

Effective use of Checkpoint Nerve Stimulator in the dissection of a peroneal nerve tumor

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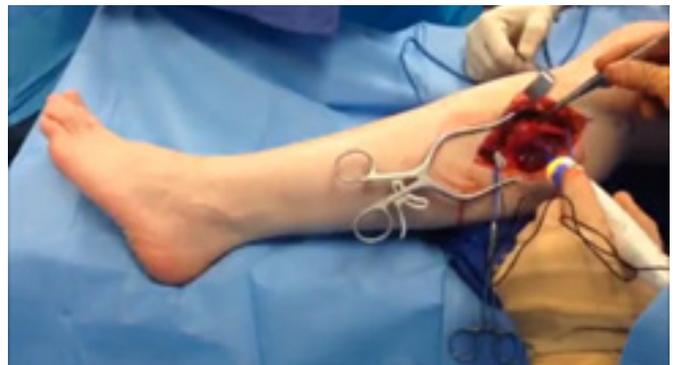
Introduction

Schwannomas are the most common neurogenic tumor in peripheral nerves, accounting for approximately 5% of benign soft tissue neoplasms. In contrast to a neurofibroma where the fascicles are embedded in the tumor, schwannomas arise from and are well encapsulated by the neural sheath.¹ While damage to the parent nerve is inevitable in neurofibroma excision, in schwannoma, surgical enucleation is generally believed to be routinely possible, producing little damage to the underlying nerve fascicles. However, recent studies suggest a greater likelihood of neural injury. Even with meticulous dissection under magnification, resection of schwannomas may cause transient or permanent neurological damage.² Oberle et al. reported immediate postoperative sensory deficits in six of 12 patients.³ Donner et al. reported that 13% of 85 patients in their series developed muscle weakness after surgery,⁴ and a study by Kim et al. showed an immediate neurological deficit in 76.7% of patients and residual deficit at final follow up in 36% of patients.⁵ Given the significant risk of neurologic complications inherent to the excision of schwannomas, we present a case illustrating the use of a hand-held biphasic nerve stimulator (Checkpoint Surgical, Cleveland, OH) for safe, repetitive intra-operative nerve stimulation for monitoring nerve function throughout the procedure.

Case Study

Patient is a 43-year-old male with a left lower extremity mass, just distal to the lateral knee, slowly enlarging over the previous seven to eight years. On examination, the mass was found to be tender to palpation, with a positive Tinel's sign radiating distally into the leg. No sensory or motor deficits of the extremity were observed. An MRI was subsequently ordered which confirmed the diagnosis of schwannoma of the peroneal nerve. The decision was made to proceed with surgical excision, and pre-operatively the patient was extensively counseled on the risk of both sensory and motor loss to the extremity, including foot drop.

Intra-operatively, the tumor was identified and meticulously dissected from the surrounding



Intraoperative stimulation to identify and preserve motor fascicles during the dissection.



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fascicles under magnification. It was found to be at the bifurcation of the superficial and deep peroneal branches, and each branch was carefully peeled away from the tumor. The Checkpoint® nerve stimulator was used throughout dissection to identify and preserve motor fascicles. Specifically, Checkpoint's biphasic waveform allowed for repeated stimulation without fatigue, providing reliable, continuous feedback of fascicle function.

Post-operatively the patient suffered no neurologic or functional deficits to the lower extremity, and by four year follow up had returned to all activities, including sports.

Conclusion

Despite the encapsulated nature of schwannomas, surgical excision can be fraught with neurologic complications. Especially in the lower extremity, the threshold for iatrogenic injury tends to be lower as the functional consequences of motor weakness can be devastating. The Checkpoint Nerve Stimulator allows for intraoperative feedback of motor function, allowing for a safer dissection of these challenging tumors.

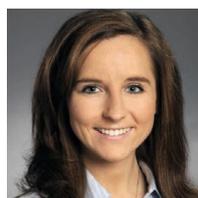
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About the authors



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The Checkpoint Stimulator is a single-use, sterile device intended to provide electrical stimulation of exposed motor nerves or muscle tissue to locate and identify nerves and to test nerve and muscle excitability. Do not use this Stimulator when paralyzing anesthetic agents are in effect, as an absent or inconsistent response to stimulation may result in inaccurate assessment of nerve and muscle function. For a complete list of warnings and precautions regarding the use of the Stimulator please see www.checkpointsurgical.com.