GE HealthCare

BRAIN

Case studies from Lawrence N Tanenbaum, MD FACR using macrocyclic CLARISCAN™ (gadoteric acid)

Lawrence N Tanenbaum, MD FACR is Vice President/Chief Technology Officer Director of CT, MR and Advanced Imaging for RadNet, a large network of outpatient diagnostic imaging centres in USA. Dr Tanenbaum has 37+ years experience in the medical field, is a member of editorial boards of several journals/educational organizations and a reviewer for scientific journals. He has authored 100+ scholarly and peer-reviewed articles, chairs educational/academic meetings, and has delivered 2000+ invited global lectures.

All case study images courtesy of Lawrence N Tanenbaum, MD FACR and RadNet.

Clariscan™

Macrocyclic, ionic GBCA

Cage-like structure encloses and tightly binds the Gd^{3+} ion[1]

Highly stable[2]

Rapid biodistribution and elimination

GE HealthCare

GBCA: gadolinium-based contrast agent
Gd: gadolinium

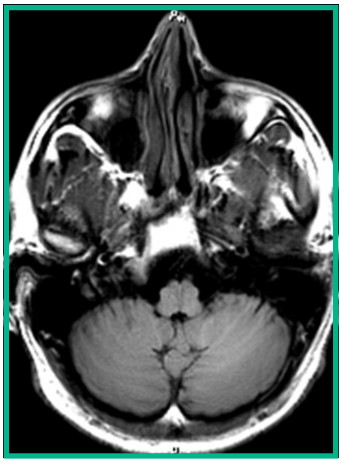
Case study 1

macrocyclic
Clariscan™
gadoteric acid

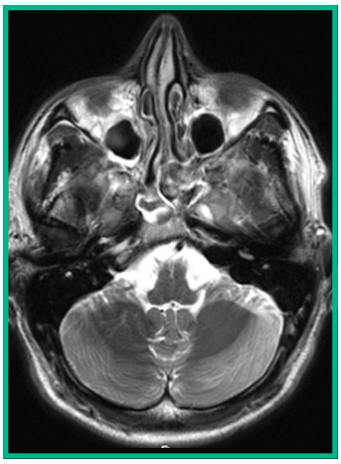
Clinical presentation
A 32-year-old male weighing 85 kg, presented with left facial paresthesias

Imaging
MRI of the brain without contrast and with 18 mL of Clariscan

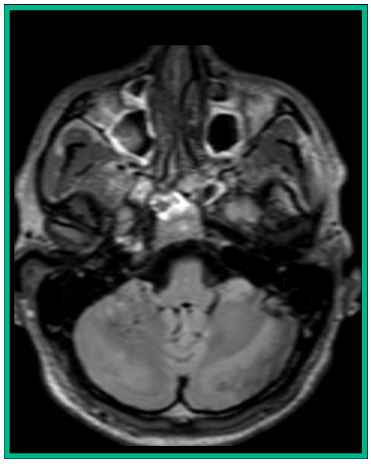
T1 axial



T2 axial



Post-contrast FLAIR axial



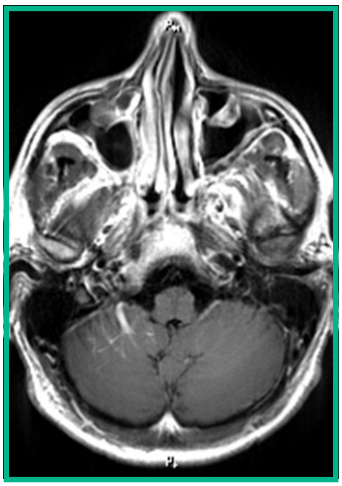
- Pre-contrast images show no obvious abnormality

Imaging findings
Multiple dendritic enhancing vascular structures coalescing on a single draining vein consistent with a developmental venous anomaly

