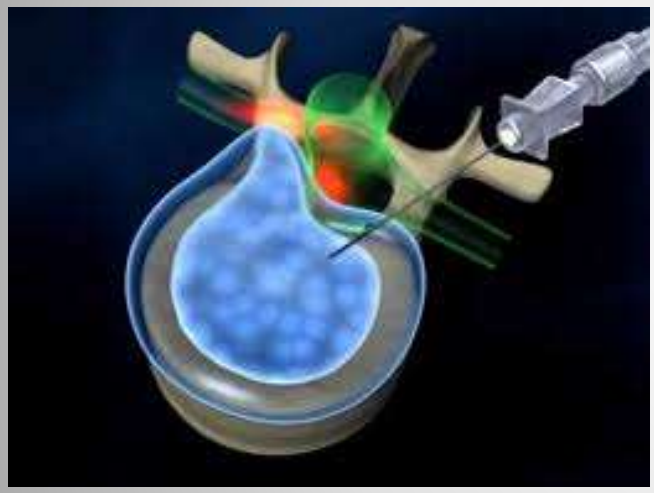

PLDD

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Member of **ISRAPM**

- In pldd, laser energy is used via a fiber into the nucleous pulposus under local A.
- This leads to vaporization of the water content in the nucleous and a change in its protein structure
- This volume reduction results in a disproportionate decrease in intradiscal pressure releasing the entrapped nerve root

- Lasers were first reported to be clinically used in the disc in 1977 as part of an open thoracic discectomy using Co2 laser

- Nowadays Ho-yag is the choice for most physicians because of the low penetration and the very high power

- The first lumbar pldd was performed by dr Choy et al. in 1986
- The US food and drug administration (FDA) approved pldd for use in the United states in 1991

