Spondylolysis

Lysis (Greek λύσις, *lýsis* from *lýein* "to separate") refers to the breaking down.

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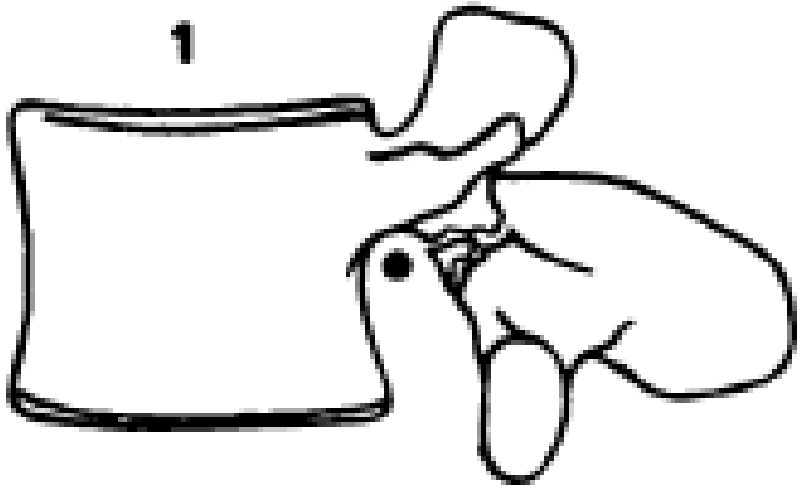
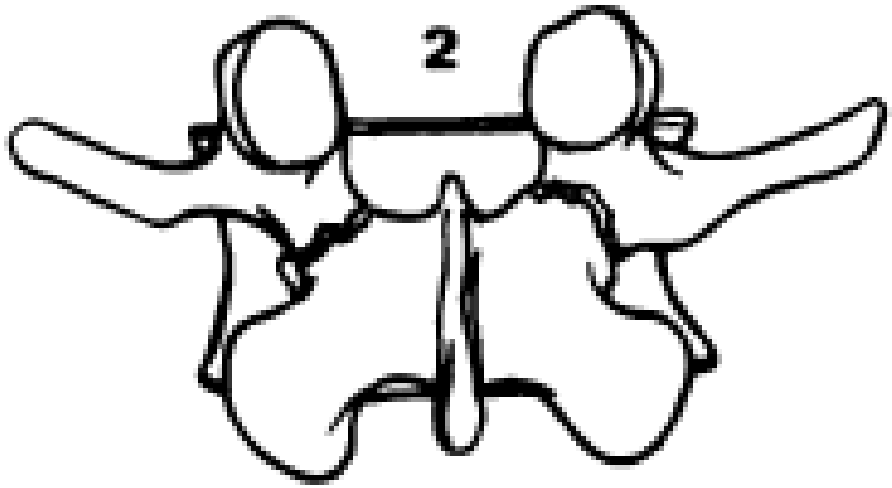
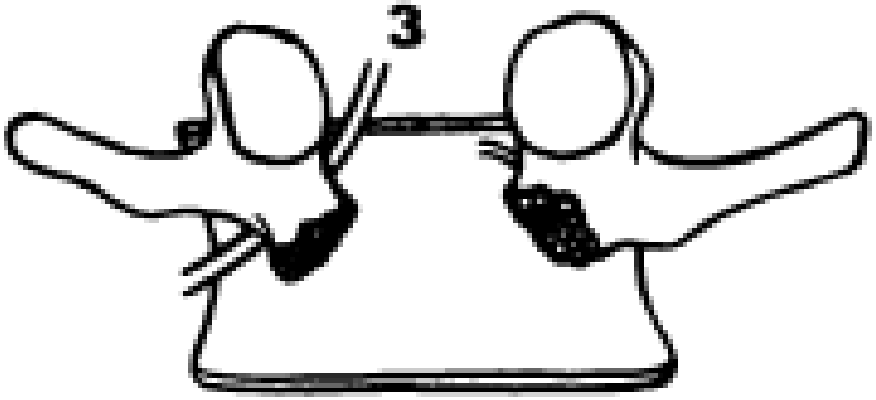
Spondylolysis

- Defect in the pars interarticularis
- 5 % incidence.
- Boys > Girls
- High grade listhesis more common in girls
- 85 % at L5 level
- Gymnasts, eskimos, fast bowlers etc





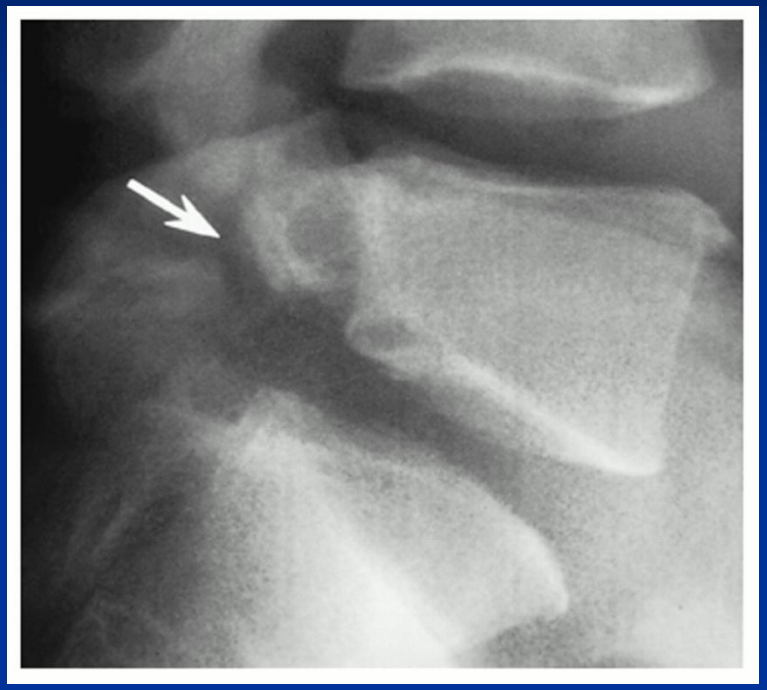


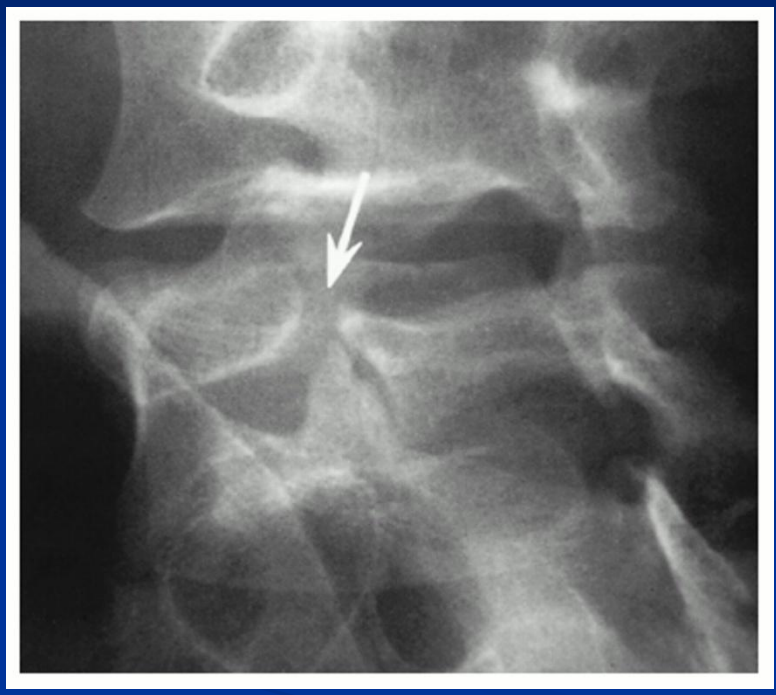
Relation between pars defect and the nerve root

