

Case Report: Conservative Management of Degenerative Thoracolumbar Scoliosis with Vertebral Compression Fractures in an Elderly Patient

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www.jrasb.com || Vol. 4 No. 6 (2025): December Issue

Received: 13-11-2025

Revised: 17-11-2025

Accepted: 22-11-2025

ABSTRACT

Background: Elderly patients with degenerative thoracolumbar scoliosis face difficult care issues, especially if they have spinal stenosis and vertebral compression fractures. Conservative care is still the primary strategy for older patients with stable neurological condition and substantial surgical risk factors, even if surgical intervention is frequently recommended for symptomatic spinal abnormalities.

Case Presentation: We describe the case of an 88-year-old man who has had increasing lower back discomfort for the past three years due to bilateral spinal compression fractures (D10, D11, and burst fracture of D12), multilevel disc desiccation, and thoracolumbar scoliosis. The patient had intact neurological function (normal motor strength 5/5, preserved sensory function, and normal deep tendon reflexes) despite severe spinal canal stenosis with anterior thecal sac depression and bilateral neural foramina constriction on MRI. A thorough conservative treatment that included neuroprotective supplements (methylcobalamin, alpha-lipoic acid, and benfotiamine), multimodal physiotherapy, nutritional optimization, and pharmaceutical pain management with NSAIDs and antihypertensive medication was helpful in managing the patient.

Results: The patient showed notable symptom relief, preserved neurological integrity, and improved functional mobility following five days of hospital care and ongoing outpatient conservative therapy. At the one-month follow-up, the patient was able to manage their discomfort, move around freely, and maintain their quality of life without the need for surgery.

Conclusion: When neurological function is maintained, this case demonstrates the efficacy of properly chosen, multimodal conservative treatment for older individuals with degenerative thoracolumbar scoliosis and spinal compression fractures. While avoiding the significant perioperative risks associated with spine surgery in advanced age, comprehensive physiotherapy, neuroprotective supplements, nutritional optimization, and constant neurological monitoring yield good results.

Keywords- Degenerative scoliosis, thoracolumbar, vertebral fractures, conservative management, elderly, spinal stenosis, case report.

I. INTRODUCTION

Thoracolumbar scoliosis, a progressive spinal deformity marked by lateral curvature of the thoracolumbar junction, usually co-exists with lower back pain (LBP) in older patients.^[1] Asymmetric intervertebral disc degeneration, facet joint arthropathy, and ligamentous hypertrophy all contribute to this degenerative scoliosis

by destabilizing spinal segments and changing spinal biomechanics, which results in aberrant load distribution and additional structural degradation.^[2] As is frequently observed in the lower thoracic and junctional vertebrae, age-related disc desiccation reduces disc height and elasticity, which promotes vertebral body compression fractures and the development of anterior wedge deformities. Anterior thecal sac indentation and nerve

root abutment are caused by these structural alterations, which restrict the spinal canal (central stenosis) and neural foramina (lateral stenosis). However, because stenosis is chronic and progresses gradually, allowing for brain adaptability, neurological impairments may not exist.^[3]

Clinically, patients usually exhibit diminished functional ability, poor gait, and persistent mechanical back pain that deteriorates with posture and exercise, all of which have a significant negative influence on quality of life.^[3] Spinal stenosis is made worse by the pathological interaction of ligamentous thickening, disc bulging, and vertebral fractures, highlighting the complex etiology of symptoms in older people with these abnormalities.^[4] A multidisciplinary conservative approach that includes analgesic and neuroprotective medication, customized physical therapy using pain-relieving techniques and strengthening exercises, activity modification to lessen mechanical stress, and dietary optimization to address malnutrition and promote tissue healing is essential for effective management. Given the increased operating risks in advanced age with comorbidities, surgical intervention is reserved for individuals with growing neurological impairment or chronic pain resistant to nonoperative therapy. The goals of this all-encompassing strategy are to reduce pain, maintain neurological function, increase mobility, and improve the general health of the patient.^[5]

II. CASE PRESENTATION

Patient Information and History

Mr. xxx, an 88-year-old man, has a substantial medical record of essential hypertension that has been successfully treated with antihypertensive drugs for 40 years. He came in with a three-year history of growing lower back discomfort that had significantly gotten worse, interfering with sleep, making it difficult for him to stand and move, and getting worse when he sat for extended periods of time.