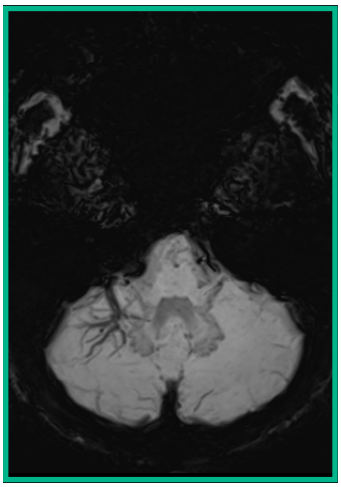
Diagnosis
Developmental venous anomaly

Treatment plan
None

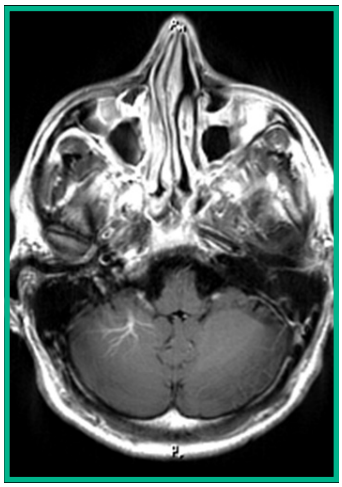
Post-contrast T1 axial



Post-contrast SWI



Post-contrast T1 axial



Case study 2

macrocyclic
Clariscan™
gadoteric acid

Clinical presentation

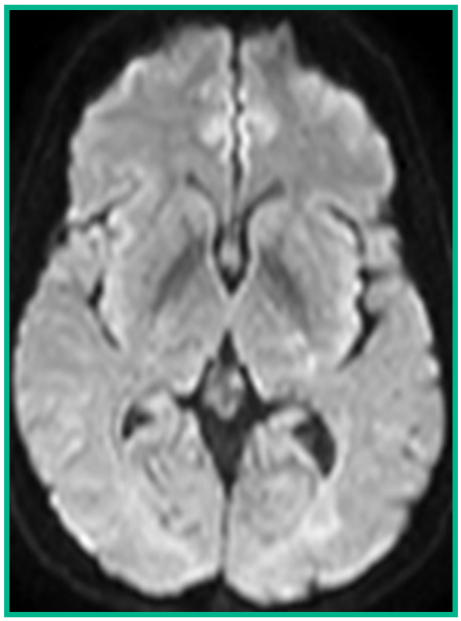
47-year-old female weighing 80 kg, presented with headache

Imaging

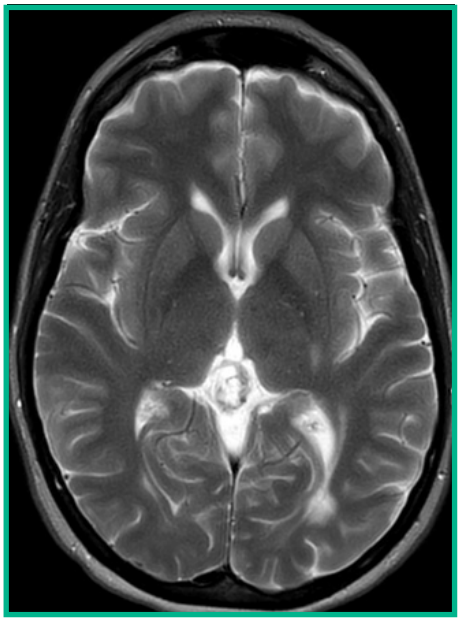
MRI of the brain and pituitary without contrast and with 17 mL of Clariscan

