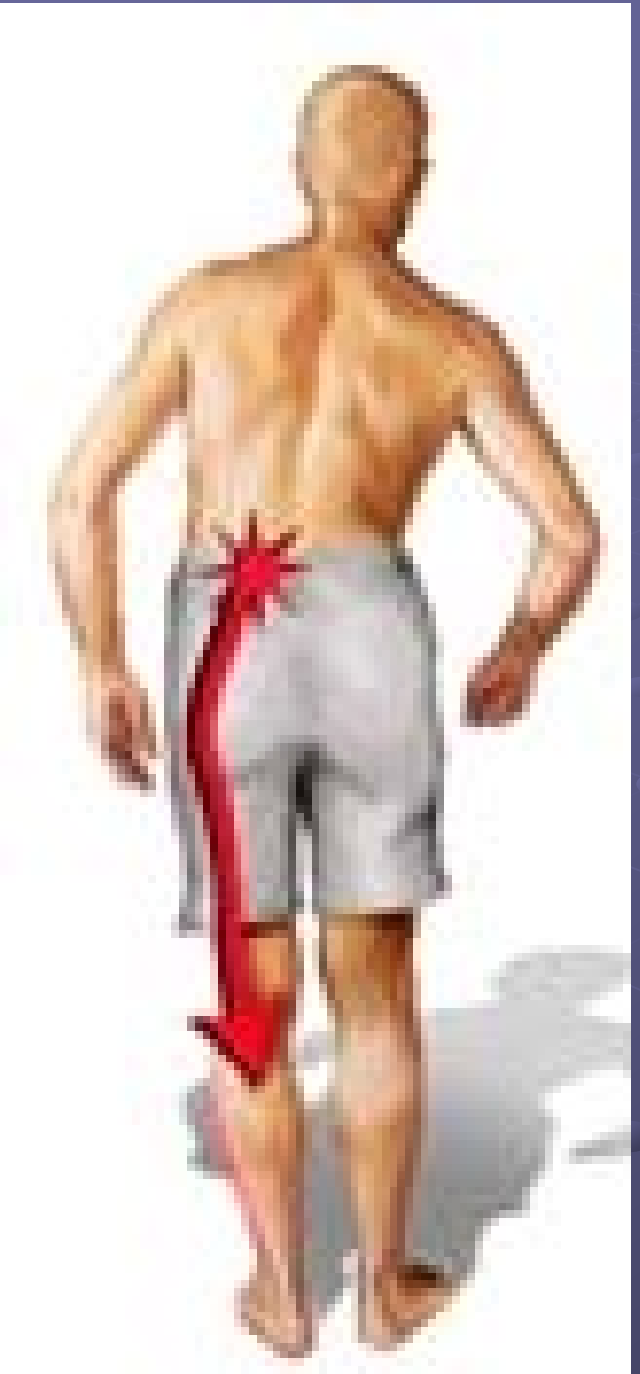


Lumbar disc herniation

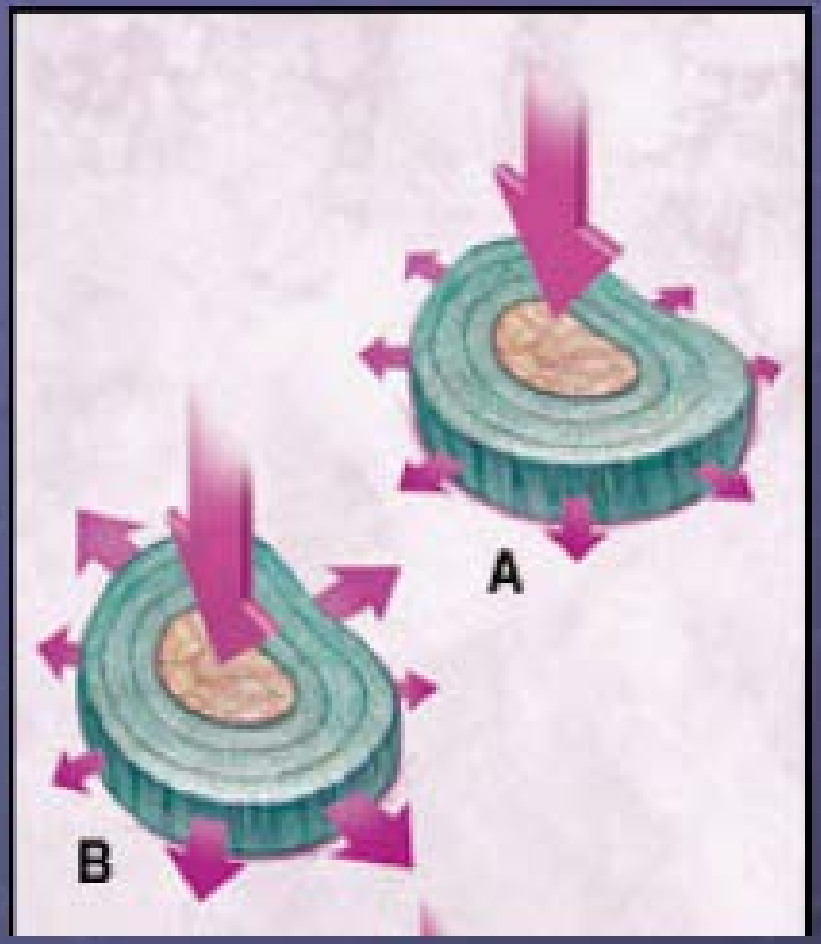
Thomas Kishen

Spine Surgeon

Sparsh Hospital for Advanced Surgeries

Bangalore

Intervertebral disc



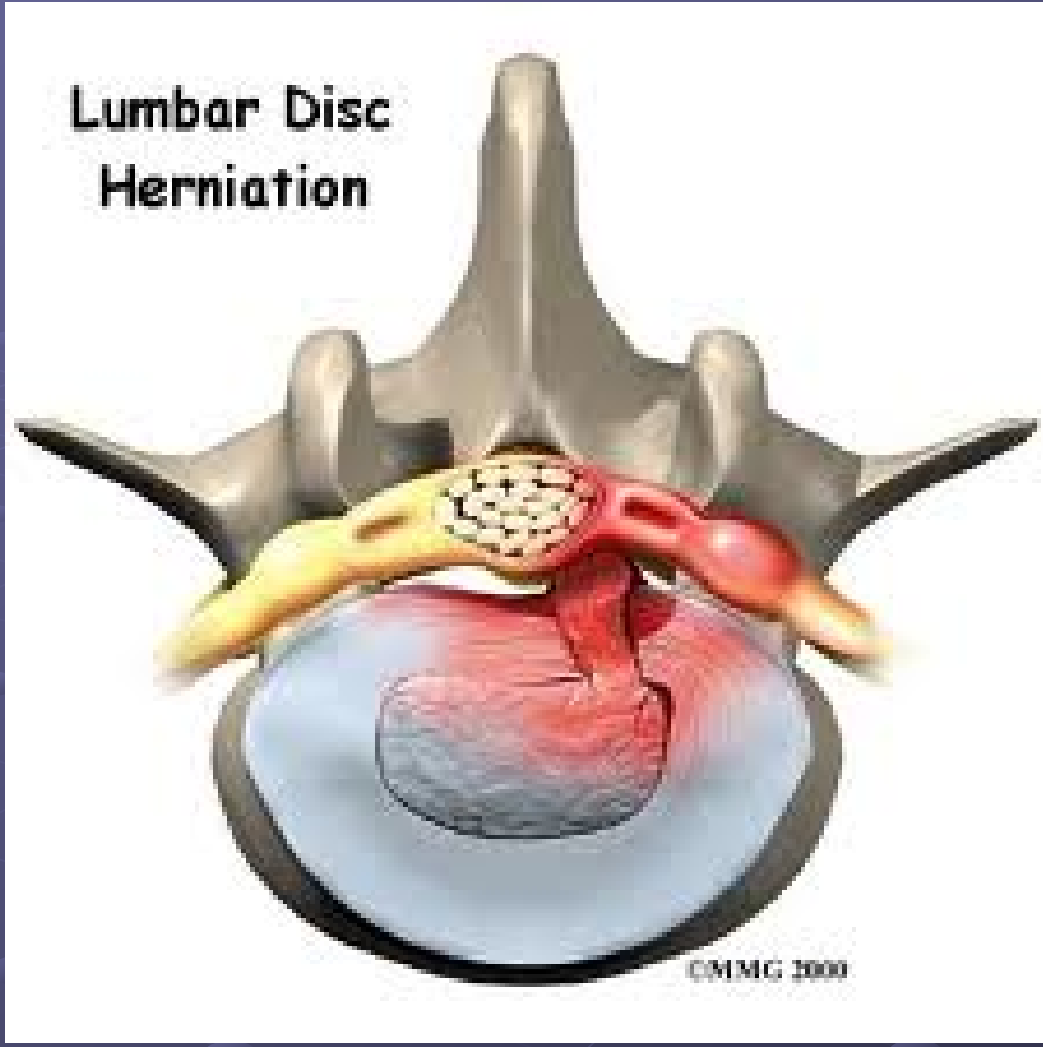
