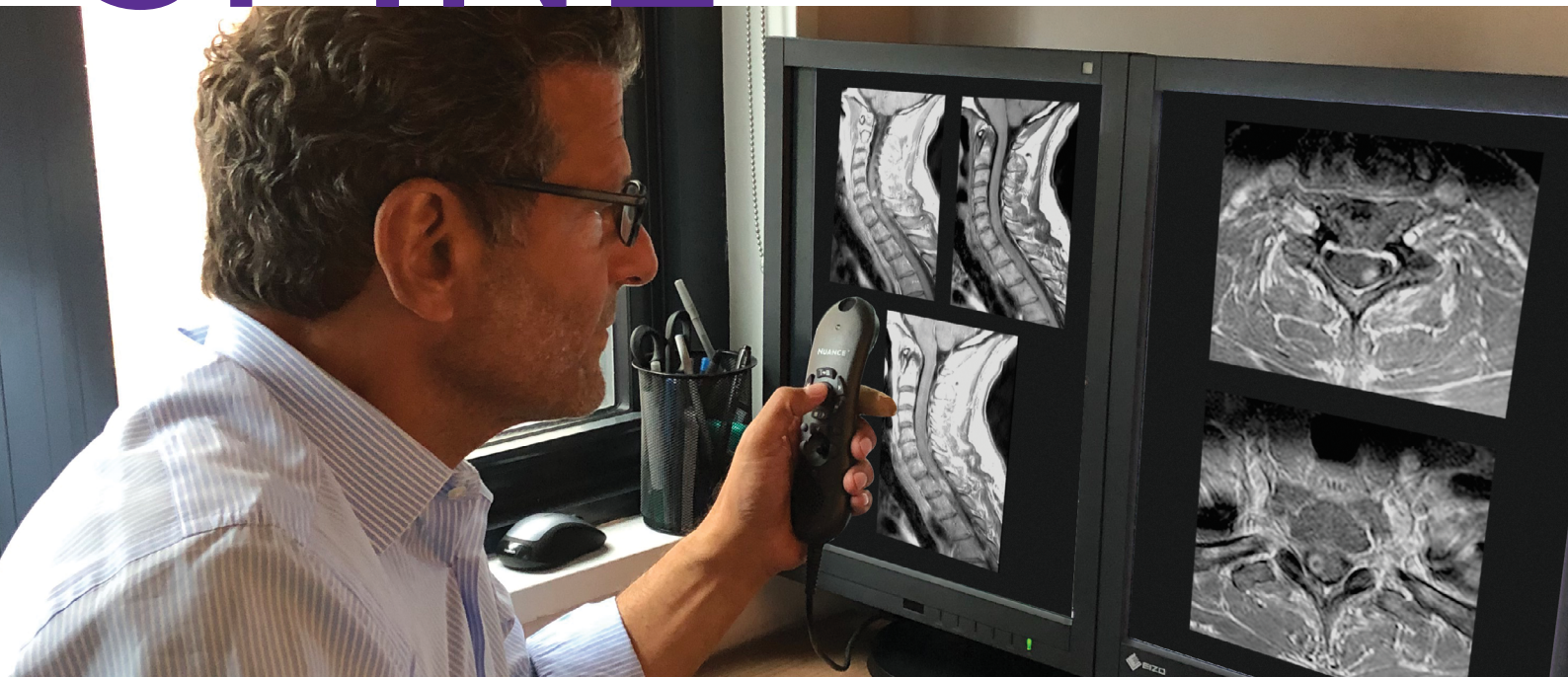




GE HealthCare

# SPINE




## 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.

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macrocyclic  
**Clariscan™**  
gadoteric acid