Symptoms

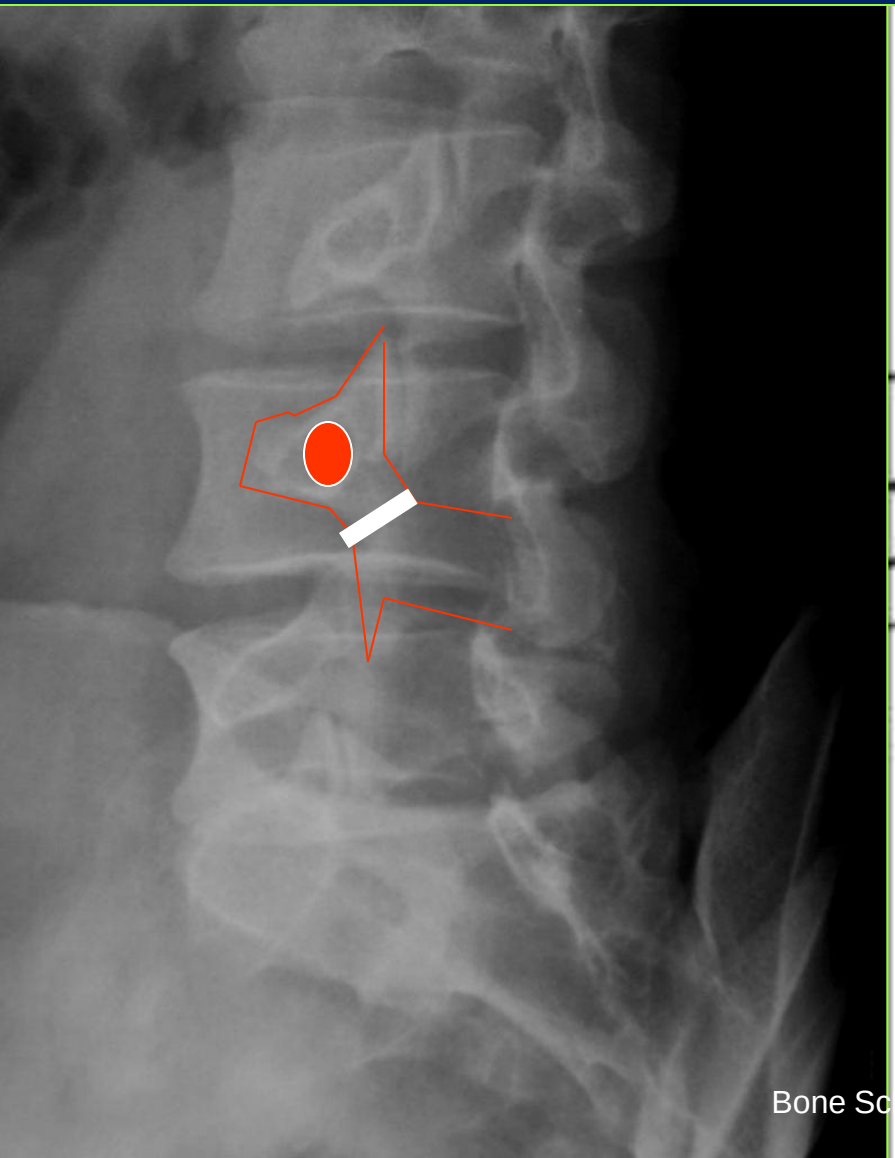
- Low back pain
- Leg pain
- Back and leg pain