Pre-contrast T1 axial

Pre-contrast DWI axial



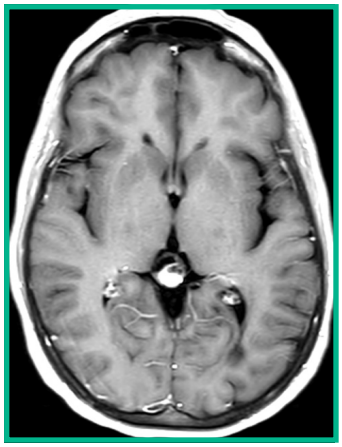
Pre-contrast T2 axial



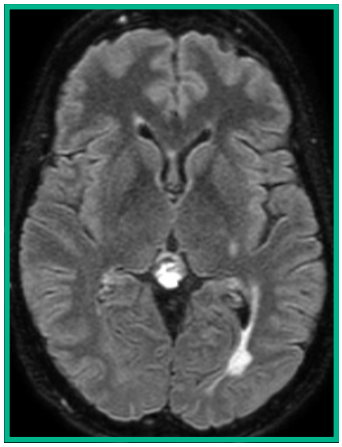
- Complex, predominantly cystic pineal lesion noted

Pre-contrast T1 axial

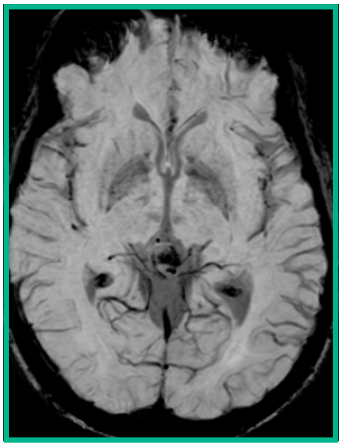
Post-contrast T1 axial



Post-contrast FLAIR



SWI axial



- Complex, partially cystic pineal lesion with enhancing, solid components
- Note the prominent susceptibility effects associated with likely calcified lesion components

Case study 2 *(cont'd)*

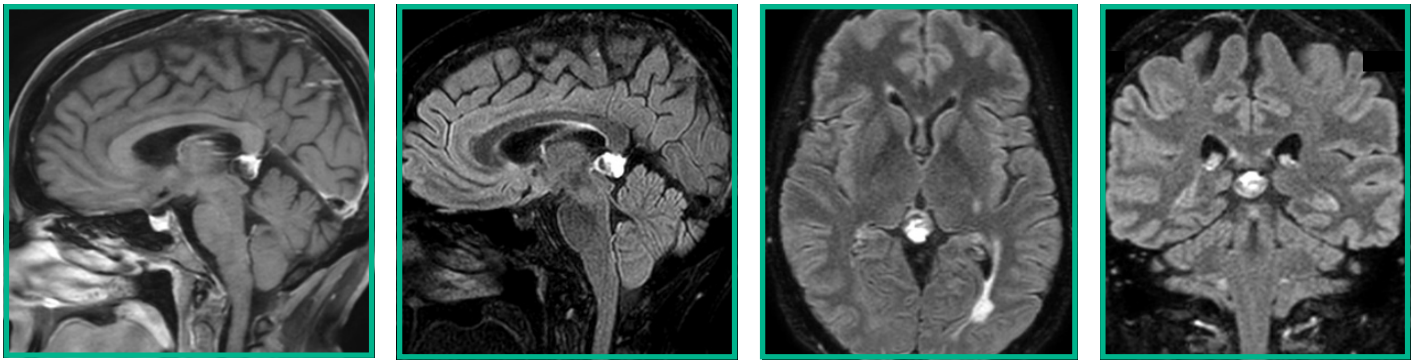
macrocyclic
Clariscan™
gadoteric acid

Imaging findings
Complex, partially cystic pineal lesion with enhancing solid components