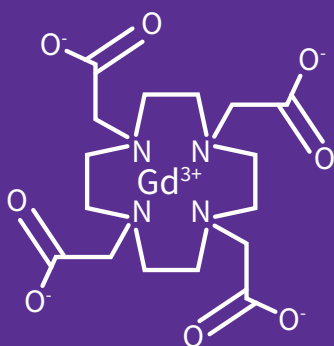
# Clariscan™

Macrocyclic, ionic GBCA

Cage-like structure encloses and tightly binds the  $Gd^{3+}$  ion<sup>1</sup>

Highly stable<sup>2</sup>

Rapid biodistribution and elimination



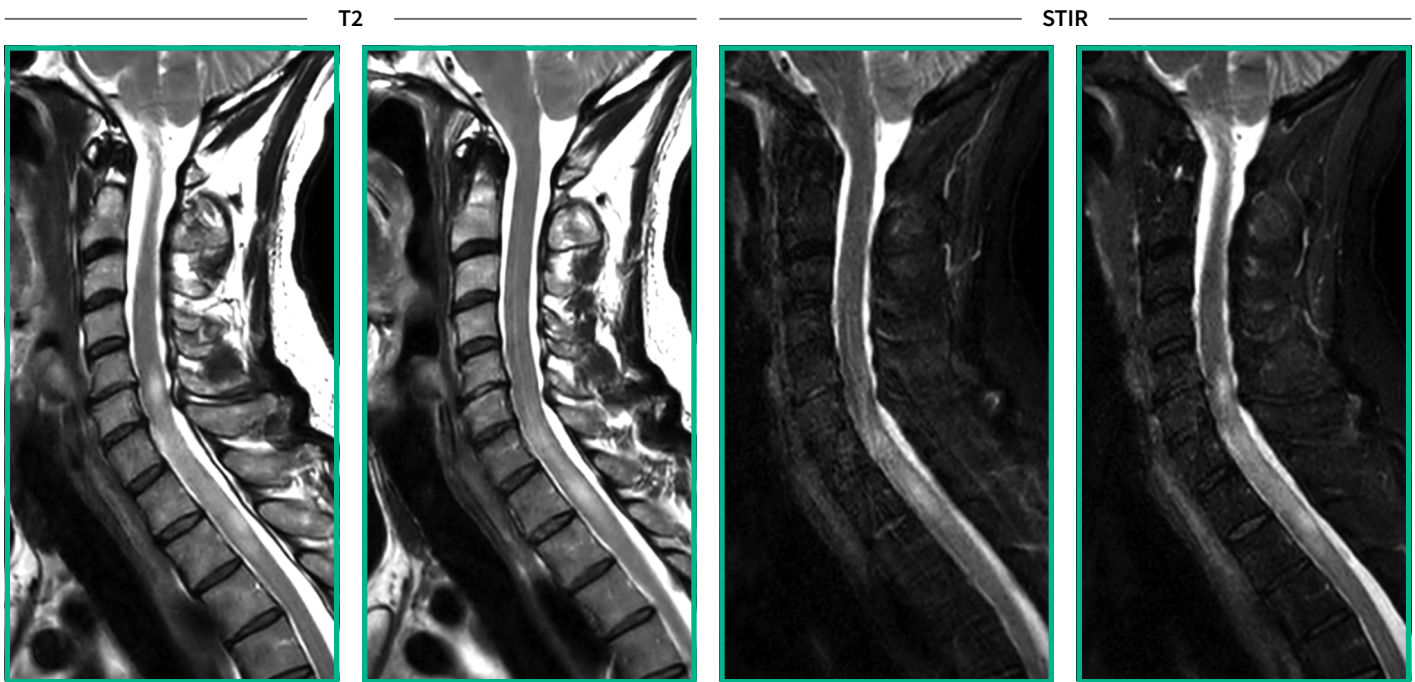
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## Clinical presentation

55-year-old male weighing 73 kg, presented with bilateral sensory and motor symptoms.  
Prior brain and optic nerve imaging normal