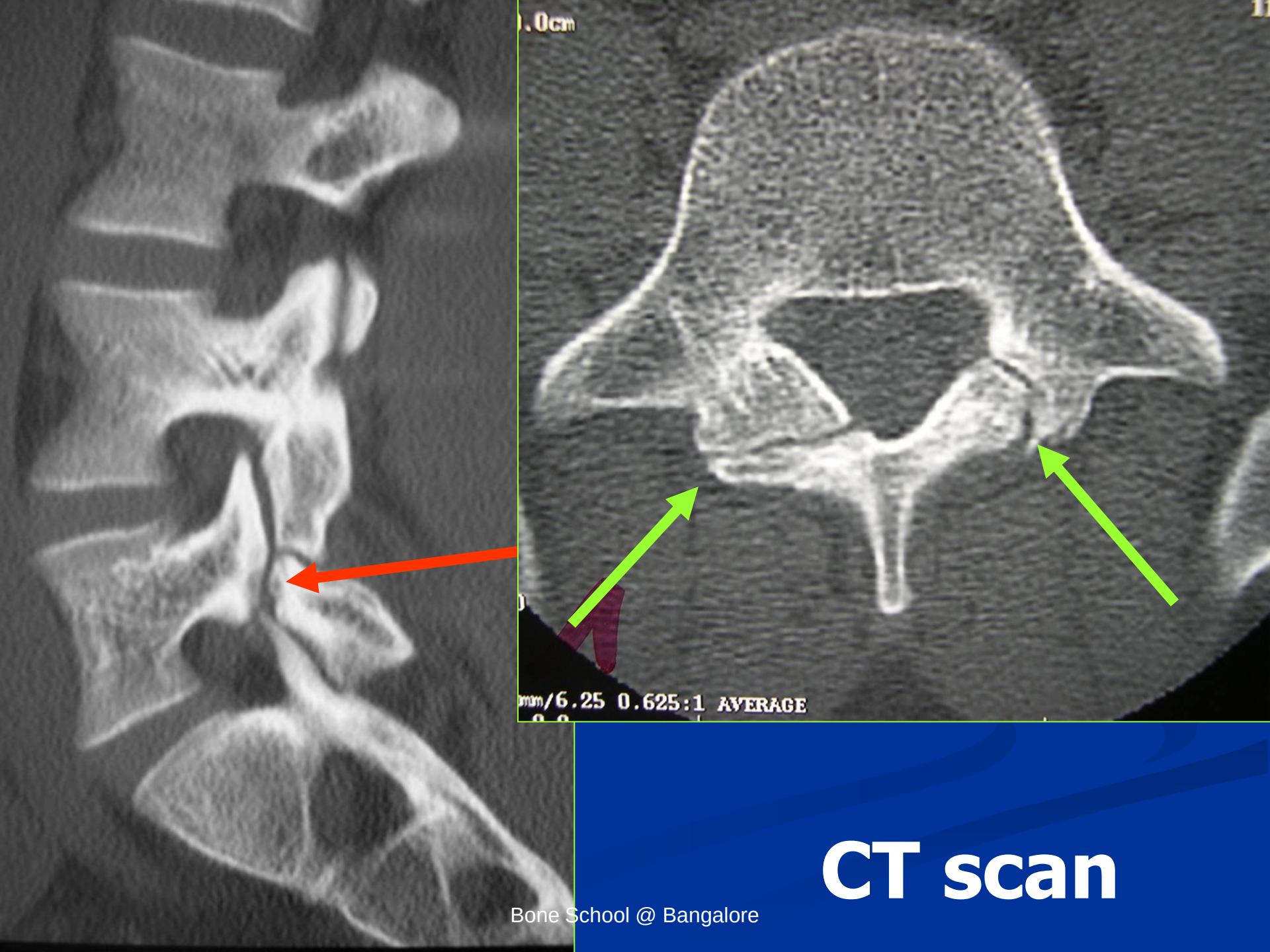
Lateral and oblique radiograph



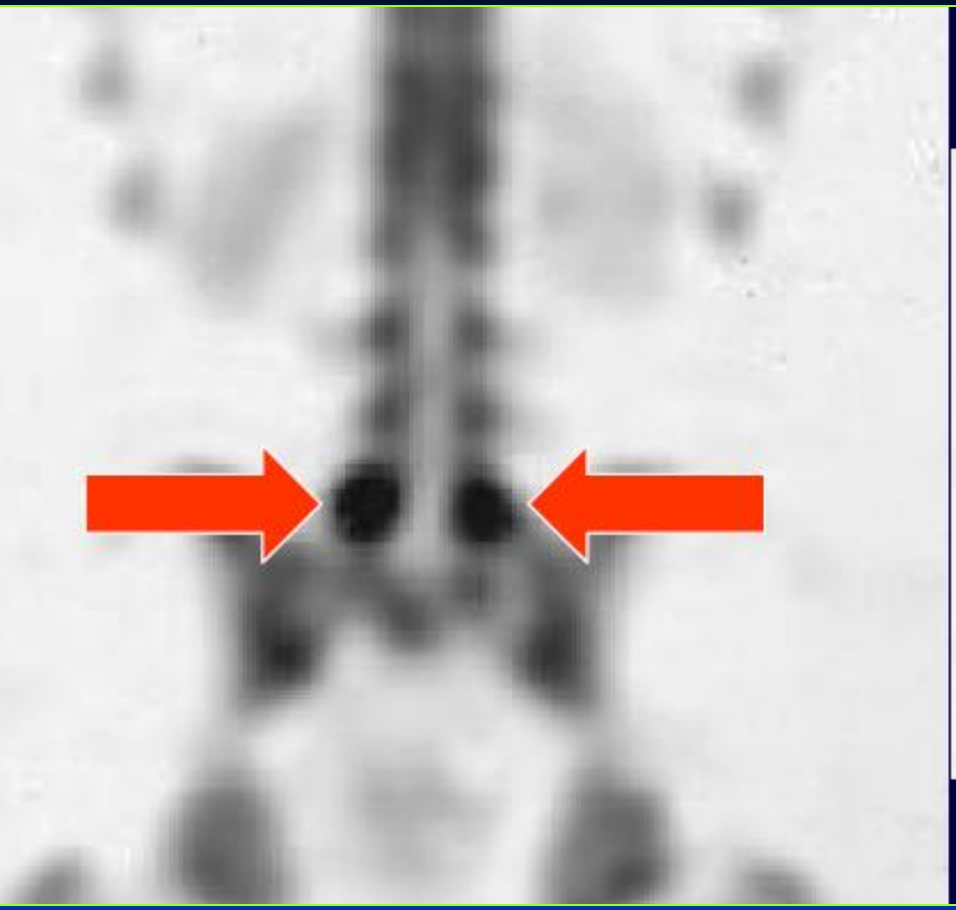


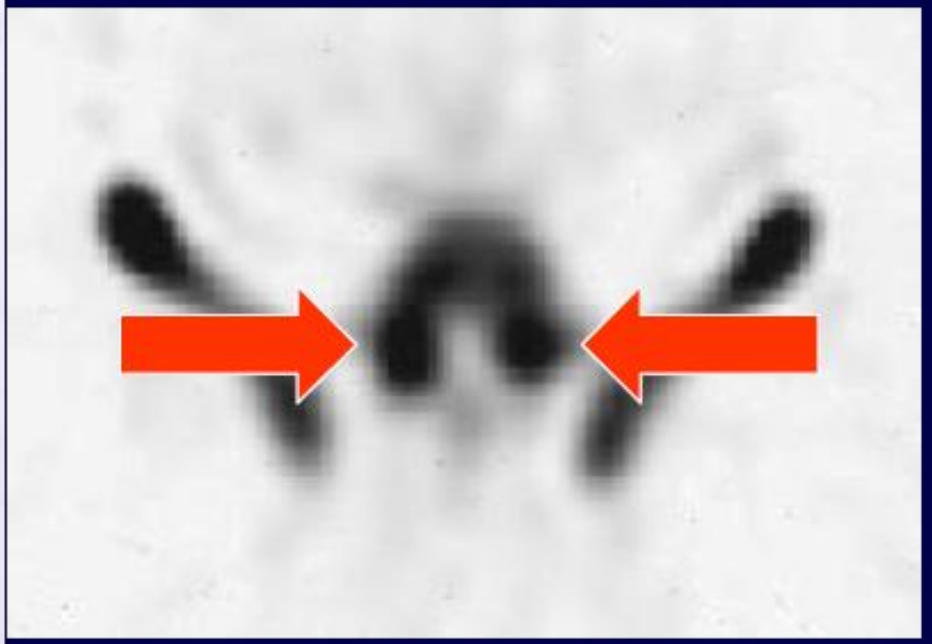
Oblique lumbar radiograph





CT scan





Technitium bone scan

Natural history

- Unilateral defects – no slippage over time.
- Progression of listhesis slowed with each decade.

The natural history of spondylolysis and spondylolisthesis: 45-year follow-up evaluation. Spine 2003

Acute spondylolysis

Positive SPECT Scan + CT scan pars thickening

↓

Restricted activity

Positive SPECT scan + Fracture on CT scan

↓

Brace for 6 months

Failure of conservative management → Surgery

Long standing lysis (Children / adolescents)

- Severe symptoms – Rest and brace
- Exercises and avoidance of vigorous activity
- Yearly standing lateral radiographs
- No response – rule out other causes
- Surgery for persistent symptoms

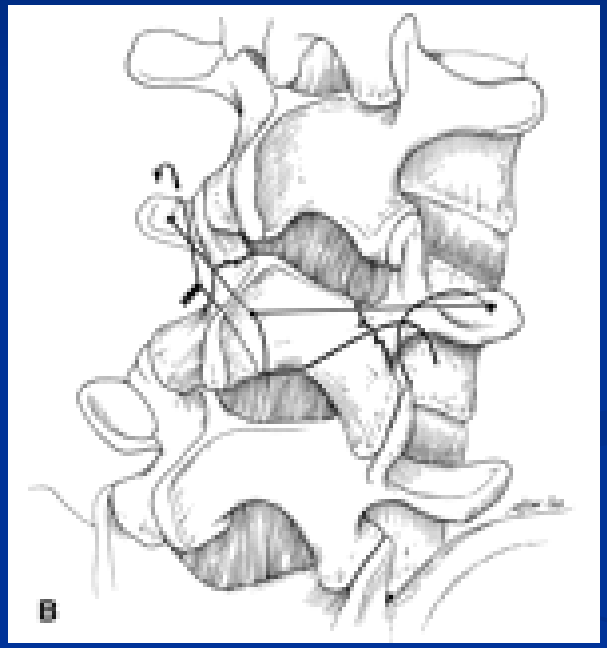
Indications for repair of pars defect

- Low grade slip (<25%) in young patients (<30 yrs)
- Gap less than 2-3 mm
- Normal disc on MRI / Discogram

Procedure

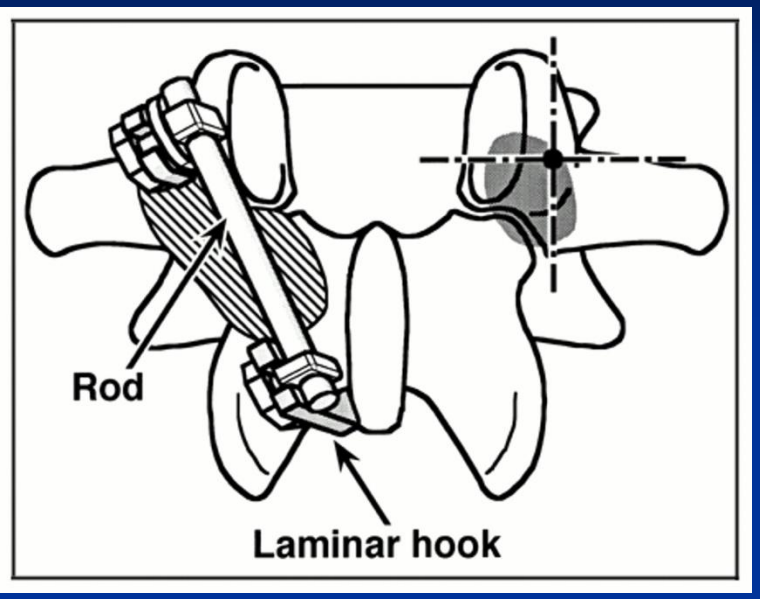
- Debridement of defect
- Bone grafting
- Compression stabilisation

