Diagnosis and Management of lumbar spondylolithesis

M ETEMADIFAR MD

SPINE SURGERY FELLOWSHIP

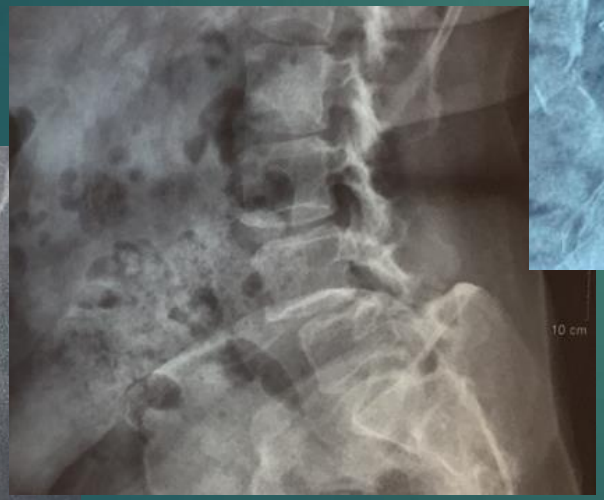
ALZAHRA HOSPITAL IUMS

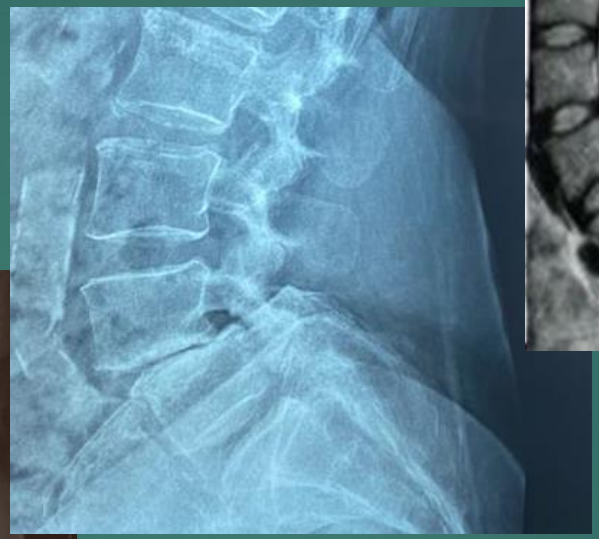
- Definition and classification
- Sign and symptoms
- Diagnostic investigation
- Treatment including non-surgical & Surgical
- Outcome

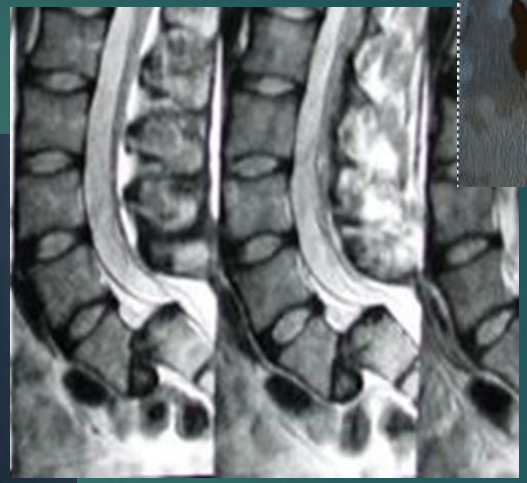
Definition of spondylolisthesis

- Displacement of one vertebra over the other in sagittal plane
  - 2 mm in posterior part of body
  - 4 mm in anterior part of body
  - 3.5 mm in flexion extension Xray
- In minor displacements signs & symptoms are more important
- Anterior displacement much more common than posterior

Degree of slip







classification

- ***Isthmic*** (the most common)
  - Fracture (LYSIS)
  - Elongated
  - Isthmic & dysplastic
- *Degenerative (<30% slip)*
- Dysplastic
- Traumatic
- pathologic

Natural history

- The majority of patients with symptomatic degenerative lumbar spondylolisthesis and an absence of neurologic deficits will do well with conservative care.

Patients who present with sensory changes, muscle weakness or cauda equina syndrome, are more likely to develop progressive functional decline without surgery

Progression of slip correlates with jobs that require repetitive anterior flexion of the spine.