## Imaging

MRI of the cervical spine and brain without contrast and with 16 mL of Clariscan



- Poorly defined intramedullary lesion extending from C5-T3

# Case study 1 (cont'd)

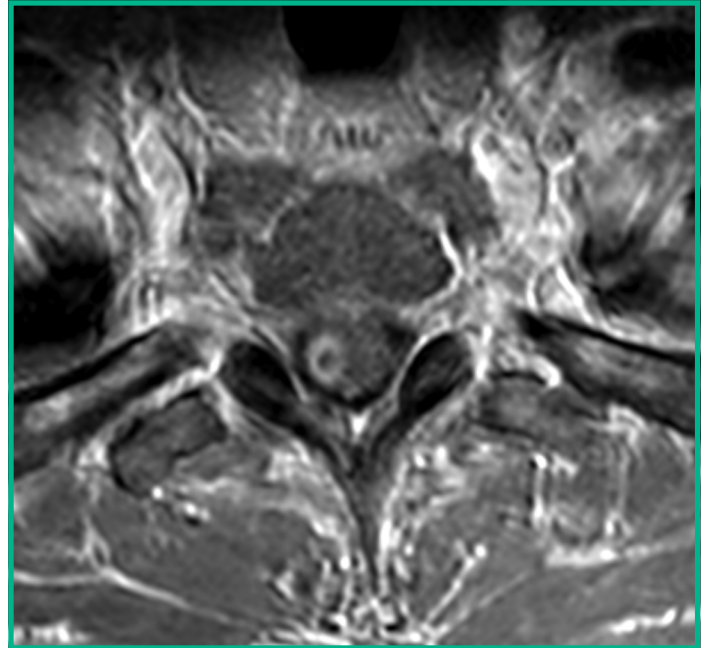
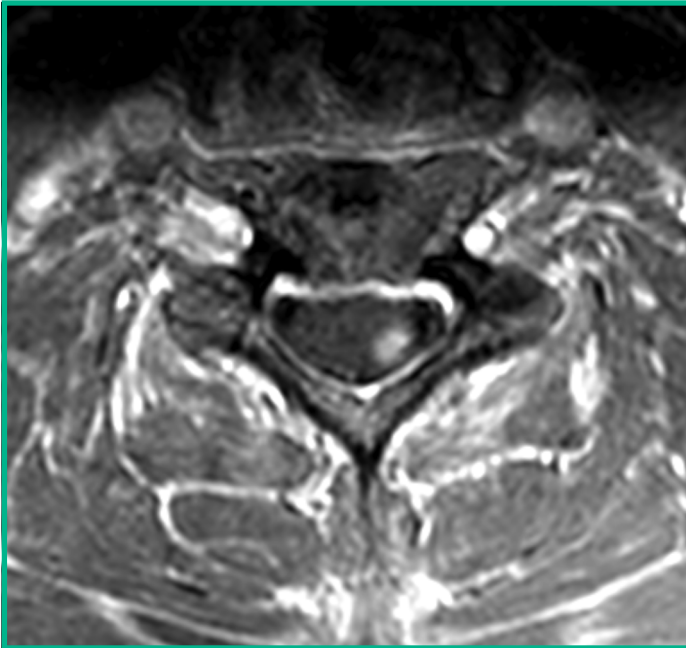
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Pre-contrast T1WI

Post-contrast T1WI



Post-contrast T1



- Nodular and ring enhancing lesions within the cord consistent with myelitis

### Imaging findings

Nodular and ring enhancing lesions within the cord consistent with myelitis.  
No evidence of abnormality on brain or optic nerve imaging

### Diagnosis

MRI results are consistent with myelitis

### Treatment

Medical therapy

# Case study 2

## Clinical presentation

72-year-old male weighing 64 kg, presented with back pain; history of prostate CA

## Imaging

MRI of the spine without contrast and with 14 mL of Clariscan

Pre-contrast T1



Pre-contrast T1



Post-contrast T1



- Lesions at L2 and L5 which fill in/enhance post-contrast (arrows)