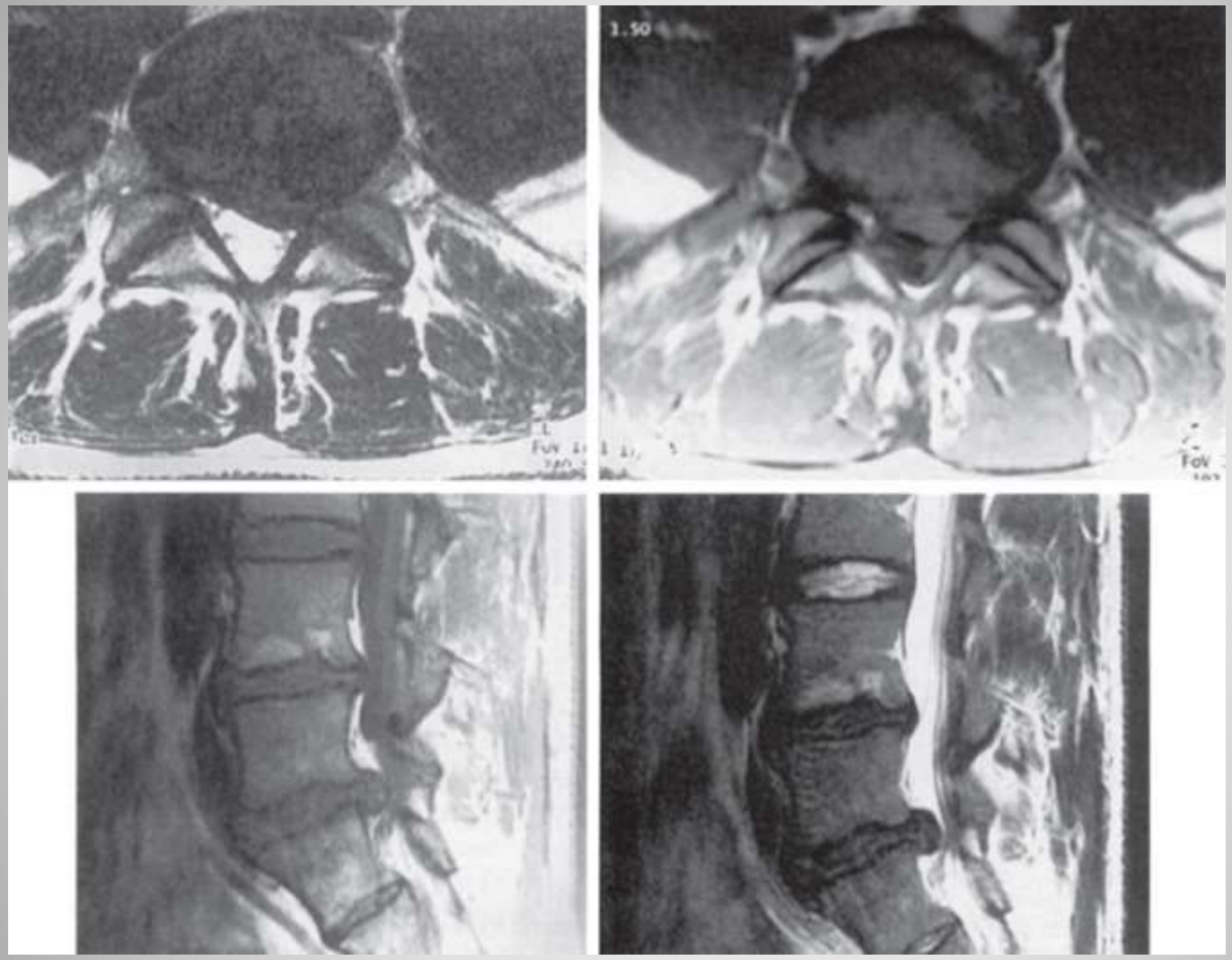
- Indications

- Percutaneous diskectomy using laser assistance is indicated for a special subset of patients who have low back and radicular pain thought to be caused by contained disk protrusion

- Better to be without neurologic deficit
- Because experience shows that results are much better than pateints experiencing paresis or paresthesia

- And a minimum of 6 weeks of conservative treatment without significant improvement consisting of a trial of simple analgesics, nonsteroidal anti-inflammatory agents, or cyclooxygenase-2 inhibitors; bed rest; and epidural steroids.

- Some pain management specialists also recommend that a trial of transforaminal epidural steroid nerve block be attempted before percutaneous diskectomy is considered.
- For optimal patient selection, the ideal candidate for percutaneous diskectomy using laser assistance should have magnetic resonance imaging (MRI), diskographic,
- and electromyographic findings that correlate
- with the patient’s radicular pain pattern




contained
discs


non-contained
disc herniation
free fragment

Exclusion criteria

- Foraminal or central canal stenosis
- Facet sny.
- Previous spinal surgery in the same part
- Bony deformity
- Cauda equina syndrome
- pregnancy

Success rate

- If according to selection and without any stenosis or spondylolisthesis or extruded fragment or leakage of dye from annulus fibrosus or multiple prior surgeries:

71%

Unless, maybe 20-30%

Anatomic considerations

- Patient size
- Neuroforaminal size
- Disc height
- Anatomic problems (osteophyte, iliac crest morphology)

