Lumbar Disc Herniation

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Lumbar Disc Pathology

- Disc Degeneration: Desiccation, narrowing of the disc space, anular tears, osteophytes
- Disc Bulge: Generalized displacement (>50% of the circumference) of the disc
- Disc Herniation: Localized displacement (<50%) of the disc. There are several types:

Lumbar Disc Herniation

Types of Disc Herniation

- Focal: (<25% of the circumference)
- Broad Based: (25-50%)
- Protrusion: Herniated fragment has no narrow neck.
- Extrusion: Herniated fragment has a narrow neck. 2 subtypes:
  - Sequestration: Free disc fragment
  - Migration: Displaced disc fragment
- Intravertebral disc herniation (Schmorl's node)

Red Flags in Low Back Pain (need special diagnostic tests)

Condition	Red Flags
Cancer or Infection	Old age, weight loss, UTI, fever, immunosuppression, IV drug abuse, pain not improving with rest
Spinal #	H/O trauma, On steroids, > 70 yrs
Cauda Equina Syndrome	Acute urine retention, loss of anal tone, saddle anesthesia, Progressive LL weakness

When Red Flags excluded

Patients without Red Flags can be observed for ≈ 4 weeks before special diagnostic tests as most of them will improve

(Symptomatic treatment with analgesics can be given during that period)

Clinical Picture

- Low Back Pain: (disc degeneration, bulge)

- Radiculopathy: (herniated disc compressing the nerve root)
  - Sensory (sciatica, sensory loss)
  - Motor weakness
  - Reflex (hypo or areflexia)

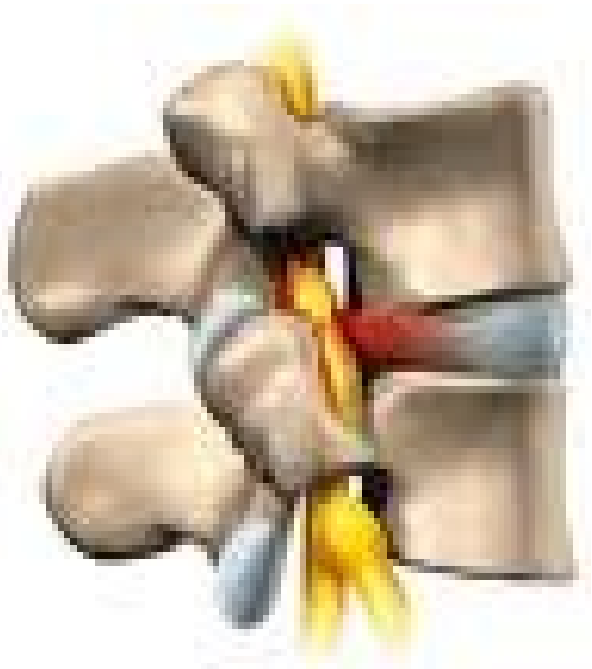
Radicular pain (Sciatica)

- Dermatomal distribution
- Improves upon flexing the knee & thigh
- Increases with cough & straining
- Positive nerve root tension sign (Lasegue's sign or straight leg raising -SLR)

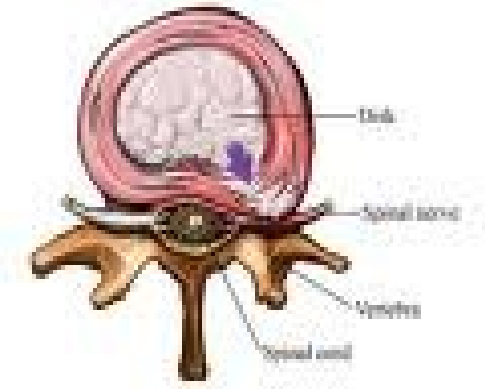
Lumbar Disc Syndromes

	Level		
	L3-4	L4-5	L5-S1
Root	L4	L5	S1
%	5%	45%	50%
Reflex	Knee	-	Ankle
Weakness	Knee ext.	EHL, ankle drosiflexion	Ankle platarflexion
Hypesthesia	Medial malleolus	1st & 2d toe web space	Lateral malleolus
Pain	Ant. thigh	Post LL	Post LL to the ankle

Disc Herniation







Radiographic Evaluation

- Myelography
- CT myelography
- CT
- MRI (The best)

Advantages of MRI

- More sensitive & specific than CT or Myelography
- As sensitive & specific as CT myelography but less invasive
- Gives sagittal plane
- No radiation
- Best for far lateral disc herniation
- Best for previously operated disc pts.

