

Safety Considerations for
Performing Radiofrequency
Ablation in Patients with Deep
Brain Stimulators



PRESENTER:
Gabriel Augustin, MD

INTRODUCTION

Radiofrequency ablation (RFA) is a widely utilized interventional technique for managing chronic axial pain, particularly in the cervical and lumbar regions. However, limited data exist regarding the safety of RFA in patients with implanted neurostimulators such as deep brain stimulators (DBS) where risks include electromagnetic interference (EMI), thermal injury, and device malfunction.

Furthermore, this presentation aims to provide evidence-based safety strategies regarding the three procedural phases for performing RFA in patients with DBS.

METHODS

As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per Henry Ford Hospital's policy.

Case Report:

This is a case of a 71-year-old male with the PMHx of lumbosacral spondylosis, Parkinson's disease s/p deep brain stimulator (DBS) placement (04/2024), CAD s/p LAD stent 2024 (currently on DAPT), and type 2 DM.

The patient was referred to our Pain Clinic for a bilateral L3, L4 medial branch and bilateral L5 dorsal root primary ramus radiofrequency ablation under fluoroscopic guidance.

On the day of his procedure, the patient's DBS device was neither interrogated nor deactivated prior to the intervention. Additionally, the DBS device representative was not contacted.

Prior to starting the procedure, the interventionalist performed a rapid literature review and found that it is recommended to place the grounding pad on the contralateral side of the DBS, however they were unable to find any additional recommendations.

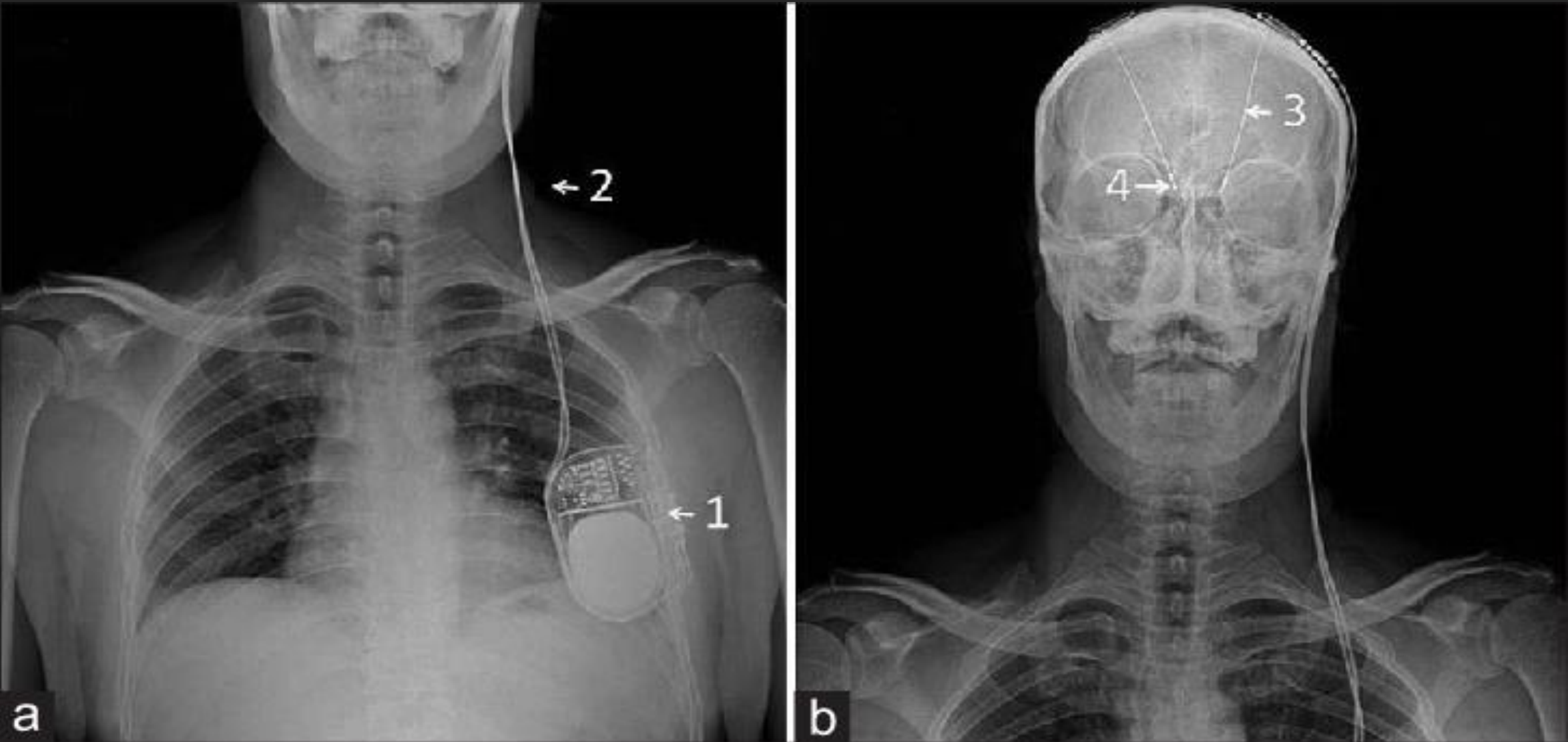


Figure 1: X-rays showing deep brain stimulation hardware implanted in a patient. Figure 1A shows the extra-cranial components and 1B, the intracranial components. (1) pulse generator, (2) extension wire (3) deep brain stimulation lead (4) tip of the lead with four electrode contacts implanted in the target

Preprocedural recommendations and
guidelines:

- Consult device representative
- Multidisciplinary consult with Neurology + Neurosurgery
- Preprocedural DBS device interrogation
- DBS deactivation for approximately 30 minutes can serve as a clinical trial to assess the patient's tolerance and anticipated neurologic status during the procedure

Intraprocedural recommendations and
guidelines:

- Appropriate adjustment of power settings and lesion time
- Bipolar RFA preferred over monopolar RFA
- Place the RFA cannula more than 6 inches from the internal pulse generator and its leads to avoid EMI interference
- If using Monopolar RFA utilize contralateral grounding pad placement

Postprocedural recommendations and
guidelines:

- Postprocedural device interrogation
- Evaluate for pain, warmth, or swelling over the pulse generator + lead tracts (could indicate thermal injury)

DISCUSSION

Key points

- RFA should always be performed with the DBS turned off
- Grounding pad on the contralateral side + placed far away from the pulse generator and leads
- Lowest effective power and lesion time
- Evaluate DBS site and lead tracts for signs of thermal injury

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Gabriel Augustin, M.D.,
Ketan Chopra, M.D.