Annulus fibrosus

- Resists tensile stresses
- Resists torsional stresses

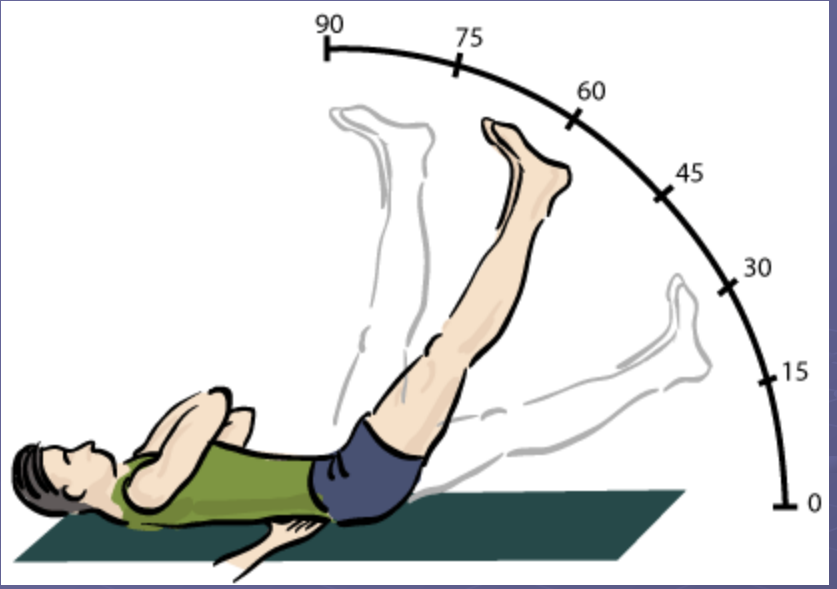
Nucleus pulposus

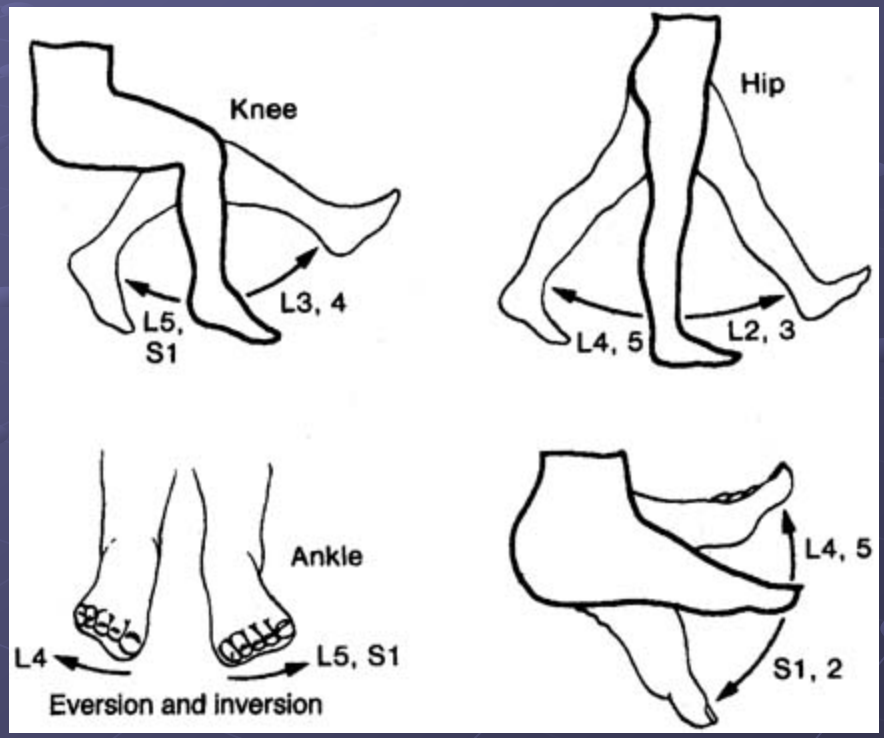
- Distributes compressive stresses

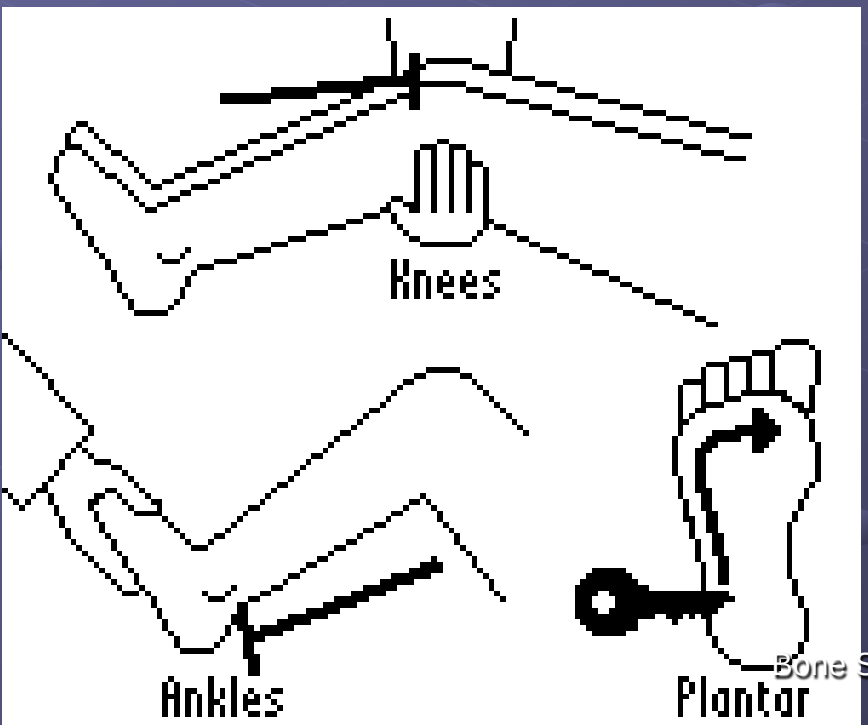
Symptoms



- Radicular Pain – in the distribution of the involved nerve
- Neurological deficit – motor, sensory, reflexes


90
75
60
45
30
15
0


Knee
L5, S1
L3, 4
Hip
L4, 5
L2, 3
Ankle
L4
L5, S1
Eversion and inversion
L4, 5
S1, 2