Disadvantages of MRI

- Movement artifacts (pain, claustrophobia)
- Slow
- Not good for bone
- Not good for acute blood
- Not easily available
- Expensive
- A number of contraindications

Disc Herniation on Sagital MRI







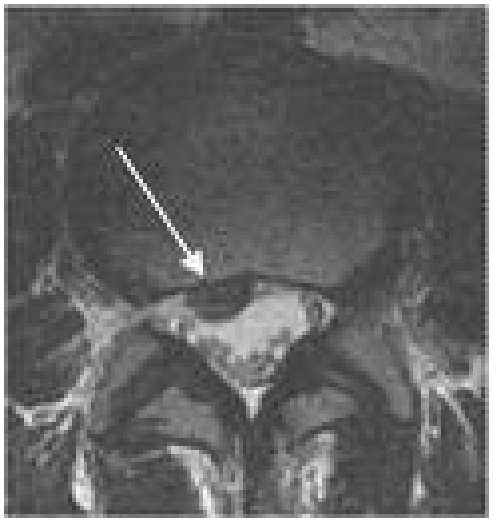
Disc Herniation on Sagital MRI

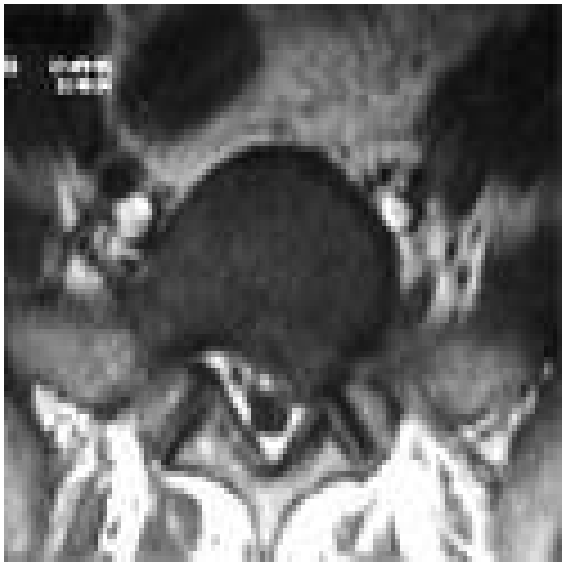




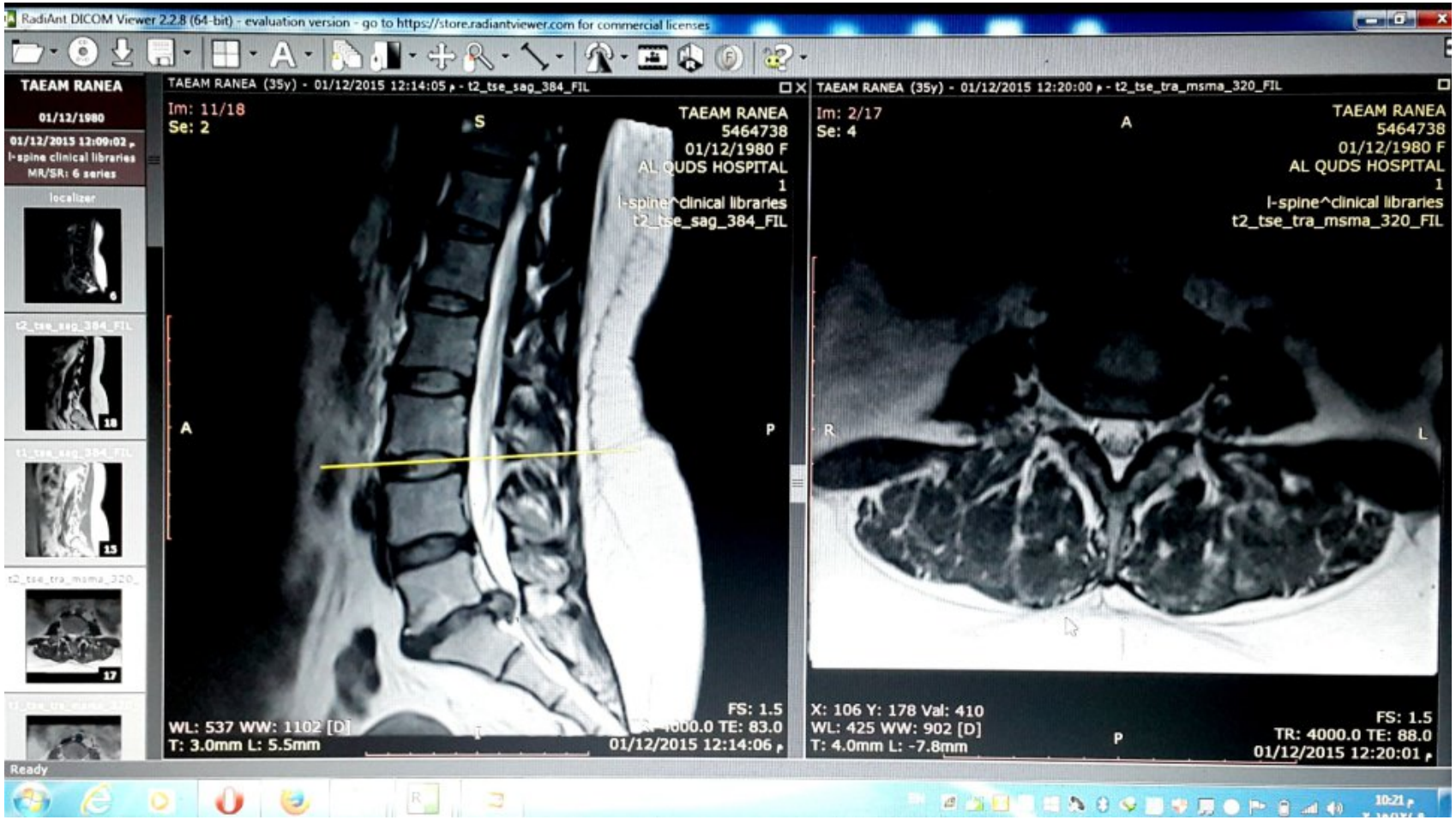
Disc Herniation on Axial MRI



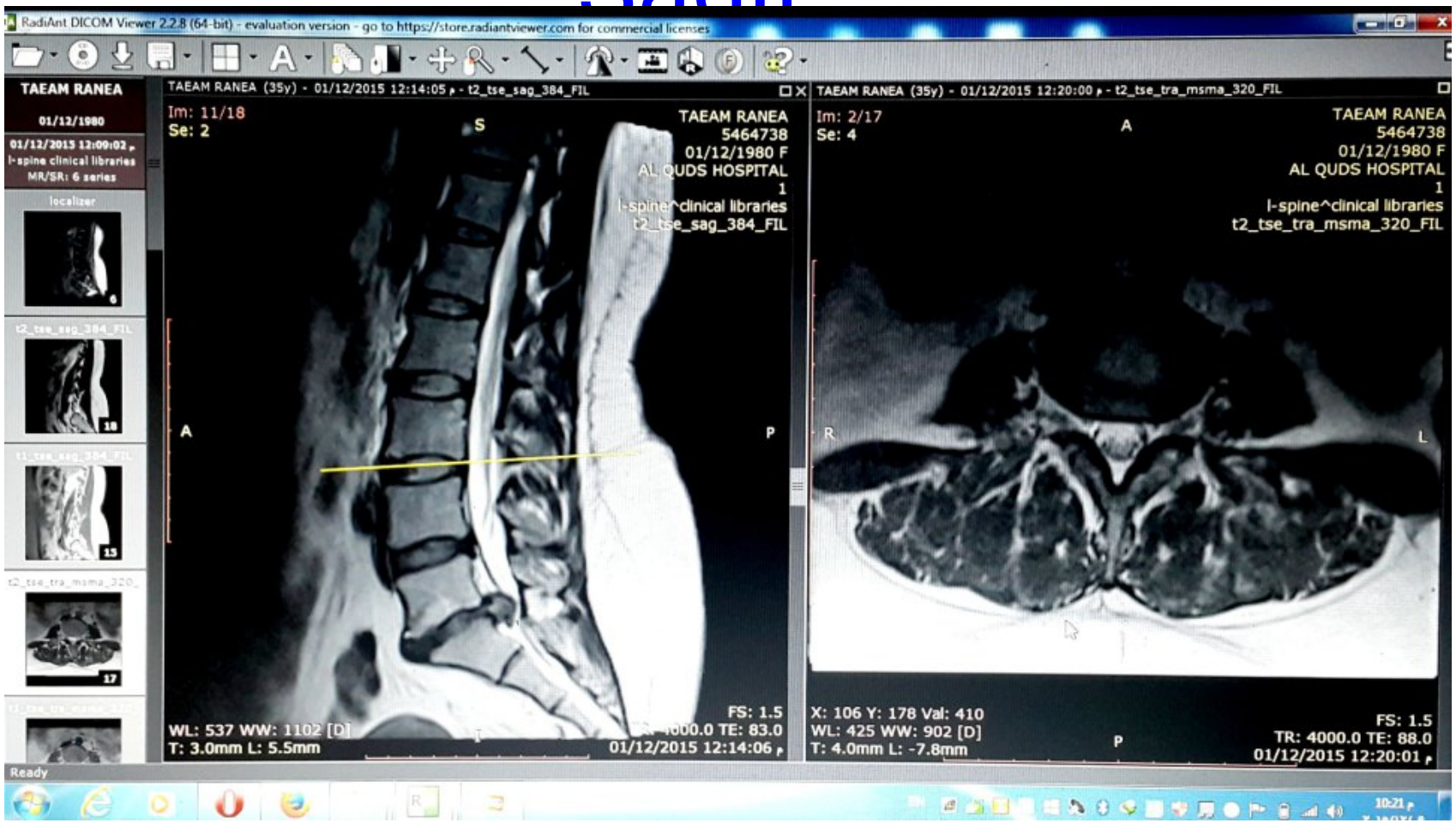




