

Novel technique for intraoperative sciatic nerve assessment in complex primary total hip arthroplasty: *a pilot study*

Shai Shemesh, MD, Samuel Overly, MD, Jonathan Robinson, MD, Calin Moucha, MD & Darwin Chen, MD

Hip Int. 2017 Oct 9:0. doi: 10.5301/hipint.500055

Abstract

Sciatic nerve injury (SNI) is a potentially devastating complication after total hip arthroplasty (THA). Intraoperative neural monitoring has been found in several studies to be useful in preventing SNI, but can be difficult to implement. In this study, we

examine the results of using a handheld nerve stimulator for intraoperative sciatic nerve (SN) monitoring during complex THA requiring limb lengthening and/or significant manipulation of the SN.



Scan QR code for access to full article as published in *Techniques in Orthopaedics*, August 2017

Checkpoint Surgical

Checkpoint Surgical, Inc.
22901 Millcreek Blvd., Suite 360
Cleveland, Ohio 44122
216.378.9107
www.checkpointsurgical.com

Author's Objective and Conclusion:

- ✓ The objective is to present the technique of using a biphasic handheld nerve stimulator in the complex total hip arthroplasty procedure as an alternative way to monitor neurological structures intraoperatively to avoid clinically detectable nerve injuries in this complex procedure
- ✓ Neural monitoring has been found to be useful in preventing sciatic nerve injury, but can be difficult to implement during surgery
- ✓ "With regards to predicting post-operative SCI, there were no false positive or false negative results. Therefore, in our small population, the sensitivity and the specificity of the intraoperative measurements to predict SCI were both 100%."



Key Points As Determined by Qualified Checkpoint Personnel

1. Sciatic nerve injury (SNI) is reported in the literature as a well known potentially devastating injury with an occurrence rate between 0.08% to 3.7% in total hip arthroplasty, and can increase up to 5.2% for individuals that have developmental dysplasia of the hip
2. The mechanisms for SNI include forceful dislocation of the femoral head, direct compression or excessive tension from retractors, stretching of the nerve from leg lengthening, pressure from hematoma, and entrapment of the nerve from cerclage wires
3. While studies have shown that intraoperative nerve monitoring can be useful, the method requires additional equipment and an expensive addition with estimated cost ranging from \$6,088 to \$7,828
4. Stimulation was applied directly to the nerve to ascertain the baseline threshold (lowest amplitude and pulse duration to evoke a muscle contraction), this was done pre-reduction and pre-lengthening. Both tibial and peroneal divisions were stimulated.
5. Sciatic nerve stimulation was again performed following trial component placement and reduction. If the baseline stimulation increased as compared to the original threshold levels, tension on the nerve was reduced by one of four options reported in the study
6. The return to baseline of the threshold values indicated that the nerve was no longer under tension and that the appropriate measure had been taken to minimize SNI
7. In 11 complex THA reconstruction cases, there was no occurrence of permanent postoperative sciatic nerve palsy, and there was an average increase in leg length of 28.58 mm (ranging from 6.3 to 51.19 mm)
8. The device is simple to use, reproducible, and does not significantly prolong the duration of surgery or preoperative set-up

This document is a product of Checkpoint Surgical, Inc. and has not been reviewed or approved by the authors of the above-referenced article. Please refer to the full text of the article for a complete review of the subject matter thereof.

See www.checkpointsurgical.com for indications, contraindications, precautions and warnings.

**Checkpoint
Surgical**

CS-MKT-158-A