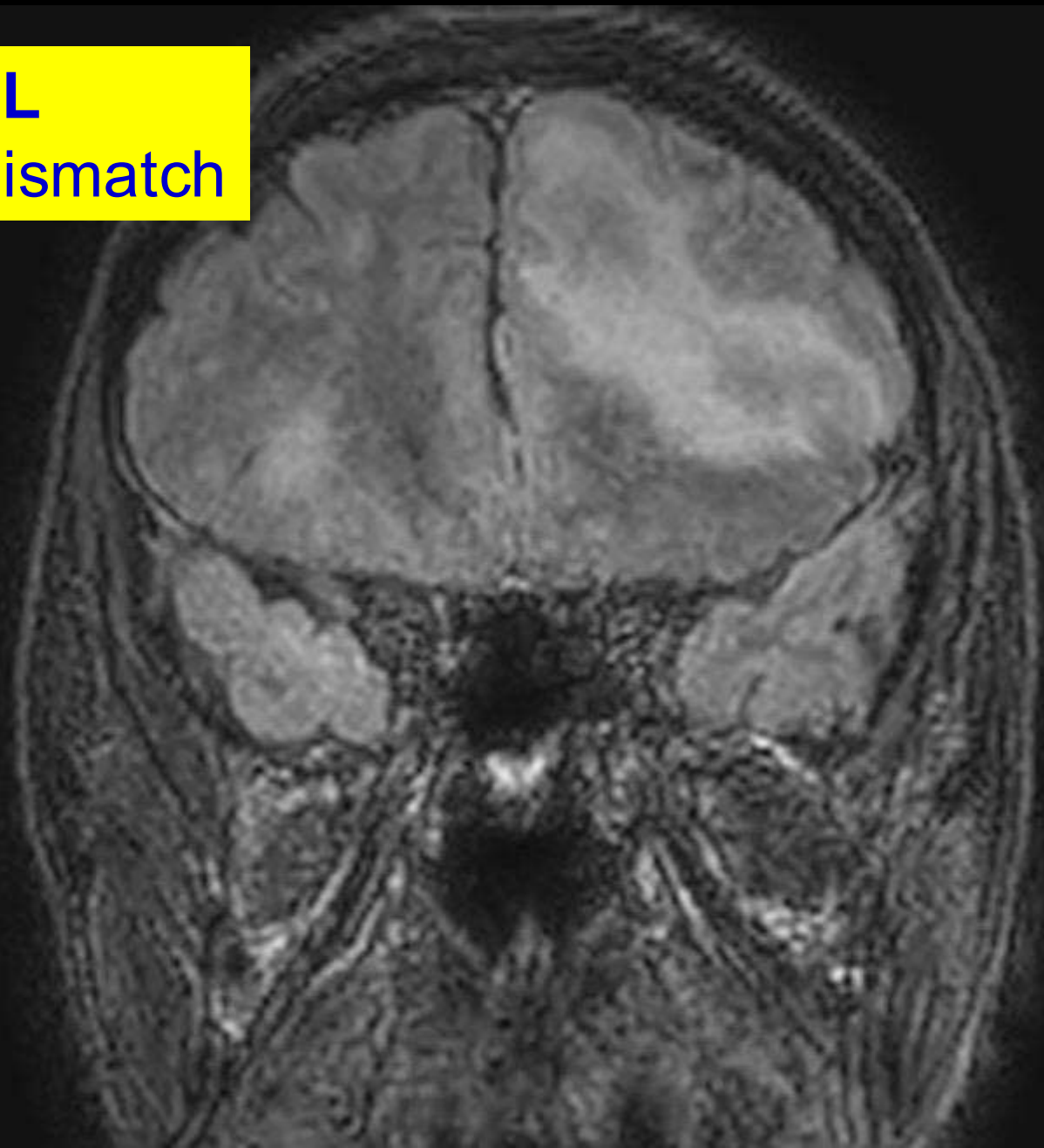
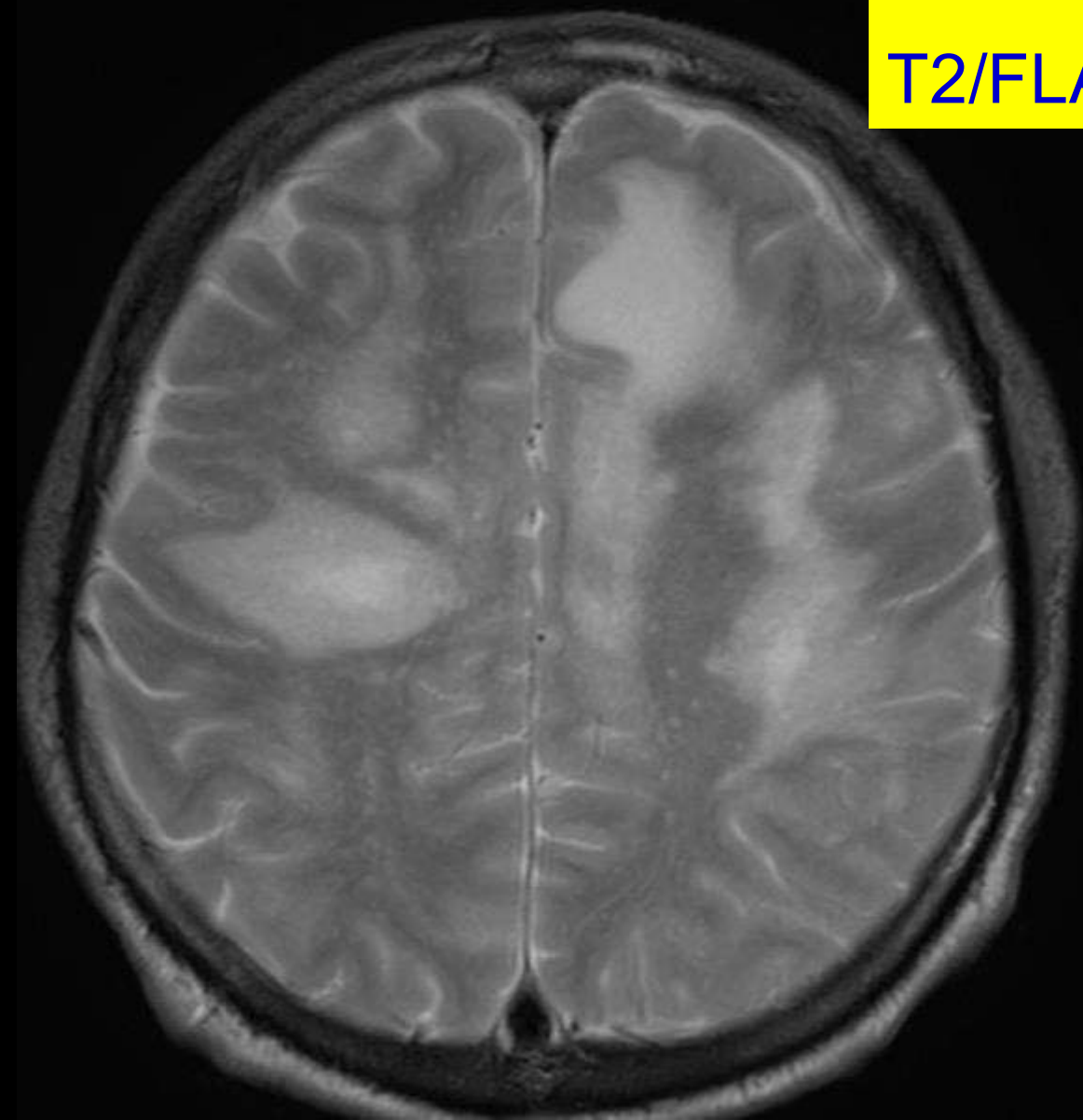


PML

Gri cevhere bakan yer keskin