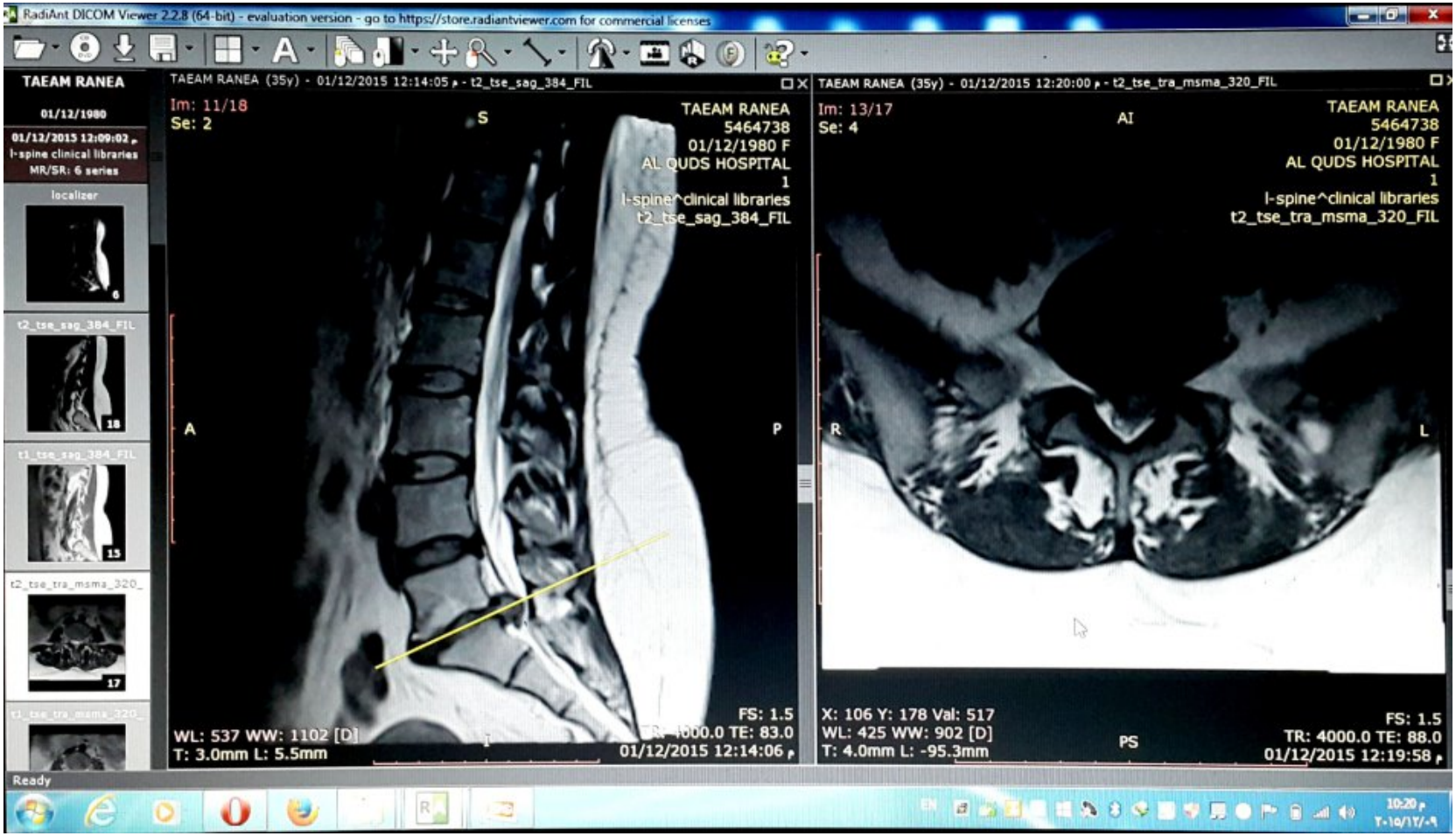
Is there a disc herniation?



Normal axial cut taken at L3-4 level, while L5-S1 disc H. on Sagit



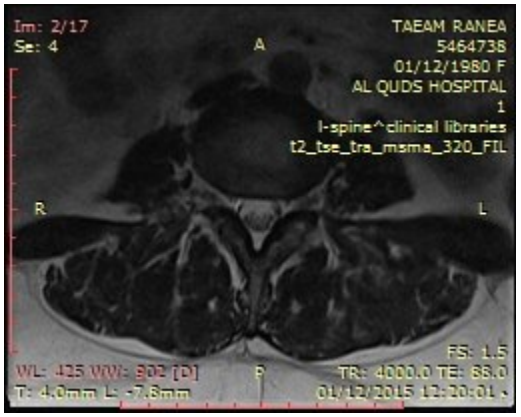
Lt L5-S1 disc herniation



Huge central L4-5 disc H.

