Right Common Iliac Artery Pseudoaneurysm and Hemorrhagic Shock During Basivertebral Nerve Ablation Resulting in Secondary Spinal Cord Stimulator Lead Fracture: A Rare Case Report

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ABSTRACT

Basivertebral nerve ablation (BVNA) is a minimally invasive treatment for chronic vertebrogenic low back pain, with a reported overall complication rate below 0.3%. Major retroperitoneal vascular injuries are exceptionally rare. We describe a 54-year-old woman who developed right common iliac artery pseudoaneurysm, hemorrhagic shock, and a ~4–5 L retroperitoneal hematoma during outpatient BVNA, requiring emergent endovascular stenting and surgical evacuation. After critical illness, she was found to have a fracture of a pre-existing spinal cord stimulator (SCS) lead. Reprogramming of the intact lead restored therapeutic coverage and avoided revision surgery. The case highlights vascular proximity during lower lumbar access and the downstream effects of emergency surgery on implanted hardware.

INTRODUCTION

- BVNA, also known as Intracept, uses intraosseous radiofrequency energy to target the basivertebral nerve within the vertebral body.
- Access follows a transpedicular trajectory; lower lumbar anterior cortical breach can place nearby retroperitoneal vessels at risk.
- Patients with implanted neuromodulation hardware may experience device complications during unrelated critical illness or surgery.
- This case describes a rare vascular catastrophe followed by secondary SCS lead fracture.

CASE DESCRIPTION

A 54-year-old woman with chronic low back pain and an Abbott SCS implanted in April 2023 (approximately 2.5 years of adequate relief) presented for elective outpatient BVNA.

During the procedure, anterior vertebral cortical breach injured the right common iliac artery, causing pseudoaneurysm, rapid hemorrhagic shock, and cardiovascular collapse at the ambulatory center. She was intubated and transferred emergently.

She underwent endovascular right common iliac artery stenting, followed by open retroperitoneal/peritoneal exploration and evacuation of an estimated 4–5 L hematoma. Recovery included prolonged coma and an extended ICU stay.

CLINICAL TIMELINE

1. **BVNA Procedure** — Anterior cortex breach→ Illiac a. injury
2. **Hemorrhagic Shock** — Cardiovascular collapse
3. **Endovascular stent + open surgery** — Evacuation of ~4–5 L hematoma
4. **ICU** — Prolonged coma / recovery

FIGURES

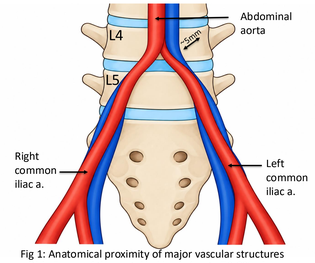


Fig 1: Anatomical proximity of major vascular structures within 5 mm of the vertebral body (up to 79.2% of cases). Image is not drawn to scale. For illustration purposes only.

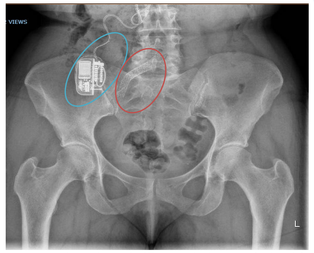


Fig 2: AP pelvic radiograph showing right iliac stent (red circle) and SCS lead fracture ~3 cm above the generator pocket (blue circle). Clinical image obtained with written patient consent

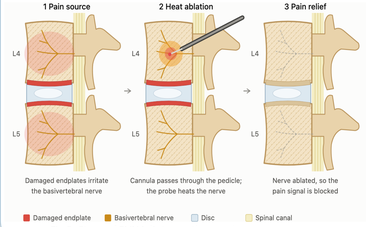


Fig 3: Steps of BVNA (Intracept) procedure. Image is not drawn to scale. For illustration purposes only.

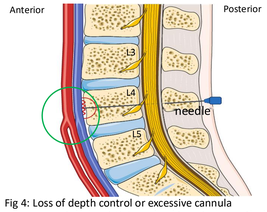


Fig 4: Loss of depth control or excessive cannula advancement during BVNA can lead to anterior cortical perforation and vascular injury (green circle). Adapted from Servier Medical Art, CC BY 4.0.[9]

SECONDARY CASUALTY: SCS LEAD FRACTURE

The patient experienced complete loss of prior SCS benefit despite the system being powered on, with erratic stimulation and automatic output reduction. Interrogation revealed diffusely elevated impedances in one lead, and AP pelvic radiography confirmed a lead fracture approximately 3 cm above the generator pocket (Fig 2). The intact lead was successfully reprogrammed with manufacturer support, restoring stimulation coverage without surgical intervention.

DISCUSSION

Anatomical Vulnerability: Anatomical mapping studies show major vascular structures within 5 mm of the vertebral body in up to 79.2% of cases at L4-L5 (Fig 1). BVNA safety margins are historically broad, but loss of depth control or excessive cannula advancement can result in anterior cortical perforation and vascular injury (Fig 3 and Fig 4).

Endovascular Triumph vs. Long-Term Compromise: Endovascular stent-graft placement was lifesaving (Fig 2). However, emergent surgery and critical illness placed substantial mechanical stress on the SCS system, resulting in a lead fracture approximately 3 cm proximal to the pulse generator (Fig 2).

CLINICAL PEARLS & TAKEAWAYS

1.Meticulous guidance: Treat the lateral fluoroscopic view as an absolute safety checkpoint during BVNA advancement to prevent anterior cortical perforation.

2. Device Interrogation First: When patients with multi-device implants undergo major trauma or emergent surgery, unexplained loss of stimulation should trigger immediate electrical interrogation before assuming neural pathology or rushing to revision.

3. The MRI Dilemma: Hardware failure can permanently foreclose future diagnostic imaging pathways (eg MRI access), drastically altering a patient's lifelong diagnostic roadmap.

LONG-TERM IMPACT

- One SCS lead fractured (other lead is intact and functional).
- Reprogramming with manufacturer (Abbott) successfully restored stimulation coverage.
- Avoided surgical revision.
- Loss of MRI compatibility; preventing future MRI including needed evaluation for bilateral knee arthralgia.

CONCLUSION

Iatrogenic right common iliac artery pseudoaneurysm during BVNA is an exceptionally rare, potentially life-threatening complication requiring immediate recognition and vascular management. This case also illustrates downstream mechanical failure of a separate implanted device after critical illness and emergency surgery. Manufacturer collaboration and reprogramming of the intact SCS lead restored therapeutic coverage and avoided revision. The event underscores careful lower lumbar depth control and systematic device assessment after major perioperative trauma.

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