# Case study 2 (cont'd)

macrocyclic  
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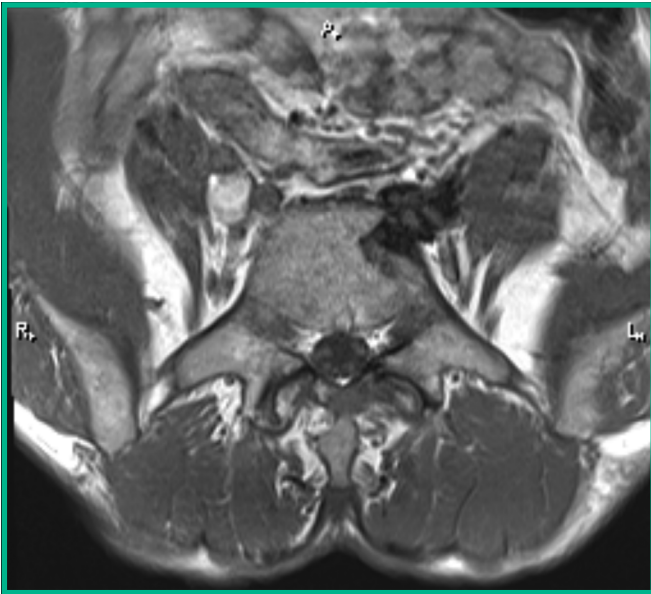
STIR



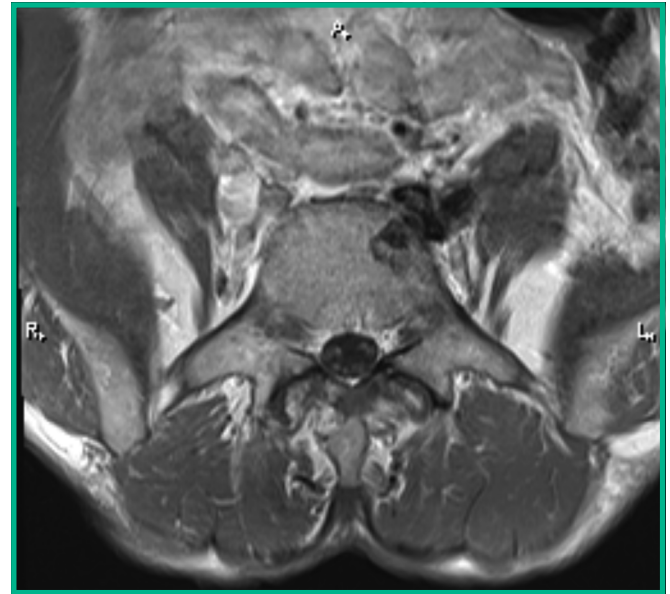
T2



Pre-contrast T1



Post-contrast T1



T2



- Partially enhancing lesion within the anterior aspect of the S1 vertebral body

## Imaging findings

Lesions at L2 and L5 which fill in/enhance post-contrast

## Diagnosis

MRI results are consistent with metastatic disease

## Treatment plan

Radiation and chemotherapy

# Case study 3

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## Clinical presentation

45-year-old male weighing 86 kg, presented with back pain and left side S1 radiculopathy;  
prior surgery at L5-S1

## Imaging

MRI of the spine without contrast and with 19 mL of Clariscan

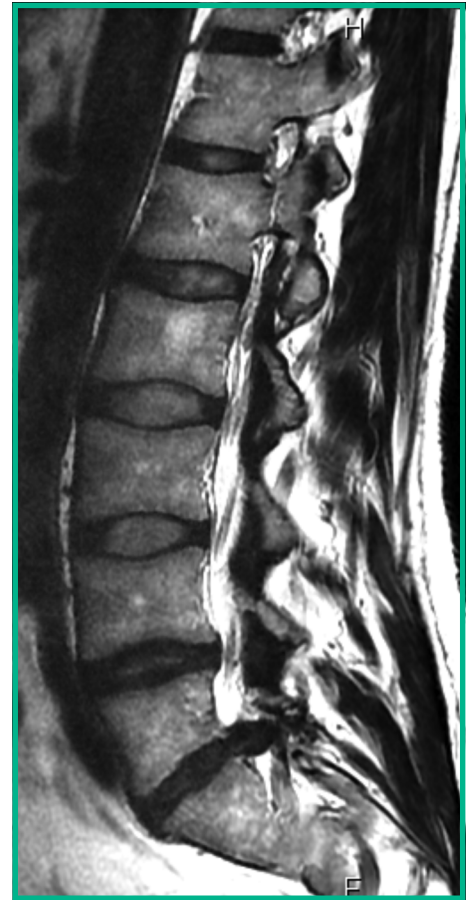
Pre-contrast T1



PD



T2



- Scans reveal abnormal anterior extradural soft tissue to the left of midline at L5-S1

