Comparative Prospective Randomized Study Comparing Conservative Treatment and Percutaneous Disk Decompression for Treatment of Intervertebral Disk Herniation

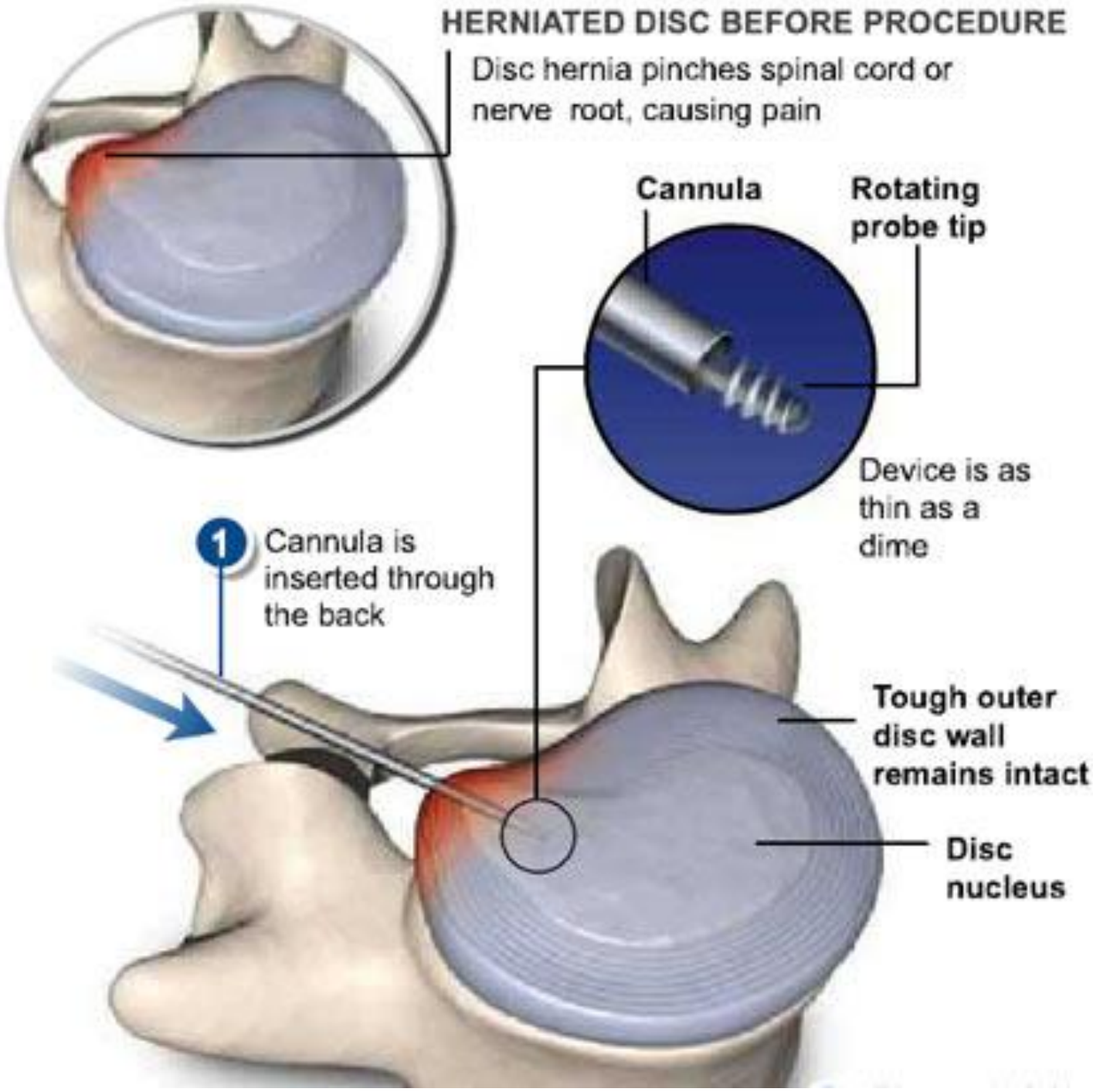
Erginousakis D et al. Radiology 2011;260:487-493