Diagnosis
Complex pineal lesion

Treatment plan
Surveillance

Post-contrast T1 sagittal — **Post-contrast FLAIR**



Case study 3

macrocyclic
Clariscan™
gadoteric acid

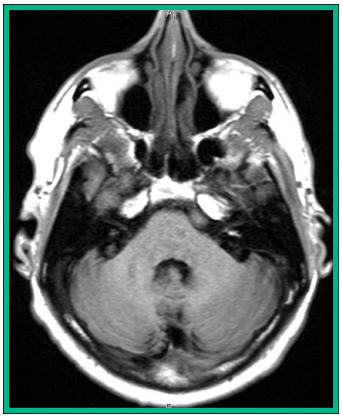
Clinical presentation

55-year-old male weighing 80 kg, presented with headache and tinnitus

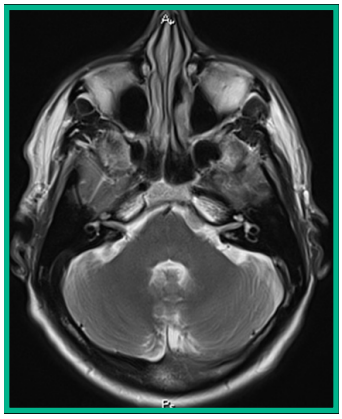
Imaging

MRI of the brain with internal auditory canals/temporary bones without contrast and with 17 mL of Clariscan

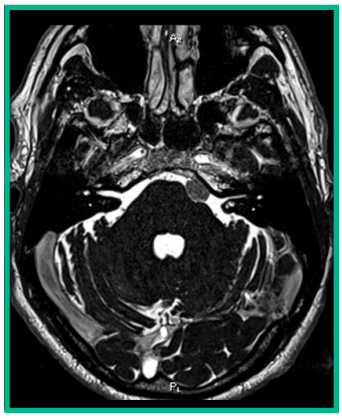
Pre-contrast T1 axial



Pre-contrast T2 axial

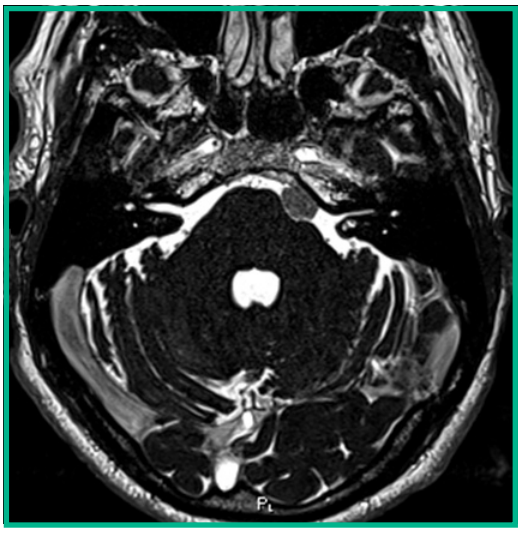


Balanced SSFP (C- cisternographic) imaging

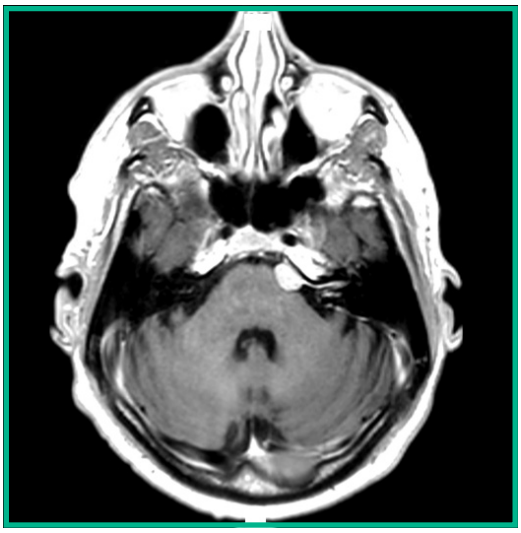


- Possible extra-axial lesion at the left lateral aspect of the pons

Balanced SSFP (C- cisternographic) imaging



Post-contrast T1



- Balanced SSFP (left) and post-contrast T1 axial demonstrate a small left lateral pontine extra-axial mass with a tail of enhancing dura extending into the left internal auditory canal most consistent with a meningioma

