PITFALLS IN SPINAL ASSESSMENT

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Training Profile

Trained at Guy's & St Thomas'

Orthopaedic Training in UCH, GOSH, RNOH, London

Fellowship Deformity Training in Stanmore / Norwich

Neurosurgical Training in Cambridge

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Consultant Profile

Chief of Spinal Surgery @ The Hospital of St John's & St Elizabeth's

Lead Spinal Services Development at The London Clinic

Immediate Past President of Royal Society of Medicine (Orthopaedics)

Editor Spinal Surgery News

JBJS Spine Reviewer

AO Spine International Faculty Teacher

NHS Choices Spinal Advisor

BASS Education & Research Committee

NASS NORTH AMERICAN SPINE SOCIETY

The Royal Society of Medicine

AOSPINE

BASS British Association of Spine Surgeons

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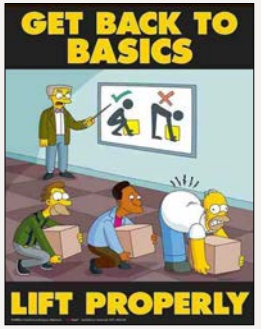
Outline of the talk

1. Basic Principles
2. Spinal Imaging
3. Cauda Equina
4. Rare Occurrences



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Initial Assessment

History

Examination

Imaging

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History

TALK to them!

Understand whole journey (acute / acute on chronic / stable conditions)

What brought them to seek attention (hidden anxieties)

What are their objectives (same age different goals)

Explore their often incorrect understandings (internet / well meaning know it all)

Beware nutters (history doesn't act as a guide)

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Worrying Patient Profile

- Pain and suffering often disproportionate to any identifiable disease process
- Depression
- Physical deconditioning
- Inappropriate use of prescribed analgesics
- Superstitious beliefs about bodily functions
- Failure to work or perform expected physical and cognitive activities

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Abnormal Psychometrics

Most predictive components:

- Elevated Hysteria
- Hypochondriasis
- Depression
- Abnormal pain behaviour
- Anxiety
- Involved in litigation

Consider pre surgical psychological screening
80% predictive value
Brock et al Spine J 2001; 1:274-282

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Examination

Spinal ROM

Spinal Neurology (power / tone / sensation / reflexes)

Special Tests

Palpate painful areas

Associated areas eg (hips/knees for low back / shoulder for neck)

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Facet Syndrome

Often to one side

Worse on sitting, easier walking

Pain can go down to back of the knee

Crouch

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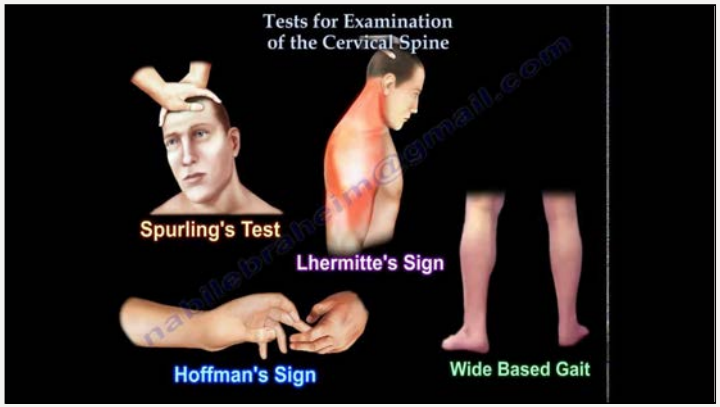
Myelopathy Tests



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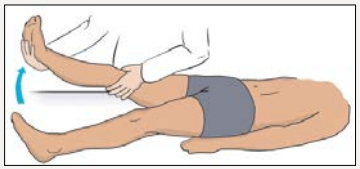
Prolapsed Disc

Slump Test

Heel Walk

Tiptoe Walk

Crouch



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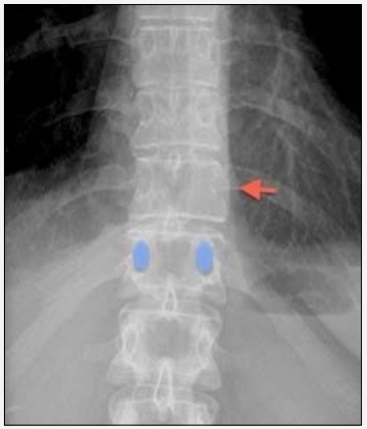
Imaging

- X-rays
- MRI
- CT
- CT SPECT



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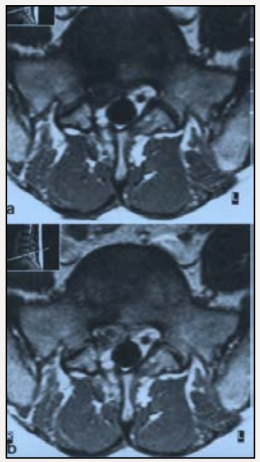
The MRI Scan

- Make sure the scan is appropriate
- If previous surgery has occurred, the scan must be contrast enhanced (otherwise scar tissue and recurrent disc look the same)
- Look to see who has reported it (neuroradiologists better). Many NHS reports are done overseas.
- Need a full set of images (localiser / T1 axial & sagittal / T2 axial & sagittal)