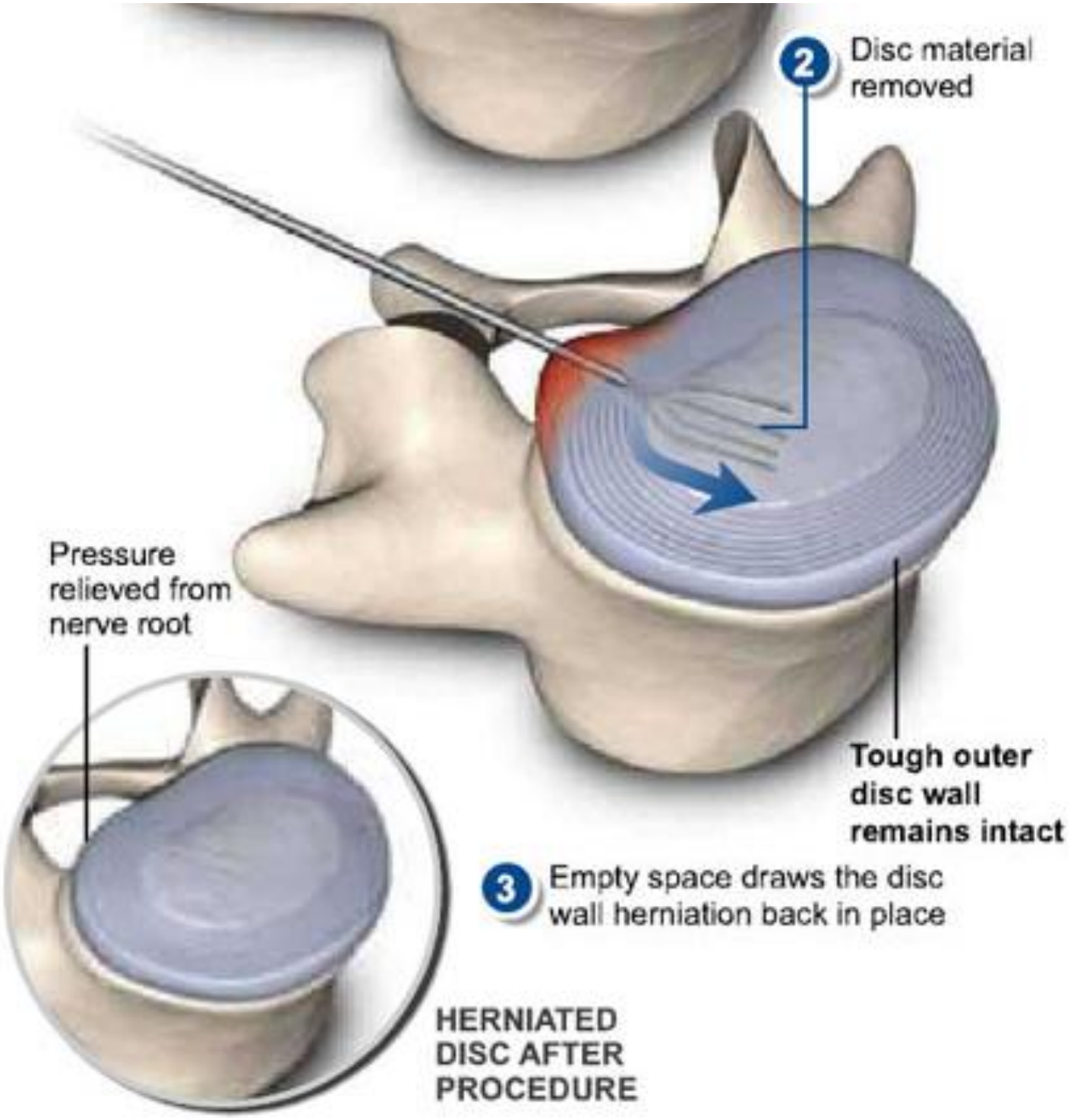
Introduction - HNP

- 80-90% success rate with medical Rx
- 4 to 6 week course of analgesics, muscle relaxants, NSAIDs, immobilization, bed rest, and physical therapy.
- 1%–1.5% complication rate (NSAID)