Knees
Ankles
Plantar

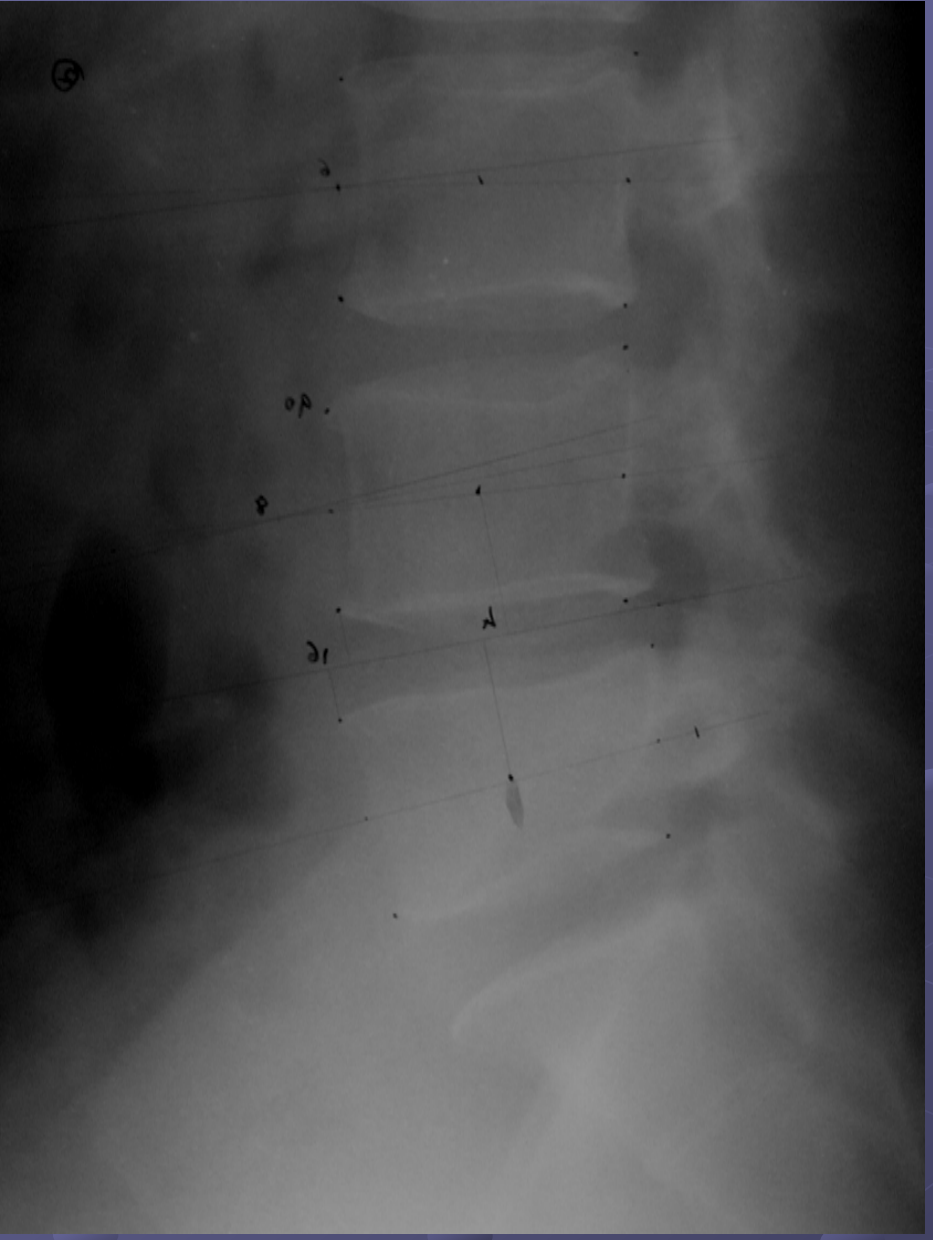
Variant 4: Radiculopathy.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Plain MRI	8	
Myelogram/CT	5	
CT	5	
MRI + Gadolinium	4	
Plain Lumbar X-Rays	4	
Isotope Bone Scan	2	
Myelogram	2	