Case study 3 *(cont'd)*

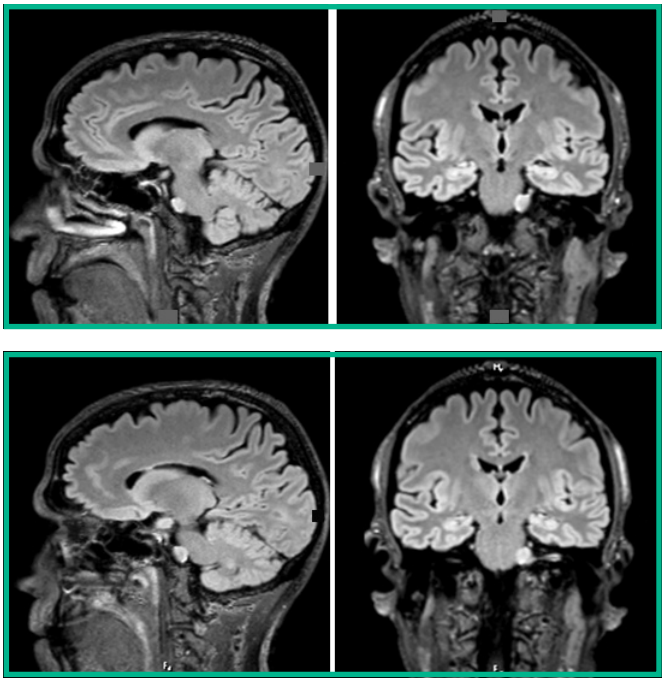
macrocyclic
Clariscan™
gadoteric acid

Imaging findings
Small extra-axial lesion at the left lateral aspect of the pons, which shows significant enhancement on post-contrast images