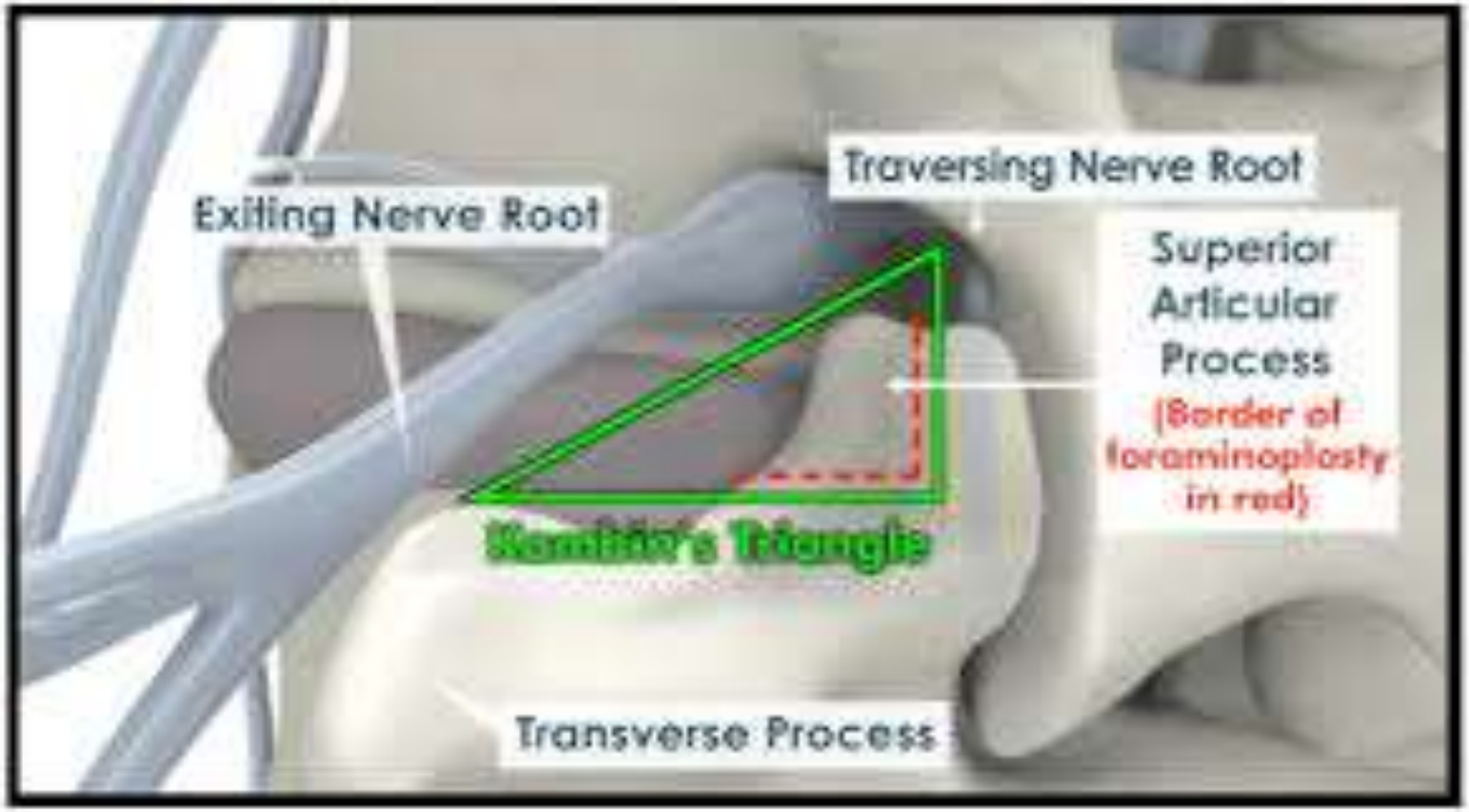
- Obese pateints are not good candidates as need needles more than 21 cm which is not available