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MRI Scan - Predictor

- Best imaging choice
- Large / sequestered improve
- Small focal less likely
- Foraminal less likely (better seen on T1)

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Sequestered Discs Improve

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Imaging: MRI

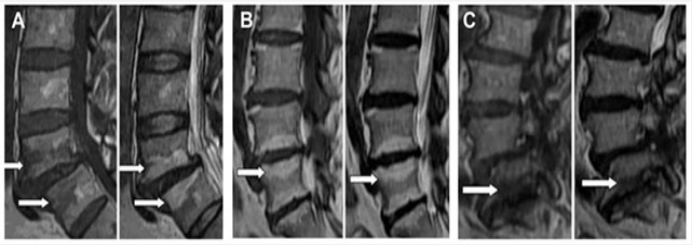

TABLE 1. MODIC CHANGES ACCORDING TO CHANGES IN MRI SIGNAL INTENSITY IN ADJACENT VERTEBRAL ENDPLATES

Modic classification	T1	T2	Represents
I	–	+	Vascularized bone marrow and/or edema
II	+	+	Proliferation of fatty tissue
III	–	–	Sclerotic bone

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Imaging: MRI

- Modic changes are dynamic markers of the normal age-related degenerative process affecting the lumbar spine
- These lesions can convert from one type to another with time
- Type 1 changes are likely to be inflammatory in origin and seem to be strongly associated with active low back symptoms and segmental instability,
- In contrast, type 2 changes are less clearly associated with LBP and seem to indicate a more biomechanically stable state, though superimposed stress may occasionally cause their reverse conversion into type 1 changes.
- The significance of type 3 changes remains largely unknown.

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Imaging: CT

- Great for assessing bony anatomy
- Facet Joints / Fractures / Alignment
- Involves radiation
- Useful preoperatively
- Can do 3d reconstructions

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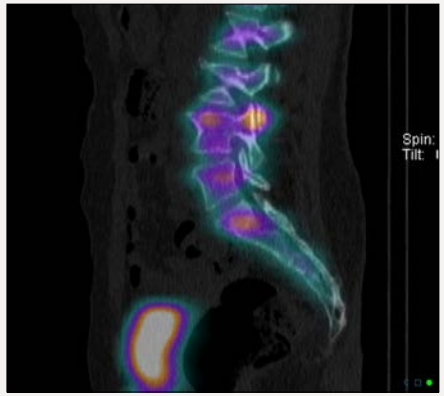
Imaging: CT SPECT

- "Live status of spine"
- CT plus functional information of a bone scan
- Can add information about pain generator
- Radiation involved
- Used sparingly



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Evidence

J Bone Joint Surg Am. 1990 Mar;72(3):403-8

Abnormal magnetic-resonance scans of the lumbar spine in asymptomatic subjects. A prospective investigation.
Boden SD, Davis DO, Dina TS, Patronas NJ, Wiesel SW

•MRI on 67 asymptomatic individuals

•Scans interpreted independently by three blinded neuro-radiologists

•About one-third of the subjects were found to have a substantial abnormality

•Those who were <60yrs old, 20% had a herniated nucleus pulposus

•Those who were >60yrs, abnormal findings on about 57%of the scans (36% of the subjects had HNP and 21% had spinal stenosis)

Abnormalities on MRI must be strictly correlated with age and any clinical signs and symptoms before operative treatment is contemplated.

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Cauda Equina Syndrome

- Clinical Diagnosis
- Acute Spinal Cord Compression
- Contrast with Spinal Stenosis
- Needs clinical assessment and MRI
- I will get out of bed at 2am

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Cauda Equina Syndrome

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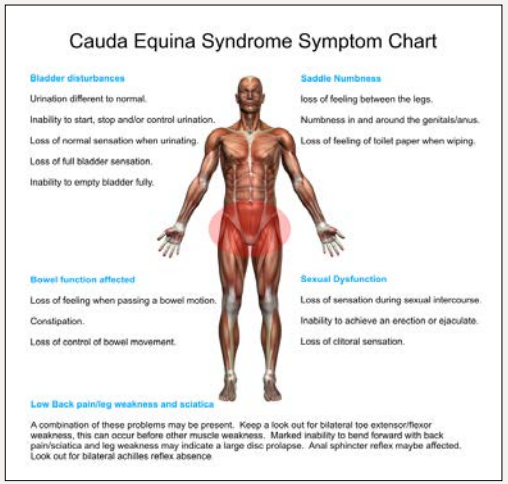

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Symptoms

S Saddle anaesthesia
- Loss of feeling around the buttocks and groin

P Pain
- Severe nerve pain in the back and/or down one or both legs

I Incontinence
- Inability or difficulty urinating and/or moving bowels

N Numbness
- Lack of sensation and/or weakness in the legs

E Emergency!!
- Any of the above symptoms could be a sign of Cauda Equina - please contact your GP or A&E department immediately

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Incorrect Diagnosis

- Misattributed
- Misdiagnosed
- MRIs may show multiple pathologies - have you got the right one?
- MRIs don't show all pathology (eg SI joint - needs CT SPECT)
- Anatomical variants - eg conjoint nerve roots
- Concomitant pathologies eg foraminal & central stenosis
- Adjacent levels to a fusion may be painful

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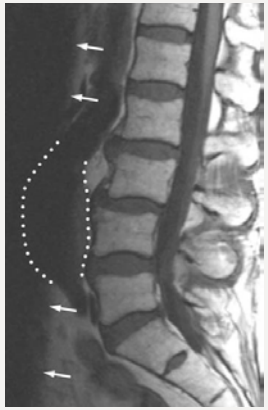
Right System?

