SOUTHWEST OHIO
PAIN INSTITUTE
Patient Care Education Research

# Beyond Epidurals
# Management of Back Pain

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Diplomat American Board of Anesthesiology and Pain Management

- Present Practice of Pain Medicine
  - Pain Management vs Pain Medicine
  - Palliative vs Curative Pain Treatments
- Future of Pain Medicine
  - Where are we going? And are we there yet?

# Past and Present Practice of Pain Medicine

## Pain Medicine vs Pain Management

- “More and more professionals and nonprofessionals are involved in **pain management**. The new name of "**pain medicine**" may also help to distinguish physicians from nonphysicians in the **pain** field. The name change may allow "others" to view **pain medicine** as a subspecialty that requires additional training, leading to a more consistent quality of care and continued emphasis on maintaining professional standards”.

**Pain Management Versus Pain Medicine**
*Philip S. Kim, M.D., Committee on Pain Management*
*F. Michael Ferrante, M.D., Chair, Task Force on Chronic **Pain***
ASA newsletter. May 1998 Volume 62 Number 5

# Past and Present Practice of Pain Medicine

## Pain Medicine vs Pain Management

- Both terms explain our pain practice, but **pain medicine** may more accurately describe our philosophy.

- **Pain medicine** is a discipline that realizes the **management** of **pain** is important but whose primary objective is the development of a science that enables healing or cure.

# Present Practice of Pain Medicine
# Multidisciplinary Pain Medicine

# Present Practice of Pain Medicine
# Multidisciplinary Pain Medicine

- Treatments offered
  - Medical
  - Interventional
  - Psychological
  - Physical
  - Surgical

# Present Practice of Pain Medicine
# Multidisciplinary Pain Medicine

# Interventional Pain Medicine

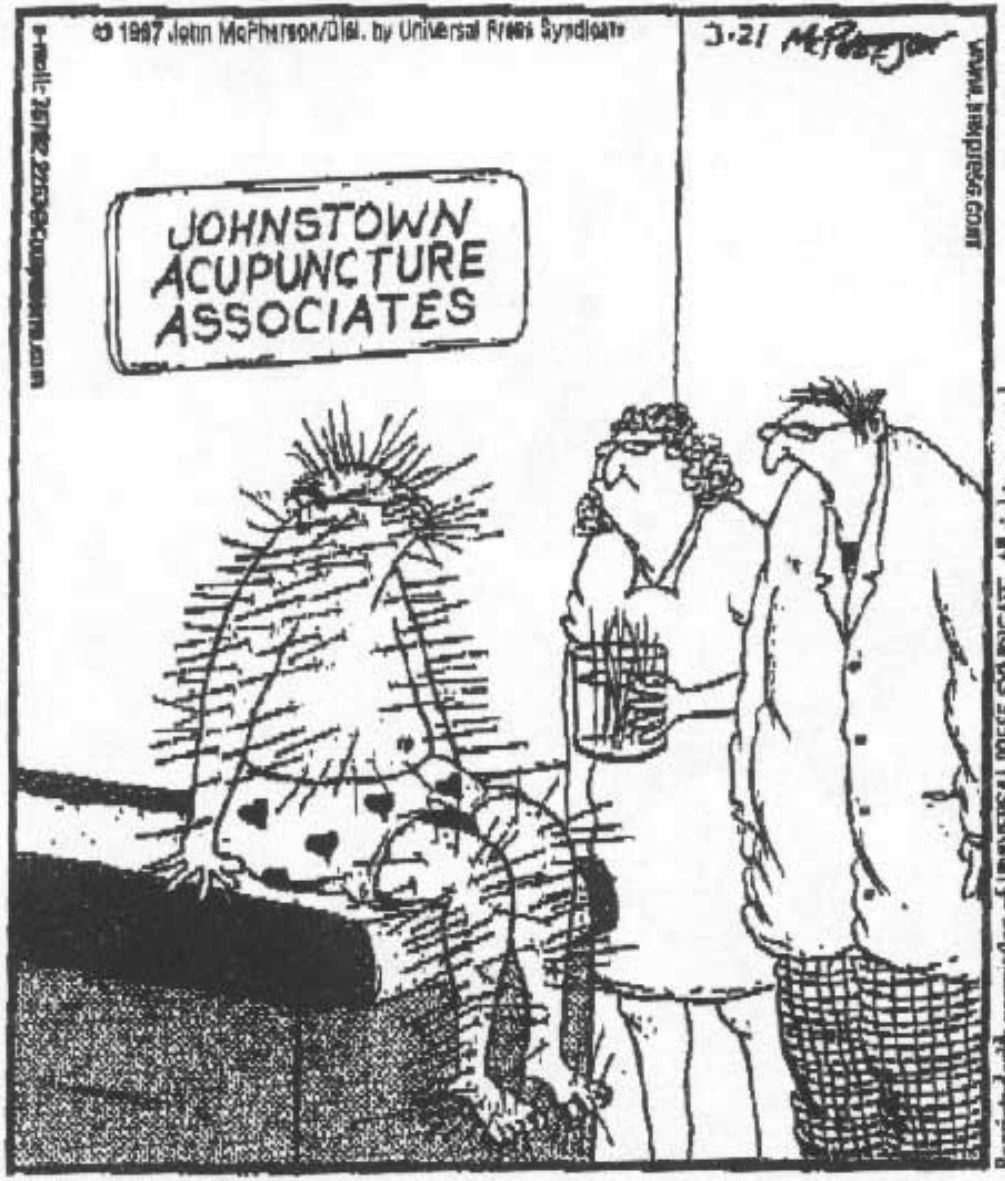
## Palliative vs Curative Procedures

- Epidural Steroid Injections
- Facet Injections
- Medial Branch Blocks
- Peripheral Nerve Injections
- Diagnostic/Therapeutic Blocks
- Injections for Cancer Pain

# Future of Interventional Pain Medicine
# Palliative vs Curative Procedures

- And even most advanced therapies
  - Spinal Cord Stimulators and
  - Intrathecal Pumps

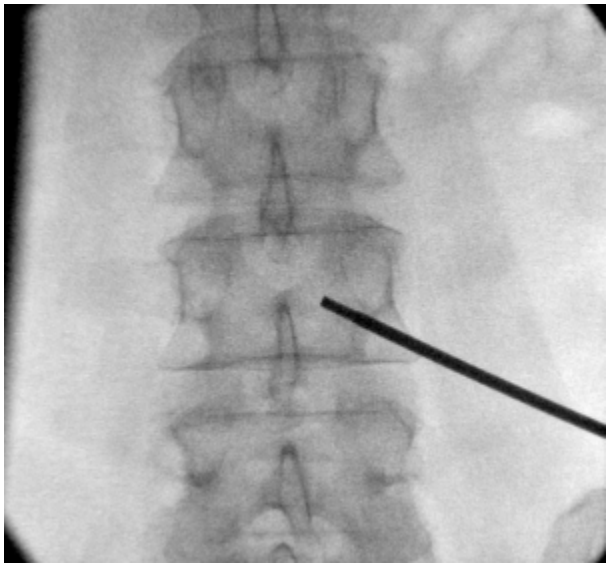
# CLOSE TO HOME JOHN McPHERSON



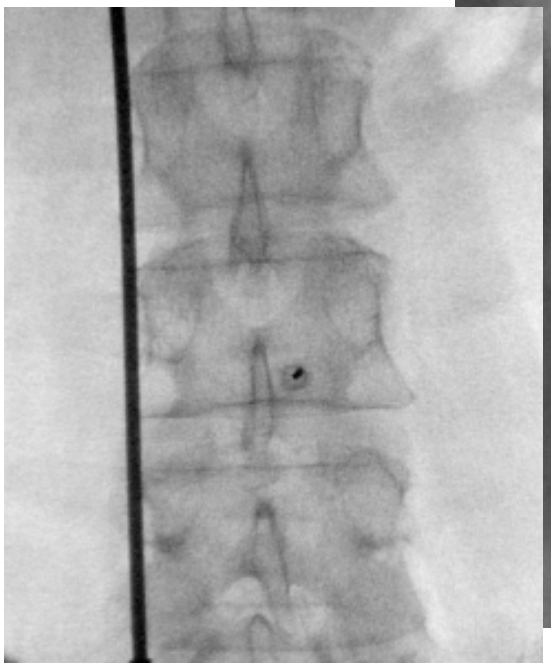

"You gotta be kidding! Your back *still* hurts?!"

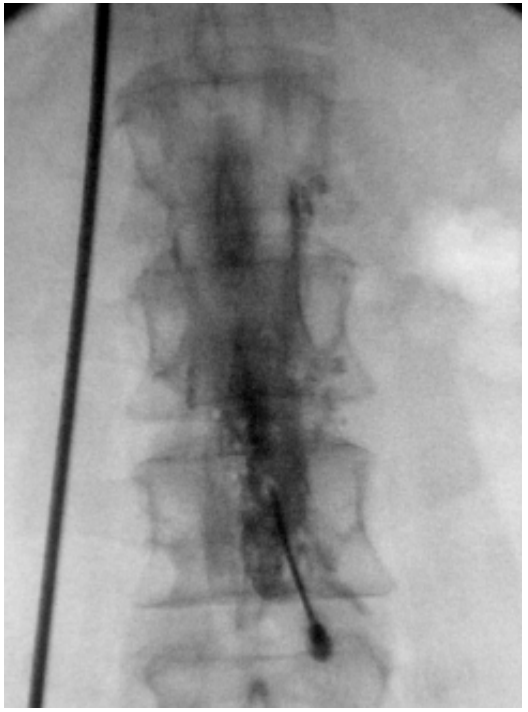
# EPIDURAL STEROID INJECTIONS

- McQuay - systematic review of over 15,000 studies evaluating outpatient services for chronic pain control
- Evidence supports beneficial short term effect from epidural steroid injections
- Positive studies: at least 3 months of pain relief in 60%-90% of patients after ESI (Benzon, 1986) (Weinstein, 1995)



# EPIDURAL STEROID INJECTIONS





# Transforaminal Epidural Steroid Injections Outcomes with Fluoroscopic Guidance

Riew et al (JBJS 82-a:1589-1593;2000)

