بسم الله الرحمن الرحيم
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Spinal Imaging

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Normal anatomy
Patient Preparation

Technique
Supine position
Scanogram [frontal, lateral]
Scan intervals

Fasting 4-6 hours
- Contrast material [Urographin, Telebrix,..] 1-2 ml/kg
- Anesthesia Children, Uncooperative patients
Contrast administration

Yes
Post-operative lumbar spine
Inflammatory and neoplastic lesions

No
Any other pathology [disc lesions, spinal trauma, congenital anomalies]
Computed Tomography

Scanning for disc lesions

- Axial sections 2-4mm
- Bone + soft tissue window
- Contrast injection [urographin, telebrix, ..]
  - post operative spine
  - Inflammatory and neoplastic lesions
- **Screening** 5-8mm segment of spine [dorsal, lumbar,…]
- **Selective scanning** 3mm trauma [focus on affected vertebra]
Bone and soft tissue windows
Intrathecal contrast injection [Omnipaque 240mg I/ml] Followed by CT Myelography
CT Myelography

Basivertebral vein

Basivertebral vein
CTM versus MRI
Items for evaluation

- Spinal canal diameter [lumbar]
- Disc lesions
- Others
  - Joints [facet, neuro central, sacroiliac]
  - Para vertebral soft tissues

D = 1.6
Disc lesions
L3-4 Facet joints
Facet joints

L3-4
Neurocentral joints
Cervical discs
Neurocentral & facet Joints
Extremity MRI
The bed rotates from Upright to Recumbent, stopping at any angle in between.
Patient with Low Back Pain **After** Surgery

Dynamic MRI

Does a Lie-Down-Only Scanner see the patient’s problem?

*Case courtesy of M. Rose, MD, Rose Radiology Centers*
Surface coils
- 4mm thickness
- No interslice gap
- Contrast injection similar to CT [Gd- DTPA]
MRI protocol

- Sagittal T1
- Sagittal T2
- Axial T1
- Axial T2
- Coronal T1 or T2 [optional]
- Scoliotic deformity
- Paraspinal soft tissue
- Extension of intraspinal pathology
Items for evaluation

- Spinal canal [cervical and lumbar]
- Intervertebral discs
- Paravertebral soft tissues
- Others [Specific for MRI]
  - Spinal cord, conus
  - Bone marrow
Capacious lumbar spinal canal
Cervical spinal canal
Cervical Spinal canal
Normal lumbar discs
Normal cervical discs
Normal bone marrow [fat signal]
Normal spinal cord and cauda equina

Intermediate signal in $T_1$ and $T_2$ [brain]
Para-vertebral shadows

- Hemorrhage, bone fragments, ... [Trauma]
- Abscesses [inflammatory lesions]
- Neoplastic extra osseous masses [Tumors]
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Thank you

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Normal, 4
Metallic artifacts + normal + bone sclerosis
disc

spondylolisthesis
**Spinal Radiographs**

AP, lateral, oblique views

- **Alignment** [lordosis, kyphosis, straightening]
- **Bony texture** [normal, osteoporosis,…]
- **Disc spaces** [maintained, narrow,…]
- **Others**
  - Cervical ribs [cervical spine]
  - Paravertebral shadows [dorsal spine]
  - Sarcoiliac joints [lumbar spine]
Normal, 4