

# Intraoperative Nerve Monitoring With a Handheld Intraoperative Biphasic Stimulator: *Evaluation of Use During the Latarjet Procedure.*

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Techniques in Orthopaedics: Post Author Corrections: August 1, 2017

Date of access 4-6-18. DOI 10.1097/BTO0000000000000250

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## Abstract

The Latarjet procedure is well known to be technically challenging, with an incidence of neurological complications ranging from 1.8% to 20.6%. Recently, intraoperative neuromonitoring has been used to define the stages of the Latarjet when the nerves are at the highest risk. Our objective is to present short-term neurological outcomes and technique of using a biphasic handheld nerve stimulator. We retrospectively evaluated the charts of all patients who had undergone a Latarjet procedure by the senior author once we began using the biphasic handheld intraoperative nerve stimulator. Data collection included age, sex,

number of prior surgeries, body mass index, length of surgery, and anesthetic. Surgical technique was the same for all procedures. Neurological examinations were documented at first postoperative visit. In total, 37 patients underwent a Latarjet procedure between May 2012 and September 2014. Average age was 23, with 35 males and 2 females. No nerve deficits were detected during surgery, nor were any deficits clinically detectable in sensory or motor examinations at first postoperative visit. This technology may be very helpful and practical to utilize during this complex surgery.



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## Objective and Conclusion:

- ✓ The objective is to present the technique of using a biphasic handheld nerve stimulator in the Latarjet procedure as an alternative way to monitor neurological structures intraoperatively to avoid clinically detectable nerve injuries in this complex procedure
- ✓ For a majority of sports surgeons, continuous intraoperative nerve monitoring for the Latarjet procedure is not realistic in the community setting from a time, cost and availability standpoint, and it is unclear if all reported intraoperative alerts and nerve injuries are clinically relevant
- ✓ The use of a handheld biphasic intraoperative nerve stimulator is a simple and safe tool to assess intraoperative nerve injury and can give surgeons confidence at the time of surgery to ensure that no catastrophic neurological injury as occurred, as evidenced by the absence of any postoperative nerve deficits detected in the 37 patients in the study



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CS-9094-MKT-149-A

## Key Points

- The Latarjet procedure provides reliable and successful results, but the high rates of reported neurological complications may deter surgeons from performing this technically challenging procedure
- Continuous neuromonitoring is a useful tool to prevent postoperative nerve deficit, but Delaney et al still reported a 20.6% rate of nerve deficit postoperatively
- Continuous neuromonitoring makes us more aware of nerve events during the procedure, it may not actually help prevent postoperative neurological deficits
- The focus of the study was to find a device that would help us avoid catastrophic nerve deficit while not alarming us too greatly about clinically nondetectable nerve alerts that may just be unavoidable in this type of surgery
- A biphasic handheld stimulator was used at specific time points during the procedure:
  - ✓ The axillary nerve and musculocutaneous nerve position can be confirmed with nerve stimulation
  - ✓ Obtain a baseline of the stimulation parameters needed to stimulate muscle response
  - ✓ After several key stages throughout the case, recheck the nerves to assure no substantial increase in stimulus to attain threshold muscle response
- Testing the nerve with the stimulator takes no > 10 seconds, so liberal use of the stimulator is encouraged to identify nerve irritation
- The drawback of the handheld biphasic nerve stimulator is that it is not a continuous monitor of nerve function and thus one cannot be sure exactly at what step a nerve injury has occurred
- The handheld biphasic nerve stimulator gave us confidence leaving the operating room, that we had avoided any major nerve injuries and we had no patients with clinically detectable nerve deficits at their first postoperative visit
- This type of handheld device could be easily utilized by the community orthopedic surgeon
- Use of this device allows proper documentation of neuroprotection during complex surgery