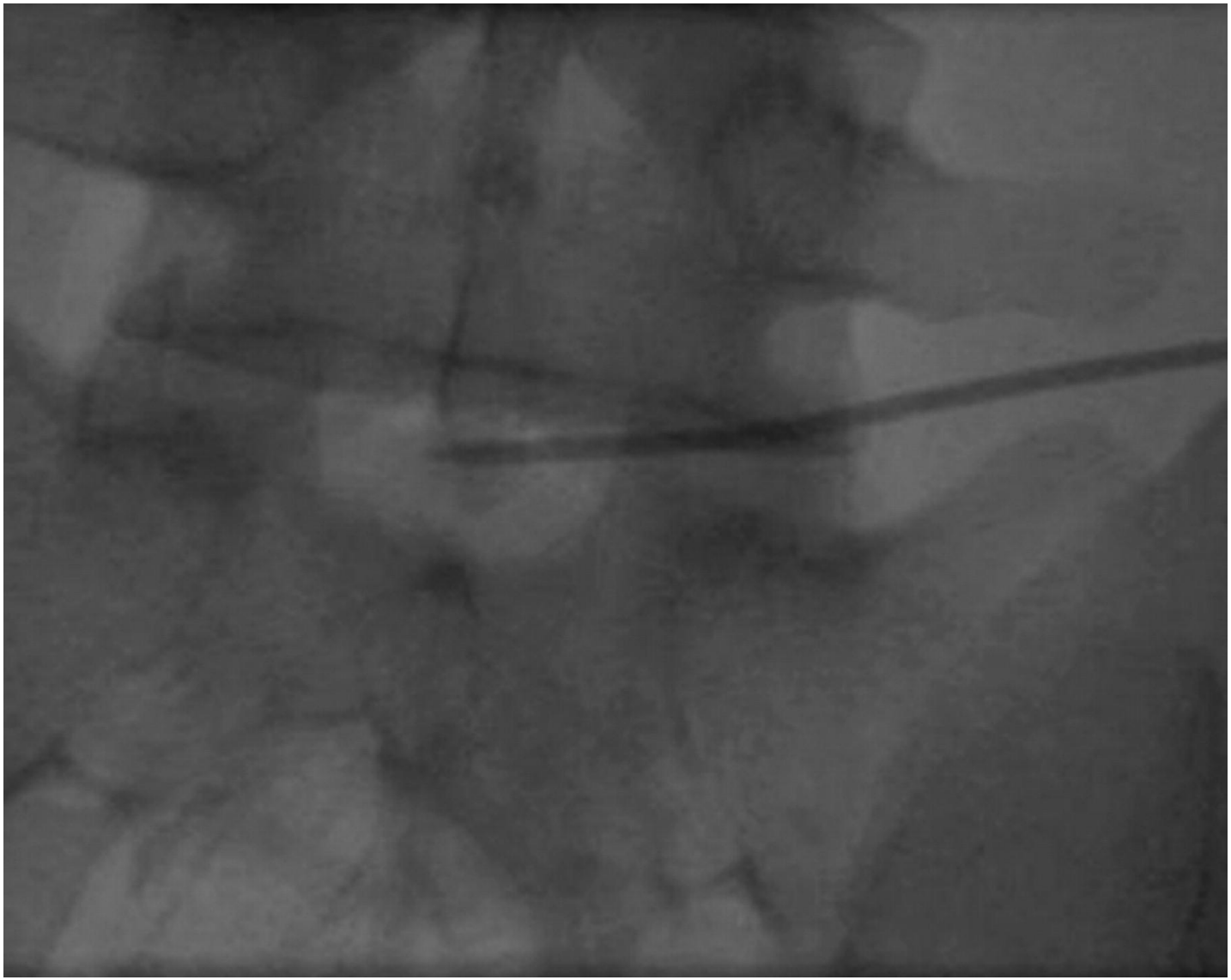
- Surgery 80-95% success rate
- Complication rate of 1- 10%

- Less invasive options ?


HERNIATED DISC BEFORE PROCEDURE
Disc hernia pinches spinal cord or nerve root, causing pain
Cannula
Rotating probe tip
Device is as thin as a dime
1
Cannula is inserted through the back
Tough outer disc wall remains intact
Disc nucleus


2
Disc material removed
Pressure relieved from nerve root
Tough outer disc wall remains intact
3
Empty space draws the disc wall herniation back in place
HERNIATED DISC AFTER PROCEDURE

(a) Anteroposterior and (b) lateral views of the L5-S1 intervertebral disk during decompression.