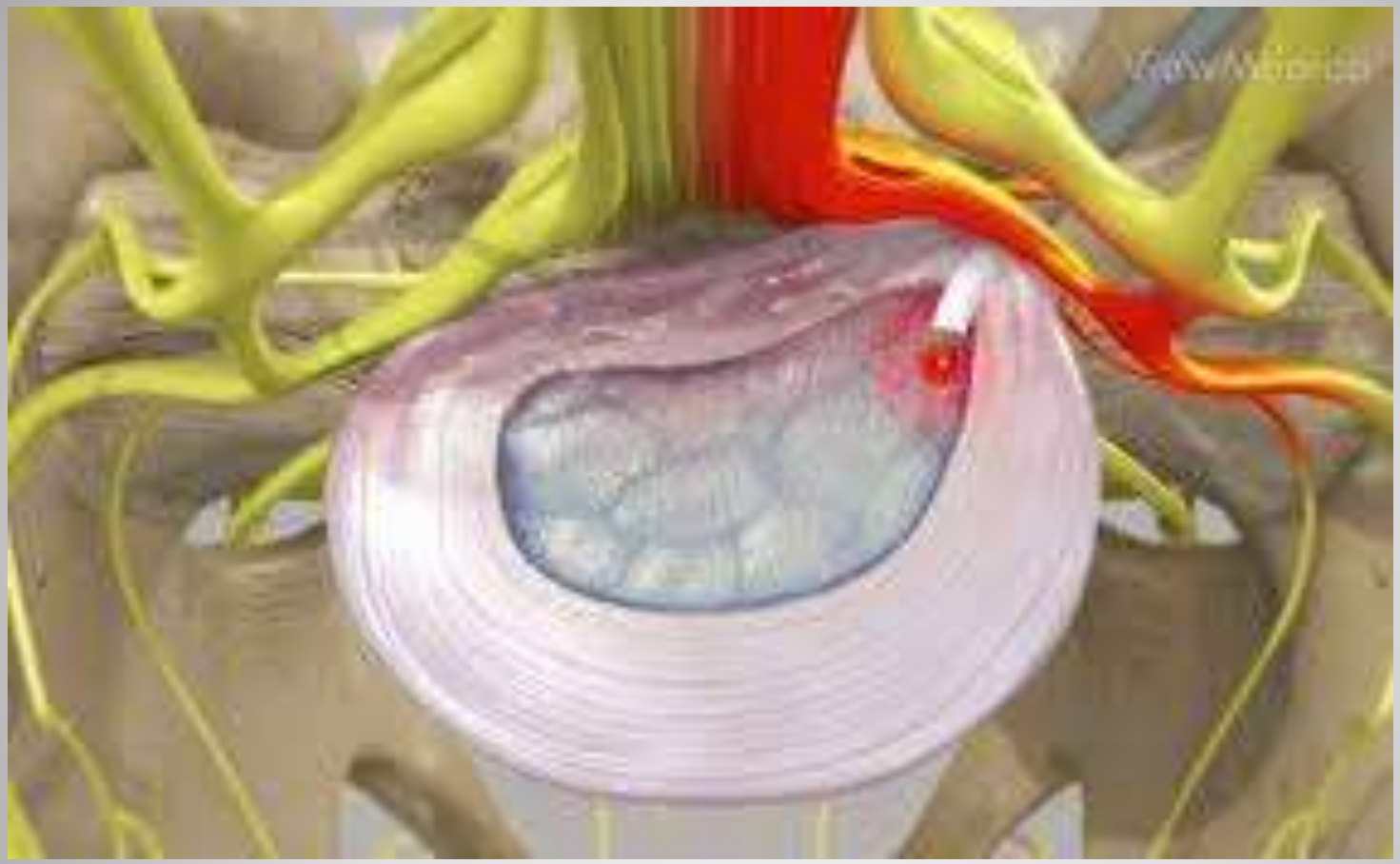
Technique

- Basic approach is: placing the needle via a postero-lateal transforaminal entry into the disc
- Then after passing the annulus, laser canula is inserted via fluoroscopic or endoscopic or CT guidance

- The angle is usually 40-55 degrees in lumbar spine or 30-40 in upper lumbar and thoracic spine

