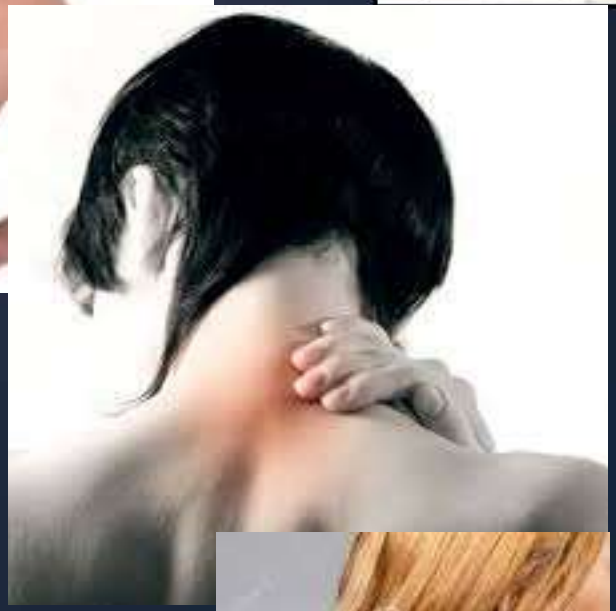
Back pain



Outline

- Urgent Vs. Elective.
- **Diagnosis** of four common spine disorders
  - Spinal Stenosis *(with and without instability)*
  - Disk degeneration
  - Herniated Disc
  - Arthritis (spondylosis)
- **Treatment** of common spine disorders
  - Nonsurgical Vs. Surgical

Urgent Vs. Electives

Urgent

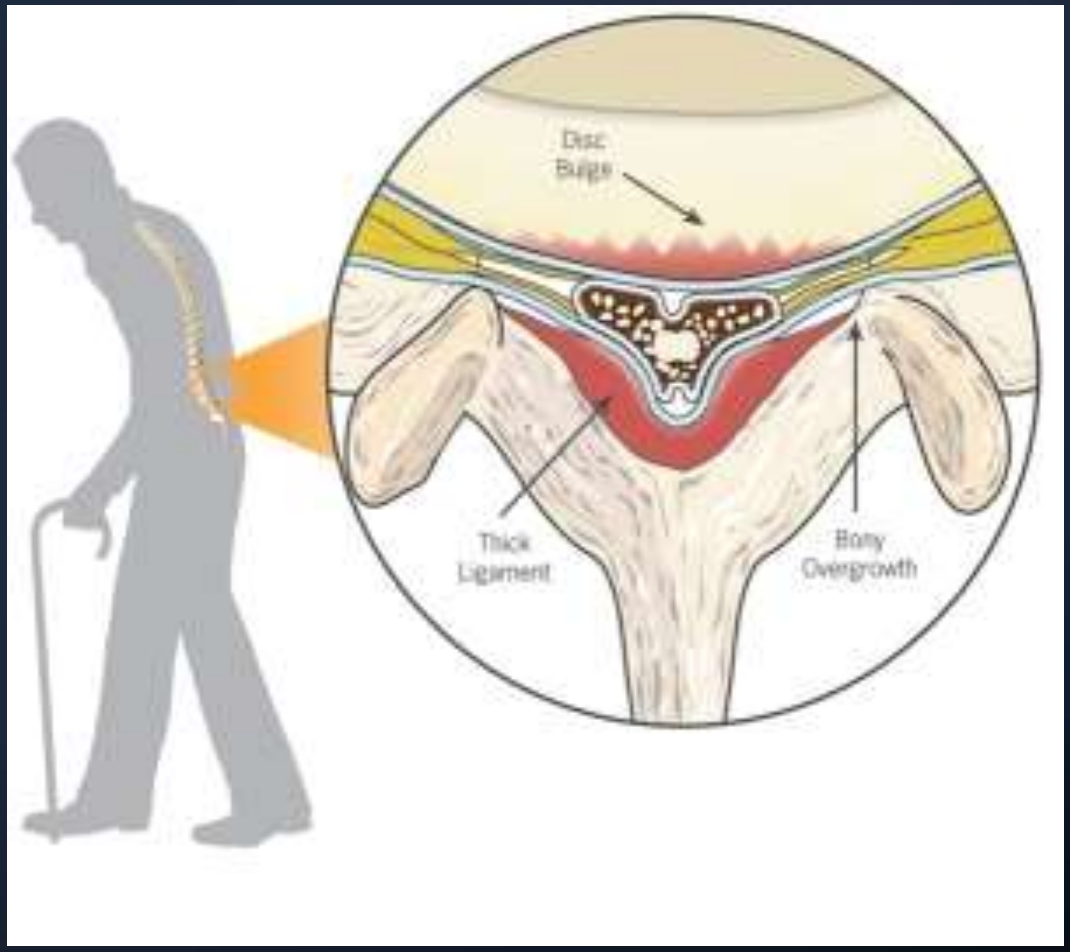
- Infection
- Tumor
- Trauma
- Caudal equina

Electives

- Everything else.

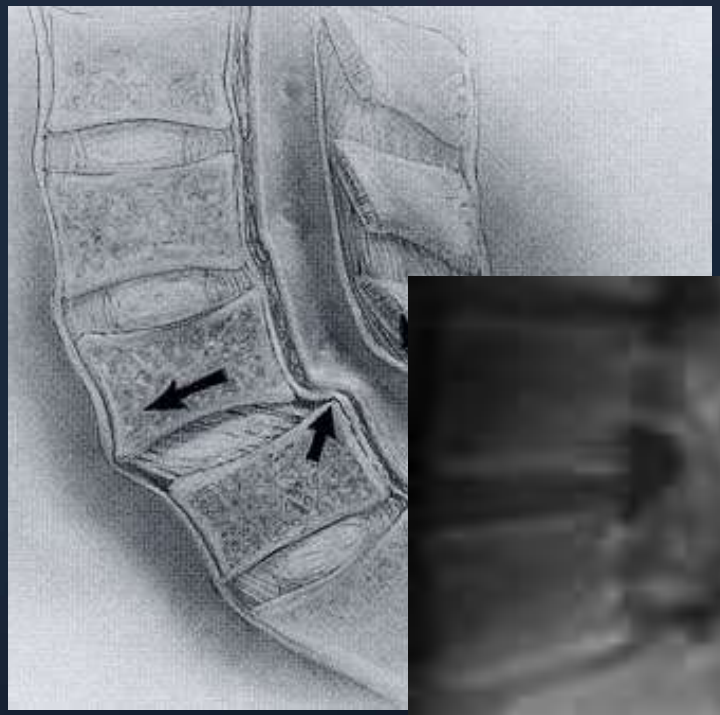
1. SPINAL STENOSIS

Anatomy



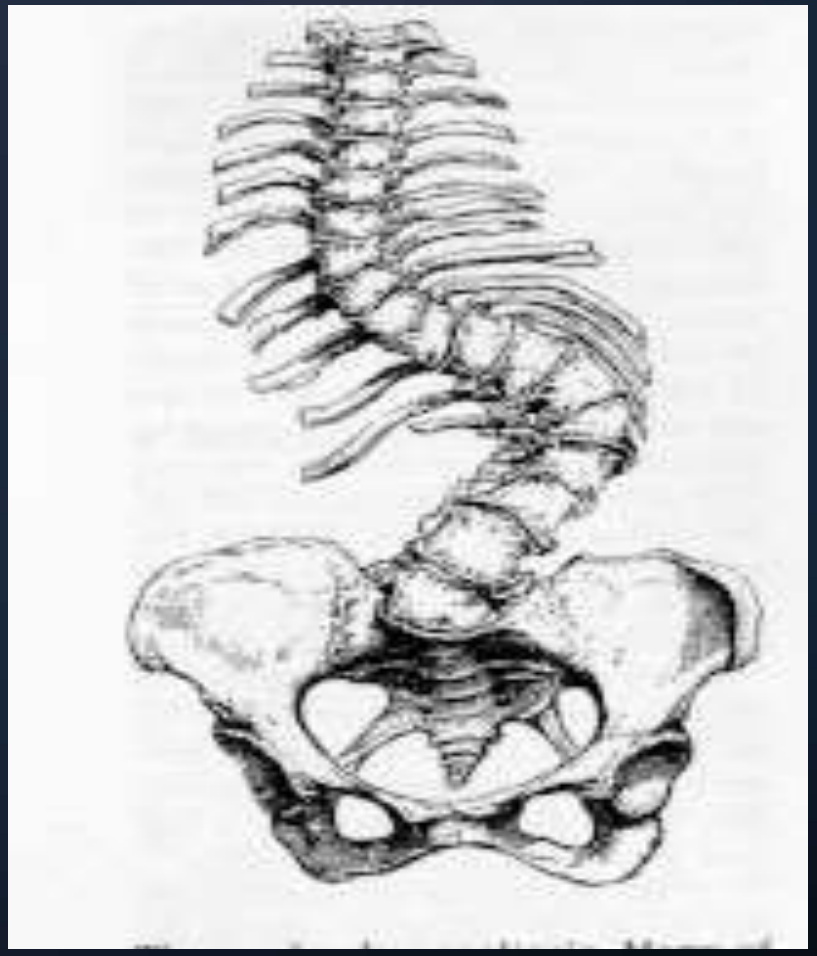
Stenosis with Spondylolisthesis

- Derivation from Greek
  - Spondylos: “vertebra”
  - Olisthein: “to slip”
- Myerding Grading System
  - Grade 1 25%
  - Grade 2 50%
  - Grade 3 75%
  - Grade 4 100%



Stenosis with scoliosis

- Rotatory instability



Pathophysiology

- Narrowing cauda equina to 63% of normal raises intrathecal pressure to 50 mmHg
- ↓ capillary flow
- ↓ electrical conduction
- ↑ edema within & along nerve roots

