



Silent Seeds: A Case of Delayed SCS Infection in the Setting of Immunosuppression and Recent Dental Procedure

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Introduction

- **Spinal cord stimulation (SCS)** is an established therapy for **refractory neuropathic pain** in well selected patients.
- **Surgical site infections (2.8–10%)**, most often involving the **implantable pulse generator (IPG) pocket**, may necessitate device explantation and interrupt therapy.
- **Immunosuppressive therapy** (e.g., **methotrexate**,) may impair wound healing and increase susceptibility to infection.
- **Transient bacteremia** from **dental or invasive procedures** can cause **hematogenous seeding** of implanted devices, particularly in immunosuppressed hosts. **Infection prophylaxis recommendations** for dental procedures in SCS patients remain **inconsistent**, requiring individualized risk assessment.
- Pain physicians should maintain **high clinical suspicion** for delayed or subtle infections, even in **afebrile patients** on DMARDs or steroids. **Prompt imaging, culture-guided antibiotics, and device removal** when indicated are essential to prevent **epidural or systemic spread**.
- This case highlights a **delayed SCS infection following dental extraction** in a **methotrexate-treated rheumatoid arthritis patient**, emphasizing the importance of **appropriate patient selection** and **early recognition of complications**.

Materials and Methods

- As this is a Case Report devoid of patient identifiers, no IRB approval was required per UMMC policy.
- Informed consent was obtained from the patient for this presentation.