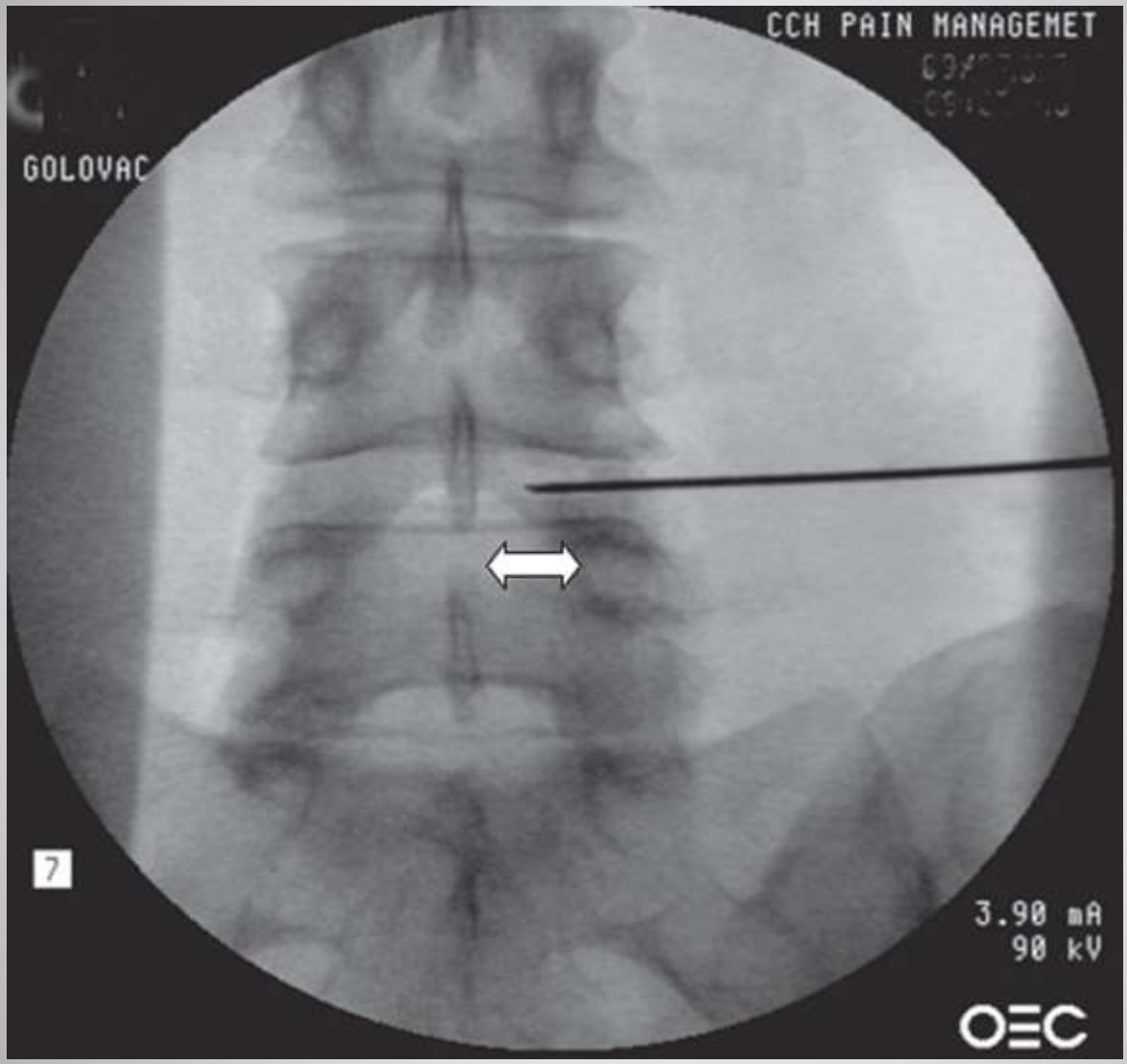
- In cervical area: 20-30 rt oblique
- Of course the end plates are also squared by CC angulation
- And needle placement lower in the hole is much safer


Exiting Nerve Root
Traversing Nerve Root
Superior
Articular
Process
(Border of
foraminoplasty
in red)
Transverse Process