Olmarker K, Acta Orthop Scand 1991; 242:1-27

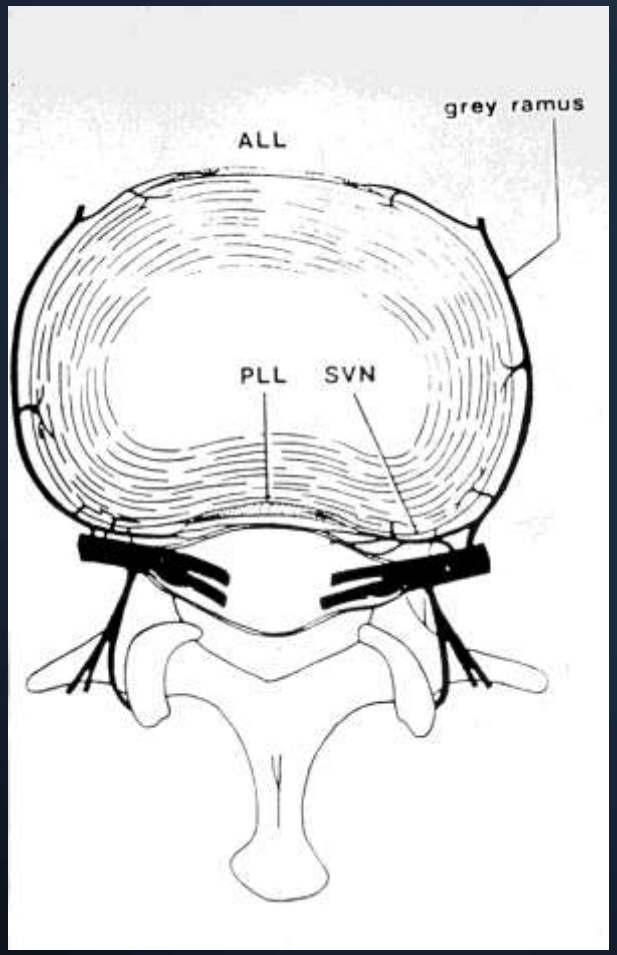
Clinical Presentation – Neurogenic Claudication

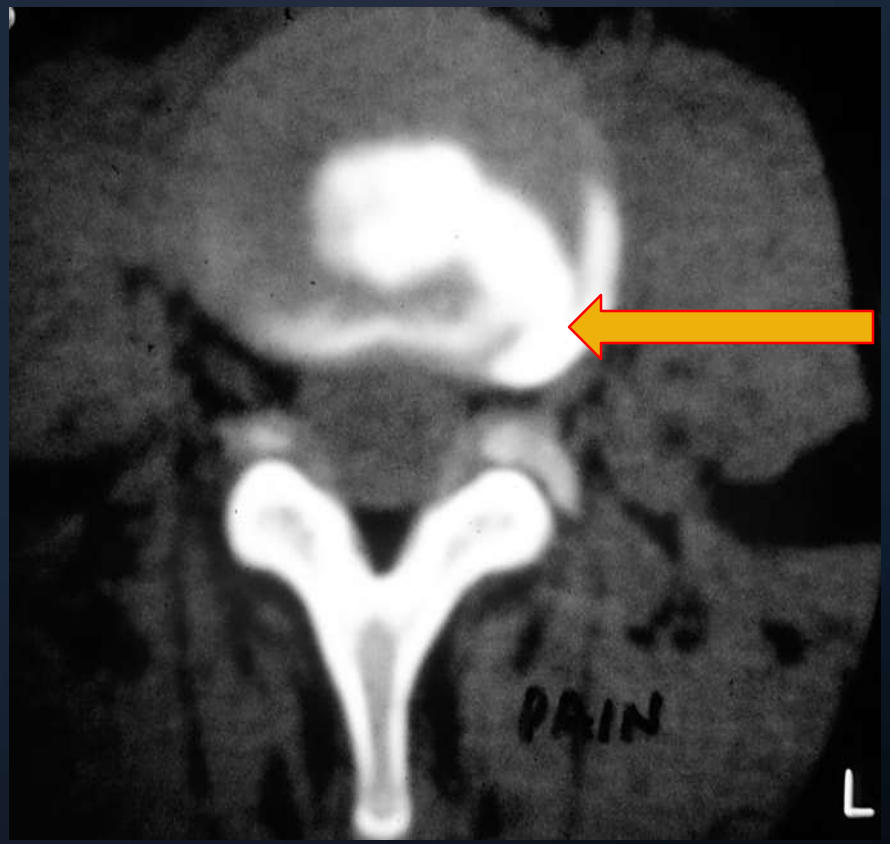
2. Disc Degeneration

- Controversial
- Young patients
- Mostly mechanical back pain worsen with any activities
- Sitting intolerance
- More pain with flexion than extension
- ?Abnormal psychological profile