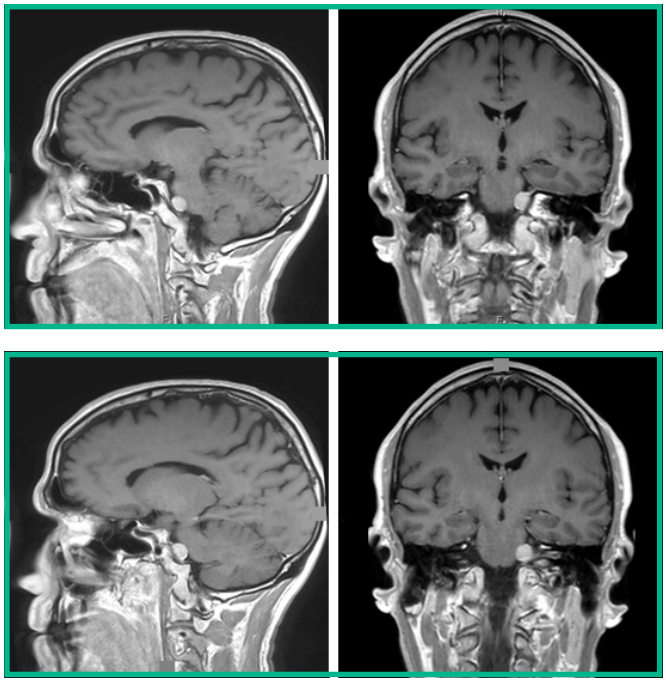
Diagnosis
Meningioma

Treatment plan
Stereotactic radiosurgery

Post-contrast FLAIR sagittal and coronal



Post-contrast T1 sagittal and coronal



Case study **4**

macrocyclic
Clariscan™
gadoteric acid

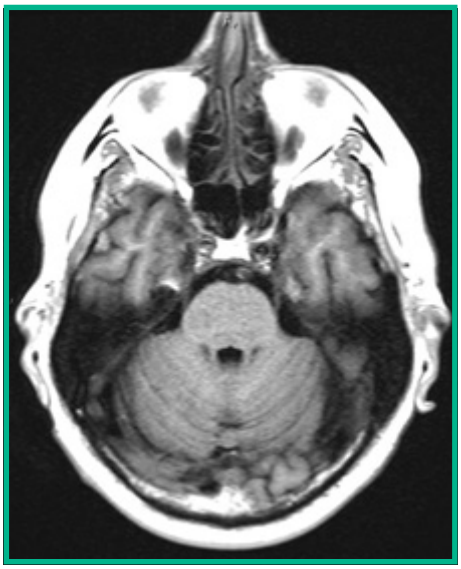
Clinical presentation

A 60-year-old male weighing 90 kg, presented with new onset of seizures

Imaging

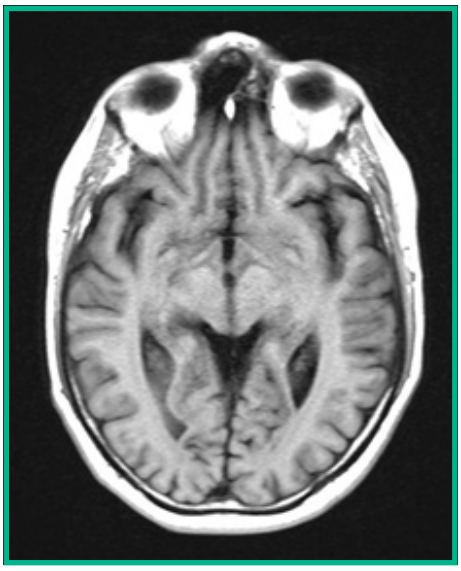
MRI of the brain was performed without contrast and with 20 mL of Clariscan

Pre-contrast T1 axial

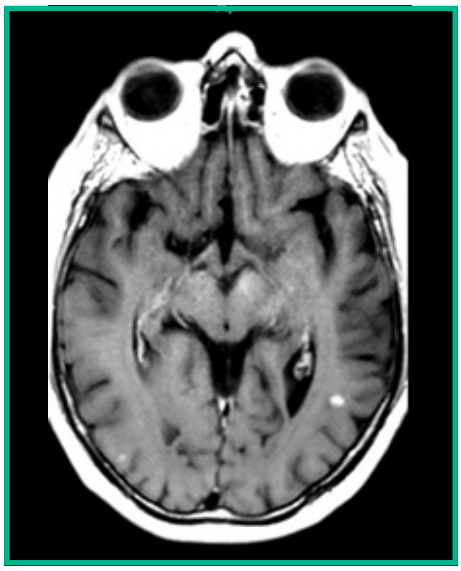


Post-contrast T1 axial

Pre-contrast T1 axial



Post-contrast T1 axial



- Multiple additional enhancing lesions appeared after administration of Clariscan (not apparent on pre-contrast T1)

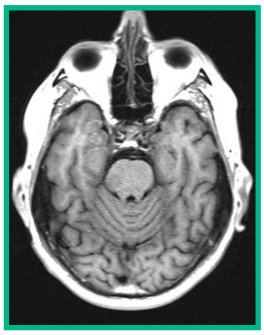
Case study 4 *(cont'd)*

macrocyclic
Clariscan™
gadoteric acid

Imaging findings
Numerous nodular enhancing lesions consistent with metastatic disease

