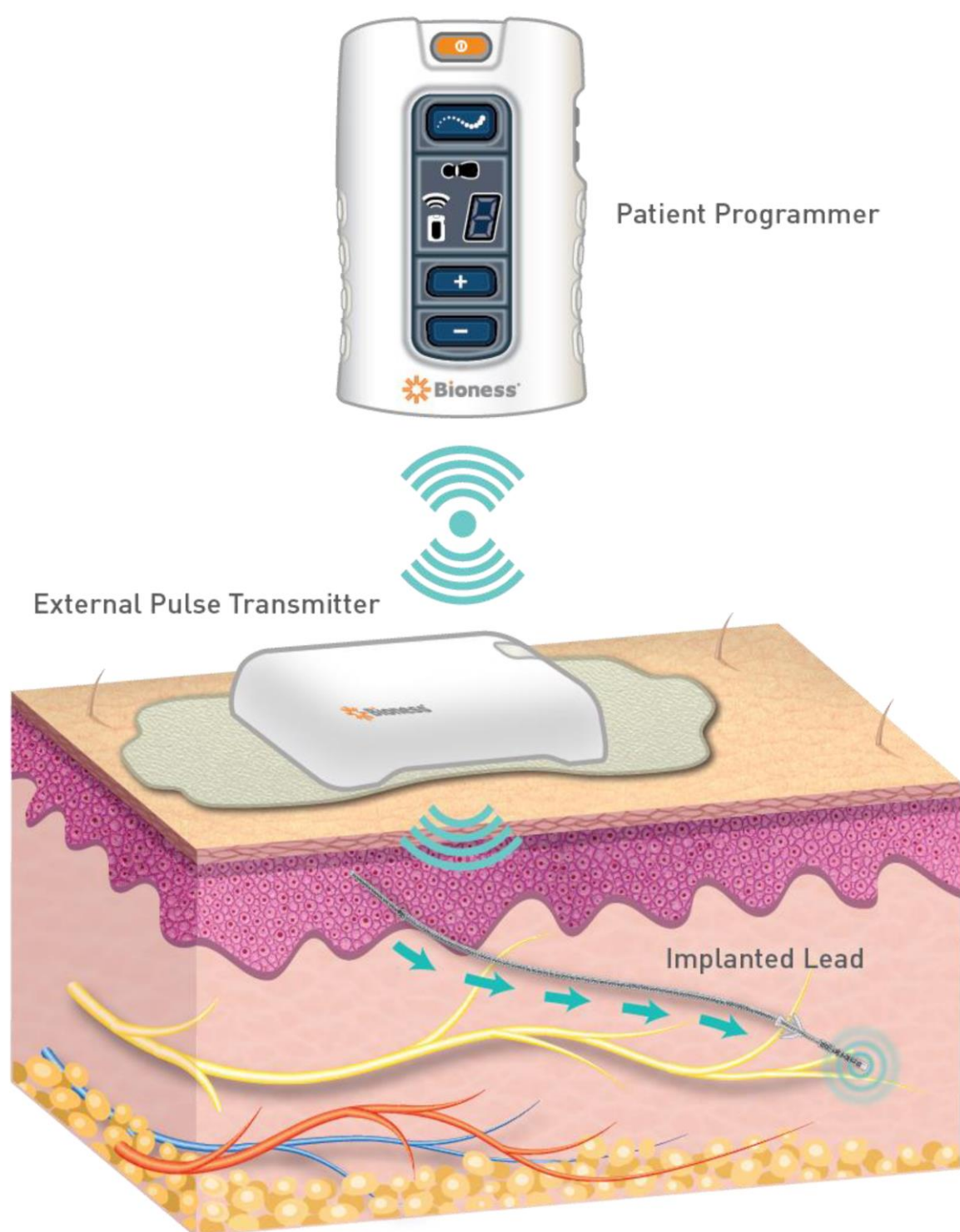


INTRODUCTION

- Phantom limb pain (PLP) is a debilitating neuropathic condition occurring after amputation caused by a combination of peripheral nerve injury, central sensitization, and cortical reorganization.
- Emerging studies support the usage of peripheral nerve stimulation (PNS) for PLP, using both temporary (60-day) and permanent systems.
- Some protocols utilize a 60-day external pulse generator as an extended trial, with progression to permanent implantation based on clinical response, though further research is warranted.

MATERIALS AND METHODS

As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per the Central Virginia Veterans Affairs Health System policy. This is considered an off-label indication for the use of peripheral nerve stimulation.



RESULTS / CASE REPORT

A veteran with a history of an above-knee amputation (AKA) due to dysvascular disease developed refractory phantom limb pain, which significantly limited his function and prosthesis use. He also had a history of difficulty with prosthesis fitting with multiple revisions due to residual limb sensitivity. Initial management included ultrasound-guided neuroma nerve blocks, which provided short-term relief. Given ongoing symptoms, he underwent a 60-day temporary peripheral nerve stimulation (PNS) trial targeting the femoral nerve. During the 60 day trial, he reported approximately 70% improvement in phantom pain. However, at three-month follow-up after explant, he reported only 40% sustained relief. Notably, during the trial he experienced difficulty ambulating with his prosthesis in place due to interference between the external battery and the prosthetic socket, which limited his functional goals.

Given the initial positive response, the decision was made to proceed with permanent PNS implantation. To mitigate issues with prosthesis fit and maximize long-term success, the femoral nerve peripheral nerve stimulator is planned to be targeted at the highest safely accessible point with an extendable patch trailing to the lower abdomen. His rehabilitation physician and prosthetist were also engaged to coordinate adjustments allowing for proper prosthesis use with the planned permanent system.

DISCUSSION

- This case report highlights a unique approach to PLP, employing a 60-day temporary femoral-nerve PNS as an extended trial prior to permanent PNS implantation.
- The patient experienced ~70% pain relief—but the external battery of the PNS device impeded proper use of his above-knee prosthesis.
- To mitigate this, an extendable abdominal patch and possible socket adjustment will be utilized for the permanent implantation, aiming to maintain prosthesis function and reduce lead fracture and migration risk.
- Temporary femoral nerve PNS provided significant short-term phantom pain relief but was limited by prosthesis interference. Future implant positioning strategies that prioritize both pain control and functional prosthesis compatibility may enhance long-term outcomes.

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