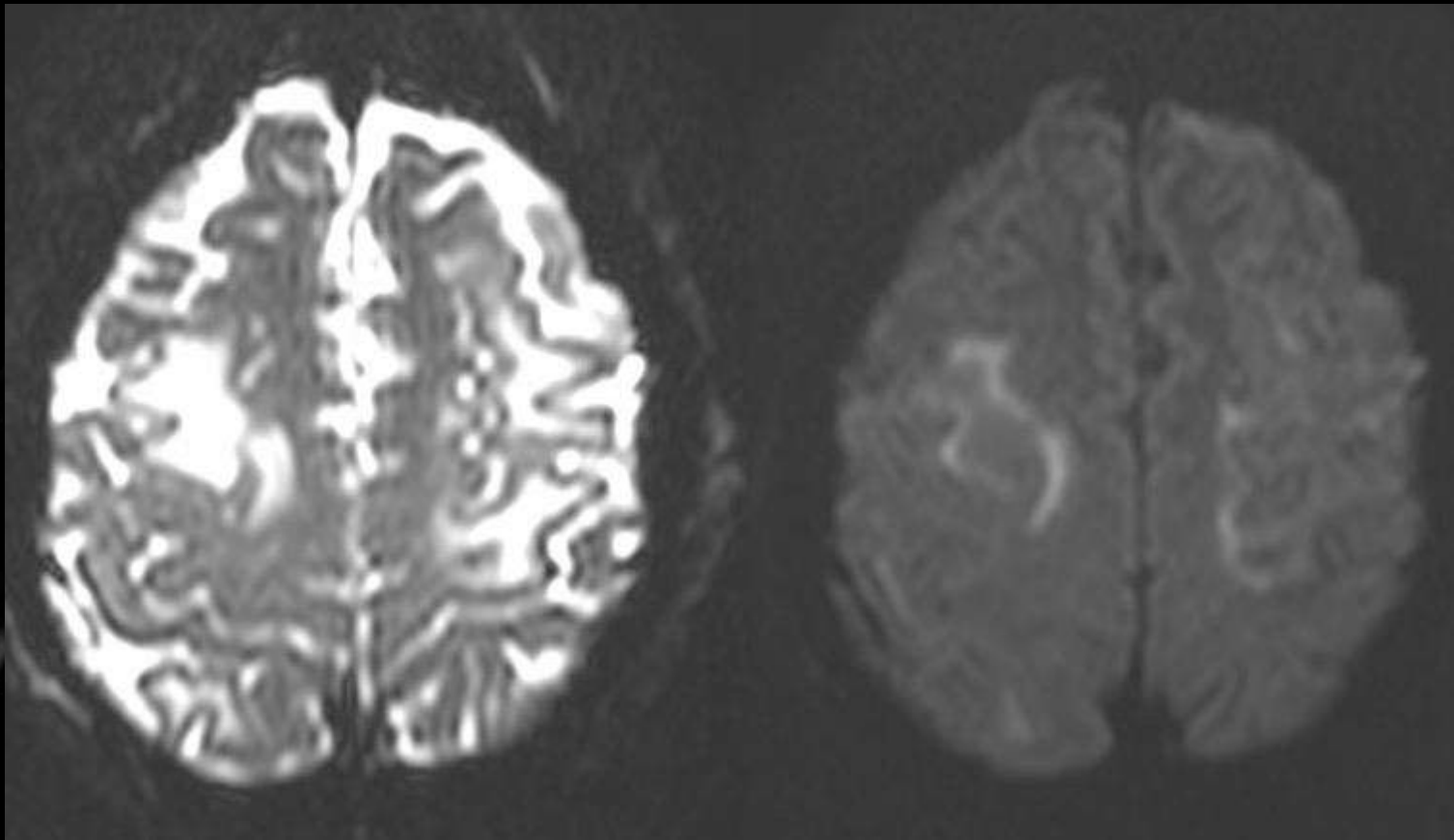
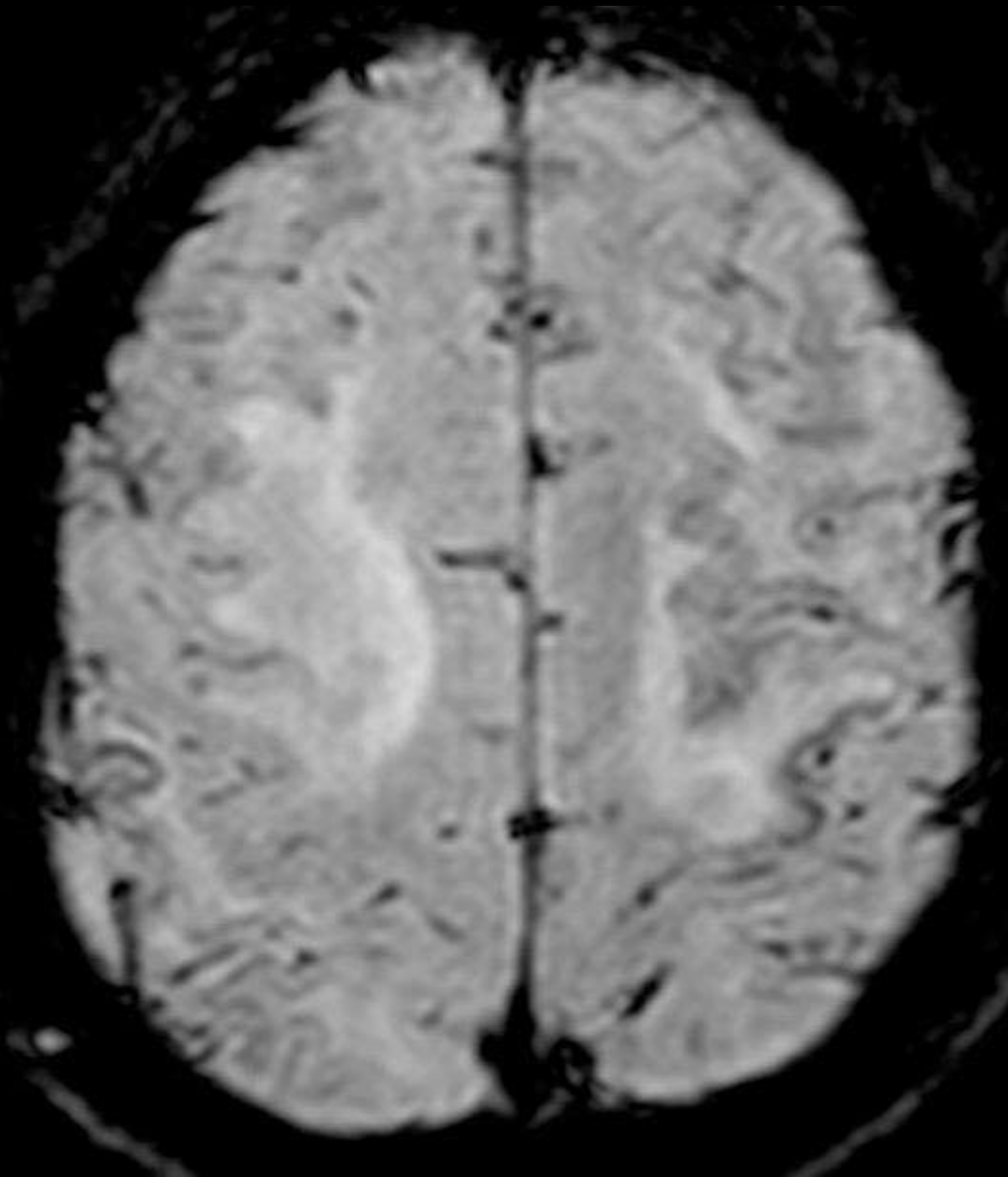
PML
T2/FLAIR Mismatch