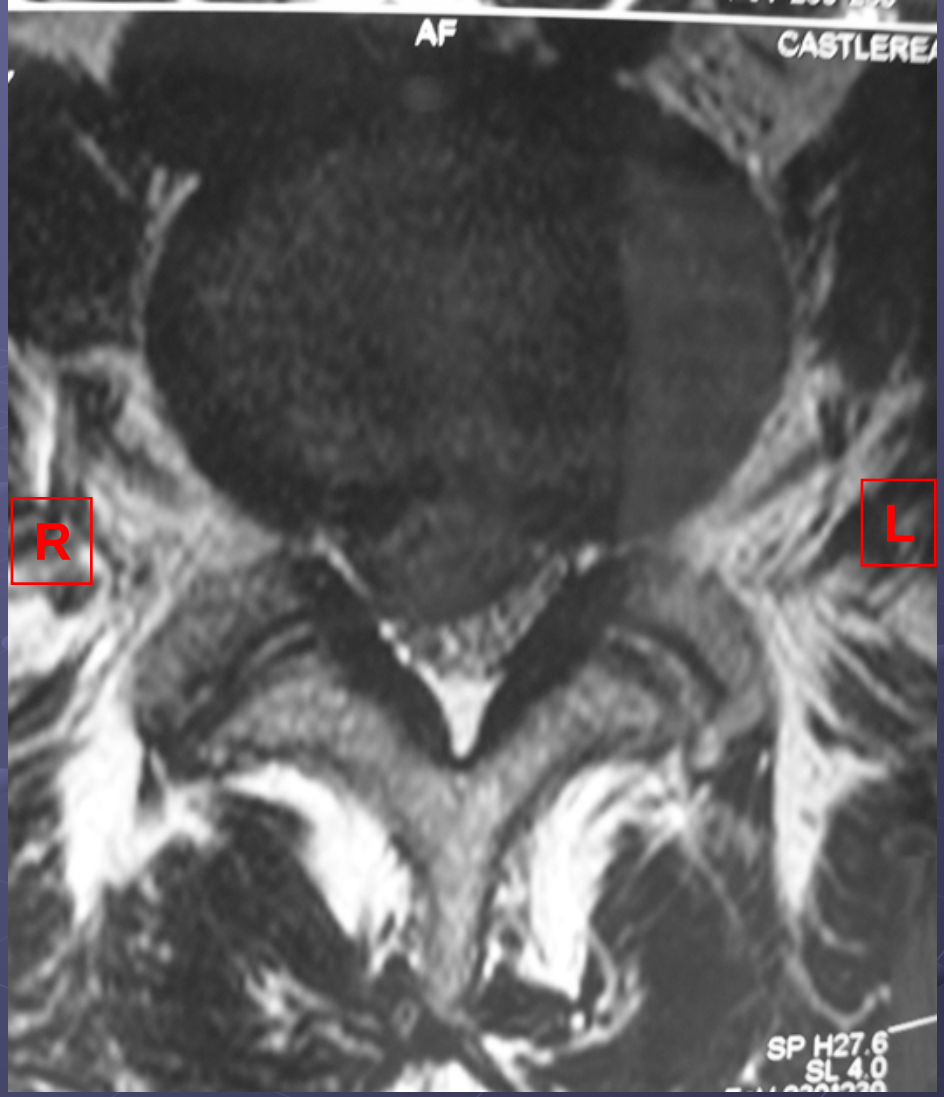
Appropriateness Criteria Scale

1 2 3 4 5 6 7 8 9

1=Least appropriate 9=Most appropriate



Plain radiographs - Normal



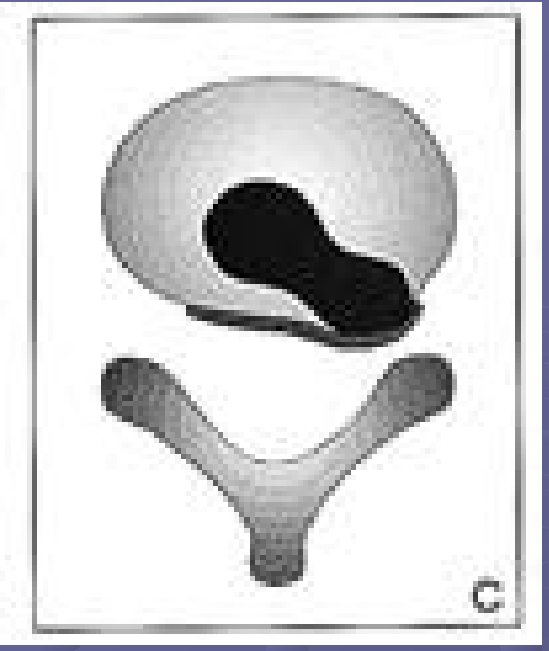
MRI scan

Normal Disc

no extension of the disc beyond the interspace

Disc bulge

circumferential symmetrical extension beyond the interspace



Disc protrusion

- Focal
- Nucleus material remains within the outermost fibres of the annulus fibrosus.

Disc protrusion or prolapse

Nucleus has penetrated the annulus fibrosus but is contained by posterior longitudinal ligament

Disc Sequestration

The extruded disc is not in continuity with the rest of the disc.

Natural history - disc herniation

87 % with extruded herniation obtained satisfactory results with conservative measures.

- 10% required surgery for inadequate resolution of symptoms

Saal JA, Saal JS Spine 1989

Our study suggests that patients with sciatica for more than 12 months have a less favourable outcome. We detected no variation in the results for patients operated on in whom the duration of sciatica was less than 12 months.

Journal of Bone and Joint Surgery

Natural history of lumbar disc hernia with radicular leg pain: Spontaneous MRI changes of the herniated mass and correlation with clinical outcome

Eiichi Takada and Masaya Takahashi

Journal of Orthopaedic Surgery 2001,

- 88% patients showed reduction of herniated mass on MRI
- Sequestrated and transligamentous extrusions more rapidly absorbed
- Morphologic changes of herniated mass correlated well with the clinical outcome

Pathomechanism of spontaneous regression of the herniated lumbar disc: histologic and immunohistochemical study.

Ikeda T, Nakamura T, Kikuchi T, Umeda S, Senda H, J Spinal Disord. 1996

Inflammatory findings such as cell infiltration, neovascularization and granulation were observed in

- 16.9% of protruded discs
- 81.8% of subligamentously extruded discs
- 100% of transligamentously extruded disks
- 80% of sequestrated discs.

208 patients with clinical features of radiculopathy analysed 2- 4 weeks after onset of symptoms

- First 4 weeks – 70 % reduced pain, 60 % resumed work
- One year - 30 % complained of back pain
  19.5 % had not resumed work
- 4 patients underwent surgery

Weber, Holme, Amlie. Spine 1993

Treatment options

- Bed rest
- Pain medications
- Oral steroids
- Nerve root block
- Surgery

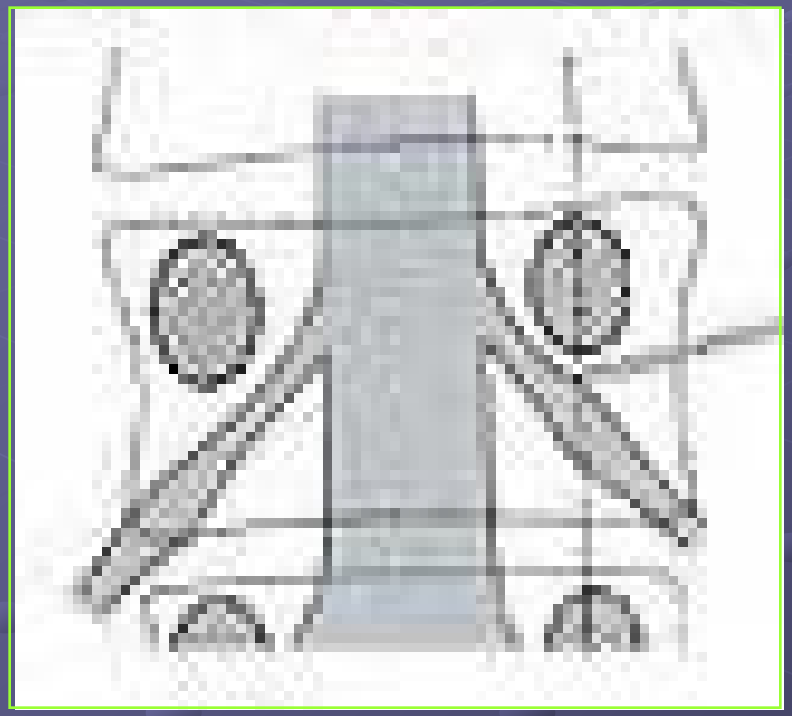
Bed rest….? ……..How long?