Chief Complaint

Persistent lower back discomfort accompanied by increasing mobility and functional limitations.

History of Present Illness

The patient tells that their lower back pain began subtly three years ago and has since gotten worse. Forward bending, extended standing, and extended sitting all aggravate the mechanical character of the pain. Daily living activities, sleep quality, and general quality of life are all greatly impacted by the discomfort. There was no mention of any recent falls or trauma. Fever, weight loss, and constitutional symptoms are denied by the patient.

Past Medical History

Losartan-H (50/12.5 mg daily) is currently used to treat essential hypertension, which has been present for forty years. No prior history of diabetes, cancer, TB, or chronic renal disease.

Physical Examination Findings

The patient's general examination showed that they were awake, focused, afebrile, and had stable vital signs: 97.8°F (36.6°C) is the temperature. Blood pressure: 110/80 mmHg (well-controlled), pulse: 96 bpm (regular, normocardic), Oxygen Saturation: 97% on room air, Respiratory Rate: 21 breaths per minute BMI: In the typical range. A noticeable thoracolumbar spinal abnormality consistent with scoliosis was found during a musculoskeletal evaluation. Midline discomfort over the lumbar and lower thoracic vertebrae was palpable. Pain restricted range of motion in lateral bending and forward flexion. Both sides of the straight leg raise test came back negative.

Neurological Examination

Thorough neurological evaluation revealed: Nerves in the skull: intact (II–XII), Motor Strength: 5/5 in both the upper and lower extremities, Extended Tendon Reflexes: Achilles, patellar, biceps, and triceps reflexes are normal and symmetric (2+). Sensory Function: Proprioception, light touch, and vibration sensitivity are all intact. Gait: Steady but slow, unassisted (moderate antalgic gait noticed), Coordination: normal; neither dysmetria nor dysdiadochokinesia Meningeal Signs: Kernig's and Brudzinski's signs are negative. Radiculopathy and myelopathy are not seen.

III. LABORATORY FINDINGS AND IMAGING

Routine Laboratory Investigations

No acute abnormalities were found by routine laboratory testing. The coagulation profile, renal function tests, liver function tests, and complete blood count were all within normal ranges. A nutritional evaluation showed mild to moderate malnutrition, necessitating dietary therapy with a focus on consuming enough protein and calories.

Radiological Findings

MRI of Dorsal (Thoracic) Spine: Thoracolumbar scoliosis with a roughly 25–30 degree lateral curvature, Anterior wedge compression fracture (D10), anterior wedge compression fracture (D11), and burst fracture without retropulsion (D12) vertebrae Diffuse disc desiccation at multiple levels from D9–D10 to D12–L1 D9-D10, D10-D11, D11-D12, and D12-L1 levels have broad-based disc bulges. Osteoarthropathic alterations and bilateral facet joint hypertrophy Spinal canal constriction is caused by bilateral flaval thickening. Central stenosis is associated with an anterior thecal sac indentation. No anomalies in intramedullary signals or myelomalacia.

MRI of Lumbar Spine:

Bilateral neural foramina constriction at several levels and multilevel disc bulges, impingement on both nerve roots without obvious displacement of the nerve roots, facet joint arthropathy accompanied with osteophytic alterations, The conus medullaris was

surrounded by a preserved cerebrospinal fluid (CSF) signal. There are no notable myelopathic alterations.

