Catastrophic Failure Of Spinal Cord Stimulator Paddle Electrodes In The Cervical Spine

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Complications of Spinal Cord Stimulator (SCS) implantation, such as lead migration and infection are well known. However, few case reports exist detailing catastrophic failure of paddle SCS leads with detachment of individual electrode contacts. The cases presented here highlight a complete fracture and migration of Boston Scientific Artisan paddle leads, implanted in the cervical region.
Clinical and imaging data were reviewed
RESULTS

Case 1

A 44 yr old female w/ a hx of cervical radiculopathy and failed anterior cervical decompression and fusion underwent a C4-5 anterograde laminotomy for implantation of a 2x8 Artisan paddle SCS. IPG was placed in right buttock. Post-op follow up through week 40 resulted in a 50% reduction in pain and decreased narcotic use. At post-op week 50, patient lost stimulation benefit. Imaging found fracturing of lead wires, and clustering of electrode contacts within the subcutaneous and subfascial space.
(Case 1) Post-op wk 50 after loss of stimulation. Fractured contacts clustered in the subfascial and subcutaneous space.
Case 2

A 19 yr old female with a 6 yr hx of chronic head pain from a series of concussions underwent Artisan paddle implantation, placed in a retrograde fashion from C1-3. An additional cylindrical lead was placed for full coverage. IPG was placed in the right flank. Postoperatively she had a 50% decrease in pain and improvement in daily activities. At post-op week 20, she reported loss of stimulation. Imaging revealed a fractured paddle with contacts scattered in the epidural space.
(Case 2)
Post-op wk 20 after loss of stimulation. Fractured contacts clustered in the epidural space.
Cervical paddle malfunction is of concern due to the potential for serious injury to the spinal cord upon lead failure, the need for a more complicated surgical revision to retrieve the fractured contacts, and the possibility of increased infection risk and cost to the patient. While several surgical techniques can be used to reduce the chances of lead failure, careful consideration should also be given to the choice of implants for cervical spinal cord stimulation.
Catastrophic failure of the Artisan spinal cord stimulator paddle electrode can occur without prior trauma, and may be more likely with cervical spine placement. These cases highlight the importance of appropriate strain-relief and positioning of the IPG.