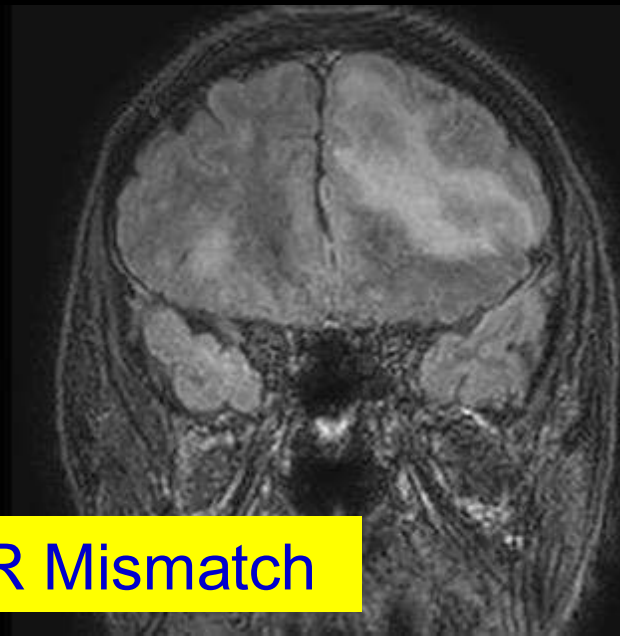
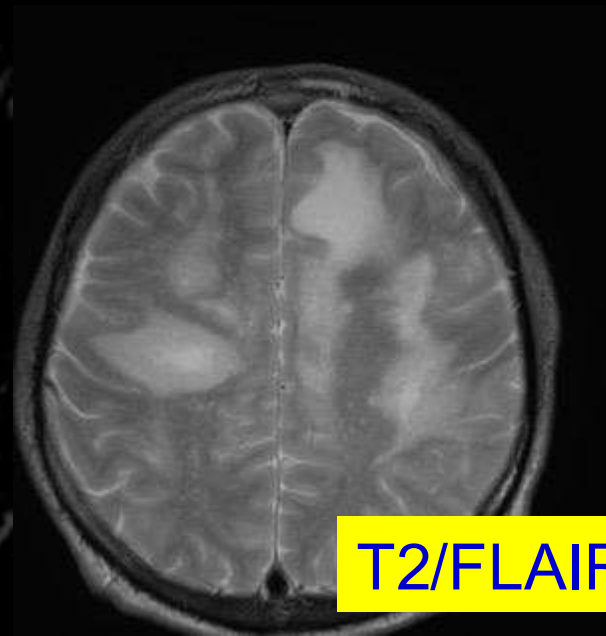
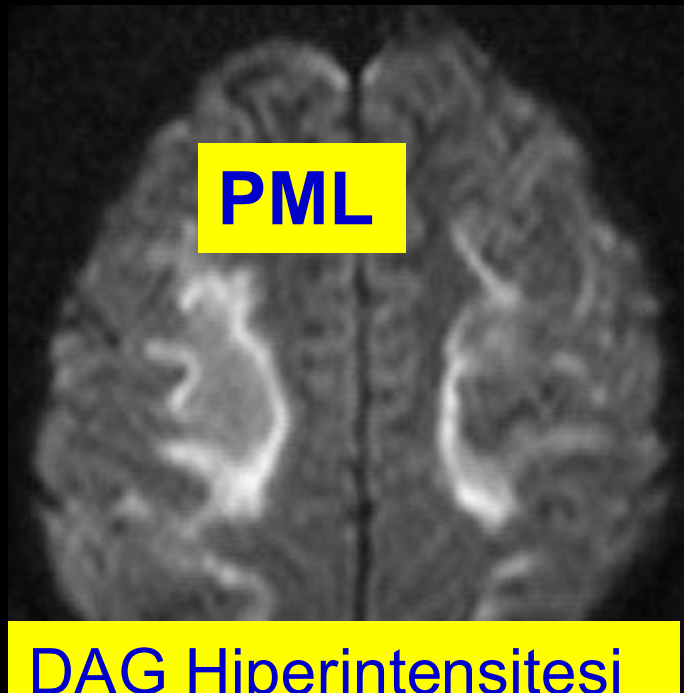