Discogenic pain

Discogenic Pain





MECHANICAL FAILURE

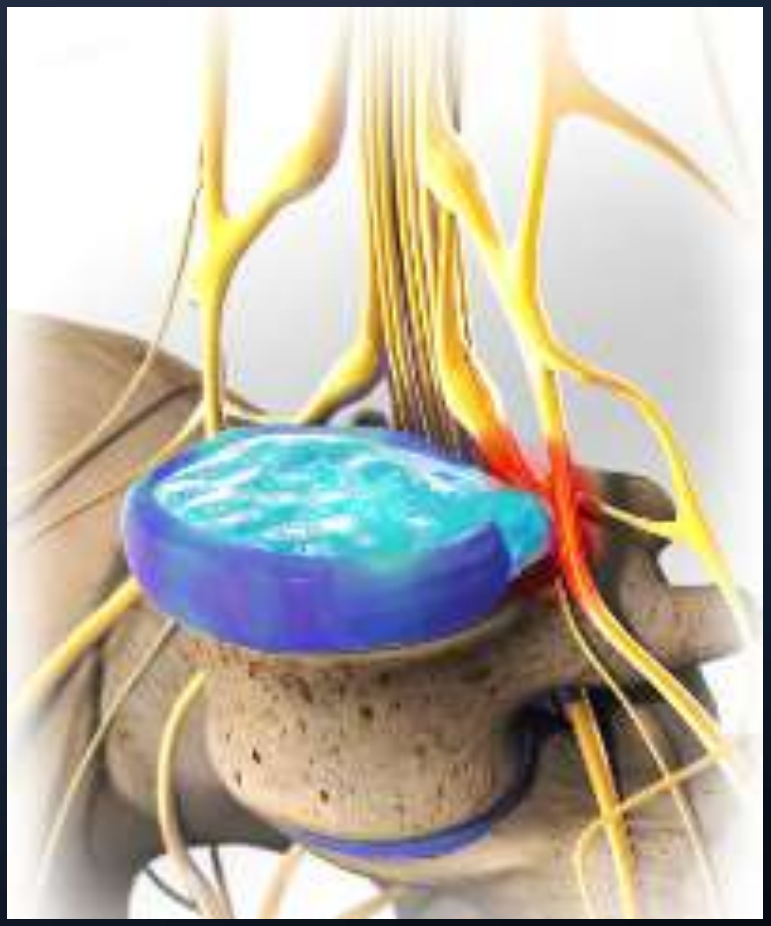
Disc Degeneration

- Black disc

Disc Degeneration

- Discogram

3. Herniated Disc

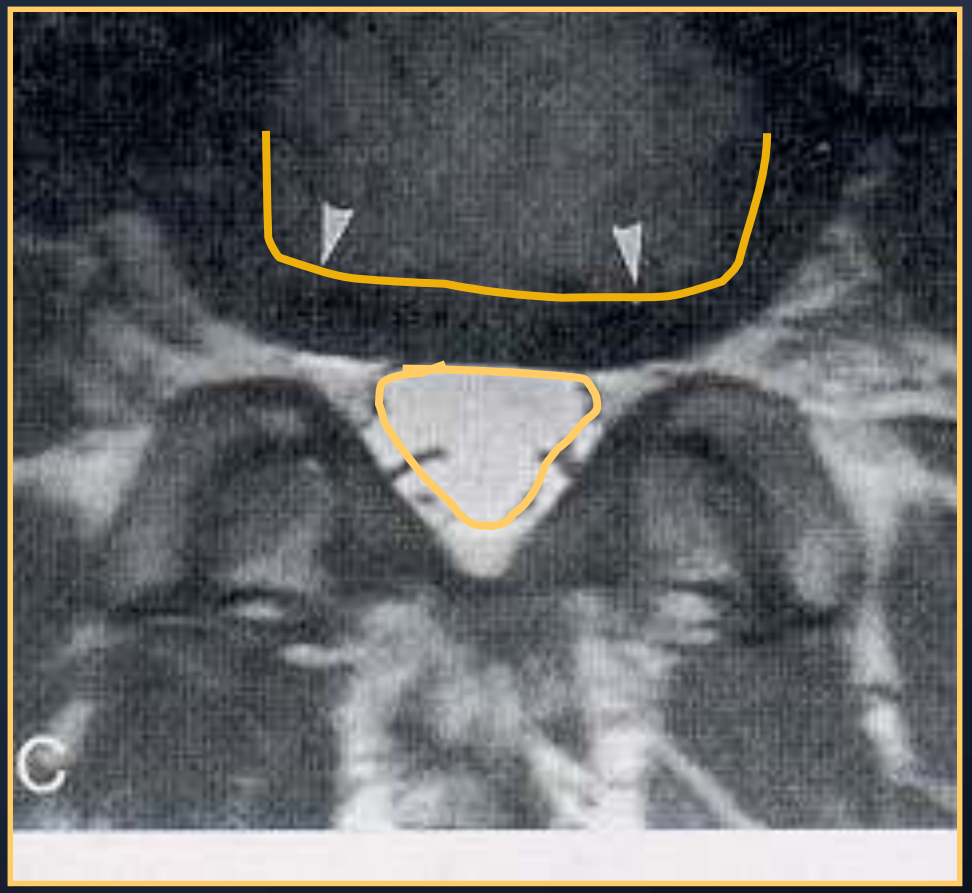


Herniated Disk
Clinical Presentation

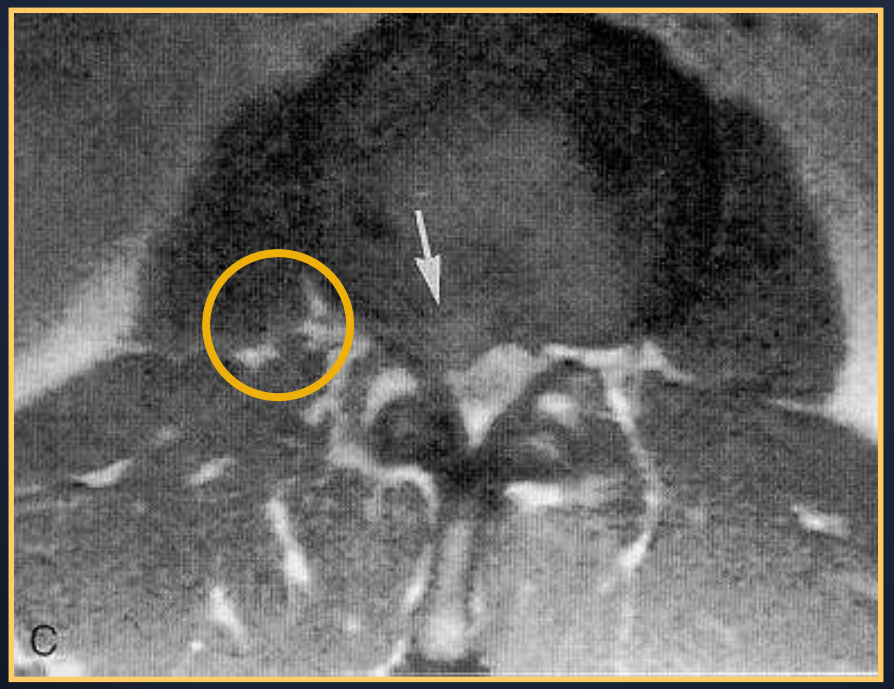
- Young patients
- Radiculopathy (sciatic pain)
  - L4, L5,S1
- Leg pain more than back pain
- Increase with cough or straining
- Positive straight leg raise
- More pain with flexion than extension

Herniated disc

Normal MRI



MRI-HNP



Treat patient not x-ray !

- **67Asymptomatic** volunteers:
  - MRI + Herniated disc
    - <60 yo = 20%
    - >60 yo = 36%
    - >80 yo = 90%

  (Boden JBJS 1990)
- **98 Asymptomatic vol**.
  - 36% had normal disc at all levels

  (Jensen NEJM 1994)

4. Arthritis of the Spine

Pathoanatomy

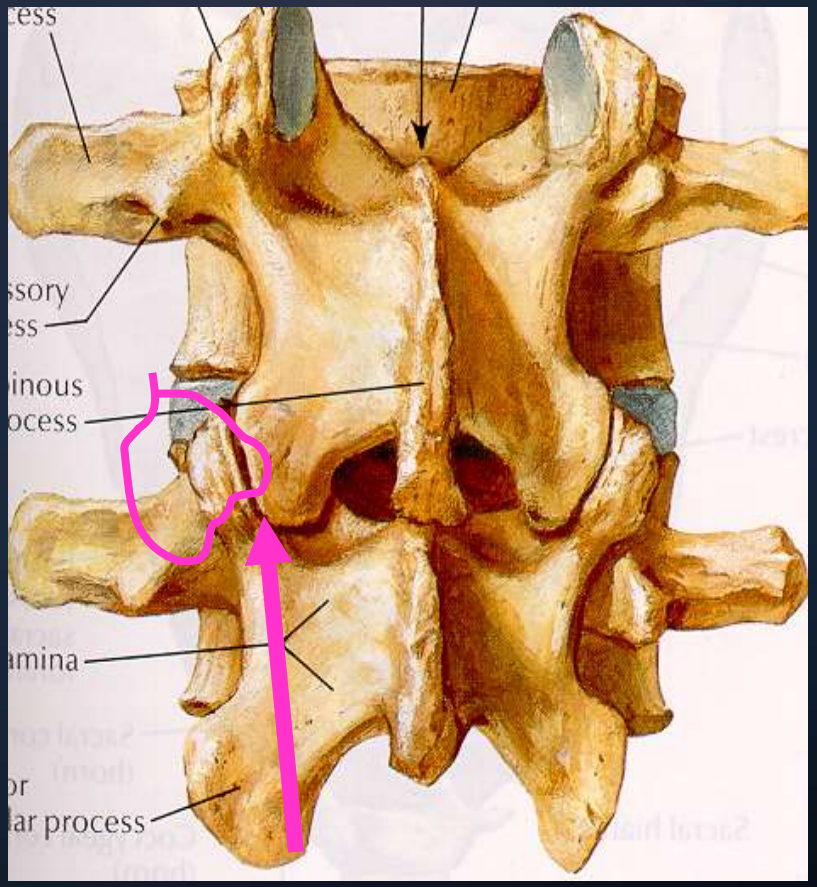
- Begins w/ disc degeneration
- Disc space collapse
- OA of facet joints from abnormal loading
- Osteophytes @ facets and bodies
- Disc **collapse**, bulging **ligamentum**, and **new bone** shorten canal and decrease overall volume
- Scoliosis/spondy/ instab worsen stenosis

Inferior articular process

-Located posterior and medially

-Forms lateral wall of spinal canal

-Osteophytes cause **central canal** narrowing



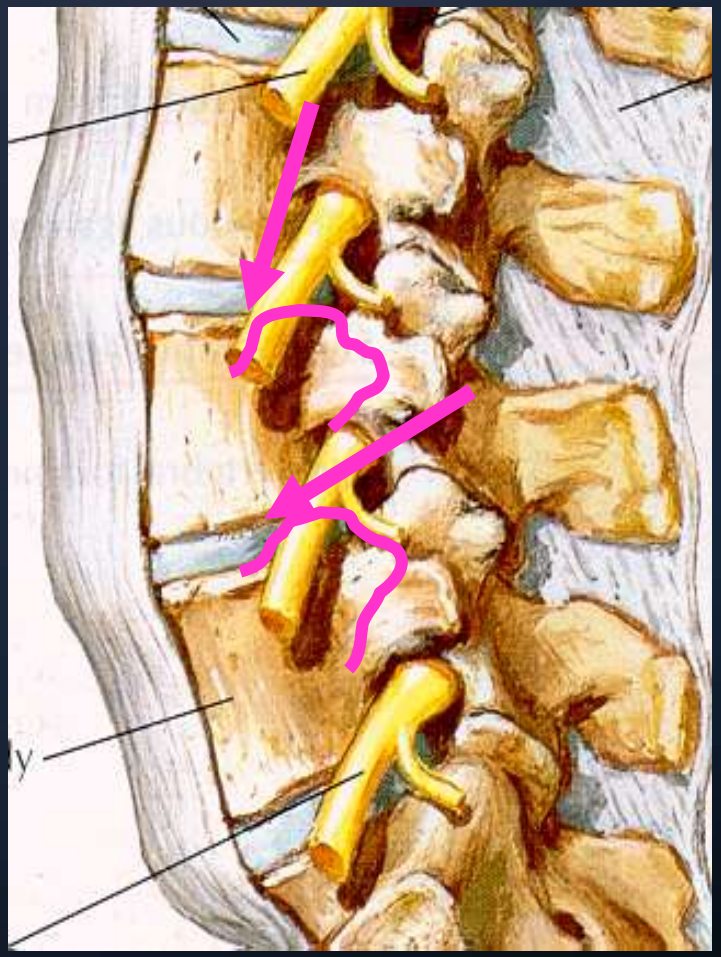
Superior articular process

-Located laterally and anteriorly

-Osteophytes cause narrowing of :

-**lateral recess**

-**neural foramen**



Clinical Presentation of Facets Arthropathy

- Morning Stiffness.
- Lower back Pain without radiculopathy
- Pain improves with activities during the day, returns in the evening.
- More pain with extension than flexion
- Aggravated by weather or humidity change

Arthritis of the Spine

- *Osteoarthritis*
- *Spondyloarthropathy*
  - Ankylosing spondylitis
  - Enteropathic(Crohn's)
  - Reiter's
  - Psoriatic
- *Rheumatoid*

Radiographic findings: AS

- Vertebral scalloping
- Ankylosis/ Bamboo spine

Non-Surgical Treatment (80-90% of patient)

- Bed rest (1-2 days)
- Traction(at least 25% of body weight)
- Acupuncture/trigger point injection
- TENS
- Corset/Braces
- Manipulation
- Medication
  - NSAID
  - Muscle relaxant

Physical Therapy

- **Aerobic** (LA firefighter-higher fitness, lower risk of subsequent back pain)
- **Stretching** (YMCA-80% improvement/6wks)
- **Williams isometric flexion program** (stenosis, arthritis)
- **McKenzie extension program** (Discogenic)

Epidural Steroid Injections (ESI)

- May be helpful in acute flare-ups with significant radicular complaints and/or mild/moderate stenosis
- Useful in older pt population with many co morbidities (poor surgical candidates) after failing medical Rx and PT
- Complications - meningitis, nerve injury, epidural hematoma, arachnoiditis

Epidural Steroid Injections (ESI)

- Prospective, randomized, double-blind study in pts with radicular Sx (~ 50% had Dx of lumbar stenosis)

- No significant difference in symptomatic improvement between steroid and placebo injections at 24-hr and 1-year f/u
  - Cuckler JM et al, JBJS Am 1985; 67:63-66

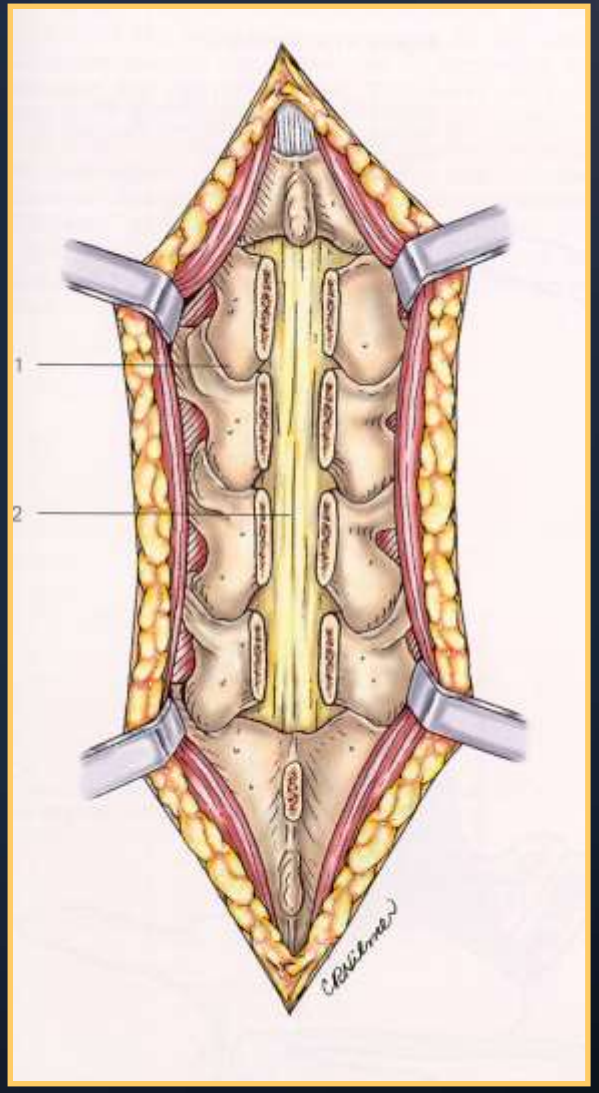
Surgical Treatment

Is a Quality of Life Issue!