- Slip progression is less likely to occur when
- the disc has lost over 80% of its native height and
- intervertebral osteophytes have formed.

Progression of clinical symptoms does not correlate with progression of the slip.

Symptoms

- Incidental finding
- Chronic LBP (most common)
- Leg pain
- Claudication
- Radiculopathy
  - Mostly unilateral in Isthmic types
  - May be uni or bilateral in Deg. type

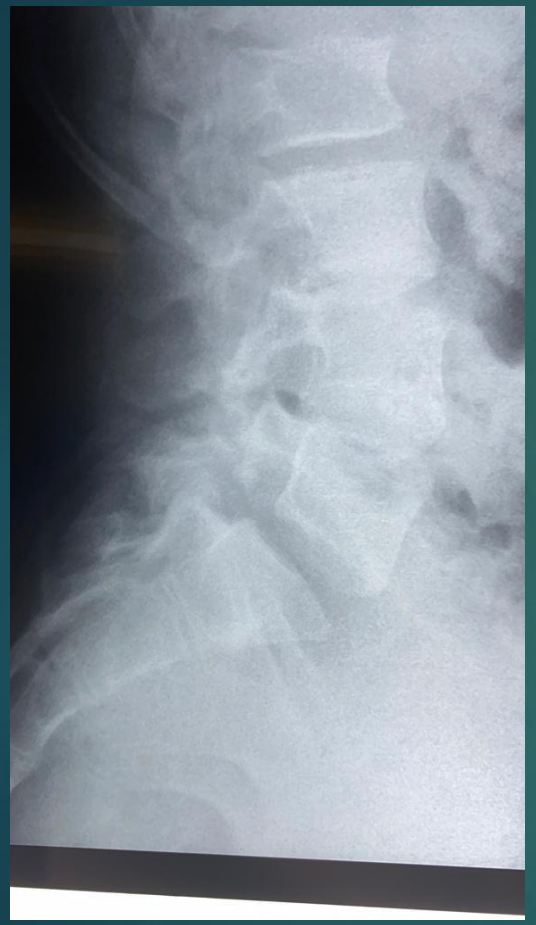
Physical Signs

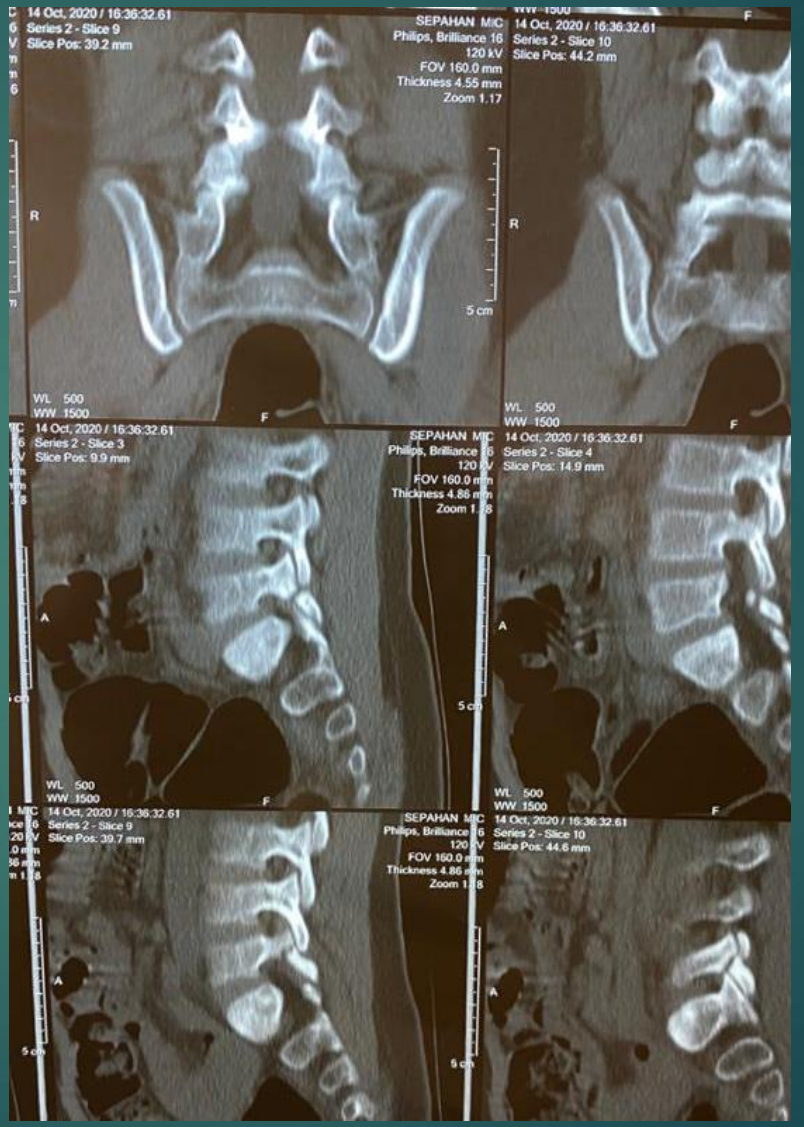
- Pain and limitation of back extension
- Tenderness over the spinous process
- SLR mostly negative
- Rarely
  - Sensory deficit
  - Motor deficit
  - Cauda equina
- Imbalance and poor posture
  - In severe listhesis especially in younger people

