
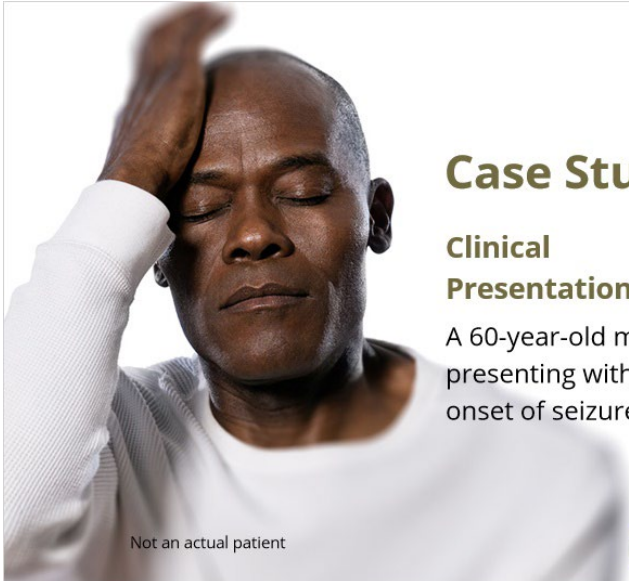


## Case Study 3

### 1. Case Study 3

#### 1.1 Case Study 3



### Case Study 3


**Clinical Presentation**

A 60-year-old male presenting with new onset of seizures

Not an actual patient

Next

#### 1.2 Pre-contrast MR



### MRI of the brain without contrast

<click all the buttons to see more>


T1 AXIAL

T1 AXIAL

T1 AXIAL

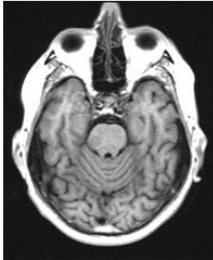
ADMINISTER CONTRAST

### T1 Axial 3 (Slide Layer)




**MRI of the brain without contrast**  
<click all the buttons to see more>

T1 AXIAL      T1 AXIAL      T1 AXIAL



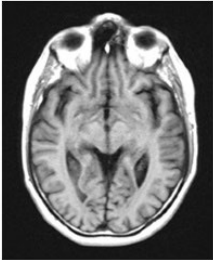
ADMINISTER CONTRAST

### T2 Axial 2 (Slide Layer)




**MRI of the brain without contrast**  
<click all the buttons to see more>

T1 AXIAL      T1 AXIAL      T1 AXIAL



ADMINISTER CONTRAST

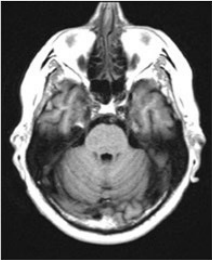
## T1 Axial 1 (Slide Layer)



### MRI of the brain without contrast

<click all the buttons to see more>

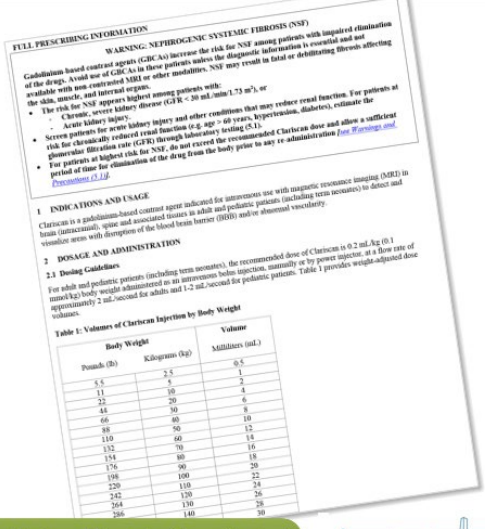
**T1 AXIAL**      **T1 AXIAL**      **T1 AXIAL**