A. Decompression

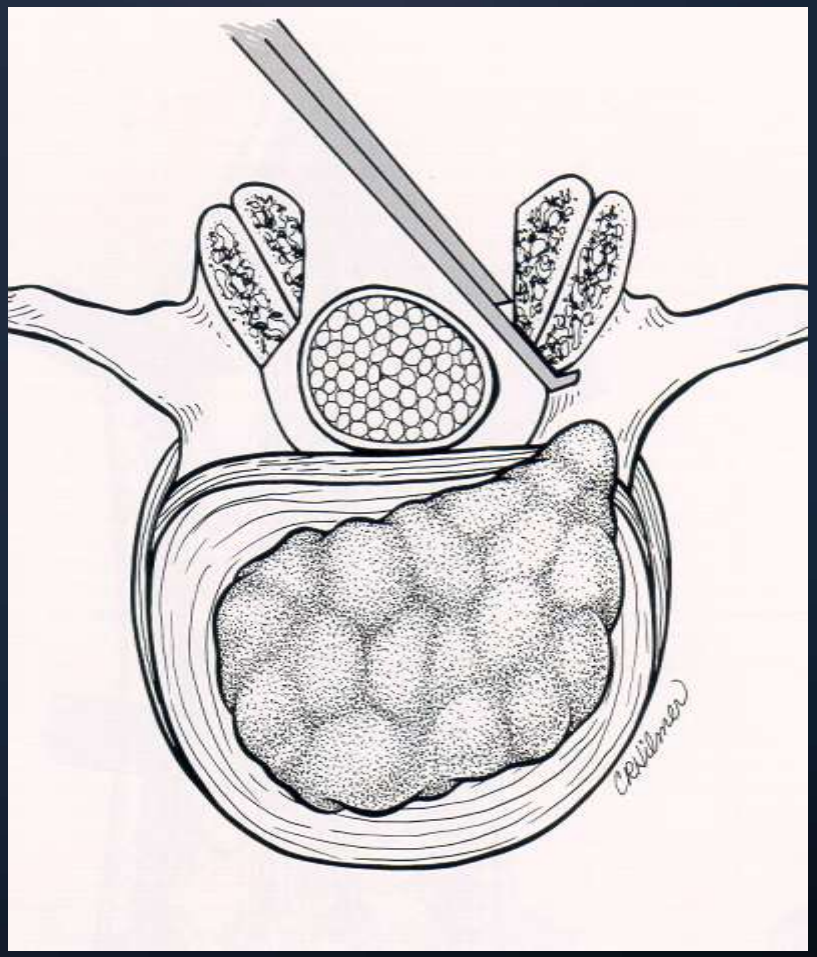
B. Stabilization

For Stenosis
Decompressive Laminectomy



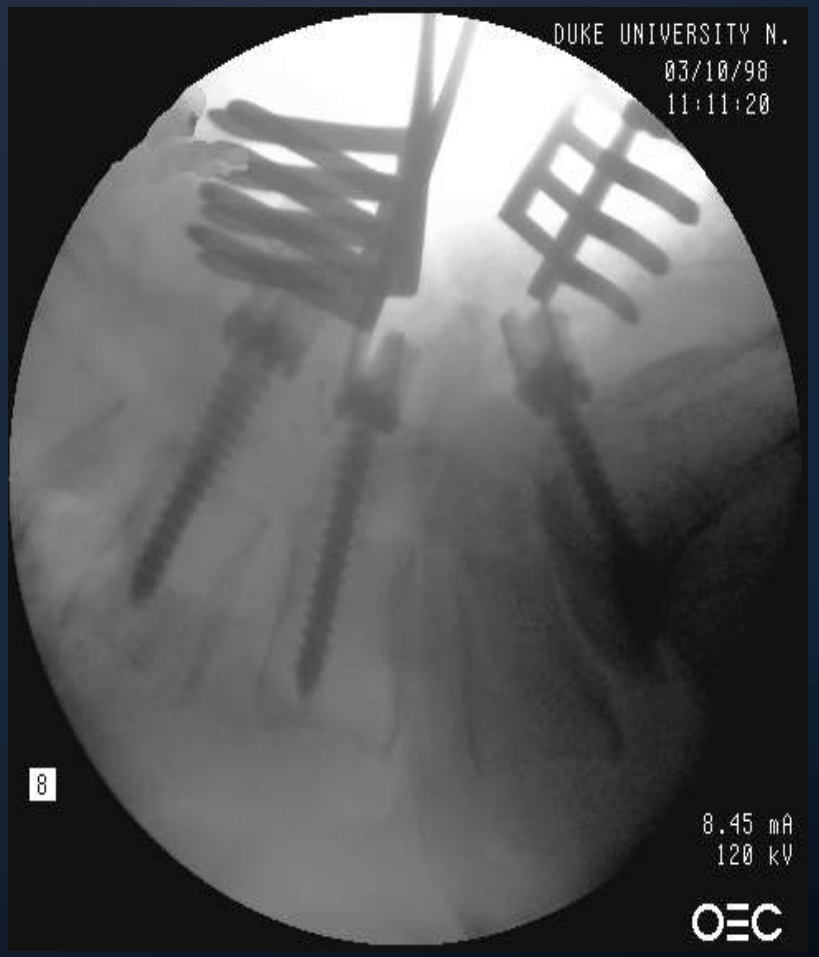
Surgical Decompression Open technique

- Unilateral/bilateral laminotomy with foraminotomy – Focal lateral stenosis
- Up to 50% of facet joint usually may be removed w/ low risk of post-op instability