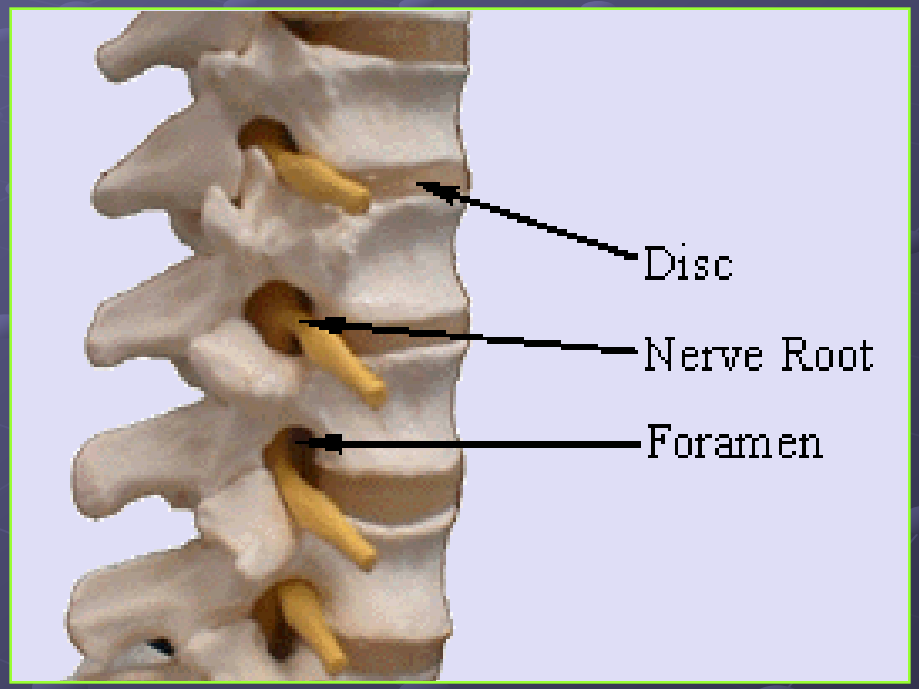
- For patients with sciatica, there is little or no difference between advice to rest in bed and advice to stay active. There is little or no difference in the effect of bed rest compared to exercises or physiotherapy, or seven days of bed rest compared with two to three.

THE COCHRANE COLLABORATION®

The Cochrane Database of Systematic Reviews 2006

Transforaminal epidural steroid injection





Bupivacaine + steroid

Spine
An international journal for the study of the spine

Transforaminal epidural steroid injections in lumbosacral radiculopathy: a prospective randomized study.

After an average follow-up period of 1.4 years, the group receiving transforaminal epidural steroid injections had a success rate of 84%, as compared with 48% for the group receiving trigger-point injections ($P < 0.005$).

Vad et al Spine 2002

The Journal of
Bone & Joint Surgery (Br)
WWW.JBJS.ORG.UK

FORAMINAL INJECTION FOR LATERAL LUMBAR DISC HERNIATION

BRADLEY K. WEINER, ROBERT D. FRASER

N = 32 patients

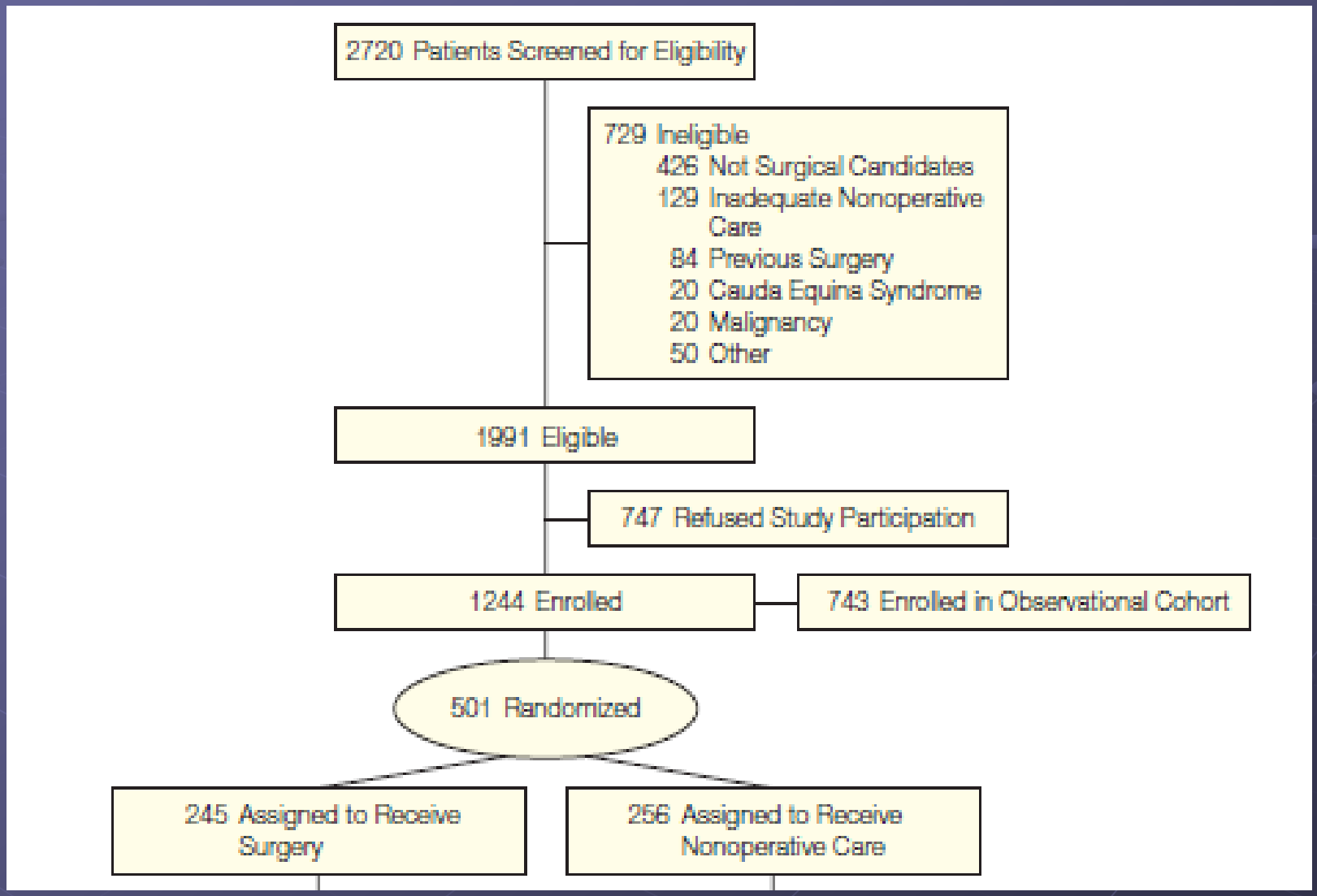
Relief of symptoms was obtained in 27 immediately after injection. Three subsequently relapsed, requiring operation, and two were lost to long-term follow-up. Thus 22 of the 28 patients available for long-term follow-up had considerable and sustained relief from their symptoms. Before the onset of symptoms 17 were