Pending CES







Treatment

Conservative

- Most surgeons will treat patients with acute radiculopathy from disc herniation conservatively for ≈ 6 weeks as long as no indication for emergent surgery & the pt is cooperative.

- 70% will improve in 4 weeks
- 85% will improve in 6 weeks

Treatment

Conservative

- Bed Rest: an option for severe radicular pain (Max. 3 days). Prolonged bed rest is worse (weakness, stiffness, more pain)

- Activity: The goal is to achieve tolerable level of discomfort while continuing sufficient physical activity. Avoid: Heavy lifting, Prolonged sitting, Bending the back

Treatment
Conservative

- Exercise:
  - 1st 4 weeks: low stress exercises: walking, swimming
  - Later: exercises for trunk muscles
- Analgesics:
  - NSAIDs & Paracetamol
  - Opioids may be used for very severe pain for short period

Treatment
Conservative

- Education:
  - Explanation of the condition to the pt
  - Proper posture, sleeping positions, lifting techniques

Surgical Treatment
Indications

- Failure of conservative treatment for 6 wks

- Indications for emergency surgery (at any time)
- +/- The pt doesn't want to invest time trying conservative treatment, if it is possible that he will still require surgery at the end of trial

Surgical Treatment
Indications for emergency surgery

- Cauda Equina Syndrome (CES)
  (usually huge central disc)
  (seen in 1-2% of herniated discs coming to surgery)

- Acute or Progressive motor deficit

- Intolerable pain in spite of adequate narcotic pain medication

Cauda Equina Syndrome (CES)

- Sphincter disturbance
- Saddle anesthesia
- Significant motor weakness (bilateral usually)
- Low back pain & sciatica (bilateral usually)
- Bilateral absence of Achilles reflex
- Sexual dysfunction

Surgical Options for HLD

- Standard open lumbar laminectomy & discectomy

- Microdiscectomy (using the microscope, less invasive, same efficacy, maybe more difficult)