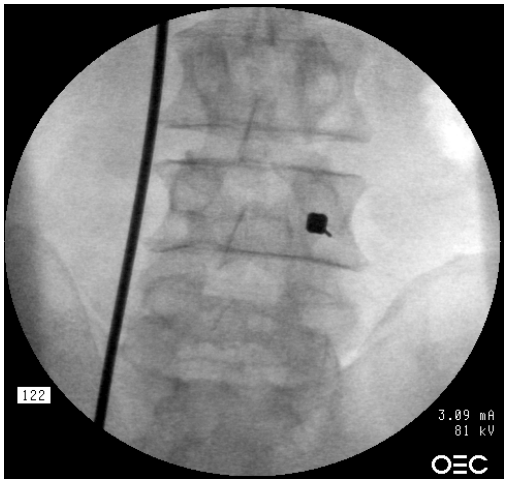
- N=55 ‘surgical’  patients with herniated disc
- Randomized controlled trial: bupivacaine control compared to steroid group
- Results: 71% steroid group were able to avoid surgery compared to 33% of the placebo group

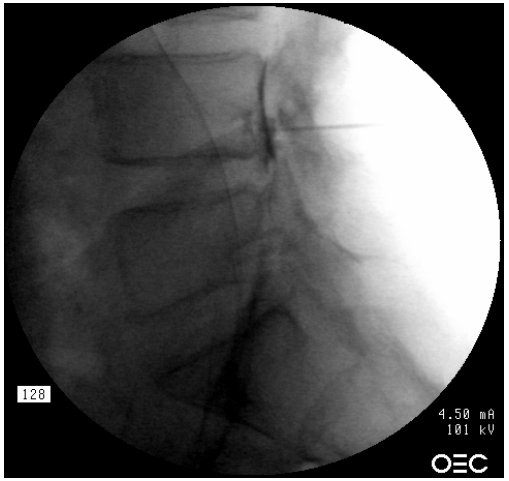
# Selective Nerve Root Injections/Transforaminal Injections

Therapeutic uses:

- Substitute for epidural steroid injections
- Patients with epidural adhesions
- Lateral recess and foramenal stenosis
- Improved Quality and Duration of Pain Relief

Success depends on proper localization



# FACET SYNDROME

- First proposed by Goldthwait (1911)
- Ghormley (1933) - coined term “facet syndrome”
- Rees (1971) - surgical denervation
- Shealy (1975) - percutaneous RF lesioning
- Bogduk (1980) - modified technique

# FACET SYNDROME

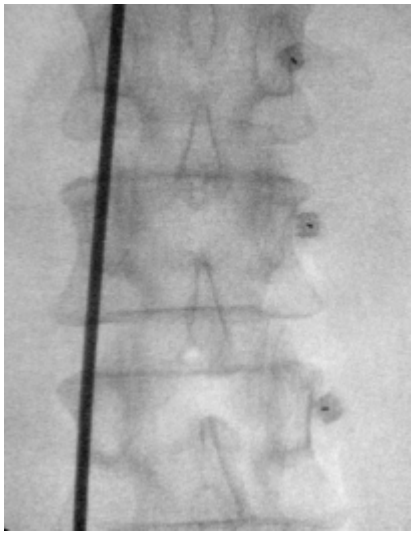
Diagnosis:  IA block vs Medial Branch Block (MBB)

- IA: more specific (unless contrast extrudes)
- MBB: may block muscles/ligaments along with joint

Marks (1992): compared 86 LBP pt, IA or MBB

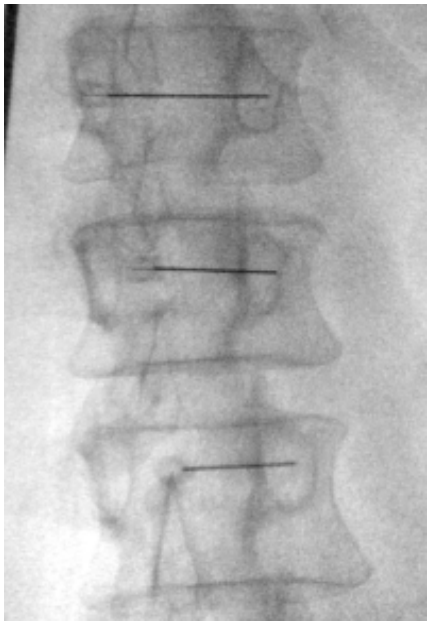
- IA: slightly longer duration relief to 3 months
- Both: general 35-40% response (1 mo), 20% (3 mo)

Both IA and MBB equally valid, neither superior



# FACET SYNDROME

Diagnostic blocks:
usually short term duration



- May institute rehabilitative program

- Persistent symptoms: consider facet neurolysis (Radiofrequency Lesioning) or surgical management

# FACET SYNDROME

Efficacy RF for lumbar pain (North, 1994)

- Multiple reports: success 17 - 83%
- 82 pts had MBB, 42 had RF, 68% with prior surgery
- Patients were followed 3.2 years
- Pt. after RF: 45% had >50% relief 2 years later
- Of the 40 pt who did not have RF: 13% improved
- No factors could predict long term results

# FACET SYNDROME

Efficacy of RF neurotomy (Lord, 1996)

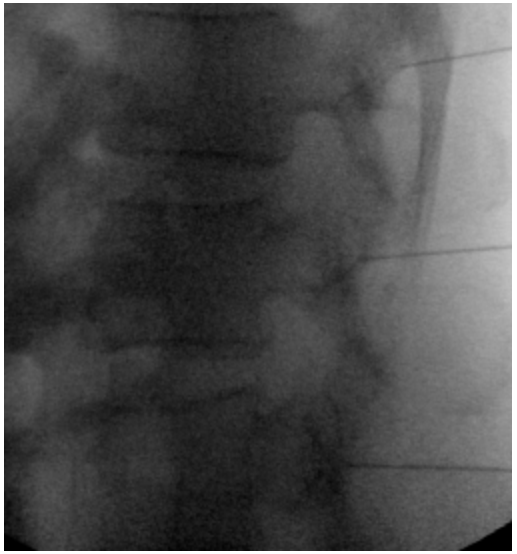
- 24 pts with neck pain after MVA:  compare RF with heated temp probe (80º C) to unheated probe
- Identify levels with double confirmatory blocks
- Return to >50% of pain:  263 days after RF
  8 days after saline
- At 27 weeks: 7 RF pts. pain free vs 1 saline pt.

# FACET SYNDROME

Efficacy of RF neurotomy (RFL-McDonald, 1999)

- 28 pts., controlled double blocks, repeat RF prn
- Initial complete pain relief:  71% of pts.
- Median duration relief: 422 days

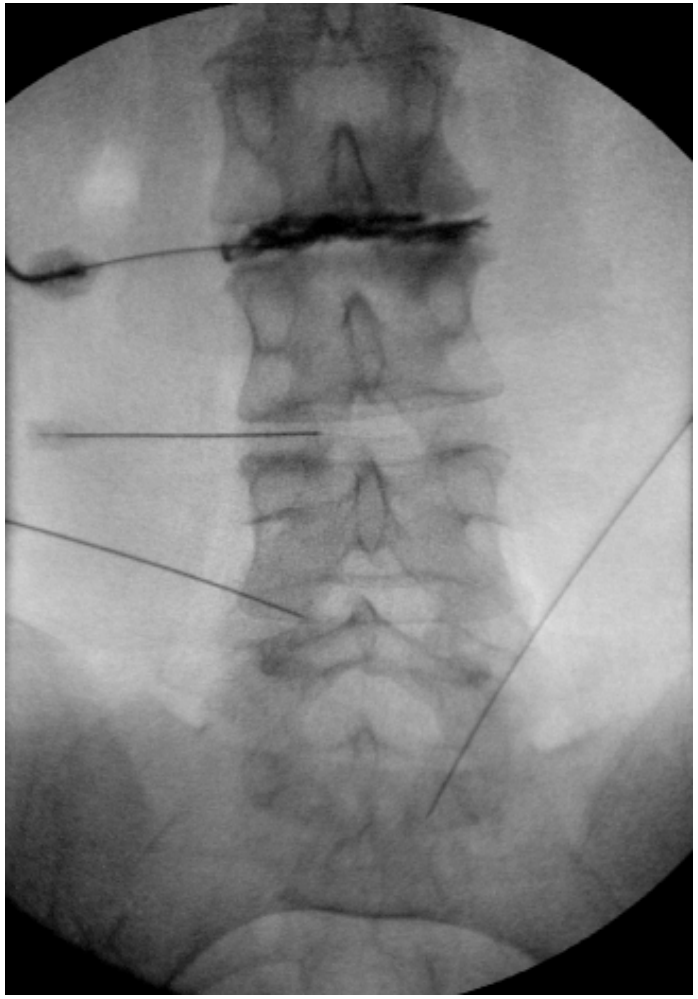
  >219 days second procedure
- Outcome not correlated:  type of block, electrode, operator




Our preliminary tests have
come up inconclusive...
perhaps a series of x-rays
can pinpoint just what's
wrong with you...

# Discogenic Pain-Discography

- A method used to elucidate the source of pain from spinal pain syndromes.
- Provides information about the structural integrity of the disc.

