

We present a medically-challenging case of a **patient who required amputations of all four extremities** due to vasopressor-induced ischemic necrosis, and received **aggressive modern multimodal pain management** post-operatively including the **pre-emptive use of peripheral nerve catheters** in a successful attempt to **prevent the development of phantom limb pain and opioid dependence.**

Prevention of phantom limb and chronic pain after amputation of all four extremities with the pre-emptive use of peripheral nerve catheters

Case Report

- A 52 year old female developed vasopressor-induced ischemic necrosis of all four extremities in the setting of streptococcal toxic shock syndrome.
- She required multiple surgical procedures including right transhumeral, left transradial, and bilateral below knee amputations.
- Each time, post-operative pain was managed aggressively with preoperative neuropathic agents and peripheral nerve catheters, specifically bilateral sciatic-popliteal and infraclavicular catheters with continuous infusions of 0.125% bupivacaine.
- Excellent pain control was achieved with the peripheral nerve catheters and neuropathic medications, with no opioid requirement.
- Upon discharge from rehabilitation, the patient reported minimal phantom limb sensation, but never developed any phantom limb pain (PLP) or opioid dependence.

Background

- Prior studies report that the incidence of PLP is as high as 41% at 3 months and 82.7% at 12 months post-amputation.¹
- The use of peripheral nerve catheters as pre-emptive analgesia in attempt to prevent PLP has been studied, although results of these studies have been mixed, and methodologic issues such as small sample sizes and patients being lost to follow-up may limit the broader applicability of these data.³
- The most robust randomized double-blind placebo-controlled trial of pre-emptive analgesia with peripheral nerve catheters after amputation found that there was no difference in the incidence of PLP compared to standard of care, although the study was underpowered to assess this primary outcome.²

Discussion

- This case supports prior hypotheses that prevention of peripheral pain signals from reaching the central nervous system after amputation may prevent cortical reorganization and the development of PLP.⁴
- Further studies with larger sample sizes are needed to determine definitively whether pre-emptive analgesia with peripheral nerve catheters after amputation reduces the incidence of PLP.
- Until further data is published, we advocate for an aggressive multimodal pain management approach including the use of peripheral nerve catheters and neuropathic agents preoperatively in all patients undergoing amputation who do not otherwise have contraindications.
- In addition to improving patient comfort, we believe that the incidence of PLP can be reduced by preventing peripheral pain signals from reaching the central nervous system in the acute post-operative period after amputation.

References