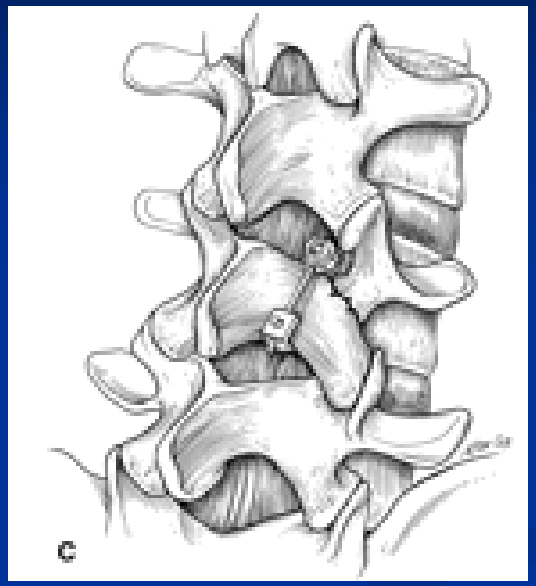
Scott's technique

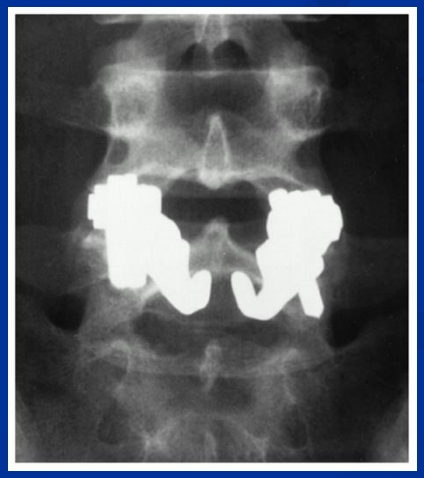


Nicol RO, Scott JH. Spine 1986, 11(10):1027-30]