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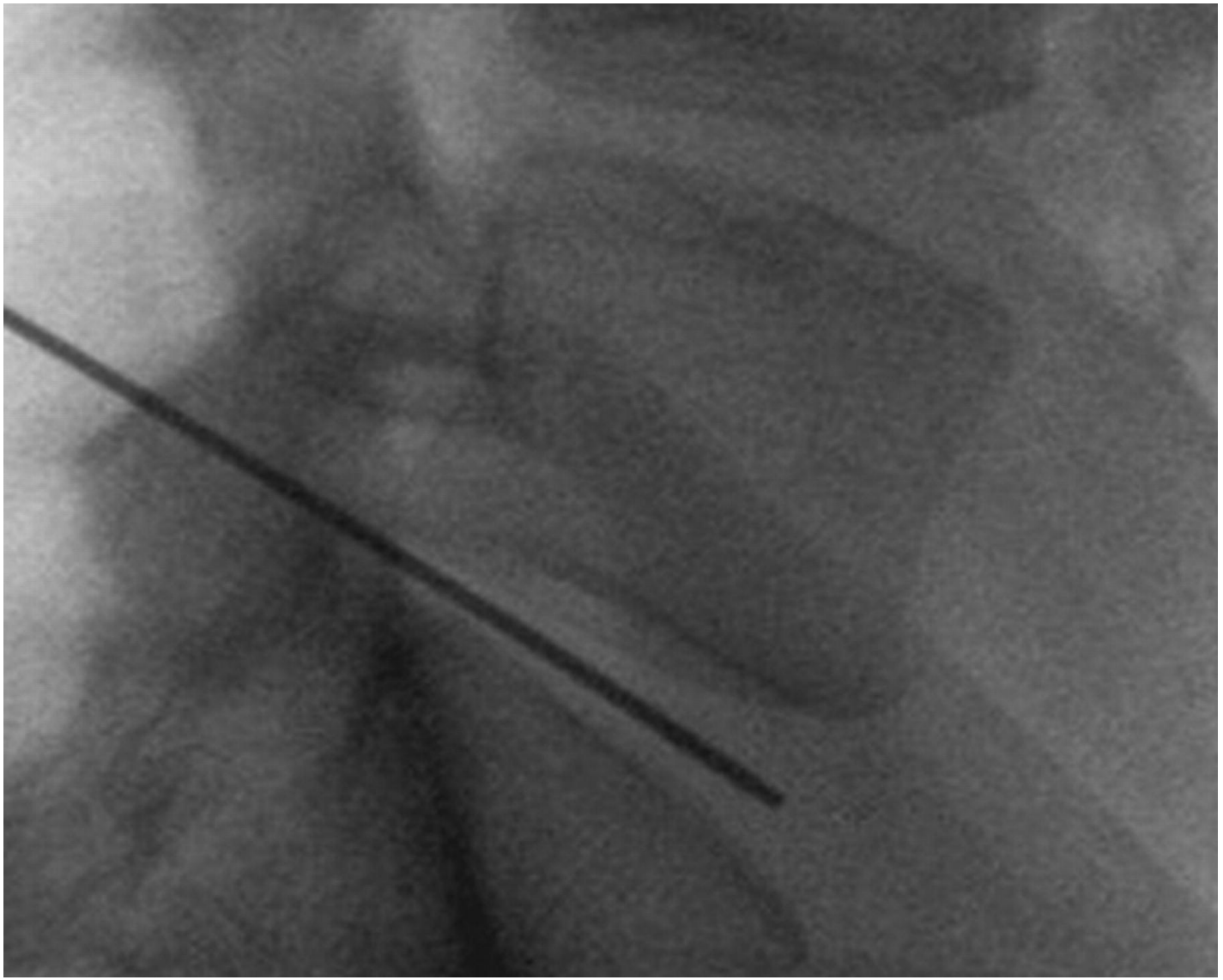

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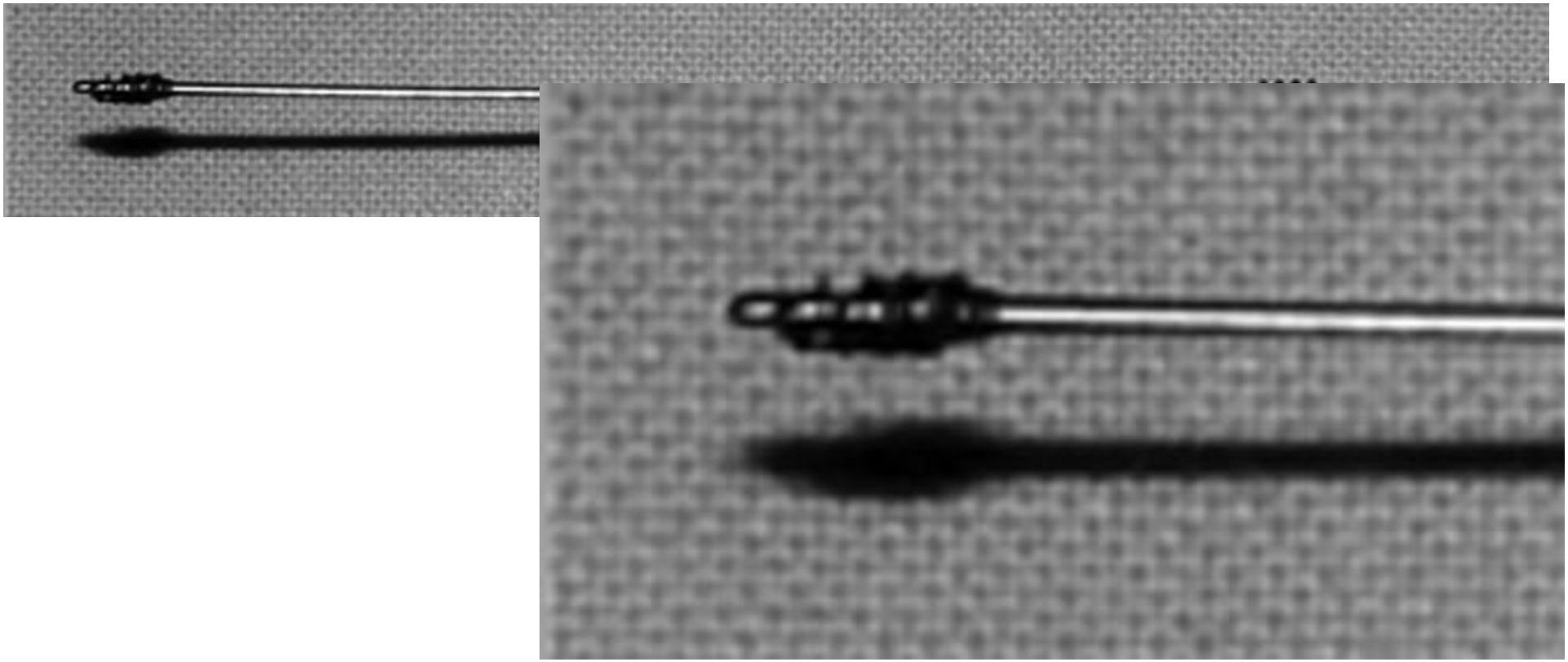
The Dekompressor (Stryker) has a high rotation speed and two spiral formations that ensure aspiration of disk material during rotation.