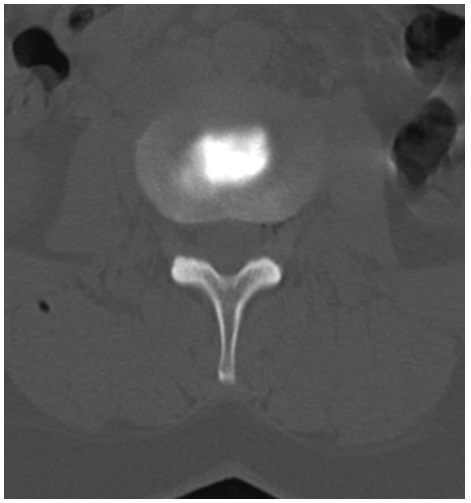


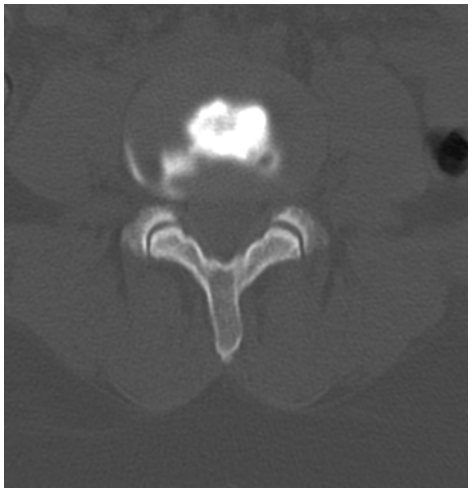
# DISCOGRAPHY: Technique

- Prone position (Lumbar)
- 3-5 levels
- 2 needle vs 1 needle technique
- Then inject contrast dye 1-5 ml
- Repeat procedure at least one level above and below suspected level
- May then inject Local Anesthetic

# DISCOGRAPHY: indications

- Diagnosis of discogenic Pain: identify morphologic changes and level of pathology.
- Identify symptomatic level and confirm source of pain when there are multiple degen. levels.
- Identify source of pain after laminectomy.
- Determine type of surgery and predict outcome.





# Vertebral Body Fractures

- Osteoporosis - occurs commonly in women after menopause
- Genetic factors, nutrition, metabolic factors play a role
- 30 million at risk in U.S. every year
- Lifetime risk: 16% (women), 5% (men)
- Women > 50: 18% will get compression fx.
- Women > 65: 27% will get compression fx.

# Vertebral Body Fractures

Medical treatments (take > 1 year)

- Hormone replacement (raloxifene = Evista)
- Bisphosphanates (alendronate = Fosamax)
- Calcitonin (Micalcin)
- FORTEO (teriparatide injection) recombinant human parathyroid hormone

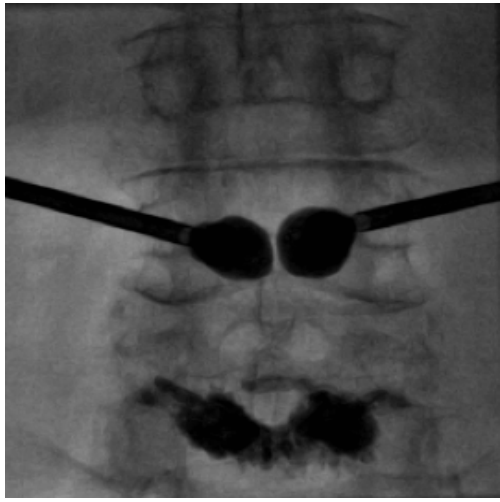
Supplemental Calcium and Vitamin D

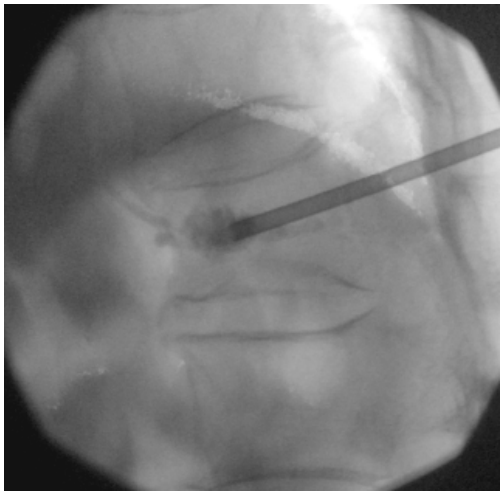
Physical Therapy and Exercise - bedrest leads to bone mineral loss, diminished muscle mass

# VERTEBROPLASTY - Background

- Injection of polymethylmethacrylate cement (PMMA)
- First done in France (mid-1980's) (Galibert, Deramond, 1987)

- Stabilizes fractured vertebrae and possibly causes degeneration/neurolysis of pain nociceptors





# VERTEBROPLASTY - Outcomes

- Pain reduction and improved quality of life in 70%-90% of patients (Deramond, 1998)
- Increased mobility = 70%-90% of patients
  Begins 1-2 days after injection (Levine, 2000)
- Osteoporosis (95% pain relief)
- Tumor (50% pain relief)
- Pain relief occurs even if vertebral height not restored

# SPINAL CORD STIMULATION

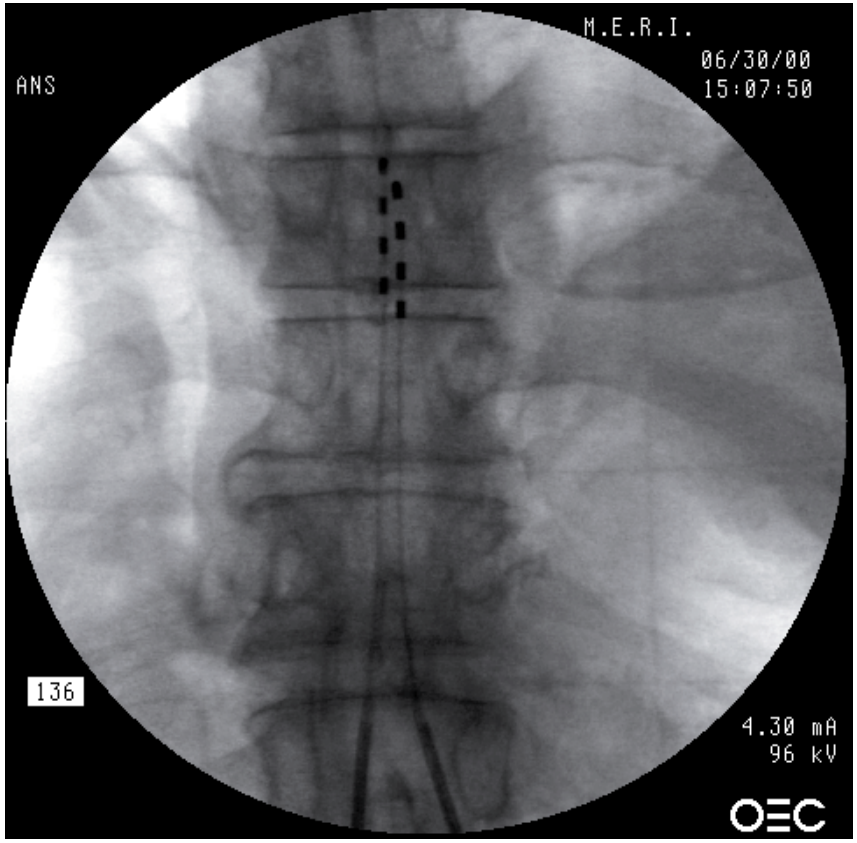
- Available for 30 years, but recent technical advances
- Four major conditions for use:
  - Failed back surgery with radiculopathy
  - Neuropathic pain
  - Peripheral vascular disease
  - Intractable Angina pectoris

# SPINAL CORD STIMULATION

Failed back surgery syndrome

- Must exhaust medical and surgical treatments
- Need psychological clearance
- Pain relief must occur with temporary trial

- Success rate:  50 - 80% (since 1990)
- North (1993):  52% pts. had >50% relief of pain
- Fiume (1995):  56% pts. had >50% relief (55 mo. f/u)

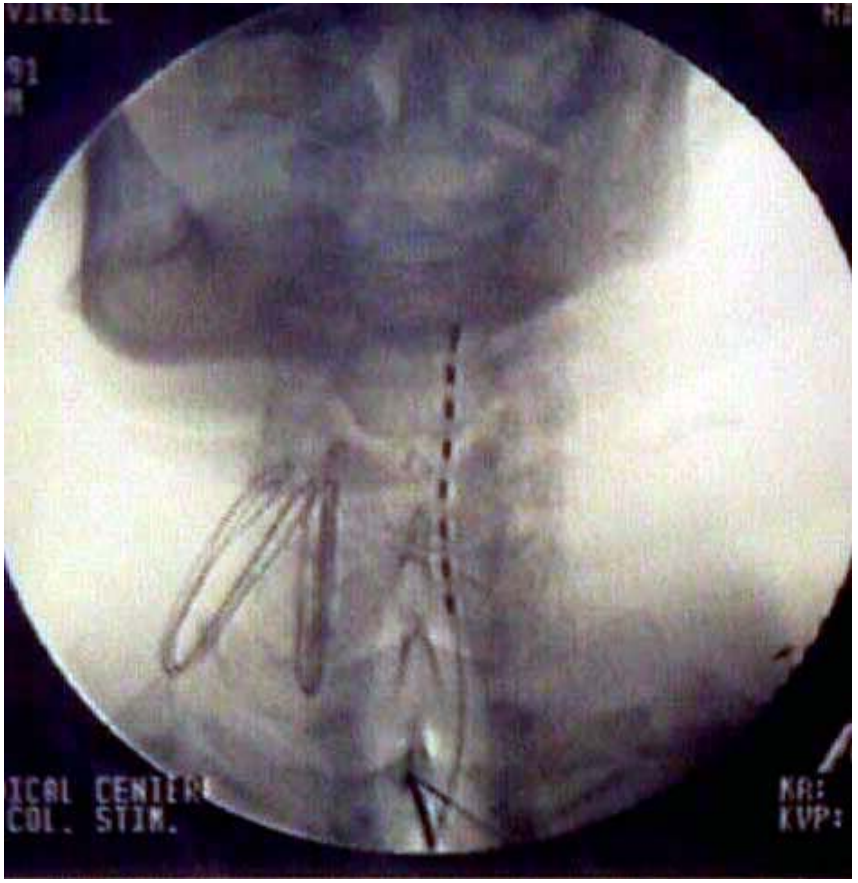


# SPINAL CORD STIMULATION

Neuropathic pain

- Painful diabetic neuropathy, peripheral nerve injury, CRPS, phantom limb
- PHN, spinal cord lesions with segmental pain

