



Successful Treatment of Breakthrough Phantom Limb Pain (PLP) with Ketamine in a Patient on Chronic Opioids



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Introduction

Phantom limb pain is common after amputation.

Treatment with ketamine has garnered recent attention, given the common persistence of symptoms despite complex multimodal treatment algorithms in PLP patients.

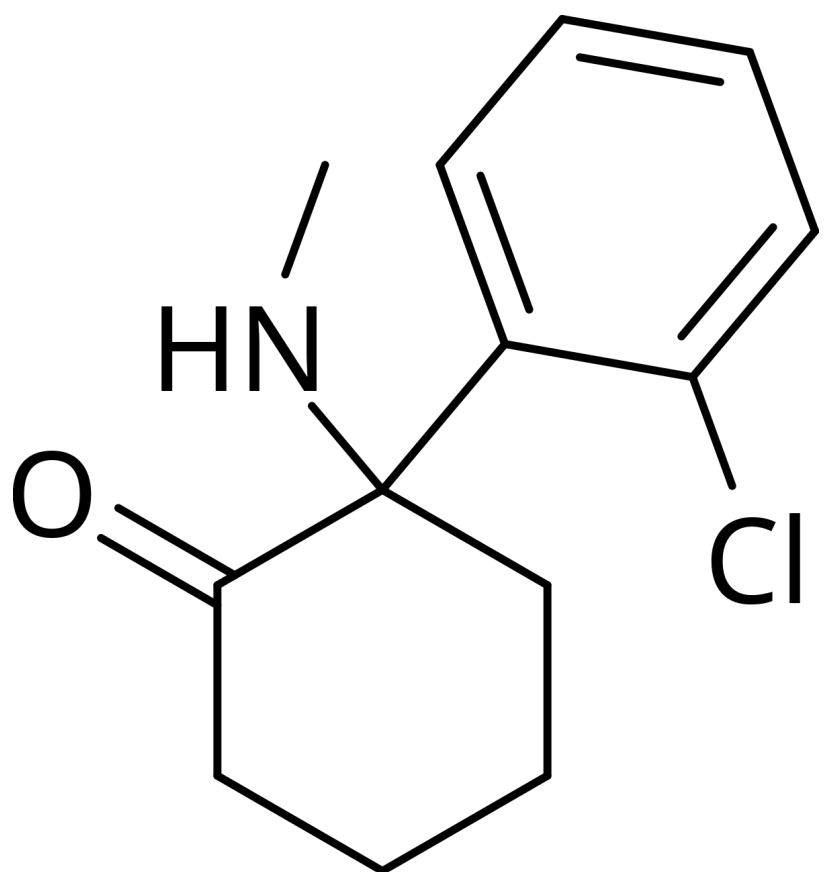
We present the case of a patient on chronic opioid therapy admitted for above-the-knee amputation with breakthrough postoperative phantom limb pain successfully treated with intravenous ketamine infusion.

Evidence supports the administration of ketamine in post-operative amputation patients with phantom limb pain.

MATERIALS AND METHODS

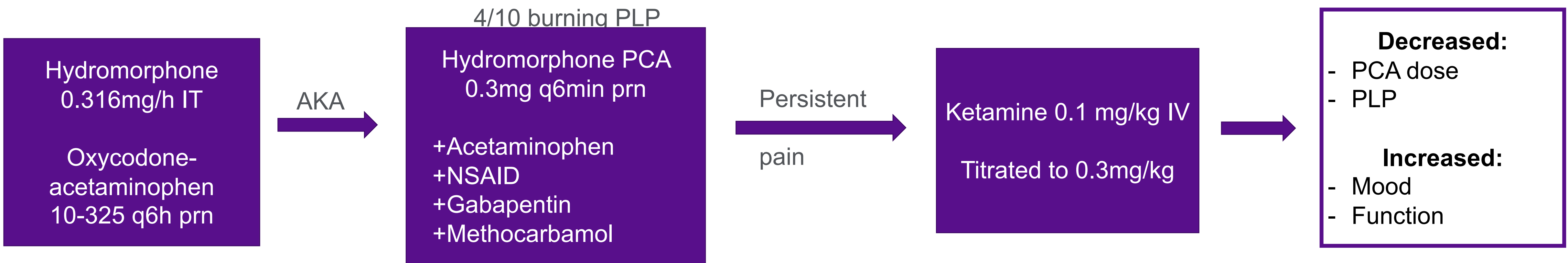
As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per NYU policy.

Figure 1. Ketamine chemical structure (C₁₃H₁₆ClNO)



RESULTS (CASE REPORT)

A 59-year-old female with a history of obesity, depression, osteoarthritis, and right knee prosthetic joint infection managed with over 80 orthopedic surgeries and procedures requiring chronic antibiotics was admitted for right above-the-knee amputation as definitive treatment for the prosthetic joint infection.



DISCUSSION

- In PLP, dorsal horn neurons are thought to be inappropriately sensitized, possibly at NMDA receptor sites [1].
- Ketamine is thought to act as a non-competitive antagonist at the phencyclidine binding site of the N-methyl-d-aspartate (NMDA) receptor, particularly in the prefrontal cortex and hippocampus [1].
- IV morphine and IV ketamine are best supported (level 2 evidence) for the short-term perioperative treatment of PLP. In long-term chronic PLP, oral Morphine has the best efficacy based on current literature [2], but this patient had previously been utilizing high-dose opioids with a hydromorphone pump for several years. Furthermore, the patient's opioid dosage had been increasing until ketamine infusion therapy was initiated.
- One study examined the effect of perioperative ketamine infusion on post-op PLP and found a non-statistically significant reduction in PLP [3].
- Ketamine's side effects should be considered in parallel with the side effects of an opioid alternative. It is important to assess cognitive function, urinary discomfort, and substance use when considering repeated administrations.
- Some Ketamine side effects, including improvement in mood [4], are beneficial. Especially in chronic pain patients, a population with a higher relative incidence of comorbid mood disorders, this additional benefit is welcomed.
- Due to the substance abuse liability of ketamine, clinicians are advised to be vigilant about the potential development of ketamine use disorder, implementing close clinical follow-up, urine toxicology screening, and monitoring attempts to seek additional treatments.

CONCLUSIONS

This case highlights the utility of ketamine trials in patients with PLP who are resistant to other pain management medications and reinforces the role ketamine may play in multimodal pain control, improving pain scores, decreasing PLP, improving functional status, and decreasing reliance on opiates.

REFERENCES

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