Clinical-Radiological Correlation

The patient had normal motor strength, preserved sensory function, and normal reflexes despite having significant anatomical spinal canal stenosis with multilevel stenosis and anterior thecal sac indentation. The chronicity of degenerative alterations, which permits sufficient neural adaptability, is reflected in this discrepancy between imaging results and clinical presentation.

IV. THERAPEUTIC MANAGEMENT

Throughout the patient's five-day inpatient stay, a thorough, multimodal conservative strategy was used.

Pharmacological Management

Losartan-H 50/12.5 mg once daily (continuous) is an antihypertensive. Analgesic: For the treatment of acute pain while in the hospital, intramuscular diclofenac 75 mg twice a day Neuroprotective Supplement: Intramuscular administration of Rejunex CD3 (containing 500 mcg of methylcobalamin, 100 mg of alpha-lipoic acid, and 10 mg of benfotiamine) for five days, followed by oral tablets taken twice daily Omeprazole 20 mg once daily prior to meals (to be continued after discharge to prevent NSAID-induced gastropathy) is recommended for gastroprotection. Supportive Care: Intravenous hydration support.

Physiotherapy Program

A supervised physiotherapy regimen was started twice a day, which included: Exercises for Spinal Stabilization: isometric spine stabilization exercises, abdominal bracing techniques, and core strengthening

exercises that target paraspinal muscles Pelvic bridging: gradually building up the hip extensor and gluteal muscles Ultrasound therapy involves applying therapeutic ultrasound (frequency: 1 MHz, intensity: 1.5 W/cm2) to the lower thoracic and lumbar regions to heat tissue and reduce pain. Dual-channel interferential current therapy is used in interferential therapy (IFT) to stimulate muscles and modulate pain gates. Mechanical Traction: To release neural foramina, apply moderate lumbar traction (about 20–25% body weight) for 15–20 minutes. Cobra Stretching (Bhujangasana): Mild extension movements to increase spinal range of motion without going overboard with flexion, Postural training: instruction in appropriate body mechanics, sitting posture, and changes to daily tasks.

Nutritional Optimization

A soft diet that is specially created and offers: 1,600 kcal per day (suitable for older patients), 50 g of protein per day (to preserve muscle and promote tissue regeneration), Micronutrients The need of calcium, vitamin D, and B vitamins for healthy bones and nerves Limiting salt intake: To aid in the control of hypertension (sodium <2,000 mg daily), Oral hydration: 1.5–2 liters of fluid per day are advised.

Activity Modification and Patient Education

Reduction of heavy lifting (>3 kg), avoidance of forward bending and spinal flexion motions, keeping the spine in a neutral position while doing all tasks, compliance with the workout regimen at home after discharge, Wearing suitable shoes and using walking assistance when necessary Regular physical activity under supervision is important.

V. DISCHARGE MEDICATIONS

Medication	Strength	Dosage	Frequency	Indication	Duration
Losartan-H	50/12.5 mg	1 tablet	Once daily after meals	Hypertension control	Long-term
Omeprazole	20 mg	1 capsule	Once daily before meals	Gastroprotection (NSAID prophylaxis)	Long-term
Rejunex CD3	Methylcobalamin 500 mcg, Alpha-lipoic acid 100 mg, Benfotiamine 10 mg	1 tablet	Twice daily	Neuroprotection and tissue healing	1 month

The patient was discharged in a stable state (afebrile, alert, and oriented, with better pain control and preserved neurological function) after five days of inpatient care due to clinical improvement. Discharge drugs comprised:

Home Exercise Program: The patient is advised to perform the physiotherapy exercises that were taught to them while they were in the hospital at least twice a day for 20 to 30 minutes each.

Plan of Follow-Up: One month after discharge, a follow-up session is scheduled to reevaluate pain levels, neurological condition, functional improvement, and drug tolerance.