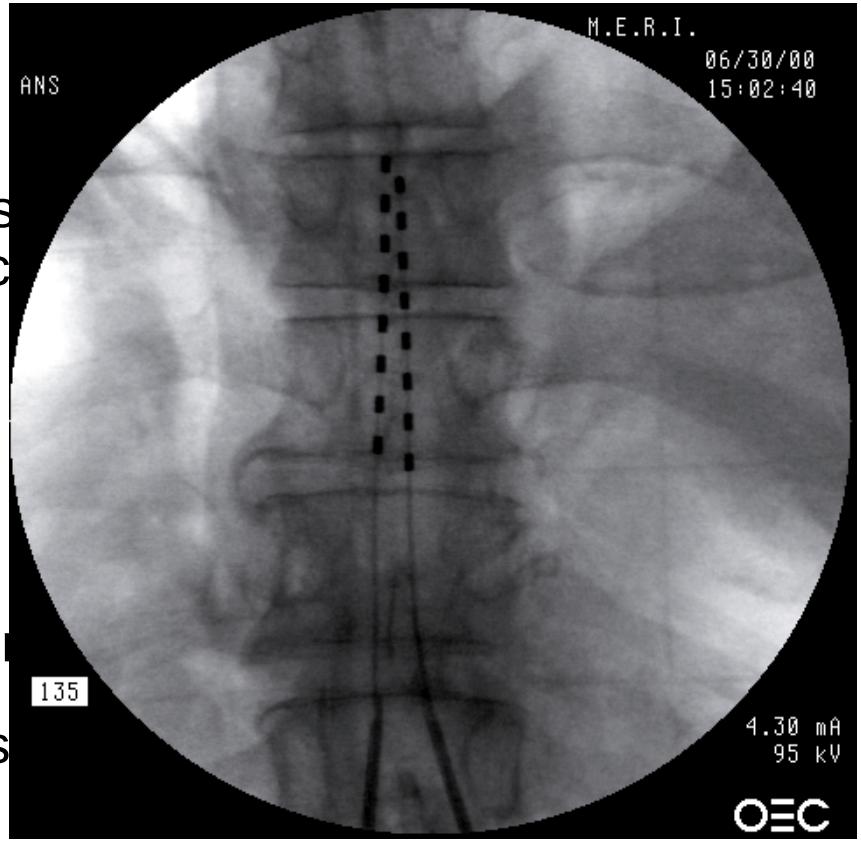
Most studies: found improvement in pain, use of analgesics, and return to work



# SPINAL CORD STIMULATION

Peripheral vascular disease

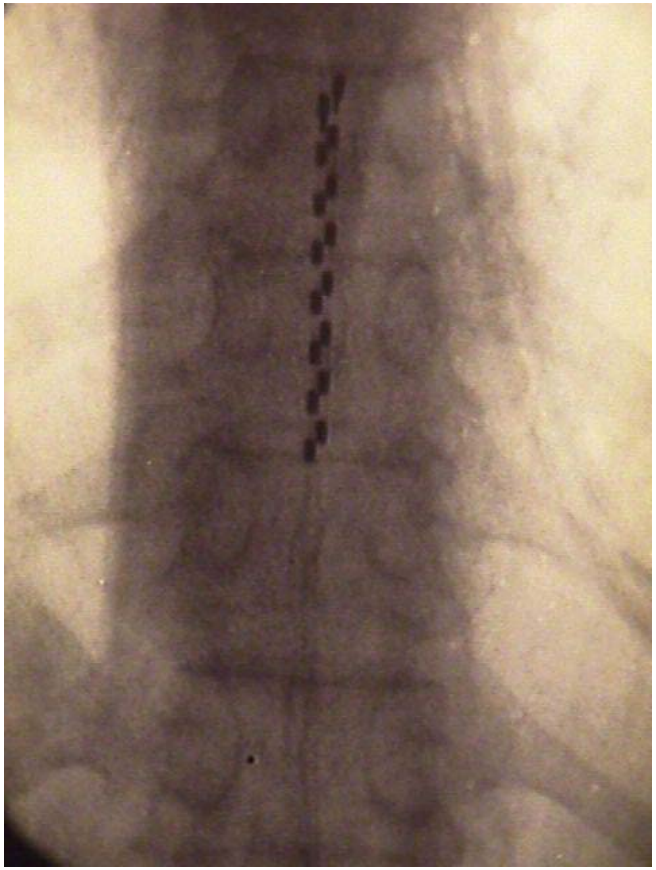
- Candidates for SCS: severe res pain, painful ulcers, failed medic mgmt., and not surgical candidates
- Many studies show significant pain relief
- Improvements in microcirculatio
- Vasospastic (Raynaud's) diseas relief 90% patients



# SPINAL CORD STIMULATION

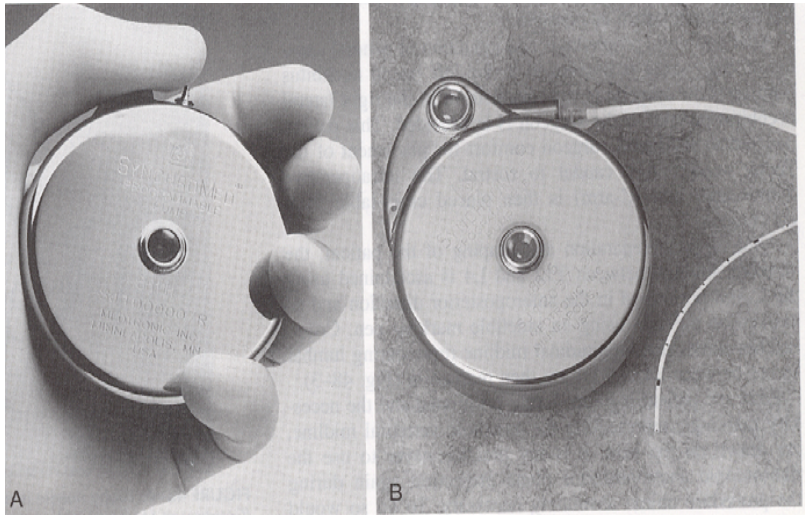
Angina

- For pts. refractory to medical treatment and not surgical candidates
- First used 1989 (Murphy and Giles)
- Decreases anginal attacks, improves quality of life
- Dec. ST dep. on EKG and inc. exercise duration
- Decreases use of sublingual TNG



# INTRATHECAL THERAPY

- First provided 1979
- Fewer side effects than systemic opioids
- Better analgesia
- Consider balance between analgesia - side effects
- Outcome:  pt. satisfied, less need for meds
- Improved ADL, qual. life, function, work



# INTRATHECAL THERAPY

Cancer pain (Van Dongen, 1993)

- Retrospective analysis 51 pts.
- Opioid, LA, or mixture given
- Morphine 0.5 - 1 mg/ml, bupivacaine 1.5 - 3 mg/ml
- Dose increased first 20 days, then stable
- When bupiv. added, 58% had good pain relief
- Side effects: nausea (21%), PDPH (10%), catheter dislodged (8%), infection (2%)

# INTRATHECAL THERAPY

Non-malignant pain (Anderson, 1999)

- 40 pts:  30 had successful pain relief with IT MS
- Patients assessed over 40 months
- Mixed pain:  neuropathic and nociceptive
- VAS improved in 50% pts (VAS >25% better)
- Improved MPQ, functional status, coping
- 20% had device complications requiring surgery

# Future of Pain Medicine

## Minimally Invasive Spine Procedure

- Bridging Gaps between conservative injections and Invasive Spine Surgery

- Curative vs Palliative Procedures

# Minimally Invasive Discectomy

- Bridging the gap between traditional surgery and conservative therapy
  - LASE
  - Nucleotome
  - Percutaneous Decompressor
  - Nucleoplasty

# Patient Indications

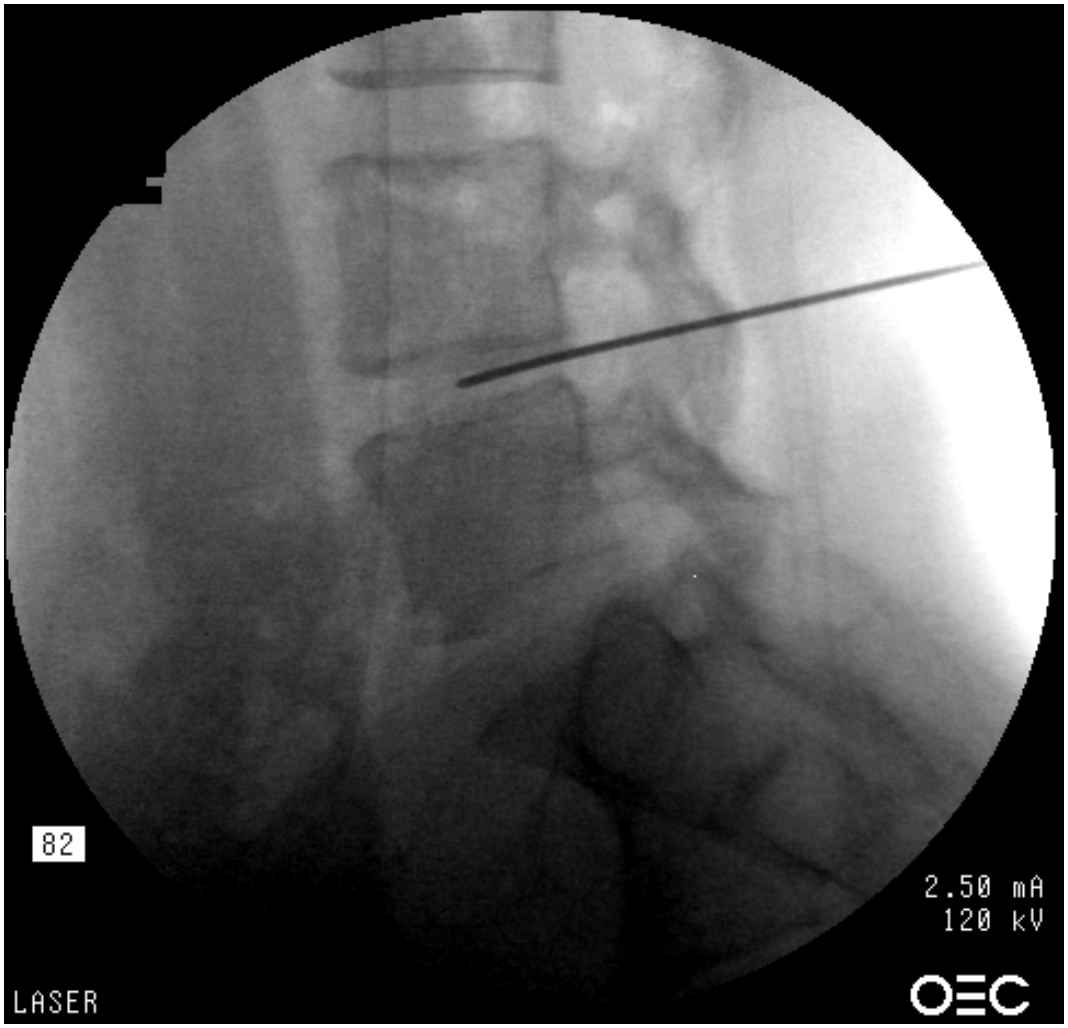
- Failed conservative therapy for 1-3 months
- Bulging lumbar disc
- Leg pain with or without low back pain
- Positive MRI scan with Disc bulge < 6mm