Surgical Treatment

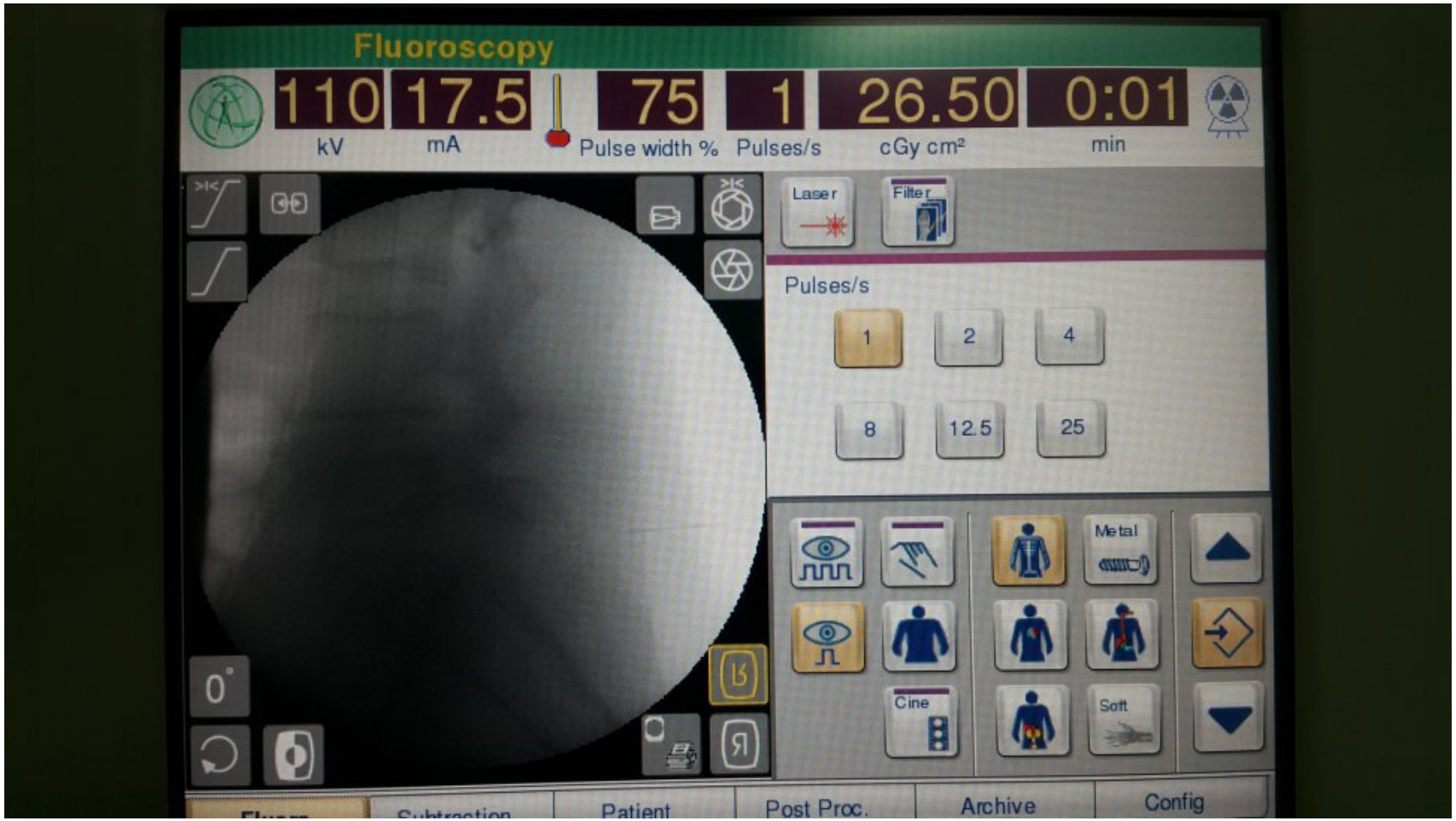
Prone position



X-ray level identification



L5-S1 level marked with a needle



Skin marking

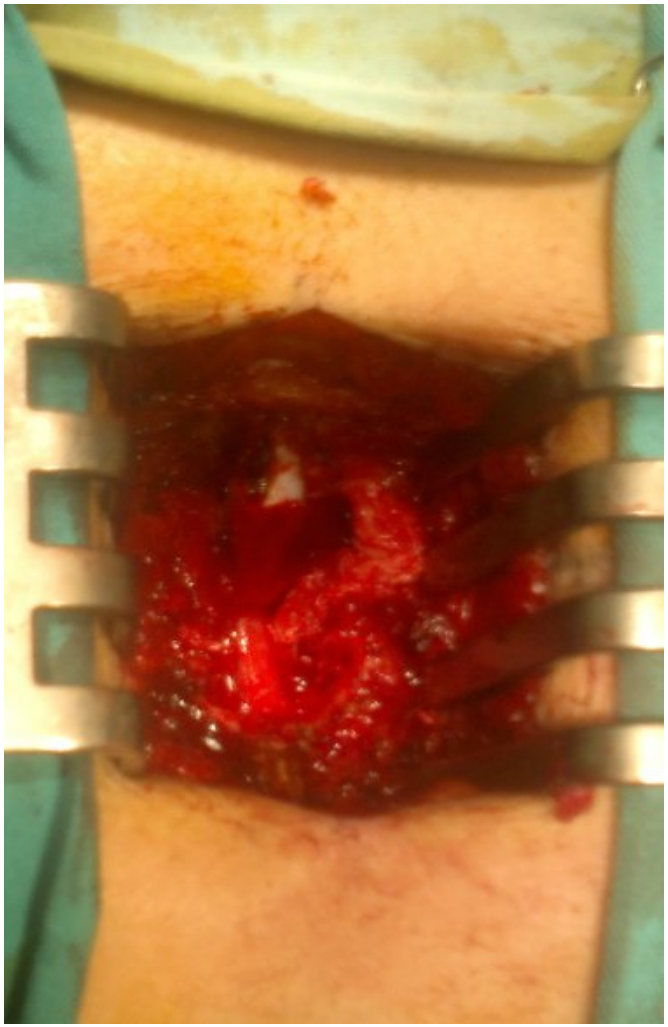


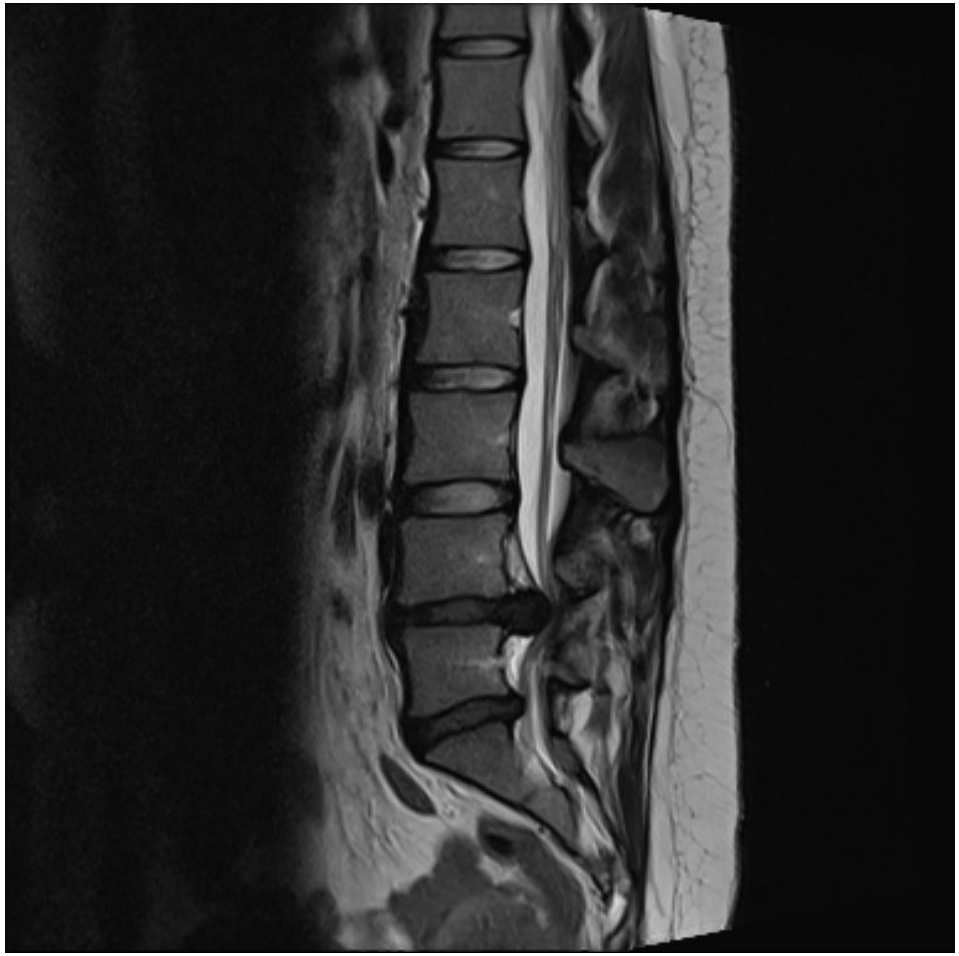
Preop MRI & the removed disc





Another case





Postop Check

- Dressing (Blood, CSF)
- Motor Power (relevant to the root)
- Sings of CES

Surgical Treatment
Possible complications - Common

- Infection 1-5%
- Root injury ≈ 5%
- Unintended durotomy with CSF leak ≈ 6%
  (Higher in redo surgeries – up to 18%)
- Recurrent disc (same level in 6%)
- Missed disc fragment (gives no adequate pain relief)

Back pain will not respond well to surgery as root pain!

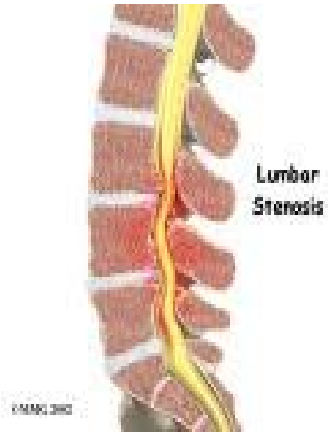
Surgical Treatment
Complications - Uncommon

- Injury to structures anterior to vertebral bodies (great vessels, ureters, bowel)