# Case study 3 (cont'd)

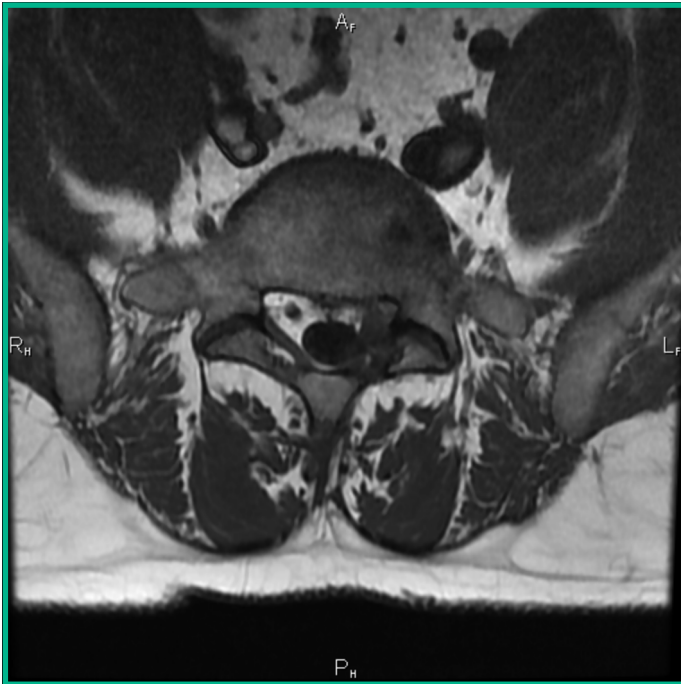
Pre-contrast T1



Post-contrast T1



- Images demonstrate anterior extradural nonenhancing tissue at L5-S1 consistent with a recurrent herniation



## Pre-contrast T1

- Abnormal soft tissue obscuring the tissue planes with the left S1 nerve root



## Pre-contrast T1

- Island of nonenhancing tissue within a 'sea' of enhancement at L5-S1 consistent with a recurrent herniation which displaces the left S1 root posteriorly
- Herniated material (upper/anterior arrow)
- Displaced S1 root (lower/posterior arrow)

## Imaging findings

Island of nonenhancing tissue within a 'sea' of enhancement at L5-S1 consistent with a recurrent herniation

## Diagnosis

MRI results are consistent with recurrent herniation

## Treatment plan

Repeat surgery

# Case study 4

## Clinical presentation

60-year-old female weighing 64 kg, presented with right sided back pain and right sided radiculopathy; prior surgery at L5-S1 for herniation

## Imaging

MRI of the spine without contrast and with 14 mL of Clariscan

Pre-contrast T1



STIR



T2



- Abnormal anterior extradural tissue at the L5-S1 level which could reflect postsurgical change or recurrent herniation