# Benefits of the Percutaneous Procedure

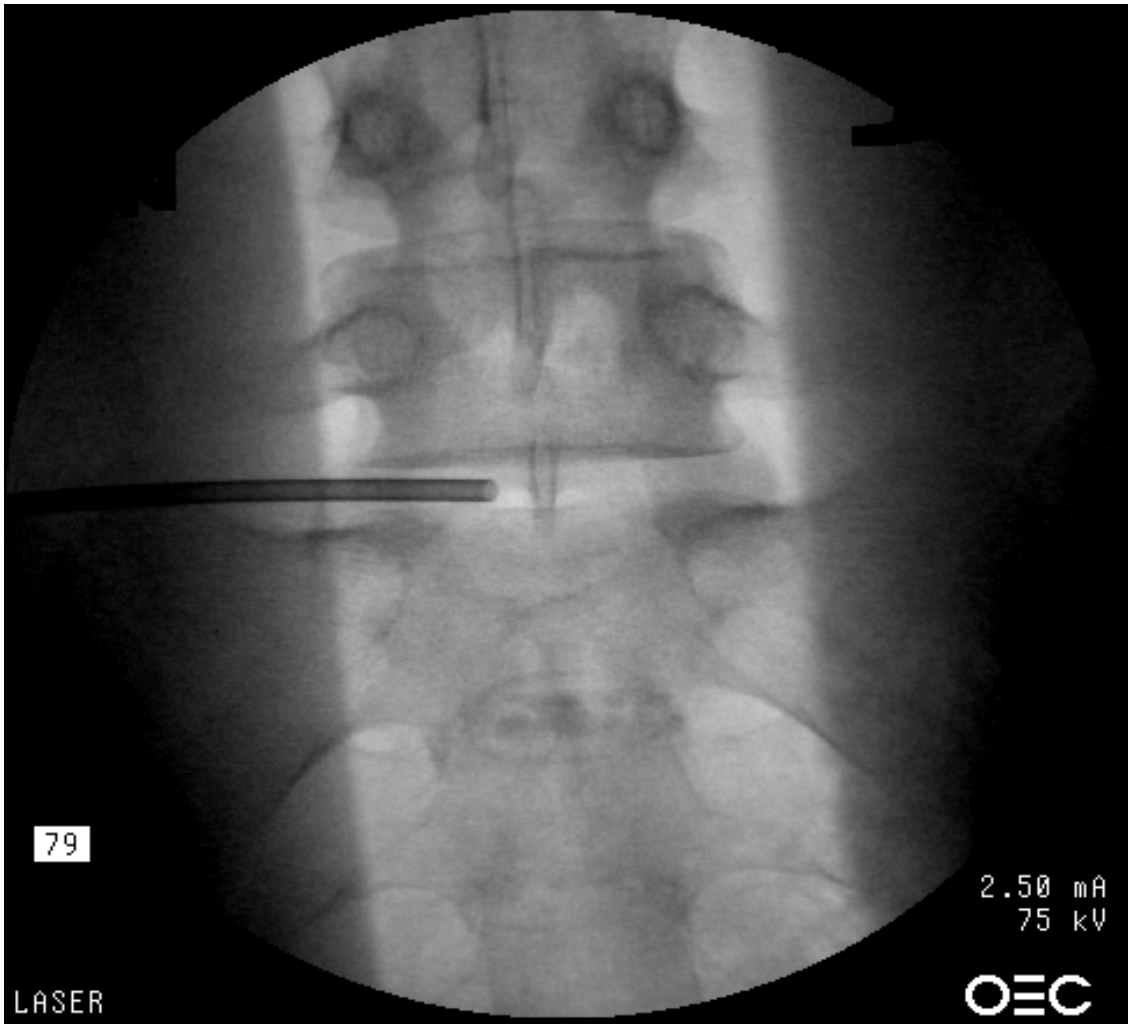
- **Minimally invasive**
- **Outpatient procedure**
- **Fast recovery**
- **Local anesthesia**
- **Minimal patient risk**
- **Cost effective**

# Percutaneuos Discectomy

- Expands patient population by providing minimally-invasive intervention for individuals whose age or medical condition may not otherwise permit open surgery
- Offers a cost-effective remedy for a condition traditionally treated by expensive, long-term physical therapy, supplemented by medication and possibly invasive surgery


82
2.50 mA
120 kV
LASER
OEC


kV 65
mA 6.0


79
2.50 mA
75 kV
LASER
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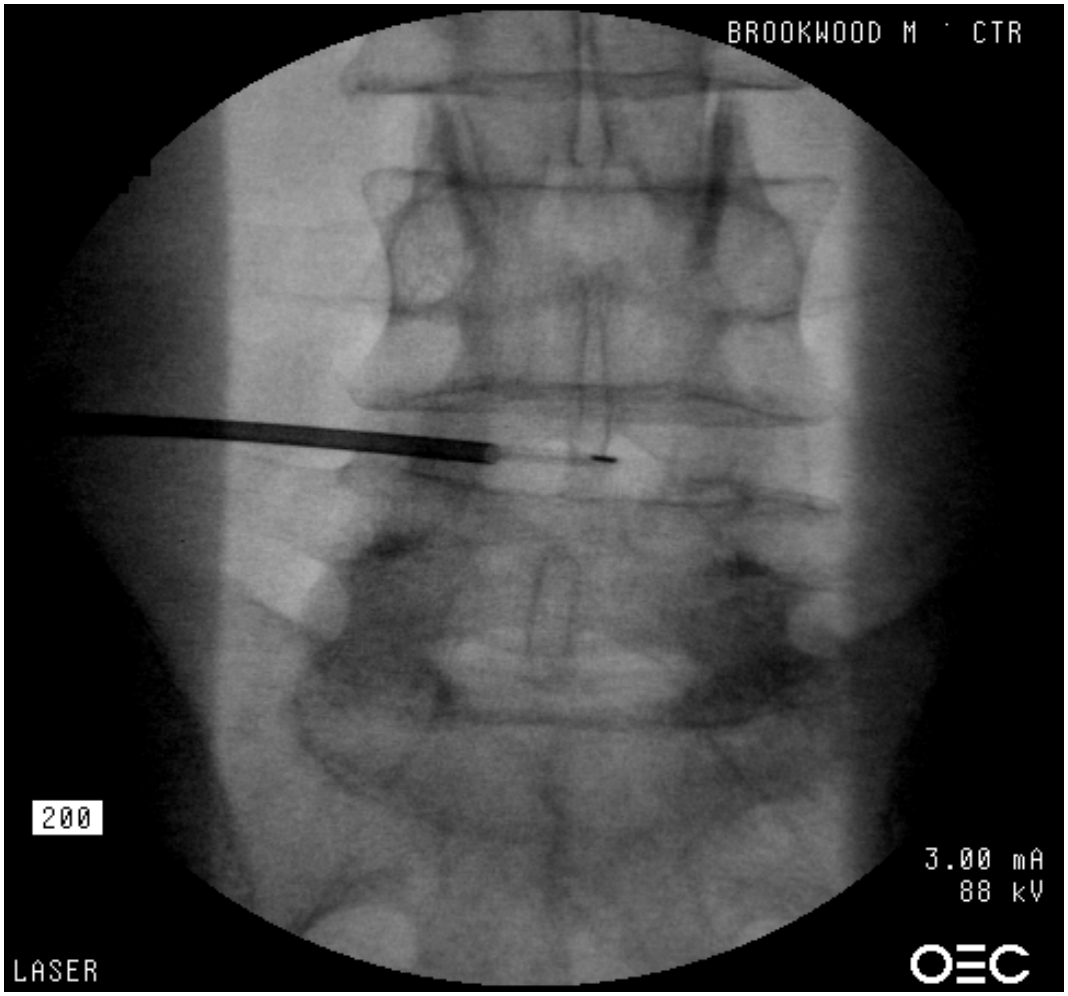