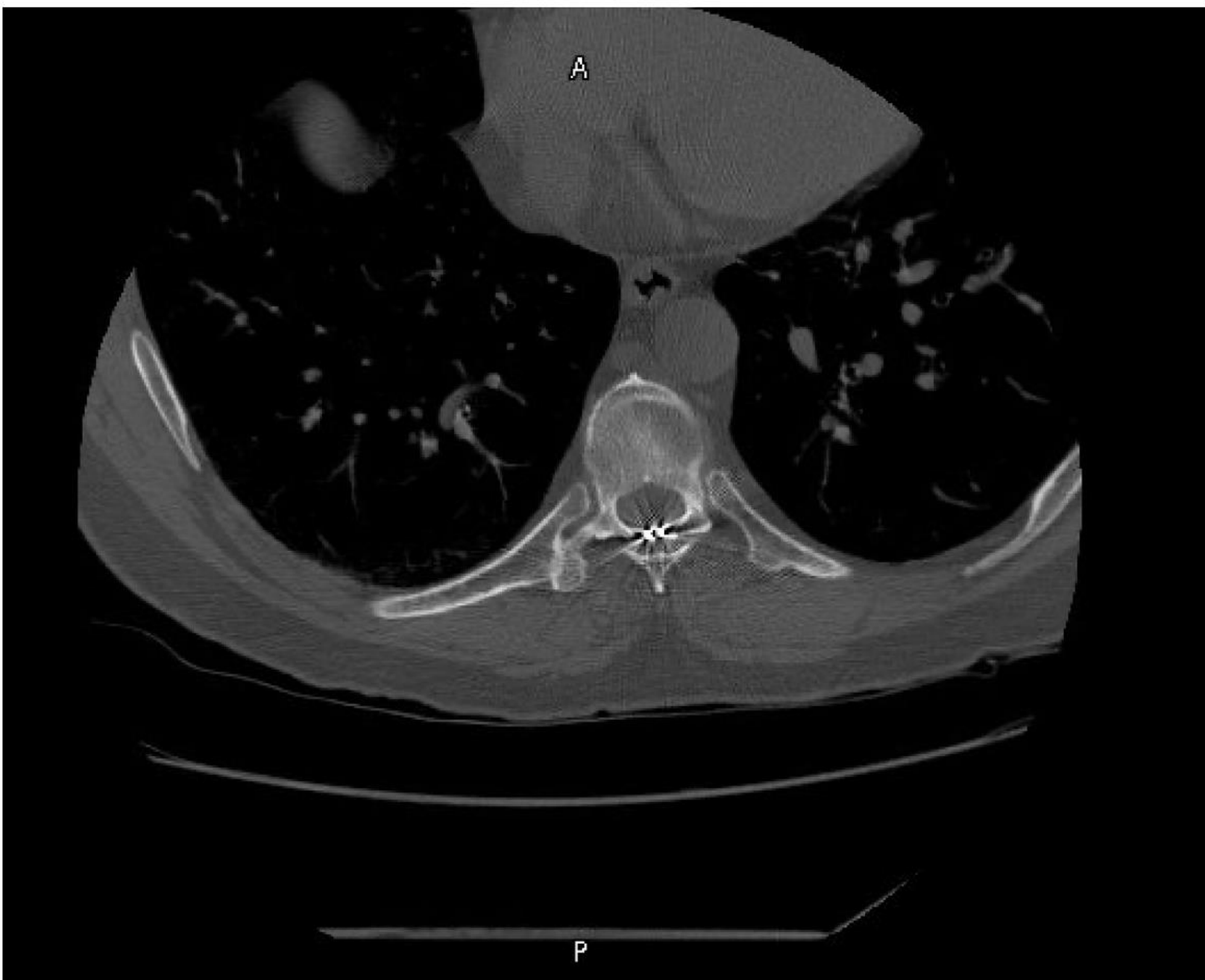
Case Report

- **60-year-old man** with **rheumatoid arthritis** on **methotrexate** and **prednisone** underwent **Boston Scientific SCS implantation** on **01/16/2025** for chronic neuropathic pain.
- **Five months post-implant**, developed **swelling, erythema, and drainage** over the **IPG site**.
- Symptoms appeared **one week after a dental extraction** for a recent dental infection.
- Denied **fever, chills, or night sweats**; exam revealed **boggy, erythematous IPG pocket** with cellulitic changes.
- **Vitals:** HR 103, BP 92/58, afebrile. **Labs:** WBC 18.8, CRP 13.5, ESR 59.
- **POCUS:** Cobblestoning with localized **fluid collection**.
- **CT imaging:** Confirmed **IPG pocket infection**; no epidural abscess.
- Underwent **OR explantation** of battery and leads — **seropurulent drainage** noted at pocket; leads removed cleanly.
- **Cultures:** Grew **Staphylococcus aureus**.
 - **Wound irrigated** with vancomycin solution and closed in layers.
 - **MRI post-op:** Trace posterior **epidural fluid at L1**, likely **inflammatory**, not infectious.
 - **Treatment:** IV antibiotics transitioned to **30-day oral doxycycline** after ID consultation.
 - **Outcome:** Recovered well with **resolution of infection** and no neurological deficits.

Discussion

- This case highlights a **delayed spinal cord stimulator (SCS) pocket infection** likely caused by **hematogenous seeding** following a **dental extraction** in a patient with **rheumatoid arthritis** on **methotrexate** and **prednisone**.
- **Methotrexate** impairs lymphocyte proliferation and macrophage function, while **corticosteroids** inhibit cytokine production and collagen synthesis—together leading to **delayed wound healing** and **increased infection risk**.
- **Transient bacteremia** from dental manipulation can introduce **Staphylococcus aureus**, the most common organism in **SCS-related infections**, particularly within the **implantable pulse generator (IPG) pocket**, where bacterial **biofilm formation** complicates eradication.
- Infection onset can be **subacute to delayed**, presenting **weeks to months post-implantation** and often **without systemic symptoms** such as fever—especially in immunosuppressed patients.
- **Pain specialists** should maintain vigilance for infection (**localized erythema, swelling, drainage, or new tenderness** over the IPG pocket) even in afebrile individuals.
- **Ultrasound and CT** are valuable for identifying **fluid collections or soft-tissue involvement**, while **MRI** can rule out **epidural abscess or lead tract infection**.
- **Early recognition and prompt management** are critical, as delayed intervention can allow **epidural spread, sepsis, or neurological compromise**.
- **Definitive treatment** requires **complete hardware removal, intraoperative irrigation, and culture-directed antibiotics**; partial removal or suppressive therapy carries a **high risk of recurrence**.
- **Vancomycin irrigation** intraoperatively and **layered closure** without drain placement, as performed here, can reduce local bacterial load and promote wound healing.
- **Peri-procedural antibiotic prophylaxis** for SCS patients undergoing **dental or invasive procedures** is not standardized. **Individualized risk assessment** is essential for patients on **DMARDs, biologics, or chronic steroids**.
- **Temporary cessation of methotrexate** before major procedures may lower infection risk, though evidence remains mixed.
- Multidisciplinary input from **rheumatology** is recommended.
- **Interprofessional collaboration** among **pain physicians, infectious disease specialists, dentists, and rheumatologists** ensures comprehensive management and optimized outcomes.
- **Patient education** regarding the need for **early reporting of local site changes or systemic symptoms** is vital to early detection.
- This case emphasizes the importance of **infection prevention strategies, careful perioperative planning, and heightened surveillance** in immunosuppressed SCS patients, aiming to reduce morbidity, preserve therapeutic benefit and reduce financial burden on the healthcare system.

Relevant Imaging



CT Lumbar Spine

IMPRESSION:

1. Stimulator device within the subcutaneous soft tissues overlying the left lumbar paraspinal musculature. No abscess is appreciated about the stimulator device accounting for streak artifact.
2. Low-attenuation fluid collection measuring 11.5 x 1.5 cm within the subcutaneous fat overlying the lower lumbar paraspinal musculature which could reflect edema. Postoperative seroma and abscess are not fully excluded. Trace fluid extends superiorly from this fluid collection to the stimulator leads at midline.
3. Multilevel degenerative changes of the lumbar spine.
4. Other findings as detailed above.



MRI Lumbar Spine

IMPRESSION:

Spinal stimulator device better visualized on CT.

Probable small subcutaneous collection at L2 vertebral body level measuring approximately 3.5 cm craniocaudally, demonstrating mild peripheral enhancement. No definite extension of collection into the epidural space. Ill-defined enhancement and mild fluid signal along the posterior epidural space superior to L2 extending into the lower thoracic spine, possibly related to the spinal stimulator device, though infection would be difficult to definitively exclude.

Multilevel degenerative changes and anterior epidural lipomatosis L2-S1. Prior posterior spinal decompression at L2-L4 without spinal canal stenosis. Interval improvement in spinal canal stenosis at L4-S compared to 3/28/2024. Similar mild to moderate spinal canal stenosis posterior to L5 vertebral body level and mild spinal canal stenosis at L5-S1 secondary to anterior epidural lipomatosis and disc bulge.

No convincing evidence of discitis osteomyelitis.

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