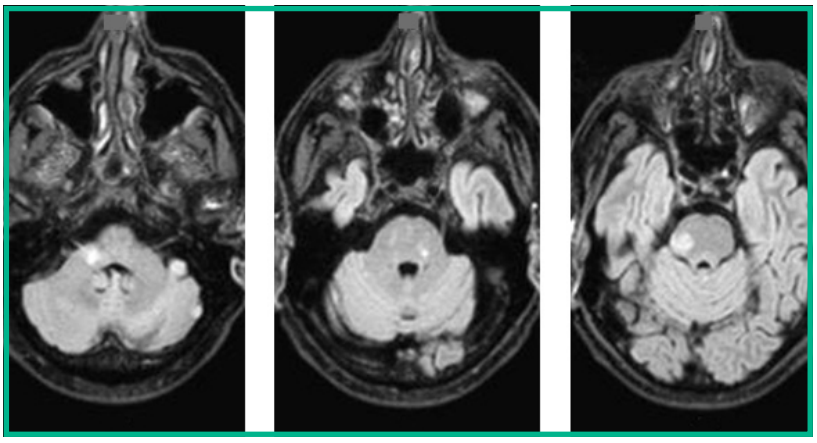
Diagnosis
Brain metastasis

Pre-contrast T1 axial



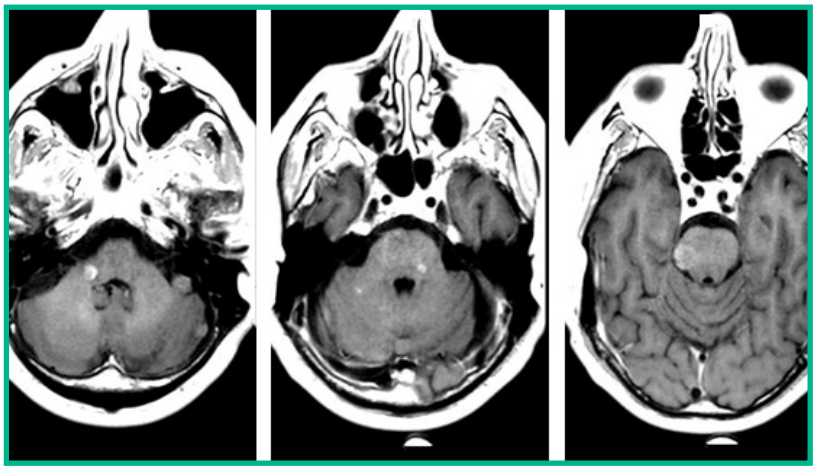
Post-contrast T1 axial

Post-contrast axial FLAIR



- Probable right pontine solitary lesion that is much more clearly defined on Clariscan-enhanced T1 weighted image (right)

Post-contrast T1 axial



- Post-contrast FLAIR axial and T1 reveal multiple nodular enhancing lesions consistent with metastatic disease