BROOKWOOD M · CTR
200
3.00 mA
88 kV
LASER
OEC

# Comparison of Results – Perc Disc vs. Surgery

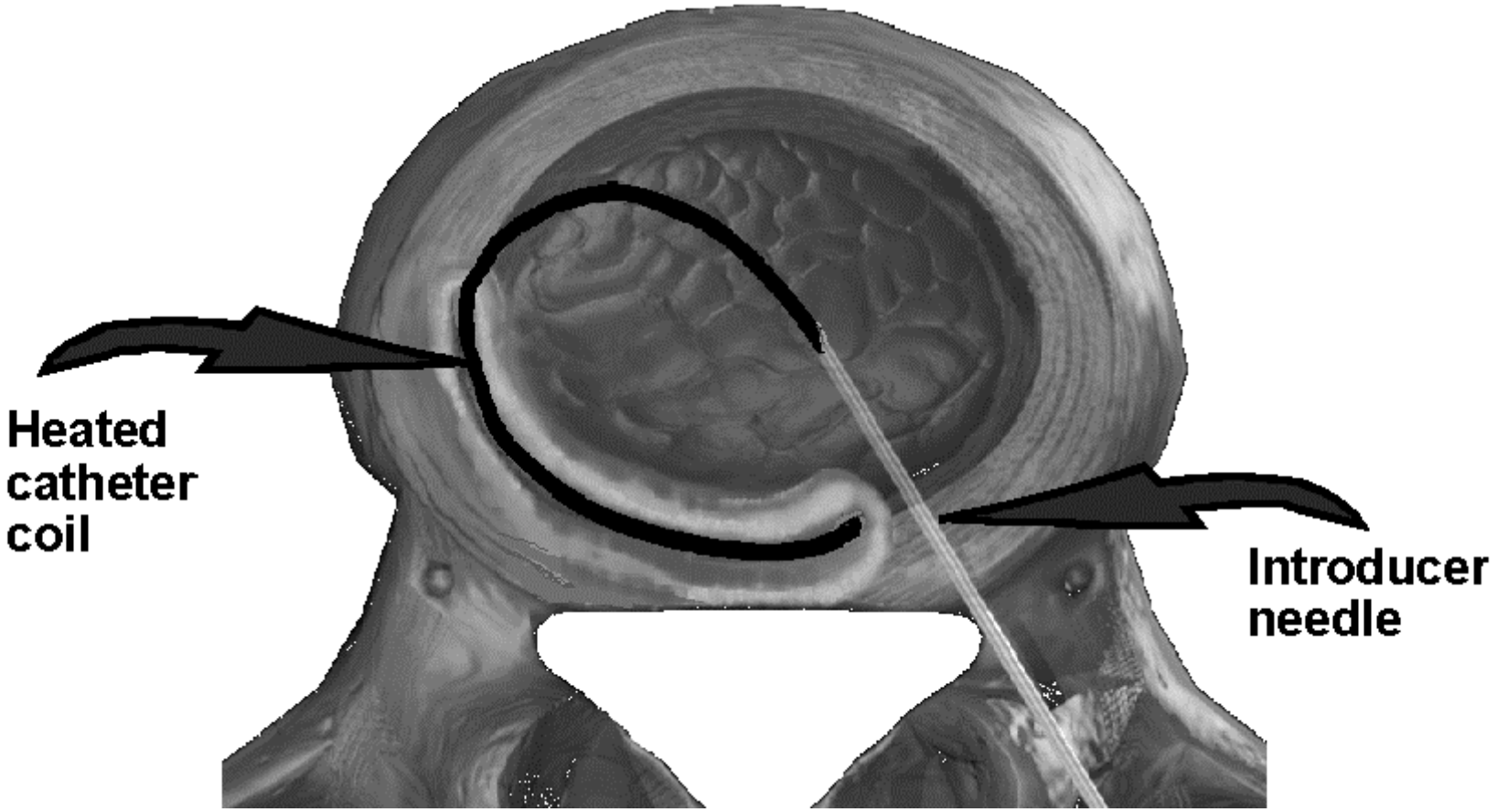
| Success Rates for Various Disc Conditions | | | |
|---|---|---|---|
| CONDITION | SUCCESS RATE | | BEST THERAPY |
| | Open Surgery | Percutaneous diskectomy | |
| Sequestered or Extruded | 90% | NOT INDICATED | surgery |
| Prolapsed | 79% | 80% | Percutaneous diskectomy |
| Bulging | 60% | 80% | Percutaneous diskectomy |

Reference: Jonsson and Stromqvist, J. Spinal Disorders, Vol. 9 pp 32-38, 1996

# Discogenic pain-Pathology of Pain

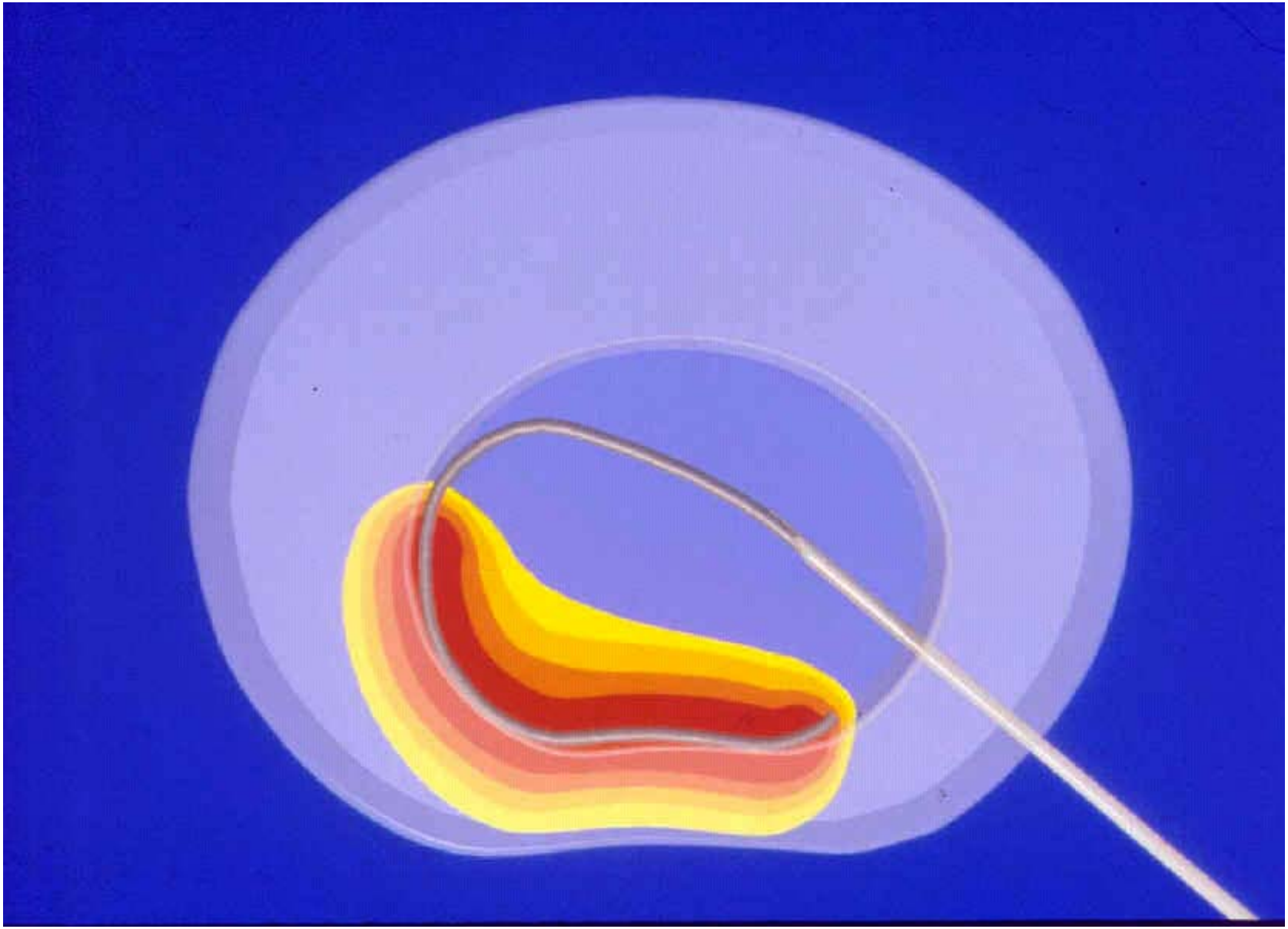
- Intervertebral disc is a known pain generator - nociceptors are present in outer third of the annulus + ALL/PLL
- Buckling of annulus leads to increased mobility of adjacent spinal segment
- Leads to fissuring of annulus, sensitizing mechanoreceptors/nociceptors (Roberts,'95)
- Get both mechanical and neural irritation

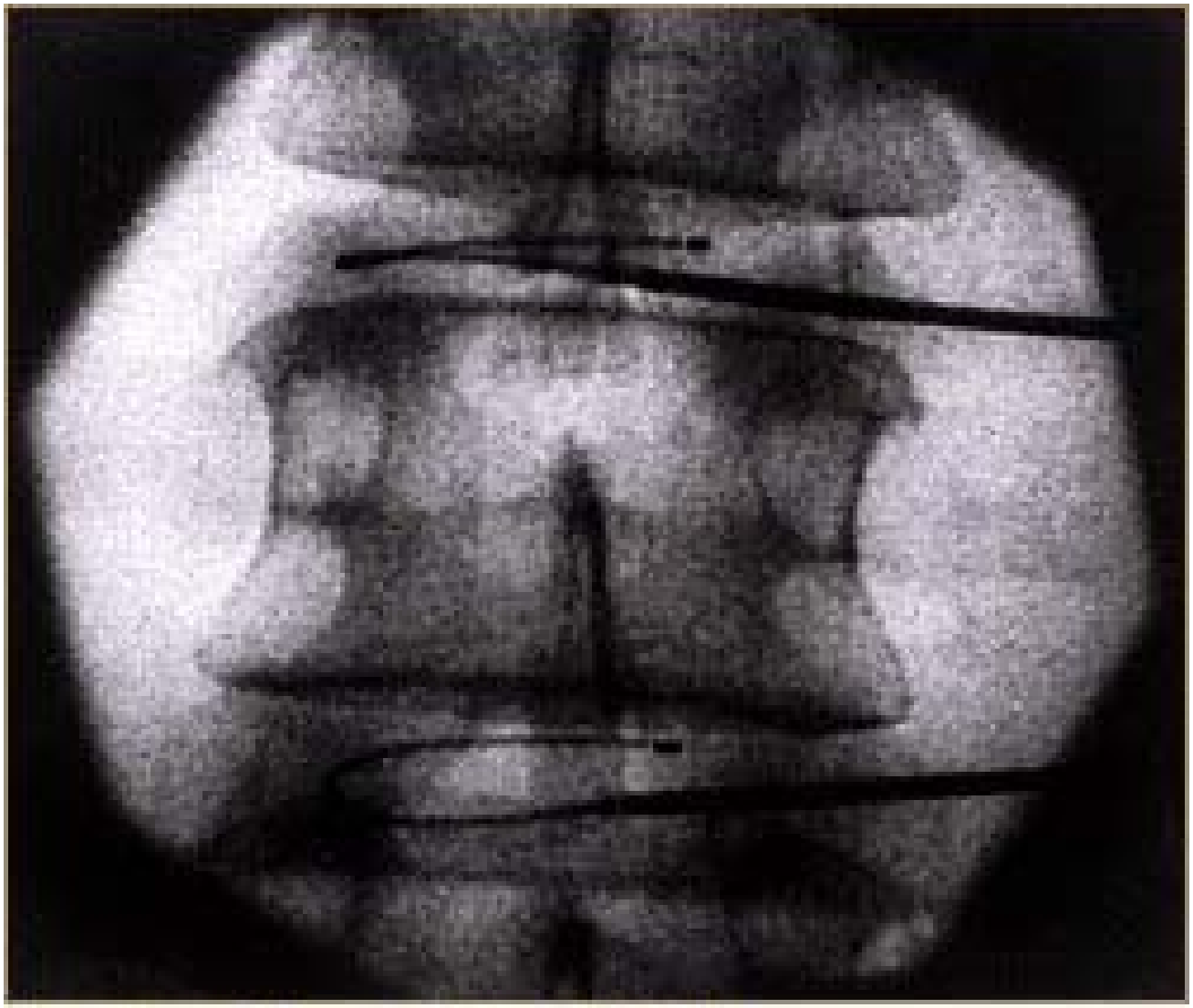
# Position of heated catheter within the disc.