VI. DISCUSSION

This 88-year-old male patient's chronic lower back discomfort, which is caused by thoracolumbar scoliosis and vertebral compression fractures, illustrates the intricate etiology and difficult treatment of geriatric spinal degenerative disease. The primary etiopathological factors of degenerative scoliosis—asymmetric intervertebral disc degeneration, facet joint arthropathy, and ligamentous thickening—as well as osteoporotic changes that increase the risk of anterior wedge deformities and burst fractures were conclusively identified by the patient's MRI results.^[1]

Clinical-Radiological Dissociation and Adaptive Neuroplasticity

The sufferer showed intact neurological function with normal motor strength (5/5), preserved sensory function, and normal deep tendon reflexes despite severe structural spinal canal constriction marked by bilateral flaval thickening, broad-based multilevel disc bulges, and anterior thecal sac depression. This finding is especially noteworthy.^[6] The significance of chronicity in degenerative spinal illness is highlighted by this separation. Despite severe anatomical narrowing, the slow progression of stenosis over years permits adaptive alterations to the spinal cord and nerve roots through neuroplastic mechanisms, preventing acute neurological deficits. This finding is consistent with established literature showing that acute onset stenosis from trauma or acute disc herniation usually results in immediate neurological compromise, whereas slowly progressive stenosis may not cause acute myelopathic or radicular symptoms.^[7]

Pathophysiological Mechanisms

Disc disease and vertebral collapse are made worse when scoliosis develops because the lack of normal thoracic kyphosis mechanically alters the distribution of load across spinal segments. The patient's multilayer disc desiccation (D9-D10 to D12-L1) is indicative of chronic degenerative disc disease, which is characterized by a loss of disc hydration and structural integrity. The anterior wedge compression fractures of D10 and D11, as well as the burst fracture of D12 without retropulsion, demonstrate osteoporotic bone quality typical of advanced age. Combining these degenerative changes results in a biomechanically unstable segment that is susceptible to increased deformity and functional decline.^[8]

Conservative Management: Rationale and Evidence Base

The cornerstone of care for older patients with stable neurological disorders and considerable surgical risk factors is still conservative care. This case's multimodal therapeutic strategy, which includes analgesics, neuroprotective medications, physiotherapy, and nutritional optimization, is in line with evidence-based recommendations that highlight both pharmaceutical and non-pharmacological interventions.

Each element focuses on distinct pathophysiological mechanisms:^[9]

Pharmacological Neuroprotection:

Rejunex CD3, which contains benfotiamine, alpha-lipoic acid, and methylcobalamin, is used to treat oxidative stress and encourage nerve regeneration in chronic degenerative neuropathies linked to spinal stenosis. Benfotiamine, a fat-soluble form of vitamin B1, promotes nerve tissue metabolism and repair; alpha-lipoic acid offers antioxidant neuroprotection against free radical-mediated nerve damage; and methylcobalamin supports myelin development and neuronal function. There is growing evidence that this neuroprotective

approach can effectively manage the symptoms of persistent spinal stenosis.^[5]

Analgesic Management:

During hospitalization, intramuscular diclofenac quickly reduced pain, allowing for physiotherapy. NSAIDs reduce pain perception and inflammatory mediators by inhibiting cyclooxygenase. Given the patient's age and exposure to NSAIDs, gastroprotection with proton pump inhibitors (omeprazole) is crucial for lowering the risk of gastrointestinal issues.^[3]

Physical Therapy and Spinal Stabilization:

Interferential therapy and ultrasound are examples of physiotherapeutic procedures that reduce pain and encourage tissue repair. The paraspinal musculature is strengthened by exercises that focus on spinal stabilization (pelvic bridging, core strengthening), which is essential for stabilizing deteriorated spinal segments and enhancing functional mobility. By breaking the cycle of pain, immobility, and deconditioning, these non-pharmacological therapies improve results without the negative effects of medicine.^[10]

Nutritional Optimization:

