Diagnostic Challenge of Delayed Radiation-Induced Lumbosacral Plexopathy Masquerading as Lumbar Radiculopathy

[1]Anna Ly, DO, MS, [1] Verda Mirza, DO, [1] Ricki Ehrenfeld, DO, [1]Jahmel Jordon, [2] Christopher Szeles, MD, [1] Sanjeev Agarwal, MD

[1]Department of Orthopaedic Surgery & Rehabilitation Medicine, State University of New York Downstate Health Sciences University, Brooklyn, New York, USA.
[2] Department of Rehabilitation Medicine, Staten Island University Hospital, Staten Island, New York, USA.



DOWNSTATE
HEALTH SCIENCES UNIVERSITY

INTRODUCTION

Delayed radiation-induced lumbosacral plexopathy (RILSP) typically presents years to decades after radiotherapy. Diagnosis of delayed RILSP is challenging because routine MRI may be unrevealing, as the pathology is often non-mass-forming and characterized by fibrosis, microvascular ischemia, and axonal degeneration rather than tumor or compression.

CASE DESCRIPTION

A 58-year-old woman with a history of lumbar dermatofibrosarcoma treated with resection and radiotherapy in 2003 presented with two months of progressive low back and left buttock pain radiating to the left lower extremity (LLE), acutely worsening after lifting a 25-pound object, followed by LLE weakness, a spastic gait, and nocturnal urinary incontinence. CT of the lumbar spine and MRI of the thoracic and lumbar spine showed only mild multilevel degenerative changes without significant stenosis, and pelvic MRI revealed no lumbosacral plexus abnormalities. Her prior back symptoms had been attributed to lumbar radiculopathy, and she underwent two L5–S1 epidural steroid injections without relief nine years earlier. Given her radiation history and progressive neurologic deficits, RILSP was suspected.

RESULTS

She completed a successful course of rehabilitation with functional gains, including improved LLE strength and gait performance and resolution of urinary incontinence. After discharge, an electrodiagnostic study revealed findings suggestive of left lumbosacral plexopathy.

DISCUSSION

This case highlights how delayed RILSP can be overlooked when imaging is unrevealing and symptoms are attributed to common spinal pathology. Her back pain was diagnosed as lumbar radiculopathy nine years earlier and treated with two L5–S1 epidural steroid injections without relief, possibly representing early plexopathy. Neurologic deficits disproportionate to imaging findings should prompt consideration of RILSP, with electrodiagnostic testing, MR neurography when indicated, and careful review of radiation history.

CONCLUSION

Delayed RILSP should remain in the differential when progressive neurologic deficits are disproportionate to conventional imaging findings, particularly in patients with a history of radiation exposure. Early recognition and electrodiagnostic evaluation may help avoid misattribution to common spinal pathology and facilitate appropriate management.

REFERENCES

- Attard, K. A., Vella, J. C., & Chircop, C. (2021). Late-onset radiation-induced brachial plexopathy. BMJ Case Reports, 14(9), e243354.
- Laughlin, R. S., & Dyck, P. J. B. (2013). Electrodiagnostic testing in lumbosacral plexopathies. Physical Medicine and Rehabilitation Clinics of North America, 24(1), 93–105.
- Pitman, J., Lin, Y., Tan, E. T., & Sneag, D. B. (2025). MR neurography of the lumbosacral plexus: Technique and disease patterns. RadioGraphics, 45(6), e240099.
- Rahmani, S., Hamilton, C., Nguyen, J. K., Zaree, O. A., Kenny-Howell, C. L., Kirsch, C. F. E., & Tu, L. H. (2025). Utilization, detection rate, and pathologies on lumbosacral plexus MRI: A 25-year institutional experience. Clinical Imaging, 125, 110529.
- Rudra, S., Roy, A., Brenneman, R., Gabani, P., Roach, M. C., Ochoa, L., Prather, H., Appleton, C., Margenthaler, J., Peterson, L. L., Bagegni, N. A., Zoberi, J. E., Garcia-Ramirez, J., Thomas, M. A., & Zoberi, I. (2021). Radiation-induced brachial plexopathy in patients with breast cancer treated with comprehensive adjuvant radiation therapy. Advances in Radiation Oncology, 6(1), 100602.
- Skolka, M., Shelly, S., Pinto, M. V., Dubey, D., Oishi, T., Uhm, J. H., Santilli, A., Staff, N. P., Spinner, R. J., Dyck, P. J. B., Robertson, C. E., & Klein, C. J. (2023). Clinical, neurophysiologic, and pathologic features in patients with early-onset postradiation neuropathy. Neurology, 101(14), e1455–e1460.