  → Don't go deeper than 3cm!
- Wrong site surgery → 4.5/10000
- CES (postop spinal EDH) → 0.21%
- Postop visual loss (↑Blood loss, ↑Duration)
- Complications of positioning (neuropathies, eyes, C-spine)

Outcome of Surgical Treatment

- At 1 yr:
  - 73% had complete relief of leg pain
  - 63% had complete relief of back pain
- At 5-10 yrs:
  - The numbers were 62% for each category
  - 86% were better than preop

Lumbar Stenosis

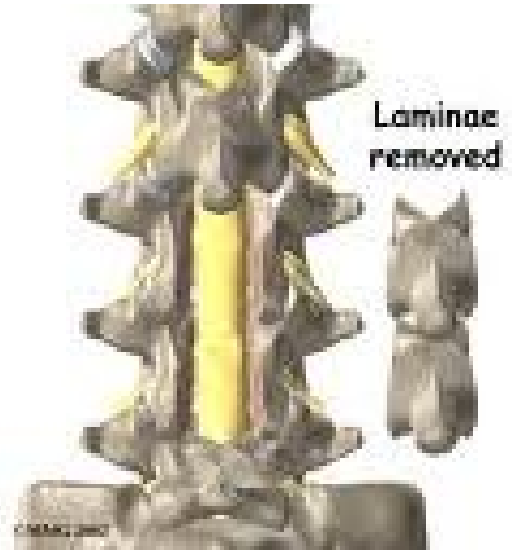








Lumbar Stenosis
Treatment - Laminectomy



Routine Postop Rehabilitation

Oxford Radcliffe Hospitals

- Painkillers for surgical site
- Ambulation: 8hrs postop
- Exercises: the day after surg, each N5, tid
  - Alternate knees to chest
  - Crook lying, legs side to side
  - Sitting pelvic tilt
  - Transversus in standing
  - Left & right side bend