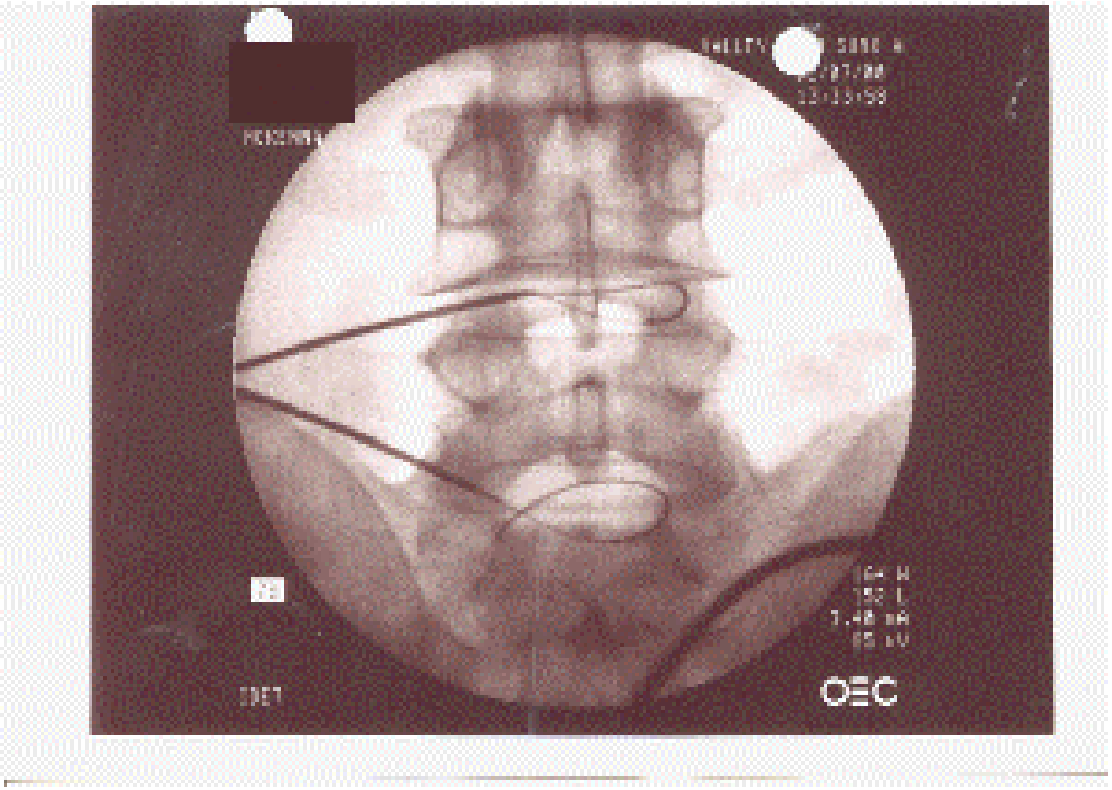
# IDET - Technique

- Insert 17-gauge 6” needle into disc
- Thread heat-conducting 18-gauge catheter
- Catheter: 30 cm long, 6 cm active tip
- Position to posterior border of interior part of annulus
- Heat catheter to 90º (tissue temp. = 75º)
  (65º, then 2º per min x 13 min, total 17 min)





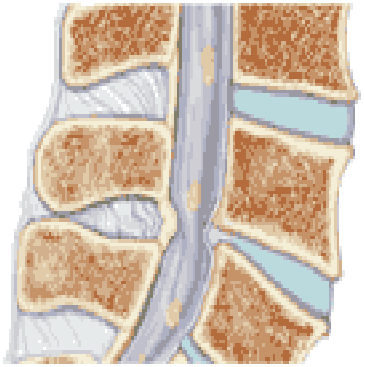
*Intradiscal electrothermy (IDET)*

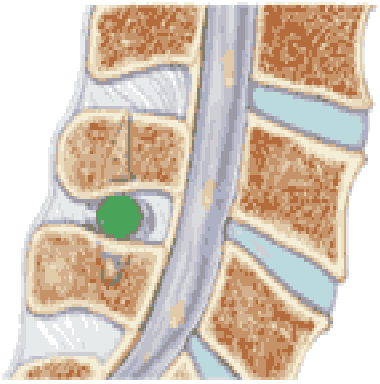



# Two-level IDET

# X-Stop Interspinous Process Distraction System (X-stop IPD)

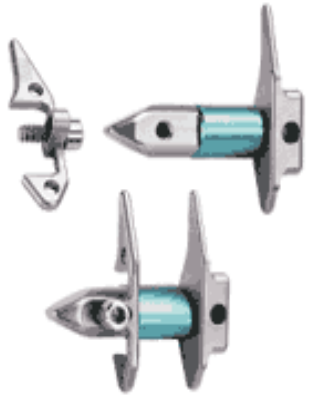
- Novel minimally invasive treatment for spinal stenosis
- X STOP is placed between the spinous processes of the symptomatic disc levels
- Distracts the space and maintains it in a slightly flexed position, allowing patients to resume their normal posture rather than flex the entire spine to gain relief of symptoms

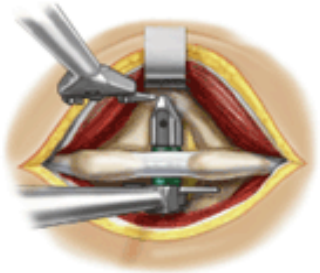


# X-stop IPD

- Procedure performed under Local Anesthesia
- Non-surgical candidates with high grade spinal stenosis and neurogenic claudication
- Osteoprotic and other comorbidities
- Reversable Procedure