Discectomy - Indications

- Failure of non-operative measures
- Progressive / significant neuro deficit
- Signs of cauda equina compression

Surgical vs Nonoperative Treatment for Lumbar Disk Herniation

The Spine Patient Outcomes Research Trial (SPORT): A Randomized Trial

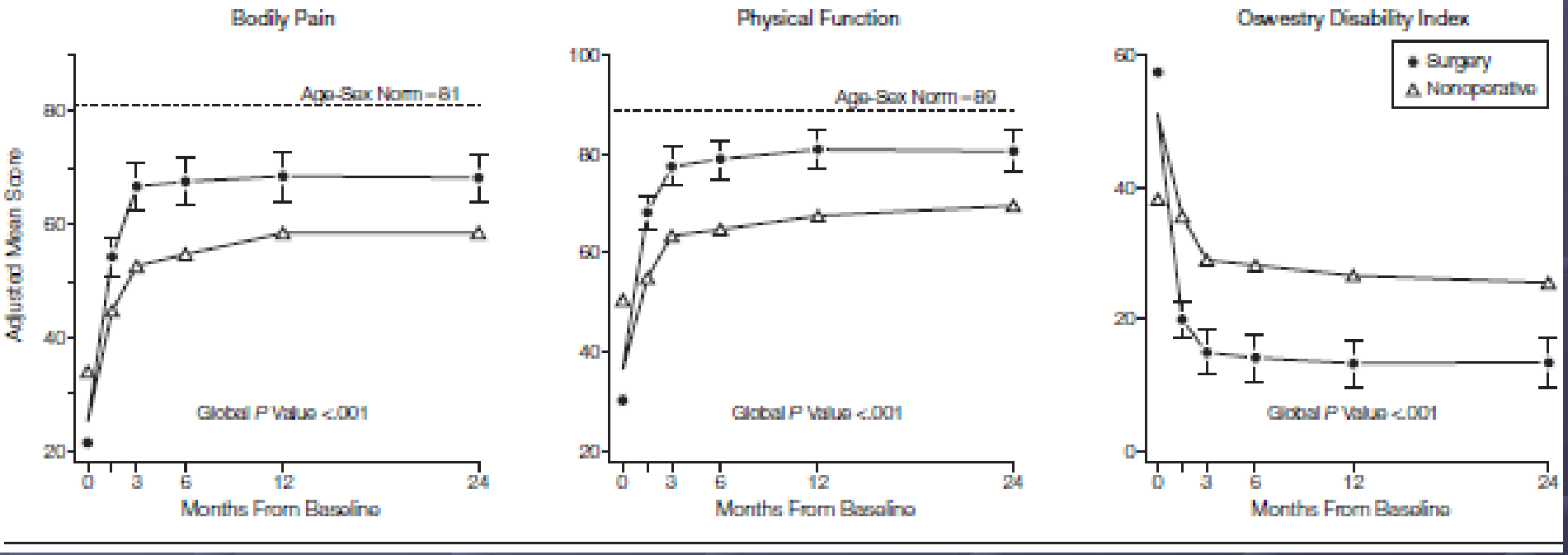


Weinstein et al JAMA. 2006;296:2441-2450

Surgical vs Nonoperative Treatment for Lumbar Disk Herniation

The Spine Patient Outcomes Research Trial (SPORT)

Observational Cohort



- Patients with persistent sciatica from lumbar disk herniation improved in both groups.
- Operated patients reported greater improvements

Weinstein et al JAMA. 2006;296:2451-2459

Surgical vs Nonoperative Treatment for Lumbar Disk Herniation

The Spine Patient Outcomes Research Trial (SPORT): A Randomized Trial

Intraoperative complications	No. (%)
Dural tear/spinal fluid leak	10 (4)
Vascular injury	1 (0)
Other	2 (1)
None	230 (95)

Postoperative complications	No. (%)
Superficial wound infection	4 (2)
Other	9 (4)
None	226 (95)

Reoperation at 2 years	No. (%)
Additional surgery	13 (5)
Recurrent herniation	8 (3)
Complication or other	4 (2)

n = 243

Weinstein et al JAMA. 2006;296:2441-2450

END

Disk	Nerve root	Reflex	Motor examination	Sensory loss signature zone
L3-L4	L4	Patellar	 Ankle dorsiflexion	Medial malleolus 
L4-L5	L5	None	 Great toe dorsiflexion	Dorsal third metatar-sophalangeal joint 
L5-S1	S1	Achilles	 Ankle plantar flexion	Lateral heel 