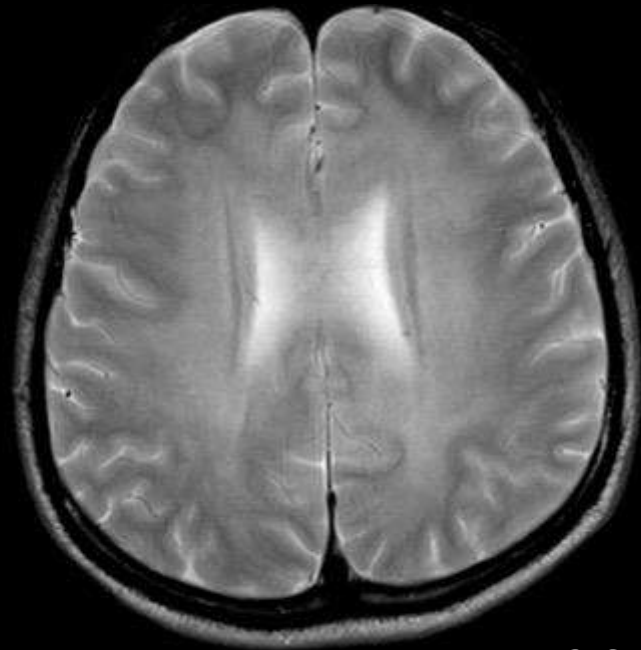
PML

SWI Hipointens

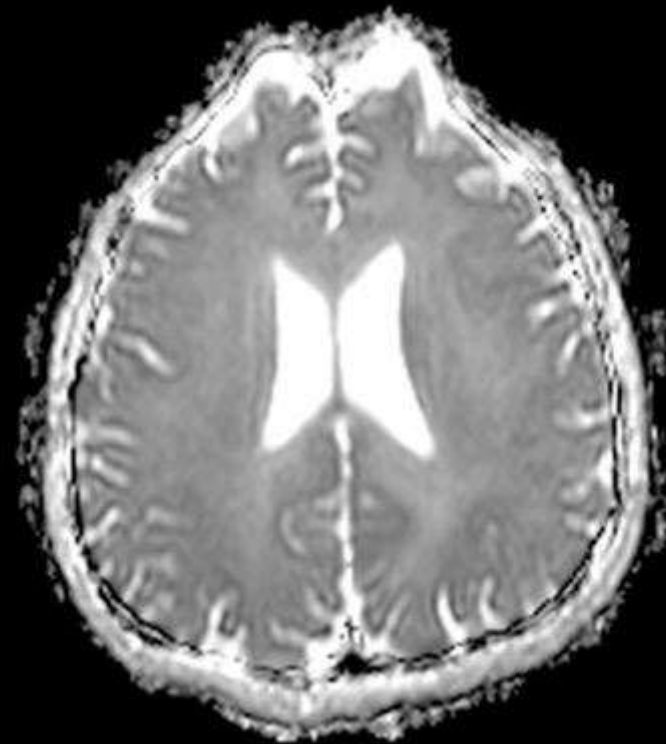
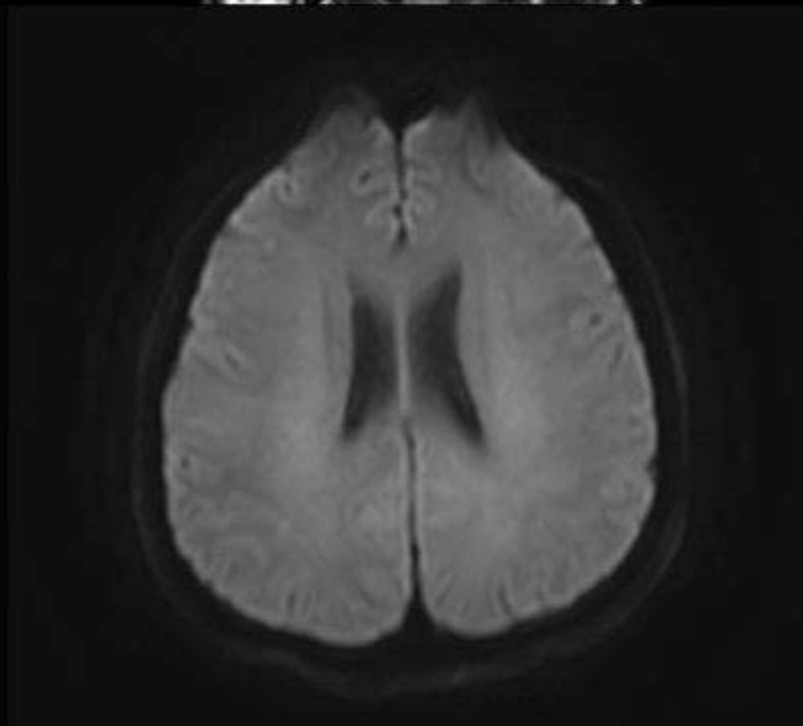
