Degenerative spine disease treatment

- O-arm-Assisted Balloon Kyphoplasty for the Treatment of Vertebral Compression Fractures: A Retrospective Study
- Preoperative Epidural Steroid Injections and Surgical Site Infection Risk in Lumbar Spine Surgery: A Retrospective Cohort Study
- Surgical Invasiveness, Hidden Blood Loss, and Outcomes of Two Endoscopic Lumbar Fusion Techniques for Degenerative Disease: A Comparative Study
- Finite Element Analysis of Biomechanical Assessment: Traditional Bilateral Pedicle Screw System vs. Novel Reverse Transdiscal Screw System for Lumbar Degenerative Disc Disease
- Stand-Alone Lateral Lumbar Interbody Fusion at L3-L4 with 3D-Printed Porous Titanium Cages: A Safe and Effective Alternative in the Treatment of Degenerative Disc Disease (DDD)
- Surgical Management of Lower Back Pain: Is Optimizing Spinopelvic Alignment Beneficial for Patient Outcomes?
- Correlation and risk factor analysis of multifidus muscle atrophy in degenerative lumbar spondylolisthesis
- Comparison of the Biportal Endoscopic Versus Tubular Approach for the Treatment of Lumbar Degenerative Disease: A Systematic Review and Meta-Analysis

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1. Conservative (Non-Surgical) Management

Most patients benefit from non-operative treatments, especially in early stages.

Medications

NSAIDs (ibuprofen, naproxen): reduce inflammation and pain

Acetaminophen: for pain control

Muscle relaxants: if muscle spasms are present

Neuropathic pain agents: gabapentin, pregabalin, duloxetine

Physical Therapy

Strengthening core muscles

Improving posture and flexibility

Aerobic conditioning (e.g., swimming, cycling)

Lifestyle Modifications

Weight loss

Smoking cessation (smoking accelerates disc degeneration)

Ergonomic improvements at work/home

Interventional Pain Management

Epidural steroid injections

Facet joint injections

Medial branch blocks or radiofrequency ablation

2. Surgical Treatment Indicated when there is:

Neurological deficits (e.g., weakness, myelopathy)

Persistent disabling pain despite 6+ months of conservative therapy

Structural instability or deformity (e.g., spondylolisthesis, scoliosis)

Common Surgical Options Discectomy – removal of herniated disc material

Laminectomy / Laminotomy – decompression of spinal canal

Foraminotomy – decompresses exiting nerve roots

Spinal Fusion – stabilizes spine by fusing vertebrae

Disc Replacement (cervical or lumbar in selected cases) – preserves motion

Minimally Invasive Techniques Smaller incisions, less tissue damage

Shorter recovery times

Options: endoscopic discectomy, MIS-TLIF (minimally invasive transforaminal lumbar interbody fusion)

3. Advanced & Adjunctive Therapies Neuromodulation: spinal cord stimulation for chronic pain

Regenerative medicine (under investigation): PRP, stem cell injections

Orthobiologics may assist in spinal fusion healing

Tailored Approach The treatment should always be personalized, involving:

Imaging (MRI, CT, X-rays)

Clinical correlation

Patient preferences and goals

The standard treatment for a variety of advanced degenerative spinal pathologies is arthrodesis of the affected motion segments. This often follows a procedure of direct or indirect decompression of the afflicted neural tissue. Arthrodesis, or joint fusion, is often warranted following decompression because of mechanical instability of the joint, either as a result of degenerative changes leading up to surgical intervention or due to tissue disruption caused by the decompression procedure itself. Fusion of the index level is aided by a graft material consisting of either a synthetic bone substitute or bony tissue derived from the patient (autograft) or a donor (allograft). Internal fixation devices, consisting of such implants as screws, rods, plates and interbody spacers, have emerged as useful adjuncts to the fusion graft by providing immobilization of the joint during the fusion process.

The rate of pseudarthrosis, or the failure of successful fusion, has been reported at a variety of ranges depending on factors such as the specific pathology treated, the surgical technique, the technique used to assess the non-union, the number of levels fused and the presence of any metabolic abnormalities [1) 2) 3)].

1)
Steinmann JC, Herkowitz HN. Pseudarthrosis of the spine. Clin Orthop Relat Res. 1992 Nov;(284):80–90.
2)
Brantigan JW. Pseudarthrosis rate after allograft posterior lumbar interbody fusion with pedicle screw and plate fixation. Spine (Phila Pa 1976) 1994 Jun 1;19(11):1271–1279. discussion 1280.
3)
Thaller J, Walker M, Kline AJ, Anderson DG. The effect of nonsteroidal anti-inflammatory agents on spinal fusion. Orthopedics. 2005 Mar;28(3):299–303. quiz 304-295.