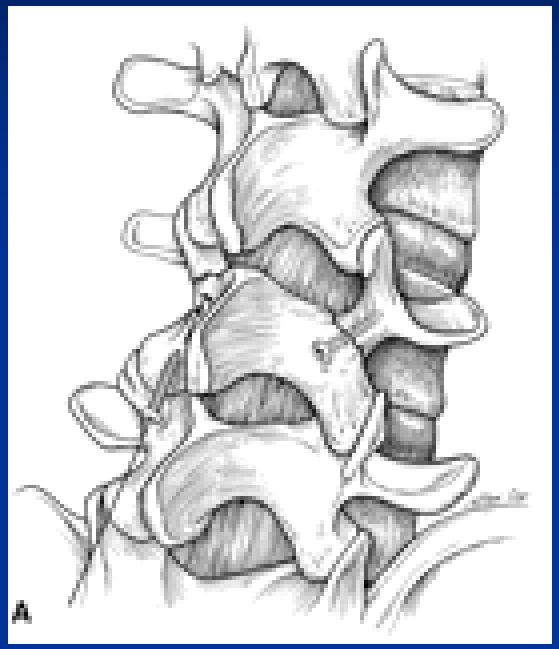
Screw and hook construct

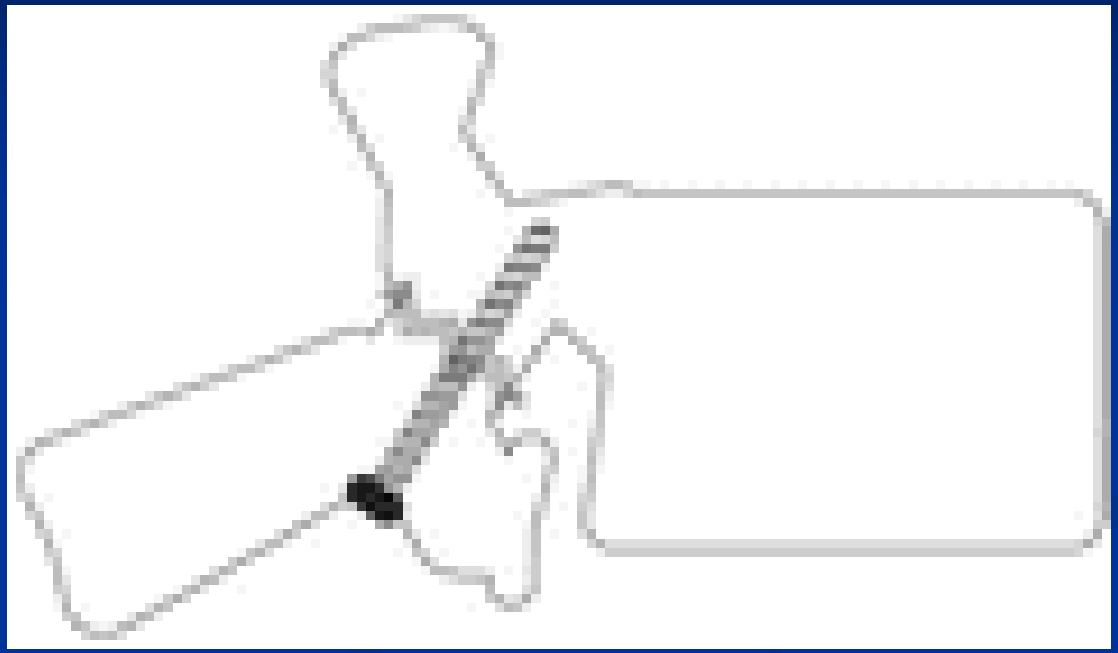


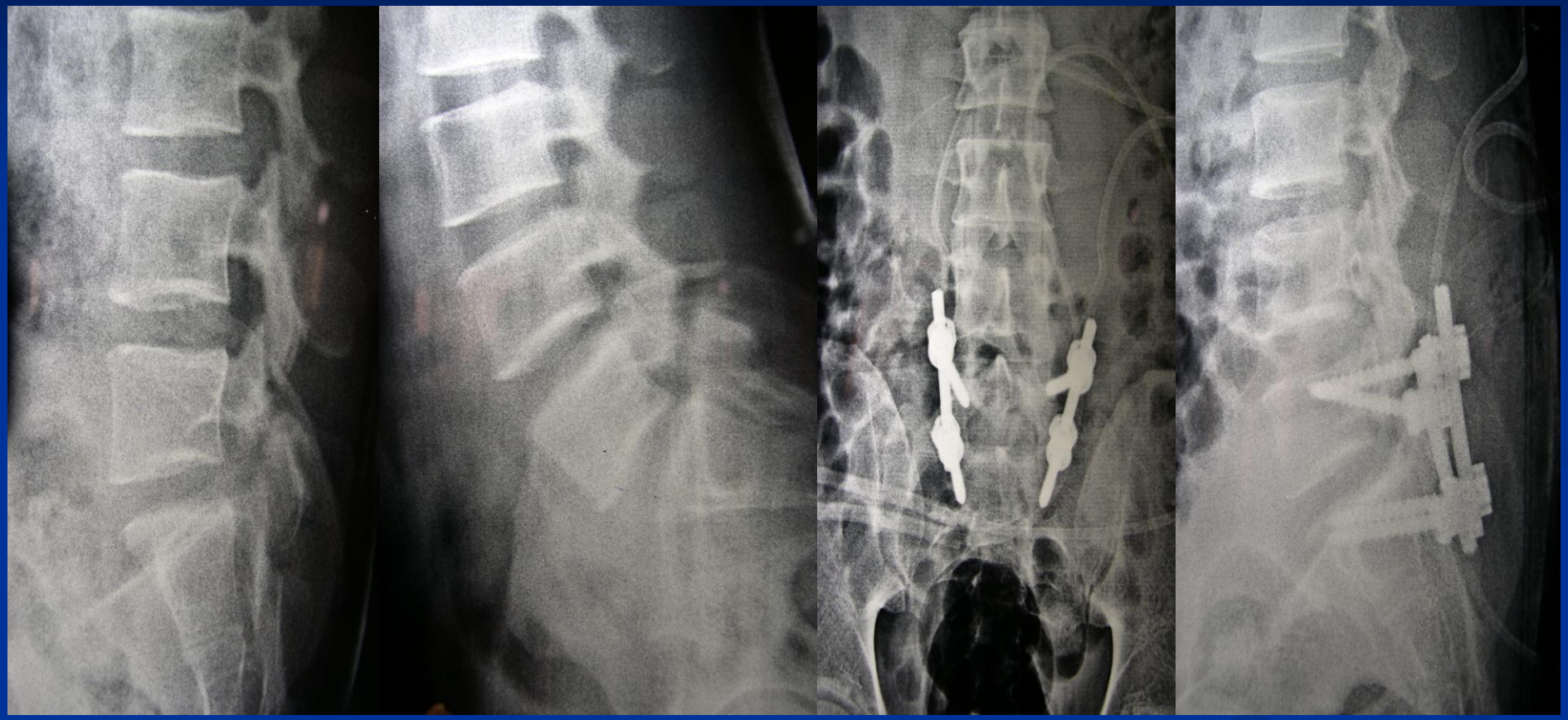




Bucks fusion







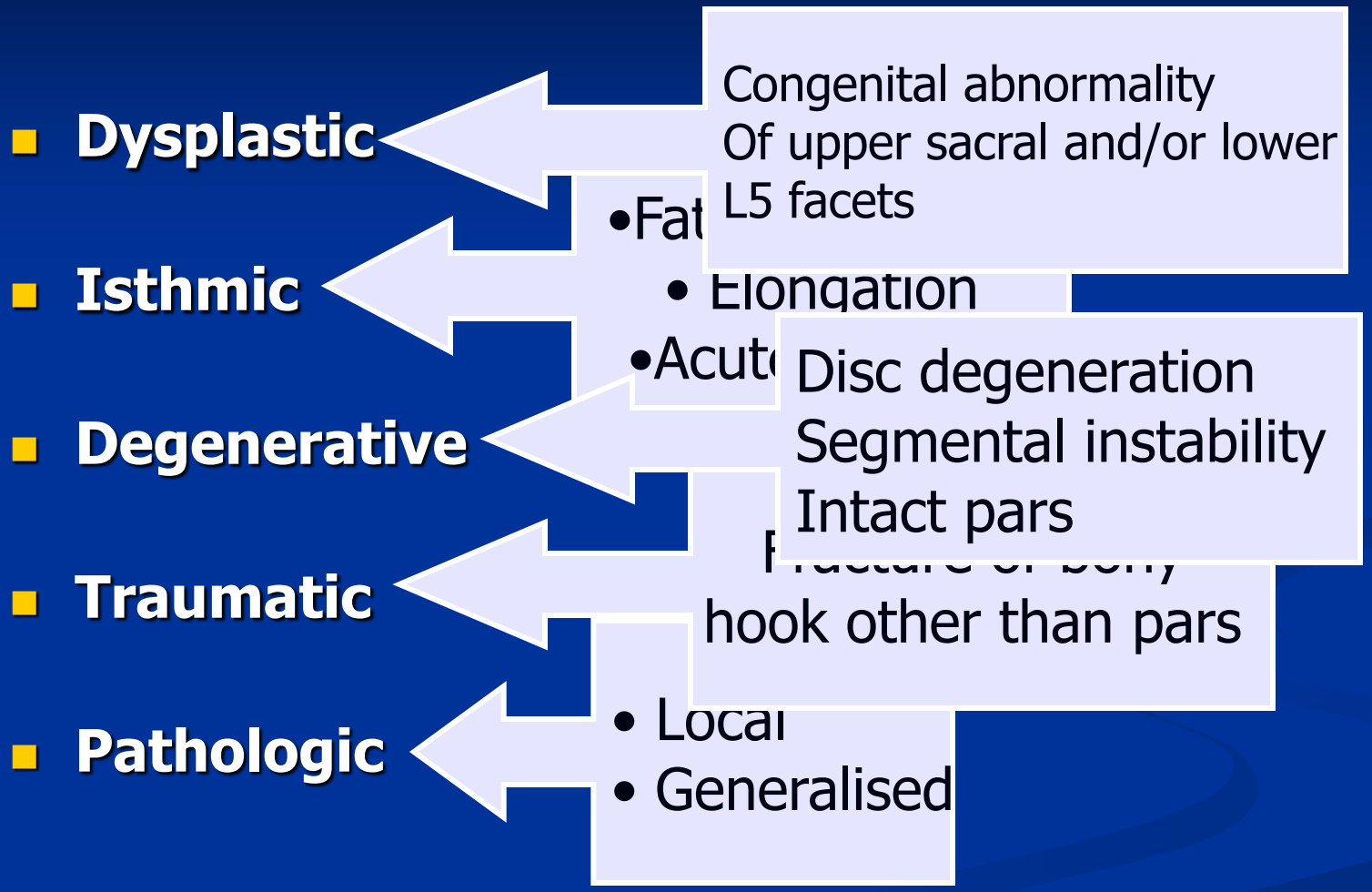
25 year old male with low back pain
Instrumented fusion