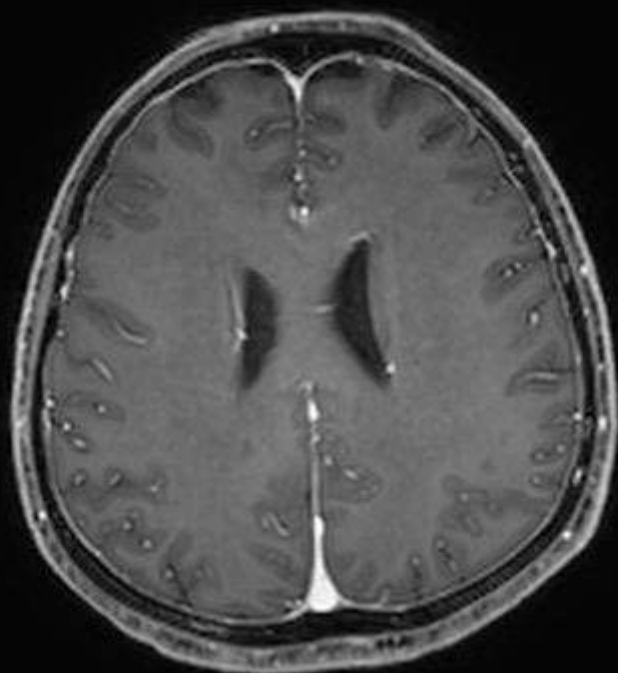
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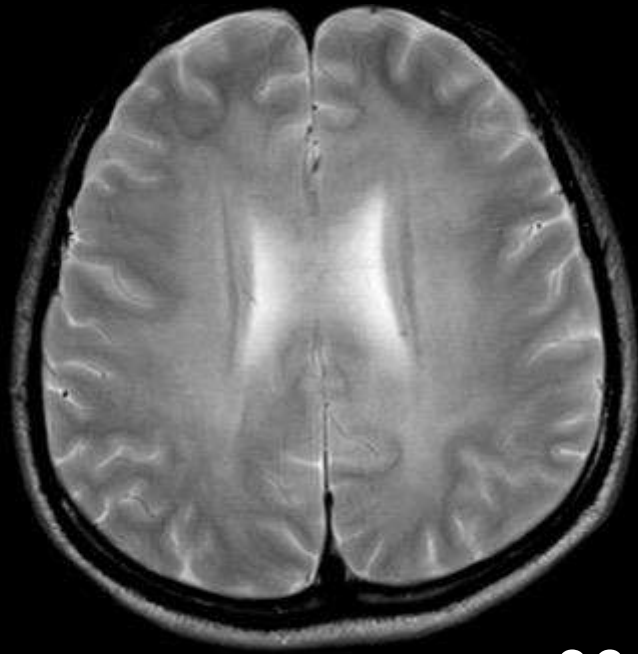