Investgation (Imaging)

- Plain X ray
  - **Standing lateral & Ap**
  - Flexion- extension??!
  - Oblique films?!!

- Multi-slice sagittal CT
  - Standard imaging for detection of lysis
  - Evaluate pedicle thickness, angle

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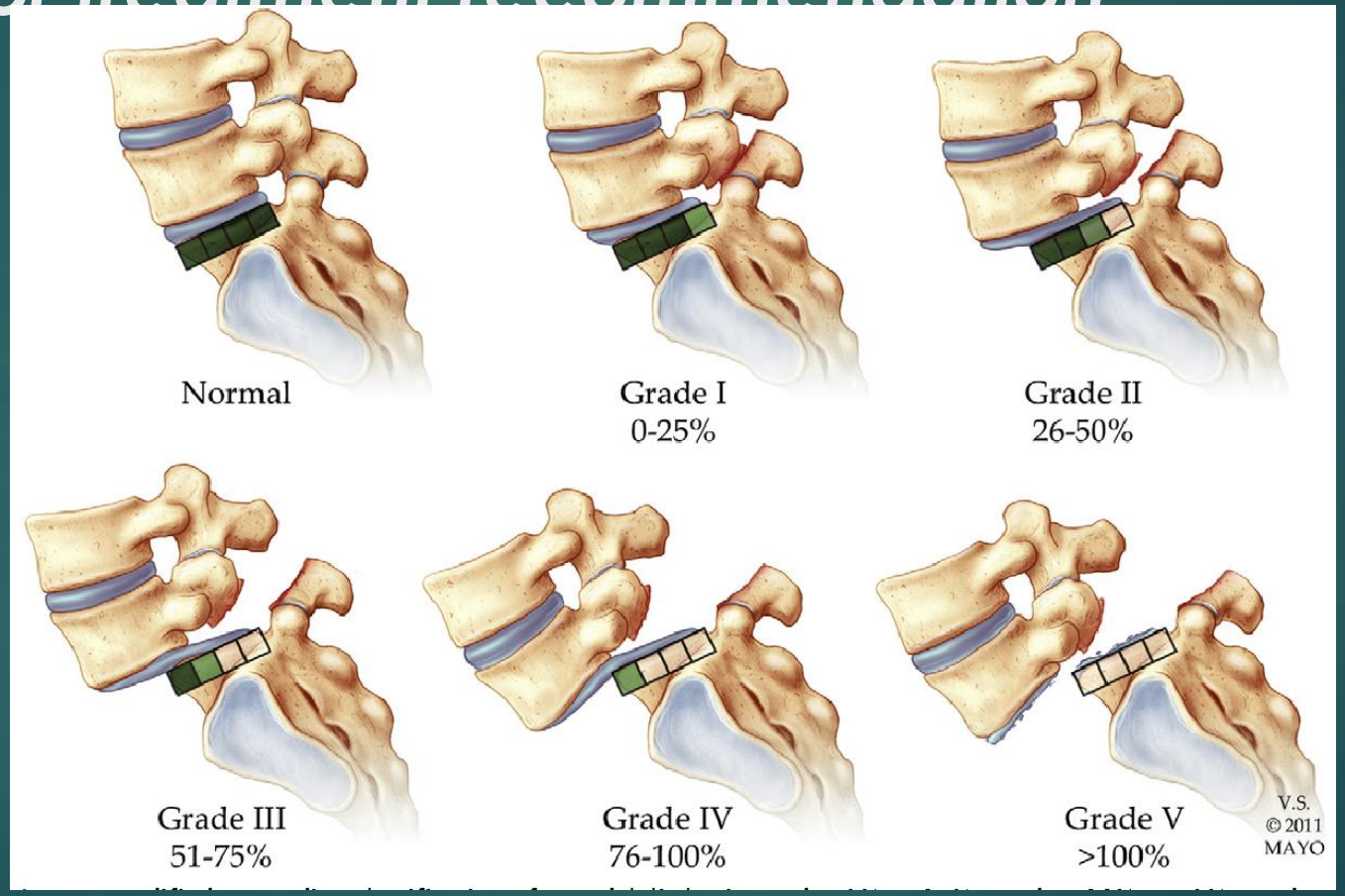
Imaging

