

Clinical Decision-Making Following Complications After a Spinal Cord Stimulator Implantation

Anesh Rugnath, MD*; Hammad Baig, MBBS., Devin Reed, M.D., Casey Orzechowicz, M.D., Odai Abdalla, MD; Oluwasegun Lijofi, MD;
Department of Pain Management, University of Mississippi Medical Center. Jackson, Mississippi

Introduction

- Spinal Cord stimulation (SCS) is a safe, minimally invasive non pharmacologic treatment for the treatment of chronic pain that involves electrical stimulation of the dorsal column of the spinal cord.
- Complications from SCS implantation are often divided into device related and biological complications[1]
- Device related complications such as lead migration, breakage, disconnection and battery malfunction make up the majority of the complications related to SCS[1] [2]
- A lesser percentage is attributed to biological complications such as post op infections, neurological injury, epidural hematoma, wound dehiscence and dural puncture [1] [2] [3]
- Neurological injury makes a very small percentage of the complications but can be potentially devastating for the patient.
- Occurrence and management of these complications are not well documented and discussed in the literature[1]

Materials and Methods

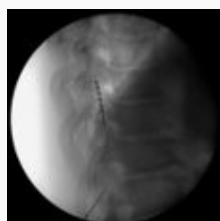
- For a medically challenging case IRB approval is not mandatory in absence of PHI per UMMC .
- Patient informed consent was obtained for submission of a case report.
- All patient protected health information has been de-identified.

Case Report

➤ 64 yo male with past history of lumbar radicular pains and post-laminectomy syndrome s/p multiple epidural injections with diminishing relief was evaluated for a SCS implantation

➤ The SCS Trial done with great coverage and pain relief and it was decided to proceed with a SCS implant.

➤ The SCS implantation was done under monitored anesthesia care. The Fellow had difficulty accessing the epidural space on the left side and after a few unsuccessful attempts the Attending managed to access the epidural space a level above and place the leads without any difficulty. The second lead placement on the right side was uneventful.



- Patient was then woken up to do intraoperative testing, however this could not be achieved as patient was combative, so anesthetic was deepened and the decision was made to continue with the implantation.
- The rest of the procedure went well and the patient was taken to PACU. In PACU patient was very uncomfortable and complained of severe pain down left lower extremity with difficulty moving his left leg.
- Neurosurgery was consulted immediately. On arrival, they did a physical exam and advised to explant the SCS.
- The patient was immediately rebooked to the OR for stimulator removal.
- While waiting for OR availability, the patient was given pain medication and 12 mg of dexamethasone. He started reporting easing of his pain.
- A Neurosurgery resident reexamined the patient at this stage and he demonstrated 5/5 strength in bilateral lower extremities.
- The patient appeared to be quite comfortable and it was decided to get a CT scan to rule out device related or biological complications
- The CT scan was discussed with Radiology in person and who confirmed that the leads were in the posterior epidural space with no hematoma or areas of compression around the cord. The rest of the CT was unremarkable.
- Given the patient's progressively improving neurological status, Neurosurgery and Pain Management decided to postpone the explant and admit the patient for observation.

Case Report (Continued)

- The next 2 days the patient underwent physical therapy and gradually returned to his baseline neurological status. The SCS was turned on and he had good coverage and pain relief.
- The patient had some trouble with urinary retention but this resolved within a day and he was discharged on POD 2
- Today he has no neurological deficits; continues to have good pain relief from his SCS to this day.



Discussion

- Neurological injury after SCS implantation is a rare but potentially devastating complication of SCS [1]
- When a neurological injury is suspected during SCS implantation or post op, often there is a rush to explant the device.
- For patients suffering from chronic pain, this can be a big set back in their efforts to control their pain.

Discussion (Continued)

- An evidence based, logical approach is often required to determine what is going on and how to best treat the patient's symptoms
- A thorough physical exam is needed and it is a good idea to consult Neurosurgery early.
- Appropriate imaging is often warranted, with a CT scan being a quick, and safe option. This can help detect an epidural hematoma and make sure the leads are intact and in the correct place.
- In this case, while it was unclear what was causing the patient's symptoms, a timely multidisciplinary approach was taken to the problem. Neurosurgery was brought on board quickly, and plans were adapted to the changing patient symptoms and physical exam.
- We believe that, by not rushing to explant the SCS and adapting our plan to the patient's changing symptoms and physical exam, we were able to give the patient an opportunity at getting relief from his chronic pain and lead a more active life.

References

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3. Lawal Labaran, Nikhil Jain, Varun Puvanesarajah, Amit Jain, Avery L. Buchholz, Hamid Hassanzadeh. A Retrospective Database Review of the Indications, Complications, and Incidence of Subsequent Spine Surgery in 12,297 Spinal Cord Stimulator Patients. Neuromodulation: Technology at the Neural Interface. 23 (5) 2020. p 634-638, <https://doi.org/10.1111/ner.12952>.