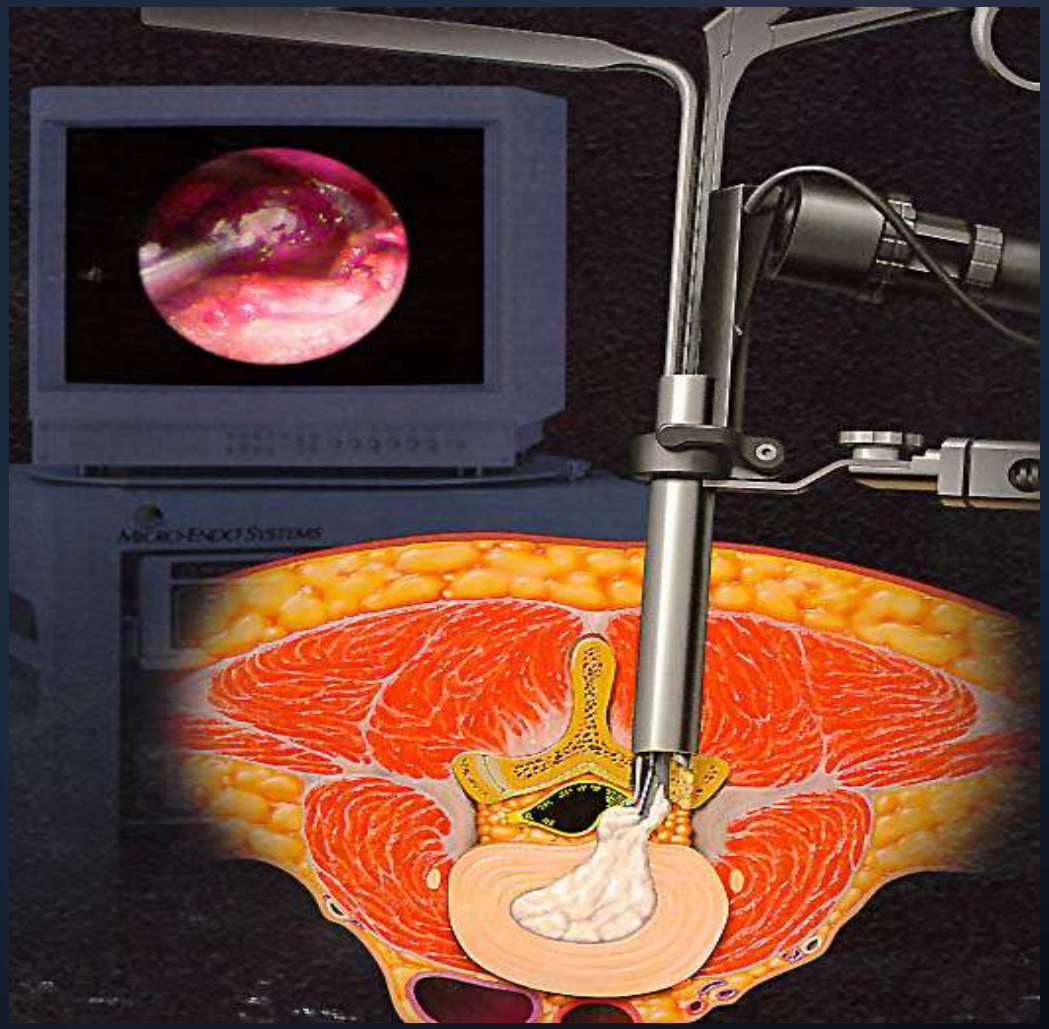
Unstable spine-Fusion

- Instability
  - Spondylolisthesis
  - Scoliosis
  - Severe disc degeneration

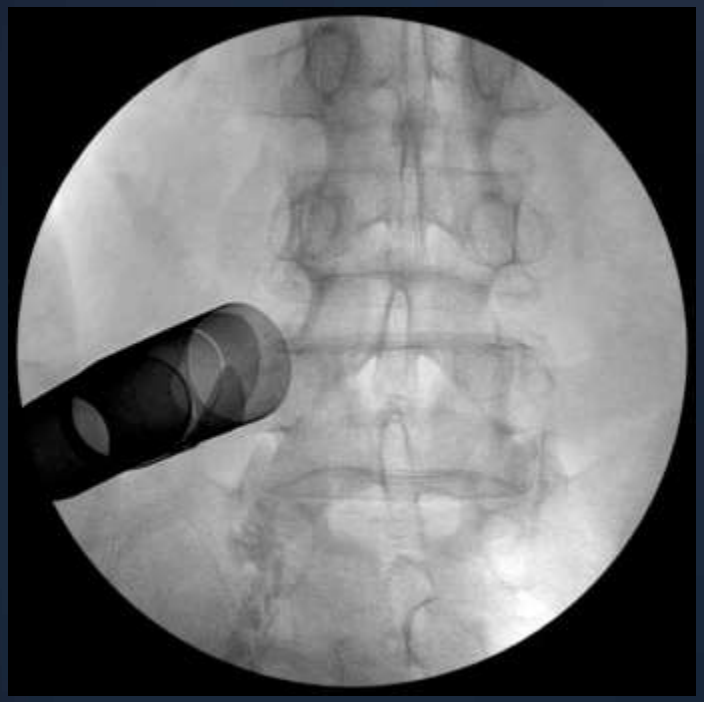


Bones & Spine Surgery

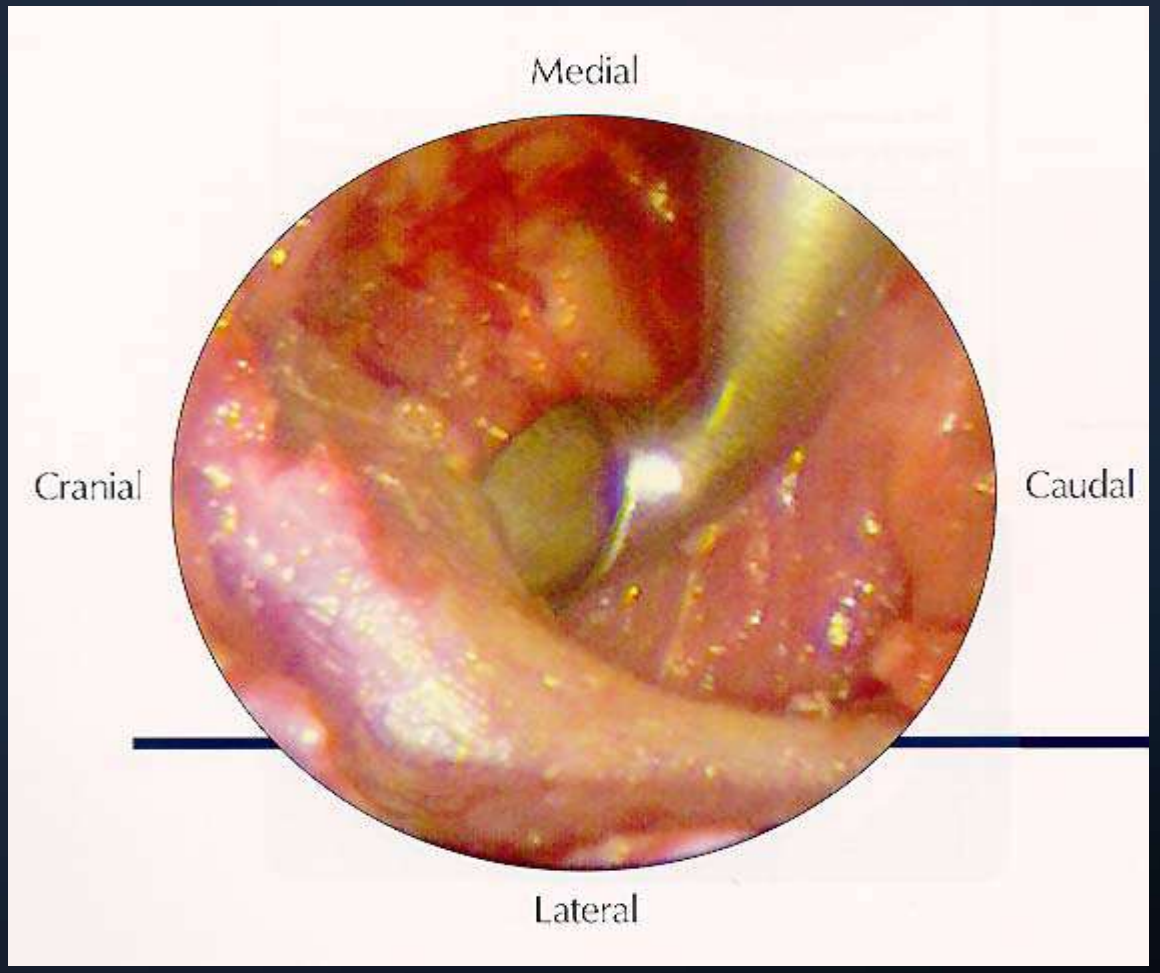
Minimal Invasive decompression



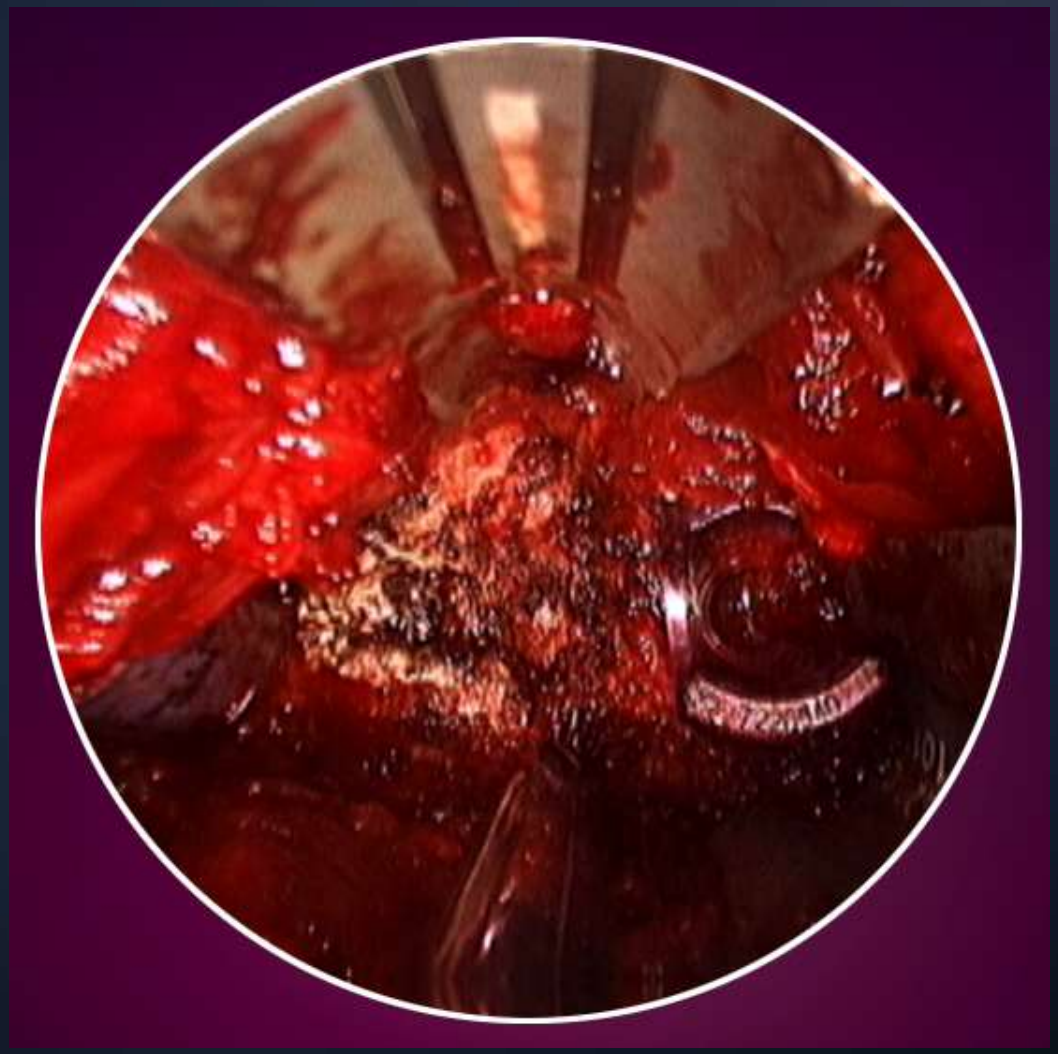