Pre-contrast T1

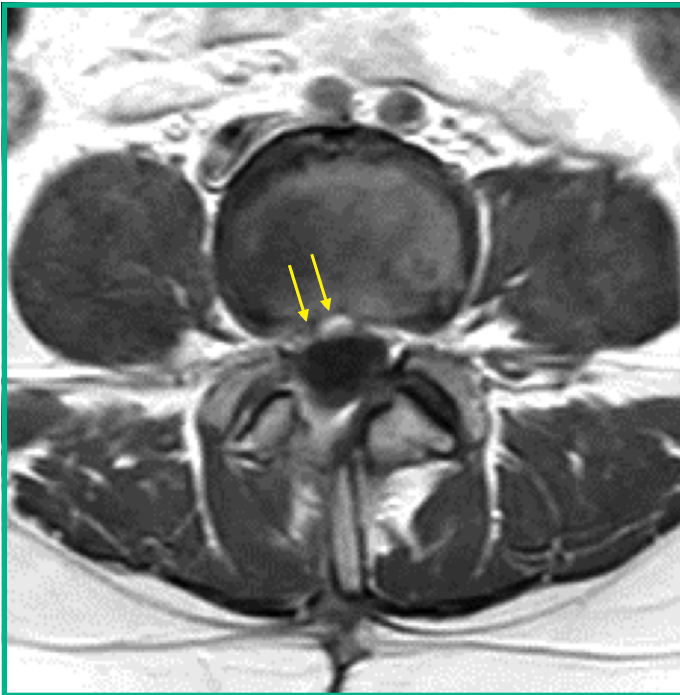


Post-contrast T1



- Enhancing anterior extradural tissue at the L5-S1 level consistent with postsurgical change

Post-contrast T1



Non-contrast T2



- Right sided hemilaminotomy and enhancing epidural soft tissue consistent with treatment-related change

## Imaging findings

Right sided hemilaminotomy and enhancing epidural soft tissue consistent with treatment-related change

## Diagnosis

MRI results are consistent with postsurgical change

## Treatment plan

Conservative treatment

# Case study 5

## Clinical presentation

60-year-old female weighing 64 kg, presented with right sided back pain and right sided radiculopathy; prior surgery at L5-S1 for herniation