Dietary therapies focusing on sufficient calories (1,600 kcal), protein (50 g), and micronutrients necessary for tissue healing, bone remodeling, and neurological function were used to treat the patient's mild to moderate malnutrition. For senior individuals, a healthy diet promotes both overall physiological resilience and physical rehabilitation.^[11]

Cardiovascular and Comorbidity Management:

Cardiovascular stability is ensured by continuing antihypertensive medication (Losartan-H), which is especially crucial given the patient's advanced age and 40-year history of hypertension. Perioperative risks are decreased and brain perfusion is supported by effective blood pressure control.^[12]

Surgical Decision-Making and Risk-Benefit Analysis

A thorough risk-benefit analysis led to the choice to choose conservative therapy as opposed to surgery. Although spinal deformity and stenosis may be more definitively treated by surgical fusion and decompression, there are significant perioperative risks in an 88-year-old patient with hypertension and several comorbidities.

An independent risk factor for surgical complications, such as greater infection rates, longer hospital stays, higher readmission rates, and higher operational mortality, is advanced age. Additionally, as surgical justifications in scoliosis usually require either progressive neurological deterioration or chronic pain resistant to conservative care, the patient's maintained neurological state argues against the procedure. The strongest case for surgery was ruled out in the absence of myelopathic symptoms or increasing neurological impairment.

To detect any growing abnormalities that might require surgical intervention, close neurological monitoring is still crucial.^[13]

Expected Outcomes and Monitoring

The efficacy of multimodal conservative treatment for older patients with degenerative scoliosis and stenosis has been documented. Research shows that in carefully chosen patients, conservative therapy can reduce pain, retain or enhance function, and maintain quality of life. To quickly detect any growing neurological deterioration necessitating surgical consideration, regular follow-up with neurological reassessment is crucial. Until clinical deterioration occurs, imaging follow-up (repeat MRI) is not usually required.^[14]

VII. CONCLUSION

This case study of an 88-year-old male patient with bilateral vertebral compression fractures, multilevel disc desiccation, and degenerative thoracolumbar scoliosis shows the great potential of carefully chosen, multimodal conservative treatment for elderly patients with spinal degenerative disease when neurological function is maintained. The patient's neurological function remained intact despite notable radiological findings such as severe spinal canal stenosis and anterior thecal sac indentation. This is indicative of the adaptive neuroplasticity associated with chronic, progressive degenerative illness.^[15]

The all-encompassing conservative strategy that used neuroprotective supplements (methylcobalamin, alpha-lipoic acid, and benfotiamine), targeted physiotherapy that focused on spinal stabilization, nutritional optimization, pharmacological pain management, and close neurological monitoring was very successful in lowering pain, enhancing functional mobility, and preserving quality of life. This instance emphasizes the idea that neurological status—rather than radiological appearance—should inform treatment choices in cases of chronic degenerative spine illness, as imaging severity does not always correspond with clinical severity.^[16]

The patient's clinically stable neurological condition, substantial perioperative risks related to advanced age and comorbidities, and data demonstrating the effectiveness of conservative therapy all supported the decision to forego surgical intervention. Surgical reappraisal would be required if neurological impairments worsened, thus ongoing monitoring is still crucial. This case serves as an illustration of evidence-based, patient-centered therapy that prioritizes quality of life and functional preservation in advanced age and offers important therapeutic insights for managing elderly patients with severe spinal degenerative illness.^[10]

COMPETING INTERESTS

The writers claim to have no conflicting interests. For this case report, no funding was obtained. The authors don't have any financial ties to any

organizations that could be interested in the material they submitted.

ACKNOWLEDGEMENTS

For the publication of this case report and the use of his clinical data, imaging results, and patient information, Mr. xxx - the patient, gave written informed consent. No personally identifying patient data has been made public. In order to better understand conservative therapy strategies for older patients with degenerative spinal illness, the patient and his family have given permission for this clinical case to be shared for educational and research purposes. The patient's cooperation and adherence to the extensive treatment plan are recognized and valued.

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