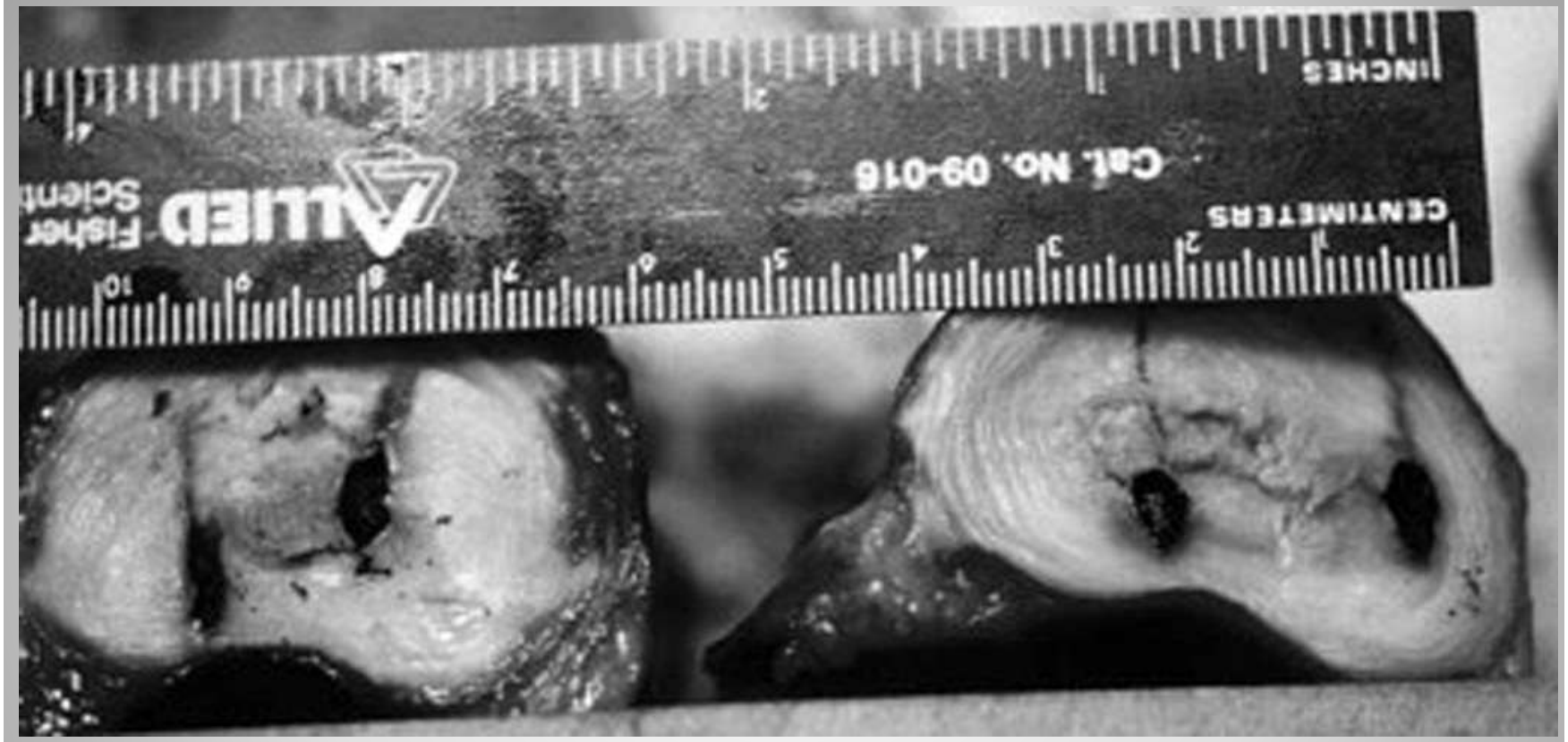


- Although laser-assisted percutaneous diskectomy could theoretically be performed under fluoroscopic guidance, computed tomography (CT) guidance is preferred because CT can actually demonstrate the vaporization of the nuclear material and help guide the procedure.
- The patient is placed in the lateral or prone position with a pillow under the abdomen to slightly flex the lumbar spine as if for a lumbar sympathetic block.