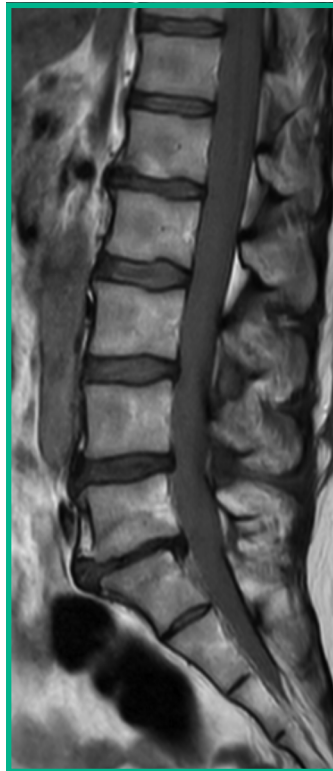
## Imaging

MRI of the spine without contrast and with 14 mL of Clariscan

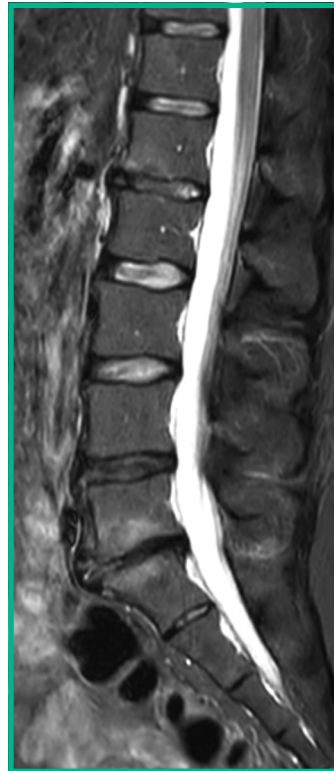
Pre-contrast T1



Proton density



STIR



T2

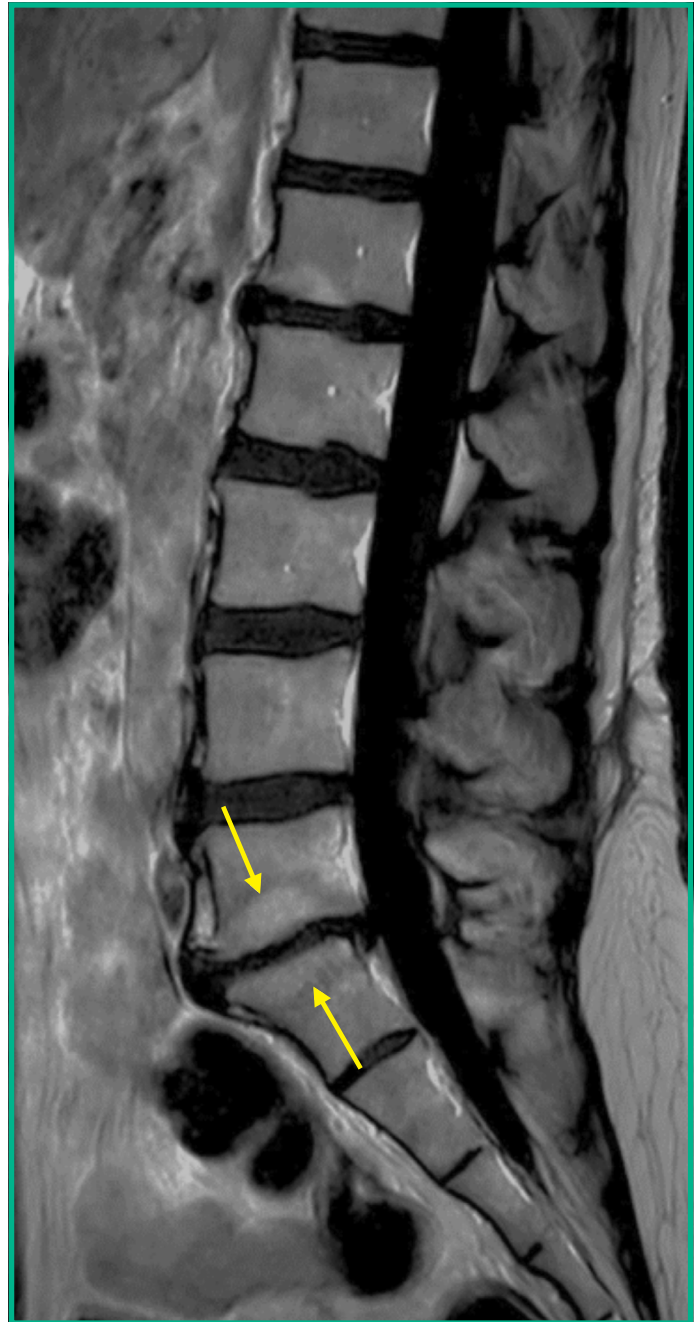


- Non-contrast images demonstrate loss of disc height with mixed endplate region signal changes and loss of disc height at L4-L5

Pre-contrast T1



Post-contrast T1



- Loss of disc height with mixed endplate region signal changes and enhancement

## Imaging findings

Loss of disc height with mixed endplate region signal changes and enhancement which may be clinically symptomatic

## Diagnosis

MRI results are consistent with symptomatic degenerative endplate changes

## Treatment plan

Conservative treatment and physical therapy

# Case study 6

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## Clinical presentation

62-year-old male weighing 91 kg, presented with back pain

## Imaging

MRI of the spine without contrast and with 20 mL of Clariscan

Pre-contrast T1



STIR



T2



- Dorsal extradural lesion at L1-2 indenting the thecal sac (circle)

Pre-contrast T1

Post-contrast T1



- Peripherally enhancing dorsal extradural lesion at L1-2 indenting the thecal sac