Case study 5

macrocyclic
Clariscan™
gadoteric acid

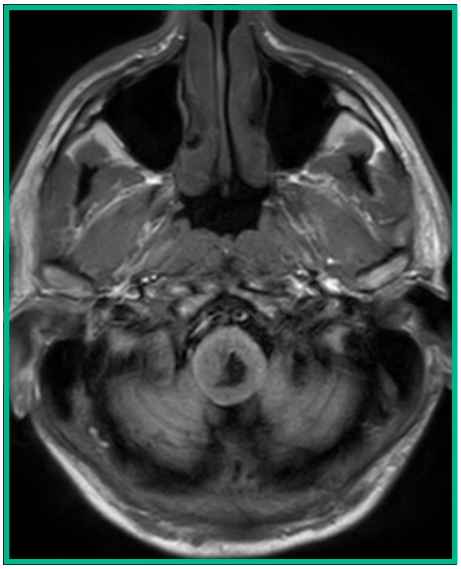
Clinical presentation

A 28-year-old female weighing 70 kg, presented with headache and weakness

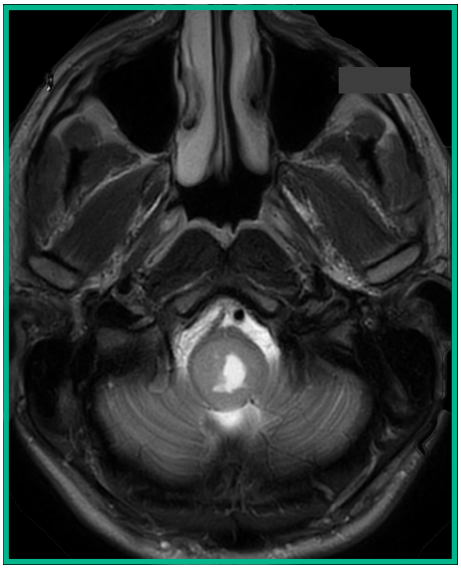
Imaging

MRI of the brain without contrast and with 15 mL of Clariscan

Pre-contrast T1

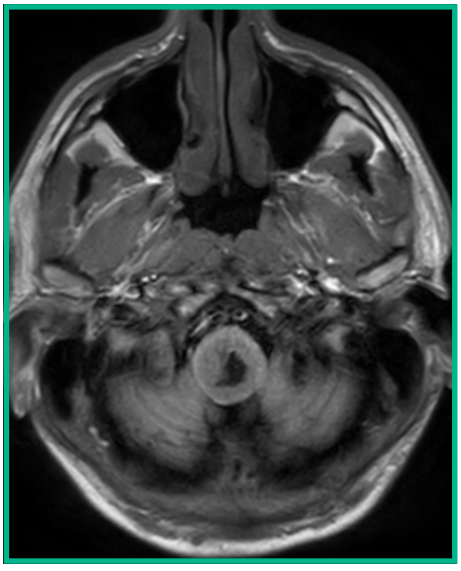


T2

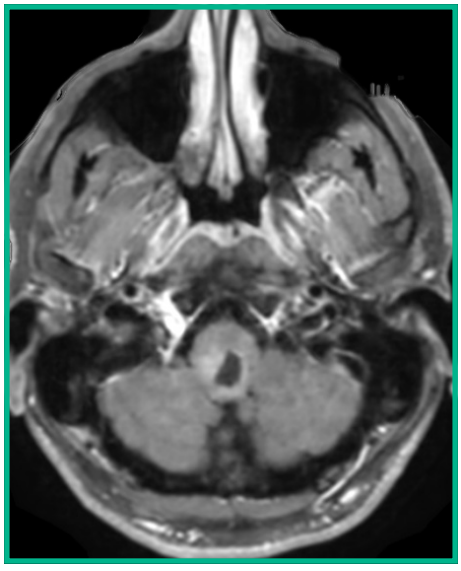


- Imaging reveals a complex, exophytic lower brainstem lesion

Pre-contrast T1



Post-contrast



- Complex, exophytic lower brain stem lesion with enhancing and non-enhancing components

Case study 5 *(cont'd)*

macrocyclic
Clariscan™
gadoteric acid

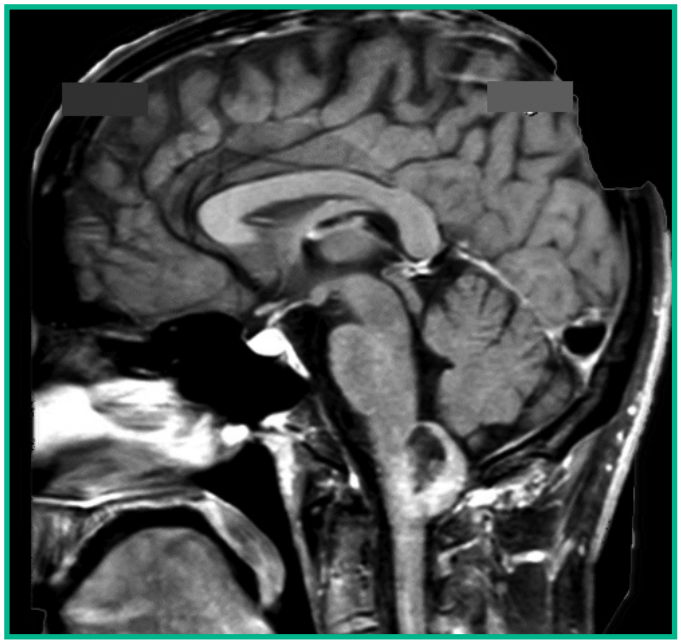
Imaging findings
Complex, dorsally exophytic lower brainstem lesion

Diagnosis
Diffuse midline-brainstem glioma

Treatment plan
Radiation and chemotherapy

Post-contrast sagittal FLAIR

Post-contrast T1 FSE



- Partially enhancing, complex dorsally exophytic lower brainstem lesion

Dr Tanenbaum is a consultant of GE HealthCare

References:
1. Tweedle MF *et al*. App Radiol 2014; (suppl): 1-11.
2. Port M *et al*. Biometals 2008; 21: 469-90.

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