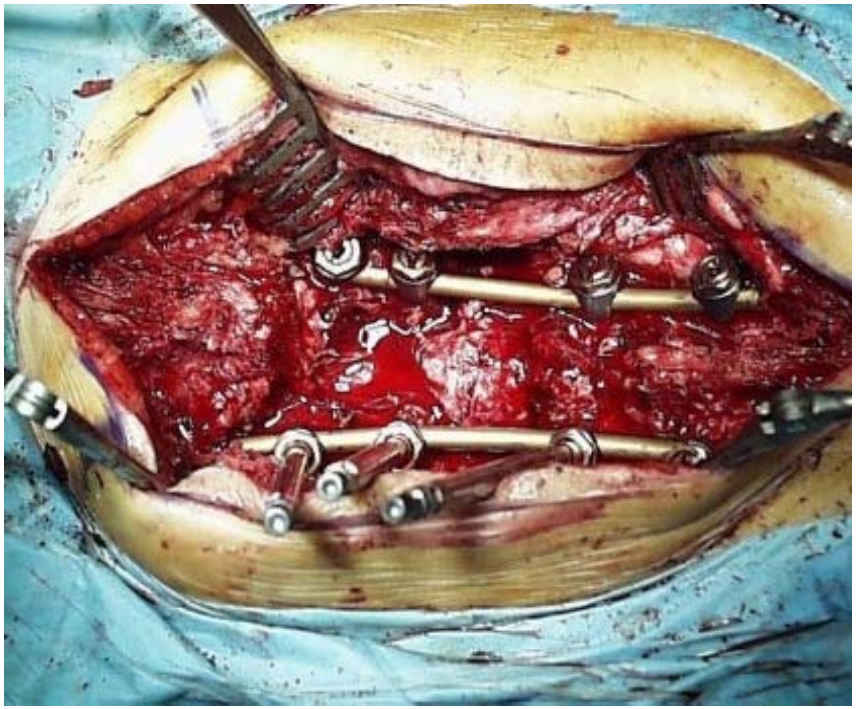
# Future Promises

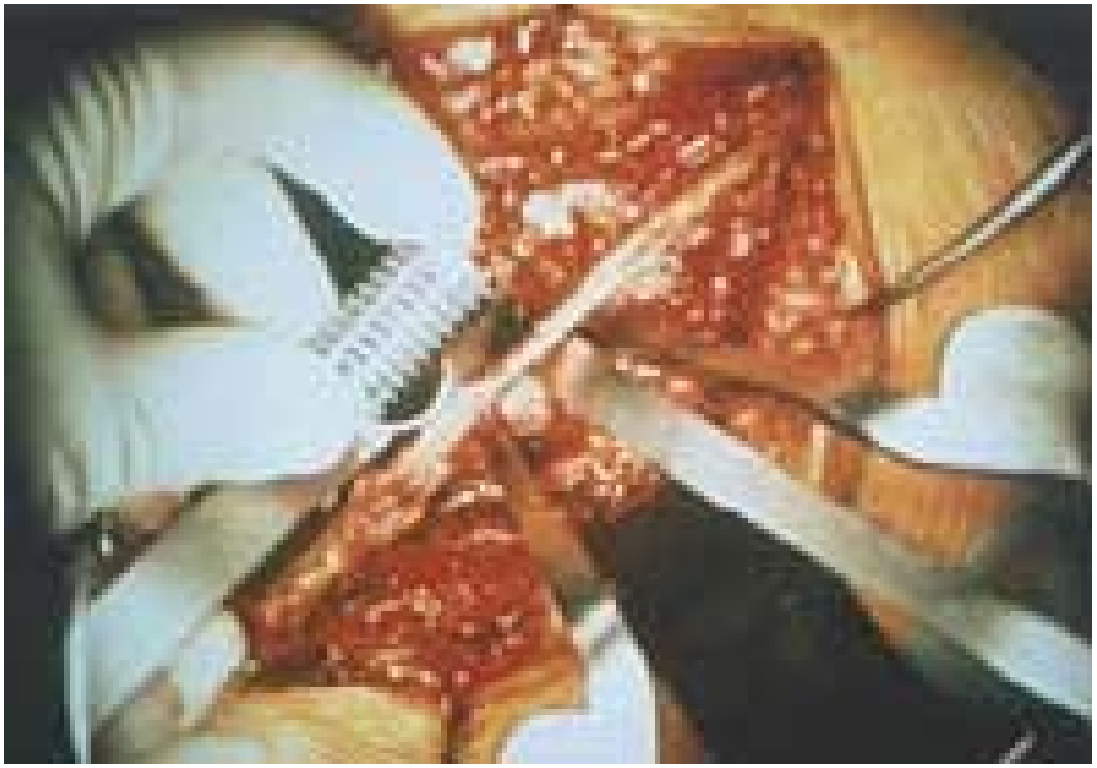
- Percutaneous Spinal Fusion/stabilization
- Endoscopic spinal decompression
- Percutaneous BMP implant

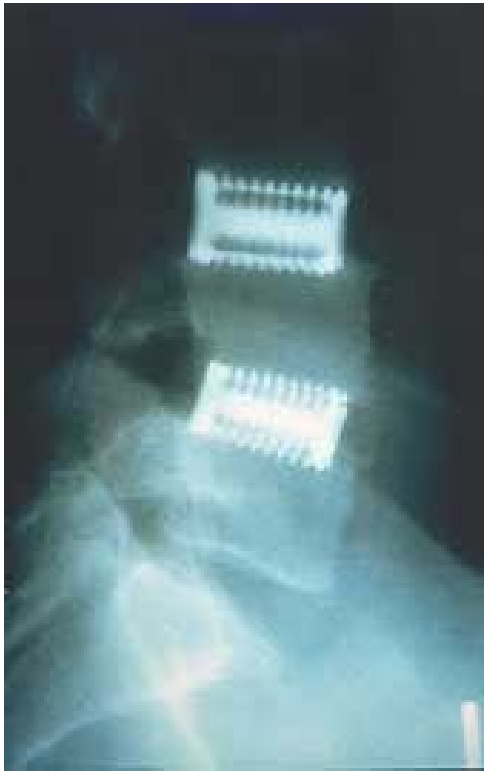
# Minimally Invasive Therapies

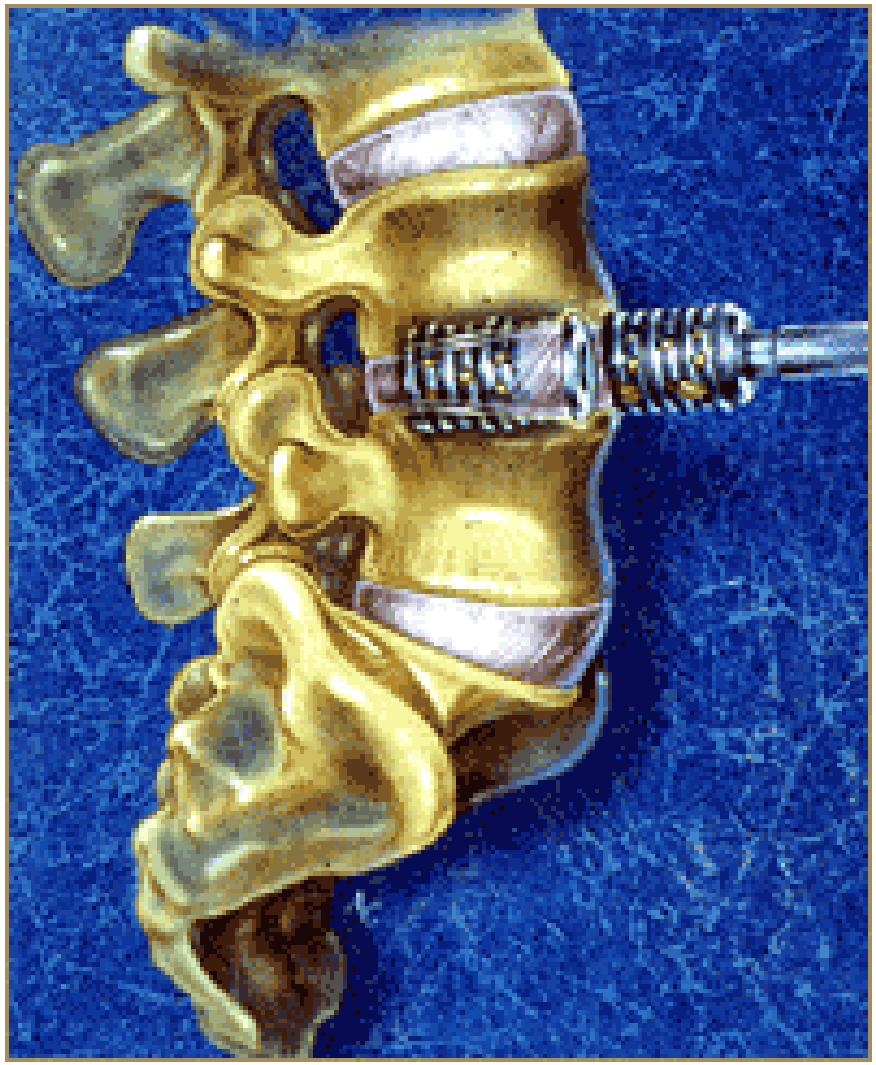
- Doesn’t burn bridges - subsequent surgery is still an option.
- Provides a curative option for patients otherwise not a surgical candidate secondary to medical co-morbidities or because of presentation

# There is nothing to lose….

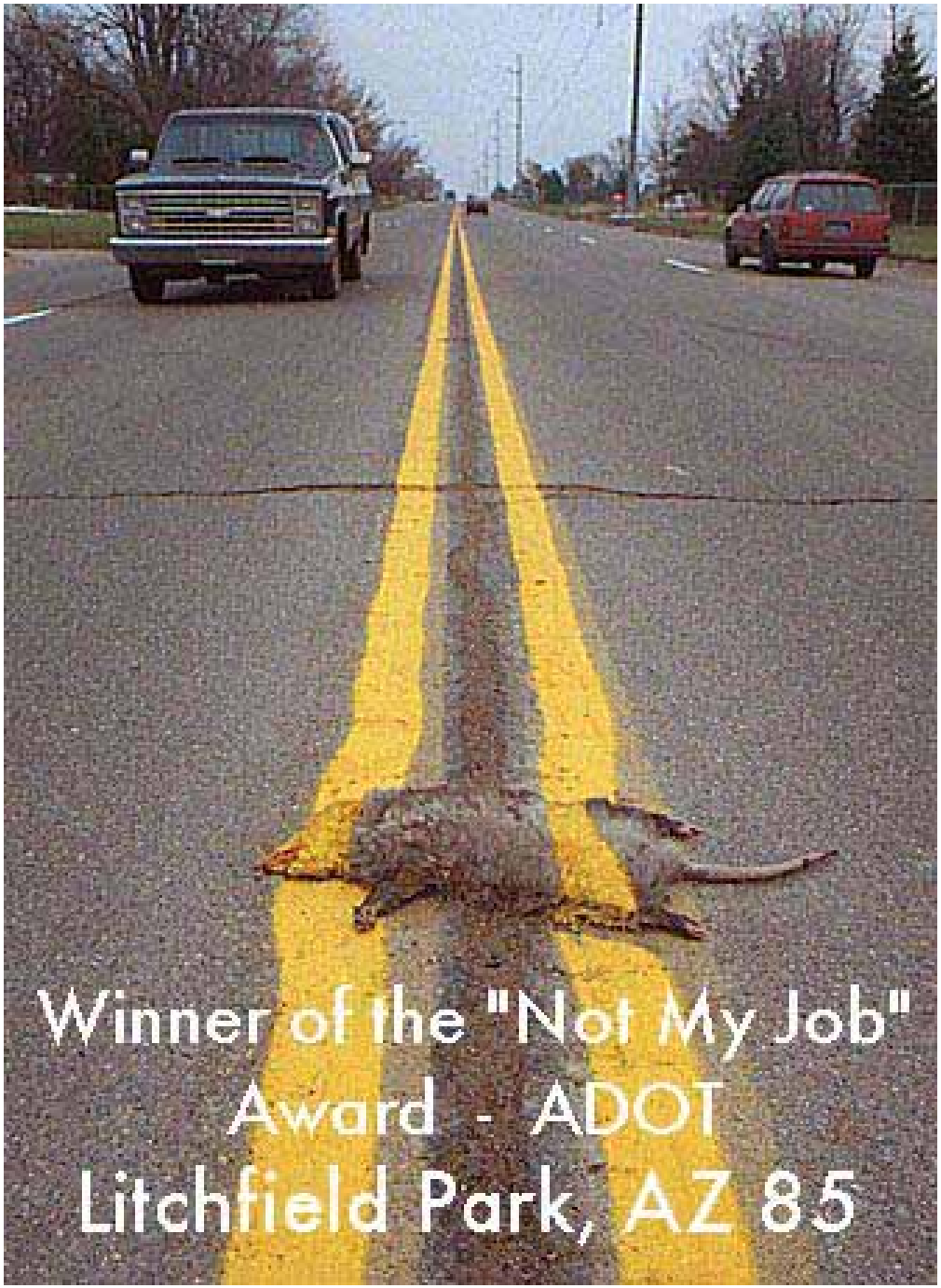








*Drawing of insertion of anterior interbody fusion cage.*


Winner of the "Not My Job"
Award - ADOT
Litchfield Park, AZ 85