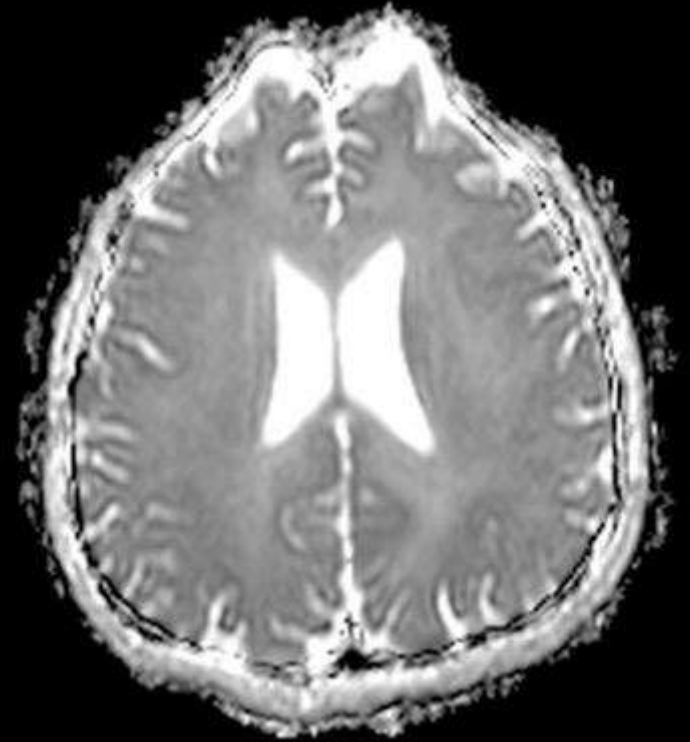
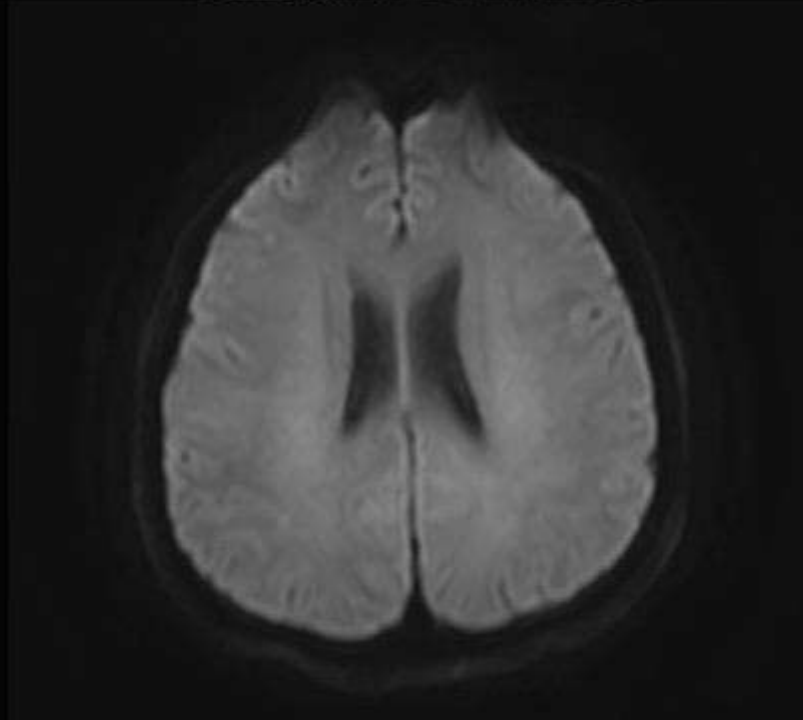
