Delayed Syrinx Formation Following Repeated MRI Exposure in a Patient with a Non-MRI-Conditional Spinal Cord Stimulator

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Introduction

Spinal cord stimulators (SCS) are an established treatment for chronic pain, commonly used for neuropathic pain, complex regional pain syndrome, and failed back surgery syndrome. Older or non-MRI-conditional systems complicate advanced imaging needed to monitor disease progression, requiring formal device evaluation and risk/benefit discussion before MRI. While device malfunction and thermal injury are well-documented risks, delayed spinal cord pathology from repetitive MRI exposure remains rarely reported.

Case Report

A patient with a non-MRI-compatible SCS who underwent multiple MRIs developed a syrinx with resultant symptoms. Literature describes rare tethering from surgical trauma or arachnoiditis causing CSF disruption and syrinx formation, a complication more common after SCS explant/revision with post-traumatic myelopathy.

This patient received an SCS in 2003 via partial laminotomy with paddle lead placement for chronic low back pain and refractory L5 radiculitis. Postoperative pain control was inadequate, with ribcage paresthesias, prompting lead revision that improved analgesic efficacy. The generator was removed in 2007, but the paddle lead(s) remained. A 2020 MRI for chronic low back pain—the patient's tenth—showed advanced degenerative changes, moderate-to-severe spinal stenosis, a paracentral disc protrusion, and a small syrinx from lower T5 to lower T10, up to 2 mm in diameter. Imaging confirmed appropriate device positioning without spinal cord signal abnormalities, paraspinal soft tissue changes, or STIR-sequence edema related to the syrinx. Despite no radiologic evidence of nerve impingement, exams repeatedly noted decreased abdominal sensation in lower thoracic dermatomes and diminished right versus left leg touch sensation. Follow-up showed persistent axial back pain and radicular symptoms alongside foraminal compression, foraminal stenosis, and worsening spondylosis on imaging.



Images

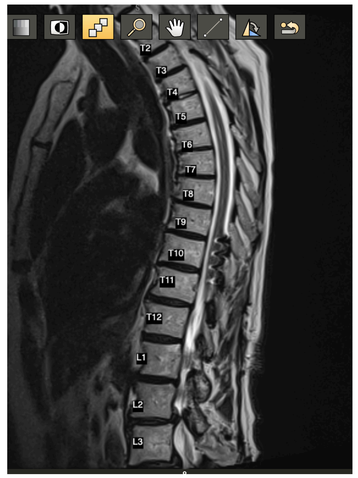


Image 1

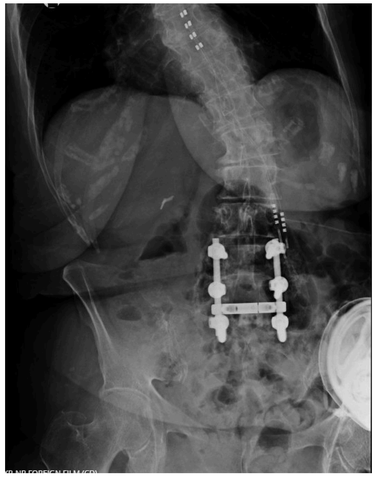


Image 2



Image 3

Images 1,2, and 3 are various MRI's and X-ray from this specific patient demonstrating presence of a syrinx, retained paddle lead and the other findings noted prior in the case report discussion

Image 1 demonstrates paddle lead with associated syrinx from T5 to T10

Image 2 is an X-ray demonstrating the presence of the paddle lead and IPG.

Image 3 T2 MRI sagittal demonstrating paddle lead and syrinx

Outcomes

In this case, the repeated MRIs with the known non-MRI conditional paddle lead SCS could have resulted in radiofrequency induced thermal injury with resultant alteration in CSF flow dynamics and development of a syrinx. Although the lack of additional evidence and other case reports makes it difficult to imply causation, the temporal association of the device placement, imaging chronology and eventual syrinx development points toward the repeated MRIs as a likely culprit for its formation.

References

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