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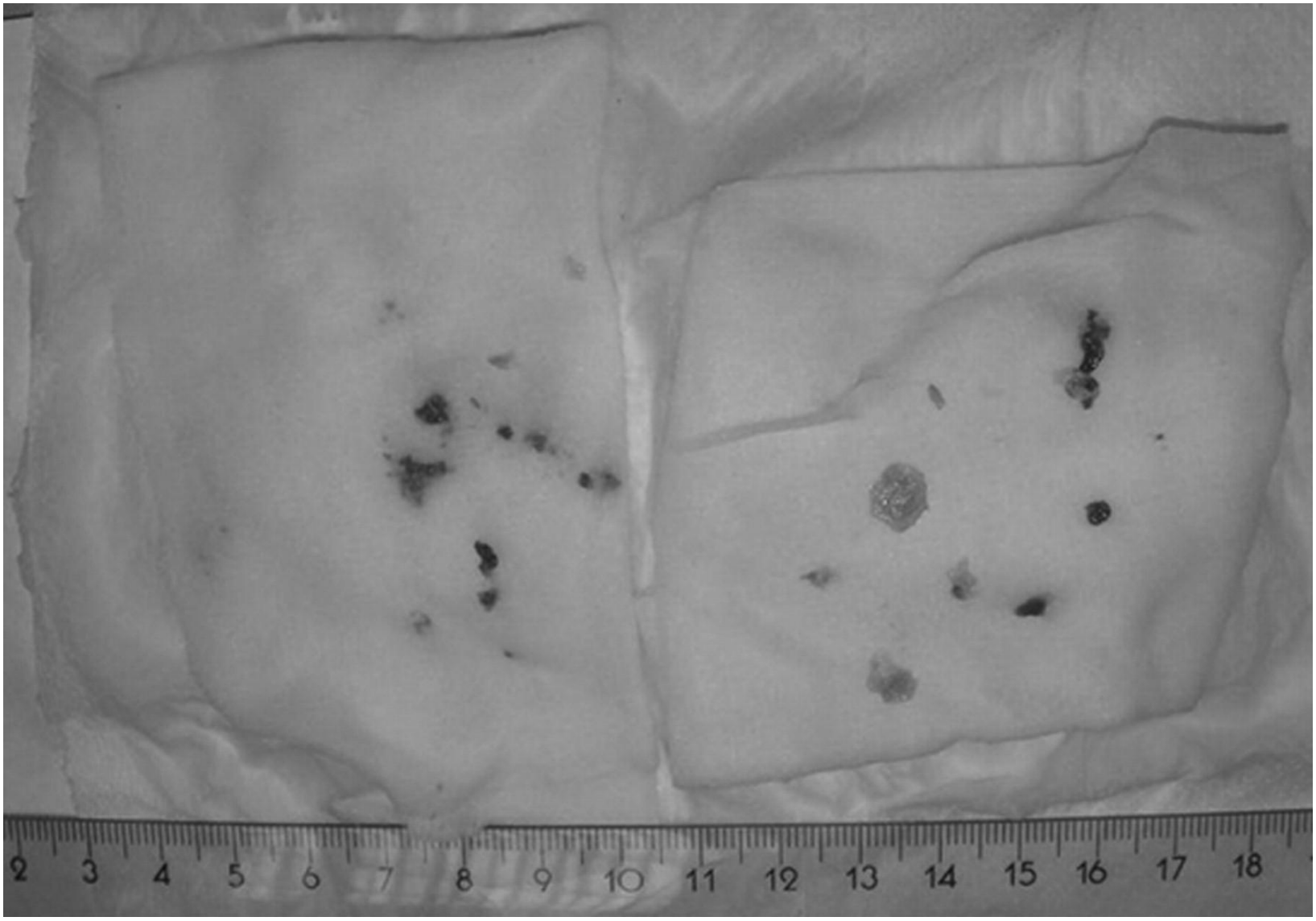
Benefits of disc decompression include:

- 15- 30 min
- Significant pain relief[6][7]
- Maintained annular integrity[6][8][9]
- Reduced use of analgesics[6][7]
- Improved quality of life[6][7]
- Quantifiable disc material removal[7]
- Less epidural scarring
- Quick recovery: generally 3 to 5 days
- Low complication and morbidity rates[10][11][12][13][14][15][16][17][18]
- Outpatient procedure requiring only local anesthetic alleviates possible complications of open surgery and general anesthesia

Compared to surgery, percutaneous discectomy provides:

- Possible reduction in:
  —Perineural scarring
  —Postoperative fibrosis
  —Permanent structural alterations
  —Spinal instability
- Decreased complication rate: 0.5% vs. 3% with open surgical discectomy[19][20]
- Lower re-herniation rate: 5% vs. 10-15% compared to open lumbar discectomy[21]
- No incision required
- Decrease in:
  —Anesthesia
  —Procedure time
  —Recovery time

Intervertebral disk fragments that have just been removed with the Dekompressor (Stryker).



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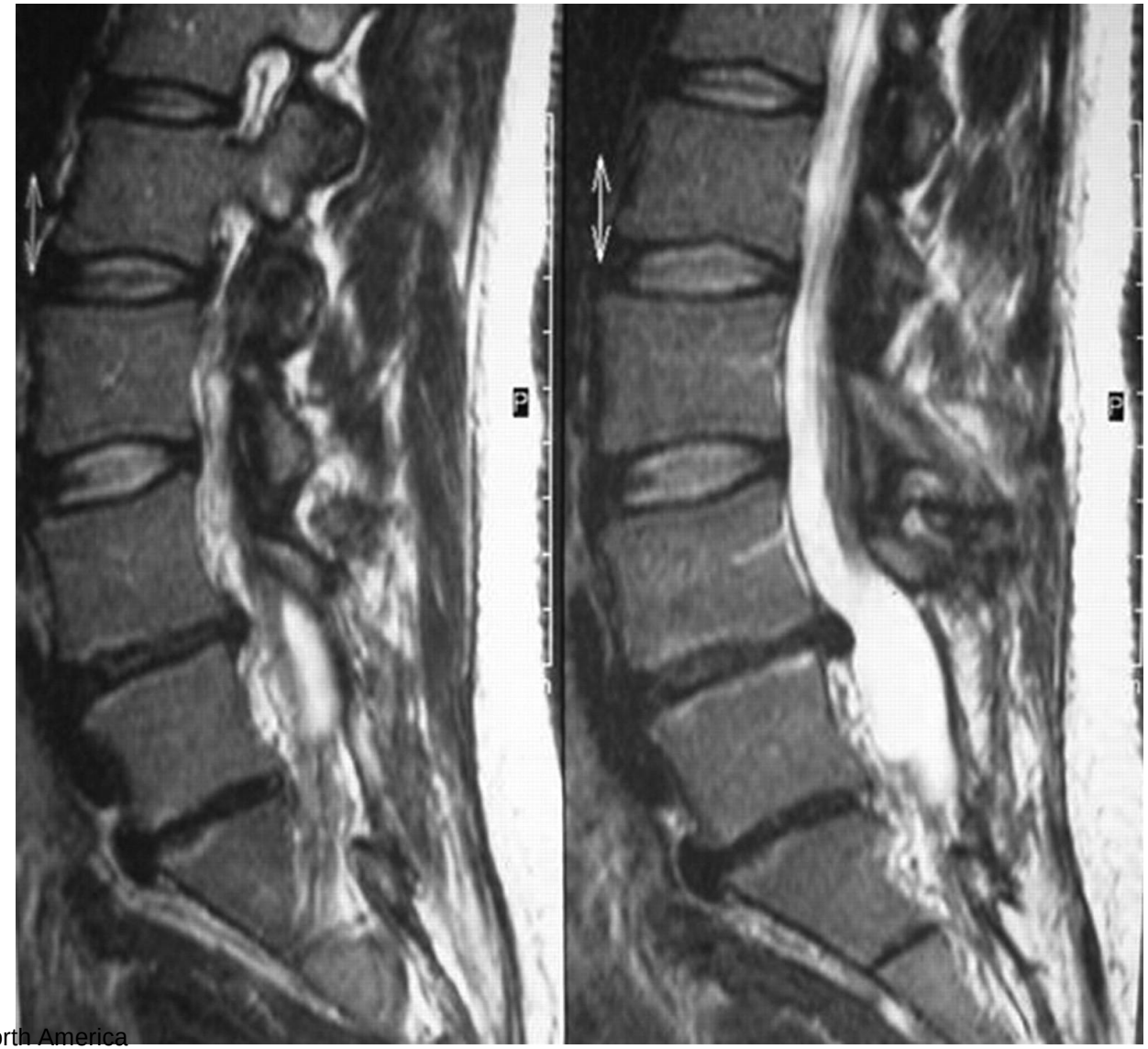
Approximately 1cc -3 cc removed.