Minimal Invasive Access



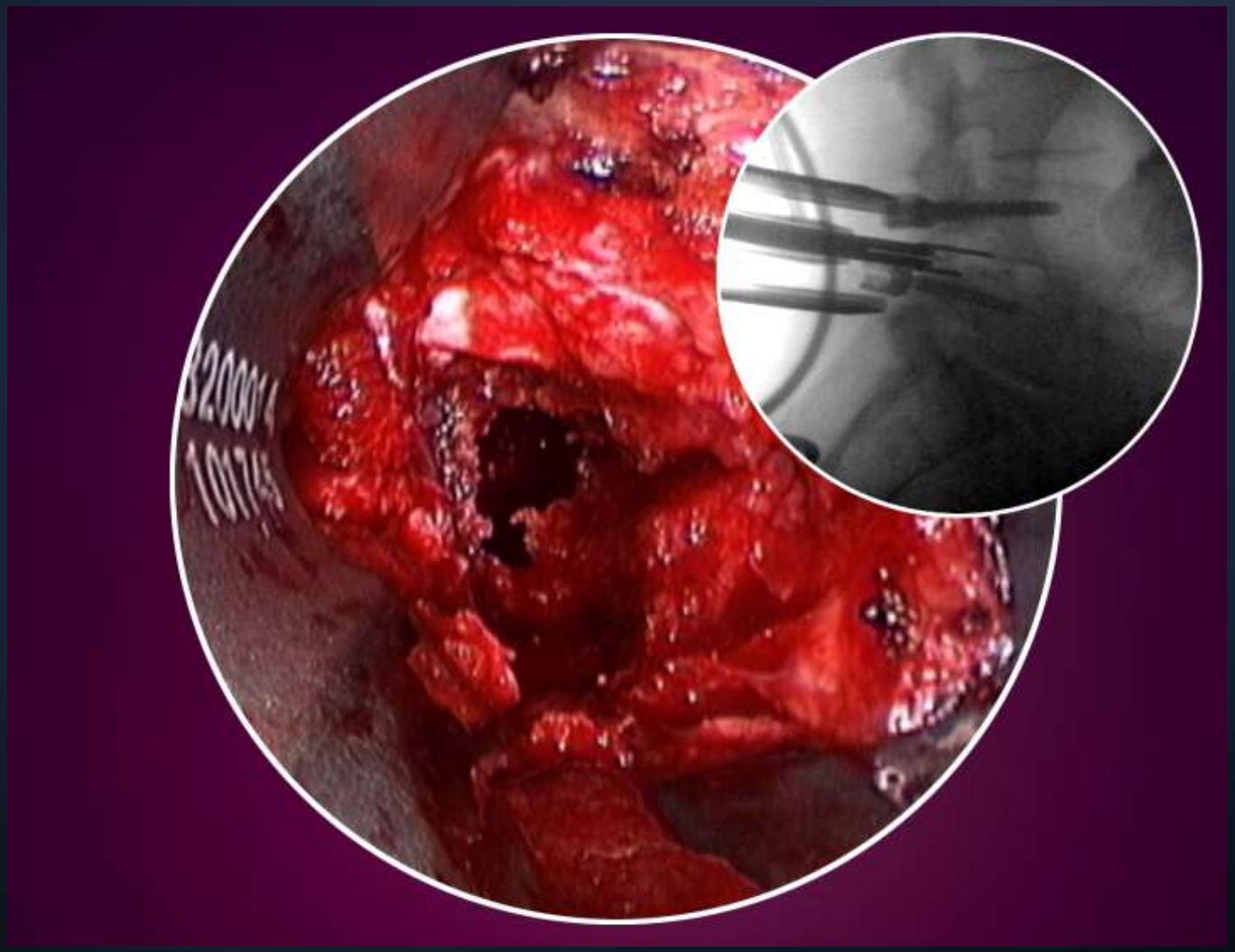
Minimal Invasive exposure



Minimal Invasive Decompression



Minimal Invasive cage placement

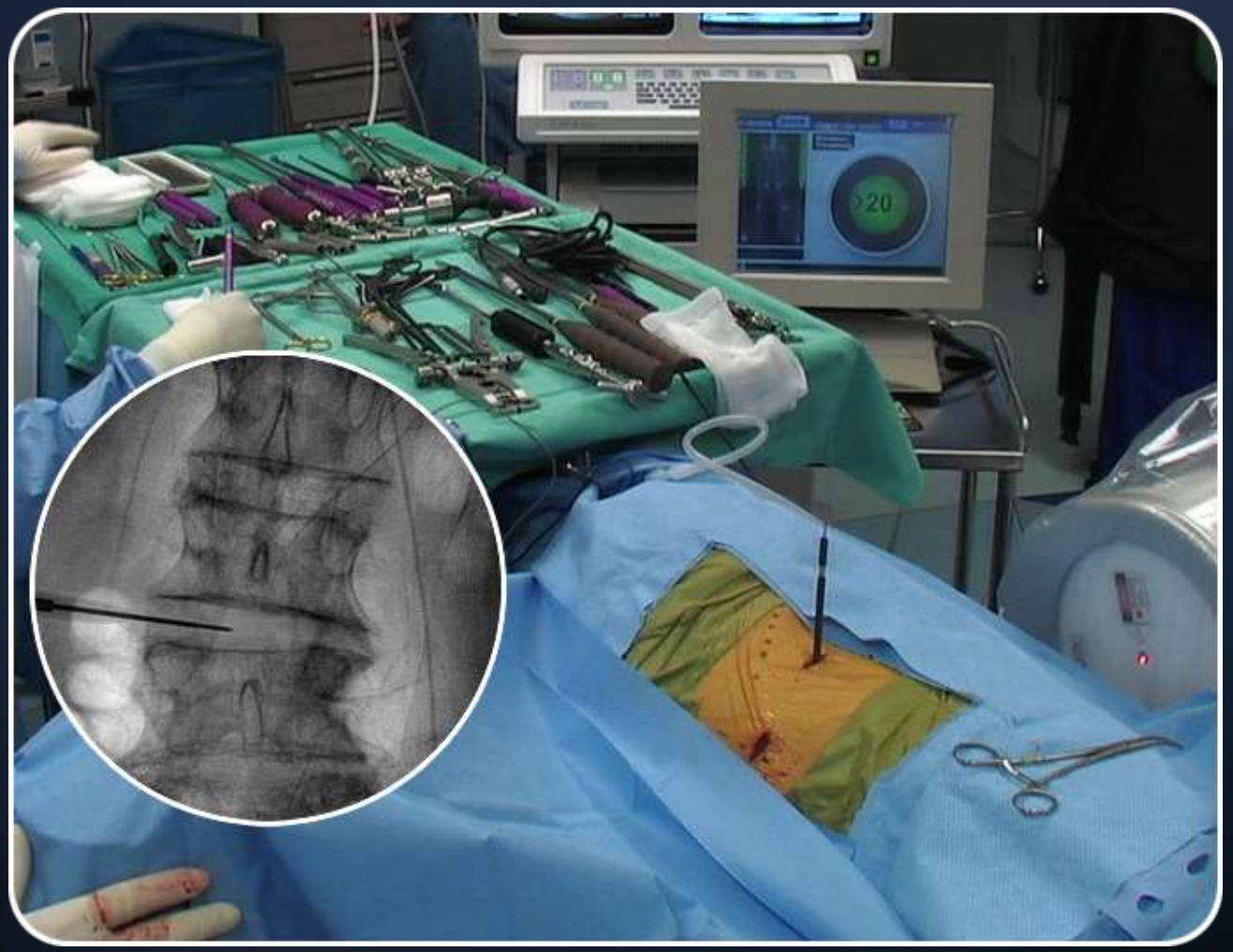


Result

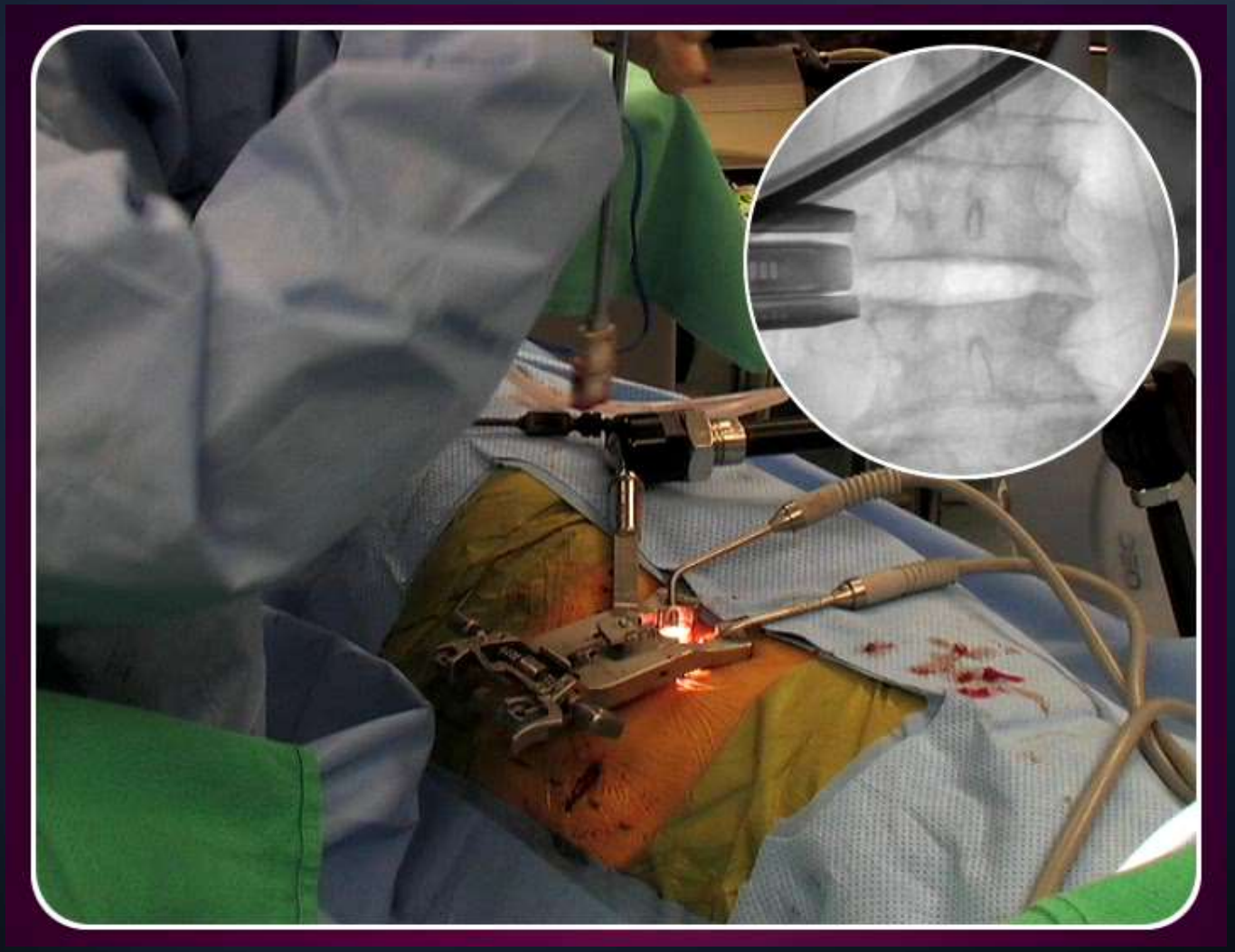
Minimal Invasive-lateral transpsoas technique