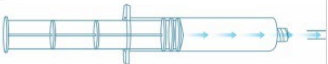
**ADMINISTER CONTRAST**

## 1.3 Administer Contrast

### Syringe (Slide Layer)



**Administer Clariscan™ (gadoterate meglumine)**

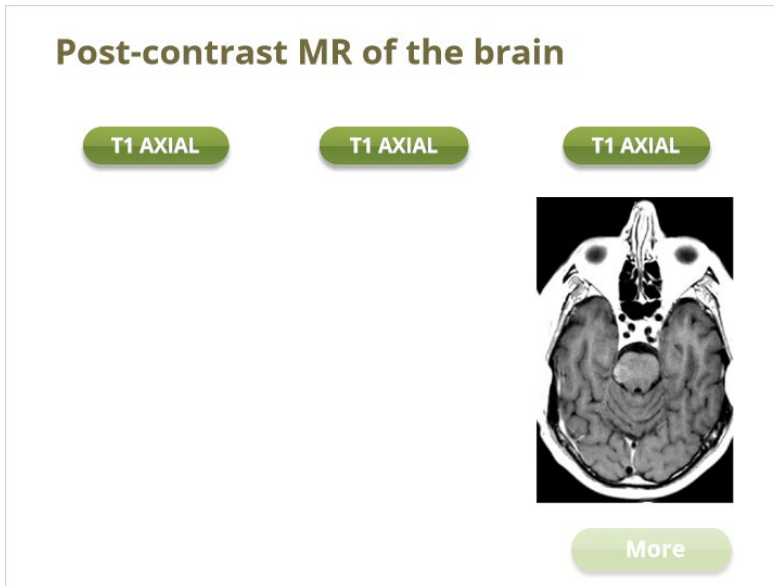


**Table 1: Volumes of Clariscan Injection by Body Weight**

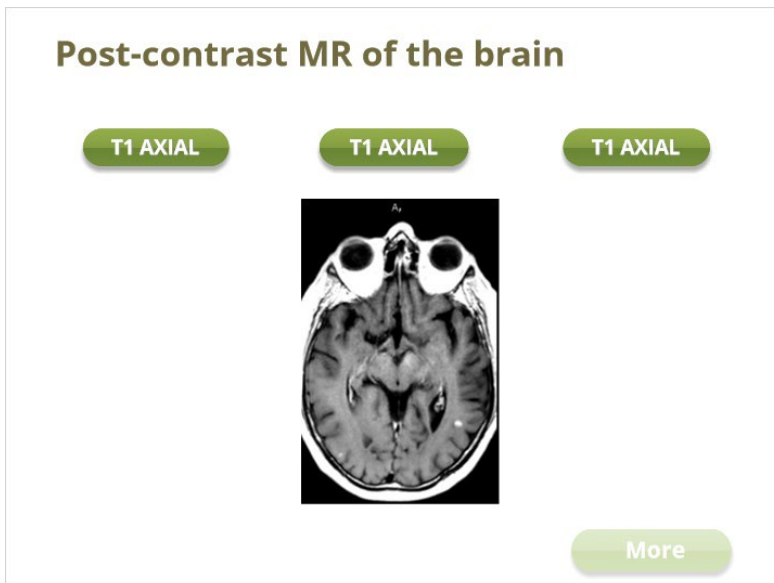
| Body Weight |                | Volume           |
|-------------|----------------|------------------|
| Pounds (lb) | Kilograms (kg) | Milliliters (mL) |
|             |                | 0.5              |
| 5.5         | 2.5            | 1                |
| 11          | 5              | 2                |
| 22          | 10             | 4                |
| 33          | 15             | 6                |
| 44          | 20             | 8                |
| 55          | 25             | 10               |
| 66          | 30             | 12               |
| 77          | 35             | 14               |
| 88          | 40             | 16               |
| 99          | 45             | 18               |
| 110         | 50             | 20               |
| 132         | 60             | 24               |
| 154         | 70             | 28               |
| 176         | 80             | 32               |
| 198         | 90             | 36               |
| 220         | 100            | 40               |
| 242         | 110            | 44               |
| 264         | 120            | 48               |
| 286         | 130            | 52               |
| 308         | 140            | 56               |
| 330         | 150            | 60               |

## 1.4 Post-contrast MR of the brain

### T1 Axial 3 (Slide Layer)




### T1 Axial 2 (Slide Layer)



### T1 Axial 1 (Slide Layer)

**Post-contrast MR of the brain**

T1 AXIAL      T1 AXIAL      T1 AXIAL



More


This slide layer displays a single axial T1-weighted post-contrast MR scan of the brain. The scan shows the brain parenchyma with contrast enhancement. The image is centered in the lower-left quadrant of the slide. Above the image are three green buttons labeled 'T1 AXIAL', and a 'More' button is located in the bottom right corner.

### 1.5 Post-contrast MR of the brain

### T1 Axial 3 (Slide Layer)

**Post-contrast MR of the brain**

T1 AXIAL      T1 AXIAL      T1 AXIAL




More

This slide layer displays a single axial T1-weighted post-contrast MR scan of the brain. The scan shows the brain parenchyma with contrast enhancement. The image is centered in the lower-right quadrant of the slide. Above the image are three green buttons labeled 'T1 AXIAL', and a 'More' button is located in the bottom center.