Experiment (Choy DSJ, 1992. J Clin Laser Med Surg 1992;10:177– 84)

Inject 1cc into the nucleus proplusus

Pressure increases by 2340 mmHg

Sagittal reconstructed T2-weighted MR images of a female patient (not included in our study) who presented with back pain and sciatica.



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Randomized Control Study
Prior to randomization – failed “conservative Rx”

Inclusion Criteria

1. Small to medium HNP, less than 1/3 canal

2. Symptomatic HNP (Pain at corresponding level)

3. PDD group underwent provocative discography to prove that the disc was symptomatic disc

Exclusion Criteria

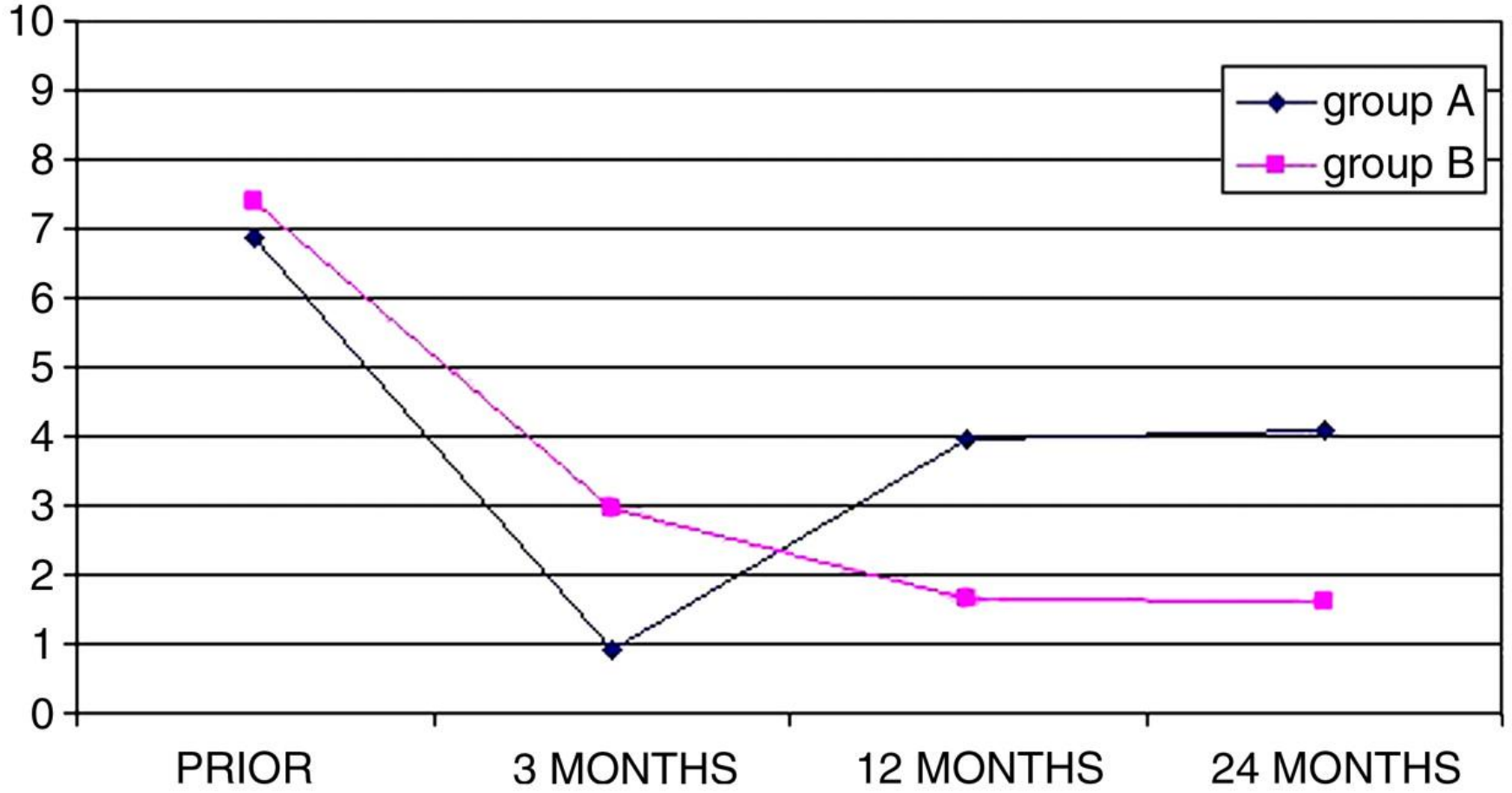
disc height was less than 50%, no PDD

coagulopathy, nonsymptomatic disc, large disc (>1/3 canal)

Randomized Study
4 years
31 patients
Control Group (antiinfilammatory drugs, muscle relexants, physotherapy for 6 weeks.)
Pain Scale (0-10)
PDD performed by **Interventional MSK Radiologist**

Time	Decompression Group	Control Group
Baseline	7.4	6.9
3 Months Follow-up	3	0.9
12 Months	1.7	4.0
24 Months	1.6	4.0