Ct guided

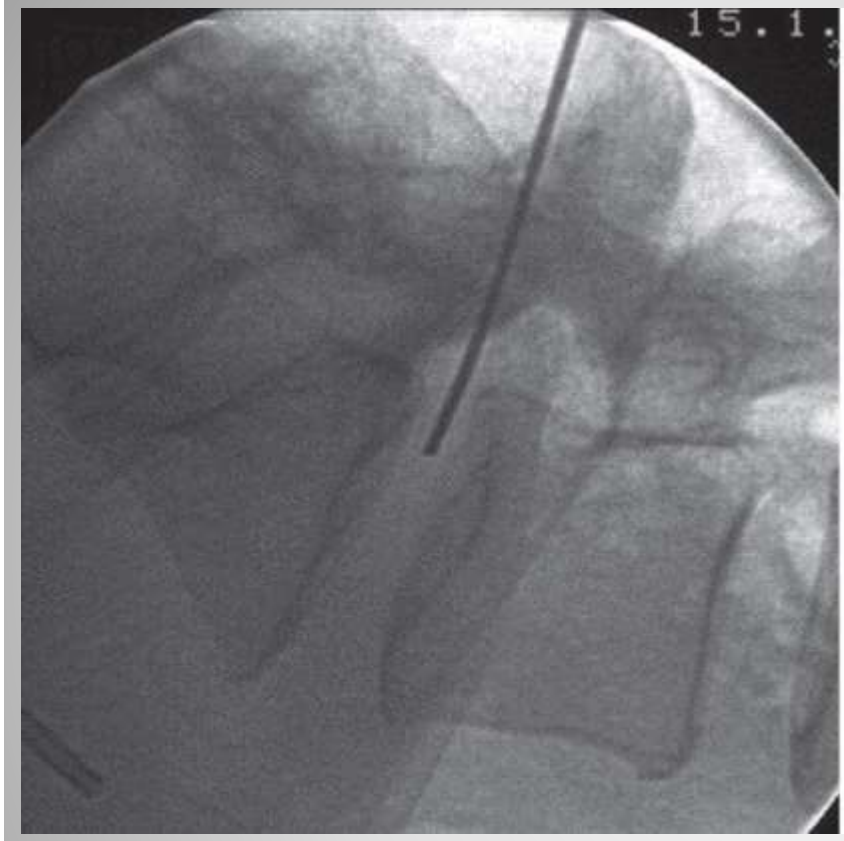

CCH PAIN MANAGEMET
GOLOVAC
7
3.90 mA
90 kV
OEC

- An energy level of 15 to 20 W for Ho-yag(diode:6-8 w) delivered in 0.5- to 1-second pulses at 4- to 10-second intervals.
- The total delivered laser energy dose should be in the range of 1200 to 1500 J with the L4-L5 disk sometimes requiring an additional 300 to 400 J to effect adequate vaporization of the nucleus.



A 1.2 cm decrease in size

- After the procedure is completed, the patient is
- observed for 30 minutes before discharge. The patient should be warned to expect minor postprocedure discomfort, including some pain in the paraspinous musculature.
- Placing ice packs on the injection site for 20-minute periods will help decrease these untoward effects.
- The patient should be instructed to call immediately if fever or other systemic symptoms occur that might suggest infection.


15.1.