Spondylolisthesis

Spondylos – vertebra

Listhesis - slip

Classification Wiltse –McNab- Newman



Classification Marchetti- Bartolozzi

DEVELOPMENTAL

A. **High dysplastic**
   With lysis
   With elongation

B. **Low dysplastic**
   With lysis
   With elongation

ACQUIRED

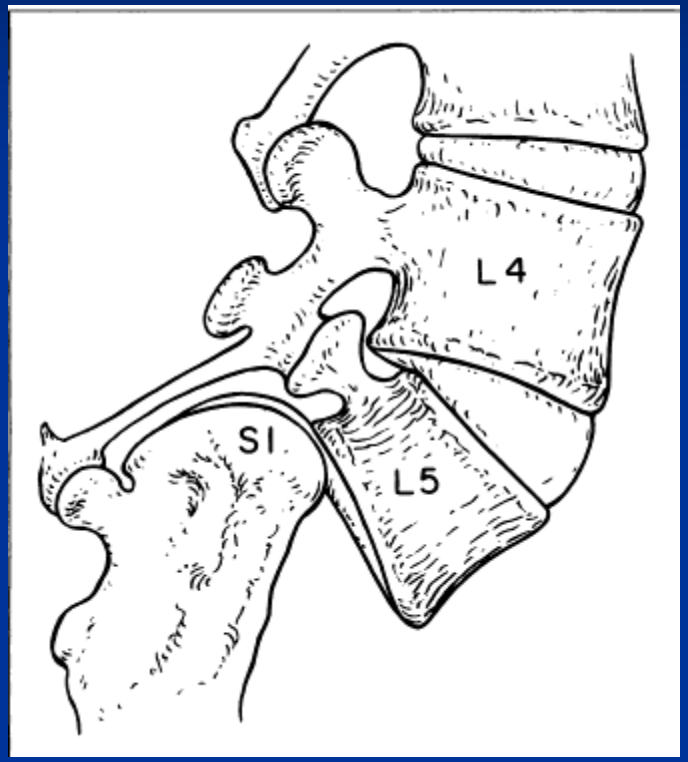
A. **Traumatic**

B. **Iatrogenic**

C. **Pathologic**

D. **Degenerative**

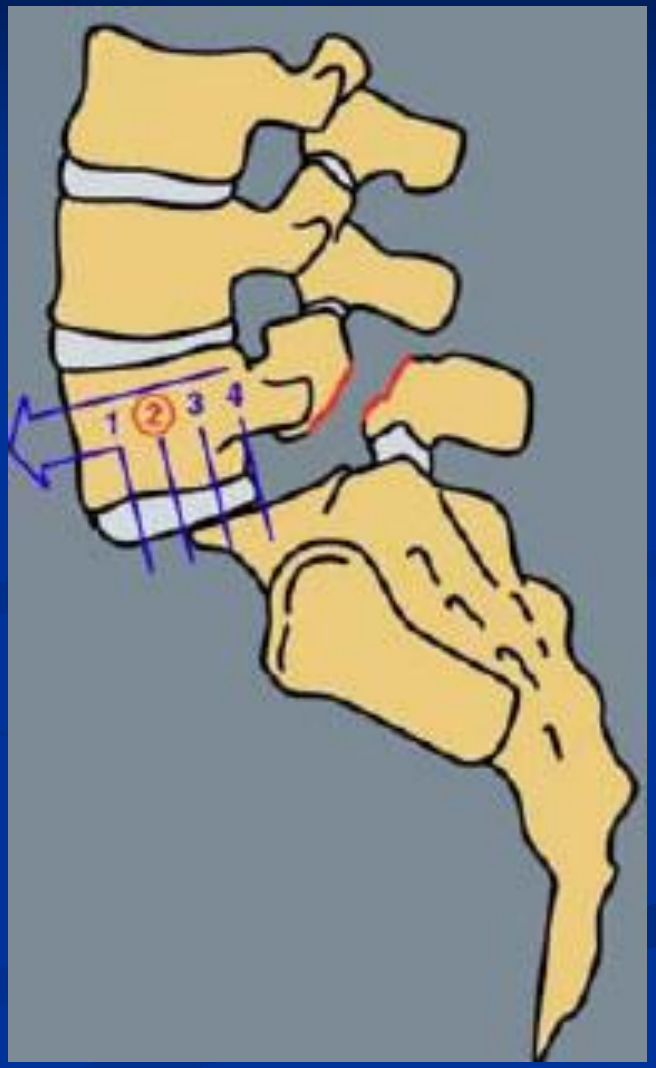
Dysplastic listhesis



- Rounded sacrum
- Trapezoid L5
- Hypoplastic facet joints
- Elongated pars

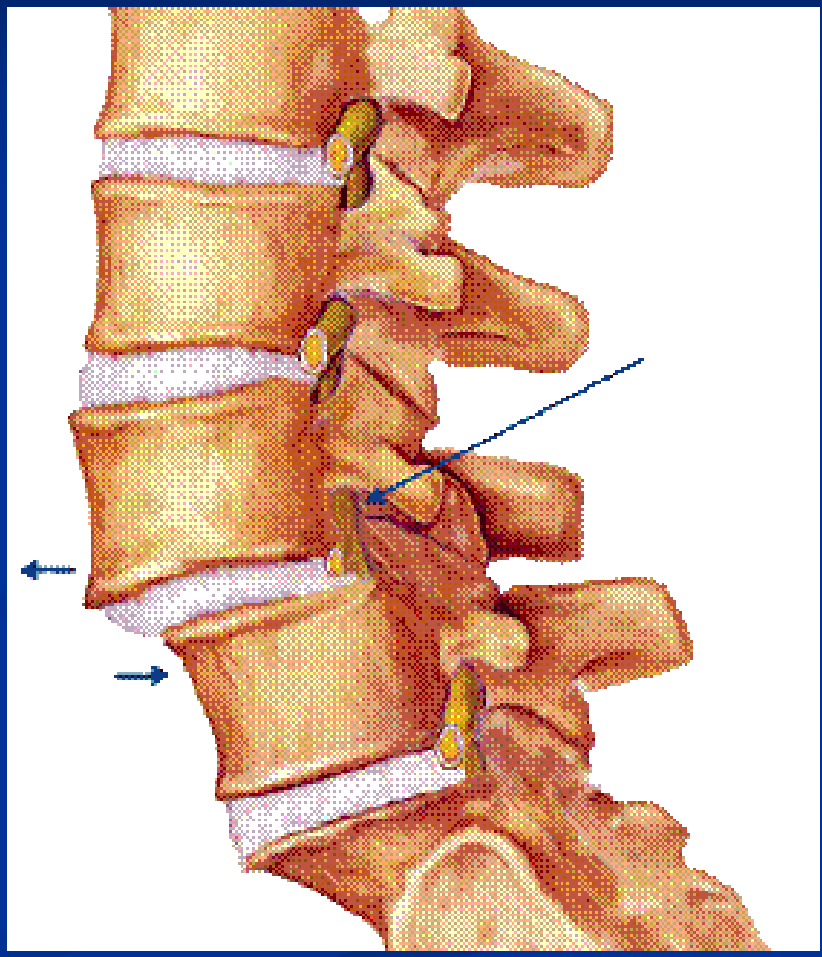
Isthmic listhesis

- Break in the pars Interarticularis
- Usually at L5-S1

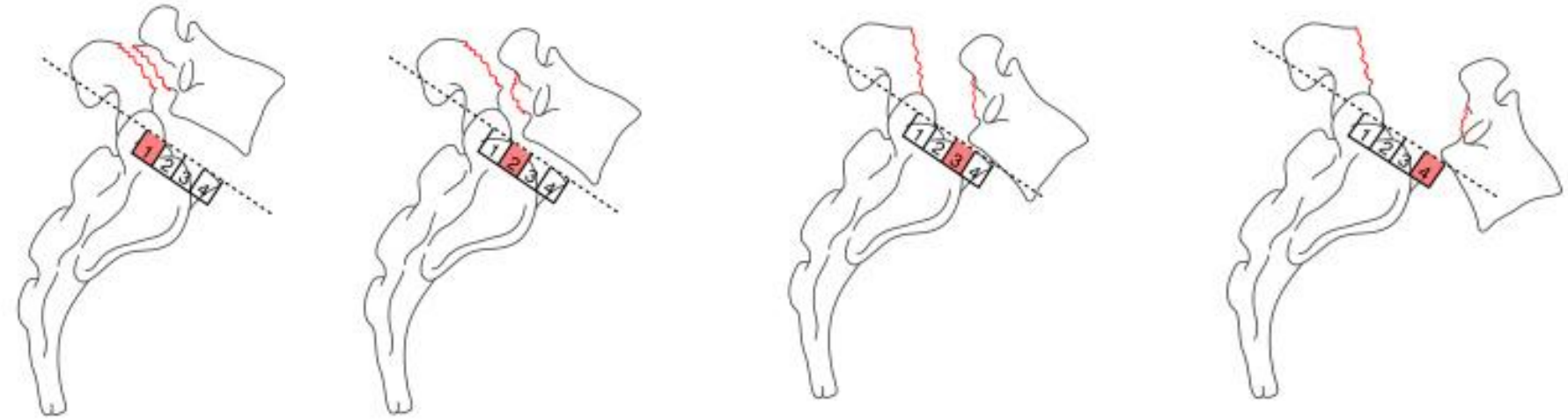


