



ECAP-Controlled Closed-Loop Spinal Cord Stimulation for Chronic Angina – A Case Report

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Introduction

Spinal cord stimulation (SCS) is an effective treatment for refractory angina pectoris (RAP).^{1, 2} Despite development of paresthesia-free stimulation, RAP is often managed with tonic paresthesia-based stimulation. One limitation of tonic, closed-loop SCS systems is intermittent unpleasant changes in stimulation intensity due to variation in distance between electrodes and the spinal cord. Closed-loop systems adjust stimulation automatically thereby maintaining intensity within a therapeutic window, and subsequently offering an advantage in conditions responsive to tonic stimulation.^{3,4,5}

Materials and Methods

As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per Mayo Clinic policy. Patient consent was obtained.

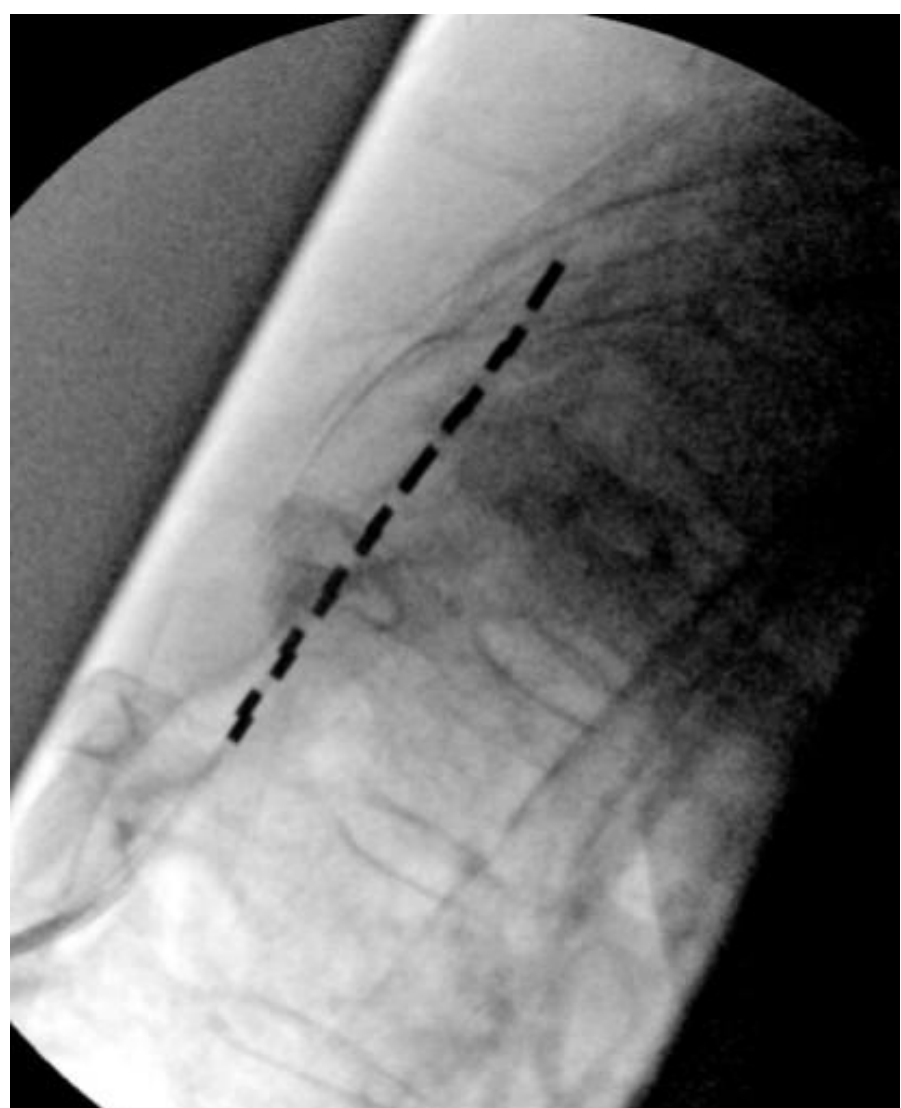
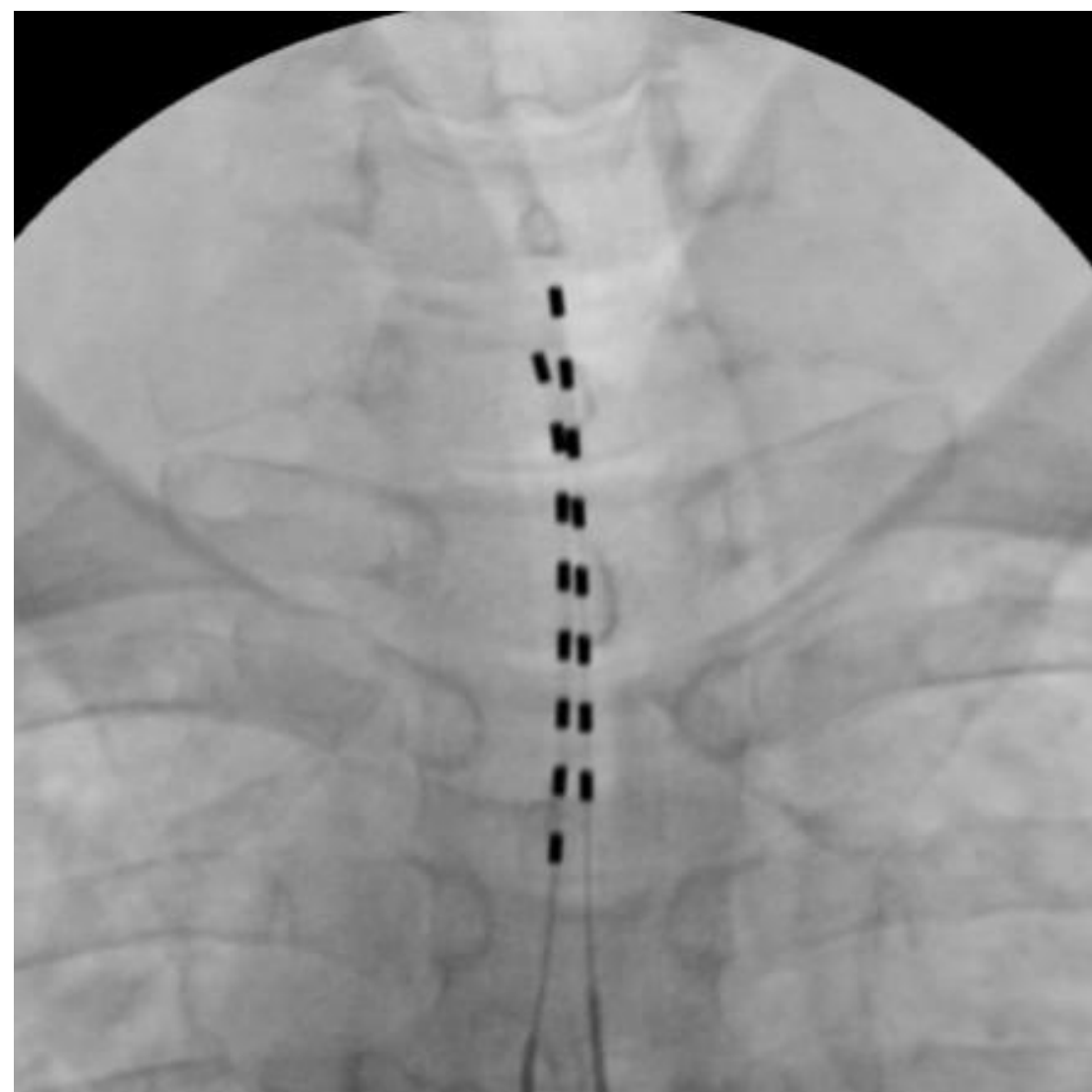


Results/Case Report

47-year-old woman was referred to our clinic from cardiology for refractory angina pectoris. Patient described episodic left chest pain with dyspnea which has significantly impacted her ability to work and function. The pain often required multiple nitroglycerin tablets per day and has led to frequent emergency room visits. She has been diagnosed with severe coronary endothelial dysfunction based upon coronary angiography with a coronary spasm provocation study. After failure of multiple first and second line treatments, she was referred for consideration of SCS.

We proceeded with SCS utilizing an evoked compound action potential (ECAP)-controlled closed-loop system with electrodes spanning from the bottom of C7 to the bottom of T3.

At four month follow up, the patient reported 90% improvement in pain and significant functional improvements. Her utilization of the nitroglycerin tablets had decreased, and she was very satisfied. Similar improvements were reported at the most recent 8 month follow up.



Discussion

This case demonstrates the third patient to experience success with ECAP-controlled closed-loop SCS for refractory angina pain to our knowledge. Considering the historical reliance on tonic stimulation for RAP and the associated risk of intermittent unpleasant changes in stimulation intensity, ECAP-controlled closed-loop SCS offers a potential solution. Further research comparing closed-loop SCS to other SCS technologies for RAP would be beneficial.

References

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