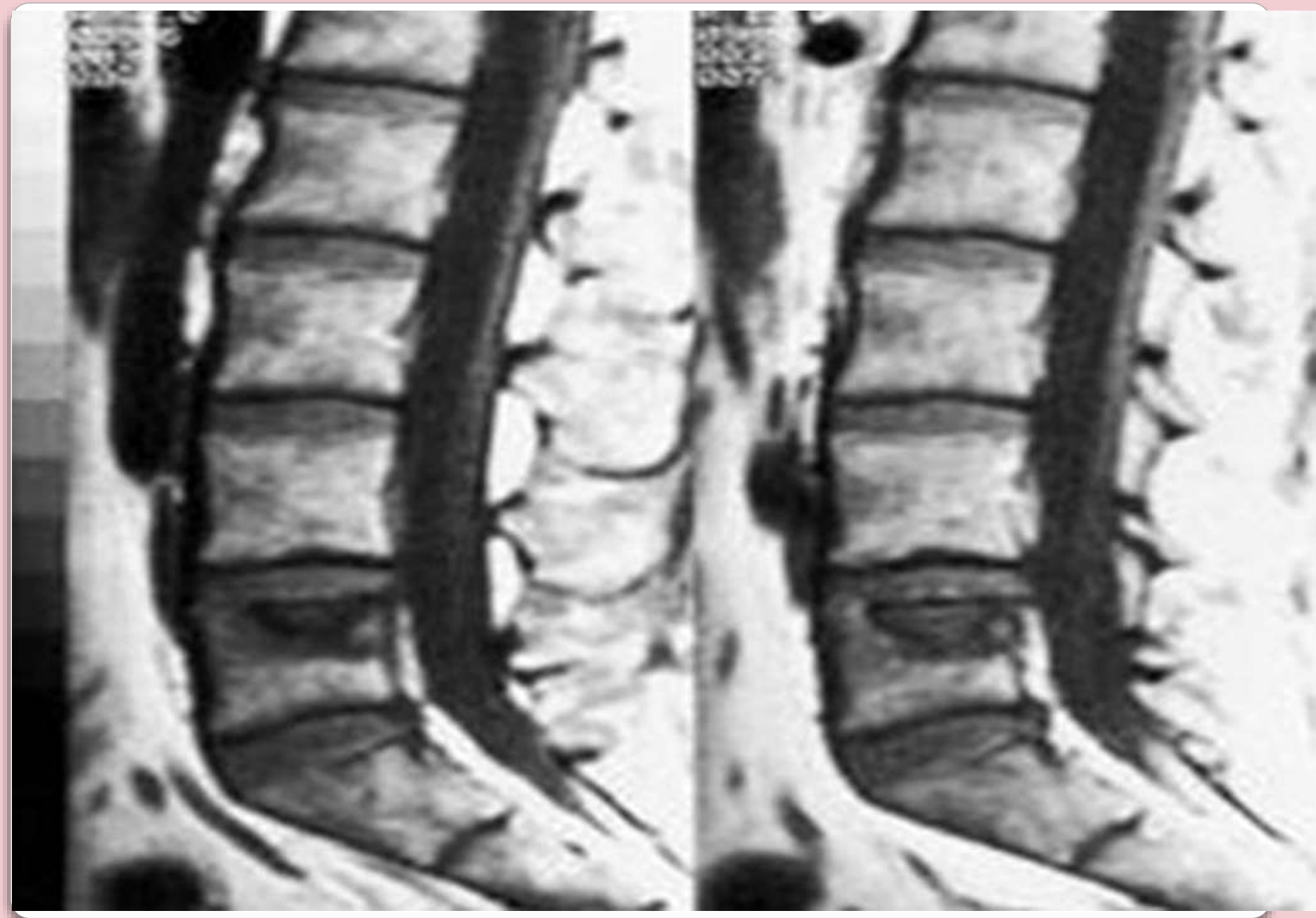
SIDE EFFECTS AND COMPLICATIONS

- Complications directly related to laser-assisted percutaneous diskectomy are generally self-limited, although occasionally, even with the best technique, severe complications can occur.
- The most common of all:paravetebral muscle spasm

- The most common severe complication after percutaneous diskectomy using laser assistance is infection of the disk, which is commonly referred to as *diskitis.*
- Because of the limited blood supply of the disk, such infections can be extremely hard to eradicate.
- Diskitis usually presents as an increase in spine pain several days to a week after percutaneous diskectomy.
- Acutely, there will be no change in the patient's neurologic examination findings as a result of disk infection.

- Epidural abscess, which can rarely occur after percutaneousdiskectomy, generally presents within 24 to 48 hours.
- Clinically, the signs and symptoms of epidural abscess are high temperature, spine pain, and progressive neurologic deficit.
- If either diskitis or epidural abscess is suspected, blood and urine samples should be taken for culture, antibiotics started, and emergent MRI scan of the spine performed to allow identification and drainage of any abscess to prevent irreversible neurologic deficit

- Postprocedure osteonecrosis of the vertebral body adjacent to the disk being treated has been reported occasionally.
- This complication is usually seen when a side-firing potassium triphosphide or holmium:yttriumaluminum-garnet (Ho:YAG) laser is used and is rarely seen when a direct-firing neodymium-doped yttrium-aluminumgarnet
- (Nd:YAG) laser is employed



- Direct trauma to the nerve roots and the spinal cord can occur if the needle is allowed to traverse the entire disk or is placed too laterally. These complications should occur rarely if incremental fluoroscopic or CT scans are taken while the needle is advanced.
- Such needle- and/orheat-induced trauma to the lower lumbar spinal cord andcauda equina can result in neurologic deficits, including cauda equina syndrome and paraplegia.

We have the responsibility to cure when we can but treat suffering Always