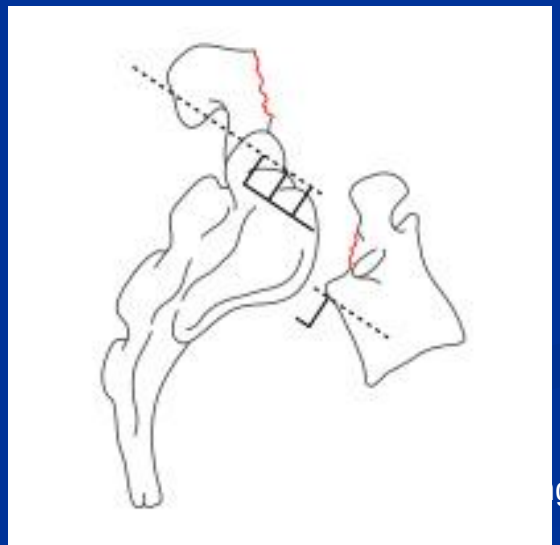
Degenerative listhesis

- Older individuals
- Usually at L4-L5
- Low grade listhesis



Meyerding's grading of severity of slip

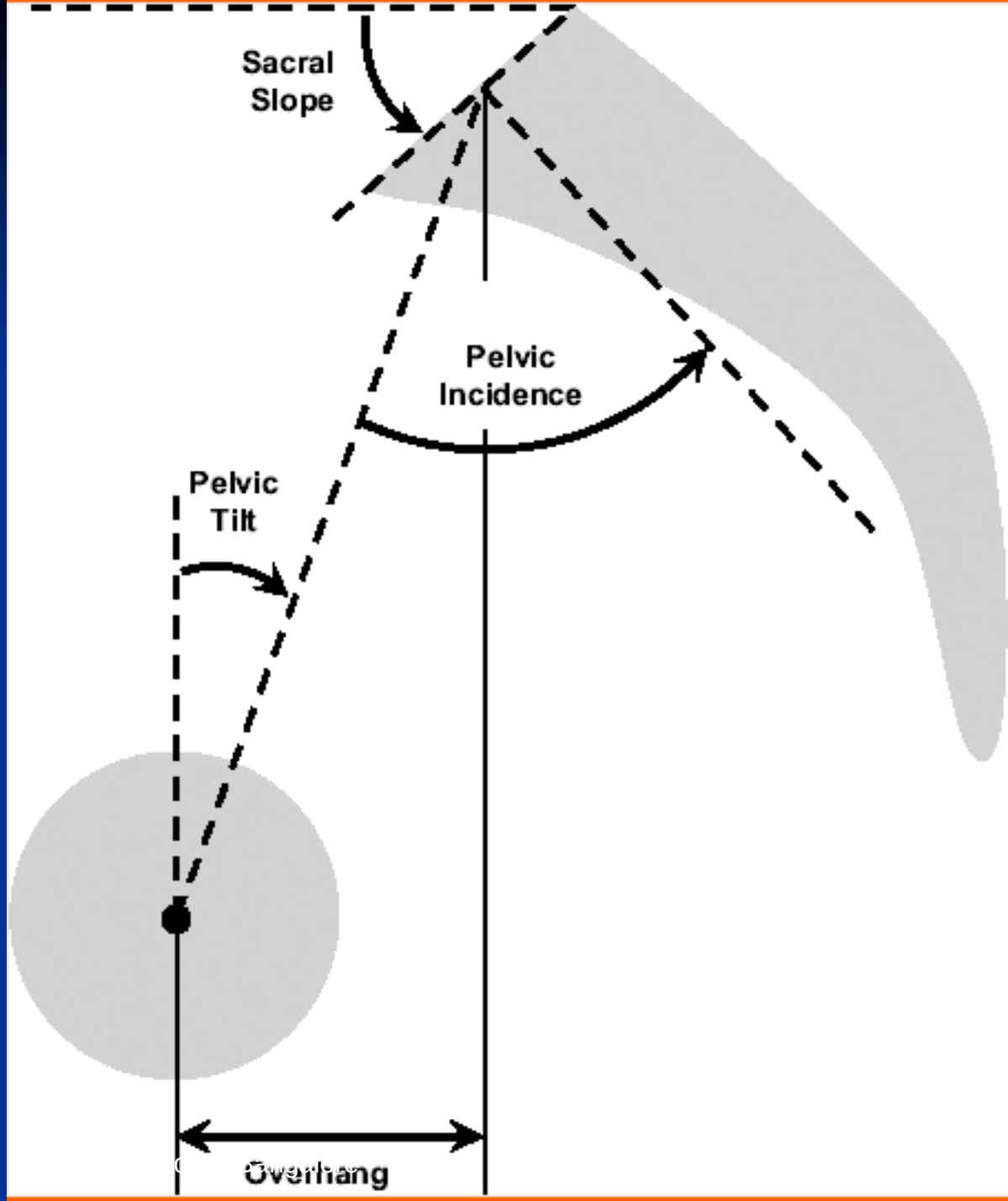




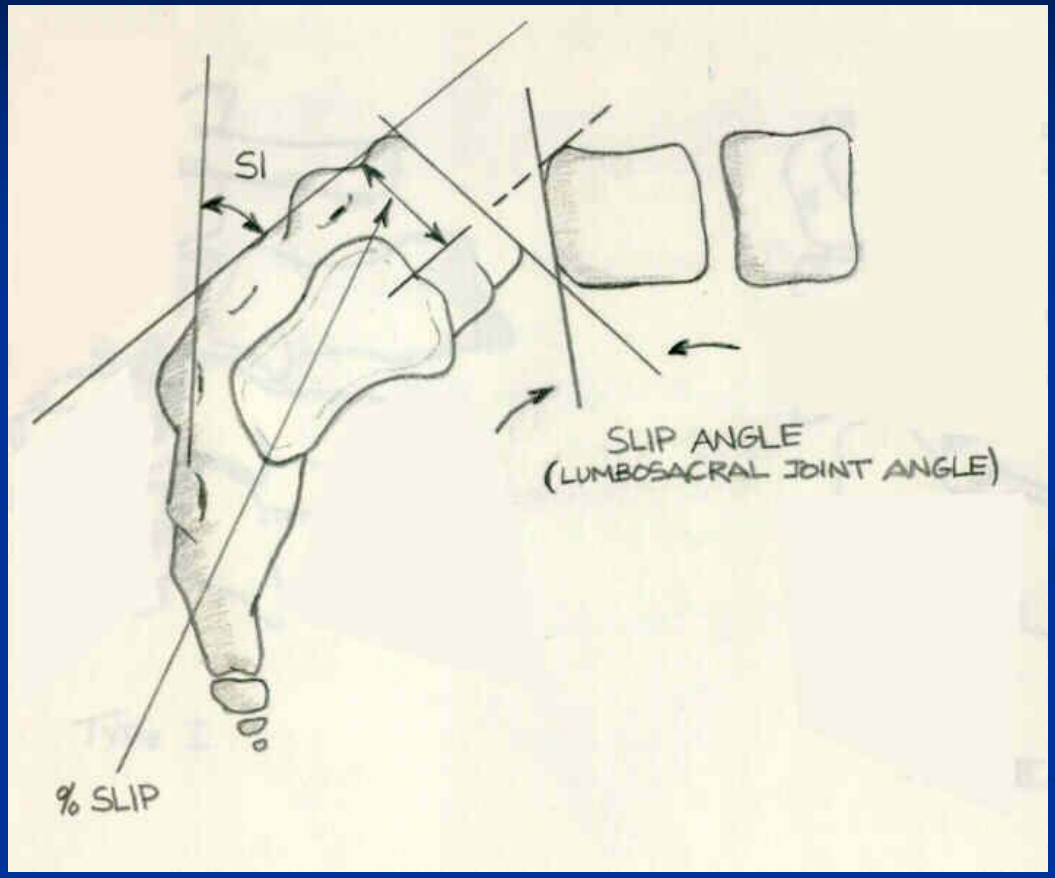
Spondyloptosis

- Sacral slope
- Pelvic tilt
- Pelvic incidence

Children -47°
Adults - 57°



Slip angle



Sacral inclination

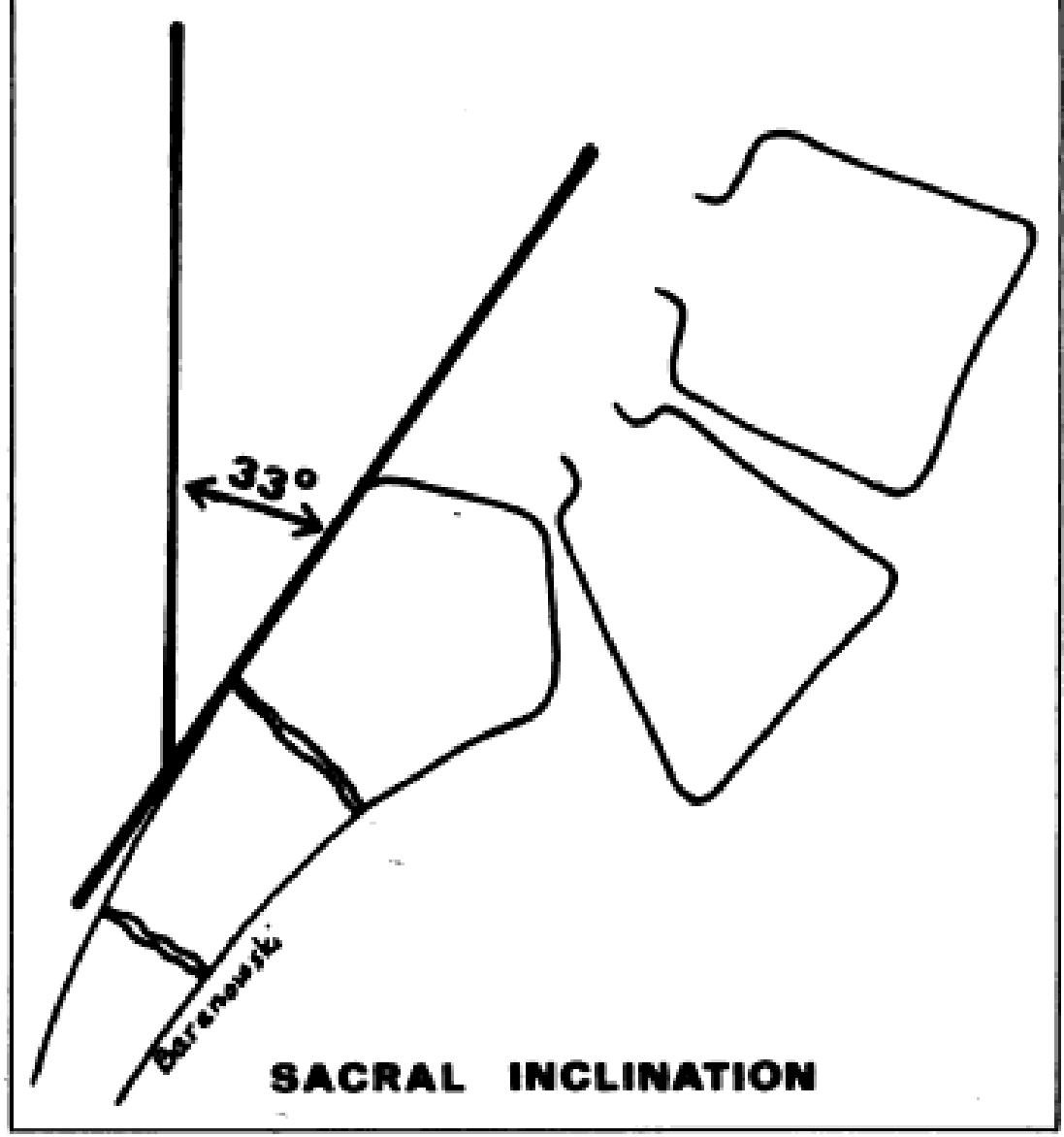


Figure 7. Sacral inclination. Sacral inclination is determined by drawing a line along the posterior cortex of S1 and measuring the angle created by this line intersecting the true vertical line.

Surgical Indications