## T1 Axial 2 (Slide Layer)

**Post-contrast MR of the brain**

T1 AXIAL      T1 AXIAL      T1 AXIAL

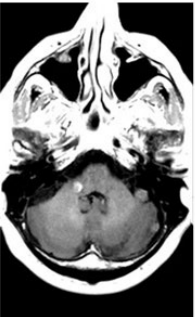


More

## T1 Axial 1 (Slide Layer)

**Post-contrast MR of the brain**

T1 AXIAL      T1 AXIAL      T1 AXIAL



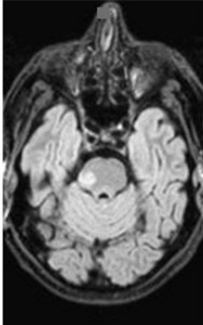
More

## ***1.6 Post-contrast MR of the brain***

### T1 Axial 3 (Slide Layer)

**Post-contrast MR of the brain**

AXIAL FLAIR      AXIAL FLAIR      AXIAL FLAIR

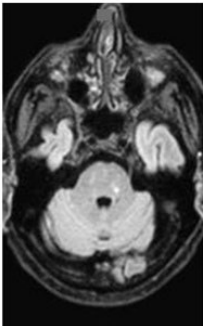


Findings

### T1 Axial 2 (Slide Layer)

**Post-contrast MR of the brain**

AXIAL FLAIR      AXIAL FLAIR      AXIAL FLAIR



Findings

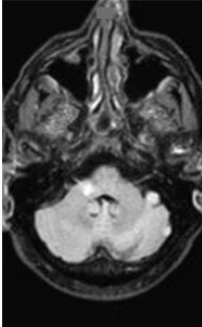
## T1 Axial 1 (Slide Layer)

**Post-contrast MR of the brain**

AXIAL FLAIR


AXIAL FLAIR

AXIAL FLAIR



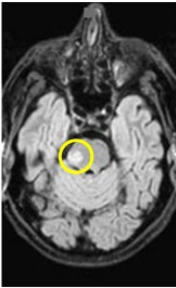

Findings

### 1.7 Findings

 **Findings**

Numerous nodular enhancing lesions consistent with metastatic disease

**Diagnosis**  
Brain metastases



Clinical Information



## 1.8 Clinical information

### Epidemiology

Brain metastases are estimated to account for approximately 25-50% of intracranial tumors in hospitalized patients. The true incidence of brain metastases is unknown.

### Primary tumors that commonly account for brain metastases

lung cancer  
renal cell carcinoma  
breast cancer  
melanoma  
gastrointestinal tract adenocarcinomas  
(the majority colorectal carcinoma)



Next

## 1.9 Clinical information

### Clinical presentation

These patients can commonly present with headaches, seizures, mental status alterations, ataxia, nausea and vomiting, and visual disturbances. However, up to 60-75% of patients can be asymptomatic at the time of imaging.

Radiographic features

## 1.10 Radiographic features

### Radiographic features: MRI

Brain metastases can vary in imaging appearance, make it challenging to evaluate these lesions on cross-sectional imaging. They often occur at the grey-white matter junction.

#### T1

Typically iso- to hypointense

#### T1 C+

Enhancement pattern can be uniform, punctate, or ring-enhancing, but it is usually intense. Delayed sequences may show additional lesions, therefore contrast-enhanced MR is the current standard for small metastases detection

#### T2

Typically hypointense

#### FLAIR

Typically, hyperintense with hyperintense peri-tumoral edema

Treatment

## 1.11 Treatment and prognosis

### Treatment and prognosis



#### Symptomatic treatment

Corticosteroids are given to limit the effects of peritumoral edema. Hyperosmolar agents (e.g., mannitol) can be given to decrease ICP and anticonvulsants are given to prevent seizures.

#### Therapeutic treatment

Radiation (whole brain external beam or stereotactic for smaller masses), chemotherapy, and surgical resection may be done to prolong survival and palliate symptoms.

#### Prognosis

Overall, patients with brain metastases typically have a mean survival of one month without treatment. With treatment, survival improves, but it is still dismal. The mean age of survival is still less than one year, although in some patients with solitary metastases longer survival is encountered.

References

## 1.12 References

### References:

1. Barnholtz-Sloan JS, Sloan AE, Davis FG et-al. Incidence proportions of brain metastases in patients diagnosed (1973 to 2001) in the Metropolitan Detroit Cancer Surveillance System. *J Clin Oncol.* 2004;22 (14): 2865-2872. doi:10.1200/JCO.2004.12.149
2. Fink KR, Fink JR. Imaging of brain metastases. *Surg Neurol Int.* 2013;4 (Suppl 4): S209-S219.
3. Soffietti R, Cornu P, Delattre JY et-al. EFNS Guidelines on diagnosis and treatment of brain metastases: report of an EFNS Task Force. *Eur J Neurol.* 2006;13 (7): 674-81. doi:10.1111/j.1468-1331.2006.01506.x
4. Kaal EC, Taphoorn MJ, Vecht CJ. Symptomatic management and imaging of brain metastases. *J Neurooncol.* 2005;75 (1): 15-20. doi:10.1007/s11060-004-8094-5-Pubmed citation.



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