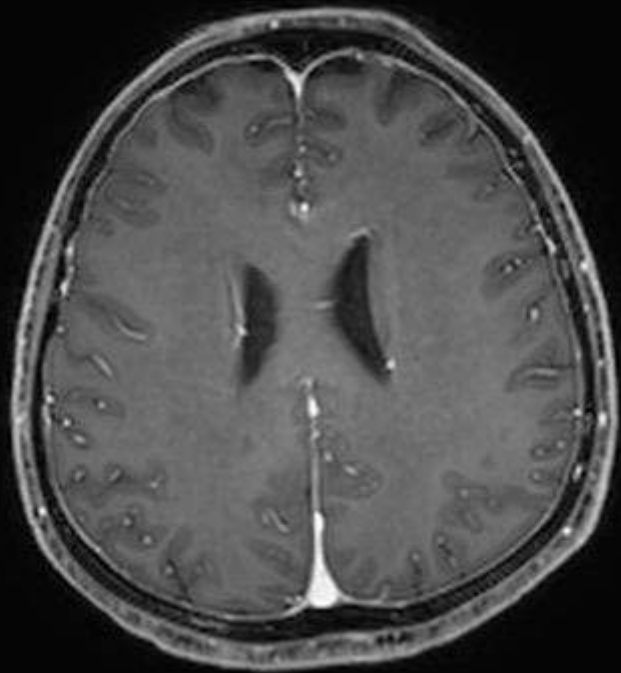
36 y, E





HIV ENSEFALOPATİSİ

36 y, E

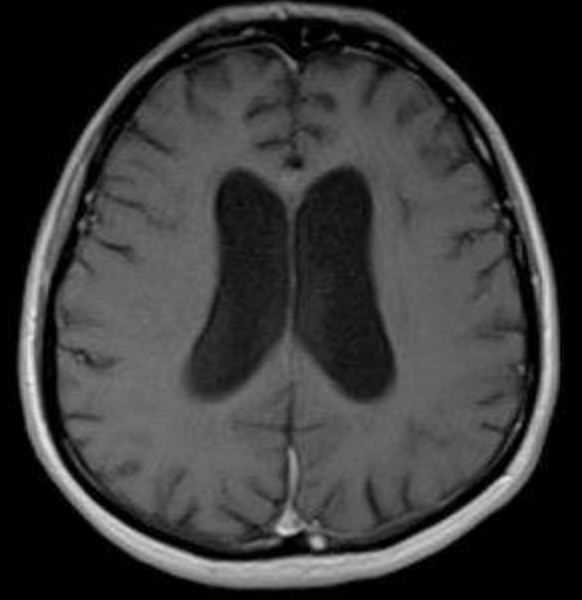