- MRI
  - Gold standard to evaluate neural compression
  - Evaluate the disc space
  - Check adjacent disc spaces
- Facet effusion in axial images
  - Check for listhesis with standing lat X-ray
- CT myelography
  - If MRI is contraindicated

Modified myerding classification of displacement

important for treatment recommendation



Other investigations

- Bone mineral density (surgical consideration in older Pts)
- EMG & NCV
  - Comorbidities like DM
  - R/O peripheral neuropathies
  - Neural deficits from previous Tx
- CT scan for Hansfield number

Management of spondylolithesis

- Standard of care is non- surgical Tx
  - Modification of activities
  - Flexion exercise
  - Physical therapy
  - Part-time use of lumbar corset
  - Pain control medications
- Most patients do well with conservative Tx

Indications for surgery

- Severe LBP not responding to conservative Tx
- Impaired function and ADLs
- Severe neurological claudication, radicular symptoms
  - the most common indication
  - Usually after 3rd or 4th decade
- Neural deficit (Rare)
  - Motor, sensory
  - Cauda equina

Hip- knee, spine syndrome

- Try to find source of pain
- In pts without neurological symptoms and advanced hip or knee DJD
  - Approach to the hip or knee first
  - In case of sagittal imbalance consider the version of acetabular component
- If there is severe radicular symptoms or neurological claudication
  - Approach the spine first

Surgical Tx

- Neural decompression
  - Laminectomy
  - Foraminotomy
  - Lateral recess decompression
- Segmental fusion
  - Posterolateral
  - Interbody
- Instrumentation
  - Pedicle screw fixation

Neural decompression

- Cornerstone of surgery in degenerative type
- Includes laminectomy, lateral recess decompression
- In isthmic listhesis it includes foraminal decompression
- Both sides need decompression (even if unilateral symptoms)

Fusion

- Contraversial topic in Degenerative Listhesis
- Almost always needed in Isthmic listhesis
- Posterolateral versus 360 fusion??
  - Lack of sufficient evidence
  - 360 degree may improve fusion rate