Routine Postop Rehabilitation

Oxford Radcliffe Hospitals

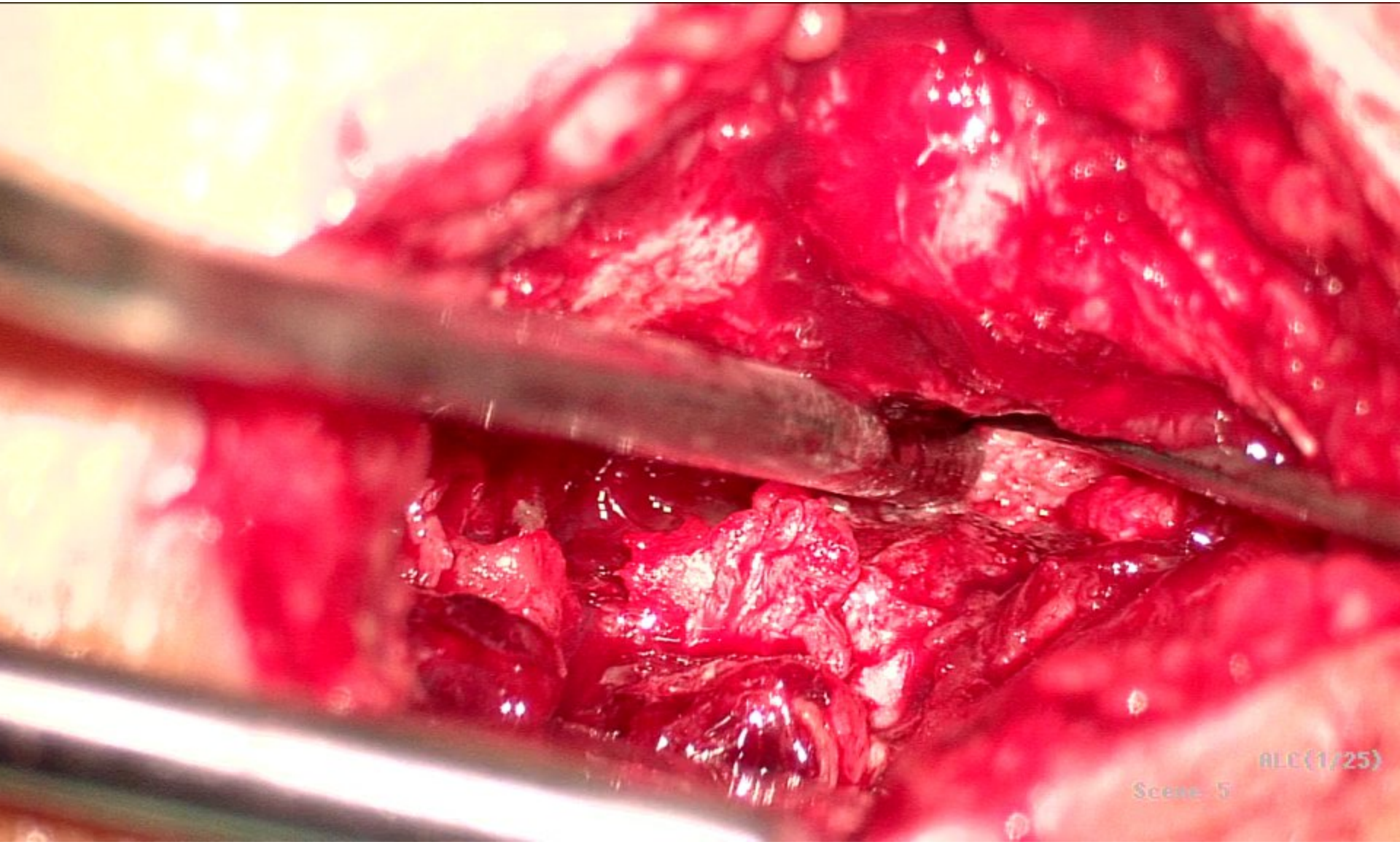
- Sitting: Avoid prolonged sitting
- Bracing: generally not needed
- Driving: 2 wks
- Lifting: < 10 kg for 4-6 wks
- Back to work: 6 wks (light: 4 wks, hard: 8-12)
- Back to sport: 10 wks

Conclusion: Remain mobile, return to full activities & work quickly.

Any exceptions or deviation from that rehab protocol?

This should be clearly instructed by the surgeon! For example:

- Prolonged bed rest in case of dural tear
- Brace in case of instability



Thanks



Any Questions?