## Imaging findings

Peripherally enhancing dorsal extradural lesion at L1-2 indenting the thecal sac

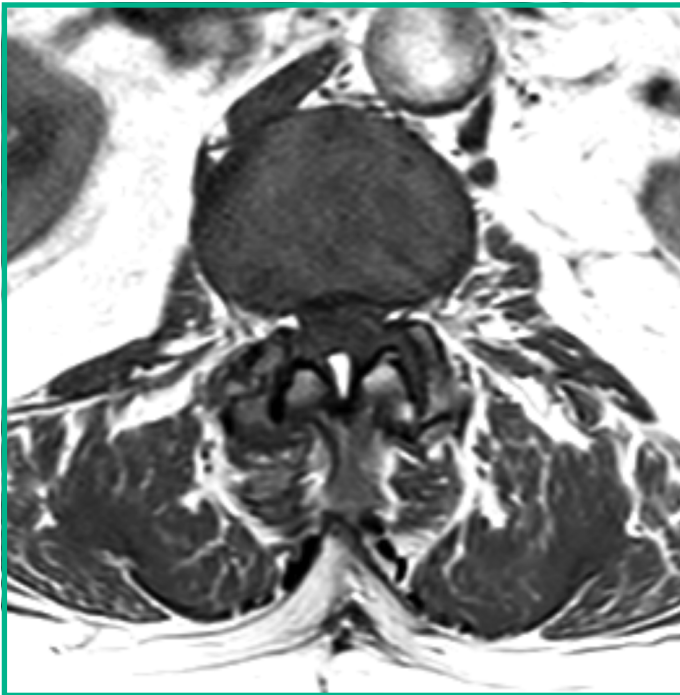
## Diagnosis

MRI results are consistent with synovial cyst

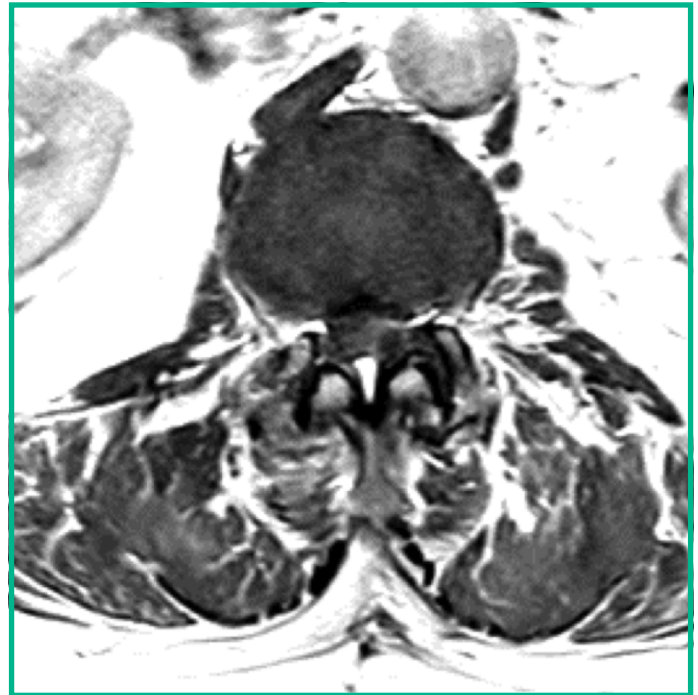
## Treatment plan

Resection

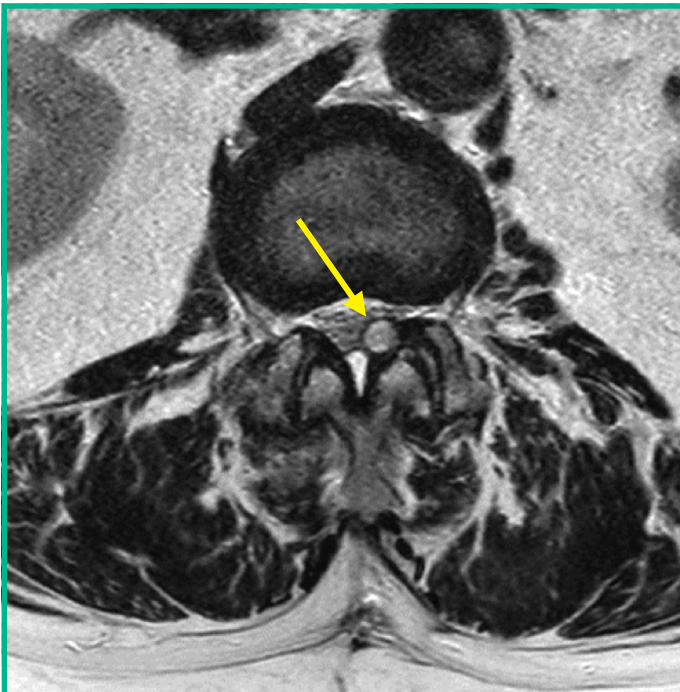
Pre-contrast T1



Post-contrast T1



Non-contrast T2



- Left sided dorsal extradural lesion at L1-2 indenting the thecal sac consistent with a facet joint synovial cyst



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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