Retroperitoneal Access

Position Confirmation



Implant Insertion



Disk Preparation

Minimal Invasive Technique

Motion Preservation-Artificial Disc for Patients w Disc Degeneration

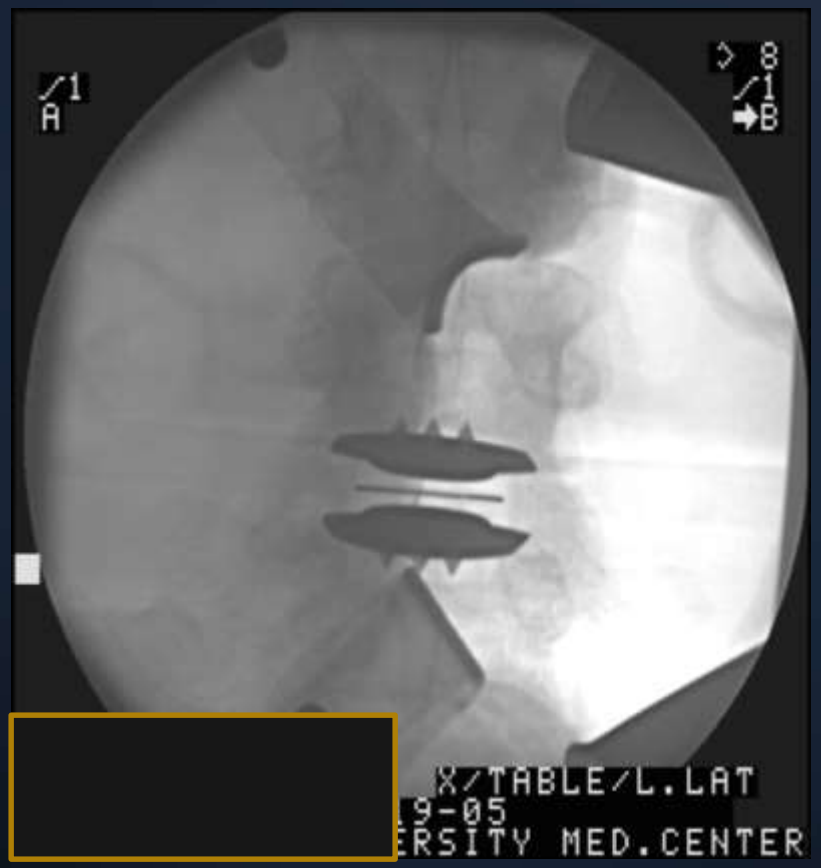
Charite' (depuy)

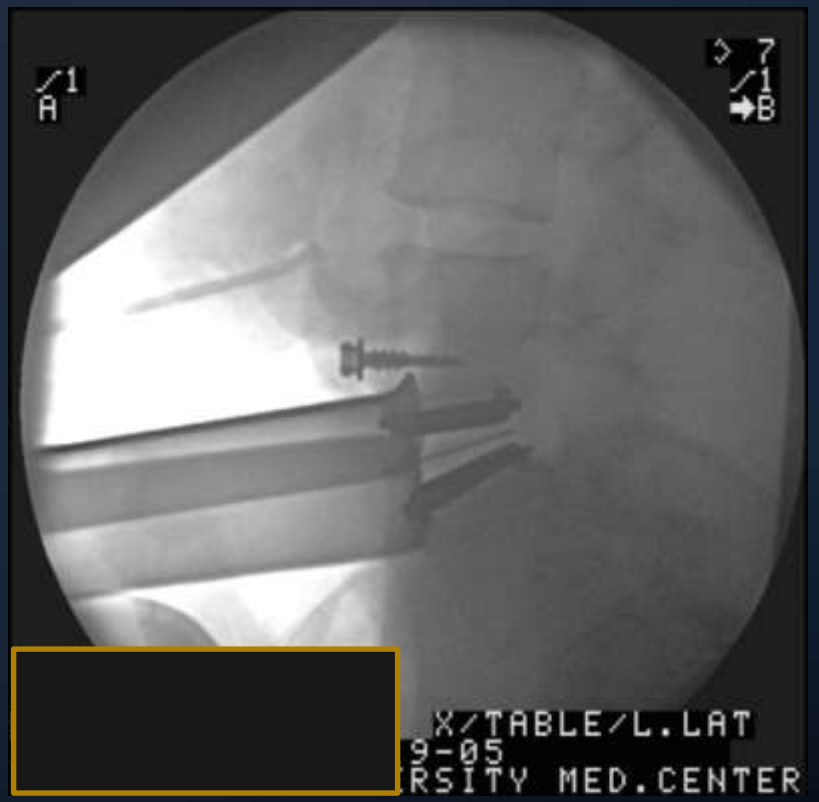
Prodisc (synthes)

Maverick (Medtronic)

Flexicore (stryker)

