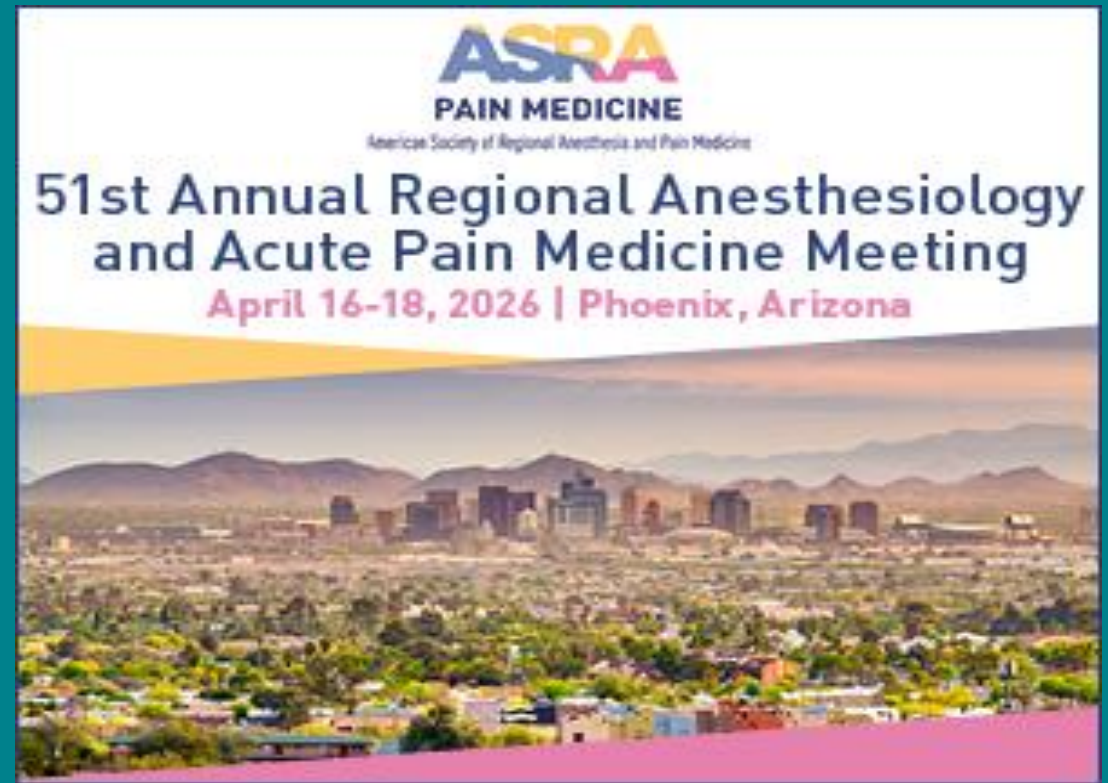




Neuromodulation of Lumbar Medial Branches in a Patient with Osteogenesis Imperfecta and Dynamic Listhesis

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Case Description

A 46-year-old woman with osteogenesis imperfecta (OI), lumbar spondylosis, severe lumbar spinal stenosis, dynamic L5–S1 anterolisthesis presented to our pain clinic in early 2025. Previous neurosurgical evaluation deemed the patient a non-surgical candidate due to risks of spinal fusion in osteogenesis imperfecta and conservative management was recommended. She reported non-radiating lumbosacral pain described as sharp, achy, worsened with ambulation and exertion, and minimally relieved by lumbar flexion. Examination revealed bilateral lower lumbar facet joint tenderness with positive facet loading tests, worse on the right. She had minimal improvement from conservative treatments including PT and medications. Given her OI and dynamic instability, 60-day peripheral nerve stimulation (PNS) was selected over radiofrequency ablation (RFA) to reduce the risk of paraspinal muscle weakness. A right L4 medial branch PNS lead was placed under fluoroscopic guidance, followed two weeks later by a left-sided lead as she felt 50% improvement from PNS on the right. At 60-day follow-up, she reported 60–80% pain relief, with numeric pain scores improving from 8/10 to 3–4/10, pre- and 8-week post-PNS placement respectively. The PNS leads were removed without complication, and she was discharged with follow-up instructions. Further follow up at 12-, 16-, 20- and 24-weeks post-implant will be done.

Background

Lumbar medial branch radiofrequency ablation (RFA) is a common treatment for chronic low back pain secondary to facet joint osteoarthritis¹. Some studies suggest RFA at this site can weaken core stability². Thus, alternative treatment options should be considered for certain populations. We present a case of a 46-year-old female with lumbar spondylosis and a history of Osteogenesis Imperfecta (OI) who underwent peripheral nerve stimulation (PNS) of lumbar medial branches rather than RFA.

Discussion

Adults with OI often develop accelerated degenerative joint disease, with axial low back pain as their common chief complaint⁴. In our patient, preservation of multifidus muscle function was critical due to co-existing dynamic anterolisthesis and severe spinal stenosis. Peripheral nerve stimulation (PNS) was therefore pursued to provide analgesia while maintaining neuromuscular support. Unlike ablative techniques, PNS preserves paraspinous muscle integrity and should be considered preferentially in patients with OI and spinal instability^{2, 3}.

Table 1 - Oswestry Disability Index (ODI)

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Pain Intensity	3	3	1	0	0	0	0	0
Disability %	68	60	36	38	38	38	38	38
Disability Range	Crippled	Severe	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Table 2 - Oswestry Disability Index (ODI) Mobility

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Sitting	3	2	1	0	0	0	0	0
Standing	4	2	2	2	2	2	2	2
Walking	3	2	1	1	1	1	1	1
Lifting	3	3	3	4	4	4	4	4

Table 3 - Oswestry Disability Index (ODI) Wellness

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Sleeping	3	3	2	2	2	2	2	2
Personal Care	4	4	3	3	3	3	3	3
Social Life	3	3	0	2	2	2	2	2
Sex Life	5	5	5	5	5	5	5	5
Traveling	3	3	0	0	0	0	0	0

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