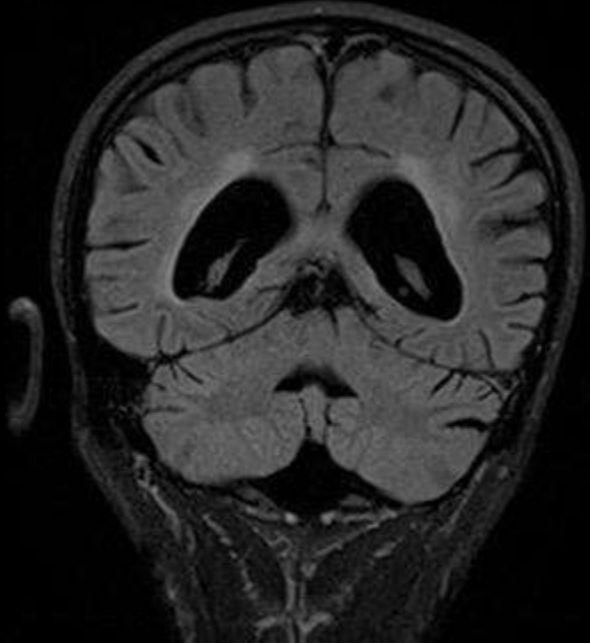




HIV ENSEFALOPATİSİ



3 yıl sonra kognitif fonksiyonlarda
belirgin bozulma





Teşekkürler