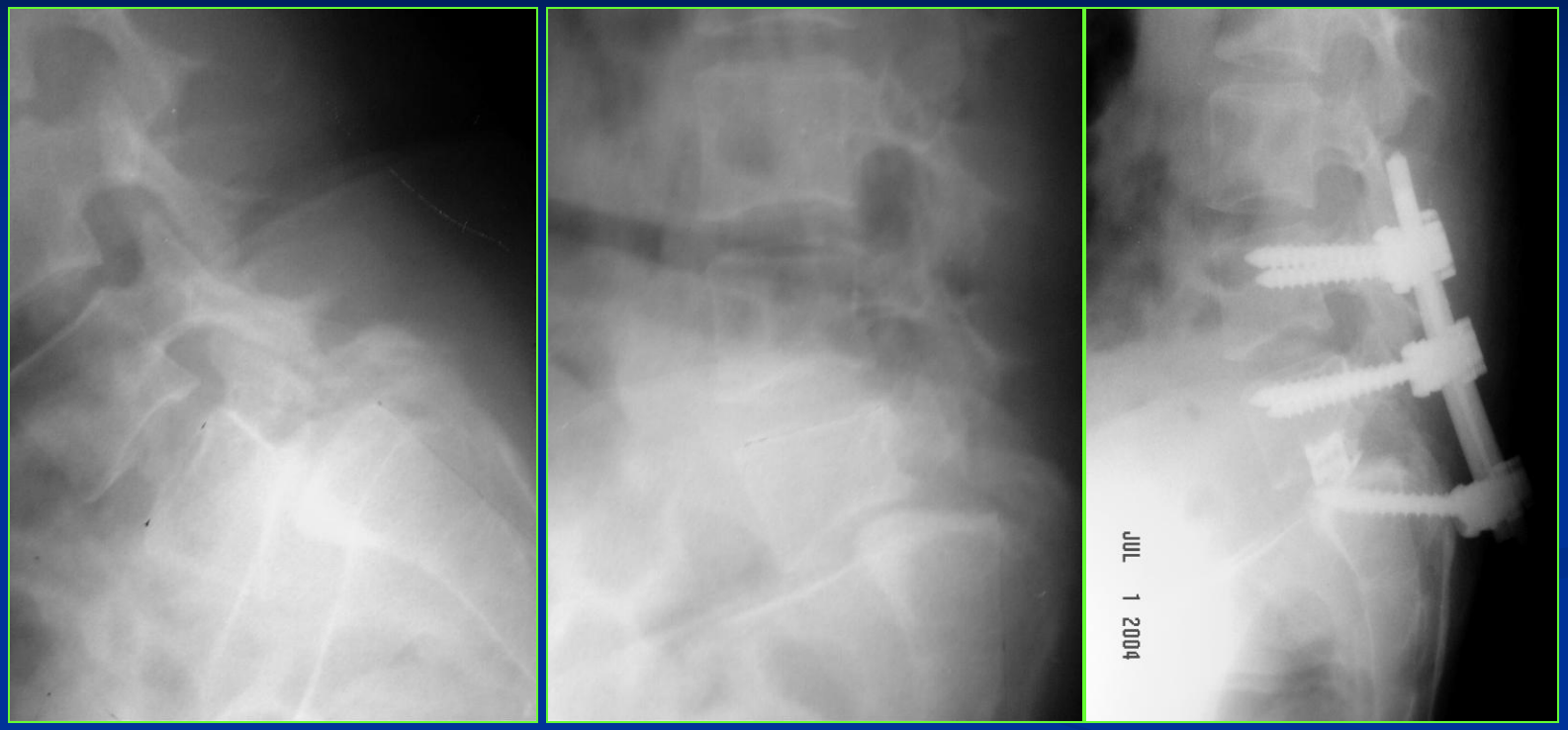
- Failure of conservative management
- Significant or progressive neurological deficit
- Progressive slip beyond 25-50% (even asymptomatic)
- High slip angle in children

Goals of surgery

- Reduction of back / leg pain
- Prevent further slip
- Reverse neurological deficit
- Stabilise unstable segment
- Restoration of normal spinal alignment

Surgical options

- Posterior decompression
- Insitu instrumentation and fusion (decompression +/-)
- Reduction and fusion
- Anterior and posterior fusion
- Vertebrectomy



Grade 3 listhesis
Reduction of listhesis and fusion

22 year old lady with Grade 4 listhesis
Anterior and posterior fusion


ENO