Graph shows results of the two methods were similar during the first 3 months; however, follow-up showed that conservative treatment (group A) failed in the long run, whereas results achieved with PDD (group B) were sustainable.



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Takes less than 1 hour

Same day procedure

0.2 % diskitis

Implication for Patient Care

PDD yields significant and long-lasting pain reduction in patients with a small, symptomatic disk herniation.

Percutaneous Laser Disc Decompression
(Schenk, AJNR Jan 2006)

1986 Choy did first PLDD on human
1997 FDA approved
2002 35,0000 PLDD worldwide

Laser
- evaporates water in NP (decreased volume and pressure)
- heat denatures protein (NP no longer attracts water)
- permanent reduction in pressure by < 57%

No randomized trial

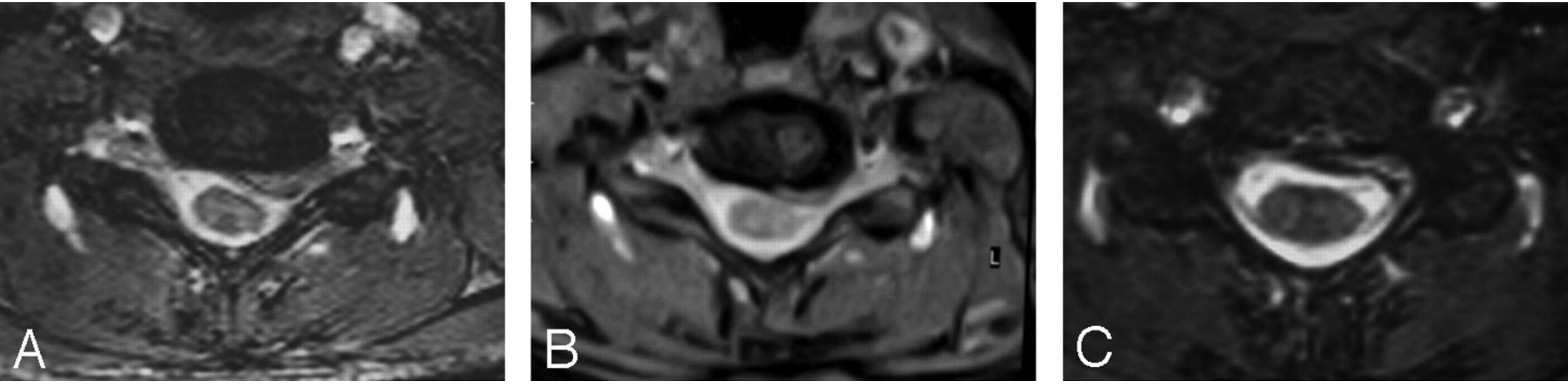
75-87 % success rate
0-1.2% diskitis (aspetic or septic)

Plasma Radio-Frequency–Based Diskectomy

(Bonaldi AJNR 27 Nov-Dec 2006)

Electrodes into the disc
Bipolar voltage pulses at 100 KHz

Sodium ion vaporizes (Plasma field)
Ionized particles fragments the disc into liquid and gas
Minimal damage to adjacent tissue



7 wks

9 months