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## Independent Study Projects

### **Title**

MRI neuroimaging in the evaluation of post-laminectomy pain syndrome

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## MRI Neuroimaging in the Evaluation of Post-Laminectomy Pain Syndrome

Post-laminectomy pain syndrome refers to persistent leg and/or lumbar back pain after a surgical procedure. The pathophysiology of this syndrome is complex, as often the operation was technically successful. Evaluation with MRI plays a crucial role in the assessment of post-laminectomy pain syndrome, as it provides soft tissue resolution for evaluation for common post-surgical pain generators, including recurrent posterior disc disease and associated narrowing of the spinal canal, lateral recess or neural foramina. As such, much attention is paid to the course and appearance of the epidural course of the exiting nerve roots in the setting of new onset, post-surgical radiculopathy, with the remainder of the intradural course of the traversing lumbar nerve roots often overlooked in the setting of radiculopathy (Akbas, et. al). This article presents the case of a 32 year old woman with a history of prior lumbar decompression presenting with symptoms concerning for both cauda equina syndrome and recent onset S1 radiculopathy. She received a contrast MRI of the lumbar spine during workup for an epidural abscess, suspected due to her clinical picture of cauda equina syndrome combined with a low-grade fever on presentation. Although no convincing contact or compression of the exiting, epidural course of the right S1 was noted, a small T2-hypointense band was seen tethering the proximal, intradural course of the traversing right S1 nerve root at the level of L3-4 (See figure), raising concern for intradural adhesions/granulation tissue as the underlying etiology for the patient's S1 radiculopathy. This case report underscores the importance of a thorough knowledge of spinal neuroanatomy, while demonstrating "double-crush" syndrome (Kane, et. al.), in the assessment for potential pain generators in the post-surgical state, as the identification of potentially symptomatic intradural adhesions markedly changes future pain management strategies and could potentially prevent unnecessary surgical intervention (Erdem et. al.).

Akbas, M, et al. "Comparison of 3 Approaches to Percutaneous Epidural Adhesiolysis and Neuroplasty in Post Lumbar Surgery Syndrome." *Pain Physician*, vol. 21, no. 5, 21 Sept. 2018, pp. 501–508.

Erdem, Mehmet Nuri, et al. "The Effectiveness of Non-Surgical Treatments, Re-Discectomy and Minimally Invasive Transforaminal Lumbar Interbody Fusion in Post-Discectomy Pain Syndrome." *Journal of Spine Surgery*, vol. 4, no. 2, 2018, pp. 414–422., doi:10.21037/jss.2018.04.02.

Kane, Patrick M., et al. "Double Crush Syndrome." *Journal of the American Academy of Orthopaedic Surgeons*, vol. 23, no. 9, 2015, pp. 558–562., doi:10.5435/jaaos-d-14-00176.

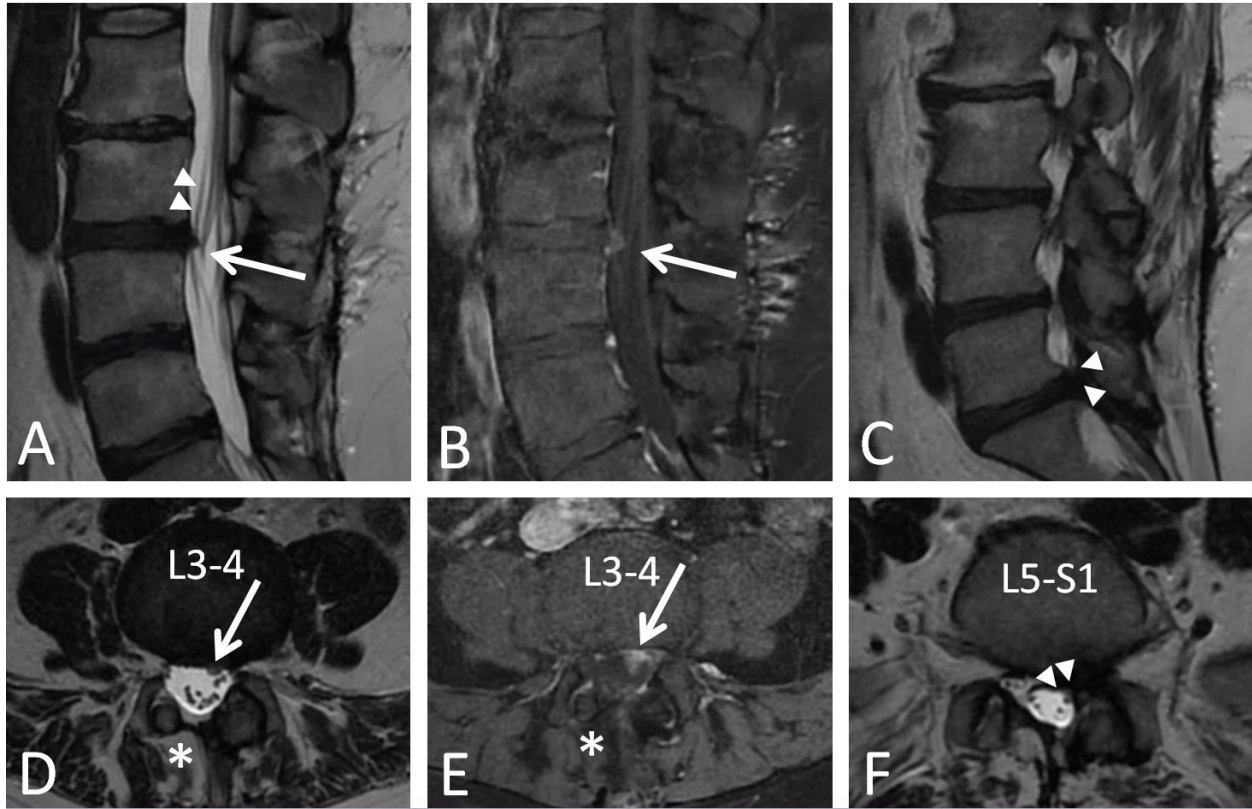


Figure 1. Lumbar spine MRI. Although no epidural abscess is seen, sagittal (A) and axial (B) T2 weighted sequences demonstrate a T2 hypointense, nodular region of soft tissue extending from the left paracentral anterior epidural space at the level of the L3-L4 intervertebral disc space (arrows). The mass appears contiguous with the traversing left S1 nerve roots, which are displaced/clumped anteriorly (arrowheads in A). Superimposed enhancement on T1-weighted post-gadolinium sequences (sagittal in B, axial in A, arrows), raises suspicion for scar/granulation tissue, potentially related to prior right L4 hemilaminectomy (demarcated by the asterisk in D-E). Additional region of suspected contact of the traversing left S1 nerve roots identified on T2 weighted sequences (sagittal in C and axial in F) by a paracentral disc osteophyte complex at L5-S1 (arrowheads in C and F).