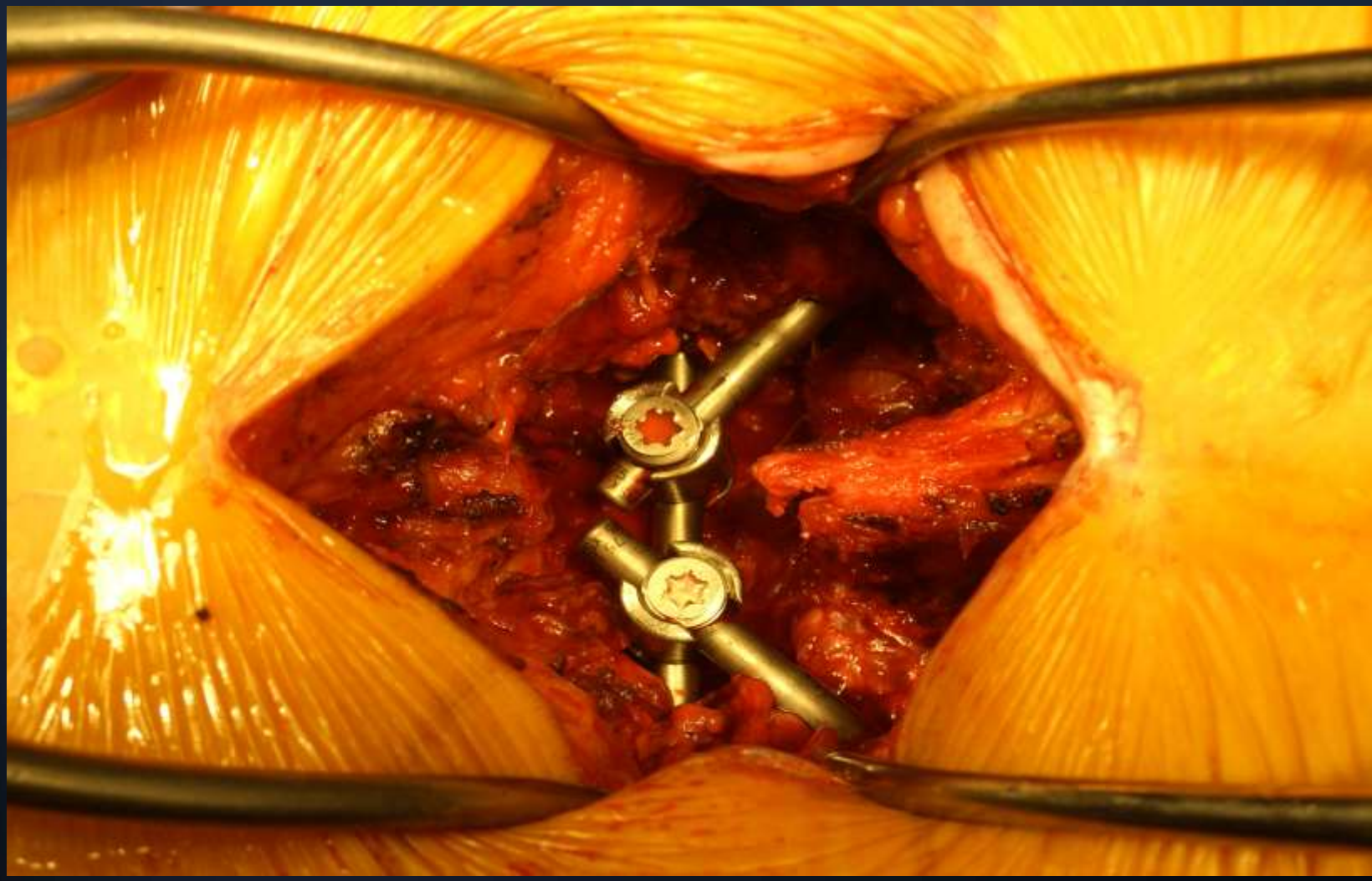
Intra-op: Artificial Disc



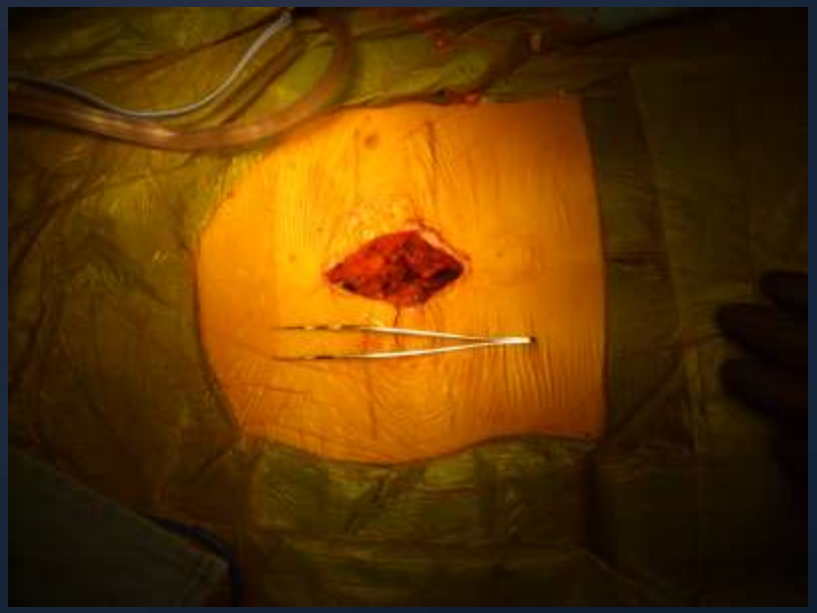


Posterior Dynamic Stabilization IDE

Facet Joint Replacement - IDE

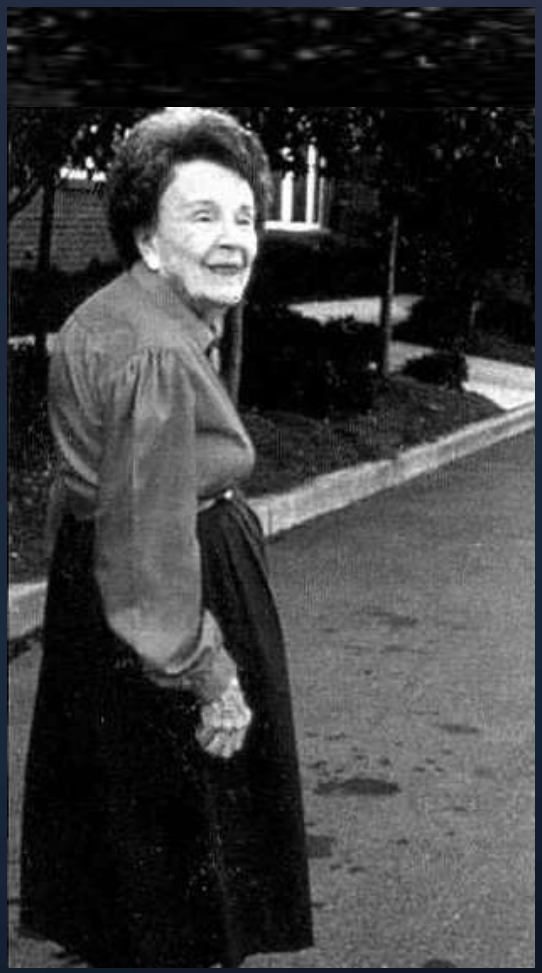


Facet Joint Replacement



Fracture in osteoporosis

Age 50

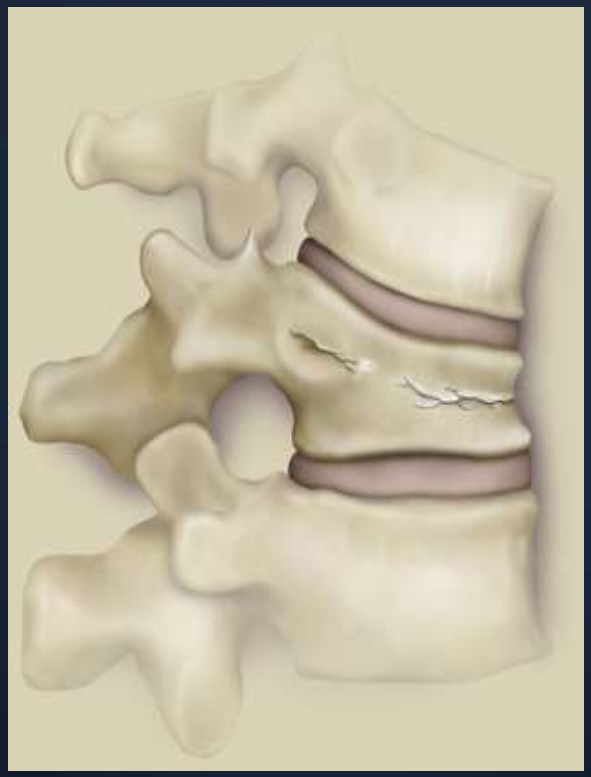


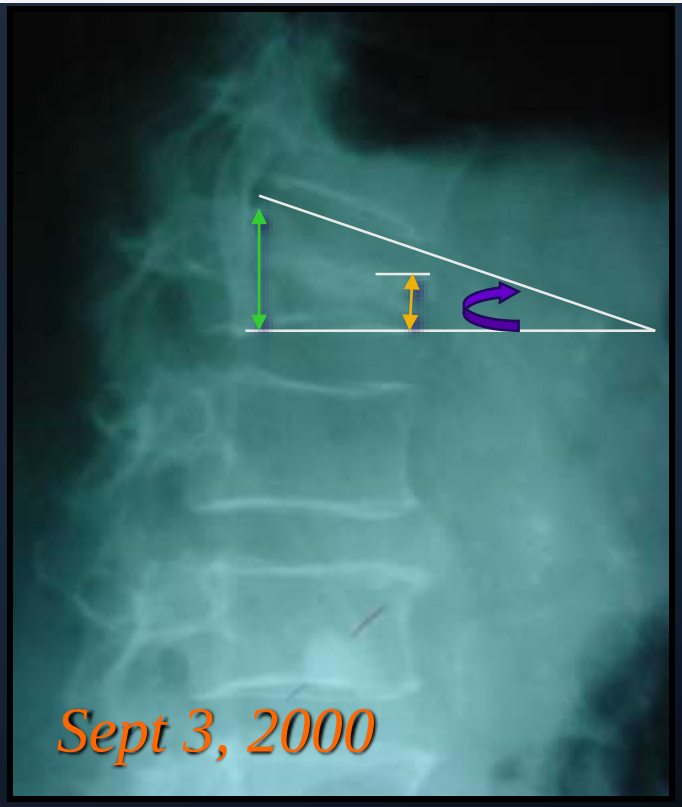
Age 75

National Osteoporosis Foundation

Kyphoplasty for fracture in Elderly

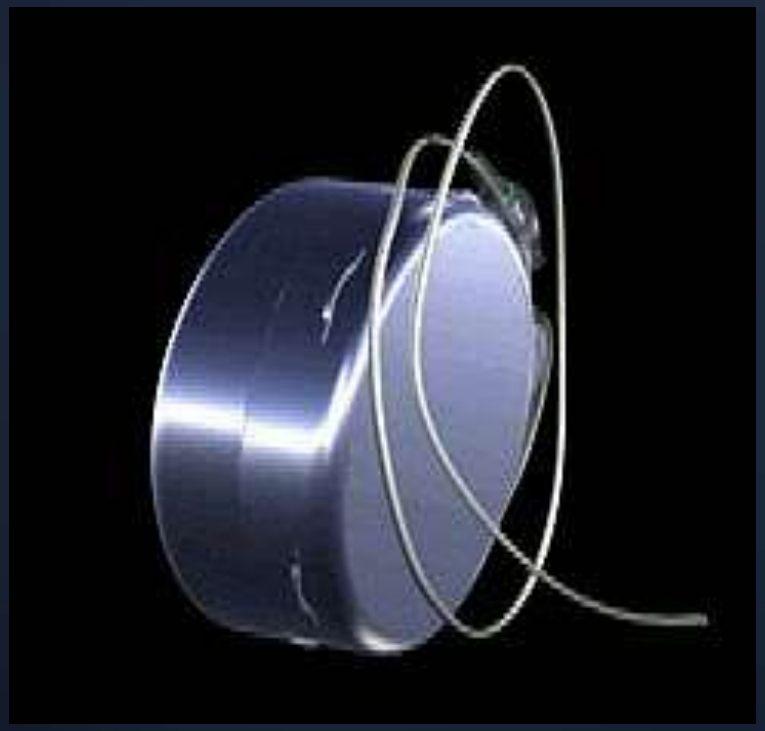
Minimally Invasive Fracture Reduction

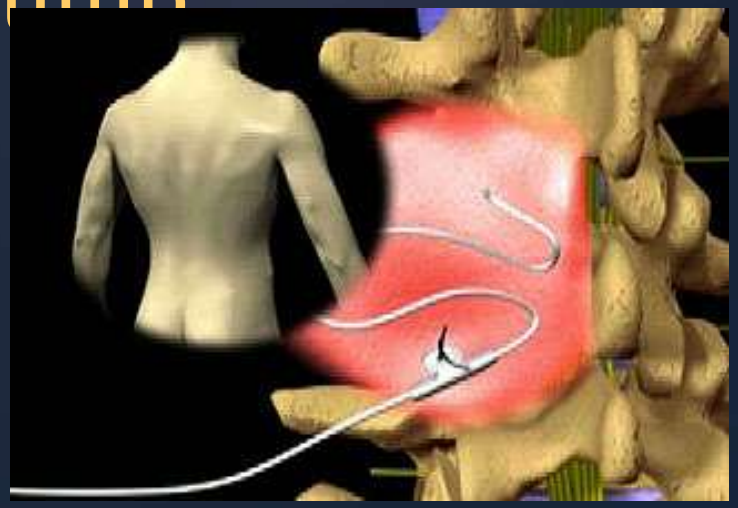


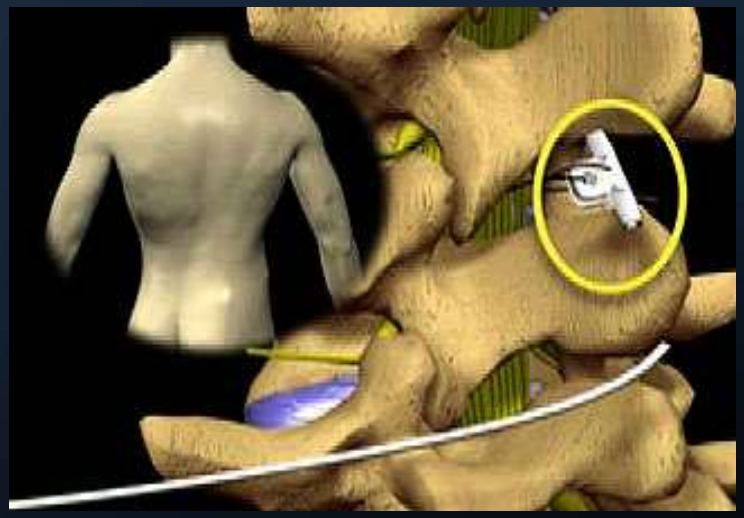


Kyphoplasty

Chronic pain- Stimulator & pain pump







Conclusion

Patient selection and Making the correct diagnosis is the key to success.

Thank You