- Kidney Stone - back pain
- Lung Tumour - shoulder pain
- AAA - back pain
- Cardiac - left arm pain
- Brain - balance
- Hip
- Neurological - intrinsic pathology
- Shoulder



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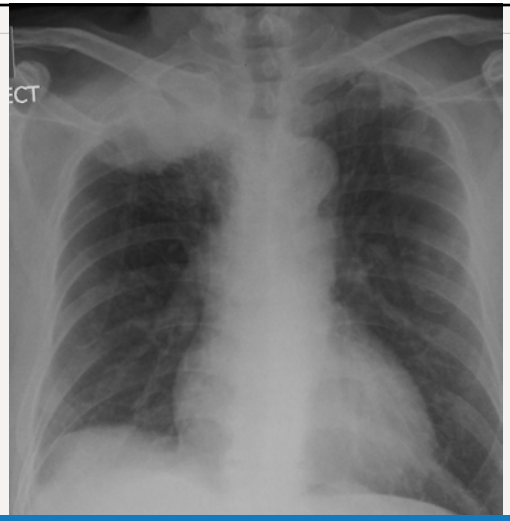

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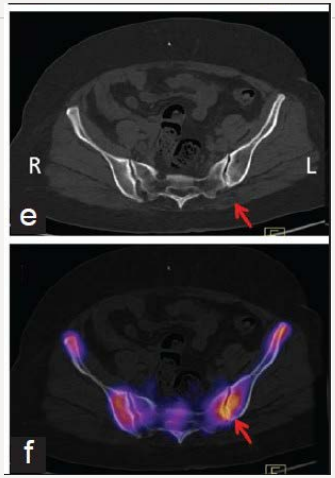
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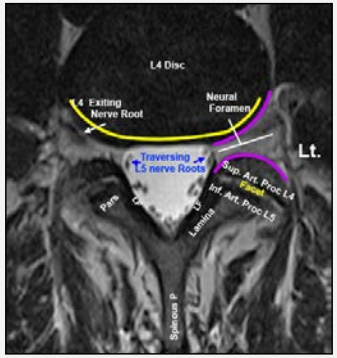
L4 Disc
L4 Exiting Nerve Root
Neural Foramen
Lt.
Traversing L5 nerve Roots
Sup. Art. Proc. L4
Pedicle
Inf. Art. Proc. L5
Lamina

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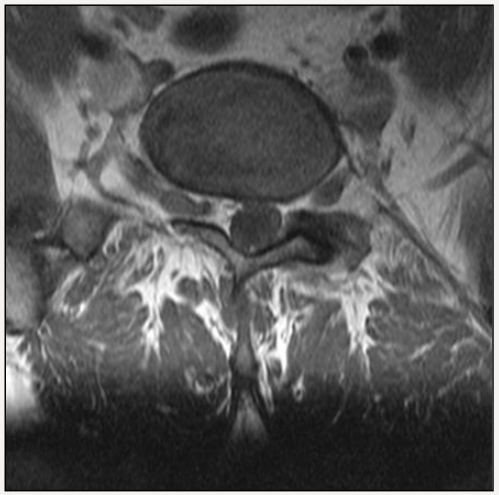

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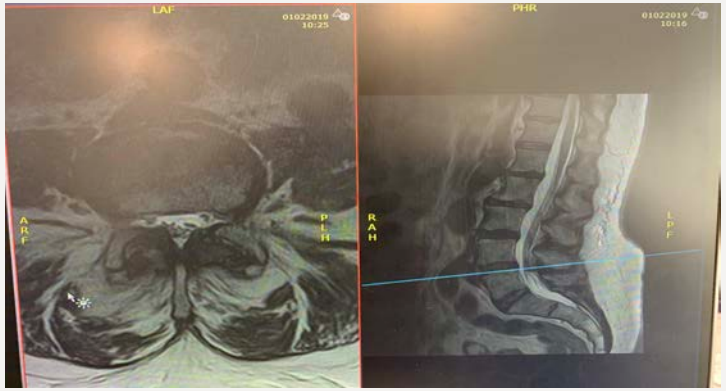

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Take Home Points

- History is the most important
- Cauda Equina Syndrome is a clinical diagnosis and not a radiological one
- MRI is the most useful imaging modality for diagnosis
- Don’t forget to consider other joints and other symptoms

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Thank you very much for attending & listening

Any Questions?

www.harleystreetspine.co.uk www.totalorthopaedics.london