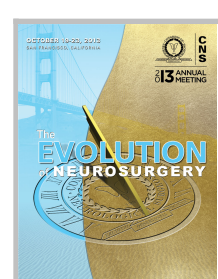


# Use of Intraoperative Collision Testing vs Electromyography for Predicting Postoperative Foot Paresthesias during Spinal Cord Stimulation

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## Introduction

Intraoperative neurophysiologic mapping has been shown to facilitate placement of spinal cord stimulators (SCS) under general anesthesia. While several techniques are effective in predicting laterality of stimulation effect, no study has described a technique for predicting postoperative paresthesias in the feet.

Mapping using stimulator triggered electromyography (stimTrEMG) uses responses elicited in specific myotomes to predict corresponding dermatomal paresthesias. Another mapping technique utilizes SCS collision interference with ascending somatosensory signals (SSEP) to verify activation of dorsal column fibers corresponding to the sensory distribution of a peripheral nerve. In this study we compared collision testing and stimTrEMG for predicting SCS-triggered paresthesias in the foot/ankle.

## Methods

The records of 12 patients were reviewed retrospectively following placement of a thoracic SCS under general anesthesia. Each patient was tested intraoperatively using both stimTrEMG and collision of posterior tibial nerve (PTN) SSEPs. The distal extent of stimTrEMG activation and the presence of SSEP collision were compared with patient reports of foot/ankle paresthesias during stimulator programming post-operatively.

## Results

Paresthesias in the foot/ankle were noted for 13 of 19 (73%) tested SCS sites (electrode pairs) in 12 patients. StimTrEMG elicited responses from the distal leg at 3/19 sites, only two of which were associated with foot/ankle paresthesias. The sensitivity of stimTrEMG for prediction of distal paresthesias was 15%, while the specificity was 83%. By comparison, positive collision was noted at 11/19 sites, all of which were associated with post-operative foot/ankle paresthesias. The sensitivity of collision testing for prediction of distal paresthesias was 85%, while the specificity was 100%.

## Conclusions

Positive PTN SSEP collision tests appear correlated with post-operative ankle/foot paresthesias. While patients may experience ankle/foot paresthesias even when stimTrEMG activation does not include the foot or lower leg, the sensitivity for this prediction may be low.

## Learning Objectives

By the conclusion of this session, participants should be able to

- 1) Be familiar with two different techniques for intraoperative dorsal column mapping in asleep placement of spinal cord stimulators
- 2) Understand the relative value of these two techniques for predicting foot/ankle paresthesias post-operatively.

## References

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