Instrumentation

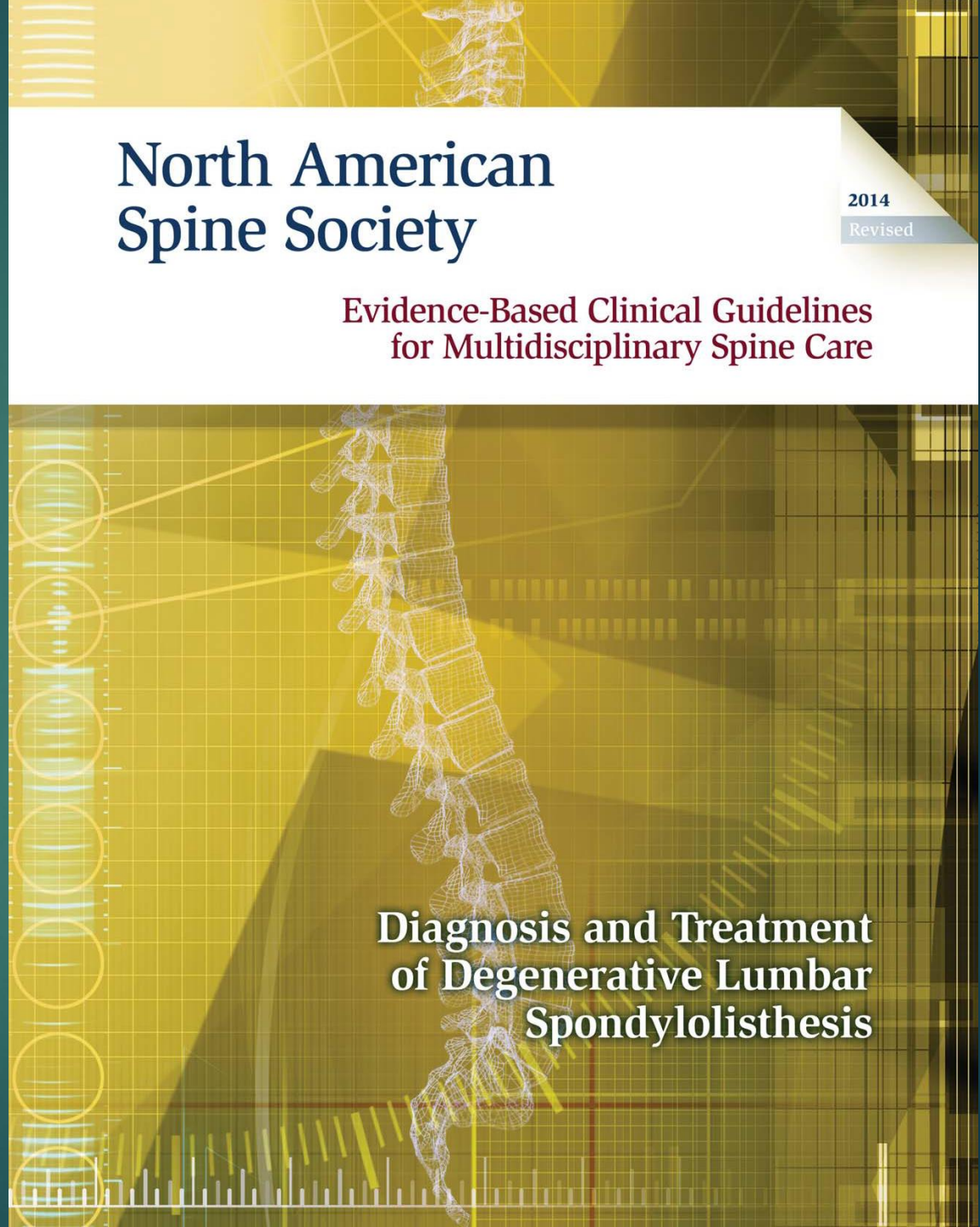
- Mostly used in those who are candidates for Fusion
- May enhance fusion rate
- Effects on clinical outcomes in deg. type not clear
- Most spine surgeons recommend instrument in addition to fusion

Reduction

- Is not the goal of surgical Tx
- Improves fusion rate
- May improve clinical outcome
- Improvement of lumbopelvic alignment
- Usually partial reduction is recommended in high grade slips

Outcome of surgical Tx

- There are few high quality researches for
- evidence based recommendations
- Most patients are satisfied with the surgery if
  - Good patient selection
    - Symptoms related to the spondylolisthesis
    - Poorer outcome in obese Pts??
    - Lack of multiple comorbidities??
  - Appropriate neural decompression
  - Rigid instrumentation
  - Solid fusion



Key take home messages

- ***Spondylolisthesis is a common cause of chronic LBP***
- ***Mostly Isthmic (lytic) type and degenerative***
- ***Xray standing, CT scan and MRI for evaluation***
- ***Most cases can be treated with conservative measures***
- ***Persistent radicular symptoms or neural deficit need surgery***
- ***Through decompression , fusion & partial reduction***
- ***Obtain normal segmental sagittal alignment***
- ***Carefully selected cases have good long term outcome***