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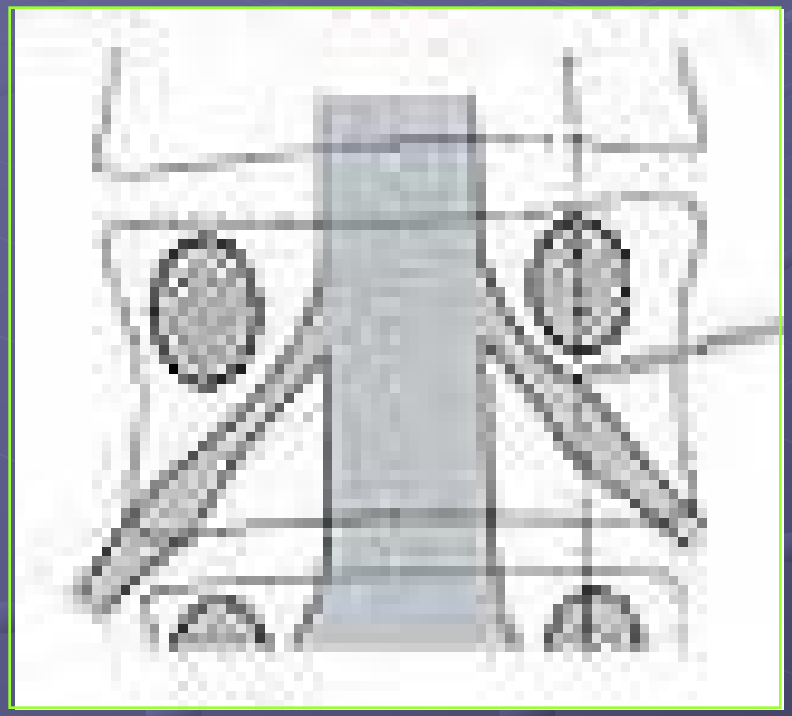

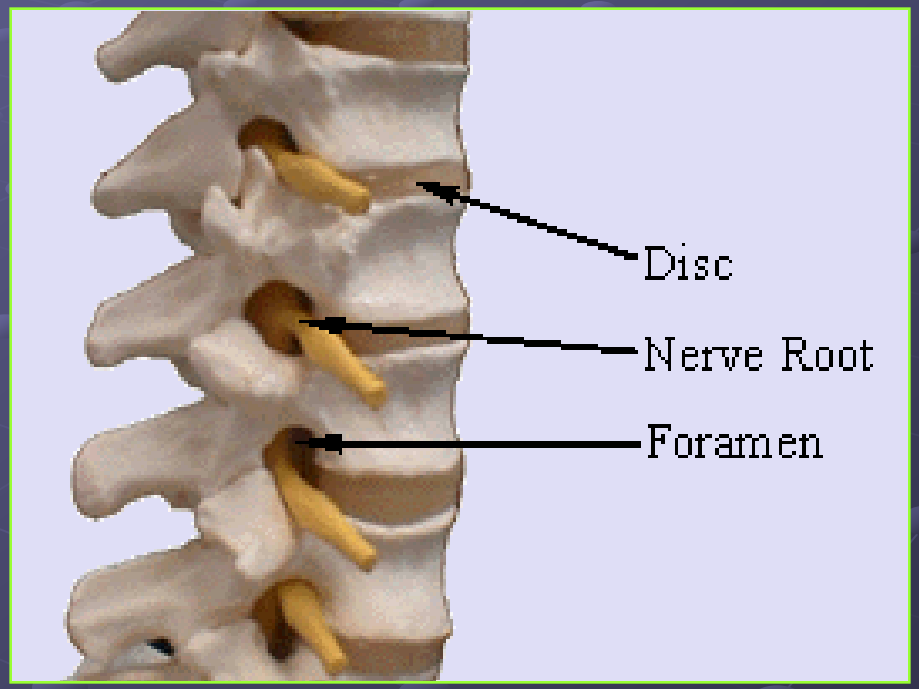

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Microdiscectomy - Indications

- Failure of non-operative measures
- Progressive / significant neuro deficit
- Signs of cauda equina compression

Outcome Analysis in 654 Surgically Treated Lumbar Disc Herniations.

- Non-industrial injury patients had a 96% excellent or good rating (4.5 years)

Conrad Pappas et al Neurosurgery 1992

The Cochrane Review of Surgery for Lumbar Disc Prolapse and Degenerative Lumbar Spondylosis

J. N. Alastair Gibson, MD, FRCS, Inga C. Grant, MSc, and Gordon Waddell, DSc, MD, FRCS

What Evidence Exists on the Clinical Effectiveness of Lumbar Spine Surgery?

1. There is strong evidence (Strength A) that chemonucleolysis with chymopapain produces better clinical outcomes than placebo.
2. There is considerable evidence (Strength A) of the clinical effectiveness of discectomy for carefully selected patients with sciatica caused by lumbar disc prolapse. Discectomy provides faster relief from the acute attack (Strength A), although any positive or negative effects on the lifetime natural history of disc problems are unclear (Strength C).
3. There is no acceptable evidence (Strength D) of the efficacy of any form of decompression for degenerative lumbar spondylosis or spinal stenosis.
4. There is no acceptable evidence (Strength D) of the efficacy of any form of fusion for degenerative lumbar spondylosis, back pain, or "instability."

Non-compressive radiculopathy

- Rare
- Diabetes
- Vasculitis
- Infection
- Tumor infiltration